

NEW BEDFORD CITY HALL NEW ELEVATOR RENOVATIONS

133 WILLIAMS STREET, NEW BEDFORD, MA 02740

PROJECT MANUAL

BID SET
June 12, 2019

ARCHITECT
MOUNT VERNON GROUP ARCHITECTS, INC.
47 N. Second Street
New Bedford, MA 04720
(508) 991-7500

STRUCTURAL ENGINEER
SOUZA, TRUE AND PARTNERS
265 Winter Street, 3rd Floor
Waltham, MA 02451
(617) 926-6100

ELECTRICAL ENGINEER
SHEPHERD ENGINEERING, INC.
1308 Grafton Street
Worcester, MA 01604
(508) 757-7793

FIRE SUPPRESSION, PLUMBING, MECHANICAL ENGINEER
CROSSFIELD ENGINEERING, INC.
921 Salem St.
Groveland, MA 01834
(978) 372-8880

ELEVATOR CONSULTANT
SYSKA HENNESSY GROUP
10 Post Office Square, Suite 725
Boston, MA 02019
(617) 682-4776

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**NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS
NEW BEDFORD, MASSACHUSETTS**

June 12, 2019

Mount Vernon Group Architects, Inc., Project No. 02014.35

SPECIFICATION SECTION

DOCUMENT DATE

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June 12, 2019

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**NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS
NEW BEDFORD, MASSACHUSETTS**

Mount Vernon Group Architects, Inc., Project No. 02014.35

June 12, 2019

SPECIFICATION SECTION

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June 12, 2019

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June 12, 2019

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**NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS
NEW BEDFORD, MASSACHUSETTS**

Mount Vernon Group Architects, Inc., Project No. 02014.35

June 12, 2019

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NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

May 14, 2019

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

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INVITATION FOR BID
CITY OF NEW BEDFORD
Dept. of Facilities and Fleet Management
City Hall Elevator Project
New Bedford, Massachusetts

Contract # 20192009



Date: Wednesday, June 12, 2019

Jonathan F. Mitchell
Mayor

Dept. of Facilities and Fleet Management
294 Liberty Street
New Bedford, MA 02740

Legal Ad
CITY OF NEW BEDFORD
MASSACHUSETTS
Advertisement
City Hall Elevator Project
INVITATION FOR BID # **20192009**

The City of New Bedford, Purchasing Department, in conjunction with the City of New Bedford Department of Facilities and Fleet Management is soliciting sealed bids for the New Bedford City Hall Elevator Project, in accordance with the drawings and specifications prepared by Mount Vernon Group Architects, Inc.

The construction cost for this project is estimated at \$1,000,000.00 dollars.

The work of this contract is predominately: GENERAL CONTRACTOR. Contract Documents, including Drawings, Bidding Requirements, General Conditions, Specifications, and Addenda may be seen or examined after **Wednesday, June 12, 2019**. Documents are available electronically to Jorge Figueiredo at jfigueiredo@mvgarchitects.com.

Sealed Bids for the Following Filed Sub-Trades:

Section: Elevator, Masonry, HVAC and Electrical will be received by the New Bedford Purchasing Department, 133 William Street, Room 208, New Bedford, MA 02740 until **11:00 am on Thursday, June 27, 2019** at which time all bids will be publicly opened and read aloud. Included with all Sub-bids shall be an updated statement, DCAMM Certification and 5% bid deposit. Bid deposits may be in the form of Certified Check, Certificate of Deposit or Bid Bond made payable to the City of New Bedford, MA.

Sealed Bids for the General Contract will be received by the New Bedford Purchasing Department, 133 William Street, Room 208, New Bedford, MA 02740 until **11:00 am on Tuesday, July 9, 2019**, at which time all bids will be publicly opened and read aloud. Included with the General Bid shall be an update Statement, DCAMM Certification and a 5% bid deposit. Bid Deposits may be in the form of a Certified Check, Certificate of Deposit or Bid Bond made payable to the City of New Bedford, MA.

A Pre-Conference/Site Inspection will be conducted for the benefit of all potential bidders on **Friday, June 21, 2019, at 10:00 am** at City Hall, 133 William Street, New Bedford, MA 02740

Questions regarding the site inspection may be forwarded by Monday, July 1, 2019 by 4:00 pm to Jorge Figueiredo at jfigueiredo@mvgarchitects.com.

The attention of Bidders is called to Massachusetts General laws Chapter 149, Sections 44A through 44H inclusive, qualification will be by the Division of Capital Asset Management and Maintenance (DCAMM). Furthermore, all bidders must submit a Certificate of Eligibility and Update Statement along with their bid. Any bid submitted without the appropriate certificate shall be invalid. Procedures respecting bids and the selection of contractors shall be in conformance with the provisions of M.G.L. Chapter 149, Sections 44A-44H inclusive.

Bids are subject to MGL c. 149 e44A-J and to minimum wage rates as required by MGL c. 149 Sections 26 to 27H inclusive.

The Awarding Authority reserves the right to waive any and/or all informalities in the bidding. The Awarding Authority also reserves the right to reject any or all bids, or to accept any other than the lowest bidder should it be deemed to be in the best interest of the City.

AWARDING AUTHORITY
CITY OF NEW BEDFORD
Susan Bruce, Director of Purchasing



INVITATION FOR BID

The City of New Bedford, the Awarding Authority, invites sealed bids for the New Bedford City Hall Elevator project in accordance with Drawings and Specifications prepared by Mount Vernon Group Architects, Inc. Bidding procedures shall be in accordance with all applicable portions of Massachusetts General Laws, Chapter 149 – Sections 44A to 44J, inclusive, Section 26 to 29 inclusive, and Chapter 30, Section 39F to 39M inclusive, and 39R of the General Laws of the Commonwealth of Massachusetts, as amended to date. All inquiries and requests for bid documents are to be sent to Jorge Figueiredo, Mount Vernon Group Architects, Inc. at jfigueiredo@mvgarchitects.com.

Project Value is estimated to be \$ 1,000,000.00

The Work of this Contract is scheduled to be substantially completed no later than 180 days, following receipt of the Owner's Notice to Proceed.

Sealed Bids for the following Filed Sub-Trades: Elevator, Masonry, HVAC and Electrical will be received by the New Bedford Purchasing department, 133 William street, Room 208, New Bedford, MA 02740 until **11:00 am on Thursday, June 27, 2019** at which time all bids will be publicly opened and read aloud. Included with all Sub-bids shall be an updated statement, DCAMM Certification and 5% bid deposit. Bid deposits may be in the form of a Certified Check, Certificate of Deposit or Bid Bond made payable to the city of New Bedford.

Sealed Bids for the General Contract will be received by the New Bedford Purchasing Department, 133 William Street, New Bedford, Massachusetts, 02740 until **11:00 am, on Tuesday, July 9, 2019** at which time all bids will be publicly opened and read aloud. Included with General Bid shall be an Update Statement, DCAMM Certification and 5% bid deposit.

General Bids must be submitted on the Form or General Bid included herein. The General Bids shall be completely filled in, signed, enclosed in an envelope, sealed and plainly marked with the project name. The General Bids shall be filed with the Owner at the location designated above accompanied by a bid deposit 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 payable to the City of New Bedford in the amount of 5% of the bid.

The rate per hour of the wages to be paid to mechanics, teamsters, chauffeurs and laborers in the Work to be performed shall not be less than the rate of wages determined for this Work by the Commissioner of Labor and Industries of the Commonwealth of Massachusetts under the provisions of General Laws, Chapter 149, Section 28, as amended, a schedule of which appears in the Specifications.

A Performance Bond and also a Labor and Materials Payment Bond, each of a surety company qualified to do business under the laws of the Commonwealth of Massachusetts, satisfactory to the Owner, and each in the sum of 100% of the Contract Price will be required of the successful general bidder.

The successful bidder will be required to provide insurance for the payment of compensation and the furnishing of other benefits under the Workmen's Compensation Law, General Laws, Chapter 152, to all persons to be employed under the Contract, and sufficient proof of compliance with the forgoing stipulation will be required before commencing performance of this Contract.

All bids shall remain in effect for thirty (30) days, Saturdays, Sundays and legal holidays excluded, after the opening of General Bids.

There shall be a re-bid meeting on Wednesday, October 24, 2018 at 10:00 am at the project site located at 51 Bedford Street, New Bedford, MA 02740.

The Owner reserves the right to waive any informalities and to reject any or all general bids if it be in the public interest to do so.

END OF INVITATION TO BID

FORM FOR GENERAL BID

FROM:

TO: City of New Bedford
Purchasing Department
133 William Street, Room 208
New Bedford, MA 02740

- A. The undersigned proposes to furnish all labor and materials required for the implementation of: **New Bedford City Hall Elevator Project**

In accordance with the accompanying plans and specifications prepared by **Mount Vernon Group Architects, Inc.** for the contract price specified below, subject to additions and deductions in accordance with terms of the Specifications.

- B. This bid includes addenda numbered: _____, _____, _____, _____, _____, _____, _____, _____

- C. The proposed Contract Price is: _____ Dollars (\$_____)

- 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:

Item 2: Filed Sub-Bids as follows:

<u>SUB-TRADE</u>	<u>NAME OF SUB-BIDDER</u>	<u>AMOUNT</u>	<u>BOND REQUIRED</u>
<u>Elevator</u>	_____	\$ _____	_____
Masonry	_____	\$ _____	_____
HVAC	_____	\$ _____	_____
Electrical	_____	\$ _____	_____
TOTAL OF ITEM 2		\$ _____	

- E. 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 agrees that if he is selected as General contractor, 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 duly 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 amount names in their respective sub-bids and be in every way 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 hereto.

- F. The undersigned further certifies under the pains and 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 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 any other chapter of the General Laws or any rule or regulation promulgated there under.

Date: _____

Name of General Bidder: _____

By:

Name of Person Signing Bid and Title

Address

City, State, Zip Code

Email

Telephone

FORM FOR SUB- BID

FROM:

TO: City of New Bedford
Purchasing Department
133 William Street, Room 208
New Bedford, MA 02740
and
ALL GENERAL BIDDERS EXCEPT THOSE EXCLUDED:

A. The undersigned proposes to furnish all labor and materials required for completing, in accordance with the hereinafter described Contract Documents, including Plans, Specifications, and Addenda, all the Work specified in Section No. _____ SUB-TRADE _____ of the Specifications and in any Plans specified in such Section prepared by **Mount Vernon Group Architects, Inc.** for the New Bedford City Hall Elevator Project for the Contract Sum of: _____ Dollars (\$ _____)

B. This bid includes addenda numbered: _____, _____, _____, _____, _____, _____, _____, _____

C. This Sub-Bid

____ May be used by all General Bidders except: _____

____ May be used only by the following General Bidders: _____

(To exclude General Bidders, insert "X" on one line only and fill in the blank following the line.
Do not answer "C" if no General Bidders are excluded.)

D. The undersigned agrees that, if he is selected as a Sub-Bidder, he will within five (5) days, Saturdays, 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 so to do in the general bid by such General Bidder, who shall pay the premiums therefore, or if prequalification is required pursuant to Section 44D3/4, 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.

If prequalification is required pursuant to Section 44D3/4 of M.G.L. Ch. 149, the undersigned sub-bidder further agrees to pay the premiums for the performance and payment bonds furnished by sub-bidders as required therein and that all the cost of all such premiums is included in the amount set forth in Item A of this sub-bid.

E. The names of all persons, firms, and corporations furnishing the undersigned labor or labor and materials for the class or classes or part thereof of Work for which the provisions of the Section of the Specifications for this sub-trade require a listing in this paragraph, (including the undersigned if customarily furnished by persons on his own payroll and in the absence of a contrary provision in the specifications) the name of each such class of Work or part thereof and the bid price for each such class of work or part thereof are:

Name: _____ Class of Work: _____ Bid Price: _____

(Do not give bid price for any class or part thereof furnished by the undersigned.)

F. The undersigned agrees that the above list of bids to the undersigned represents bona fide bids based on the Drawings, Plans, Specifications and Addenda and that, if the undersigned is awarded the Contract, they will be used for the Work indicated at the amounts stated, if satisfactory to the Awarding Authority.

G. The undersigned further agrees to be bound to the General contractor by the terms of the herein before described Plans, Specifications (including all General Conditions stated herein) and Addenda, and to assume toward the general Contractor by all the obligations and responsibilities that the General Contractor, by those documents, assumes toward the Owner.

H. The undersigned offers the following information as evidence of his qualifications to perform the Work as bid upon according to all the requirements of the Plans and Specifications.

1. Has been in business under present business name _____ years
2. Ever failed to completed any Work awarded? _____ (If yes, briefly explain)
3. List one or more recent buildings with name of General Contractor and Architect on _____ which you served as Sub-Contractor for work of similar character as required for this _____ project.

Building Type	Architect	G/C	Contract Amount
a. _____			
b. _____			
c. _____			

4. Bank Reference: _____

I. The undersigned hereby certifies that he is able to furnish all 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 ten (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 made subject to section 44F.

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 the penalty of perjury that the said undersigned is not presently debarred from doing public construction Work in the Commonwealth under the provisions of Section 29F of M.G.L. Ch. 29, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated there under.

Date: _____

Name of Sub-Bidder: _____

By: _____
Name and Title of Person Signing

Address

City, State, Zip

Email

Telephone

INSTRUCTIONS TO BIDDERS

- A. **FOREWORD:** The attention of all bidders is called to all applicable provisions of Massachusetts General Laws, Chapter 149 – Sections 44A to 44J, inclusive, Section 26 to 29 inclusive, and Chapter 30, Section 39F to 39M inclusive, and 39R of the General Laws of the Commonwealth of Massachusetts, as amended to date.
- B. **GENERAL:** The Awarding Authority invites proposals for the Work described in the Contract Documents attached hereto. Before submitting his/her proposal each bidder shall visit the site, examine its conditions, thoroughly acquaint himself/herself with its obstacles and advantages for performing the Work, and compare the Contract Documents with the conditions found. All proposals submitted shall be subject to all applicable provisions of law, including, without limiting the generality of the foregoing, Chapter 30, Section 39F to 39M inclusive, and 39R, and Chapter 193 of the Acts of 2004, as amended to date.
- C. **QUESTIONS:** All questions as to the interpretation of the Contract Documents shall be submitted via email Jorge Figueiredo, Architect at jfigueiredo@mvgarchitects.com no later than **Monday, July 1, 2018 by 4:00 pm** to the and answers to such questions will be sent by the via email in the form of an Addendum, to every individual or firm on record as having taken a set of Contract Documents **on Wednesday, July 3, 2019 by 3:00 pm**. No questions will be answered unless received at least seven days, Saturdays, Sundays and legal holidays excluded prior to the expiration of the time set for filing sub-bids.
- D. **BID FORMS:** The Awarding Authority will furnish to every person applying therefore a Form for General Bid and a Form for Sub-Bid.
- E. **CONTRACT DOCUMENTS:** The Awarding Authority will, upon deposit of the amount per set as designated in the Invitation to Bid for the return of same in good condition, furnish one (1) complete set of Contract Documents to each Bidder requesting same. No partial sets of Contract Documents will be issued.
- F. **REJECTION OF CERTAIN GENERAL BIDS REQUIRED BY LAW:** The law requires that every general bid, and every sub-bid, which is not accompanied by the prescribed bid deposit or which is not on a form furnished by the Architect or Awarding Authority or otherwise does not conform with Chapter 30, Section 39F to 39M inclusive, and 39R, and Chapter 193 of the Acts of 2004, as amended to date, or which is on a form not completely filled in or which is incomplete, conditional, or obscure, or which contains any addition not called for, shall be rejected by the Awarding Authority.
- G. **FURTHER RIGHT TO REJECT GENERAL BIDS:** The Awarding Authority further reserves the right to reject any or all general bids if it be in the public interest so to do and to reject any sub-bid on any sub-trade if it determines that such sub-bid does not represent the sub-bid of a person competent to perform the Work as specified or that less than three such sub-bids were received and that the prices are not reasonable for acceptance without further competition.
- H. **GENERAL BIDS:** General Bids must be submitted on the FORM FOR GENERAL BID, a sample of which is bound into the Contract Documents as Section 00300 and may be removed and used for additional copies. The General Bid shall be completely filled in, signed, enclosed in an envelope, sealed and plainly marked with the Project Name. The bid accompanied by a bid deposit in the amount of five percent (5%) of the bid price shall be filed with the Awarding Authority at the place designated in the Invitation to Bid. The bid shall be filed before the time designated in the Invitation to Bid for the opening of General Bids.
- I. General Bids shall be for the complete Work as specified, with no Work to be performed by sub-bidders; and the General Contractor shall be selected on the basis of such General Bids.
2. If the bid is mailed, the General Bidders shall enclose their sealed bid in an outer envelope and address as follows:
FROM: General Bidder's Name and Business Address

TO: City of New Bedford
Purchasing Department
133 William Street
New Bedford, MA 02740

3. No telegraphic or facsimile transmission of bid or telegraphic or facsimile transmission modification of a bid will be considered. No bids received after the time fixed for receiving them will be considered. Late bids will be returned to the bidder unopened.

- I. **REQUIREMENTS FOR FOREIGN CORPORATIONS:** The attention of all bidders is called to the provisions of General Laws Chapter 30, Section 39L, which provides that the Awarding Authority may not enter into a contract for construction Work and may not approve as a sub-contractor furnishing labor and materials for a part of any such Work a foreign corporation which has not complied with the requirements of of Chapter 156d Section 151 of the General Laws. The term "foreign corporation" means a corporation not incorporated under the laws of the Commonwealth of Massachusetts.
- J. **SALES TAX:** Purchases of building materials and supplies to be used on this project are entitled to exemption from the Sales and Use Tax if the conditions imposed by Paragraph 6 (f) of Section I of Chapter 14 of the Acts of 1966 are otherwise satisfied. Bidders are instructed to submit proposals on the basis that no Massachusetts Sales and Use Tax will be imposed on purchases of building materials and supplies used in connection with this Project.
- K. **CONSTRUCTION TIME:** The Agreement will include a stipulation that the Work be substantially completed no later than One Hundred Eighty (180) days following receipt of the Owner's Notice to Proceed. If the Contractor fails to meet the construction deadline, the Contractor is responsible for all Owner and Architect costs associated with the deadline not being met. The Architect is to perform two on-site punch lists. If additional punch lists are needed, the Contractor shall be responsible for all Owner and Architect costs associated with the additional punch list visits.
- L. **WITHDRAWAL OF BIDS:** A bidder may withdraw his bid, either personally or by written request, at any time prior to the scheduled time for opening bids. No bidder may withdraw his bid for a period of thirty calendar days after the date set for the opening thereof, and bids shall be subject to acceptance by the Owner during this period. Failure to submit a completed copy of the required Statement of Bidder Qualifications shall be cause for rejection of a General Bid by the Owner.
- M. **EXECUTION OF AGREEMENT:**
The form of Agreement which the successful bidder will be required to execute is included in the Project Manual.
The bidder to whom the Contract is awarded shall, within fifteen calendar days after notice of award and receipt of Agreement forms from the Owner, sign and deliver required copies to the Owner.
At or prior to delivery of the signed Agreement, the bidder to whom the Contract is awarded shall deliver to the Owner those Certificates of Insurance required by the Contract Documents and such Labor and Materials Payment Bonds and Performance Bond as are required by the Owner.
Bonds and Certificates of Insurance shall be approved by the Owner before the successful bidder may proceed with the Work. Failure or refusal to provide Bonds or Certificates of Insurance in a form satisfactory to the Owner shall subject the successful bidder to loss of time from the allowable construction period equal to the time of delay in furnishing the required material.
- N. **METHOD OF AWARD:** The contract will be awarded to the lowest responsible and eligible general bidder on the basis of the proposed contract price if such exists, and if the Awarding Authority, in its sole discretion, decides to award on the basis of such alternate. Special attention is called to the provisions of the General Laws, Chapter 149, Sections 44A to 44H defining the term "lowest responsible and eligible bidder" and giving the Awarding Authority the right to require essential information in regard to qualifications.
- O. **TAX CERTIFICATION:** The successful Bidder will be required to submit a tax certificate as required by chapter 62C, Section 49A of the Massachusetts General Laws, as follows:

CERTIFICATE UNDER M.G.L. c.62C, §49A

I certify under the pains and penalties of perjury that _____
has/have complied with all laws of the Commonwealth of Massachusetts relating to taxes.

Employer Identification Number

Name

Date

Title of Business Officer (if Applicable)

END OF INSTRUCTIONS TO BIDDERS
STATEMENT OF BIDDER'S QUALIFICATIONS

This Statement shall be completed and a copy attached to the Form For General Bid. All questions must be answered. Additional sheets required for answers shall be included with Statement.

1. Name of Company_____

Address_____

Tel. No._____FAX No._____Email _____

2. Type Company: ___Partnership ___Corporation___ Other_____Date Formed:_____

3. List the like projects your company has performed , giving the information indicated below:

<u>Name/Address of Owner</u>	<u>Scope of Work</u>	<u>Contract Amount</u>	<u>Completion Date</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

4. Identify the subcontractors for this proposed project:

<u>Name/Address of Subcontractor</u>	<u>Scope of Work</u>
_____	_____
_____	_____
_____	_____

5. Has your present company ever failed to complete any work awarded to it and if so state where, when and why:

1. Address of bank which has information that would enable them with your approval to advise regarding the financial stability of your company:

Signed _____ Print Name: _____
Officer _____ Date: _____

END OF SECTION

INSERT PREVAILING WAGES HERE

**CITY OF NEW BEDFORD
MASSACHUSETTS**

**VOTE OF CORPORATION AUTHORIZING
EXECUTION OF CORPORATE AGREEMENTS**

At a meeting of the Board of Directors of _____duly called and held on _____, 20____ at which a quorum was present and acting throughout, the following vote was duly adopted.

VOTED: That _____, the _____ of the corporation, be and hereby is authorized to affix the Corporate Seal, sign and deliver in the name and behalf of the corporation contract documents with the City of New Bedford, the above mentioned documents to include but not be limited to Bids, Proposals, Deeds, Purchase and Sales Agreements, Agreements, Contracts, Leases, Licenses, Releases and Indemnifications; and also to seal and execute, as above, surety company bonds to secure bids and proposals and the performance of said contract and payment for labor and materials, all in such form and on such terms and conditions as he/she, by the execution thereof, shall deem proper. A true copy

ATTEST:

Name (printed)

_____ (Affix Corporate Seal)
Signature

Title Date _____

TO BE SUBMITTED WITH BID

CONTRACTOR CERTIFICATION

As evidenced by the signature of the Contractor's Authorized signatory below, the Contractor certifies under the pains and penalties of perjury that the Contractor shall not knowingly use undocumented workers in connection with the performance of any City contract; that pursuant to federal and state requirements, the Contractor shall verify the immigration status of all workers assigned to such contracts without engaging in unlawful discrimination; and that the Contractor shall not knowingly or recklessly alter, falsify, or accept altered or falsified documents from any such worker(s). The Contractor understands and agrees that breach of any of these terms during the period of each contract may be regarded as a material breach, subjecting the Contractor to sanctions, including but not limited to monetary penalties, withholding of payments, contract suspension or termination.

Contractor Authorized Signature

Printed Name

Date

Title_____Telephone:_____

Fax:_____Email:_____

OSHA CERTIFICATION REQUIREMENT

Effective **July 1, 2006**, all employees of a contractor to be employed on **public building and public works** worksites must have successfully completed at least a 10 hour course in construction safety and health approved by OSHA at the time the employee begins work.

I, _____, as _____, of the
(Print Name) (Position with the entity submitting bid)

joint venture/corporation/partnership or other legal entity submitting this bid for a public works project falling under §39M of Chapter 30 of the Massachusetts General Laws and Chapter 149 of the same, do hereby certify that any and all employees found on my worksite for this project have, or will have by the start of their work on the project, successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that was at least 10 hours in duration.

A copy of the OSHA completion cards for each employee must be submitted to the City of New Bedford before work on this project is to begin and must be supplemented as new employees are hired or contracted to work on this project.

_____, as
Signature

_____, of
Position

_____, on
Company/Corporation/Joint Venture/Partnership/Etc.

Date

**CITY OF NEW BEDFORD
MASSACHUSETTS**

NON-COLLUSION AND TAX COMPLIANCE FORM

CERTIFICATE OF NON-COLLUSION

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

Signature of individual submitting bid

Name of business/organization

TAX COMPLIANCE CERTIFICATION

Pursuant to M.G.L. c. 62C, §49A, I certify under the penalties of perjury that, to the best of my knowledge and belief, I am in compliance with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

Signature of person submitting bid

Name of business

TO BE SUBMITTED WITH BID

**CITY OF NEW BEDFORD
STANDARD VERTICAL CONSTRUCTION CONTRACT
For Projects Over \$100,000 Subject to M.G.L. c149, §44A -F**

OWNER - CONTRACTOR AGREEMENT

This agreement ("Contract") is made as of the ____ day of _____, 20____, by and between the City of New Bedford acting by and through its _____(Department)_____ with a principal place of business at 133 William Street, New Bedford, MA 02740 and _____, a _____ with a principal place of business at _____, hereinafter called the "Contractor."

Terms used in this Owner - Contractor Agreement which are defined in the General Conditions of the Contract shall have the meanings designated therein.

The Awarding Authority and the Contractor agree as follows:

Article 1. Scope of Work. The Work under this Contract is defined as all work required by the Contract Documents for the construction of _____, City of New Bedford Contract No. _____, in accordance with and as described in the Plans and Specifications dated _____, 20_____, prepared by _____("Designer"), as modified by Addenda Nos. _____, dated ____ 20__.

Article 2. Time for Completion. The Contractor shall commence the Work under this Contract on the date specified in the written "Notice to Proceed," and shall, within ____ days after such date, bring the Work to Substantial Completion and to the point at which a Certificate of Agency Use and Occupancy may be issued, and shall bring the Work to Final Acceptance within 45 days after the date specified for Substantial Completion.

Article 3. Contract Price. The Awarding Authority shall pay the Contractor, in current funds, for the performance of the Work, subject to additions and deductions by Approved Change Order(s), the Contract Price of _____ Dollars (\$_____). The Unit Prices, if any, approved by the Awarding Authority are those included in the Contractor's General Bid. The following Alternates have been accepted and their costs are included in the Contract Price:

Alternate No(s):

Article 4. Approved Subcontractors. The filed Subcontractors listed in the Contractor's

General Bid submitted by the Contractor have been approved for the performance of the specified portions of the Work. No other filed Subcontractors and no non-filed Subcontractors shall be used for these or any other portions of the Work without the prior written approval of the Awarding Authority.

Article 5. Certifications. Pursuant to M.G.L. c. 62(c), s.49 (a), the individual signing this Contract on behalf of the Contractor hereby certifies, under the penalties of perjury, that to the best of his or her knowledge and belief the Contractor has complied with any and all applicable state and federal tax laws. The individual signing this Contract on behalf of the Contractor further certifies under penalties of perjury that the Contractor is not presently debarred from doing public construction work in the Commonwealth under the provisions of M.G.L. c. 29, s. 29F, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder and is not presently debarred from doing public construction work by any agency of the United States.

Article 6. The Contract Documents: The following documents form the Contract, are incorporated by reference herein, and are referred to as the “Contract Documents:”

- The Instructions to Bidders
- The General Bid submitted by the Contractor
- This Owner — Contractor Agreement
- The General Conditions of the Contract
- The Supplementary General Conditions
- The Plans and Specifications, including Addenda identified in Article 1 above
- All Approved Change Orders issued after execution of this Owner - Contractor Agreement

Article 7. Minority Business Enterprise and Women Business Enterprise Participation Goals and Minority/Women Workforce Utilization Percentages: The applicable goals, if any, for minority business enterprise and woman business enterprise participation established for this Contract are as follows:

MBE: ____% of the Contract Price. WBE: _% of the Contract Price.

The applicable minority workforce utilization percentage, if any, is _____.

The applicable women workforce utilization percentage, if any, is _____.

Article 8. Liquidated Damages. For the purposes of Article VI of the General Conditions of the Contract, liquidated damages for delay shall be as follows:

\$ _____ Per day

In witness whereof, the parties hereto have caused this instrument to be executed under seal as of the date of _____20__

Contractor:	City Of New Bedford,
By: _____ Title:	By: Jonathan F. Mitchell Title: Mayor
CERTIFIED that funds are available	Dept.
By: Robert Ekstrom Title: City Auditor	By: _____ Title:
APPROVED as to Form and Legality	Chief Financial Office
By: Eric Cohen Title: Associate City Solicitor	By: Ari Sky Title: Chief Financial Officer
Purchasing Department	
By: Susan Bruce, Director of Purchasing	

CITY OF NEW BEDFORD
GENERAL CONDITIONS
STANDARD VERTICAL CONSTRUCTION CONTRACT
For Projects over \$100,000 Subject to M.G.L. c. 149, s. 44A-F

GENERAL CONDITIONS OF THE CONTRACT

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ARTICLE I: DEFINITION OF TERMS

The following words shall have the following meanings as used in this Contract:

Advertisement: The Advertisement or Invitation for Bids or Proposals for the Work identified in Article 6 of the Owner - Contractor Agreement.

Approval: (or Approved): An approval in writing signed by the authorized signatory of the Awarding Authority.

Architect: The architect identified as the Designer in Article 1 of the *Owner - Contractor Agreement*.

As directed (As permitted, as required, as determined or words of like effect): The direction, permission, requirement or determination of the Designer or the Awarding Authority. Similarly, *approved, acceptable, satisfactory* or words of like import shall mean approved by or acceptable or satisfactory to the Designer, except as may be otherwise determined by the Awarding Authority.

Awarding Authority: The public agency awarding and administering this Contract identified as the Awarding Authority in the Owner - Contractor Agreement.

Building Code: All applicable rules and regulations to which the Awarding Authority is subject and which are contained or referenced in the code authorized by M.G.L. c. 143, s. 93 et seq., including all amendments thereto.

Certificate of Occupancy: A certificate signed by the Designer and the Awarding Authority pursuant to the requirements of Article VI of these General Conditions of the Contract, indicating that the Awarding Authority has determined that (1) the Work has been completed in accordance with the Contract Documents, except for Punch List items, (2) certificates of inspection, testing and/or approval (including a certificate of occupancy under the Building Code), operating permits for any mechanical apparatus which may be required to permit full use and occupancy of the Work by its intended users (which in a Subcontractor's case may include the Contractor) have been delivered to the Awarding Authority, (3) any applicable written warranties, operating instructions and related materials have been delivered to the Awarding Authority, and (4) the Work may be used for its intended purpose without substantial inconvenience or interference.

Change Order: (1) A written order not requiring the consent of the Contractor, signed by the Owner's Project Manager and designated as a Change Order, directing the Contractor to make changes in the Work within the general scope of the Contract, or (2) any written or oral order from the Project Manager that causes any change in the Work, provided that the Contractor has given the Awarding Authority written notice stating the date, circumstances, and source of the order and that the Contractor regards the order as a Change Order.

Contract: The Contract formed by the Contract Documents as defined in Article 6 of the Owner - Contractor Agreement.

Contract Documents: The documents listed in Article 6 of the Owner - Contractor Agreement.

Contract Modification: Any alteration of the Contract Documents accomplished by a written agreement properly executed by the parties to this Contract.

Contract Price: The Contract Price stated in Article 3 of the Owner - Contractor Agreement which is the total sum owed to the Contractor for all of the Work.

Designer: The architect or engineer identified as the Designer in Article 1 of the Owner - Contractor Agreement, subject to the provisions of Article III, Section 1 of these General Conditions of the Contract.

Engineer: The Designer.

Drawings: The Drawings are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including Plans, elevations, sections, details, schedules, and diagrams.

Final Acceptance: The written determination by the Designer and by the Awarding Authority that the Work has been 100% completed, except for the Contractor's indemnification obligations, warranty obligations, obligations to continue to maintain insurance coverage for the time periods provided in the Contract Documents, and any other obligations which are intended to survive Final Acceptance and/or the termination of the Contract.

General Bid: The completed bid form submitted by the Contractor in accordance with the requirements of M.G.L. c. 149.

Laws: All applicable statutes, regulations, ordinances, codes, laws, orders, decrees, approvals, certificates and requirements of governmental and quasi-governmental authorities.

Neutral: An impartial third party not having an interest in the Owner, the Designer, the Contractor or the Project.

Notice to Proceed: The written notice provided by the Awarding Authority to the Contractor which authorizes the Contractor to commence the Work as of a date specified therein, from which date the time of completion specified in Article 2 of the Owner - Contractor Agreement is measured.

Or equal (or words of like import): Equal in the opinion of the Awarding Authority determined pursuant to the provisions of M.G.L. c.30, s. 39M and the provisions of these General Conditions of the Contract.

Owner: The city of New Bedford, Massachusetts.

Plan(s): Drawing(s).

Product Data: Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor or its Subcontractors and suppliers to illustrate materials or equipment for some portion of the Work. Product data also include any such information or instructions produced by the manufacturer or distributor of such materials or equipment and made readily available by said manufacturer or distributor.

Progress Schedule: The progress schedule Approved by the Designer and the Awarding Authority in accordance with Article VI of these General Conditions of the Contract.

Project: The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner or by separate contractors.

Owner's Project Manager (OPM): The Awarding Authority's representative assigned to the Project.

Punch List: A list of items determined by the Awarding Authority to be minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the Work for its intended purpose.

Samples: Samples are physical examples that illustrate materials, equipment, or workmanship and establish standards by which the Work will be judged.

Schedule of Values: The schedule Approved by the Awarding Authority pursuant to Article VIII of these General Conditions of the Contract which allocates the Contract Price to the various portions of the Work and is used as a basis for payments to the Contractor.

Shop Drawings: Drawings, diagrams, details, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate a portion of the Work.

Site: The land and, if any, building(s) or space within any such building(s) on which or in which the Contractor is to perform the Work.

Specifications: The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards, and workmanship for the Work and performance of related services.

Subcontractor: Person or entity with whom the Contractor contracts in order to perform the Work, except as otherwise specifically provided or required herein or by Law.

Substantial Completion: For work subject to M.G.L. c. 30 s. 39K, "substantial completion" shall occur when (1) the Contractor fully completes the Work or substantially completes the Work so that the value of the Work remaining to be done is, in the estimate of the Awarding Authority, less than one percent of the original contract price, or (2) the Contractor substantially completes the work and the Awarding Authority takes possession for occupancy, whichever occurs first. For work subject to M.G.L. c. 30 s. 39G "substantial completion" shall mean either that the work required by the Contract has been fully completed, completed except for work having a Contract Price of less than one percent of the then adjusted total Contract Price, or substantially all of the Work has been completed and opened to public use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the Work.

Superintendent: The licensed construction supervisor who is an employee of the Contractor designated to be in full-time attendance at the Site throughout the prosecution and progress of the Work and who shall have complete authority to act for the Contractor.

Work: The Work defined in Article 1 of the Owner - Contractor Agreement, Article II, Section 2 of these General Conditions of the Contract and otherwise in the Contract Documents.

Working Hours: 7:00 a.m. to 5:00 p.m., but not more than eight hours per day, Monday through Friday, unless otherwise specified by applicable Laws.

All terms that this Contract defines may be used with or without initial capital letters. Other terms, abbreviations and references are defined as they appear herein. Words and abbreviations that are not defined in the Contract Documents but which have recognized technical or trade meanings are used in accordance with those meanings. For additional definitions of terms, abbreviations and references refer to the *Supplementary General Conditions, or Specifications*.

ARTICLE II: EXECUTION OF THE CONTRACT, SCOPE OF WORK, INTERPRETATION OF CONTRACT DOCUMENTS

1. Execution.

The execution of the Owner – Contractor Agreement by the Contractor is a representation that the Contractor has visited the Site, has become familiar with local conditions under which the Work is to be performed and has correlated personal observations with requirements of the Contract Documents.

2. Scope of Work.

The Work consists of the Work identified in the Contract Documents. The Work comprises the completed construction required by the Contract Documents and includes all labor, tools, materials, supplies, equipment, permits, approvals, paperwork, calculations, submittals, and certificates necessary to develop, construct and complete the Work in accordance with all Laws, and all construction and other services required to be supervised, overseen, performed or furnished by Contractor or that the Contract Documents require the Contractor to cause to be supervised, overseen, performed or furnished. The Contractor shall provide and perform for the Contract Price all of the duties and obligations set forth in the Contract Documents.

3. Interpretation.

A. The Plans and Specifications and other Contract Documents are to be considered together and are intended to be mutually complementary, so that any work shown on the Plans though not specified in the Specifications, and any work specified in the Specifications though not shown on the Plans, is to be executed by the Contractor as a part of this Contract.

B. All things that in the opinion of the Designer may be reasonably inferred from the Plans, Specifications and other Contract Documents are to be executed by the Contractor. The Designer shall determine whether the detail Plans conform to the general Plans and Contract Documents, except as may be otherwise determined by the Awarding Authority.

C. The tables of contents, titles, headings and marginal notes or sub-scripts contained herein are solely to facilitate references, are not intended to be construed as provisions of the Contract, and in no way affect the interpretation of the provisions to which they refer.

D. Where reference is made in the Contract Documents to publications, standards, or codes issued by associations or societies, such reference shall be interpreted to mean the current edition of such publications, standards, or codes, including revisions in effect on the date of the Advertisement, notwithstanding any reference to a particular date. The foregoing sentence shall not apply to the dates, if any, specified with respect to insurance policy endorsement forms.

E. In case of any conflict among the Contract Documents, unless the context clearly otherwise requires, the Contract Documents shall be construed according to the following priorities:

- First Priority: Contract Modifications
- Second Priority: Owner - Contractor Agreement
- Third Priority: General Conditions of the Contract
- Fourth Priority: Drawings -- Schedules take precedence over enlarged detail Drawings, and enlarged Detail Drawings take precedence over reduced scale Drawings; figured dimensions shall prevail over scale.
- Fifth Priority: Specifications

4. Distribution of Work.

The distribution of the Work is intended to be described under the appropriate trades and, except for filed sub-bid work, may be redistributed, except as directed herein, provided that such redistribution shall cause no controversy among the trades and no delay in the progress of the Work.

5. Contract Price.

The Contract Price constitutes full compensation to the Contractor for everything to be performed and furnished in connection with the Work and for all damages arising out of the performance of the Work and/or the action of the elements, and constitutes the maximum compensation regardless of any difficulty incurred by the Contractor in connection with the Work or in consequence of any suspension or discontinuance of the Work.

ARTICLE III: CONTROL OF WORK / ADMINISTRATION OF THE CONTRACT

1. Designer.

Notwithstanding anything to the contrary expressed or implied in this Contract, any of the powers, rights, and duties of the Designer may be exercised by the Awarding Authority, provided that the Awarding Authority shall be under no obligation to do so. The Awarding Authority may rely on the Designer for the performance and exercise of its rights and obligations hereunder and shall be presumed to so rely on the Designer in the absence of an explicit written assumption by the Awarding Authority of any such rights and obligations, except that any Approval required to be obtained from the Awarding Authority hereunder shall not be valid without the signature of the Awarding Authority. The Awarding Authority may explicitly overrule in writing any action, determination or decision of the Designer should the Awarding Authority choose to do so, except to the extent that the same would violate applicable law. Subject to the foregoing, the Designer shall be responsible for the general administration of the Contract and shall perform the duties and exercise the rights herein conferred on the Designer. Except as otherwise specifically provided herein, the Designer shall decide all questions which may arise as to the conduct, quantity, quality, equality, acceptability, fitness, and rate of progress of the several kinds of work and materials to be performed and furnished under this Contract, and shall decide all questions which may arise as to the interpretation of the Plans and Specifications and as to the fulfillment of this Contract on the part of the Contractor. In the case of the death, resignation, inability or refusal of the Designer to act, or the termination of his or her or its employment, the Awarding Authority may appoint another person to act as Designer for the purposes of this Contract. The Awarding Authority shall give written notice to the Contractor of any such appointment.

2. Right of Access to Work.

The Awarding Authority and the Designer (and persons designated by them) may for any purpose enter upon the Work, the Site, and premises used by the Contractor, and the Contractor shall provide safe facilities therefore. Other contractors of the Awarding Authority may also enter upon the same for the purposes which may be required by their contracts or work. Any differences or conflicts which may arise between the Contractor and other contractors of the Awarding Authority with respect to their work shall be initially resolved by the Designer.

3. Inspection No Waiver.

No inspection by the Awarding Authority or the Designer or employees or agents of either of them, and no order, measurement, certificate, approval, payment order, payment, acceptance or any other action or inaction of any of them, shall operate as a waiver by the Awarding Authority of any provision of this Contract.

ARTICLE IV: GENERAL PERFORMANCE OBLIGATIONS OF THE CONTRACTOR

The Contractor shall complete for the Contract Price all of the Work in a proper, thorough, and workmanlike manner in accordance with the Contract Documents. Without limiting the foregoing and without limiting the Contractor's obligations under any other provision of the Contract Documents, the Contractor shall for the Contract Price perform the following general obligations:

1. Review of Contract Documents and Field Conditions.

A. Before commencing the Work, the Contractor shall carefully study the Contract Documents and carefully compare all Specifications, Plans, Drawings, figures, dimensions, lines, marks, scales, directions of the Designer, and any other information provided by the Awarding Authority and shall at once report to the Designer any questions, errors, inconsistencies, or omissions.

B. Before commencing the Work, the Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents and shall at once report to the Designer any questions, errors, inconsistencies, or omissions.

2. Supervision and Construction Procedures; Coordination; Cutting, and Patching.

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

B. The Contractor shall be responsible for the proper fitting of all Work and the coordination of the operations of all trades, Subcontractors, and materialmen engaged upon the Work. The Contractor shall guarantee to each of its Subcontractors all dimensions which they may require for the fitting of their work to all surrounding work.

C. All necessary cutting, coring, drilling, grouting, and patching required to fit together the several parts of the Work shall be done by the Contractor, except as may be specifically noted otherwise under any particular filed sub-bid section of the Specifications.

D. The Contractor shall be responsible to the Awarding Authority for the acts and omissions of the Contractor's employees, agents and Subcontractors, and their agents and respective contractors' employees, and other persons performing portions of the Work or supplying materials therefore.

E. The Contractor shall be responsible for the inspection of portions of the Work already performed under this Contract to determine that such portions are in proper condition to receive subsequent Work.

F. The Contractor shall employ a registered land surveyor to perform any engineering required for establishing grades, lines, levels, dimensions, layouts, and reference points for the trades. The Contractor shall be responsible for maintaining benchmarks and other survey marks and shall replace any benchmarks or survey marks that may have become disturbed or destroyed. The Contractor shall verify the materials shown on the Drawings before laying out the Work and shall be responsible for any error resulting from its failure to exercise this precaution.

G. Unless otherwise required by the Supplementary General Conditions or the Plans and Specifications, or directed in writing by the Awarding Authority, Work shall be performed during regular Working Hours. However, if the Contractor desires to carry on the Work outside of regular Working Hours or on Saturdays, Sundays, or Massachusetts or federal holidays then the Contractor shall allow ample time to allow satisfactory arrangements to be made for inspecting Work in progress and shall bear the costs of such inspection. The Awarding Authority shall bill the Contractor directly for such costs.

H. Work performed outside of regular Working Hours without the consent or knowledge of the Awarding Authority shall be subject to additional inspection and testing as directed by the Awarding Authority. The cost of this inspection and testing shall be borne by the Contractor whether the Work is found to be acceptable or not. The Awarding Authority at its election shall be entitled either to issue a credit Change Order to cover such cost or to withhold such cost from any further payments due the Contractor and/or to receive a payment from the Contractor of the amount of such cost.

3. Superintendent.

A. The Contractor shall employ a Superintendent whose appointment shall be subject to the Approval of the Awarding Authority. The Superintendent shall be in attendance at the Site full-time during the performance of the Work. The Superintendent shall represent the Contractor. Communications given to and from the Superintendent shall be deemed given to and from the Contractor. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed upon written request in each case. The Superintendent shall attend each job meeting. The Superintendent shall be responsible for coordinating all of the Work of the Contractor and the Subcontractors.

B. The Superintendent shall be a competent employee regularly employed by the Contractor. The Superintendent shall be licensed in accordance with the Building Code and shall have satisfactorily performed similar duties on previous construction projects similar in type, complexity and scale to the Project. The Superintendent's resume shall be submitted to the Awarding Authority prior to commencement of construction together with such other information as the Awarding Authority may reasonably require in order to determine whether or not to approve of his or her appointment. Any change in the Superintendent shall require the prior consent of the Awarding Authority. The

Contractor shall establish an emergency telephone line by which the Awarding Authority, the Designer, or their respective agents may contact the Superintendent during non-working hours.

4. Labor.

A. The Contractor shall employ only competent workers. The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall certify and insure 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 the Contractor and each of its subcontractors and others working on the Project shall furnish documentation of successful completion of said course by employees working with the first certified payroll report for each employee. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them. Whenever the Awarding Authority shall notify the Contractor in writing that any worker is, in the Designer's opinion, incompetent, unfaithful, disorderly, or otherwise unsatisfactory, such employee shall be discharged from the Work and shall not again be employed on the Project except with the consent of the Awarding Authority.

B. The Contractor shall employ a sufficient number of workers to carry on the Work with all proper speed in accordance with Laws, the requirements of the Contract Documents, and the Progress Schedule.

C. The Contractor shall procure materials from such sources and shall manage its own forces and the forces of its Subcontractors and any sub-subcontractors in such a manner as will result in harmonious labor relations on the Project Site. The Contractor shall cause persons to be employed in the Work who will work in harmony with others so employed. Should the Work be stopped or materially delayed in the Awarding Authority's reasonable judgment due to a labor dispute, the Awarding Authority shall have the right to require the Contractor to employ substitutes acceptable to the Awarding Authority.

5. Notices and Permits.

A. The Contractor at its sole cost shall take out and pay for all approvals, permits, certificates and licenses required by Laws, pay all charges and fees, and pay for (or cause the appropriate Subcontractor to pay for) all utilities required for the proper execution of the Work.

B. The Contractor shall comply with all Laws and shall give all notices required thereby.

C. Except as otherwise specified in this Contract, it is not the Contractor's responsibility to ascertain that the Contract Documents are in accordance with applicable Laws. However, if the Contractor observes that portions of the Contract Documents are at variance with the requirements of Laws, the Contractor shall promptly notify the Designer and Awarding Authority in writing, and necessary changes shall be accomplished by an appropriate Contract Modification.

D. If the Contractor performs Work knowing it to be contrary to Laws without giving such notice to the Designer and Awarding Authority, the Contractor shall bear full responsibility for such Work and all costs attributable thereto, including, without limitation, corrections to the Work.

6. Lines, Marks etc.

The Contractor shall furnish batter boards and stakes and shall cause to be placed and maintained thereon so as to be easily read, such lines, marks and directions relating to the Work as the Designer shall from time to time direct. The Designer shall establish base lines and benchmarks on the Drawings for the locations of the Work but all other lines and grades shall be determined by the Contractor.

7. Excavation.

The Contractor shall prevent by sheeting and shoring or bracing, if necessary, any caving or bulging of the sides of any excavation made by the Contractor, leaving sheeting and shoring in place, or if any is removed, filling solid the spaces left thereby.

8. Dewatering/Hoisting/Staging.

The Contractor shall provide pumping, drainage, and disposal of all water and other flows so that no puddle, nuisance, or damage will be caused by water or flooding. The Contractor shall provide all hoisting equipment and machinery required for the proper execution of the Work. The Contractor shall provide all exterior and interior staging required to be over eight feet in height, except as may be otherwise provided in the Contract Documents.

9. Corrections to the Work; Inspection No Bar to Subsequent Corrections.

The Designer's inspection of the Work shall not relieve the Contractor of its responsibilities to fulfill the Contract obligations. Defective work may be rejected by the Designer or Awarding Authority whether or not such work and/or materials have been previously overlooked or misjudged by the Designer 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 cease the performance of any defective work in progress and, whether or not such work is still in progress, shall forthwith correct such defect in a manner satisfactory to the Designer and Awarding Authority. If any material brought upon the Site for use in the Work, or selected for the same, shall be rejected by the Designer as unsuitable or not in conformity with the Contract Documents, or as damaged by casualty or deteriorated due to improper storage at the Site or to any other factor, the Contractor shall forthwith remove such materials from the Site. The Contractor shall pay for the cost of making good all work or property of other contractors or of the Awarding Authority destroyed or damaged by such removal or replacement; repair any injury, defect, omission or mistake in the Work as soon as it is discovered; finish and immediately make good any defect, omission or mistake in the Work; and complete and leave the Work in perfect condition.

10. Sanitary Facilities.

The Contractor shall provide and maintain sanitary facilities for all persons employed on the Work, beginning with the first worker at the Site. Said facilities shall meet the following requirements unless otherwise specified in the Supplementary General Conditions or Specifications.

A. There shall be no fewer facilities than the number required by applicable Laws;

B. Facilities shall be kept in a clean sanitary condition at all times and shall be adequately screened to be inaccessible to flies.

(**Note:** If existing sanitary facilities at the Site are to be used by the Contractor, this requirement will be modified accordingly in the Supplementary General Conditions or Specifications.)

11. Temporary Offices.

A. Except as otherwise specified in the Supplementary General Conditions or Specifications, the Contractor shall erect the following temporary offices near the Site as directed by the Awarding Authority and adequately furnish and maintain them in a clean, orderly condition:

(1) A Contractor's field office at which Contractor's authorized representative shall be present at all times while work is in progress. Instructions, notices, and other communications delivered there by the Designer or the Awarding Authority shall be deemed delivered to the Contractor. The Contractor shall provide a separate conference room space with a conference table and chairs sufficient to accommodate 12 persons at one time.

(2) Office for the OPM, either a separate building or trailer. Such office shall be in close proximity to the Contractor's field office, shall be at least 475 square feet in area, and shall be equipped with partitions to separate it from public access, electric lights, heat, air conditioning, window screens, secure locking devices, and a toilet room with a working chemical toilet. Such office shall be equipped with the following furniture and equipment in good condition: 2 lockable steel desks, word processor, 2 swivel chairs, two stools, 2 metal plan racks, plan table at least 32 by 84 inches, 2 metal filing cabinets with locks, 12 feet of 10 inch deep shelving, one accurate Fahrenheit thermometer, one electric water cooler with disposable cups and water supply service, one hard hat for each project representative and 6 visitor hard hats, one dry plain paper copy machine with a legal and standard paper tray, and one calculator with paper print out, all of which shall become the property of the Contractor at the conclusion of the Work. (**Note:** If office space can be assigned in existing buildings at the Project Site, this requirement will be modified accordingly in the Supplementary General Conditions or Specifications.)

B. The Contractor shall relocate the OPM's trailer at no additional cost to the Owner if the need for relocation arises as determined by the Awarding Authority.

12. Contract Documents and Samples at the Site.

A reasonable number of sets of Contract Documents will be furnished to the Contractor by the Awarding Authority immediately after signing of the Contract, one of which shall be maintained at the Site for reference by authorized representatives of the Awarding Authority. The Contractor shall maintain at the Site for the use and information of the Awarding Authority one record copy of the Drawings, Specifications, Addenda, Change Orders, Approved Shop Drawings, Product Data, Samples, updated Progress Schedule, and all other submittals, all in good order and marked currently

to record changes and selections made during construction. These shall be available to the Designer and the Awarding Authority and shall be delivered to the Designer for submittal to the Awarding Authority upon completion of the Work.

13. Telephones.

The Contractor shall provide and maintain separate individual telephone service and pay for all calls relating to the Work. Service and equipment shall meet the requirements, if any, of the Supplementary General Conditions and Specifications and shall include provisions for incoming and outgoing calls: (1) in the Contractor's field office for the use of its authorized agents and (2) in the OPM's office for the use of the Designer and authorized agents of the Owner.

14. Health, Safety, and Accident Prevention

A. In performing the Work, the Contractor shall:

- (1) Ensure that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his/her health and/or safety as determined under construction safety and health standards promulgated by the U.S. Secretary of Labor by regulation;
- (2) Protect the lives, health, and safety of other persons; and
- (3) Prevent damage to property, materials, supplies, and equipment.

B. For these purposes, the Contractor shall:

- (1) Comply with 84 Stat. 1590, the "Occupational Safety and Health Act of 1970" (OSHA) and with regulations and standards issued by the U.S. Secretary of Labor at 29 CFR Part 1926; and
- (2) Include the terms of this Section 14 in every subcontract so that such terms will be binding on each subcontractor.
- (3) Designate by notice to the Awarding Authority a responsible member of its organization at the Site whose duties shall include ensuring safety, implementation of Contractor's Safety Plan referenced below and preventing accidents

C. The Contractor shall maintain an accurate record of exposure data on all accidents incident to the Work resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment, and shall report this data in the manner prescribed by 29 CFR Part 1904. Without limiting the foregoing, the Contractor shall submit to the Awarding Authority without delay verbal and written reports of all accidents involving bodily injury or property damage arising in connection with the Work.

D. In any emergency affecting the safety of persons or property the Contractor shall immediately act in the exercise of reasonable judgment to prevent threatened damage, injury, or loss. The Contractor shall immediately notify the Awarding Authority of such emergency.

E. The Contractor shall be responsible for its Subcontractors' compliance with the provisions of this Section 14.

F. Before commencing any portion of the Work the Contractor shall submit a written Project-specific plan for implementing this Section 14. The plan shall include an analysis of the significant hazards to life, limb and property inherent in the performance of the Work and a plan for controlling these hazards.

G. Without limiting the foregoing provisions of this Section 14, the Contractor shall comply with all health and safety Laws applicable to the Work. Without limitation,

(1) If the Contractor uses, stores or encounters toxic or hazardous substances it shall comply with M.G.L. c. 111F, s. 2, the "Right to Know" law and regulations promulgated by the Department of Public Health, 105 CMR 670, the Department of Environmental Protection, 310 CMR 33, and the Department of Labor and Workforce Development, 441 CMR 21; and shall post a Workplace Notice obtainable from the Department of Labor and Workforce Development.

(2) The Contractor shall comply with the Federal Resource Conservation and Recovery Act, the Federal Comprehensive Environmental Response, Compensation and Liability Act, M.G.L. c. 21C, M.G. L. c. 21E, and any other Laws affecting toxic or hazardous materials, solid, special or hazardous waste (collectively "Hazardous Materials Laws"). Should the Contractor discover unforeseen materials subject to Hazardous Materials Laws at the Site, the Contractor shall immediately comply with any and all requirements for dealing with such materials and notify all required governmental authorities and the Awarding Authority of such discovery.

(3) The Contractor shall be responsible for the location of all utilities in connection with the Work. Without limiting the foregoing, the Contractor shall comply with Dig-Safe Laws. Dig-Safe is the Utility Underground Plant Damage Prevention System, 331 Montvale Road, Woburn, MA, 01801, 1-888-344-7233. The Contractor shall notify Dig-Safe of contemplated excavation, demolition, or explosive work in public or private ways, and in any utility company right of way or easement, by certified mail, with a copy to Department of Environmental Protection (DEP). This notice shall be given at least 72 hours prior to the work, but not more than sixty days before the work is to be done. Such notice shall state the name of the street or the route number of the way and shall include an accurate description of the location and nature of the proposed work. Dig-Safe is required to respond to the notice within 72 hours of receipt by designating the location of pipes, mains, wires or conduits at the Site. The Contractor shall not commence work until Dig-Safe has responded. The work shall be performed in such manner and with reasonable precautions taken to avoid damage to utilities under the surface at the work location. The Contractor shall provide the Superintendent with current Dig-Safe regulations, and a copy of M.G.L. c. 82, s. 40. Any costs related to the services performed by Dig-Safe shall be borne by the Contractor.

(4) The Contractor shall comply with M.G.L. c. 149, s. 129A, relative to shoring and bracing of trenches.

H. Without limiting the Contractor's responsibilities described above, the Contractor shall take all reasonable precautions for the safety of, and the prevention of injury or damage to (1) all agents and employees and contractors on the Work and all other persons who may be affected thereby including the general public, (2) all the Work and all materials and equipment to be incorporated therein, whether in storage on or off the Site, under the care custody or control of the Contractor or any of its Subcontractors or any contractors directly or indirectly contracting through any of them, and (3) other property at the Site or adjacent thereto, including but not limited to trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of the Work. The Contractor shall promptly remedy all damage or loss to any such property caused in whole or in part by the Contractor, any Subcontractor, or anyone directly or indirectly contracted or employed by any of them or by anyone for whose acts any of them may be liable. Without limiting the foregoing, the Contractor shall:

- (1) post and maintain adequate danger signs and other warnings against hazards;
- (2) promulgate safety regulations and give appropriate notices to the Awarding Authority and users of adjacent utilities and property;
- (3) insure the adequate strength and safety of all scaffolding, staging and hoisting equipment, temporary shoring, bracing and tying;
- (4) protect adjoining private or public property;
- (5) provide barricades, temporary fences, and covered walkways required by prudent construction practices, Laws and/or the Contract Documents;
- (6) furnish approved hard hats and other personal protective equipment, furnish approved first aid supplies, furnish the name of the first aid attendant, and maintain a posted list of emergency facilities;
- (7) provide proper means of access to property where the existing access is cut off by the Contractor;
- (8) maintain from the beginning of any darkness or twilight through the whole of every night sufficient lights on or near any obstruction so as to guard and protect travelers from injury from such obstruction;
- (9) maintain adequate security at the Site so as not to expose the Work and surrounding property to vandalism or malicious mischief;
- (10) provide adequate fire protection procedures during the use of cutting torches, welding equipment, plumbers' torches and other flame and spark producing apparatus;
- (11) take prompt action to correct any dangerous or hazardous conditions.

I. The Contractor shall not use or store explosives in the performance of the Work unless the Contractor first obtains the Awarding Authority's prior written specific Approval. If the Awarding Authority Approves the use or storage of explosives during the performance of the Work, the Contractor shall first comply with all Laws and obtain all permits, approvals, and certificates required in connection with the same and shall exercise best efforts, including but not limited to the employment and supervision of properly qualified personnel, to prevent damage, injuries, and accidents involving said explosives.

J. The Contractor shall not permit cutting or welding in or immediately adjacent to existing property of the Owner, Awarding Authority or of anyone else without the Awarding Authority's prior Approval in each instance.

15. Debris and Chemical Waste.

A. The Contractor shall not permit the accumulation of interior or exterior debris. The Contractor shall keep the Work area clean at all times. Without limitation, garbage shall be removed daily.

B. The Contractor shall properly classify and remove debris and waste from the Site and transport and dispose of it, all in accordance with Laws, employing a qualified and properly licensed transporter, at any landfill, disposal or recycling facility licensed under applicable Laws, including without limitation, hazardous materials laws. The Contractor shall make all arrangements and give and obtain all notices, communications, documentation, permits, certificates, and approvals necessary for said disposal from the owner or officials in charge of such landfills, disposal or recycling facilities. The Contractor shall bear all fees and costs in connection with such classification, removal, transportation, disposal and storage. The Contractor shall not permit any storage of debris or waste except in accordance with Laws.

C. The Contractor shall not permit any open fire on the Site.

D. Chemical Waste: Chemical waste shall be stored in corrosion resistant containers, removed from the Site, and disposed of not less frequently than monthly unless more frequently required by Laws, including without limitation hazardous materials laws, or by the Supplementary General Conditions or Specifications. Disposal of chemical waste shall be performed in accordance with requirements of the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (DEP). Fueling and lubricating of vehicles and equipment shall be conducted in a manner that affords the maximum protection against spills and evaporation. Lubricants shall be disposed of in accordance with procedures meeting all applicable Laws. The Contractor shall immediately notify the Designer of any hazardous materials release large enough to require reporting under applicable Laws. The Contractor shall be responsible for immediately cleaning up in accordance with Laws any oil or hazardous materials releases resulting from its operations. Any costs incurred in cleaning up any such releases shall be borne by the Contractor.

16. Weather Protection (M.G.L. c. 149, s. 44G and 44F (1)).

The Contractor shall furnish and install "weather protection," which means temporary protection of that Work adversely affected by moisture, wind and cold. Weather protection shall be achieved by covering, enclosing and/or heating working areas such that a minimum temperature of 40 degrees Fahrenheit is maintained at the working surface during the months of November through March in order to permit construction to be carried on during such period in accordance with the Progress Schedule. After the building or portion thereof is completely enclosed by either permanent construction or substantial temporary materials having a resistance comparable to the specified permanent construction, the Contractor shall provide heat therein of not less than 55 degrees F. nor more than 75 degrees F. The foregoing provisions do not supersede any specific requirements for methods of construction, curing of materials and the like. Such weather protection shall be consistent with the Progress Schedule, shall permit the continuous progress of the Work necessary to maintain an orderly and efficient sequence of construction operations, shall include one thermometer for every 2,000 square feet of floor space or fraction thereof, shall be subject to the Approval of the Awarding Authority, and shall meet such additional requirements as may be specified by the Supplementary General Conditions or the Specifications.

17. Furnishings and Equipment.

When, in the opinion of the Designer, any portion of the Work is in a reasonable condition to receive fittings, furniture, or other property of the Owner not covered by this Contract, the Contractor shall allow the Awarding Authority to bring such fittings, furniture, and/or other property into such portions of the Work and shall provide all reasonable facilities and protection thereof. No such occupancy shall be construed as interfering with the provisions relating to time of completion, or as constituting an acceptance of the whole or any part of the Work. Any furniture or fittings so installed shall be placed in the Work at the risk of the Awarding Authority except that the Contractor shall be liable for damages or losses to such furniture or fittings to the extent such damages or losses arise in whole or in part from the negligence or intentional misconduct of

Contractor, Subcontractors, their agents and/or employees, or anyone for whose acts Contractor is responsible.

18. Form for Sub-contract.

The Contractor when subcontracting with sub-bidders filed pursuant to M.G.L. c. 149, s.44F shall use the form for sub-Contract in M.G.L. c. 149, s. 44F(4) (c). The Contractor shall not interpret paragraph 3 of the statutory form of Subcontract to require such sub-bidders to provide insurance with limits higher than the limits that are required by Article XIV of these General Conditions of the Contract assuming that the term "Contractor" refers to the sub-bidder and that the term "Contract Price" refers to the sub-bidder's price stated in paragraph 1 of the statutory form of Subcontract.

19. Sales Tax Exemption and Other Taxes.

All building materials and supplies as well as the rental charges for construction vehicles, equipment and machinery rented exclusively for use on the Site, or while being used exclusively for the transportation of materials for the Work are entitled to an exemption from sales taxes under M.G.L. c. 64H, s. 6(f). The Contractor shall take all action required to obtain the benefit of such sales tax exemption. The Contractor shall bear the cost of any sales taxes that Contractor incurs in connection with the Work and the Awarding Authority shall not reimburse the Contractor for any such taxes. The exemption number assigned to the Contractor as an exempt purchaser shall be provided to the Contractor by the Awarding Authority upon the written request of the Contractor.

20. Final Cleaning.

At the completion of the Work, the Contractor shall remove all waste materials, rubbish, tools, equipment, machinery and surplus materials, and professionally clean all sight-exposed surfaces so that the Work is clean and ready for occupancy. Subsequent to installation of furniture, telephones, and equipment, the Contractor shall provide such additional cleaning as may be necessary to remove any soil resulting from installation of such furniture, telephones and equipment.

21. Maintenance Data.

Subject to such additional requirements as may be provided in the Supplementary General Conditions or Specifications, the Contractor shall compile 3 complete and identical binders of operating and maintenance data for the entire Work. The Contractor shall submit record maintenance data to the Designer for approval, shall submit approved maintenance data to the Awarding Authority, and shall instruct and train the Awarding Authority's personnel in proper inspection and maintenance procedures.

22. Closeout Procedures.

The Contractor shall take all actions and submit all items required for the issuance of the Certificate of Use and Occupancy and Final Acceptance as specified in the Contract Documents.

23. Risk of Loss.

The Contractor shall bear all risk of loss to the Work during the term of the Contract except for any portion of the Work as to which the Certificate of Occupancy has been issued pursuant to Article VI of these General Conditions of the Contract. Nothing herein shall limit the Contractor's responsibilities under Article IX or XV of these General Conditions of the Contract.

ARTICLE V: MATERIALS AND EQUIPMENT

1. Materials Generally.

A. Unless otherwise specifically provided in the Contract Documents, the Contractor shall provide and pay for materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

B. Materials and equipment to be installed as part of the Work (both or either of which are hereinafter referred to as "materials") shall be new, unused, of recent manufacture, assembled, and used in accordance with the best construction practices. The Contractor shall give a preference in

the purchase of supplies and materials, other considerations being equal, in favor, first, of supplies and materials manufactured and sold within the Commonwealth, and, second, of supplies and materials manufactured and sold elsewhere within the United States.

2. Shop Drawings, Product Data, and Samples.

A. The Contractor shall furnish to the Designer all samples of the materials to be used in the execution of the Work as required by the Contract Documents. The Contractor shall furnish to the Designer in a timely manner all coordination Drawings, shop details, Shop Drawings, and setting diagrams which may be necessary for acquiring and installing materials. These shall be reviewed as required by the Designer. A minimum of four (4) copies shall be submitted for final approval, one of which shall be returned to the Contractor, one to the OPM, one to the Awarding Authority and one filed with the Designer. The inspection and approval by the Designer of Shop Drawings, etc. shall be general and shall in no way relieve the Contractor from responsibility for proper fitting, coordinating, construction, and construction sequencing. The Contractor shall furnish to the Designer such information and vouchers relative to the Work, the materials therefore, and the persons employed thereon, as the Designer shall from time to time request.

B. Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. The purpose of their submission is to demonstrate for those portions of the Work for which submittals are required the way the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.

C. The Contractor shall review, approve, and submit to the Designer, Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Awarding Authority or of separate contractors. Submittals made by the Contractor which are not required by the Contract Documents or which do not comply with the Contract Documents may be returned without action. The Contractor's attention is directed to the provisions of Section 4 of this Article V and to the Specifications.

D. The Contractor shall prepare and keep current for the Designer's approval a schedule of submittals which is coordinated with the Progress Schedule and allows the Designer reasonable time to review submittals.

E. The Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Designer. Such Work shall be in accordance with Approved submittals.

F. By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements, and field construction criteria related thereto and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

G. The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Designer's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Designer in writing of such deviation at the time of submittal and the Awarding Authority has given explicit written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals by the Designer's or the Awarding Authority's actions.

H. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Designer on previous submittals.

I. Informational submittals upon which the Designer is not expected to take responsive action may be so identified in the Contract Documents.

J. When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, such certification must be stamped by a registered Massachusetts professional in the discipline required. The Designer shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.

K. Materials furnished or used or employed under the Contract must be equal in quality to the samples furnished and be satisfactory to the Designer.

3. Tests.

A. Any material to be used in the Work may be tested or inspected at any time by the Designer with the prior Approval of the Awarding Authority and may be rejected if it fails to comply with specified tests. The Awarding Authority shall pay for all testing of specified material. If the Contractor requests permission to use a material that was not specified, then the Contractor shall

pay for such testing. The cost of testing of materials that fail the testing criteria shall be borne by the Contractor

B. The Contractor shall notify the Designer and the Awarding Authority of the proposed sources of materials in time to permit all required testing and inspection before the material is needed for incorporation into the Work. The Contractor shall have no claim arising from Contractor's failure to designate the proposed source or to order the material in time for adequate testing and inspection. Necessary arrangements shall be made to permit the Designer to make factory, shop or other inspection of materials or equipment ordered for the Work in process of manufacture or fabrication, or in storage elsewhere than the Site.

4. "Or Equal" Submissions.

A. Where products or materials are prescribed by manufacturer name, trade name, or catalog reference, the words "or Approved equal" shall be understood to follow. An item shall be considered equal to the item so named or described if in the opinion of the Awarding Authority (a) it is at least equal in quality, durability, appearance, strength and design, (b) it performs at least equally the function imposed in the general design for the Work, and (c) it conforms substantially, even with deviations, to the detailed requirements for the items as indicated by the Specifications. Any structural or mechanical changes made necessary to accommodate products or materials substituted as an "or equal" shall be at the expense of the Contractor. "Approved equal" shall mean an item with respect to which the Awarding Authority shall have issued a written statement to the Contractor to the effect that the item is, in the Awarding Authority's opinion, equal within the meaning of this paragraph to that prescribed in the Contract Documents.

B. The Contractor shall be responsible for providing the Designer with any information and test results that the Designer reasonably requires to determine whether or not a material is equal to a material named or described in the Contract Documents.

C. Whenever the Contractor submits a material for approval as a substitute for a material named or described in the Contract Documents, such submission shall be made at least sixty (60) days prior to the date the materials will be used in the Work. In no event shall the Contractor maintain a claim for delays based upon the Designer's review of such substituted materials if the Contractor has failed to comply with the sixty (60) day submission requirement.

D. The Contractor shall save the written calculations, pricing information, and other data that the Contractor used to calculate the General Bid (the "Bid Pricing Materials") for at least six years after the Awarding Authority makes Final Payment under this Contract. No increase in the Contract Price shall be allowed for any material later found to have been improperly rejected as not being equal unless the Contractor can show persuasive evidence that the rejection increased the Contractor's costs over those provided for in the Bid Pricing Materials, net of all savings the Contractor obtained by substituting other "or-equal" items. Without limiting the foregoing, if the Awarding Authority rejects a proposed substitution on the basis that the item is not equal and if the appropriate authority finds that the proposed substitution was equal, the Contract Price may be increased only to the extent that (1) the item that the Contract Documents specifically require costs more than the item later approved as equal, (2) the Bid Pricing Materials prove that the Contractor calculated its bid using the cost of the item later found as equal, (3) any increase is reduced by any cost that the Contractor would have incurred for structural or mechanical changes necessary to accommodate the substitute item, (4) the Contractor shall not be entitled to any adjustment for overhead and profit, (5) any increase must exceed the aggregate amount that the Contractor saved using products or materials that the Awarding Authority approved as equal under this Contract. In calculating the Contractor's aggregate saving under the preceding clause (5), the Contractor shall provide the Awarding Authority with the Bid Pricing Materials and a calculation based on the Bid Pricing Materials that compare the price (stated in the Bid Pricing Materials) of each item replaced with an "or equal" item, with the cost of the approved equal item, specifically describes all costs that Contractor would have incurred making structural or mechanical changes to include within the Work the item later found to have been improperly rejected and copies of all plans, specifications, shop Drawings, and other design documents that the Awarding Authority deems necessary or desirable.

5. Delivery and Storage of Materials; Inspection.

A. Materials and equipment shall be progressively delivered to the Site so that there will be neither delay in the progress of the Work nor an undue accumulation of materials that are not to be used within a reasonable time and so that their security, quality, and fitness of the materials for the Work is preserved.

B. Materials stored off Site shall be insured and stored at the expense of the Contractor so as to guarantee the preservation of their security, quality and fitness for the Work. Without derogating from the Contractor's responsibilities in the previous sentence, when necessary to avoid deterioration or damage, material (on or off Site) shall be placed on wooden platforms or other hard clean surfaces and not on the ground and shall be properly protected.

C. Expenses for inspection of material by the Designer and/or the Awarding Authority personnel including travel, quarters, and subsistence shall be borne by the Contractor requesting the inspection of material stored outside the Commonwealth of Massachusetts as part of the Contract Price. The policy of the Awarding Authority precludes the payment for material stored outside the boundaries of Massachusetts except in extremely limited circumstances with the express written consent of the Awarding Authority. If the Contractor requests an inspection of material stored outside the Commonwealth of Massachusetts, the Awarding Authority will initially pay for all expenses of inspecting the material incurred by the Designer and/or Awarding Authority's personnel including travel, quarters, and subsistence. The Awarding Authority will then give Contractor an invoice for those costs and the Contractor shall submit a credit Change Order for the amount of those expenses.

D. Stored materials either at the Site or at some other location agreed upon in writing shall be so located as to facilitate prompt inspection and even though approved before storage, may again be inspected prior to their use in the Work.

E. All storage sites shall be restored to their original condition by the Contractor at the Contractor's expense.

F. The Contractor shall take charge of and be liable for any loss of or injury to the materials for his use delivered to or in the vicinity of the place where the Work is being done, whether furnished by the Owner or otherwise; the Contractor shall notify the Designer as soon as any such materials are so delivered, allow them to be examined by the Designer, and furnish workers to assist therewith.

6. Defective, Damaged, or Deteriorated Materials and Rejection Thereof.

The Designer or Awarding Authority may reject materials if either reasonably determines that such materials do not conform to the Contract Documents in any manner, including but not limited to materials that have become damaged or deteriorated from improper storage whether or not such materials have previously been accepted. The Contractor at its own expense shall remove rejected materials from the Work. No rejected material, the defects of which have been subsequently corrected, shall be used except with the written permission of the Designer. Should the Contractor fail to remove rejected material within a reasonable time, the Designer and/or Awarding Authority may, in addition to any other available remedies, remove and/or replace the rejected material, and to deduct the cost of such removal and/or replacement from any moneys due or to become due the Contractor. No extra time shall be allowed for completion of Work by reason of such rejection. The inspection of the Work shall not relieve the Contractor of any of its obligations herein prescribed, and any defective Work shall be corrected. Work not conforming to the Contract Documents may be rejected notwithstanding that such Work and materials have been previously overlooked or misjudged by the Designer and accepted for payment. If the Work or any part thereof shall be found defective at any time before Final Acceptance of the whole Work, the Contractor shall forthwith make good such defect in a manner satisfactory to the Designer. Nothing in the Contract shall be construed as vesting in the Contractor any property rights in the materials used after they have been attached or affixed to the Work or the Site; but all such materials shall upon being so attached or affixed become a property of the Owner.

ARTICLE VI: PROSECUTION AND PROGRESS

1. Beginning, Progress Schedule, and Completion of Work.

A. The Contract time shall commence upon the date specified in the Notice to Proceed. The Contractor shall begin Work at the Site within ten days of said date unless otherwise ordered in writing by the Awarding Authority.

B. Within ten days after the Work has commenced, the Contractor shall submit to the Designer and to the Awarding Authority, a progress schedule for the term of the Contract as required by the Contract Documents, showing in detail his proposed progress for the construction of the various parts of the Work and the proposed times for receiving required materials. Upon Approval by the Awarding Authority, said schedule shall constitute the Progress Schedule. The Contractor shall at the end of each month, or more often if required, furnish to the Designer and to the Awarding

Authority a schedule meeting the requirements of the Specifications showing the actual progress of the parts of the Work in comparison with the Progress Schedule.

C. Time is of the essence of this Contract. The Work shall be completed within the time specified in Article 2 of the Owner - Contractor Agreement. Should the Contractor require additional time to complete the Work, the Contractor shall document the reasons therefore and submit a written request for an extension of time within 20 days of the occurrence of the event alleged to be the cause of the delay, as provided in this Article and in Article VII of these General Conditions of the Contract. Failure to submit said written request within the time required by the preceding sentence shall preclude the Contractor from subsequently claiming any time extension due to said delay.

D. If, in the opinion of the Designer or the Awarding Authority, the Contractor fails to comply with the Progress Schedule, the Awarding Authority may give the Contractor a notice specifying the time limits and performance standards that the Contractor is failing to meet whereupon (1) the Contractor shall, if the notice requires, discontinue all or any portion of the Work (which discontinuance shall neither terminate the Contract nor give the Contractor any claim for an increase in the Contract Price, damages, or an extension of any completion deadlines); or (2) at Contractor's sole cost increase the work force, equipment and plant, or any of them, employed on the whole or any part of the Work, to the extent required by such notice, and employ the same from day to day until the completion of the Work or such part thereof, or until the failure regarding the rate of progress, in the opinion of the Designer or the Awarding Authority, shall have been sufficiently corrected.

E. If, in the opinion of the Awarding Authority, the Contractor fails to comply with the Progress Schedule, and whether or not the Awarding Authority shall have given the Contractor a notice described in D above, the Awarding Authority may (but shall not be required to) give the Contractor notice of such failure and five days to cure the same. Unless the Contractor shall within that five days take all necessary steps to do so (including, if the Awarding Authority requires, increasing its forces, equipment and plant) and continue to do so until in the opinion of the Awarding Authority the failure is corrected, the Awarding Authority may at the Contractor's expense and without terminating this Contract take exclusive or joint possession of all or a portion of the Site and employ and direct the labors of existing or such additional forces, equipment and plant as may in the Designer's or Awarding Authority's opinion be necessary to insure the completion of the Work or such part thereof within the time specified in the Contract Documents or at the earliest possible date thereafter. The Awarding Authority may exercise its rights under this Article at any time and from time to time without waiving any of its rights under this Contract, at law or in equity, including, without limitation, the right to deem this Contract terminated or to order the Contractor to discontinue the Work at any time thereafter. The Contractor shall continue to perform the remaining Work under this Contract even if the Awarding Authority elects to have another contractor perform a portion of the Work under this Article.

F. The Awarding Authority shall deduct the cost of any actions the Awarding Authority takes under this Article from any amount then due or which might have become due to the Contractor under this Contract had the Contractor performed as required. On demand, the Contractor shall pay the Awarding Authority any amount by which the cost of completing all or any portion of the Work exceeds the amount attributable to that Work under the Contract Documents. The Awarding Authority's sole goal will be to complete the Work that it elects to complete within the time limits stated in the Contract or at the earliest possible date thereafter. Consequently, the Awarding Authority shall have no obligation to obtain competitive bids or the lowest cost for completing the Work or any part thereof. The Awarding Authority's election to complete all or part of the Work shall not release the Contractor from any liability for failure to complete the Work as the Contract Documents require, and shall not entitle the Contractor to a claim for an increase in the Contract Price or an extension of the time for completing the Work. If the cost that the Awarding Authority incurs in completing all or any portion of the Work is less than the amount that the Contract Documents attribute to that Work, the Awarding Authority will pay or credit the difference to the Contractor, less any other costs and expenses that the Awarding Authority incurs, including the cost of supervision, and the Designer's and attorneys' fees and costs.

2. Failure to Complete Work on Time - Liquidated Damages.

A. If liquidated damages are specified in the Owner - Contractor Agreement, the Awarding Authority has determined that its damages as a result of Contractor's failure to complete the Work to the point at which it qualifies for the issuance of a Certificate of Use and Occupancy will be difficult or impracticable to ascertain. Accordingly, if the Work is not completed to such point by the date specified in this Contract, the Contractor shall pay to the Awarding Authority the sum

designated as liquidated damages in the Contract for each and every calendar day that the Contractor is in default in completing the Work to such point. Such monies shall be paid as liquidated damages, not as a penalty, to cover losses and expenses to the Awarding Authority and/or the User Agency resulting solely from the fact that the Work is not completed on time.

B. Similarly, if the Contract states that by a specified date a designated portion of the Work shall be prosecuted to the point at which it qualifies for the issuance of a Certificate of Agency Use and Occupancy, and if such portion has not been prosecuted to such point by said date, the Contractor shall pay to the Awarding Authority the sum designated in the Contract for each calendar day that the Contractor is in default in completing such portion of the Work to such point. Such monies shall also be paid as liquidated damages not as a penalty, to cover losses and expenses to the Owner resulting solely from the fact that the Work is not completed on time.

C. The Awarding Authority may recover such liquidated damages by deducting the amount thereof from any moneys due or that might become due the Contractor, and if such moneys shall be insufficient to cover the liquidated damages, then the Contractor or the Surety shall pay to the Awarding Authority the amount due.

D. Permitting the Contractor to continue and finish the Work or any portion of it after the time fixed in the Contract for its completion shall not be deemed as a waiver of any of the Owner's rights hereunder, at law or in equity.

E. Liquidated damages or a portion thereof may be waived by the Awarding Authority if the Contractor submits evidence satisfactory to the Awarding Authority that the delay was caused solely by conditions beyond the control of the Contractor and that the Awarding Authority has not suffered any damages as a result of said delay.

F. Failure by the Awarding Authority to specify a sum as liquidated damages in the Owner - Contractor Agreement, or the insertion of "N/A" or "none" in the space provided therein for liquidated damages, shall not be deemed a waiver of the Awarding Authority's right to recover actual damages arising from the Contractor's failure to complete the Work on time.

3. Delays; Statutory Provisions (M.G.L. c. 30, s. 39O).

A. Notwithstanding any provision of this Contract to the contrary, except as otherwise provided by law as set forth in paragraph B below, the Contractor shall not be entitled to increase the Contract Price or to receive damages on account of any hindrances or delays, avoidable or unavoidable; but if any delay is caused in the opinion of the Designer by the Awarding Authority, the Contractor shall be entitled to an extension of time. The length of the extension shall be sufficient in the opinion of the Designer for the Contractor to complete the Work. Although no delay shall increase the Contract Price, the Awarding Authority may require that any change in the date by which the Contractor must complete all or any part of the Work be processed on a standard Change Order form.

B. If 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 Contractor with respect to such increase as the Contractor shall have against the Awarding Authority by virtue of (a) and (b) of M.G.L. c. 30, s. 39O set forth below, but nothing in provisions (a) and (b) shall alter any other rights which the Contractor or the subcontractor may have against each other. As used in the statutory language of (a) and (b) below, "contract" means this Contract, "general contractor" means the Contractor and "awarding authority" means the Awarding Authority:

"(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 or failure to act and, in any event, not later than the date of final payment under this contract and except for

costs due to a suspension order, the awarding authority shall not approve any costs in the claim incurred more than twenty days before the general contractor notified the awarding authority in writing of the act or failure to act involved in the claim."

4. Use and Occupancy Prior to Final Acceptance.

A. The Contractor agrees to the use and occupancy of the Project or any portion thereof before Final Acceptance of the Work by the Awarding Authority.

B. The Awarding Authority will cooperate with the Contractor with respect to the completion of the Work by taking such reasonable steps as may be possible to avoid interference with the Contractor's Work provided that they do not interfere with the proper functioning of the facility.

C. The Contractor shall not be responsible for wear and tear or damage resulting solely from temporary occupancy.

D. Use and occupancy of any part of the Work prior to Final Acceptance by the Awarding Authority shall not relieve the Contractor from maintaining the required payment and performance bonds and insurance (to the extent that insurance is required to be maintained after Substantial Completion) required by this Contract.

5. Certificate of Occupancy.

A. When the Work, or portion thereof which the Awarding Authority agrees to accept separately has reached the state of Substantial Completion as shown on Approved payment request, the Contractor shall develop, with the participation of the Designer and the Awarding Authority, the Punch List identifying those items of unfinished or unacceptable Work that remain to be performed or corrected under the Contract.

B. Before the Work shall be deemed completed to the point where it is ready for the issuance of a Certificate of Occupancy, the Contractor shall:

- (1) Provide Contractor's proposed Punch List containing a statement of the reason for each item listed thereon;
- (2) Advise the Awarding Authority of proposed changes in insurance in accordance with the provisions of this Contract, and provide to the Awarding Authority evidence of Contractor's Completed Operations insurance coverage to the extent required by the Contract Documents;
- (3) Execute and submit a notarized warranty on a form provided by the Awarding Authority meeting the requirements of Article IX of these General Conditions of the Contract, to commence upon the date of the issuance of the Certificate of Occupancy for the Work or the designated portion thereof, unless otherwise provided in the Certificate of Occupancy;
- (4) Submit signed special warranties and warranties of longer than one year as required by the Contract Documents;
- (5) Submit signed maintenance agreements for all portions of the Work specified to receive maintenance after the issuance of the Certificate of Occupancy;
- (6) Submit all preliminary record Drawings and documents and framed data in the forms required by the Contract Documents to the Awarding Authority and Designer;
- (7) Complete all items required to be completed by the New Bedford Department of Inspectional Services and obtain a Certificate of Occupancy from the Department of Inspectional Services and similar releases which permit the Awarding Authority full and unrestricted use of the areas claimed to be ready for occupancy;
- (8) Deliver specified maintenance stocks of materials, required spare parts, and all special tools furnished by manufacturers to persons designated by the Awarding Authority and obtain written receipts for same;
- (9) Make final changes of lock cylinders or cores and advise the Awarding Authority of the change of project security responsibility;
- (10) Complete start-up of systems and instruct Awarding Authority personnel on proper operation and routine maintenance of all systems and equipment and notify the Awarding Authority that start-up and instruction have been completed;
- (11) Remove all remaining temporary facilities that are no longer needed, surplus materials, and debris; (the Contractor shall not remove construction offices and trailers without the prior Approval of the Awarding Authority);

(12) Submit final utility meter readings and similar information and advise the Awarding Authority of the change of responsibility for utility charges and payments upon the issuance of the Certificate of Occupancy;

(13) Complete final clean-up of all Work, restoration of damaged finishes, and replacement of all damaged and broken glass not listed on the Contractor's Punch List.

(14) Complete such other items as may be called for in the Supplementary General Conditions, if any, or in the Specifications.

C. After completing the items specified in subsection A above, the Contractor shall make a written request for the Designer's inspection for a Certificate of Occupancy in accordance with the Contract Documents. The Designer shall review the submittals and the Work and shall either 1) sign a Certificate of Occupancy or 2) notify the Contractor of incomplete and/or incorrect Work that must be completed and corrected prior to the issuance of the Certificate of Occupancy. The Designer shall notify the Contractor of any additions to the Punch List. In connection with the execution of the Certificate of Occupancy the Designer shall assign dollar values to each item on the Punch List. Failure to include any incomplete or defective item on the Punch List shall not relieve the Contractor of the obligation to complete all Work in accordance with the Contract Documents.

6. Final Acceptance of the Work.

A. Prerequisites for Final Acceptance. After the issuance of a Certificate of Occupancy for the entire Work, and after the Contractor has completed all of the Work required by this Contract, including Change Orders and Punch List Items, the Contractor shall submit the following completed items to the Awarding Authority together with such additional items as may be specified in the Contract Documents:

(1) A completed Final Application for Payment showing a final accounting of all changes in the Work, on the form provided by the Awarding Authority.

(2) Certification and satisfactory evidence that all taxes, fees, and similar obligations have been paid.

(3) Consent of the Surety to Final Payment executed by applicable bonding companies.

(4) Certified copy of the Punch List stating that the Contractor has completed or corrected every item listed.

(5) Evidence of Contractor's continuing Completed Operations Insurance coverage to the extent required by the Contract Documents.

(6) All final record Drawings and documents in the forms specified by the Contract Documents.

(7) A notarized certification that all purchases made under the tax exemption certificate were legitimate and entitled to exemption.

(8) Written certifications from the Department of Inspectional Services and the Designer to the effect that: a) the Work has been inspected for compliance with the Contract Documents and has satisfied the Department of Inspectional Services; b) all equipment and systems included in the Work have been tested in the presence of the Designer and are operational and satisfactory; c) the Work is completed and ready for final inspection.

(9) Such other items as may be required by the Contract Documents.

B. Re-inspection; Final Acceptance. After notification from the Contractor that all remaining contract exceptions, omissions and incomplete items have been completed (with the exception of Contractor's continuing warranty, insurance, indemnification, and such other obligations as are intended by the terms of the Contract Documents to extend beyond the date of Final Acceptance), the Awarding Authority and the Designer shall inspect the Work to verify the completion of the same. If the Work is satisfactory, the Awarding Authority shall prepare a Certificate of Final Acceptance or shall notify Contractor of items which remain to be completed prior to Final Acceptance.

7. One-Year Warranty Repair List and Inspection.

Approximately 30 days prior to the expiration of the comprehensive one-year warranty period, the Contractor shall schedule an appointment with the Awarding Authority for a re-inspection of the Work with the Awarding Authority, and shall thereafter inspect the work at the time scheduled. Based on this inspection and on prior inspections, the Awarding Authority shall issue a "Warranty Repair List" of items to be corrected by the Contractor. The Contractor shall make the repairs and/or replacements listed within 30 days of the issuance of the Warranty Repair List unless otherwise agreed by the Awarding Authority in writing.

ARTICLE VII: CHANGES IN THE WORK

1. Change Orders Generally.

A. No changes in the Work shall be made in absence of a Change Order (sometimes called a "Notice to Proceed") defined in Article I of these General Conditions of the Contract, directing the Contractor to perform such changes. A request for a change in the provisions of this Contract may be submitted to the Awarding Authority by the Contractor, Designer, or OPM. The request must be made in writing and in accordance with the provisions of this Contract, Laws, and the procedures of the Awarding Authority.

B. A Change Order may be issued by the Awarding Authority for changes in the Work within the scope of the Contract, including but not limited to, changes in: (1) the Plans and Specifications; (2) the method or manner of performance of the Work; (3) the Owner-furnished facilities, equipment, materials, services or Site; (4) the schedule for performance of the Work.

C. The Contractor shall immediately perform any Change Order work that is ordered by the Awarding Authority.

D. Whenever a Change Order is issued and said Change Order will cause a change in the Contractor's cost, the Contractor or the Awarding Authority may request an equitable adjustment in the Contract Price. A request for such an adjustment shall be in writing and shall be submitted by the party making such claim to the other party before commencement of the pertinent work or as soon thereafter as possible.

E. The Awarding Authority and the Contractor shall negotiate in good faith an agreement on an equitable adjustment in the Contract Price, and/or time if appropriate, before commencement of the pertinent work or as soon thereafter as is possible. In the absence of an agreement for an equitable adjustment, the Awarding Authority shall unilaterally determine the costs attributable to the change and provide the Contractor with a written notice to that effect. The Contractor may appeal the decision of the Awarding Authority within thirty days of receipt of said notice, to the chief executive official of the Awarding Authority or his designee. However, if the Contractor shall exercise its rights to appeal the decision of the Awarding Authority as aforesaid, the Contractor shall be required to engage in the mandatory mediation procedures set forth in Section 5 of this Article VII.

F. During the negotiation of an equitable adjustment in the Contract Price, the Contractor shall, if requested, provide the Awarding Authority with all cost and pricing data used by him in computing the amount of the equitable adjustment, and the Contractor shall certify that the pricing data used was accurate, complete and current. If the Awarding Authority subsequently determines that the data submitted by the Contractor was incomplete, incorrect or not current, the Awarding Authority may exclude such data from consideration under the equitable adjustment request.

2. Methods of Computing Equitable Adjustments.

A. Equitable adjustments in the Contract Price shall be determined according to one of the following methods, or a combination thereof, as determined by the Awarding Authority: (1) fixed price basis, provided that the fixed price shall be inclusive of items (a) through (e) below and shall be computed in accordance with those provisions; (2) estimated lump sum basis to be adjusted in accordance with Contract unit prices or other agreed upon unit prices provided that the unit prices shall be inclusive of all costs related to such equitable adjustment; (3) time and materials basis to be subsequently adjusted on the basis of actual costs (but subject to a predetermined "not to exceed limit") calculated as follows:

(a) the direct cost (or credit) for labor at the minimum wage rates established for this Contract pursuant to M.G.L. c. 149, s 26-27H, and the direct cost for material and use of equipment;

(b) plus (or minus) the cost of Workmen's Compensation Insurance, Liability Insurance, Federal Social Security and Massachusetts Unemployment Compensation, or as an alternative the Contractor may elect to use a flat 30% of the total labor rate computed in accordance with subparagraph (a) above;

(c) plus an allowance equal to 20% of the amount of (a) above for overhead, superintendence and profit; (In the case of Item 1 work, which is the work of the Contractor and all his non-filed Subcontractors, said 20% allowance shall be paid to the Contractor and the Contractor and said non-filed Subcontractors shall agree upon the distribution of this amount as a matter of contract between them. In the case of Item 2 work, which is work performed by a Subcontractor filed pursuant to M.G.L. c. 149, s. 44F, said 20% allowance shall be paid to the filed Subcontractor, it being understood that this provision does not apply to other Subcontractors including sub-Subcontractors listed under paragraph E of the form for sub-Bid);

(d) plus, for work performed by a Subcontractor filed pursuant to M.G.L. c. 149, s. 44F, an additional allowance equal to 7% of the sum of (a) through (c) above as full compensation to the Contractor for processing forms and assuming full responsibility for the faithful performance of such work by said filed Subcontractor(s);

(e) plus (or minus) the actual direct premium cost of payment and performance bonds required of Contractor and filed Subcontractors for this Contract.

B. If the net change is an addition to the Contract Price, it shall include the Contractor's overhead, superintendence and profit. On any change that involves a net credit, no allowance for overhead, superintendence and profits shall be included. For any change that does not include labor performed or materials installed in the project, there will be no markup for the Contractor's overhead, superintendence, and profit, even though there may be a net increase in the Contract Price. Charges for small tools known as "tools of the trade" are not to be computed in the amount of any change in the Contract Price.

C. Statutory Contract adjustments made under the provisions of M.G.L. c. 149, s.44F shall not be considered Change Orders and shall not entitle the Contractor to any adjustments for overhead, profit, and superintendence, although the Awarding Authority may require that such Contract adjustments be processed on standard Change Order and equitable adjustment forms.

3. Work Performed Under Protest.

The Contractor agrees to perform all Work as directed by the Awarding Authority, and if the OPM determines that certain Work that the Contractor believes to be or to warrant a Change Order under this Article does not represent a change in the Work, the Contractor shall perform said Work. The Contractor shall be deemed to have concurred with the OPM's determination as aforesaid unless the Contractor shall perform Work under protest in compliance with the following sub-paragraphs (1) and (2) below:

(1) If the Contractor claims compensation for a change in the Work that is not deemed by the OPM to be a change or to warrant additional compensation as claimed by the Contractor, the Contractor shall on or before the first working day following the commencement of any such work or the sustaining of any such damage submit to the Designer, OPM and the Awarding Authority a written statement of the nature of such work or claim. The Contractor shall not be entitled to additional compensation for any work performed or damage sustained for which written notice is not given within the time limit specified in the preceding sentence, even though similar in character to work or damage with respect to which notice is timely given.

(2) On or before the second working day after the commencement of such work or the sustaining of

such damage, and daily thereafter, the Contractor shall file to the extent possible with the OPM, the

Designer, and the Awarding Authority, itemized statements of the details and costs of such work

performed or damage sustained.

4. False Claims, Statutory Provisions Regarding Changes.

A. Criminal Penalties: The Contractor's attention is directed to M.G.L. c. 30, s. 39I, which provides criminal penalties for unauthorized deviations from the Plans and Specifications, and to M.G.L. c. 30, s. 39J. The Contractor's attention is also directed to M.G.L. 266, s. 67B which provides criminal penalties for false claims by Contractor under this Contract:

"Whoever makes or presents to any employee, department, agency or public instrumentality of the commonwealth, or of any political subdivision thereof, any claim upon or against any department, agency, or public instrumentality of the commonwealth, or any political subdivision thereof, knowing such claim to be false, fictitious, or fraudulent, shall be punished by a fine of not more than ten thousand dollars or by imprisonment in the state prison for not more than five years, or in the house of correction for not more than two and one-half years, or both."

B. Differing Site Conditions (M.G.L. c. 30, s. 39N): *"If, during the progress of the work, the contractor or the awarding authority discovers that the actual subsurface or latent physical conditions encountered at the Site differ substantially or materially from those shown on the plans or indicated in the contract documents either the contractor or the contracting authority may request an equitable adjustment in the contract price of the contract applying to work affected by*

the differing Site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a contractor, or upon its own initiative, the contracting authority shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the contract documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and contract documents 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."

C. Timely Decision By Awarding Authority(M.G.L. c. 30, s. 39P): *"Every contract subject to section thirty-nine M of this chapter or section forty-four A of chapter one hundred forty-nine which requires the awarding authority, any official, its architect or engineer to make a decision on interpretation of the specifications, approval of equipment, material or any other approval, or progress of the work, shall require that the decision be made promptly and, in any event, no later than thirty days after the written submission for decision; but if such decision 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."*

5. Mandatory Mediation.

In the case of every dispute where the dollar amount in dispute (or the estimated dollar value of the extension of time in dispute) is \$50,000 or more and the Contractor appeals the decision of the chief executive officer of the Awarding Authority or his designee described in Section 4.B above, the Awarding Authority and the Contractor shall engage in good faith in a non-binding mediation process, which process shall be concluded within sixty days from the date that the Contractor files an appeal from said decision as provided in Section 4.B above. In the case of such disputes where the dollar amount in dispute (or the estimated dollar value of the extension of time in dispute) is \$500,000 or more, the parties shall, if the mediation process fails, submit the dispute to a third-party Neutral which shall within sixty days render a non-binding advisory opinion. Unless the parties have previously agreed in writing to a process for submitting disputes to mediation, the Awarding Authority shall determine in its reasonable discretion the procedures to be followed and shall give the Contractor notice of the same in writing within 7 days of the date that the Awarding Authority receives notice of the Contractor's appeal from the decision of the chief executive officer of the Awarding Authority or his designee. The mediator shall be selected jointly by the parties to this Contract. The cost of the services of any mediator selected jointly by the parties to this Contract or jointly by mediators selected by the parties to this Contract shall be borne equally by the Contractor and the Awarding Authority.

ARTICLE VIII: PAYMENT PROVISIONS

1. Schedule of Values.

Before the first application for payment the Contractor shall submit to the Designer and the Awarding Authority a schedule of values allocated to various portions of the Work in sufficient detail to reflect the various major components of each trade (with filed Subcontractors as well as MBE/WBE noted), including quantities when requested, aggregating the total Contract Price and divided so as to facilitate payments for work under each section of the Specifications. The schedule shall be prepared in such form and supported by such data to substantiate its accuracy as the Designer or the Awarding Authority may require. Each item in the schedule shall include its proper share of overhead and profit. When Approved by the Designer and the Awarding Authority, it shall constitute the Schedule of Values and shall be used only as a basis for the Contractor's requests for payments.

2. Payment Liabilities of Contractor.

A. The Contractor shall pay to the Owner all expenses, losses and damages, as determined by the Awarding Authority or the Designer, incurred in consequence of any default, defect, omission or mistake of the Contractor or his employees or Subcontractors or the making good thereof.

B. If the Work (or a portion thereof) is not completed to Substantial Completion and the Contractor has not satisfied the requirements for the issuance of a Certificate of Occupancy by the date specified in Article 2 of the Owner - Contractor Agreement, the Contractor shall pay to the Owner liquidated damages as provided in Article VI, Section 2 of these General Conditions of the Contract.

3. Retention of Moneys by Awarding Authority.

A. The Awarding Authority may keep any moneys which would otherwise be payable at any time hereunder, and apply the same, or so much as may be necessary therefore, to (1) the Owner's expenditures for the Contractor's account, (2) to secure the Awarding Authority's remedies against the Contractor for the Contractor's breach of its obligations under this Contract or the breach of any person performing any part of the Work and (3) the payment of any expenses, losses or damages incurred by the Awarding Authority or any agency of the Commonwealth as a result of the failure of the Contractor to perform its obligations hereunder. The Awarding Authority may retain, until all claims are settled, such moneys as the Awarding Authority estimates to be the fair value of the Awarding Authority's claims against the Contractor, and of all claims for labor performed or furnished and for materials used or employed in or in connection with the Work and for the rental of vehicles, appliances and equipment employed and for the employment of substitute contractors and labor in connection with the Work filed in accordance with M.G.L. c. 30, s. 39A and s. 39F. The Awarding Authority may make such settlements and apply thereto any moneys retained under this Contract.

B. The Contractor shall each week examine all claims so filed, and if the same are in any respect incorrect or do not correctly show the amount due from the Contractor to the claimant for such labor and materials, the Contractor shall forthwith file with the Awarding Authority a separate written statement of all inaccuracies in each claim and of the correct amount due from the Contractor to each claimant therefore, and shall immediately file a statement of all payments thereafter made to such claimants. Each such statement shall be sworn to and contain a detailed breakdown required by M.G.L. c. 30 s. 39F(d) and (e). Unless such statements are so filed by the Contractor the amount shown by the claims filed shall at the option of the Awarding Authority be conclusively deemed to be the accurate amount due from the Contractor therefore in all accounting with the Awarding Authority. If the moneys retained under this Contract are insufficient to pay the sums found by the Awarding Authority to be due under the claims for labor and materials filed as aforesaid, the Awarding Authority may, at its discretion, pay the same, and the Contractor shall repay to the Awarding Authority all sums paid out. The Awarding Authority may also at its discretion use any moneys retained, due or to become due under this Contract, for the purpose of paying for both labor and materials used or employed in the Work for which claims have not been filed with the Awarding Authority.

C. No moneys retained under the provisions of this Article shall be held to be statutory security for the payment of claims filed in accordance with the provisions of M.G.L. c. 149, s. 29, as amended, for which security is provided by bond.

4. Applications for Payment.

A. The Contractor shall, once in each month on the day of the month corresponding to the day of the month specified in the Notice to Proceed referenced in Article 2 of the Owner - Contractor Agreement, on forms provided and in the manner prescribed by the Awarding Authority, submit to the Awarding Authority a statement showing the total amount of Work done to the time of such estimate and the value thereof as approved by the OPM and the Designer. It shall be the sole responsibility of the Contractor to deliver or cause to be delivered to the OPM (the "designee" as provided by M.G.L. c. 30, s. 39K) said periodic estimate in proper form, approved as provided above and arithmetically correct. All periodic estimates shall contain such certifications and other evidence supporting the Contractor's right to payment as the Awarding Authority may require, including without limitation, lien waivers and other evidence, on such forms as the Awarding Authority may require, establishing that title to the equipment or materials is unencumbered and has been transferred to the Owner. If there is no OPM assigned to the Contract, the Designer shall be the designee. If there is neither an OPM nor a Designer the designee shall be a person designated by the Awarding Authority at the project field office or alternatively the home office of the Awarding Authority. The Contractor shall include in such periodic estimate only such materials as are incorporated in the Work, except as provided in paragraph C below. The Awarding

Authority shall retain five percent of such estimated value as part security for the completion of the Work and shall pay to the Contractor while carrying on the Work the balance not retained as aforesaid, subject to the Approval of the Awarding Authority after deducting therefrom all previous payments and all sums to be kept under the provisions of this Contract.

B. Each periodic estimate shall constitute the Contractor's representation that (1) the payment then requested to be disbursed has been incurred by the Contractor on account of the Work and is justly due to Subcontractors or, to the Contractor in the case of other Work performed by the Contractor on account thereof, (2) the materials, supplies and equipment for which Application for Payment is being submitted have been installed or incorporated into the Work or have been stored at the Site or at such off Site storage locations as the Awarding Authority shall have Approved, (3) the materials, supplies and equipment are insured in accordance with the provisions of this Contract, (4) the materials, supplies and equipment are owned by the Owner and are not subject to any liens or encumbrances, (5) the Work which is the subject of such periodic estimate has been performed in accordance with the Contract Documents and (6) that all due and payable bills with respect to the Work have been paid to date or shall be paid from the proceeds of such periodic estimate. The Contractor's attention is directed to the criminal penalties for false claims referenced in paragraph A above.

C. The Contractor may include in a periodic estimate the value of materials or equipment delivered at the Site (or at some location agreed to in writing) only upon delivery to the Awarding Authority of: (1) an acceptable transfer of title on the form provided by the Awarding Authority; (2) written certification by the Contractor (or applicable subcontractor) on the form provided by the Awarding Authority that the Contractor (or the Subcontractor which executed the transfer of title) is the lawful owner and that the materials or equipment are free from all encumbrances, accompanied by receipted invoices or other acceptable proof of prior payment for such materials; (3) a stored materials insurance binder that covers the materials for which payment is requested, that names the Owner as an insured party should the stored materials be subjected to any casualty, loss, or theft prior to their inclusion in the Work. The material(s) or equipment must, in the judgment of the Designer (1) meet the requirements of the Contract, including prior shop drawing, product data, and sample approval, (2) be ready for use, and (3) be properly stored by the Contractor and be adequately protected until incorporated into the Work. See also Article V.5.C of these General Conditions of the Contract concerning the cost of inspections.

D. The Awarding Authority may make changes in any periodic estimate submitted by the Contractor in accordance with M.G.L. c.30, s. 39K (see below) and the payment due shall be computed in accordance with the changes so made. The provisions of said section 39K shall govern payments on which the Awarding Authority has made changes.

E. No certificate for payment and no progress payment shall constitute acceptance of Work that is not in accordance with the Contract Documents.

F. The Contractor and all Subcontractors furnishing labor on this Contract agree to furnish certified payroll reports if requested to do so, at no additional expense to the Awarding Authority. The Awarding Authority may at all reasonable times audit such reports.

5. Periodic Payments (M.G. L. c. 30, s. 39K).

The Awarding Authority shall make payment to the Contractor in accordance with M.G.L. c. 30, s. 39K.

6. Payment of Subcontractors (M.G.L. c. 30, s. 39F).

The Contractor shall make payments to Subcontractors in accordance with M.G.L c.30, s. 39F which is quoted in this section below. For the purposes of this Contract, the word "forthwith" appearing in paragraph (1) (a) of c. 30, § 39F shall be deemed to mean "within five (5) business days."

7. Final Payment; Release of Claims by Contractor.

Upon Final Acceptance of the Work the Contractor shall be entitled to payment of the balance of the Contract Price. Final payment shall be as provided in this Article above and in accordance with any process set forth in the *Supplementary General Conditions*. The Contractor agrees to

execute a Certificate of Final Inspection, Release (with Contractor's own exceptions listed thereon) and Acceptance as a condition precedent to Final Payment. The acceptance by the Contractor of the Final Payment made as aforesaid, or the execution of the Certificate of Final Acceptance by the Contractor, shall constitute a release of the Owner, the Awarding Authority, the Designer, and every member and agent of any of them, from all claims of and liability to the Contractor for anything done or furnished for or relating to the Work, or for any act or neglect of the Owner, the Designer, or of any person relating to or affecting the Work, except the claim against the Owner or the Designer for the remainder, if any there be, of the amounts set forth by the Contractor in the Certificate of Final Inspection, Release and Acceptance. Final Acceptance shall not relieve Contractor of the requirements of Articles IX, XIV, and XV of these General Conditions of the Contract, or of other provisions of this Contract, to the extent that the same are intended to survive Final Acceptance.

ARTICLE IX. GUARANTEES AND WARRANTIES

1. General Warranty.

If at any time during the period of one (1) year from the date of the issuance of the Certificate of Occupancy by the Awarding Authority or the date of Final Acceptance, whichever occurs first, any part of such Work shall in the reasonable opinion of the Awarding Authority be defective or require replacing or repairing, or damage to other property of the Owner is caused by any defect in the Work, the Awarding Authority shall notify the Contractor in writing to make the required repairs or replacements and repair such damage. If the Contractor shall neglect to commence such repairs or replacements to the satisfaction to the Awarding Authority within ten (10) days from the date of the giving of such notice, then the Awarding Authority may employ other persons to make the same. The Contractor agrees, upon demand, to pay to the Awarding Authority all amounts which it expends for such repairs, replacements, and/or damages. During this one-year guarantee period any corrective work shall be performed under all the applicable terms of this Contract, and if Change Orders are issued in accordance with the terms of this Contract, the Contractor shall be entitled to compensation for special insurance, as required. This one-year guarantee shall not limit any express guaranty or warranty provided elsewhere in the Contract.

2. Special Guarantees and Warranties.

A. The Contractor's obligation to correct Work as set forth in paragraph 1 above is in addition to, and not in substitution of, such guarantees or warranties as may be required in the various sections of the Specifications.

B. Guarantees and warranties required in the various sections of the Specifications must be delivered to the Owner before final payment to the Contractor may be made, or in the case of guarantees and warranties which originate with a subcontractor's section of the Work, before final payment for the amount of that subtrade or for the phase of Work to which the guarantee or warranty relates.

C. The failure to deliver a required guarantee or warranty shall constitute a failure to fully complete the Work in accordance with the Contract Documents and a breach of the Owner-Contractor General Contract.

ARTICLE X: MISCELLANEOUS LEGAL REQUIREMENTS.

1. Contractor to be Informed.

The Contractor shall inform itself of all existing and future Laws in any manner affecting those engaged or employed in the Work, or the materials used or employed in the Work, or in any way affecting the conduct of the Work, and of all orders and decrees of bodies or tribunals having any applicable jurisdiction or authority over the Work.

2. Compliance with all Laws.

The Contractor shall cause all persons employed in the performance of the Work to comply with all existing and future Laws, including but not limited to those set forth below:

A. Corporate Disclosures. The Contractor, if a foreign corporation, shall comply with M.G.L. c. 181, s.3 and s. 5, and M.G.L. c. 30, s.39L.

A ½. Employment Eligibility Verification

The Contractor shall comply with Federal Department of Homeland Security Requirements in hiring any and all "Employees" to be employed in the Project who are required to be listed in the

certified payroll reports for the Project. Such compliance shall include, but not be limited to the faithful completion of the Federal Department of Homeland Security Form I-9 process by the Contractor for each of its Employees. The Contractor shall execute a Certificate of Compliance with Employment Eligibility Verification Requirements (I-9 Certificate) with the execution of its Contract. The Contractor shall require each of its subcontractors and sub subcontractors to execute and provide to Contractor an I-9 Certificate with the execution of each subcontract, and Contractor shall immediately provide a copy to the Awarding Authority. Contractor acknowledges that the weekly workforce report form contained in the contract documents, which must be submitted by the Contractor on a weekly basis, contains a statement that the Form I-9 process was faithfully completed for all employees listed on the weekly certified payroll report. By the signature of the Contractor's Authorized Signatory on the I-9 Certificate, the Contractor certifies under the pains and penalties of perjury that the Contractor shall not knowingly use undocumented workers in connection with the performance of this contract; that pursuant to federal requirements, the Contractor shall verify the immigration status of all workers assigned to the contract without engaging in unlawful discrimination; and that the Contractor shall not knowingly or recklessly alter, falsify, or accept altered or falsified documents from any such worker. The Contractor understands and agrees that breach of any of these terms during the period of a contract may be regarded as a material breach, subjecting the Contractor to sanctions, including but not limited to monetary penalties, withholding of payments, contract suspension or termination.

B. Veterans Preference. In the employment of mechanics and apprentices, teamsters, chauffeurs, and laborers in the performance of Work in the Commonwealth, 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 and who are veterans as defined M.G.L. c.4, s.7 (34), 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.

C. Prevailing Wages. The Contractor shall comply with M.G.L. c. 149, s. 26- 27H. The prevailing wage schedule is found in Exhibit A to the Instructions to Bidders, listing the prevailing minimum wage rates that must be paid to all workers employed in the Work. The Awarding Authority is not responsible for any errors, omissions, or misprints in the said schedule. Such Schedule shall continue to be the minimum rate wages payable to workers employed in the Work throughout the term of this Contract, subject to the exceptions provided in M.G.L c.149, s. 26-27H. The Contractor shall not have any claim for extra compensation from the Owner if the actual wages paid to workers employed in the Work exceeds the rates listed on the schedule or as otherwise provided by law. The Contractor shall cause a copy of said Schedule to be kept in a conspicuous place at the Site during the term of the Contract. If reserve police officers are employed by the Contractor, they shall be paid the prevailing wage of regular police officers. (See M.G.L c.149, s.34B).

D. Payroll Records and Statement of Compliance. The Contractor shall comply and shall cause its Subcontractors to comply with Massachusetts General Law c. 149, s. 27B, which requires that a true and accurate record be kept of all persons employed on the a project for which the prevailing wage rates have been provided. The Contractor and all Subcontractors shall keep these records and preserve them for a period of three years from the date of completion of the Contract. Such records shall be open to inspection by any authorized representative of the Owner at any reasonable time, and as often as may be necessary. The Contractor shall, and shall cause its subcontractors to, submit weekly copies of their weekly payroll records to the Awarding Authority. In addition, the Contractor and each Subcontractor shall furnish to the Awarding Authority within fifteen days after completion of its portion of the Work a signed Statement of Compliance in the form required by c. 149, § 27B.

E. Vehicle operators. If the Director of the Department of Labor and Workforce Development has established a Schedule of wage rates to be paid to the operators of trucks, vehicles or equipment for the Work, the Contractor shall be obligated to pay such operators at least the minimum wage rate contained on such Schedule. (See M.G.L. c.149, s.26-27H).

F. Eight Hour Day. The Contractor shall comply with M.G.L. c. 149, s. 30, 34 and 34A which provide 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 part of the Work 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 cases of extraordinary emergency.

G. Timely Payment of Wages. The Contractor shall comply with, and shall cause its Subcontractors to comply with M.G.L. c. 149, s. 148 which requires the weekly or biweekly payment of employees within six days of the end of the pay period during which wages were earned if employed for five or six days of a calendar week, and within other periods of time under certain circumstances as set forth therein.

H. Lodging, etc. The Contractor shall comply with, and shall cause its Subcontractors to comply with, M.G.L. c. 149, s. 25 which provides that every employee under this Contract shall lodge, board and trade where and with whom he elects, and neither the Contractor nor his agents or employees shall, either directly or indirectly, require as a condition of the employment of any person that the employee shall lodge, board or trade at a particular place or with a particular person.

I. Truck Rates. The use by the Contractor of trucks or other motor vehicles hired from either common or contract motor carriers in the course of performance of this Contract is subject to such minimum rates and charges, and rules and regulations as may from time to time be promulgated by the Department of Public Utilities of the Commonwealth of Massachusetts or other agency of the State or Federal government which may be authorized by law to set rates or otherwise regulate the use of such vehicles. The Contractor expressly assumes the risk of any additional expense that may arise by reason of any change in such minimum rates and charges, and rules and regulations, and shall be entitled to no additional compensation or reimbursement by reason thereof.

ARTICLE XI: CONTRACTOR'S ACCOUNTING METHOD REQUIREMENTS (M.G.L. c. 30, s. 39R)

1. Definitions.

The words defined herein shall have the meaning stated below whenever they appear in this Article XI:

--"Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a Contract pursuant to M.G.L. c. 30, s. 39M, M.G.L. c. 149, s. 44A-J, and M.G.L. c. 7, s. 30B-P.

--"Contract" means any Contract awarded or executed pursuant to M.G.L. c. 30, s. 39M, M.G.L. c. 149, s. 44A-J, and M.G.L. c. 7, s. 30B-P, which is for an amount or estimated amount greater than one hundred thousand dollars.

-- "Independent Certified Public Account" means a person duly registered in good standing and entitled to practice as a certified public accountant under the laws of the place of his/her residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the awarding authority.

-- "Records" means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language.

-- "Audit", when used in regard to financial statements, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of expressing a certified opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons.

or other person or persons primarily responsible for the financial and operational policies and practices of the Contractor.

Accounting terms, unless otherwise defined herein, shall have a meaning in accordance with generally accepted accounting principles and auditing standards.

2. Record Keeping.

A. The Contractor shall make, and keep for at least six years after final payment, books, records, and accounts that in reasonable detail accurately and fairly reflect the transactions and dispositions of the Contractor.

B. Until the expiration of six years after final payment, the Inspector General, DCAM, and the Awarding Authority shall have the right to examine any books, documents, papers or records of the Contractor and Subcontractors that directly pertain to, and involve transactions relating to the Contractor and Subcontractors.

C. The Contractor shall describe any change in the method of maintaining records or recording transactions which materially affects any statements filed with the Awarding Authority including the date of the change and reasons therefore, and shall accompany said description with a letter from the Contractor's independent certified public accountant approving or otherwise commenting on the changes.

D. The Contractor represents that it has, prior to the execution of the Contract, filed a statement of management on internal accounting controls as set forth in Section 3 below.

E. The Contractor represents that it has, prior to the execution of the Contract, filed an audited financial statement for the most recent completed fiscal year as set forth in section 4 below and will continue to file such statement annually during the term of the Contract.

3. Statement of Management Controls.

A. The Contractor shall file with the Awarding Authority a statement of management as to whether the system of internal accounting controls of the Contractor and its subsidiaries reasonably assures that:

- (1) transactions are executed in accordance with management's general and specific authorization;
- (2) transactions are recorded as necessary to: (a) to permit preparation of financial statements in conformity with generally accepted accounting principles, and (b) to maintain accountability for assets;
- (3) access to assets is permitted only in accordance with management's general or specific authorization; and
- (4) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

B. The Contractor shall file with the Awarding Authority a statement prepared and signed by an independent certified public accountant, stating that the accountant has examined the statement of management on internal accounting controls, and expressing an opinion as to:

- (1) whether the representations of management in response to subparagraph 3 above are consistent with the results of management's evaluation of the system of internal accounting controls; and
- (2) whether such representations of management are reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statement.

4. Annual Financial Statement.

A. Every Contractor awarded a contract shall annually file with DCAM during the term of the Contract a financial statement prepared by an independent certified public accountant on the basis of an audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report.

B. The office of Inspector General and DCAM shall have the right to enforce the provisions of this Article. A Contractor's failure to satisfy any of the requirements of this section may be grounds for debarment pursuant to M.G.L. c. 149, s. 44C.

5. Bid Pricing Materials.

The Contractor shall save the written calculations, pricing information, and other data that the Contractor used to calculate the bid that induced the Awarding Authority to enter into this Contract (the "Bid Pricing Materials") for at least six years after the Awarding Authority makes final payment under this Contract.

ARTICLE XII: INSURANCE REQUIREMENTS

1. Insurance Generally.

A. The Contractor shall take out and maintain the insurance coverages listed in this Article with respect to the operations as well as the completed operations of this Contract. This insurance shall

be provided at the Contractor's expense and shall be in full force and effect for the full term of the Contract or for such longer period as this Article requires.

B. All policies shall be written on an occurrence basis and be issued by companies authorized to write that type of insurance under the laws of the Commonwealth and rated in Best's Insurance Guide (or any successor thereto or replacement thereof) as having a general policy holder rating of "A" or better and a financial rating of at least "9" or otherwise acceptable to the Awarding Authority.

C. Contractor shall submit three originals of each certificate of insurance, acceptable to the Awarding Authority, simultaneously with the execution of this Contract. Certificates shall show the Awarding Authority and the Owner as an additional insured as to all policies of liability insurance and shall state that Contractor has paid all premiums and that none of the coverages shall be cancelled, terminated, or materially modified unless and until 30 days prior notice is given in writing to the Awarding Authority. Contractor shall submit updated certificates prior to the expiration of any of the policies referenced in the certificates so that the Awarding Authority shall at all times possess certificates indicating current coverage. Certificates shall indicate that the contractual liability coverage, and Contractor's Protective Liability coverage is in force. Certificates shall include specific acknowledgment that the following coverages are included in the policies:

- Contractual liability
- Contractor's protective
- Owner as additional insured by form CG2010 (11/85 ed.) to the general liability
- Owner as additional insured to automobile liability, umbrella liability, and pollution liability
- General Liability is endorsed with CG2404, Waiver of Subrogation, in favor of the Owner
- Builder's Risk or Installation Floater includes Owner, Contractor and subcontractors of any tier as named insureds. Builder's Risk or Installation floater is on an All Risk basis including earthquake and flood.

D. The Contractor shall file one certified copy of all policies with the Awarding Authority within sixty days after Contract award. If the Awarding Authority or the Owner is damaged by the Contractor's failure to maintain such insurance and to comply with the terms of this Article, then the Contractor shall be responsible for all costs and damages to the Owner attributable thereto.

E. Termination, cancellation, or material modification of any insurance required by this Contract, whether by the insurer or the insured, shall not be valid unless written notice thereof is given to the Awarding Authority at least thirty days prior to the effective date thereof, which shall be expressed in said notice

2. Contractor's Commercial General Liability.

A. The Contractor shall provide the following minimum general liability coverage with respect to the operations performed by Contractor and any employee, subcontractor, or supplier, unless a higher coverage is specified in Exhibit A to the Owner - Contractor Agreement, in which case the Contractor shall provide the additional coverage:

Bodily Injury &	\$1,000,000	each occurrence
Property Damage	\$2,000,000	general aggregate, per project
Products & Completed Operations	\$1,000,000	annual aggregate
Personal & Advertising Injury	\$1,000,000	each occurrence
Medical Expenses	\$10,000	

B. This policy shall include coverage relating to explosion, collapse, and underground property damage.

C. This policy shall include contractual liability coverage.

D. The completed operations coverage shall be maintained for a period of three (3) years after Substantial Completion.

E. If the Work includes work to be performed within 50 feet of a railroad, any exclusion for liability assumed under contract for work within 50 feet of a railroad shall be deleted.

F. This policy shall include endorsement CG2010 (10/85 edition), *Owner as Additional Insured* and CG2404 (11/85 edition) *Waiver of Subrogation in Favor of Owner*.

3. Vehicle Liability.

A. The Contractor shall provide the following minimum coverage with respect to the operations of any employee, including coverage for owned, non-owned, and hired vehicles, unless a higher coverage is specified in Exhibit A to the Owner - Contractor Agreement, in which case the Contractor shall provide the additional coverage:

Combined Single Limit

\$1,000,000

B. The policy shall include a CA9948 Pollution Endorsement and shall name the Owner as an Additional Insured.

4. Pollution Liability.

The Contractor shall provide coverage for bodily injury and property damage resulting from liability arising out of pollution related exposures such as asbestos abatement, lead paint abatement, tank removal, removal of contaminated soil, etc. The Awarding Authority and the Owner shall be named as an additional insured and coverage must be on an occurrence basis. The amount of coverage shall be \$1,000,000 per occurrence and \$3,000,000 in the aggregate unless a higher amount is specified in Exhibit A to the Owner - Contractor Agreement, in which case the Contractor shall provide the additional coverage.

5. Worker's Compensation.

A. The Contractor shall provide the following coverage in accordance with M.G.L. c.149 §34A and c.152 as amended, unless a higher coverage is specified in Exhibit B to the Owner - Contractor Agreement, in which case the Contractor shall provide the higher coverage:

Worker's Compensation

Part One

Employer's Liability

Part Two

Provide Statutory Minimum

\$ 500,000 each accident

\$ 500,000 disease per employee

\$ 500,000 disease policy aggregate

B. If specified in Exhibit A to the Owner - Contractor Agreement the policy must be endorsed to cover United States Longshoremen & Harborworkers Act (USLHW), Maritime Liability for \$1,000,000/\$1,000,000, or Federal Employer's Liability Act liability.

6. Builder's Risk/ Installation Floater/Stored Materials.

A. The Contractor shall provide coverage against loss or damage on all Work included in this Contract in an amount equal to the Contract Price. Such coverage shall be written on an all risks basis or equivalent form and shall include, without limitation, insurance against perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood (if the project is not in an "A" or a "V" flood Zone), windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss. This policy and/or installation floater shall indicate if Stored Materials coverage is provided as required below.

B. When Work will be completed on existing buildings owned by the Owner, the Contractor shall provide an installation floater, in the full amount of the Contract Price. Such coverage shall be written on an all risks basis or equivalent form and shall include, *without limitation, insurance against perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood (if the project is not in an "A" or a "V" flood Zone), windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss. This policy and/or installation floater shall indicate if Stored Materials coverage is provided as required below.

C. The Contractor shall maintain insurance on delivered and/or stored material designated to be incorporated in the Work against fire, theft or other hazards. Any loss or damage of whatever nature to such material while stored at some approved off Site location shall be forthwith replaced by the Contractor at no expense to the Awarding Authority.

D. The policy or policies shall specifically state that they are for the benefit of and payable to the Awarding Authority, Owner, the Contractor, and all persons furnishing labor or labor and materials for the Contract Work, as their interests may appear. The policy or policies shall list the Awarding Authority, Owner, the Contractor, and Subcontractors of any tier as named insureds.

E. Coverage shall include any costs for work performed by the Designer or any consultant as the result of a loss experienced during the term of this Contract.

F. Coverage shall include temporary occupancy and waiver of subrogation.

7. Umbrella Coverage.

The Contractor shall provide Umbrella Coverage in form at least as broad as primary coverages required by Sections 2, 3 and 5 of this Article in the following amount unless a higher amount is specified in Exhibit A to the Owner - Contractor Agreement, in which case the Contractor shall provide the higher amount:

Umbrella Coverage:

Contract	Price:
Under \$1,000,000	\$2,000,000
\$1,000,000 -- \$5,000,000	\$5,000,000
\$5,000,001-- \$10,000,000	\$10,000,000
\$10,000,001 and over	\$25,000,000

8. Additional types of Insurance.

The Contractor shall provide such other types of insurance as may be required by Exhibit A to the Owner - Contractor Agreement.

ARTICLE XIII: INDEMNIFICATION

1. Generally.

To the fullest extent permitted by law, the Contractor shall indemnify, defend, and hold harmless the Owner, Awarding Authority and Designer and their officers, agents, divisions, agencies, employees, representatives, successors and assigns from and against all claims, damages, losses and expenses, including but not limited to court costs and attorneys' fees, arising out of or resulting from the performance of the Work, including but not limited to those arising or resulting from:

- labor performed or furnished and/or materials used or employed in the performance of the Work;
- violations by Contractor, any Subcontractor, or by any person directly or indirectly employed or used by any of them in the performance of the Work or anyone for whose acts any of them may be liable (Contractor, subcontractor and all such persons herein collectively called "Contractor's Personnel") of any Laws;
- violations of any provision of this Contract by any of Contractor's Personnel;
- injuries to any persons or damage to any property in connection with the Work;
- any act, omission, or neglect of Contractor's Personnel.

The Contractor shall be obligated as provided above, regardless of whether or not such claims, damages, losses and/or expenses, are caused in whole or in part by the actions or inactions of a party indemnified hereunder. In any and all claims by Contractor's Personnel against parties indemnified hereunder, the Contractor's indemnification obligation set forth above shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Article XV.

2. Designer's Actions.

The obligations of the Contractor under Section 1 above shall not extend to the liability of the Designer, its agents or employees, arising out of (i) the preparation or approval of maps, Drawings, opinions, reports, surveys Change Orders, designs or specifications, or (ii) the giving of or the failure to give directions or instructions by the Designer, its agents to employees provided such giving or failure to give is the primary cause of the injury or damage.

3. Survival.

The provisions of this Article XV are intended to survive Final Acceptance and/or any termination of this Contract.

ARTICLE XIV: PERFORMANCE AND PAYMENT BONDS

1. Contractor Bonds.

A. The Contractor shall provide performance and payment (labor and materials) bonds in the form provided by the Awarding Authority, executed by a surety licensed by the Commonwealth of Massachusetts Division of Insurance. Each such bond shall be in the amount of the Contract Price.

B. If at any time prior to final payment to the Contractor, the Surety:

- is adjudged bankrupt or has made a general assignment for the benefit of its creditors;
- has liquidated all assets and/or has made a general assignment for the benefit of its creditors;
- is placed in receivership;
- otherwise petitions a state or federal court for protection from its creditors; or
- allows its license to do business in Massachusetts to lapse or be revoked;

then the Contractor shall, within 21 days of any such action listed above, provide the Awarding Authority with new performance and payment bonds as described in Paragraph A above. Such bonds shall be provided solely at the Contractor's expense.

2. Subcontractor Bonds.

A. If the Contractor provided in its General Bid that any or all filed subcontractors shall provide the Contractor with payment and performance bonds for the full amount of their respective Subcontracts, then the costs for said bonds shall be the responsibility of the Contractor.

B. If the Contractor provided in its General Bid that filed Subcontractors shall provide bonds, and subsequently waives the requirement, the Contractor shall give the Awarding Authority a written certification that the Contractor understands that if the filed Subcontractor defaults or is terminated, the Contractor shall have full responsibility for all costs and expenses related to said default or termination but shall be entitled to a credit adjustment to the Contract Price in an amount equal to the bond premium Contractor would have paid had Contractor required the filed Subcontractor to provide such bonds.

ARTICLE XV: TERMINATION OF CONTRACT

1. Termination for Cause.

A. The Awarding Authority may without prejudice to any other right or remedy deem this Contract terminated for cause if any of the following defaults shall occur and not be cured within three (3) days after the giving of notice thereof by the Awarding Authority to the Contractor and any surety that has given bonds in connection with this Contract:

- (1) The Contractor has filed a petition, or a petition has been filed against the Contractor with its consent, under any federal or state law concerning bankruptcy, reorganization, insolvency or relief from creditors, or if such a petition is filed against the Contractor without its consent and is not dismissed within sixty (60) days; or if the Contractor is generally not paying its debts as they become due; or if the Contractor becomes insolvent; or if the Contractor consents to the appointment of a receiver, trustee, liquidate, custodian or the like of the Contractor or of all or any substantial portion of its assets and such appointment or possession is not terminated within sixty (60) days; or if the Contractor makes an assignment for the benefit of creditors;
- (2) The Contractor refuses or fails, except in cases for which extension of time is provided under this Contract's express terms, to supply enough properly skilled workers or proper materials to perform its obligations under this Contract, or the Designer has determined that the rate of progress required for the timely completion of the Work is not being met;
- (3) The Contractor fails to make prompt payment to Subcontractors or for materials, equipment, or labor;
- (4) All or a part of the Work has been abandoned;
- (5) 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 expressly permitted in this Contract;
- (6) The Contractor has failed to comply with Laws;
- (7) The Contractor fails to maintain, or provide to the Awarding Authority evidence of the insurance or bonds required by this Contract, or
- (8) The Contractor has failed to prosecute the Work or any portion thereof to the standards required under this Contract or has otherwise breached any material provision of this Contract.

B. The Awarding Authority shall give the Contractor and any surety notice of such termination for cause, but the giving of notice of such termination shall not be a condition precedent or subsequent to the termination's effectiveness. In the event of such termination, and without limiting any other available remedies, the Awarding Authority may, at its option:

- (1) hold the Contractor and its sureties liable in damages for a breach of Contract;
- (2) notify the Contractor to discontinue all work, or any part thereof, and the Contractor shall discontinue all work, or any part thereof, as the Owner may designate;
- (3) complete the Work, or any part thereof, and charge the expense of completing the Work or part thereof, to the Contractor;
- (4) require the surety or sureties to complete the Work and perform all of the Contractor's obligations under this Contract.

If the Awarding Authority elects to complete all or any portion of the Work as specified in (3) above, it may take possession of all materials, equipment, tools, machinery, implements at or near the Site owned by the Contractor and finish the Work at the Contractor's expense by whatever means the Awarding Authority may deem expedient; and the Contractor shall cooperate at its expense in the orderly transfer of the same to a new contractor or to the Awarding Authority as directed by the Awarding Authority. In such case the Awarding Authority shall not make any further payments to the Contractor until the Work is completely finished. 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 Site after the Owner has no further use for them. Unless so removed within fifteen days after notice to the Contractor to do so, they may be sold at public auction, after publication of notice thereof at least twice in any newspaper published in the county where the Work is being performed, and the proceeds credited to the Contractor's account; or they may, at the option of the Awarding Authority, be stored at the Contractor's expense subject to a lien for the storage charges.

C. Damages and expenses incurred under paragraph B above shall include, but not be limited to, costs for the Designer's extra services and OPM services required, in the opinion of the Awarding Authority, to successfully inspect and administer the construction contract through final completion of the Work.

D. Expenses charged under paragraph B above may be deducted and paid by the Awarding Authority out of any moneys then due or to become due the Contractor under this Contract.

E. All sums damages, and expenses incurred by the Owner to complete the Work shall be charged to the Contractor. In case the damages and expenses charged are less than the sum that would have been payable under this Contract if the same had been completed by the Contractor, the Contractor shall be entitled to receive the difference. In case such expenses shall exceed the said sum, the Contractor shall pay the amount of the excess to the Owner.

2. Termination For Convenience.

A. The Awarding Authority may terminate this Contract for convenience even though the Contractor is not in default by giving notice to the Contractor specifying in said notice the date of termination.

B. In case of such termination without cause, the Contractor shall be paid:

- (1) all sums due and owing under this Contract through the date of termination, including any retainage withheld to the date of termination, less any amount which the Awarding Authority determines is necessary to correct or complete the Work performed to the date of termination; plus
- (2) a reasonable sum to cover the expenses which Contractor would not have incurred but for the early termination of the Contract, such as demobilization of the work force, restocking charges, termination fees payable to Subcontractors.

C. The payment provided in paragraph B above 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.

3. Contractor's Duties upon Termination for Convenience.

Upon termination of this Contract for convenience as provided in Section 2 of this Article, the Contractor shall: (1) stop the Work; (2) stop placing orders and Subcontracts in connection with this Contract; (3) cancel all existing orders and Subcontracts; (4) surrender the Site to the Awarding Authority in a safe condition; (5) transfer to the Awarding Authority all materials, supplies, work in process, appliances, facilities, equipment and machinery of this Contract, and all plans, Drawings, specifications and other information and documents used in connection with this Contract.

ARTICLE XVI: MISCELLANEOUS PROVISIONS

1. No Assignment by Contractor.

The Contractor shall not assign by power of attorney or otherwise, or sublet or subcontract, the Work or any part thereof, without the previous written consent of the Awarding Authority and shall not, either legally or equitably, assign any of the moneys payable under this Contract, or Contractor's claims hereunder, unless with the like consent of the Awarding Authority, whether said assignment is made before, at the time of, or after the execution of the Contract. The Contractor shall remain responsible for satisfactory performance of all Work sublet or assigned. Consent of the Awarding Authority shall not be deemed to constitute a representation or waiver of any right hereunder by the Awarding Authority as to the qualifications or the responsibility of the Contractor or Subcontractor(s).

2. Non-Appropriation.

If the Awarding Authority is unable to obtain an appropriation of funds sufficient to discharge its obligations under this Agreement for any fiscal year during the term of this Agreement, it shall not be obligated to make any further payments, and this Agreement may be terminated immediately by either the Awarding Authority or the Contractor, provided that the Awarding Authority shall make payment to the Contractor for obligations incurred during the period for which funding was included in an annual or supplemental appropriation.

3. Claims by Others Not Valid.

No person other than the Contractor shall acquire any interest in this Contract or claim against the Awarding Authority or Owner hereunder, and no claim by any other person shall be valid except as provided in M.G.L. c. 30, s. 39F of the General Laws.

4. No Personal Liability of Public Officials.

No public official, employee, or agent of the Awarding Authority or Owner shall have any personal liability for the obligations of the Awarding Authority or Owner set forth in this Contract.

5. Severability.

The provisions of this Contract are severable, and if any of these provisions shall be held unconstitutional or unenforceable by any court of competent jurisdiction, the decision of such court shall not affect or impair any of the other provisions of this Contract.

6. Choice of Laws.

This Contract shall be governed by the laws of the Commonwealth of Massachusetts for all purposes, without regard to its laws on choice of law. All proceedings under this Contract or related to the Project shall be brought in the courts of the Commonwealth of Massachusetts.

7. Standard Forms. NOT APPLICABLE

8. No Waiver of Subsequent Breach.

No waiver of any breach or obligation of this Contract shall constitute a waiver of any other or subsequent breach or obligation.

9. Remedies Cumulative.

All remedies of the Awarding Authority provided in this Contract shall be construed as cumulative and may be exercised simultaneously or in any order as determined by the Awarding Authority in its sole discretion. The Awarding Authority shall also be entitled as of right to specific performance and equitable relief including the right to an injunction against any breach of any of the provisions of this Contract

10. Notices.

Notices to the Contractor shall be deemed given when hand delivered to the Contractor's temporary field office at or near the Site, or when deposited in the U.S. mail addressed to the Contractor at the Contractor's address specified in the Owner - Contractor Agreement, or when delivered by courier to either location. Unless otherwise specified in writing by the Awarding Authority, notices and deliveries to the Awarding Authority shall be effective only when delivered to the Awarding Authority at the address specified in the Owner - Contractor Agreement and date-

stamped at the reception desk or for which a receipt has been signed by the agent or employee designated by the Awarding Authority to receive official notices.

ARTICLE XVII: EQUAL EMPLOYMENT OPPORTUNITY, NON-DISCRIMINATION AND AFFIRMATIVE ACTION PROGRAM.

This Contract includes the provisions of the Awarding Authority's "Equal Employment Opportunity, Non-Discrimination, and Affirmative Action Program" attached as Appendix A to these General Conditions of the Contract and incorporated herein by reference.

ARTICLE XVIII: GOALS FOR PARTICIPATION BY MINORITY BUSINESS ENTERPRISES AND WOMEN BUSINESS ENTERPRISES

This Contract includes the provisions of the Awarding Authority's program relating to Goals for Participation by Minority Business Enterprises and Women Business Enterprises attached as Appendix B to these General Conditions of the Contract and incorporated herein by reference.

**City of
New Bedford**

**INSTRUCTIONS TO BIDDERS
For
AFFIRMATIVE ACTION ISSUES**

for Public Works and Construction Projects

Office of Equal Opportunity & Contract Compliance
133 William Street, Room 208
New Bedford, Massachusetts 02740
ph: 508-979-1446 / fax: 508-991-6148
Revised May 2018

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AA.01: Definitions

Relevant to the requirements set forth in this bidding document

Construction Bidding Statutes*

Public Works Projects

Governed under Massachusetts General Laws, ch. 30, sec. 39M.

Includes all municipal contracts for construction, reconstruction, alteration, remodeling, and/or repair/s estimated to cost more than \$10,000 which does not include work on a building. Includes the construction and repair of roads, bridges, water mains, sewers, and the like, as well as improvement to public land (i.e.: operation of a municipal landfill, removal of waste materials, grading, erosion control, and other forms of improvement and maintenance.

Also governs contracts of \$50,000-150,000 for construction, reconstruction, installation, demolition, maintenance, or repair work on a building.

Building Projects

Governed under Massachusetts General Laws, Ch. 149, sec. 44.

Includes all contracts for the construction, reconstruction, installation, demolition, maintenance, or repair of a building at an estimated cost of more than \$25,000.

Lowest Eligible & Responsible Bidder*

Massachusetts G.L. c. 30, sec. 39M; c. 149, sec. 44A state that the contract be awarded to the lowest eligible and responsible bidder.

Eligible means the bidder meets all of the requirements set forth in the bidding documents.

Responsible means the bidder possesses the skill, ability, and integrity to complete the job.

Reasonable Accommodations

Any change in work environment or the way job duties are customarily performed that enables individuals with disabilities to perform the essential functions of the job in issue, or that ensures equal opportunity for individuals with disabilities with respect to the application process or the enjoyment of benefits and privileges of employment.

Administering Agency

The agency that administers the city, state, state-assisted, or federally assisted contract awarded by the contracting agency

Contracting Agency

The agency that directly awards the contract

Contractor

Any general contractor and all subcontractors

* This information is taken directly from "Designing and Constructing Municipal Facilities: Legal Requirements; Recommended Practices; Sources of Assistance" Published by, William Francis Galvin, Secretary of the Commonwealth, Office of the Inspector General, Oct. 1989.

AA.01: continued

Minority / Women Business Enterprise

As defined by the Massachusetts SDO (State Diversity Office) (formerly known as SOMWBA). In summary, an MBE/WBE is a business at least fifty-one percent (51%) owned or controlled by minority/women group members, or an individual contractor or professional who is a minority/women group member (as defined by SDO).

Minority refers to:

Native American

A person having origin in any of the original people of North America, who is recognized as American Indian by a tribe or tribal organization or is recognized as such within his/her community

Asian

A person having origin in any of the original people of the Far East, Southeast Asia, Indian Subcontinent, Korea, Philippines, and Samoa

Black

A person having origin in any of the black racial groups of Africa

Cape Verdean

A person having origin in any of the original people of the Cape Verde Islands

Eskimo / Aleut

A person having origin in any of the original people of Northern Canada, Greenland, Alaska, and East Siberia

Hispanic

A person of Spanish descent and culture having origin in Mexico, the Island of the Caribbean, Central America or South America

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City of New Bedford
133 William Street
New Bedford, MA 02740

EEO/AA POLICY STATEMENT

City of New Bedford has a statutory mandate under law to guarantee equal treatment for all who seek access to its services or opportunities for employment and advancement. No discrimination will be tolerated on the basis of race, creed, political affiliation, color, sex, national origin, age, or handicap. The ultimate goal is for personnel of this organization to reflect the proportions of minority, female, and handicapped persons in the populations they serve.

City of New Bedford will meet its legal, moral, social, and economic responsibilities for Equal Employment Opportunity/Affirmative Action as authorized and required by all pertinent state and federal legislation, executive orders and rules and regulations, including the following:

1. Title II of the Civil Rights Act of 1964 (42 USC s2000e et seq.), which prohibits discrimination in employment on the basis of race, color, religion, sex, or national origin; and
2. The Age Discrimination in Employment Act of 1967 (29 USC s621 et seq.), which prohibits discrimination in employment on the basis of age with regard to those individuals who are at least 40 years of age, but less than 65 years of age; and
3. Section 504 of the Rehabilitation Act of 1973 (29 USC s794), and the regulations promulgated pursuant thereto (45 CFR Part 84), which prohibit discrimination against qualified handicapped individuals on the basis of handicap and requires employers to make reasonable accommodations to known physical or mental limitations of otherwise qualified handicapped applications and employees; and
4. M.G.L. c. 151B s4 (1), as amended by Chapter 533, 1983, which prohibits discrimination in employment on the basis of race, color, sex, religious creed, national origin, ancestry, age or handicap,

In addition, the Provider agrees to be familiar with and abide by:

- * Massachusetts Executive Order 524
- * Massachusetts Executive Order 526
- * Equal Pay Act of 1963
- * Massachusetts Architectural Barriers Board Act
- * Federal Executive Orders 11246 and 11375 as amended.
- *

All employees, unions, sub contractors and vendors must make genuine and consistent efforts:

1. To ensure equal employment opportunities for present and future employees, and
2. To implement affirmative action, as legally required, to remedy the effects of past employment discrimination and social inequalities.

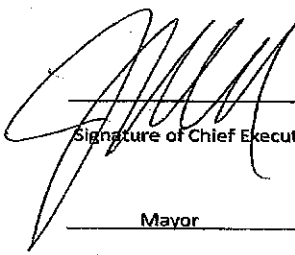
The responsibility for implementing and monitoring this policy has been delegated to:

EEO Contract Compliance Officer

Name and Title of Employee

Furthermore, City of New Bedford

prohibits that any employee, or applicant, be subjected to coercion, intimidation, interference or discrimination for filing a complaint or assisting in an investigation under this program. No portion of this Equal Employment Opportunity/Affirmative Action Policy shall be construed as conflicting with any existing or future judicial or legislative mandate where a constriction consistent with that mandate is reasonable.


Signature of Chief Executive

Mayor

Title of Chief Executive

2/10/12
Date

AA.02: Statement of Policy

MINORITY/WOMAN BUSINESS ENTERPRISE PROGRAM

It is the policy of the government of the United State of America, the Commonwealth of Massachusetts and the City of New Bedford, that no person shall be discriminated against in any manner whatsoever, on the grounds of race, color, age, national origin, disability, religion, or sex.

Under this policy, the minority and woman business enterprises shall have the maximum practicable opportunity to participate in federally assisted projects, and shall not be excluded from such participation, nor denied the benefits of or be subjected to discrimination under any program or activity receiving federal assistance.

The City of New Bedford unequivocally ascribes to said policies as the recipient of Federal and state financial assistance, in connection with its activities, and may receive further Federal and State financial assistance in the future.

The City of New Bedford strongly affirms that it will not discriminate in any contractual procedure against any person because of race, color, age, national origin, disability, religion, or sex, or any other condition that is a bona fide qualification. This policy shall be administered at all levels with a positive, aggressive and supportive attitude by all department heads.

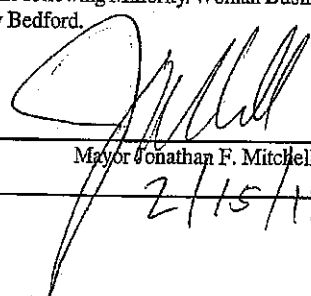
It is the responsibility of all department heads and employees to take affirmative steps to implement this policy to ensure equality of opportunity in conducting the affairs of the City of New Bedford, including notifying those persons and businesses doing business with the City of New Bedford, that contracts for goods and services and construction, shall be made without, reference to race, color, age, national origin, disability, religion or sex.

This Minority/Woman Business Enterprise Program sets forth the administrative standards for the further implementation of the City of New Bedford's policy for the utilization of minority and female contractor, subcontractors, and suppliers.

Each department shall ensure that all solicitation in advertisements includes a statement of the City's affirmation action policy, in an approved format.

The city's Equal Opportunity Officer shall be responsible for ensuring that all aspects of the MBE/WBE program are initiated and undertaken. By virtue of the delegation of this responsibility and authority to direct the program, the Contract Compliance Officer will report directly to the Mayor on equal opportunity matters. The Equal Opportunity Officer shall be responsible for the development, administration, and monitoring of all activities necessary to ensure the accomplishment and success of this program.

NOW, THEREFORE IT IS HEREBY RESOLVED that the following Minority/Woman Business Enterprise Program is instituted for and in behalf of the City of New Bedford.



Mayor Jonathan F. Mitchell

Date

2/15/12

Revised 2007

AA.03: City of New Bedford Ordinances - Synopsis

See **Appendix A** for complete City Ordinances relevant to this bid document

(1) **Residency Requirements for Certain City-Supported Construction Projects, Chap. 10, Article II.**

(a) Shall apply to all general and subcontractors of public works projects which have a projected cost of more than \$100,000.00

(b) Fifty (50) percent of the total employee man-hours in each trade must be performed by residents of the City of New Bedford (excluding the employer's foreman or supervisor and two other key employees.)*

** Contact the N.B. EEO Dept. for further assistance in this matter.*

(c) resident is defined as someone having his/her true, fixed, and permanent home and principal establishment in the City of New Bedford, for a *minimum of six (6) months prior* to the contract bid opening date.

(2) **Contractor Qualifications and Sanctions, a.k.a. "The Responsible Employer Plan", Chap. 10-77.**

(a) Shall apply to all bidders and subcontractors for projects subject to MGL c. 149

(b) Not applicable to construction projects where the low general bid was less than \$100,000; to subcontracts bid for less than \$25,000; or to re-bids for which the City receives fewer than three (3) qualified bidders in the original bid

(c) Must pay appropriate lawful prevailing wage rates to employees

(d) Must maintain or participate in a bona fide apprentice training program for each apprenticeable trade represented in the workforce

(e) Must furnish hospitalization and medical benefits and maintain appropriate accident insurance coverage

(f) Must classify all employees as employees rather than independent contractors, and treat accordingly regarding workers compensation, unemployment taxes, social security taxes and income tax withholding.

AA.04: Contractors Agreements under Executive Order 11246, as Amended by Executive Order 11375

During the performance of this contract, the contractor agrees as follows:

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment of compensation; and selection of training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.

2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

(3) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The contractor will comply with all provisions of Executive Order No. 11246 of Sept. 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) The contractor will furnish all information and reports required by Executive Order No. 11246 of Sept. 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of Sept. 24, 1965, or by rule, regulation or order of the Secretary of Labor, or as otherwise provided by law.

(7) The contractor will include the provisions of paragraphs (1) through (7) in every subcontract or purchase order, unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of Sept. 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions including sanctions for noncompliance: provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

AA.05: Dept. of Labor, 41 Code of Federal Regulations Parts 60-1, 60-6 - Government Contractors, Affirmative Action Requirements, Executive Order 11246

(1) Segregated Facilities. The contractor hereby certifies that it does not and will not maintain or provide any facilities for its employees in a segregated manner, or permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. Further, the contractor shall obtain a similar certification of non-segregated facilities prior to the award of any contract or subcontract, which is subject to Executive Order 11246, and shall provide a copy thereof to the Association.

This clause prohibits segregation on the basis of race, color, religion, national origin, or sex, and applies to all contracts regardless of the amount thereof. The term facilities includes, but is not limited to, waiting rooms, work areas, restaurants and other eating areas, time clock, parking

lots, drinking fountains, recreation or entertainment areas, transportation, employer-provided housing, washrooms, locker rooms or other storage or dressing areas.

(2) Affirmative Action Compliance Program. The contractor certifies that it has developed a written affirmative action compliance program for each of its establishments consistent with the rules and regulations published by the Department of Labor in 41 CFR Chapter 60, and agrees to require a similar certification from each of its nonexempt subcontractors. Such an affirmative action program shall contain a set of specific and result-oriented procedures, the objective of which shall be the achievement of equal employment opportunity. An acceptable affirmative action program must include an analysis of areas within which the contractor is deficient in the utilization of minority groups and women and further, goals and timetables to which the contractor's good faith efforts must be directed to correct any deficiencies and, thus, to achieve prompt and full utilization of minorities and women, at all levels and in all segments of his work force where deficiencies exist.

The contractor's affirmative action plan shall be summarized and updated annually and the program summary shall be submitted to the Office of Federal Contract Compliance Programs (OFCCP) on the anniversary date of the contractor's affirmative action program.

(3) Contractor's Compliance with Exec. Order and 41 CFR Par 60-4. The contractor's compliance with E.O. 11246 and 41 C.F.R. Part 60-4, shall be based on its implementation of the Equal Opportunity clause, specific affirmative action obligations required by the specifications set forth in 41 C.F.R. 60-4.3, and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation is to be performed.

AA.06: Section 503 of the Rehabilitation Act of 1973

(Dept. of Labor, 41 Code of Federal Regulations, Parts 60-250 and 60-741, Affirmative Action & Nondiscrimination Obligations of Contractors and Subcontractors Regarding Individuals with Disabilities, Disabled Veterans, and Veterans of Vietnam Era)

Parties holding a Government contract or subcontract in excess of \$10,000 must take affirmative action to employ and advance in employment-qualified individuals with disabilities. Contractors are required to use effective practices to recruit qualified individuals with disabilities.

Applicants with disabilities must be provided a reasonable accommodation if they are qualified with respect to the application process (e.g.: if they present themselves at the correct location and time to fill out an application).

AA.07: MBE / WBE Policy (for the life of the project)

(1) **Eleven (11) percent** of the work on this project shall be performed by Minority Business Enterprises (MBEs) and **five (5) percent** of the work shall be performed by Women Business Enterprises (WBEs) for a total of 16% overall. **Four and one-third (4.33%) percent of all Airport projects shall be performed by Disadvantaged Business Enterprises (DBE)**. Proven documentation of non-availability and the filing of a MBE/WBE/DBE Request for Waiver will be required to be submitted by the general contractor in circumstances where the EEO goals are not met.

(2) If it is determined that one or more of the MBE/WBE or DBE contractors, as submitted by the Contractor on the EEO forms, is not SDO (State Diversity Office) (formerly known as SOMWBA)

certified or certified by the Local Government Unit, in accordance with the provision of Executive Order 237, **the bidder shall have five (5) working days following notification to either find a certified MBE/WBE/DBE contractor to perform work equal to or greater than that of the uncertified contractor, or to submit a waiver request.**

(3) The contractor shall not enter into any subcontract with any person or firm debarred from government contracts, pursuant to Executive Order 11246.

AA.08: Workforce Utilization (for the life of the project)

(1) Minimum percentages for **employment (workforce utilization)** on the project are at **18% minority** and **6.9% female** participation. The employment percentages shall apply to the contractor and to all subcontractors, regardless of tier, for all on-site work.

A single goal for minorities and a separate goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the contractor has achieved its goals for women generally, the contractor may be in violation of the Exec. Order if a specific minority group of women is under-utilized.)

(3) The contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

AA.09: Contractor's EEO / Records Monitor

The contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof, as may be required by the Government, and to keep records which shall at least include, for each employee, the name, address, telephone numbers, social security number, race, sex, status, (e.g.: mechanic, apprentice, trainee, helper, or laborer) dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents.

AA.10: Bidder's Eligibility

The lowest responsible and eligible bidder shall mean the General Bidder whose bid is the lowest of those bidders demonstrating possession of the skill, ability and integrity necessary for the faithful performance of the work, and

(a) who shall certify that he/she is able to furnish labor that can work in harmony with other labor employed on the work;

(b) who shall certify that he/she will demonstrate good faith efforts to obtain the minority workforce goal (18%) the woman workforce goal (6.9%) and, for projects \$100,000+, NB residency goal of 50%; the insurance that all subcontractors and/or sub-subcontractors are

also in compliance with workforce utilization goals; including compliance with the minority business goal (11%) and woman business goal (5%), for a total of 16% (or 4.33% for Airport projects) of the total dollar amount of the contract, and will certify that it will meet all applicable City Ordinances in accordance with this contract provision.

AA.11: Bid Submission Requirements

(1) Required bid forms that must be completed, signed, and submitted with the bid at the time of the bid opening, are as follows:

(a) Certificate of Understanding; Certification of Compliance w/ Exec. Order 11246

(b) Schedule of Participation for MBE/WBE or DBE as required

(c) Letter of Intent (for each MBE/WBE/DBE participation)

(d) MBE/WBE/DBE Contractor Identification Statement (for each MBE/WBE/DBE)

(e) Bidder's Certification (to be completed by both the General Contractor *and* each MBE/WBE/DBE)

(f) If applicable, a completed and signed MBE/WBE/DBE Unavailability Certification in the event that the work listed on the Schedule is not sufficient to fulfill the requirement for MBE/WBE/DBE Participation. This certification must include a statement by the bidder of the reasons why it believes it is in compliance with this provision, and a list of the names, addresses, telephone numbers and reason given for unavailability of the Minority/Women Contractor contacted by the bidder with respect to the performance of work under the contract.

(g) If applicable, a completed and signed Minority / Women / Disadvantaged Business Enterprises Request for Waiver.

(2) The successful bidder will also be required to submit, prior to award, its estimates of labor (permanent and trainee) and material required to carry out its work under the contract, for review by the City, so as to establish maximum feasible goals for the utilization of City residents and business concerns. These goals, and the basis for monitoring and reporting progress toward meeting them, will be established by mutual agreement, with the assistance of the City's Contract Compliance Officer, and discussed in the Pre-Construction and/or Pre-Award Conference.

AA.12: Bid Approval or Disapproval

(1) At the time of the bid opening, the bidder will have five (5) days, from the date of the bid opening, to comply with the MBE/WBE/DBE requirements. Failure to meet these requirements within the five days will have the Bid/Proposal disapproved by the Office of Equal Opportunity.

(2) Each bidder, as part of its bid submission, must agree to make good faith efforts to contract with minority and woman owned businesses (and disadvantaged business when applicable), as defined by the State Diversity Office (SDO) (formerly known as Office of Minority and Woman Business Assistance (SOMWBA)) and the City of New Bedford's affirmative action policies. The

amount of participation reserved for such enterprises shall not be less than 16% of the total bid amount, of which at least 11% of the total bid amount applies to minority businesses. The balance 5% is applied to women-owned businesses. Proven documentation of non-availability of either one of these entities provides that the available business may be awarded no less than 16% of the total contract dollar value.

(3) If the general bidder is either an MBE or WBE and is responsible for 100% of the project work, the 16% is fulfilled. If said MBE/WBE contractor is a joint venture, the MBE/WBE must be responsible for at least 51% of the project.

(4) The general contractor must submit, as part of its bid and as a condition of contract approval, signed Letters of Intent with all subcontractors and material suppliers listed on the participation schedule. Sub-bidders must submit the participation schedule with their bid and a participation schedule if they intend to sub-sub work.

AA.13: Steps to Ensure a Responsive Bid

The total price for work to be performed by Minority/Woman or Disadvantaged Contractors, as indicated in each bidder's bid submission, is required to be sufficient to fulfill the MBE/WBE/DBE requirements, unless the bidder shall demonstrate to the satisfaction of the Awarding Authority that:

(1) it has made every possible effort to contact and negotiate with Minority/Women or Disadvantaged Contractors in an attempt to subcontract work, including every possible effort to select the portions of the work proposed to be subcontracted in order to meet the requirements;

(2) it was unable, notwithstanding such efforts, to achieve the stated requirement because Minority/Woman or Disadvantaged Contractors were not qualified or were unavailable (any proven non-availability of MBE/WBE/DBE must make up the difference to still fulfill the 16% goals with the available MBE or WBE or 6.0% DBE. If neither category is available to fulfill the goal, it must have a SDO statement as to no business listed);

(3) it included in its Schedule of Participation such proposed agreements as could be made with such efforts;

(4) the general contractor is a MBE or WBE and said contractor is performing 16% of work or the general contractor is a DBE and is performing 6.0% of the work and therefore, will be deemed as fulfilling the affirmative action bidding requirements;

(5) for contractors performing work under \$50,000 that can demonstrate all work will be completed under the contractor's own workforce, the contractor must be able to demonstrate how this will be accomplished and submit, at the time of the bid a statement requesting a waiver of the 16% MBE/WBE or 6.0% DBE participation goal. Said contractors will still be required to demonstrate good faith efforts regarding the prescribed employment workforce percentage goals.

AA.14: Bid Award or Rejection

(1) The Awarding Authority will responsible for awarding or rejecting any bid, with the

approval/disapproval of the Office of Equal Opportunity & Contract Compliance in its decision. The Awarding Authority also reserves the right to reject any or all bids, or to accept any other than the lowest bidder, should it be deemed to be in the best interest of the City of New Bedford, Massachusetts, to do so.

(2) The Awarding Authority may reject, as non-responsive, any bid, which it determines, fails to comply with the applicable requirements of this contract provision. Nothing, herein, shall relieve any bidder or any contractor performing any work under the contract, from any of the terms, conditions, or requirements of the contract.

AA.15: Awarded Contractor's Obligations

(1) The Contractor shall specifically ensure that the City's EEO policy and affirmative action obligations under this contract provision, is reviewed with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decision, including specific review of these terms with on-site supervisory personnel, prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

(2) Minority/Woman Work Hours must be maintained for the life of this project (at a minimum ratio of 18% minority work hours and 6.9% woman work hours to total work hours in each job category, including, but not limited to bricklayers, carpenters, cement masons, electricians, ironworkers, operating engineers, and those classes of work identified in Section 44C of M.G.L. ch. 149). *(Please note the City of New Bedford's Residency Ordinance requiring 50% City of New Bedford residents on projects of \$100,000+)*

(3) Apprentices and Trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability, in order for the apprentices and trainees to be counted toward the minority/woman work hour percentage goals.

(4) Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the contractor has a collective bargaining agreement to refer either minorities or women, shall excuse the contractor's obligation under these specifications, Exec. Order 11246 or the regulations promulgated pursuant thereto.

(5) In the employment of journeymen, apprentices, teamsters and laborers, the Contractor shall give preference first, to citizens of the Commonwealth who have served in the armed forces of the United States in time of war and have been honorably discharged therefrom or released from active duty therein, and who are qualified to perform the work which the employment relates, and secondly, to citizens of the City of New Bedford, and if such cannot be obtained in sufficient numbers, the Commonwealth generally, then to citizens of the United States.

(6) Reports to Be Submitted to the Office of Equal Opportunity & Contract Compliance include:

(a) Licensing Statutes: Every contractor and subcontractor must submit, before starting work, a plan by which he/she will satisfy the requirements of licensing statutes, including the following, where applicable: MGL Ch. 149, Sec. 6 (painters); Ch. 146, Sec. 53 (hoisting engineers); Ch. 149, Sections 6B-6F (asbestos abatement workers, supervisors & contractors); Ch. 146, Sec. 3 & 3B (plumbers & gas fitters); Ch. 141, Sec. 1

(electricians); Ch. 14, Sec. 84 (pipefitters & sprinkler fitters); and Ch. 143, Sec. 94 (construction supervisor).

(b) Work Hour Reports: The contractor and each subcontractor shall prepare weekly reports in an approved form, of the hours worked in each trade by each employee, identified as minority or non-minority, and/or female, and/or resident. Copies of these shall be provided at the end of each such week to the City's Office of Equal Opportunity & Contract Compliance.

(c) Projected Manning Tables: The contractor shall prepare projected manning tables on a quarterly basis. These shall be broken down into projections, by week, of workers required in each trade. Copies shall be furnished one week in advance of the commencement of the period covered, and also when updated, to the City. A copy of the certified payroll will be submitted with these reports.

(d) Billing Reports: The contractor shall prepare and submit monthly billing reports of amounts paid to MBEs, WBEs and/or DBEs each monthly billing period, as well as the record of final payment accompanied by canceled checks.

(e) Payroll Reports: Every contractor and subcontractor shall submit weekly payroll reports to the City, indicating the following information for each employee and/or independent contractor employed on the project; name, address, hours worked, occupational classification, wages, and fringe benefit payments, if any. Said reports shall be signed by the employer or his authorized agent under the penalties of perjury (see MGL Ch. 149, Section 27B).

AA.16 Recruitment/Referral Responsibilities

(1) In the hiring of minority/woman journeymen, apprentices, teamsters, and laborers, the contractor shall rely on referrals from a multi-employer affirmative action program approved by the City, traditional referral method utilized by the construction industry, and referrals from agencies, not more than three in number at any one time, designated by the City's Equal Opportunity Officer.

(2) Records of employment referral orders, prepared by the contractor, shall be made available to the awarding authority.

(3) The contractor will maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source, or community organization, and of what action was taken with respect to each such individual.

(4) If such individual was sent to the union hiring hall for referral, and was not referred back to the contractor, this shall be documented in the file with the reason therefore, along with whatever additional actions the contractor may have taken.

(5) The contractor will document and maintain a record of all solicitations of offers for subcontractors from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractors' associations and groups.

(6) The contractor will, in all solicitations or advertisements for employees placed by or on

behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin, and maintain a record thereof.

AA.17: Subcontracts

(1) The Contractor receiving the award of the contract shall be required to obtain from each of its subcontractors (filed or non-filed) and submit to the Authority prior to the performance of any work under said subcontract, a certification by said subcontractor, regardless of tier, that it will comply with the minority and women work hours/employee ratio and specific affirmative action steps, and to submit this information to the Office of Equal Opportunity, prior to the subcontractor's performance on the project.

(2) In order to ensure that the said subcontractor's certification becomes a part of all subcontracts under the prime contract, no subcontract shall be executed until an authorized representative of the Authority administering this project has determined, in writing, that the said certification has been incorporated in such subcontract, regardless of tier. Any subcontract executed without such written approval shall be void.

(3) Whenever the contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000, the contract provisions listed in this Instructions to Bidders for Affirmative Action Issues, and the applicable goals for minority and female participation and which is set forth in the solicitation form which the contract resulted.

(4) Noncompliance of a subcontractor in compliance with these provisions, will result in the contractor taking such action, with respect to any subcontract or purchase order, as the administering agency may direct, as a means of enforcing such equal opportunity provisions; provided that, in the event a contractor becomes involved in, or is threatened with litigation with a subcontractor or vendor, as a result of such direction, the contractor may request the United States, the State of Massachusetts or the City of New Bedford, to enter into such litigation to protect the interests of the U.S., the State or the City.

AA.18: Wage Rates

(1) Attention is called to Labor Standards provisions regarding conditions of employment, including State and Federal Wage Rates, the Davis-Bacon Act, the Copeland Anti-Kickback Act, and the Contract Work Hours and Safety Standards Act. Where Federal and State wage rates differ, the higher rates shall be used as a minimum.

(2) The rate per hour of the wages to be paid to mechanics, apprentices, teamsters, chauffeurs, and laborers employed on the work shall be not less than the rate of wages in Minimum Wage Rates as determined by the Commissioner of Labor and Industries, as required by M.G.L. Chapter 149, Sections 26 & 27-27h. This schedule shall be in place for said employees during the life of this contract.

(3) Contractor shall keep posted on the site, a legible copy of said schedule. The Contractor shall keep on file wage rates and classifications of labor employed on this work, in order that they may be available for inspection by the Administrator, the Office of Equal Opportunity, or the Architect.

(4) 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.

(5) Pay reserve police officers employed on this work the prevailing rate of wages paid to regular police officers, as required by M.G.L. Chap. 149, Sec. 34B, as amended. Such police officers shall be covered by Workmen's Compensation Insurance and Employer's Liability Insurance by the Contractor.

(6) Noncompliance by the contractor or any subcontractor will result in the City's Contract Compliance Office and/or Legal Office, to consult with the Department of Labor and Industries, and will result in the contractor or subcontractor receiving notification of such, and subsequently must respond to the City of New Bedford within five (5) business days.

AA.19: Access to Compliance Information & Reports

(1) The contractor will provide all information and reports, required by the administering agency or the City of instructions issued by either of them, and will permit access to its facilities and any books, records, accounts, and other sources of information pertinent to the City's affirmative action contract requirements.

(2) Where the information required is in the exclusive possession of another who fails or refuses to furnish this information, the contractor shall so certify to the administering agency or the City, and shall set forth what efforts he/she has made to obtain the information.

AA.20: Noncompliance

(1) Investigation

Whenever the administering agency or the City believe the general contractor or any subcontract may not be operating in compliance with the terms of this provision, the City directly or through its designated agent, shall conduct an appropriate investigation, and may confer with the parties, to determine if such contractor is operating in compliance with the terms of this contract provision. If noncompliance is found, then a preliminary report on noncompliance will be made, and the City or its agent will notify such contractor, in writing, of such steps as will, in the judgment of the city or its agent, bring such contractor into compliance.

(2) Report of Noncompliance

In the event that such contractor fails or refuses to fully perform such affirmative action steps, the City shall make a final report of non-compliance, and recommend to the administering agency, the imposition of one or more of the sanctions identified in these provisions. Within fourteen (14) days of the receipt of the recommendations of the City, the administering agency shall move to impose one or more of the following sanctions as it may deem appropriate to attain full and effective enforcement.

(3) Any disagreement between the City and a contractor or subcontractor shall be submitted for a hearing pursuant to the provisions of Chapter 30A. The City shall impose one or more of the following sanctions, as it may deem appropriate, to attain full and effective enforcement.

AA.21: Sanctions

(1) The recovery by the administering agency from the general contractor of 1/100 of 1% of the

contract award price, or \$1,000.00, whichever sum is greater, in the nature of liquidated damages, or if a subcontractor is in non-compliance, the recovery by the administering agency from the general contractor, a back charge against the subcontractor, of 1/10 of 1% of the subcontract price or \$400.00, whichever sum is greater, in the nature of liquidated damages, for each week that such party fails or refuses to comply.

- (2) The suspension of any payment or part thereof, due under the contract, until such as the general contractor or any subcontractor is able to demonstrate his/her compliance with the terms of the preceding sections of the contract.
- (3) The termination of employment of the contractor and taking possession of the site and finishing the work by whatever method he/she may deem expedient, upon giving the contractor and his/her surety, if any, seven days' written notice.
- (4) The termination or cancellation of the contract, in whole or in part.
- (5) The denial to the general contractor and any subcontractor of the right to participate in any future contract awarded by the administering agency for a period of up to three years.
- (6) Other sanctions to be applied, as stipulated in the City of New Bedford Ordinances (Residency and Responsible Employer Plan ordinances) and other local, state, and federal laws and regulations, as applicable.

AA.22: Appeal of Sanctions

If, at any time after imposition of one or more of the sanctions listed in these provisions, the contractor or subcontractor is able to demonstrate that it is in compliance with the EEO/AA program, the contractor or subcontractor may request the administering or contracting agency, in consultation with the City's Equal Employment Opportunity compliance officer, to conditionally suspend the sanction, pending final determination by the investigating officer, whether the contractor is in compliance. Upon final determination by the investigating office, the administering or contracting agency, based on the investigating officer's recommendation, shall either lift the sanctions or impose them.

Sanctions shall not be imposed by the contracting agency or administering agency except after an adjudicatory proceeding, as defined by M.G.L. Chapter 30A, has been conducted. No investigation by the Office of Equal Opportunity shall be initiated without prior notice to the contractor or the subcontractor.

AA.23: Severability

The provisions of this section are severable, and if any of these provisions shall be held Unconstitutional by any court of competent jurisdiction, the decision of such court shall not affect or impair any of the remaining provisions.

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APPENDIX A

BID SUBMISSION DOCUMENTS

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Bid Submission Checklist

THE GENERAL BIDDER SHALL SUBMIT ALL THE FOLLOWING FORMS AS A PART OF ITS BID SUBMISSION, AND SHALL SUBMIT A COPY OF SUCH TO:

The City of New Bedford
Office of Equal Opportunity
133 William Street Room 208
New Bedford, MA 02740
ph: 979-1446 / fax: 508-991-6148

- (1) Certificate of Understanding: Certification of Compliance with Executive Order 11246"
- (2) Schedule of Participation for Minority, Woman & Disadvantaged Business Enterprises
- (3) Letter of Intent - for each MBE/WBE/DBE Participation
- (4) MBE/WBE Contractor Identification Statement - for each MBE/WBE/DBE
- (5) Bidder's Certification - must be completed and signed by the General Contractor and all Subcontractors who will work on the project (to include MBE/WBE/DBE **and** non-MBE/WBE/DBEs)
- (6) If applicable, a completed and signed MBE/WBE/DBE Unavailability Certification in the event that the work listed on the Schedule is not sufficient to fulfill the Requirement for MBE/WBE/DBE Participation. This certification must include a statement by the bidder of the reasons why it believes it is in compliance with this Provision, and a list of the names, addresses, telephone numbers and reason given for unavailability of the Minority /Woman/ Disadvantaged Contractor who was contacted by the Bidder with respect to the performance of work under the contract.

BIDDERS CERTIFICATE OF UNDERSTANDING**Equal Employment Opportunity Provisions**

Contractor _____ Project _____

Address _____ Tel. # _____ Project # _____

_____ Fax # _____

I, the undersigned, understand that:

- A. Minority Business Enterprises are to be awarded at least 11% of the total contract amount for construction/public works projects.
- B. Woman Business Enterprises are to be awarded at least 5% of the total contract amount for construction/public works projects.
- C. Disadvantaged Business Enterprises are to be awarded at least 4.33% of the total contract amount for airport projects.
- D. All required MBE/WBE/DBE forms included in Instructions to Bidders are to be completed and submitted with the bid.
- E. Prior to award of the contract, a pre-construction conference must be held (to be attended by the general contractor and all subcontractors, regardless of tier) at which time the following requirements will be discussed:
 1. Weekly Workforce Utilization Reports (Form CAD85) are to be submitted weekly with payroll reports within five (5) days of last payroll;
 2. Quarterly Manpower Projection Tables (Form CAD85-1) are to be submitted with the Start Construction notification;
 3. Any project in the amount of \$100,000+ is subject to the New Bedford Resident Hiring and Responsible Employer Plan ordinances;
 4. A minimum goal of 18% minority manpower utilization, in terms of total work hours in the aggregate workforce, in each trade or craft, on each project, will be maintained. The goal for female manpower utilization will be maintained at 6.9% according to regulations;
 5. Minority and female work hours are to be uniform in each trade, and minorities and females are to be employed evenly on each project;
 6. Minority or female employees are not be transferred from project to project for the purpose of meeting goals;
 7. A roster of all minority and/or female applicants for employment must be maintained at each project site (Federal & Non-Federal) in the New Bedford Hometown Plan Area.
- F. The submission of the above reports and adherence to hiring practices and equal opportunity performance of subcontractors is the responsibility of the prime contractor.

The bidder hereby certifies that he/she shall comply with the minority manpower ratio and specific affirmative action steps contained in the EEO above, including compliance with the minority contractor compliance specifications. The Contractor receiving the award of the contract shall be required to obtain from each of its subcontractors, and submit to the contracting or administering agency prior to the performance of any work under said contract, a certification by said subcontractor, regardless of tier, that it will comply with the minority manpower ratio and specific affirmative action steps contained in this appendix.

Authorized Signature_____
Date_____
Name (Please Print or Type)_____
Title

SCHEDULE OF PARTICIPATION
DISADVANTAGED/MINORITY/WOMAN BUSINESS ENTERPRISES
to be completed by the Bidder

Item I - Minority Or Disadvantaged Business Enterprise Participation

1. Name: _____
 Address: _____
 Nature of Participation: _____
 Dollar Value / % of Bid: _____
2. Name: _____
 Address: _____
 Nature of Participation: _____
 Dollar Value / % of Bid: _____

TOTAL BID PRICE	TOTAL DBE or MBE COMMITMENT	
\$ _____	\$ _____	_____ %

Item II – Woman Or Disadvantaged Business Enterprise Participation

1. Name: _____
 Address: _____
 Nature of Participation: _____
 Dollar Value / % of Bid: _____
2. Name: _____
 Address: _____
 Nature of Participation: _____
 Dollar Value / % of Bid: _____

TOTAL BID PRICE	TOTAL WBE or DBE COMMITMENT	
\$ _____	\$ _____	_____ %

The bidder agrees to furnish implementation reports, as required by the awarding authority, to indicate the MBE/WBE/DBE which it has used or intends to use. Breach of this commitment constitutes a breach of the contract.

General Bidder: _____

Signature: _____ Date: _____

LETTER OF INTENT
to be completed by the DBE/MBE/WBE

This form is to be completed by the DBE or MBE and WBE and must be submitted by the General Bidder as part of the Bid Proposal. A separate form must be completed for each MBE, WBE or DBE involved in the project.

Project Title: _____ Project Location: _____

To: _____
(Name of Bidder)

From: _____
(Name of DBE/MBE/WBE)

Indicate DBE/MBE/WBE
status

I / we intend to perform work in connection with the above project as (Check One)

☐ an individual ☐ a partnership
☐ a corporation ☐ a joint venture with: _____
☐ other (explain): _____

It is understood that if you are awarded the contract, you intend to enter into an agreement to perform the activity described below for the prices indicated.

DBE/MBE/WBE PARTICIPATION:

Description of Activity	Project Start Date	\$ Amount	% of Bid Price
_____	_____	_____	_____
_____	_____	_____	_____

The undersigned certify that they will enter into a formal agreement upon execution of the contract for the above-referenced Project

BIDDER

DBE/MBE / WBE

Authorized Signature Date

Authorized Signature Date

Address

Address

Telephone / Fax

Telephone / Fax

MINORITY / WOMAN BUSINESS ENTERPRISE PROGRAM

CONTRACTOR IDENTIFICATION STATEMENT

Project Name: _____ Project #: _____

Total Bid Price: \$ _____ Bid Date: _____

In accordance with the New Bedford Minority Business Enterprise Program, the undersigned bidder certifies that he/she:

1. is a bona fide Minority/Woman/Disadvantaged Business Enterprise currently certified by the State Office of Minority/Woman Business Assistance (SOMWBA); and such SOMWBA certification has not changed; and in the event of said status changing, it will immediately forward written notification to the City of New Bedford and SOMWBA; and
2. intends to perform certain work (specified by formal bid proposal) under a contract in connection with the above-named project, and that work will not be sublet to any company at any tier; and
3. will comply with the minority/woman workforce ratio and specific affirmative action steps contained in the EEO/AA Contract Provisions and shall obtain from each of its subcontractors a copy of the bidder's certification and submit to the administering agency, prior to the award of such subcontract, regardless of tier, that he/she will comply with the minority/woman workforce ratio and specific affirmative action steps contained in these and the EEO/AA Contract Provisions.

SOMWBA CERTIFICATION CATEGORY: _____

 CONTRACTORS NAME: _____
☐ MBE ☐ WBE ☐ DBE

ADDRESS: _____

TELEPHONE #: _____ FAX #: _____

REPRESENTATIVE NAME & TITLE: _____

AUTHORIZED SIGNATURE: _____

GENERAL BIDDERS NAME: _____

BIDDERS CERTIFICATION

To be completed by General Contractor & each of its Subcontractors (MBE/WBE/DBE and non-MBE/WBE/DBE)

The undersigned bidder hereby certifies that he/she will comply with the Minority/Woman Workforce Ratio and Specific Affirmative Action Steps contained in the EEO/AA Provisions of this contract, including compliance with the Minority/Woman/Disadvantaged Business Enterprise as required under these contract provisions.

The contractor receiving the award of the contract shall be required to obtain, from each of its subcontractors, regardless of tier, a copy of this Bidder's Certification indicating that it will comply with the Minority/Woman Workforce Ratio and Specific Affirmative Action Steps contained in these EEO/AA Contract Provisions, and submit it to the contracting agency prior to the award of such contract and subcontract.

Name of General Contractor

Name of Subcontractor

{ } MBE { } WBE { } DBE { } Non-MBE/WBE

Signature of Authorized Representative

Signature of Authorized Representative

Name & Title (Printed or Typed)

Name & Title (Printed or Typed)

Date

Date

**MINORITY / WOMAN BUSINESS ENTERPRISES
UNAVAILABILITY CERTIFICATIONS
to be completed by General Contractor**

*(The Bidder shall prepare additional copies of this information form
in the quantity necessary to comply with the bidding requirements)*

I, _____, _____
Name Title

of _____
Contractor Name

certify that on _____, I contacted the below listed MBE/WBE/DBE
Date of Contact
requesting a bid for

Project _____ as an { } MBE, { } WBE or { } DBE for the provision of
{ } Goods & Services or { } Labor to accomplish _____
Subcontract Work Offered to this MBE/WBE/DBE Company

Name of Prospective Sub-Contractor

Address City and State Telephone #

Contact was made by { } Telephone { } In Person

Said sub-contractor was unavailable for work on this project or unable to prepare a bid for the following reason(s):
(check appropriate answer):

{ } MBE/WBE/DBE Firm Declined Job

{ } MBE/WBE/DBE Firm offered to do a job at the price of \$ _____, which was not
acceptable because: _____

{ } Other _____

The above information is accurate and complete, to the best of my knowledge and belief. Signed under the
pains and penalties of perjury.

Signature of Authorized Representative, General Contractor

Date

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MINORITY / WOMAN/DISADVANTAGED BUSINESS ENTERPRISES

REQUEST FOR WAIVER

Upon exhausting all known sources and making every possible effort to meet the minimum requirements for MBE/WBE/DBE participation, the Contractor may seek relief from these requirements by filing this form (completed) NO LATER THAN FIVE (5) working days following the bid opening. Failure to comply with this process shall be cause the bidder to be rejected, thereby rendering the contractor not eligible for award of the contract.

General Information

Project Title: _____ Location: _____

Bid Opening (time/date): _____ Location: _____

Bidder: _____

Mailing Address: _____

Contact Person: _____

Telephone No.: () _____ Ext. _____

Minimum Requirements

The contractor must show that good faith efforts were undertaken to comply with the percentage goals, as specified. The bidder seeking relief must show that such efforts were taken appropriately, in advance of the time set for opening bid proposals, to allow adequate time for response(s) by submitting the following: *(please check all that apply and attach applicable documentation)*

- A. A detailed record of the effort made to contact and negotiate with minority, woman or disadvantaged business enterprises, to include:
- () 1. Names, addresses and telephone numbers of all such companies contacted;
 - () 2. Copies of written notice(s) which were sent to MBE/WBE/DBE potential subcontractors prior to bid opening;
 - () 3. Copies of advertisements prior to bid opening, as appearing in general publications, trade-oriented publications, and applicable minority/women focused media detailing the opportunities for participation;
 - () 4. A detailed statement as to why each subcontractor contacted (a) was not willing to do the job or (b) was not qualified to perform the work as solicited; and
 - () 5. In the case(s) where a negotiated price could not be reached, the bidder should detail what efforts were made to reach an agreement on a competitive price
 - () 6. Contractor certifies that 100% of the project is to be carried out with his/her own workforce. No subcontractors are to be utilized.

- B. The Agency may require the contractor to produce such additional information, as it deems appropriate and may obtain whatever other information it deems necessary to reach a conclusion from any source.
- C. No later than fifteen (15) days after receipt of all necessary information and documentation, a decision will be made in writing to the bidder. If the waiver request is denied, the facts upon which a denial is based will be set forth. A contractor who is dissatisfied with the decision may then appeal that decision to the Equal Opportunity Employment Agency.

Certification

The undersigned herewith certified that the above information and appropriate attachments are true and accurate to the best of my ability, and that I have been authorized to act on behalf of the bidder in this matter.

(Authorized original signature)

Date

Submit to: Equal Employment Opportunity
Compliance Officer
133 William Street, Room 208
New Bedford, MA 02740

To be completed by the City of New Bedford's EEO

Bid Date

Date Received by EEO

Initials

BOND NO. _____

PAYMENT BOND

CITY OF NEW BEDFORD
MASSACHUSETTS

KNOW ALL MEN BY THESE PRESENTS:

That we, _____, as **Principal**, and
_____, as **Surety**,
are held and firmly bound unto the City of New Bedford, Massachusetts, 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 _____, 20____
for the _____ in _____, Massachusetts.

PROJECT TITLE

NOW the conditions of this obligation are such that if the **Principal** and all subcontractors 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 and virtue.

IN WITNESS WHEREOF, the **Principal** and **Surety** have hereunto set their hands and seals this:

_____ Day of _____ 20____

PRINCIPAL _____

SURETY _____

By: _____

SEAL

By: _____

ATTORNEY-IN FACT

Attest: _____

Attest: _____

The rate for this bond is _____% for the first \$ _____ and _____% for the next \$ _____

The total premium for this bond is \$ _____

**NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS
NEW BEDFORD, MASSACHUSETTS**

Mount Vernon Group Architects, Inc., Project No. 02014.43

June 12, 2019

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BOND NO. _____

PERFORMANCE BOND

CITY OF NEW BEDFORD
MASSACHUSETTS

KNOW ALL MEN BY THESE PRESENTS:

That we, _____, as **Principal**, and
_____, as **Surety**,
are held and firmly bound unto the City of New Bedford, Massachusetts, 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 _____, 20____
for the _____ in _____, Massachusetts.

PROJECT TITLE

NOW, the condition of this obligation is such that if the **Principal** and all Subcontractors under said contract
shall well and truly keep and perform all the undertakings, covenants, agreement, 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 and virtue.

IN THE EVENT, that the contract is abandoned by the **Principal**, or in the event that the Obligee, under the
provisions of Article 19 of the General Conditions of said contract 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 hereunto set their hands and seals this:

_____ Day of _____ 20____

PRINCIPAL _____

SURETY _____

By: _____

By: _____

SEAL

ATTORNEY-IN FACT

Attest: _____

Attest: _____

The rate for this bond is _____% for the first \$ _____ and _____% for the next \$ _____

The total premium for this bond is \$ _____

**NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS
NEW BEDFORD, MASSACHUSETTS**

Mount Vernon Group Architects, Inc., Project No. 02014.43

June 12, 2019

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SECTION 00 90 00

LABOR STANDARDS OF THE COMMONWEALTH

ARTICLE 1 - EMPLOYMENT, HOURS AND WAGES

- 1.1. The Contractor and any Subcontractor shall conform to any Labor Laws of the Commonwealth, and, without limiting the generality of the foregoing, shall conform to the provisions of Sections 25, 26, 27B, 30, 34, 34A and 34B of Chapter 149 of the General Laws, as amended, which Sections are incorporated herein by reference and made a part hereof.
- 1.2. Every employee in the work to be performed under this Contract shall lodge, board and trade where and with whom he elects, and the Contractor and any Subcontractor shall not directly or indirectly require, as a condition of employment in said work, that an employee shall lodge, board or trade at a particular place or with a particular person.
- 1.3. The Contractor and any Subcontractor shall give preference in the employment of mechanics, teamsters, chauffeurs and laborers first 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 veterans as defined in clause Forty-three of Section Seven of Chapter Four, and who are qualified to perform the work to which the employment relates; and secondly, to citizens of the Commonwealth generally who have been residents of the Commonwealth for at least six months at the commencement of their employment, and if they cannot be obtained in sufficient numbers, then to citizens of the United States.
- 1.4. No laborer, workman, mechanic, foreman, or inspector working in the employment of the Contractor, Subcontractor or other person doing or contracting to do the whole or a part of the work contemplated by this Contract, shall be required or permitted to work any more than eight hours in any one day, or more than forty-eight hours in any one week, except in cases of emergency.
- 1.5. The rate per hour of the wages to be paid to mechanics, teamsters, chauffeurs, and laborers in the work to be performed under this Contract shall not be less than the rate of wages in the schedule annexed hereto and made a part hereof as determined by the Commissioner of Labor and Industries of the Commonwealth. This schedule shall continue to be the minimum rate of wages for said employees during the life of this Contract.
- 1.6. The Contractor shall pay to any reserve police officer employed by him in any City or Town the prevailing rate of wages paid to regular police officers in such City or Town as required by General Laws, Chapter 149, Section 24B, as amended.
- 1.7. Claims and disputes pertaining to the classification of labor or wage determinations made by the Commission of Labor and Industries must be presented by appeal filed with the Department of Labor and Industries within three days from the date of the first advertisement of call for bids; in one manner provided by General Laws, Chapter 14, Section 27A.
- 1.8. The Contractor shall include with the Form For General Bid, signed and certified copies of Owner's Instructions To Bidders For Affirmative Action Issues, Non-Collusion and State Tax Compliance Certificate, OSHA Training Certificate, and Undocumented Worker Certificate, included at the end of this Section, as set forth in the contract, Article XII, and hereby made a part of the Contract Documents.

ARTICLE 2 - MINIMUM WAGE RATES

- 2.1. The Contractor shall keep posted on the site of the Work a legible copy of the schedule of "Minimum Wage Rates and Health and Welfare Fund Contributions" attached thereto.
- 2.2. The rates listed are straight hourly rates. 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, and if any other labor is not included in this list, the Contractor shall insert the rates of all those employed on the work.
- 2.3. The Contractor must keep on file the wage rates and qualifications of all labor employed on this Project in order that they may be available for inspection by the Awarding Authority or the Architect.

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

June 12, 2019

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

ARTICLE 3 – CITY OF NEW BEDFORD REQUIREMENTS

- 3.1 The Contractor shall complete and include with Section 00 30 00 – Form For General Bid the following documents included as part of Division 00 of the Contract Documents:

City of New Bedford Instructions To Bidders For Affirmative Action Issues

City of New Bedford Non-Collusion and State Tax Compliance Certificate

City of New Bedford OSHA Compliance Certificate

City of New Bedford Undocumented Worker Certificate

(MINIMUM WAGE RATES AND HEALTH AND WELFARE AND PENSION CONTRIBUTIONS FOLLOW)

END OF SECTION



CHARLES D. BAKER
Governor

KARYN E. POLITO
Lt. Governor

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

Prevailing Wage Rates

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

ROSALIN ACOSTA
Secretary
WILLIAM D MCKINNEY
Director

Awarding Authority: City of New Bedford
Contract Number: 20192009 **City/Town:** NEW BEDFORD
Description of Work: New Bedford City Hall Elevator Project Filed Sub Bid Categories: Elevator, Masonry, HVAC, Electrical
Job Location: 133 William Street New Bedford, Ma

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2019	\$34.25	\$11.91	\$12.70	\$0.00	\$58.86
	08/01/2019	\$34.25	\$12.41	\$12.70	\$0.00	\$59.36
	12/01/2019	\$34.25	\$12.41	\$13.72	\$0.00	\$60.38
	06/01/2020	\$35.15	\$12.41	\$13.72	\$0.00	\$61.28
	08/01/2020	\$35.15	\$12.91	\$13.72	\$0.00	\$61.78
	12/01/2020	\$35.15	\$12.91	\$14.82	\$0.00	\$62.88
	06/01/2021	\$35.95	\$12.91	\$14.82	\$0.00	\$63.68
	08/01/2021	\$35.95	\$13.41	\$14.82	\$0.00	\$64.18
	12/01/2021	\$35.95	\$13.41	\$16.01	\$0.00	\$65.37
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2019	\$34.32	\$11.91	\$12.70	\$0.00	\$58.93
	08/01/2019	\$34.32	\$12.41	\$12.70	\$0.00	\$59.43
	12/01/2019	\$34.32	\$12.41	\$13.72	\$0.00	\$60.45
	06/01/2020	\$35.22	\$12.41	\$13.72	\$0.00	\$61.35
	08/01/2020	\$35.22	\$12.91	\$13.72	\$0.00	\$61.85
	12/01/2020	\$35.22	\$12.91	\$14.82	\$0.00	\$62.95
	06/01/2021	\$36.02	\$12.91	\$14.82	\$0.00	\$63.75
	08/01/2021	\$36.02	\$13.41	\$14.82	\$0.00	\$64.25
	12/01/2021	\$36.02	\$13.41	\$16.01	\$0.00	\$65.44
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2019	\$34.44	\$11.91	\$12.70	\$0.00	\$59.05
	08/01/2019	\$34.44	\$12.41	\$12.70	\$0.00	\$59.55
	12/01/2019	\$34.44	\$12.41	\$13.72	\$0.00	\$60.57
	06/01/2020	\$35.34	\$12.41	\$13.72	\$0.00	\$61.47
	08/01/2020	\$35.34	\$12.91	\$13.72	\$0.00	\$61.97
	12/01/2020	\$35.34	\$12.91	\$14.82	\$0.00	\$63.07
	06/01/2021	\$36.14	\$12.91	\$14.82	\$0.00	\$63.87
	08/01/2021	\$36.14	\$13.41	\$14.82	\$0.00	\$64.37
	12/01/2021	\$36.14	\$13.41	\$16.01	\$0.00	\$65.56
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2018	\$97.80	\$9.90	\$21.15	\$0.00	\$128.85
	08/01/2019	\$102.78	\$9.90	\$21.15	\$0.00	\$133.83
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2019	\$35.14	\$7.85	\$14.44	\$0.00	\$57.43
	12/01/2019	\$36.00	\$7.85	\$14.44	\$0.00	\$58.29
	06/01/2020	\$36.89	\$7.85	\$14.44	\$0.00	\$59.18
	12/01/2020	\$37.78	\$7.85	\$14.44	\$0.00	\$60.07
	06/01/2021	\$38.70	\$7.85	\$14.44	\$0.00	\$60.99
	12/01/2021	\$39.61	\$7.85	\$14.44	\$0.00	\$61.90
For apprentice rates see "Apprentice- LABORER"						
ASBESTOS WORKER (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (SOUTHERN MASS)</i>	06/01/2019	\$36.40	\$12.50	\$8.50	\$0.00	\$57.40
	12/01/2019	\$37.40	\$12.50	\$8.50	\$0.00	\$58.40
	06/01/2020	\$38.40	\$12.50	\$8.50	\$0.00	\$59.40
	12/01/2020	\$39.40	\$12.50	\$8.50	\$0.00	\$60.40

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ASPHALT RAKER <i>LABORERS - ZONE 2</i>	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40
	For apprentice rates see "Apprentice- LABORER"					
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2019	\$48.18	\$12.00	\$15.60	\$0.00	\$75.78
	12/01/2019	\$49.33	\$12.00	\$15.60	\$0.00	\$76.93
	06/01/2020	\$50.43	\$12.00	\$15.60	\$0.00	\$78.03
	12/01/2020	\$51.58	\$12.00	\$15.60	\$0.00	\$79.18
	06/01/2021	\$52.68	\$12.00	\$15.60	\$0.00	\$80.28
	12/01/2021	\$53.83	\$12.00	\$15.60	\$0.00	\$81.43
	For apprentice rates see "Apprentice- OPERATING ENGINEERS"					
BACKHOE/FRONT-END LOADER <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2019	\$48.18	\$12.00	\$15.60	\$0.00	\$75.78
	12/01/2019	\$49.33	\$12.00	\$15.60	\$0.00	\$76.93
	06/01/2020	\$50.43	\$12.00	\$15.60	\$0.00	\$78.03
	12/01/2020	\$51.58	\$12.00	\$15.60	\$0.00	\$79.18
	06/01/2021	\$52.68	\$12.00	\$15.60	\$0.00	\$80.28
	12/01/2021	\$53.83	\$12.00	\$15.60	\$0.00	\$81.43
	For apprentice rates see "Apprentice- OPERATING ENGINEERS"					
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 2</i>	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40
	For apprentice rates see "Apprentice- LABORER"					
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 2</i>	06/01/2019	\$35.14	\$7.85	\$14.44	\$0.00	\$57.43
	12/01/2019	\$36.00	\$7.85	\$14.44	\$0.00	\$58.29
	06/01/2020	\$36.89	\$7.85	\$14.44	\$0.00	\$59.18
	12/01/2020	\$37.78	\$7.85	\$14.44	\$0.00	\$60.07
	06/01/2021	\$38.70	\$7.85	\$14.44	\$0.00	\$60.99
	12/01/2021	\$39.61	\$7.85	\$14.44	\$0.00	\$61.90
	For apprentice rates see "Apprentice- LABORER"					
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2019	\$44.71	\$7.07	\$17.72	\$0.00	\$69.50
	01/01/2020	\$46.10	\$7.07	\$17.98	\$0.00	\$71.15

Classification
Effective Date
Base Wage
Health
Pension
**Supplemental
Unemployment**
Total Rate
Apprentice - BOILERMAKER - Local 29
Effective Date - 01/01/2019

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

Effective Date - 01/01/2020

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

Notes:
Apprentice to Journeyworker Ratio:1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)	02/01/2019	\$53.55	\$10.75	\$20.66	\$0.00	\$84.96
BRICKLAYERS LOCAL 3 (NEW BEDFORD)	08/01/2019	\$54.90	\$10.75	\$20.80	\$0.00	\$86.45
	02/01/2020	\$55.54	\$10.75	\$20.80	\$0.00	\$87.09
	08/01/2020	\$56.89	\$10.75	\$20.95	\$0.00	\$88.59
	02/01/2021	\$57.53	\$10.75	\$20.95	\$0.00	\$89.23
	08/01/2021	\$58.93	\$10.75	\$21.11	\$0.00	\$90.79
	02/01/2022	\$59.52	\$10.75	\$21.11	\$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 - 02/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.78	\$10.75	\$20.66	\$0.00	\$58.19
2	60	\$32.13	\$10.75	\$20.66	\$0.00	\$63.54
3	70	\$37.49	\$10.75	\$20.66	\$0.00	\$68.90
4	80	\$42.84	\$10.75	\$20.66	\$0.00	\$74.25
5	90	\$48.20	\$10.75	\$20.66	\$0.00	\$79.61

Effective Date - 08/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.45	\$10.75	\$20.80	\$0.00	\$59.00
2	60	\$32.94	\$10.75	\$20.80	\$0.00	\$64.49
3	70	\$38.43	\$10.75	\$20.80	\$0.00	\$69.98
4	80	\$43.92	\$10.75	\$20.80	\$0.00	\$75.47
5	90	\$49.41	\$10.75	\$20.80	\$0.00	\$80.96

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER	06/01/2019	\$47.69	\$12.00	\$15.60	\$0.00	\$75.29
OPERATING ENGINEERS LOCAL 4	12/01/2019	\$48.83	\$12.00	\$15.60	\$0.00	\$76.43
	06/01/2020	\$49.91	\$12.00	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.05	\$12.00	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.14	\$12.00	\$15.60	\$0.00	\$79.74
	12/01/2021	\$53.28	\$12.00	\$15.60	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN	06/01/2019	\$40.75	\$7.85	\$15.55	\$0.00	\$64.15
LABORERS - FOUNDATION AND MARINE	12/01/2019	\$41.75	\$7.85	\$15.55	\$0.00	\$65.15
	06/01/2020	\$42.74	\$7.85	\$15.55	\$0.00	\$66.14
	12/01/2020	\$43.72	\$7.85	\$15.55	\$0.00	\$67.12
	06/01/2021	\$44.74	\$7.85	\$15.55	\$0.00	\$68.14
	12/01/2021	\$45.75	\$7.85	\$15.55	\$0.00	\$69.15
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER	06/01/2019	\$39.60	\$7.85	\$15.55	\$0.00	\$63.00
LABORERS - FOUNDATION AND MARINE	12/01/2019	\$40.60	\$7.85	\$15.55	\$0.00	\$64.00
	06/01/2020	\$41.59	\$7.85	\$15.55	\$0.00	\$64.99
	12/01/2020	\$42.57	\$7.85	\$15.55	\$0.00	\$65.97
	06/01/2021	\$43.59	\$7.85	\$15.55	\$0.00	\$66.99
	12/01/2021	\$44.60	\$7.85	\$15.55	\$0.00	\$68.00
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CAISSON & UNDERPINNING TOP MAN <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2019	\$39.60	\$7.85	\$15.55	\$0.00	\$63.00
	12/01/2019	\$40.60	\$7.85	\$15.55	\$0.00	\$64.00
	06/01/2020	\$41.59	\$7.85	\$15.55	\$0.00	\$64.99
	12/01/2020	\$42.57	\$7.85	\$15.55	\$0.00	\$65.97
	06/01/2021	\$43.59	\$7.85	\$15.55	\$0.00	\$66.99
	12/01/2021	\$44.60	\$7.85	\$15.55	\$0.00	\$68.00
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						
CARPENTER <i>CARPENTERS -ZONE 2 (Eastern Massachusetts)</i>	03/01/2019	\$42.35	\$9.90	\$17.50	\$0.00	\$69.75

Apprentice - CARPENTER - Zone 2 Eastern MA

Effective Date - 03/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.18	\$9.90	\$1.73	\$0.00	\$32.81
2	60	\$25.41	\$9.90	\$1.73	\$0.00	\$37.04
3	70	\$29.65	\$9.90	\$12.31	\$0.00	\$51.86
4	75	\$31.76	\$9.90	\$12.31	\$0.00	\$53.97
5	80	\$33.88	\$9.90	\$14.04	\$0.00	\$57.82
6	80	\$33.88	\$9.90	\$14.04	\$0.00	\$57.82
7	90	\$38.12	\$9.90	\$15.77	\$0.00	\$63.79
8	90	\$38.12	\$9.90	\$15.77	\$0.00	\$63.79

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 \$30.69/ 3&4 \$36.59/ 5&6 \$53.59/ 7&8 \$59.55

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME <i>CARPENTERS -ZONE 2 (Wood Frame)</i>	04/01/2019	\$27.52	\$7.07	\$7.86	\$0.00	\$42.45
	10/01/2019	\$27.95	\$7.07	\$7.86	\$0.00	\$42.88
All Aspects of New Wood Frame Work						

Classification
Effective Date
Base Wage
Health
Pension
**Supplemental
Unemployment**
Total Rate
Apprentice - CARPENTER (Wood Frame) - Zone 2
Effective Date - 04/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$16.51	\$7.07	\$0.00	\$0.00	\$23.58
2	60	\$16.51	\$7.07	\$0.00	\$0.00	\$23.58
3	65	\$17.89	\$7.07	\$7.86	\$0.00	\$32.82
4	70	\$19.26	\$7.07	\$7.86	\$0.00	\$34.19
5	75	\$20.64	\$7.07	\$7.86	\$0.00	\$35.57
6	80	\$22.02	\$7.07	\$7.86	\$0.00	\$36.95
7	85	\$23.39	\$7.07	\$7.86	\$0.00	\$38.32
8	90	\$24.77	\$7.07	\$7.86	\$0.00	\$39.70

Effective Date - 10/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$16.77	\$7.07	\$0.00	\$0.00	\$23.84
2	60	\$16.77	\$7.07	\$0.00	\$0.00	\$23.84
3	65	\$18.17	\$7.07	\$7.86	\$0.00	\$33.10
4	70	\$19.57	\$7.07	\$7.86	\$0.00	\$34.50
5	75	\$20.96	\$7.07	\$7.86	\$0.00	\$35.89
6	80	\$22.36	\$7.07	\$7.86	\$0.00	\$37.29
7	85	\$23.76	\$7.07	\$7.86	\$0.00	\$38.69
8	90	\$25.16	\$7.07	\$7.86	\$0.00	\$40.09

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 \$19.45/ 3&4 \$26.96/ 5&6 \$34.19/ 7&8 \$36.95

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING
BRICKLAYERS LOCAL 3 (NEW BEDFORD)

01/01/2019	\$47.50	\$12.50	\$22.41	\$0.30	\$82.71
07/01/2019	\$48.24	\$12.50	\$22.41	\$0.30	\$83.45
01/01/2020	\$49.64	\$12.50	\$22.41	\$0.30	\$84.85

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - CEMENT MASONRY/PLASTERING - Eastern Mass (New Bedford)
Effective Date - 01/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.75	\$12.50	\$15.41	\$0.00	\$51.66
2	60	\$28.50	\$12.50	\$17.41	\$0.30	\$58.71
3	65	\$30.88	\$12.50	\$18.41	\$0.30	\$62.09
4	70	\$33.25	\$12.50	\$19.41	\$0.30	\$65.46
5	75	\$35.63	\$12.50	\$20.41	\$0.30	\$68.84
6	80	\$38.00	\$12.50	\$21.41	\$0.30	\$72.21
7	90	\$42.75	\$12.50	\$22.41	\$0.30	\$77.96

Effective Date - 07/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.12	\$12.50	\$15.41	\$0.00	\$52.03
2	60	\$28.94	\$12.50	\$17.41	\$0.30	\$59.15
3	65	\$31.36	\$12.50	\$18.41	\$0.30	\$62.57
4	70	\$33.77	\$12.50	\$19.41	\$0.30	\$65.98
5	75	\$36.18	\$12.50	\$20.41	\$0.30	\$69.39
6	80	\$38.59	\$12.50	\$21.41	\$0.30	\$72.80
7	90	\$43.42	\$12.50	\$22.41	\$0.30	\$78.63

Notes:

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

Apprentice to Journeyworker Ratio:1:3

CHAIN SAW OPERATOR LABORERS - ZONE 2	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES OPERATING ENGINEERS LOCAL 4	06/01/2019	\$49.18	\$12.00	\$15.60	\$0.00	\$76.78
	12/01/2019	\$50.33	\$12.00	\$15.60	\$0.00	\$77.93
	06/01/2020	\$51.43	\$12.00	\$15.60	\$0.00	\$79.03
	12/01/2020	\$52.58	\$12.00	\$15.60	\$0.00	\$80.18
	06/01/2021	\$53.68	\$12.00	\$15.60	\$0.00	\$81.28
	12/01/2021	\$54.83	\$12.00	\$15.60	\$0.00	\$82.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR OPERATING ENGINEERS LOCAL 4	06/01/2019	\$32.28	\$12.00	\$15.60	\$0.00	\$59.88
	12/01/2019	\$33.07	\$12.00	\$15.60	\$0.00	\$60.67
	06/01/2020	\$33.82	\$12.00	\$15.60	\$0.00	\$61.42
	12/01/2020	\$34.60	\$12.00	\$15.60	\$0.00	\$62.20
	06/01/2021	\$35.35	\$12.00	\$15.60	\$0.00	\$62.95
	12/01/2021	\$36.14	\$12.00	\$15.60	\$0.00	\$63.74

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE)	01/01/2019	\$50.36	\$8.15	\$20.85	\$0.00	\$79.36
<i>PAINTERS LOCAL 35 - ZONE 2</i>	07/01/2019	\$50.66	\$8.20	\$21.45	\$0.00	\$80.31
	01/01/2020	\$50.96	\$8.20	\$22.10	\$0.00	\$81.26
	07/01/2020	\$52.06	\$8.20	\$22.10	\$0.00	\$82.36
	01/01/2021	\$53.16	\$8.20	\$22.10	\$0.00	\$83.46

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.18	\$8.15	\$0.00	\$0.00	\$33.33
2	55	\$27.70	\$8.15	\$5.64	\$0.00	\$41.49
3	60	\$30.22	\$8.15	\$6.15	\$0.00	\$44.52
4	65	\$32.73	\$8.15	\$6.66	\$0.00	\$47.54
5	70	\$35.25	\$8.15	\$17.78	\$0.00	\$61.18
6	75	\$37.77	\$8.15	\$18.29	\$0.00	\$64.21
7	80	\$40.29	\$8.15	\$18.80	\$0.00	\$67.24
8	90	\$45.32	\$8.15	\$19.83	\$0.00	\$73.30

Effective Date - 07/01/2019

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

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN	06/01/2019	\$39.80	\$7.85	\$15.35	\$0.00	\$63.00
<i>LABORERS - ZONE 2</i>	12/01/2019	\$40.80	\$7.85	\$15.35	\$0.00	\$64.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR	06/01/2019	\$40.80	\$7.85	\$15.35	\$0.00	\$64.00
<i>LABORERS - ZONE 2</i>	12/01/2019	\$41.80	\$7.85	\$15.35	\$0.00	\$65.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS	06/01/2019	\$40.55	\$7.85	\$15.35	\$0.00	\$63.75
<i>LABORERS - ZONE 2</i>	12/01/2019	\$41.55	\$7.85	\$15.35	\$0.00	\$64.75
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER	06/01/2019	\$40.80	\$7.85	\$15.35	\$0.00	\$64.00
<i>LABORERS - ZONE 2</i>	12/01/2019	\$41.80	\$7.85	\$15.35	\$0.00	\$65.00
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: JACKHAMMER OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2019	\$40.55	\$7.85	\$15.35	\$0.00	\$63.75
For apprentice rates see "Apprentice- LABORER"	12/01/2019	\$41.55	\$7.85	\$15.35	\$0.00	\$64.75
DEMO: WRECKING LABORER <i>LABORERS - ZONE 2</i>	06/01/2019	\$39.80	\$7.85	\$15.35	\$0.00	\$63.00
For apprentice rates see "Apprentice- LABORER"	12/01/2019	\$40.80	\$7.85	\$15.35	\$0.00	\$64.00
DIRECTIONAL DRILL MACHINE OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2019	\$47.69	\$12.00	\$15.60	\$0.00	\$75.29
	12/01/2019	\$48.83	\$12.00	\$15.60	\$0.00	\$76.43
	06/01/2020	\$49.91	\$12.00	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.05	\$12.00	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.14	\$12.00	\$15.60	\$0.00	\$79.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2021	\$53.28	\$12.00	\$15.60	\$0.00	\$80.88
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2018	\$65.20	\$9.90	\$21.15	\$0.00	\$96.25
For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2019	\$68.52	\$9.90	\$21.15	\$0.00	\$99.57
DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2018	\$46.57	\$9.90	\$21.15	\$0.00	\$77.62
For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2019	\$48.94	\$9.90	\$21.15	\$0.00	\$79.99
DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2018	\$69.86	\$9.90	\$21.15	\$0.00	\$100.91
For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2019	\$73.41	\$9.90	\$21.15	\$0.00	\$104.46
DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 2)</i>	08/01/2018	\$97.80	\$9.90	\$21.15	\$0.00	\$128.85
For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2019	\$102.78	\$9.90	\$21.15	\$0.00	\$133.83
ELECTRICIAN <i>ELECTRICIANS LOCAL 223</i>	03/01/2019	\$41.64	\$9.90	\$13.15	\$0.00	\$64.69
	09/01/2019	\$42.26	\$10.15	\$13.54	\$0.00	\$65.95
	03/01/2020	\$42.87	\$10.40	\$13.94	\$0.00	\$67.21

Classification

Effective Date Base Wage Health Pension Supplemental
Unemployment Total Rate

Apprentice - ELECTRICIAN - Local 223
Effective Date - 03/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$16.66	\$9.90	\$0.50	\$0.00	\$27.06
2	42	\$17.49	\$9.90	\$0.52	\$0.00	\$27.91
3	45	\$18.74	\$9.90	\$0.58	\$0.00	\$29.22
4	48	\$19.99	\$9.90	\$4.64	\$0.00	\$34.53
5	50	\$20.82	\$9.90	\$4.68	\$0.00	\$35.40
6	55	\$22.90	\$9.90	\$5.04	\$0.00	\$37.84
7	60	\$24.98	\$9.90	\$5.34	\$0.00	\$40.22
8	65	\$27.07	\$9.90	\$5.64	\$0.00	\$42.61
9	70	\$29.15	\$9.90	\$5.93	\$0.00	\$44.98
10	75	\$31.23	\$9.90	\$6.18	\$0.00	\$47.31

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$16.90	\$10.15	\$0.51	\$0.00	\$27.56
2	42	\$17.75	\$10.15	\$0.53	\$0.00	\$28.43
3	45	\$19.02	\$10.15	\$0.57	\$0.00	\$29.74
4	48	\$20.28	\$10.15	\$4.93	\$0.00	\$35.36
5	50	\$21.13	\$10.15	\$4.97	\$0.00	\$36.25
6	55	\$23.24	\$10.15	\$5.33	\$0.00	\$38.72
7	60	\$25.36	\$10.15	\$5.64	\$0.00	\$41.15
8	65	\$27.47	\$10.15	\$5.94	\$0.00	\$43.56
9	70	\$29.58	\$10.15	\$6.25	\$0.00	\$45.98
10	75	\$31.70	\$10.15	\$6.50	\$0.00	\$48.35

Notes:

Steps are 750 hours

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR	01/01/2019	\$59.47	\$15.58	\$17.51	\$0.00	\$92.56
ELEVATOR CONSTRUCTORS LOCAL 4	01/01/2020	\$61.42	\$15.73	\$18.41	\$0.00	\$95.56
	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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - ELEVATOR CONSTRUCTOR - Local 4

Effective Date - 01/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$29.74	\$15.58	\$0.00	\$0.00	\$45.32
2	55	\$32.71	\$15.58	\$17.51	\$0.00	\$65.80
3	65	\$38.66	\$15.58	\$17.51	\$0.00	\$71.75
4	70	\$41.63	\$15.58	\$17.51	\$0.00	\$74.72
5	80	\$47.58	\$15.58	\$17.51	\$0.00	\$80.67

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.71	\$15.73	\$0.00	\$0.00	\$46.44
2	55	\$33.78	\$15.73	\$18.41	\$0.00	\$67.92
3	65	\$39.92	\$15.73	\$18.41	\$0.00	\$74.06
4	70	\$42.99	\$15.73	\$18.41	\$0.00	\$77.13
5	80	\$49.14	\$15.73	\$18.41	\$0.00	\$83.28

Notes:

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

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER	01/01/2019	\$41.63	\$15.58	\$17.51	\$0.00	\$74.72
ELEVATOR CONSTRUCTORS LOCAL 4	01/01/2020	\$42.99	\$15.73	\$18.41	\$0.00	\$77.13
	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	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
LABORERS - ZONE 2	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40

For apprentice rates see "Apprentice- LABORER"

FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY	05/01/2019	\$43.68	\$11.50	\$15.60	\$0.00	\$70.78
OPERATING ENGINEERS LOCAL 4	11/01/2019	\$44.68	\$11.50	\$15.60	\$0.00	\$71.78
	05/01/2020	\$45.83	\$11.50	\$15.60	\$0.00	\$72.93
	11/01/2020	\$46.83	\$11.50	\$15.60	\$0.00	\$73.93
	05/01/2021	\$47.98	\$11.50	\$15.60	\$0.00	\$75.08
	11/01/2021	\$48.98	\$11.50	\$15.60	\$0.00	\$76.08
	05/01/2022	\$50.13	\$11.50	\$15.60	\$0.00	\$77.23

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	05/01/2019	\$45.17	\$11.50	\$15.60	\$0.00	\$72.27
	11/01/2019	\$46.18	\$11.50	\$15.60	\$0.00	\$73.28
	05/01/2020	\$47.33	\$11.50	\$15.60	\$0.00	\$74.43
	11/01/2020	\$48.34	\$11.50	\$15.60	\$0.00	\$75.44
	05/01/2021	\$49.50	\$11.50	\$15.60	\$0.00	\$76.60
	11/01/2021	\$50.51	\$11.50	\$15.60	\$0.00	\$77.61
	05/01/2022	\$51.67	\$11.50	\$15.60	\$0.00	\$78.77
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	05/01/2019	\$22.48	\$11.50	\$15.60	\$0.00	\$49.58
	11/01/2019	\$23.07	\$11.50	\$15.60	\$0.00	\$50.17
	05/01/2020	\$23.74	\$11.50	\$15.60	\$0.00	\$50.84
	11/01/2020	\$24.33	\$11.50	\$15.60	\$0.00	\$51.43
	05/01/2021	\$25.01	\$11.50	\$15.60	\$0.00	\$52.11
	11/01/2021	\$25.61	\$11.50	\$15.60	\$0.00	\$52.71
	05/01/2022	\$26.28	\$11.50	\$15.60	\$0.00	\$53.38
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 223</i>	03/01/2019	\$41.64	\$9.90	\$13.15	\$0.00	\$64.69
	09/01/2019	\$42.26	\$10.15	\$13.54	\$0.00	\$65.95
	03/01/2020	\$42.87	\$10.40	\$13.94	\$0.00	\$67.21
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING <i>ELECTRICIANS</i> <i>LOCAL 223</i>	03/01/2019	\$35.25	\$9.90	\$11.14	\$0.00	\$56.29
	09/01/2019	\$35.78	\$10.15	\$11.45	\$0.00	\$57.38
	03/01/2020	\$36.27	\$10.40	\$11.78	\$0.00	\$58.45
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2019	\$39.54	\$12.00	\$15.60	\$0.00	\$67.14
	12/01/2019	\$40.49	\$12.00	\$15.60	\$0.00	\$68.09
	06/01/2020	\$41.40	\$12.00	\$15.60	\$0.00	\$69.00
	12/01/2020	\$42.35	\$12.00	\$15.60	\$0.00	\$69.95
	06/01/2021	\$43.26	\$12.00	\$15.60	\$0.00	\$70.86
	12/01/2021	\$44.21	\$12.00	\$15.60	\$0.00	\$71.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER <i>LABORERS - ZONE 2</i>	06/01/2019	\$22.50	\$7.85	\$14.44	\$0.00	\$44.79
	12/01/2019	\$23.50	\$7.85	\$14.44	\$0.00	\$45.79
	06/01/2020	\$23.50	\$7.85	\$14.44	\$0.00	\$45.79
	12/01/2020	\$24.50	\$7.85	\$14.44	\$0.00	\$46.79
	06/01/2021	\$24.50	\$7.85	\$14.44	\$0.00	\$46.79
	12/01/2021	\$24.50	\$7.85	\$14.44	\$0.00	\$46.79
For apprentice rates see "Apprentice- LABORER"						
FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE I</i>	03/01/2016	\$42.13	\$9.80	\$17.62	\$0.00	\$69.55

Classification
Effective Date
Base Wage
Health
Pension
**Supplemental
Unemployment**
Total Rate
Apprentice - FLOORCOVERER - Local 2168 Zone I
Effective Date - 03/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.07	\$9.80	\$1.79	\$0.00	\$32.66
2	55	\$23.17	\$9.80	\$1.79	\$0.00	\$34.76
3	60	\$25.28	\$9.80	\$12.25	\$0.00	\$47.33
4	65	\$27.38	\$9.80	\$12.25	\$0.00	\$49.43
5	70	\$29.49	\$9.80	\$14.04	\$0.00	\$53.33
6	75	\$31.60	\$9.80	\$14.04	\$0.00	\$55.44
7	80	\$33.70	\$9.80	\$15.83	\$0.00	\$59.33
8	85	\$35.81	\$9.80	\$15.83	\$0.00	\$61.44

Notes: Steps are 750 hrs.

% After 09/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)

Step 1&2 \$30.55/ 3&4 \$36.49/ 5&6 \$53.33/ 7&8 \$59.33

Apprentice to Journeyworker Ratio:1:1
FORK LIFT/CHERRY PICKER
OPERATING ENGINEERS LOCAL 4

06/01/2019	\$48.18	\$12.00	\$15.60	\$0.00	\$75.78
12/01/2019	\$49.33	\$12.00	\$15.60	\$0.00	\$76.93
06/01/2020	\$50.43	\$12.00	\$15.60	\$0.00	\$78.03
12/01/2020	\$51.58	\$12.00	\$15.60	\$0.00	\$79.18
06/01/2021	\$52.68	\$12.00	\$15.60	\$0.00	\$80.28
12/01/2021	\$53.83	\$12.00	\$15.60	\$0.00	\$81.43

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

GENERATOR/LIGHTING PLANT/HEATERS
OPERATING ENGINEERS LOCAL 4

06/01/2019	\$32.28	\$12.00	\$15.60	\$0.00	\$59.88
12/01/2019	\$33.07	\$12.00	\$15.60	\$0.00	\$60.67
06/01/2020	\$33.82	\$12.00	\$15.60	\$0.00	\$61.42
12/01/2020	\$34.60	\$12.00	\$15.60	\$0.00	\$62.20
06/01/2021	\$35.35	\$12.00	\$15.60	\$0.00	\$62.95
12/01/2021	\$36.14	\$12.00	\$15.60	\$0.00	\$63.74

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

**GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR
SYSTEMS)**
GLAZIERS LOCAL 1333

06/01/2019	\$38.18	\$10.60	\$9.90	\$0.00	\$58.68
06/01/2020	\$39.18	\$10.80	\$10.45	\$0.00	\$60.43

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - GLAZIER - Local 1333

Effective Date - 06/01/2019

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

Effective Date - 06/01/2020

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

Notes:

Apprentice to Journeyworker Ratio:1:3

HOISTING ENGINEER/CRANES/GRADALLS
OPERATING ENGINEERS LOCAL 4

06/01/2019	\$48.18	\$12.00	\$15.60	\$0.00	\$75.78
12/01/2019	\$49.33	\$12.00	\$15.60	\$0.00	\$76.93
06/01/2020	\$50.43	\$12.00	\$15.60	\$0.00	\$78.03
12/01/2020	\$51.58	\$12.00	\$15.60	\$0.00	\$79.18
06/01/2021	\$52.68	\$12.00	\$15.60	\$0.00	\$80.28
12/01/2021	\$53.83	\$12.00	\$15.60	\$0.00	\$81.43

Apprentice - OPERATING ENGINEERS - Local 4

Effective Date - 06/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$26.50	\$12.00	\$0.00	\$0.00	\$38.50
2	60	\$28.91	\$12.00	\$15.60	\$0.00	\$56.51
3	65	\$31.32	\$12.00	\$15.60	\$0.00	\$58.92
4	70	\$33.73	\$12.00	\$15.60	\$0.00	\$61.33
5	75	\$36.14	\$12.00	\$15.60	\$0.00	\$63.74
6	80	\$38.54	\$12.00	\$15.60	\$0.00	\$66.14
7	85	\$40.95	\$12.00	\$15.60	\$0.00	\$68.55
8	90	\$43.36	\$12.00	\$15.60	\$0.00	\$70.96

Effective Date - 12/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$27.13	\$12.00	\$0.00	\$0.00	\$39.13
2	60	\$29.60	\$12.00	\$15.60	\$0.00	\$57.20
3	65	\$32.06	\$12.00	\$15.60	\$0.00	\$59.66
4	70	\$34.53	\$12.00	\$15.60	\$0.00	\$62.13
5	75	\$37.00	\$12.00	\$15.60	\$0.00	\$64.60
6	80	\$39.46	\$12.00	\$15.60	\$0.00	\$67.06
7	85	\$41.93	\$12.00	\$15.60	\$0.00	\$69.53
8	90	\$44.40	\$12.00	\$15.60	\$0.00	\$72.00

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) SHEETMETAL WORKERS LOCAL 17 - B	04/01/2019	\$34.71	\$13.20	\$16.55	\$1.93	\$66.39
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) ELECTRICIANS LOCAL 223	03/01/2019	\$41.64	\$9.90	\$13.15	\$0.00	\$64.69
	09/01/2019	\$42.26	\$10.15	\$13.54	\$0.00	\$65.95
	03/01/2020	\$42.87	\$10.40	\$13.94	\$0.00	\$67.21
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) SHEETMETAL WORKERS LOCAL 17 - B	04/01/2019	\$34.71	\$13.20	\$16.55	\$1.93	\$66.39
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) PLUMBERS & PIPEFITTERS LOCAL 51	09/01/2018	\$42.04	\$10.00	\$18.20	\$0.00	\$70.24
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC PLUMBERS & PIPEFITTERS LOCAL 51	09/01/2018	\$42.04	\$10.00	\$18.20	\$0.00	\$70.24
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HYDRAULIC DRILLS <i>LABORERS - ZONE 2</i>	06/01/2019	\$35.14	\$7.85	\$14.44	\$0.00	\$57.43
	12/01/2019	\$36.00	\$7.85	\$14.44	\$0.00	\$58.29
	06/01/2020	\$36.89	\$7.85	\$14.44	\$0.00	\$59.18
	12/01/2020	\$37.78	\$7.85	\$14.44	\$0.00	\$60.07
	06/01/2021	\$38.70	\$7.85	\$14.44	\$0.00	\$60.99
	12/01/2021	\$39.61	\$7.85	\$14.44	\$0.00	\$61.90
For apprentice rates see "Apprentice- LABORER"						
INSULATOR (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (SOUTHERN MASS)</i>	09/01/2018	\$42.38	\$12.50	\$15.60	\$0.00	\$70.48
	09/01/2019	\$44.63	\$12.50	\$15.60	\$0.00	\$72.73

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

Effective Date - 09/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.19	\$12.50	\$11.40	\$0.00	\$45.09
2	60	\$25.43	\$12.50	\$12.24	\$0.00	\$50.17
3	70	\$29.67	\$12.50	\$13.08	\$0.00	\$55.25
4	80	\$33.90	\$12.50	\$13.92	\$0.00	\$60.32

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.32	\$12.50	\$11.40	\$0.00	\$46.22
2	60	\$26.78	\$12.50	\$12.24	\$0.00	\$51.52
3	70	\$31.24	\$12.50	\$13.08	\$0.00	\$56.82
4	80	\$35.70	\$12.50	\$13.92	\$0.00	\$62.12

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER <i>IRONWORKERS LOCAL 37</i>	03/16/2019	\$38.81	\$7.70	\$17.10	\$0.00	\$63.61
	09/16/2019	\$39.71	\$7.70	\$17.10	\$0.00	\$64.51
	03/16/2020	\$40.61	\$7.70	\$17.10	\$0.00	\$65.41
	09/16/2020	\$41.51	\$7.70	\$17.10	\$0.00	\$66.31
	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 - 03/16/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	70	\$27.17	\$7.70	\$17.10	\$0.00	\$51.97
2	75	\$29.11	\$7.70	\$17.10	\$0.00	\$53.91
3	80	\$31.05	\$7.70	\$17.10	\$0.00	\$55.85
4	85	\$32.99	\$7.70	\$17.10	\$0.00	\$57.79
5	90	\$34.93	\$7.70	\$17.10	\$0.00	\$59.73
6	95	\$36.87	\$7.70	\$17.10	\$0.00	\$61.67

Effective Date - 09/16/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	70	\$27.80	\$7.70	\$17.10	\$0.00	\$52.60
2	75	\$29.78	\$7.70	\$17.10	\$0.00	\$54.58
3	80	\$31.77	\$7.70	\$17.10	\$0.00	\$56.57
4	85	\$33.75	\$7.70	\$17.10	\$0.00	\$58.55
5	90	\$35.74	\$7.70	\$17.10	\$0.00	\$60.54
6	95	\$37.72	\$7.70	\$17.10	\$0.00	\$62.52

Notes:
Apprentice to Journeyworker Ratio:1:4

JACKHAMMER & PAVING BREAKER OPERATOR	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
LABORERS - ZONE 2	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						
LABORER	06/01/2019	\$34.39	\$7.85	\$14.44	\$0.00	\$56.68
LABORERS - ZONE 2	12/01/2019	\$35.25	\$7.85	\$14.44	\$0.00	\$57.54
	06/01/2020	\$36.14	\$7.85	\$14.44	\$0.00	\$58.43
	12/01/2020	\$37.03	\$7.85	\$14.44	\$0.00	\$59.32
	06/01/2021	\$37.95	\$7.85	\$14.44	\$0.00	\$60.24
	12/01/2021	\$38.86	\$7.85	\$14.44	\$0.00	\$61.15

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - LABORER - Zone 2

Effective Date - 06/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.63	\$7.85	\$14.44	\$0.00	\$42.92
2	70	\$24.07	\$7.85	\$14.44	\$0.00	\$46.36
3	80	\$27.51	\$7.85	\$14.44	\$0.00	\$49.80
4	90	\$30.95	\$7.85	\$14.44	\$0.00	\$53.24

Effective Date - 12/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$21.15	\$7.85	\$14.44	\$0.00	\$43.44
2	70	\$24.68	\$7.85	\$14.44	\$0.00	\$46.97
3	80	\$28.20	\$7.85	\$14.44	\$0.00	\$50.49
4	90	\$31.73	\$7.85	\$14.44	\$0.00	\$54.02

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER: CARPENTER TENDER	06/01/2019	\$34.39	\$7.85	\$14.44	\$0.00	\$56.68
LABORERS - ZONE 2	12/01/2019	\$35.25	\$7.85	\$14.44	\$0.00	\$57.54
	06/01/2020	\$36.14	\$7.85	\$14.44	\$0.00	\$58.43
	12/01/2020	\$37.03	\$7.85	\$14.44	\$0.00	\$59.32
	06/01/2021	\$37.95	\$7.85	\$14.44	\$0.00	\$60.24
	12/01/2021	\$38.86	\$7.85	\$14.44	\$0.00	\$61.15

For apprentice rates see "Apprentice- LABORER"

LABORER: CEMENT FINISHER TENDER	06/01/2019	\$34.39	\$7.85	\$14.44	\$0.00	\$56.68
LABORERS - ZONE 2	12/01/2019	\$35.25	\$7.85	\$14.44	\$0.00	\$57.54
	06/01/2020	\$36.14	\$7.85	\$14.44	\$0.00	\$58.43
	12/01/2020	\$37.03	\$7.85	\$14.44	\$0.00	\$59.32
	06/01/2021	\$37.95	\$7.85	\$14.44	\$0.00	\$60.24
	12/01/2021	\$38.86	\$7.85	\$14.44	\$0.00	\$61.15

For apprentice rates see "Apprentice- LABORER"

LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER	06/01/2019	\$34.59	\$7.85	\$14.39	\$0.00	\$56.83
LABORERS - ZONE 2	12/01/2019	\$35.45	\$7.85	\$14.39	\$0.00	\$57.69

For apprentice rates see "Apprentice- LABORER"

LABORER: MASON TENDER	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
LABORERS - ZONE 2	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 2</i>	06/01/2019	\$34.39	\$7.85	\$14.44	\$0.00	\$56.68
	12/01/2019	\$35.25	\$7.85	\$14.44	\$0.00	\$57.54
	06/01/2020	\$36.14	\$7.85	\$14.44	\$0.00	\$58.43
	12/01/2020	\$37.03	\$7.85	\$14.44	\$0.00	\$59.32
	06/01/2021	\$37.95	\$7.85	\$14.44	\$0.00	\$60.24
	12/01/2021	\$38.86	\$7.85	\$14.44	\$0.00	\$61.15
	For apprentice rates see "Apprentice- LABORER"					
LABORER: TREE REMOVER <i>LABORERS - ZONE 2</i>	06/01/2019	\$34.39	\$7.85	\$14.44	\$0.00	\$56.68
	12/01/2019	\$35.25	\$7.85	\$14.44	\$0.00	\$57.54
	06/01/2020	\$36.14	\$7.85	\$14.44	\$0.00	\$58.43
	12/01/2020	\$37.03	\$7.85	\$14.44	\$0.00	\$59.32
	06/01/2021	\$37.95	\$7.85	\$14.44	\$0.00	\$60.24
	12/01/2021	\$38.86	\$7.85	\$14.44	\$0.00	\$61.15
	This classification applies to all tree work associated with the removal of standing trees, and trimming and removal of branches and limbs when the work is not done for a utility company for the purpose of operation, maintenance or repair of utility company equipment. For apprentice rates see "Apprentice- LABORER"					
LASER BEAM OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40
	For apprentice rates see "Apprentice- LABORER"					
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2019	\$40.91	\$10.75	\$18.97	\$0.00	\$70.63
	08/01/2019	\$41.99	\$10.75	\$19.11	\$0.00	\$71.85
	02/01/2020	\$42.50	\$10.75	\$19.11	\$0.00	\$72.36
	08/01/2020	\$43.58	\$10.75	\$19.26	\$0.00	\$73.59
	02/01/2021	\$44.09	\$10.75	\$19.26	\$0.00	\$74.10
	08/01/2021	\$45.21	\$10.75	\$19.42	\$0.00	\$75.38
	02/01/2022	\$45.68	\$10.75	\$19.42	\$0.00	\$75.85

Apprentice - MARBLE & TILE FINISHER - Local 3 Marble & Tile**Effective Date -** 02/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.46	\$10.75	\$18.97	\$0.00	\$50.18
2	60	\$24.55	\$10.75	\$18.97	\$0.00	\$54.27
3	70	\$28.64	\$10.75	\$18.97	\$0.00	\$58.36
4	80	\$32.73	\$10.75	\$18.97	\$0.00	\$62.45
5	90	\$36.82	\$10.75	\$18.97	\$0.00	\$66.54

Effective Date - 08/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.00	\$10.75	\$19.11	\$0.00	\$50.86
2	60	\$25.19	\$10.75	\$19.11	\$0.00	\$55.05
3	70	\$29.39	\$10.75	\$19.11	\$0.00	\$59.25
4	80	\$33.59	\$10.75	\$19.11	\$0.00	\$63.45
5	90	\$37.79	\$10.75	\$19.11	\$0.00	\$67.65

Notes:**Apprentice to Journeyworker Ratio:1:3**MARBLE MASONS, TILELAYERS & TERRAZZO MECH
BRICKLAYERS LOCAL 3 - MARBLE & TILE

02/01/2019	\$53.57	\$10.75	\$20.66	\$0.00	\$84.98
08/01/2019	\$54.92	\$10.75	\$20.80	\$0.00	\$86.47
02/01/2020	\$55.55	\$10.75	\$20.80	\$0.00	\$87.10
08/01/2020	\$56.90	\$10.75	\$20.95	\$0.00	\$88.60
02/01/2021	\$57.54	\$10.75	\$20.95	\$0.00	\$89.24
08/01/2021	\$58.94	\$10.75	\$21.11	\$0.00	\$90.80
02/01/2022	\$59.51	\$10.75	\$21.11	\$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 - 02/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.79	\$10.75	\$20.66	\$0.00	\$58.20
2	60	\$32.14	\$10.75	\$20.66	\$0.00	\$63.55
3	70	\$37.50	\$10.75	\$20.66	\$0.00	\$68.91
4	80	\$42.86	\$10.75	\$20.66	\$0.00	\$74.27
5	90	\$48.21	\$10.75	\$20.66	\$0.00	\$79.62

Effective Date - 08/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.46	\$10.75	\$20.80	\$0.00	\$59.01
2	60	\$32.95	\$10.75	\$20.80	\$0.00	\$64.50
3	70	\$38.44	\$10.75	\$20.80	\$0.00	\$69.99
4	80	\$43.94	\$10.75	\$20.80	\$0.00	\$75.49
5	90	\$49.43	\$10.75	\$20.80	\$0.00	\$80.98

Notes:
Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES)	06/01/2019	\$47.69	\$12.00	\$15.60	\$0.00	\$75.29
OPERATING ENGINEERS LOCAL 4	12/01/2019	\$48.83	\$12.00	\$15.60	\$0.00	\$76.43
	06/01/2020	\$49.91	\$12.00	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.05	\$12.00	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.14	\$12.00	\$15.60	\$0.00	\$79.74
	12/01/2021	\$53.28	\$12.00	\$15.60	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE	06/01/2019	\$47.69	\$12.00	\$15.60	\$0.00	\$75.29
OPERATING ENGINEERS LOCAL 4	12/01/2019	\$48.83	\$12.00	\$15.60	\$0.00	\$76.43
	06/01/2020	\$49.91	\$12.00	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.05	\$12.00	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.14	\$12.00	\$15.60	\$0.00	\$79.74
	12/01/2021	\$53.28	\$12.00	\$15.60	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 2)	04/01/2019	\$38.87	\$9.90	\$18.50	\$0.00	\$67.27
MILLWRIGHTS LOCAL 1121 - Zone 2						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Apprentice - MILLWRIGHT - Local 1121 Zone 2						
Effective Date - 04/01/2019						
Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$21.38	\$9.90	\$5.31	\$0.00	\$36.59
2	65	\$25.27	\$9.90	\$15.13	\$0.00	\$50.30
3	75	\$29.15	\$9.90	\$16.10	\$0.00	\$55.15
4	85	\$33.04	\$9.90	\$17.06	\$0.00	\$60.00
Notes:						
Steps are 2,000 hours						
Apprentice to Journeyworker Ratio:1:5						
MORTAR MIXER	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
LABORERS - ZONE 2	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS)	06/01/2019	\$23.11	\$12.00	\$15.60	\$0.00	\$50.71
OPERATING ENGINEERS LOCAL 4	12/01/2019	\$23.68	\$12.00	\$15.60	\$0.00	\$51.28
	06/01/2020	\$24.23	\$12.00	\$15.60	\$0.00	\$51.83
	12/01/2020	\$24.80	\$12.00	\$15.60	\$0.00	\$52.40
	06/01/2021	\$25.35	\$12.00	\$15.60	\$0.00	\$52.95
	12/01/2021	\$25.93	\$12.00	\$15.60	\$0.00	\$53.53
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS)	06/01/2019	\$27.57	\$12.00	\$15.60	\$0.00	\$55.17
OPERATING ENGINEERS LOCAL 4	12/01/2019	\$28.24	\$12.00	\$15.60	\$0.00	\$55.84
	06/01/2020	\$28.89	\$12.00	\$15.60	\$0.00	\$56.49
	12/01/2020	\$29.57	\$12.00	\$15.60	\$0.00	\$57.17
	06/01/2021	\$30.21	\$12.00	\$15.60	\$0.00	\$57.81
	12/01/2021	\$30.89	\$12.00	\$15.60	\$0.00	\$58.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS II	06/01/2019	\$47.69	\$12.00	\$15.60	\$0.00	\$75.29
OPERATING ENGINEERS LOCAL 4	12/01/2019	\$48.83	\$12.00	\$15.60	\$0.00	\$76.43
	06/01/2020	\$49.91	\$12.00	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.05	\$12.00	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.14	\$12.00	\$15.60	\$0.00	\$79.74
	12/01/2021	\$53.28	\$12.00	\$15.60	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS)	01/01/2019	\$50.36	\$8.15	\$20.85	\$0.00	\$79.36
PAINTERS LOCAL 35 - ZONE 2	07/01/2019	\$50.66	\$8.20	\$21.45	\$0.00	\$80.31
	01/01/2020	\$50.96	\$8.20	\$22.10	\$0.00	\$81.26
	07/01/2020	\$52.06	\$8.20	\$22.10	\$0.00	\$82.36
	01/01/2021	\$53.16	\$8.20	\$22.10	\$0.00	\$83.46

Apprentice - PAINTER Local 35 - BRIDGES/TANKS**Effective Date -** 01/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.18	\$8.15	\$0.00	\$0.00	\$33.33
2	55	\$27.70	\$8.15	\$5.64	\$0.00	\$41.49
3	60	\$30.22	\$8.15	\$6.15	\$0.00	\$44.52
4	65	\$32.73	\$8.15	\$6.66	\$0.00	\$47.54
5	70	\$35.25	\$8.15	\$17.78	\$0.00	\$61.18
6	75	\$37.77	\$8.15	\$18.29	\$0.00	\$64.21
7	80	\$40.29	\$8.15	\$18.80	\$0.00	\$67.24
8	90	\$45.32	\$8.15	\$19.83	\$0.00	\$73.30

Effective Date - 07/01/2019

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

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SIGN, PICTORIAL & DISPLAY)

06/01/2013

\$25.81

\$7.07

\$7.05

\$0.00

\$39.93

PAINTERS LOCAL 35 - ZONE 2

Apprentice - PAINTER SIGN - Local 35 Zone 2**Effective Date - 06/01/2013**

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

Notes:

Steps are 4 mos.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *

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

01/01/2019	\$41.26	\$8.15	\$20.85	\$0.00	\$70.26
07/01/2019	\$41.56	\$8.20	\$21.45	\$0.00	\$71.21
01/01/2020	\$41.86	\$8.20	\$22.10	\$0.00	\$72.16
07/01/2020	\$42.96	\$8.20	\$22.10	\$0.00	\$73.26
01/01/2021	\$44.06	\$8.20	\$22.10	\$0.00	\$74.36

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - New
Effective Date - 01/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.63	\$8.15	\$0.00	\$0.00	\$28.78
2	55	\$22.69	\$8.15	\$5.64	\$0.00	\$36.48
3	60	\$24.76	\$8.15	\$6.15	\$0.00	\$39.06
4	65	\$26.82	\$8.15	\$6.66	\$0.00	\$41.63
5	70	\$28.88	\$8.15	\$17.78	\$0.00	\$54.81
6	75	\$30.95	\$8.15	\$18.29	\$0.00	\$57.39
7	80	\$33.01	\$8.15	\$18.80	\$0.00	\$59.96
8	90	\$37.13	\$8.15	\$19.83	\$0.00	\$65.11

Effective Date - 07/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.78	\$8.20	\$0.00	\$0.00	\$28.98
2	55	\$22.86	\$8.20	\$5.78	\$0.00	\$36.84
3	60	\$24.94	\$8.20	\$6.30	\$0.00	\$39.44
4	65	\$27.01	\$8.20	\$6.83	\$0.00	\$42.04
5	70	\$29.09	\$8.20	\$18.30	\$0.00	\$55.59
6	75	\$31.17	\$8.20	\$18.83	\$0.00	\$58.20
7	80	\$33.25	\$8.20	\$19.35	\$0.00	\$60.80
8	90	\$37.40	\$8.20	\$20.40	\$0.00	\$66.00

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT)	01/01/2019	\$39.32	\$8.15	\$20.85	\$0.00	\$68.32
PAINTERS LOCAL 35 - ZONE 2	07/01/2019	\$39.62	\$8.20	\$21.45	\$0.00	\$69.27
	01/01/2020	\$39.92	\$8.20	\$22.10	\$0.00	\$70.22
	07/01/2020	\$41.02	\$8.20	\$22.10	\$0.00	\$71.32
	01/01/2021	\$42.12	\$8.20	\$22.10	\$0.00	\$72.42

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint
Effective Date - 01/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.66	\$8.15	\$0.00	\$0.00	\$27.81
2	55	\$21.63	\$8.15	\$5.64	\$0.00	\$35.42
3	60	\$23.59	\$8.15	\$6.15	\$0.00	\$37.89
4	65	\$25.56	\$8.15	\$6.66	\$0.00	\$40.37
5	70	\$27.52	\$8.15	\$17.78	\$0.00	\$53.45
6	75	\$29.49	\$8.15	\$18.29	\$0.00	\$55.93
7	80	\$31.46	\$8.15	\$18.80	\$0.00	\$58.41
8	90	\$35.39	\$8.15	\$19.83	\$0.00	\$63.37

Effective Date - 07/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.81	\$8.20	\$0.00	\$0.00	\$28.01
2	55	\$21.79	\$8.20	\$5.78	\$0.00	\$35.77
3	60	\$23.77	\$8.20	\$6.30	\$0.00	\$38.27
4	65	\$25.75	\$8.20	\$6.83	\$0.00	\$40.78
5	70	\$27.73	\$8.20	\$18.30	\$0.00	\$54.23
6	75	\$29.72	\$8.20	\$18.83	\$0.00	\$56.75
7	80	\$31.70	\$8.20	\$19.35	\$0.00	\$59.25
8	90	\$35.66	\$8.20	\$20.40	\$0.00	\$64.26

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (TRAFFIC MARKINGS)	06/01/2019	\$34.39	\$7.85	\$14.44	\$0.00	\$56.68
LABORERS - ZONE 2	12/01/2019	\$35.25	\$7.85	\$14.44	\$0.00	\$57.54
	06/01/2020	\$36.14	\$7.85	\$14.44	\$0.00	\$58.43
	12/01/2020	\$37.03	\$7.85	\$14.44	\$0.00	\$59.32
	06/01/2021	\$37.95	\$7.85	\$14.44	\$0.00	\$60.24
	12/01/2021	\$38.86	\$7.85	\$14.44	\$0.00	\$61.15
For Apprentice rates see "Apprentice- LABORER"						
PAINTER / TAPER (BRUSH, NEW) *	01/01/2019	\$39.86	\$8.15	\$20.85	\$0.00	\$68.86
* If 30% or more of surfaces to be painted are new construction,	07/01/2019	\$40.16	\$8.20	\$21.45	\$0.00	\$69.81
NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2	01/01/2020	\$40.46	\$8.20	\$22.10	\$0.00	\$70.76
	07/01/2020	\$41.56	\$8.20	\$22.10	\$0.00	\$71.86
	01/01/2021	\$42.66	\$8.20	\$22.10	\$0.00	\$72.96

Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW**Effective Date - 01/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.93	\$8.15	\$0.00	\$0.00	\$28.08
2	55	\$21.92	\$8.15	\$5.64	\$0.00	\$35.71
3	60	\$23.92	\$8.15	\$6.15	\$0.00	\$38.22
4	65	\$25.91	\$8.15	\$6.66	\$0.00	\$40.72
5	70	\$27.90	\$8.15	\$17.78	\$0.00	\$53.83
6	75	\$29.90	\$8.15	\$18.29	\$0.00	\$56.34
7	80	\$31.89	\$8.15	\$18.80	\$0.00	\$58.84
8	90	\$35.87	\$8.15	\$19.83	\$0.00	\$63.85

Effective Date - 07/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.08	\$8.20	\$0.00	\$0.00	\$28.28
2	55	\$22.09	\$8.20	\$5.78	\$0.00	\$36.07
3	60	\$24.10	\$8.20	\$6.30	\$0.00	\$38.60
4	65	\$26.10	\$8.20	\$6.83	\$0.00	\$41.13
5	70	\$28.11	\$8.20	\$18.30	\$0.00	\$54.61
6	75	\$30.12	\$8.20	\$18.83	\$0.00	\$57.15
7	80	\$32.13	\$8.20	\$19.35	\$0.00	\$59.68
8	90	\$36.14	\$8.20	\$20.40	\$0.00	\$64.74

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT)

PAINTERS LOCAL 35 - ZONE 2

01/01/2019	\$37.92	\$8.15	\$20.85	\$0.00	\$66.92
07/01/2019	\$38.22	\$8.20	\$21.45	\$0.00	\$67.87
01/01/2020	\$38.52	\$8.20	\$22.10	\$0.00	\$68.82
07/01/2020	\$39.62	\$8.20	\$22.10	\$0.00	\$69.92
01/01/2021	\$40.72	\$8.20	\$22.10	\$0.00	\$71.02

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 2 - BRUSH REPAINT
Effective Date - 01/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.96	\$8.15	\$0.00	\$0.00	\$27.11
2	55	\$20.86	\$8.15	\$5.64	\$0.00	\$34.65
3	60	\$22.75	\$8.15	\$6.15	\$0.00	\$37.05
4	65	\$24.65	\$8.15	\$6.66	\$0.00	\$39.46
5	70	\$26.54	\$8.15	\$17.78	\$0.00	\$52.47
6	75	\$28.44	\$8.15	\$18.29	\$0.00	\$54.88
7	80	\$30.34	\$8.15	\$18.80	\$0.00	\$57.29
8	90	\$34.13	\$8.15	\$19.83	\$0.00	\$62.11

Effective Date - 07/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.11	\$8.20	\$0.00	\$0.00	\$27.31
2	55	\$21.02	\$8.20	\$5.78	\$0.00	\$35.00
3	60	\$22.93	\$8.20	\$6.30	\$0.00	\$37.43
4	65	\$24.84	\$8.20	\$6.83	\$0.00	\$39.87
5	70	\$26.75	\$8.20	\$18.30	\$0.00	\$53.25
6	75	\$28.67	\$8.20	\$18.83	\$0.00	\$55.70
7	80	\$30.58	\$8.20	\$19.35	\$0.00	\$58.13
8	90	\$34.40	\$8.20	\$20.40	\$0.00	\$63.00

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PANEL & PICKUP TRUCKS DRIVER	06/01/2019	\$34.08	\$11.91	\$12.70	\$0.00	\$58.69
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	08/01/2019	\$34.08	\$12.41	\$12.70	\$0.00	\$59.19
	12/01/2019	\$34.08	\$12.41	\$13.72	\$0.00	\$60.21
	06/01/2020	\$34.98	\$12.41	\$13.72	\$0.00	\$61.11
	08/01/2020	\$34.98	\$12.91	\$13.72	\$0.00	\$61.61
	12/01/2020	\$34.98	\$12.91	\$14.82	\$0.00	\$62.71
	06/01/2021	\$35.78	\$12.91	\$14.82	\$0.00	\$63.51
	08/01/2021	\$35.78	\$13.41	\$14.82	\$0.00	\$64.01
	12/01/2021	\$35.78	\$13.41	\$16.01	\$0.00	\$65.20
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK)	08/01/2018	\$42.93	\$9.90	\$21.15	\$0.00	\$73.98
PILE DRIVER LOCAL 56 (ZONE 2)	08/01/2019	\$44.61	\$9.90	\$21.15	\$0.00	\$75.66
For apprentice rates see "Apprentice- PILE DRIVER"						
PILE DRIVER	08/01/2018	\$42.93	\$9.90	\$21.15	\$0.00	\$73.98
PILE DRIVER LOCAL 56 (ZONE 2)	08/01/2019	\$44.61	\$9.90	\$21.15	\$0.00	\$75.66

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - PILE DRIVER - Local 56 Zone 2

Effective Date - 08/01/2018

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

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

Apprentice to Journeyworker Ratio:1:5

PIPELAYER LABORERS - ZONE 2	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40

For apprentice rates see "Apprentice- LABORER"

PLUMBER & PIPEFITTER PLUMBERS & PIPEFITTERS LOCAL 51	09/01/2018	\$42.04	\$10.00	\$18.20	\$0.00	\$70.24

Apprentice - PLUMBER/PIPEFITTER - Local 51

Effective Date - 09/01/2018

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$16.82	\$10.00	\$2.50	\$0.00	\$29.32
2	50	\$21.02	\$10.00	\$2.50	\$0.00	\$33.52
3	60	\$25.22	\$10.00	\$7.85	\$0.00	\$43.07
4	70	\$29.43	\$10.00	\$12.56	\$0.00	\$51.99
5	80	\$33.63	\$10.00	\$15.70	\$0.00	\$59.33

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	09/01/2018	\$42.04	\$10.00	\$18.20	\$0.00	\$70.24

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

PNEUMATIC DRILL/TOOL OPERATOR LABORERS - ZONE 2	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWDERMAN & BLASTER <i>LABORERS - ZONE 2</i>	06/01/2019	\$35.39	\$7.85	\$14.44	\$0.00	\$57.68
	12/01/2019	\$36.25	\$7.85	\$14.44	\$0.00	\$58.54
	06/01/2020	\$37.14	\$7.85	\$14.44	\$0.00	\$59.43
	12/01/2020	\$38.03	\$7.85	\$14.44	\$0.00	\$60.32
	06/01/2021	\$38.95	\$7.85	\$14.44	\$0.00	\$61.24
	12/01/2021	\$39.86	\$7.85	\$14.44	\$0.00	\$62.15
For apprentice rates see "Apprentice- LABORER"						
POWER SHOVEL/DERRICK/TRENCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2019	\$48.18	\$12.00	\$15.60	\$0.00	\$75.78
	12/01/2019	\$49.33	\$12.00	\$15.60	\$0.00	\$76.93
	06/01/2020	\$50.43	\$12.00	\$15.60	\$0.00	\$78.03
	12/01/2020	\$51.58	\$12.00	\$15.60	\$0.00	\$79.18
	06/01/2021	\$52.68	\$12.00	\$15.60	\$0.00	\$80.28
	12/01/2021	\$53.83	\$12.00	\$15.60	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2019	\$48.18	\$12.00	\$15.60	\$0.00	\$75.78
	12/01/2019	\$49.33	\$12.00	\$15.60	\$0.00	\$76.93
	06/01/2020	\$50.43	\$12.00	\$15.60	\$0.00	\$78.03
	12/01/2020	\$51.58	\$12.00	\$15.60	\$0.00	\$79.18
	06/01/2021	\$52.68	\$12.00	\$15.60	\$0.00	\$80.28
	12/01/2021	\$53.83	\$12.00	\$15.60	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2019	\$32.28	\$12.00	\$15.60	\$0.00	\$59.88
	12/01/2019	\$33.07	\$12.00	\$15.60	\$0.00	\$60.67
	06/01/2020	\$33.82	\$12.00	\$15.60	\$0.00	\$61.42
	12/01/2020	\$34.60	\$12.00	\$15.60	\$0.00	\$62.20
	06/01/2021	\$35.35	\$12.00	\$15.60	\$0.00	\$62.95
	12/01/2021	\$36.14	\$12.00	\$15.60	\$0.00	\$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS LOCAL 59</i>	06/01/2008	\$19.00	\$5.10	\$4.21	\$0.00	\$28.31
RECLAIMERS <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2019	\$47.69	\$12.00	\$15.60	\$0.00	\$75.29
	12/01/2019	\$48.83	\$12.00	\$15.60	\$0.00	\$76.43
	06/01/2020	\$49.91	\$12.00	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.05	\$12.00	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.14	\$12.00	\$15.60	\$0.00	\$79.74
	12/01/2021	\$53.28	\$12.00	\$15.60	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ROLLER/SPREADER/MULCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2019	\$47.69	\$12.00	\$15.60	\$0.00	\$75.29
	12/01/2019	\$48.83	\$12.00	\$15.60	\$0.00	\$76.43
	06/01/2020	\$49.91	\$12.00	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.05	\$12.00	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.14	\$12.00	\$15.60	\$0.00	\$79.74
	12/01/2021	\$53.28	\$12.00	\$15.60	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

ROOFER (Inc.Roofing Waterproofing &Roofing Damproofing) <i>ROOFERS LOCAL 33</i>	02/01/2019	\$43.36	\$11.50	\$15.90	\$0.00	\$70.76

Apprentice - ROOFER - Local 33

Effective Date - 02/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.68	\$11.50	\$3.69	\$0.00	\$36.87
2	60	\$26.02	\$11.50	\$15.90	\$0.00	\$53.42
3	65	\$28.18	\$11.50	\$15.90	\$0.00	\$55.58
4	75	\$32.52	\$11.50	\$15.90	\$0.00	\$59.92
5	85	\$36.86	\$11.50	\$15.90	\$0.00	\$64.26

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

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE <i>ROOFERS LOCAL 33</i>	02/01/2019	\$43.61	\$11.50	\$15.90	\$0.00	\$71.01

For apprentice rates see "Apprentice- ROOFER"

SHEETMETAL WORKER <i>SHEETMETAL WORKERS LOCAL 17 - B</i>	04/01/2019	\$34.71	\$13.20	\$16.55	\$1.93	\$66.39

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - SHEET METAL WORKER - Local 17-B
Effective Date - 04/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$13.88	\$13.20	\$4.02	\$0.95	\$32.05
2	45	\$15.62	\$13.20	\$4.52	\$1.02	\$34.36
3	50	\$17.36	\$13.20	\$10.48	\$1.26	\$42.30
4	55	\$19.09	\$13.20	\$10.48	\$1.31	\$44.08
5	60	\$20.83	\$13.20	\$13.52	\$1.43	\$48.98
6	65	\$22.56	\$13.20	\$13.78	\$1.49	\$51.03
7	70	\$24.30	\$13.20	\$14.03	\$1.55	\$53.08
8	75	\$26.03	\$13.20	\$14.28	\$1.61	\$55.12
9	80	\$27.77	\$13.20	\$14.54	\$1.67	\$57.18
10	85	\$29.50	\$13.20	\$14.79	\$1.72	\$59.21

Notes:
Apprentice to Journeyworker Ratio:1:3

SPECIALIZED EARTH MOVING EQUIP < 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2019	\$34.54	\$11.91	\$12.70	\$0.00	\$59.15
	08/01/2019	\$34.54	\$12.41	\$12.70	\$0.00	\$59.65
	12/01/2019	\$34.54	\$12.41	\$13.72	\$0.00	\$60.67
	06/01/2020	\$35.44	\$12.41	\$13.72	\$0.00	\$61.57
	08/01/2020	\$35.44	\$12.91	\$13.72	\$0.00	\$62.07
	12/01/2020	\$35.44	\$12.91	\$14.82	\$0.00	\$63.17
	06/01/2021	\$36.24	\$12.91	\$14.82	\$0.00	\$63.97
	08/01/2021	\$36.24	\$13.41	\$14.82	\$0.00	\$64.47
	12/01/2021	\$36.24	\$13.41	\$16.01	\$0.00	\$65.66
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2019	\$34.83	\$11.91	\$12.70	\$0.00	\$59.44
	08/01/2019	\$34.83	\$12.41	\$12.70	\$0.00	\$59.94
	12/01/2019	\$34.83	\$12.41	\$13.72	\$0.00	\$60.96
	06/01/2020	\$35.73	\$12.41	\$13.72	\$0.00	\$61.86
	08/01/2020	\$35.73	\$12.91	\$13.72	\$0.00	\$62.36
	12/01/2020	\$35.73	\$12.91	\$14.82	\$0.00	\$63.46
	06/01/2021	\$36.53	\$12.91	\$14.82	\$0.00	\$64.26
	08/01/2021	\$36.53	\$13.41	\$14.82	\$0.00	\$64.76
	12/01/2021	\$36.53	\$13.41	\$16.01	\$0.00	\$65.95
SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 550 - (Section B) Zone 2</i>	03/01/2019	\$53.08	\$9.47	\$19.60	\$0.00	\$82.15
	10/01/2019	\$54.43	\$9.47	\$19.60	\$0.00	\$83.50
	03/01/2020	\$55.78	\$9.47	\$19.60	\$0.00	\$84.85
	10/01/2020	\$57.13	\$9.47	\$19.60	\$0.00	\$86.20
	03/01/2021	\$58.48	\$9.47	\$19.60	\$0.00	\$87.55

Classification
Effective Date
Base Wage
Health
Pension
**Supplemental
Unemployment**
Total Rate
Apprentice - SPRINKLER FITTER - Local 550 (Section B) Zone 2
Effective Date - 03/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$18.58	\$9.47	\$9.10	\$0.00	\$37.15
2	40	\$21.23	\$9.47	\$9.10	\$0.00	\$39.80
3	45	\$23.89	\$9.47	\$9.10	\$0.00	\$42.46
4	50	\$26.54	\$9.47	\$9.10	\$0.00	\$45.11
5	55	\$29.19	\$9.47	\$9.10	\$0.00	\$47.76
6	60	\$31.85	\$9.47	\$10.60	\$0.00	\$51.92
7	65	\$34.50	\$9.47	\$10.60	\$0.00	\$54.57
8	70	\$37.16	\$9.47	\$10.60	\$0.00	\$57.23
9	75	\$39.81	\$9.47	\$10.60	\$0.00	\$59.88
10	80	\$42.46	\$9.47	\$10.60	\$0.00	\$62.53

Effective Date - 10/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$19.05	\$9.47	\$9.10	\$0.00	\$37.62
2	40	\$21.77	\$9.47	\$9.10	\$0.00	\$40.34
3	45	\$24.49	\$9.47	\$9.10	\$0.00	\$43.06
4	50	\$27.22	\$9.47	\$9.10	\$0.00	\$45.79
5	55	\$29.94	\$9.47	\$9.10	\$0.00	\$48.51
6	60	\$32.66	\$9.47	\$10.60	\$0.00	\$52.73
7	65	\$35.38	\$9.47	\$10.60	\$0.00	\$55.45
8	70	\$38.10	\$9.47	\$10.60	\$0.00	\$58.17
9	75	\$40.82	\$9.47	\$10.60	\$0.00	\$60.89
10	80	\$43.54	\$9.47	\$10.60	\$0.00	\$63.61

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

06/01/2019	\$47.69	\$12.00	\$15.60	\$0.00	\$75.29
12/01/2019	\$48.83	\$12.00	\$15.60	\$0.00	\$76.43
06/01/2020	\$49.91	\$12.00	\$15.60	\$0.00	\$77.51
12/01/2020	\$51.05	\$12.00	\$15.60	\$0.00	\$78.65
06/01/2021	\$52.14	\$12.00	\$15.60	\$0.00	\$79.74
12/01/2021	\$53.28	\$12.00	\$15.60	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN
OPERATING ENGINEERS LOCAL 4

06/01/2019	\$47.69	\$12.00	\$15.60	\$0.00	\$75.29
12/01/2019	\$48.83	\$12.00	\$15.60	\$0.00	\$76.43
06/01/2020	\$49.91	\$12.00	\$15.60	\$0.00	\$77.51
12/01/2020	\$51.05	\$12.00	\$15.60	\$0.00	\$78.65
06/01/2021	\$52.14	\$12.00	\$15.60	\$0.00	\$79.74
12/01/2021	\$53.28	\$12.00	\$15.60	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TELECOMMUNICATION TECHNICIAN	03/01/2019	\$35.25	\$9.90	\$11.14	\$0.00	\$56.29
<i>ELECTRICIANS LOCAL 223</i>	09/01/2019	\$35.78	\$10.15	\$11.45	\$0.00	\$57.38
	03/01/2020	\$36.27	\$10.40	\$11.78	\$0.00	\$58.45

Apprentice - TELECOMMUNICATION TECHNICIAN - Local 223

Effective Date - 03/01/2019

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

Notes: See Electrician Apprentice Wages

Steps are 750hrs

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

Apprentice to Journeyworker Ratio:2:3***

TERRAZZO FINISHERS	02/01/2019	\$52.49	\$10.75	\$20.66	\$0.00	\$83.90
<i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	08/01/2019	\$53.84	\$10.75	\$20.80	\$0.00	\$85.39
	02/01/2020	\$54.48	\$10.75	\$20.80	\$0.00	\$86.03
	08/01/2020	\$55.83	\$10.75	\$20.95	\$0.00	\$87.53
	02/01/2021	\$56.47	\$10.75	\$20.95	\$0.00	\$88.17
	08/01/2021	\$57.87	\$10.75	\$21.11	\$0.00	\$89.73
	02/01/2022	\$58.46	\$10.75	\$21.11	\$0.00	\$90.32

Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile

Effective Date - 02/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.25	\$10.75	\$20.03	\$0.00	\$57.03
2	60	\$31.49	\$10.75	\$20.03	\$0.00	\$62.27
3	70	\$36.74	\$10.75	\$20.03	\$0.00	\$67.52
4	80	\$41.99	\$10.75	\$20.03	\$0.00	\$72.77
5	90	\$47.24	\$10.75	\$20.03	\$0.00	\$78.02

Effective Date - 08/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.92	\$10.75	\$20.80	\$0.00	\$58.47
2	60	\$32.30	\$10.75	\$20.80	\$0.00	\$63.85
3	70	\$37.69	\$10.75	\$20.80	\$0.00	\$69.24
4	80	\$43.07	\$10.75	\$20.80	\$0.00	\$74.62
5	90	\$48.46	\$10.75	\$20.80	\$0.00	\$80.01

Notes:

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TEST BORING DRILLER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2019	\$41.00	\$7.85	\$15.55	\$0.00	\$64.40
	12/01/2019	\$42.00	\$7.85	\$15.55	\$0.00	\$65.40
	06/01/2020	\$42.99	\$7.85	\$15.55	\$0.00	\$66.39
	12/01/2020	\$43.97	\$7.85	\$15.55	\$0.00	\$67.37
	06/01/2021	\$44.99	\$7.85	\$15.55	\$0.00	\$68.39
	12/01/2021	\$46.00	\$7.85	\$15.55	\$0.00	\$69.40
For apprentice rates see "Apprentice- LABORER"						
TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2019	\$39.72	\$7.85	\$15.55	\$0.00	\$63.12
	12/01/2019	\$40.72	\$7.85	\$15.55	\$0.00	\$64.12
	06/01/2020	\$41.71	\$7.85	\$15.55	\$0.00	\$65.11
	12/01/2020	\$42.69	\$7.85	\$15.55	\$0.00	\$66.09
	06/01/2021	\$43.71	\$7.85	\$15.55	\$0.00	\$67.11
	12/01/2021	\$44.72	\$7.85	\$15.55	\$0.00	\$68.12
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2019	\$39.60	\$7.85	\$15.55	\$0.00	\$63.00
	12/01/2019	\$40.60	\$7.85	\$15.55	\$0.00	\$64.00
	06/01/2020	\$41.59	\$7.85	\$15.55	\$0.00	\$64.99
	12/01/2020	\$42.57	\$7.85	\$15.55	\$0.00	\$65.97
	06/01/2021	\$43.59	\$7.85	\$15.55	\$0.00	\$66.99
	12/01/2021	\$44.60	\$7.85	\$15.55	\$0.00	\$68.00
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2019	\$47.69	\$12.00	\$15.60	\$0.00	\$75.29
	12/01/2019	\$48.83	\$12.00	\$15.60	\$0.00	\$76.43
	06/01/2020	\$49.91	\$12.00	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.05	\$12.00	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.14	\$12.00	\$15.60	\$0.00	\$79.74
	12/01/2021	\$53.28	\$12.00	\$15.60	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2019	\$35.12	\$11.91	\$12.70	\$0.00	\$59.73
	08/01/2019	\$35.12	\$12.41	\$12.70	\$0.00	\$60.23
	12/01/2019	\$35.12	\$12.41	\$13.72	\$0.00	\$61.25
	06/01/2020	\$36.02	\$12.41	\$13.72	\$0.00	\$62.15
	08/01/2020	\$36.02	\$12.91	\$13.72	\$0.00	\$62.65
	12/01/2020	\$36.02	\$12.91	\$14.82	\$0.00	\$63.75
	06/01/2021	\$36.82	\$12.91	\$14.82	\$0.00	\$64.55
	08/01/2021	\$36.82	\$13.41	\$14.82	\$0.00	\$65.05
	12/01/2021	\$36.82	\$13.41	\$16.01	\$0.00	\$66.24
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	06/01/2019	\$51.88	\$7.85	\$15.95	\$0.00	\$75.68
	12/01/2019	\$52.88	\$7.85	\$15.95	\$0.00	\$76.68
	06/01/2020	\$53.87	\$7.85	\$15.95	\$0.00	\$77.67
	12/01/2020	\$54.85	\$7.85	\$15.95	\$0.00	\$78.65
	06/01/2021	\$55.87	\$7.85	\$15.95	\$0.00	\$79.67
	12/01/2021	\$56.88	\$7.85	\$15.95	\$0.00	\$80.68
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	06/01/2019	\$53.88	\$7.85	\$15.95	\$0.00	\$77.68
	12/01/2019	\$54.88	\$7.85	\$15.95	\$0.00	\$78.68
	06/01/2020	\$55.87	\$7.85	\$15.95	\$0.00	\$79.67
	12/01/2020	\$56.85	\$7.85	\$15.95	\$0.00	\$80.65
	06/01/2021	\$57.87	\$7.85	\$15.95	\$0.00	\$81.67
	12/01/2021	\$58.88	\$7.85	\$15.95	\$0.00	\$82.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	06/01/2019	\$43.95	\$7.85	\$15.95	\$0.00	\$67.75
	12/01/2019	\$44.95	\$7.85	\$15.95	\$0.00	\$68.75
	06/01/2020	\$45.94	\$7.85	\$15.95	\$0.00	\$69.74
	12/01/2020	\$46.92	\$7.85	\$15.95	\$0.00	\$70.72
	06/01/2021	\$47.94	\$7.85	\$15.95	\$0.00	\$71.74
	12/01/2021	\$48.95	\$7.85	\$15.95	\$0.00	\$72.75
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	06/01/2019	\$45.95	\$7.85	\$15.95	\$0.00	\$69.75
	12/01/2019	\$46.95	\$7.85	\$15.95	\$0.00	\$70.75
	06/01/2020	\$47.94	\$7.85	\$15.95	\$0.00	\$71.74
	12/01/2020	\$48.92	\$7.85	\$15.95	\$0.00	\$72.72
	06/01/2021	\$49.94	\$7.85	\$15.95	\$0.00	\$73.74
	12/01/2021	\$50.95	\$7.85	\$15.95	\$0.00	\$74.75
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	06/01/2019	\$34.54	\$11.91	\$12.70	\$0.00	\$59.15
	08/01/2019	\$34.54	\$12.41	\$12.70	\$0.00	\$59.65
	12/01/2019	\$34.54	\$12.41	\$13.72	\$0.00	\$60.67
	06/01/2020	\$35.44	\$12.41	\$13.72	\$0.00	\$61.57
	08/01/2020	\$35.44	\$12.91	\$13.72	\$0.00	\$62.07
	12/01/2020	\$35.44	\$12.91	\$14.82	\$0.00	\$63.17
	06/01/2021	\$36.24	\$12.91	\$14.82	\$0.00	\$63.97
	08/01/2021	\$36.24	\$13.41	\$14.82	\$0.00	\$64.47
	12/01/2021	\$36.24	\$13.41	\$16.01	\$0.00	\$65.66
WAGON DRILL OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						
WASTE WATER PUMP OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2019	\$48.18	\$12.00	\$15.60	\$0.00	\$75.78
	12/01/2019	\$49.33	\$12.00	\$15.60	\$0.00	\$76.93
	06/01/2020	\$50.43	\$12.00	\$15.60	\$0.00	\$78.03
	12/01/2020	\$51.58	\$12.00	\$15.60	\$0.00	\$79.18
	06/01/2021	\$52.68	\$12.00	\$15.60	\$0.00	\$80.28
	12/01/2021	\$53.83	\$12.00	\$15.60	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER <i>PLUMBERS & PIPEFITTERS LOCAL 51</i>	09/01/2018	\$42.04	\$10.00	\$18.20	\$0.00	\$70.24
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$27.14	\$7.75	\$1.81	\$0.00	\$36.70
For apprentice rates see "Apprentice- LINEMAN"						
CABLEMAN (Underground Ducts & Cables) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$38.45	\$7.75	\$9.53	\$0.00	\$55.73
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN CDL <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$31.66	\$7.75	\$9.44	\$0.00	\$48.85
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$24.88	\$7.75	\$1.75	\$0.00	\$34.38
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class A CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$38.45	\$7.75	\$13.61	\$0.00	\$59.81
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class B CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$33.92	\$7.75	\$10.21	\$0.00	\$51.88
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$24.88	\$7.75	\$1.75	\$0.00	\$34.38
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN -Inexperienced (<2000 Hrs.) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$20.35	\$7.75	\$1.61	\$0.00	\$29.71
For apprentice rates see "Apprentice- LINEMAN"						
JOURNEYMAN LINEMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/03/2017	\$45.23	\$7.75	\$16.61	\$0.00	\$69.59

Apprentice - LINEMAN (Outside Electrical) - East Local 104

Effective Date - 09/03/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$27.14	\$7.75	\$3.31	\$0.00	\$38.20
2	65	\$29.40	\$7.75	\$3.38	\$0.00	\$40.53
3	70	\$31.66	\$7.75	\$3.45	\$0.00	\$42.86
4	75	\$33.92	\$7.75	\$5.02	\$0.00	\$46.69
5	80	\$36.18	\$7.75	\$5.09	\$0.00	\$49.02
6	85	\$38.45	\$7.75	\$5.15	\$0.00	\$51.35
7	90	\$40.71	\$7.75	\$7.22	\$0.00	\$55.68

Notes:

Apprentice to Journeyworker Ratio:1:2

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TREE TRIMMER <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	01/31/2016	\$18.51	\$3.55	\$0.00	\$0.00	\$22.06
This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is not on the ground. This classification does not apply to wholesale tree removal.						
TREE TRIMMER GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	01/31/2016	\$16.32	\$3.55	\$0.00	\$0.00	\$19.87
This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is on the ground. This classification does not apply to wholesale tree removal.						

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.

**NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS
NEW BEDFORD, MASSACHUSETTS**

Mount Vernon Group Architects, Inc., Project No. 02014.43

June 12, 2019

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SECTION 01 00 00

GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All the Contract Documents, including Drawings, General Conditions, Supplementary Conditions, and all Sections of Division 1- General Requirements, apply to the Work of this Section.

1.02 DESCRIPTION OF WORK

- A. The Work of this Section applies to all Work performed under the Contract.
- B. Any discrepancies found in the Contract Documents after signing of the Owner-Contractor agreement must be brought to the attention of the Architect for resolution. The Architect will determine which document entry governs and his decision will be final. The Contractor will not be entitled to a change in the Contract Time or Contract Sum based on discrepancies found after signing of the Owner-Contractor agreement.
- C. Should conflict be evident between Contract Documents or within any Contract Document, the Contractor is deemed to have estimated the more expensive method of doing the Work unless he shall have asked for, and obtained, a written decision prior to submittal of bid or price quote, as to which method or materials will be required. Should the Work proceed after the discovery of errors, conflict, or omission by the Contractor and clarification has not been received from the Architect, the Contractor will be held fully responsible for replacement or correction, as directed by the Architect, at the Contractor's expense.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 PROJECT IDENTIFICATION AND DESCRIPTION OF WORK

- A. Project Identification: The name of the Project is "NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS". The Project site is located in New Bedford, Massachusetts.

- B. Abbreviated Written Summary: The Work of the Contract can be summarized by reference to the Contract Documents. Work of this Contract includes the coordination of the entire Work indicated by the Contract Documents. Work of this Contract includes architectural and demolition Work which together provide a fully functioning facility in accordance with requirements of the Contract Documents. All items shown, indicated, or inferable from the Contract Documents are to be included such that there are no omissions which would prevent full use in all respects. Materials shown or indicated in any one Contract Document are to be inferred as if required by all. Work of the Contract is also unavoidably affected or influenced by governing regulations, natural phenomenon including weather conditions, and other forces outside the Contract Documents. Briefly, without limitation the Work can be summarized as follows:

1. The Project consists of: selective demolition; relocation of existing chiller; new elevator, elevator shaft, vestibule; new plumbing, HVAC, electrical work; at the New Bedford City Hall.

- C. Examination of Site and Documents:

1. All Bidders are required to visit the site and examine all Contract Documents before submitting a bid. Inspect and be thoroughly familiar with the same and conditions under which the Work will be carried out. Neither the Owner nor the Architect will be responsible for errors, omissions and/or charges for extra Work arising from Contractor's failure to familiarize themselves with the Contract Documents or existing site and conditions. By submitting a Bid, the Bidder agrees and warrants that he had the opportunity to examine the building site and the Contract Documents, that he is familiar with the conditions and requirements of both and where they require, in any part of the Work, a given result to be produced, that the Contract Documents are adequate and that he will produce the required result.
2. The building site will be available for inspection as set forth in City of New Bedford Front End, Pre-Bid Conference/Site Inspection

1.05 SPECIFICATION INFORMATION

- A. These specifications are a special form of technical writing edited from master specifications and contain deviations from traditional writing formats. Capitalization, underlining and bold print is only used to assist reader in finding information and no other meaning will be implied.
- B. Except where specifically indicated otherwise, the subject of all imperative statements is the Contractor.
- C. Sections are generally numbered in conformance with Construction Specifications Institute Master Format System. Numbering sequence is not consecutive. Refer to Index of Specification Sections for names and numbers of Sections included in this Project.
- D. Pages are numbered separately for each Section. Each Section is noted with "End of Section" to indicate when Section is complete.

1.06 DEFINITIONS

- A. Owner: City of New Bedford, New Bedford, Massachusetts.
- B. Provide: means furnish and install, complete with all necessary components and accessories, ready for intended use.
- C. Indicated: is a reference to other portions of the Contract Documents.
- D. Approved: Except where specifically stated otherwise, the words "approved", "directed", "requested", "selected", "accepted" mean "approved by the Architect", "directed by the Architect" and so on. The words "approved" and "accepted" shall be held to the limitations stated in the General Conditions. In no case, shall "approval" or "acceptance" by the Architect be interpreted as a release of Contractor of his responsibilities to fulfill all the requirements of the Contract Documents. Where the Contract Documents require Contractor approval, approval must be submitted in writing using the word "approved" Contractor "review" only is not an acceptable substitute for Contractor approval.
- E. Observe/Observation: Except as otherwise defined in greater detail, the Architect's observation of the Work will be held to the limitations stated in the General Conditions and the Owner/Architect agreement. In no case, shall observation by the Architect be interpreted as a release of Contractor of his responsibilities to fulfill all the requirements of the Contract Documents. Observe shall be defined in accordance with the General Conditions of the Contract to include only visiting the site periodically, observing the condition and progress of the Work, and reporting to the Owner.

- F. Furnish: Except as otherwise defined in greater detail, furnish means supply, including shop fabrication if applicable, and deliver to project site, ready for unloading, unpacking, assembly, installation and the like as applicable in each instance.
 - G. Install: Except as otherwise defined in greater detail, install means operations at project site including, but not limited to, unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, placing in service and similar operations as applicable in each instance.
 - H. Installer: The person or firm engaged by Contractor or Subcontractor for performance of a specific unit of installation Work at the project site. It is a general requirement that Installers be expert and experienced in the Work they are engaged to perform.
 - I. Day: Except as otherwise defined in Owner-Contractor Agreement, day means calendar day.
 - J. Public: Any person in the building other than those attending to central mechanical, electrical, and plumbing services.
 - K. Public Areas: All areas other than rooms dedicated solely to central mechanical, electrical, and plumbing equipment.
 - L. Back-of-House Areas: Rooms not designated as part of a public area.
 - M. Continuation of Material: Where a given material is indicated on any of the Drawings, it is intended that such material be used throughout the length and height of walls, partitions, spandrels, panels, windows, lights, areas, etc., or in the assembly detail in which it occurs, for other similar locations throughout the building, unless a different material is specifically indicated.
- 1.07 INDUSTRY STANDARDS
- A. Referenced standards are part of the Contract Documents and have the same force and effect as if bound with these specifications.
 - B. Except where specifically indicated otherwise, comply with the current standard in effect as of the date of the Owner/Contractor Agreement.
 - C. Obtain copies of industry standards directly from publisher.
 - D. The titles of industry standard organizations are commonly abbreviated; full titles may be found in *Encyclopedia of Associations* or consult Architect.
 - E. Where Workmanship is governed by a referenced standard, submit one copy to Architect and additional copies to fabricators, installers, and others involved in the performance of the Work.
- 1.08 CONTRACTOR USE OF PREMISES
- A. The Contractor may be allowed to use a limited portion of the existing building for field offices and/or storage areas at the discretion of the Owner. Temporary office and storage space shall be provided by the Contractor in accordance with requirements of Section 01 50 00 - Temporary Facilities and Controls. Owner approval will be required for all temporary office facilities and storage areas, including their size and location.
 - B. The Contractor shall submit a Site Utilization Plan for approval prior to commencing the Work of this Contract. The plan shall include, but not be limited to, proposed locations for Contractor and Subcontractor laydown and/or material storage areas, field offices, and site access.
- 1.09 USER OCCUPANCY
- A. The existing site will be occupied during the Work of this Contract. Work required to be performed in areas occupied for summer programs, as indicated on the Drawings, shall be performed before or after program hours, or on weekends, at no additional cost to the Owner.

1.10 PERMITS, INSPECTION AND TESTING REQUIRED BY GOVERNING AUTHORITIES

- A. If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any portion of the Work to be inspected, tested or approved, the Contractor shall give the Architect and such Authority timely notice of its readiness so that the Architect may observe such inspection and testing.
- B. Prior to the start of construction, the Contractor shall complete application to the applicable Building Code enforcement authority for the building permits. Such Permits shall be displayed in a conspicuous location at the project sites. Fees for Building, Electrical, Plumbing, Fire Protection, and Mechanical Permits will be paid in accordance with the City of New Bedford Building Department Permit Fee Schedule included as Appendix A at the end of this Section.
 - 1. Application for Building Permit shall include the following Documents:
 - a. Energy Conservation Mandatory Checklist for New Construction, 780 CMR, 1301.8.1.
 - b. Narrative Report for compliance with 780 CMR, 1301.8.4
- C. Submit copies of all permits, licenses, certifications, inspection reports, releases, notices, judgements, and communications from authorities having jurisdiction.

1.11 CONSTRUCTION SCHEDULES

- A. Within 14 days after signing the Owner/Contractor Agreement, provide the following for the Project:
 - 1. A comprehensive bar chart schedule showing all major and critical minor portions of the Work, sequence of Work and duration of each activity. Update and reissue regularly.
 - 2. Progress schedule indicating Substantial Completion within the specified Contract Time
 - 3. Critical path chart indicating the interrelationships of critical and non-critical events required to complete the Project on the dates established. The Contractor will be required to use "Primvera/P-3" CPM scheduling software.
 - 4. Update all schedules and distribute monthly.
 - 5. Other required schedules, including but not limited to, Submittals and Testing.
- B. Provide all schedules in accordance with requirements of Section 01 51 11 – Progress Schedule.

1.12 SCHEDULE OF VALUES

- A. Prepare Schedule of Values to coordinate with application for payment breakdown. The Schedule of Values shall be broken down into labor and materials for each Work activity with increments no greater than \$50,000.00. Submit at least 10 days before first payment application. Update and reissue regularly. The CPM shall be tied into and reflect the Schedule of Values.

1.13 PAYMENT REQUESTS

- A. Provide three copies of each request in a complete filled out copies of AIA G702 and continuation sheet G703. Substantiate requests with complete documentation; include change orders to date. Provide partial lien waivers for Work in progress and full lien waivers for completed Work. Contractor shall be required by Law to submit payroll records substantiating payment of wage rates to employees on a weekly basis.
- B. Before first payment application, provide the following:
 - 1. List of Subcontractors, suppliers and fabricators
 - 2. Schedule of Values
 - 3. Progress Schedule
 - 4. Submittal Schedule keyed to project schedule
 - 5. List of Contractor's key project personnel
 - 6. Copies of permits and other communications from authorities
 - 7. Contractor's Certificate of Insurance
 - 8. Performance and Payment Bonds
 - 9. Unit Price Schedule
 - 10. Contractor's complete submittal log
 - 11. Contractor's complete submittal schedule

C. Before final payment application, provide and complete the following:

1. Complete closeout requirements
2. Complete punch list items
3. Settle all claims
4. Transmit Record Documents to Architect
5. Prove that all taxes, fees and similar obligations have been paid
6. Remove of temporary facilities and surplus materials
7. Change lock cylinders or cores
8. Clean the Work
9. Submit Consent of Surety for final payment.

1.14 PROCEDURES & CONTROLS

- A. Preconstruction Conference: Require representatives of all major Subcontractors and suppliers to attend; notify Owner and Architect at least 72 hours in advance.
- B. Progress Meetings: Hold regular weekly meetings with Owner and Architect, and meetings before preparation of payment requests. The Contractor shall be represented by a principal, project manager, general superintendent or other authorized main office representative, as well as by his own superintendent. An authorized representative of any Subcontractor or Subcontractors shall attend such meetings if his presence is requested by the Architect. Such representatives shall be empowered to make binding commitments on all matters to be discussed at such meetings, including costs, payments, change orders, time schedules and manpower. Any notices required under the Contract may be served on such representatives.
1. As a prerequisite for monthly payments, ordering schedules, shop drawing schedule, and coordination meeting schedules shall be prepared and maintained by the Contractor and shall be reviewed and updated in a monthly basis, and a copy shall be submitted to the Owner's Representative and Architect.
 2. To expedite construction progress on this project, the Contractor shall order all materials immediately after the approval of shop drawings and shall obtain a fixed date of delivery to the project site for all materials ordered which shall not impede or otherwise interfere with construction progress.
 3. Scheduling shall be discussed with all concerned parties, and methods shall be presented by the Contractor which shall reflect construction completion not being deferred, at no additional expense to the Owner.
 4. Project meetings shall be chaired by the Architect.
 5. Project Meeting Notes: The Contractor shall be responsible for recording meeting minutes at each project meeting. The minutes shall incorporate the substance of all issues discussed, noting date of entry of each issue, the resolution, the party responsible for issue resolution, and the date of resolution. The meeting minutes will be distributed to all attendees and responsible parties at the next scheduled project meeting.
- C. Daily Reports: Prepare daily reports recording all important information concerning events at the site for each project site. Submit to Architect weekly. Minimum required information contained in the daily report will be:
1. Manpower by trade
 2. Work activity by trade
 3. Equipment by trade
 4. Material deliveries by trade
 5. Weather conditions
 6. All safety violations and accidents
 7. Inspections if any
- D. Layout: Layout Work and be responsible for all lines, elevations, and measurements of the building, grading, utilities and other Work executed under the Contract.
- E. Project Limit Line: The boundaries of the site do not limit the responsibility of the Contractor to perform the Work in its entirety. Make utility connections as indicated. The Contractor's superintendent must be present at each of the sites whenever any Work is being performed.
- F. Matching: Where matching is indicated, the Architect shall be the sole and final judge of what is an acceptable match.

- G. Observation: Notify the Architect and authorities having jurisdiction at least thirty-six hours in advance of concealing any Work.
 - H. Utilities: Prior to interrupting utilities, services or facilities, notify the utility owners and obtain their written approval.
 - I. Furnishings, Fixtures, and Equipment: Cooperate and permit the Owner to install his furnishings and equipment during the progress of the Work. Owner's installation of furnishings or equipment does not signify Owner's acceptance of any portion of the Work.
 - J. Clean-Up: Clean-up all waste at least once a week, remove from site regularly, and legally dispose of off-site.
 - K. Installer's Acceptance of Conditions: All installers shall inspect substrates and conditions under which Work is to be executed and shall report in writing to the Contractor all conditions detrimental to the proper execution and completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected. Beginning Work means installer accepts previous Work and conditions.
 - L. Documentation: The Contractor shall be responsible for providing and maintaining filing, reporting, Submittals, RFI's. Payment Requisitions, Schedules, Change Proposals, Change Orders, and the like for the project.
 - M. Management and Financial Records: Management and financial records shall be maintained by the Contractor pursuant to M.G.L. c 30 § 39 R.
 - N. Provide noise and dust control procedures in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.
- 1.15 SPECIAL PROJECT CONDITIONS
- A. The Contractor shall undertake every possible measure to prevent damage of any kind to any portion of existing surrounding properties or areas.
 - B. The Contractor is required to exercise all possible care in the conduct of any Work which would affect surrounding properties and occupied areas and to be aware of the potential for damage. The Contractor shall be prepared to stop any Work immediately which is deemed to cause deleterious affects to adjacent areas.
 - C. The Contractor shall be held responsible for any damage to surrounding properties and occupied areas resulting from his failure to exercise care during the course of construction.
- 1.16 PROTECTION OF EXISTING UTILITIES
- A. The Contractor shall schedule, execute and pay all costs associated with implementation of all requirements related to disconnection or interruption of existing public or private utility services in accordance with requirements of local authorities having jurisdiction, including but not limited to the following:
 - 1. City of New Bedford Police Department
 - 2. City of New Bedford Fire Department
 - 3. City of New Bedford Department of Public Works
 - 4. City of New Bedford Water Department
 - 5. Local Telephone Provider
 - 6. Local Natural Gas Provider
 - 7. Local Cable TV Provider
 - 8. Dig Safe
 - B. Protect existing utilities which remain from damage due to construction operations. Identify locations of utilities with temporary markers.

- C. The Contractor shall be responsible for determining locations of underground structures and utilities, including but not limited to: water, sewer, gas, electric, telephone, and cable TV. Utility services to adjacent buildings shall be maintained without interruption, unless otherwise authorized in writing by the Architect. Utilities located in public ways surrounding the Project site shall be protected from damage related to the Work of this Section. All costs related to repair or replacement of damage to existing utilities not called for to be altered under the Work of this Contract shall be paid by the Contractor. No excavation in a public street or way, or in any public or private place, shall take place prior to verification of the location of all underground utilities by DIG SAFE.
- D. Place markers to indicate locations of disconnected services and identify service lines and capping locations on Project Record Documents.

1.17 WARRANTIES

- A. The Work of this Contract, including Substantial Completion, will be completed in two (2) Phases. The Contractor shall be responsible for providing full manufacturer warranties in accordance with requirements of individual trade Sections for specific product warranty requirements. Because of overlapping nature of the required construction Phases, the Contractor shall be responsible for providing manufacturer warranties, the Effective Starting Date of which, shall commence upon Substantial Completion of the respective Phase of the Work of the Contract, as described in the Contract Documents, and shall run for the warranty period indicated in the respective trade Section.
- B. Procurement: Where a warranty is required, do not purchase or subcontract for materials or Work until it has been determined that parties required to countersign warranties are willing to do so.
- C. Warranty Forms: Submit written warranty to Owner through Architect for approval prior to execution. Furnish 2 copies of executed warranty to Owner for his records; furnish 2 additional conformed copies where required for maintenance manual.
- D. Work Covered: Contractor shall remove and replace other Work of project which has been damaged as a result of failure of warranted Work or equipment, or which must be removed and replaced to provide access to Work under warranty. Unless otherwise specified, warranty shall cover full cost of replacement or repair, and shall not be pro-rated on basis of useful service life.
- E. Warranty Extensions: Work repaired or replaced under warranty shall be warranted until the original warranty expiration date or for ninety days whichever is later in time.

1.18 DELIVERY, STORAGE, HANDLING, & INSTALLATION CONDITIONS

- A. Manufacturer's Instructions: Strictly comply with manufacturer's instructions and recommendations and prevent damage, deterioration and loss, including theft.
- B. Minimize long-term storage of products at the site. Maintain environmental conditions, temperature, ventilation, and humidity within range permitted by manufacturers of materials and products used.

1.19 LABELS

- A. Labels, Trademarks, & Trade Names: Locate required labels on inconspicuous surfaces (**not typically visible to the public**). No manufacturer labels, nameplates, trademarks, or other identifying markings shall be located on surfaces visible to the public. Any such markings shall be removed and damage repaired, or item replaced, at the discretion of the Architect. Provide permanent data plate on each item of mechanical equipment stating manufacturer, model, serial number, capacity, ratings and all other essential data.

1.20 MUNICIPAL POLICE SERVICES

- A. The Contractor shall make all necessary arrangements with the City of New Bedford Police Department in advance of times when regular off-duty, or reserve, police officers will be needed for traffic control protection, due to operations performed under this Contract. Officers shall be compensated, by the Contractor, in accordance with City of New Bedford wage rates for such services. Extend the Workman's compensation Insurance and Employer's Liability Insurance, required under the General Contract, to cover police used on the project.

1.21 WELDING, CUTTING, AND BURNING PROCEDURES**A. PURPOSE**

1. The purpose of this procedure is to provide minimum standards to prevent loss of life and property from fire during welding, cutting or burning processes involving the use of oxygen-fuel gas and electric arc cutting and welding equipment.

B. GENERAL REQUIREMENTS

1. In the performance of welding, cutting and burning operations, only approved equipment shall be used and the equipment shall be installed and operated in accordance with OSHA standards, the manufacturer's instructions, and nationally recognized good practice.
2. A "Hot Work" permit for welding, cutting, burning or spark producing operations shall not be issued unless the individual in charge of performing such operations is deemed capable of doing such work in a safe manner by the Contractor's Safety Representative. Demonstration of knowledge of fire safety requirements and this welding and cutting procedure in addition to the equipment manufacturer's operational instructions shall constitute acceptable evidence of compliance.
3. A fire watch shall be provided by the Contractor or the Filed-Subcontractor's for their respective work to safeguard against the ignition of any material by the welding, cutting or burning operation, to make use of portable fire extinguishers or fire hose and to perform similar fire prevention and fire protection duties. The fire watch shall remain on the job at least 30 minutes after the "hot-work" including but not limited to welding or cutting operations have been completed to ensure that no fire exists. A signed inspection report attesting to that fact shall be filed and available for inspection by the local Fire Department.
4. A record shall be maintained by the responsible Contractor and Filed-Subcontractor Safety Representative of all locations where welding or cutting operations are performed. The record shall state the name of the assigned fire watch or watches and the length of time for which the fire watch standby was continued after work was completed (a minimum of 30 minutes). It shall include the date, time, and specific location at which work was done and describe the work, fire protection provided, and special precautions taken. Individual job authorizations shall be kept available always for inspection by the local Fire Department or the Owner's Representative. The assigned fire watch or fire watches shall sign the work authorization attesting to the fact that no fire existed after the work ceased and the standby period had passed.
5. Where welding, cutting or burning is done near walls, partitions, ceiling or roof of combustible construction, fire resistant shields or guards shall be provided to prevent ignition. When welding, cutting or burning is to be done on a metal wall, partition, ceiling, or roof, precautions shall be taken to prevent ignition of combustibles on the other side due to conduction of radiation. A fire watch shall be required on the other side of the exposed wall, partition, ceiling or roof if there is any danger of the welding, cutting or burning on one side to result in ignition of materials or structure on the unexposed side. Welding, cutting or burning shall not be attempted on a metal partition wall or on partitions of combustible sandwich-type panel construction.

C. FIRE SAFETY REQUIREMENTS

1. Cutting or welding operations shall be performed only in areas that have been protected against the ignition and spread of fire.
2. Within the confines of a Contractor and Filed-Subcontractor's work area welding, cutting or burning shall be done in specific areas designed and approved for such work as a maintenance shop, an outside location or a detached structure which shall be of noncombustible or fire resistive construction.
3. When work cannot be moved as in most construction or structural modification activity, the area shall be made fire safe by removing all combustible material within distance of 35 feet and all combustible material from beneath the location where welding, cutting or burning is to be performed.
4. When work cannot be relocated and combustible material cannot be feasibly relocated, all combustible material exposed within 35 feet horizontally or beneath the welding, cutting or burning operation or within 35 feet of exposed floor, ceiling or wall openings shall meet the following requirements:
 - a. Such combustible construction or material shall be protected from possible sparks, hot metal or oxidized by fire resistive shields or noncombustible covers as required by the Massport Fire Rescue Department.

- b. Such floor, ceiling or wall openings shall be protected by fire resistive shields and openings or cracks in walls, floors or ducts shall be tightly covered to prevent the passage of sparks or slag to adjacent areas.
- 5. At least one portable fire extinguisher having a rating of not less than 4-A:60-B:C shall be kept at the location where welding, cutting or burning is done and at least one portable fire extinguisher having a rating of not less than 2-A:10-B:C shall be attached to all portable welding carts.
- 6. Welding, cutting or burning shall not be done in or near rooms or locations where flammable gases, liquids or vapors, lint dust or loose combustible stocks are present when sparks or hot metal from the welding, cutting or burning operations may cause ignition or explosion of such materials.
- 7. Welding, cutting or burning shall not be performed in the presence of explosive atmospheres or on containers, equipment or in hollow spaces or cavities which contain or have contained flammable fluids, gases or solids until these containers or equipment have been thoroughly cleaned, inverted or purged.
- 8. Sprinkler protection shall not be shut off while welding, cutting or burning work is being performed. When welding, cutting or burning work is being done close to automatic sprinkler heads, noncombustible board products or damp cloth guards shall be used to shield the individual heads, but shall be removed when the work is completed.
- 9. Where a sprinkler system will be impaired or rendered inoperative for any reason, this shall be noted in the application for permit so that all necessary precautions may be taken as required by the local Fire Department.
- 10. Hot tapping of other welding, cutting or burning on a flammable gas or liquid transmission or distribution utility pipe line shall be qualified to perform such work.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

June 12, 2019

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SECTION 01 23 00

ALTERNATES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All the Contract Documents, including Drawings, General Conditions, Supplementary Conditions, and all Sections of Division 1 - General Requirements, apply to the Work of this Section.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section shall be listed under each Alternate specified below.

1.03 ALTERNATES

- A. Alternates are alternative products, materials, equipment, installations or systems, which may, at the Owner's option be selected and recorded in the Contract (Owner/Contractor Agreement) to either supplement or displace corresponding basic requirements of Contract Documents. Alternates may or may not substantially change scope and general character of the Work.
- B. A Schedule of Alternates is included with this Section. Each alternate is defined by abbreviated language, recognizing that Contract Documents define the requirements. Coordination of related Work is required to ensure that Work affected by each selected alternate is complete and properly interfaced with Work of accepted alternates.
- C. The Contractor shall provide written prices for each alternate on the General Bid and Sub-Bid Forms. Each alternate amount shall include the entire cost of the alternate portion of Work including all overhead, profit, and all other costs including costs to coordinate and interface the alternate with related and adjacent Work.
- D. Alternates may or may not be accepted by the Owner in accordance with requirements set forth in Chapter 149.

1.04 SCHEDULE OF ALTERNATES

- A. The Alternate described below are as called for on the Drawings. Changes to this Schedule, in the form of deletions or additions, may be proposed and/or accepted by the Owner during the Bid period. It shall be the Contractor's responsibility to determine the number and extent of the Alternates to be included in the Work of this Contract, prior to submission of the final Bid price.
- B. Alternate No. 1: The amount to be ADDED to the Contract Price for the construction of Exterior Insulation and Finish Systems (EIFS) at the elevator shaft and vestibule in lieu of face brick, as called for in the Contract Documents. The Work of this Alternate shall include, but not be limited to, all other items of Work required to provide a fully functional facility as called for in, and in accordance with requirements of, the Contract Documents.
 - 1. RELATED WORK SPECIFIED ELSEWHERE: Carefully examine all the Contract Documents for requirements which effect the Work of this Section. Specification Divisions which directly relate to the Work of Alternate No. 1 include, but are not limited to, the following:
 - a. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - b. Section 02 41 13 – Selective Demolition
 - c. DIVISION 03 – CONCRETE; including all Sections contained therein
 - d. DIVISION 04 – MASONRY; including all Sections contained therein
 - e. DIVISION 05 – METALS; including all Sections contained therein.
 - f. Section 06 10 00 – Rough Carpentry
 - g. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.

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- h. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
- i. DIVISION 09 – FINISHES; including all Sections contained therein.
- j. Section 10 14 00 – Signage
- k. Section 14 21 00 – Traction Elevators
- l. Section 22 00 00 – Plumbing
- m. Section 23 00 00 - HVAC
- n. Section 26 00 00 – Electrical
- o. Section 31 20 00 – Earth Moving

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION

SECTION 01 26 00

CONTRACT MODIFICATION PROCEDURES

PART I - GENERAL

1.01 RELATED DOCUMENTS

- A. All the Contract Documents, including Drawings, General Conditions, Supplementary Conditions, and all Sections of Division 1 - General Requirements, apply to the Work of this Section.

1.02 DESCRIPTION OF WORK

- A. The Work of this Section shall include, but not be limited to, the following:
 - 1. Administrative and procedural requirements for handling and processing Contract modifications.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specifications Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 MINOR CHANGES IN THE WORK

- A. Supplemental instructions authorizing minor changes the Work, not involving an adjustment to the Contract Sum or Contract Time, will be issued by the Architect on AIA form G710, Architects Supplemental Instructions.

1.05 CHANGE ORDER PROPOSAL REQUESTS

- A. Prior to issuing instructions for changes in the Work which the Architect judges will require adjustment to the Contract Sum or Contract Time, the Architect may, at its discretion, request the Contractor to prepare an estimate of the amount of the adjustment.
- B. Owner-Initiated Proposal Requests: The Architect will issue a detailed description of the proposed change and supplemental or revised Drawings and Specifications.
 - 1. Respond to the request by submitting a proposal to the Architect for the Owner's review within 21 calendar days of receipt of the proposal request, unless a shorter period for response is indicated in the proposal request.

2. Include in the proposal, an estimate of cost necessary to execute the proposed change and a statement indicating the effect the proposed change, in the Work will have on the Contract time. Include the supporting data listed in paragraph F, below.
 3. Proposal requests are not an instruction either to stop Work in progress, or to execute the proposed change. Continue with Work in progress that is not affected by the proposed change.
- C. Contractor-Initiated Change Order Requests: When latent or other unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.
1. Notify the Architect in writing of proposed changes within 21 calendar days after the occurrence of the event of observance of the condition giving rise to the change proposal request.
 2. Submit the change-order proposal request within 21 calendar days after delivering such notification to the Architect.
 3. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time. Include the supporting data listed in paragraph F, below.
 4. Comply with requirements in Section "Product Substitutions" if the proposed change in the Work requires the substitution of one product or system for a product or system specified.
- D. No extensions of Contract Time nor increase in the Contract Sum will be considered if the additional time or additional cost is a consequence of the Contractor's failure to submit an estimate within the time stipulated, regardless of whether the proposal request or change order request was initiated by the Owner or the Contractor.
- E. Proposal Request Form: Use AIA Document G709 for Change Order Proposal Requests.
- 1.06 CHANGE ORDERS
- A. The following requirements shall apply to both Owner-initiated proposal requests and Contractor-initiated Change Order request.
1. Submit a complete and accurate Price to the Architect and the Construction Manager for review. Incomplete proposals will be returned to the Contractor without review, and shall be completed by the Contractor and returned to the Architect and the Construction Manager within the same time: period specified above for submittal of proposals; there shall be no extension of time for such re-submittals.
 2. The Architect and the Construction Manager will review and act on the Contractor's Proposal within 21 days of receipt. The Architect's review, at the Architects discretion, may include consideration of Costs listed in Means "Construction Cost Data" or a similar data base, and/or on conversations with local manufacturers and suppliers.
 3. Include applicable taxes, delivery charges, equipment rental, and amounts of trade, discounts.
 4. Itemize Work which is to be performed by employees of the Contractor.
 5. For Work which is not to be performed by employees of the Contractor, submit pricing on the letterhead of the proposed Subcontractor, fabricator or supplier.
 6. Itemize General Conditions Work included in the proposed cost of the change; a lump sum or percentage of the cost will not be accepted.
 7. Prices shall remain valid for a minimum of 90 days from the date of the initial pricing approval to execution of the Change Order by the Owner.
- B. Consideration and Acceptance of Price Proposal: The following procedures shall apply to both Owner-Initiated proposal requests and Contractor-initiated Change Order requests:
1. Submit a complete and accurate Price to the Architect for review. Incomplete proposals will be returned to the Contractor without review, and shall be completed by the Contractor and returned to the Architect within the same time: period specified above for submittal of proposals; there shall be no extension of time for such resubmittals.
 2. The Architect will review and act on the Contractor's Proposal within 21 days of receipt. The Architect's review, at the Architects discretion, may include consideration of Costs listed in Means "Construction Cost Data" or a similar database, and/or on conversations with local manufacturers and suppliers.

3. Within 10 calendar days after receipt of the Architect's comments, make changes to the cost proposal in response to the Architects comments and resubmit for approval.
4. The Architect will promptly notify the Contractor whether the pricing is accepted or will direct the Contractor to make additional changes.
5. When the Contractor's proposal is approved by the Architect the Architect will prepare a Change Order for execution by the Owner, the Architect and the Contractor.

1.07 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: When the Owner and Contractor are not in total agreement on the terms of a Change Order Proposal, the Architect may issue a Construction Change Directive on AIA Form G714, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. The Construction Change Directive will contain a description of the change in the Work and designate the method to be followed to determine change in the Contract Sum or Contract Time, in accordance with Article 7.3 of the General Conditions.
- B. Documentation: If the Construction Change Directive is for Work which is to be compensated on the basis of Time and Materials, the Contractor shall maintain detailed daily records, verified with the Architect on a time and material basis of Work required by the Construction Change Directive.
 1. After completion of the change, the Contractor shall submit an itemized account, including supporting data, as may be required by the Architect and Construction Manager, to substantiate cost and time adjustments to the Contract.

1.08 CHANGE ORDER PROCEDURES

- A. Upon the Owner's approval of a Change Order Proposal Request, the Architect will issue a Change Order for signatures of the Owner and Contractor on AIA Form G701, as provided in the Conditions of the Contract.
- B. The Contractor shall promptly execute the Change Order.
- C. The Architect will present the Change Order to the Owner for review and approval. Upon Owner approval, the Change Order will then be forwarded by the Architect to the City of New Bedford DFFM Department for approval during its next regularly scheduled meeting subsequent to the date of the Change Order. A copy of the fully approved and executed Change Order will then be forwarded to all parties for the record.

1.09 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

1.10 COMPUTING EQUITABLE ADJUSTMENTS

- A. The Owner and the Contractor shall attempt to negotiate an equitable adjustment in the Contract price before commencement of the pertinent work. In the absence of a Contract for an equitable adjustment and when so directed, the Contractor shall proceed with the Change Order work on a time and material basis as provided in subparagraph 1.10C, Items 3a through 3e, and the Contractor will provide the Owner with a written notice to that effect.
- B. The Contractor shall provide the Owner and the Architect with all cost and pricing data used in computing the amount of the equitable adjustment, and the Contractor shall certify that the pricing data used was accurate, complete, and current.
 1. With respect to any sum of money due to be paid by the Contractor to the Owner under the Contract, an appropriate Change Order shall be issued deducting said sum of money from payments then due or thereafter due to the Contractor from the Owner. If such deductions from payments then due or thereafter due to the Contractor from the Owner are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

- C. Equitable adjustments in the Contract price shall be determined according to one of the following methods, or a combination thereof, as determined by the Owner:
1. Fixed price basis, provided that the fixed price shall be inclusive of items (3a) through (3e) (below) and shall be computed in accordance with those provisions;
 2. Estimated lump sum basis, to be adjusted in accordance with contract unit prices, or other agreed upon unit prices provided that the unit prices shall be inclusive of all costs related to such equitable adjustment;
 3. Time and materials basis, on a not-to-exceed predetermined upset amount to be subsequently adjusted on the basis of actual costs based on the following items (3a) through (3e):
 - a. The cost at prevailing rates for direct labor, material, supplies and use of equipment exclusive of hand tools;
 - b. Plus cost of Workers Compensation Insurance, union fringe benefits, federal unemployment taxes, Federal Social Security, and Massachusetts Unemployment Compensation, the sum of which shall be no more than 20% of the total labor rate in Item (3a), or, as an alternative the Contractor may elect to use a flat twenty (20%) percent of the total labor rate in item (3a);
 - c. Plus fifteen (15%) percent of item (3a) for overhead, superintendence, and profit, which will be paid to the Contractor for work performed by the Contractors' own trade forces (for work performed by a Subcontractor, the Subcontractor will be entitled to a fifteen (15%) percent mark-up and the Contractor to a five (5%) percent mark-up; for work performed by a Sub-subcontractor, the Sub-subcontractor will be entitled to a fifteen (15%) percent mark-up, the Subcontractor to a five (5%) percent mark-up, and the Contractor to a five (5%) percent markup);
 - d. If the net change is in addition to the contract price, it shall include the Contractor's overhead, superintendence, and profit. On any change which involves a net credit, no allowances for overhead, superintendence, and profit shall be figured;
 - e. Plus actual direct premium cost of payment and performance bonds required of the Contractor and its Subcontractors, provided there will be an appropriate credit for bond premiums in the case of a credit Change Order.
 4. If unit prices are stated in the Contract Documents or subsequently agreed upon, or if quantities originally contemplated are so changed in a proposed Change Order or Construction Change Directive that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART I - GENERAL

1.01 RELATED DOCUMENTS

- A. All the Contract Documents, including Drawings, General Conditions, Supplementary Conditions, and all Sections of Division 1 - General Requirements, apply to the Work of this Section.

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, the following:
 - 1. Administrative and supervisory requirements necessary for Project coordination
 - 2. Request for Information (RFI's)
 - 3. Coordination of the work and coordination among separate contractors
 - 4. Administrative and Supervisory personnel
 - 5. Project meetings
 - 6. Field measurements

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 – HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 REQUESTS FOR INFORMATION

- A. Contractor's responsibility for review of Contract Documents is set forth in the General and Supplementary Conditions.
- B. Study the Contract Documents applicable to each component of the Work sufficiently in advance of the time such Work will be ordered, fabricated or installed, so that if additional information or instructions are needed, the Architect will have sufficient time to respond such requests before the information is needed by the Contractor; allow at least 15 calendar days for the Architect to respond.

- C. When requesting additional Drawings, Specifications, or instructions, submit the request in writing and clearly state what information is required. Include a reference to the drawing sheet and detail number, and/or the specification Section and paragraph number requiring clarification, or give other similar precise information to direct the Architects attention to the matter and to show that the Contractor has made a conscientious effort to locate the information and understand the information presented in the Contract Documents. Requests for information not accompanied by a precise, detailed reference to the Contract Documents will be returned to the Contractor unanswered for revision. Requests for information regarding information which is clearly shown or stated in the Contract Documents, will be returned to the Contractor unanswered. By submitting Requests for Information, the Contractor represents that the Contractor has determined and verified materials, field measurements, and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within each Request for Information with the requirements of the Work and of the Contract Documents. By submitting Requests for Information, the Contractor further represents that the Contractor has reviewed each Request for Information as it relates to the rest of the Work and Contract Documents. The Architect's responses to the Contractor's Requests for Information shall not relieve the Contractor of the obligations of Paragraphs 3.3, 3.5, 3.12, and 4.2 of the General & Supplementary General Instructions.

1.05 COORDINATION

- A. Coordination: Coordinate construction activities included under various Sections; of these Specifications to assure efficient and orderly installation of each part of the Work.
1. Schedule construction activities in the sequence required to obtain the best results. When best sequence cannot be achieved, make provisions to accommodate items scheduled for later installation.
 2. Where space is tight, coordinate installation of different components to provide maximum accessibility for required maintenance, service and repair.
 3. Coordinate construction activities under this Contract with separate contractors performing related work.
- B. Where necessary, prepare memoranda outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings. Transmit to the Architect and distribute to all other parties involved.
1. Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.
- C. Coordinate administrative activities with construction activities to avoid conflicts and ensure - orderly progress of the Work. Examples of administrative activities which must be carried out in a timely fashion to facilitate timely progress of the work include, but without limitation: preparation of schedules, delivery and processing of submittals, scheduling meetings,
- D. Provide Coordination Drawings in accordance with requirements of Section 01 33 00 – Submittal Procedures. The Contractor shall provide the services of a designated on-site representative to oversee implementation of Work related to completion of information contained in the Coordination Drawings, in accordance with requirements of the Contract Documents.

1.06 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. Employ a competent superintendent, reasonably acceptable to the Owner, and necessary assistants. Require these supervisory personnel to be in-attendance at the project site full time during the progress of the work from the beginning of the Work, until the date of Substantial Completion, and for such additional time thereafter as the Architect may determine to be necessary for the expeditious completion of the Work.
1. "From the beginning of the Work" means before any temporary construction or sitework begins, including staking out the site, placing of erosion control devices, site clearing, or cutting of trees.
 2. Provide the superintendent with a cellular phone or paging device, so that he or she can be reached at all times.
 3. The Owner reserves the right to request replacement of the Contractor's Superintendent for just cause, in accordance with requirements of the Contract Documents.

- B. Agency: The Contractor's superintendent shall attend the regularly scheduled project meetings and special project meetings as the Contractor's agent, and shall be empowered to make: binding commitments on all matters to be discussed, including costs, payments, change orders, time schedules, and manpower. Notices required under the Contract may be served on the Contractor's superintendent.

1.07 PROJECT MEETINGS

- A. Project Meetings: Project meetings are specified in Section 01 00 00 – General Requirements.
- B. Subcontractor Progress Meetings: In addition to meetings called by the Owner or Architect, schedule and administer weekly subcontractor progress meetings.
 - 1. Special Meetings: Schedule and attend additional informational and problem solving meetings as required by progress of the work or requested by the Owner or the Architect to discuss non-routine issues. The Architect will prepare and distribute agenda, record and distribute the minutes.

1.08 REVIEW OF WORK BY SUBCONTRACTORS

- A. Before permitting any subcontractor to begin work on the project site, meet with the subcontractor to review the work ahead. As a minimum, review the Contract Documents for work pertaining to that subcontractor; review the subcontractor's shop drawings, examine existing conditions affecting the work of the subcontractor, and review environmental and other project conditions for conformance to specified requirements,

1.09 FIELD MEASUREMENTS

- A. Before beginning the Work, check and compare critical dimensions at the site with those shown on the Drawings, and immediately bring discrepancies to the attention of the Architect and request resolution.
- B. As the work progresses, continue to check and compare dimensions at the site with those shown on the Drawings before ordering materials, in preparation for producing shop drawings, before beginning fabrication, before ordering materials, and before cutting and fitting materials at the site, and at other times as frequently as required to ensure that the work will be fabricated to the right size(s) and will fit together correctly in the field. If discrepancies between site dimensions and Drawings are detected, immediately notify the Architect in writing, describing the nature and extent of the discrepancy, and attaching sketches or annotated copies of the plans if necessary to make the observation clear.
- C. Mark on shop drawings, prior to submission to the Architect relevant field dimensions and note conflicts with the submitted material.

1.10 SUBMITTALS

- A. Provide submittals in accordance with requirements of Section 01 33 00 – Submittal Procedures, or as otherwise required for completion and transmittal of all documents in accordance with requirements of the Contract Documents.

1.11 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS NOT USED**PART 3 - EXECUTION NOT USED****END OF SECTION**

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

June 12, 2019

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SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All the Contract Documents, including Drawings, General Conditions, Supplementary Conditions, and all Sections of Division 1 - General Requirements, apply to the Work of this Section.

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, the following:
 - 1. Administrative and procedural requirements for submittal of Shop Drawings, Product Data, Samples, and other required submittals as called for in the Contract Documents.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 GENERAL REQUIREMENTS

- A. Electronic Submittal Procedures
 - 1. General Requirements
 - a. Shop Drawings and Product Data submittals shall be transmitted to the Architect in electronic (PDF) format.
 - b. The intent of electronic submittals is to expedite the construction process by reducing paperwork, improving information flow, and decreasing turnaround time.
 - c. The electronic submittal process is not intended for submittal of color samples, color charts, or physical material samples.
 - 2. Submittal Procedures
 - a. The Contractor may use any or all of the following options for submittal preparation:
 - 1) Subcontractors and suppliers provide PDF submittals to the Contractor.

- 2) Subcontractors and suppliers provide paper submittals to the Contractor who electronically scans and converts to PDF format.
 - 3) Subcontractors and suppliers provide paper submittals converted to PDF format.
 - b. The Contractor shall review and apply electronic stamp certifying that the submittal complies with requirements of the Contract Documents, including verification of manufacturer and product, dimensions, and coordination of information required for integration into all related components of the Work.
 - c. The Architect/Engineer will notify the Contractor by e-mail of completed review and will make review comments available.
 - d. The Contractor is responsible for distribution of reviewed submittals to all subcontractors and suppliers.
 - e. The Contractor shall submit paper copies of reviewed submittals at Project closeout in accordance with requirements of Section 01 77 00 – Contract Closeout Procedures, Section 01 78 39 – Project Record Documents.
 - B. Prior to submittal of any shop drawings, product data or samples the Contractor shall submit to the Architect for approval, within 15 business days after being awarded the Contract, a complete submittal log and a schedule of submissions of shop drawings and miscellaneous Work-related submittals which corresponds to the requirements of the CPM schedule and the General Contract. No Submittals will be processed prior to the receipt of such schedule for the project. The schedules shall indicate, by trade, the date by which final approval of each item must be obtained, and shall be revised as required by the conditions of the Work, subject to the Architect's approval. The Architects review period, including those of his consultants, will not exceed 30 days from the established date of each submission of shop drawings, product data, and samples, plus the additional time, if any, for distribution by the Contractor and receipt of submissions by the Architect. The Contractor shall be required to strictly adhere to the dates established in the schedule. The information in this submittal schedule shall also be included in the Contractor's CPM schedule for the project submitted in accordance with Section 01 51 11 - Progress Schedule.
 - C. Following approval of submittal log and schedule, submit to the Architect, shop drawings, product data and samples required by each specification Section.
 - D. When the phrase "By Others" (or similar expression) appears on a submittal and refers to any of the Contract Work, it shall be interpreted to mean "by the General Contractor or another Subcontractor". The Architect's review of any submittal containing such phrase shall not be considered permission to delete any Work from the Contract.
 - E. Review and approval of shop drawings by the Architect does not indicate approval of changes in the Contract, Time or Cost
- 1.05 SHOP DRAWINGS
- A. Original drawings, prepared by The Contractor, Subcontractor, Supplier or distributor which illustrate some portion of the Work; showing fabrication, layout, setting or erection details.
 1. Prepare drawings in a clear and thorough manner.
 2. Identify details by reference to sheet and detail numbers shown on Contract Drawings
- 1.06 PRODUCT DATA
- A. Manufacturer's standard schematic drawings:
 1. Modify drawings to delete information which is not applicable to project.
 2. Supplement standard information to provide additional information applicable to project.
 - B. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data.
 1. Clearly mark each copy to identify pertinent materials, products or models.
 2. Show dimensions and clearances required.
 3. Show performance characteristics and capacities.
 4. Show wiring diagrams and controls.

1.07 SAMPLES

- A. Physical examples to illustrate materials, products, units of Work, equipment or Workmanship, and to establish standards by which completed Work is to be judged.
 - 1. Office samples: Of sufficient size and quality to clearly illustrate:
 - a. Functional characteristics of product or material, with integrally related parts and attachment devices.
 - b. Full range of color.

1.08 CONTRACTOR RESPONSIBILITIES

- A. Review Shop Drawings, Project Data and Samples prior to submission.
- B. Verify:
 - 1. Field measurements
 - 2. Field construction criteria
 - 3. Catalog numbers and similar data
- C. Coordinate each submittal with requirements of Work and of Contract Documents.
- D. Contractor's responsibility for errors and omissions in submittals is not relieved by Architect review of submittals.
- E. Contractor's responsibility for deviation in submittals is not relieved by Architect review of submittals, unless the Architect gives written acceptance of specific deviations.
- F. Notify Architect/Engineer, in writing at time of submission, of deviations in submittals from requirements of Contract Documents.
- G. Furnish miscellaneous submittals (non-administrative) including, but not limited to warranties, maintenance agreements, Workmanship bonds, project photographs, survey data and reports, physical Work records, quality testing and certifying reports, copies of industry standards, record Documents, field measurement data, operating and maintenance materials, overrun stock, and similar information, devices and materials applicable to the Work.

1.09 SUBMISSION REQUIREMENTS

- A. Schedule submissions to permit time for review and resubmission.
- B. Submit number of Samples specified in each of specification Sections.
- C. Accompany submittals with transmittal letter, in duplicate, containing:
 - 1. Date
 - 2. Project title and number
 - 3. Contractor's name and address
 - 4. Specification Section number, paragraph and item number
 - 5. The number of each Shop Drawing, Product Datum and Sample submitted
 - 6. Notification of deviations from Contract Documents
 - 7. Manufacturer's name or source of supply
 - 8. Trade name
 - 9. Catalog number
 - 10. Contractor's certification that he has checked all samples for compliance with Contract requirements and availability of material
 - 11. Name and address of Architect, Subcontractor, and supplier
 - 12. Other pertinent data
- D. Submittals shall include:
 - 1. Date and revision dates
 - 2. Project title and number
 - 3. The names of:
 - a. Architect
 - b. Contractor

- c. Subcontractor
 - d. Supplier
 - e. Manufacturer
 - f. Separate detailer when permitted
 - 4. Identification of product or material.
 - 5. Relation to adjacent structure or materials.
 - 6. Field Dimensions, clearly identified as such.
 - 7. Specification Section number, paragraph and item number.
 - 8. Applicable standards, such as ASTM number or Federal Specification.
 - 9. A blank space, 3 in. x 6 in., for Architect/Engineer's stamp.
 - 10. Identification of deviations from Contract Documents.
 - 11. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements and compliance with Contract Documents.
- E. The Architect will complete the review and return the record sepias and product data to the Contractor.
- F. The Contractor shall be fully responsible for delay in the delivery of materials or progress of Work caused by late review of shop drawings due to failure of the Contractor to submit, revise, or resubmit shop drawings in adequate time to allow the Architect reasonable time (up to 10 calendar days) for normal checking and processing of each submission or resubmission.
- G. The Contractor shall assume full liability for delay attributed to insufficient time for delivery and/or installation of material or performance of the Work when approval of pertinent shop drawings and product data is withheld due to failure of the Contractor to submit, revise, or resubmit items in adequate time to allow the Architect reasonable time, not to exceed thirty (30) calendar days, for normal checking and processing of each submission or resubmission.
- 1.10 ARCHITECTS REVIEW ACTIONS
- A. Submittals Marked "Reviewed as Required by Construction Contract Documents And Approved":
- 1. Submittals which require no corrections by the Architect will be marked "Reviewed as Required by Contract Documents and Approved". Reviewed as required by Contract Documents and approved, but only for conformance to the design concept of the Work, and subject to further limitations and requirements contained in the Construction Documents.
- B. Submittals Marked "Furnish as Corrected":
- 1. Submittals which require only a minor amount of correcting will be marked "Furnish as Corrected". This mark means that checking is complete and all corrections are obvious without ambiguity. Fabrication will be allowed on Work "Furnish as Corrected", provided such action will expedite construction and noted corrections are adhered to. If fabrication is not made strictly in accordance with corrections noted, the item shall be rejected in the field and the Contractor will be required to replace such Work and that of other Contractor's, in accordance with corrected submittals, at his own expense.
- C. Submittals Marked "Revise and Resubmit":
- 1. When submittals are marked "Revise and Resubmit" details of items noted by Architect shall be further clarified before full approval can be given and noted items must not be fabricated until corrected and approved.
- D. Submittals Marked "Rejected":
- 1. When submittals are contrary to Contract requirements or too many corrections are required, they shall be marked "Rejected". No Work shall be fabricated under this mark. The Architect shall list his reasons for non-approval on the submittal or in a transmittal letter accompanying their return. The submittals must be corrected and resubmitted for approval.
- E. Submittals Marked "Review":
- 1. Submittals sent for information only will be marked "Reviewed". No approval or disapproval is given unless requested by Contractor.

- F. Return of Submittals To Contractor Unchecked:
 - 1. The Architect may return submittals to the Contractor unchecked for any of the following reasons, in which case the submission will not be considered official:
 - a. Submittal in violation of specified procedure or product
 - b. Inadequately checked by Contractor
 - c. Inaccurate and in substantial error
- 1.11 RESUBMISSION REQUIREMENTS
 - A. Shop Drawings:
 - 1. Revise initial drawings as required and resubmit as specified for initial submittal.
 - 2. Indicate on drawings any changes which have been made other than those requested by Architect/Engineer.
 - B. Product Data and Samples: Submit new data and samples as required for initial submittal.
- 1.12 DISTRIBUTION OF SUBMITTALS AFTER REVIEW
 - A. Distribute copies of Shop Drawings and Product Data which carry Architect/Engineer's stamp, to:
 - 1. Contractor's Job site file
 - 2. Record Documents file
 - 3. Subcontractors and/or suppliers
 - 4. Owner
 - 5. Testing Agency (where applicable)
 - B. Distribute samples as directed.
- 1.13 ARCHITECT / ENGINEER'S DUTIES
 - A. Review submittals with reasonable promptness.
 - B. Review for:
 - 1. Design concept of project
 - 2. Information given in Contract Documents
 - C. Review of separate item does not constitute review of an assembly in which item functions.
 - D. Affix stamp and initials or signature certifying to review of submittal.
 - E. Return submittals to Contractor for distribution.
- 1.14 DAILY CONSTRUCTION REPORTS
 - A. Prepare daily construction reports, recording the following information concerning events at the site and submit copies to the Architect at weekly intervals.
 - 1. List of Subcontractors at the site
 - 2. Approximate count of personnel at the site
 - 3. High/low temperatures, general weather conditions
 - 4. Accidents and unusual events
 - 5. Meeting and significant events
 - 6. Stoppages and delays, shortages, losses
 - 7. Meter readings and similar recordings
 - 8. Emergency procedures
 - 9. Orders and requests of governing authorities
 - 10. Job modifications received and implemented
 - 11. Services connected, disconnected
 - 12. Equipment or system tests and start-ups
 - 13. Partial completion, occupancies

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

June 12, 2019

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

14. Substantial completion authorization

1.15 EMERGENCY ADDRESSES

- A. Within 15 days of Notice to Proceed, submit to the Owner and the Architect, in writing, the name, addresses and telephone numbers of key members of their organization including Superintendent and personnel at the site, to be contacted in the event of emergencies at the building site, which may occur during non-Working hours.

1.16 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS

2.01 SUBSTITUTIONS

- A. Contractor's request for changes in products, materials and methods of construction required by Contract Documents are considered requests for "substitutions" and are subject to requirements specified under Section 01 60 00 – Product Requirements.

PART 3 - EXECUTION NOT USED

END OF SECTION

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, the following:
 - 1. Administrative and procedural requirements for quality assurance and quality control.
 - 2. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with requirements of the Contract Document.
 - a. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - b. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with requirements of the Contract Documents.
 - c. Requirements for Contractor to provide quality assurance and control services required by the Owner, Architect, or authorities having jurisdiction are not limited by provisions of this Section.
 - d. Specific test and inspection requirements are not specified in this Section.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

- B. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- C. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- D. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- E. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- F. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
- G. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trades.

1.05 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.06 REPORTS AND DOCUMENTS

- A. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
 - 1. Name, address, and telephone number of technical representative making report.
 - 2. Statement on condition of substrates and their acceptability for installation of product.
 - 3. Statement that products at Project site comply with requirements.
 - 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 6. Statement whether conditions, products, and installation will affect warranty.
 - 7. Other required items indicated in individual Specification Sections.
- B. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.07 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- G. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.08 QUALITY CONTROL

- A. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 "Submittal Procedures."
- B. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- C. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.
 - 1. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 - a. Access to the Work.
 - b. Incidental labor and facilities necessary to facilitate tests and inspections
 - c. Adequate quantities of representative samples of materials that require testing and inspecting.
 - d. Assist agency in obtaining samples.
 - e. Facilities for storage and field curing of test samples.
 - f. Delivery of samples to testing agencies as required
 - g. Preliminary design mix proposed for use for material mixes that require control by testing agency. Security and protection for samples and for testing and inspecting equipment at Project site.
 - h. Security and protection for samples and for testing and inspecting equipment at Project site.
 - 2. Coordination: Coordinate sequence of activities to accommodate required quality assurance and control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 - a. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.09 SUBMITTALS

- A. Provide submittals in accordance with requirements of Section 01 33 00 – Submittal Procedures, or as otherwise required for completion and transmittal of all documents required in accordance with requirements of the Contract Documents.

1.10 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION

3.01 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Architect.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.02 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 51 00 – Cutting and Patching.
 - 2. Protect construction exposed by or for quality-control service activities.
 - 3. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART I - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. Provide, maintain, remove, and pay all costs related thereto, all temporary facilities included under the Work of this Section, or as otherwise required for progress and completion of the Work in accordance with requirements of the Contract Documents.
- B. Coordinating and scheduling among all trades and Subcontractors, the furnishing and use of all temporary facilities for the Work in accordance with all Federal, State, and local governing rules and regulations.
- C. Relocate chiller at a temporary location as shown in the architectural drawings. The chiller shall remain operational during construction at the temporary location. After Work is completed, the chiller shall be move back to its original location.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving
- C. Nothing in this Section is intended to limit types and amounts of temporary Work required, and no omission from this Section shall be recognized as an indication by the Architect that such temporary activity is not required for successful completion of the Work or compliance with requirements of the Contract Documents.

1.04 REQUIREMENTS OF REGULATORY AGENCIES

- A. Provide and maintain all temporary facilities in compliance with governing rules, regulations, codes, ordinances and laws of agencies and utility companies having jurisdiction over Work involved in the project.
- B. Be responsible for all temporary Work provided and obtain any necessary permits and inspections for such Work.

- C. Do not interfere with normal use of streets in vicinity of project site except as indicated on drawings and/or as necessary to execute required Work, and then only after proper arrangement has been made with applicable authorities, including traffic control.
- 1.05 FIELD OFFICES AND STORAGE SHEDS
- A. The Owner will provide the use of an on-site Field Office that will include a Restroom and Electricity /Water.
 - B. The Contractor shall provide field offices and storage sheds as per the Contract. The storage of construction materials in the building are permitted, depending on the type of materials and the duration of expected storage, as determined by the Architect and Owner. All temporary structures shall be removed at Substantial Completion.
- 1.06 TEMPORARY SERVICES
- A. Temporary Electricity and Lighting:
 - 1. The Contractor shall provide temporary wiring of a special nature, and power required to complete the Work in accordance with requirements of the Contract Documents.
 - B. Temporary Heat and Ventilation:
 - 1. The Contractor shall provide adequate ventilation of enclosed areas as required to disperse humidity and to prevent hazardous accumulation of dust, fumes, vapors or gasses.
 - C. Removal:
 - 1. Completely remove temporary materials and equipment when their use is no longer required.
 - 2. Clean and repair damage caused by temporary installations or used for temporary facilities.
 - 3. Restore permanent facilities used for temporary services to specified condition.
 - a. 14 days prior to Substantial Completion, remove temporary lamps and install new lamps in all permanent light fixtures.
- 1.07 VEHICLE AND CONTRACTOR ACCESS AND TRAFFIC CONTROL
- A. The General Contractor shall be responsible for all traffic control, including municipal police services, at streets adjacent to the Project site, as may be required to provide safe access and egress for Owner and construction related vehicles. Provide and maintain a suitable means of access to the Contract Work areas as necessary for vehicles and equipment of all trades requiring such access.
 - B. The General Contractor shall be responsible for all measures necessary to maintain public access at all times
- 1.08 TEMPORARY PARKING
- A. Parking for vehicles belonging to the General Contractor, Subcontractors, or other personnel providing services included under the Work of this Contract shall be the responsibility of the General Contractor and Subcontractors.
- 1.09 SCAFFOLDING, LADDERS, AND HOISTING FACILITIES
- A. The General Contractor shall provide and maintain all temporary stairs, ramps, runways, chutes, ladders, staging, and hoists as required for proper execution of the Work in accordance with applicable requirements of Federal, State and Local Codes, except as otherwise indicated below. The construction, installation, and maintenance of such equipment shall be in accordance with applicable requirements of Federal, State and Local Codes.
 - B. The General Contractor shall provide means to safely enable access to all parts of Work by Architect, Owner, or other such person authorized to inspect Work.
- 1.10 TEMPORARY BARRICADES AND ENCLOSURES
- A. The General Contractor shall provide temporary enclosure where indicated and where reasonably required to ensure adequate Workmanship and protection from weather, personnel, visitors, and unsatisfactory ambient conditions for the Work.

1. Provide barricades as required for traffic control at streets adjacent to the Project site, as required to provide safe access and egress for Owner and construction related vehicles.

1.11 SECURITY AND PROTECTION PROVISIONS

- A. The General Contractor shall provide temporary security and protection provisions including, but not be limited to, guard rails, fire protection, barricades, warning signs/lights, and similar provisions intended to minimize property losses, personal injuries and claims for damages at project site.
 1. Provide types, sizes, numbers and locations of fire extinguishers, as would be reasonably effective in extinguishing fires during early stages, by personnel at project site (minimum 2 per floor of each building). Provide type A extinguishers at locations of low-potential for either electrical or grease-oil-flammable liquids fires; provide Type ABC dry chemical extinguishers at other locations; comply with recommendations of NFPA No. 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations. Post warning and quick-instructions at each extinguisher location, and instruct all personnel at project site, at time of their first arrival, on proper use of extinguishers and other available facilities at project site. Post local fire department call number at project site.
 - a. Perform torch cutting and welding operations only when approved by the Contractor. Provide chemical extinguishers at all locations where such Work is in progress.
 - b. Maintain a fire watch of the interior and exterior of the facility for at least one hour after the Project's daily quitting time when the following activities have been done: torching, welding or other activities capable of starting combustion.

1.12 HAZARDOUS MATERIALS

- A. The General Contractor is solely responsible for all matters relating to hazardous or toxic materials and lawful removal of same from the site. If hazardous or toxic materials are indicated or discovered, properly inform governing authorities and abide by their requirements.

1.13 DUST AND NOISE CONTROL

- A. The General Contractor shall use every effort and every means possible to minimize noise caused by his operations, which the Architect, Owner, or governing authorities may consider objectionable. The noise levels on the construction site will be controlled so that at no time will the noise level measured at the Limit of Work line shall exceed 70dB. The General Contractor shall provide Working machinery and equipment equipped with suitable mufflers and sound-deadening panels in accordance with the latest edition of the OSHA regulations. Compressors shall be equipped with silencers or mufflers on intake and exhaust lines. Wherever practical electricity shall be used for power to reduce noise. Dumping bins, hoppers and trucks used for disposal shall be lined with wood or other sound deadening material if required. Where required agencies have jurisdiction, certain noise-producing Work may have to be performed during specified periods only; further, the General Contractor and Subcontractors are required to comply with all applicable regulations.
 1. Prior to the start of construction, the General Contractor shall submit to the Architect, a Noise Control Program for review where Work with high level of noise is anticipated to Work out plans to mitigate the noise impact, especially for Work anticipated to be done during normal work hours.

1.14 WEATHER PROTECTION

- A. Hot Weather Protection: Use mortar within 1-1/2 hours after mixing. Discard all mortar over 1-1/2 hours old and all mortar that has stiffened due to hydration (setting).
- B. Cold Weather Protection: The General Contractor shall strictly comply with recommendations of Brick Institute of America Technical Note No. 1a, Cold Weather Masonry Construction, Construction and Protection Recommendations and The Portland Cement Association. When the temperature is below 40°F temporary enclosures and heat shall be provided by the General Contractor and the following procedures shall be followed by the Masonry Subcontractor:
 1. Cold Weather Protection:
 - a. Preparation:

- 1) Remove ice or snow formed on masonry bed by carefully applying heat until top surface is dry to touch.
 - 2) Remove frozen or damaged masonry.
 - 3) Sprinkle with heated water when brick suction exceeds 30 gm/min./30 sq. in.
 - a) When units are above 32°F, heat water above 70°F.
 - b) When units are below 32°F heat water above 130°F.
 - 4) Use dry masonry units.
 - 5) Do not use frozen units.
 2. Construction requirements while Work is progressing:
 - a. Air temperature 40°F to 32°F:
 - 1) Heat sand or mixing water to produce mortar temperatures between 40°F and 120°F.
 - b. Air temperature 32°F to 25°F:
 - 1) Heat sand and mixing water to produce mortar temperatures between 40°F and 120°F.
 - 2) Maintain temperature of mortar on boards above freezing.
 - c. Air temperatures 25°F to 20°F:
 - 1) Heat sand and mixing water to produce mortar temperatures between 40°F and 120°F.
 - 2) Maintain mortar temperatures on boards above freezing.
 - 3) Use approved heat sources on both sides of walls under construction by the General Contractor.
 - 4) Use windbreaks when wind is in excess of 15 mph.
 - d. Air temperature 20°F and below:
 - 1) Heat sand and mixing water to produce mortar temperatures between 40°F and 120°F.
 - 2) The General Contractor shall provide temporary enclosures and heat as necessary to maintain air temperature above 32°F.
 - 3) Minimum temperature of units when laid: 20°F.
 - 4) Produce subsequent mortar batches within +/-10°F of first batch.
 3. Protection requirements for completed masonry and masonry not being Worked on:
 - a. Mean daily air temperature 40°F to 32°F: Protect masonry from rain or snow for 24 hours by covering with non-staining weather-resistive membrane.
 - b. Mean daily air temperature 32°F to 25°F: Completely cover masonry with non-staining weather-resistive membrane for 24 hours.
 - c. Mean daily air temperature 25°F to 20°F: Completely cover masonry with insulating blankets or equal protection for 24 hours.
 - d. Mean daily air temperature 20°F and below: Maintain masonry temperature above 32°F for 24 hours by enclosure and supplementary heat, electric heating blankets, infrared lamps, or other acceptable methods provided by the General Contractor.

C. Cover Work at the end of each day and whenever Work is not in progress. Extend cover down both sides of walls at least 24 in. and hold securely in place.

D. Load Application:
 1. Do not apply uniform floor loading or roof loading for at least twelve hours after building masonry columns or walls.
 2. Do not apply concentrated loads for at least three days after building masonry columns or walls.

E. Perform Work only when ambient temperature and surface temperature of existing unit masonry and new materials are between 40 deg. F and 80 deg. F. Work only when temperature is forecasted to be 40 deg. F or above for at least one week after completion of Work unless temporary enclosures and heat are provided.

F. Prevent mortar from staining face of masonry and other building components that are to be left exposed. Clean exposed masonry immediately using soft brushes and water only. Protect base of walls from splashed mud and other stains. Protect sills, ledges and projections from mortar droppings.

1.15 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and legally disposed daily off-site to avoid large accumulations. The General Contractor shall be responsible for providing dumpsters and all labor, materials, and equipment to remove all waste and debris caused by the Work of this Contract.
- B. Burning or on-site disposal of waste and debris caused by the Work of this Contract shall not be allowed.

1.16 SAFETY AND COOPERATION

- A. This project is subject to compliance with Public Law 91-596, "Occupied Safety and Health Act of 1970" (OSHA) and all amendments thereto, with respect to all rules and regulations pertinent to construction.
 - 1. The Work of this Contract shall be performed between the hours of 7:00 AM and 5:00 PM, Monday through Friday, and 9:00 AM and 4:00 PM on Saturday. Performance of the Work of this Contract shall not be allowed on Sunday or Holidays. Exceptions to the specified hours of Work shall be allowed in the event of an emergency, in coordination with the Owner.
- B. The General Contractor shall coordinate all Work and extend full cooperation to Owner's personnel and the Work of other trades.
- C. The following rules and regulations will be required of all personnel providing services included under the Work of this Contract. No deviation or exception will be permitted without the express written approval of the Owner. The General Contractor shall take responsibility for ensuring all construction personnel adhere to and cooperate with the Owner in enforcing these responsibilities.
 - 1. All Workers must be properly, permanently and visually identified.
 - 2. All Workers shall maintain their actions in a professional and workmanlike manner while at the Project site. Failure to comply with the following restrictions shall be grounds for permanent removal from the list of authorized workers, as described above. Worker restrictions include, but are not limited to, the following:
 - a. No abusive language
 - b. No littering
 - c. No lewd behavior
 - d. No conduct otherwise deemed unacceptable by the Owner or Architect
 - e. No smoking on Owner's property, in accordance with State of Massachusetts law
 - f. Consumption of alcoholic beverages on the job, or coming to Work in an intoxicated condition
 - g. Possessing or consuming illegal drugs or any other illegal substance while working on the Project
 - h. Using or removing Owner's or Subcontractors' possessions from the property without prior written authorization
 - i. Violating any state, federal or city statutes, rules, regulations, and the like while working on the Project
 - j. Possessing firearms or explosives while Working on the Project
 - k. Using Project facilities for jobs other than specific assignments directly related to the Work of this Project
 - l. Physically abusing or harming an individual who Works at or visits the Project
 - m. Duplication of any keys used in the existing or new building without prior written authorization by the Owner
 - n. Providing building access at any time to anyone not directly working for the Contractor
 - o. Abusing, defacing, or destroying existing or new property of the Owner
 - p. Preventing access to all areas of the Project by the Owner, Architect and the Owner's Consultants.

1.17 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

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PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION

SECTION 01 10 90

CUTTING AND PATCHING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, the following:
 - 1. All cutting, coring, patching, parging, and as required to complete the Work of this Contract.
 - 2. Cut and cap refrigerant lines to existing condensing unit. The existing condensing unit shall be relocated to a temporary location as shown in the architectural drawings. The existing condensing unit shall remain operational during construction at the temporary location. After Work is completed, cut and cap refrigerant lines and relocate existing condensing at final location as shown in the mechanical drawings.
 - 3. Making all parts of the Work fit together properly
 - 4. Uncovering portions of the Work to provide for installation of ill-timed Work
 - 5. Removal and replacement of defective Work
 - 6. Removal and replacement of Work not conforming to requirements of Contract Documents
 - 7. Removal of samples of installed Work as specified for testing
 - 8. Providing routine penetrations of non-structural surfaces for installation of ductwork, piping and electrical conduit.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 – HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. Requirements for Structural Work: Do not cut and patch structural Work without prior approval of a structural engineer registered in the State of Massachusetts.

- B. Operational and Safety Limitations: Do not cut and patch operational elements or safety related components in a manner that would result in a reduction of their capacity to perform in the manner intended, including energy performance, or that would result in increased maintenance, or decreased operational life or decreased safety.

1.05 SUBMITTALS

- A. Procedural Proposal for Cutting and Patching: Where prior approval of cutting and patching is required, submit proposed procedures for this Work well in advance of the time Work shall be performed and request approval to proceed. Include the following information, as applicable, in the submittal.
- C. List products to be used and firms that shall perform Work.
- D. Give dates when Work is expected to be performed.
- E. List utilities that shall be disturbed or otherwise be affected by Work, including those that shall be relocated and those that shall be out-of-service temporarily. Indicate how long utility service shall be disrupted.
- F. Approval by the Architect to proceed with cutting and patching Work does not waive the right to later require complete removal and replacement of Work found to be cut and patched in an unsatisfactory manner.
- G. Submit a written request for approval to Architect well in advance of executing any cutting or alteration which effects:
 - 1. The structural value or integrity of any element of the Project;
 - 2. The integrity or effectiveness of weather-exposed or moisture resistant elements or systems.
 - 3. The efficiency, operational life, maintenance or safety of operational elements;
 - 4. The visual qualities of sight-exposed elements.
- H. The request shall include the following:
 - 1. Description of the effected Work, its' proposed extent, and the reason it cannot be avoided.
 - 2. The necessity for cutting, alteration or excavation.
 - 3. The effect on the structural or weatherproof integrity of the Project.
 - 4. Description of the proposed Work:
 - a. The scope of cutting, patching, alteration, or excavation.
 - b. The trades who shall execute the Work.
 - c. Products proposed to be used.
 - d. The extent of refinishing to be done.
 - 5. Alternates to cutting and patching
 - 6. Cost proposal, when applicable
 - 7. List utilities that shall be disturbed or affected, including those that shall be relocated and this that shall be temporarily out of service. Indicate how long service shall be disrupted.
 - 8. Indicate dates when cutting and patching are to be performed.

1.06 QUALITY ASSURANCE

- A. Requirements for Structural Work:
 - 1. Do not cut and patch structural elements in a manner that would reduce their load carrying capacity or load deflecting ratio.
 - 2. Obtain Architect and Engineer approval prior to cutting and patching of the following:
 - a. Foundation construction
 - b. Bearing and retaining walls
 - c. Structural concrete
 - d. Structural steel
 - e. Lintels
 - f. Structural deck
 - g. Stair systems
 - h. Miscellaneous structural metals
 - i. Equipment supports

- j. Piping, ductwork, vessels and equipment.

1.07 CUTTING AND CORING

- A. The installation of new Work that requires coring of floors, walls, and/or roof penetrations measuring 4-1/2 in. or less shall be performed by the Subcontractor of Filed Sub-Bid Sections. The General Contractor shall cut and core floors, walls, and/or roof penetrations for sizes not indicated by the Filed Sub-Bid Sections.

1.08 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS

2.01 PATCHING AND PARGING

- A. Provide quick setting, polymer modified, fiber reinforced, cementitious mortar, Planitop 330 Fast, as manufactured by MAPEI, Quikrete, Euclid Chemical, or Architect approved equal. The cementitious mortar shall have the following characteristics:
 - 1. Can be applied at 1/8 in. to 1-1/4 in. thickness in a single coat.
 - 2. Mix with water only
 - 3. Smooth, creamy consistency with easy troweling application.
 - 4. Fast drying allows tile installation in 90 minutes.
 - 5. Pot life of 20 to 30 minutes
 - 6. Non-sagging/non-slumping properties
 - 7. Non-shrinking formulation
 - 8. Approved for freeze/thaw environments

PART 3 - EXECUTION

3.01 INSPECTION

- A. Before cutting, examine the surface to be cut and patched and the conditions under which the Work is to be performed. If unsafe or otherwise unsatisfactory conditions are encountered notify the Architect immediately. Execute cutting (including excavation) fitting or patching of Work required to: make several parts fit properly; uncover Work to provide for installation or ill-timed Work; remove and replace defective Work; remove and replace Work not conforming to requirements of Contract Documents.

3.02 PREPARATION

- A. Temporary Support: To prevent failure provide temporary support of Work to be cut.
- B. Protection: Protect other Work during cutting and patching to prevent damage. Provide protection from adverse weather conditions for that part of the project that may be exposed during cutting and patching operations.

3.03 CUTTING AND CORING

- A. All new Work that requires cutting and coring of existing floors, walls, and/or roof penetrations measuring 4-1/2 in. or less, shall be performed by the Subcontractor of a Filed Sub-Bid Section. The General Contractor shall cut and core existing floors, walls, and/or roof penetrations for sizes not indicated by the Filed Sub-Bid sections.

3.04 PATCHING AND PARGING APPLICATION

- A. Preparation: All substrates shall be structurally sound, stable, dry, clean, and free of any substance or condition that may reduce or prevent proper adhesion.
 - 1. For direct-bond applications, the concrete surfaces must be clean and porous with a minimum concrete surface profile (CSP) of #2.
 - 2. Surface exposed to direct sunlight or wind must be dampened with a wet sponge before applying the cementitious mortar.
 - 3. Concrete substrates shall be saturated surface dry.
- B. Mixing: Mix thoroughly until the mixture becomes a smooth, homogenous, lump free paste. The paste remains workable for approximately 20 to 30 minutes at 70 deg. F.
- C. Application: The polymer modified cementitious mortar shall be applied at 1/8 in. to 1-1/4 in. in thickness in a single coat.
 - 1. Apply a thin skimcoat/bonding layer of polymer modified cementitious mortar into the substrate using a flat trowel.
 - 2. Immediately apply a build layer of polymer modified cementitious mortar into the fresh skimcoat at the thickness required to level and even the substrate in a single layer, up to maximum of 1-1/4 in.

3.05 PERFORMANCE

- A. General: Except as otherwise indicated or approved by the Architect, proceed with cutting and patching at the earliest feasible time and complete Work without delay.
- B. Cutting: Cut the Work using methods that are least likely to damage Work to be retained or adjoining Work. Where possible review proposed procedures with the original installer; comply with original installer's recommendations.
- C. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut through concrete and masonry using a cutting machine such as a carborundum saw or core drill to insure a neat hole. Cut holes and slots neatly to size required with minimum disturbance of adjacent Work. To avoid marring existing finished surfaces, cut or drill from exposed or finished side into concealed surfaces. Temporarily cover openings when not in use.
- D. Comply with requirements of applicable Sections of Divisions 31 where cutting and patching require excavating and backfilling.
- E. Patching: Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the Work.
- F. Where feasible, inspect and test patched areas to demonstrate integrity of Work.
- G. Restore exposed finishes of patched areas and where necessary extend finish restoration into retained adjoining Work in a manner, which shall eliminate evidence of patching and refinishing.
- H. Where removal of walls or partitions extends one finished area into another finished area, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance, remove existing floor and wall coverings and replace with new materials.
- I. Where patch occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing patch, after patched area has received prime and base coat.

3.06 CLEANING

- A. Thoroughly clean areas and spaces where Work is performed or used as access to Work. Remove completely, point mortar, oils, putty, and items of similar nature. Thoroughly clean piping, conduit, and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

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3.07 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

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SECTION 01 51 11

PROGRESS SCHEDULE

PART I - GENERAL

1.01 RELATED DOCUMENTS

- A. All the Contract Documents, including Drawings, General Conditions, Supplementary Conditions, and all Sections of Division 1 - General Requirements, apply to the Work of this Section.

1.02 DESCRIPTION OF WORK

- A. The Work of this Section shall include, but not be limited to, the following:
 - 1. Administrative and procedural requirements for the Contractor's Progress Schedule, which is required to be in a Critical Path Method (CPM) format.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
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 - 10. Section 10 14 00 – Signage
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 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 PRELIMINARY SCHEDULE

- A. Preliminary Submittal: Submit, within 10 calendar days following receipt of the Notice to Proceed, a detailed Project Schedule, in bar chart format.

1.05 PROGRESS SCHEDULE (CPM), SUBMITTALS

- A. Prepare the Progress Schedule required by the General Conditions in the form of a Critical Path Method network, to control work of this Contract and to provide a definitive basis for determining job progress. Require each principal subcontractor to provide detailed information about their own portion of the Work; include this information in the CPM Progress Schedule.
- B. Use commercially available CPM scheduling software to develop and maintain the schedule and to prepare and print spreadsheets, schedules, Gantt charts, and reports for the Project. The Contractor shall coordinate the required scheduling software with the Owner's designated representative. Prepare a spreadsheet listing activities, a network schedule showing the connections between activities, and Gantt Charts (bar charts) as required by this Section.

- C. Within 10 business days following receipt of the Notice to Proceed, submit the following to the Architect and Construction Manager for review:
 - 1. An illustration of a feasible CPM schedule for completion of the Work of the Contract within the time limits specified
 - 2. Sample format to be utilized for the detailed CPM in accordance with requirements of the Contract Documents
 - 3. Milestone dates
 - D. Upon approval of the draft submittal, prepare and submit the CPM network; prepare the schedule with spreadsheet information.
 - 1. Correlate the Progress Schedule with the Schedule of Values required under Section 01 00 00 – General Requirements, so that the value of the Work in place at any time can be definitively determined. Each activity on the CPM schedule shall appear on the Schedule of Values.
 - 2. Submit the full detailed schedule to the Architect and Owner for review and approval within 10 days following receipt of the Notice to Proceed, and at least 25 working days before the first Application for Payment is submitted. The Architect will not review any Application for Payment until the CPM schedule has been submitted and approved.
 - E. Submit 3 copies, and electronic file in format acceptable to the Architect, of the schedule for review by Architect and Owner. Make changes as directed by the Architect and resubmit within 10 calendar days.
 - 1. Acceptance and approval of the Construction Schedule by the Owner and Architect is a prerequisite to certification of the first Application for Payment.
 - 2. The Architect's approval of the Construction Schedule shall not relieve the Contractor of responsibility for timing, planning and scheduling of the Work, nor impose any duty on the Architect or Owner with respect to the timing, planning or scheduling of the Work.
 - F. After the initial schedule has been approved, print, and distribute colored copies of the approved schedule to the Architect, Owner, subcontractors, and other parties required to comply with scheduled dates. Place one copy in the job site file and post copies in the Project meeting room and temporary field office.
 - 1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities,
- 1.06 PROGRESS SCHEDULE, CONTENT AND FORMAT
- A. The Start Date for the CPM Progress Schedule shall be the date of the Notice to Proceed. The date for Final Completion, shall be 10 days after the date scheduled for Substantial Completion.
 - B. Classes of Work: List as separate classes of work on the spreadsheet and schedules:
 - 1. Each category of work listed in the Schedule of Values
 - 2. Activities by others that have to be coordinated with Contractor's work, such as:
 - a. Inspections by the Owner's Testing and Inspection Agency
 - b. Work by separate contractors
 - c. Architect's inspection at the time of Partial Completions and at the time of Substantial Completion
 - d. Additional subdivisions of work as the Contractor deems necessary to control the progress of the Work, or as requested by the Owner or Architect.
 - C. Input from Subcontractors: Require each Principal subcontractor to provide detailed information about their own Portion of the Work; include this information in the Progress Schedule.
 - D. Spreadsheet: On the spreadsheet for the Project, for each activity included in the spreadsheet, as a minimum the following information:
 - 1. A code number for the activity.
 - 2. Description of the activity
 - 3. Early and late start dates. These dates may not be changed after the activity has commenced and the actual start date has been inserted (see item10).

4. Duration
 5. Early and late finish dates. These dates may not be changed after the activity has been completed, and the actual finish date has been inserted (see item 10).
 6. Activity float
 7. Percentage completion
 8. Remaining duration
 9. Predecessor activities and successor activities, including start constraints for activities with no predecessor.
 10. Blank columns for Actual Start and Actual Finish dates, to be filled in with each monthly submission.
 11. Dollar amount for the activity.
 12. Number of tradesmen and laborers required for each activity ("manpower loading")
 13. Print in red activities on the critical path.
- E. CPM Schedule: On the CPM Schedule for the Project, show the order and interdependence of activities and the sequence in which work is to be accomplished, as planned by the Contractor. Show predecessor and successor activities; show the start of a given activity is dependent on completion of preceding activities and how its completion is necessary for the start of following activities.
1. Provide a path for each trade or significant type of work. Use the same breakdown of units of the Work as indicated for the spreadsheet.
 2. Arrange schedule to show graphically major sequences for Coordinating work; lead times required; float time allowed; all major categories of work and critical minor work units affecting overall work sequences. Show phased completion dates. Show dates when Owner will be moving in equipment, furniture, and fixtures.
 3. Break each trade or class of Work into specific activities, each of duration no longer than 20 calendar days, and structured by Work area, i.e., floors, wings, etc. Selection and number of activities shall be subject to Architect's approval. Non-construction activities (such as procurement and delivery) and such other activities which the Architect may approve, may be of longer duration. At a minimum, break out the following as separate activities, where they apply to a type of Work.
 - a. Construction activities
 - b. Fabrication
 - c. Delivery
 - d. Installation
 - e. Testing
 - f. Start-up
 - g. Instruction of Owner's Personnel
 4. Critical Path: Clearly define the Critical Path beginning with the Notice to Proceed and ending at Substantial Completion. Activities on the Critical Path shall have no (zero) float time indicated. Print in red activities which are on the critical path.
- F. Utilization of Float Time: It is intended by the Awarding Authority that the Work should progress as expeditiously as possible. To this end, the Contractor shall proceed with the start of each activity promptly upon the completion of the previous activity or activities on which it depends. If the Contractor completes an activity on the scheduled "early finish date" or sooner, the Contractor shall not expend the "float time" for that activity (if any) but rather reserve it as a safeguard against possible impediments or delays which may occur later in the progress of the Work. Float time is to be expended judiciously, for the benefit of the Project as a whole, and not for the convenience of the Contractor or the Owner. Neither the Contractor nor the Owner "owns" the project float time: the float time belongs to the Project.
- 1.07 MONTHLY REPORTS
- A. Report progress for the Project on a bi-weekly basis. Evaluate the status of the work as of the 25th of each month to show actual progress and identify, problem areas. Include Change Orders and Construction Change Directives within the updated schedule. With each Contractor Application for Payment, submit one (1) electronic copy, and three (3) colored copies of the complete update schedule, accompanied by a written narrative.

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

June 12, 2019

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

1.08 SUBMITTALS

- A. Provide submittals in accordance with requirements of Section 01 33 00 – Submittal Procedures, or as otherwise required for completion and transmittal of all documents required in accordance with requirements of the Contract Documents.

PART 2 – PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. Products, which include materials, equipment, and systems of assemblies of materials and equipment, shall conform to the requirements listed in each of Section of the Specifications. Provide connections, fasteners, accessory materials, trim, finish and other accessories needed for proper use, function and appearance.
 - 1. Where available, provide standard products of types which have been produced and used previously and successfully on other projects and in similar applications.
 - 2. Where additional amounts of a product, by nature of its application, are likely to be needed by Owner at a later date for maintenance and repair or replacement Work, provide a standard, domestically produced product which is likely to be available to Owner at such later date.
- B. Nameplates: Except as otherwise indicated for required approval labels, and operating data, do not permanently attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which shall be exposed in occupied spaces or on exterior of the Work.
 - 1. Labels: Locate required labels and stamps on a concealed surface, or where required for observation after installation, on an accessible surface which, in occupied spaces, is not conspicuous.
 - 2. Equipment Nameplates: Provide permanent nameplate on each item of service-connected or power operated equipment. Indicate manufacturer, product name, model number, serial number, capacity, speed, ratings, and similar essential operating data. Locate nameplates on an easily accessed surface which in occupied spaces, is not conspicuous.
- C. Products are specified by:
 - 1. The descriptive method: Listing qualities that they must possess
 - 2. The reference standard method: Listing published product standards
 - 3. The proprietary method: Listing one or more source names, which may include such information as name of manufacturer or fabricator, trade name, or catalog number
 - 4. A combination of the above three.
- D. Where a reference standard is specified, the edition of the standard in the current governing building code shall be followed. Where the standard is not listed in the building code, follow the edition current with the issue date of these Specifications.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.

6. Section 06 10 00 – Rough Carpentry
7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
9. DIVISION 09 – FINISHES; including all Sections contained therein.
10. Section 10 14 00 – Signage
11. Section 14 21 00 – Traction Elevators
12. Section 22 00 00 – Plumbing
13. Section 23 00 00 - HVAC
14. Section 26 00 00 – Electrical
15. Section 31 20 00 – Earth Moving

1.04 PRECEDENCE: QUALITY, REFERENCE STANDARD, AND SOURCE**A. Qualities:**

1. For the products specified by stated qualities or by the description, as well as by the reference standard or by the source, the specified qualities or description shall take precedence.
2. For a product specified only by stated qualities or by the description, provide materials, equipment or fabrications conforming to those qualities and description, suitable for the uses shown on the Drawings.

B. Reference Standards:

1. For product specified by reference to a published standard, as well as buy the source, the reference standard shall take precedence over the source.
2. For a product described only by reference standard, provide material, equipment or fabrications conforming to that reference standard, suitable for the use shown on the Drawings.

C. Procedures for Selecting Products: Contractor's options for selecting products are limited to Contract document requirements and governing regulations and are not controlled by industry traditions or procedures experienced by Contractor on previous construction projects. Required procedures include, but are not limited to, the following for various methods of specifying:

1. For a product described by manufacturer, manufacturer's brand name, or origin, with or without catalog number or model number, provide a product that conforms to the specified qualities and reference standards.
2. For a product specified by source and "no substitution", provide only that product specified. No request for substitution shall be considered.
3. For a product specified by one or more names, provide any one of the products specified. Where two or more sources are named, the choice is the Contractor's. Any other product shall be considered only if requested as substitution.
4. For a product specified by one or more source names and "or approved substitute", provide one of the specified products, or, submit a request for substitution for a product not named which the Contractor can demonstrate to be of equal or higher quality.
5. Performance Requirements: Provide products which comply with specific performances indicated, and which are recommended by manufacturer for overall application indicated. Overall performance of a product is implied where product is specified with only certain specific performance requirements.
6. Prescriptive Requirements: Provide products which have been produced in accordance with prescriptive requirements, using specified ingredients and components, and complying with specified requirements for mixing, fabricating, curing, finishing, testing and similar operations in manufacturing process.
7. Visual Matching: Where matching with an existing product or established sample is required, final judgement of whether a product proposed by the Contractor matches sample satisfactorily is the Architect's judgement. Where no product within specified cost category is available, which matches sample satisfactorily and complies with requirements, comply with Contract document provisions concerning, "Substitutions" and "Change Orders" for selection of a matching product outside established cost category or a product not complying with requirements.

1.05 CONTRACTOR'S OPTION

- A. Where an option (or choice) is specified, provide one or the other of the options. The choice of an option is the Contractor's. Where submittals are required, he shall state which option has been chosen by him.
- B. For economy of drawing, only one option is usually shown on the Drawings. If another option is elected by the Contractor, he shall adjust details, dimensions and physical settings to conform. The Contractor shall review adjustments and details with the Architect before implementation.

1.06 SPECIAL WARRANTIES AND SERVICE

- A. In addition to the warranty and correction Work provisions of the General Conditions, provide the following as specified:
 - 1. Special Warranties: A warranty or guarantee provide by the manufacturer, fabricator, supplier or installer and the Contractor providing specific representation of quality and fitness for a specific period. When also specified, a special warranty lists the actions the Contractor, his installer, supplier or manufacturer shall take to correct defective Work.
 - 2. Service: Specific programs of service that a manufacturer, fabricator, supplier or installer and the Contractor shall provide for a specific period of time. Service programs shall, as, specified, provide such Work as inspections, reports, parts, materials, and other products or Work needed to render the services.
- B. The Architect and Owner reserve the right to not accept unrequested warranties and guarantees offered by the Contractor, his installers or suppliers.
- C. Special warranties shall not be required to cover failure from:
 - 1. Hurricane, floods or acts of God;
 - 2. Misuse or improper maintenance by the Owner;
 - 3. Vandalism or misuse by the public after time of Substantial Completion.
- D. When defective Work is corrected under the special warranty provisions, the warranty period shall be extended by the period of time between Substantial Completion and the correction of the Work.

1.07 CERTIFICATION BY MANUFACTURERS OR INSTALLERS

- A. Provide where specified, as a submittal, certification by the manufacturer or installer that the product and its method of installation are suitable for:
 - 1. The type of construction and use of this product
 - 2. For the New England climate
 - 3. For the design intent expressed in the Contract Documents

1.08 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver handle and store products in accordance with manufacturer's recommendations and by methods which prevent damage, deterioration and loss, including theft.
- B. Control delivery schedule to minimize long term storage of products at site and overcrowding of construction spaces. Provide delivery/installation coordination to ensure minimum holding or storage times for products that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other sources of loss.

1.09 SUBMITTALS

- A. Provide submittals in accordance with requirements of Section 01 33 00 – Submittal Procedures

1.10 SUBSTITUTION REQUEST PROCEDURE

- A. For a period of 60 days after the start of Contract Time, the Architect will review written requests from the Contractor for changes in products, materials and methods of construction required by Contract Documents. These changes are considered request for "substitutions", and are subject to requirements hereof. Substitutions received after the 60-day commencement of Work may be considered rejected at the discretion of the Architect.

1. Work not defined as Substitutions: The requirements for substitutions do not apply to the following:
 - a. Specified Contractor options on products and construction methods.
 - b. Revisions to Contract Documents requested by Owner or Architect are "changes" not "substitutions".
 - c. Requested substitutions during bidding period, which have been accepted prior to Contract Date and included in Contract Documents.
 - d. Contractor's determination of and compliance with governing regulations and orders issued by governing authorities do not constitute "substitutions" and do not constitute a basis for change orders, except as provided for in Contract Documents.
 - B. Requests for Substitutions: Submit 3 copies of substitution request form provided herein, fully identified for product or method being replaced by substitution, including related specification Section and drawing number(s), and fully documented to show compliance with requirements for substitutions. Include product data/drawings, description of methods, samples where applicable, Contractor's detailed comparison of significant qualities between specified item and proposed substitution, statement of effect on construction time and coordination with other affected Work, cost information or, proposal, fabrication and installation procedures and Contractor's statement to the overall Work as a substitute to or -better-than Work originally indicated.
 - C. Conditions: Contractor's request for substitution shall be received and considered when extensive revisions to Contract Documents are not required and changes are in keeping with the general intent of Contract Documents; when timely, fully documented and properly submitted; and when one or more of the following conditions is satisfied, all as judged by the Architect. The review of substitution requests is an extra service of the Architect, limited by the Owner's authorization of the Architect to perform such services. The Owner will charge the Contractor for the Architect's processing of substitution requests, except when the Contractor can demonstrate that one of the following cases applies. Otherwise, requests shall be returned without action except to record non-compliance with these requirements.
 1. When the indicated product or method cannot be provided within the approved progress schedule, but not as the result of the Contractor's failure to Contract, order, purchase, fabricate, prepare other Work, or coordinate the Work well in advance of need.
 2. When the indicated product or method is not compatible with other products or Work, cannot be coordinated or fit into Work, or shall demonstrably have adverse effect on permanence, function or use of the Work.
 3. When the indicated product or method is not approved by public authorities.
 4. When the substitute request is made in response to a source specified as "Architect approved substitute".
- 1.11 PRE-INSTALLATION MEETING
- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS NOT USED**PART 3 - EXECUTION NOT USED**

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS**June 12, 2019****133 WILLIAM STREET, NEW BEDFORD, MA 02740**

Mount Vernon Group Architects, Inc., Project No. 02014.58

SUBSTITUTION REQUEST

Project: New Bedford City Hall – New Elevator Renovations Project No.: 02014.58
Owner: City of New Bedford
To: Mount Vernon Group Architects, Inc. From:
Architects: 47 N. Second Street
New Bedford, MA 02740
Attn: Mr. Jorge Figueiredo

CONTRACTOR'S REQUEST, WITH SUPPORTING DATA

1. Section of Specifications to which this request applies: _____
6 Digit Section number
☐ Product data for proposed substitution is attached (description of product, reference standards, performance and test data).
☐ Sample is attached ☐ Sample shall be sent if requested by Architect
2. Itemized comparison of proposed substitution with product specified.

ORIGINAL PRODUCT**SUBSTITUTION**

Name, brand:

Catalog No.:

Manufacturer:

Significant
Variation:

3. Unit cost of original product and proposed substitution. State whether cost is for _____ material only, or _____ material installed.
Original Product: \$ _____ per _____ Substitution: \$ _____ per _____
4. Proposed change in Contract Sum:
Credit to Owner: _____ Additional cost to Owner: _____
5. Proposed change in Contract Time:
Reduce/Increase Contract time by: _____ days.
6. Effect of the proposed substitute on other parts of the Work, or on other Contracts:
7. Reason for requesting substitution:

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

June 12, 2019

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

CONTRACTOR'S STATEMENT OF CONFORMANCE OF PROPOSED SUBSTITUTION TO CONTRACT REQUIREMENTS:

I/we have investigated the proposed substitution. I/we

1. believe that it is equal or superior in all respects to the originally specified product, except as stated in 2. above;
2. shall provide the same warranty in accordance with General Conditions 4.1.5.;
3. shall provide the same special warranty or guaranty as specified;
4. have included all cost data and cost implications of the proposed substitution;
5. shall pay redesign and special inspection costs caused by the use of this product;
6. shall pay additional costs to other Contractors caused by substitution;
7. shall coordinate the incorporation of the proposed substitution in the Work;
8. shall modify other parts of the Work as needed, to make all parts of the Work complete and functioning.
9. waive further claims for added cost to Contractor caused by the proposed substitution.

Contractor: _____

Date: _____

ARCHITECT REVIEW AND ACTION

- A. Provide more information in the following categories. Resubmit.
- B. Sign Contractor's Statement of Conformance. Resubmit.
- C. The proposed substitution is approved, with the following conditions:
- D. The following changes shall be made by change order:
 1. Addition/Deduction from the Contract Sum:
 2. Addition/Deduction from Contract Time:

Mount Vernon Group Architects, Inc.: _____

Date: _____

END OF SECTION

SECTION 01 71 00

CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All the Contract Documents, including Drawings, General Conditions, Supplementary Conditions, and all Sections of Division 1 - General Requirements, apply to the work of this Section.

1.02 DESCRIPTION OF WORK

- A. The Work of this Section shall include, but not be limited to, the following:
 - 1. Cleaning of the Project site and building interior during progress of the Work, and at completion of the Work, in accordance with requirements of the Contract Documents.
 - 2. Re-cleaning of areas affected by the new construction following completion of the Work.
 - 3. Polish existing concrete floor to match existing.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.

- B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.01 DURING CONSTRUCTION

- A. Execute periodic cleaning to keep the Work, the site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris, resulting from construction operations.
- B. Provide on-site containers for the collection of waste materials, debris and rubbish.
- C. Remove waste materials, debris and rubbish from the site periodically and dispose of at a legal disposal areas away from the site.

3.02 DUST CONTROL

- A. Clean interior and exterior spaces and surfaces upon completion of work.

3.03 FINAL CLEANING

- A. Employ skilled Workmen for final cleaning.
- B. Just prior to inspection for Final Completion, perform a complete cleaning of the project area including, without limitation the following:
 - 1. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.
 - 2. Sweep resilient flooring
 - 3. Vacuum carpet.
 - 4. Remove protective covers from, clean and polish exposed to view equipment, Mechanical and electrical fixtures, windows, hardware etc.
 - 5. Remove debris and dirt from concealed spaces such as ceiling plenums, chases, pipe and duct spaces.
 - 6. Clean electric light fixtures to allow for full efficiency.
- C. Owner will assume responsibility for cleaning as of the date designated on Certificate of Substantial Completion for the Owner's acceptance of project, or portion thereof.

3.04 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 01 77 00

CONTRACT CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, the following:
 - 1. Supplementary instructions regarding preparation for Contract closeout, including Punch-List, prerequisites to Substantial Completion and Final Inspection, Substantial Completion, Affidavit in regard to liens, submittals of guarantees and other Documents and instruction to Owner's personnel.
 - 2. Specific requirements for individual units of Work are specified in Sections of Division 2 through 31. Time of closeout is directly related to "Substantial Completion" for all phases of the Work and therefore shall be a series of time periods for the individual phases of the Work which have been certified as substantially complete at different dates.
- B. Acceptance testing of Mechanical and Electrical Systems shall be in accordance with requirements of 780 CMR, Chapter 13, and specified requirements of the Contract Documents.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all of the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 – HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 PUNCH-LIST AND FINAL INSPECTION

- A. In accordance with requirements of the General Conditions, when the General Contractor considers the Work to be substantially complete, for either entire Work or specified phases thereof, he shall notify the Owner and the Architect in writing that the Work shall be ready for final inspection on a definite date which shall be stated in the notice. Such notice shall be given at least 10 days prior to the date stated for final inspection.
 - 1. Written notice shall also be given to Owner and Architect by the General Contractor upon completion of any Work which was determined during the above referenced final inspection, to be incomplete, incorrect or unsatisfactory.

2. On receipt of such notice from the General Contractor, additional inspection(s) shall be made until completion of all Contract requirements is complete, as determined by the Architect.

- B. The Architect will review the General Contractor's punchlist and verify Substantial Completion for individual specified phases of the Work and the entire Work. Verification of Substantial Completion by the Architect is intended to be a final inspection of the Work to determine that the Work has been executed in accordance with requirements of the Contract Documents. Requests to the Architect by the General Contractor for verification of Substantial Completion of incomplete Work, or prior to receipt by the Architect of the General Contractor's punchlist, shall not be honored.

1.05 SUBSTANTIAL COMPLETION

- A. Upon determination of Substantial Completion for individual specified phases of the Work and the entire Work, the Architect will prepare a Certification of Substantial Completion in accordance with requirements of the Contract Documents. Unless specifically provided otherwise by the Architect in the Certificate of Substantial Completion, the General Contractor shall be responsible for providing full manufacturer warranties in accordance with requirements of individual trade Sections for specific product warranty requirements. As a result of the overlapping nature of Substantial Completion for the specified individual phases of the Work, the General Contractor shall be responsible for providing manufacturer warranties, the Effective Starting Date of which, shall commence upon Substantial Completion of Phase 1D of the Work, as described in the Contract Documents. Warranties shall run for the warranty period indicated in the respective trade Section.
 1. Upon written declaration of Substantial Completion by the General Contractor, the General Contractor shall show 100% completion for the specified individual phase of the Work claimed as substantially complete. The General Contractor shall include supporting documentation of Substantial Completion in accordance with requirements of the Contract Documents, and a statement showing an accounting of changes to the Contract Sum.
 - a. If 100% completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

1.06 SUBMITTAL OF DOCUMENTS AND PROCEDURAL REQUIREMENTS

- A. At the "Substantial Completion Stage" of the Contract, the General Contractor shall submit the following items to the Architect for transmission to the Owner:
 1. Certificates of inspection applicable to the Work evidencing compliance with governing regulations, including:
 - a. Certificates of Occupancy
 - b. Certificates of inspection of elevators
 - c. Certificates of inspection for mechanical Work
 - d. Certificates of inspection for electrical Work
 2. Certifications, testing and balancing reports, and similar information substantiating that project conforms to requirements of the Contract Documents and is fully operational.
 3. Start-up performance reports and video recordings of all equipment start-up and routine maintenance.
 4. Change over information related to Owner's occupancy, use, operation and maintenance, including final meter readings, if applicable.
 5. Change-over from construction keying to final keying. Turn over keys and keying schedule to Architect for delivery to the Owner.
 6. Application for reduction in retainage, and consent of surety.
 7. List of incomplete Work, which is to be attached to the Architects Certificate of Substantial Completion as a clarification.
 8. Complete project Operational and Maintenance Manuals, assembled in three ring binders.
 9. One copy of each special warranty required by the Contract Documents, endorsed by the General Contractor, and in a form reasonably acceptable to the Architect. If the Architect accepts unbound warranties at this time, those warranties shall be returned to the General Contractor for binding into the Warranty Binders specified below.

- a. Warranties required by the Contract Documents for Work cited as not complete on the punch list shall commence when such Work is accepted as complete by the Architect, unless otherwise provided in the Certificate of Substantial Completion.
 - B. Remove construction facilities and temporary controls, except those that are required to complete punch-list Work.
 - C. At "Final Completion" the General Contractor shall prepare closeout submittals and submit to the Architect prior to "Final Completion", allowing at least 15 Working days time for review.
 1. Project record Documents marked with changes made during construction.
 2. Copy of approved shop drawings or installed drawings for all phases of the Work.
 3. Project warranties (guarantees) and maintenance agreements, assembled in 3 ring binders.
 4. Spare parts neatly wrapped or packaged in standard sizes and clearly labeled.
 5. Final construction photographs.
 6. Certified building location survey.
 7. Certificate of insurance for products and completed operations.
 8. Consent of Surety to Final Payment.
 9. An affidavit that all bills and indebtedness connected with the Work has been paid.
 10. Typed list of Subcontractors and major Material Suppliers. (Shall include address, telephone number and name of individual to Contract regarding this project.
 11. Waivers of lien from all Subcontractors and suppliers, or bond satisfactory to the Owner indemnifying Owner against all liens or other claims.
 12. Proof that all taxes, fees and similar obligations have been paid.
 13. Additional change over information which may be required by Owner's lender and Owner's property insurer.
 14. Records of training sessions and videos for Owner's personnel to instruct them in the operation of equipment and controls, to document completion of training.
 15. Deliver tools, spare parts, extra stock, and similar items.
 16. Complete final clean-up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred and exposed finishes.
 - D. Complete punch list items or, if acceptable to the Owner, furnish proposed schedule for completion and assurances that Work not completed and accepted shall be completed without undue delay. The Architect will re-inspect the Work to determine whether it is complete.
 - E. The General Contractor shall complete all the items stated in the Closeout Procedures within 45 days of date of the Certificate of Substantial Completion. Failure to complete the closeout requirements within the allowed time frame will require the Owner to charge back all costs of the Architect, Project Manager and other Consultants which the Owner requires for the completion of the project closeout. The Architect will process this by preparing a Final Change Order, reflecting adjustments to the Contract Sum not previously made by other Change Orders.
- 1.07 AFFIDAVIT IN REGARD TO LIENS
- A. A valid "Contractor's Affidavit in regard to Liens", which certifies the following, must be submitted with "Request For Final Payment".
 1. The undersigned hereby certifies that all Work required under the above Contract has been performed in accordance with the terms thereof, that all material, men, Subcontractors, mechanics and laborers have been paid and satisfied in full and that there are no outstanding claims of any character arising out of the performance of the Contract which have been paid and satisfied in full.
 2. The undersigned further certifies that to the best of his knowledge or belief, there are no unsatisfied claims for damages resulting from injury or death to any employees, Subcontractors or the public at large arising out of the performance of the Contract, or any suits or claims for any other damage of any kind, nature or description which might constitute a lien upon the property of the Owner.

3. General Contractor shall provide a written guarantee in a form acceptable to the Owner and Architect at Substantial Completion.

1.08 INSTRUCTION OF PERSONNEL

- A. General Contractor shall provide free instruction, including video tape instruction, in the proper use of all installed equipment to designated representative of the Owner.
- B. Instruction of the Owner's Maintenance Supervisor in the proper methods of cleaning and maintaining all of the finished surfaces and the proper method of replacement of the consumable items shall be part of this Work.

1.09 OPERATIONAL AND MAINTENANCE MANUALS

- A. Prior to date of substantial completion, submit to the architect Maintenance and Operational Manuals in accordance with requirements of Section 01 78 39 - Project Record Documents. Include operations and maintenance information for all items of equipment, and maintenance information for all products which may require special care, such as carpet and special finishes, whether or not a submittal is specifically required by technical Sections of these specifications.

1.10 FINAL INSPECTION

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following: List exceptions in the request.
 1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and complete operations where required.
 2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
 3. Submit a certified copy of the Architects final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.
 4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion, or when the Owner took possession of and responsibility for correcting elements of the Work.
 5. Submit consent of surety to final payment.
 6. Submit final liquidated damages settlement statement.
 7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All the Contract Documents, including Drawings, General Conditions, Supplementary Conditions, and all Sections of Division 1 - General Requirements, apply to the Work of this Section.

1.02 DESCRIPTION OF WORK

- A. The Work of this Section shall include, but not be limited to, maintaining at the site for the Building Superintendent one record copy of the following:
 - 1. Drawings
 - 2. Specifications
 - 3. Addenda
 - 4. Change Orders and other Modifications to the Contract
 - 5. Architect's Field Orders or written instructions
 - 6. Approved Shop Drawings, Product Data and Samples
 - 7. Field Test Records

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 GENERAL REQUIREMENTS

- A. Provide all necessary equipment, including but not limited to, lockable files, racks, and secure storage as required to maintain storage of documents and samples in a clean, dry, legible condition and in good order.
- B. Documents and samples shall be filed in accordance with data Filing Format of the Uniform Construction Index.
- C. Record Documents shall not be used for construction purposes.
- D. Make Documents and samples available at all times for inspection by Architect/Engineer.

- E. Provide felt tip marking pens for recording information in the color code designated by the Architect.

1.05 RECORDING

- A. Label each document "PROJECT RECORD" in neat large printed letters located in the bottom right hand corner.
- B. Record information concurrently with construction progress.
 - 1. Do not conceal any Work until required information is recorded.
- C. Drawings shall be legibly mark daily to record actual construction, as follows:
 - 1. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 2. Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the structure.
 - 3. Field changes of dimensions and detail.
 - 4. Changes made by Field Order or by Change Order.
 - 5. Details not on original Contract drawings.
 - 6. Record Drawings shall be updated each Working day. Monthly pay requisitions shall not be processed if record drawings are not up to date.
- D. Individual Specification Sections and Contract Document Addenda shall be legibly marked to record the following.
 - 1. Manufacturer, trade name, catalogue number, and supplier of each product and item of installed equipment.
 - 2. Changes made by Field Order or by Change Order.

1.06 SUBMITTALS

- A. Provide submittals in accordance with requirements of Section 01 33 00 – Submittal Procedures in accordance with requirements of the Contract Documents.
- B. Prior to Contractor claim of Substantial Completion for specified phases of the Work and the entire Work, the Contractor shall deliver Record Documents to the Architect for review and approval.
- C. Upon receipt of approval of Record Documents from the Architect, the Contractor and Subcontractors shall transfer the as-built information shown on the Record Drawings onto compact disc, in a format compatible with equipment and programs provided under the Work of Section 01 50 00 – Temporary Facilities and Controls, or as otherwise required by the Owner.
- D. Submission of accurate record drawings and their approval shall be a condition precedent to final payment.
- E. Submittals of Record Documents shall be accompanied with transmittal letter in duplicate, containing the following information:
 - 1. Date
 - 2. Title and number of each Record Document
 - 3. Signature of the Contractor or his authorized representative

1.07 OPERATIONS AND MAINTENANCE MANUALS

- A. Prior to Contractor claim of Substantial Completion for specified phases of the Work and the entire Work, submit Operation and Maintenance (O&M) manuals to the Architect for review. Generally, include operation and maintenance information for all items of equipment, and maintenance information for all products which may require special care, such as carpet and special finishes, whether or not a submittal is specifically required by the technical Sections of these specifications.
 - 1. Include complete schematic, electrical and connection diagrams for each item of equipment.
 - 2. Include instructions for installation, start-up. Operation, inspections, maintenance, parts lists and data sheets.
 - 3. On manufacturer's printed literature, where the literature covers more than one model, indicate by check mark or circle in ink the correct model number and data for the model number.

- B. Arrange manuals, instruction books, diagrams, etc. in the order and manner prescribed by the Owner. In the absence of other instructions from the Owner, organize the operation and maintenance manuals as described in this Article.
- C. Bind instruction books in hard durable covers supplied by the manufacturer, or in 3-ring binders with vinyl covers.
 - 1. Identify each volume on front and spine with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS," title of Projects, identity of subject matter covered in each volume.
 - 2. Inside cover and Title Page shall repeat information on the cover and identify the General Contractor, name of responsible principal, address and telephone number.
 - 3. Provide Table of Contents for each volume, arranged in systematic order, neatly type written. Organize information by systems, following the sequence of the table of contents of the Project Manual.
 - 4. Separate products and systems within the binder by tabbed and labeled dividers.
 - 5. For each item or system, Include the name, address and phone number of the Subcontractor who furnished and/or installed the equipment, the name(s) and telephone numbers of the Subcontractor's representative to be contacted in the event of an emergency, and the name, address and phone number of the nearest service facility authorized by the manufacturer.
- D. Require each manufacturer to prepare/provide information on its own products. In those instances where equipment or controls are job-assembled by a Subcontractor, then require that the Subcontractor prepare maintenance instructions.
- E. Information for complex systems, such as elevators and handicap lifts, may be separately bound. Include a tabbed divider for the system and insert a page directing the reader to the separate volume, or include a clear cross reference in the table of contents.
- F. Submit one review copy of the fully compiled data in final form. The Architect will review the copy and return it with comments. Upon receipt of approval of O&M Manuals from the Architect and OPM, the Contractor and Subcontractors shall resubmit one (1) corrected and bound hard copies, and three (3) electronic disk copies in a format compatible with equipment and programs provided under the Work of Section 01 50 00 – Temporary Facilities and Controls.

1.08 WARRANTIES AND GUARANTEES

- A. Prior to Contractor claim of Substantial Completion for specified phases of the Work and the entire Work, assemble two (2) executed copies of each warranty, bond, and service and maintenance Contract required for the project. Warranties are specified in the respective trade Sections of the specifications.
- B. Bind these in 3-ring loose leaf binders with vinyl covers
 - 1. Identify each volume on front and spine with typed or printed title "WARRANTIES," title of Projects, identity of subject matter covered in each particular volume.
 - 2. Inside cover and Title Page shall repeat information on the cover and identify the General Contractor, name of responsible principal, address and telephone number.
 - 3. Table of contents: For each volume, arrange in systematic order, neatly type written.
- C. For items of Work delayed beyond Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

1.09 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification Sections.
- B. Deliver to Project site and place in location directed. Obtain receipt prior to final payment.

1.10 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

June 12, 2019

PART 2 – PRODUCTS NOT USED

PART 3 – EXECUTION NOT USED

END OF SECTION

SECTION 01 91 15

GENERAL TESTING REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All the Contract Documents, including Drawings, General Conditions, Supplementary Conditions, and all Sections of Division 1 - General Requirements, apply to the Work of this Section.

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, the following:
 - 1. General testing requirements and procedures
 - 2. Acceptance testing in accordance with provisions of 780 CMR 120 of all HVAC, and electric power distribution systems, including operational features and controls
 - 3. Responsibilities of the Contractor
 - 4. Responsibilities of the Owner

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 SUBMITTALS

- A. Provide submittals in accordance with requirements of Section 01 33 00 – Submittal Procedures, or as otherwise required for completion and transmittal of all documents required in accordance with requirements of the Contract Documents.

1.05 REQUIRED TESTING

- A. The Owner will employ independent testing agencies to perform field and lab tests unless otherwise specified or indicated in other Sections of these Specifications. This testing will be paid for by the Contractor, unless otherwise specified or indicated. Employment of Testing Laboratory shall in no way relieve Contractor of his obligation to perform Work in accordance with the Contract. The Contractor shall provide standard factory testing, certification of compliance with specified requirements, testing for fire performance, and other tests as specified or indicated. Contractor employed testing agencies must be approved by the Architect.
- B. Electrical Power System Testing: At least the following tests will be performed. Where noted with an asterisk*, the test shall be performed and paid for by the installing Contractor and witnessed by the Owner's Representative.
 - 1. Polarity tests*
 - 2. Operation of all circuits*
 - 3. Ground megger tests*
 - 4. Megger tests of all circuits*
 - 5. Hi Pot and Dielectric tests of all high voltage cables, connections, oil-filled equipment, and the like*
 - 6. Lab tests to verify quality of all materials and components
- C. Electrical Lighting System Testing: At least the following tests shall be performed, paid for by the installing Contractor and witnessed by the Owner's Representative.
 - 1. Operation of every component of entire system
- D. Fire Alarm System Testing: At least the following tests will be performed. The tests shall be performed and paid for by the installing Contractor and witnessed by the Owner's on-site representative.
 - 1. All smoke and heat detectors.
 - 2. Proper operation as required by authorities having jurisdiction*

1.06 TESTING REQUIREMENTS AND PROCEDURES

- A. The Contractor shall fully cooperate with testing agencies and permit free access to all areas at all times. The Contractor shall permit taking samples at any time during construction, either before or after installation. The Contractor shall furnish casual labor and facilities to provide access to Work being tested, to obtain and handle samples at the site to facilitate inspections and tests and provide for Laboratory's exclusive use storage and curing for test samples. Prior to notice to proceed with construction, the Contractor shall submit a Testing Log of planned tests and scheduled test dates. Tests shall be numbered based on type of Work, type of test, and sequence. The Testing Log shall be maintained by the Contractor and updated weekly. The Contractor shall notify the Owner in writing at least fourteen calendar days prior to any Work requiring testing. The Contractor shall coordinate, arrange and fully administer to all testing, whether paid by or employed by the Owner or the Contractor.
- B. The Contractor shall distribute test results as follows:
 - 1. Contractor (2 copies)
 - 2. Architect (2 copies)
- C. The final Testing Log, including final acceptable tests, shall be turned over to the Owner, with four copies delivered to the Architect.
- D. The Contractor and the Owner will note the test record on the Testing Log to acknowledge test procedures and results. If follow-up or corrective action is needed, the Contractor shall submit to the Owner two written copies of proposed follow-up or corrective plans and obtain the Owner's written approval before proceeding. Costs for additional inspections, sampling and testing required when initial tests indicate Work does not comply with Contract Documents will be deducted from Contractor's monthly payments.

E. FUNCTIONAL PERFORMANCE TESTS

1. Functional testing is to be performed by the Contractor's testing agency. Testing should be witnessed by the installer and manufacturer, if possible, as referenced in the procedures listed below. The testing procedures are the same as long as the products are all newly installed, and there are no other procedures or methods identified in the Spec by the Architect. In some situations the Installer will perform their own field testing to ensure that their means and methods are suitable to meet the Performance requirements outlined in the Project Specs. This should never replace testing performed by a Contractor retained Independent Testing agency, unless deemed appropriate by the Architect.
2. As a minimum, tests shall be performed on a mock-up installation and at least on one more occasion after 50% completion during production work. Field Testing should be performed for Air Leakage Resistance and Water Penetration Resistance as soon as possible after installation of a mock-up assembly begins and the selected fenestration product is determined to be ready for testing by the installer. If failure occurs, additional testing should be performed to determine the source of the failure and no additional installation should occur until the mock-up assembly meets the Project Requirements.
3. Tests should be performed on a representative type and number of fenestration products at the discretion of the Architect. It is best if testing occurs prior to installation of interior finishes so that all areas around the product being tested may be observed for water leakage, and it makes setting up the test chamber easier and more effective.

1.07 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

June 12, 2019

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SECTION 02 41 13

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, Labor and Materials as required to complete the following:
 - 1. Remove doors, windows, metal access panels, and all related attachments.
 - 2. Remove exhaust metal piping.
 - 3. Remove metal gutters, downspouts, and all related attachments.
 - 4. Remove electrical wires, metal conduits, and all related attachments.
 - 5. Remove, store, and relocate display cases and metal storage shelves.
 - 6. Remove cabinet unit heater and all related attachments
 - 7. Remove CMU, brick wythe, cast stone band and sill.
 - 8. Remove sink, piping, and all related attachments
 - 9. Remove casework, countertop, shelving, and all related attachments
 - 10. Remove ceiling mounted air conditioning unit and all related attachments
 - 11. Remove concrete slab on grade
 - 12. Remove mechanical louver and all related attachments
 - 13. Remove plaster walls, gypsum wallboard, wood panels, fiber ceilings, studs, and all related attachments.
 - 14. Remove guardrails and all related attachments
 - 15. Remove built-up roof, flashings, gravel, metal fascia and all related attachments
 - 16. Relocate existing condensing unit at a temporary location as shown in the architectural drawings. The existing condensing unit shall remain operational during construction at the temporary location. After renovation Work is completed, the existing condensing unit shall be relocated at a final location as shown in the mechanical drawings.
 - 17. Scheduling and sequencing operations without interrupt utilities serving occupied areas. If interruption is required, obtain written permission from the utility company and the Owner. Provide temporary services as necessary to serve occupied and usable facilities when permanent utilities must be interrupted, or schedule interruption when the least amount of inconvenience will result.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.

6. Section 06 10 00 – Rough Carpentry
7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
9. DIVISION 09 – FINISHES; including all Sections contained therein.
10. Section 10 14 00 – Signage
11. Section 14 21 00 – Traction Elevators
12. Section 22 00 00 – Plumbing
13. Section 23 00 00 - HVAC
14. Section 26 00 00 – Electrical
15. Section 31 20 00 – Earth Moving

1.04 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to the Owner, ready for reuse, at a location designated by the Owner. Protect from weather until accepted by Owner.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated. Protect from weather until reinstallation.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.05 MATERIALS OWNERSHIP

- A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques, antiques, and other items of interest or value to the Owner that may be encountered during selective demolition remain property of the Owner. Carefully remove each item or object in a manner to prevent damage and deliver promptly to a location acceptable to the Owner.

1.06 SUBMITTALS

- A. Provide submittals in accordance with requirements of Section 01 30 00 of the Contract Documents
- B. Provide qualification data for demolition firm, professional engineer, and refrigerant recovery technician.
- C. Provide schedule of demolition activities, including but not limited to, the following:
 1. Detailed sequence of demolition and removal work, with starting and ending dates for each activity. Schedule shall ensure that the Owner's building and on-site operations are uninterrupted.
 2. Interruption of utility services, including dates and duration of interruption.
 3. Coordination for shutoff, capping, and continuation of utility services.
 4. Means of protection for items to remain.
- D. Provide an inventory list of items that have been removed and salvaged following completion of the Work of this Section.
- E. Provide photographs and videotapes showing existing conditions of adjoining construction and site improvements, prior to commencement of the Work of this Section that may be misconstrued as damage caused by the Work of this Section.

1.07 QUALITY ASSURANCE

- A. Examination of Existing Conditions: The Contractor shall examine the Contract Drawings for demolition and removal requirements and provisions for new work. Verify all existing conditions and dimensions before commencing work. The Contractor shall visit the site and examine the existing conditions as he finds them and shall inform herself/himself of the character, extent and type of demolition and removal work to be performed. Submit any questions regarding the extent and character of the demolition and removal work in the manner and within the time period established for receipt of such questions during the bidding period.
- B. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Standards: Comply with ANSI A10.6 and NFPA 241.
- E. Pre-demolition Conference: Review methods and procedures related to selective demolition including, but not limited to, the following:
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review structural load limitations of existing structure.
 - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 - 5. Review areas where existing construction is to remain and requires protection.

1.08 PROJECT CONDITIONS

- A. Owner Occupancy:
 - 1. The existing New Bedford Police Station Headquarters will be occupied during the Work of this Contract. Insure any impact or disruption to these occupants is kept to a minimum. The Contractor shall employ all measures necessary to protect the existing buildings and adjacent property from damage caused by the Work of this Contract.

1.09 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

1.10 CUTTING AND CORING

- A. The installation of new Work that requires coring of floors, walls, and/or roof penetrations measuring 4-1/2 in. or less shall be performed by the Subcontractor of Filed Sub-Bid Sections. The General Contractor shall cut and core floors, walls, and/or roof penetrations for sizes not indicated by the Filed Sub-Bid Sections.

1.11 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS

2.01 GENERAL

- A. All Repair materials shall be compatible with existing materials to remain and shall be as approved by the Architect.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Designer.
- E. Engage the services of a professional engineer registered in the Commonwealth of Massachusetts to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.
 - 1. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.
- F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- G. Utility Services:
 - 1. Existing utility services shall be maintained to existing facilities. Provide a minimum three (3) day notice of service shutdown to the Owner.
 - 2. Shut-off all utilities shall be conducted by the Contractor in compliance with requirements of authorities having jurisdiction.
- H. Site Access and Temporary Controls:
 - 1. Existing streets and walks shall remain open at all times. Maintain all existing building access and egress capabilities as required by local authorities having jurisdiction
 - 2. Provide and maintain temporary protection, including chain link fencing as necessary.
 - 3. Provide and maintain protection around existing trees and plantings located on adjacent property.
- I. Temporary Facilities:
 - 1. Provide and maintain temporary barricades to prevent injury to people.
 - 2. Provide and maintain temporary weather protection as required.
 - 3. Provide and maintain protection of existing finish work to remain.
 - 4. Provide and maintain protection of existing interior furnishings and equipment.
 - 5. Provide and maintain protection of exterior site improvements to remain, including on adjacent property.
- J. Provide and maintain temporary weather-tight enclosure for building exterior as required.
- K. Provide and maintain temporary shoring of existing structural building components to remain, including but not limited to, structural steel, brick masonry walls, and concrete floors and wood roof framing.
- L. Items to be removed and salvaged shall be cleaned, stored, and transported to the Owner's designated storage area.
- M. Items to be removed and reinstalled shall be cleaned, repaired, stored, and reinstalled as required.
- N. Existing items to remain shall be protected against damage during construction.

- O. Cleaning and Disposal: All waste and debris caused by the Work of this Section shall be legally disposed of off site, daily, at a facility licensed to receive and process building demolition debris. Burning shall not be permitted. Provide original Bills of Lading to the Owner in accordance with requirements of the Owner.

3.02 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Comply with requirements for access and protection in accordance with requirements of Division 01.
 - 2. Maintain adequate passage to and from all exits at all times. Before any work is done which significantly alters access or egress patterns, consult with the Designer and obtain approval of code required egress. Under no condition block or interfere with the free flow of people at legally required exits, or in any way alter the required condition of such exits.
- B. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.
 - 2. Remove temporary shoring, bracing and structural supports when no longer required.
 - 3. Post warning signs and place barricades as applicable during placement and removal of temporary shoring.
- C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around demolition area(s).
 - 1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction. Provide temporary barricades as required to limit access to demolition areas.
 - 2. Protect existing site improvements, appurtenances, and landscaping to remain.
- D. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with demolition operations.

3.03 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 - 5. Maintain adequate ventilation when using cutting torches.
 - 6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - 7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 - 8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 9. All waste and debris caused by the Work of this Section shall be removed and legally disposed of daily, in accordance with requirements of Section 01 50 00 - Temporary Facilities and Controls.

- B. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to storage area designated by the Owner.
 - 5. Protect items from damage during transport and storage.
- C. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Designer, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.
- E. Items for Re-use and Preservation of Existing Surfaces to Remain:
 - 1. The Contractor shall inspect closely each item specifically designated to be relocated, re-used, or turned over to the Owner prior to its removal, and immediately report damages and defects to the Designer and Owner. The Contractor shall be responsible for any subsequent damage to the same other than latent defects not readily apparent from close inspection, and shall bear responsibility for its repair or same replacement as directed by the Designer.
- F. Unless special surface preparation is specified under other Specification Sections, leave existing surfaces that are to remain in a condition suitable to receive new materials and/or finishes.

3.04 PROTECTION OF PUBLIC AND PROPERTY

- A. Provide all measures required by federal, state and municipal laws, regulations, and ordinances for the protection of surrounding property, the public, and workmen during all demolition and removal operations. Measures are to be taken, but not limited to installation of sidewalks, sheds, barricades, fences, warning lights and signs, trash chutes and temporary lighting.
- B. Protect all walks, roads, streets, curbs, pavements, trees and plantings, on and off premises, and bear all costs for correcting such damage as directed by the Designer.
- C. Demolition shall be performed in such a manner that will insure the safety of adjacent property. Protect adjacent property from damage and protect persons occupying adjacent property from injuries which might occur from falling debris or other cause and so as not to cause interference with the use of other portions of the building, of adjacent buildings or the free access and safe passage to and from the same.
- D. Every precaution shall be taken to protect against movement or settlement of the building, of adjacent buildings, sidewalks, roads, streets, curbs and pavements. Provide and place at the Contractor's own expense, all necessary bracing and shoring in connection with demolition and removal work.
- E. Remove portions of structures with care by using tools and methods that will not transfer heavy shocks to existing and adjacent building structures, both internal and external of the particular work area.
- F. Provide and maintain in proper condition, suitable fire resistive dust barriers around areas where interior demolition and removal work is in progress. Dust barriers shall prevent the dust migration to adjacent areas. Remove dust barriers upon completion of major demolition and removal in the particular work area.

3.05 DISCOVERY OF HAZARDOUS MATERIALS

- A. If hazardous materials, such as chemicals, asbestos-containing materials, or other hazardous materials are discovered during the course of the work, cease work in affected area only and immediately notify the Designer of such discovery. Do not proceed with work in such areas until instructions are issued by the Designer. Continue work in other areas.
- B. If unmarked containers are discovered during the course of the work, cease work in the affected area only and immediately notify the Designer of such discovery. Do not proceed with work in such areas until instructions are issued by the Designer. Take immediate precautions to prohibit endangering the containers integrity. Continue work in other areas.

3.06 CUTTING

- A. Perform all cutting of existing surfaces in a manner which will ensure a minimal difference between the cut area and new materials when patched. Use extreme care when cutting existing surfaces containing concealed utility lines which are indicated to remain and bear full responsibility for repairing or replacement of all such utilities that are accidentally damaged.
- B. Provide a flush saw cut edge where pavement, curb and concrete removals abut new construction work or existing surfaces to remain undisturbed.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Comply with requirements of Division 1, and the following.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.

3.08 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by the Work of this Section. Premises shall be left in a clean condition and ready to accept alteration work and new construction.

3.09 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls,

END OF SECTION

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

June 12, 2019

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SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section shall include, but not be limited to, furnishing and installation of the following:
 - 1. All cast-in-place concrete as shown and noted on the Drawings, including but not limited to, footings, walls, slabs on grade, slabs on deck, and insulating concrete roof deck system.
 - 2. Extruded high density polystyrene foam insulation
 - 3. Finishing.
 - 4. Control joints and joint fillers
 - 5. Sealing and curing of cast-in-place concrete

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following Divisions:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 INTENT OF WORK

- A. Except as specified otherwise herein, concrete shall be batched, mixed, placed, tested, and cured in accordance with the American Concrete Institute's "Structural Concrete for Buildings" ACI 301.
- B. Subcontractor shall schedule his Work and notify all trades in ample time so that provision for their Work can be made without delaying the progress of the project.
- C. It is the intention of the Drawings and specifications to produce concrete which will present an acceptable finished appearance. Imperfections of material or Workmanship shall be corrected as the Engineer directs, at the Sub-Contractor's expense.

- D. All the Work that is to be inserted in the forms for attachment of other Work is not described in detail. Sub-Contractor shall carefully examine all drawings and other Sections of these specifications for the extent and detail of all such Work and coordinate this Work with other trades.
- E. It will be the Subcontractor's responsibility to insure all concrete surfaces are completely free of any conditions which will adversely affect its finished appearance or the application of a specified finish.
- F. Failure to comply with these requirements will require removal of sufficiently large Sections of the Work, as determined by the Architect and Engineer, to properly integrate the Section to be replaced with the architectural and structural requirements of the total project. All such removal and replacement shall be made at the expense of the Subcontractor at no additional cost to the Owner.

1.05 QUALITY ASSURANCE

- A. Except as modified by the requirements specified herein and/or the details on the Drawings, all Work included in this Section shall conform to the applicable provisions of the following codes and standards:
 - 1. 2015 International Building Code
 - 2. Massachusetts State Building Code 780 CMR, 9th Edition
 - 3. American Concrete Institute (ACI):
 - a. "Building Code Requirements for Reinforced Concrete", ACI 318-14, Latest Edition.
 - b. "Specifications for Structural Concrete for Buildings". ACI 301-14 and ACI SP-09, Latest Edition.
 - c. ACI 302.1R-04, "Guide for Concrete Floor and Slab Construction", Latest Edition.
 - d. ACI 304.R-00 "Guide for Measuring, Mixing, Transporting and Placing Concrete", Latest Edition.
 - e. Committee ACI 305R-10, "Hot Weather Concreting", Latest Edition.
 - f. Committee ACI 306R-10, "Cold Weather Concreting", Latest Edition.
 - 4. American Society for Testing and Materials (ASTM): The specifications and standards hereinafter referred to latest editions, including but not limited to, ASTM E 1155-96 (Reapproved 2001), Standard Test Method for Determining F_F Floor Flatness and F_L Floor Levelness, Latest Edition.
- B. Laboratory Tests and Mix Designs
 - 1. General: Testing of cement and aggregate analysis will be performed by a qualified testing laboratory selected and paid for by the Owner. The laboratory shall perform all tests requested and authorized by the Architect and noted in the statement of special inspections. Tests and services shall consist of the following:
 - a. Test results of Portland cement in accordance with ASTM C150 and C114 shall be furnished by the Concrete supplier.
 - b. Analysis of aggregates in accordance with ASTM C33, and sieve analysis of fine and coarse aggregates in accordance with ASTM C136.
 - 2. Samples: Subcontractor shall furnish and deliver identified samples of all materials required for analysis and tests in the amounts required by the Testing Laboratory, without charge. The samples will be selected by the Architect or the Testing Laboratory. Deliver samples of cement and aggregates to the Testing Laboratory at least 30 days prior to use on the job.
 - 3. Mix Designs:
 - a. All mix designs shall be proportioned in accordance with Section 4.4 (trial batches) of ACI 318-95. Cost of mix design preparation shall be paid by the Subcontractor. If trial batches are used, they shall be prepared by a recognized independent testing laboratory approved by the Architect. All mix designs for each class of concrete must be approved by the Architect prior to their use in the project. Sub-Contractor shall be responsible for incorporating into the structure concrete of the minimum strengths specified.
- C. Environmental Conditions
 - 1. Cold Weather Requirements:
 - a. Concrete shall not be mixed or placed when the temperature is below 40 degrees F. or when conditions indicate that the temperature will fall below 40 degrees F. within 72 hours, without adequate protection approved by the Architect.

- b. Concrete temperature shall be maintained, when deposited, at not less than 60 degrees F. In cold weather, the reinforcement, forms, and ground which concrete will contact must be completely free of frost.
 - c. The concrete and formwork must be kept at a temperature of not less than 50 degrees F. for not less than 72 hours after placing.
 - 2. Hot Weather Requirements: The maximum placing temperature of the concrete, when deposited, shall be 90 degrees F. If the weather causes the placing temperature to exceed 90 degrees F., the mix shall be cooled by wetting the aggregate or other appropriate method as approved by the Architect.
 - D. Field inspection and testing of concrete shall be in accordance with Chapter 17 of the Massachusetts State Building Code.
- 1.06 SUBMITTALS
- A. Provide concrete mix design (including admixtures), test reports, mill certification for Portland Cement, certification for Aggregate non-reactivity, ACI certification of concrete plant, and all other required materials in accordance with requirements of this Section and the Contract Documents.
 - B. Submit shop and erection drawings for reinforcing steel (electronically) and manufacturer's data for other associated products for Architect's review.
 - C. Provide shop drawings for fabricating and placing reinforcing steel. Show all required information for cutting, bending and placing reinforcing bars, and show all accessories and support bars on placing drawings. Indicate suitable marks for placing bars.
 - D. Fabrication of any material or performing of any work prior to the final approval of the shop drawings will be entirely at the risk of the Contractor.
 - E. The Contractor is responsible for furnishing and installing materials called for in Contract Documents, even though these materials may have been omitted from reviewed shop drawings.
 - F. Before being submitted to the Architect, all shop drawings shall be properly checked and coordinated by the Fabricator and by the Contractor and shall be stamped and signed accordingly. Drawings not complying with these requirements will be returned unchecked and stamped, "Not Reviewed".
 - G. At least one copy of each approved Shop Drawing shall be kept available in the Contractor's field office. Drawings not bearing evidence of release for construction by the Architect/Engineer shall not be kept on the job.
- 1.07 PRE-INSTALLATION MEETING
- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Owner's Project Manager, Architect, and related Subcontractors.

PART 2 - PRODUCTS

2.01 CONCRETE

- A. Portland Cement: Low alkali ASTM C-150 Type 1 at all exposed concrete. Type I and II elsewhere. All cement of each type shall be from a single source. Cement to have 20% fly-ash with loss on ignition not exceeding 6%, in compliance with ACI 226.3R and ASTM C-618 or up to 25% ACI 226.1R and ASTM C-989 covering blast-furnace slag (grades 100 or 120).
- B. Only one color of cement, all the same manufacturer, shall be used for the Work.
- C. Do not use Type III cement without Architect's approval.

2.02 CONCRETE MIX

- A. Concrete shall conform to ASTM C94. One copy of the Certificate of Delivery required by ASTM C 94 shall be delivered to the Architect immediately upon arrival of each load of concrete at the site.
- B. All concrete shall be proportioned within the following limitations, as indicated in Table A.

TABLE A

Class of Concrete:	4000 Psi
Min. Compressive Strength @ 7 Days:	3300 Psi
Min. Compressive Strength @ 28 Days:	4670 Psi
U.S. Gallons for 94 Lb. Bags:	5.5
Absolute Ratio by Weight (W/C):	0.48
Consistency Range-Slump(Inches):	4-6
Max. Size of Coarse Aggregate:	3/4 In.

- * For exposed to weather concrete, the maximum w/c shall be 0.45. Use high-range water reducing admixture for w/c equal to or less than 0.45. For all other concrete with a w/c greater than 0.45, use a mid-range water reducing agent. All Concrete containing the high range water reducing admixture (superplasticizer) shall have a maximum slump of 8" unless otherwise directed by the Architect. All other concrete shall have a maximum slump of 4" for footings and retaining walls, and 5" for other members.
- C. The exact proportions for the mix, including amounts of admixture (if any), and water, shall be determined as hereinbefore specified under "Mix Designs", based on cement and aggregates submitted by the Subcontractor, and subject to the approval of the Architect.
- D. If greater amounts of cement than those specified above are required because of Subcontractor's operations, such as pumping concrete, no increase in the Contract amount will be permitted for this reason.
- E. Air-Entrainment: The air content in all concrete exposed to weathering shall be maintained at 4 to 6 percent for ground level exterior Work. The air content for other concrete exposed to weathering shall be 3 to 5 percent. All interior slabs on grade shall not contain air entraining agent and shall have an air content not exceeding 3 percent.
- F. All concrete for slabs on grade shall be placed as controlled concrete. The preparation, delivery, depositing, compaction and curing shall be monitored.

2.03 ADMIXTURES

- A. No calcium chloride admixtures are permitted in the concrete.
- B. Except as otherwise specified, use of concrete admixtures shall conform to ACI 212.
- C. Admixtures employed shall be produced and serviced by established, reputable manufacturer and used in compliance with manufacturer's recommendations.
- D. Air entraining agent shall conform to ASTM C 260
 - 1. When a high range water reducing (HRWR) admixture is used, air-entraining admixture shall be a neutralized vinsol resin solution.
 - 2. When requested by the Architect, certification attesting to compliance with these specifications shall be furnished.
- E. Water reducing agent shall conform to ASTM C 494, Type A.
- F. Water reducing agent-retarder shall conform to ASTM C 494, Type D.
- G. Superplasticizers: Where permitted by the Architect and where indicated in the approved concrete design mix, a high-range water-reducing (HRWR) admixture (superplasticizers) may be used subject to the following requirements:
 - 1. When a high range water-reducing admixture is used, the air-entraining admixture shall be a neutralized vinsol resin solution.
 - 2. Concrete shall arrive at the job site having a slump conforming to the requirements specified in Paragraph 2.01. HRWR shall be added after the concrete has been thoroughly mixed and the desired initial slump has been achieved.

3. Water to cement ratio shall not exceed 5.0 gallons per hundredweight (0.42 weight basis).
4. Pretesting of the concrete shall be performed under the guidance of the admixture manufacturer's representative to determine dosage, addition times, and compatibility with other admixtures and mixture constituents.
5. HRWR shall be added at the job site and shall be dispensed to the truck mixer using automatic dispensing equipment which accurately measures dosage.
6. Slump after addition of HRWR to concrete shall be no greater than is necessary for proper placement and compaction.
7. Air tests shall be run on the admixed concrete as placed, and air content shall be within the specified limits.
8. Dosage of HRWR admixture shall be as indicated below. Dosage listed is the quantity of admixture recommended per sack of cement when cement content is reduced.

Product	Dosage
Melment	25 fl.oz.
WRDA-19	15 fl. oz.

2.04 AGGREGATE

- A. Except as otherwise noted, aggregate shall conform to ASTM C 33 for normal weight concrete.
- B. Maximum size aggregate for Sections 16 in. or greater in thickness shall be 1-1/2 in. Maximum size aggregate for Sections less than 16 in. thick shall be 3/4-in. 3/8" Aggregate may be used for concrete on steel decking.
- C. Maximum size of aggregate shall in no case exceed that permitted by ACI 318.

2.05 WATER

- A. Water shall conform to ASTM C 94, Section 4.1.3.

2.06 GROUT

- A. Grout shall be mixed in the proportions of one part Portland cement to two parts sand, by volume. Only sufficient water shall be used to enable grout to barely hold its shape when squeezed into a ball in the hand. Sand for grout shall be ASTM C 33 Fine Aggregates.
- B. Non-shrink grout shall be pre-mixed non-shrinking, high strength grout. Compressive strength in 28 days shall be 5,000 psi minimum, but in no case less than the specified strength of the adjacent concrete. Manufacturer shall provide evidence that the material meets the requirements of the COE CRD-C 621 (558). Grout permanently exposed to view shall be non-oxidizing; metallic grout may be used in other locations.

2.07 CURING AND SEALING AGENTS

- A. Curing and sealing agents shall be compatible with applied floor finishes. Coordinate Work with requirements of Section 09 91 13 – Painting for application of colored floor sealer. Do not use curing / sealer on floors planned to receive flooring / finishes.

2.08 EXPANSION JOINTS

- A. Expansion joints (or compressible fillers) shall be 1/2 in. wide and shall be filled with preformed joint filler. Filler shall be a preformed, non-bituminous type joint filler conforming to ASTM D 1752, Type II, Sealtight Cork Expansion Joint Filler, as manufactured by W.R. Meadows, Inc., or Architect approved equal.
 1. Joint filler shall be one piece for the full depth and width of the joint. Use of multiple pieces of lesser dimensions to make up the required depth and width of the joint will not be permitted.
- B. Unless otherwise indicated on the Drawings, expansion joints shall be located 30 ft. O.C., maximum.
- C. Where indicated on the Drawings, expansion joints shall be doweled.
 1. Steel dowels shall be greased on one end; plastic-coated dowels will not require greasing.

2.09 CONTROL JOINTS

- A. Control joints shall be saw cut with diamond blade concrete that cuts into concrete slab surface at least 1 in., but not less than 25% of slab depth.
- B. Unless otherwise indicated on the Drawings, control joints at interior slabs-on-grade shall be located 12' – 6" O.C., maximum. At exterior sidewalk slabs, joints shall not exceed 6'-0" O.C.
- C. Reinforcing shall continue through control joints.
- D. At sidewalk slabs, provide formed joints.

2.10 WATERSTOPS

- A. Waterstops shall be virgin polyvinyl chloride and shall not contain any scrap or reprocessed materials. Waterstop shall meet or exceed the requirements of the COE CRD-C 572 and the following:
 - 1. PVC compound shall have a minimum tensile strength of 2,000 psi and shall have an elongation at break of not less than 300%.
 - 2. Waterstop manufacturer shall submit a copy of certified laboratory test data indicating compliance with the referenced specification.
 - 3. Waterstops shall be furnished in the longest practicable lengths.
 - 4. Waterstop, except expansion joint waterstop, shall be ribbed type.
 - 5. Expansion joint waterstop shall be ribbed type with center bulb.
 - 6. Corner intersections, and intersection of vertical and horizontal waterstops shall be factory spliced or factory-made.
- B. Do not bend waterstops within forms. Do not use split waterstops.

2.11 SLEEVES

- A. Sleeves shall be galvanized steel Schedule 40 conforming to ASTM A53 or schedule 40 PVC.

2.12 PIPE TO WALL PENETRATION SEALS

- A. Pipes passing through waterproof surfaces shall have a pipe to wall penetration seal assembly equal to Link-Seal, manufactured by Thunderline Corporation or approved equal.
 - 1. Each pipe seal shall be furnished complete with wall sleeve and wall penetration seal.
 - 2. Wall sleeve shall be steel and shall have integral waterstop and anchor collar.
 - 3. Wall penetration seal shall be a modular mechanical type, with interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and the wall sleeve.
 - 4. Service designation shall be Type "S" for corrosive service with glass reinforced nylon plastic pressure plate, stainless steel bolts and nuts, and EPDM rubber sealing element.
- B. All other pipes passing through concrete not indicated to be waterproofed shall have only the wall sleeve Model WS. Sealing of these pipes is not required.
 - 1. Other pipe sleeve material other than the Link-Seal will be considered subject to the approval of the Architect.
- C. Pipe sleeves and seals shall be properly sized in accordance with the sleeve manufacturer's recommendations to ensure a completely watertight seal upon completion of the installation.

2.13 EXTRUDED POLYSTYRENE FOAM INSULATION

- A. Provide Type V, closed cell extruded polystyrene foam insulation. Insulation shall comply with the following material and performance characteristics:
 - 1. Compressive Strength: 25 psi, minimum, in accordance with ASTM D 1621

2. Thermal Resistance: 5.0 per inch minimum, at 75°F mean temp., in accordance with ASTM C 518 and C 177
3. Water Absorption: 0.3 % by volume, in accordance with ASTM C 272
4. Water Vapor Permeance: 0.8 perms, in accordance with ASTM E 96
5. Flexural Strength: 100 psi, minimum, in accordance with ASTM C 203
6. Thickness: 2 inches

2.14 CONTROL JOINT FILLER

- A. Provide control joint filler as follows, and as approved by the Architect:
 1. Urethane joint filler: Pourthane by W.R. Meadows
 2. Epoxy joint filler-Sikadur 5 INS/SC by Sika
 3. Rapid set polymer joint filler-Chemtron CP2010 by Chemtron Polymers Inc.

2.15 MISCELLANEOUS ITEMS

- A. Welded deformed Bar Anchors: Gun-applied.
- B. Headed Stud Anchors: Headed studs welded by full-fusion process.
- C. Bolts: Conform to ASTM A 307, carbon steel with regular hexagon nuts conforming to ASTM A 563, and carbon steel washers conforming to ASTM F 436.
- D. Weepholes: Schedule 40 PVC pipe.

2.16 WATERSTOP

- A. Provide Hydrophilic, expanding butyl rubber waterstop, HF302 Hydro-Flex, as manufactured by Henry Inc., or Architect approved equal. Waterstop shall be pre-formed adhesive hydrophilic waterstop designed to swell in the presence of water, providing a watertight seal in cold joints on concrete structures. Material shall be a composite of butyl rubber, polypropylene elastomers, and a mixture of hydrophilic bentonite and hydrophobic fillers and plasticizers complying with Federal Specification SSS-210.

PART 3 - EXECUTION**3.01 CONCRETE MIXING**

- A. All concrete shall be ready-mixed concrete and shall be mixed and delivered in accordance with the requirements of "Specifications for Ready-Mixed Concrete", ASTM C94 to produce concrete with the required slump and air content.
- B. The concrete producer shall furnish with each load of concrete a numbered delivery ticket showing name of Contractor, name and location of project, date and time batched, truck number, number of cubic yards in load, specified strength, slump, and mix design number.
- C. In the event concrete is mixed at a central batching plant, the delivery shall be arranged so that intervals between batches are kept at a minimum, and in any event not more than thirty (30) minutes. Trucks shall be in first class condition and kept in constant rotation during delivery.
- D. When concrete is delivered in a truck mixer or agitator, no water from the truck-water system or elsewhere shall be added after the initial introduction of mixing water for the batch, except when on arrival at the job site the slump of the concrete is less than that specified. Such additional water to bring the slump within required limits shall be injected into the mixer. The drum or blades shall be turned an additional 30 revolutions or more at mixing speed until the concrete is within the proper slump limits if not in violation of the requirements of Paragraph 5.
- E. Discharge of concrete after initial batching shall be completed within 90 minutes, or before the drum has revolved 300 revolutions, whichever comes first, after the introduction of the mixing water to the cement and aggregates or the introduction of the cement to the aggregates. In hot weather (as defined by ACI) the discharge of the concrete shall be completed within 60 minutes.

3.02 CONCRETE PLACEMENT

- A. Before placing concrete, forms and space to be occupied by concrete shall be thoroughly cleaned, and reinforcing steel and embedded metal shall be free from dirt, oil, mill scale, loose rust, paint, and other material which might tend to reduce bond. The geotechnical engineer shall review the subgrade material prior to the placement of concrete, forms, and rebar.
- B. Existing concrete, earth, and other water-permeable material against which new concrete is to be placed shall be thoroughly damp when concrete is placed. There shall be no free water on surface.
- C. Concrete which has set or partially set before placing shall not be employed. Re-tempering of concrete will not be permitted.
- D. Segregation of the concrete shall be prevented during handling; should any segregation occur, the concrete shall be remixed before it is placed. Concrete shall be placed in the forms in horizontal layers not over 1 to 2 ft. thick. Concrete shall not be allowed to drop freely more than 4 ft. If the free drop to the point of placement must exceed 4 ft., the Contractor shall obtain the approval of the Architect for the proposed method of depositing the concrete. The concrete shall not be required to flow over distances greater than 3 ft. in any direction in the forms or on the ground, unless otherwise permitted by the Architect.
- E. Concrete shall be thoroughly spaded, and tamped, and vibrated to secure a solid and homogeneous mass, thoroughly worked around reinforcement and into corners of forms.
- F. Provide concrete where required for filling of miscellaneous site improvements provided under the Work of Section 05 50 00 – Metal Fabrications, including but not limited to, ornamental fencing, steel bollards, and vehicle gates.

3.03 TESTING OF CONCRETE

- A. Field Inspection and Testing shall be in accordance with the testing program requirements of Chapter 17-Special Inspections of the Massachusetts State Building Code.
- B. Slump Tests: The Testing Laboratory will make slump tests of concrete during placing of concrete in accordance with ASTM C143. Air content shall be tested in accordance with requirements of the Statement of Special Inspections. Slump test shall be made for each set of test cylinders or as noted on the Contract Drawings.
- C. Compression Tests:
 - 1. The Testing Laboratory will prepare and cure compression test samples at the Owner's expense. One set of at least four cylinders will be made in accordance with ASTM C31 from each 50 cubic yards of concrete, or fraction thereof, placed each day. Additional cylinders required by the Contractor for the early removal of forms shall be made at the Contractors expense.
 - 2. One cylinder from each set will be tested at 7 days for information. Two cylinders shall be tested at 28 days for acceptance in accordance with ASTM C39.
 - 3. The fourth cylinder from each set shall be kept until the 28 day test reports on the second and third cylinders in the same set has been received by the Architect.
 - 4. The strength level shall be considered satisfactory so long as the averages of all sets of three consecutive strength test results equal or exceed the specified strength f'_c , and no individual strength test result falls below the specified strength f'_c by more than 500 psi.
 - 5. In the event the average compressive strength of the two 28 day cylinders does not achieve the required level, the Architect may elect to test the fourth cylinder immediately or test it after 56 days.
 - 6. If the result is below the required level, the Architect may require test cores of the hardened structure to be taken by the Testing Laboratory in accordance with ASTM C42. If such test indicates that the core specimen is below the strength level required by ACI 318-95, Chapter, the concrete in question shall be removed and replaced without cost to the Owner. Any other Work damaged by the result of concrete removal shall be replaced with new materials to the satisfaction of the Architect at no additional cost to the Owner. The cost of coring will be deducted from the Contract amount. Where core cylinders have been taken by the Testing Laboratory and the concrete proves to be satisfactory, the cutout Sections shall be restored to the original condition in a manner satisfactory to the Architect at no additional cost to the Owner.

3.04 SUBMITTAL OF CONCRETE TEST REPORTS

- A. Concrete test reports submitted by the testing laboratory shall contain the following information:
1. Name and location of project
 2. Name of Architect/Engineer
 3. Name of Contractor
 4. Name of concrete producer
 5. Delivery ticket number
 6. Date and time batched
 7. Date and item sampled, with identification number or letter for each specimen
 8. Temperature of concrete
 9. Temperature of air
 10. Slump
 11. Air content and unit weight of concrete
 12. Mix reported used
 13. Approximate number of cubic yards represented by sample
 14. Location or portion of structure represented by sample
 15. Description of initial curing of test specimens
 16. Date of test and age of specimen
 17. Compressive strength PSI
 18. Statement signed by laboratory supervisor that all applicable ASTM Standards performed by the laboratory have been followed, except as noted.

3.05 CONVEYING AND PLACING CONCRETE

- A. Notification: The Engineer shall be notified at least 72 hours in advance of the placing of any concrete.
- B. Foundation bearing area under footings and slabs shall be approved by the Testing Agency before placing concrete.
- C. Forms: Before placing concrete, forms shall be thoroughly inspected. All chips, dirt, and other foreign matter shall be removed, all temporary bracing and cleats taken out, all openings for pipes, sleeves, and other similar related penetrations shall be properly boxed, all forms properly secured in their correct position and made tight, all reinforcements, anchors, and embedded items secured in their proper places. Concrete which may be on the forms or reinforcement, and which is set and dry, shall be cleaned off, and the forms and steel washed off before proceeding. Remove water and all foreign matter from forms and excavations. Unless otherwise directed, sand or sandy soil shall be moist but not saturated just prior to placing concrete.
1. To permit satisfactory finishing, forms shall be removed from the vertical faces of the concrete without damaging the surface. Immediately after stripping forms, any fins or projections left by the forms will be chipped off, and the surfaces rubbed smooth.
 2. Form tie holes and other voids and faults shall be patched. All voids, faults, honeycombs, and similar surface deficiencies shall be cleaned out, roughened, thoroughly wetted, coated with neat cement paste, and filled with mortar of cement and sand in the same proportions, materials, and color as used in the concrete. The surface of the patch shall be flush with the surrounding surface after finishing operations are complete. Surface shall be kept continuously damp until patches are firm enough to be rubbed without damage.
 3. Rubbing shall be performed while the surface is wet using a carborundum or cement sand brick, to achieve a smooth, uniform, even textured finish. Patched and chipped areas shall be blended to match as closely as possible the appearance of the rest of the surface. No cement wash or plastering will be permitted, and no mortar shall be used except in accordance with requirements of the Contract Documents.
- D. Vertical surfaces of concrete which will be concealed in finished structure shall be formed to produce a "rough form finish", as defined in ACI 301.
- E. Vertical surfaces of concrete which will be exposed in finished structure shall be formed to produce a "smooth formed - rubbed finish", as defined in ACI 301.

3.06 CONCRETE SLAB FINISHES

- A. All interior slabs surfaces shall be screeded, leveled, floated and steel troweled. Mechanical troweling machines may be used if the desired finish and level tolerances can be obtained by their use, but finishing shall be by hand troweling at edges and areas inaccessible to machine trowels.
1. Scratch Finish: Apply scratch finish to monolithic slab surfaces to receive concrete floor topping or mortar setting beds for tile, Portland cement terrazzo, and other bonded applied cementitious finish flooring material, and where indicated.
 - a. After placing slabs, finish surface to tolerances of F_F 38 (floor flatness) and F_L 25 (floor levelness) measured in accordance with requirements of ASTM E 1155. (Note: F_L 25 applies to slabs-on-grades only – not suspended / elevated slabs.) Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes, brooms, or rakes.
 2. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as specified; slab surfaces to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or epoxy terrazzo, and where indicated.
 - a. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, when surface water has disappeared, or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Finish surfaces to tolerances of F_F 38 (floor flatness) and F_L 25 (floor levelness) measured in accordance with requirements of ASTM E 1155. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture. (Note: F_L 25 applies to slabs-on-grades only – not suspended / elevated slabs.)
 3. Trowel Finish: Apply a trowel finish to monolithic slab surfaces exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or thin-set quarry tile, paint, or another thin film-finish coating system.
 - a. After floating, begin first trowel-finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and finish surfaces to tolerances of F_F 50 (floor flatness) and F_L 33 (floor levelness) measured in accordance with requirements of ASTM E 1155. Grind smooth any surface defects that would telegraph through applied floor covering system. (Note: F_L 33 applies to slabs-on-grades only – not suspended / elevated slabs.)
 - b. Finish and measure surface so gap at any point between concrete surface and an unleveled freestanding 10-foot long straightedge, resting on two high spots and placed anywhere on the surface, does not exceed 1/8".
- B. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply a trowel finish as specified, then immediately follow by slightly scarifying the surface with a fine broom.
- C. Non-slip Broom Finish: Apply a non-slip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.
- D. Non-slip Aggregate Finish: Apply non-slip aggregate finish to concrete stair treads, platforms, ramps, sloped walks.
1. After completing float finishing and before starting trowel finish, uniformly spread 25 lbs. of dampened non-slip aggregate per 100 sq. ft. of surface. Tamp aggregate flush with surface using a steel trowel, but do not force below surface. After broadcasting and tamping, apply trowel finishing as specified.
 2. After curing, lightly work surface with a steel wire brush or an abrasive stone, and water to expose non-slip aggregate.
- E. The addition of cement, sand, water, or mortar to slab surfaces while finishing concrete is strictly prohibited.
- F. All surfaces shall be finished to the tolerances noted above. Proper care shall be taken to finish troweling around the edges of the slabs so finish surface at edges shall be at same elevations as the rest of the top surface of the slab.

- G. Slabs shall be laid to temporary screeds set level at the proper elevations. Screeds to be pipe or metal. Wet screeds will not be allowed. Screeds shall be set no further apart than 12'-0" on center.
- H. Mark-off lines shall be formed with curbed edging tool, neat and true to line, uniform throughout. Conform to markings shown on Drawings.
- I. Immediately following finishing operations, arise at edges and both sides of expansion joints shall be rounded to a 1/4 in. radius. Control joints shall be scored into slab surface with scoring tool. Adjacent edges of control joint shall at same time be finished to a 1/4 in. radius.
- J. Where finishing is performed before end of curing period, concrete shall not be permitted to dry out, and shall be kept continuously moist from time of placing until end of curing period, or until curing membrane is applied.

3.07 CONTROL JOINTS

- A. Control joints in slab surfaces shall be located as shown on the Contract Drawings. Control joints may be made by sawing a continuous slot to a depth of 1/4 the thickness of the slab. Joints shall be spaced at intervals indicated on Contract drawings and shall be made in the concrete slabs-on-grade within 24 hours after placement of concrete.
- B. Control joints and/or construction joints in walls shall be spaced at 40'-0" O.C. maximum and shall align with masonry control joints where applicable. Joints shall be made with a 1/2" deep chamfer strip on each face of the walls.

3.08 FILLING TIE ROD AND BOLT HOLES

- A. Holes resulting from the removal of bolts or tie rods shall be solidly filled with cement grout. Holes passing entirely through concrete members shall be filled from the inside face, with a plunger-type grease gun or other device that will force the mortar through to the outside face, holding a piece of canvas at the exterior surface to assure complete filling. Holes which do not pass entirely through shall be filled, using tools which will permit the opening to be packed thoroughly full. Excess mortar at the faces of filled holes shall be struck off flush, with canvas.

3.09 CURING

- A. It is essential that concrete be kept continuously damp from time of placement until end of specified curing period. It is equally essential that water not be added to surface during floating and troweling operations, and not earlier 24 hours after concrete placement. Between finishing operations surface shall be protected from rapid drying by a covering of waterproofing paper. Surface shall be damp when the covering is placed over it, and shall be kept damp by means of a fog spray of water, applied as often as necessary to prevent drying, but not sooner than 24 hours after placing concrete. None of the water so applied shall be troweled or floated into surface.
- B. Concrete surfaces, not otherwise specified, shall be cured by being kept wet with clean water for a period of not less than seven days after placing. Each day the forms are left in place, and kept wet enough to prevent the opening of joints in the forms and the drying out of the concrete, will be counted as one day of curing.
- C. Concrete surfaces shall be cured by completely covering with curing paper or by use of a curing compound.
 - 1. Concrete cured using curing paper shall be completely covered with paper with seams lapped at least 2 in. and sealed with tape. Concrete surface shall not be allowed to become moistened within 24 hours of placing concrete. During curing period surface shall be checked frequently, and sprayed with water or curing compound, as applicable, as often as necessary to prevent drying, but not earlier than 24 hours after placing concrete.
 - 2. Concrete cured with a curing compound shall have curing compound applied at a rate of 200 sq. ft. per gallon. A second coat of the specified curing and sealing compound shall be applied to all exposed concrete slab.
 - 3. Concrete surfaces to receive paint, waterproofing, damproofing, thin-set adhesives and coatings, and similar applied materials which require bond and adhesion to concrete surfaces, shall be cured using curing paper. The use of curing compounds on these surfaces will not be permitted.
 - 4. Concrete surfaces in apparatus bay that will be shot blasted and receive epoxy coatings shall be treated in accordance with manufacturer's recommendations.
 - 5. Unless otherwise directed by the Architect, curing period shall be seven days, minimum.

3.10 COLD WEATHER CONCRETING

- A. Materials for concrete shall be heated when concrete is mixed, placed, or cured when the mean daily temperature is below 40 degrees F., or is expected to fall to below 40 degrees F., within 72 hours, and the concrete after placing shall be protected by covering, heat, or both.
- B. Details of handling and protecting of concrete during freezing weather shall be subject to the approval and direction of the Architect. Procedures shall be in accordance with provisions of ACI 306.

3.11 HOT WEATHER CONCRETING

- A. Concrete just placed shall be protected from the direct rays of the sun and the forms and reinforcement just prior to placing shall be sprinkled with cold water. Every effort shall be made to minimize delays which will result in excessive mixing of the concrete after arrival on the job.
- B. During periods of excessively hot weather (95 degrees F. or above), ingredients in the concrete shall be cooled insofar as possible and cold mixing water shall be used to maintain the temperature of the concrete at permissible levels, all in accordance with the provisions of ACI 305. Any concrete with a temperature above 95 degrees F., when ready for placement, will not be acceptable and will be rejected.
- C. Temperature records shall be maintained throughout the period of hot weather, including but not limited to, air temperature, general weather conditions, ie: wind speed, velocity, and direction, clear or cloudy, and relative humidity. Records shall include checks on temperatures of concrete as delivered and after placing in forms. Data should be correlated with the progress of the Work so that conditions surrounding the construction of any part of the structure can be ascertained.

3.12 BRACING AND SUPPORT

- A. Concrete members shall be adequately and safely supported and braced until the permanent supports and braces (by whomever supplied) are installed.

3.13 REMOVING FORMS AND SUPPORTS

- A. Except as otherwise specifically authorized by the Architect, forms shall not be removed until the concrete has aged for at least three days or the following number of day-degrees, whichever is greater. Form removal by methods other than day-degree method will not be permitted.

<u>Location</u>	<u>Day-Degrees*</u>
Beams and Slabs	500
Walls and Vertical Surfaces	100

* The term day-degrees represents the product of the number of days elapsed since time of concrete placement and the average daily air temperature at the surface of the concrete. For example, five days at a daily average temperature of 60 degrees F. equals 300 day-degrees.

- B. Shores under beams and slabs shall not be removed until the concrete has attained at least 75 percent of the specified cylinder strength and sufficient strength to support safely its own weight and the construction loads upon it.

3.14 EXPANSION JOINT

- A. Expansion joint shall be 1/2 in. wide, clean, dry, and free of loose material, dirt, oil and grease, and shall be formed in the concrete to required width with preformed joint filler in place. Joint filler shall extend the full length of the expansion joint.
 - 1. Depth of filler shall extend to the full thickness of the concrete in vertical surfaces and in concealed horizontal surfaces.
 - 2. Depth of filler in exposed horizontal surfaces shall form a 1/2 in. deep sealant recess below finished surface.

3.15 SAW CUT JOINT

- A. Saw cut joints shall be made following finishing as soon as the concrete surface is firm enough not to be torn or damaged by the blade, (within 24 hours after placement), and before random shrinkage cracks can form in the concrete surface.
- B. Saw cut shall be made accurately to the dimensions, line, and spacing indicated.

3.16 INTERIOR JOINTS OF SLAB ON GRADE

- A. All interior construction and control joints, where noted on the Drawings, shall be filled with the specified epoxy joint filler or urethane joint sealer. These compounds shall be mixed and installed in strict accordance with the directions of the manufacturer.
- B. The epoxy joint filler shall not be installed until 90 days after slab placement.

3.17 EXTRUDED POLYSTYRENE FOAM INSULATION

- A. Individual insulation panels shall be placed staggered wall-to-wall with a minimum of 1 ft. – 0 in. overlap at all joints and no gaps wider than 1/4 in., from 16 to 20 inches in overall depth and exposed leading edges tapered at 45 degrees.

3.18 PROTECTION OF CONCRETE SURFACES

- A. Concrete and insulating concrete surfaces shall be protected from traffic or damage until surfaces have hardened sufficiently. If necessary, 1/2 in. thick plywood sheets shall be used to protect the exposed surface.

3.19 DEFECTIVE WORK

- A. The following Work will be considered defective and may be ordered by the Architect to be removed and replaced at no additional cost to the Owner:
 - 1. Concrete incorrectly formed
 - 2. Concrete not plumb or level
 - 3. Concrete not achieving specified strength
 - 4. Concrete containing rock pockets, voids, honeycomb, or cold joints
 - 5. Concrete containing wood or foreign matter
 - 6. Concrete otherwise not in accordance with requirements of the Contract Documents

3.20 REPAIR OF DEFECTIVE AREAS:

- A. Immediately after stripping forms, patch minor defects, including but not limited to form-tie holes, voids, faults, honeycombing, and similar related surface deficiencies, before concrete is thoroughly dry. Remove ledges and bulges. Repair gravel pockets by cutting out to solid surface, form key, and thoroughly dampen. Apply the specified bonding compound. Place patching mortar consisting of 1-part cement to 2 parts fine sand, after the bonding compound has dried. Compact fine sand, after the bonding compound has dried. Compact mortar into place and neatly finish to exactly match surface texture. Grind or fill surfaces to produce level, true planes. Patching of honeycombed areas to gravel pockets which, in the Architect's opinion, are too large and unsatisfactory for mortar patching as described above, is to be cut out to solid surface, keyed, and packed solid with matching concrete to produce firm bond and surface. Patching shall match adjacent surfaces.
- B. All structural repairs shall be made with an epoxy adhesive or mortar specified by the Structural Engineer of Record thru the administration of the Architect for the type of repair required.

3.21 AS-CAST FORMED FINISHES

- A. Vertical surfaces of concrete concealed in finished structure shall be formed to produce a "rough form finish", as defined in ACI 301. Vertical surfaces of concrete exposed in finished structure shall be formed to produce a "smooth formed - rubbed finish", as defined in ACI 301.

- B. Provide a smooth-formed finish as imparted by the approved form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Remove fins and other projections exceeding specified limits on formed-surface irregularities. Repair and patch tie holes and defects.
- C. Not later than one day after form removal, at areas of exposed architectural concrete as indicated on the Drawings, moisten concrete surfaces and rub with carborundum brick or another approved abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
- D. Install pre-manufactured concrete form liners in accordance with the approved manufacturer's written requirements at locations and in patterns as indicated on the Drawings or otherwise approved on-site by the Architect.

3.22 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris daily and dispose in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 03 31 00

CONCRETE FORMWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section shall include all Work necessary and required to complete the Work as indicated, including but not limited to, the following:
 - 1. All concrete formwork necessary and required for the construction of the Project, as indicated
 - 2. Furnishing and installing of forms for all cast-in-place concrete Work
 - 3. Removal of forms at completion of concrete Work
 - 4. Obtain and pay for all local and/or state approvals including necessary permits.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following Divisions:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. All concrete formwork included in this Contract shall conform to the applicable requirements of ACI 301, 318 and 347.

1.05 SUBMITTALS

- A. Provide submittals in accordance with requirements of Section 01 33 00 – Submittal Procedures, and in accordance with requirements of the Contract Documents.
- B. Provide large scale shop drawings and manufacturer's product data sheets for materials and methods required to complete the Work of this Section.

1.06 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Plywood forms when used for concrete Work shall conform to the U.S. Product Standard PS I. for "Plyform" Class I or II and shall be a minimum of 5/8 in. thick.
- B. Metal forms of sufficient strength may be used in lieu of plywood forms.
- C. Control joints shall be standard metal keyed dividers for cold joints, subject to approval of the Architect.
- D. Form ties and spreaders shall be standard metal form clamp assembly, of type acting as spreaders and leaving no metal within 1 inch of concrete face. Inner tie rod shall be left in concrete when forms are removed. Submit samples and manufacturer's specifications to the Architect for approval before using. No wire ties or wood spreaders will be permitted.
- E. Anchors and hangers used for exposed concrete shall not leave exposed metal at surface.
- F. Form coating shall be non-grain raising and non-staining type that will not leave residual matter on surface of concrete or adversely affect proper bonding of subsequent application of other material applied to concrete surface (such as waterproofing or flooring adhesives). Coatings containing mineral oils or other non-drying ingredients will not be permitted. Acceptable manufacturers: Symons Corp., Superior Manufacturing Corp., Burke Concrete Accessories or an approved equal.

PART 3 - EXECUTION

3.01 CONSTRUCTION OF FORMS

- A. Forms shall be constructed of sound material, shall be of the correct shape and dimensions, mortar tight, of sufficient strength, and so braced and tied together that the movement of men, equipment, materials, or placing and vibrating the concrete will not throw them out of line or position. Forms shall be strong enough to maintain their exact shape under all imposed loads. Camber where necessary to assure level finished soffits. Forms shall be so constructed that they may be easily removed without damage to the concrete. Before concrete is placed in any form, the horizontal and vertical position of the form shall be carefully verified and all inaccuracies corrected. All wedging and bracing shall be completed in advance of placing of concrete.
- B. Framing, bracing, supporting members, and centering shall be of ample size and strength of safely carry, without deflection, all dead and live loads to which forms may be subjected, and shall be spaced sufficiently close to prevent any bulging or sagging of forms. Distribute bracing loads over base area on which bracing is erected. When placed on ground, protect against undermining or settlement.
- C. Tolerances:
 - 1. Variation from plumb in lines and surfaces of walls, and arises shall not exceed 1/8 inch in 10 feet with maximum "in" and "out" variation occurring in not less than 20 feet.
 - 2. Variation in linear building lines from established position of columns, piers, or walls shall not exceed 1/2 inch in any bay of 20 feet or 1 inch in 40 feet or greater length.
- D. Form ties shall be of sufficient strength and used in sufficient quantities to prevent spreading of the forms. Ties shall be placed at least 1 inch away from the finished surface of the concrete. The use of ties consisting of twisted wire loops will not be permitted. Inner rods shall be left in concrete when forms are stripped.

- E. Provide removable cleanout Sections or access panels at the bottom of all forms to permit inspection and effective cleaning of loose dirt, debris, and waste material. All forms and surfaces to receive concrete shall be cleaned of all chips, sawdust, and other debris and shall be thoroughly blown out with compressed air just before concrete is placed.
- F. Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.
- G. Provide a surfaced pouring strip where construction joints intersect exposed surfaces to provide straight line at joints. Just prior to subsequent pour, remove strip and tighten forms to conceal shrinkage. Construction joints shall show no "overlapping" of concrete and shall, as closely as possible, present the same appearance as butted plywood joints. Joints in a continuous line shall be straight, true and sharp.
- H. Embedded items shall conform to requirements of ACI Building Code - Section 503. Provisions shall be made for pipes, sleeves, anchors, embedments, inserts, reglets, anchor slots, nailers, waterstops, and other features. No wood other than necessary nailing blocks shall be embedded in concrete. Complete cooperation shall be extended suppliers of embedded items in their installation. Secure all information and specific components required to be embedded items from other trades allowing adequate and sufficient time for coordination and placement and embedment. All embedded items shall be securely anchored in correct location and alignment prior to placing concrete. Electrical and telephone conduits shall be run in concrete only upon the written approval of the Architect. Under no circumstances will aluminum conduit be permitted in concrete. No electrical or telephone conduit larger than 3/4 inch in diameter and no plumbing pipes of any size will be permitted in concrete walls or slabs. The following applies to conduits, pipes, and sleeves which may be embedded in concrete. Sizes refer to outside diameter.
 - 1. Pipes shall not be coated with paint or enamel or otherwise except galvanizing, sherardizing or their approved equivalent.
 - 2. Reinforcing shall not be cut or displaced from its indicated position to accommodate pipes; in particular pipes shall not be placed between forms and bottom slab rods, or above top slab rods.
 - 3. In slabs pipes shall not be larger than 1/4 the slab or wall thickness and shall be placed and kept within the middle two quarters of that thickness.
 - 4. Pipes larger than 1/6 the slab or wall thickness shall be run roughly parallel and at right angles to the reinforcing, not diagonally.
 - 5. Pipes nearly parallel shall be spaced at least three diameters on centers.
 - 6. Pipes shall not be embedded lengthwise in beams or columns.
- I. Frame openings in concrete where indicated on architectural, structural, plumbing, mechanical, or electrical drawings. Subcontractor shall establish exact locations, sizes, and other conditions required for openings and attachment of Work specified under other Sections. Subcontractor shall be held responsible for proper coordination of all Work of this nature in order that there will be no unnecessary cutting and patching of concrete. Any cutting and repairing to concrete required as result of failure to provide for such openings shall be paid for by the Subcontractor at no additional expense to the Owner.
- J. Variation from these Specifications as to size and placement of openings or embedded pipes, size and arrangement of sleeves, may be made in specific cases upon written approval by the Architect. Such approval will be given on request when the safety of the building and conformity to the Building Code allow. Request shall be made in writing accompanied by sketch or adequate description of what is desired.
- K. Straight edges shall be checked with a taut line regularly and spares shall be available in case any bowing becomes evident.
- L. Care shall be exercised that no weight be placed on the straight edge and that it will always be cleaned and laid flat when not in use.
- M. Thoroughly clean forms and recoat with specified form coating before each reuse. Do not reuse any form for exposed Work which cannot be reconditioned to "like new" condition. Discard forms considered unsatisfactory by the Architect. Apply form coating to all forms in accordance with the manufacturer's specifications. Apply form coatings before placing reinforcing steel.

- N. Prior to placing of any concrete, and after placement of reinforcing steel in the forms, Subcontractor shall notify the Architect so that proper inspection may be made. Such notification shall be made at least 72 hours in advance of placing concrete to permit proper arrangements to be made for inspection.
- O. Any movement or bellying of forms during construction or variations in excess of tolerances specified will be considered just cause for rejection and removal of such forms and concrete Work so affected. Reconstruction of forms and new concrete shall be furnished at no additional cost to the Owner.

3.02 REMOVAL OF FORMS AND SHORES

- A. The supporting forms shall not be removed until the members have acquired sufficient strength to support their weight and the loads superimposed thereon safely. In no case may any forms be removed until the time and sequence has been approved by the Architect. Earlier removal than specified below may be approved by the Architect, based on the weather and tests of job-cured cylinders. All formwork shall be removed without damage to the concrete.
- B. The minimum time for forms to remain in place shall be as follows:
 - 1. Walls, columns, and beam sides: 4 days.
 - 2. Slabs on grade and sides of footings: 3 days.
- C. Any request for earlier removal of forms and shoring shall be made to the Architect in writing, along with supporting evidence that the safety of the structure will not be impaired. Subcontractor shall prepare test cylinders in accordance with ASTM C31 and have compression tests performed in accordance with ASTM C39, at his own expense, as supporting evidence for earlier form removal, if required by the Engineer.
- D. During the period that forms are in place on the concrete Work, said forms shall be kept wet at all times.
- E. In removing plywood forms, no metal pinch bars shall be used and special care shall be taken in stripping. Start at top edge or vertical corner where it is possible to insert wooden wedges. Wedging shall be done gradually and shall be accompanied by light tapping on the plywood panels to crack them loose. Do not remove forms with a single jerk after it has been started at one end.
- F. Forms shall be left in place as long as possible to permit shrinkage away from concrete.
- G. Nothing herein shall be construed as relieving the Contractor of any responsibility for the safety of the structure.
- H. After stripping, Subcontractor shall properly protect all concrete to be exposed in the finish Work from damage to prevent spalled edges, chips, etc.

3.03 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris daily and dispose in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 03 31 13

CONCRETE REINFORCING

PART I – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. All work necessary to provide all concrete reinforcement such as reinforcing steel, welded wire fabric, and concrete inserts as called for on the Drawings and as specified herein.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following Divisions:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 REFERENCES

- A. American Concrete Institute (ACI)
 - 1. ACI 315: Details and Detailing of Concrete Reinforcement, Latest Edition.
 - 2. ACI 315R: Manual of Engineering and Placing Drawings for Reinforced Concrete Structures, Latest Edition.
- B. American Society for Testing and Materials (ASTM):
 - 1. A185: Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement, Latest Edition.
 - 2. A 615: Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement, Latest Edition.
 - 3. A 706/A 706M: Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement, Latest Edition.
- C. American Welding Society (AWS):
 - 1. AWS D1.4: American Welding Society, Structural Welding Code, Reinforcing Steel, Latest Edition.
- D. 2015 International Building Code.

- E. Massachusetts State Building Code, Latest Edition.

1.05 SUBMITTALS

- A. Provide submittals in accordance with requirements of Section 01 33 00 – Submittal Procedures, and in accordance with requirements of the Contract Documents.
- B. Provide shop drawings as follows:
 - 1. Shop drawings for reinforced concrete structures shall be submitted after the concrete pour sequences, construction joint locations, and placement schedules have been approved by the Architect.
 - 2. Structural drawings shall not be duplicated for use in the production of shop drawings.
 - 3. At least 30 days before each scheduled concrete placement, submit shop drawings covering the reinforcing steel details, bar lists, support bars and details, locations of reinforcing bar cut-offs, splices, development lengths and placement details. Prepare shop drawings in accordance with ACI 315 and 315R from reinforcement details shown on the drawings.
 - 4. Mill Certificates: Accompanying the shop drawings, submit steel producer's certification of mill analysis, tensile, and bend tests for reinforcing steel.
 - 5. Welder's certification in conformance with AWS D1.4, when welding is indicated or specified. Testing of welds shall be conducted and witnessed by an independent testing laboratory prior to welding of reinforcement. Maintain qualification and certification records at the job site, readily available for examination of test results.
- C. Manufacturer's literature including installation instructions for the following.
 - 1. Supports

1.06 QUALITY CONTROL

- A. Provide in accordance with the requirements of the Quality Control section and as specified.
- B. Do not fabricate reinforcement until shop and placement drawings have been approved by the Architect.
- C. Tolerances:
 - 1. Tolerances shall be as specified in ACI 315R.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver reinforcement to the job site bundled, tagged, and marked. Use metal tags indicating bar size, lengths, and other information corresponding to markings shown on shop drawings.
- B. Storage: Store reinforcement at the job site in a manner to prevent damage and accumulation of dirt and excessive rust.

1.08 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Reinforcing bars shall be newly rolled deformed bars conforming to ASTM A615 Grade 60, unless otherwise indicated on the Drawings.
 - 1. Where necessary, bars to be welded shall conform to ASTM A706 deformed, Grade 60. As an alternate to welding, provide mechanical splice anchors (or couplers).

2. Provide mill bent reinforcing bars, bent cold to the dimensions indicated and conforming to the requirements of ACI SP-66.
 - B. Welded wire fabric shall conform to ASTM A 185, with a minimum ultimate tensile strength of 70,000 psi. Provide in sizes indicated. Provide support bars and reinforcing bar supports as specified to obtain the concrete cover.
 - C. Bar support and accessories (bolsters or chairs) shall be galvanized or plastic coated and shall conform to ACI 315. Provide minimum size number 5 support bars.
 - D. Provide 3-in. by 3-in. plain precast concrete blocks and precast concrete doweled blocks for reinforcing bar supports in foundation mats, base slabs, footings, pile caps, grade beams and slabs on grade. Provide block thickness to produce concrete cover of reinforcement as indicated. Provide blocks of Type II cement with 3000 psi minimum compressive strength in conformance with the Section 03 30 00 - Cast-in-Place Concrete.
 - E. Wire for tying reinforcement in place shall be No. 16 AWG or heavier black soft-annealed wire.
- 2.02 FABRICATION
- A. Fabricate reinforcement only after shop drawings have been returned by the Architect and Engineer marked with some form of approval to proceed.
 - B. Provide reinforcing bars that have been cut and bent before shipment. If bars must be bent on site, bend reinforcing steel cold, and do not straighten or re-bend in a manner which will damage the material. Bend in conformance with requirements of ACI SP-66 or with ASTM A767 when reinforcement is to be galvanized.
 - C. Splices:
 1. Provide standard reinforcement splices by lapping ends, placing bars in contact, and tightly wire tying for the full length of the splice. All lap splices shall be ACI 318, Class B, unless indicated otherwise on the Drawings.
 2. Adjacent splices shall be staggered whenever possible.

PART 3 - EXECUTION

- 3.01 GENERAL
- A. General: Comply with Concrete Reinforcing Steel Institute's recommended Practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.
- 3.02 PLACEMENT
- A. Comply with the specified standards for details and methods of reinforcement placement and supports, and as herein specified. Comply with concrete protective cover requirement indicated on the Drawings.
 - B. Clean reinforcement to remove loose rust and mill scale, earth, and other materials that would reduce or destroy bond with concrete.
 - C. Position, support, and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers to ensure no movement occurs during placing and finishing of concrete.
 - D. Place reinforcement to obtain the specified coverage for concrete protection. Arrange, space, and securely tie bars and bar supports together with wire, to hold reinforcement accurately in position during concrete placement operation. Set wire ties so that twisted ends are directed away from exposed concrete surfaces.
 - E. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least two full squares.
 - F. Provide supports of sufficient numbers and strengths to carry reinforcement. Do not place reinforcing bars more than 2 inches beyond the last leg of any continuous bar support. Do not use supports as bases for runways for conveying equipment and similar construction loads.

- G. Bars may be moved as necessary to avoid interference with other reinforcing steel, conduits or embedded items. Bars moved more than three inches are subject to approval of Engineer. Place required number of bars.
- H. Position dowels accurately, rigidly support, and securely tie. Align dowels normal to concrete surface before concrete placement. Setting dowels into wet concrete is prohibited.
- I. Provide and place safety caps on all exposed ends of vertical reinforcement.
- J. Tie a minimum of 25 percent of all intersecting bars in foundation mats, base slabs, footings, pile caps, slabs on grade and elevated slabs.
- K. Do not splice reinforcement steel in foundation mats, base slabs, beams, girders, slabs and walls at points of maximum stress unless otherwise indicated.
- L. Lap splice welded wire fabric reinforcement at least two full meshes. Stagger splices to avoid continuous laps in either direction and wire tightly together. Straighten rolled welded wire fabric reinforcement into flat sheets before use.
- M. Provide continuous reinforcement through construction joints.

3.03 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris daily and dispose in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 04 01 20.91

CONCRETE MASONRY UNIT (CMU) WALL RESTORATION

(Filed Sub-Bid Required)

PART 1 - GENERAL

1.01 FILED SUB-BID REQUIREMENTS

- A. The Work of this Section shall be included as part of the Filed Sub-Bid for Section 04 20 00 – Unit Masonry, stipulated as a Filed Sub-Bid under Paragraph D, Item 2 of the Form for General Bid.
- B. All Sub-bids shall be submitted on the Form for Sub-Bid, included as Section 00 00 20 of these Specifications, as required by Section 44F of Chapter 149 of the General Laws, as amended.
- C. The attention of Bidders is directed to Section 00 00 20 – City of New Bedford Front End Documents. Instructions to Bidders. Sub-Bids shall be filed with the Awarding Authority in accordance with requirements stipulated therein.
- D. The Trade Contractor for this Section shall examine all drawings and specification sections for requirements that may affect the Work of this Section. The Work of this Section is shown primarily on the following listed Drawings:
EX1.01 through EX4.01 inclusive; D1.01 through D4.01 inclusive; A1.01 through A8.01 inclusive; VT.01; S0.01 through S1.03 inclusive; PD1.01 through P1.01 inclusive; MD1.01 through M2.01 inclusive; ED1 through E4.1 inclusive.

1.02 RELATED DOCUMENTS

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

1.03 DESCRIPTION OF WORK

- A. The Work of this Section shall include, but not be limited to, furnishing and installation of the following:
 - 1. Repair CMU wall
 - 2. Repoint joints

1.04 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.05 DEFINITIONS

- A. Low-Pressure Spray: 100 to 400 psi.

1.06 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For each exposed Product and for each color and texture specified.

1.07 INFORMATIONAL SUBMITTALS

- A. Preconstruction Test Reports.

1.08 QUALITY ASSURANCE

- A. Restoration Specialist Qualifications: Engage an experienced CMU wall restoration and cleaning firm to perform work of this Section. Firm shall have completed work in a similar material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience installing standard unit masonry is not sufficient experience for masonry restoration work.
 - 1. A Contractor's option, work may be divided between two specialist firms: one for cleaning work and one for repair work.
 - 2. Field Supervision: Restoration specialist firms shall maintain experienced full-time supervisors on Project site during times that clay masonry restoration and cleaning work is in progress.
 - 3. Restoration Worker Qualifications: Persons who are experienced in restoration work of types they will be performing.

1.09 CUTTING AND CORING

- A. The installation of new Work that requires coring of floors, walls, and/or roof penetrations measuring 4-1/2 in. or less shall be performed by the Subcontractor of a Filed Sub-Bid Section. The General Contractor shall cut and core floors, walls, and/or roof penetrations for sizes not indicated by a Filed Sub-Bid Section.

1.10 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS

2.01 MASONRY MATERIALS

- A. Provide CMU where required to complete masonry restoration work.
 - 1. Provide CMU with physical properties, colors, color variations within units, surface texture, size and shape to match existing masonry.

2.02 MORTAR MATERIALS

- A. Portland Cement: ASTM C150, Type I or Type II, white or gray or both where required for color matching of exposed mortar.
 - 1. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C 114
- B. Hydrated Lime: ASTM C 207, Type S.

- C. Mortar Sand: ASTM C144 unless otherwise indicated.
 - 1. Color: Provide natural sand or ground marble, granite, or other sound stone of color necessary to produce required mortar color.
 - 2. For pointing mortar, provide sand with rounded edges.
 - 3. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.
- D. Mortar Pigments: Natural and synthetic iron oxides compounded for mortar mixes. Use only pigments with record of satisfactory performance in masonry mortars.
- E. Water: Potable.

2.03 MANUFACTURED REPAIR MATERIALS

- A. Masonry Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching masonry.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cathedral Stone Products, Inc; Jahn M100 Terra Cotta and CMU Repair Mortar
 - b. Conproco Corporation: Mimic
 - c. Edison Coatings, Inc: Custom System 45
 - 2. Use formulation that is vapor – and water permeable (equal to or more than the masonry unit), exhibits low shrinkage, has lower modulus of elasticity than the masonry units being repaired, and develops high bond strength to all types of masonry.
 - 3. Formulate patching compound used for patching CMU in colors and textures to match each masonry unit being patched.

2.04 ACCESSORY MATERIALS

- A. Setting Buttons: Resilient plastic buttons, non-staining to masonry, sized to suit joint thicknesses and bed depths of masonry units without intruding into required depths of pointing materials.

2.05 MORTAR MIXES

- A. Measurement and Mixing Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.
 - 1. Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not re-temper or use partially hardened material.
- B. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architects approval.
 - 1. Mortar pigments: Where mortar pigments are indicated, do not exceed a pigment-to-cement ratio of 1:10 by weight.
- C. Do not use admixtures in mortar unless otherwise indicated.
- D. Mortar Proportions: Mix mortar in the following proportions.
 - 1. Pointing and rebuilding (Setting) Mortar: Comply with ASTM C270, Proportion Specification, Type N unless otherwise indicated; with cementitious material limited to Portland cement and lime.

PART 3 - EXECUTION

3.01 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from masonry restoration work.

3.02 CMU REMOVAL AND REPLACEMENT

- A. At locations indicated, remove CMU that are damaged, spalled, or deteriorated or are to be reused for rebuilding. Carefully demolish or remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.
- B. Support and protect remaining CMU wall that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.
- C. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.
- D. Remove in an undamaged condition as many whole CMU as possible.
 - 1. Remove mortar, loose particles, and soil from CMU by cleaning with hand chisels, brushes and water.
 - 2. Remove sealants by cutting close to CMU with utility knife and cleaning solvents.
- E. Clean CMU wall surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.
- F. Replace removed damaged CMU units with other removed units in good quality, where possible, or with new CMU matching existing masonry, including size. Do not use broken units unless they can be cut to usable size.
- G. Install replacement CMU into bonding and coursing pattern of existing masonry wall. If cutting is required, use a mortar-driven saw designed to cut masonry with clean, sharp, unchipped edges.
 - 1. Maintain joint width for replacement units to match existing joints.
 - 2. Use Setting Buttons or shims to set units accurately spaced with uniform joints.
- H. Lay replacement CMU with completely filled bed, head, and collar joints, Butter ends with sufficient mortar to full head joints and shove into place. Wet both replacement and surrounding masonry that have ASTM C67 initial rates of absorption (suction) of more than 30 g/30 sq. in per min. Use wetting methods that ensure that units are nearly saturated but surface is dry when laid.
 - 1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing masonry work.
 - 2. Rake out mortar used for laying CMU before mortar sets and point new mortar joints in repaired area to comply with requirements for repointing existing masonry, and at same time as repointing of surrounding area.
 - 3. When mortar is sufficiently hard to support units, remove shims and other devices interfering with pointing of joints.

3.03 CMU WALL PATCHING

- A. Patching CMU Wall:
 - 1. Remove loose materials from masonry surface. Carefully remove additional material so patch will not have feathered edges but will have square or slightly undercut edges on area to be patched and will be at least ¼ inch thick, but not less than recommended by patching compound manufacturer.
 - 2. Mask adjacent mortar joint or rake out for repointing if patch will extend to edge of CMU.
 - 3. Mix patching compound in individual batches to match each unit being patched.
 - 4. Rinse surface to be patched and leave damp, but without standing water.
 - 5. Brush-coat surfaces with slurry coat of patching compound according to manufacturer's written instructions.
 - 6. Place patching compound in layers as recommended by patching compound manufacturer, but not less than ¼ inch or more than 2 inches thick. Roughen surfaces of each layer to provide a key for next layer

7. Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane or contour of the masonry unit. Shape and finish surface before or after curing, as determined by testing, to best match existing masonry unit.
8. Keep each layer damp for 72 hours or until patching compound has set.

3.04 PRELIMINARY CLEANING

- A. Removing Plant Growth: Completely remove visible plant, moss, and shrub growth from masonry surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing to dry as long as possible before removal. Remove loose soil and debris from open masonry joints whatever depth they occur.
- B. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to cleaning methods being used. Extraneous substances including paint, caulking, asphalt, and tar.
 1. Carefully remove heavy accumulations of material from surface of masonry with a sharp chisel. Do not scratch or chip masonry surface.
 2. Remove paint and caulking with alkaline paint remover.
 - a. Comply with requirements in "Paint Removal" article
 - b. Repeat application up to two times if needed
 3. Remove asphalt and tar with solvent-type paint remover.
 - a. Comply with requirements in "Paint Removal" article
 - b. Apply paint remover only to asphalt and tar by brush without pre-wetting
 - c. Allow paint remover to remain on surface for 10 to 30 minutes
 - d. Repeat application if needed

3.05 REPOINTING MASONRY WALL

- A. Rake out and repoint joints to the following extent:
 1. All joints in areas indicated.
 2. Joints where mortar is missing or where they contain holes.
 3. Cracked joints where cracks can be penetrated at least 1/4 inch by a knife blade 0.027 inch thick.
 4. Cracked joints where cracks are 1/8 inch or more in width and of any depth
 5. Joints where they sound hollow when tapped by metal object
 6. Joints where they are worn back 1/4 inch or more from surface
 7. Joints where they are deteriorated to the point that mortar can be easily removed by hand, without tools
 8. Joints where they have been filled with substances other than mortar
 9. Joints indicated as sealant-filled joints
- B. Do not rake out and repoint joints where not required.
- C. Rake out joints as follows:
 1. Remove mortar from joints to depth of 2-1/2 times joint width but not less than 1/2 inch or not less than that required to expose sound, un-weathered mortar.
 2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
 3. Do not spall edges of masonry units or widen joints. Replace or patch damaged masonry units as directed by Architect.
 - a. Cut out mortar by hand with chisel and resilient mallet. Do not use power-operated grinders.
 - b. Cut out center of mortar bed joints using angle grinders with diamond-impregnated metal blades. Remove remaining mortar by hand with chisel and resilient mallet.
- D. Notify Architect of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.

- E. Pointing with Mortar:
1. Rinse joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen joint surfaces before pointing.
 2. Apply Pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in later not greater than 3/8 inch until a uniform depth is formed. Fully compact each later thoroughly and allow it to become thumbprint hard before applying next layer.
 3. After low areas have been filled to same depth as remaining joints, point all joints by placing mortar in layers not greater than 3/8 inch. Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing masonry units have worn or rounded edges, slightly recess finished mortar surface below face of masonry to avoid widened faces. Take care not to spread mortar beyond joint edges onto exposed masonry surfaces or to featheredge the mortar.
 4. When mortar is thumbprint hard, tool joints to match original appearance of joints as demonstrated in approved mock-up. Remove excess mortar from edge of joint by brushing.
 5. Cure mortar by maintaining mortar in thoroughly damp condition for at least 72 consecutive hours including weekends and holidays.
 - a. Acceptable curing methods include covering with wet burlap and plastic sheathing, periodic hand misting, and periodic mist spraying using systems of pipes, mist, heads and timers.
 6. Hairline cracking within mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.
- F. Where repointing work precedes cleaning of existing masonry, allow mortar to harden at least 30 days before beginning cleaning work.

3.06 CLEANING

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 04 20 00

UNIT MASONRY

(Filed Sub-Bid Required)

PART 1 - GENERAL

1.01 FILED SUB-BID REQUIREMENTS

- A. The Work of this Section is stipulated as a filed Sub-Bid under Paragraph D, Item 2 of the Form for General Bid.
- B. All Sub-bids shall be submitted on the Form For Sub-Bid, included as Section 00 03 25 of these Specifications, in accordance with requirements of Section 44F of Chapter 149 of the General Laws, as amended.
- C. The attention of Bidders is directed to Section 00 01 00 - Instructions to Bidders. Sub-Bids shall be filed with the Awarding Authority in accordance with requirements stipulated therein.
- D. The Work of the Filed Sub-Bid for Section 04 20 00 shall include the Work of the following Specification Section in its entirety:
 - 1. 04 01 20.91 Concrete Masonry Unit (CMU) Wall Restoration
 - 2. Section 04 21 11 - Reinforced Unit Masonry
- E. The Trade Contractor for this Section shall examine all drawings and specification sections for requirements that may affect the Work of this Section. The Work of this Section is shown primarily on the following listed Drawings:
EX1.01 through EX4.01 inclusive; D1.01 through D4.01 inclusive; A1.01 through A8.01 inclusive; VT.01; S0.01 through S1.03 inclusive; PD1.01 through P1.01 inclusive; MD1.01 through M2.01 inclusive; ED1 through E4.1 inclusive.

1.02 RELATED DOCUMENTS

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

1.03 DESCRIPTION OF WORK

- A. The Work of this Section shall include, but not be limited to, furnishing and installation of the following:
 - 1. Solid and cored clay brick masonry units
 - 2. Concrete Masonry Units (CMU)
 - 3. Cast stone masonry
 - 4. Rigid insulation at masonry cavity wall
 - 5. Self-adhered thru-wall flashing with drip edge
 - 6. Horizontal reinforcing, ties, anchors, cavity and mortar drop prevention, control joint materials, weep baffle and accessories
 - 7. Final cleaning of exterior masonry and interior exposed to view masonry work.
 - 8. Stainless steel drip edge
- B. Items to be Furnished Only: Furnish the following items for installation by the designated Sections:
 - 1. Section 03 30 00 – Cast-in-Place Concrete: Dovetail anchor slots
- C. Items to be Installed Only: Install the following items as furnished by the designated Sections:
 - 1. Section 04 21 11 - Reinforced Unit Masonry: Vertical reinforcing bars and mortar and grout mixes
 - 2. Section 05 50 00 - Metal Fabrications: Loose steel angle lintels for all openings in masonry walls, and anchors, blocking, plates, anchor bolts, and ties to be built into masonry
 - 3. Fire Protection, Plumbing, Mechanical, and Electrical: Access panels, sleeves for piping and conduit to be built into the Work of this Section.

- D. NOTE: Build-in all anchors, blocking, plates, anchor bolts, ties and all other items required to be built into masonry as furnished by other trade Sections. The Mason shall cooperate with all other trades and notify them sufficiently in advance of the time when the material furnished by them is to be built into the masonry so that progress of the Work shall not be impeded. Take every precaution to minimize cutting and patching.

1.04 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all of the Contract Documents for requirements which effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following Divisions:
1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 2. Section 02 41 13 – Selective Demolition
 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 4. DIVISION 04 – MASONRY; including all Sections contained therein
 5. DIVISION 05 – METALS; including all Sections contained therein.
 6. Section 06 10 00 – Rough Carpentry
 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 10. Section 10 14 00 – Signage
 11. Section 14 21 00 – Traction Elevators
 12. Section 22 00 00 – Plumbing
 13. Section 23 00 00 – HVAC
 14. Section 26 00 00 – Electrical
 15. Section 31 20 00 – Earth Moving

1.05 QUALITY ASSURANCE

- A. Provide the products of one manufacturer for each type of material required for the Work of this Section.
- B. Before beginning primary Work of this Section, provide two 4 ft. x 6 ft. mock-ups of each different type of masonry wall and obtain Architect's acceptance of visual qualities at transition of brick types, and cast stone window sill. Include all flashings, reinforcing, ties, back-up structural components, lintels, window and other related Work of this and other Sections. Provide mock-ups at locations and with orientation acceptable to Architect. Protect and maintain acceptable mock-ups throughout the Work of this Section to serve as criteria for acceptance of this Work.
- C. Reinforced concrete masonry construction shall conform to all requirements of "Specification for Concrete Masonry Construction (ACI 531.1)" published by the American Concrete Institute, except as modified by the supplemental requirements contained herein or as specified in Section 04 21 11 - Reinforced Masonry.

1.06 TESTS

- A. Where fire-resistance ratings are indicated or required by authorities having jurisdiction, provide materials and construction which is identical to assemblies whose fire-resistance rating has been tested in compliance with ASTM E119 by independent agencies acceptable to the Architect and authorities having jurisdiction. If proposed units have not been tested ascertain fire resistance rating by utilizing equivalent thickness/type of aggregate calculations.
- B. Verify by testing in compliance with ASTM C780 that mortar and grout used meets specification requirements. At random, take samples from mortar boards every day. Make written reports.
1. Testing Agency: The Owner will employ an independent testing agency to perform tests and certifications indicated.

1.07 SUBMITTALS

- A. Samples:
1. Submit five samples of typical brick showing extreme variations in color and texture.

2. Submit two full size concrete masonry units, glazed concrete masonry units and high density prefaced concrete masonry units of each type and color required.
 3. Submit two ties and anchors of each type.
 4. Submit 6 in. long samples of mortar in aluminum channels.
 5. Submit samples of mortar drop prevention, cell vent weeps, and joint control materials.
 6. Submit minimum 12 in. x 12 in. sample of through wall flashing material.
 7. Furnish a 1 ft. x 1 ft. sample of cavity insulation labeled with manufacturer's name, thickness and location of use.
- B. Submit certified reports for tests required.
- C. Provide large scale, detailed shop drawings for fabrication of all masonry lintels, bond beams and reinforced masonry components, showing sizes, profiles, reinforcing and all other critical elements. Indicate special face brick shapes showing size and profiles for each unit required.
1. Provide coordination drawings showing location of anchors and ties which must be built into other Work such as cast stone lintel elements.
- D. Submit certification of compliance for each fire-resistant type of CMU used. Certification shall identify aggregate and equivalent thickness of CMU if not a U.L. Design Number.
- 1.08 DELIVERY, STORAGE AND HANDLING
- A. Deliver and store unit masonry to project site stacked on pallets and in undamaged condition and handle materials in strict compliance with manufacturer's instructions and recommendations, as necessary to protect from all possible damage.
- B. Store pallets off ground to prevent contamination from mud, dirt or other materials that could cause staining.
- 1.09 PROJECT CONDITIONS
- A. Hot Weather Protection: Use mortar within 1-1/2 hours after mixing. Discard all mortar over 1-1/2 hours old and all mortar that has stiffened due to hydration (setting).
- B. Cold Weather Protection: The Masonry Subcontractor shall strictly comply with recommendations of Brick Institute of America Technical Note No. 1a, Cold Weather Masonry Construction, Construction and Protection Recommendations and The Portland Cement Association. When the temperature is below 40°F temporary enclosures and heat shall be provided by the General Contractor and the following procedures shall be followed by the Masonry Subcontractor:
1. Cold Weather Protection:
 - a. Preparation:
 - 1) Remove ice or snow formed on masonry bed by carefully applying heat until top surface is dry to touch.
 - 2) Remove frozen or damaged masonry.
 - 3) Sprinkle with heated water when brick suction exceeds 30 gm/min./30 sq. in.
 - a) When units are above 32°F, heat water above 70°F.
 - b) When units are below 32°F heat water above 130°F.
 - 4) Use dry masonry units.
 - 5) Do not use frozen units.
 2. Construction requirements while Work is progressing:
 - a. Air temperature 40°F to 32°F:
 - 1) Heat sand or mixing water to produce mortar temperatures between 40°F and 120°F.
 - b. Air temperature 32°F to 25°F:
 - 1) Heat sand and mixing water to produce mortar temperatures between 40°F and 120°F.
 - 2) Maintain temperature of mortar on boards above freezing.
 - c. Air temperatures 25°F to 20°F:
 - 1) Heat sand and mixing water to produce mortar temperatures between 40°F and 120°F.

- 2) Maintain mortar temperatures on boards above freezing.
 - 3) Use approved heat sources on both sides of walls under construction by the General Contractor.
 - 4) Use windbreaks when wind is in excess of 15 mph.
 - d. Air temperature 20°F and below:
 - 1) Heat sand and mixing water to produce mortar temperatures between 40°F and 120°F.
 - 2) The General Contractor shall provide temporary enclosures and heat as necessary to maintain air temperature above 32°F.
 - 3) Minimum temperature of units when laid: 20°F.
 - 4) Produce subsequent mortar batches within +/-10°F of first batch.
 3. Protection requirements for completed masonry and masonry not being Worked on:
 - a. Mean daily air temperature 40°F to 32°F: Protect masonry from rain or snow for 24 hours by covering with non-staining weather-resistive membrane.
 - b. Mean daily air temperature 32°F to 25°F: Completely cover masonry with non-staining weather-resistive membrane for 24 hours.
 - c. Mean daily air temperature 25°F to 20°F: Completely cover masonry with insulating blankets or equal protection for 24 hours.
 - d. Mean daily air temperature 20°F and below: Maintain masonry temperature above 32°F for 24 hours by enclosure and supplementary heat, electric heating blankets, infrared lamps, or other acceptable methods provided by the General Contractor.
 - C. Cover Work at the end of each day and whenever Work is not in progress. Extend cover down both sides of walls at least 24 in. and hold securely in place.
 - D. Load Application:
 1. Do not apply uniform floor loading or roof loading for at least twelve hours after building masonry columns or walls.
 2. Do not apply concentrated loads for at least three days after building masonry columns or walls.
 - E. Perform Work only when ambient temperature and surface temperature of existing unit masonry and new materials are between 40 deg. F and 80 deg. F. Work only when temperature is forecasted to be 40 deg. F or above for at least one week after completion of Work unless temporary enclosures and heat are provided.
 - F. Prevent mortar from staining face of masonry and other building components that are to be left exposed. Clean exposed masonry immediately using soft brushes and water only. Protect base of walls from splashed mud and other stains. Protect sills, ledges and projections from mortar droppings.
- 1.10 CUTTING AND CORING
- A. The installation of new Work that requires coring of floors, walls, and/or roof penetrations measuring 4-1/2 in. or less shall be performed by the Subcontractor of a Filed Sub-Bid Section. The General Contractor shall cut and core floors, walls, and/or roof penetrations for sizes not indicated by a Filed Sub-Bid Section.
- 1.11 PRE-INSTALLATION MEETING
- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 BRICK VENEER MASONRY**

- A. Provide face brick conforming to ASTM C 216, Type FBS Grade SW. Brick shall be cored and solid brick units, with finish and coloration as selected by the Architect from the approved manufacturer's complete selection of standard colors. Brick units shall meet the following guidelines:
1. Grade SW for all Work
 2. Color/Finish/Texture: As selected by the Architect from the manufacturer's complete selection.
 3. Lintel brick shall be solid brick units: Use solid bricks where required so cores shall not be visible after final installation.
 4. Minimum Compressive Strength: 9000 psi
 5. Maximum saturation coefficient: 0.78
- B. Provide Economy Size Brick masonry as described and manufactured below, or Architect approved equal, at locations, orientation, and bond style as indicated on the Drawings, and as follows:
1. Brick Type 1: University Blend Red (310) brick as manufactured by Redland or Architect approved equal by Watsontown or Belden Brick.
 2. Brick Type 2: Victorian (104) brick as manufactured by Redland or Architect approved equal by Watsontown or Belden Brick.
- C. Provide all special shaped brick necessary for a complete installation in accordance with requirements of the Contract Documents, and as indicated on the Drawings. Special shape brick shall match performance criteria and color of the basic masonry type. Provide solid shape brick for sills and caps, and elsewhere as indicated. Use solid bricks where required so cores shall not be visible after final installation.

2.02 CONCRETE MASONRY UNITS

- A. Provide hollow load bearing concrete masonry units conforming to ASTM C90. Provide concrete masonry having the following characteristics:
1. Provide units with nominal 8 in. high x 16 in. long face dimensions (7-5/8 in. x 15-5/8 in. actual), unless indicated otherwise. Provide thicknesses indicated, or if not indicated, as necessary to create a properly supported, structurally safe walls built within the height to width limitations required by codes and recommended by the National Concrete Masonry Association.
 2. Provide special shaped units for lintels, bond beams, corners, jambs, headers, control joints and other conditions. Never expose cores. Provide bullnose units full wall height at all vertical and horizontal corners, and door jambs, where CMU is exposed.
 3. Provide normal weight units, except provide units with weight as standard with manufacturer for all units in fire-rated assemblies.

2.03 CAST STONE MASONRY

- A. Provide architectural cast stone units as manufactured by Architectural Cast Stone or Architect approved equal by Custom Cast Stone or Arban Stone. Units shall be wet cast, and manufactured with selected aggregates, cement, and pigments, with controlled techniques intended to simulate natural cut stone in the size and profile of units indicated on the Drawings in accordance with requirements of the Cast Stone Institute, by a producing member of the Cast Stone Institute. Use of cast stone produced by dry tamp method shall not be acceptable.
- B. Provide cast stone masonry units of sizes and shapes, and at locations, orientation and bond coursing, as indicated on the Drawings, complying with requirements of ASTM C 1364, and the following physical properties:
1. Compressive Strength: 6,500 psi at 28 days, in accordance with ASTM C 1194
 2. Absorption: 6% maximum at 28 days by cold water method, in accordance with ASTM C 1195
 3. Linear Shrinkage: No greater than 0.065%, in accordance with ASTM C 426
 4. Density: Greater than 120 pounds per cubic foot, in accordance with ASTM C 140

5. Freeze-Thaw: Less than 5% cumulative mass loss after 300 cycles, in accordance with ASTM C 666
- C. Cast stone ingredient materials shall comply with the following:
1. Portland Cement: Type I or III in accordance with ASTM C 150, containing not more than 0.60 percent total alkali when tested in accordance with ASTM C 114. Provide natural color white and/or gray to match Architect selected unit color.
 2. Coarse Aggregates: Granite, quartz, or limestone, in accordance with ASTM C 33, except for gradation
 3. Fine Aggregates: Manufactured or natural sand, in accordance with ASTM C 33
 4. Pigments: Inorganic iron oxide pigments or colored water-reducing admixtures; in color stable, free of carbon black, nonfading, and resistant to lime and other alkalis in accordance with ASTM C 979, use of carbon black pigments not allowed.
 5. Water: Potable
 6. Reinforcing Bars: Deformed steel bars, Grade 60 in accordance with ASTM A615. Bars shall be epoxy coated when covered with less than 1-1/2 inches of material.
 7. Admixtures: Water Reducing, Retarding, and Accelerating admixtures shall comply with requirements of ASTM C 494. Air-Entraining admixture shall comply with requirements of ASTM C 260. Other admixtures, including integral water repellents and other chemicals for which no ASTM Standard exists, shall be previously established as suitable for use in concrete by proven field performance or through laboratory testing.
- D. All surfaces exposed to view shall have a fine-grained texture, with no air voids greater than 1/32", with no more than 3 voids in any one (1) square inch area, and not obvious under direct daylight illumination at a distance of 5'-0". Total color variation between individual units of comparable age exposed to similar weathering shall be no greater than 6 units, and total hue difference shall be no greater than 4 units, measured in accordance with ASTM D 2244. Color shall be as selected by the Architect from the approved manufacturer's complete selection of standard colors.
- E. Cast stone units shall be manufactured within tolerances in accordance with Cast Stone Institute Technical Manual, unless otherwise specified. Cross section dimensions shall not deviate by more than plus or minus 1/8 inch from approved dimensions. Length of units shall not deviate by more than length/360 +/- 1/8 inch, whichever is greater, not to exceed 1/4 inch. Warp, bow, or twist shall not exceed length/360 or plus or minus 1/8 inch, whichever is greater
- 2.04 RIGID INSULATION AT MASONRY CAVITY WALL
- A. At exterior wall locations behind brick masonry veneer, provide rigid, closed cell, extruded polystyrene (XPS) insulation Foamular 250 by Owens Corning, or Architect approved equal STYROFOAM Scoreboard by Dow Chemical or Amoco Foam Products. Insulation shall have the following performance properties:
1. R-Value: 5.0 per inch at 75° F mean temperature, in accordance with ASTM C518
 2. Compressive Strength: 25 psi minimum, in accordance with ASTM D1621
 3. Flexural Strength: 50 psi minimum, in accordance with ASTM C203
 4. Water Absorption: 0.3% maximum by volume, in accordance with ASTM C272
 5. Water Vapor Permeability: 1.5 perm maximum, in accordance with ASTM E96
 6. Dimensional Stability: 2% maximum linear change, in accordance with ASTM D2126
 7. Flame Spread: 10, in accordance with ASTM E84
 8. Smoke developed: 175, in accordance with ASTM E84
 9. Thickness: 3 in.
 10. Size: 1 in. x 48 in. x 96 in., square edge to fit cavity wall tie spacing.
 11. Environmental Product Declaration No.: 4786077032.101.1
 12. Low-Emitting: GreenGuard Certified
 13. Recycled Content: 0% Post-Consumer, 20% Pre-Consumer

2.05 REINFORCING, TIES AND ANCHORS

- A. Horizontal joint reinforcing and masonry ties shall be truss type, welded wire units fabricated from 9 gauge ASTM A 82 cold-drawn galvanized steel wire with deformed side wires and smooth cross wires spaced 16 in. O.C. Provide prefabricated corners and tees.
- B. Exterior brick masonry veneer wall anchors and tie systems that comply with ACI 530.1/ASCE 6/TMS 602 and 780 CMR 13, as follows:
 - 1. No. 75 Pos-I-Tie®, as manufactured by Heckmann, or Architect approved equal, with tapcon screw for anchors to masonry backup, and self-drilling screw for anchors to metal stud backup.
 - 2. Barrel length shall fully penetrate masonry or steel stud back-up.
 - 3. Masonry ties shall be 3/16 in. diameter galvanized wire, by length required, to provide a minimum of 2 inches embedment in mortar. Provide ties as follows or otherwise required to complete the Work:
 - a. No. 75 Pos-I-Tie® triangle wire tie, as manufactured by Heckmann, or Architect approved equal
 - b. No. 75 Pos-I-Tie® single wire tie, as manufactured by Heckmann, or Architect approved equal
 - c. Masonry Veneer Seismic Ties: Continuous wire in mortar joint, anchored to Pos-I-Tie® Triangle Tie with welded No. 370 Seismic clip, as manufactured by Heckmann, or Architect approved equal.
 - d. Where details or installation conditions require, provide ties fabricated of shape and size to suit conditions and provide adequate anchorage.
 - 4. Recycled Content: Post-Consumer 75.8%, Pre-Consumer 15.6%.
- C. Provide minimum 22 gauge, hot dip galvanized steel dovetail slots No. 305, and hot dip galvanized flexible dovetail brick tie No. 315, as manufactured by Hohmann & Bernard, or Architect approved equal by Dur-O-Wall or Heckmann Building Products, Inc. at all locations of masonry veneer over concrete. Provide temporary, removable filler to keep dovetail slots clear and free from concrete, mortar, or grout. Finish shall be hot-dip galvanized after fabrication in accordance with ASTM A 153.
- D. Furnish weld-on ties for masonry anchors for installation under the Work of Section 05 12 00 – Structural Steel Framing, as follows, or as otherwise required to provide anchorage in accordance with requirements of the Contract Documents.
 - 1. Masonry perpendicular to column flange: 12 gauge, 1-1/4 in. wide, No. 353 as manufactured by Hohmann & Bernard, or Architect approved equal by Dur-O-Wall or Heckmann Building Products, Inc.
 - 2. Masonry parallel to column flange: 12 gauge, 1-1/2 in. wide, No. 354 as manufactured by Hohmann & Bernard, or Architect approved equal by Dur-O-Wall or Heckmann Building Products, Inc.
 - 3. Masonry perpendicular to column web: 1/4 in. diameter by 8 in. long, No. 359, and 3/16 in. diameter by 12 in. long, No. 301W, both as manufactured by Hohmann & Bernard, or Architect approved equal by Dur-O-Wall or Heckmann Building Products, Inc.
- E. Provide joint stabilization anchors to connect masonry to other materials and to allow in-plane movement while resisting out-of-plane movement and to maintain alignment of expansion joints and control joints while allowing movement within the plane of the wall. Provide joint stabilization anchors with two, 8-gauge steel wires enclosed in a 1/32 in. sheet metal sleeve separated at the center by a plastic sleeve, D/A 2200 as manufactured by Dur-O-Wall or Architect approved equal by Hohmann & Barnard, Inc., or Heckmann Building Products, Inc. Provide mill galvanized units for interior partitions and stainless-steel units for exterior wall applications.
- F. Provide miscellaneous hot-dip galvanized steel straps, bars, rods and similar items, fabricated from not less than 16-gauge sheet steel or 3/16 in. diameter steel wire, to provide a complete installation in accordance with requirements of the Contract Documents.
- G. Provide structural break away anchors for lateral bracing of CMU fire walls as called for on the Drawings. Structural ties shall be minimum 1/8 in. rolled strip zinc alloy, Type 70 X as manufactured by Heckmann Building Products Inc. or Architect approved equal by Dur-O-Wall or Hohmann & Barnard, Inc. Melting point of the zinc strips shall be below 800 degrees Fahrenheit.
- H. Provide vertical reinforcing steel bars in accordance with requirements of Section 04 21 11 - Reinforced Unit Masonry.

- I. Provide hot-dip galvanized, ASTM A153, class B2, 1.5 oz./ft.² zinc coating on all ties, reinforcing, anchors and similar items which extend into an exterior wall assembly, except items of stainless steel. Semi-exposed areas shall be considered exterior.
- J. Provide reinforcing, ties, and anchors for all Work of this Section, including but not limited to, concrete masonry, clay brick veneer, and cast stone utilizing the appropriate type for each condition, including stainless steel for cast stone, in accordance with requirements of this Section, Section 04 21 11 – Reinforced Unit Masonry, and Cast Stone Institute Technical Manual.
 - 1. All ties for use at cast stone masonry shall be designed by the approved cast stone manufacturer.

2.06 FLASHING AND MISCELLANEOUS MATERIALS

- A. Provide 15 lb. roofing felt as bond breaker, complying with ASTM D 226 or ASTM D227.
- B. Provide solid rubber control joint strips with a Shore “A” hardness of 60 to 80, designed to fit standard CMU control joint, and maintain the lateral stability of the wall.
- C. Provide self-adhered, 2 mil stainless steel, thru-wall flashing, York 304 as manufactured by York, or Architect approved equal.
- D. Provide stainless steel drip edges, 0.025 in. thick, soldered at all joints, ASTM A167. Extend horizontally into wall and 1/2 inch out from exterior face of wall with outer edge bent down 30 degrees and hemmed. See Architectural Drawings for sizes and configurations.
- E. Provide one-part non-skinning butyl sealant conforming to ASTM C1311.
- F. Provide flexible, ultraviolet resistant, gray, polypropylene, honeycomb design, masonry cavity vent, Quadro-Vent as manufactured by Hohmann & Bernard, or Architect approved equal by Dur-O-Wall or Heckmann Building Products, Inc. Vent material shall be 3/8 in. x 3-1/2 in. x 3-1/2 in., for use in the vertical (head) mortar joint of the masonry veneer.
- G. Provide Mortar Net™ as manufactured by Hohmann & Bernard, or Architect approved equal by Dur-O-Wall or Heckmann Building Products, Inc. Mortar net shall be manufactured of high density polyethylene (HDPE), 1 in. or 2 in. thick or as otherwise required to fully fill masonry cavity, with continuous 3 in. high bottom strip and 10 in. overall height, in manufacturer's standard length. Net shall be 90% open mesh allowing water and air to move through the material itself and out of cavities.
- H. Provide prefabricated closed cell neoprene expansion joint material for use as fillers in vertical and horizontal movement of clay masonry. Material shall conform with the requirements of ASTM D1056, Class RE41.
 - 1. Vertical expansion joint shall be 3/8 in. thick by 3 in. wide, Type D/A-2015 as manufactured by Dur-O-Wall, Inc. or Architect approved equal by Hohmann & Barnard or Heckmann Building Products, Inc.
 - 2. Horizontal expansion joint shall be 1/4 in. thick by 2-3/4 in. wide with an adhesive surface on one side, Type D/A-2010 as manufactured by Dur-O-Wall, Inc. or Architect approved equal by Hohmann & Barnard or Heckmann Building Products, Inc.

2.07 MORTAR AND GROUT MIXES

- A. Provide pre-packaged mortar cement consisting of a controlled blend of Portland cement and Type S hydrated lime, Blue Circle Eaglebond or Architect approved equal, and complying with requirements of ASTM C150, Type II, and shall be free from water soluble salts and alkalies. Provide mortar complying with ASTM C270 property specifications. When mixing use known volume measures; do not batch by shovel. Mortar aggregate shall be well graded, complying with ASTM C 144.
 - 1. Provide type N mortar for masonry above grade and interior and exterior Work, except as indicated otherwise and below.
 - 2. Provide type S mortar for reinforced and load bearing masonry, and elsewhere as indicated.

- B. Mortar pigment shall be natural and synthetic oxides of iron and chrome, compounded for use in mortar. Use only pigments with proven record of satisfactory performance, as manufactured by Davis Colors and Solomon Colors, or Architect approved equal. Mortar colors shall be as selected by the Architect from the approved manufacturer's complete selection of standard and premium colors.
 - 1. Provide a minimum of three cement colors as necessary to provide mortar color as selected by the Architect from the approved manufacturer's complete selection of standard colors.
- C. Provide grout complying with requirements of ASTM C 476 and with consistency appropriate to conditions so that grout shall completely fill all spaces intended to receive grout. Grout aggregate shall comply with requirements of ASTM C 404
- D. Do not use admixtures or antifreeze agents. Do not use masonry cement. Do not use calcium chloride or any compounds or mortar ingredients containing chlorides.
- E. Lime shall be hydrated, Type S, complying with ASTM C 207.
- F. Mortar to be used in the architectural CMU, used the same integral water repellant that is used by the manufacturer of the CMU.
- G. Water shall be clean and potable.

PART 3 - EXECUTION**3.01 INSTALLATION - GENERAL**

- A. Strictly comply with industry standards and recommendations of Brick Institute of America, National Concrete Masonry Association, and Pre-stress Concrete Institute, American Concrete Institute, except where more restrictive requirements are specified in this Section. The Masonry Subcontractor shall examine substrates and conditions under which this Work is to be performed and notify the General Contractor, in writing, of conditions detrimental to the proper completion of the Work. Beginning Work means Installer accepts substrates and conditions.
- B. Lay face brick, calcium silicate units, and cast stone, with joints in running bond to conform with coursing shown on the Drawings and lay concrete masonry with 3/8 in. wide joints in running bond with each vertical joint centered over masonry unit in next lower course, except where indicated otherwise.
 - 1. Brick shall be plumb, true to line, with level courses accurately spaced and joints aligned vertically. Drifting of joints shall be cause for rejection of Work.
 - 2. Provide expansion, control and isolation joints in masonry Work where shown, or if not shown, at locations approved by Architect. Provide expansion joints spaced not more than 30 ft. O.C. and between 4 ft. and 6 ft. of outside corners in brick masonry construction.
 - 3. Cover Work at the end of each day and whenever Work is not in progress. Extend cover down both sides of walls at least 24 in. and hold securely in place.
- C. Tool joints with weather joints as Work proceeds. Compress mortar to form a dense, smooth weathertight surface. Rake out mortar where sealants are shown to be installed.
- D. Lay masonry plumb and level with full bed and head joints, fully buttered and shoved into place. Do not slush joints. Keep cavity walls completely clear and free from projections and obstructions. Strike joints facing cavity flush.
- E. Remove, clean and reset with fresh mortar all masonry units that are disturbed after laying.
- F. Provide weeps vents at every third head joint immediately above all flashings and ledges. Install vent in joint while placing masonry units in wall. Position vent 1/8 in. from exterior face of masonry.
- G. Install mortar net in conformance with manufacturer's written instructions and recommendations. Install mortar net in one continuous row at base of wall and over all openings directly on flashing of cavity wall construction. Multiple thicknesses of the mortar net may be installed to match cavity widths. When installing multiple thicknesses, align the dovetail Sections with each other.

- H. Cut masonry units with power saw designed for cutting masonry with sharp, unchipped edges. Cut masonry to form special shapes as indicated. Where special shapes cannot be cut or formed without exposing coring or frogging, provide custom made special shaped units.
- I. Install Work with random color variations with no groups of lighter or darker units. Take masonry units from stacks randomly to avoid noticeable color variations.
- J. Layout walls in advance for accurate spacing, uniform joint widths, and accurate bond pattern. Avoid the use of less-than-half size units.
- K. Where Work is interrupted, do not tooth masonry. Cut back one-half unit in each higher course.
- L. Do not wet concrete masonry units before installation. Wet clay masonry before installation.
- M. Leave openings for other materials and equipment as necessary. Complete masonry Work after installation of other Work. Build-in other Work as masonry Work progresses to the greatest extent possible.
- N. Grout units wherever shown and at all masonry lintels, bond beams, jambs and bearing points. At bearing points, fully grout concrete masonry for three full courses immediately below bearing point. Fully grout metal frames built into masonry Work.
- O. For non-loadbearing Work allow for deflection between top of walls and structure above. Maintain lateral stability in a manner acceptable to Architect and authorities having jurisdiction. Provide compressible fillers and joint sealers to maintain acoustical performance and fire ratings of wall assembly. Top of walls to be anchored to structure as shown on the drawings.

3.02 REINFORCING, TIE, AND ANCHOR INSTALLATION

- A. Provide reinforcing, ties, and anchors for all Work of this Section, including but not limited to, concrete masonry, clay brick veneer, calcium silicate masonry, and cast stone utilizing the appropriate type for each condition, in accordance with requirements of this Section, Section 04 21 11 – Reinforced Masonry, and Cast Stone Institute Technical Manual. Allow at least 1 in. space between masonry and structural members when masonry is tied to structure.
- B. Space wall ties to comply with codes and manufacturer's recommendations. Provide at least one tie for every 1.77 sf. of wall area, unless more frequent spacing is indicated or required by codes. Do not space more than 16 in. O.C. vertically and horizontally. Maximum misalignment of bed joints from one wythe to the other shall be 1-1/4 in. Provide ties within 12 in. of wall openings and within 24 in. of wall perimeters and corners. Anchor ties securely to concrete masonry, precast or studs. All fasteners exposed to cavity shall be coated with mastic compatible with the required air barrier system.
- C. Provide reinforcing, ties and anchors for all Work, including but not limited to, concrete masonry, brick masonry, and cast stone masonry using the appropriate specified type for each condition, and in accordance with requirements of Section 04 21 11 - Reinforced Masonry. Cast stone masonry shall be anchored in accordance with the approved manufacturer's written recommendations and the Cast Stone Institute, or as otherwise indicated on the Drawings.
- D. Provide continuous joint reinforcing spaced not more than 16 in. O.C. vertically, except space reinforcing at 8 in. O.C. immediately above and below openings and extend this reinforcing at least 2 ft. beyond each jamb. Overlap joints in reinforcing at least 6 in. Do not bridge expansion and control joints, if any. Provide preformed corners and tees.

3.10 LINTEL INSTALLATION

- A. Install loose metal lintels where shown and elsewhere as needed.
- B. Provide masonry lintels where indicated and wherever openings are shown without another type of lintel. Provide precast concrete, preformed or built-in-place lintels which are adequate for loading conditions encountered. Provide at least 8 in. of bearing at each end. Obtain Architect's approval of masonry lintels used.

3.03 FLASHING INSTALLATION AND COORDINATION

- A. Prepare surfaces to receive flashings to be free of projections, loose material, debris, oil, and smooth and dry. Surface and air temperature at time of installation, and 24 hours prior to installation, shall be not less than 25 degrees Fahrenheit. Spray, roll, or brush apply the approved manufacturer's recommended primer at the rate of 250 to 300 square feet per gallon. Allow primer to dry 1 hour before application of membrane. Areas of primer exposed more than 8 hours, or contaminated by dust or debris shall be cleaned and re-primed.
- B. Apply membrane flashing starting from the lowest point and working upwards in a methodical manner, to install flashing with no wrinkles or air pockets. Use a hand roller to firmly secure membrane to all surfaces. Overlap all seams a minimum of 3 in. Inside and outside corners shall receive a second layer of membrane, and shall be sealed with the approved manufacturer's recommended mastic. Install the approved manufacturer's termination bar and sealant continuously along the top edge of the membrane, securely fastened with neoprene washer screws. Trim the leading edge of the flashing membrane to be recessed 1/2 in. from the exterior exposed face of the brick masonry.
- C. Provide flashing to protect against the downward flow of water at every obstruction, including, but not limited to, ledges, shelf angles, lintels, door and window heads, sills, and jambs, and elsewhere as indicated or required. Form and install flashing to effectively control and divert water to the exterior. Form at least 4 in. high three-sided pans above lintel end and similar conditions to extend the entire length of the lintel. Make watertight joints and seams overlapped at least 3 in. Extend concealed flashings from outer face of wall through the wall and turned up a minimum of 16 in. on the inside face of the wall when the wall is concealed from view.
- D. Coordinate and install reglet where indicated and where needed. Provide reglet in accordance with requirements of Section 07 62 00 - Sheet Metal Flashing and Trim.

3.04 INSULATION INSTALLATION

- A. Mechanically attach insulation to cavity walls or where indicated on drawings per manufacturers recommendations. All panels shall be butted snugly with no gaps greater than 1/4 in. Gaps greater than 1/4 in. shall be filled with the same material. Insulation panels may be applied to cavity walls while air barrier is tacky. Insulation manufacturer shall verify compatibility with air barrier materials.

3.05 TOLERANCES

- A. The building facade brick Work relates directly to the buildings structural steel. Line and grade shall therefore be adjusted to any misalignment or translation of the existing building structure. The following allowable installed tolerances are allowable variations from existing conditions and shall not be added to allowable tolerances indicated for other Work.
 - 1. Maximum variation from plumb in vertical lines and surfaces of columns, walls and arises:
 - a. 1/8 in. at 10 ft.
 - b. 1/4 in. at a story height not to exceed 20 ft.
 - c. 3/8 in. at 40 ft. or more.
 - 2. Maximum variation from plumb for external corners, expansion joints and other conspicuous lines:
 - a. 1/4 in. at any story or 20 ft. maximum.
 - b. 1/2 in. at 40 ft. or more
 - 3. Maximum variation from level of grades for exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines:
 - a. 1/4 in. at any bay or 20 ft.
 - b. 1/2 in. at 40 ft. or more.
 - 4. Maximum variation from plan location of related portions of columns, walls and partitions:
 - a. 1/2 in. at any bay or 20 ft.
 - b. 3/4 in. at 40 ft. or more.
 - 5. Maximum variation in cross-Sectional dimensions of columns and thicknesses of walls from dimensions shown on drawings:
 - a. Minus 1/4 in.

- b. Plus 1/2 in.

3.06 REPAIRING, CLEANING, AND PROTECTION

- A. Remove and replace Work that is loose, chipped, broken or otherwise damaged. Eliminate all evidence of repair. Enlarge voids and holes in mortar joints and point with mortar to exactly match sound adjacent mortar.
- B. Clean exposed concrete masonry units by dry brushing at the end of each day's Work. Comply with recommendations of NCMA TEK Bulletin No. 28. Remove and replace Work that cannot be successfully cleaned. Demonstrate cleaning technique on sample panel and obtain Architect's approval before beginning cleaning Work. Do not use muriatic acid or other chemical cleaners without the written permission of the Architect.
- C. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from brick and/or stone restoration work.
 - 1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of restoration and cleaning work.
- D. Prevent mortar from staining face of surrounding masonry and other surfaces.
 - 1. Cover sills, ledges, and projections to protect from mortar droppings.
 - 2. Keep wall area wet below rebuilding and pointing work to discourage mortar from adhering.
 - 3. Immediately remove mortar in contact with exposed masonry and other surfaces.

3.07 FINAL CLEANING

- A. At or near to Substantial Completion of the Work of this Section, final cleaning shall be performed. Ground Face concrete masonry shall be cleaned using Light Duty Concrete Cleaner by Sure Klean. Follow Manufacturer's cleaning instructions. Brick specific product selection shall be dependent on final selection of brick and in strict accordance with manufacturer's instructions. Materials shall not be applied when temperatures are below 45° F. Temperatures shall not fall below 32° F in 24-hour period after cleaning.
- B. A test area of wall surface from ten to twenty square feet in size shall be cleaned with the recommended masonry cleaning material for inspection and approval by the Architect. Samples of adjacent non-masonry material shall be tested for possible reaction with the diluted cleaning materials. Such samples shall be available for inspection by the Architect. Protection to be provided as necessary and required by the Architect to all non-masonry surfaces during the cleaning process.
- C. Follow manufacturer's recommended procedures for preparation, precautions, application and handling of masonry cleaning products. Do not use muriatic acid or other chemicals without written permission of the Architect.

3.08 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 04 21 11

REINFORCED UNIT MASONRY

(Filed Sub-Bid Required)

PART 1 - GENERAL

1.01 FILED SUB-BID REQUIREMENTS

- A. The Work of this Section shall be included as part of the Filed Sub-Bid for Section 04 20 00 – Unit Masonry, stipulated as a Filed Sub-Bid under Paragraph D, Item 2 of the Form for General Bid.
- B. All Sub-bids shall be submitted on the Form for Sub-Bid, included as Section 00 00 20 of these Specifications, as required by Section 44F of Chapter 149 of the General Laws, as amended.
- C. The attention of Bidders is directed to Section 00 00 20 – City of New Bedford Front End Documents. Instructions to Bidders. Sub-Bids shall be filed with the Awarding Authority in accordance with requirements stipulated therein.
- D. The Trade Contractor for this Section shall examine all drawings and specification sections for requirements that may affect the Work of this Section. The Work of this Section is shown primarily on the following listed Drawings:
EX1.01 through EX4.01 inclusive; D1.01 through D4.01 inclusive; A1.01 through A8.01 inclusive; VT.01; S0.01 through S1.03 inclusive; PD1.01 through P1.01 inclusive; MD1.01 through M2.01 inclusive; ED1 through E4.1 inclusive.

1.02 RELATED DOCUMENTS

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

1.03 DESCRIPTION OF WORK

- A. The Work of this Section shall include, but not be limited to, furnishing and installation of the following:
 - 1. Vertical reinforcing bars
 - 2. Mortar and grout materials and mixes
- B. Extent of each type of reinforced unit masonry Work shall be as defined in the most recent edition of the International Building Code, IBC, including most recent amendments thereto, or as otherwise indicated on the Drawings.

1.04 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all of the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

June 12, 2019

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

- 13. Section 23 00 00 - HVAC
- 14. Section 26 00 00 – Electrical
- 15. Section 31 20 00 – Earth Moving

1.05 QUALITY ASSURANCE

- A. Allowable tolerances shall be in accordance with requirements of Section 04 20 00 – Unit Masonry.
- B. Reinforced concrete masonry construction shall conform to all requirements of "Specification for Masonry Construction (ACI - ASCE 530.1)" published by the American Concrete Institute, except as modified by the supplemental requirements contained herein.
- C. All Work shall conform to requirements of the most recent edition of the International Building Code, IBC, including most recent amendments thereto, and applicable referenced standards therein.

1.06 SUBMITTALS

- A. Submit shop drawings for fabrication, bending, and placement of reinforcement bars. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures". Show bar schedules, diagrams of bent bars, stirrup spacing, lateral ties and other arrangements and assemblies necessary for fabrication and placement of reinforcement for unit masonry Work. Shop drawings shall include wall elevations of the buildings indicating rebar placement locations and sizes.
- B. Submit manufacturer's specifications for each type of masonry unit, accessory, and other manufactured product, including certifications that each type complies with specified requirements. Include instructions for handling, storage, installation and protection.
- C. Submit samples of load bearing blocks, ties, reinforcing, and other items as may be required by Architect.

1.07 JOB CONDITIONS

- A. The Work of this Section shall be provided in accordance with requirements of Section 04 20 00 – Unit Masonry.

1.08 TESTING

- A. Field inspection and testing of Work performed under this Section shall be in accordance with testing requirements of International Building Code, most recent Edition, as amended, for Special Inspections and the Owner's Statement of Special Inspections. The Owner's testing agency shall be present when the Work of this Section is being constructed, and assisted while conducting their Work. Coordinate with the Owner's designated representative and the testing agency to verify requirements for testing of Work performed under this Section.

1.09 CUTTING AND CORING

- A. The installation of new Work that requires coring of floors, walls, and/or roof penetrations measuring 4-1/2 in. or less shall be performed by the Subcontractor of a Filed Sub-Bid Section. The General Contractor shall cut and core floors, walls, and/or roof penetrations for sizes not indicated by a Filed Sub-Bid Section.

1.10 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 MATERIALS**

- A. Refer to Section 04 20 00 - Unit Masonry for hollow load bearing concrete masonry units and other masonry materials and accessories not included in this Section.
- B. Hollow Load Bearing CMU: ASTM C90 grade N, moisture controlled units, normal weight, two cell units. F'm = 2,000 psi.
- C. Reinforcement Bars: Provide deformed bars of following grades complying with ASTM A 615, except as otherwise indicated.
 - 1. Provide Grade 40 for bars, except as otherwise indicated
 - 2. Provide Grade 60 for bars No. 4 to No. 18, except as otherwise indicated
 - 3. Shop-fabricate reinforcing bars which are shown to be bent or hooked
- D. Ties and Horizontal reinforcement: Refer to Section 04 20 00 – Unit Masonry.

2.02 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I, except as otherwise approved by Architect. Provide natural color or white cement to produce required mortar color.
- B. Lime: ASTM C 207, special finishing hydrated lime, non-air-entrained.
- C. Aggregate for Mortar: Sand, ASTM C 144 or ASTM C 404, Size No. 2, except for joints. 1/4 inch and less (if any) use aggregate graded with 100 percent passing the No. 16 sieve.
- D. Fine Aggregate for Grout: Sand, ASTM C 33 or ASTM C 404, Size No. 1.
- E. Coarse Aggregate for Grout: ASTM C 404, Size No. 8 or Size No. 89.

2.03 MORTAR AND GROUT MIXES

- A. Measurement: Use methods which shall ensure that specified proportions are controlled and accurately maintained. Measure aggregate materials in a damp, loose condition.
- B. Mortar: ASTM C 270, and the following:
 - 1. Use Type PL mortar proportioned by volume; one-part Portland cement, 1/4 to 1/2 part lime, and sand equal to 2-1/4 to 3 times the sum of the volume of cement and lime materials. (Type S, with a 28 days compressive strength of 2000 psi.)
- C. Grout: ASTM C 476, and the following:
 - 1. Fine Grout: Proportion by volume; one part Portland cement, zero to one-tenth part lime and sand equal to 2-1/4 to 3 times the sum of the volumes of cement and lime materials. 2500 psi minimum strength. Verify 28-day compressive strength by testing.
 - 2. Coarse Grout: Proportion by volume; one-part Portland cement, zero to one-tenth part lime, and fine aggregate (sand) equal to 2-1/4 to 3 times the sum of the volumes of cement and lime materials, and 3/8 in. (pea stone) aggregate equal to one to two times the sum of the volumes of cement and lime materials. 2500 psi minimum strength. Verify 28 days compressive strength by testing.
- D. Mixing: Combine and mix cement, lime, water and aggregates for a minimum of five minutes in a mechanical batch mixer. For mortar, add as much water as is required for Workability. Mortar may be re-tempered only once by adding water and remixing to maintain acceptable workability. Do not use mortar or grout which has begun to set or if more than 2-1/2 hours have elapsed after initial mixing.
 - 1. Mix grout to have a slump of ten inches plus or minus one inch, at time of placement.
- E. Do not add air-entraining agents or other admixtures to mortar or grout materials.

2.04 TESTING AND MASONRY STRENGTH

- A. The Masonry Subcontractor shall determine the ultimate net compressive strength of masonry (f_m) by either unit tests or prism tests and submit test results to the Architect prior to first use in the structure. See general notes for requirements.
- B. The cost of additional testing and inspection required because of changes in materials or proportions requested by the Masonry Subcontractor shall be paid by the Masonry Subcontractor.

PART 3 - EXECUTION**3.01 PLACING REINFORCEMENT**

- A. Clean reinforcement of loose rust, mill scale, earth, ice or other materials which shall reduce bond to mortar or grout. Do not use reinforcement bars with kinks or bends not shown on drawings or final shop drawings, or bars with reduced cross-section due to excessive rusting or other causes.
- B. Position reinforcement accurately at the spacing shown. Support and secure vertical bars against displacement. Place horizontal reinforcement as the masonry Work progresses. Where vertical bars are shown in close proximity, provide a clear distance between bars of not less than the nominal bar diameter or 1 in. (whichever is greater).
 - 1. For columns, piers and pilasters, provide clear distance between vertical bars as indicated, but not less than 1-1/2 times the nominal bar diameters or 1-1/2 in., whichever is greater. Provide lateral ties as indicated.
- C. Splice reinforcement bars where shown; do not splice at other points unless acceptable to the Architect. Provide lapped splices, unless otherwise shown. In splicing vertical bars or attaching to dowels, lap ends, place in contact and wire tie.
 - 1. Provide not less than minimum lap shown, or if not shown, use 48 bar diameters.
- D. For multiple wythe walls, embed prefabricated horizontal joint reinforcing as the Work progresses, with a minimum cover of 5/8 in. on exterior face of walls and 1/2 in. at other locations. Lap units not less than 6 in. at ends. Use prefabricated "L" and "T" units to provide continuity at corners and intersections. Cut and bend units as recommended by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.
- E. Anchor reinforced masonry Work to supporting structure as indicated on drawings.
- F. Vertical Reinforcing: Place one bar per cell (size as noted on the structural drawings) at spacing noted on the structural drawings, plus at corners and each side of openings as minimum reinforcement unless shown otherwise.
- G. CMU Bond Beams: Provide minimum two No. 5 bars horizontally at top and bottom or directed by Structural Engineer.
- H. Horizontal joint reinforcing for 6 in. thick and smaller CMU shall be welded ladder type, No. 9 gauge diameter and No. 9 gauge cross wire. Ties and joint reinforcing shall be hot-dipped galvanized, in accordance with ASTM A 153.
- I. Horizontal joint reinforcing for 8 in. thick and wider CMU shall be welded tri-rod truss type, No. 9 gauge side pods and No. 9 gauge cross wire. Ties and joint reinforcing shall be hot-dipped galvanized, in accordance with ASTM A 153.
- J. Horizontal joint reinforcing shall be provided for all CMU walls spaced not more than 16 in. O.C. vertically, except space reinforcing at 8 in. O.C. immediately above and below openings and extend this reinforcing at least 2 ft. beyond each jamb. Overlap joints in reinforcing at least 8 in. Do not bridge expansion and control joints, if any. Provide preformed corners and tees.

3.02 INSTALLATION - GENERAL

- A. Refer to Section 04 20 00 - Unit Masonry for general installation requirements of unit masonry and mortar bedding and jointing requirements, except where specifically modified by this Section.

3.03 INSTALLATION OF REINFORCED CONCRETE UNIT MASONRY

- A. General:
 - 1. Do not wet concrete masonry units.
- B. Lay CMU units with full-face shell and full-web mortar beds. Fill vertical head joints (end joints between units) solidly with mortar from face of unit to a distance behind face equal to not less than the thickness of longitudinal face shells. Maintain head and bed joints widths shown, or if not shown, provide 3/8 in. joints.
- C. Maintain vertical continuity of core or cell cavities, which are to be reinforced and grouted, to provide minimum clear dimensions indicated and to provide minimum clearance and grout coverage for vertical reinforcement bars. Keep cavities free of mortar. Solidly bed webs in mortar where adjacent to reinforced cores or cells.
- D. Where horizontal reinforced beams (bond beams) are shown, use special units to allow for placement of continuous horizontal reinforcement bars. Place small mesh expanded metal lath or wire screening in mortar joints under bond beam courses over cores or cells of non-reinforced vertical cells, or provide units with solid bottoms. The use of other materials must be approved by the Architect prior to use.
- E. Grouting:
 - 1. Use "Fine Grout" for filling 4 in. spaces or smaller in both horizontal directions.
 - 2. Use "Course Grout" for filling 4 in. spaces or larger in both horizontal directions.
 - 3. Grouting Technique: Use Low-Lift grouting techniques only.
- F. Grout shall be placed in masonry at a minimum temperature of 70 degrees F and a maximum temperature of 120 degrees F. The grouted masonry shall be maintained above 32 degrees F for 24 hours following placement of grout.
- G. Place and tie vertical reinforcement prior to laying of CMU. Extend above elevation of maximum pour height to allow for proper splicing. Support in position at vertical intervals not exceeding 24 in. with rebar spacers.
- H. Lay CMU to maximum pour height. Do not exceed 4 ft. height, or if bond beam occurs below 4 ft. height stop pour at course below bond beam.
- I. Pour grout using container with spout or by chute. Rod or vibrate grout during placing. Place grout continuously; do not interrupt pouring of grout for more than one hour. Terminate grout pour 1-1/2 in. below top course of pour.
- J. Bond Beams: Stop grout in vertical cells 1-1/2 in. below bond beam course. Place horizontal reinforcement in bond beams; lap at corners and intersections as shown. Place grout in bond beam course before filling vertical cores above bond beam.
- K. Provide cleanout holes in first course at all vertical cells which are to be filled with grout.
 - 1. Use units with one face shell removed and provide temporary supports for units above, or use header units with concrete brick supports, or cut openings in one face shell.
- L. Construct masonry to full height of maximum grout pour specified, prior to placing grout.
 - 1. Limit grout lifts to heights recommended by the National Concrete Masonry Association, NCMA, for the type of units, reinforcing and grout used in the Work, but in no case exceed 160 bar diameter.
 - 2. Place vertical reinforcement before grouting. Place before or after laying masonry units, as influenced or controlled by job conditions. Tie vertical reinforcement to dowels at base of masonry where shown and thread CMU over or around reinforcement. Support vertical reinforcement at intervals not exceeding 160 bar diameters.
 - 3. Where individual bars are placed after laying masonry, place wire loops extending into cells as masonry is laid and loosen before mortar sets. After insertion of reinforcement bar, pull loops and bar to proper position and tie free ends.
 - 4. Place horizontal beam reinforcement as the masonry units are laid.
- M. Prior to grouting, inspect and clean grout spaces. Remove dust, dirt, mortar droppings, loose pieces of masonry and other foreign materials from grout spaces. Clean reinforcement and adjust to proper position. Clean top surface of structural members supporting masonry to ensure bond. After final cleaning and inspection, close cleanout holes and brace closures to resist grout pressures.

- N. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist displacement of masonry units and breaking of mortar bond. Install shores and bracing, if required, before starting grouting operations.
- O. Place grout by pumping into grout spaces unless alternate methods are acceptable to the Architect.
 - 1. Limit grout pours to Sections which can be completed in one Working day with not more than one hour interruption of pouring operation. Place grout in lifts which do not exceed 4'. Allow not less than 30 minutes, nor more than one hour between lifts of a given pour. Rod or vibrate each grout lift during pouring operation.
 - 2. Place grout in lintels or beams over openings in one continuous pour.
- P. Where bond beam occurs more than one course below top of pour, fill bond beam course to within 1 in. of vertically reinforced cavities, during construction of masonry.
- Q. When more than one pour is required to complete a given Section of masonry, extend reinforcement beyond masonry as necessary for proper splicing. Pour grout to within 1-1/2 in. of top course of first pour. After grouted masonry is cured, lay masonry units and place reinforcement for second pour Section before grouting. Repeat sequence if more pours are required.

3.04 INSPECTION

- A. Field inspection and testing of Work performed under this Section shall be in accordance with testing requirements of International Building Code, most recent Edition, as amended, for Special Inspections and the Owner's Statement of Special Inspections. The Owner's testing agency shall be present when the Work of this Section is being constructed, and assisted while conducting their Work. Coordinate with the Owner's designated representative and the testing agency to verify requirements for testing of Work performed under this Section.

3.05 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 05 31 00

STEEL DECKING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section shall include, but not be limited to, furnishing and installation of the following:
 - 1. Roof deck
 - 2. Composite floor deck
 - 3. Closure plates, bent angle plates, sump pans, hanger tabs and accessories for fastening the deck to the steel frame, perimeter closure angles, and closure angles around interior openings.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contracts Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following Divisions:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. Any material or operation specified by reference to the published specifications or a manufacturer, the American Society for Testing and Materials (ASTM), the American Welding Society (AWS), the American Iron and Steel Institute (AISI), the Steel Deck Institute (SDI) or other published standard, shall comply with the requirements of the current specifications or standard listed. In case of a conflict between the referenced specification and the project specification, the project specification shall govern.
- B. The Contractor shall furnish a notarized affidavit from an officer of the deck manufacturer listing each material that is used, its required applicable specification and a statement that the materials comply with the applicable specifications. However, such certification shall not relieve the Contractor from the responsibility of complying with any added requirements specified herein.

- C. Deck and erection methods shall conform to the handbook of Industrial Loss Prevention, Chapter 75, "Wind Forces and Roof Anchorage Design", published by Factory Mutual Engineering and Research of Norwood, Massachusetts.

1.05 SUBMITTALS

- A. Shop drawings for steel deck shall include the name of the manufacturer and all physical properties.
- B. Metal deck layout shop drawing shall be drawn no smaller than 1/8"=1'-0" and Sections showing all edge conditions and conditions around openings, changes in deck direction, etc., shall be clearly detailed drawn to a scale no smaller than 1-1/2"=1'-0". Welds and crimps as specified herein shall also be detailed on the shop drawings. Shop drawings shall state type of steel and minimum yield point. Shop drawings will not be reviewed without all the above information clearly indicated.
- C. No fabrication shall take place until the shop drawings have been reviewed.
- D. All welds shall be indicated by AWS "Welding Symbols".
- E. The General Contractor shall check the shop drawings and shall indicate in colored pencil his correction, holes, etc., modifications for the other trades, and necessary field dimensions before forwarding them to the Architect for correction and review.

1.06 TESTING AND INSPECTION

- A. Field inspection and testing of Work performed under this Section shall be in accordance with testing requirements of 780 CMR, Chapter 17-Special Inspections and the Owner's Statement of Special Inspections. The Owner's testing agency shall be present when the Work of this Section is being constructed, and assisted while conducting their Work. Coordinate with the Owner's designated representative and the testing agency to verify requirements for testing of Work performed under this Section.
- B. The materials and Workmanship to be furnished under this Section shall be subject to inspection in the shop and field by the Architect or the Official. Such inspection shall not relieve the Contractor of his requirements to furnish materials and Workmanship in accordance with requirements of the Contract Documents.
- C. Access shall be provided for inspection of all facilities by the Engineer, Architect or local Building Commissioner. The fabricator shall, when requested, aid the inspectors in carrying out their duties.

1.07 GUARANTEE

- A. The Contractor shall furnish to the Owner a written guarantee covering all defects in materials and Workmanship of the Work of this Section that occur within a period of one year from the date of final completion of the building. Should any defects in materials or Workmanship develop within this time, all necessary repairs and replacements shall be made at no additional costs to the Owner.

1.08 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Owner's Project Manager, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 MATERIALS**

- A. Metal roof deck shall be one of the following as shown on the Drawings.
 - 1. Deep Rib Deck, Type N, 3 in. deep, 24 in. wide, 18 gage, galvanized G90 sheet carbon steel conforming to ASTM A653 Grade C, D or E with a minimum yield point of 33,000 psi with the following minimum properties:

Ip=1.19 in ⁴	Sp=0.68 in ³
In=1.38 in ⁴	Sn=0.74 in ³

- B. Metal floor decks shall be the following and as shown on the drawings.
1. Floor form deck shall be 1 in. deep, 18 gage, galvanized G60 sheet carbon, conforming to ASTM A653, Grade 33 with a minimum yield point of 33,000 psi. Deck shall be formed with deformations to provide a mechanical lock between concrete and steel and have the following minimum properties:
 $I = 0.088 \text{ in}^4$ $Sp = 0.167 \text{ in}^3$ $Sn = 0.165 \text{ in}^3$
 2. Floor composite deck shall be 3 in. deep, 16 gage, galvanized G60 sheet carbon, conforming to ASTM A653, Grade 33 with a minimum yield point of 33,000 psi. Deck shall be formed with deformations to provide a mechanical lock between concrete and steel and have the following minimum properties:
 $I = 1.58 \text{ in}^4$ $Sp = 1.013 \text{ in}^3$ $Sn = 1.013 \text{ in}^3$
- C. Provide 16% total recycled content of Basic Oxygen Furnace (BOF) produced steel or 67% total recycled content of Electric Arc Furnace (EAF) produced steel.

2.02 MATERIAL FABRICATION

- A. Decks shall be fabricated to fit about all roof openings. Special 18-gauge minimum overlapping edge pieces with one rib or 18-gauge channel shall be used at all edges, parallel to the span where the deck is continuous, wherever the centerline of a regular rib does not occur within two in. of the edge. On the sides of all openings, parallel to deck, provide a similar channel or single ribbed piece. Flat bearing must be provided at all edges of the roof and around all openings, so nailers or metal curbs will have solid bearing.
- B. All deck must be shop fabricated to proper lengths and delivered to the job with durable identification corresponding to the shop drawings.
- C. Deck shall be fabricated in three span lengths or longer.
- D. The Contractor shall submit complete calculations to the Engineer. Calculations shall verify ability of the deck to support all design loads.

2.03 ACCESSORIES

- A. Provide minimum 16 gauge sheet steel closures with return lip and cover plates, to close panel end conditions where panels end, change direction, or abut.

2.04 HANDLING AND STORAGE

- A. Handle and stack materials carefully in order to prevent deformation or damage. During unloading and hoisting, extra care shall be taken to prevent damage to ends and sides of individual panels. If panels are to be stored prior to installation, they shall not be placed in direct contact with ground and shall be protected from elements and dry. If mud, dirt, or other foreign matter is accumulated on panels, such accumulation shall be completely removed prior to erection. All deformed or damaged panels shall be removed from the site and replaced at no additional expense to the Owner.

PART 3 - EXECUTION**3.01 ERECTION**

- A. Metal decking panels and accessories shall be erected and mechanically fastened for diaphragm action as specified.
- B. NOTE: Penetration through metal decking panels for hangers or hanger attachment devices is prohibited.
- C. Metal decking panels shall be shipped to the field cut to the proper length. All notching at column bevel cuts or other similar fabrication shall be done by metal decking erector.

- D. Holes and openings which are located and dimensioned on the structural drawings shall be cut by the metal decking erector. Holes required for Work by other trades will be located and cut by the respective trades. All openings cut in the metal deck panels shall be reinforced by the metal deck supplier. No opening shall be cut in metal decking panels unless shown on the structural drawings. Refer to OSHA Standards for additional requirements for deck penetrations.
- E. All cutting of metal decking panels shall be done in a Workmanlike fashion by power shears, gas-torch cold chisel, or other means reviewed by the Architect.
- F. Metal decking panels shall be placed on support steel and accurately aligned to final position before being permanently fastened. All metal roof deck panels shall have a minimum bearing of two inches on the supporting steel.
- G. If the supporting steel framework is not in proper alignment, or at the proper level, the metal decking erector shall notify the General Contractor for corrective action. The metal decking panels shall not be installed until the necessary corrections have been made.
- H. Metal decking panels shall rest tightly on the flange of beams or girders of any other support surfaces.
- I. Mechanically fasten roof deck using 36/7 pattern minimum if not otherwise noted on the Drawings. Each deck piece shall be equivalently fastened to the piece it overlaps at every rib. Side laps shall be fastened with three (4) No. 10 self-tapping screws between all supports @ roof deck and either crimped or welded @ 4 locations between supports @ the floor deck. Where deck bears on steel and the span is parallel to the supporting steel at edges of the roof, around openings, and where deck changes direction, etc., similar screw fastening shall be provided not over 6 in. on center.
 - 1. Mechanical Fasteners shall comply with the following material and performance characteristics:
 - a. Material: AISI 1070 modified
 - b. Hardness: Minimum Rockwell Hardness C 54.5
 - c. Strength: Minimum tensile strength 285 ksi; minimum shear strength 175 ksi
 - d. Design and Manufacture: Knurled shank with forged ballistic point. Manufacturing process shall ensure steel ductility and prevent development of hydrogen embrittlement.
 - e. Washers:
 - 1) For steel bar joist framing: Minimum 0.472 in. steel washers
 - 2) For structural steel framing: Minimum 0.591 in. steel washers
 - f. Corrosion Resistance:
 - 1) For steel roof decks with waterproofing membrane: 5 micron zinc electroplated in accordance with ASTM B 633 SC1 Type III
 - 2) For exposed steel roof decks: Minimum AISI 304 stainless steel sealing caps with bonded neoprene washer shall be installed over each fastener
 - g. Design Requirements:
 - 1) ICC-ES AC43 or SDI method for diaphragm shear strength and stiffness and in compliance with the 2009 International Building Code.
 - 2) FM wind uplift resistance or as indicated on drawings
 - 3) UL fire classification
 - h. Approved Types:
 - 1) For use with steel bar joist and light structural steel framing supports with top chord or flange thicknesses at least 1/8 in. and up to 1/4 in. thick: Hilti X-EDNK22 THQ12 or approved equal
 - 2) For use with steel bar joist and light structural steel framing supports with top chord or flange thicknesses at least 3/16 in. and up to 3/8 in. thick: Hilti X-EDN19 THQ12 or approved equal
 - 3) For use with structural steel framing supports with top flange thicknesses 1/4 in. thick or greater: Hilti X-ENP-19 L15 or approved equal
- J. Roof deck shall be fastened to adjacent deck sheets at side laps with mechanical side lap fasteners with the following requirements:
 - 1. Drive mechanical side lap connectors completely through adjacent lapped roof deck sheets to achieve positive engagement of adjacent sheets with a minimum of three thread penetration.

2. Material: ASTM A 510 Grade 1022
 3. Hardness: Minimum Vickers Surface Hardness of 450 HV0.3
 4. Design and Manufacture: Hex washer head undercut with reverse serrations; self-piercing or stitch point at center.
 5. Corrosion Resistance:
 - a. For roof decks with waterproofing membrane: 5 micron zinc electroplated in accordance with ASTM B 633 SC1 Type III.
 - b. For exposed steel roof decks: AISI 410 or 304 stainless steel with bonded neoprene washer.
- K. Roof deck design requirements shall comply with the following:
1. ICC-ES AC43 or SI method for diaphragm shear strength and stiffness in accordance with the 2009 International Building Code.
 2. In addition to the above requirements, the Contractor shall submit written documentation that the proposed steel roof deck system complies with requirements of the following recognized code approval or testing agencies. The Work of this Section shall not commence prior to submittal, and approval of, the Contractor's written documentation of steel roof deck system compliance with the following minimum Factory Mutual Research Laboratory standards:
 - a. F.M. 1-90 wind uplift resistance in roof field
 - b. F.M. 1-135 wind uplift resistance in perimeter areas
 - c. F.M. 1-195 wind uplift resistance in corner areas
- L. Roof deck connector types shall be as follows:
1. Hilti S-SLC01 M HWH Sidelap Connector
 2. Hilti S-SLC02 M HWH Sidelap Connector
 3. Hilti S-MD 10-16 x ¾ HWH No. 3 Stainless Steel Screws
- 3.02 RUBBISH REMOVAL
- A. The General Contractor shall remove all waste and debris daily and dispose in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

June 12, 2019

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SECTION 05 50 00

METAL FABRICATIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. Ladders
 - 2. Miscellaneous loose steel lintels
 - 3. Clip angles attached to CMU walls
 - 4. Bearing plates, leveling plates, and rough hardware required to complete the Work of this Section.
 - 5. Bent plates and roof edge angles not specifically sized by length, width, thickness, or weight on Structural Drawings.
 - 6. Hot dip galvanizing and shop priming of miscellaneous metal materials.
- B. Items to Be Furnished Only: Furnish the following items for installation by the designated Sections:
 - 1. Section 03 30 00 – Cast-in-Place Concrete: Anchor rods, inserts and pipe sleeves required to attach items of miscellaneous metals to concrete
 - 2. Section 04 20 00 - Unit Masonry: Loose steel lintels for masonry openings

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. Reference Standards:
 - 1. ASTM A36: Specification for Structural Steel.

2. ASTM A569: Specification for Steel, Carbon (0.15 maximum percent), Hot-rolled Sheet and Strip, Commercial Quality.
 3. ASTM A123: Specification for Zinc (hot galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged steel shapes, Plates, Bars and Strip.
 4. ASTM A143: Practice for Safeguarding against Embrittlement of Hot-Dip Galvanized Structural Steel Products and the Procedure for Detecting Embrittlement.
- B. Provide the services of a Professional Engineer, registered in the State of Massachusetts to design and certify that the Work of this Section meets or exceeds the performance requirements specified in this Section. Engineer shall be experienced in providing engineering services of the kind indicated that have resulted in the successful installation of metal fabrications similar in material, design, and extent to that indicated for this project.
1. Items requiring an Engineers certification include, but are not limited to, the following:
 - a. Ladders
 - b. Miscellaneous bearing plates
 - c. Bent plates and roof edge angles
- C. Shop fabricate Work to the greatest extent possible. Clearly label pieces in shop to facilitate field assembly.
- D. Perform welding in compliance with American Welding Society Code.
- E. Certifications:
1. Submit certification that the shop painting has been done in accordance with specifications.
 2. Submit certificate of compliance from galvanizer.
- 1.05 SUBMITTALS
- A. Submit large scale shop drawings for fabrication, installation and erection of all parts of the Work. Provide plans, elevations, and details of anchorages, connections and accessory items.
 - B. Take accurate field measurements before preparation of shop drawings and fabrication. Allow for field cutting and fitting where taking field measurements before fabrication is not possible. Do not field cut or fit items which have been hot-dip galvanized after fabrication.
 - C. Submit professionally prepared calculations and certification of the performance of this Work. Show how design load requirements and other performance criteria have been satisfied. Calculations shall be stamped and signed by a professional Engineer registered in the Commonwealth of Massachusetts.
- 1.06 DELIVERY, STORAGE AND HANDLING
- A. All materials shall be carefully handled and stacked to prevent deformation or damage. All miscellaneous steel members shall be carefully stored on substantial timbers and blocking, so arranged that the steel shall be free from the earth and properly drained, preventing any spattering or accumulation of water in or about the steel. Care shall be taken to prevent damage to the shop coat of paint and prevent the accumulation of mud dirt or other foreign matter on the steel. Such accumulation shall be completely removed prior to erection.
- 1.07 PROJECT CONDITIONS
- A. Do not permit use of ladders, handrails, guardrails, counters or other Work until Work is completely and fully installed and ready to assume its intended design loads. Do not permit overloading of any miscellaneous metal system.
- 1.08 SOURCE QUALITY CONTROL
- A. The registered engineer as referenced in Paragraph 1.06 B. above shall make periodic visits to the site to inspect and test as necessary the stair, handrail, and other metal Work assemblies. After completion of the Work and based on these inspections, an affidavit stamped with the seal of the engineer is to be issued. The affidavit shall state that the Work has been installed in accordance with his/her design.

1.09 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 MATERIALS AND PRODUCTS**

- A. Steel Shapes: Steel shapes shall conform to the requirements of Standard Specifications for Structural Steel, ASTM A - 36. All necessary holes and sinkages shall be provided for attaching hardware or other items, and all anchorage for attachment to adjacent construction shall be included.
- B. Steel Tubing: ASTM A500 or A501, hot or cold rolled.
- C. Steel Sheet: ASTM A366, A570 or A611, of grade required for design loading.
- D. Steel Pipe: ASTM A53, black schedule 40 or 80 for 3 in. diameter pipe and under and schedule 80 for all pipe over 3 in. in diameter. Type and grade necessary to achieve design loading.
- E. Iron Castings: ASTM A47 or A48, grade and class are manufacturer's option.
- F. Grout: Pre-mixed, non-staining, non-corrosive, non-shrink, non-metallic cement based grout requiring only the addition of water. Grout shall exhibit shrinkage compensation characteristics in both the plastic and hardened states, and conform with ASTM C1107, "Grade C", CRD-C621-91, Standard Specification for Packaged Dry Hydraulic Grout - Non Shrink. One of the following grouts, or Engineer approved substitute, may be used:
1. Five Star Grout 100 by Five Star Products Inc.
 2. SikaGrout 212 as manufactured by Sika Corporation.
 3. Masterflow 928 by Master Builders, Inc.
- G. Bolts and Fasteners: ASTM A307 and other types as appropriate and approved by Architect.
- H. Concrete: Comply with requirements of Section 03 30 00 – Cast-in-Place Concrete.
- I. Shop Paint: Shop paint shall be Modified Alkyd primer equal to Tnemec No. 10-99G Green Metal Primer, Dupont 681 FD Primer or Hempel Primer 1205.
- J. Field Painting: Surface preparation and field painting shall be as specified in Section 09 91 13 - Painting.
- K. Aluminum: Provide alloy and temper recommended by aluminum producer or finisher for the type of use and finish indicated:
1. Extruded bar and shapes: ASTM B 221, 6061-T6, 6063-T6.
 2. Extruded pipe and tube: ASTM B 429, 6063-T6.
 3. Drawn Seamless tube: ASTM B 483, 6063-T832.
 4. Plate and sheet: ASTM B209, 3003-H14.
- L. Expansion Fastening Systems: Expansion bolts shall be HILTI KWIK bolts, or Architect approved equal by Powers Fastening, Inc. or ITW Ramset/Redhead. Install bolts in accordance with the approved manufacturer's written requirements. Provide minimum 1/2 in. diameter bolts with 3-1/4 in. embedment unless otherwise indicated.
- M. Adhesive Anchor Rod System: Adhesive anchor rod system shall be Hilti HY150, or Architect approved equal by W.R. Meadows or Five Star, utilizing ASTM F 593 AISI 304 threaded stainless steel rods or Engineer approved substitute. Preparation, drilling and installation shall be in accordance with the approved manufacturer's written requirements. Install rods as recommended by manufacturer. Unless otherwise indicated, provide adhesive anchor rod system for fastening support steel to fully grouted concrete masonry, and concrete or precast concrete walls/panels and floors.

2.02 FABRICATION

- A. General Fabrication: Fabricate Work to be straight and true, plumb, level and square and to sizes, shapes, and profiles indicated on approved shop drawings. Ease exposed edges. Cut, reinforce, drill and tap metalwork as necessary for proper assembly and use.
1. Fabricate all miscellaneous metal supports, brackets, braces and the like required to fully complete the Work of this project.
 2. Coordinate miscellaneous metal requirements with other specification Sections to ensure proper interface of various parts of the Work.
 3. Obtain loading requirements from suppliers of Work to be supported and design and fabricate support systems with factor of safety of at least 6.
- B. Work Exposed to View: Take special care in choosing materials that are smooth and free of blemishes such as pits, roller marks, trade names, scale and roughness. Fabricate Work with uniform, hairline tight joints. Form welded joints and seams continuously and grind flush and smooth to be invisible after painting. For exposed fasteners, use hex head bolts or Phillips head machine screws.
- C. All steel to be installed in or on exterior portions of building, or otherwise attached thereto, including but not limited to, steel framing members at exterior soffits, lintels, shelf angles, stabilization angles, ladders, and bolts, washers, and other hardware, shall be coated by hot-dip process after fabrication in accordance with requirements of ASTM A 123 for fabricated components, and ASTM A 153 for hardware. All hot-dipped galvanized fabricated steel components and hardware shall be inspected, and marked with a stamp indicating compliance with the respective ASTM standard for the number of ounces of zinc per square foot of steel, in accordance with requirements of the referenced standards. Zinc for galvanizing shall be applied by the hot-dip process, Duragalv® by Duncan Galvanizing, or Architect approved equal. The galvanizing bath shall contain high-grade zinc, nickel, and other earthly materials. Galvanizing shall exhibit a rugosity (smoothness) not greater than 4 rug (16-20 microns of variation) when measured by a profilometer over a 1 inch straight line on the surface of architectural and structural elements that are less than 24 pounds per running foot. Profilometer shall be capable of operating in 1 micron increments.
1. Galvanizing shall be performed by a company with a minimum of five-year experience in the successful application of hot-dip galvanizing utilizing the dry kettle process. Use of the wet kettle process shall not be allowed. The Architect shall have the right to inspect and approve or reject the galvanizer/galvanizing facility.
 2. The galvanizer/galvanizing facility must have an ongoing Quality Control/Quality Assurance program acceptable to the Architect which has been in effect for a minimum of five years and shall provide the Architect with process and final inspection documentation.
 3. Touch-up damaged galvanizing after installation using organic zinc coating complying with ASTM A 780 and as recommended by galvanizer.
 4. Fabricator shall provide a notarized statement from the galvanizer, along with a description of the material processed, indicating that all work has been done in conformance with this specification prior to receiving payment.
 5. All items of Work noted or specified to be galvanized shall be galvanized after fabrication. Where size of assembly is too large for galvanizing, only these assemblies shall be galvanized prior to fabrication. Submit galvanizer's certification that shop drawings for metal fabrications to receive metal coatings have been reviewed and that fabrications are acceptable to galvanizer for proper application of galvanizing and metal coatings. All drawings should be stamped by the galvanizer to indicate approval of design for galvanizing.
 6. Provide factory-applied prime coat, Primergalv, by Duncan Galvanizing, or Architect approved equal. Prime coat shall be certified VOC compliant, conforming to applicable regulations and EPA standards. Apply primer within 12 hours after galvanizing at the same facility where the galvanizing is done in a controlled environment meeting applicable environmental regulations and as recommended by the primer coating manufacturer. Blast cleaning of the surface is unacceptable for surface preparation by means of blast cleaning shall not be allowed. Coatings shall meet or exceed the criteria for the following categories as stipulated by the coatings manufacturer:
 - a. Abrasion: CS17 Wheel, 1,000 grams load, in accordance with ASTM D 4060
 - b. Adhesion: 5 mm Crosshatch, in accordance with ASTM D 3359, Method B
 - c. Humidity: ASTM D 4585

d. Salt Spray (Fog): ASTM B 117

D. Painting and Preparation of Non-Galvanized Steel Products:

1. Thoroughly clean all steel of all loose mill scale by power wire-brushing or sand blasting. Remove all rust, dirt weld flux, weld splatter and other foreign matter by wire brushing or scraping (power wire brushing if necessary). Grind smooth any sharp projections. Oil and grease deposits shall be removed by solvent.
2. All steel members, except galvanized items, after they are prepared, shall be painted before shipping. All surfaces shall be painted, except machine surfaces, surfaces which are to be welded and surfaces to be encased in concrete. Paint shall be applied thoroughly and evenly on the surfaces and Worked into the joints and other open surfaces. Surfaces inaccessible after assembly shall be given two coats. Painting materials shall be as follows:
 - a. Cleaned steel shall receive one coat of shop applied, two-component, moisture-cured, urethane based, zinc-rich organic coating applied at rate of 3.0 - 3.5 mil DFT, as manufactured by Benjamin-Moore, or Architect approved equal.

2.03 LADDERS

- A. Ladder fabrication shall comply with requirements of ANSI A 14.3. Unless otherwise indicated, provide 3/8 in. x 1-1/2 in. bar side rails spaced 18 in. apart with 3/4 in. diameter solid structural galvanized steel bar rungs, with non-slip top surface, at 12 in. on center vertically. Provide extended side rails at least 42 in. above top rung and return to wall or structure. Fit rungs in holes drilled in side rails. Weld and grind smooth to touch. Securely anchor each ladder side rail with clip angles at top, bottom and intermediate points spaced not more than 5 ft. on center. Provide 7 in. clearance from walls to centerline of rungs.

2.04 LINTELS

- A. Fabricate lintels for openings and recesses in walls and partitions where shown and elsewhere as needed. Provide at least 8 in. bearing at each end, unless otherwise detailed. Weld together individual members of composite lintels made up of more than one member. Lintel type and sizes shall be as follows:

LINTEL SCHEDULE				
Masonry Opening	Lintel Type	Angle	Plate	Weld
Up to 3 ft.	Standard	3-1/2 x 3-1/2 x 5/16 in.		
Up to 4 ft. - 6 in.	Standard	L 4 x 3-1/2 x 5/16 in. (4 in. leg vertical)		
Up to 5 ft. - 4 in.	Standard	L 4 x 3-1/2 x 5/16 in. (4 in. leg vertical)		
Up to 6 ft.	Standard	L 5 x 3-1/2 x 5/16 in. (5 in. leg vertical)		
Up to 8 ft.	Standard	L 6 x 3-1/2 x 5/16 in. (6 in. leg vertical)		
Up to 10 ft.	Standard	L 6x4x5/16 in. (6 in. leg vertical)		
Up to 4 ft. - 6 in.	Composite	L 4x3x1/4 in. (4 in. leg vertical)	5/16 in.	1/4 in. Fillet
Up to 5 ft. - 4 in.	Composite	L 5x3x1/4 in. (5 in. leg vertical)	5/16 in.	1/4 in. Fillet
Up to 6 ft.	Composite	L 5x3x1/4 in. (5 in. leg vertical)	5/16 in.	1/4 in. Fillet
Up to 8 ft.	Composite	L 6x3x1/4 in. (6 in. leg vertical)	5/16 in.	1/4 in. Fillet
Up to 10 ft.	Composite	C 7x9.8 (7 in. vertical)	5/16 in.	1/4 in. Fillet
Up to 12 ft.	Composite	C 7x9.8 (7 in. vertical)	5/16 in.	1/4 in. Fillet
Up to 14 ft.	Composite	C 7x9.8 (7 in. vertical)	5/16 in.	1/4 in. Fillet

2.05 BEARING AND LEVELING PLATES

- A. Design and fabricate plates for steel and wood members bearing on masonry or concrete that are not indicated or required on structural drawings. Provide flat, uniform bearing areas of size and thickness required for loading conditions encountered. Use standard AISC and AITC design criteria. Drill plates as necessary to receive anchor bolts and for grouting access.

2.06 CLIP ANGLES ATTACHED TO CMU WALLS

- A. All clip angles attached to CMU walls shall be furnished and installed under the Work of this Section, with sizes as indicated on the structural drawings. If required angles are not indicated on structural drawings provide 12 gauge, 4 in. x 6 in. x 8 in. long steel angles at top of masonry partitions, 4 feet on center staggered, to resist lateral movement. The Metal Fabrication Subcontractor shall provide details of the various conditions needed to meet project requirements.

2.07 MISCELLANEOUS FRAMING AND SUPPORTS

- A. Provide all miscellaneous framing and supports, including but not limited to, elevator support sills and hoist beam, galvanized bent steel plates for attachment and mounting of horizontal exterior sunshade system, and stabilizing angles and related components for operable partitions.
 - 1. Provide continuous, concealed support angle for elevator sill. Coordinate requirements for size, load and anchorage with Elevator Supplier. Provide anchors spaced not more than 2 ft. on center.
- B. Provide miscellaneous bearing and leveling plates necessary to provide fully functional systems in accordance with requirements of this Section and the Contract Documents.
- C. Provide all steel indicated on Structural Drawings not specifically sized by length, width, thickness, or weight shall be provided under the Work of this Section unless otherwise noted.

2.08 ROUGH HARDWARE

- A. Provide standard and custom fabricated bolts, anchors, hangers, dowels and other miscellaneous metal items as needed to properly complete the Work of the project.

PART 3 - EXECUTION**3.01 INSTALLATION/ERECTION**

- A. Provide suitable anchors and fasteners to connect miscellaneous metal items to other construction. Provide setting templates and diagrams and coordinate with other Work so that adequate anchor bolts, blocking and bracing is in place and accurately located. Beginning Work means Installer accepts substrates and conditions.
- B. Set Work accurately and plumb, level and aligned. Make field assembly and connections with the same level of quality as shop fabricated Work.
- C. For bearing and leveling plates, clean concrete and masonry bearing surfaces and roughen to improve bond. Thoroughly clean steel bearing surfaces. Set loose plates on shims or wedges. Level and plumb Work, then tighten anchor bolts. Cut off protruding shims and wedges and pack voids solidly with grout.
- D. Install elevator sill support angle at locations and position directed by elevator supplier. Securely anchor to supporting structure in compliance with approved shop drawings.

3.02 REPAIRING, CLEANING, AND PROTECTION

- A. Repair minor damage to all Work of this Section, including coatings and finishes, to eliminate all evidence of repair. Remove and replace Work which cannot be satisfactorily repaired, as determined by the Architect.

3.03 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, provision and installation of the following:
 - 1. Pressure treated deck boards and ledger boards at existing dock.
 - 2. Concealed wood blocking and nailers within gypsum wallboard partitions, walls and ceilings for attachment of equipment, wood blocking for wall mounted shelving, plywood panels and similar items.
 - 3. Plywood, wood nailers, furring, grounds and blocking for all exterior and interior Work, except Work of Section 07 52 16 Styrene-Butadiene Styrene (SBS) Modified Bituminous Membrane Roofing, Section 07 54 19 – Polyvinyl-Chloride (PVC) Roofing, and all related Sections.
 - 4. Pressure treated wood framing members and plywood for all wood in contact with concrete or masonry
 - 5. Fire retardant treated wood framing members and plywood required by codes and ordinances.
 - 6. Telephone and electrical equipment backing panels.
 - 7. Wood preservative treatment for lumber and plywood cut in field
 - 8. Nails, screws, bolts and fasteners for securing items of rough carpentry installed under the Work of this Section

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 PURPOSE

- A. The Work of this Section shall be to provide concealed blocking, grounds, nailers, and backing panels, for the Work of this Project. Portions of Work related to this Section include, but are not limited to, toilet accessories, handrails and railings, and telephone and electrical equipment.
- B. Coordinate the Work of this Section with the Work specified in Section 06 20 00 - Finish Carpentry and Section 09 22 16 – Non-Structural Metal Framing and Gypsum Board. Determine which type of blocking, wood or metal, is best suited to each situation and provide the appropriate type of blocking. Do not use wood blocking in fire-rated assemblies or other locations prohibited by authorities having jurisdiction.

1.05 QUALITY ASSURANCE

- A. Lumber Grading Rules and Wood Species to be in conformance with Voluntary Product Standard PS-20; grading rules of the following associations apply to materials furnished under this Section.
 - 1. Northeast Lumber Manufacturer's Association, Inc.
 - 2. Western Wood Products Association.
- B. Plywood Grading Rules:
 - 1. Softwood Plywood: Construction and Industrial: Product Standard PS-1.
 - 2. Hardwood Plywood: Product Standard PS-51.
- C. Grade Marks: Identify all lumber and plywood by the official grade mark.
 - 1. Lumber: Grade stamp to contain symbol of grading agency, mill number or name, grade of lumber, species grouping or combination designation, rules under which graded, where applicable and condition of seasoning at time of surfacing.
 - 2. Softwood Plywood: Appropriate grade trademark of the American Plywood Association.
 - a. Type, grade, class and Identification Index.
 - b. Inspection and testing agency mark.
 - 3. Hardwood Plywood: Appropriate grade trademark of the American Plywood Association or other qualified testing and grading agency.
- D. Requirements of Regulatory Agencies:
 - 1. Working Stresses: Softwood lumber, National Design Specification; National Forest Products Association.
 - 2. Pressure Treated Lumber and Plywood: American Wood Preservers Association (AWPA) Standards.
 - 3. Pressure Treated Material: American Wood Preservers Association Standards.
 - 4. Fire Classification: Underwriters Laboratories, Inc. FRS for treated lumber and plywood.

1.06 SUBMITTALS

- A. Submit manufacturer's product data, installation instructions, use limitations and recommendations for each material used. Provide certifications demonstrating materials comply with requirements of the Contract Documents.
- B. Certifications:
 - 1. Pressure Treated Wood: Submit certification by treating plant stating chemicals and process used, net amount of salts retained, and conformance with applicable standards.
 - 2. Pressure Treated Wood: Submit certification for water-borne preservative that moisture content was reduced to 19% maximum, after treatment.
 - 3. Fire Retardant Treatment: Submit certification by the treating plant that the fire-retardant treatment materials comply with governing ordinances and that the treatment shall not bleed through finished surfaces.
 - 4. Fire Treated Wood: Submit certification from the supplier of the fire retardant treated lumber or plywood attesting that the wood is Dicon wood or satisfies the following:
 - a. All pieces of lumber have been kiln dried to a maximum moisture content of 19% or less after treatment. All plywood shall be dried to a moisture content of 15% after treatment.

- b. The fire retardant chemicals used to treat the lumber were free of halogens, sulfates, ammonium phosphate and formaldehyde.
- c. The fire retardant treated wood does not require brush treatment of end cuts made in the field.
- d. The fire retardant treated wood has an equilibrium moisture content of not more than 25 % when tested in accordance with ASTM D3201 procedures at 95% relative humidity and 80°F.

1.07 DELIVERY STORAGE AND HANDLING

- A. Deliver, store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from moisture and damage. Stack materials to promote air circulation. Protect sheet materials from corner breakage and other damage.

1.08 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 LUMBER**

- A. Provide kiln dried southern yellow pine or hem-fir construction grade boards, stud grade or no. 2 boards, and structural light framing, complying with applicable requirements of PS 20 "American Softwood Lumber Standards", and having 19 percent maximum moisture content.
- B. Provide above ground lumber and plywood in contact with masonry, concrete and dampproofing that is pressure treated to a level of 0.25 pounds per cubic foot of wood product, with waterborne CCA preservatives in accordance with requirements of AWPAC Standard U1 and T1. Pressure treated lumber shall be dried to a maximum moisture content of 15 percent after treatment.
- C. Provide UL labeled fire-retardant treated wood in telephone and electrical closets, window framing, and elsewhere as indicated. Provide fire-retardant treatment suitable for interior exposures and complying with AWPAC C20. Kiln dry lumber after treatment.

2.02 PLYWOOD

- A. Backing panels, interior wall sheathing panels, and continuous or partial partition blocking, shall be APA trademarked, UL labeled, fire-retardant treated, BD, Group 2, Exposure 1 plywood panels not less than 3/4 in. thick at locations of electrical and telephone panels, or 1/2 in. thick for wall sheathing. Panels shall comply with requirements of PS 1. Plywood shall be fire retardant treated to yield a flame spread rating of not more than 25 when tested according to ASTM E84. Kiln dry after treatment to maximum moisture content of 15%.

2.03 FASTENERS AND MISCELLANEOUS MATERIALS

- A. Provide size, type, and material appropriate for intended use, as follows:
 - 1. Self-Tapping Screws, surface hardened with a fluoropolymer paint finish equal to Buildex or Stalgard. Threads shall be self-locking to prevent backing out under wind load, vibration or other stress. A 5/8 in. penetration of the screw through the metal deck is required.
 - 2. Bolts:
 - a. Bolts, and nuts shall conform to Fed. Spec. FF-B-571a and FF-B-575, as applicable.
 - b. Expansion shields shall conform to Fed. Spec. FF-S-325. Shields shall be accurately recessed and, unless otherwise indicated, shall be not less than 2-1/2 in. into concrete or masonry. Devices of Groups IV, V, VI and VII shall not be used in sizes greater than 3/8 in. unless otherwise indicated.
 - c. Lag screws or lag bolts shall conform to Fed. Spec. FF -B-561b.

- d. Toggle bolts shall conform to Fed. Spec. FF-B-588b.
 - 3. Screws: Wood screws shall conform to Fed. Spec. FF-S-111b.
 - 4. Nails: Nails shall conform to Fed. Spec. FF-N-105a. Nails for plywood secured to wood shall be ring or annular type.
 - B. Provide fasteners with G-90 hot dip galvanized coating, or fluoropolymer coating, at areas of high humidity, including roof blocking and sheathing. Fasteners for use with non-CCA pressure treated lumber, including ACQ Types B and D, CBA-A, and CA-B, shall be stainless steel.
 - C. Preservative treatment for field cut surfaces of pressure treated blocking and sheathing shall contain 2% copper naphthenate complying with AWPA Standard M4. Material shall be Green No. 10, as manufactured by Cuprinol, or Architect approved equal by WM Barr or Behr.
- 2.04 FINISHES
- A. Paint all surfaces, exposed and concealed, of plywood backing panels at electrical and telephone panels, and mechanical rooms with fire retardant paint in accordance with requirements of Section 09 91 13 - Painting, and the approved manufacturer's written instructions.

PART 3 - EXECUTION

3.01 INSPECTION

- A. The Installer/Erector shall examine substrates, supports, and conditions under which this Work is to be performed and notify General Contractor, in writing, of conditions detrimental to the proper completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected. Beginning Work means Installer accepts substrates and conditions.

3.02 INSTALLATION / ERECTION

- A. Strictly comply with National Forest Products Association, *Manual for House Framing* and building codes, except where more restrictive requirements are specified in this Section or indicated on the drawings.
- B. Choose wood members carefully to eliminate split, warped and twisted members. Set Work to required levels and lines with members plumb and true to line with joints neatly and tightly cut and butted. Securely anchor Work in strict compliance with referenced standards and building code nailing schedule. Countersink bolts and other fasteners flush with face of wood to provide a proper substrate for later Work.
- C. Blocking shall be provided as necessary for the applications of sheathing, wallboard and other materials or building items, and to provide fire stopping. Blocking shall be cut to fit between framing members and rigidly attached thereto.
- D. Saturate cut ends of treated wood with same chemicals used for original treatment.
- E. Install nailers and blocking at metal studs as indicated. All wood shall be pressure treated or fire treated as indicated on drawings. Apply two brush coats of same preservative used in original treatment to all sawed or cut surfaces of preservative treated lumber.
 - 1. Bolt nailers to deck, not over 24 inches on center. Counter sink bolt heads.
 - 2. Screw nailers to studs, not over 12 inches on center.

3.03 INSTALLATION OF CONSTRUCTION PANELS

- A. Reference Standards: Comply with instructions and recommendations of APA, *Design and Construction Guide - Residential and Commercial* for types of panels, nail size and fastening spacing used and applications indicated.
- B. Fasten panels as indicated below:
 - 1. Backerboards: Screw to framing or expansion bolt to CMU.
 - 2. Wall Sheathing: Screw to framing or expansion bolt to CMU.

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Mount Vernon Group Architects, Inc., Project No. 02014.43

3.04 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and legally disposed daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

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SECTION 06 20 00

FINISH CARPENTRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, the following:

- 1. Oak casing at elevator opening
- 2. Back priming of concealed Work
- 3. Shop finishing of exposed Work

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. Provide Work complying with applicable requirements of *AWI Architectural Woodwork Quality Standards, 6th Edition, Version 1.1*. Where not otherwise indicated, fabricator may choose among options permitted by AWI for grade of Work specified.
- B. Softwood lumber shall comply with PS 20 and with applicable grading rules of the respective grading and inspecting agency for the species and product indicated.
- C. Plywood shall comply with PS 1/ANSI A 199.1.
- D. Hardwood lumber shall comply with National Hardwood Lumber Association (NHLA) rules.
- E. Hardwood plywood shall comply with HPVA, PS 51.

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- F. Provide minimum 42 pounds per cubic foot medium density particleboard complying with requirements of NPA and ANSI 208.1 Standards. Use of hardboard shall not be allowed.
- G. Provide minimum 31 pounds per cubic foot to 55 pounds per cubic foot medium density fiberboard (MDF) complying with National Particleboard Association sponsored ANSI A208.2 *Medium Density Fiberboard for Interior Use*. Moisture content shall be between four and nine percent.
- H. All concealed Work in this Section shall be UL labeled fire-retardant treated. Exposed woodwork shall have a flame spread of less than 200. Comply with ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials and AWPA C20 - Structural Lumber Fire Retardant Treatment by Pressure Process.

1.05 SUBMITTALS

- A. Certifications:
 - 1. Submit certification by the treating plant that the fire-retardant treatment materials comply with governing ordinances and that the treatment shall not bleed through finished surfaces.
 - 2. Submit certification from the supplier of the fire retardant treated lumber or plywood attesting that the wood is Dricon wood or satisfies the following:
 - a. All pieces of lumber have been kiln dried to a maximum moisture content of 19% or less after treatment. All plywood shall be dried to a moisture content of 15% after treatment.
 - b. The fire retardant chemicals used to treat the lumber were free of halogens, sulfates, ammonium phosphate and formaldehyde.
 - c. The fire retardant treated wood does not require brush treatment of end cuts made in the field.
 - d. The fire retardant treated wood has equilibrium moisture content of not more than 25% when tested in accordance with ASTM D3201 procedures at 95% relative humidity and 80° F.
- B. Provide large-scale shop drawings, including plans, elevations, details of anchorage's, connections and accessory items, required for fabrication, installation and erection of all parts of the Work. Indicate location of both shop and field joints including provisions for controlling or adjusting joint tolerances for field conditions.
- C. Take accurate field measurements before preparation of shop drawings and fabrication. No field cutting and fitting of factory finished millwork items, except standing and running trim, shall be allowed. Manufacturer shall indicate on his shop drawings all required field dimensions beyond his control. The Millwork Subcontractor and millwork manufacturer shall cooperate to establish and maintain these field conditions.
- D. Submit at least two fully finished representative samples of each material that is to be exposed in the finished Work, showing the full range of color and finish variations expected. Provide samples having minimum area of 144 square inches.
- E. Submit the approved manufacturer's written certification demonstrating compliance with environmental material requirements in accordance with requirements of the Contract Documents.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products only after wet Work has been completed and environmental conditions similar to those of the finished Work are established and maintained. Store and handle Work to prevent deterioration and damage. Comply with the approved manufacturer's and AWI standards and recommendations.

1.07 PROJECT CONDITIONS

- A. Maintain optimum environmental conditions to prevent woodwork from shrinkage, swelling and all other forms of damage. Millwork installer shall be aware of environmental conditions of the building and shall install his Work to conform to normal moisture conditions and wear and tear within the building.

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1.08 WARRANTY

- A. All architectural woodwork shall be guaranteed by the woodwork manufacturer/installer to be of good material and Workmanship and free from defects that render it unserviceable for the use for which it is intended. Natural variations in color or texture of the wood are not considered defects. The quality of architectural woodwork shall be safeguarded while in the possession of the Millwork Subcontractor and shall not be stored in damp warehouses or placed in moist or freshly plastered buildings. The woodwork shall not be subjected to abnormal heat or dryness. Permanent heat and air-conditioning must be in operation a sufficient length of time to cure the building before any woodwork or doors are delivered to the site. Woodwork shall be guaranteed for a period of one year from date of Substantial Completion to repair or replace without charge any woodwork which is defective. Defects shall include, but not be limited to, warping and twisting of panels or surfaces, delamination of veneers from back-up substrates, failure of hardware components associated with desk and cabinet units, and cracking, chipping or discoloring of finish systems.

1.09 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS

2.01 FIRE RETARDANT TREATMENT

- A. Materials for interior applications shall be pressure impregnated with Dricon fire retardant chemicals in accordance with recommendations and quality control of Hickson Corporation or Architect approved equal.

2.02 OAK CASING

- A. Oak casing for new elevator opening shall be built with Premium Grade materials in accordance with requirements of AWI Section 1700. Shop finishing shall conform to AWI 1500 Series, Premium Grade, for closed grained woods and to match Architects approved samples.
- B. Oak casing shall be clear finish to match existing door casing. Oak grain shall run vertically, matching, and shall comply with the following, in accordance with AWI Section 500 requirements.
- C. Oak casing shall be 3/4 in. solid oak (WD1) trims. See Drawings for profile and configurations.

2.03 PRIMING

- A. Work of this Section which has the back side concealed shall be back primed. Primer shall be alkyd pigmented material Cabot Stain Problem Solver Primer 8011 (white) or 8044 (grey) or Benjamin Moore, Moorewood Exterior Primer 094 (white) or a tinted sealer as recommended by the millwork fabricator.

2.10 FINISHING

- A. Shop Finishing: Provide Premium Grade materials and workmanship in accordance with AWI Section 1500 Factory Finishing requirements.
- B. Field Finishing: Transparent finish Work shall be touched up in the field by the installer required to match shop finishing approved by the Architect.
- C. Field Finishing Opaque Work: Opaque Work shall be field finished in accordance with requirements of Section 09 91 13 - Painting.

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PART 3 - EXECUTION

3.01 INSPECTION

- A. The Contractor shall examine substrates, supports, and conditions under which this Work is to be performed and notify Architect, in writing, of conditions detrimental to the proper completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected. Beginning of installation Work means Installer's acceptance of substrates and conditions.

3.02 INSTALLATION

- A. Strictly comply with referenced standards. Make sure Work is back primed before Work is installed.
 - 1. Provide Work to sizes, shapes, and profiles indicated on approved shop drawings.
 - 2. Install Work to comply with quality standards and tolerances specified for shop Work.
 - 3. Install Work plumb and level and in perfect alignment.
 - 4. Install in longest practical lengths to minimize joints and seams. (Window stools to be one piece only)
 - 5. Located visible joints and seams only where approved by Architect.
 - 6. Scribe and fit Work neatly and accurately with hairline tight joints in transparent Work.
 - 7. Joints in painted Work shall be invisible after painting.
 - 8. Provide long scarf joints in running Work.
 - 9. Miter and cope joints and seams.
 - 10. Color match wood at joints and seams to minimize expression of joints and seams in transparent finished Work.
 - 11. Secure counter support brackets to concealed blocking in walls to withstand loading specified. Allow for 1/2 in. shim and leveling space above brackets and below underside of countertops.
- B. Securely anchor Work to substrates, blocking and grounds with concealed fasteners.

3.03 REPAIRING AND PROTECTION

- A. Repair minor damage to eliminate all evidence of repair. Remove and replace Work which cannot be satisfactorily repaired.
- B. Provide temporary protection to ensure Work being without damage or deterioration at time of final acceptance. Remove protections and re-clean as necessary immediately before final acceptance.

3.04 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and legally disposed daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 07 21 00

THERMAL INSULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section shall include, but not be limited to, furnishing and installation of the following:
 - 1. Rigid board insulation under slabs on grade
 - 2. Rigid board insulation at perimeter footings and foundations
 - 3. Rigid board insulation at exterior walls and soffits not located within masonry cavity wall.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. Use adequate numbers of skilled Workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.
- B. Provide products which meet or exceed flammability ratings indicated and required by authorities having jurisdiction.
- C. Where material thickness is indicated, they are related to the K-values or R-values specified. Provide additional thickness, if necessary, to obtain the same level of performance with acceptable substitute materials which have different values of thermal conductivity. Where R-values are indicated, provide thickness required to achieve value specified.

1.05 SUBMITTALS

- A. Submit the following product data:
 - 1. Materials list of items proposed to be provided under this Section
 - 2. Manufacturers' specifications and other data needed to demonstrate compliance with the specified requirements.
 - 3. Certified test reports for performance required.
- B. Furnish a 1 ft. x 1 ft. sample of each type of insulation specified, labeled with manufacturer's name, thickness and location of use.

1.06 PRODUCT HANDLING

- A. Provide all means necessary to protect the materials of this Section before, during, and after installation and to protect installed Work and materials of all other trades.
- B. Repair and replacement of damage to the Work of this Section, as determined by the Architect, shall be completed immediately at no additional cost to the Owner.

1.07 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS

2.01 RIGID INSULATION

- A. At concrete foundations and below concrete slabs-on-grade, provide rigid, closed-cell, extruded polystyrene, Styrofoam SM, as manufactured by Dow Chemical, Green Guard by Pactiv Corporation, or Architect approved equal by Owens Corning, complying with ASTM C 578, with integral high-density skin, and the following properties and characteristics:
 - 1. Thermal Resistance, 75°F mean temp.: 5 per inch, in accordance with ASTM C 518
 - 2. Compressive Strength: 25 psi minimum; in accordance with ASTM D 1621
 - 3. Water Absorption: Less than 0.1% by volume; in accordance with ASTM C 272
 - 4. Water Vapor Permeability: Maximum 1.1 perm-inch; in accordance with ASTM E 96
 - 5. Flexural Strength: 50 psi, in accordance with ASTM C 203
 - 6. Edges: Square for below grade applications
 - 7. Water Affinity: Hydrophobic
 - 8. Water Capillarity: None
 - 9. Thickness: 2 in. minimum
 - 10. Size: Provide the largest sheets possible, to minimize seams.
 - 11. Recycled Content: 18% Pre-Consumer, 40% Post-Consumer

2.02 RIGID INSULATION AT EXTERIOR WALLS AND SOFFITS

- A. At exterior wall locations and soffits not located within masonry cavity wall, provide rigid, closed cell, extruded polystyrene (XPS) insulation Foamular 250 by Owens Corning, or Architect approved equal STYROFOAM Scoreboard by Dow Chemical or Amoco Foam Products. Insulation shall have the following performance properties:
 - 1. R-Value: 5.0 per inch at 75° F mean temperature, in accordance with ASTM C518
 - 2. Compressive Strength: 25 psi minimum, in accordance with ASTM D1621
 - 3. Flexural Strength: 50 psi minimum, in accordance with ASTM C203
 - 4. Water Absorption: 0.3% maximum by volume, in accordance with ASTM C272
 - 5. Water Vapor Permeability: 1.5 perm maximum, in accordance with ASTM E96
 - 6. Dimensional Stability: 2% maximum linear change, in accordance with ASTM D2126
 - 7. Flame Spread: 10, in accordance with ASTM E84

8. Smoke developed:	175, in accordance with ASTM E84
9. Thickness:	3 in.
10. Size:	1 in. x 48 in. x 96 in., square edge to fit cavity wall tie spacing.
11. Environmental Product Declaration No.:	4786077032.101.1
12. Low-Emitting:	GreenGuard Certified
13. Recycled Content:	0% Post-Consumer, 20% Pre-Consumer

2.03 CONSTRUCTION ADHESIVE

- A. Provide rubber based, solvent dispersed, adhesive designed for bonding extruded polystyrene to construction materials, Styrofoam Construction Adhesive, as manufactured by Dow Chemical Company or Architect approved equal.

PART 3 - EXECUTION**3.01 INSPECTION**

- A. The Insulation Subcontractor shall examine substrates, supports, and conditions under which this Work is to be performed and notify General Contractor, in writing, of conditions detrimental to the proper completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected. Beginning Work means Installer accepts substrates and conditions.

3.02 INSTALLATION

- A. Strictly comply with manufacturer's instructions and recommendations, except where more restrictive requirements are specified in this Section. Install insulation between all heated and unheated spaces.
1. Clean substrates and remove projections which could puncture vapor barriers.
 2. Extend insulation over entire area indicated to be insulated.
 3. Fit tightly around penetrations and obstructions. Fill all holes, gaps and voids.
 4. Do not over compress insulation.
 5. Provide insulation in one layer with tightly butted edges, unless indicated otherwise.
- B. Rigid board insulation at foundation walls and beneath concrete slabs on grade shall be adhered to clean substrate with spot application of adhesive or mastic approved by insulation manufacturer. Extend insulation over the area shown, or if not shown, as follows:
1. Vertically: Down at least 4 ft. below finish grade to below the frost depth.
 2. Horizontally: Beneath slabs on grade continuously under entire slab.
- C. Board Type Insulation at Cavity Walls: Mechanically attach insulation to cavity walls or where indicated on drawings per manufacturers recommendations. All panels shall be butted snugly with no gaps greater than 1/4 inch. Gaps greater than 1/4 inch shall be filled with the same material. Insulation panels may be applied to cavity walls while air barrier is tacky. Insulation manufacturer shall verify compatibility with air barrier materials.

3.03 PROTECTION

- A. Provide temporary protection to ensure Work being without damage or deterioration from weather or physical abuse. Repair and replacement of damage to the Work of this Section, as determined by the Architect, shall be completed immediately at no additional cost to the Owner.

3.04 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

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SECTION 07 24 00

EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section shall include, but not be limited to, furnishing and installation of the following:
 - 1. Exterior Insulation and Finish System (EIFS), including silicone treated gypsum substrate, air/moisture barrier, adhesives, EPS insulation, waterproofing base coat, reinforcing mesh, primer, and finish coat as indicated on the Drawings.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contracts Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 DESIGN AND PERFORMANCE REQUIREMENTS

- A. Design and performance of Exterior Insulation and Finish System (EIFS) shall comply with the following properties:
 - 1. Weight: <2 PSF (not including sheathing and frame)
 - 2. Thickness Insulation: 1 to 12 in.
 - 3. R-value: 3.6-43.2 SF/deg. F/Btu
 - 4. Wind Load Resistance: Tested up to +188 psf
 - 5. Compliance: IBC and IRC (2006, 2009, 2012), ASHRAE 90.1-2010
 - 6. Construction Types I-V, NFPA 285 tested for Types I-IV, ASTM E 119 tested for 1 & 2-hour walls

1.05 SUBMITTALS

- A. Manufacturer's specifications, details, installation instructions and product data.
- B. Manufacturer's code compliance report.

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- C. Manufacturer's standard warranty.
- D. Applicator's industry training credentials.
- E. Samples for approval as directed by architect or owner.
- F. Sealant manufacturer's certificate of compliance with ASTM C 1382.
- G. Prepare and submit project-specific details (when required by contract documents).

1.06 REFERENCES

A. ASTM Standards:

- 1. B 117 Test Method for Salt Spray (Fog) Testing
- 2. C 297 Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions
- 3. C 578 Specification for Preformed, Cellular Polystyrene Thermal Insulation
- 4. C 1177 Specification for Glass Mat Gypsum for Use as Sheathing
- 5. C 1382 Test Method for Determining Tensile Adhesion Properties of Sealants When Used in Exterior Insulation and Finish Systems (EIFS) Joints
- 6. D 968 Test Method for Abrasion Resistance of Organic Coatings by Falling Abrasive
- 7. D 1784 Specification for Rigid Poly (Vinyl Chloride) (PVC) and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
- 8. D 2247 Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
- 9. D 3273 Test for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
- 10. E 72 Standard Test Methods of Conducting Strength Tests of Panels for Building Construction
- 11. E 84 Test Method for Surface Burning Characteristics of Building Materials
- 12. E 96 Test Methods for Water Vapor Transmission of Materials
- 13. E 119 Method for Fire Tests of Building Construction and Materials
- 14. E 330 Test Method for Structural Performance of Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
- 15. E 331 Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
- 16. E 1233 Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Difference
- 17. E 2098 Test Method for Determining Tensile Breaking Strength of Glass Fiber Reinforcing Mesh for Use in Class PB Exterior Insulation and Finish System after Exposure to a Sodium Hydroxide Solution
- 18. E 2134 Test Method for Evaluating the Tensile-Adhesion Performance of an Exterior Insulation and Finish System (EIFS)
- 19. E 2178 Test Method for Air Permeance of Building Materials
- 20. E 2273 Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish System (EIFS) Clad Wall Assemblies
- 21. E 2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
- 22. E 2485 Standard Test Method for Freeze/Thaw Resistance of Exterior Insulation and Finish Systems (EIFS) and Water Resistive Barrier Coatings
- 23. E 2486 Standard Test Method for Impact Resistance of Class PB and PI Exterior Insulation and Finish Systems (EIFS)
- 24. E 2568 Standard Specification for PB Exterior Insulation and Finish Systems
- 25. E 2570 Test Method for Water-Resistive (WRB) Coatings used Under Exterior Insulation and Finish Systems (EIFS) or EIFS with Drainage

- 26. G 153 Recommended Practice for Operating Light-and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Nonmetallic Materials
- 27. G 154 Recommended Practice for Operating Light-and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials
- B. Building Code Standards
 - 1. AC 235 Acceptance Criteria for EIFS Clad Drainage Wall Assemblies (November 2009).
- C. National Fire Protection Association (NFPA) Standards
 - 1. NFPA 268 Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source
 - 2. NFPA 285 Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Non-Load-Bearing Wall Assemblies containing Combustible Components Using the Intermediate-Scale, Multistory Test Apparatus
- D. Other Referenced Documents
 - 1. American Association of Textile Chemists and Colorists AATCC-127 Water Resistance: Hydrostatic Pressure Test
 - 2. APA Engineered Wood Association E 30, Engineered Wood Construction Guide
 - 3. ICC-ES ESR-1233, StoGuard with Gold Coat, StoGuard with EmeraldCoat, and StoGuard VaporSeal Water-Resistive Barriers and StoEnergy Guard
 - 4. ICC-ES ESR-1748, StoTherm® ci
- 1.07 DESIGN REQUIREMENTS
 - A. Wind Load
 - 1. Design for maximum allowable system deflection, normal to the plane of the wall, of $L/240$.
 - 2. Design for wind load in conformance with code requirements.
 - 3. Maximum wind load resistance: + 188 PSF (9.00 kPa), provided structural supports and sheathing/sheathing attachment are adequate to resist these pressures.
 - B. Moisture Control
 - 1. Prevent the accumulation of water behind the EIFS or into the wall assembly, either by condensation or leakage through the wall construction, in the design and detailing of the wall assembly:
 - a. Provide flashing to direct water to the exterior where it is likely to penetrate components in the wall assembly, including, above window and door heads, beneath window and door sills, at roof/wall intersections, decks, abutments of lower walls with higher walls, above projecting features, at floor lines, and at the base of the wall.
 - b. Air Leakage Prevention – provide continuity of the air barrier system at foundation, roof, windows, doors, and other penetrations through the wall with connecting and compatible air barrier components to minimize condensation and leakage caused by air movement.
 - c. Vapor Diffusion and Condensation – perform a dew point analysis and/or dynamic hygrothermal modeling of the wall assembly to determine the potential for accumulation of moisture in the wall assembly by diffusion. Adjust insulation thickness and/or other wall assembly components accordingly to minimize risk. Avoid the use of vapor retarders on the interior side of the wall in warm, humid climates.
 - C. Impact Resistance
 - 1. Provide ultra-high impact resistance of the EIFS to a minimum height of 6'-0" above finished grade at all areas accessible to pedestrian traffic and other areas exposed to abnormal stress or impact. Indicate the areas with impact resistance other than "Standard" on contract drawings.
 - D. Color Selection
 - 1. Colors shall be as selected by the Architect from approved manufacturer's complete selection of standard and premium colors, excluding exotic colors or metallic finishes.

2. Finish coat shall have a light reflectance value of 20 or greater. (The use of dark colors is not recommended over expanded polystyrene [EPS]. EPS has a service temperature limitation of approximately 165° F.
- E. Joints
1. Provide minimum 3/4 in. wide joints in the EIFS where they exist in the substrate or supporting construction, where the cladding adjoins dissimilar construction or materials, at changes in building height, at expansion, control, and cold joints in construction, and at floor lines in multi-level wood frame construction. Size joints to correspond with anticipated movement. Align terminating edges of EIFS with joint edges of through wall expansion joints and similar joints in construction.
 2. Provide minimum 1/2 in. wide perimeter sealant joints at all penetrations through the EIFS (windows, doors, mechanical, electrical, and plumbing penetrations).
 3. Specify compatible backer rod and sealant that has been evaluated in accordance with ASTM C 1382, and that meets minimum 50% elongation after conditioning.
 4. Provide joints so that air barrier continuity is maintained across the joint, and drain joints to the exterior, or provide other means to prevent or control water infiltration at joints.
- F. Grade Condition
1. Provide minimum 6 in. clearance above grade or as required by code.
- G. Trim, Projecting Architectural Features and Reveals
1. Trims and projecting architectural features shall have a minimum 1:2 slope along their top surface. All reveals must have minimum 3/4 in. insulation thickness at the bottom of the reveal. Horizontal reveals must have a minimum 1:2 slope along their bottom surface. Increase slope for northern climates to prevent accumulation of ice/snow and water on surface. Where trim/feature or bottom surface of reveal projects more than 2 in. from the face of the EIFS wall plane, protect the top surface with waterproof base coat. Periodic inspections and increased maintenance may be required to maintain surface integrity of the EIFS finish on weather exposed sloped surfaces. Limit projecting features to easily accessible areas and limit total area to facilitate and minimize maintenance.
 2. Do not use the EIFS on weather exposed projecting ledges, sills, or other projecting features unless supported by framing or other structural support and protected with metal coping or flashing.
- H. Insulation Thickness
1. Minimum EPS insulation thickness is 1 in.
 2. Maximum EPS insulation thickness is 12 in., except for fire-resistance rated wall assemblies.
- I. Fire Protection
1. Do not use EPS foam plastic in excess of 12 in. thick on types I, II, III, or IV construction unless approved by the code official.
 2. Where a fire-resistance rating is required by code use the EIFS over a rated concrete or concrete masonry assembly. Limit use over rated frame assemblies to non-load bearing assemblies (the EIFS is considered not to add or detract from the fire-resistance of the rated assembly). Maximum allowable EPS thickness: 4 in.
 3. Refer to manufacturer's testing or applicable code compliance report for other limitations that may apply.
- J. Performance Requirements
1. Comply with ASTM E 2570 (Air/Moisture Barrier) and ASTM E 2568 (EIFS)

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Mount Vernon Group Architects, Inc., Project No. 02014.58

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1.08 PERFORMANCE REQUIREMENTS

- A. Comply with ASTM E 2570 (Air/Moisture Barrier) and ASTM E 2568 (EIFS)

Table 1 Air/Moisture Barrier Performance

TEST	METHOD	CRITERIA	RESULT
1. Weathering	AATCC 127 (Water Column)	No cracking, bond failure or water penetration after 210 hours UV exposure, 25 wet/dry cycles, and 21.6 in (55 cm) water column	Pass
2. Durability	ASTM E 1233/ ASTM E 72 / ASTM E 331	No cracking or water penetration at sheathing joints after 10 cycles transverse loading, 1 cycle racking, 5 cycles environmental conditioning, and 15 minutes water spray at 2.86 PSF (137 kPa) pressure differential	No water penetration
3. Water Resistance	ASTM D 2247	Absence of deleterious effects after 14-day exposure	No deleterious effects
4. Water Vapor Transmission	ASTM E 96 Method B (Water Method)	Measure	Sto Gold Fill®*: 7.10 perms [408 ng/(Pa·s·m²)] Sto Gold Coat: > 10 perms [574 ng/(Pa·s·m²)] Sto AirSeal; >12 perms [689 ng/(Pa s m²)]
5. Air Leakage (material)	ASTM E 2178	≤ 0.004 cfm/ft² at 1.57 psf (0.02 L/s·m² at 75 Pa)	Pass
6. Air Leakage (assembly)	ASTM E 2357	≤ 0.04 cfm/ft² (0.2 L/s·m²)	Pass ¹
7. Freeze -Thaw	ASTM E 2485	No delamination or surface changes after 10 cycles when viewed under 5X magnification	No delamination or surface changes
8. Surface Burning	ASTM E 84	Flame Spread less than or equal to 25 Smoke developed less than or equal to 450	Flame Spread: < 25 Smoke Density: < 450
9. Tensile Bond	ASTM C 297	Greater than 15 psi (103 kPa)	Pass over Plywood, OSB, Glass Mat Faced Gypsum sheathings, CMU

1. Based on testing of air barrier joint treatment material at sheathing joints and no top coat.

Table 2 EIFS Weather Resistance and Durability Performance*

TEST	METHOD	CRITERIA	RESULT
1. Accelerated Weathering	ASTM G 153 (Formerly ASTM G 23)	No deleterious effects* at 2000 hours when viewed under 5x magnification	Pass
2. Accelerated Weathering	ASTM G 154 (Formerly ASTM G 53)	No deleterious effects* at 2000 hours	Pass
3. Freeze/Thaw Resistance	ASTM E 2485	No deleterious effects* at 10 cycles when viewed under 5x magnification	Pass
4. Water Penetration	ASTM E 331 (modified per ICC-ES AC 235)	No water penetration beyond the plane of the base coat/insulation board interface after 15 minutes at 6.24 psf (299 Pa) or 20% of design wind pressure, whichever is greater	Pass at 12.0 psf (575 Pa) after 30 minutes
5. Drainage Efficiency	ASTM E 2273	90% minimum	> 90%
6. Tensile Adhesion	ASTM E 2134	Minimum 15 psi (103kPa) tensile strength	Pass
7. Water Resistance	ASTM D 2247	No deleterious effects* at 14 day exposure	Pass @ 28 days
8. Salt Spray	ASTM B 117	No deleterious effects* at 300 hours	Pass @ 300 hrs
10. Abrasion Resistance	ASTM D 968	No cracking or loss of film integrity at 528 quarts (500 L) of sand	Pass @ 528 quarts (1000 L)
11. Mildew Resistance	ASTM D 3273	No growth supported during 28-day exposure period	Pass @ 28 days
12. Impact Resistance	ASTM E 2486	Standard: 25-49 in-lbs (2.83-5.54J) Medium: 50-89 in-lbs (5.65-10.1J) High: 90-150 in-lbs (10.2-17J) Ultra-High: >150 in-lbs (>17J)	Pass with one layer Sto Mesh Pass with two layers Sto Mesh Pass with one layer Sto Intermediate Mesh Pass with one layer Sto Armor Mat and one layer Sto Mesh

2. *No deleterious effects: no cracking, checking, crazing, erosion, rusting, blistering, peeling or delamination

Table 3 Air/Moisture Barrier and EIFS Fire Performance

TEST	METHOD	CRITERIA	RESULT
1. Fire Endurance	ASTM E 119	Maintain fire resistance of existing rated assembly	Pass (4 inch [102 mm] maximum allowable insulation thickness)
2. Intermediate Scale Multi-Story Fire Test	NFPA 285 (formerly UBC Standard 26-9)	1. Resistance to vertical spread of flame within the core of the panel from one story to the next 2. Resistance to flame propagation over the exterior surface 3. Resistance to vertical spread of flame over the interior surface from one story to the next 4. Resistance to significant lateral spread of flame from the compartment of fire origin to adjacent spaces	Pass with 12 inches (305 mm) insulation
3. Radiant Heat Ignition	NFPA 268	No ignition @ 20 minutes	Pass with 1 and 12 inches (25 and 305 mm) insulation
4. Surface Burning (individual components)	ASTM E 84	Individual components shall each have a flame spread of 25 or less, and smoke developed of 450 or less	Flame Spread: < 25 Smoke Developed: < 450

Table 4 EIFS Component Performance

TEST	METHOD	CRITERIA	RESULT
1. Alkali Resistance of Reinforcing Mesh	ASTM E 2098	Greater than 120 pli (21 dN/cm) retained tensile strength	Pass
2. Requirements for Rigid PVC Accessories	ASTM D 1784	Meets cell classification 13244C	Pass

1.09 QUALITY ASSURANCE

A. Manufacturer Requirements

1. Member in good standing of the EIFS Industry Members Association (EIMA)
2. Air/moisture barrier and EIFS manufacturer for a minimum of thirty (30) years
3. Manufacturing facilities ISO 9001:2008 Certified Quality System and ISO 14001:2004 Certified Environmental Management System

B. Contractor Requirements

1. Engaged in application of similar systems for a minimum of three years

2. Knowledgeable in the proper use and handling of Sto materials
 3. Employ skilled mechanics who are experienced and knowledgeable in air/moisture barrier and EIFS application, and familiar with the requirements of the specified work
 4. Successful completion of minimum of three projects of similar size and complexity to the specified project
 5. Provide the proper equipment, manpower and supervision on the job site to install the system in compliance with Sto's published specifications and details and the project plans and specifications
- C. Insulation Board Manufacturer Requirements
1. EPS board listed by an approved agency
 2. EPS board manufactured under Sto licensing agreement and recognized by Sto as being capable of producing EPS insulation board to meet EIFS requirements
 3. EPS board labeled with information required by Sto, the approved listing agency, and the applicable building code.
- D. Mock-up Testing
1. Construct full-scale mock-up of typical air/moisture barrier and EIFS/window wall assembly with specified tools and materials and test air and water infiltration and structural performance in accordance with ASTM E 283, ASTM E 331 and ASTM E 330, respectively, through independent laboratory. Mock-up shall comply with requirements of project specifications. Where mock-up is tested at job site maintain approved mock-up at site as reference standard. If tested off-site accurately record construction detailing and sequencing of approved mock-up for replication during construction.
- E. Inspections
1. Provide independent third party inspection where required by code or contract documents
 2. Conduct inspections in accordance with code requirements and contract documents
- 1.10 DELIVERY, STORAGE, AND HANDLING
- A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product
 - B. Protect coatings (pail products) from freezing and temperatures in excess of 90°F (32°C). Store away from direct sunlight.
 - C. Protect Portland cement based materials (bag products) from moisture and humidity. Store under cover off the ground in a dry location.
- 1.11 PROJECT / SITE CONDITIONS
- A. Maintain ambient and surface temperatures above 40°F (4°C) during application and drying period, minimum 24 hours after application of Air/Moisture barrier and EIFS products
 - B. Provide supplementary heat for installation in temperatures less than 40°F (4°C)
 - C. Provide protection of surrounding areas and adjacent surfaces from application of products
- 1.12 COORDINATION / SCHEDULING
- A. Provide site grading such that the EIFS terminates above grade a minimum of 6 inches (150 mm) or as required by code
 - B. Coordinate installation of foundation waterproofing, roofing membrane, windows, doors and other wall penetrations to provide a continuously connected air and moisture barrier
 - C. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall
 - D. Install window and door head flashing immediately after windows and doors are installed
 - E. Install diverter flashings wherever water can enter the wall assembly to direct water to the exterior

- F. Install splices or tie-ins from air/moisture barrier over back leg of flashings, starter tracks, and similar details to form a shingle lap that directs incidental water to the exterior
 - G. Install copings and sealant immediately after installation of the EIFS when coatings are dry, and such that, where sealant is applied against the EIFS surface, it is applied against the base coat or primed base coat surface
 - H. Schedule work such that air/moisture barrier is exposed to weather no longer than 30 days if Sto Gold Coat is used, 90 days if Sto AirSeal is used.
 - I. Attach penetrations through the EIFS to structural support and provide water tight seal at penetrations
- 1.13 PRE-INSTALLATION MEETING
- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, determine acceptable mock-ups, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Owner's Project Manager, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 MANUFACTURERS**

- A. Provide single source manufacturer of Exterior Insulation and Finish System (EIFS) to include air/moisture barrier, EIFS coatings, and accessories. The EIFS shall be StoTherm ci, as manufactured by Sto Corp or Architect approved equal by Senergy or Parex.

2.02 MATERIALS

- A. Air / Moisture Barrier
 - 1. StoGuard®
 - a. Joint Treatment, Rough Opening Protection, and Detail Components:
 - 1) Sto Gold Coat: Ready mixed coating applied by brush, roller or spray for rough opening protection of frame walls and joint treatment of sheathing when used with StoGuard Fabric. Also used as a detail component with StoGuard Fabric to splice over back flange of starter track, flashing, and similar ship lap details.
 - 2) Sto RapidGuard: One component STPE rapid drying gun-applied treatment for sheathing joints, rough openings, seams, cracks, penetrations and other static transitions in above grade wall construction such as: shingle lap transitions to flashing, wall to balcony floor slab or ceilings, and through wall penetrations – pipes, electrical boxes, and scupper penetrations.
 - 2. Waterproof Coating
 - a. Sto Gold Coat: Ready mixed waterproof coating for concrete, concrete masonry, wood-based sheathing, and glass mat gypsum sheathing.
 - 3. Transition Membrane
 - a. StoGuard Transition Membrane: Flexible air barrier membrane for continuity at transitions such as sheathing to foundation, dissimilar materials (CMU to frame wall), wall to balcony floor slab or ceiling, flashing shingle lap transitions, floor line deflection joints, masonry control joints, and through wall joints in masonry or frame construction.
- B. Adhesive
 - 1. Sto BTS Plus: Factory blended one-component polymer-modified portland cement based high build adhesive

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- C. Insulation Board
 - 1. Sto EPS Insulation Board: Nominal 1.0 lb./ft³ Expanded Polystyrene (EPS) insulation board in compliance with ASTM E 2430 and ASTM C 578 Type I requirements and listed, labeled, and furnished in accordance with Section 1.6C.
 - D. Base Coat
 - 1. Cementitious Base Coat
 - a. Sto BTS Plus: Factory blended one component polymer modified portland cement based high build base coat. Also used as a leveler for concrete and masonry surfaces
 - E. Reinforcing Meshes
 - 1. Sto Mesh: Nominal 4.5 oz/yd² (153 g/m²), symmetrical, interlaced open-weave glass fiber fabric made with alkaline resistant coating for compatibility with Sto materials
 - F. Primer
 - 1. StoPrime: Acrylic based tintable primer for spray application
 - G. Finish Coat
 - 1. Stolit Lotusan: Acrylic based textured wall finish with graded marble aggregate and self-cleaning properties.
- 2.03 JOB MIXED INGREDIENTS
- A. Water – clean and potable
 - B. Portland cement – Type I, Type II, or Type I-II in conformance with ASTM C 150
- 2.04 ACCESSORIES
- A. Starter Track: Rigid PVC (polyvinyl chloride) plastic track Part No. STDE as furnished by Plastic Components, Inc., 9051 NW 97th Terrace, Miami, FL 33178 (800 327 – 7077).
 - B. Sto-Mesh Corner Bead Standard: One component PVC (polyvinyl chloride) accessory with integral reinforcing mesh for outside corner reinforcement.
 - C. Sto Drip Edge Profile: One component PVC (polyvinyl chloride) accessory with integral reinforcing mesh that creates a drip edge and plaster return
- 2.05 MIXING
- A. Sto Gold Coat: Mix with a clean, rust-free high-speed mixer to a uniform consistency
 - B. Sto BTS Plus: Mix ratio with water: 5-6.5 quarts (4.7-6.2 L) of water per 47 pounds bag of Sto BTS Plus. Pour water into a clean mixing pail. Add Sto BTS Plus, mix to a uniform consistency and allow to set for approximately 5 minutes. Adjust mix if necessary with additional Sto BTS Plus or water and remix to a uniform trowel consistency. Avoid re-tempering. Keep mix ratio consistent. Do not exceed maximum water amount in mix ratio.
 - C. Sto Primer: Mix with a clean, rust-free high-speed mixer to a uniform consistency
 - D. Stolit Lotusan: Mix with a clean, rust-free high-speed mixer to a uniform consistency. A small amount of water may be added to adjust workability. Limit addition of water to amount needed to achieve the finish texture.
 - E. Mix only as much material as can readily be used
 - F. Do not use anti-freeze compounds or other additives
- 2.06 SEALANTS
- A. Provide joint fillers, joint substrates, silicone sealants, and other related materials in accordance with requirements of Section 07 92 00 – Joint Sealants, or the approved manufacturer, whichever is more restrictive.

PART 3 - EXECUTION

3.01 ACCEPTABLE INSTALLERS

- A. Installers shall be prequalified under quality assurance requirements of subparagraph 1.09.

3.02 EXAMINATION

- A. Inspect sheathing application for compliance with applicable requirement and installation in conformance with specification and manufacturer requirements:
 - 1. Glass Mat Faced gypsum sheathing compliant with ASTM C 1177
 - 2. Exterior Grade and Exposure I wood based sheathing – APA Engineered Wood Association E 30
 - 3. Cementitious sheathing – consult manufacturer
 - 4. Attachment into structural supports with adjoining sheets abutted (gapped if wood-based sheathing) and fasteners at required spacing to resist design wind pressures as determined by design professional
 - 5. Fasteners seated flush with sheathing surface and not over-driven
- B. Report deviations from the requirements of project specifications or other conditions that might adversely affect the Air/Moisture Barrier and the EIFS installation to the General Contractor. Do not start work until deviations are corrected.

3.03 SURFACE PREPARATION

- A. Remove surface contaminants on concrete, concrete masonry, gypsum sheathing, or coated gypsum sheathing surfaces
- B. Repair cracks, spalls or damage in concrete and concrete masonry surfaces and level concrete and masonry surfaces to comply with required tolerances
- C. Apply conditioner by spray or roller to chalking or excessively absorptive surfaces or pressure wash to remove surface chalkiness
- D. Remove fasteners that are not anchored into supporting construction and seal holes with air barrier material
- E. Seal over-driven fasteners with air barrier material and install additional fasteners as needed to comply with fastener spacing requirement
- F. Fill large gaps between sheathing or voids around pipe, conduit, scupper, and similar penetrations with spray foam and shave flush with surface.
- G. Replace weather-damaged sheathing and repair or replace damaged or cracked sheathing

3.04 INSTALLATION

- A. Air/Moisture Barrier Installation over glass mat faced gypsum sheathing in Compliance with ASTM C 1177.
- B. Transition Detailing with StoGuard Transition Membrane
 - 1. At floor line deflection joints up to 1 inch wide, and static joints and transitions such as: sheathing to foundation, dissimilar materials (i.e., CMU to frame wall), flashing shingle-lap transitions, and wall to balcony floor slab or ceiling:
 - a. Apply waterproof coating Sto Gold Coat liberally to properly prepared surfaces with brush, roller, or spray.
 - b. Place pre-cut lengths of StoGuard Transition Membrane centered over the transition in the wet coating. At changes in plane crease the membrane and similarly place the membrane material in the wet coating. At floor line deflection joints achieve a slightly concave profile (recessed into the joint) of the membrane.
 - c. Immediately top coat the membrane with additional coating and apply pressure with brush or roller to fully embed the membrane in the coating and achieve a smooth and wrinkle-free surface without gaps or voids.

- d. Apply coating liberally along all top horizontal edges on walls and along all edges on balcony floor slabs to fully seal the edges.
 - e. Overlap minimum 2 inches at ends and adhere lap seams together with coating. Shingle lap vertical seams and vertical to horizontal intersections with minimum 2 in. overlap.
 2. At movement joints up to 1 in. wide with up to + 50% movement such as masonry control joints, and through wall joints in masonry or frame construction:
 - a. Insert backer rod sized to friction fit in the joint (diameter 25% greater than joint width).
 - b. Recess the backer rod 1/2 in.
 - c. Apply the waterproof coating liberally to properly prepared surfaces with brush, roller, or spray along the outer surface on each side of the joint (not in the joint).
 - d. Immediately place the membrane by looping it into the joint against the backer rod surface to provide slack.
 - e. Embed the membrane in the wet coating along the outer surface on the sides of the joint by top coating with additional coating material and applying pressure with a brush or roller.
 3. For all applications, after the membrane installation is complete and the waterproof coating is dry:
 - a. Apply a final liberal coat of the waterproof coating to all top horizontal edges on walls to ensure waterproofing integrity. Similarly apply coating at all edges on balcony floor slabs.
 - b. Inspect the installed membrane for fish mouths, wrinkles, gaps, holes or other deficiencies. Correct fish mouths or wrinkles by cutting, then embedding the area with additional coating applied under and over the membrane.
 - c. Seal gaps, holes, and complex geometries at three dimensional corners with StoGuard RapidGuard.
- C. Transition Detailing with StoGuard RapidGuard
 1. At flashing shingle laps, and through wall penetrations such as pipes, electrical boxes, and scupper penetrations:
 - a. Flashing leg or penetration flange must be seated flat against the wall surface without gaps. Apply StoGuard RapidGuard liberally with a caulking gun in a zig-zag pattern across the flashing leg or flange/wall surface seam and spread to a thickness that covers the flange and fastener penetrations and directs water away from the wall. Extend application minimum 1 in. onto both surfaces (flashing leg/flange and wall surface).
 - b. At through wall penetrations without flanges ensure the penetrating element (i.e., pipe or scupper) is fitted snug against abutting wall surfaces. Apply a fillet bead with a caulking gun around the penetration and tool against both surfaces (penetration and wall surface) to create a bead profile that directs water away from the penetration. Extend application minimum 1 in. onto both surfaces.
- D. Rough Opening Protection
 1. Sto Gold Coat or Sto AirSeal with StoGuard Fabric: apply coating liberally by spray or roller to corners of openings, immediately place StoGuard RediCorners in the wet coating, and apply additional coating over the RediCorners to completely embed them. After all corners have been completed apply coating liberally to the entire rough opening, immediately place StoGuard Fabric in the wet coating, smooth any wrinkles with a brush or roller, and apply additional coating over the fabric to completely embed it. Overlap all seams minimum 2 inches (51 mm). Once completed top coat with additional coating as needed to completely seal the surface. Allow to dry and inspect for pinholes or voids. If pinholes or voids are present, seal with additional coating or StoGuard RapidSeal.
- E. Sheathing Joint Treatment
 1. Sto RapidGuard: Apply to properly installed sheathing - joints butted for gypsum sheathing, and joints gapped for plywood and OSB sheathings (wood-based sheathing typically requires 1/8 inch spacing at edge and end joints). Apply a thick bead of Sto RapidGuard with a caulking gun along sheathing joints or apply in a zig-zag pattern across and down the joints. Spread to a uniform thickness of 20-30 mils before the material skins. Spread 1 inch beyond the sheathing joint on each side. Follow the same procedure for inside and outside corners.

F. Air/Moisture Barrier Coating Installation

1. Gypsum Sheathing: apply waterproof coating by spray or roller over sheathing surface, including the dry joint treatment, rough opening protection, and transition areas, to a uniform wet mil thickness of 10 mils in one coat (Sto Gold Coat) or 20 mils in one coat (Sto AirSeal). Use 1/2 in. nap roller for plywood. Use 3/4 in. nap roller for glass mat faced gypsum sheathing. Protect from weather until dry.

G. EIFS Installation**1. Starter Track**

- a. Strike a level line at the base of the wall to mark where the top of the starter track terminates.
- b. Attach the starter track even with the line into structural supports with the proper fastener: Type S-12 corrosion resistant screws for steel framing with minimum 3/8 in. and three thread penetration, galvanized or zinc coated nails for wood framing with minimum 3/4 in. penetration, and corrosion resistant concrete or masonry screws with minimum 1 in. penetration for concrete or CMU. Attach between studs into blocking as needed to secure the track flat against the wall surface. Attach at maximum 16 inches (406 mm) on center into framing. For solid wood sheathing or concrete/masonry surfaces, attach directly at 12 in. on center maximum.
- c. Butt sections of starter track together. Miter cut outside corners and abut. Snip front flange of one inside corner piece (to allow EPS insulation board to be seated inside of track) and abut.
- d. Install Starter Track at other EIFS terminations as designated on detail drawings: above roof along dormers or gable end walls, and beneath window sills with concealed flashing (refer to Sto Details).

2. Detail Splice Strips for Starter Track, Flashing at Floor Lines, Head of Windows and Doors

- a. Starter Track, Window/Door Head Flashing, Floor Line Flashing, and Roof/Side Wall Step Flashing: Install minimum 4 in. wide detail component over back flange of starter track, floor line flashing, head flashing, and roof/side wall step flashing. Center the detail component so it spans evenly between the back leg of flashing (or accessory) and the coated sheathing. Make a smooth transition to the coated sheathing with a trowel, knife, or roller, depending on the detail component material being used. When Sto Gold Fill with StoGuard Mesh is the detail component apply another coat of the waterproof coating over the detail area. Do not leave detail components exposed for more than 30 days.

3. Backwrapping

- a. Apply a strip of detail mesh to the dry air/moisture barrier at all system terminations (windows, doors, expansion joints) except where the Starter Track is installed. The mesh must be wide enough to adhere approximately 4 in. of mesh onto the wall, be able to wrap around the insulation board edge and cover a minimum of 2-1/2 in. on the outside surface of the insulation board. Attach mesh strips to the air/moisture barrier and allow them to dangle until the backwrap procedure is completed (paragraph 3.04 G1). Alternatively, pre-wrap terminating edges of insulation board.

4. Adhesive Application and Installation of Insulation Board

- a. Ensure the air/moisture barrier surface (Sto Gold Coat) is free of surface contamination. Install the insulation board within 30 days of the application of the air/moisture barrier coating (Sto Gold Coat), or clean the surface and recoat with Sto Gold Coat.
- b. Rasp the interior lower face of insulation boards to provide a snug friction fit into the Starter Track. (Note: rasping prevents an outward bow at the Starter Track).
- c. Use either polyurethane cementitious adhesive, Sto BTS Plus:
 - 1) Cementitious Adhesive, Sto BTS Plus: apply adhesive to the back of the insulation board with the proper size (1/2 x 1/2 x 2 in.) stainless steel notched trowel. Apply uniform ribbons of adhesive parallel with the SHORT dimension of the board so that when boards are placed on the wall the ribbons will be VERTICAL. Apply adhesive uniformly so ribbons of adhesive do not converge. Immediately place insulation boards in a running bond pattern on the wall with the long dimension horizontal. Start by inserting the lower edge of the boards inside the starter track at the base of the wall until they contact the bottom of the track. Apply firm pressure over the entire surface of the boards to ensure uniform contact of adhesive. IMPORTANT: do not delay installation once adhesive is applied. If adhesive "skins" remove it and apply fresh adhesive.

- d. Bridge sheathing joints by a minimum of 6 in. Interlock inside and outside corners.
 - e. Butt all board joints tightly together to eliminate any thermal breaks. Care must be taken to prevent any adhesive from getting between the joints of the boards.
 - f. Cut insulation board in an L shaped pattern to fit around openings. Do not align board joints with corners of openings.
 - g. Check for satisfactory contact of the insulation board with the substrate. If any boards have loose areas use the spray foam adhesive dispensing pistol to create a hole through the board and inject adhesive to attach the loose area. Allow the adhesive to expand to the outer face of the board while withdrawing the pistol. Cut excess adhesive flush with the surface of the insulation. Do not use nails, screws, or any other type of non-thermal mechanical fastener.
5. Trim, Reveals and Projecting Aesthetic Features
- a. Attach features and trim where designated on drawings with adhesive to a base layer of insulation board or to the coated sheathing surface. Fill any gaps between the trim and base layer of insulation with spray foam adhesive and rasp flush with the trim surface. Slope the top surface of all trim/features minimum 1:2 and the bottom of all horizontal reveals minimum 1:2.
 - b. Cut reveals/aesthetic grooves with a hot-knife, router or groove-tool in locations indicated on drawings.
 - c. Offset reveals/aesthetic grooves minimum 3 in. from insulation board joints.
 - d. Do not locate reveals/aesthetic grooves at high stress areas.
 - e. Ensure minimum 3/4 in. thickness of insulation board at the bottom of the reveals/aesthetic grooves.
6. Completion of Backwrapping
- a. Complete the backwrapping procedure by applying base coat to exposed edges of insulation board and approximately 4 inches (100 mm) onto the face of the insulation board. Pull mesh tight around the board and embed it in the base coat with a stainless-steel trowel. Use a corner trowel for clean, straight lines. Smooth any wrinkles or gaps in the mesh.
7. Accessory Installation
- a. Corner Bead: Cut the corner bead accessory to proper length as needed. Use full pieces wherever possible and avoid using short filler pieces. Offset accessory butt joints from substrate joints. Apply base coat with a stainless-steel trowel to an approximate thickness of 1/8 in. to the outside corner area that will receive the accessory. Immediately place the accessory directly into the wet base coat material. Do not slide into place. Press the accessory into place. A corner trowel is best for this purpose. Embed and completely cover the mesh and PVC by troweling from the corner to the edge of the mesh so that no mesh or PVC color is visible. Avoid excess build-up of base coat and feather along mesh edges. Adjoin separate pieces by abutting PVC to PVC and overlapping the mesh "tail" from one piece onto the next piece. Fully embed the accessory and mesh "tail" in base coat material. When installing field mesh reinforcement overlap accessory mesh and PVC. Remove any excess base coat from the outside corner.
 - b. Drip Edge: Install the drip edge accessory prior to application of field mesh. Install with arrow on mesh pointing UP. Cut the accessory to proper length as needed. Use full pieces wherever possible and avoid using short filler pieces. Offset accessory butt joints from substrate joints. Apply base coat with a stainless-steel trowel to an approximate thickness of 1/8 in. to the area that will receive the accessory. Immediately place the accessory directly into the wet base coat material and press into place. Do not slide into place. Embed and completely cover the mesh and PVC by troweling from the drip edge screed rail to the edge of the mesh. Avoid excess build-up of base coat, feather along mesh edges, and remove any excess base coat from the drip edge nosing. Abut adjoining pieces and install as described above. When installing field mesh reinforcement overlap accessory mesh 4 in. on both vertical and horizontal faces so the PVC is overlapped, and remove any excess base coat from the drip edge nosing. On vertical and horizontal faces of the accessory install finish to the drip edge lines and remove any protruding finish from the drip edge nosing.
8. Base Coat and Reinforcing Mesh Application
- a. Ensure the insulation board is firmly adhered and free of surface contamination or UV degradation, and is thoroughly rasped before commencing the base coat application.

- b. Apply minimum 9 x 12 in. diagonal strips of detail mesh at corners of windows, doors, and all penetrations through the system. Embed the strips in wet base coat and trowel from the center to the edges of the mesh to avoid wrinkles.
 - c. Apply detail mesh at trim, reveals and projecting architectural features. Embed the mesh in the wet base coat. Trowel from the base of reveals to the edges of the mesh.
 - d. Ultra-High impact mesh application (recommended to a minimum height of 6'-0" above finished grade at all areas accessible to pedestrian traffic and other areas exposed to abnormal stress or impact, and where indicated on contract drawings): apply base coat over the insulation board with a stainless-steel trowel to a uniform thickness of approximately 1/8 in. Work horizontally or vertically in strips of 40 in., and immediately embed the mesh into the wet base coat by troweling from the center to the edge of the mesh. Butt ultra-high impact mesh at seams. Allow the base coat to dry.
 - e. Standard mesh application: Apply base coat over the insulation board, including areas with Ultra-High impact mesh, with a stainless-steel trowel to a uniform thickness of approximately 1/8 in. Work horizontally or vertically in strips of 40 in., and immediately embed the mesh into the wet base coat by troweling from the center to the edge of the mesh. Overlap mesh not less than 2-1/2 in. at mesh seams and at overlaps of detail mesh. Feather seams and edges. Double wrap all inside and outside corners with minimum 6 in. overlap in each direction. Avoid wrinkles in the mesh. The mesh must be fully embedded so that no mesh color shows through the base coat when it is dry. Re-skim with additional base coat if mesh color is visible.
 - f. Sloped Surfaces: for trim, reveals, aesthetic bands, cornice profiles, sills or other architectural features that project beyond the vertical wall plane more than 2 in. apply waterproof base coat with a stainless-steel trowel to the sloped surface and minimum four inches above and below it. Embed standard mesh or detail mesh in the waterproof base coat and overlap mesh seams a minimum of 2-1/2 in.
 - g. Allow base coat to thoroughly dry before applying primer or finish.
9. Primer Application
- a. Ensure the base coat surface is free of surface contamination before commencing the primer application.
 - b. Apply primer evenly with brush, roller or proper spray equipment over the clean, dry base coat and allow to dry thoroughly before applying finish.
10. Finish Coat Application
- a. Ensure the base coat surface or primed base coat is free of surface contamination before commencing the finish application.
 - b. Apply finish directly over the base coat or primed base coat when dry. Apply finish by spray or stainless steel trowel, depending on the finish specified. Follow these general rules for application of finish:
 - 1) Avoid application in direct sunlight.
 - 2) Apply finish in a continuous application, and work to an architectural break in the wall.
 - 3) Weather conditions affect application and drying time. Hot or dry conditions limit working time and accelerate drying. Adjustments in the scheduling of work may be required to achieve desired results. Cool or damp conditions extend working time and retard drying and may require added measures of protection against wind, dust, dirt, rain and freezing. Adjust work schedule and provide protection.
 - 4) Do not install separate batches of finish side-by-side.
 - 5) Do not apply finish into or over sealant joints. Apply finish to outside face of wall only.
 - 6) Do not apply finish over irregular or unprepared surfaces, or surfaces not in compliance with the requirements of the project specifications.
11. Installation of Joint Sealants
- a. Joint sealants shall be installed immediately following completion of EIFS installation to prevent infiltration of moisture into and behind EIFS. Sealants shall be provided and installed in accordance with requirements of Section 07 92 00 – Joint Sealants

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June 12, 2019

ALTERNATE NO. 1

3.05 MAINTENANCE STOCK

- A. Provide the approved manufacturer's standard maintenance kit, including accessories and repair material. Provide a minimum of one new, unopened container of each material provided under the Work of this Section.

3.06 PROTECTION

- A. Provide protection of installed materials from water infiltration into or behind them
- B. Provide protection of installed materials from dust, dirt, precipitation, freezing and continuous high humidity until they are fully dry

3.07 CLEANING, REPAIR, AND MAINTENANCE

- A. Clean and maintain the EIFS for a fresh appearance and to prevent water entry into and behind the system. Repair cracks, impact damage, spalls or delamination promptly.
- B. Maintain adjacent components of construction such as sealants, windows, doors, and flashing, to prevent water entry into or behind the EIFS and anywhere into the wall assembly.

3.08 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 07 25 00

WEATHER BARRIERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. Vapor Barrier below concrete slabs-on-grade
 - 2. Spray applied single component polyurethane waterproofing at elevator pit
 - 3. Protection of completed Work

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all of the Contracts Documents for requirements which effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. The Work of this Section shall be performed by manufacturer approved applicators having a minimum of five (5) years application experience with the required materials.
- B. For each type of material required for the Work of this Section, provide primary materials which are the products of one manufacturer. Provide secondary materials which are acceptable to the manufacturers of the primary materials.
- C. Make all arrangements and payments necessary to have the approved manufacturer's authorized representative on-site at beginning of waterproofing to advise installer and to ensure compliance with manufacturer's requirements.
- D. Provide materials suitable for the intended use and compatible with the materials with which they shall be in contact. Compatibility of sealants and accessories shall be verified in writing by the approved manufacturer.

1.05 SUBMITTALS

- A. Submit manufacturer's product data, installation instructions, use limitations and recommendations for each material and system required by the Work this Section.
 - 1. Prior to ordering waterproofing materials, the Waterproofing Subcontractor shall submit the items listed below to the Architect for approval:
 - a. 3 copies of manufacturer's specifications for proposed products and installation instructions.
 - b. Written approval of manufacturer's use of the products in the proposed system.
 - c. Specimen copy of membrane manufacturer's warranty.
 - d. Dimensioned shop drawings indicating areas of Work, membrane layout and profile details of flashing methods for penetrations and terminations. It shall be the manufacturer's responsibility to verify compatibility with surrounding materials, especially at interface with other types of waterproofing.
- B. Provide samples as follows:
 - 1. Submit representative samples of each control joint, sealant and expansion joint specified herein, showing the full range of color and finish variations expected. Provide actual samples having minimum length of 6 inches.
 - 2. Provide samples of each waterproofing material to be used in the systems described herein, including primers, mastics, tapes, liquid waterproofing, termination bars and fasteners, protection and drainage composite boards.
- C. Provide certifications as follows:
 - 1. Provide manufacturer's certification of sealant and joint material performance, including compatibility with adjacent materials to which material shall be applied. Provide certified test reports on aged performances, hardness, stain resistance, adhesion, cohesion and tensile strength, low temperature flexibility, elongation, modules of elasticity, water absorption, and the resistance to weight loss and deterioration due to heat, ozone and ultraviolet exposure.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products to the job site in original, unopened package, clearly labeled with the manufacturer's identification and printed instructions. All material shall be stored and handled in accordance with manufacturer's instructions and recommendations. Protect from damage

1.07 PROJECT CONDITIONS

- A. Perform Work only when ambient conditions are within the limits established by manufacturers of the materials and products used.
- B. Proceed with Work related to composite sheet waterproofing only when substrate construction and penetrating Work is complete and concrete or mortar has cured for at least 28 days.
- C. Provide ventilation in accordance with the approved manufacturer's written requirements and recommendations throughout application and curing for all materials specified in this Section.

1.08 WARRANTY

- A. Provide written warranty signed by the approved manufacturer for a period of 10 years from date of Substantial Completion and Installer warranty for a period of one year for all materials provided under the Work of this Section.

1.09 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.
- B. Advise other trades to ensure that no other Work adversely effects sealer bonding surfaces.

PART 2 - PRODUCTS**2.01 VAPOR BARRIER**

- A. Provide Class A, polyolefin vapor barrier, Stego Wrap, as manufactured by Stego Industries LLC, Perminator by W.R. Meadows, VaporBlock by Raven Industries, or Architect approved equal, complying with requirements of ASTM E 1745. Vapor barrier shall be manufactured using prime virgin resins and additives in a multi-layer extrusion process.
- B. Vapor Barrier shall comply with the following minimum performance characteristics:
 - 1. Permeance: 0.1 perms, ASTM F1249
 - 2. Puncture Resistance: 2,200 grams, ASTM D1709
 - 3. Tensile Strength: 45.0 lbf./in, ASTM D882
 - 4. Methane Transmission Rate: ASTM D1434
 - 5. Roll Dimensions: 14 ft. x 140 ft.
 - 6. Thickness: 15 mils
- C. Provide the approved manufacturer's required accessories, including joint sealant tape, as required for a complete installation.

2.02 SPRAY APPLIED WATERPROOFING

- A. Provide one component elastomeric waterproofing compound at elevator pit, HE784 - Aqua-Bloc WB, as manufactured by Henry Inc., or Architect approved equal by WR Meadows or PolyGuard Products. Material shall comply with the following material and performance characteristics:
 - 1. Compatible with sheet waterproofing membrane and substrate,
 - 2. Solids by volume: 60%
 - 3. Water vapour permeance: 0.05 perms, ASTM E96,
 - 4. Complies with CGSB 37.58
 - 5. Elongation: 1500%,
 - 6. Recovery: 95%
 - 7. Chemical resistance: Alkalis, calcium chloride, mild acid and salt solutions.
- B. Provide polyester reinforcement sheet capable of allowing the membrane to bleed through adequately to provide a monolithic reinforced membrane system. Fabric reinforcement shall be Polyester Fabric as supplied by Henry Inc., or Architect approved equal by WR Meadows or PolyGuard Products.
- C. Provide modified bitumen membrane, *modified*PLUS® NP180s/s as manufactured by Henry., or Architect approved equal by WR Meadows or PolyGuard Products. Material shall have having a minimum thickness of 90 mils and a non-woven polyester reinforcement of 180g/m², and comply with requirements of CGSB 37-GP-56M Type 2 Class C Grade 2. The upper and lower surface shall be sanded.

2.03 PRE-FABRICATED DRAINAGE BOARD

- A. Provide two-part prefabricated geo-composite drain board with additional film attached to back side of membrane, consisting of a formed polystyrene or PVC core covered on one side with a woven or non-woven polypropylene filter fabric, DB 500, as manufactured by Henry, or Architect approved equal by WR Meadows or PolyGuard Products. Drainage board shall comply with the following material and performance characteristics:
 - 1. Material: Polystyrene
 - 2. Thickness: 7/16 in.
 - 3. Compressive Strength: 15,000 lbs./SF
 - 4. Flow Capacity: 16 gpm
 - 5. Tensile Strength: 110 lbs.
 - 6. Puncture Strength: 65 lbs.
- B. Provide continuous 1/4 in. x 3/4 in. HDPE securement bar for screw attachment.
- C. Provide continuous 3-1/2 in. wide 'Z' flashing moulding strip to fit over exposed top edge of drain board.

- D. Provide HDPE pre-moulded washer to fit dimples, complete with high strength, corrosion resistant concrete nails, UCAN AFH 37 or equal.

PART 3 - EXECUTION

3.01 INSPECTION

- A. The Waterproofing Subcontractor shall examine substrates, supports, and conditions under which the Work of this Section is to be performed and notify the General Contractor, in writing, of conditions detrimental to the proper completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected. Beginning Work means Installer accepts substrates and conditions.
- B. Strictly comply with the approved manufacturer's written instructions and recommendations, except where more restrictive requirements are specified in this Section.

3.02 SUBSTRATE PREPARATION FOR WATERPROOFING

- A. Vertical Application:
 - 1. Surfaces to receive membrane shall be clean and dry, free of projections, voids, depressions, scale, efflorescence, loose material, raised face grain, checking, oil, grease, paint, and all other foreign contaminants that could affect proper adhesion of the vapor barrier.
 - 2. All new concrete shall be properly cured (min. seven days for normal weight structural concrete) per manufacturer's recommendations.
 - 3. Provide epoxy type mortar cants, sized as recommended by the membrane manufacture on all inside corners. Do not use wood or fiber cant strips.
 - 4. In wall penetrations shall include, but not be limited to, tiebacks and whalers which penetrate the waterproofing system and are encapsulated in the concrete wall. Apply the approved waterproofing manufacturer's recommended filler at all in wall penetrations to provide continuous flush surface prior to application of spray applied waterproofing.
 - 5. Through wall penetrations shall include, but not be limited to, metal sleeves and metal or plastic pipe and conduit which penetrate concrete foundations. Fill and trowel smooth all gaps between concrete and sleeves, pipe, and conduit with the approved waterproofing manufacturer's recommended filler at all through wall penetrations to provide continuous flush surface prior to application of spray applied waterproofing.
 - 6. Damaged or incomplete coverage of waterproofing membrane shall be repaired and replace in accordance with the approved manufactures written recommendations.

3.03 WATERPROOFING INSTALLATION

- A. Strictly comply with the approved manufacturer's written instructions and recommendations, except where more restrictive requirements are specified in this Section.
- B. Through slab and in slab penetrations shall be sealed in accordance with the approved manufacturer's written requirements. Maintain continuity of the vapor barrier under all columns.
- C. Tie-ins associated with footings and pits shall be installed in accordance with the approved manufacturer's written requirements.
- D. Material shall fully cover the area of slab-on-grade to be poured. All joints and seams shall be overlapped a minimum of 6 in., and fully taped using the approved manufacturer's joint sealant tape.
- E. Completely seal all penetrations using the approved manufacturer's required joint sealant tape, mastic and wrap.
- F. Repair damage to the barrier by installing an overlapping piece of barrier material large enough to provide a minimum of 6 in. overlap on all sides of the damaged area. All joints and seams shall be overlapped a minimum of 6 in., and fully taped using the approved manufacturer's joint sealant tape.

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3.04 FIELD QUALITY CONTROL/TESTING

- A. Installation of concrete floor slab applied over the waterproofing shall not commence until the membrane is inspected and approved for its intended use by the Architect.

3.05 REPAIR AND CLEANING

- A. Remove and replace Work which is damaged or deteriorated in any respect.
- B. Clean adjacent surfaces using materials and methods recommended by system manufacturer. Remove and replace Work that cannot be successfully cleaned.

3.06 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

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SECTION 07 27 26

FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section shall include, but not be limited to, furnishing and installation of the following:
 - 1. Fluid applied air / vapor barrier at exterior wall assemblies
 - 2. Self-adhered air barrier membrane to provide air and water tight closure at all rough openings and all penetrations at exterior wall assemblies for electrical, plumbing, mechanical, fire protection, and structural.
 - 3. Related accessories necessary for a complete installation
- B. Items to Be Furnished Only: Furnish the following items for installation by the designated Sections:
 - 1. Section 07 54 19 – Polyvinyl-Chloride (PVC) Roofing, Self-Adhered Air Barrier Membrane
 - 2. Section 08 11 13 – Hollow Metal Doors and Frames, Self-Adhered Air Barrier Membrane
 - 3. Section 08 31 13 – Access Doors and Frames
 - 4. Section 08 90 00 – Louvers and Vents, Self-Adhered Air Barrier Membrane
- C. All Work of this Section shall be installed in a professional workmanlike manner to provide a continuous air barrier assembly in accordance with requirements of 780 CMR, 9th Edition, Chapter 61.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 – HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 PERFORMANCE REQUIREMENTS

- A. The Work of this Section shall comply with requirements of 780 CMR, 9th Edition, Chapter 61, including Section 6106.2 Building Envelope Requirements and 6106.3 Air Leakage

- B. The building envelope shall be constructed with a continuous air barrier to control air leakage into, or out of the conditioned space, in accordance with requirements of 780 CMR, 9th Edition, Chapter 61. An air barrier shall also be provided for interior partitions between conditioned space and space designed to maintain temperature or humidity levels which differ from those in the conditioned space by more than 50 percent of the difference between the conditioned space and design ambient conditions. The air barrier shall provide and maintain the following material and performance characteristics:
1. The air barrier shall be continuous, with all joints made air-tight.
 2. The air barrier shall have an air permeability not to exceed 0.004 cubic feet per minute per square foot under a pressure differential of 0.3 in. water.
 3. The air barrier shall be capable of withstanding positive and negative combined design wind, fan and stack pressures on the envelope without damage or displacement, shall transfer the load to the structure, and shall not displace adjacent materials under full load.
 4. The air barrier shall be durable or maintainable.
 5. The air barrier shall be joined in an air-tight and flexible manner to itself and all related building systems to allow for relative movement of the air barrier and building systems due to thermal and moisture variations and creep. Connection shall be made between:
 - a. Foundation and walls
 - b. Wall systems and windows, doors, louvers, and all other exterior wall penetrations
 - c. Different exterior wall systems
 - d. Wall and roof assemblies
 - e. Walls, floor and roof across construction, control and expansion joints
 - f. Walls, floors and roof to utility, pipe, conduit, duct, and all other penetrations
- C. All penetrations of the air barrier, and all other possible paths of air infiltration/exfiltration shall be made air-tight in accordance with requirements with 780 CMR, 9th Edition, Chapter 61, including Section 6106.2 Building Envelope Requirements and 6106.3 Air Leakage.
- D. Design Intent: Air barrier membrane shall be located, constructed and flashed to perform as an air and water barrier to discharge to the outside any incidental condensation or water penetration. Air barrier membrane shall accommodate movements of building materials by providing expansion and control joints in accordance with the approved manufacturers written requirements, with appropriate air seal materials at such locations, changes in substrate and perimeter conditions, as may be required to provide a continuous air-tight system.

1.05 REFERENCES

- A. American Society for Testing Materials (ASTM):
1. D 412 Standard Test Methods for Rubber Properties in Tension
 2. D 903 Standard Test Method for Peel or Stripping Strength of Adhesive Bonds
 3. D 1644 Test Methods for Nonvolatile Content of Varnishes
 4. D 1970 Standard Specification for Self-Adhered Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
 5. D 3767 Standard Practice for Rubber - Measurements of Dimensions
 6. E 2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
 7. E 283 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

1.06 SUBMITTALS

- A. Submit manufacturer's product data for each material, including but not limited to, standard details, certified test results, installation instructions, and recommendations for sealing penetrations and perimeter.
- B. Submit three labeled samples of each product, not less than 6 by 12 inches in size.

- C. Submit shop drawings for mockup indicating size of mockup, details of construction, and expansion and control joints. Include relationship with adjacent materials, sequence of installation and materials and methods for sealing penetrations. Obtain approval of shop drawings prior to construction of mockup. Revise to show changes necessary to obtain approval of mockup.
- D. Submit large scale shop drawings indicating details of construction, including expansion and control joints. Include relationship with adjacent materials, sequence of installation and materials and methods for sealing penetrations. Shop drawings shall include, but not be limited to, details of the following connections, as applicable to the project:
 - 1. Foundation and walls
 - 2. Wall systems and windows, doors, louvers, and all other exterior wall penetrations
 - 3. Different exterior wall systems
 - 4. Wall and roof assemblies
 - 5. Walls, floor and roof across construction, control and expansion joints
 - 6. Walls, floors and roof to utility, pipe, conduit, duct, and all other penetrations
- E. Submit qualifications of firm installing air barrier membrane materials, including name and qualifications of supervisor for this project, and including name and location of three projects where similar Work was performed by both firm and supervisor.

1.07 QUALITY ASSURANCE

- A. Installer shall be a firm with a minimum of 3 years experiences in Work of the type required by this Section.
- B. All components of the air barrier system, including but not limited to, primers, membrane, and flashings shall be the products of a single manufacturer to provide a manufacturer warranty, fully compatible system complying with requirements of the Massachusetts Energy Code. The Waterproofing Subcontractor shall provide manufacturer verification of compatibility between all materials and components provided under the Work of this Section and its' related Sections.

1.08 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting a minimum of one week prior to commencing Work of this Section. Attendees shall include representatives of air barrier manufacturer, exterior wall installers, project superintendent, and Architect. Agenda shall include the following:
 - 1. Review of approved submittals
 - 2. Coordination with sequence of installation with adjacent materials
 - 3. Schedule for subsequent Work covering air barrier
 - 4. Procedures for quality assurance

1.09 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products in labeled packages. Store and handle in strict compliance with manufacturer's instructions, recommendations and material safety data sheets. Protect from damage from sunlight, weather, excessive temperatures and construction operations. Remove damaged material from the site and dispose of in accordance with applicable regulations.
 - 1. Do not double-stack pallets of waterproofing on the job site. Provide cover on top and all sides, allowing for adequate ventilation.
 - 2. Protect waterproofing materials from freezing. In cool temperatures, store the material for several hours at room temperature to facilitate mixing and application.
- B. Sequence deliveries to avoid delays, but minimize on-site storage.

1.10 PROJECT CONDITIONS

- A. Perform Work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials and products used.

- B. Proceed with installation only when substrate construction and preparation Work is complete and in condition to receive membrane waterproofing.

1.11 WARRANTY

- A. Standard Product Warranty:
 - 1. Submit manufacturer's warranty that air & vapor barrier and accessories are free of defects at time of delivery, and are manufactured to meet manufacturer's published physical properties and material specifications. Warranty period shall be a minimum of 5 years.
 - 2. Installer to warrant for a period of 2 years that air & vapor barrier and accessories have been installed in accordance with manufacturer's recommendations.

1.12 SCAFFOLDING AND EQUIPMENT

- A. Provide, maintain, and remove safe and adequate interior and exterior staging, scaffolding, hoists, and all other related equipment necessary 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 and codes.
- B. Staging, scaffolding, hoists, and all other related equipment shall be provided and maintained to complete the Work, and removed when no longer required.

1.13 PRE-INSTALLATION MEETING

- A. After approval of mockup shop drawings, but prior to construction of mock-up, the General Contractor shall convene a meeting with representatives of materials to be incorporated in the mockup and installers of mockup. Agenda shall include sequence and details of construction to ensure continuity of air barrier.
- B. The General Contractor shall schedule a pre-installation meeting a minimum of one week prior to commencing Work of this Section. Attendees shall include representatives of air barrier manufacturer, exterior wall installers, project superintendent, and Architect. Agenda shall include the following:
 - 1. Review of approved submittals
 - 2. Coordination with sequence of installation with adjacent materials
 - 3. Schedule for subsequent Work covering air barrier
 - 4. Procedures for quality assurance

PART 2 - PRODUCTS**2.01 AIR / VAPOR BARRIER**

- A. Air / Vapor Barrier shall be fluid applied, Air-Bloc 16MR, as manufactured by Henry, or Architect approved equal by W.R. Meadows or W.R. Grace, meeting the following physical properties and 780 CMR 13 Energy Conservation Requirements.
 - 1. Air Permeance: .00012 CFM/ft² or less, in accordance with ASTM E 2178
 - 2. Water Vapor Permeance: 0.03 perms, in accordance with ASTM E 96
 - 3. Elongation: 800% minimum, in accordance with ASTM D 412
 - 4. VOC Content: 100 g/L, or less
 - 5. Thickness: 40 mils DFT; 75 WFT

2.02 SELF-ADHERED AIR BARRIER MEMBRANE

- A. Self-Adhered air barrier membrane at all penetrations shall be Blueskin SA, as manufactured by Henry, or Architect approved equal by W.R. Meadows or W.R. Grace. All air barrier components shall be provided by a single manufacturer to insure a complete system and compatibility between all components.

1. Membrane shall be comprised of Self-Adhered rubberized asphalt integrally bonded to high density, cross laminated, polyethylene sheeting. All membranes shall include an edge bead as an integral part of the membrane at all side laps. The absence of an edge bead shall constitute rejection of the membrane and all Work shall be deemed unacceptable. Membrane types shall be used as follows:
 - a. Detail Membrane: 36 mils rubberized asphalt and 4 mils cross laminated polyethylene, for use at locations not in direct contact with masonry, for tie into windows and doors.
 - b. Wall Flashing: 32 mils rubberized asphalt and 8 mils cross laminated polyethylene, for use at locations where masonry materials shall be placed onto membrane
 - c. Joint Sealant - Joints in exterior silicone treated sheathing and at masonry and insulation fastener locations shall be treated with the approved manufacturer's recommended sealant, HE925 BES Sealant, as manufactured by Henry, or Architect approved equal.
2. Provide the approved manufacturer's recommended surface conditioner, primer, mastics, and adhesives in accordance with requirements of the approved manufacturer's written requirements and requirements of the Contract Documents.

PART 3 - EXECUTION**3.01 EXAMINATION**

- A. The Waterproofing Subcontractor shall examine conditions of substrates and other conditions under which this Work is to be performed and notify the General Contractor, in writing, of circumstances detrimental to the proper completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected.

3.02 PREPARATION OF SUBSTRATES

- A. Preparation of substrates shall comply with the approved manufacturer's written requirements, and the Contract Documents. Surfaces shall be structurally sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods in accordance with the approved air barrier manufacturer's written requirements.
- B. Masonry Substrates:
 1. Air barrier application may commence as soon as the substrate can accept loading. Mortar joints shall be struck full and flush, with no laitance or protrusions.
- C. Treat joints and install flashing in accordance with written requirements of the approved silicone treated gypsum sheathing and air barrier manufacturer.

3.03 INSTALLATION OF AIR BARRIER MEMBRANE AT FOUNDATION AND EXTERIOR WALLS

- A. Coordinate installation of the Work of this Section with the Work of Section 07 25 00 – Weather Barriers, Section 08 90 00 – Louvers and Vents, and Section 07 92 00 – Joint Sealants, required to comply with requirements of the Contract Documents, or otherwise ensure air and water tight construction and assembly.
- B. All components of the air barrier system, including but not limited to, primers, membrane, and flashings shall be the products of a single manufacturer to provide a fully compatible system complying with requirements of the Massachusetts Energy Code. Strictly comply with the approved air barrier membrane manufacturer's printed instructions and the following:

1. Apply materials within the approved manufacturer's requirements for temperature and weather conditions. Apply air barrier over cast-in-place concrete, concrete block and silicone treated sheathing materials utilizing spray or trowel application. Membrane cured film thickness shall provide a fully compatible system complying with requirements of the Massachusetts Energy Code. Swipe or trowel marks of the membrane are acceptable as the minimum thickness is maintained. Membrane thickness control on both vertical or horizontal applications shall be achieved by marking an area and spot checking the thickness with a wet film thickness gauge. Surface gaps shall be filled with the approved air barrier manufacturer's required sealant, troweled smooth and flush, and allowed to cure, prior to application of the air barrier membrane.
 2. Air barrier membrane shall be spray applied to all wall surfaces and allowed to cure. Install detail strips at beams, columns, changes in substrate material, and similar joints or connections. Detail strips shall be lapped from exterior wall surface to the sill, jamb, and head of all door, window, and louver openings, and other wall penetrations to provide a minimum of 3 inches of wall contact and 1 inch of full contact with doors, windows, louvers, and all other fixed objects penetrating air barrier membrane.
 3. Air barrier components shall not be applied to wet or frozen substrates.
 4. Seal air barrier components completely at all edges, perimeter and penetrations.
 5. Apply a scratch coat prior to the full application of the air barrier membrane if substrate is damp or if concrete mortar is "green" and the area to be coated is in direct sunlight with the temperature rising.
 6. Provide the approved air barrier manufacturer's required sealant for all silicone treated sheathing joints, brick veneer anchors, and insulation fasteners necessary to establish and maintain a continuous air barrier system.
- C. Protect installed Work from damage due to harmful weather exposures, physical abuse, and other causes.
- D. Provide temporary protection over air barrier membrane to prevent contamination with dust or dirt if finish materials shall not be installed within the approved manufacturer's recommended time limit for exposure.
- E. Repair damage to air barrier membrane caused by construction activities or subsequent Work prior to covering.
- 3.04 CONNECTION OF AIR BARRIER MEMBRANE AT ROOF ASSEMBLIES**
- A. The Work of this Section shall be connected and sealed to roof air barrier membranes as indicated on the Drawings, with all seams and penetrations taped and sealed in accordance with the approved manufacturer's written instructions, or as otherwise required to comply with requirements of the Contract Documents.
- B. The Work of this Section shall be coordinated with Section 07 25 00 – Weather Barriers, Section 08 90 00 – Louvers and Vents, Section 07 52 16 – Styrene-Butadiene Styrene (SBS) Modified Bituminous Membrane Roofing, and Section 07 54 19 – Polyvinyl Chloride (PVC) Roofing, to provide a complete and fully functional air barrier system in accordance with requirements of 780 CMR, 9th Edition, Chapter 61, including Section 6106.2 Building Envelope Requirements and 6106.3 Air Leakage, and the Contract Documents.
- 3.05 CLEANING AND PROTECTION**
- A. Remove any masking materials after installation. Clean any stains on materials which would be exposed in the completed Work.
- B. Protect completed membrane waterproofing from subsequent construction activities as recommended by manufacturer.
- 3.06 RUBBISH REMOVAL**
- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 07 52 16

**STYRENE-BUTADIENE-STYRENE (SBS)
MODIFIED BITUMINOUS MEMBRANE ROOFING**

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

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

1.02. DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. SBS-modified bituminous membrane roofing
 - 2. Flat and tapered insulation
 - 3. Flashing for roof mounted equipment and roof penetrations

1.03. RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04. PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer or Architect approved equal, based on testing and field experience.
- C. Design basic wind speed: 139 mph.
- D. Roofing System Design
 - 1. Hail-Resistance Rating: SH.
 - 2. Roofing systems shall be provided to withstand the following wind uplift pressures:

- a. Field – 70.2 psf
 - b. Perimeter – 110.1 psf
 - c. Corners – 150.1 psf.
 - E. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - F. Flashings: Provide base flashings, perimeter flashings, detail flashings and component materials that comply with requirements and recommendations in FMG 1-49 Loss Prevention Data Sheet for Perimeter Flashings; FMG 1-29 Loss Prevention Data Sheet for Above Deck Roof Components; NRCA Roofing and Waterproofing Manual (Fourth Edition) for Construction Details and SMACNA Architectural Sheet Metal Manual (Fifth Edition) for Construction Details, as applicable.
- 1.05. SUBMITTALS
- A. Product Data: For each type of product indicated.
 - B. Shop Drawings: For roofing system. Include plans, elevations, sections, details in compliance with performance requirements, and attachments to other Work.
 - 1. Base flashings, cants, and membrane terminations.
 - 2. Crickets, saddles, and tapered edge strips, including slopes.
 - 3. Insulation attachment patterns.
 - C. Installer Certificates: Signed by roofing system manufacturer or Architect approved equal, certifying that Installer is approved, authorized, or licensed by manufacturer or Architect approved equal, to install roofing system for a period of at least last two years.
 - D. Installer Experience: Successful installation of at least five projects of similar size and complexity using the proposed roofing system with the past three years.
 - E. Letter from the manufacturer or Architect approved equal, confirming that the proposed new roofing system will provide a UL Class A fire rating.
 - F. Maintenance Data: For roofing system to include in maintenance manuals.
 - G. Inspection Report: Copy of roofing system manufacturer's inspection report or Architect approved equal, of completed roofing installation.
- 1.06. QUALITY ASSURANCE
- A. Source Limitations: Obtain components for roofing system from or approved by roofing system manufacturer or Architect approved equal.
 - B. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure: Class A; ASTM E 108 and UL 790, for application and roof slopes indicated.
- 1.07. DELIVERY, STORAGE, AND HANDLING
- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name or Architect approved equal, product brand name and type, date of manufacture, and directions for storage.
 - B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer or Architect approved equal. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions or Architect approved equal, for handling, storing, and protecting during installation.

- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.08. PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions or Architect approved equal, and warranty requirements.

1.09. WARRANTY

- A. Roofing Contractor's Warranty: The roofing subcontractor shall supply User Agency with a minimum two-year workmanship warranty for each roof, starting at the date of Substantial Completion of the portion of the Project of which the roof is a part. In the event any work related to the roofing, flashing, or metalwork is found to be defective within two years of substantial completion, the roofing contractor shall remove and replace such at no additional cost to the Commonwealth. The roofing subcontractor's warranty obligation shall run directly to the building owner (User Agency), and a copy the roofing signed warranty shall be sent to the roofing system's manufacturer or Architect approved equal.

- 1. The duration of the Roofing Contractor's two-year warranty shall run concurrent with the roofing system's manufacturer's 20-year warranty or Architect approved equal.

- B. Roofing Systems Manufacturer's Warranty or Architect approved equal: The roofing manufacturer or Architect approved equal shall guarantee roof areas to be in a watertight condition, for a period of 20 years, starting at the date of Substantial Completion of the portion of the Project of which the roof is a part. The warranty shall be a 20-year no dollar limit (NDL), non-prorated total system labor and material warranty, for wind speeds up to 72 miles per hour. Total system warranty shall include all roofing materials, related components and accessories including, but not limited to the substrate board, vapor retarder, insulation board, cover board, roofing membrane, membrane flashings, fasteners, adhesives, metal roof copings, metal roof edges and termination metals and roof drain assemblies. The manufacturer or Architect approved equal, shall repair defects in materials and workmanship as promptly after observation as weather and site conditions permit.

1.10. TESTING REQUIREMENTS

- A. The Owner will employ independent testing agencies to perform field and lab tests unless otherwise specified or indicated in other Sections of these Specifications. This testing will be paid for by the Owner, unless otherwise specified or indicated. Employment of Testing Laboratory will in no way relieve General Contractor or Subcontractors of his obligation to perform Work in accordance with the Contract. The General Contractor and Subcontractor shall provide standard factory testing, certification of compliance with specified requirements, testing for fire performance, and other tests as specified or indicated. Subcontractor's employed testing agencies must be approved by the Architect. Refer to Section 01 91 15 for additional testing requirements.

1.11. PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, determine acceptable mock-ups, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

- B. Review methods and procedures related to roofing system including, but not limited to, the following:

- 1. Meet with the Designer, the User Agency's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative or Architect approved equal, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions or Architect approved equal.

3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

PART 2 - PRODUCTS**2.01 SBS-MODIFIED ASPHALT-SHEET MEMBRANE SYSTEM**

- A. Subject to compliance with requirements, manufacturers offering products or Architect approved equal, that may be incorporated into the Work include, but are not limited to, the following manufacturers or Architect approved equal:
 1. SBS-Modified Bituminous Membrane Roofing:
 - a. Siplast, Inc.
 - b. Soprema Roofing and Waterproofing Inc.
 - c. Tremco.
- B. Flashing Backer Base Sheet for Nailed Application
 1. ASTM D 4601, Type 2, 33 lb./sq. min. base sheet.
- C. Roofing Base Sheet (2 plies) & Metal Flange Stripping Sheet (1 ply)
 1. ASTM 6163 Type 1, Grade S, glass fiber reinforced, SBS-Modified Bituminous sheet, smooth or suitable for self-adhered application or
 2. ASTM 6164 Type 1, Grade S, polyester fabric reinforced, SBS-Modified Bituminous sheet, smooth or suitable for self-adhered application.
- D. Roofing Membrane Cap Sheet and Flashing Sheet:
 1. ASTM D 6163, Type 2, Grade G, glass fiber reinforced, SBS modified bitumen sheet; suitable for cold adhesive application or
 2. ASTM D 6164, Type 2, Grade G, polyester fabric reinforced, SBS modified bitumen sheet; suitable for cold adhesive application.

2.02 AUXILIARY ROOFING MEMBRANE MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer or Architect approved equal, for intended use and compatible with roofing membrane.
- B. Mastic Sealant: Polyisobutylene, plain or modified bitumen, nonhardening, nonmigrating, nonskinning, and nondrying.
- C. Cold-Applied Adhesive for Cap Sheet Application: Roofing system manufacturer's standard asphalt-based or Architect approved equal, one-or two-part, asbestos-free, solvent-free, cold-applied adhesive specially formulated for compatibility and use with roofing membrane and base flashings.
- D. Primers: Low VOC water-based asphalt primer.
- E. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roofing membrane components to substrate, tested by manufacturer or Architect approved equal, for required pullout strength, and acceptable to roofing system manufacturer or Architect approved equal.

1. Nails for attaching backer sheet to plywood: 1 in. plastic or steel cap x 3/4 in. long annular ring nail.
 - F. Roofing Granules: Ceramic-coated roofing granules, No. 11 screen size with 100 percent passing No. 8 sieve and 98 percent of mass retained on No. 40 sieve, color to match roofing membrane
 - G. Device for pressuring membrane into adhesive: The Followtool by Roofmaster Products Co., Los Angeles, CA or approved equal.
 - H. Termination Bar: Extruded aluminum (6063 T6 alloy) with preformed 45° lip with punched 1/4 in x 3/8 in oval holes spaced on 6 in. centers, mill finish.
 - I. Hot-Air Welder for side and end laps: BITUMAT B2 Roofing Machine by Leister Technologies or approved equal.
 - J. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer or Architect approved equal.
- 2.03 LIQUID-APPLIED ROOFING ACCESSORIES
- A. Cleaning Solution/Solvent: A clear solvent used to clean and prepare transition areas of in-place catalyzed resin to receive subsequent coats of resin and to clean substrate materials to receive resin.
 - B. Paste: A PMMA-based paste used for remediation of depressions in substrate surfaces prior to the application of the waterproofing system.
 - C. Catalyst: A peroxide-based reactive agent used to induce curing of PMMA-based resins.
 - D. Fleece Reinforcement: Non-woven polyester fleece reinforcement used in liquid membrane applications.
- 2.04 SHEET METALS
- A. Copper Sheet for Counterflashings, Skirt and Sleeve flashings: ASTM B 370, Temper H00 or H01, 20 oz. cold-rolled zinc-coated copper sheet.
 1. Use 24 oz. for 2 in. wide cold-rolled zinc-coated copper sheet counterflashing "Dutchman" cleats.
 - B. Flanges for Sleeve Flashings and Roof Drain Flashings
 1. Lead Sheet: ASTM B 749, 4 lb. sheet lead.
 - C. Underlayment Materials
 1. Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
 2. Slip Sheet: Rosin-sized paper, minimum 3 lb./100 sq. ft.
- 2.05 ROOF INSULATION
- A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes or Architect approved equal, and of thicknesses indicated.
 - B. Polyisocyanurate Board Insulation (flat stock): ASTM C 1289 Type II, Class 4, Grade 1.
 1. 1/2 in. thick high-density polyisocyanurate foam core with polymer coated glass facers.
 2. "R" Value: 2.50 min.
 3. Board size: 4 ft x 8 ft.
 4. Edges: Square.
- 2.06 INSULATION ACCESSORIES
- A. Low-rise Foam Adhesive: Adhesive for insulation and cants as approved by Roof Manufacturer or Architect approved equal.
 - B. Cant. Strip: ASTM C 208, Type 2, Grade 1, fiberboard, 4 in. high x 1-1/2 in. thick x 48 in. long.

PART 3 - EXECUTION

3.01 PROTECTION

- A. Protect paved areas, building and its contents, interior finishes, autos, trucks, and the site from the effects of work in this Section and against all risks associated with this Work. Repair all damage to the building and appurtenances as a result of the work of this Section to the condition at start of work, or if this cannot be determined, to the original condition, by approved means at no extra cost.

3.02 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
 - 2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Verify that minimum concrete drying period recommended by roofing system manufacturer or Architect approved equal, has passed.
 - 4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.03 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions or Architect approved equal. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
 - 1. laps to ensure complete adhesion.
 - 2. Provide temporary flashings at corners of all penetrations.

3.04 INSULATION / COVERBOARD INSTALLATION

- A. Comply with roofing system manufacturer's written instructions or Architect approved equal, for installing roof insulation.
- B. Discard all wet or damaged material.
- C. Install 1/2 in. insulation within area removed with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
- D. Stagger insulation within layers and offset layers 6 in. min.
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- F. Adhere primary, fill-in, tapered edge, and coverboard in low-rise foam adhesive to vapor retarder and to each other according to a pattern prescribed by the roof membrane manufacturer or Architect approved equal, for field, perimeters, and corners.
- G. Insulation Cant. Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing membrane system with vertical surfaces or angle changes greater than 45 degrees. Set cant strips into a continuous bead application of low-rise foam adhesive. Apply pressure on cant until adhesive is set.

3.05 ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Install roofing membrane system according to roofing system manufacturer's written instructions or Architect approved equal, and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing." Install roofing system according to specification-plate classifications in NRCA's "The NRCA Roofing and Waterproofing Manual" and requirements in this Section.
- B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel or Architect approved equal.
- C. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.
- D. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
 - 1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.
 - 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
 - 3. Remove and discard temporary seals before beginning work on adjoining roofing.
- E. Substrate-Joint Penetrations: Prevent roofing asphalt from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.06 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

- A. Install modified bituminous roofing membrane sheet and cap sheet according to roofing manufacturer's written instructions or Architect approved equal, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:
 - 1. Unroll roofing membrane sheets and allow sheets to relax for minimum time period required by manufacturer or Architect approved equal.
 - 2. Install double application of base sheet laminar fashion to cover board according to manufacturer's instructions or Architect approved equal. Lap edges and ends 3 in. minimum. Offset end laps of base sheet 12 in. minimum. Offset surfacing cap sheet side laps 12 in. minimum and end laps 18 in. minimum from base ply sheet. Offset end laps of surfacing ply 36 in. from each other. Extend first ply onto existing roofing 6 in. min. Extend second ply 6 in. beyond first ply.
 - 3. Apply base sheets with solvent-free cold adhesive at a rate approved by the manufacturer or Architect approved equal.
 - 4. Provide surfacing cap sheet:
 - a. Extend sheet 6 in. beyond final base ply.
 - b. Adhere cap sheet with solvent-free cold adhesive at a rate approved by the manufacturer or Architect approved equal. Do not apply adhesive onto selvage lap.
 - c. Heat weld side and end laps with hot-air welder.
 - 5. Note: Complete installation and stripping of metal flashings prior to installation of surfacing cap sheet.
 - a. Prime flanges (top and bottom) then apply self-adhered modified bitumen stripping.
 - 6. Lightly broom plies as they are adhered to substrate.
- B. Align rolls prior to application by unrolling entire length of membrane. Reroll membrane from both ends to halfway point. Align side laps of ply sheets with those of previous day's. Maintain straight lap lines.
- C. Ensure complete and continuous seal and contact between membranes, without wrinkles, fish mouths, or blisters. Do not apply adhesive within laps. Apply pressure on the sheet using to ensure full contact with the substrate and completed embedment into the adhesive.

- D. End laps:
 - 1. Remove, embed, or prime granules of underlying sheet according to manufacturer's recommendations or Architect approved equal.
 - 2. Make "dog ear" angle cuts on the overlapping selvage edge,
 - 3. At "T" joints apply pressure with a rounded clean trowel to top seal all edges.
- E. Verify adhesion of all laps by rounded trowel.
- F. Apply matching granules to any bitumen overruns while bitumen is still plastic. Provide complete coverage. Press granules into plastic bitumen.
- G. Avoid walking on ply sheets until rolls have set.
- H. Overlap previously installed work by "feathering" new work onto previous work. Maintain 6 in. minimum "feather" between plies. Offset membrane end laps 18 in. from adjacent ply sheets.
- I. Extend ply sheets 2 in. beyond top edge of cant at wall and projection bases.
- J. Remove and replace all ply sheets which are not fully and continuously bonded.
- K. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps leaving no voids.
 - 1. Repair tears and voids in laps and lapped seams not completely sealed.
 - 2. Apply roofing granules to cover exuded bead at laps while bead is still plastic.
 - a. Coat laps to match roof membrane after exuded bead has cured.
- L. Install roofing membrane sheets so side and end laps do not "buck" water.

3.07 FLASHING AND STRIPPING INSTALLATION

- A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions or Architect approved equal, and as follows:
 - 1. Prime substrates with asphalt primer if required by roofing system manufacturer or Architect approved equal.
 - 2. Backer Sheet Application: Install backer sheet and nail sheet to substrate on 8 in. centers.
 - 3. Flashing Sheet Application: Adhere base sheet and flashing sheet to substrate in either cold-applied adhesive at rate required by roofing system manufacturer or Architect approved equal, or by using self-adhered flashing membranes.
 - 4. DO NOT torch apply flashings.
- B. Extend base flashing up walls or parapets a minimum of 8 inches above roofing membrane and 6 inches onto field of roofing membrane.
- C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
 - 1. Seal top termination of base flashing with termination bar. Seal top of termination bar with modified bitumen sealant.
- D. Prior to cap sheet installation, strip metal flashing flanges and edgings according to roofing system manufacturer's written instructions or Architect approved equal. Ensure metal flange is primer prior to membrane stripping.
- E. Install lead flashing and at all drains. Prime and set into modified bitumen mastic. Strip flange watertight prior to installation of cap sheet.

3.08 LIQUID-APPLIED FLASHING

- A. Preparation: Clean substrate of dust, debris, moisture, and other substances detrimental to liquid-applied roofing installation according to roofing system manufacturer's written instructions or Architect approved equal. Remove sharp projections.

- B. Mixing and Catalyzing of Resins: Thoroughly mix the entire drum of uncatalyzed resins for 2-minutes if pouring the resin into a second container when batch mixing. Catalyze only the amount of material that can be used within its pot life. Add pre-measured catalyst powder to the resin component and stir for 2-minutes using a slow-speed mechanical agitator or mixing stir stick. The amount of catalyst added is based on the weight of the resin used. Refer to the waterproofing system manufacturer's literature or Architect approved equal, for mixing ratios.
- C. Priming: Using the manufacturer recommended primer or Architect approved equal, apply to qualified/prepared surfaces that will receive the waterproofing membrane or flashing. Apply primers when ambient and substrate temperatures are falling rather than rising to minimize the potential for pinhole formation. Apply the primer using a roller at the minimum rate specified by the primer manufacturer or Architect approved equal, and allow to cure for a minimum of 45 min. Increase application rates over other absorbent substrates. Do not let resin pool or pond. Do not over-apply primers as this may interfere with proper primer catalyzation. When calculating application rates, make allowances for saturation of roller covers and application equipment.
- D. Application of Reinforced Liquid Applied Flashing System:
 - 1. Using cleaner/solvent, wipe flashing membrane and primer surfaces to receive the field membrane. Allow the surface to dry for a minimum 20 minutes before continuing work.
 - 2. Using a roller, apply a layer of catalyzed base resin over the primed substrate at the minimum rate specified by the resin manufacturer or Architect approved equal. Embed fleece reinforcement into wet, catalyzed base resin waterproofing layer using a wet, but not saturated, roller to remove trapped air. Overlap side and end laps of fleece a minimum of 2 in. Apply an additional coat of catalyzed base resin between layers of overlapping fleece. Apply second coat of catalyzed resin immediately following embedment of fleece with an application roller or brush at minimum rate specified by resin manufacturer or Architect approved equal, ensuring full saturation of fleece reinforcement. Allow to cure for a minimum of 45 minutes before application of wearing layer of resin.

3.09 FIELD QUALITY CONTROL

- A. Cooperate with field quality control personnel. Allow inspectors access to scaffolding and work areas, as needed to perform inspections.
- B. Additional inspections and retesting of materials which fail to comply with specified material and installation requirements shall be performed at Contractor's expense.
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel or Architect approved equal, to inspect roofing installation on completion and submit report to Designer.
 - 1. Notify Designer and the Owner's Project Manager 48 hours in advance of date and time of inspection.
- D. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

3.01 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer or Architect approved equal, of affected construction.

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

June 12, 2019

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

3.02 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris daily and dispose in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 07 54 19

POLYVINYL-CHLORIDE (PVC) ROOFING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. New mechanically attached induction welded PVC membrane roofing system including, but not limited to, the following:
 - a. Overlayment board
 - b. Flat and tapered rigid insulation
 - c. Air barrier membrane
 - d. Expansion joints, base flashing membranes, penetration boots
 - e. Roof metal edge and fascia
 - f. Sealants
 - 2. Pressure treated and non-pressure treated plywood sheathing, eaves blocking for membrane securement, including all fasteners.
- B. Items to Be Installed Only: Install the following items as furnished by the designated Sections:
 - 1. Section 23 00 00 - HVAC: Prefabricated equipment support curbs

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all of the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following Divisions:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. Roofing system shall be applied by a Trade Contractor for this Section shall have a minimum 10 years of experience who has been approved and authorized prior to bid, by the approved roof membrane manufacturer.

- B. All roof membrane system materials, components, insulation, and accessories shall be the products of a single manufacturer for compliance with requirements of the Contract Documents to provide twenty-five (25) year, full system warranty.
- C. Upon completion of the installation, and at appropriate intervals during installation, an inspection shall be made by a representative of the manufacturer to ascertain that the roofing system has been installed according to applicable manufacturer's specifications and details.

1.05 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.
- C. Roofing System Design: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE 7-10.
 - 1. Field-of-Roof Uplift Pressure: 51 psf.
 - 2. Perimeter Uplift Pressure: 76 psf.
 - 3. Corner Uplift Pressure: 109 psf.
- D. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a membrane roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.
 - 1. Fire/Windstorm Classification: Class 1A-60.
 - 2. Hail Resistance: MH.
- E. Underwriters Laboratories
 - 1. Class A Assembly Rating: UL 1256; Insulated Metal Deck Construction Assemblies – No. 120, 123, 292; UL 790; UL 263 Hourly Rated P Series Roof Assemblies.

1.06 SUBMITTALS

- A. Certificates:
 - 1. Submit certified manufacturer documentation of acceptance of roof membrane system installer.
 - 2. Written certification by the approved manufacturer of roofing and insulation materials that all materials supplied comply with all requirements of the appropriate ASTM Standards, and that all the materials are suitable for the specified roofing system. Certification shall be provided in time to prevent delay in implementation of the Work of this Section.
 - 3. Pressure Treated Wood: Submit certification by treating plant stating chemicals and process used, net amount of salts retained, and conformance with applicable standards.
 - 4. Pressure Treated Wood: Submit certification for water-borne preservative that moisture content was reduced to 19% maximum, after treatment.
 - 5. Preservative treatment for field cut surfaces of pressure treated blocking and sheathing shall contain 2% copper naphthenate complying with AWWA Standard M4. Material shall be Green No. 10, as manufactured by Cuprinol, or Architect approved equal by WM Barr or Behr.
- B. Samples and Shop Drawings:
 - 1. Provide two samples, labeled, of all materials provided under the Work of this Section.
 - 2. Provide shop drawings to include, but not be limited to, the following:
 - a. Outline of roofs and sizes, showing field, corners, and perimeters
 - b. Insulation fastening pattern for fasteners and adhesives at field, corners, and perimeter
 - c. Location and type of all penetrations
 - d. Perimeter and penetration flashing details

- e. Rigid insulation manufacturer brand, thickness
 - f. Tapered and flat rigid insulation layout
 - g. Fastener manufacturer, brand and length
 - h. Warranty type and period
 - i. Technical acceptance from membrane manufacturer
 - C. Provide the manufacturer's most recent edition of material and performance specifications for all materials provided under the Work of this Section.
 - D. Provide three copies of membrane manufacturer's full system warranty, and three (3) copies of the applicators warranty.
- 1.07 DELIVERY, STORAGE AND HANDLING
- A. Deliver materials and products in unopened factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from damage.
 - B. Handle all materials to avoid damage to materials and roof deck. Store rolled goods directed by manufacturer. Discard rolls which have been flattened, creased, or otherwise damaged. Bonding adhesive shall be stored at temperatures above 40°F.
 - C. All flammable materials shall be stored in a cool dry area away from sparks and open flames. Follow precautions outlined on containers or supplied by material manufacturer/supplier.
 - D. Do not allow materials or incomplete roofing Work to be exposed to moisture, anywhere, at any time, during transportation, storage, handling or installation. Use pallets and tarpaulins to cover all stored material, top to bottom. Secure tarpaulin.
- 1.08 PROJECT CONDITIONS
- A. Perform Work only when existing and forecasted weather conditions are within the limits established by manufacturers of the materials and products used.
 - B. Only as much of the new roofing as can be made weather-tight each day including all flashing Work, shall be installed.
 - C. All Work shall be scheduled and executed without exposing the interior building areas to the effects of inclement weather. The existing building and its contents shall be protected against all risks.
 - D. The membrane manufacturer requires the owner's representative or Trade Contractor for this Section run pullout tests of fasteners to verify condition of deck/substrate and confirm pullout values.
 - E. All surfaces to receive new insulation, membrane or flashings shall be thoroughly dry. Should surface moisture occur, the Trade Contractor for this Section shall provide the necessary equipment to dry the surface prior to application.
 - F. Temporary water stops shall be installed at the end of each day's Work, and shall be removed before proceeding with the next day's Work. Waterstops shall be compatible with all materials and shall not emit dangerous or incompatible fumes. Provide waterstops for all roofing systems described in this specification per manufacturers recommendations.
 - G. The Trade Contractor for this Section shall provide all necessary protection and barriers to segregate the Work area and to prevent damage to adjacent areas. Plywood protection shall be provided for all new roofing areas which shall receive traffic during construction.
 - H. Prior to and during application, all dirt, debris and dust shall be removed from surfaces either by vacuuming, sweeping, blowing with compressed air and/or similar methods.
 - I. Membranes and accessories shall not be exposed to prolonged temperature in excess of 160° F.
 - J. Contaminants, such as grease, fats, oils and solvents, shall not be allowed to come into direct contact with the roofing membrane. Any unusual exposures shall be presented to the membrane manufacturer for assessment of any impact on the roofing membrane.

1.09 WARRANTY

- A. Provide twenty-five year full system warranty, no cap, non-prorated, transferable, labor and material, manufacturer's warranty to the Owner by the approved roof membrane system manufacturer from the date of Final Completion. Warranty length:
- B. The Roofing Subcontractor, as a condition precedent to final payment, shall execute his own written guarantee direct to the Owner, warranting all roofing, base flashing and sheet metal work to be weather and watertight for a period of two years after date of final completion on the Project. Any imperfections as a whole or in part, by reason of defective materials, workmanship or arrangement of the various parts shall be made good to the satisfaction of the Owner at the Trade Contractor's expense.

1.10 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS

2.01 ROOF MEMBRANE SYSTEM

- A. Mechanically attached induction-welded PVC membrane as indicated on the Drawings shall be Type II, Grade 1, thermoplastic PVC membrane with fiberglass reinforcement conforming with ASTM D 4434 (latest version), "Standard for Poly Vinyl Chloride Sheet Roofing", S327 as manufactured by Sika Sarnafil, Inc., or Architect approved equal by Carlisle SynTec or Johns-Manville.
- B. Minimum roof membrane requirements shall comply with the following physical material and performance characteristics:

PARAMETERS	ASTM TEST METHOD	PHYSICAL PROPERTIES
1. Reinforcing Material:		Fiberglass
2. Overall Thickness (mil):	D751	72
3. Thickness Over Scrim (mil):		36
4. Felt Weight (oz/yd ²):		9
5. Tensile Strength, min., psi, (Mpa)		
a. Machine Direction (%):	D638	1625
b. Cross Direction (5):	D638	1575
6. Elongation of Break, min.		
a. Machine Direction (%):		250
b. Cross Direction (%):		220
7. Seam Strength, min., (% of original):	D638	Pass
8. Retention of Properties After Heat Aging		
a. Tensile Strength, min. (% of original):	D638	Pass
b. Elongation, min., (% of original):	D638	Pass
9. Tearing Resistance (M.D.), min., (lbf):	D1004	20.5
10. Low Temperature Bend (-40° F):	D2136	Pass
11. Accelerated Weathering Test		
a. Cracking (7x magnification):		None
b. Discoloration (by observation):		Negligible
c. Crazing (7x magnification):		None
12. Linear Dimensional Change (%):	D1204	-0.01
13. Weight Change After Immersion in Water (%):	D570	1.8
14. Static Puncture Resistance, 33 lbf	D5602	Pass

- 15. Dynamic Puncture Resistance, 7.3 ft-lbf D5635, Pass
- 16. Color: White; complying with the following performance characteristics:
 - a. Initial Reflectivity: 0.83
 - b. Initial Emissivity: 0.90
 - c. Solar Reflective Index (SRI): 104 (ENERGY STAR listed)
- 17. Recycled Content (10 ft. & 5 ft. sheet only): 9% Pre-consumer / 1% Post-Consumer
- 18. Environmental Product Declaration No.: EPD028

2.02 ROOF METAL EDGE AND FASCIA

- A. Provide PVC coated, heat-weldable sheet metal, cut to size and formed to shape, Sarnafil as manufactured by Sika Sarnafil, or Architect approved equal.
 - 1. Gauge: 24 gauge, G90 galvanized
 - 2. Aluminum Finish: Standard color as selected by the Architect from the roof manufacturer's color chart
 - 3. Length: Standard 10 ft.
 - 4. Metal Hook Strip: continuous 22 gauge and fastened using galvanized annular ring nails.
 - 5. Flashing Strip: Hot-air welded Sarnafil flashing strip

2.03 WOOD BLOCKING AND PLYWOOD SHEATHING

- A. Provide wood blocking and plywood sheathing that is pressure treated to a level of 0.25 pounds per cubic foot of wood product, with waterborne CCA preservatives in accordance with requirements of AWP Standard U1 and T1. Plywood shall be dried to a maximum moisture content of 19 percent after treatment.
 - 1. Provide non-pressure treated lumber at all locations where roof membrane and adhesive flashings are required to be directly adhered to the lumber surface.
- B. Provide APA trademarked, Exposure 1 Rated and non-rated plywood performance rated sheathing, 3/4 in. thick, with span rating for spans indicated. Use of particleboard, flakeboard, or oriented strand board (OSB), shall not be allowed. Sheathing shall be pressure treated to a level of 0.25 pounds per cubic foot of wood product, with waterborne CCA preservatives in accordance with requirements of AWP Standard U1 and T1.
 - 1. Provide non-pressure treated plywood at all locations where roof membrane and adhesive flashings are required to be directly adhered to the plywood surface.
- C. Wood blocking and nailers shall be in profiles and sizes as indicated on the Drawings or as otherwise required by the approved roof membrane manufacturer. Blocking and nailers shall be installed at the perimeter of the entire roof and around all other roof projections and penetrations. Thickness of blocking and nailers shall be fabricated and installed to provide a smooth transition from blocking to adjacent insulation.
- D. Provide fasteners with G-90 hot dip galvanized coating, or fluoropolymer coating, at areas of high humidity, including roof blocking and sheathing. Fasteners for use with non-CCA pressure treated lumber, including ACQ Types B and D, CBA-A, and CA-B, shall be stainless steel.

2.04 INSULATION AND ACCESSORIES

- A. Roof insulation shall be Type II, Class 2, Grade 3 polyisocyanurate insulation, ASTM C 1289, as approved by the roof membrane manufacturer modified as follows:
 - 1. Facer: Coated glass.
 - 2. Board size: 4 ft x 8 ft.
 - 3. Thickness: Bottom layer 3 in., top layer 2.5 in. Total thickness: 5.5 in.
 - 4. Density: 25 psi minimum
 - 5. Edges: Square
- B. Provide compatible tapered insulation to provide crickets and drain insulation sumps where shown on the Drawings. Tapered insulation slope shall be 1/2 in. per foot.

C. Insulation Fasteners:

1. The fastening system shall be 3 in. metal plate with a polymer coating, Sarnadisc Rhinobond and #12 fastener, Sarnafastener as manufactured by Sika Sarnafil, or Architect approved equal. The metal plate is positioned on the surface of the insulation board. The fastener is set through the center of the metal plate and holds the insulation in place into the roof deck.
2. Fasteners and fastening plates incorporated in roofing system shall conform to FM 4470 standard and DIN 50018 specification for corrosion resistance.

D. Membrane and Flashing Adhesives and Sealants:

1. Membrane and flashing adhesive shall be VOC compliant as supplied by the approved roof membrane manufacturer for the required substrate. Application rates shall be in compliance with the approved manufacturer's recommendations for the intended substrate.
2. Sealant shall be as supplied by the approved roof membrane manufacturer, with color to match the adjacent roof membrane.

E. Elastomeric Flashing:

1. Base flashing shall be compatible with sheet membrane as supplied by the approved roof membrane manufacturer.
2. Pipe seals and prefabricated flashing accessories shall be as supplied by the approved roof membrane manufacturer.
3. Molded Pipe Flashing shall be as supplied by the approved roof membrane manufacturer.

F. Provide the following accessory products as manufactured by the approved membrane manufacturer:

1. Provide all clips, cleats, straps, anchors and similar items necessary to properly complete the Work. Provide accessories that are compatible with sheet metal materials used and which are of sufficient size and gage to perform as intended.
2. Provide the approved manufacturer's recommended roof expansion joints at all locations as indicated on the Drawings, or as otherwise required to comply with the approved roof system manufacturer's written warranty requirements.

G. Provide spray foam insulation to achieve R15 at exposed flutes of metal roof deck. See Architectural drawings for locations. The spray foam insulation shall be Class 1, Class A, ASTM E-84, K-13 as manufactured by International Cellulose Corporation, or Architect approved equal.**H. Overlayment Board and Adhesive:**

1. Coverboard shall be 5/8 in. thick, water and mold resistant, silicone treated gypsum sheathing, Dens Deck Prime, as provided by Sarnafil, or Architect approved equal by Georgia Pacific, complying with requirements of ASTM C 1177. Board dimensions shall be as follows:
 - a. 4 ft x 4 ft boards when adhering board with low-rise foam adhesive.
2. Overlayment board adhesives shall be low-rise foam urethane adhesive as manufactured by the approved roofing membrane manufacturer.

2.05 MISCELLANEOUS ACCESSORIES

- A. Aluminum Tape: 2 in. wide pressure-sensitive aluminum tape used as a separation layer between small areas of asphalt contamination and the membrane and as a bond-breaker under the coverstrip at Sarnaclad joints.
- B. Multi-Purpose Tape: High performance sealant tape used with metal flashings as a preventive measure against air and wind-blown moisture entry.
- C. Seam Cleaner: Used on PVC membranes to clean the in the seam area only.
- D. Peel Stop Perimeter Bar: Extruded 1/8 x 1 in. aluminum, low profile bar with predrilled holes on 6 in. centers used to attach to the roof deck or to walls/curbs at terminations, penetrations and at incline changes of the substrate

- E. Miscellaneous fasteners and anchors shall be of the same type as metal being secured. In general, all fasteners, anchors, nails, straps, shall be of zinc or cadmium plated steel, galvanized, or stainless steel. All fasteners and anchors shall have a minimum embedment of 1-1/4 inches and shall be approved for such use by the fastener manufacturer. Fasteners for attachment of metal to wood blocking shall be annular ring nails. Fasteners for attachment of metal to masonry shall be expansion type fasteners. All fasteners shall meet Factory Mutual Standard 4470 for corrosion resistance.
 - 1. Fasteners for attachment of pressure treated blocking shall be stainless steel.

2.06 AIR BARRIER MEMBRANE

- A. Air barrier membrane at roof assemblies shall be 10 mil air barrier membrane, Sarnavap-10 as manufactured by Sarnafil, or Architect approved equal. Air barrier membrane shall comply with requirements of 780 CMR, Commonwealth of Massachusetts Building Code, Chapter 13, Section 1304.3, Air Leakage, and the following material and performance characteristics:
 - 1. Tensile Strength: 3470 psi per ASTM D 882
 - 2. Elongation at Break: 1000% per ASTM D 882
 - 3. Yield Strength: 1595 psi per ASTM D 882
 - 4. Water Vapor Permeance: 0.019 perms per ASTM E 96
 - 5. Impact Strength: 1.87 lbs. per ASTM D 1709
- B. Provide the approved roof membrane manufacturer's recommended spray applied foam insulation for infill of exposed steel roof deck flutes perpendicular to the edge of roof penetrations.

PART 3 - EXECUTION**3.01 GENERAL**

- A. The Work of this Section shall include coordination of the installation as necessary to ensure each area is made watertight at the end of each Work period.

3.02 DECK PREPARATION

- A. At new steel decks a proper substrate shall be provided to receive the membrane as a mechanically attached system.
- B. The Trade Contractor for this Section shall inspect the roofing surface for defects, including but not limited to, proper anchorage for compliance with required wind uplift resistance ratings, excessive surface roughness, contaminated surfaces, and structurally unsound substrates that shall adversely affect the quality of Work. Do not proceed with application of roofing until defects are corrected, and the surfaces have been approved by a representative of the membrane manufacturer.
- C. The substrate shall be clean, smooth, dry, free of flaws, sharp edges, loose and foreign material, oil and grease. Roofing shall not start until all defects have been corrected.
- D. Verify that the Work of other trades which penetrates roof deck has been completed, and that nailers have been installed at perimeter and at vents.
- E. Remove all materials that could inhibit adhesion or could contain or include water.

3.03 WOOD BLOCKING INSTALLATION

- A. Wood blocking and nailers shall be installed using the approved roof membrane manufacturers non-corrosive fasteners, or as otherwise required to comply with F.M. 1-60 wind uplift resistance requirements. All blocking and nailers required to be anchored by bolts and/or screws shall be counter bored to allow the top of the bolt or screw head to be flush with, or slightly below, the top of the finished wood surface. Provide all required expansion sleeves and other anchorages necessary and required for compliance with requirements of the Contract Documents.
 - 1. Perform pull-out test to field verify integrity of fasteners

- B. Wood blocking and nailers shall be provided in accordance with the approved roof membrane manufacturers installation details, or as otherwise required to accommodate field conditions, approved by the Architect.
- C. Provide non-pressure treated blocking and plywood at all locations where roof membrane is required to be directly adhered to the exposed wood surface. Coordinate areas to receive fully adhered membrane roofing to ensure the proper substrate material is used in accordance with the approved roof membrane manufacturer's written recommendations, and the Contract Documents.
- D. Refer to the Drawings for all conditions necessary to complete the Work. In the absence of Drawing details, blocking shall be provided in accordance with the approved roof membrane manufacturer's written installation details, or as otherwise required to accommodate field conditions approved by the Architect.
- E. Install plywood roof sheathing with the grain of the outer plies at right angles to supports. Stagger end joints and locate over the center lines of supports. Allow 1/6 in. spacing at panel ends and 1/8 in. at panel edges. Fasten panels to metal members with self-tapping screws and to wood members with wood screw nails spaced 6 in. on centers at bearings.

3.04 INSTALLATION OF AIR BARRIER MEMBRANE

- A. Air barrier membrane shall be placed over metal deck and pulled tight in all directions to eliminate all wrinkles and air bubbles. All seams and penetrations shall be taped in accordance with the approved manufacturer's written instructions, or as otherwise required to comply with requirements of the Contract Documents.
 - 1. At locations where flutes of roof deck are exposed and perpendicular to roof edge and roof deck penetrations, flutes shall be filled solid with expanding foam sealant to eliminate air flow.
 - 2. Seal all joints in air infiltration barrier and provide adhesives as recommended by the approved roof membrane manufacturer for securing air barrier membrane to steel deck prior to application of rigid insulation.
 - 3. Air barrier membrane shall extend beyond all roof edges whatever distance necessary for connection of the roof air barrier membrane to the wall air barrier membrane. The Work of this Section shall be coordinated with the Work of Section 07 27 26 – Fluid Applied Membrane Air Barriers” to provide a complete and fully functional air barrier system in accordance with requirements of 780 CMR, 9th Edition, Chapter 13, including Section 1304.3, Air Leakage, and the Contract Documents.

3.05 APPLICATION OF ROOF INSULATION

- A. Verify all dimensions, drain heights and drain locations in the field prior to installation of the tapered insulation system.
- B. Starting at low points lay flat and tapered insulation panels directly over the steel or concrete decks in strict accordance with the layout pattern indicated on the Architect approved shop drawings. Flat insulation panels shall be installed over the deck substrates in thickness as indicated on the Drawings. All flat and tapered insulation panels shall be butted snugly with no gaps greater than 1/4 in. Gaps greater than 1/4 in. shall be filled with the same material.
 - 1. Perform pull-out test to field verify integrity of fasteners.
 - 2. Mechanically attach insulation to structural deck with roof membrane approved fasteners and plates at a rate approved and tested by the roof membrane manufacturer to meet uplift pressures as defined in Part 1 of this Section.
- C. Fill insulation shall be utilized in 2 in. increments as necessary to achieve the specified thickness and thermal values.
- D. Install crickets where indicated on the Drawings
- E. Provide insulation sumps as shown on Drawings using tapered roof insulation to ensure final membrane surface is flush and smooth and does not restrict flow of water.

3.06 ROOF MEMBRANE INSTALLATION

- A. The surface of the insulation shall be inspected prior to installation of roof membrane. The insulation surface shall be clean and dry and smooth without excess surface roughness, contaminated surfaces or unsound surfaces.
 - 1. Over the properly installed and prepared insulation surface, apply approved adhesive and membrane in strict accordance with membrane manufacturer's printed instructions. All sheets shall be overlapped a minimum of three inches or as otherwise required for compliance with specified and approved welding techniques.

- a. Roof membrane shall not be installed when the dewpoint temperature is within 5 degrees Fahrenheit of the ambient air temperature.
 2. Installer shall take steps to ensure all membrane installation including seams, joints, accessories, and welding are of the highest standard, uniform in appearance providing roof surface with a monolithic appearance.
 - B. Membrane Securement:
 1. Securement shall be provided at the perimeter of each roof level, roof section, curb, and all other roof penetrations, and at base of slope where slope or combined slopes exceed 2 in. in one horizontal foot.
 2. Bar fastenings shall be mechanically fastened into the appropriate structural substrate and secured to roofing membrane.
 3. All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary membrane flashing shall be allowed without the prior written approval of the membrane manufacturer and Architect. Approval shall only be for specific locations on specific dates.
- 3.07 HOT-AIR WELDING OF SEAM LAPS
- A. General
 1. All seams shall be hot-air welded. Seam overlaps should be 3 in. wide when automatic machine-welding and 4 in. wide when hand-welding, except for certain details.
 2. Weld coverstrips at all membrane seams that do not have a factory selvage edge such as butt joints and cut edges.
 3. Welding equipment shall be provided by or approved by membrane manufacturer. All mechanics intending to use the equipment shall have successfully completed a training course provided by Sika Sarnafil Technical Representative prior to welding. Ensure welding equipment is functioning properly prior to using
 4. All membrane to be welded shall be clean and dry.
 - B. Hand-Welding
 1. Hand-welded seams shall be completed in two stages. Hot-air welding equipment shall be allowed to warm up for at least one minute prior to welding.
 2. Back edge of seam shall be welded with a narrow but continuous weld to prevent loss of hot air during final welding.
 3. Insert nozzle into seam at a 45° angle to edge of membrane. Once proper welding temperature has been reached and membrane begins to "flow," position hand roller perpendicular to nozzle and roll lightly. For straight seams, use 1-1/2 in. wide nozzle. For corners and compound connections, use 3/4 in. wide nozzle.
 - C. Machine Welding
 1. Machine welded seams are achieved by the use of approved automatic welding equipment. When using this equipment, manufacturer's instructions shall be followed and local codes for electric supply, grounding and over current protection observed. Dedicated circuit house power or a dedicated portable generator is recommended. No other equipment shall be operated off simultaneously the generator.
 2. Metal tracks may be used over the deck membrane and under the machine welder to minimize or eliminate wrinkles.
 - D. Quality Control of Welded Seams
 1. Applicator shall check all welded seams for continuity using a rounded screwdriver. Visible evidence that welding is proceeding correctly is smoke during the welding operation, shiny membrane surfaces, and an uninterrupted flow of dark grey material from the underside of the top membrane.
 2. On-site evaluation of welded seams shall be made daily by the Applicator at locations directed by the Owner's Representative or manufacturer's representative.
 3. 1 in. wide cross-section samples of welded seams shall be taken at least three times a day. Correct welds display failure from shearing of the membrane prior to separation of the weld.
 4. Each test cut shall be patched by the Applicator at no additional cost to the Owner.

5. Apply roofing membrane with side laps shingled in such a manner that water runs over or parallel to lap. Do not allow roof membrane to “buck” water.
 - E. Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.
 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane.
 2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
 3. Repair tears, voids, and lapped seams in roofing membrane that do not meet requirements.
 4. T-Joints (three-way overlaps): Wherever possible, the head lap shall extend under the field seam so that the T - joint patch only has to step down over one thickness of membrane. When welding a T-joint, the top edge of the second membrane layer shall be chamfered to create a smooth transition for the top membrane layer to conform to for positive welding. Chamfer the edge of the membrane using a hand-held chamfer tool supplied by the manufacturer. Provide T-joint patches at all T-joints.
 - F. Spread sealant over deck drain flange at roof drains and securely seal membrane in place with clamping ring.
- 3.10 PERIMETER PEEL STOP
- A. Provide enhanced mechanical attachment of membrane perimeter with a 1/8 x 1 in. bar attached on 12 in. centers 3 ft. from roof perimeter. Gap bar ends 1 in. Wrap bar ends with PVC membrane prior to membrane stripping.
 - B. Provide PVC membrane stripping centered over bar. Heat-weld stripping to membrane roofing with minimum 3 in. wide weld.
- 3.11 COMPLETION
- A. All Trade Contractor for this Section and manufacturer warranties required under the Work of this Section shall be submitted for approval prior to final payment.
- 3.12 RUBBISH REMOVAL
- A. The General Contractor shall remove all waste and debris and legally disposed daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section shall include, but not be limited to, furnishing and installation of the following:
 - 1. Formed aluminum scupper, valley flashing, step flashing, and counterflashing
 - 2. Aluminum downspout
 - 3. Pre-cast concrete splash block
 - 4. Pressure treated and non-pressure treated wood blocking and plywood sheathing, including all fasteners.
 - 5. All receivers, clips, cleats, and trim required for a complete installation

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
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 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 SUBMITTALS

- A. Submit manufacturer's product data for each product indicated
- B. Submit large scale shop drawings, including layouts, profiles, shapes, seams, dimensions, and details for fastening, joining, supporting, and anchoring sheet metal flashing and trim
- C. Submit 12 in. square, or 12 in. long samples for each type of sheet metal flashing and trim

1.05 QUALITY ASSURANCE

- A. The Work of this Section shall comply with requirements of SMACNA's "Architectural Sheet Metal Manual", and conform to dimensions and profiles shown unless more stringent requirements are indicated.

1.06 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 ALUMINUM SHEET METALS**

- A. Scupper, valley flashing, step-flashing, and counterflashing shall be .063 in., pre-finished aluminum sheet, ASTM B 209, Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14.
1. Aluminum sheet shall be finished with the approved manufacturer's standard 3-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight, with a minimum total dry film thickness of 1.5 mil; complying with AAMA 2605.
 2. Color of aluminum sheet shall be as selected by the Architect from the approved manufacturer's complete selection of standard and premium colors.
 3. Step flashing, counterflashing, formed roof scuppers, and related accessories and fasteners shall be Type 304 stainless steel in sizes and configurations as indicated on the Drawings.

2.02 ALUMINUM DOWNSPOUTS

- A. Downspouts shall be formed of extruded 0.125 in. aluminum in 4 in. x 6 in. rectangular profile, with integral sleeves for joints, as manufactured by Southern Aluminum Finishing Company, or Architect approved equal by Hickman or Metal-Era. Provide SMACNA Type C Hanger/Wall brackets with minimum 2 in. standoff from building. The wall and downspout brackets shall be fastened together and to the downspout. Provide the approved manufacturer's rectangular/round transition from downspout to subsurface drainage system, or Architect approved equal, Model DS4 by McKinley. Downspout and bracket finish and color shall match aluminum gutter system.

2.03 PRE-CAST CONCRETE SPLASH BLOCK

- A. Provide 12 in. x 30 in., 49 lbs., 4,000 to 6,000 psi, steel reinforced, pre-cast concrete splash blocks as manufactured by Modern Pre-Cast or Architect approved equal.

2.04 PRESSURE TREATED WOOD

- A. Provide pressure treated wood blocking and sheathing that is pressure treated to a level of 0.25 pounds per cubic foot of wood product, with waterborne CCA preservatives in accordance with requirements of AWPA Standard U1 and T1. Pressure treated lumber shall be dried to a maximum moisture content of 15 percent after treatment.
1. Provide non-pressure treated lumber at all locations where roof membrane and adhesive flashings are required to be directly adhered to the lumber surface.
- B. Provide APA trademarked, Exposure 1 Rated and non-rated plywood performance rated sheathing, 3/4 in. thick, with span rating for spans indicated. Use of particleboard, flakeboard, or oriented strand board (OSB), shall not be allowed. Sheathing shall be pressure treated to a level of 0.25 pounds per cubic foot of wood product, with waterborne CCA preservatives in accordance with requirements of AWPA Standard U1 and T1.
1. Provide non-pressure treated plywood at all locations where roof membrane and adhesive flashings are required to be directly adhered to the plywood surface.
- C. Wood blocking and nailers shall be in profiles and sizes as indicated or required by the approved roof membrane manufacturer. Blocking and nailers shall be installed at the perimeter of the entire roof and around all other roof projections and penetrations. Thickness of blocking and nailers shall be fabricated to provide a smooth transition from blocking to adjacent insulation.

- D. Provide fasteners with G-90 hot dip galvanized coating, or fluoropolymer coating, at areas of high humidity, including roof blocking and sheathing. Fasteners for use with non-CCA pressure treated lumber, including ACQ Types B and D, CBA-A, and CA-B, shall be stainless steel.

2.05 MISCELLANEOUS MATERIALS

- A. Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items required for complete sheet metal flashing and trim installation.
- B. Fasteners, including wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners shall be designed and installed to withstand specified design loads.
- C. Butyl sealant shall comply with requirements of ASTM C 1311 for single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, heavy bodied for hooked-type expansion joints with limited movement.
- D. Bituminous coating shall be cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat.

2.06 FABRICATION, GENERAL

- A. Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.
- B. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
 - 1. Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- C. Form non-expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.
- D. Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
- E. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal, and in thickness not less than that of metal being secured.
- H. Formed counterflashing shall be two-piece stainless steel, 0.025 in. thick.

PART 3 - EXECUTION**3.01 INSTALLATION, GENERAL**

- A. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items necessary and required to complete sheet metal flashing and trim system.
 - 1. Torch cutting of sheet metal flashing and trim is not permitted.
 - 2. Saw cut existing masonry a minimum of 1 inch in depth or as otherwise required for installation of new base flashing and counter flashing.
 - 3. Install new counter flashing in a continuous manner, anchored with lead wedges at 8 inches on center, minimum, overlapped and sealed in accordance with the Contract Documents.

- B. Where dissimilar metals shall contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.
 - C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
 - D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and butyl sealant.
 - E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 - 1. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
 - 2. Extruded termination base plate shall be set in a full bed of sealant in accordance with requirements of Section 07 54 19 – Polyvinyl-Chloride (PVC) Roofing.
 - F. Seal joints with butyl sealant in a professional workmanlike manner to produce a clean, tight watertight construction.
 - G. Clean surfaces to be soldered, removing oils and foreign matter. Pre-tinned edges of sheets to be soldered to a width of 1-1/2 inches except where pre-tinned surface would show in finished Work. Pre-tinning is not required for lead-coated copper.
 - H. Provide non-pressure treated blocking and plywood at all locations in accordance with the approved manufacturers written requirements.
 - I. Refer to the Drawings for all conditions necessary to complete the Work. In the absence of drawing details, blocking and sheathing shall be provided in accordance with the approved flashing or pre-manufactured manufacturer's written installation details, or as otherwise required to accommodate field conditions approved by the Architect.
- 3.02 RUBBISH REMOVAL
- A. The General Contractor shall remove all waste and debris and legally disposed daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 07 81 00

APPLIED FIREPROOFING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. All labor, materials, equipment and services necessary for installation of concealed and exposed spray applied fireproofing, including related primers or bonding agents, and metal lath, at locations as indicated on the Drawings.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which effect the Work of this Section.
- B. Other specifications Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. Paint primer applied to structural steel shall be compatible with the fireproofing material specified. It shall be the responsibility of the fireproofing material manufacturer to certify in writing that the primer is a suitable substrate to receive spray applied fireproofing and that adequate bond shall be obtained. Performance bond tests shall be conducted on existing primed or similarly coated steel scheduled to be fireproofed.
- B. Qualifications of Applicator:
 - 1. Fireproofing applicator shall be qualified and approved by manufacturer of fireproofing materials and have proper equipment required for installation in accordance with manufacturers recommendations.
 - 2. Installer shall have experience in application of similar fireproofing materials on a minimum of two projects with equal or greater quantities of sprayed fireproofing materials.

- C. Requirements of Regulatory Agencies and References:
 - 1. Requirements of Massachusetts Building Code for fire resistance ratings of members to receive sprayed fireproofing materials.
 - 2. Underwriters Laboratories, Inc. (U.L.): Fire Resistive Classification.
 - 3. ASTM: American Society of Testing and Materials.
 - 4. USEPA: 40 CFR Part 763 Asbestos Containing Materials in School; Final Rule and Notice.
 - 5. AWCI Publications: Inspection Procedure for Field Applied Sprayed Fire Protection.
- D. Testing:
 - 1. ASTM E 84: Surface Burning Characteristics of Building Materials.
 - 2. ASTM E 119: Fire Tests of Building Construction and Materials.
 - 3. ASTM E 605: Thickness and Density of Sprayed Fire-Resistive Materials Applied to Structural Members.
 - 4. ASTM E 736: Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.
 - 5. ASTM E 759: Effect of Deflection on Sprayed Fire-Resistive Materials Applied to Structural Members.
 - 6. ASTM E 760: Effect of Impact on Bonding of Sprayed Fire-Resistive Materials Applied to Structural Members.
 - 7. ASTM E 761: Compressive Strength of Sprayed Fire-Resistive Materials Applied to Structural Members.
 - 8. ASTM E 859: Air Erosion of Sprayed Fire-Resistive Materials Applied to Structural Members.
 - 9. ASTM E 937: Corrosion of Steel by Sprayed Fire-Resistive Materials Applied to Structural Members.
- E. Provide in-place spray applied fireproofing to achieve the minimum fire resistance rating, in hours, for the respective Building Types and Use Groups as indicated on the Drawings, in accordance with requirements of 780 CMR Massachusetts State Building Code, 9th Edition, Table 601, and requirements of authorities having jurisdiction.
- F. Prior to commencing the Work of this Section, the fireproofing applicator shall apply each type of fireproofing specified, in accordance with the required fire-resistance ratings, to a representative surface area of 50 sq. ft. minimum. Finish density, bond and appearance shall be evaluated and approved by the Architect and the fireproofing materials manufacturer before proceeding with the Work of this Section.

1.05 TESTS

- A. Provide materials, density, and construction which are identical to established UL assemblies whose fire-resistance rating has been tested in compliance with ASTM E 119, by independent agencies acceptable to the Architect and authorities having jurisdiction, for the respective Building Types and Use Groups as indicated on the Drawings.
 - 1. Steel members are to be considered unrestrained unless specifically noted otherwise.
- B. Provide materials whose surface burning characteristics, when tested in compliance with ASTM E 84 are Class A or Class 1.
- C. The Owner may engage an independent testing agency to sample and test completed Work for density and thickness in compliance with ASTM E 605.

1.06 SUBMITTALS

- A. Submit manufacturer's certified reports on performances including, but not limited to, burning characteristics, fire-performance, densities, compressive strengths, bond strengths, hardness, water absorption, air erosion and corrosion resistance. Submit in-place density and thickness test results, if tests are performed. Submit copies of fire test reports of sprayed fireproofing application to substrate materials required.
 - 1. Submit result of bulk sample analysis test report indicating no asbestiform fiber present when tested in accordance with the requirements of USEPA 40 CFR Part 763.87 (PLM Test Method) Test shall be conducted by an independent test laboratory and shall be current within three months of its submittal.
- B. Furnish manufacturer's printed material specifications and application instructions for each type of sprayed fireproofing.
- C. Furnish applicator's certification that the material has been completed as specified to meet resistance ratings, thickness requirements, and application requirements.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original unopened factory labeled packages on pallets covered with watertight plastic wrap. Packaging shall bear name of manufacturer and product identification along with UL listings for appropriate fire resistive ratings. Store and handle in strict compliance with manufacturer's instructions and recommendations. Keep materials dry at all times.

1.08 PROJECT CONDITIONS

- A. Do not apply sprayed fireproofing when temperature of substrate is below 40°F or the surrounding air temperature is below 40°F for a minimum of 24 hours before and during application and for 24 hours after application of the sprayed fireproofing.
- B. Protection:
 - 1. Protect adjacent surfaces and equipment from damage by overspray, fallout, and dusting-off of sprayed fireproofing materials.
 - 2. Ensure that fresh air is introduced and exhausted continuously during and 24 hours after application to properly dry the fireproofing.
 - 3. Provide fire extinguishers and post caution signs warning against smoking and open flame when Working with flammable materials.
 - 4. Protect the public, adjoining property and adjacent structures from over spray. Provide clean-up necessary to remove overspray.

1.09 SEQUENCING AND SCHEDULING

- A. Perform the Work of this Section in the optimum sequence that minimizes exposure to weather and the elements, minimizes exposure to abrasion and other possible damage due to subsequent construction operations, and which provides fireproofing protection for the structure at the earliest possible time. Coordinate installation to minimize need for other trades to remove installed fireproofing. Immediately patch cut-away fireproofing to comply with requirements for original Work.

1.10 WARRANTY

- A. Fireproofing applicator shall guarantee that its installation of materials conforms to fireproofing manufacturer's written recommendations, and shall further guarantee his Workmanship connected with the installation for a period of two years from the date of Substantial Completion.

1.11 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 MATERIALS AND PRODUCTS**

- A. Provide non-asbestos fireproofing, Medium Durability SFRM, Monokote Z-106/HY as manufactured by GCP Applied Technologies (formerly WR Grace), or Architect approved equal by Southwest Type 7GP or Isolatak CAFCO 400. The applied fireproofing for spray application in one or more courses shall provide fire resistance ratings, in hours, as indicated on the Drawings and otherwise required by authorities having jurisdiction.
- B. Manufacturer's standard, factory-mixed, Portland cement based dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application.
 - 1. Bond Strength: Minimum 2,000-lbf/sq. ft. (94.5-kPa) cohesive and adhesive strength based on field testing according to ASTM E 736.

2. Density: Not less than 22 lb/cu. ft. (350 kg/cu. m) and as specified in the approved fire-resistance design, according to ASTM E 605.
 3. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E 605, whichever is thicker, but not less than 0.375 inch (9 mm).
 4. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 5. Flame-Spread Index: 5.
 6. Smoke-Developed Index: 0.
 7. Compressive Strength: Minimum 100 lbf/sq. in. (680 kPa) according to ASTM E 761.
 8. Corrosion Resistance: No evidence of corrosion according to ASTM E 937.
 9. Deflection: No cracking, spalling, or delamination according to ASTM E 759.
 10. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E 760.
 11. Air Erosion: Maximum weight loss of 0.0 g/sq. ft. (0.0 g/sq. m) in 24 hours according to ASTM E 859.
 12. Fungal Resistance: Treat products with manufacturer's standard antimicrobial formulation to result in no growth on specimens per ASTM G 21
 13. Finish: Spray-textured finish
- C. Dry mix sprayed fire resistive materials containing mineral fibers are not allowed.
- D. Provide primers recommended by fireproofing manufacturer which are compatible with steel shop primer, if any.
- E. Provide the approved manufacturer's recommended bonding agent complying with applicable fire endurance tests and ratings.
- F. Reinforcement: Lath shall be 3.4 lbs/sq. yd. galvanized metal lath, or type and weight as recommended by the approved manufacturer complying with applicable UL fire endurance tests and ratings.
1. Strip wire lath shall be required on primed steel components and elsewhere as noted, prior to fireproofing.
 2. Glass fiber mesh or wire lath which comply with UL design for fire endurance tests and ratings.

PART 3 - EXECUTION**3.01 INSPECTION**

- A. Fireproofing Subcontractor shall inspect all surfaces to receive fireproofing to assure that they are clear of all loose rust, mill scale, dirt, grease, oil and any other potential impediment to bond. Primed (coated) surfaces shall be inspected to assure compatibility of the primer for use with the fireproofing materials specified herein. The General Contractor shall notify the Architect in writing of conditions detrimental to proper and timely completion of the Work. Work shall not proceed until satisfactory conditions have been corrected. Proceeding with the Work shall indicate acceptance of surfaces to receive fireproofing, and responsibility for correction and/or replacement due to delamination.
- B. Provide in-place spray applied fireproofing to achieve the minimum fire resistance rating, in hours, for the respective Building Types and Use Groups as indicated on the Drawings, in accordance with requirements of 780 CMR Massachusetts State Building Code, 9th Edition, Table 601, and requirements of authorities having jurisdiction.

3.02 PREPARATION AND INSTALLATION

- A. Inspect, clean, and field verify all surfaces and substrates strictly comply with the approved manufacturer's written instructions and recommendations.

- B. Verify installation of all clips, hangars, supports, sleeves, and other items required to penetrate the Work of this Section is complete prior to commencing the Work of this Section. Verify building components and systems that would interfere with application of the Work of this Section, including but not limited to, ductwork, fire protection and plumbing piping, electrical conduit, miscellaneous equipment, or other related items, are not positioned until the Work of this Section is complete.
- C. Apply fireproofing to roof assembly only after roofing is complete and roof traffic has ceased. Metal lath weighing 3.4 lbs. per sq. yd., shall be required below steel roof decking if roof operations are not complete prior to commencing the Work of this Section.

3.03 APPLICATION

- A. Apply spray applied fireproofing in accordance with the approved manufacturer's written recommendations, to achieve the minimum fire resistance rating, in hours, for the respective Building Types and Use Groups as indicated on the Drawings, in accordance with requirements of 780 CMR Massachusetts State Building Code, 9th Edition, Table 601, and requirements of authorities having jurisdiction.
- B. Cut board to size using a table saw or broad knife, making due allowance for steel tolerance. Strips 4 in. wide and 1-1/2 in. thick to fit tightly between the top and bottom flanges at 2 in. on center.
- C. Nogging shall extend approximately 1/16 in. beyond the flange tip. For beams with webs in excess of 18 in. use tee-shaped noggings.
- D. Cut side panels to match depth of the steel section, plus the thickness of the fireproofing board. Cut width of soffit boards to fit between fit tightly between the side panels. Install the panel tight up to the flange at 6 in. on center along each side. For beam flanges 12 in. or more in width provide the approved manufacturer's recommended adhesive. Fill flutes in steel deck above beams
- E. Install all panels using the approved manufacturer's recommended fasteners in accordance with approved manufacturer's written requirements. Length of fasteners shall fully penetrate the full thickness of fireproofing panels to be applied

3.04 FIELD QUALITY CONTROL

- A. Testing Completed Work:
 - 1. Independent testing laboratory, employed by Owner, shall:
 - a. Verify applied thickness and density meets fire rating requirements.
 - b. Verify installation meets approved test reports and acceptable sample installation.
 - 2. Fireproofing Subcontractor shall correct unacceptable Work and pay for further testing required to prove acceptability of installation.
- B. Patch areas from which testing samples have been removed to satisfy fire rating requirements.

3.05 ADJUSTING AND CLEANING

- A. Patch damage to this Work caused by other trades before fireproofing is covered up, or if exposed, before final inspection.
- B. Protect applied fireproofing until permanent covering is installed, or when exposed, until final acceptance.
- C. After completion of fireproofing Work, remove all equipment and remove all deposits of sprayed material from exposed walls and floors.

3.06 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

June 12, 2019

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SECTION 07 84 13

PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section shall include, but not be limited to, furnishing and installation of the following:
 - 1. Through-penetration firestop systems at wall penetrations, top of walls, and all other locations
 - 2. Mineral wool insulation at roof penetrations and as damming material
 - 3. Clips, closures, and support accessories for a complete installation

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all of the Contract Documents for requirements which effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 PERFORMANCE REQUIREMENTS

- A. Provide firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.
 - 1. Fire-resistance-rated walls including fire walls, fire partitions, fire barriers, and smoke barriers.
 - 2. Fire-resistance-rated horizontal assemblies including floors, floor/ceiling assemblies, and ceiling membranes of roof/ceiling assemblies.
- B. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.
- C. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined in accordance with requirements of ASTM E84.

1.05 SUBMITTALS

- A. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system configuration for construction and penetrating items.
- B. Where Project conditions require modification to a qualified testing and inspecting agency's illustration of a through-penetration firestop condition, submit illustration, with modifications marked, approved by through-penetration firestop system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.
- C. Provide schedule indicating locations of each through-penetration firestop system, along with the following information:
 - 1. Types of penetrating items
 - 2. Types of constructions penetrated, including fire-resistance ratings and, where applicable, thicknesses of construction penetrated.
 - 3. Through-penetration firestop systems for each location identified by firestop design designation of qualified testing and inspecting agency.
- D. Provide manufacturer qualification Data for Installer
- E. Provide manufacturer product certificates for through-penetration firestop system products
- F. Provide product test reports from a qualified testing agency indicating through-penetration firestop system complies with requirements, based on comprehensive testing of current products.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications shall require a firm has been approved in accordance with FM 4991, "Approval of Firestop Contractors", with a minimum five years experiences in installing through-penetration firestop systems similar in material, design, and extent to that indicated on the Drawings, whose work has resulted in construction with a record of successful performance. Qualifications shall include having the necessary experience, staff, and manufacturer certified training to install the approved manufacturer's products in accordance with the specified requirements. The approved manufacturer's willingness to sell its through-penetration firestop system products to the Firestopping Subcontractor or to an installer engaged by the firestopping does not in and of itself confer qualification as a Firestopping Subcontractor.
- B. All through-penetration firestop systems, for each kind of penetration and construction condition indicated, shall be obtained through one source from a single manufacturer.
- C. Provide through-penetration firestop systems that comply with the following Fire-Test-Response Characteristics:
 - 1. Acceptable firestopping tests shall be as performed by UL or other agency performing testing and follow-up inspection services for firestop systems and acceptable to authorities having jurisdiction.
 - 2. Acceptable through-penetration firestop systems shall be identical to those tested per testing standard referenced in Paragraph 1.04 above. Provide rated systems complying with the following requirements:
 - a. Through-penetration firestop system products shall bear the required classification marking of the qualified testing and inspecting agency.
 - b. Through-penetration firestop systems shall correspond to those indicated by reference to through-penetration firestop system designations listed by the UL in its "Fire Resistance Directory."

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver through-penetration firestop system products to the Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multi-component materials.
- B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.08 PROJECT CONDITIONS

- A. Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

1.09 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.
- C. Notify the Owner's inspecting agency at least seven days in advance of through-penetration firestop system installations; confirm dates and times on days preceding each series of installations.
- D. Do not cover up through-penetration firestop system installations that shall become concealed behind other construction until each installation has been examined by the Architect, Owner's inspecting agency and local authorities having jurisdiction.

1.10 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 MANUFACTURERS**

- A. Subject to compliance with requirements, provide one of the through-penetration firestop systems indicated for each application that are produced by one of the following manufacturers:
 - 1. Grace Construction Products
 - 2. AD Fire Protection Systems
 - 3. USG

2.02 FIRESTOPPING, GENERAL

- A. 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.
- B. Provide accessory components for each through-penetration firestop system required by the approved manufacturer to install fill materials and in accordance with Paragraph 1.04 above. 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/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. Collars
5. Steel sleeves

2.03 FILL MATERIALS

- A. Provide factory-assembled, cast-in-place, firestop devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
- B. Provide single-component, latex sealants with formulations that after cure do not re-emulsify during exposure to moisture.
- C. Provide factory-assembled, firestop collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of items penetrating the rated assembly.
- D. Provide rigid, intumescent, composite sheet panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.
- E. Provide non-hardening, dielectric, water-resistant, intumescent putties containing no solvents, inorganic fibers, or silicone compounds.
- F. Provide single-component, intumescent, elastomeric, wrap strips with aluminum foil on one side.
- G. Provide pre-packaged, dry mix mortar consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a non-shrinking, homogeneous mortar.
- H. Provide reusable, heat-expanding, pillows and/or bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives.
- I. Provide multi-component, silicone-based, liquid elastomer foams that, when mixed, expand and cure in place to produce a flexible, non-shrinking foam.
- J. Provide single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and non-sag formulation for openings in vertical and other surfaces requiring a nonslumping, gunnable sealant, unless indicated firestop system limits use to non-sag grade for both opening conditions.
 2. Grade for Horizontal Surfaces: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces.
 3. Grade for Vertical Surfaces: Non-sag formulation for openings in vertical and other surfaces.

2.04 MINERAL WOOL INSULATION

- A. Provide mineral wool insulation, non-combustible, moisture resistant, foil faced, Thermafiber Safing as manufactured by Owens Corning, or Architect approved equal by Fibrex or Roxul Safe.
- B. Mineral wool insulation shall be UL tested, listed, and labeled for designs similar to applications indicated in the Contract Documents. Applications shall include, but not be limited to, the following:
 1. Top of rated and non-rated masonry and gypsum board partitions to close top of wall to floor or roof deck above.
 2. Wall and floor penetrations
 3. Roof penetrations at mechanical rooftop units and pipe chase housing box
 4. Other locations as may be required to comply with current Building and Life Safety code requirements.
- C. Standards, Codes Compliance:
 1. ASTM C665: Non-corrosive, Type I, III
 2. ASTM C612: Type IA, IB, II, III, IVA
 3. ASTM E136: Non-combustible as defined per NFPA Standard 220
 4. ASTM E96: Foil Faced, 0.02 perms as tested

- 5. ASTM C1104: Absorbs less than 1% by volume
- 6. ASTM E814: Safing insulation used in conjunction with an approved fill, void, or cavity material sealant or other approved material in through – penetration firestop systems complies.

D. Mineral wool insulation shall comply with the following performance requirements:

- 1. Actual Density: 6.0 pcf
- 2. K-Value: 0.23 at 75 degrees F as tested to ASTM C518
- 3. Thickness: 7 in.
- 4. R-Value: 4.3 per one inch of thickness.
- 5. Flame Spread: 25 as tested to ASTM E84

2.05 MIXING

- A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of work.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean out openings immediately before installing through-penetration firestop system in accordance with the approved firestop system manufacturer's written instructions and with the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates in accordance with the approved through-penetration firestop system manufacturer written requirements. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Mask adjacent surfaces to prevent through-penetration firestop systems from contacting adjoining surfaces that shall remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.03 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

- A. Install through-penetration firestop systems in accordance with the approved firestop system manufacturer's written installation instructions and the Contract Documents, for products and applications indicated.
- B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

- C. Install fill materials for firestop systems by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items to achieve fire-resistance ratings indicated.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that shall remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.04 IDENTIFICATION

- A. Identify through-penetration firestop systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of edge of the firestop systems so that labels shall be visible to anyone seeking to remove penetrating items or firestop systems. Use mechanical fasteners for metal labels. For plastic labels, use self-adhering type with adhesives capable of permanently bonding labels to surfaces on which labels are placed and, in combination with label material, shall result in partial destruction of label if removal is attempted. Include the following information on labels:
 - 1. The words "Warning - Through-Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage"
 - 2. Firestopping Subcontractor's name, address, and phone number
 - 3. Through-penetration firestop system designation of applicable testing and inspecting agency
 - 4. Date of installation
 - 5. Through-penetration firestop system manufacturer's name
 - 6. Installer's name

3.05 FIELD QUALITY CONTROL

- A. Inspecting Agency: Firestopping Subcontractor shall engage a qualified, independent inspecting agency to inspect through-penetration firestops. Independent inspecting agency shall comply with ASTM E 2174 requirements including those related to qualifications, conducting inspections, and preparing test reports.
- B. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.
- C. Proceed with enclosing through-penetration firestop systems with other construction only after inspection reports are issued and firestop installations comply with requirements.

3.06 CLEANING AND PROTECTING

- A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce systems complying with specified requirements.

3.07 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. Exterior polyurethane sealant for perimeter wall openings, expansion, and control joints
 - 2. Interior acrylic latex sealant for perimeter wall openings, wall joints, control joints, and countertop joints
 - 3. Expanding foam sealants
 - 4. Joint fillers and sealers, including preparation, filling, sealing, and curing of joints at all exterior and interior locations, as described in Part 3 – Execution of this Section
 - 5. Backer rods
 - 6. Concealed sealants
 - 7. Protection of completed Work

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contracts Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. The Work of this Section shall be performed by manufacturer approved applicators having a minimum of five (5) years application experience with the required materials.
- B. For each type of material required for the Work of this Section, provide primary materials which are the products of one manufacturer. Provide secondary materials which are acceptable to the manufacturers of the primary materials.
- C. Make all arrangements and payments necessary to have the approved manufacturer's authorized representative on-site at beginning of waterproofing to advise installer and to ensure compliance with manufacturer's requirements.

- D. Provide materials suitable for the intended use and compatible with the materials with which they shall be in contact. Compatibility of sealants and accessories shall be verified in writing by the approved manufacturer.
- E. Provide products and materials tested and certified for low emissions of volatile organic compounds (VOC), in accordance with requirements of the Contract Documents. Testing and certification shall comply with requirements of the following:
 - 1. All paints and architectural coatings totaling 90% or more of the total volumes of such products applied in the project's interior shall meet the VOC content requirements in the applicable category of South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings (amended July 2007 or current version).
 - 2. All adhesives and sealants shall meet the VOC content requirements in the applicable category of South Coast Air Quality Management District (SCAQMD) Rule 1168, Adhesive and Sealant Applications (amended January 2005, or current version).

1.05 SUBMITTALS

- A. Submit manufacturer's product data, installation instructions, use limitations and recommendations for each material and system required by the Work this Section.
 - 1. Prior to ordering waterproofing materials, the Waterproofing Subcontractor for this Section shall submit the items listed below to the Architect for approval:
 - a. 3 copies of manufacturer's specifications for proposed products and installation instructions.
 - b. Written approval of manufacturers use of the products in the proposed system.
 - c. Specimen copy of membrane manufacturer's warranty.
 - d. Dimensioned shop drawings indicating areas of Work, membrane layout and profile details of flashing methods for penetrations and terminations. It shall be the manufacturer's responsibility to verify compatibility with surrounding materials, especially at interface with other types of waterproofing.
- B. Provide samples as follows:
 - 1. Submit representative samples of each control joint, sealant and expansion joint specified herein, showing the full range of color and finish variations expected. Provide actual samples having minimum length of 6 inches.
 - 2. Provide samples of each waterproofing material to be used in the systems described herein, including primers, mastics, tapes, liquid waterproofing, termination bars and fasteners, protection and drainage composite boards.
- C. Provide certifications as follows:
 - 1. Provide manufacturer's certification of sealant and joint material performance, including compatibility with adjacent materials to which material shall be applied. Provide certified test reports on aged performances, hardness, stain resistance, adhesion, cohesion and tensile strength, low temperature flexibility, elongation, modules of elasticity, water absorption, and the resistance to weight loss and deterioration due to heat, ozone and ultraviolet exposure.

1.06 TESTS

- A. Submit samples of every material to be used in the Work including, but not limited to, glass, gaskets, glazing materials, framing members, and all other components such as precast concrete, brick, concrete block and other adjoining materials, and accessories, to glazing sealant manufacturer to verify sealant compatibility and to determine, by testing in accordance with requirements of ASTM C794, if primers and what type of primers are required to ensure adhesion to substrates.
 - 1. Submit at least 6 pieces of each type, class, kind, condition, and form of glass including monolithic, laminated, coated and insulated glass for adhesion testing. Provide 6 pieces of each type of brick, precast concrete, concrete block, and other adjoining materials for adhesion and staining testing.
 - 2. Schedule sufficient time for testing, analysis and reporting of results, understanding that long lead times are required by the sealant manufacturer.
 - 3. Obtain manufacturer's written report and recommendations regarding proper sealant choice and use. Use sealants and substrates only in combinations for which favorable adhesion and compatibility results have been obtained.

4. Make all arrangements and pay all expenses related to these tests.
 - B. Periodically test sealants in place for adhesion using methods recommended by sealant manufacturer. Promptly replace all sealant which does not adhere or which fails to cure properly.
 - C. If manufacturers cannot or shall not perform these tests, employ at the expense of the Waterproofing Subcontractor for this Section an independent testing agency acceptable to the Architect to perform tests and certifications indicated.
- 1.07 DELIVERY, STORAGE AND HANDLING
- A. Deliver materials and products to the job site in original, unopened package, clearly labeled with the manufacturer's identification and printed instructions. All material shall be stored and handled in accordance with manufacturer's instructions and recommendations. Protect from damage
- 1.08 PROJECT CONDITIONS
- A. Perform Work only when ambient conditions are within the limits established by manufacturers of the materials and products used.
 - B. Proceed with Work related to composite sheet waterproofing only when substrate construction and penetrating Work is complete and concrete or mortar has cured for at least 28 days.
 - C. Provide ventilation in accordance with the approved manufacturer's written requirements and recommendations throughout application and curing for all materials specified in this Section.
- 1.09 WARRANTY
- A. Provide written warranty signed by manufacturer, agreeing to repair or replace Work which exhibits defects in materials or Workmanship. "Defects" shall include, but not be limited to, leakage of water, abnormal aging or deterioration, and failure to perform in accordance with requirements of the Contract Documents. Include requirement for removal and replacement of covering and connected adjacent Work. Warranty periods shall be as follows:
 1. Sealants and Crack Control Materials: 5 years from date of Substantial Completion
 2. Waterproofing: 10 years from date of Substantial Completion
 3. Exterior sealants: 20 years from date of Substantial Completion
- 1.10 PRE-INSTALLATION MEETING
- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.
 - B. Advise other trades to ensure that no other Work adversely effects sealer bonding surfaces.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Each sealant shall be checked for adhesion and compatibility with all adjacent materials. Select a sealant that is recommended by the approved manufacturer for the specified application.
- B. Color of each sealant shall be as selected by the Architect from the approved manufacturer's complete selection of standard and premium colors.

2.02 EXTERIOR SEALANT

- A. Provide single-component, non-sag, moisture-cure, polyurethane sealant, Dymonic 100, as manufactured by Tremco, or Architect approved equal by Pecora or Dow Corning. Polyurethane sealant is for exterior caulking of perimeter wall openings, expansion and control joints. Polyurethane sealant shall comply with the following requirements:

1. Color: As selected by Architect from Manufacturer's standard and premium line of not less than 20 colors.
2. Solids: 98%
3. Application: gun-grade sealant, applied with typical caulking equipment
4. Stain and Color Change: Pass, ASTM C510
5. Movement Capability: +/-50%, ASTM C719
6. Tensile Strength: 350 to 450 psi, ASTM D412
7. % Elongation: 800 to 900%, ASTM D412
8. Modulus at 100%: 75 to 85 psi, ASTM D412
9. Tear Strength: 65 to 75 psi, ASTM D412
10. Application Temperature: 40 to 100°F
11. Smoke Development: 5, ASTM E84
12. Fire Spread: 5, ASTM E84
13. Fire Resistance of Assembly: PASS, NFPA 285

2.03 INTERIOR SEALANT

- A. Provide single component, non-sag, acrylic latex sealant, AC-20 + Silicone as manufactured by Pecora Corporation, or Architect approved equal by Dow Corning or Tremco. Acrylic latex sealant is for interior caulking of perimeter wall openings, wall joints, control joints, and countertop joints. Acrylic latex sealant shall comply with the following requirements:

1. Color: As selected by Architect from Manufacturer's standard and premium line of not less than 20 colors.
2. Adhesion Loss: 0.5, ASTM C736
3. Elongation, Ultimate: 150%, ASTM D412
4. Extrudability: 9.8 g/sec, ASTM C731
5. Low-Temperature Flexibility: PASS, ASTM C734
6. 100% Modulus: 60-65 psi, ASTM D412
7. Recovery: 90%, ASTM C736
8. Slump: <0.05 in., ASTM D2202
9. Tensile, Ultimate: 80-90 psi, ASTM D412
10. VOC Content: 31 g/L, ASTM D3960

2.04 EXPANDING FOAM SEALANT

- A. Provide self-expanding, open cell polyurethane foam sealant, impregnated with water based, stabilized, polymer modified acrylic, with internal laminations of closed cell (EVA) foam, and factory applied and cured silicone weather facing, Colorseal, as manufactured by Emseal, or Architect approved equal. The expanding foam sealant shall be applied to metal deck flutes at roof perimeter, interior vertical joints above grade, including but not limited to, building expansion and control joints. Impregnation agent shall be non-migratory and compatible with sealant at interface. Sealant width shall be determined by joint width, as required to provide +/- 25% of joint movement capacity. Sealant shall comply with the following material and performance characteristics:

1. Tensile Strength: 21 psi minimum, in accordance with requirements of ASTM D 3574
2. Durometer Hardness: Shore A, 15 points, in accordance with requirements of ASTM D 2240
3. Staining: None, in accordance with requirements of ASTM C 510
4. Primary Surface Weathering: Minimal after 6,000 hours, in accordance with requirements of ASTM G 26-77
5. Thermal Conductivity: .34 BTU in./hr., Ft², in accordance with requirements of ASTM C 518
6. Color: As selected by the Architect from the approved manufacturer's complete selection of standard colors

2.05 MISCELLANEOUS MATERIALS

- A. Provide appropriate surface primers and accessories for surfaces to be adhered to, in accordance with the approved manufacturer's written requirements.

- B. Provide bond breaker tape No. 40 or No. 531 (heavy duty), as manufactured by Valley Industrial Products, or Architect approved equal by Decker, in accordance with the approved manufacturer's written requirements, appropriate for the sealant being used.
- C. Provide backer rods compatible with the specified sealant, and as follows:
 - 1. Backer rod for all building joints shall be non-absorbing, with highly resistant interior network of closed and open cells, SOF ROD as manufactured by Applied Extrusion Technologies, or Architect approved equal.
 - 2. Backer rod for paving and floor joints shall be closed cell polyethylene rod extruded in continuous lengths, GREEN ROD as manufactured by NMC, or Architect approved equal.
- D. Sealant shall be non-drying, non-hardening, non-bleeding, non-staining sealant complying with ASTM C 834 and C 919.

PART 3 - EXECUTION**3.01 INSPECTION**

- A. For each material the installer shall examine substrates, supports, and conditions under which this Work is to be performed and notify General Contractor, in writing, of conditions detrimental to the proper completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected. Beginning Work means Installer accepts substrates and conditions.
- B. Strictly comply with the approved manufacturer's written instructions and recommendations, except where more restrictive requirements are specified in this Section.

3.02 JOINT SEALANTS AND FILLERS

- A. Clean joint surfaces immediately before installation of sealants, primers, tapes and fillers. Remove all substances which could interfere with bond. Prime, etch, or roughen joint surfaces as necessary to improve bond. Tape or mask adjoining surfaces to prevent spillage and migration problems. Provide backer rods for all liquid sealants except where specifically recommended against by sealant manufacturers. Prevent three-sided adhesion by use of bond breaker tapes or backer rods.
- B. Force sealant into joints to provide uniform, dense, continuous ribbons free from gaps and air pockets. Install sealants so that compressed sealants do not protrude from joints. Dry tool sealants to form a smooth dense surface with joint surfaces adhering equally on opposite sides. At horizontal joints form a slight cove to prevent trapping water. Except in hot weather, make sealant surface slightly concave.
 - 1. Make sealant joint depth equal to joint width for joints up to 1/2 in. wide. For joints over 1/2 in. wide, make depth equal to one-half of the joint width. Joint depth at exterior silicone sealant shall not be greater than 1/2 in.
 - 2. Fill all joints solidly and continuously with a sealant, neatly applied with a standard caulking gun in a continuous motion, using slight pressure. "Push" the sealant bead ahead of the nozzle; do not "drag" the nozzle.
 - 3. Within 5 minutes of sealant application and before sealant skins over, dry tool the joint surface with a concave tool to insure intimate contact with substrate and to eliminate air bubbles. Do not use any liquid for tooling. Provide a smooth, uniform, finished surface.
 - 4. Avoid contaminating adjacent surfaces with excess sealant. Remove all traces of smears and droppings on metal, stone, glass, or other surfaces promptly, using a solvent recommended by the sealant manufacturer and that shall not damage or discolor the building surfaces. Remove smears and droppings on face surfaces by mechanical means after the initial cure of the sealant.
 - 5. Coordinate Work with other trades to prevent contamination of fresh sealant by dust or other debris. Do not seal over any epoxy placements which are not cured.
 - 6. Install internal wall joints so as to maintain connectivity between vertical and horizontal constructions. Extend internal sealant to the face of wall where indicated and as otherwise directed by Architect to compartmentalize waterproofing protection.

7. Install internal sealant materials at sufficient depth (2 1/2 in.+) to maintain 3/4 in. clear unobstructed cavity between finish face of internal sealant and back of external sealant backing material.
 8. Internal joint integrity shall be equal to external joint integrity. Internal seals are primary seals to prevent internal building water intrusion.
- C. Provide acoustical insulation and sealant to seal tightly and completely around all penetrating objects through non-fire rated gypsum drywall and masonry walls and concrete floors, including but not limited to, HVAC duct, fire protection piping, and electrical conduit penetrations, as indicated on the Drawings.
1. Provide a thin sheet metal sleeves at all penetrations through gypsum drywall construction to allow a minimum 3/4 in. wide gap between the penetrating object and adjacent gypsum drywall construction. Fit the sheet metal sleeve tightly to the surrounding drywall construction on all sides, or the entire perimeter, of the penetrating object. Pack the resulting 3/4 in. space between the sleeve and the penetrating object solidly with fibrous acoustical insulation. Provide resilient, non-hardening acoustical sealant to completely seal both sides of wall between the penetrating object and adjacent gypsum drywall construction.
 2. At all penetrations through masonry walls wrap the penetrating object with 1 in. thick fibrous acoustic insulation and fill the space remaining between the acoustic insulation and masonry wall opening solid with cementitious grout prepared in accordance with Section 04 20 00 – Unit Masonry. Provide resilient, non-hardening acoustical sealant to completely seal both sides of wall between the penetrating object and adjacent masonry construction and grout infill.
 3. Installation of acoustic insulation and sealant is not required at locations of penetrating objects through fire rated gypsum drywall and masonry walls.
- D. Seal all interior and exterior joints, seams, intersections between dissimilar materials, unless specifically noted to be performed under the Work of other Sections.
1. The Work of this Section shall include, but not be limited to, sealing of the following exterior conditions:
 - a. Building expansion and control joints
 - b. Concrete to concrete at cold joints
 - c. Vertical wall flashing terminations and reglets
 2. The Work of this Section shall include, but not be limited to, sealing of the following interior conditions at new and existing building:
 - a. Perimeter wall openings at H.M. door frames, H.M. security window frames, and overhead sectional door frames.
 - b. All joints between gypsum drywall and dissimilar materials
 - c. Backsplash to counter joints and backsplash to wall joints at countertops
 - d. Completely around all plumbing fixtures, fittings, and trim to countertops, walls and floors
 - e. At the perimeters of all backsplashes to wall, ends, and backsplash to counter whether a sink is present or not and all counter to wall areas with no backsplash.
 - f. At all slab-on-grade construction joints, control joints, and column bases.
- E. Cure sealants in strict compliance with the approved manufacturers' instructions and recommendations to obtain highest quality surface and maximum adhesion. Make every effort to minimize accelerated aging effects and increase in modulus of elasticity.
- 3.03 REPAIR AND CLEANING
- A. Remove and replace Work which is damaged or deteriorated in any respect.
 - B. Clean adjacent surfaces using materials and methods recommended by system manufacturer. Remove and replace Work that cannot be successfully cleaned.

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

June 12, 2019

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

3.04 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and legally disposed daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

June 12, 2019

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SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. Interior rated hollow metal doors and frames
 - 2. Sealant at perimeter of H.M. door frames in contact with other dissimilar materials
- B. Items to Be Installed Only: Install the following items as furnished by the designated Sections:
 - 1. Section 08 80 00 – Glazing: Clear Tempered Glass

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. Provide products of one manufacturer for each type of door and frame required for the Work of this Section. Provide secondary materials and products which are acceptable to the door and frame manufacturers.
- B. Provide doors and frames that comply with Steel Door Institute SDI-100, Recommended Specifications for Standard Steel Doors and Frames. Install doors in strict compliance with the following as they apply:
 - 1. American Society for Testing and Materials (ASTM):
 - a. ASTM-A1008/A1008M-00 - Specification for Commercial Steel (CS) Sheet, Carbon, Cold-Rolled.
 - b. ASTM B 117 - Standard Test Method of Salt Spray (Fog) Testing
 - c. ASTM E 152 – Standard Method for Fire Tests of Door Assemblies

- d. ASTM E 283 – Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
 - e. ASTM A 366 – Standard Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
 - f. ASTM-A568/A568M - Specification for Steel, Sheet, Carbon, and High Strength, Low-Alloy, Hot-Rolled, and Cold-Rolled.
 - g. ASTM A 653 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
 - h. ASTM A 924 – Standard Specification for General Requirements for Steel Sheet, Metallic Coated by the Hot-Dip Process
 - i. ASTM D 610 – Standard Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces
 - j. ASTM D 1735 – Standard Practice for Testing Water Resistance of Coating Using Water Fog Apparatus
2. American National Standards Institute (ANSI):
- a. ANSI/UL 10B Fire Tests of Door Assemblies
 - b. ANSI/NFPA 80 Fire Doors and Fire Windows
 - c. ANSI/NFPA 252 Fire Tests of Door Assemblies
 - d. ANSI A250.3 – Test Procedure and Acceptance Criteria for Factory Applied Finish Painted Steel Surfaces for Steel Doors and Frames
 - e. ANSI A250.4 – Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcing
 - f. ANSI A250.6 (SDI 107) – Hardware on Standard Steel Doors (Reinforcement-Application)
 - g. ANSI A250.7 – Nomenclature for Steel Doors and Steel Door Frames
 - h. ANSI A250.8 (SDI-100) – Recommended Specifications for Steel Doors & Frames
 - i. ANSI A250.10 – Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames
 - j. ANSI/DHI A115 Specifications for Hardware Preparations in Standard Steel Doors and Frames
 - k. ANSI/DHI A115.IG Installation Guide for Doors and Frames
3. Steel Door Institute:
- a. SDI 105 – Recommended Erection Instructions for Steel Frames
 - b. SDI 106 – Recommended Standard Door Type Nomenclature
 - c. SDI 108 – Recommended Selection and Usage Guide for Standard Steel Doors
 - d. SDI 109 – Hardware for Standard Steel Doors & Frames
 - e. SDI 110 – Standard Steel Doors & Frames for Modular Masonry Construction
 - f. SDI 111 – Recommended Standard Details for Steel Doors and Frames
 - g. SDI 112 – Zinc-Coated (Galvanized/Galvannealed) Standard Steel Doors & Frames
 - h. SDI 122 – Installation and Troubleshooting Guide for Standard Steel Doors and Frames
 - i. SDI 124 – Maintenance of Standard Steel Doors and Frames
- C. Provide door and frame assemblies that comply with NFPA 80, *Standard for Fire Doors and Windows*, and which have been tested, listed and labeled in compliance with ASTM E152, *Standard Methods of Fire Tests of Door Assemblies* by an independent agency acceptable to authorities having jurisdiction for all doors and frames installed in fire-rated assemblies and where indicated or required by authorities having jurisdiction. Doors and frames shall also comply with the following:
- 1. UL 10B Fire Tests of Door Assemblies for negative test pressure
 - 2. UL 10C Standard for Safety Positive Pressure Fire Tests of Door Assemblies
 - 3. NFPA 252 Fire Tests of Door Assemblies for negative test pressure
 - 4. UBC 7-2-1997 Positive Pressure Fire Tests of Door Assemblies
 - 5. Temperature Rise Rating: Provide doors that have temperature rise rating of 450 degrees F (232C) or 250 deg. F (121 C) maximum in 30 minutes of fire exposure in accordance with local building code.
- D. All hollow metal borrowed lite s and doors shall comply with current state and local building codes.
- 1.05 SUBMITTALS
- A. Provide manufacturer's product data, installation instructions, use limitations and recommendations for each door and frame product used. Provide manufacturers' certifications stating that products and assemblies comply with specification requirements. All Fire Doors shall bear UL label.

- B. Provide large scale shop drawings, including plans, elevations, and details of anchors, anchor spacing, reinforcement, connections, hardware preparation, and accessory items required for fabrication and installation of all parts of the Work. Provide schedule of doors and frames using the same references used on Contract Documents.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Strictly comply with all storage and handling requirements of the Steel Door Institute.
- B. Doors and frames shall be protected from all possible damage. Doors shall be individually wrapped in cartons and identified with mark and size. Store doors upright in a protected, dry area.
- C. In the event of damage, the General Contractor shall immediately make all replacements and repairs necessary, approved by the Architect, at no additional cost to the Owner.

1.07 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 ACCEPTABLE MANUFACTURERS**

- A. Subject to compliance with requirements, provide products of one of the following manufacturers:
 - 1. Steelcraft
 - 2. Amweld
 - 3. Republic
 - 4. Deansteel

2.02 BASIC MATERIALS

- A. Hot rolled steel shall be commercial quality, pickled and oiled, in accordance with ASTM A 568 and ASTM A 569.
- B. Cold rolled steel shall be commercial quality carbon steel in accordance with ASTM-A1008/A1008M-00 or ASTM A 568.
- C. Galvanized sheet steel shall be roller leveled, commercial quality, hot dipped zinc and zinc-iron alloy coated, carbon steel sheets in accordance with ASTM-A653.
- D. Anchors and fasteners shall be the approved manufacturer's standard units fabricated from not less than 18 GA. galvanized sheet steel or 18 GA. hot-dip galvanized steel, in accordance with ASTM A 153, Class C or D.
- E. Shop primer shall be thermosetting rust inhibitive primer compatible with finish system specified in Section 09 91 13 - Painting.

2.03 FABRICATION

- A. Fabricate Work to be rigid, straight, plumb, level and square. Provide Work matching sizes, shapes, and profiles indicated on approved shop drawings.
- B. Fabricate exterior doors and frames from galvanized sheet steel with closed tops and bottoms and no places to catch or hold water.
- C. Fabricate concealed components in doors and frames from either hot or cold rolled steel. Exterior doors shall have concealed components and reinforcing galvanized with G90 coating.
- D. Fabricate doors and frames to receive mortised and concealed finish hardware as indicated on approved final hardware schedules. Comply with applicable provisions of ANSI A 115 for hardware preparation.

- E. Locate hardware as indicated on final hardware shop drawings or, if not shown, in accordance with Recommended Locations for Builder's Hardware, published by Door and Hardware Institute.

2.04 FRAMES

- A. Provide F Series hollow metal frames for both CMU and GWB installations, as manufactured by Steelcraft, or Architect approved equal by Amweld, Republic, or Deansteel, for doors, borrowed light frames, and other openings as scheduled. Use concealed fasteners wherever possible.
 - 1. Fabricate exterior door frames from 14 GA. hot dipped zinc coated steel, in accordance with requirements of ASTM A 653 and A 924 for G90 coatings. Frame profiles shall be as called for on the Drawings.
 - 2. Fabricate all interior door frames from 16 GA. steel sheet in accordance with requirements of ASTM A 568 or ASTM-A1008/A1008M-00. Interior door frames at areas subject to corrosive conditions, including but not limited to locker rooms, toilets, and kitchen, shall be hot dipped zinc-iron alloy coated steel, in accordance with requirements of ASTM A 653 and A 924 for A60 coatings. Frame profiles shall be as called for on the Drawings.
- B. All steel frames shall be assembled with mitered and fully welded corners and seams to ensure the face miter seam is "closed and tight". Weld the face seam and the full web of the frame corner or intersection. Grind and dress welds and seams to be flush and invisible after priming. Apply a zinc rich primer over all ground areas of steel frames, and finish with a matching prime paint. Knock-down frames shall be provided as indicated in the door schedule.
- C. Provide steel frames and components fabricated from the following sheet steel GA.s. All hinge, strike and closer reinforcements shall be projection welded to the door frames.

1. Plaster guards and mortar boxes:	26 GA.
2. Interior frames 4 ft. wide and smaller:	16 GA. steel
3. Interior frames over 4 ft. wide:	14 GA. steel
4. Exterior frames:	14 GA., G90 coatings
5. Floor anchors:	14 GA.
6. Strike reinforcement:	14 GA. steel
7. Closer reinforcement:	12 GA. steel
8. Head channel reinforcement for frames over 4' wide:	12 GA. steel
9. Hinge reinforcement:	10 GA. steel
- D. Provide profiles and shapes as shown on the Drawings free of warp, buckles, fractures or other defects. Stops shall be formed integral with frames.
- E. Provide anchors at each jamb for each 2 ft. - 6 in. of height or fraction thereof. At masonry wall locations provide T type or wire type. Provide Z type for metal studs. Provide floor anchors at both sides of all jambs. Provide UL approved anchors for fire-rated assemblies.
- F. Prepare single door frames to receive 3 resilient silencers on strike jamb. Prepare double door frames to receive 2 resilient silencers at the center of the head jamb.
- G. Stops shall be 5/8 in. minimum depth, cut-off and capped at 90° at 4 inches above finished floor at locker rooms, toilets, and kitchen, and where otherwise indicated. Fill and grind smooth, jamb joints below cut-off stops, making them imperceptible.

2.05 HOLLOW METAL DOORS

- A. Fire rated interior doors shall be T Series, as manufactured by Steelcraft, or Architect approved equal by Amweld, Republic, or Deansteel in accordance with requirements of SDI Classification Level 2, Performance Level B- Heavy Duty, Model 2, with minimum 16 GA. face sheets and mineral fiberboard composite construction. Doors shall have a 450° F temperature rise label. This type of door shall be required at all stair locations.
 - 1. Face sheets shall be commercial quality, cold rolled steel, in accordance with requirements of ASTM-A1008/A1008M-00 or ASTM A 366 and A 620. Interior doors at areas subject to corrosive conditions, including but not limited to locker rooms, toilets, and kitchen, shall be hot dipped zinc-iron alloy coated steel, in accordance with requirements of ASTM A 653 and A 924 for A60 coatings.
 - 2. Vertical edges shall be mechanically interlocked with a hairline edge seam.

3. Hinge reinforcement shall be not less than 7 GA. (3/16 in.) plate 1-1/4 in. X 10 in. or a 12 GA. continuous channel with formed holes drilled and tapped. The manufacturer shall provide test information that the continuous type of reinforcement is equal to a 3/16 in. or 7 GA. plate.
4. Reinforce tops and bottoms of all doors with a continuous steel channel not less than 16 gage, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel shall have a steel closure channel screwed in place so that the web of the channel is flush with the face sheets of the door.
5. Door cores shall be a one-piece resin-impregnated honeycomb or polystyrene core securely bonded to both face sheets.

2.06 GLAZING STOPS

- A. Provide the approved manufacturer's standard rolled steel shapes with mitered corners and countersunk, tamper proof fasteners. Location of screw heads shall be on the inside, or least public side of door.

2.07 FINISHES

- A. After fabrication, tool marks and surface imperfections shall be filled and sanded to make face sheets, vertical edges and weld joints free from irregularities.
- B. Provide factory primed finish on all surfaces, including galvanized and galvanized, with a minimum 1.0 mil dry film thickness of baked rust-inhibiting primer conforming to ANSI A250.10, and compatible with finish paint specified in Section 09 91 13 - Painting. All surfaces shall be prepared in accordance with specified reference standards and written requirements of the primer manufacturer.
- C. Exposed galvanized surfaces of steel doors shall be solvent wiped before application of shop coat of paint.
- D. All surfaces of door frames to be concealed by installation in an exterior wall, or in contact with concrete or masonry mortar, shall receive a 1/16 in. thick coating of asphalt emulsion, after priming.

2.08 PERIMETER SEALANT

- A. Provide single-component, non-sag, moisture-cure, polyurethane sealant at door perimeter, Dymonic 100 as manufactured by Tremco, or Architect approved equal. The sealant shall comply with the following material and performance characteristics:
 1. Volatile Organic Content: 40 g/l, maximum
 2. Volatile Organic Emissions: Not greater than Greenguard Children & Schools Certification emissions levels
 3. Tensile Strength: 350 to 450 PSI, in accordance with ASTM D412
 4. Percent Elongation: 800 to 900%, in accordance with ASTM D412
 5. Modulus at 100%: 75 to 85 psi, in accordance with ASTM D412
 6. Tear Strength: 65 to 75 psi, in accordance with ASTM D412
 7. Smoke Development: 5, in accordance with ASTM E84
 8. Color: As selected by Architect from Manufacturer's standard and premium line of not less than 20 colors.

PART 3 - EXECUTION

3.01 INSPECTION

- A. The H.M. Door Installer shall examine supports and conditions under which this Work is to be performed and notify General Contractor in writing of conditions detrimental to the proper completion of the Work. Assure that frame openings correspond to dimensions of frame furnished. Do not proceed with installation until unsatisfactory conditions are corrected. Beginning Work means Installer accepts substrates and conditions.

3.02 INSTALLATION

- A. Installation shall be in accordance with the approved manufacturer's written instructions, except where more restrictive requirements are specified in this Section, and shall comply with applicable referenced standards.
- B. Frames shall be installed prior to erection of walls and ceilings, and accurately plumb, level, aligned, squared and braced. Provide anchors at each jamb for each 2 ft. 6 in. of height or fraction thereof, at hinge locations. At masonry wall locations provide T type or wire type. Provide Z type for metal studs. Provide floor anchors at both sides of all jambs. Provide UL approved anchors for fire-rated assemblies. Frames at masonry partitions, and elsewhere as noted in door schedule, shall be grouted solid.
- C. Install hinges supplied under Section 08 71 00 – Door Hardware, and hang doors accurately into frame openings with uniform tight clearances around jambs and head. Doors shall swing freely without binding or scraping and shall remain motionless at any location when released.
- D. Install glazing stops where scheduled or indicated. Provide symmetrically spaced fasteners not more than 8 in. O.C.

3.03 TOLERANCES

- A. Install fire-rated doors and frames with clearances and tolerances in accordance with NFPA Standard 80.
- B. Install non-rated doors and frames with clearances and tolerances in accordance with SDI-100.

3.04 ADJUSTING, TOUCH-UP AND REPAIR

- A. After installation of doors and hardware, adjust clearances and operating parts to Work easily, smoothly, and correctly. Doors shall not rub frame, scratch primer, nor bind.
- B. Touch-up damaged shop coatings and repair minor damage to eliminate all evidence of repair. Remove and replace Work which cannot be satisfactorily repaired.

3.05 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and legally disposed daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 08 31 13

ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. Interior access doors
 - 2. Exterior access door
- B. Items to Be Installed Only: Install interior access doors as furnished under the Work of the following Divisions:
 - 3. Section 22 00 00 - Plumbing
 - 4. Section 23 00 00 - HVAC
 - 5. Section 26 00 00 - Electrical

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all of the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. Provide materials which are the products of one manufacturer for each type of access door required to complete the Work of this Section.
- B. Provide the approved manufacturer's standard, appropriately sized, access doors for the intended use.

1.05 TESTS

- A. Where fire-resistance ratings are indicated or required by authorities having jurisdiction, provide UL labeled access doors which are identical to assemblies whose fire-resistance rating has been tested by independent agencies acceptable to the Architect and authorities having jurisdiction.

1.06 SUBMITTALS

- A. Submit manufacturer's product data, installation instructions, use limitations and recommendations for each type of access door. Provide manufacturer certifications demonstrating compliance with Contract Document requirements.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products in unopened, factory labeled packages. Store and handle in accordance with the approved manufacturer's written instructions as necessary to protect from damage.

1.08 COORDINATION

- A. Furnish inserts and anchors which must be built into other Work. Work closely with installers of finish materials, so that access doors are aligned and installed flush with adjacent finishes.

1.09 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 INTERIOR ACCESS DOORS**

- A. Provide each access door assembly manufactured as a complete unit, ready for installation with all necessary parts.
- B. Provide access door Type RDW as manufactured by Karp Associates or Architect approved equal by Karp or Mildor, at drywall partitions with a door recessed to receive gypsum board. Door frame shall include a drywall bead so that the drywall cement can be applied to the concealed flange. Unit shall be fabricated from sheet steel as follows:
 - 1. Frames shall be minimum 13 gauge steel and doors shall be 16 gauge steel
 - 2. Door recess shall be equal to the thickness of adjacent gypsum drywall as necessary to provide a flush, uniform appearance
 - 3. Finishing trim shall be 22 gauge galvanized steel drywall bead
 - 4. Hinges shall be concealed, continuous pivoting rod type
 - 5. Provide at least two screwdriver operated cam latches for each door to hold door in flush, smooth plane when closed. Provide keyed cylinder locks, with all doors keyed the same, at all access panels located in public areas. Provide two keys for each lockable access door.
 - 6. Provide four 6 in. square lockable access panels at Control Booth B 114. Two (2) panels shall be lockable.
 - 7. Recycled Content: 35% Post-Consumer, 35% Post-Industrial
- C. Provide access door, Type DSC-214M as manufactured by Karp Associates or Architect approved equal by Karp or Mildor, at concrete masonry and ceramic tile surfaces. Unit shall be fabricated from sheet steel as follows:
 - 1. Frames shall be minimum 16 gauge steel and doors shall be 14 gauge steel
 - 2. Frame flange shall be one piece construction, 3/4 in. wide
 - 3. Masonry anchor straps shall be included for all access doors located in masonry walls
 - 4. Hinges shall be concealed, continuous piano hinge

5. Provide at least two screwdriver operated cam latches for each door to hold door in flush, smooth plane when closed. Provide keyed cylinder locks, with all doors keyed the same, at all access panels located in public areas, including toilet rooms. Provide two keys for each lockable access door.
 6. Recycled Content: 35% Post-Consumer, 35% Post-Industrial
- D. Provide access door, Type KRP-150 FR as manufactured by Karp Associates or Architect approved equal by Karp or Mildor, at fire rated concrete masonry or ceramic tile faced partitions. Unit shall be fabricated from sheet steel as follows:
1. Frames shall be 16 gauge steel and doors shall be 20 gauge steel, welded pan style
 2. Frame flange shall be one piece construction 1 in. wide, fully welded
 3. Hinges shall be concealed, continuous piano hinge
 4. Doors shall be filled with 2 in. thick fire rated insulation
 5. Doors shall be furnished with an automatic closer
 6. Latches shall be bolt type operated by ring or a flush key
 7. Recycled Content: 35% Post-Consumer, 35% Post-Industrial
- E. Access doors shall be factory primed, with a minimum 2.0 mil dry film thickness of rust-inhibiting primer compatible with finish paint specified in Section 09 99 13 - Painting.
- 2.02 EXTERIOR ACCESS DOOR
- A. Provide 24 in. x 48 in. exterior aluminum access door, LT4000 as manufactured by Acudor or Architect approved equal by Babcock Davis or Karp Associates, Inc. The exterior access door shall comply with the following characteristics:
1. Door: 0.064, flush to edge of frame, 1-5/16 in. mitered aluminum extension flange
 2. Mounting Frame: 0.080 in., 1-1/2 in. deep
 3. Hinge: Concealed pin hinge
 4. Insulation: 3/4 in. Type 3 Expanded Polystyrene (EPS) Foil Lined Insulation, with a 3.18 R-Value
 5. Gasket: 1/8 in. x 3/8 in. closed cell neoprene gasketing
 6. Standard Latch: Screwdriver operated cam latch
 7. Locks: Mortise Cylinder Lock
 8. Finish: Mill Finish

PART 3 - EXECUTION**3.01 INSTALLATION**

- A. Access doors shall be installed in accordance with the approved manufacturer's written instructions, except where more restrictive requirements are specified in this Section. Beginning Work means Installer accepts substrates and conditions.
- B. Coordinate installation with related and adjacent Work. Set frames accurately into position and securely fasten plumb and level and in proper alignment with adjacent finishes. Set doors so that frames are in full contact with surrounding construction on entire perimeter.

3.02 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust operating parts to Work easily, smoothly, and correctly.
- B. Repair, and touch-up paint minor damage as necessary to eliminate all evidence of repair. Remove and replace Work which cannot be satisfactorily repaired.
- C. Clean exposed surfaces using materials and methods in accordance with the approved manufacturer's written instructions. Remove and replace Work that cannot be successfully cleaned.

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

June 12, 2019

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

3.03 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 087100

DOOR HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. All hardware for all doors, as specified in hardware sets, and as indicated and required by actual conditions at the building, including any doors and/or door hardware sets not referenced or indicated herein. The hardware shall include the furnishing of all necessary screws, bolts, expansion shields, drop plates, and all other devices necessary for the proper application of the hardware.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 – HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 CODES AND REFERENCES

- A. Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. 521 CMR – MA Architectural Access Board.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 80 - Fire Doors and Windows.
 - 4. NFPA 101 - Life Safety Code.
 - 5. NFPA 105 - Installation of Smoke Door Assemblies.
 - 6. State Building Codes, Local Amendments.
- B. Standards: All hardware specified herein shall comply with the following industry standards:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series
 - 2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.05 SUBMITTALS

- A. Provide submittals in accordance with requirements of Section 01 33 00 – Submittal Procedures, in accordance with requirements of the Contract Documents.
- B. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- C. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 - 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- D. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.
- E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.
- F. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.

1.06 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing both standard and electrified builders hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

- C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor in good standing by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
 - 1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
- D. Regulatory Requirements: Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the model building code including, but not limited to, the following:
 - 1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
 - a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
 - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
 - 1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
 - 2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.
 - 2. NFPA 101: Comply with the following for means of egress doors:
 - a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
 - b. Thresholds: Not more than 1/2 inch high.
 - 3. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 (neutral pressure at 40" above sill) or UL-10C.
 - a. Test Pressure: Positive pressure labeling.
- E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Requirements for key control storage and software.
 - 4. Installation of permanent keys, cylinder cores and software.
 - 5. Address and requirements for delivery of keys.
- G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
 - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware for hollow metal doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 - 2. Review and finalize construction schedule and verify availability of materials.
 - 3. Review the required inspecting, testing, commissioning, and demonstration procedures
- H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.08 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

1.09 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- C. Special Warranty Periods:
 - 1. Ten years for mortise locks and latches.
 - 2. Five years for exit hardware.
 - 3. Twenty-five years for manual surface door closers.

1.10 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- B. Continuing Service: Beginning at Substantial Completion, and running concurrent with the specified warranty period, provide continuous (6) months full maintenance including repair and replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door opening operation. Provide parts and supplies as used in the manufacture and installation of original products.

1.11 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 – PRODUCTS**2.01 SCHEDULED DOOR HARDWARE**

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
 - 1. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

- a. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
 - B. Substitutions: Requests for substitution and product approval for inclusive mechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.
- 2.02 HANGING DEVICES
- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.
 - 1. Quantity: Provide the following hinge quantity, unless otherwise indicated:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" heavy weight.
 - 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 - 4. Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:
 - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
 - 1) Out-swinging access controlled doors.
 - 2) Out-swinging lockable doors.
 - 5. Acceptable Manufacturers:
 - a. Bommer Industries (BO).
 - b. Hager Companies (HA).
 - c. McKinney Products (MK).
 - B. Continuous Geared Hinges: ANSI/BHMA A156.26 certified continuous geared hinge with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Provide concealed flush mount (with or without inset), full surface, or half surface, in standard and heavy-duty models, as specified in the Hardware Sets. Concealed continuous hinges to be U.L. listed for use on up to and including 90-minute rated door installations and U.L. listed for windstorm components where applicable. Coordinate with aluminum door manufacturer.
 - 1. Acceptable Manufacturers:
 - a. Bommer Industries (BO).
 - b. McKinney Products (MK).
 - c. Pemko Manufacturing (PE).
- 2.03 CYLINDERS AND KEYING
- A. General: Cylinder manufacturer to have minimum ten year experience designing secured master key systems and have on record a published security keying system policy.
 - B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
 - C. Cylinders: Original manufacturer cylinders complying with the following:
 - 1. Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.

2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
 4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 5. Keyway: Owner to advise.
- D. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:
1. Removable Cores: Core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware. Provide removable core (small or large format) as specified in Hardware Sets.
- E. Patented Cylinders: ANSI/BHMA A156.5, Grade 1, certified cylinders employing a utility patented and restricted keyway requiring the use of patented controlled keys. Provide bump resistant, fixed core cylinders as standard with solid recessed cylinder collars. Cylinders are to be factory keyed where permanent keying records will be established and maintained.
1. Provide a 6 pin multi-level master key system comprised of patented controlled keys.
 - a. Cylinders: Provide utility patented controlled keyway cylinders that are furnished with patented keys available only from authorized distribution.
 2. Acceptable Manufacturer:
 - a. Sargent Manufacturing (SA) - Degree Series.
 - b. Corbin Russwin (RU) – Access 3 Series.
 - c. Schlage – Everest 29 Series.
 - d. Medeco – X4 Series.
- F. Keying System: Each type of lock and cylinders to be factory keyed. Conduct specified "Keying Conference" to define and document keying system instructions and requirements. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner. Incorporate decisions made in keying conference, and as follows:
1. Grand Master Key System: Cylinders are operated by a change key, a master key, and a grand master key.
- G. Key Quantity: Provide the following minimum number of keys:
1. Top Master Key: One (1)
 2. Change Keys per Cylinder: Three (3)
 3. Master Keys (per Master Key Group): Two (2)
 4. Grand Master Keys (per Grand Master Key Group): Two (2)
 5. Construction Keys (where required): Ten (10)
 6. Construction Control Keys (where required): Two (2)
 7. Permanent Control Keys (where required): Two (2)
- H. Construction Keying: Provide construction master keyed cylinders or temporary keyed construction cores where specified. Provide construction master keys in quantity as required by project Contractor. Replace construction cores with permanent cores. Furnish permanent cores for installation as directed under specified "Keying Conference".
- 2.04 MECHANICAL LOCKS AND LATCHING DEVICES
- A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified mortise locksets furnished in the functions as specified in the Hardware Sets. Locksets to be manufactured with a corrosion resistant, stamped 12 gauge minimum formed steel case and be field-reversible for handing without disassembly of the lock body. Lockset trim (including knobs, levers, escutcheons, roses) to be the product of a single manufacturer. Furnish with standard 2 3/4" backset, 3/4" throw anti-friction stainless steel latchbolt, and a full 1" throw stainless steel bolt for deadbolt functions.
1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) – ML2000 Series.
 - b. Sargent Manufacturing (SA) – 8200 Series.
 - c. Schlage (SC) – L9000 Series.

- B. Lock Trim Design: As specified in Hardware Sets.
- C. Knurling: Where required by local code provide knurling or abrasive coating to all levers on doors leading to hazardous areas such as mechanical rooms, boiler and furnace rooms, janitor closets, and as otherwise required or specified.

2.05 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 - 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 - 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
- B. Standards: Comply with the following:
 - 1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 - 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 - 3. Strikes for Auxiliary Deadlocks: BHMA A156.5.
 - 4. Dustproof Strikes: BHMA A156.16.

2.06 EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
 - 1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1, and UL listed for Panic Exit and/or Fire Exit Hardware. Cylinders: Refer to 2.04 KEYING.
 - 2. Exit devices shall be touchpad type, fabricated of brass, bronze, stainless steel, or aluminum, plated to the standard architectural finishes to match the balance of the door hardware.
 - 3. Touchpad shall extend a minimum of one half of the door width. Touch-pad finish shall be compatible to exit device finish. Compression springs will be used in devices, latches, and outside trims or controls, tension springs also acceptable.
 - 4. Devices to incorporate a deadlatching feature for security and/or for future addition of alarm kits and/or other electrical requirements.
 - 5. Provide manufacturer's standard strikes.
 - 6. Provide exit devices cut to door width and height. Locate exit devices at a height recommended by the exit device manufacturer, allowable by governing building codes, and approved by the Architect.
 - 7. Mechanism case shall sit flush on the face of all flush doors, or spacers shall be furnished to fill gaps behind devices. Where glass trim or molding projects off the face of the door, provide glass bead kits.
 - 8. Non-fire-rated exit devices shall have cylinder dogging.
 - 9. Removable mullions shall be a 2 inches x 3 inches steel tube. Where scheduled, mullion shall be of a type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
 - 10. Where lever handles are specified as outside trim for exit devices, provide heavy-duty lever trims with forged or cast escutcheon plates. Provide vandal-resistant levers that will travel to a 90-degree down position when more than 35 pounds of torque are applied, and which can easily be re-set.
 - 11. Lever style will match the lever style of the locksets.
 - 12. Lever trim on doors serving rooms considered by the authority having jurisdiction to be hazardous shall have a tactile warning.
 - 13. Exit devices for fire rated openings shall be UL labeled fire exit hardware.
 - 14. Field drill weep holes per manufacturer's recommendation for exit devices used in full exterior application, highly corrosive areas, and where noted in the hardware sets.
 - 15. Provide electrical options as scheduled.
 - 16. Acceptable manufacturers and/or products: Falcon 24/25 series with deadlatching, Precision Apex series, Sargent 80 series with deadlatching.

2.07 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
 2. Standards: Closers to comply with UL-10C and UBC 7-2 for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
 3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
 4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
 5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 - a. Where closers are indicated to have mechanical dead-stop, provide heavy duty arms and brackets with an integral positive stop.
 - b. Where closers are indicated to have mechanical hold open, provide heavy duty units with an additional built-in mechanical holder assembly designed to hold open against normal wind and traffic conditions. Holder to be manually selectable to on-off position.
 - c. Where closers are indicated to have a cushion-type stop, provide heavy duty arms and brackets with spring stop mechanism to cushion door when opened to maximum degree.
 - d. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics. Provide drop plates or other accessories as required for proper mounting.
 6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper mounting.
- B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.
1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - DC8000 Series.
 - b. LCN Closers (LC) - 4040XP Series.
 - c. Norton Door Controls (NO) – 9500 Series.
 - d. Sargent Manufacturing (SA) - 281 Series.

2.10 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
1. Acceptable Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Rockwood Manufacturing (RO).
 - c. Trimco (TC).
- C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Acceptable Manufacturers:
 - a. Rixson Door Controls (RF).
 - b. Rockwood Manufacturing (RO).
 - c. Sargent Manufacturing (SA).
 - d. Glynn Johnson.

2.11 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and UBC 7-2, Fire Tests of Door Assemblies.
- D. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- E. Acceptable Manufacturers:
 1. National Guard Products (NG).
 2. Pemko Manufacturing (PE).
 3. Reese Enterprises, Inc. (RS).

2.12 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.13 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.02 INSTALLATION

- A. Install each item of mechanical hardware to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 3. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.03 FIELD QUALITY CONTROL

- A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.04 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.05 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.06 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS**June 12, 2019****133 WILLIAM STREET, NEW BEDFORD, MA 02740**

Mount Vernon Group Architects, Inc., Project No. 02014.58

3.07 DOOR HARDWARE SCHEDULE

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
- B. Manufacturer's Abbreviations:
1. MK – McKinney
 2. PE – Pemko
 3. RU - Corbin Russwin
 4. MC – Medeco
 5. RO – Rockwood
 6. RF – Rixson
 7. 00 - Other

Hardware Schedule**Set: 1.0- Door No. 001A**

Description: Interior H.M. Single, Push/Pull, Keyed

1 Continuous Hinge	CFM-SLF-HD1		PE
1 Cylinder Housing	1070 Series	626	RU
1 Core	Keyed as directed	26	MC
1 Concealed Overhead Stop	1-X36	630	RF
1 Closer (surface)	DC8200 Series	689	RU
1 Exit Device	Falcon 24/25 series with deadlatching		

Set: 1.0- Door No. 402B

Description: Interior H.M. Single, Push/Pull, Keyed

1 Continuous Hinge	CFM-SLF-HD1		PE
1 Cylinder Housing	1070 Series	626	RU
1 Core	Keyed as directed	26	MC
1 Concealed Overhead Stop	1-X36	630	RF
1 Closer (surface)	DC8200 Series	689	RU

END OF SECTION

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

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SECTION 08 80 00

GLAZING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All the Contract Documents, including Drawings, General Conditions, and all Sections of Division 1 - General Requirements, apply to the Work of this Section.

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of glass and glazing for the following:
 - 1. Door vision panel

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which effect the Work of this Section.
 - B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving
 - C. Work of this Section shall withstand normal loads due to wind, temperature and normal impact without failure, breakage of glass or seals, fogging or other defects.
 - 1. Glass and glazing shall function correctly and normally throughout an ambient temperature range of 100°F above and below installation temperature.
 - 2. Insulated units shall be free from internal dirt, moisture, condensation, fogging, deterioration of protected internal glass coating, and visual evidence of seal failure throughout the warranty period.
 - 3. Coated glass shall be free from peeling, cracking, hazing, visual non-uniformity, and other defects throughout the warranty period.
- 1.04 QUALITY ASSURANCE**
- A. Requirements of Regulatory Agencies: Install glass and glazing to meet requirement of Local Building Code.
 - 1. Fenestration glazing shall comply with Commonwealth of Massachusetts Energy Code, 780 CMR, Chapter 13, Section 1304.3.
 - 2. All glazing shall comply with current state and local building codes.

B. Reference Standards:**1. Federal Specifications:**

- a. FS-DD-G-451, Glass, Float or Plate, Sheet, Figured (Flat, For Glazing, Mirrors and Other Uses).
- b. FS-DD-G-1403, Glass, Plate (Float) Sheet, Figured and (Heat Strengthened and Fully Tempered).
- c. FS-TT-S00230, Sealing Compound: Elastomeric Type, Single Component (For Caulking, Sealing and Glazing in Buildings and Other Structures).

2. Sealed Insulating Glass Manufacturers Association (SIGMA): Sigma 70-7-1, Glazing Recommendation for Sealed Insulating Glass Units.**3. American Society for Testing and Materials (ASTM):** E-774, Specification for Sealed Insulating Glass Units.**4. Insulating Glass Certification Council (IGCC):** Certified Products Program or A.L.T. Certification.**5. Safety Glass Standards:** Provide safety glass which complies with ANSI Z97.1 and requirements of 16 CFR Part 1201 for category II materials and is permanently marked with certification label of Safety Glass Certification Council.**C. Determine exact sizes and thicknesses of glass products and certify that the Work of this Section meets or exceeds the performance requirements specified in this Section. Provide proper thicknesses, edge clearances and tolerances to comply with the recommendations of the glass manufacturer. Provide thicknesses required for application indicated.****1.05 SUBMITTALS****A. Submit manufacturer's descriptive data, installation instructions, use limitations and recommendations for each type of glass. Provide certifications stating that materials comply with requirements.****B. Submit example copies of manufacturer's warranties before ordering materials.****C. Provide glass manufacturer's wind load charts, calculations and certification of the performance of this Work. Show how design load requirements and other performance criteria have been satisfied.****D. Submit three 12 in. x 12 in. samples of each glass and glazing material that is to be used in the Work. Provide 12 in. long samples of sealant and glazing materials. Samples of single thickness, non-fabricated clear glass are not required.****E. Submit certified reports for tests required.****1.06 DELIVERY, STORAGE AND HANDLING****A. Deliver materials and products in labeled, protective packages. Store and handle in strict compliance with manufacturer's instructions and recommendations of FGMA Handbook.**

1. Protect from all possible damage.
2. Keep shipping containers closed when not in use.
3. Protect materials during storage from moisture, sunlight, excess heat, sparks and flame.
4. Carefully store materials to avoid overloading any building component or structure.
5. Provide adequate ventilation to prevent build-up of dangerous solvent concentrations.
6. Use clean gloves and tools when handling materials. Avoid contamination.
7. Use rolling blocks and suction cups to move glass units not in shipping crates.

1.07 PROJECT CONDITIONS**A. Perform Work only when existing and forecasted weather conditions are within the limits established by manufacturers of the materials and products used.****B. Install sealants only when temperatures are within the recommended range established by sealant manufacturer and never below 40 deg. F.**

1.08 WARRANTIES

- A. Provide written warranties signed by manufacturer and Installer, agreeing to repair or replace Work which exhibits defects in materials or Workmanship for the following periods. "Defects" is defined to include, but is not limited to, leakage of water, abnormal aging or deterioration, failure of hermetic seal in insulating units, edge separation or delamination of laminated glass, peeling, cracking, crazing or other failure of metallic coatings in coated glass, spoiling of mirrors, and failure to meet requirements of Contract Documents. Provide warranty periods standard with manufacturer, but not less than the following:
1. Insulating Glass: 10 years from date of Substantial Completion
 2. Coated Glass: 5 years from date of Substantial Completion
 3. Laminated Glass: 4 years from date of Substantial Completion
 4. Mirror Glass: 10 years from date of Substantial Completion

1.09 MAINTENANCE STOCK

- A. Provide one packaged, wrapped and labeled maintenance stock item for each different type and size of glass used on the project, except single pane clear glass which is not heat treated.

1.10 PRE-INSTALLATION MEETING

- A. The Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 GLASS MATERIALS AND PRODUCTS**

- A. Clear Tempered Glass shall be 1/4 in., Condition A, Type I, Class 1, Quality q3, Kind FT, in accordance with requirements of ASTM C 1036 and C 1048. Tempered glass shall be subjected to quality control measures to minimize inclusions which could result in spontaneous breakage. Such inclusions are defined as a material defect by this specification. Installed tempered glass which experiences spontaneous breakage shall be replaced (material and labor) under the warranty provisions.

2.02 GLAZING TYPES

- A. Glazing types shall be as follows:
1. Type 1: 1/4 in. clear tempered glass

2.03 GLAZING MATERIALS AND PRODUCTS

- A. Provide sealants and gaskets which have performance characteristics suitable for applications intended. Make sure that glazing sealants are compatible with sealants used in insulated glass fabrication, with laminated glass inner layer, and with surfaces to be in contact. Provide colors of sealants and gaskets as selected by Architect from the approved manufacturer's complete selection of standard and premium colors.
- B. Provide sealant compatible with all substrates and materials and having maximum Shore A hardness of 50. Provide products as specified in Section 07 92 00 - Sealants.
- C. Provide non-acid curing sealant having movement range of $\pm 50\%$ when tested according to ASTM C719. Provide products as specified in Section 07 92 00 – Sealants.
- D. Provide preformed butyl-polyisobutylene rubber glazing tape with 100% solids content in extruded tape roll form and complying with AAMA 804.1. Provide one of the following products if they meet or exceed the requirements of these specifications:
1. Protective Treatments 303 or 606
 2. Tremco Pre-shimmed 440

3. Woodmouse Chem-Tape 40

- E. Provide extruded black sponge gaskets and weatherstrips conforming to ASTM C509 with Shore A durometer hardness of 40 +/-5 and 20% to 35% compression. Provide black extruded dense gaskets conforming to ASTM C864 with Shore A durometer hardness of 75 +/-5 for hollow profiles and 60 +/-5 for solid profiles. Provide neoprene outdoor gaskets and neoprene or EPDM indoor gaskets. Injection mold all corners of gaskets where compatible with installation procedures. Design interior and exterior gasket profiles to produce a glass edge pressure of not less than four pounds per linear inch and not more than ten pounds per linear inch.
- F. Provide dense extruded neoprene or silicone setting blocks with a hardness of 85 ±5 Shore A Durometer hardness, a minimum length of 4 in. and a minimum width equal to the glass thickness. Provide materials as recommended and approved by glass and sealant manufacturers. Provide products certified by their manufacturers to be "silicone compatible". Shims used with setting blocks shall be the same material, hardness, length and width as setting blocks.
- G. Provide dense extruded neoprene or silicone side blocks with a hardness of 55 ±5 Shore A Durometer hardness. Provide block with sufficient length to prevent point loading on the glass. Provide materials as recommended and approved by glass and sealant manufacturers. Provide products certified by their manufacturers to be "silicone compatible". Provide silicone side blocks for insulating units with silicone edge seals. Neoprene side blocks are acceptable only if permitted by the insulating glass fabricator.
- H. Provide flexible, resilient polyethylene foam, urethane foam, or extruded silicone sealant backer rods in accordance with the approved sealant and glass manufacturers written requirements.
- I. Provide cleaners, primers and sealers in accordance with the approved sealant and glass manufacturers written requirements.

PART 3 - EXECUTION

3.01 INSPECTION

- A. The Glazing Subcontractor shall examine substrates, supports, and conditions under which this Work is to be performed and notify the General Contractor, in writing, of conditions detrimental to the proper completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected. Beginning Work means Installer accepts substrates and conditions.

3.02 PREPARATION AND GLAZING

- A. All Work of this Section shall comply with requirements of the FGMA *Glazing Manual*, and the approved manufacturer's written instructions and recommendations, except where more restrictive requirements are specified in this Section. Do not glaze when ambient temperature is below 40°F.
 - 1. Inspect all glass before installation. Do not install defective glass.
 - 2. Check glass for correct size and squareness. Adjust frame or glass size to correct as necessary.
 - 3. Protect glass from edge damage. Replace all damaged or weakened glass.
 - 4. Remove coatings which are not firmly bonded to substrates. Remove lacquer, if any.
 - 5. Center glass in opening and provide minimum 1/2 in. glass bite and 1/8 in. minimum edge clearances.
 - 6. Place setting blocks at quarter points and side blocks at upper half of each side.
 - 7. Securely set setting blocks and side blocks in position to prevent displacement.
 - 8. Keep weeps clear.
 - 9. Prevent metal to glass contact. Protect edges of insulating units from solvents and damage.
 - 10. Replace stops and clean and prime stops, framing, and glass on both sides.
 - 11. Cap seal all exterior joints between glazing and framing with clear liquid sealant.
 - 12. Cap seal with a uniform fillet sealant joint having proper bite on both glass and framing.
 - 13. Clean, prime and mask for liquid sealants immediately before sealant application.
 - 14. Apply wet sealant in continuous motion and tool thoroughly to "wet" contact surfaces uniformly.
 - 15. Slope sealant to promote drainage away from glass and sealant.
 - 16. Defer glazing of openings needed for construction operations until directed.

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

June 12, 2019

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

3.03 CLEANING AND PROTECTION

- A. Remove excess sealant and labels from glass surfaces. Clean exposed surfaces using materials and methods recommended by manufacturer of material or product being cleaned. Remove and replace Work that cannot be successfully cleaned. Provide temporary protection to ensure Work being without damage or deterioration at time of final acceptance. Do not apply markers to surfaces of glass. Clean frequently, if necessary, to remove build-up of potentially harmful construction contaminants. Re-clean all glass within one week of final acceptance of the project.
- B. Remove and replace all broken, chipped, cracked, scratched or otherwise damaged glass from whatever cause.

3.04 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and legally disposed daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

June 12, 2019

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SECTION 08 90 00

LOUVERS AND VENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. Aluminum wall louvers, including smoke damper at elevator hoistway
 - 2. Bird and insect screening
 - 3. Install self-adhered air barrier membrane to provide air-tight closure and connection from louvers and vents to air barrier materials at cavity wall and exterior wall construction.
- B. Items to Be Installed Only: Install the following items as furnished by the designated Sections:
 - 1. Section 07 27 26 – Fluid Applied Membrane Air Barriers: Self-Adhered Air Barrier Membrane

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all of the Contract Documents for requirements which effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 – HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. Provide exterior wall louvers whose performance ratings have been determined in compliance with Standard 500 of the Air Movement and Control Association and which bear the AMCA Certified Ratings Seal.
- B. Provide exterior wall louvers which are the products of a single manufacturer. Provide secondary materials which are acceptable to the approved louver manufacturer.
- C. Comply with requirements of the SMACNA *Architectural Sheet Metal Manual* for fabrication, details and installation.
- D. Combination louvers and air shut-off dampers shall comply with requirements of 780 CMR, 9th Edition, Chapter 13, for Air Tight Dampers.

1.05 SUBMITTALS

- A. Submit manufacturer's product data, installation instructions, certified performance data, including a statement demonstrating compliance with specified free air area requirements, and finish specifications. Provide manufacturer certifications demonstrating materials and performance comply with specified requirements.
- B. Provide large scale shop drawings including elevations, details of anchorages, connections, joinery, fasteners, accessory items, and all other relevant information, required for fabrication, installation and erection of the Work of this Section.
- C. Take accurate field measurements prior to preparation of shop drawings and final fabrication so as not to delay job progress.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle all components in accordance with the approved manufacturer's written instructions, except where more stringent requirements are specified in this Section. Use all means necessary to protect materials before, during, and after installation from damage. Materials damaged, as determined by the Architect, shall be repaired or replaced in accordance with requirements of the Contract Documents at no additional cost to the Owner.

1.07 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 EXTERIOR WALL LOUVERS**

- A. Exterior wall louvers shall be Model No. SCH5, as manufactured by Air-o-Lite Louvers, or Architect approved equal by Airline or Greenheck, fabricated in accordance with the following requirements:
 - 1. Frames shall be 5 in. deep, and fabricated of 6063-T5 alloy, .081 in. extruded aluminum. Stationary storm blades shall be fabricated of 6063-T5 alloy, .063 in. extruded aluminum, contained within the frame, and fully welded.
 - 2. Blades shall be stationary storm type, set at 45 degrees and 4 in. on center, providing not less than 50% free area.
 - 3. Provide 3/4 in. square, 0.051 in. expanded and flattened aluminum wire screens, in removable frame finished to match louver, and mounted to the inside face of louvers.
 - 4. Oversized louvers shall be built-up by Louver Installer from factory assembled louver sections, in a manner to provide overall size called for on the Drawings. Louver designs shall limit span between visible mullions to 10 feet, and shall incorporate structural supports to withstand wind loading of 25 lbs per square foot.
 - 5. Provide closed cell PVC compression gaskets between bottom of mullions and jambs and top of sill frame, as may be required to provide leak proof connections.
 - 6. Water penetration shall not exceed 0.10 ounces of water per square foot area at a velocity of 980 FPM when tested for 15 minutes per AMCA Standard 500-L-99, Section 8.3.2.
 - 7. Provide continuous .090 aluminum sill flashings, and .125 aluminum clip angles at louver jambs and head as may be required to provide a complete installation in accordance with requirements of the Contract Documents.
 - 8. Louvers shall bear AMCA Certified Rating Seals for air performance and water penetration ratings.
- B. Provide stainless steel or aluminum fasteners, anchors, and inserts, or as otherwise required to maintain compatibility with material being fastened, and substrate.
- C. Provide 1 in. insulated, high impact, infill panels securely fastened to interior face of wall louvers at locations not required to receive installation of HVAC ductwork. Panels shall be MapeShield, as manufactured by Mapes Architectural Products, or Architect approved equal, complying with the following fabrication requirements:

1. Exterior and interior face sheets shall 26 gauge aluminum with smooth finish laminated to 1/8 in. cement board.
2. Insulating core shall be polyisocyanurate insulation, providing a minimum R-value of 6.13.
3. Lamination process used to construct sandwich panels shall be a permanently elastic type neoprene or rubber base adhesive used under heat and pressure.
4. Panel finish shall be a three coat, thermo-cured, fluorocarbon system, having a minimum 1.2 mil dry film thickness, and containing a minimum of 50% Kynar 500 or Hylar 5000 resin.
5. Color of face sheets shall match surrounding louvers and frames.
6. Dimensional tolerances shall be 1/16 in. for width and length. Panel thickness shall be $\pm 1/16$ in.
7. All panels shall be protected using a peelable protective film applied at the factory during fabrication.

2.02 ELEVATOR HOISTWAY BLOCK VENT AND SMOKE DAMPER

- A. Provide extruded aluminum dual face modular block vents, Model 811 as manufactured by Construction Specialties, Inc., or Architect approved equal. Vents shall be fabricated from 6063-T5 alloy, .125 in. thick, extruded aluminum sections, with 1/4 in. structural ribs, and aluminum wire insect screen mechanically fastened on both faces of the vent. Provide cold applied asphalt mastic to coat all metal surfaces that, when installed, shall be in contact with concrete, masonry, or other dissimilar metals.
- B. Provide elevator hoistway smoke damper, Model SMD-202, as manufactured by Greenheck, or Architect approved equal, complete with 120V actuator and open/closed indicator. Smoke damper shall be tied to the building fire alarm system, and shall remain in a closed position and automatically open upon activation of the fire alarm from a device in the building's fire alarm system, or upon interruption of power to the damper.

2.03 FABRICATION

- A. Field verify size, location, and placement of all exterior wall louvers prior to fabrication. All exterior wall louvers shall be factory assembled to the greatest extent possible. All Work shall be fully welded; straight and true, plumb, level and square, with equal blade spacing from blade to blade and from blade to frame.
- B. Provide Work to sizes, shapes, and profiles indicated on approved shop drawings. Provide all supports, anchors, fasteners and accessories required for a complete installation.
- C. Fabricate Work with uniform, tight joints. Blades shall be joined to each jamb frame and vertical stiffening member with two fillet welds each 1 in. long produced by the Pulsed Gas Metal Arc Welding process (GMAW/MIG) with a minimum .125 in. throat. Frames shall be joined at each corner with a full length GMAW fillet weld with a minimum .125 in. throat. Each weld shall be capable of withstanding a minimum 526 pound shear force. Provide concealed mullions if necessary and space not more than 6 ft. on center, align with window mullions as indicated on drawings.
- D. Provide all sills, extensions and other items to ensure proper drainage to the exterior. Prevent water penetration in excess of limits specified. Sill extension pieces shall be furnished by louver manufacturer and be painted to match louver color.

2.04 FINISHES

- A. All exposed surfaces shall be provided with a three coat, thermo-cured, fluorocarbon system, having a minimum 1.2 mil dry film thickness, and containing a minimum of 50% Kynar 500 or Hylar 5000 resin. Aluminum substrate shall be prepared in accordance with the approved coating manufacturer's written instructions and recommendations. Color shall be as selected by the Architect from the approved manufacturer's complete line of standard and premium colors.
- B. Provide cold applied asphalt mastic required to coat all metal surfaces that, when installed, shall be in contact with concrete, masonry, or other dissimilar metals.

PART 3 - EXECUTION

3.01 INSTALLATION/ERECTION

- A. Installation shall be in accordance with the approved manufacturer's written instructions, except where more restrictive requirements are specified in this Section. The installer shall examine the areas and conditions under which the Work of this Section shall be performed. Notify the General Contractor, in writing, of conditions detrimental to successful completion of the Work. Do not proceed until unsatisfactory conditions have been corrected. Beginning installation of the Work shall indicate acceptance of all areas and conditions by the Installer.
- B. The Work of this Section shall be installed plumb, level, square and in alignment with adjacent Work. Conceal fasteners and connections to the greatest extent possible. No exposed fasteners shall be allowed on finish surfaces of the wall louver visible from the exterior of the building.
- C. All connections and joints shall be made watertight. Leave 1/4 in. gap around the entire perimeter of all exterior wall louvers to allow installation of joint sealant in accordance with requirements of the Contract Documents.
- D. Coordinate installation with all related and adjacent Work required to provide a complete and watertight installation in accordance with requirements of the Contract Documents.
- E. Provide butyl sealant strip between louvers and insulated panels, around the entire louver perimeter, at locations of insulated panels fastened to interior face of exterior wall louvers.

3.02 TOLERANCES

- A. The following allowable installed tolerances are allowable variations from locations and dimensions indicated by the Contract Documents and shall not be added to allowable tolerances indicated for other Work.
 - 1. Allowable Variation from True Plumb: $\pm 1/8$ in. in 20 ft.
 - 2. Allowable Variation from True Level: $\pm 1/8$ in. in 20 ft.
 - 3. Allowable Variation from True Line: $\pm 1/8$ in. in 20 ft.
 - 4. Allowable Variation from True Plane of Adjacent Surfaces: $\pm 1/16$ in.

3.03 CLEANING, TOUCH UP AND PROTECTION

- A. All damage to exposed surfaces shall be repaired in accordance with the approved manufacturer's written instructions prior to final acceptance. Surfaces and components unable to be acceptably repaired, as determined by the Architect, shall be replaced at no additional cost to the Owner.
- B. All exposed surfaces shall be repaired in accordance with the approved manufacturer's written instructions prior to final acceptance.
- C. Provide temporary protection required to ensure Work remains without damage or deterioration at time of final acceptance. Remove protections and re-clean as necessary immediately before final acceptance.

3.04 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris daily and dispose in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 09 22 16

NON-STRUCTURAL METAL FRAMING AND GYPSUM BOARD

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. Metal framing, support systems, and related accessories
 - 2. Gypsum wallboard, abuse-resistant gypsum wallboard, gypsum sheathing, and other related accessories
 - 3. Fiberglass insulation
 - 4. Miscellaneous wood blocking to support other Work
 - 5. Surface finishing of gypsum wallboard in preparation for painting and finishing
 - 6. Grouting of rated metal door frames in metal stud partition systems.
 - 7. Accessories, including fasteners, taping materials, and sealants, necessary for a complete installation
 - 8. Gypsum wallboard assemblies for chases, mechanical equipment noise control enclosures, and other miscellaneous enclosures.
- B. Items to Be Installed Only: Install sleeves for piping and conduit as furnished under the Work of the following Sections and Divisions:
 - 1. Section 22 00 00 - Plumbing
 - 2. Section 23 00 00 - HVAC
 - 3. Section 26 00 00 - Electrical

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design framing, including comprehensive engineering analysis by a qualified professional engineer registered in the state in which the Project occurs, using performance requirements and design criteria indicated.
- B. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design loads in accordance with current building code requirements and the Contract Documents.
 - 2. Deflection limits of framing systems shall withstand design loads within deflections greater than Horizontal deflection of $L/360$ of the wall height under a horizontal load of 5 lbs./sq. ft.
 - 3. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg. F.
 - 4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load, plus superimposed dead load, deflection of primary building structure.
- C. Sound Transmission Performance:
 - 1. Provide gypsum drywall assemblies with a minimum STC value of 47 at Administrative, Guidance, and SPED Suites, when tested in accordance with ASTM E90.

1.05 QUALITY ASSURANCE

- A. Structural Performance for all Interior Work: Limit deflection to $L/360$ for ceramic tile and other rigid finishes; do not exceed $L/240$ for all other finishes. Lateral load is 5 psf.
- B. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, ductility, and metallic-coating thickness.
- C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, *Structural Welding Code—Steel*, and AWS D1.3, *Structural Welding Code—Sheet Steel*.
- D. Anchorage: Coordinate anchorage to concrete and steel with project structural requirements, through the submittal process as specified.
- E. Installation shall be performed by a firm with a minimum of ten-year experience in Work of the type required by this Section. Conduct pre-installation conference at Project site in accordance with requirements of Division 01 and this Section.
 - 1. Provide materials which are the products of one manufacturer for each type of material required for the Work of this Section. Provide secondary accessory materials acceptable to the approved manufacturer of the primary materials and the Architect.
- F. Reference Standards: Comply with applicable requirements of the following:
 - 1. AISI Standard; North American Specification for the Design of Cold-Formed Steel Structural Members
 - 2. AISI Standard for Cold-Formed Steel Framing - General Provisions
 - 3. AISI Standard for Cold-Formed Steel Framing - Truss Design
 - 4. AISI Standard for Cold-Formed Steel Framing - Header Design
 - 5. Terminology Standard: Gypsum Association Publication GA-505, GA-201 and GA -216.
 - 6. American National Standards Institute (ANSI): A108.11, American National Standard for Interior Installation of Cementitious Backer Units.

1.06 TESTS

- A. Where fire-resistance ratings are indicated or required by authorities having jurisdiction, provide materials and construction which are identical to assemblies whose fire-resistance rating has been tested in compliance with ASTM E119 and ASTM E136 by independent agencies acceptable to the Architect and authorities having jurisdiction.

1.07 SUBMITTALS

- A. Submit manufacturers product literature for all items with schedule of use, installation instructions, and recommendations for each material used.
- B. Submit manufacturers certificates demonstrating compliance with applicable code for fire-rated assemblies.
- C. Shop Drawings: Show layout, spacing, sizes, thicknesses, and types of metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work including but not limited to the following items:
 - 1. Details of all unusual conditions in connection with gypsum drywall construction.
 - 2. Proposed locations of control joints that are required but not shown.
 - 3. Locations of access doors occurring in gypsum drywall construction.
 - 4. Details of attachment to primary ceiling supports.
 - 5. Details of rated assemblies with copies of their respective approval
 - 6. Anchorage to concrete and steel for approval by Structural Engineer.
- D. Delegate design submittal for metal framing as indicated to comply with performance requirements and design criteria, including analysis/calculation data bearing the seal and signature of the Professional Engineer registered in the state responsible for their preparation.
- E. Welding certificates.
- F. Qualification data for professional engineer.
- G. Product Test Reports: From a qualified testing agency, unless otherwise stated, indicating that each of the following complies with requirements, based on evaluation of comprehensive tests for current products:
 - 1. Steel sheet
 - 2. Expansion anchors
 - 3. Power-actuated anchors
 - 4. Mechanical fasteners
 - 5. Vertical deflection clips
 - 6. Miscellaneous structural clips and accessories
- H. Samples:
 - 1. One-foot square samples of board materials.
 - 2. One-foot long Sections of all galvanized steel or zinc members and accessories.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products in unopened factory labeled packages. Store and handle in strict compliance with manufacturers ft. instructions and recommendations. Protect from damage. Adequately support stored gypsum panels to avoid sagging. Avoid overloading floor system. Protect metal lath, metal suspension materials and metal accessories from dampness and wetting. Keep plaster and other cementitious materials dry until ready to be used. Store off ground, under cover, and away from sweating walls and other damp surfaces.
- B. Deliver fire-rated materials in original, unopened containers, bearing testing agency label and required fire classification numbers.

1.09 PROJECT CONDITIONS

- A. Perform Work only when existing and forecasted weather conditions are within the limits established by manufacturers of the materials and products used. Comply with requirements of Gypsum Association publication 220.
- B. Proceed with installation of gypsum board products provided under the Work of this Section only when steel framing Work is completed in accordance with installation tolerances specified in ASTM C 754 and this specification Section.
- C. Do not expose gypsum boards or metal accessories to weather during storage.

- D. Comply with the approved manufacturers requirements and Gypsum Association publication 216. Avoid too rapid drying in hot weather.

1.10 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.
- B. Items such as exterior finish assemblies, wall interfacing, expansion joint locations, caulking materials, firesafing applications, mechanical and electrical wall penetration treatment shall be reviewed.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Gypsum Board: Provide products of one of the following manufacturers if they meet or exceed the requirements of these specifications:
 1. United States Gypsum Company
 2. LaFarge
 3. National Gypsum Company
- B. Metal Framing and Support: Provide products of one of the following manufacturers if they meet or exceed the requirements of these specifications:
 1. Clark Dietrich
 2. United States Gypsum Company
 3. MarinoWare

2.02 GYPSUM BOARD MATERIALS

- A. Abuse Resistant Gypsum Wallboard shall be Sheetrock Mold Tough Very High Impact (VHI) Firecode X, as manufactured by United States Gypsum Company or Architect approved equal to provide a Category 3, Heavy Duty assembly. Provide one layer 5/8 in. abuse resistant gypsum board as indicated on the Drawings, except at fire rated partitions and assemblies. Panels shall be a non-combustible combination of gypsum, cellulose fiber, and reinforcing fiber mesh, with paper face, complying with requirements of ASTM C 36 and C 1278, and the following material and performance characteristics:
 1. Thickness: 5/8 in.
 2. Weight: 2.8 lbs./SF
 3. Flame Spread: 5, in accordance with ASTM E 84
 4. Smoke Developed: 0, in accordance with ASTM E 84
 5. Recycled Content: 95%
 6. Mold Resistance: 10, in accordance with ASTM D3273
 7. Abrasion Resistance: Level 2, 0.059 in. in accordance with ASTM C1629
 8. Indentation Resistance: Level 1, 0.15 in. in accordance with ASTM C1629
 9. Soft Body Impact: Level 3, 300 ft./lbs. in accordance with ASTM C1629
 10. Hard Body Impact: Level 3, 150 ft./lbs. in accordance with ASTM C1629
 11. Flexural Strength: 243 ft. lbs., either direction
 12. Edges: Tapered
 13. Ends: Square
- B. Gypsum Wallboard shall be Sheetrock Mold Tough Firecode X, as manufactured by United States Gypsum Company, or Architect approved equal. Panels feature a non-combustible, moisture resistant gypsum core, complying with requirements of ASTM C1396, and the following material and performance characteristics:
 1. Thickness: 5/8 in.
 2. Weight: 2.2 lbs./SF

3. Flame Spread: 15, in accordance with ASTM E 84
4. Smoke Developed: 0, in accordance with ASTM E 84
5. Recycled Content: 100%
6. Edges: Tapered
7. Ends: Tapered

- C. Exterior Sheathing shall be Securock Glass-Mat Sheathing Firecode X, as manufactured by United States Gypsum Company, Dens-Glass Gold by Georgia/Pacific, or Architect approved equal, for installation as exterior wall sheathing. Panels shall be non-combustible and comply with requirements of ASTM C 1396, C931, C 1177, C 1278, and the following material and performance characteristics:

1. Thickness: 5/8 in.
2. Weight: 3 PSF
3. Flame Spread: 0, in accordance with ASTM E 84
4. Smoke Developed: 5, in accordance with ASTM E 84
5. Mold Resistance: 10, in accordance with ASTM D 3273-00
6. Flexural Strength: 189 ft. lbs.
7. Edges: Square

2.03 METAL FRAMING AND SUPPORTS

- A. Provide steel studs, runners, furring, and channels, hot dip galvanized, in accordance with ASTM A 653 and C 645, as follows:
1. Depth shall be as indicated on the Drawings, including but not limited to, 3-5/8 in., 6 in., and 8 in.
 2. Gauge shall be 25 EO, 0.15 in. bare metal; 0.034 in. dimple to dimple, unless otherwise required by the approved manufacturer to comply with conditions, spans and deflection constraints indicated. Provide 20 DW gauge EO, .025 in. bare metal; .055 in. dimple to dimple studs for walls supporting rigid finishes, including but not limited to, fiber cement panels, ceramic tile, and silicone treated, fiberglass reinforced, gypsum board at exterior walls. Provide 16 DW gauge EO, 0.025 in. bare metal; 0.055 in. dimple to dimple studs for exterior framing at soffits, fascia, and mansards, unless otherwise noted or required.
 3. Runner channel shall match stud type as recommended by the approved stud manufacturer.
 4. Provide 25 gauge, G60 galvanized furring in accordance with ASTM A 653 and C 645, and 20 gauges where spans exceed 4 ft. Furring shall be hat shaped or Z-shaped necessary to complete the Work. Where indicated as resilient, provide special sound transmission reducing type, USG RC-1, or Architect approved equal.
 5. Hanger Wire shall be 9 gauges, soft temper, Class 1, galvanized, complying with ASTM A 641.
- B. Provide 1/2 in. thick, 60-durometer rubber isolator bushing, Kinetics Model KAI-S, as manufactured by Kinetics Noise Control, Inc., or Architect approved equal. Unit shall prevent any rigid contact of the anchor to the base and/or top plate of the stud wall.
- C. Provide 1/2 in. thick bearing pad, Model Wallmat, as manufactured by Kinetics Noise Control, Inc., or Architect approved equal. Pad shall be designed to carry continuous loads up to 25-psi without excessive creep or pad failure. Pad deflection shall be 0.175 in. (4-mm) at maximum rated load.

2.04 METAL TRIMS AND ACCESSORIES

- A. Provide galvanized steel trim units for interior Work at all areas subject to high humidity, including locker rooms, shower rooms, and kitchen. Provide the following trim and accessory types as manufactured by United States Gypsum, or Architect approved equals from a specified manufacturer:
1. Corner Bead: USG No. 103, 1-1/4 in.x1-1/4 in., or Architect approved equal
 2. Control Joint: USG No. 093, 1/4 in. wide by 7/16 in. deep opening, or Architect approved equal
 3. Edge Trim: USG No. 801-A and 801-B, or Architect approved equal
- B. Channels:
1. Furring channels shall be USG No. DWC-25 and DWC-20, or Architect approved equal
 2. Resilient furring channels shall be USG No. RC-1, or Architect approved equal

3. Cold rolled channels shall be 16 gauges, galvanized steel, as manufactured by USG, or Architect approved equal

2.05 JOINT MATERIALS

- A. Joint Compound shall be Durabond, as manufactured by USG, or Architect approved equal, at areas to receive abuse resistant gypsum wall panels. Provide water resistant compound, USG Sheetrock Brand W/R, or Architect approved equal, at locations of water, mold, and moisture resistant gypsum wall panels.
- B. Joint tape shall be non-perforated paper tape, complying with requirements of ASTM C 475.
- C. Provide Sheetrock Brand, Tuff-Hide Primer-Surfacer, as manufactured by United States Gypsum, or Architect approved equal, at locations of abuse resistant gypsum wall panels, to provide a Level 4 finish.

2.06 FIBERGLASS INSULATION

- A. Fiberglass insulation at interior partitions and other locations as indicated on the Drawings, including exterior soffits and fascias framed under the work of this Section, shall be Type I, un-faced, inorganic fiber blankets, complying with ASTM C 665, with the following features and characteristics:
 1. Thickness: 3-1/2 in., 6 in., or as otherwise required to fill cavity.
 2. Flame Spread: 10; in accordance with ASTM E84
 3. Smoke Developed: 0; in accordance with ASTM E84
 4. Combustion Characteristics: Passes ASTM E 136.
 5. Fire Resistance Ratings: Passes ASTM E 119 as part of a complete fire tested wall assembly.
 6. Dimensional Stability: Linear Shrinkage less than 0.1%
 7. Recycled Content: 30% post-consumer

2.07 MISCELLANEOUS MATERIALS

- A. Acoustical sealant shall be non-drying, non-hardening, non-bleeding, non-staining sealant complying with ASTM C 834 and C 919, USG Acoustical Sealant, or Architect approved equal by Pecora or Tremco.
- B. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035 or ASTM A 780.
 1. Provide interior, field-applied paint with a VOC content of 250 g/L or less, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Nonmetallic, Non-shrink Grout: Premixed, nonmetallic, noncorrosive, non-staining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107, with fluid consistency and 30-minute working time.
- D. Shims: Load bearing, high-density multi-monomer plastic, non-leaching.
- E. Laminating adhesive shall be as recommended by the approved gypsum board manufacturer.
- F. Fasteners shall be Type S, bugle head, for attaching gypsum panels to steel framing. Fasteners for fiber cement panels attached to steel framing shall be corrosion resistant, Hi-Lo, S-12, bugle head screws. Provide wafer head, *Climaseal* coated, Type S-12 self-drilling screws for attaching silicone treated sheathing to steel framing. Provide stainless steel fasteners for all fasteners in wet or humid areas, including but not limited to, exterior assemblies, toilet rooms, shower rooms, locker rooms, and kitchen. Provide other types in accordance with requirements of the approved gypsum board or fiber cement board manufacturer. All fasteners shall provide a minimum of 3/4 in. penetration through steel framing.
- G. Provide screws, bolts, powder actuated fasteners, inserts and other fasteners that are customarily used in standard construction practices and which are proven capable of supporting at least 3 times design load.
- H. Grout for metal door frames shall be Structo-Base Gypsum plaster, as manufactured by U. S. Gypsum or Architect approved equal, complying with ASTM C 28 and C 472.
- I. Provide rigid vinyl trim at locations where gypsum board edge is exposed or abutting dissimilar materials, except at all areas of interior Work subject to high humidity, including locker rooms, shower rooms, and kitchen. Trim shapes shall be RP-2, RP-4, and RP-46, as manufactured by USG, or Architect approved equal.

- J. Provide the approved manufacturers joint sealing tape for sealing of all horizontal and vertical joints in silicone treated gypsum sheathing.

PART 3 - EXECUTION

3.01 INSPECTION

- A. The Installer/Erector shall examine substrates, supports, and conditions under which this Work is to be performed and notify General Contractor, in writing, of conditions detrimental to the proper completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected. Beginning Work means Installer accepts substrates and conditions.

3.02 INSTALLATION OF GYPSUM BOARD AND RELATED PRODUCTS

- A. Strictly comply with the approved manufacturers written instructions and recommendations, except where more restrictive requirements are specified in this Section.
- B. Framing:
1. Install and erect framing in accordance with requirements of ASTM C 754. Provide framing to comply with published details and recommendations of the approved manufacturer, and the Gypsum Construction Handbook, as published by USG.
 - a. Framing shall not bridge building construction or control joints; frame separately on both sides and allow for movement.
 - b. Isolate framing system from structural loading both horizontally and vertically.
 - c. Provide slip or cushioned joints at top of walls. Maintain lateral stability and acoustical performance.
 - d. All partitions, including framing and wallboard, shall be terminated at structural deck above, except as noted otherwise.
 - e. Space framing members at 16 in. o. c., unless indicated otherwise, or as otherwise required to meet specified deflection requirements.
 - f. Cut metal studs 1/2 in. short of top track.
- C. Secure ceiling framing to structure above using hangers and fasteners capable of supporting at least 3 times actual loads.
- D. Installation of gypsum board and all related materials shall be in strict compliance with requirements of ASTM C 840 and Gypsum Association Publication No. 216, *Recommended Specifications for the Application and Finishing of Gypsum Board*, and the following:
1. Locate joints between boards as far from center of walls and ceilings as possible
 2. Stagger vertical joints on opposite sides of walls and in multiple layer Work
 3. Install gypsum and related board materials with face side out and with joints over framing members
 4. Do not butt dissimilar board edges
 5. Cover both faces of stud partitions, except at chase walls
 6. Attach boards to framing with self-tapping, bugle head screws or fasteners recommended by manufacturer
 7. Space fasteners as recommended by manufacturer
 8. Install drywall ceilings prior to gypsum board walls
 - a. Provide two layers of gypsum board at selected ceilings as indicated on the Drawings for sound reduction.
 9. Provide water, mold, and mildew resistant interior wall panels at all Toilet Rooms and Locker Rooms
 10. Provide abuse resistant panels at all interior gypsum board partitions, as indicated on the Drawings
 11. Provide water and mold resistant exterior wall sheathing panels at all exterior wall assemblies, soffits and overhangs as called for on the Drawings
 12. In multiple layer walls, provide backing board or multiple layers of face board
 13. Form control joints by preparing space between edges to receive metal control joint trim
 14. Do not use tapered edges at doors, windows, or casing beads

- E. Provide all additional supplemental framing at openings in walls and ceilings as may be required to comply with written requirements of the approved manufacturer, and the *Gypsum Construction Handbook*, as published by USG.
- F. Fiberglass insulation at all interior and exterior locations shall be friction fit into spaces between LGMF, including wall cavities, soffits, fascia, and other voids. Fit insulation closely around openings and penetrations. Provide supplemental stick-clips as needed to hold insulation in cavities and prevent falling.
- G. Provide continuous bead of acoustical sealant at both faces of bottom runners, perimeters, openings, expansion and control joints. Close off all sound flanking paths and openings, including those above ceilings.
 - 1. Installation of acoustical insulation and sealant to seal tightly and completely around penetrating objects through non-fire rated gypsum drywall, including but not limited to, HVAC duct, fire protection piping, and electrical conduit, shall be provided under the Work of Section 07 92 00 – Joint Sealants.
- H. Strictly comply with manufacturer's instructions and recommendations for installation of metal trims and accessories. Meet installation tolerance requirements.
 - 1. Provide corner bead trim at all external corners. Provide joint reinforcing tape at all internal corners.
 - 2. Provide control joints where shown, or not less than 30 ft. O.C., at locations approved by the Architect.
 - 3. Provide edge trim wherever edge of gypsum board is exposed, revealed, sealant filled, abutting dissimilar materials.
 - 4. Provide galvanized trim accessories at all Toilets.
- I. Provide 3 coats joint compound treatment at all joints, flanges of trim accessories, penetrations, fastener heads and surface defects. Provide Level 4 finish at all interior areas to receive gypsum wall panels, and prior to application of primer/surfacers at locations of abuse resistant gypsum wall panels.
 - 1. Extend joint finishing to floor behind wall base to provide a smooth flat surface for installation of wall base.
 - 2. For water-resistant board applications, use special water-resistant joint compound to seal joints, cover fastener heads, fill surface defects and seal cut edges.
- J. Fully grout metal door frames located in metal stud partitions that are rated wall assemblies. Mix grout to a thick, workable mix and completely fill heads and jambs. Rake out joints along back bend of door frame to depth of back edge of anchors. Width of raked joint shall be of sufficient size so that gypsum panels can be installed behind back bend of frame. Provide a fully grouted frame on site, which shall act as a prototype for the installation of all frames for the project. Such a prototype shall be approved by the Architect prior to the installation of any door frames in metal stud partitions.
- K. Install joint sealant tape at all horizontal and vertical joints located in silicone treated gypsum sheathing at exterior walls in accordance with the approved manufacturers written instructions.
- L. Provide prefabricated suspended acoustic panels at Auditorium, Band Room, Music/Choral Room, and as indicated on the Drawings.

3.03 TOLERANCES

- A. The following installed tolerances for gypsum drywall are allowable variations from locations and dimensions indicated by the Contract Documents and shall not be added to allowable tolerances indicated for other Work.
 - 1. Allowable Variation from True Plumb, Level, & Line: $\pm 1/8$ in. in 20 ft.-0 in.
- B. After finishing joints and screw heads shall be flush and invisible. Surfaces shall appear flush, smooth, seamless and uniform. Planes shall be flat. Corners shall be crisp and at true angles. Where gypsum drywall contact dissimilar materials, joints shall be tight and shall be accurately scribed to adjacent construction without gaps.

3.04 ADJUSTING, CLEANING, AND PROTECTION

- A. Cut, patch, repair and point Work as needed to accommodate other Work and to repair cracks and defective surfaces. Eliminate blisters, check cracking, dried out spots and all other defects and problem areas. Repair minor damage to eliminate all evidence of repair. Leave Work including trims and accessories ready for finishing.
- B. Clean adjacent surfaces using non-abrasive materials and methods to make adjacent Work in "as-found" condition, undamaged by plaster operations. Remove and replace Work that cannot be successfully cleaned or repaired.

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- C. Provide temporary protection to ensure completed Work is without damage or deterioration at time of final acceptance. Remove protections and re-clean as necessary immediately before final acceptance.

3.05 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris daily and dispose in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

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SECTION 09 51 13

ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. Acoustic ceiling tiles
 - 2. Suspension system for acoustic tiles and drywall ceilings
 - 3. Accessory components

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 SUBMITTALS

- C. Provide manufacturer product data for each product indicated
- D. Provide product samples as follows:
 - 1. 6 in. x 6 in. for each color and texture of acoustical tile
 - 2. 12 in. long for each suspension system member and each exposed molding and trim
- E. Provide manufacturer product test reports demonstrating compliance with specified requirements.
- F. Provide manufacturer research and evaluation reports demonstrating compliance with specified requirements.
- G. Provide manufacturer maintenance data.

1.05 QUALITY ASSURANCE

- A. Tolerances:
 - 1. Deflection:
 - a. Maximum deflection shall be 1/360 of the span in accordance with ASTM C 635
 - b. Finished ceiling system shall be level within 1/8 in. in 12 ft.
- B. Fire-Test-Response Characteristics:
 - 1. Provide acoustical tile ceiling assemblies identical to those of assemblies tested for compliance with fire resistance ratings in accordance with ASTM E119 by an independent testing agency acceptable to authorities having jurisdiction.
 - a. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
 - b. Acoustical tiles shall be Class A, when tested in accordance with ASTM E1264
- C. Seismic Standard:
 - 1. Acoustical tile ceiling assemblies shall be installed in accordance with ASTM E580-96 and as otherwise required by local authorities having jurisdiction.
- D. Before beginning primary Work of this Section, provide minimum 100 square foot mock-ups of each ceiling system specified at locations acceptable to Architect and obtain Architect's acceptance of visual qualities. Protect and maintain acceptable mock-ups throughout the Work of this Section to serve as criteria for acceptance of this Work. Acceptable mock-ups may be incorporated into the finished Work.

1.06 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Provide quantity of full-size units equal to five percent of quantity installed, but not less than three new, unopened boxes for each color and texture of acoustical tile ceiling.
 - 2. Provide the following quantity of each concealed grid and exposed component:
 - a. Main Tees: 25 pieces
 - b. Cross Tees: 150 pieces
 - c. Wall Molding: 50 pieces

1.07 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 GENERAL**

- A. Acoustical ceiling tile and acoustical ceiling suspension systems shall be products of the same manufacturer.
- B. Acoustical ceiling tile and acoustical ceiling suspension systems shall comply with the following minimum test requirements:
 - 1. ASTM E1264; Standard Test Method for Sound Absorption and Sound Attenuation by the Reverberation Room Method
 - 2. ASTM C635; Standard Specification for Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings
 - 3. ASTM C423; Standard Test Method for Sound Absorption by Reverberation Room Method
 - 4. ASTM E1414; Standard Test Method for Airborne Sound Attenuation Between Rooms
 - 5. ASTM E1111; Standard Test Method for Measuring the Attenuation of Open Office

6. ASTM E1477; Standard Test Method for Luminous Reflectance Factor of Acoustical Materials
7. ASTM D3273; Standard Test Method for Resistance to Growth of Mold on Surface of Interior Coatings
- C. Attachment devices shall be sized for five (5) times the design load indicated in ASTM C635, Table 1, in Direct Hung – Intermediate Duty, in. unless otherwise indicated.
 1. Anchors in concrete shall be fabricated from corrosion-resistant materials with the capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing per ASTM E488.
- D. Hanger wire shall be 12 GA, zinc-coated carbon-steel wire, soft temper, pre-stretched, in accordance with requirements of ASTM A 641.
- E. Seismic struts and clips shall be the approved manufacturer's standard struts and clips in compliance with the requirements of this specification.

2.02 ACOUSTICAL CEILING TYPES

- A. Type 1.1a
 1. Size: 24 in. x 48 in. x 3/4 in.
 2. Grid Face: 9/16 in., White
 3. Edge Profile: beveled or angled tegular
 4. Perimeter Trim: shadow molding, white
 5. Surface Texture: fine
 6. Surface Finish: factory applied latex paint
 7. ASTM E1264: Type IV, Form 2, Pattern E
 8. Content: Mineral Fiber
 9. NRC Range: .70 min.
 10. CAC: 35 min.
 11. Light Reflectance: .85 min.
 12. Recycled Content: 70% min.
 13. Color: White
 14. Sag Resistant yes
 15. Antimicrobial yes
 16. Acceptable Products:
 - a. Armstrong Ultima No.1915
 - b. Certainteed

2.03 ACOUSTICAL TILE SUSPENSION SYSTEMS

- A. Suspension components shall be as provided by the approved acoustic tile ceiling manufacturer, compatible with the specified acoustic tile, and required to provide a 30-year full system warranty by the approved manufacturer.
 1. Provide 9/16 in. Suprafine XL Exposed Tee Systems, complete with main tee's, cross tee's, as manufactured by Armstrong, Donn Centricitee DXT by USG, or Architect approved equal by Certainteed.
 2. Provide 9/16 in. with 1/4 in. reveal, Suprafine Shadow molding, as manufactured by Armstrong, or Architect approved equal by USG or Certainteed.
 3. Provide 15/16 in. Prelude XL Exposed Tee System, complete with main tee's, cross tee's, as manufactured by Armstrong, Donn DX/DXL by USG, or Architect approved equal by Certainteed.
 4. Provide 15/16 in. Prelude Plus XL Fireguard, HD 8201, complete with main tee's, cross tee's, as manufactured by Armstrong, Donn DX/DXL by USG, or Architect approved equal by Certainteed.
 5. Provide hold down clips at all vestibules and, in accordance with requirements of the approved manufacturer's written requirements.
 6. Recycled Content: 30% Pre-Consumer

2.04 DRYWALL SUSPENSION SYSTEM AND TRANSITION

- A. Drywall suspension system shall be commercial quality hot-dipped galvanized steel as provided by the approved acoustic tile ceiling manufacturer, and required to provide a 30-year full system warranty by the approved manufacturer.
 - 1. Provide 1 1/2 in. x 12 ft. HD drywall main beam, HD8906, as manufactured by Armstrong, or Architect approved equal by USG and Certainteed.
 - 2. Provide 1 1/2 in. x 6 ft. drywall cross tee, XL8965, as manufactured by Armstrong, or Architect approved equal by USG and Certainteed.
 - 3. Provide 1 1/2 in. x 10 ft. wall molding, KAM 1510 as manufactured by Armstrong.
 - 4. Provide hangar wire, class 1 zinc coating, soft temper, pre-stretch, with a yield stress load three times the design load, but not less than 12 gauge.

PART 3 – EXECUTION**3.01 INSTALLATION**

- A. Install acoustical tile ceilings and exposed tee suspension system in accordance with the approved manufacturer's written instructions and requirements of the Contract Documents.
- B. The Ceiling Subcontractor shall measure each ceiling area and establish layout of acoustical tiles to establish equal width border units at opposite edges of each ceiling. Use of less-than-half-width tiles at borders shall be reason for rejection. At 2 ft. x 2 ft. perimeters, the Ceiling Subcontractor shall provide filed cut 2 ft. x 4 ft. panel to avoid slivers smaller than 6 in. At 2 ft. x 4 ft. perimeters, the Ceiling Subcontractor to provide filed cut 2 ft. x 5 ft. panel to avoid slivers smaller than 6 in.
- C. Hangers:
 - 1. Provide maximum spacing of 4 ft. on center in each direction and 6 in. from each end of main runners
 - 2. Provide one wire hanger at each corner of recessed light fixtures
 - 3. Hanger wire shall not be splayed more than 4 in. in 4 ft. vertical drop
 - 4. Wrap each end of hanger wire around itself a minimum of three times
- D. Edge moldings and trim:
 - 1. Install at all intersections of acoustical tile ceiling and vertical surfaces.
 - 2. Screw attach edge molding to substrate with concealed fasteners at intervals not more than 16 in. O.C. and not more than 3 in. from ends.
 - 3. Miter corners accurately and connect securely with color matched rivets. Install suspension system runners so they are square and securely interlocked with one another.
 - 4. Remove and replace dented, bent, or kinked members.
- E. Install acoustical tiles in coordination with suspension system and exposed moldings and trim. Scribe and cut tile, including dado cut at cut edges of tegular tile, for accurate fit at borders and around penetrations through tile. Install tiles with pattern running in one direction. Replace all damaged or discolored tiles directed by Architect and/or Owner.

3.02 REPAIR, CLEANING AND PROTECTION

- A. Repair minor damage to eliminate all evidence of repair. Remove and replace Work which cannot be satisfactorily repaired. Leave Work free of broken, cracked, or otherwise damaged tile.
- B. Remove and legally dispose off-site daily, all rubbish and debris caused by the Work of this Section.
- C. Broom clean all areas.
- D. Provide temporary protection to ensure new Work is conveyed to Owner without damage or deterioration at time of final acceptance.

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3.03 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

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SECTION 09 65 13

RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. Resilient base
 - 2. Transition and reducer strips
 - 3. Adhesives

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. Provide each type of accessory as produced by a single manufacturer, including recommended primers, adhesives, sealants, and leveling compounds. Manufacturer of resilient flooring materials shall have a minimum of 10 years in the production and sale of types of flooring materials required for this project and be able to reference successful projects of similar magnitude and scope.
- B. Installer shall employ personnel certified and trained by the approved manufacturer, with technical qualifications and facilities required to complete the Work of this Section in accordance with the Contract Documents.

1.05 SUBMITTALS

- A. Submit complete line of manufacturer's standard and premium samples showing complete range of colors, textures, and finishes available for each material used.

- B. Submit three full size samples of each material that is to be used in the finished Work having a minimum area of 144 square inches. Provide 6 in. lengths of base and trim pieces.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products to project site in the approved manufacturer's original, unopened containers with labels indicating brand names, colors, patterns, and quality designations, legible and intact. Store and handle in strict compliance with the approved manufacturer's written instructions. Protect from damage.
- B. Store flooring, adhesives, and accessories in original containers at not less than 70° F for not less than 48 hours immediately prior to installation.

1.07 PROJECT CONDITIONS, SEQUENCING AND SCHEDULING

- A. Maintain a minimum temperature of 60 deg. F and a maximum temperature of 75 deg. F in the spaces to receive accessories for a minimum of 48 hours before, during, and after installation. Thereafter, maintain a minimum temperature of 55 deg. F in areas where Work has been completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating fixtures and appliances.
- B. Proceed with Work only when substrate construction and penetrating Work is complete. Perform the Work of this Section after other finishing operations, including painting, have been completed.
- C. Comply with the approved manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting installation of the Work of this Section. Evaluate slab condition, including slab moisture and pH content and extent of repairs required, if any. Concrete to receive resilient flooring shall have cured for at least 28 days and be free of all curing compounds. Test concrete substrate to determine acceptable moisture levels prior to installation. Testing should be conducted in accordance with requirements of ASTM F 2170 for determining relative humidity in concrete slabs using in situ probes. Coordinate Work of this Section with Work of Section 03 30 00 – Cast-in-Place Concrete, to ensure that concrete curing compounds used do not interfere with adhesion of resilient flooring. The Resilient Flooring Subcontractor shall conduct and pay for all testing, by an independent agency, of substrates designated to receive resilient flooring, necessary to comply with the approved manufacturer's minimum relative humidity level requirements.

1.08 EXTRA MATERIAL

- A. Provide factory packaged, wrapped, and labeled, maintenance stock equal to 2 percent of the actual quantity of each type and color of flooring and stair tread/riser installed, and 2 percent of the actual quantity of each type and color of trim and base installed.

1.09 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 RESILIENT BASE AND ACCESSORIES**

- A. Resilient base shall be solid color rubber, as manufactured by Armstrong, or Architect approved equal by Johnsonite, BurkeMercer, or Flexco, complying with the following material and performance characteristics:
 - 1. Type TP rubber Group 1, in accordance with requirements of ASTM F 1861
 - 2. Dimensions shall be 4 in. high and 6 in. high x .125 in. thick x 100 ft. rolls. Provide 6 in. high base at corridors.
 - 3. Corners shall be factory formed interior and exterior
 - 4. Finish shall be matte

- B. Provide CRS Series by Johnsonite, or Architect approved equal, standard rubber, tapered profile, edge reducer strips or transitions strips necessary to provide smooth, uninterrupted transition from resilient flooring to adjacent dissimilar flooring materials.
- C. Provide leveling compound, concrete primers, and waterproof adhesives necessary to comply with the approved manufacturer's written instructions for installation of resilient flooring and base, trim and accessories.
- D. Provide a minimum of eight colors, as selected by the Architect from the approved manufacturer's complete selection of standard and premium colors for all base, reducers, and transitions.

PART 3 - EXECUTION**3.01 INSPECTION**

- A. The Resilient Flooring Subcontractor shall examine substrates and conditions under which this Work is to be performed and notify General Contractor, in writing, of conditions detrimental to the proper completion of the Work. Beginning Work means Installer accepts substrates and conditions.

3.02 PREPARATION

- A. Strictly comply with the approved manufacturer's written installation instructions, except where more restrictive requirements are specified in this Section.
- B. Vacuum clean subfloors immediately before installation.
- C. Check substrate tolerances and fill holes, depressions and cracks with leveling compound. Correct deficiencies in accordance with requirements of the Contract Documents to create a level substrate in true plane.
- D. Perform moisture, alkalinity, and bond tests on concrete substrates to determine surfaces to receive resilient flooring are cured and dry in accordance with moisture and alkalinity limits established by the approved resilient flooring manufacturer.
 - 1. Repair substrate cracks in accordance with the approved water vapor reduction and alkalinity control system and resilient flooring manufacturers' written requirements.
- E. Apply the approved manufacturer's required primer prior to application of adhesive, to comply with the approved manufacturer's requirements for porous or powdery subfloors.

3.03 APPLICATION OF ADHESIVES

- A. Mix and apply adhesive in accordance with the approved manufacturer's most stringent written instructions. Provide safety precautions during mixing and application as recommended by adhesive manufacturer.
- B. Apply adhesives with notched trowel or other suitable tool uniformly over surfaces in accordance with the following minimum criteria:
 - 1. Cover only that amount of area which can be covered by accessory material within the recommended Working time of the adhesive.
 - 2. Remove any adhesive which dries or films over
 - 3. Do not soil walls, bases, or adjacent areas with adhesives
 - 4. Promptly remove any spillage
 - 5. Clean trowel and rework notches to insure proper application of adhesive.

3.04 INSTALLATION OF RESILIENT BASE AND ACCESSORIES

- A. Fit material neatly and tightly into breaks and recesses, including at toe kick of all wood casework, around pipes and penetrations, under saddles or thresholds, and around permanent cabinets and equipment.
- B. Installation of resilient base and accessories shall be in accordance with the approved manufacturer's written requirements

- C. Base Components: Adhere base to walls, columns, casework, including toe kicks, and all other permanent surfaces and fixtures. Tightly bond all components to substrates encountered. Base shall be installed from rolls to minimize seams. Apply base with 100% coverage of adhesive and hand roll to ensure full contact and adhesion to eliminate any gaps between wall and base. Form internal and external corners using pre-molded corners for cove base, and back scoring and bending sufficient length around corner for straight base. Scribe base accurately to abutting materials.

- 1. Top edge of base adhered to irregular wall surfaces, including but not limited to CMU, shall be filled with sealant to eliminate visible gaps. Sealant color shall be as selected by the Architect to match base color.

3.05 CLEANING AND PROTECTION

- A. Repair minor damage to eliminate all evidence of repair. Clean exposed surfaces using materials and methods recommended by manufacturer of material or product being cleaned. Remove excess adhesives immediately. Remove and replace Work that cannot be successfully repaired or cleaned.
- B. Prohibit traffic over newly installed flooring for at least 48 hours. Provide temporary protection to ensure Work being without damage or deterioration at time of final acceptance. Remove protections and clean immediately before final acceptance.

3.06 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 09 65 16

RESILIENT FLOORING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. Vinyl composition tile
 - 2. Adhesives
 - 3. Initial cleaning, sealing, and polishing of all flooring installed under the Work of this Section

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following Divisions:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. Provide each type of resilient flooring and accessories as produced by a single manufacturer, including recommended primers, adhesives, sealants, and leveling compounds. Manufacturer of resilient flooring materials shall have a minimum of 10 years in the production and sale of types of flooring materials required for this project and be able to reference successful projects of similar magnitude and scope.
- B. Installer shall employ personnel certified and trained by the approved manufacturer, with technical qualifications and facilities required to complete the Work of this Section in accordance with the Contract Documents.

1.05 SUBMITTALS

- A. Submit complete line of manufacturer's standard and premium samples showing complete range of colors, textures, and finishes available for each material used.

- B. Submit three full size samples of each material that is to be used in the finished Work having a minimum area of 144 square inches. Provide 6 in. lengths of base and trim pieces.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products to project site in the approved manufacturer's original, unopened containers with labels indicating brand names, colors, patterns, and quality designations, legible and intact. Store and handle in strict compliance with the approved manufacturer's written instructions. Protect from damage.
- B. Store flooring, adhesives, and accessories in original containers at not less than 70 deg. F for not less than 48 hours immediately prior to installation.

1.07 PROJECT CONDITIONS, SEQUENCING AND SCHEDULING

- A. Maintain a minimum temperature of 60 deg. F and a maximum temperature of 75 deg. F in the spaces to receive flooring and accessories for a minimum of 48 hours before, during, and after installation. Thereafter, maintain a minimum temperature of 55 deg. F (13 deg. C) in areas where Work has been completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating fixtures and appliances.
- B. Proceed with Work only when substrate construction and penetrating Work is complete. Perform the Work of this Section after other finishing operations, including painting, have been completed.
- C. Comply with the approved manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting installation of the Work of this Section. Evaluate slab condition, including slab moisture and pH content and extent of repairs required, if any. Concrete to receive resilient flooring shall have cured for at least 28 days and be free of all curing compounds. Test concrete substrate to determine acceptable moisture levels prior to installation. Testing should be conducted in accordance with requirements of ASTM F 2170 for determining relative humidity in concrete slabs using in situ probes. Coordinate Work of this Section with Work of Section 03 30 00 – Cast-in-Place Concrete, to ensure that concrete curing compounds used do not interfere with adhesion of resilient flooring.

1.08 EXTRA MATERIAL

- A. Provide factory packaged, wrapped, and labeled, maintenance stock equal to 2 percent of the actual quantity of each type and color of flooring and stair tread/riser installed, and 2 percent of the actual quantity of each type and color of trim and base installed.

1.09 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 RESILIENT FLOOR TILE**

- A. Vinyl composition tile (VCT) shall be Standard Excelon Imperial Texture and Multi-colors, as manufactured by Armstrong, or Architect approved equal by Tarkett or Mannington.
- B. VCT shall be composed of polyvinyl chloride resin binder, plasticizers, fillers, and pigments, with colors and texture dispersed uniformly throughout its thickness, and complying with the following minimum requirements:
 - 1. Type 2, through pattern and color, in accordance with requirements of ASTM F 1066
 - 2. Dimensions shall be 12 in. x 12 in. x .125 in.
 - 3. Minimum density shall be 75 PSI in accordance with requirements of ASTM F 970
 - 4. Slip resistance shall be equal to or greater than 0.6, ADA compliant, per ASTM D 2047
 - 5. Environmental Product Declaration No.: EPD-0001

6. Recycled Content: 1 % Pre-Consumer
- C. Provide resilient flooring and base materials that are “through pattern” and uniform in thickness and size. Color variations in tile with variegated patterns shall be kept to a minimum. Edges shall be cut accurately and square. Colors shall be as selected by the Architect from the approved manufacturer’s complete selection of standard and premium colors. The manufacturer’s standard product line shall provide a minimum of sixty different colors for selection by the Architect. Resilient flooring patterns shall be comprised of a minimum of 30 percent field tile and 70 percent accent tile. A minimum of twelve colors, two field colors and a maximum of 10 accent colors, shall be selected.
- D. Provide the approved manufacturer’s non-slip resilient floor tile at Platform ramp.
- E. VCT flooring adhesive shall be premium clear, thin-spread, Ultrabond ECO 711 as manufactured by MAPEI or Architect approved equal. Adhesive shall have high moisture resistance up to 8 lbs. in MVER, and to comply with the following performance characteristics:
- | | |
|---------------------------|--|
| 1. Polymer Type: | SBR emulsion solution |
| 2. Percent Solids: | 60% to 65% |
| 3. VOC: | 11 g/L (Rule # 1168 of California’s SCAQMD) |
| 4. pH: | 9 to 10 |
| 5. Trowelability: | Light, easy |
| 6. Density: | 8.9 lbs. per U.S. gal. |
| 7. Consistency: | Creamy |
| 8. Color: | Off-white |
| 9. Shelf Life: | 2 years when stored in original packaging at 73°F |
| 10. Storage Conditions: | 40°F to 100°F |
| 11. Flash Point (Tag): | >212°F |
| 12. Protect from traffic: | 24 hours for light traffic; 48 hours for heavy traffic |

PART 3 - EXECUTION

3.01 INSPECTION

- A. The Resilient Flooring Subcontractor shall examine substrates and conditions under which this Work is to be performed and notify General Contractor, in writing, of conditions detrimental to the proper completion of the Work. Beginning Work means Installer accepts substrates and conditions.

3.02 PREPARATION

- A. Vacuum clean subfloors immediately before installation.
- B. Check subfloor tolerances and fill holes, depressions and cracks with leveling compound. Scrape, grind, or sand down ridges and irregularities to create a level substrate in true plane.
- C. Perform moisture, alkalinity, and bond tests on concrete substrates to determine surfaces to receive resilient flooring are cured and dry in accordance with moisture and alkalinity limits established by the approved resilient flooring manufacturer. Resilient flooring shall include, but not be limited to, vinyl composition tile.
1. Repair substrate cracks in accordance with the approved water vapor reduction and alkalinity control system and resilient flooring manufacturers’ written requirements.
 2. Randomly adhere 3 ft. x 3 ft. panels of the approved flooring materials 50 ft. apart throughout areas to receive resilient flooring. Install test panels with the approved manufacturer’s required adhesive. If panels are not securely bonded after 72 hours, reclean substrates and repeat test until adequate bond is achieved.
- D. Apply the approved manufacturer’s required primer prior to application of adhesive to comply with the approved manufacturer’s requirements for porous or powdery subfloors.

3.03 APPLICATION OF ADHESIVES

- A. Mix and apply adhesive in accordance with the approved manufacturer's most stringent written instructions. Provide safety precautions during mixing and application as recommended by adhesive manufacturer.
- B. Apply adhesives with notched trowel or other suitable tool uniformly over surfaces in accordance with the following minimum criteria.
 - 1. Cover only that amount of area which can be covered by flooring material within the recommended Working time of the adhesive.
 - 2. Remove any adhesive which dries or films over
 - 3. Do not soil walls, bases, or adjacent areas with adhesives
 - 4. Promptly remove any spillage
 - 5. Clean trowel and rework notches to insure proper application of adhesive.

3.04 INSTALLATION OF FLOORING

- A. Fit flooring material neatly and tightly into breaks and recesses, including at toe kick of all wood casework, around pipes and penetrations, under saddles or thresholds, and around permanent cabinets and equipment.
- B. Installation of resilient floor tile materials shall be in accordance with the following procedures:
 - 1. Layout tile from center of room or space and install tile from the center, working toward the outside room perimeter. Lay tile parallel to room axis in straight courses with cross-joints straight; lay tile with grain or pattern running in the perpendicular direction as adjacent tile.
 - 2. Do not install floor tile equal to or less than one half the width of a field tile, except where approved by the Architect for irregularly shaped rooms or spaces. Cut border tile neatly and accurately to fit within 1/64 in. of abutting surfaces.
 - 3. All areas to receive resilient floor tile shall be rolled with a 150 pounds roller in accordance with the approved manufacturer's written instructions, to ensure good contact and bond.

3.05 CLEANING AND PROTECTION

- A. Repair minor damage to eliminate all evidence of repair. Clean exposed surfaces using materials and methods recommended by manufacturer of material or product being cleaned. Remove excess adhesives immediately. Remove and replace Work that cannot be successfully repaired or cleaned.
- B. Prohibit traffic over newly installed flooring for at least 48 hours. Provide temporary protection to ensure Work being without damage or deterioration at time of final acceptance. Remove protections and clean immediately before final acceptance.
- C. Provide initial maintenance of VCT flooring in accordance with the approved manufacturer's most stringent written instructions, and as follows:
 - 1. Do not wet wash, scrub, or strip flooring for a minimum of seven days following installation.
 - 2. Vacuum thoroughly prior to commencing initial maintenance procedures.
 - 3. Scrub VCT with a neutral detergent solution, Armstrong S-485 Floor Cleaner, or Architect approved equal, with a scrubbing pad, 3M blue/green or Architect approved equal. Substitute Armstrong S-490 Floor Stripper, or Architect approved equal, if floor is badly soiled or scratched. Carefully scrub black marks and excessive soil with a non-abrasive brush or cloth.
 - 4. Rinse thoroughly and allow to dry completely.
 - 5. Apply high quality, stain resistant sealer, Armstrong S-495 Floor Sealer, or Architect approved equal, in accordance with manufacturer's written requirements.
 - 6. Apply a minimum of seven coats of high quality, commercial floor polish, Armstrong S-480 Floor Polish, or Architect approved equal, in accordance with manufacturer's written requirements. Polish shall contain a minimum of 30 percent solids. Each coat of polish shall be burnished prior to application of each succeeding coat.

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

June 12, 2019

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

3.06 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

133 WILLIAM STREET, NEW BEDFORD, MA 02740

Mount Vernon Group Architects, Inc., Project No. 02014.58

June 12, 2019

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SECTION 09 66 23

RESINOUS MATRIX TERRAZZO FLOORING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. Resinous matrix terrazzo flooring
 - 2. Resinous coved base at floor to wall intersections with metal edge strips

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following Divisions:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. Installer shall be a firm who is a contractor member of NTMA with a minimum of ten (10) years experience in Work of the type required by this Section. Installer shall be factory trained and certified by the approved manufacturer of the resinous flooring system. Installer shall have completed a minimum of five (5) projects in the past two (2) years, equal in scope and size to the Work of this Section.
- B. The approved manufacturer shall furnish inspection during conduct of the Work of this Section, and shall furnish a written report to the Architect, including pertinent findings of the inspection and compliance with requirements of the Contract Documents. The required inspections shall be provided at times established in consultation with the Architect and at no additional expense to the Owner.
- C. Provide primary materials which are the products of one manufacturer for each type of material required for the Work of this Section. Provide secondary materials acceptable to the approved resinous flooring manufacturer.

- D. Obtain each color, grade, type, and variety of granular materials from single source with resources to provide materials of consistent quality in appearance and physical properties.

1.05 SUBMITTALS

- A. Submit manufacturer's specifications on cured system and individual components, including physical properties and performance properties and test compliance
- B. Submit Material Safety Data Sheets
- C. Submit four (4) manufacturer's standard color charts. A minimum of four (4) colors will be selected from the charts for submittal of 6 in. x 6 in. cured samples for Architect approval.
- D. Submit a list of projects using either specified material or equivalent that they have installed during the last ten (10) years. Information shall include: project name, square footage, owner contact name with owner's address and phone number. Also, the contractor shall furnish resumes detailing the experience of key project personnel including supervisors and mechanics.
- E. Submit a copy of the manufacturer's packing slip, tagged for this specific job, along with calculations, signed by an officer of the primary material supplier demonstrating that the quantity of material furnished for the project will achieve the specified coverage and mil thickness.

1.06 FIELD CONDITIONS

- A. Comply with the approved manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting terrazzo installation.
- B. Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during terrazzo installation.
- C. Close spaces to traffic during terrazzo application and for not less than 24 hours after application unless manufacturer recommends a longer period.
- D. Control and collect water and dust produced by grinding operations. Protect adjacent construction from detrimental effects of grinding operations.
- E. Comply with the approved manufacturer's written instructions for substrate and ambient temperature, moisture, ventilation, and other conditions affecting installation of the Work of this Section. Evaluate slab condition, including slab moisture and pH content and extent of repairs required, if any. Concrete to receive resilient flooring shall have cured for at least 28 days and be free of all curing compounds. Test concrete substrate to determine acceptable moisture levels prior to installation. Testing should be conducted in accordance with requirements of ASTM F 2170 for determining relative humidity in concrete slabs using in situ probes. Coordinate Work of this Section with Work of Section 03 30 00 – Cast-in-Place Concrete, to ensure that concrete curing compounds used do not interfere with adhesion of resinous matrix terrazzo flooring. The Contractor shall conduct and pay for all testing, by an independent agency, of substrates, as required to comply with the approved manufacturer's minimum relative humidity level requirements.
- F. The Installer shall furnish, maintain, and remove all temporary protection, including but not limited to, barriers and plastic sheeting, necessary to protect adjacent construction from water or moisture damage, dust contamination, or other detrimental effects caused by the Work of this Section, as determined by the Architect.

1.07 WARRANTY

- A. The General Contractor and the manufacturer shall furnish a standard guarantee of the Resinous Terrazzo Flooring System for a period of one year after installation. The labor and material guarantee shall include loss of bond and wear-through to the concrete substrate from normal use.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products to project site in the approved manufacturer's original, unopened containers with labels indicating brand names, colors, patterns, and quality designations, legible and intact. Store and handle in strict compliance with the approved manufacturer's written instructions. Protect from damage.
- B. Store flooring, adhesives, and accessories in original containers at not less than 70 deg. F for not less than 48 hours immediately prior to installation.

1.09 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Primers:
 - 1. Provide water-based, zero VOC content, resinous matrix terrazzo primer for damp or green concrete, Terroxy® Moisture Vapor Primer, as manufactured by Terrazzo & Marble Supply Companies, or Architect approved equal by Crossfield Products Corp. or Polymerica Incorporated, and designed to tolerate moisture vapor transmission rates (MVT) of greater than 80% as measured in accordance with requirements of ASTM F 2170 for determining relative humidity in concrete slabs using in situ probes.
 - 2. Provide 100% solids, moisture insensitive resinous matrix terrazzo primer for cured concrete surface application, Terroxy® Primer, as manufactured by Terrazzo & Marble Supply Companies, or Architect approved equal by Crossfield Products Corp. or Polymerica Incorporated, and complying with the following minimum performance requirements:
 - a. Elongation: Greater than 10%, in accordance with ASTM C 638
 - b. Tensile Strength: 3,500 psi minimum, in accordance with ASTM C 790
 - c. Concrete Bond Strength: 2,290 psi, in accordance with ASTM D 882
 - d. Shrinkage: Passes, in accordance with ASTM C 883
 - e. Thermal Compatibility: Passes, in accordance with ASTM C 884
 - f. Water Absorption: 0.36%, in accordance with ASTM D 670-63 (24 hour immersion)
 - g. Compressive Strength: 10,000 psi minimum, in accordance with ASTM D 695
 - h. Adhesion to Concrete: 250 psi, in accordance with ACI Committee 403
- B. Crack Isolation Membrane:
 - 1. Provide 40 mil thick, 100% solid, zero VOC content, flexible resinous matrix terrazzo membrane, Terroxy Iso-Crack Resinous Matrix Terrazzo Membrane, as manufactured by Terrazzo & Marble Supply Companies, or Architect approved equal by Crossfield Products Corp. or Polymerica Incorporated, designed to suppress reflective cracking, with fiberglass scrim reinforcement, and providing a minimum of 140-160% elongation.
- C. Resinous Matrix Terrazzo Matrix:
 - 1. Provide two part, chemical resistant, odor free, 100% solid matrix consisting of a 5:1 ratio, Part A Resin to Part B Hardener, Terroxy® Matrix, as manufactured by Terrazzo & Marble Supply Companies, or Architect approved equal by Crossfield Products Corp. or Polymerica Incorporated, and complying with NTMA's "Guide Specification for Resinous matrix terrazzo", and the following minimum performance requirements:
 - a. Flammability: Self-extinguishing, extent of burning 0.25 in. maximum, in accordance with ASTM D 635
 - b. Thermal Coefficient of Linear Expansion: 25×10^{-6} in. per degrees to 140°F, in accordance with ASTM D 696
 - c. Bond Strength: 300 psi, in accordance with ACI COMM 403, Bulletin 59-43

2. Provide 90% marble and 10% glass aggregate containing no deleterious or foreign matter, and complying with NTMA aggregate gradation standards and proportions for Architect approved NTMA mix and the following performance requirements:
 - a. Abrasion and Impact Resistance: Less than 40 percent loss per ASTM C 131
 - b. 24-Hour Absorption Rate: Less than 0.74 percent
 - c. Dust Content: Less than 1.0 percent by weight
 - d. Color and Pattern: As selected by the Architect from the approved manufacturer's complete selection of standard colors and patterns.
 - D. Finishing Grout:
 1. Provide two-part, chemical resistant, odor free, 100% solid matrix consisting of a 5:1 ratio, Part A Resin to Part B Hardener, Terroxy® Matrix, as manufactured by Terrazzo & Marble Supply Companies, or Architect approved equal by Crossfield Products Corp. or Polymerica Incorporated.
 - E. Colors: Provide a min. of 4 colors.
- 2.02 DIVIDER STRIPS**
- A. Provide 3/8 in., L-type, stainless steel, thin-set divider strips, as manufactured by Terrazzo & Marble Supply Companies, or Architect approved equal by Crossfield Products Corp. or Polymerica Incorporated.
 - B. Control-Joint Strips: Separate double L-type angles back to back with minimum 1/8 in. width between. Fill joint and area between strips with semi-flexible joint filler. Match material, thickness and color of divider strips and depth required for topping thickness indicated.
 - C. Construction-Joint (Cold-Joint) Strips: Separate double L-type angles back to back with minimum 1/8 in. width between. Fill joint and area between strips with semi-flexible joint filler. Match material, thickness and color of divider strips and depth required for topping thickness indicated.
 - D. Expansion-Joint Strips: Separate double L-type angles, positioned back to back with minimum 1/8 in. width between. Fill area between strips with semi-flexible joint filler. Match material, thickness and color of divider strips and depth required for topping thickness indicated.
 - E. Accessory Strips: Match divider strip width, material and color unless otherwise indicated. Use the following types of accessory strips as required to provide a complete installation:
 1. Base-bead strips for exposed top of terrazzo base
 2. Edge-bead for exposed edges of terrazzo

PART 3 - EXECUTION**3.01 EXAMINATION**

- A. The Installer shall examine substrates and conditions under which this Work is to be performed and notify Contractor, in writing, of conditions detrimental to the proper completion of the Work. Beginning Work means Installer accepts substrates and conditions.
- B. The Contractor shall perform by independent agency an adequate number, ten (10) minimum, of in-place Hygrometer Probe Tests in accordance with requirements of ASTM F 2170. Results of tests shall demonstrate a Relative Humidity of less than 75% within concrete slabs-on-grade and above grade. Results of tests shall be provided to the Owner prior to commencing the Work of this Section. Failure by the Contractor to provide the required testing and subsequent failure of areas of resilient flooring shall not be cause for additional cost to Owner for repair or replacement of areas of failed flooring.

3.02 PREPARATION

- A. Clean substrates of substances, including oil, grease and curing compounds, that might impair terrazzo bond. Provide clean, dry and neutral substrate for terrazzo application.
- B. Concrete Slabs:
 - 1. Provide sound concrete surface free of laitance, glaze, efflorescence, curing compounds, form release agents, dust, dirt, grease, oil and other contaminants incompatible with terrazzo.
 - a. Prepare concrete mechanically by shot blasting or by grinding with scarifying diamonds. Surface preparation results should achieve a CSP3-CSP5 profile in accordance with requirements of International Concrete Repair Institute Guideline No. 03732.
 - b. Repair or level damaged and deteriorated concrete in accordance with the approved manufacturers' written requirements.
 - c. Repair cracks and non-expansion joints greater than 1/16 in. wide in accordance with the approved manufacturers' written requirements.
 - 2. Verify that concrete substrates are visibly dry and free of moisture in accordance with the approved manufacturers' written requirements.
 - 3. Test for concrete moisture content in accordance with requirements of ASTM F 2170 for determining relative humidity in concrete slabs using in situ probes.
 - 4. Perform moisture, alkalinity, and bond tests on concrete substrates to determine surfaces to receive resinous matrix terrazzo flooring are cured and dry in accordance with moisture and alkalinity limits established by the approved resinous matrix terrazzo flooring manufacturer.
 - a. Repair substrate cracks in accordance with the approved water vapor reduction and alkalinity control system and resinous matrix terrazzo flooring manufacturers' written requirements.
 - 5. Proceed with installation only after substrates have a maximum relative humidity measurement reading less than 80%. If relative humidity measurement reading is greater than or equal to 80%, moisture vapor primer shall be installed in accordance with the approved manufacturers' written requirements.
 - a. Provide water vapor reduction and alkalinity control system at all existing and new concrete slabs called for to receive resinous matrix terrazzo in accordance with requirements of this Section.
- C. Protect other Work from dust generated by grinding operations. Control dust to prevent air pollution and comply with environmental protection regulations. Provide temporary enclosures or other suitable methods to limit dust migration and to ensure adequate ambient temperatures and ventilation conditions during installation. Protect adjacent construction from water or moisture damage, or other detrimental effects caused by the Work of this Section, including but not limited to, preparation of substrate, placement and leveling of resinous matrix terrazzo matrix, and grinding operations.
 - 1. Repair or replacement of adjacent construction resulting from water or moisture damage, dust contamination, or other detrimental effects caused by the Work of this Section shall be completed at no additional cost to the Owner.

3.03 RESINOUS MATRIX TERRAZZO INSTALLATION

- A. General:
 - 1. Comply with NTMA's written recommendations for resinous matrix terrazzo and accessory installation.
 - 2. Place, rough grind, grout, cure grout, fine grind and finish terrazzo in accordance with the approved manufacturers' written requirements and NTMA Terrazzo Specifications and Design Guide requirements.
 - 3. Ensure that matrix components and fluids from grinding operations do not stain terrazzo by reacting with divider and control-joint strips.
 - 4. Delay fine grinding until heavy trade work is complete and construction traffic through area is restricted.
- B. Thickness of finished resinous matrix terrazzo installation shall be 3/8 in.

- C. Flexible Reinforcing Membrane
 - 1. Route out all cracks and fill with the approved manufacturers' semi-flexible joint filler and apply crack isolation membrane spread at a minimum thickness of 40 mils across the crack, extending a minimum of 12 in. on both sides. Imbed fiberglass scrim into wet membrane and saturate with additional membrane.
- D. Apply moisture vapor primer or standard primer, as required depending on results of in-situ probe testing, in accordance with the approved manufacturers' written requirements.
- E. Strip Materials:
 - 1. Divider and Accessory Strips:
 - a. Install strips in adhesive setting bed without voids below strips or mechanically anchor strips as required to attach strips to substrate.
 - b. Control-Joint Strips: Separate double L-type angles, positioned back to back with a minimum of 1/8 in. width between. Fill joint and area between strips with semi-flexible joint filler. Match material, thickness and color of divider strips and depth required for topping thickness indicated.
 - c. Construction-Joint (Cold-Joint) Strips: Separate double L-type angles, positioned back to back with a minimum 1/8 in. width between. Fill joint and area between strips with semi-flexible joint filler. Match material, thickness and color of divider strips and depth required for topping thickness indicated.
 - d. Expansion-Joint Strips: Separate double L-type angles, positioned back to back with a minimum 1/8 in. width between. Fill area between strips with semi-flexible joint filler. Match material, thickness and color of divider strips and depth required for topping thickness indicated.
- F. Placing Terrazzo:
 - 1. Mix resinous matrix terrazzo matrix with chips and fillers in accordance with the approved manufacturers' written requirements.
 - 2. Trowel apply terrazzo mixture over resinous matrix terrazzo primer to provide a dense flat surface to top of divider strips. Allow to cure in accordance with the approved manufacturers' written requirements before rough grinding.
- G. Rough Grinding: Grind with 24 grit silicon carbide or D-36 Diamond matrix stones until all divider strips and matrix chips are uniformly exposed.
- H. Grouting:
 - 1. Thoroughly cleanse floor with clean water and rinse.
 - 2. Remove excess rinse water by wet vacuum and thoroughly dry surface. Fill voids with resinous matrix terrazzo matrix.
 - 3. Allow grout to cure. Grout may be left on terrazzo until other trades work is completed.
- I. Polishing:
 - 1. Grind with 120 grit or finer stones until all grout is removed from surface. Repeat rough grinding, grout coat and polishing process if large terrazzo chip voids exist after initial polishing. Produce finished surface with a minimum of 70 percent aggregate exposure, or as otherwise required to match Architect approved NTMA color and pattern.
- J. Surface Finishing:
 - 1. Flood, mop, and wet vacuum all slurry from surface, as required to insure all latency and particulate matter is removed in accordance with the approved manufacturers' written requirements.
 - 2. Continue grinding process with Genesis diamond grits 220, 400 and 600. Repeat step No. 1 above between all steps as required to insure all previous grit latency and particulate matter is removed.
 - 3. Inspect entire surface for consistent appearance, manifesting no abrasion scratches from previous grits. Readdress any area manifesting previous grit scratch pattern not matching 600 220 grit finish before continuing.
 - 4. Mechanically polish surface using 1,000 220 grit Ceramica Diamond Pads as supplied by the approved manufacturer and to match approved sample. Finished surface shall have uniform reflective appearance showing no high or low sheen variances.

5. Repeat Step No. 1 above, as required to ensure no presence of any particulate matter or other trades' dirt or oils remain on the surface.
6. Final polish surface in accordance with the approved manufacturers' written requirements, utilizing clean, new, 3M or equal white polishing pads mounted on a 175 rpm floor polishing machine with integral solution tank and standard pad driver as supplied by the approved manufacturer.
7. Thoroughly scrub and agitate entire surface using the approved manufacturers' cleaning solution, and wet vacuum surface as required to ensure all final chemistry is removed.
8. Allow entire surface to thoroughly dry for a minimum of four (4) hours. Impregnate and seal the entire surface with the approved manufacturers' recommended surface impregnator, and remove any excess, in accordance with the approved manufacturers' written requirements.
9. Prohibit use or open traffic for a minimum of 24 hours.

3.04 CLEANING AND PROTECTION

- A. Remove grinding dust from installation and wash all finished surfaces provided under the Work of this Section with the approved manufacturers' recommended cleaning solution.
- B. Apply chemically neutral, slip and stain resistant sealer, with a pH factor between 7 and 10. Sealer shall not affect physical or aesthetic properties of the finished terrazzo surface and shall comply with requirements of NTMA Terrazzo Specifications and Design Guide.
- C. Provide final protection and maintain conditions as required to ensure finished terrazzo surfaces are without damage or deterioration at time of Substantial Completion.

3.05 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

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Mount Vernon Group Architects, Inc., Project No. 02014.58

June 12, 2019

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SECTION 09 91 13

PAINTING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All the Contract Documents, including Drawings, General Conditions, Supplementary Conditions, and all Sections of Division 01 - General Requirements, apply to the Work of this Section.
- B. Carefully examine all the Contract Documents for requirements which affect the Work of this Section. The exact scope of Work of this Section cannot be determined without a thorough review of all specification Sections and other Contract Documents.

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, preparation, painting and finishing of all exposed interior and exterior surfaces including existing exterior windows (interior and exterior window frame), except the following:
 - 1. Factory finished items
 - 2. Finished metal surfaces of stainless steel, copper, brass, bronze, and aluminum
 - 3. Finished metal surfaces that are plated such as finished hardware
 - 4. Surfaces in concealed areas such as crawl spaces, above ceilings, and the like
 - 5. Moving parts, code required labels, and equipment data plates
 - 6. Mechanical and electrical items not in public spaces
 - 7. Acoustical ceiling systems
 - 8. Finished masonry surfaces such as face brick, glazed block, ceramic tile, and the like.
 - 9. Testing for VOC compliance

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. All materials, including primers, other undercoat paint, and finish paint shall be produced by a single manufacturer. Use thinners and other accessory materials acceptable to the approved paint manufacturer, and use only within the approved manufacturer's recommended limits.
- B. Review other Sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information or characteristics of finish materials provided for use, to ensure that compatible coats are used.
- C. Before beginning primary Work of this Section, provide 100 square foot mock-ups of each color and paint system at locations acceptable to Architect and obtain Architect's acceptance of visual qualities. Protect and maintain acceptable mock-ups throughout the Work of this Section to serve as criteria for acceptance of this Work. Acceptable mock-ups may be incorporated into the finished Work.

1.05 TESTS

- A. The Owner may employ an independent testing agency to perform tests, evaluations and certifications. Cooperate and permit samples of materials to be taken as they are used. The Painting Subcontractor shall pay all costs associated with tests demonstrating failure of the tested material to comply with requirements of the Contract Documents.

1.06 SUBMITTALS

- A. Submit list of all materials proposed for use, indicating:
 - 1. Manufacturer
 - 2. Product name
 - 3. Surface for which proposed
- B. Submit color swatches showing complete range of colors and finishes available for each paint and finish system.
- C. Before painting mock-ups, submit representative samples of each material that is to be exposed in the finished Work, showing the full range of color and finish variations expected. Prepare paint samples on gypsum drywall or poster board and make samples not less than 12 inches square. On actual wood surfaces provide 4 in. x 8 in. samples of each natural and stained wood finish.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products in unopened, factory labeled packages. Store and handle in strict compliance with the approved manufacturers' written instructions, and protect from freezing and damage.
- B. Avoid the possibility of fire by removing flammable materials, solvents and spirits from the project site or by storing materials in UL approved fire-resistive cabinets. Keep Work area free from flammable waste and soiled rags.

1.08 PROJECT CONDITIONS

- A. Perform Work only when existing and forecasted conditions are within the limits established by the approved manufacturer of the materials and products used.
 - 1. Apply water-based paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50°F and 90°F, unless otherwise permitted by manufacturer's printed instructions.
 - 2. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45°F and 95°F, unless otherwise permitted by paint manufacturer's printed instructions.
 - 3. Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 85%, or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

- B. The Painting Subcontractor shall examine substrates, supports, and conditions under which this Work is to be performed and notify General Contractor, in writing, of conditions detrimental to the proper completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected. Beginning Work means Installer accepts substrates and conditions.
 - C. Comply with the approved manufacturer's requirements and recommendations for area ventilation.
 - D. Perform Work only when permanent lighting system is operational and in use. If not in use provide temporary lighting that simulates as closely as possible permanent lighting system.
 - E. Cover or otherwise protect finished Work of other trades.
- 1.09 EXTRA MATERIAL
- A. Provide maintenance stock in the approved manufacturer's new, unopened containers equal to 5% of the actual quantity installed. Provide a minimum of two, five-gallon containers of each wall color and two, one-gallon containers of each trim color.
- 1.10 PRE-INSTALLATION MEETING
- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.
 - B. Coordinate the Work of this Section with Work specified in other Sections. Furnish information on finish materials to be used in the field to ensure that correct prime coats are used in the shop.

PART 2 - PRODUCTS**2.01 ACCEPTABLE MANUFACTURERS**

- A. Materials shall be first line products of one of the following manufacturers, approved by the Architect:
 - 1. Conventional Paint Finishes:
 - a. Sherwin-Williams
 - b. Benjamin Moore
 - c. California Paints
 - 2. Specialty Paint Finishes
 - a. Sherwin Williams
 - b. DuPont
 - c. Albi Manufacturing
 - 3. Colored Concrete Sealer
 - a. Scofield
 - b. Benjamin Moore
 - c. Sherwin-Williams

2.02 MATERIALS

- A. Products specified are as manufactured by Sherwin Williams, unless otherwise indicated. Similar products of acceptable manufacturers listed in Paragraph 2.01 may be furnished in lieu of those listed, approved by the Architect.
 - 1. Provide primary products of the system from the products of a single manufacturer.
 - 2. Products not specified by name and required for the job, such as shellac, thinners, putty, shall be "best grade" or "first Line" products of a reputable manufacturer and acceptable to the approved manufacturer of the paint coatings.

3. Colors shall be as selected by the Architect from the approved manufacturer's complete selection of standard and premium colors. Public areas of the building shall be considered decorative and shall require the use of several colors, including but not limited to, deep tone, bright, and accent colors.
 - a. Classrooms and offices shall be limited to one wall of accent color. Cafeteria, Library, Art Rooms, Music Room, Lobbies, and Corridors shall contain no more than three different wall colors and one trim color. Building wide, the Owner shall select no more than ten wall colors, five trim colors, and two structural steel, steel deck, ductwork, and mechanical system colors.
 - b. Exposed structural steel, metal deck, plumbing piping, fire protection piping, and electrical conduit shall be painted one color. Exposed HVAC ductwork shall be painted one color. Colors shall be as selected by the Architect from the approved manufacturers' complete selection of standard colors.

PART 3 - EXECUTION**3.01 INSPECTION AND PREPARATION**

- A. The Installer shall be solely responsible for the finishing Work and shall prepare substrates as needed to obtain the highest quality finished surfaces.
- B. Strictly comply with the approved manufacturers' written instructions, except where more restrictive requirements are specified in this Section.
- C. Clean surfaces in accordance with the approved manufacturer's requirements for removal of dirt, oil, grease, mildew, asphalt, concrete splatters, and all other foreign substances. Do not finish over dirt, rust, grease, moisture and other conditions detrimental to formation of a durable finish film.
- D. Remove finish hardware, fixtures, accessories, and similar items, or tape and mask all surfaces not to be painted to protect these surfaces from damage or overpaint. Replace these items when finishing Work is completed.
- E. Remove incompatible primers and re-prime or provide barrier coats in compliance with the approved finish paint manufacturer's written instructions.
- F. Prepare masonry and concrete materials by removing laitance, efflorescence, form release agents, and surface glaze by cleaning and washing as recommended by the approved finish paint manufacturer and approved by Architect. Brush surfaces to remove loose particles. Fill cracks and irregularities with Portland cement grout to provide uniform surface texture. Allow a minimum of 60 to 90 days curing time before finishing poured and pre-cast concrete. Allow a minimum of 30 to 60 days curing time before finishing concrete masonry. Determine substrate alkalinity and moisture content and, if necessary, take appropriate remedial actions as recommended by the approved finish paint manufacturer.
- G. Prepare all wood surfaces not indicated to be factory finished under the Work of Section 06 20 00 by sanding smooth, sealing knots, setting nails and fasteners, and filling holes, cracks, and imperfections with putty acceptable to the approved finish manufacturer. For transparent finished Work, use putty and filler color matched to wood to minimize its appearance. All interior and exterior woodwork shall be sealed and back primed immediately after delivery to site and before installation.
- H. Prepare shop primed, ferrous metal surfaces by solvent wiping, sanding and touching-up shop prime coats. Prepare bare metal surfaces by power tool cleaning in accordance with SSPC SP 3 requirements. Remove rust, welding flux and spatter, burrs, and all other surface defects and foreign substances. Clean surfaces by washing with water followed by phosphate rinsing. Apply prime coats immediately after completion of cleaning.
- I. Aggressively clean new galvanized surfaces with grease cutting solvent, such as mineral spirits, to remove fabricating oils. After cleaning provide a SSPC SP 7 brush off blast of galvanized steel surfaces to create a 2mil profile for paint adherence. Touch-up abraded surfaces immediately with zinc-rich paint having a minimum dry film content of 95% by weight, Galviline Galvanizing Repair Compound, as manufactured by ZRC, or Architect approved equal.
- J. Solvent clean aluminum surfaces in accordance with SSPC SP 1 requirements.
- K. Finish tops, bottoms, and edges of all doors the same as door faces.

- L. Clean gypsum drywall surfaces as to make free of dust and foreign substances. Joint treatment materials shall be thoroughly dry. Paint metal corner beads and trim with metal primer before application of water based finish coatings.
- M. Ducts visible through supply and return grilles shall be painted flat black.

3.02 APPLICATION

- A. Strictly comply with the approved manufacturers' written instructions, except where more restrictive requirements are specified in this Section.
- B. Mix and prepare materials in strict compliance with the approved manufacturers' written instructions. Do not thin materials without Architect's approval. Keep foreign substances out of finishing materials.
- C. Provide primers as recommended by the approved finish paint manufacturer for substrates encountered. Tint all primers and undercoats to the approximate shade of the finish coat, making each coat slightly darker and closer to the finished shade. Use deep base primers for deep tone, bright, and accent colors. Prime surfaces immediately after surface preparation to prevent contamination of substrate.
- D. Apply finish materials at the lowest coverage rate and the highest dry film thickness recommended by the approved manufacturer. Provide additional coats as needed to eliminate all show through and bleed through areas. Apply paint and finish systems as scheduled using brushes or rollers. Stain shall be applied with a brush and then wiped off at the proper time to produce the desired effect.
 - 1. Spray application of paint and finish systems is acceptable for CMU, gypsum drywall, metal doors and frames, interior steel roof decks, structural steel joists, HVAC ducts, and mechanical piping, where Painting Subcontractor can demonstrate adequate control of overspray, control of coats, and has first obtained Architect's written permission. CMU and gypsum drywall shall be rolled following spray application of paint to provide a dense, uniform appearance. Provide uniform final finishes, free of runs, sags, wrinkles, streaks, shiners, brush/roller marks, color variations and other imperfections.
- E. Finish interior of HVAC ductwork behind louvers and grilles, when these surfaces are visible, with flat black paint. Wall surfaces located behind wall mounted markerboards and tack boards shall be painted. Painting of surfaces located behind metal corridor lockers and pre-manufactured casework is not required.
- F. Fine sand all painted woodwork and painted metal between coats in accordance with the approved manufacturers' written instructions.
- G. Allow the required waiting period between successive coats in accordance with the approved manufacturer's written instructions.
- H. Provide final finishes which exactly match Architect approved mock-ups.

3.03 TOUCH UP, CLEANING, AND PROTECTION

- A. Touch up damaged coatings and finishes to eliminate evidence of repair.
- B. Clean finished surfaces and remove all finish splatters from adjacent Work. Remove and replace Work that cannot be successfully cleaned.
- C. Provide signs and temporary protection to ensure Work being without damage or deterioration at time of final acceptance. Remove protections and re-clean as necessary immediately before final acceptance.

3.04 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and legally disposed daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

3.05 FINISH PAINTING SCHEDULE

- A. The following finish systems refer to products of Sherwin Williams, unless indicated otherwise. Provide these systems or comparable systems from any specified manufacturer, approved by the Architect.

1. INTERIOR FERROUS METAL

Primer: Sherwin Williams Pro-Cryl Primer, B66 Series
Finish Coat 1: Sherwin Williams ProMar 200 Zero VOC Interior Latex Semi-Gloss B31
Finish Coat 2: Sherwin Williams ProMar 200 Zero VOC Interior Latex Semi-Gloss B31

2. EXTERIOR FERROUS METAL

Primer: Sherwin Williams Pro-Cryl Primer B66 Series
Finish Coat 1: Sherwin Williams Pro Industrial DTM Satin B66
Finish Coat 2: Sherwin Williams Pro Industrial DTM Satin NB66

Note 1: Where rust has formed, scrape, sand and provide one coat of IMC Rust Converter M 82, prior to application of primer

3. EXTERIOR FERROUS METAL - GALVANIZED

Primer: Sherwin Williams Pro-Cryl Primer, B66 Series
Finish Coat 1: Sherwin Williams Pro Industrial DTM Satin B66
Finish Coat 2: Sherwin Williams Pro Industrial DTM Satin NB66

4. INTERIOR WOOD - PAINTED

Primer: Sherwin Williams ProMar 200 Zero VOC Primer B28
Finish Coat 1: Sherwin Williams ProMar 200 Zero VOC Interior Latex Eq-Shel B20
Finish Coat 2: Sherwin Williams ProMar 200 Zero VOC Interior Latex Eq-Shel B20

5. INTERIOR DRYWALL

Primer: Sherwin Williams ProMar 200 Zero VOC Primer, B28
Finish Coat 1: Sherwin Williams ProMar 200 Zero VOC Interior Latex Eq-Shel B20
Finish Coat 2: Sherwin Williams ProMar 200 Zero VOC Interior Latex Eq-Shel B20

6. INTERIOR CONCRETE - PAINTED

Primer: Sherwin Williams Loxon Concrete Masonry Primer A24
Finish Coat 1: Sherwin-Williams Pro Industrial Water Based Epoxy B73

7. INTERIOR CONCRETE - SEALED

Primer: Sherwin Williams Armorseal Tread-Plex Primer, B90W110
Finish Coat 1: Sherwin Williams Armorseal Water Based Epoxy 8100
Finish Coat 2: Sherwin Williams Armorseal Water Based Epoxy 8100

8. INTERIOR CMU

Primer: Sherwin Williams Pro Industrial Heavy Duty Block Filler, B42W00150
Finish Coat 1: Sherwin Williams Pro Industrial Water Based Epoxy B73
Finish Coat 2: Sherwin Williams Pro Industrial Water Based Epoxy B73

9. EXTERIOR CMU

Primer: Sherwin Williams Loxon Concrete Primer, A24W8300
Finish Coat 1: Sherwin Williams Superpaint Satin A89W1151
Finish Coat 2: Sherwin Williams Superpaint Satin A89W1151

B. SPECIALTY PAINT FINISHES

The following finish systems refer to products of California Paints, Benjamin Moore, and Tnemec unless indicated otherwise. Provide these systems or comparable systems for any specified manufacturer, approved by the Architect.

1. OVERHEAD EXPOSED STRUCTURAL STEEL AND INTERIOR STEEL ROOF DECK

NOTE: Primary surface preparation: Self-priming, test patch recommended on galvanized ceiling deck to check for presence of factory-applied stabilizers.

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- a. Rust and other surface contaminate shall be removed from ferrous metals, aluminum, copper, brass, and galvanized steel. The surface shall be thoroughly cleaned in accordance with the approved manufacturer's written preparation method.
 - b. Additional Prep for Galvanized Steel: Caution must be used when selecting coatings for use on all galvanized metal surfaces. These substrates may have a factory-applied stabilizer, which is used to prevent white rusting during storage and shipping. Such stabilizers must be removed by either brush blasting or chemical treatment applied directly to properly prepared galvanized steel, with the exception of areas that are subjected to high humidity.
2. GALVANIZED STEEL AND METAL FINAL COATINGS
- a. Sherwin Williams Pro Industrial Waterborne Acrylic Dryfall White 15-2.5 mils DFT
 - b. California Paints: Latex Flat Dryfall No. 3701
 - c. Benjamin Moore: M53 Sweep-up Spray Flat Latex, 1.5 – 2.5 mils DFT
 - d. Tnemec: Uni-bond 115 DF Acrylic Dryfall, 2- 4 mils DFT

END OF SECTION

NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS

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June 12, 2019

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SECTION 10 14 00

SIGNAGE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. Elevator sign surface mounted at adjacent wall to elevator door opening of each floor.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all of the Contract Documents for requirements which effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.04 QUALITY ASSURANCE

- A. Provide primary materials which are the products of one manufacturer for each type of material required for the Work of this Section. Provide secondary materials which are acceptable to the manufacturers of the primary materials.
- B. All rooms shown on the Drawings, whether specifically mentioned or not in the Signage and Graphics Schedule, shall be provided with signage required by the Architect.
- C. Provide installed mock-up of each sign and graphic system specified at locations acceptable to Architect and obtain Architect's acceptance of visual qualities. Protect and maintain acceptable mock-ups throughout the Work of this Section to serve as criteria for acceptance of this Work. Acceptable mock-ups may be incorporated into the finished Work.

1.05 SUBMITTALS

- A. Submit manufacturer's product data, installation instructions, use limitations and recommendations for each material used. Provide manufacturer certifications demonstrating materials comply with specified requirements.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle materials provided under the Work of this Section in unopened factory labeled packages, and in accordance with the approved manufacturer's written instructions, required to protect from damage before, during, and after installation. In the event of damage, immediately make all repairs and replacements necessary at no additional cost to the Owner.

1.07 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

PART 2 - PRODUCTS**2.01 ELEVATOR SIGNS**

- A. Provide surface mounted, ADA, black on gray elevator sign with tactile and braille text, RSME-305-BLK on Gray, as manufactured by Compliance Signs, or Architect approved equal by Mohawk Sign Systems or Bayuk Graphic Systems. The elevator sign shall comply with the following characteristics:
 - 1. Grade 2 braille designed to meet federal ADA / ADAAG guidelines.
 - 2. Gray color 1/16 in. ADA acrylic core is manufactured with a 1/32 in. precision cut top color layer.
 - 3. Plastic sign has a matte finish for improved visibility and tactile feel for the visually impaired.
 - 4. Braille dots meet ADA for size, shape, and spacing.
 - 5. Install signs with gold finish wall bracket.

PART 3 - EXECUTION**3.01 INSPECTION**

- A. The sign Installer shall examine substrates, supports, and conditions under which this Work is to be performed and notify General Contractor, in writing, of conditions detrimental to the proper completion of the Work. Do not proceed with Work until unsatisfactory conditions are corrected. Beginning Work means Installer accepts substrates and conditions.

3.02 INSTALLATION

- A. Installation of the Work of this Section shall be in accordance with the approved manufacturer's written instructions, except where more restrictive requirements are specified in this Section.
- B. Install Work plumb, level, in true plane and alignment. Provide signs and graphics where shown or scheduled using mechanical mounting methods.

3.03 ADJUSTING, CLEANING AND PROTECTION

- A. Adjust Work to present the best possible appearance. Touch-up damaged finishes and repair damage to eliminate evidence of repair. Clean exposed surfaces using materials and methods recommended by manufacturer of material or product being cleaned. Remove and replace Work that cannot be successfully repaired or cleaned.

3.04 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

**SECTION 14 21 00
TRACTION ELEVATORS
(FILED SUB BID)**

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.
- B. The Contractor shall be subject to the Bidding Documents, Contract Documents and entire Project Manual.
- C. Where General Condition clauses are repeated herein, it shall be understood as calling attention to them or as further qualification and shall not be construed as omitting any other part of the General Conditions clause. Where there is a conflict in terms, it is understood that the Project Manual General requirements take precedence.
- D. In all instances, the “Contract and General Conditions” governs the project.

1.02 FILED SUB-BID REQUIREMENTS

- A. The Work of this Section is stipulated as a filed Sub-Bid under Paragraph D, Item 2 of the Form for General Bid.
- B. All Sub-bids shall be submitted on the Form For Sub-Bid, included as Section 00 03 25 of these Specifications, in accordance with requirements of Section 44F of Chapter 149 of the General Laws, as amended.
- C. The attention of Bidders is directed to Section 00 01 00 - Instructions to Bidders. Sub-Bids shall be filed with the Awarding Authority in accordance with requirements stipulated therein.
- D. The Sub-Bidder for this Section shall examine all drawings and specification sections for requirements that may affect the Work of this Section. The Work of this Section is shown primarily on the following listed Drawings:
- E. EX1.0 through EX4.01 inclusive; D1.01 through D4.1 inclusive; CR1.01, A1.01 through A7.02 inclusive; S0.01 through SS1.03 inclusive; MD1.01 through M1.03 inclusive; ED1 through E2.1 inclusive.

1.03 DESCRIPTION OF WORK

- A. Provide labor, materials and equipment necessary to complete the work of this section, to install and maintain one (1) Simplex Control Machine Room Less (M.R.L.) Electric Traction Elevator, New Bedford City Hall, New Bedford., Massachusetts.
- B. The Elevator Contractor shall bear the responsibility of coordinating all his work, in conjunction with required related work specified elsewhere, for a complete elevator installation that will conform with all safety and handicap access codes.
- C. In general, the elevator contractor shall be responsible for, but not limited to the following:
 - 1. The work to be performed under this Section 14 21 00.
 - 2. Providing a complete Elevator installation in accordance with all codes and regulations.

3. Final cleaning prior to acceptance testing as well as complete and final clean down of elevator equipment, control rooms, hoistways and pits at the completion of all building construction work prior to building occupancy.

D. The requirements on the Drawings shall apply to the Work of this Section.

1. Drawing Sections:

- a. VT.01: Elevators 1 Plans and Sections

1.4 DESCRIPTION OF WORK

A. Labor, materials, equipment and services necessary for complete safe installation, including the following specification sections of the contract documents:

1. General Provisions for MRL Traction Elevator Work.
2. Hoistway Equipment for MRL Traction Elevator Work.
3. Control Room Equipment for MRL Traction Elevator Work.
4. Operating System for MRL Traction Elevator Work.
5. Signal System for Traction Elevator Work.
6. Medical Emergency for Traction Elevator Work.
7. Communication System for Traction Elevator Work.
8. Car Equipment for Traction Elevator Work.
9. Doors and Door Equipment for Traction Elevator Work.
10. Emergency/Standby Power for Traction Elevator Work
11. Cameras: Hoistway wiring (Provisions only. Wiring properly marked)
12. Annunciator Panel in Fire Command for Traction Elevator Work
13. Pit Ladder for Traction Elevator Work.

B. Shop drawings and samples.

C. Record "As-Built" drawings.

1. As herein noted.

D. Items to Be Furnished Only: Furnish the following items for installation by the designated Sections.

1. Lintels, sleeves, anchors, inserts, plate, rail bracket inserts and similar items for elevators.

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February 13, 2019

1.5 RELATED WORK BY OTHERS: The following items are not included in this Section and will be performed under the designated Sections:

1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
2. Section 02 41 13 – Selective Demolition
3. DIVISION 03 – CONCRETE; including all Sections contained therein
4. DIVISION 04 – MASONRY; including all Sections contained therein
5. DIVISION 05 – METALS; including all Sections contained therein.
6. Section 06 10 00 – Rough Carpentry
7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
9. DIVISION 09 – FINISHES; including all Sections contained therein.
10. Section 14 24 00 – Hydraulic Elevators
11. Section 21 00 00 – Fire Suppression
12. Section 22 00 00 – Plumbing
13. Section 23 00 00 - HVAC
14. Section 26 00 00 – Electrical
15. Section 31 20 00 – Earth Moving
16. Indicated or required chases, openings.
17. Finish painting except as noted.
18. Guarding, protecting hoistway during construction.
19. Storage space for tools, materials.
20. Electric power for testing, adjusting equipment.
21. Metal gratings.
22. Sump pits, removable gratings.
23. Grouting under entrance sills.
24. Smoke detectors.

- 25. Signal from fire alarm system.
- 26. Telephone raceway systems.
- 27. HVAC for hoistway and Control Room Ventilation in accordance with energy code.
- 28. Elevator flooring.

1.6 PREPARATORY WORK

- A. Preparatory Work in conjunction with the elevator installation shall be performed by the General Contractor and shall consist of the following:
 - 1. Provide a legal hoistway properly framed and enclosed, including supports for guide rails and elevator support beams and furnish a pit of proper depth with access, sump and sump pump, and waterproofing. Hoistway to be properly vented.
 - 2. Provide a legal machine room with proper lighting and adequate heat, ventilation, and if required air conditioning to maintain the machine room temperature between 55° and 95° F.
 - 3. Furnish and install all elevator inserts and provide necessary recesses to accommodate doors, sills, control and signal fixtures.
 - 4. Furnish and install steel channel door frames and steel building sill. Furnish and install metal ladder in elevator pit. Install and maintain temporary guard rails at hoistway entries during the time the elevator equipment is being installed.
 - 5. Provide electric service of ample capacity, including the following facilities: Install electric feed wires to the terminals of the elevators control panels, including necessary main line disconnect switches and circuit breakers. Furnish the required electric power of the same characteristics as the permanent power for the erection, adjusting and testing of the elevator.
 - 6. Provide for an Underwriter's approved light outlet where shown for the car light, a light and switch and convenience outlet in the pit and in the machine room, and if required a separate fused circuit as specified by the Elevator Subcontractor for the operation of the elevator control and signal system complete. Provide smoke detectors, heat sensors, and all other related systems and equipment in accordance with current Massachusetts Elevator Code requirements, including circuits wired to a clearly marked terminal strip contained in a covered metal box located in the machine room adjacent to the elevator controller.
 - 7. Provide dry, protected storage space adjacent to hoistway at grade level, complying with elevator installer requirements.

1.7 DEFINITIONS

- A. Specifications are of simplified form and include complete sentences, words or phrases such as "The Contractor shall," "shall be," "provide," "furnish," "a," "an," "the," and "all" have been omitted for brevity.
- B. Additional definition:
 - 1. "Provide": to supply, install and connect complete and ready for safe and regular operation of particular work referred to unless specifically indicated otherwise.
 - 2. "Install": to erect, mount and connect complete with related accessories.

3. "Supply": to purchase, procure, acquire and deliver complete with related accessories.
4. "Work": labor, materials, equipment, apparatus, controls, accessories, and other items required for proper and complete installation.
5. "Call Back": A customer request which requires a check of an elevator other than regularly scheduled examination.
6. "Repair Work": A scheduled work order as a result of a 'call back', recommendation, etc.
7. "Wiring": raceway, fittings, wire, boxes, and related items.
8. "Concealed": embedded in masonry or other construction, installed in furred spaces, within double partitions or hung ceilings, in trenches, in crawl spaces or in enclosures.
9. "Exposed": not installed underground or "concealed" as defined above.
10. "Indicated," "shown," or "noted": as indicated, shown or noted on drawings or as specified.
11. "Similar" or "equal": of base bid manufacturer, equal in materials, weight, size, design, and efficiency of specified product, conforming with "Acceptable Manufacturers."
12. "Reviewed," "satisfactory," "accepted," or "directed," as reviewed, satisfactory, accepted or directed, by or to Owner.
13. "M.R.L.": Machine Room-Less Elevator (In compliance with MA 524 CMR, Section 13.00)
14. "Control Room/Machine Room.": Interchangeable use for purpose of this specification. Located above, adjacent or within 10 feet of Hoistway.
15. "Fire Service Access Elevator": In Buildings more than 70 feet (21336 mm) in height above grade plane, a minimum of one fire service access elevator shall be provided in accordance with MA 780 CMR, Section 3007.
16. "Defective Elevator Work": Operation or control system failures; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; the need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.

1.8 REFERENCES

- A. Labor, materials, equipment services necessary for complete safe installation in conformity with:
 1. American National Standard, Safety Code for Elevators and Escalators (ANSI/ASME A17.1-2013) as amended by 524 CMR Article 35, June 1, 2018 edition.
 2. MA 527 CMR Electrical Code.
 3. MA 780 State Board of Building Regulations and Standards: The Massachusetts State Building Code.
 4. American National Standard Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People (ANSI A117.1), 521 CMR, and Americans with Disabilities Act (ADA).
 5. International Building Code.

6. Earthquake provisions in conformance with ANSI/ASME A17.1, and MA 524 CMR Seismic Risk Zone 2.
7. Local codes.
8. National Codes
9. Authorities having jurisdiction.

1.9 QUALITY ASSURANCE

- A. Elevators: Product of individual firms or corporations regularly engaged in manufacturing elevators comparable with this contract and in satisfactory operation for a period of not less than five years.
- B. Installer Qualifications: Elevator manufacturer or manufacturer's authorized representative who is trained and approved for installation of units required for this Project: MA Licensed Elevator Constructor.
- C. Operation performance.
 1. The control systems shall provide smooth acceleration and deceleration with leveling accuracy at all landings from no load to full rated load in the elevator.
 2. The floor-to-floor performance time under the above criteria shall be in accordance with industry standards. (Floor-to-floor time is measured from the start of a door closing at one floor to three quarters open position at the next local floor).
 3. Prior to Final Acceptance as well as prior to the termination of the maintenance period, the elevators shall be adjusted as required to meet all performance requirements plus or minus 5 percent of 10 seconds floor-to-floor time.
 4. All elevators, prior to expiration of issued Certificates of Use during the final warranty/full preventive maintenance period, shall be state safety (or five year) tested and all new annual Certificates of Use posted in all elevators.
- D. Quality and gauges of materials:
 1. New, best of their respective kinds, free from defects.
 2. Materials, equipment of similar application; same manufacturer, except as noted.
 3. Gauges as noted.
 4. Secure review of materials, equipment and installation.
- E. Fire-Rated Hoistway Entrance Assemblies: Door and frame assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252.

1.10 WARRANTY

- A. Warranty:
 1. Special Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to maintain elevator equipment as well as repair, restore, or replace defective elevator work within specified warranty period.

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2. Elevators.

3. Associated equipment.

B. Warranty against:

1. Defective material.

2. Imperfect work.

3. Faulty operation.

C. Warranty period:

1. Continue in effect at the completion of each elevator (substantial completion) and as well as for one year after completion and certification by the Department of Public Safety and acceptance of final elevator.

2. Full preventative maintenance on each elevator to continue uninterrupted and coincide with final one-year warranty period.

D. Repair or replace defective work at no additional cost to Owner.

E. Exceptions:

1. Parts damaged by parties other than Contractor through:

a. Misuse.

b. Accident.

c. Negligence.

1.11 ELECTRIC SERVICE

A. Power:

1. 480 volts, 3 phase, 60 hertz.

B. Lighting:

1. 120 volts, 1 phase, 60 hertz.

C. Signal:

1. 120 volts, 1 phase, 60 hertz.

1.12 SUBMITTALS

A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information. Include product data for the following:

Traction Elevators

14 21 00 - 7

1. Car enclosures and hoistway entrances.
2. Operation, control, and signal systems.
- B. Shop Drawings: Show plans, elevations, sections, and large-scale details indicating service at each landing, equipment layout, coordination with building structure, relationships with other construction, and locations of equipment and signals. Include large-scale layout of car control station and standby power operation control panel. Indicate variations from specified requirements, maximum dynamic and static loads imposed on building structure at points of support, and maximum and average power demands.
- C. Shop Drawings - Hoistway:
 1. Dimensional drawings indicating:
 - a. Hoistway and equipment.
 - b. Supports of equipment.
 - c. Reactions.
 - d. Weights of equipment.
 - e. Electrical and BTU data.
- D. Shop Drawings - Control Room:
 1. Dimensional layout indicating:
 - a. Machine room and equipment.
 - b. Electrical data.
 - c. Clearances around equipment.
 - d. Weights and supports for equipment.
 - e. Reactions.
 - f. BTU Data
- E. Samples for Verification: For exposed finishes of cars, hoistway doors and frames, and signal equipment; 12-inch-square Samples of sheet materials; 4-inch lengths of running trim members; 12-inch length of railing.
- F. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on Drawings, and electrical service, as shown and specified, are adequate for elevator system being provided.
- G. Qualification Data: For Installer.
- H. Operation and Maintenance Data: For elevators to include in emergency, operation, and maintenance manuals.

- I. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.
- J. Warranty: Special warranty specified in this Section.
- K. Continuing Maintenance Proposal: Service agreement specified in this Section.
 - 1. Prior to end of Warranty period, Contractor shall file for annual state test permits and insure elevators are tested, certified and current Certificates of Use posted.
- L. Solid State Diagnostic Tools:
 - 1. The elevator control equipment for all elevators will contain diagnostic capabilities required for complete maintenance of all aspects of the control, dispatch systems and solid state motor drive units.
 - 2. The diagnostic system shall be an integral part of the controller and provide user-friendly interaction between the service person and the controls.
 - 3. All such systems shall be free from secret codes and decaying circuits that must be periodically reprogrammed by the manufacturer.
 - 4. All external devices and manuals for troubleshooting, repairing, and testing shall remain the property of the Owner.

1.13 MAINTENANCE SERVICE

- A. Full Maintenance Service:
 - 1. Include in base bid, lump sum price for initial full preventive maintenance service, during warranty period by trained mechanics for period of:
 - a. 12 months after completion and certification of final elevator.
 - b. Warranty and preventative maintenance program shall commence at substantial completion of each elevator under this Section 14 2100 and shall continue in effect until one year after substantial completion and acceptance of final elevator.
 - 2. To commence upon completion and acceptance of all elevator work.
 - 3. Include:
 - a. But not limited to: examination, adjustment, greasing, oiling, parts, equipment replacement due to normal use and wear and tear.
 - 4. Cost adjusted to reflect warranty.
 - a. For the purpose of this agreement and subsequent adjustments, the straight time hourly rate for elevator mechanics shall equal the actual hourly rate paid to the elevator mechanics plus the fringe benefits granted in lieu of, or in addition to, hourly rate increases. Fringe benefits include, but are not limited to, pensions, vacations, paid holidays, group life insurance, sickness and accident insurance, and hospitalization insurance.

- b. Any change in prices under this provision shall not result in the payment of more than the maximum price permitted by any applicable legally issued government regulations in effect at the time such adjustment is made.

B. Schedule of Preventive Maintenance

1. Full Service Contract: Following is provided as a guideline and shall include; but not be limited to the following: Monthly and systematically examine, adjust, lubricate, clean and when conditions warrant, repair or replace, including but not limited to, the following equipment:
 - a. Machine: Gearless M.R.L. Machine: all components.
 - b. Brake pulley, brake coil, brake pins, brake contacts, linings and all other brake components.
 - c. Motor and Solid State Drive: Entire Unit consisting of but not limited to motor windings, armature fields, rotating elements, commutators, brushes, brush holders, bearings, field coils, rotators, stator slip rings.
 - d. Controller, Selector and Dispatching Equipment: all components including all relays, solid state components, resistors, condensers, transformers, contacts, leads, dashpots, computer devices, steel selector tape (wire or cable), mechanical or electrical timing devices, mechanical and electrical driving equipment, coils, magnet frames, contact switch assemblies, springs, solenoids, resistance grids, hoistway vanes, magnets and inductors.
 - e. Governor: including governor sheave, shaft assembly gears, bearing contacts, jaws, and pit tension assembly.
 - f. Sheaves: including deflector, secondary compensating sheaves, shafts, bearings, grease retainers, compensating sheave frame, contacts, rails and hold-down devices.
 - g. Hoistway door equipment including but not limited to interlocks or locks and contacts hoistway door hangers and tracks, bottom door gibs, cams, rollers, and auxiliary door closing devices for power operated doors.
 - h. Hoistway limit switches, slow down switches, leveling switches and associated cams, vanes, and electronic components.
 - i. Guide shoes including rollers or replaceable gibs.
 - j. Automatic power operated door operators, door protective devices, car door hangers, tracks, car door contacts and all related equipment.
 - k. Traveling cables.
 - l. Elevator control wiring in car, hoistway and machine room.
 - m. Seismic Controls
 - n. Car and counterweight safety mechanism and load weighing equipment.
 - o. Hoist cables, flat belts, governor cables compensating cables and compensating chains, including replacing, shortening and adjustment of tension on all cables and belts.
 - p. Monitoring devices for flat belts shall remain the property of the Owner.

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- q. Buffers.
 - r. Fixture contacts, pushbuttons, key switches, locks, lamps and sockets of button stations (car and corridor), traveling lanterns, position landing (car and corridor), direction indicators (car and landing).
 - s. The guide rails shall be kept free of rust. Rails shall be kept dry. Renew guide shoe rollers as required to insure smooth and satisfactory operation.
 - t. Examine and make necessary adjustments or repairs to the following necessary equipment including relamping of signal equipment: corridor lanterns, car and corridor position indicators, car stations, annunciator station, electric door operators, intercom systems, interlocks, door hangers, safety edges.
 - u. Examine regularly and systematically all safety devices and governors and conduct an annual load test, and each fifth year perform a full load, full speed test of safety mechanism, overhead speed governors car and counterweight buffers. The car balance shall be checked and governor set. If required, the governor shall be recalibrated and sealed for proper tripping speed.
 - v. Annual and or five-year weight state safety test of all safety devices including \$400.00 permit filing fee. All tests shall be performed in accordance with the provisions of the American national Standard, Safety code for Elevators and Escalators, (ANSI/ASME A17.1), Current Edition.
 - w. Monthly Firefighters' testing in accordance with ASME A17.1: 8.6 - "All elevators provided with firefighters' emergency operation shall be subjected monthly to Phase I. Recall by use of the Firefighters' Key switch and a minimum of one-floor operation on Phase II.
 - x. Repair or replace conductor cables and hoistway and control room elevator wiring.
 - y. Maintain all elevator equipment in hoistway, control room, and pit in a clean orderly condition, free of dirt, dust and debris.
 - z. Furnish lubricants compounded specifically for elevator usage.
- 2. The Elevator Contractor shall not be required to install new attachments on the elevators whether or not recommended or directed by insurance companies or by governmental authorities, not to make any replacements with parts of a different design. The Contractor shall not be required to make renewals or repairs necessitated by reason of negligence or misuse of the equipment or by reason of any other cause beyond the Contractor's control except ordinary wear and tear unless the Contractor receives just compensation.
 - 3. The Elevator Contractor shall not be responsible for the following items of elevator equipment: car enclosure (including removable panels, door panels, car gates, plenum chambers, hung ceilings, light diffusers, light tubes and bulbs, handrails, mirrors and carpets): hoistway enclosure: hoistway doors, frames and sills.
 - a. Should failure of the doors be due to a condition with hoistway door rollers, gibbs, etc., Elevator Contractor shall be responsible for corrective action.
 - 4. All work is to be performed during regular working hours of regular working days. Emergency calls shall be answered at all hours of the day or night. Should overtime work be required, the Owner will pay only the actual amount of the premium portion of the wage; the Contractor will pay the basic hourly rate.

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5. The Contractor shall check the dispatching system and make necessary tests to ensure that all circuits and time settings are properly adjusted, and that the system performs as designed and installed.

C. Maintenance Responsibility:

1. The Contractor shall keep the elevator maintained to operate at the original contract speed, maintaining the original performance time, including acceleration and retardation as designed and installed by the manufacturer. The door operation shall be adjusted as required to maintain the original door opening and door closing times, within legal limits.
2. The Owner reserves the right to make inspections and tests as and when deemed advisable. If it is found that the elevator and associated equipment are deficient either electrically or mechanically, the Contractor will be notified of these deficiencies in writing, and it shall be his responsibility to make the necessary corrections within 30 days after his receipt of such notice. In the event that the deficiencies have not been corrected within 30 days, the Owner may terminate the Contract and employ a contractor to make the corrections at the original Contractor's expense.
 - a. Elevator Contractor shall be responsible for all related costs and cost differences.
3. Approximately three months prior to the end of the contract term, the Owner will make a thorough maintenance inspection of all elevators covered under the contract.
 - a. Access to elevator equipment to be provided by Elevator Contractor.
4. At the conclusion of this inspection, the Owner shall give the Contractor written notice of any deficiencies found. The Contractor shall be responsible for correction of these deficiencies within 30 days after receipt of such notice.
5. No less than three months prior to the end of the final one year Maintenance / Warranty period, file a \$400.00 test permit on each elevator and conduct annual state safety test (or five-year load test, as applicable) in the presence of the state elevator inspector. Any cited violation is the responsibility of the Elevator Contractor and all work is to be completed prior to the completion of the maintenance/warranty period.
 - a. It is the Elevator Contractor's responsibility to ensure that new Certificates of Use are posted within the Elevators prior to the end of the final one year maintenance / warranty period.

D. Work Not Included In Full Maintenance Contract shall consist of the following:

1. The Elevator Contractor shall be required and shall receive additional compensation to install new attachments or make any replacements with parts of a different design on the elevator as recommended or directed by insurance companies or by governmental authorities. These items shall be handled as a Compensated Repair.
 - a. Elevator Contractor shall be required to provide a proposal with full detail on pricing for labor and material.
2. The contractor shall not be required to make renewals or repairs necessitated by reason of negligence or misuse of the equipment or by reason of any other cause beyond the Contractor's control except ordinary wear and tear unless the Contractor receives just compensation.
3. The Elevator Contractor shall not be responsible for the following items of elevator equipment: car enclosure (including removable panels, door panels, plenum chambers, hung ceilings, light diffuses, light tubes and bulbs, handrails, mirrors and carpets); hoistway enclosure, hoistway doors, frames and sills.

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- a. If it is determined that damage to doors is due to maintenance deficiencies in roller, gib, etc. these items may be the responsibility of the elevator contractor.

E. Maintenance and Call Back Service:

- 1. All maintenance and call back work is to be performed during regular working hours of regular working days.
- 2. Emergency call backs shall be answered at all hours of the day or night and shall be included in the scope of the contract.
- 3. Emergency call back response to be within two (2) hours for standard call back issues and for entrapments or unsafe conditions within one (1) hour on site.

F. Repair Work and Compensation for Repair Work:

1. Repair Work:

- a. The Contractor will begin on site within 24 hours all necessary repairs and replacements due to ordinary wear and tear.

2. Compensation for Repair Work:

- a. All Repair Work will be performed where possible during regular working hours of regular working days (8:00 a.m. to 4:30 p.m., Monday through Friday). No additional compensation will be paid for Repair Work performed during these working hours.
- b. When Repair Work must be performed outside of these working hours, prior approval shall be obtained from the Owner. When Repair Work is performed at the request of the Owner outside these working hours, the Contractor's compensation will be increased by only the following amounts:
 - 1) In the case of materials, no additional amount will be allowed.
 - 2) In the case of labor, only the premium portion of the Contractor's standard overtime billing rate will be billed.
- c. A separate monthly invoice under this Article will consist solely of the cost of labor for Repair Work as determined in this Article.
- d. When Repair Work is performed for the convenience of the Contractor outside of these working hours, the Contractor's compensation will not be increased.

3. Access to Records:

- a. The Contractor will provide, when requested, all records and documents in possession of the Contractor, relating to labor expended and material used in the Performance of Repair Work, for which the Contractor has been or is to be compensated according to the method described in the paragraph above. Such records and documents will be limited to time tickets and records or replacement parts with the published price lists of the Contractor.

4. Repair Work Procedures:

- a. Whenever any Repair Work is to be performed by the contractor that will require additional compensation, an estimate of the additional compensation and out-of-service time will be submitted to the Owner, who will give written approval to the contractor.

- b. In case of an emergency, verbal approval from the owner will suffice.
 - c. Such approval of the Repair Work, in accordance with the terms of this agreement, will entitle the Contractor to compensation in addition to the monthly payments for maintenance if the work is to be performed in other than regular hours.
 - d. The Contractor will, as a condition of payment for such work, furnish to the Owner at the end of each week daily time slips showing (1) the time and number of each workman employed on such work, (2) the number of hours daily which he is employed thereon, and (3) a brief description of the nature of the work performed. Such weekly time slips are for the purpose of enabling the Owner to determine the accuracy of the amounts to be paid to the Contractor for Overtime Repair Work.
- G. Extra Work and compensation for Extra Work:
- 1. Extra Work Definition:
 - a. The Owner will pay the contractor, in addition to the monthly price for maintenance, for such proportion of the material and labor cost of any repairs and replacements that are necessitated directly by negligence, misuse, accidents, fire, flood, vandalism or abuse which are not the fault of the Contractor.
 - 2. Replacement of Materials for Extra Work:
 - a. Where it is necessary for the Contractor to replace any item of material during the performance of Extra Work under this agreement, the contractor will first submit to the Owner for approval the name of the item or items, the quantity needed, and the material price that the Owner is to be billed. In case of an emergency, verbal approval from the Owner will suffice.
 - 3. Compensation for Extra Work:
 - a. The Owner and the contractor will mutually determine the amount of payment for Extra Work by the Contractor. The amount of payment shall be calculated based on the material and labor used to perform the Extra Work.
 - b. The separate monthly invoice under this Article will consist of the cost of repairs or replacement as noted above.
 - c. When Extra Work is performed for the convenience of the contractor outside of the regular working hours of regular working days, the Contractor's compensation shall be limited to the straight-time portion of labor cost. The Contractor will be compensated for overtime hours only upon prior approval by the Owner.
 - 4. Access to Records for Extra Work:
 - a. The Contractor will provide, when requested, all records and documents in possession of the Contractor directly relating to labor expended and materials used in the Performance of Extra Work (time and material basis) for which the contractor has been or is to be compensated, according to the method described above.
 - b. Such records and documents will be limited to time tickets and records of replacement parts with the published price lists of the Contractor. Certification of other costs will be provided by independent auditors of the contractor's and Owner's mutual choosing at the Owner's request. This audit will be compensated for separately by the Owner.

- c. If certain materials manufactured by the Contractor do not appear on the published price lists, the Contractor may be requested to display evidence that the charges to the Owner are comparable to those that are being offered to other similar customers of the Contractor.

5. Extra Work Procedures:

- a. Whenever any extra work is to be performed by the contractor, an estimate of additional compensation and out-of-service time will be submitted to the Owner, who will give approval to the contractor prior to start of Extra Work.
- b. Such approval of the work, in accordance with the terms of this agreement may entitle the Contractor to additional compensation.
- c. The Contractor will, as a condition to payment for such work, furnish to the Owner, for the purpose of auditing, at the end of each week, daily time slips showing (1) the number of hours daily which the Contractor has employed thereon, and (2) a brief description of the nature of the work performed, and a list of material used. Such weekly time slips are for the purpose of enabling the Owner to determine the accuracy of the amounts to be paid to the Contractor.

1.14 PRODUCTS DELIVERY, STORAGE AND HANDLING

A. Moving of equipment:

- 1. Ship in crated sections of size to permit passing through available spaces.
- 2. Contractor must obtain approval of time for delivery and routes from Owner to bring in equipment and material.
- 3. Storage of equipment and materials shall be coordinated with Owner.
- 4. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging.
- 5. Store materials, components, and equipment off of ground, under cover, and in a dry location. Handle according to manufacturer's written recommendations to prevent damage, deterioration, or soiling.

1.15 COORDINATION

- A. Coordinate installation of sleeves, block outs, and items that are embedded in concrete for elevator equipment. Furnish templates and installation instructions and deliver to project site in time for installation.
- B. Coordinate sequence of elevator installation with other work to avoid delaying the work.
- C. Coordinate locations and dimensions of other work relating to elevators including entrance subsills; and electrical service, electrical outlets, lights, and switches in pits and machine rooms.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The work and material specified pertains to the elevators unless otherwise noted.
- B. Seismic Design Protection
 - 1. Elevator to be designed to provide protection during seismic activity. The elevator safety requirements for Seismic Risk Zone 2 as described in ASME A17.1 Part 8.4 and MA 524 CMR, Section 35.00, to include as relative to an existing building, but not limited to the following:
 - a. Guarding of equipment.
 - 1) Rope retainers on drive, deflector, governor, governor tension sheave to inhibit the displacement of ropes.
 - 2) Snag Points:
 - 3) Snag points created by rail brackets, rail clip bolts, fishplates, names and similar devices shall be provided with guards to prevent snagging of compensating ropes or chains, governor ropes, hoist cables and traveling cables.
 - b. Machinery and Sheave Beams, Supports and Foundations
 - 1) Beams and Supports:
 - 2) Anchor all overhead beams and supports to prevent overturning and displacement.
 - 3) Secure machines, control panels, machine beams, sheaves to building structure.
 - 4) All fastenings including bolts used to attach equipment to the supporting structure shall be designed to withstand seismic forces acting simultaneously with elevator operation.
 - 5) Counterweight restrictors
 - c. Seismic Loading to be calculated as outlined by Code.
 - d. Special emergency operation and signaling devices as detailed in Code.
 - C. Provide framing to support elevator hoisting machine and deflector sheaves from the building structure. Comply with Section 05 1210 "STRUCTURAL STEEL."
 - D. Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery and other components of elevator work where installation of devices is specified in another section.

2.02 DESCRIPTION – HOISTWAY EQUIPMENT

- A. Complete hoistway, pit and car equipment with required appurtenances.

2.03 HOISTWAY EQUIPMENT AND MATERIAL

A. Guide rails:

1. Car and counterweight, planned steel, standard T-section.
2. Extend from pit floor to underside of concrete slab or grating at top of hoistway.

B. Guides:

1. Mount on top and bottom of car and counterweight frame.
2. Roller type:
 - a. Three, balls bearing, rubber or composition tire wheels, with adjustable springs or other method subject to review, to maintain rail contact.
 - b. Suitable for operation on dry unlubricated guiderails.

C. Cables:

1. Hoist cables or belts:
 - a. Industry standard traction steel wire rope or flat belt.
 - 1) Monitoring units to review status of belts' steel core, belt faults and belt status shall remain in place and shall be the property of the owner.
 - b. Pre-cut to required lengths.
2. Governor cables:
 - a. Minimum 3/8 in. steel or Equal.
 - b. Secure ends to car safety operating mechanism and where noted to counterweight safety operating mechanism.
 - c. Pass over governor sheave above and tension device in pit.

D. Sheaves and supporting members:

1. Sheaves: deflector overhead, under-slung, cast iron machined rim grooves and hub.
2. Supporting members: structural beams or channels.

E. Buffers:

1. Buffers, Car and Counterweights: spring type.
2. Stroke: as required by Code.
3. Pipe struts and braces as required.

4. Locate in pit under car and counterweight.
5. Mount on continuous channels secured to guide rails.
- F. Counterweights:
 1. Equal to weight of complete elevator plus 40 percent of specified load.
 2. Consisting of:
 - a. Structural steel channel frame.
 - b. Cast iron or steel subweights.
 - c. Minimum two tie rods, full height of arbor, passing through and arranged to secure subweights. Nuts secured with cotter pins.
 - d. Guards as required by Code and as noted.
- G. Governor and Safety:
 1. Governor:
 - a. Tension Type.
 - b. Switch to interrupt power to elevator.
 - c. Cable sheave.
 - d. Spring applied cable jaws held by governor cable tension.
 - e. Cable driven.
 2. Governor Cable:
 - a. Continuous.
 - b. Run from safety tripping lever of safety, over governor sheave, weighted tensioning sheave and back to lever.
 - c. Pass through governor jaws.
 - d. Tension maintained by tensioning sheave.
 3. When governor attains tripping speed:
 - a. Switch shall open, interrupting power to elevator.
 - b. Governor jaws shall grip governor cable.
 - c. Cable, when pulled through jaws shall not be damaged or deformed.

4. Car Safety:
 - a. Flexible guide clamp, self-resetting.
 - b. Actuated by governor cable.
 - c. Bolted to elevator frame.
 - d. Located under elevator.
 - e. Operable in down travel.
 - f. Engage both sides of guide rails with equal force.
 - g. Force sufficient to stop fully loaded elevator from tripping speed.
- H. Automatic terminal stopping devices:
 1. To stop car at top and bottom landings.
 2. Independent of regular operating device.
 3. Provide final limit switches.
 - a. To stop car that has traveled beyond zone of normal stopping devices.
 - b. Prevent operation of elevator until reset.
 - c. Operated by elevator car.
- I. Pit stop switch:
 1. Provide Emergency Stop Switch in pit adjacent to point of access to pit.
 - a. Stop Switch shall be located approximately 18 in. above the floor level of the landing within reach from the access floor and adjacent to the pit ladder.
- J. Pit Ladder
 1. Provided and installed by Elevator Contractor.
 2. Install in conformance with A17.1:2.2.4.2.
 3. Ladder shall extend not less than 48 in. above the sill of the access door.
 4. Rungs shall be a minimum of 16 in. wide.
 5. 3" by 3" by 4 1/2" mounting angles (typical).
- K. Fascia: Galvanized sheet steel shall be provided.

L. Guide rails:

1. Installation:

- a. Erect plumb and parallel, maximum deviation 1/8 inch.
- b. Support to prevent distortion by eccentric loading or application of safety devices.
- c. Provide rail backing when bracket spacing exceed 14 feet - 0 inches or Code recommended maximum.
- d. Supply inserts as required or noted. Installation under Related Work Specified Elsewhere.

2.4 CONTROL ROOM AND HOISTWAY EQUIPMENT

A. Elevator machines, controls, motor drives, and appurtenances.

B. Quality assurance:

- 1. Speed regulation.
- 2. Rate of change:
 - a. Variable voltage control: constant.
 - b. Independent of car operating devices.
- 3. Speed: plus or minus five percent of specified.

C. Machine:

- 1. Machine: Alternating Current Permanent Magnet (ACPM) Gearless mounted at top of hoistway.
- 2. Bedplate: Cast iron or steel in one piece or heavy structural steel shapes welded together.
- 3. Bearings:
 - a. Anti-friction metal sleeve, ball or rollertype.
 - b. Self-lubricating.
 - c. Oil reservoirs and gauges.
 - d. Capped filler openings.
 - e. Drain plugs.
- 4. Sheaves: hard alloy cast iron or steel, smooth turned grooves and flanges.
- 5. Brake:

- a. Disc braking system.
- 6. Hoisting Motors:
 - a. Variable voltage frequency AC current type, designed for this control.
 - b. Alternating Current Permanent Magnet. (ACPM)
 - c. High starting torque with low starting current.
 - d. IEEE standard for 50 deg. C, Class A insulation, 30-minute rating.
- 7. Vibration elimination and sound reduction: neoprene isolators or rubber-in-shear with maximum 1/4" static deflection to isolate from floor.
- D. Solid State Motor Drives:
 - 1. It is the intent of this specification to provide a Regenerative, AC motor drive for the elevator as follows:
 - a. Provide elevator with a solid state motor drive, providing variable voltage and regenerative power controls by means of devices that can control current without moving parts and that use static switching by means of solid state devices.
 - 1) A regenerative (Power-Back) means shall be provided to return power to the AC line during dynamic braking.
 - 2) During emergency power conditions, the AC Regenerative module will shut down. This will ensure that the existing generator will not be responsible to handle any of the received energy.
 - b. The flux vector drive shall be capable of producing full torque at zero speed and shall not require DC injection braking in order to control car deceleration.
 - c. The drive shall be capable of controlling the machine and motor.
 - d. The drive shall have built-in motor overload protection. External overload is not required.
 - e. The drive shall have the capability of being adjusted or programmed to achieve the required motor voltage, current, and frequency to properly match the characteristics of the AC elevator hoist motor and shall not create excessive audible noise from the elevator motor.
 - f. The drive shall be heavy-duty, capable of delivering sufficient current required to accelerate the elevator to contact speed with rated load. The drive shall provide speed regulation appropriate to the motor type. A regenerative drive (Power-Back) means shall be provided to return power to the AC line during dynamic braking.
 - g. A contactor shall be used to disconnect the hoist motor from the output of the drive unit each time the elevator stops. This contactor shall be monitored and the elevator shall not start again if the contactor has not returned to the de-energized position when the elevator stops. The controller shall provide step-less acceleration and deceleration and provide smooth operation at all speeds.
 - h. Provide visual (LED) indications of driving and braking operation and correct incoming power.
 - i. Provide in sequence: a zero speed electrical stop signal; brake set signal; and motor contactor turn off signal.

E. Controller and Selector:

1. It is the intent of this specification to provide a solid state control system for the controller. The system shall utilize isolated solid state input/output interface for the majority of signals. It is understood, where required by the Code, relays and/or contacts are to be utilized for safety and power control considerations. The use of relays as input and/or output devices are not acceptable.
2. All controller components shall be designed to provide the required operation as herein specified.
3. All assemblies, power supplies, switches, relays and other items shall be securely mounted on a substantial, self-supporting steel frame of angles or channels and shall be totally enclosed with covers in a floor mounted cabinet or wall mounted. Equipment shall not be mounted on any of the covers.
4. All controller switches and relays shall be magnet operated with contacts of design and material to insure maximum conductivity, long life and reliable operation without overheating or excessive wear and shall provide a wiping action to prevent sticking due to fusion.
5. Where time delay relays are used in the circuits, they shall be of an acceptable design that is reliable and consistent, such as condenser timing or electronic timing. No dashpot time relays shall be used.
6. Each device on all panels shall be properly identified by name, letter, or standard symbol which shall be neatly stencil painted (or otherwise marked), in an indelible and legible manner, on device or panel. Identification marking shall be coordinated with identical markings used on wiring diagrams. The ampere rating shall be marked adjacent to all fuse holders. All spare conductors shall be neatly formed, laced, and identified.
7. Safety switch shall cut off current, automatically apply brake and stop car upon current failure and/or upon operation of any electrical safety device.
8. The system shall include a monitor in the control room for diagnostic purposes. The system shall have capability to display on the monitor car movement, car operation status, car position, car calls, landing calls, reserved calls, car load status, car direction, door motion, door position, elevator status, group status, fault indications, emergency power indications, fire alarm, and medical emergency.
9. It must be possible to determine car position, movement, location and direction of the elevator from the control room.

F. Machine Location:

1. Overhead Hoistway Installation:
 - a. Provide steel beams, channels and bearing plates to support machine, governors, rope hitches, buffers and (as required) compensating cable sheaves.
 - b. Fasten beams and channels to supports.
 - c. Mount machine directly in hoistway.
2. Building Supported Machine Application.

G. Wiring:

1. From control panels and relay panels to equipment from hoistway junction box to elevator. Provide transformer for required relay panel control voltage.
2. Install in metal wireways and raceways without outlet boxes as specified under Electrical Work, except for trail cables and short connections.
3. Traveling cables: Underwriters, labeled, fire and moisture resistant outer braid and steel supporting strand. Provide minimum 10 percent spares, not less than 6 wires.
4. Branch circuit and control wiring: TEW or THW insulation, 600 volts.
5. Telephone wiring: shall meet telephone company requirements. In traveling cable from hoistway junction box to car. From hoistway junction box to terminal box in machine room. Provide 20 or 22 Gauge shielded pairs.
6. From shaft riser to door interlocks, type SF-2 or equivalent; maximum operating temperature, 392 degree F. (200 degree C). Terminations shall be insulated to maintain integrity of wiring.
7. Install short connections (nonmoist locations) in flexible conduit.
8. Conduit: galvanized steel.
9. Install green ground wire.
10. Additional Wiring Requirements:
 - a. Provide for future camera installation use.
 - b. 1-18/2 stranded unshielded pair.
 - c. 1-18/2 stranded shielded twisted pair.
 - d. Or as confirmed.
 - 1) Wiring to be properly secured and marked for future use.
 - e. Card Reader Wiring:
 - 1) Provide typical wiring to accommodate card reader system in car and at all levels.
 - 2) All wiring to be properly secured and properly marked.
 - f. Provide wiring interfacing.

H. Control Systems

1. Simplex Operation:
 - a. Registration of car button call shall cause car to start.

- b. Car shall respond to its own car button calls and corridor calls for direction of car travel in the order which landings are reached.
 - c. Time limit relay shall hold car a few seconds at landing to enable passengers to enter and leave car. When car has answered farthest call, this interval shall permit car button call to be registered to establish direction of travel, even though corridor call is registered for opposite direction of travel.
 - d. It shall be impossible to start a car unless car door is closed and all hoistway doors are locked in closed position.
 - e. Doors open automatically when car stops at a landing.
 - f. Doors close at a predetermined interval after opening unless:
 - 1) Closing is interrupted by door reversing device.
 - 2) DOOR OPEN button is pressed.
 - g. Pressing of corridor button at floor where car is standing shall open doors.
 - h. Key Operated Emergency stop switch: interrupts power supply and applies brake independent of regular operating device.
 - i. Key operated inspection switch: takes car out of normal operation and gives elevator contractor full control over starting, stopping and direction of car travel from car top inspection system. Car shall travel at inspection speed and shall not respond to corridor calls.
 - j. Key operated independent service switch: takes car out of normal operation and gives attendant full control over starting, stopping and direction of car travel from car buttons only. Car shall travel at contract speed and shall not respond to corridor calls.
2. System Computer:
- a. Provide computer control microprocessor based car controller.
 - b. Latching circuitry (outputs) shall be of a fail-safe design which turns off all the outputs in the event of a processor malfunction.
- I. Special Operating Features:
- 1. In addition to the previously specified features the following special operating functions shall be provided:
 - 2. Load Dispatch - Car shall be dispatched immediately from the lobby floor when loaded to predetermined percentage of rated capacity. The load detection device which initiates the dispatching shall be independently adjustable.
 - 3. Load Weighing Device – Provide car with automatic load - weighing device that shall:

- a. Operate at preset load of approximately 80 percent of full load.
 - b. Cause car to bypass corridor calls until passengers leaving car reduce load below preset level.
 4. Initiate dispatch of car at lower main terminal landing prior to elapse of normal dispatching interval.
 5. Load Bypass - Car shall bypass hall calls if loaded to a predetermined percentage of rated capacity. The load detection device which initiates load bypass shall be independently adjustable.
 6. Designated Parking - The system shall provide for car to park as designated by the Controller or to park at its last call.
 7. False Car Call Canceling - if an excessive number of car calls have been registered and the car has made two consecutive stops and the door photo cell protective beams have not been interrupted, all car calls shall be cancelled.
- J. Ascending Car Overspeed and Unintended Car Movement Protection:
1. Ascending Car Overspeed and Unintended Car Movement Protection in keeping with A17.1 section 2.19 entitled "Ascending Car Overspeed and Unintended Car Movement Protection" and 2.19.3 Emergency Brake shall be provided.
 2. As applicable to AC Gearless design.
 3. Designed to prevent the car from striking the hoistway overhead structure and/or unintended car movement away from the landing with the hoistway door not in the locked position or the car door not in the closed position.
 4. A mechanical device independent of the braking system used to retard or stop an elevator should the car over speed or move in an unintended manner.
- K. Emergency/Standby Generator Service:
1. Emergency/Standby generator service provided to elevator.
 2. Elevator to be operational upon transfer to emergency power.
 3. All systems and functions in accordance with code.
 4. Annunciator Panel at Fire Command Center in accordance with code.
 - a. Emergency Power Jewel
 - b. Digital Position and Direction Indicator
 5. Emergency Power Jewel at mainlanding.
- L. Medical Emergency Features:
1. Medical Emergency Operation shall be provided on.
 2. Medical Emergency shall be in accordance with 524 CMR 17.40.
 3. Upon activation of Hall Medical Emergency Key Switch, car shall respond to call.

4. All functions shall be in accordance with MA CMR 524.
5. Activation of Medical Emergency shall over-ride security circuitry.

M. Components:

1. The microprocessor based group dispatcher and communications network shall be designed and installed to meet the following requirements:
 - a. Provisions shall be made in the dispatch computer or computers so that the elevator system dispatching can be modified at a future time. The system shall be so designed that the modifications to the software shall be all that is required to revise the dispatching. It shall be further designed so that there will be minimum shut down time should changes be required.
 - b. The latching circuitry (outputs) shall be of fail-safe design which turns off all the outputs in the event of a processor malfunction.
 - c. Power Supplies: All power supplies utilized shall be UPS recognized. They shall all have short-circuit protection.
 - d. Frame: All assemblies, power supplies, chassis switches, relays, and other items shall be securely mounted on a substantial, self-supporting steel frame. The equipment shall be completely enclosed with covers. No equipment is to be mounted on the covers.
 - e. Wiring: All factory wiring shall utilize UP labeled copper wires. All wiring connections shall be neatly routed. All wiring connections to studs or terminals shall be made by means of solder or solderless lugs.
 - f. Marking: All components shall be clearly and permanently identified adjacent to each device and shall be identical to the wiring schematic.
 - g. All components (relays, fuses, P.C. board etc.) shall be permanently marked with symbols as shown on drawings.
 - h. Provide extender boards when computing devices are used inside a computer chassis so as to have access to the printed circuit cards utilized.
 - i. Electronic time delay devices shall use stable capacitor or crystals as the time base.
 - j. Terminals shall be provided for a future connection to a computerized test system. An adequate number of terminals shall be provided so as to monitor all of the various functions of the elevators. These shall include but not be limited to car positions, running functions up and down, door open and close hall and car calls, door protective devices, safety circuits, elevator recapture, etc.
 - k. Printed Circuits and Related Hardware:
 - 1) All printed circuit boards shall be fabricated with G10 glass epoxy material with a minimum equivalent one ounce copper.
 - 2) All printed circuitry shall be coated with tin-lead.
 - 3) All double sided boards shall have plated-through holes.

- 4) All printed circuit board edge connections shall be hold plated.
 - 5) All solid state hardware and devices shall have built-in noise suppression devices which provide a high level of noise immunity.
 - 6) Power supplies shall have noise suppression devices provided.
 - 7) All inputs from external devices (such as pushbuttons) and all outputs to external devices (such as indicators, relays) shall be isolated with opto-isolation modules.
 - 8) The use of relays as input and/or output devices are not acceptable.
 - 9) A separate regulated power supply shall be used for each computer chassis.
 - 10) The control circuits shall be so designed so that one side of the power supply is grounded to provide for testing.
 - 11) Under no circumstances shall the safety circuits be affected by accidental grounding of any part of the system.
 - 12) In the event of a power failure or interruption, the system shall function under emergency power operation as described in this Specification Section.
 - 13) System memory shall be provided so that data shall not be lost in the event of a power failure or disturbance.
 - 14) Required power will be furnished by others. Elevator Contractor shall coordinate location and requirements with the Owner.
- I. NOTE: Conduits or other wiring shall not be exposed in the lobby or other occupied parts of the building.

N. Drawings:

1. At the completion of the work and as specified, the contractor shall provide the items listed. The items shall become the Owner's property.
 - a. Five complete sets of all diagrams (corrected to incorporate any field or final changes) showing the operation of the dispatch solid state systems and/or devices that have been installed.
 - b. Five complete sets of wiring drawings, as specified under Operating Instructions and Parts Lists, incorporating all final changes showing all modifications made to the system.
 - c. The elevator control equipment for all elevators will contain on board diagnostic capabilities required for the ease of complete maintenance of all aspects of the control dispatch systems and solid state motor drive units. The diagnostic system shall be an integral part of the controller and provide user-friendly interaction between the serviceman and the controls. All such systems shall be free from secret codes and decaying circuits that must be periodically reprogrammed by the. Systems that require hook-up of external devices for troubleshooting are not acceptable.

O. Top-of-car operation:

1. Operating device:

- a. Up/Down, buttons, constant pressure type, Emergency Stop button, momentary pressure type in accordance with Code.

- 1) When operated: car to travel at reduced speed.

P. Firefighters' Service:

1. Phase I Emergency Recall Operation:

- a. Provide operation and equipment as required by governing Code. ANSI A17.1 Current Edition as modified by 524 CMR, Section 35.00.
 - 1) Elevator Contractor shall provide required elevator components and direct wiring to receive signal from fire alarm system.
 - 2) Fire alarm system devices, wiring, etc. are under Related Work Specified Elsewhere.
- b. Coordinate with fire alarm systems contractors.
- c. Activation of Firefighters' Emergency service shall over-ride lock-out circuitry for designated floors.

2. Phase II Emergency In-car Operation:

- a. Provide operation and equipment as required by governing Code.
- 3. Provide in the Fire Command Center the code required elevator annunciator indicators, fire switches and lights for the Firefighters' use.
- 4. Provide Firefighters' Key Switch, Fire Hat Jewel and code required signage at main landing.

Q. Emergency car lighting and alarm bell system:

- 1. Consisting of rechargeable battery, charger, controls, light fixtures and bell.
 - a. Fixture integrated with car operation panel.
- 2. Automatically provide emergency lighting in car upon failure or abnormal interruption of normal car lighting.
 - a. Function irrespective of position of car light switch.
 - b. Maintain minimum illumination of 0.2 foot candle at four feet above car floor and at approximately one foot in front of car operating panel for not less than four hours.
- 3. Automatically provide power to alarm bell.
 - a. Bell activated same as normal bell.
- 4. Battery, six volt minimum, sealed, lead acid or equal. Batteries using adapter type water conserving or catalytic devices are not acceptable.

5. Charger capable of restoring battery to full charge within 18 hours after resumption of normal power.
6. Provide external means for testing battery, lamps and bell.
7. Light to be located out of arms length and of vandal proof design.

2.5 OPERATION PANELS AND SIGNAL FIXTURES:

A. All fixtures and buttons to be tamper proof, vandal resistant design. All lights for buttons and signals to be LED. No plastic caps:

1. Faceplates:

- a. The faceplates of all hall fixtures shall be designated for flush mounting stainless steel Class 302 with a No.4 satin finish, beveled edge design, and not less than 1/8 thick. Car operating panels shall be satin stainless steel.
- b. Attach faceplates with spanner type security screws.
- c. Provide on all faceplates engraved fire signs, capacity, speed and all other signs required by code. There shall be no applied signage.

2. Pushbuttons:

- a. Pushbuttons in car operating panel and hall button stations shall have contacts and wearing parts of materials sized to meet the requirements of elevator service. Buttons shall be so designed that a spring will take up the initial pressure when contact is made and further pressing shall seat the button on or in the faceplate.
- b. Landing call buttons and designated car buttons shall also serve as registered call signal indicators, and shall have their function indelibly and legibly identified.
- c. Landing call buttons shall contain Up and Down arrow indications and car buttons shall contain floor designations. When a landing call button is operated, the button shall illuminate to indicate that the call has been registered. The signal shall be extinguished when the car has served the registered call.
- d. All lights shall be LED.
- e. Car and hall buttons shall be tamperproof vandal resistant type, positive stop design as approved.

3. Door Operating Buttons:

- a. "Door Open" and "Door Close" buttons shall be provided in same faceplate as operating buttons, and shall be similar in size and design to floor buttons, but not illuminated.

4. Boxes:

- a. Provide a sheet metal containing box for each fixture with sufficient knockouts, and grommets to receive cable. Box shall be minimum No.12 USSG and adequately reinforced.

B. Provisions for the Handicapped:

1. Arabic Numerals and Braille Symbols: Provide raised Arabic numerals 5/8" in height and Braille Symbols corresponding to the numerals on the elevator buttons located immediately left thereof. The Braille symbols shall be placed to the left of the corresponding raised Arabic numerals, or where space does not permit, the Braille symbols, including door open, door close, emergency alarm, emergency bell, emergency stop and telephone.
2. Locations of Numerals and Symbols: Passenger elevator door frames on all elevator floors shall have the number of the floor on which the frame is located designated Arabic numeral 2" in height of approximately 60" above the floor located on both sides of jamb so that it is visible from within the elevator. Braille symbols shall be placed directly to the left of corresponding raised Arabic numerals.

C. Car Operation Panel:

1. Car shall be equipped with Main and Auxiliary Car Operating Panels containing all controls for the type of operation specified. The top operating button shall not be more than 48 inches from the car floor for front approach and 54" for side approach. All designations shall be engraved and backfilled. No attached signs may be used. All lights to be LED.
2. Panel to be in accordance with ADA requirements.
3. Main and Auxiliary Panels shall be identical in size.
4. Features to include, but not be limited to:
 - a. Vandal Proof Design
 - b. Stop Switch (Keyed).
 - c. ALARM button.
 - d. Emergency Light Test Switch
 - e. Light switch.
 - f. Fan switch: two speed.
 - g. DOOR OPEN button.
 - h. DOOR CLOSE button
 - i. Key operated inspection switch.
 - j. Key operated independent service switch.
 - k. Fire-Emergency visual and audible signals.
 - l. Emergency telephone to be hands free ADA Type integral with car station faceplate.
 - m. Medical Emergency Key Switch, engraved signage, visual and audible signals.
 - n. Firefighter's Operation Panel, engraved signage, visual and audible signals.

- o. All signage to be engraved.
 - p. No Smoking
 - 1) Capacity
 - 2) Elevator #
 - 3) All other requirements
 - q. Certificate Frame. Sized for MA Certificate of Use.
 - r. Provision for card reader.
 - D. Car position and direction indicator.
 - 1. Electric digital, LED lighting, in each carstation.
 - E. Alarm bells:
 - 1. In hoistway pit:
 - a. Provide bell in elevator pit.
 - b. Diameter: 6 inch.
 - c. Include wiring and transformers.
 - 2. Under car platform:
 - a. Under car.
 - b. Diameter: 6 inch.
 - c. Include wiring and transformers.
 - F. Traveling Lanterns:
 - 1. All lights to be LED.
 - 2. Provide in car jambs on each side of elevator.
 - 3. Vandal Resistant.
 - 4. Satin stainless steel fixture.
 - 5. No plastic lenses.
 - G. Hoistway Access Switches:

1. Top landing.
2. Bottom landing.
3. Provide operation and equipment as required by Code.

H. Corridor Call Pushbuttons.

1. Call register type (Vandal Proof Design).
2. All lights to be LED.
3. Two buttons at all intermediate landings and single button at each terminal landings.
4. Provide Firefighters' Service Key Switch, engraved signage and fire hat jewel in hall station at designated landing.
5. Provide Medical Emergency two position key switch in hall station. Engraved lettering and visual signal and keyed switch in accordance with MA code.
 - a. Bezel or lettering to be "Blue".
6. Card Reader Provision

I. Corridor Indicators:

1. Mounted at minimum 72" centerline
2. Main Landing Only
3. All lights to be LED

2.6 COMMUNICATIONS

A. Communication system, complete with all equipment and appurtenances:

1. Provide as integral part of car station an ADA push button hands free telephone system.

2.7 ELEVATOR COMMUNICATIONS FAILURE MONITORING SYSTEM

A. In accordance with A.17.1-2013, Item 2.27.1.1.b, provide two-way communications means to verify operability of the telephone line.

1. Verification of the phone line shall be automatically performed
2. At main landing, provide visual signal labeled: "Elevator Communications Failure" in red letters which will illuminate intermittently upon phone line failure
3. The visual signal shall be located in the hall push button station in the vicinity of the "Fire Recall" switch.
 - a. Signal Labeled "ELEVATOR COMMUNICATIONSFAILURE"

- b. Illuminate intermittently upon phone line failure.
- c. Continues to illuminate intermittently until phone line is functional.
- d. Audible signal shall sound every 30 seconds.
- e. Signal shall continue until silenced by authorized personnel when the telephone line is functional
- f. Periodic Verification shall be at least once on a daily basis.

2.8 EMERGENCY OR STANDBY POWER SYSTEM

- A. New Selector Switch and Annunciator Panel shall be located at the Fire Command Area. Elevator contractor to insure operation is in accordance with A17.1.
 - 1. Elevator, upon loss of power, shall operate on emergency power within allowable timeframe.
- B. Provide in hall pushbutton station at Main Level for elevator an illuminated signal marked "Elevator Emergency Power" to indicate when normal power supply has failed and emergency or standby power is in effect.
- C. All engraved signage to be in accordance with current code requirements.
- D. Provide all required hoistway wiring and wiring to Annunciator Panel.

2.9 ANNUNCIATOR PANEL

- A. Provide Annunciator Panel in accordance with Code in Fire Command Area.
- B. Elevator Emergency Power: Provide Elevator Emergency Power Jewel to designate when elevator is on emergency power.
- C. Elevator Position Indicator: Provide digital display to identify location of elevator.
- D. Provide two-position Firefighters' Key Switch, visual fire hat symbol and engraved operation detail in accordance with code.
- E. All systems and functions in accordance with Code Regulations.

2.10 CAR EQUIPMENT

- A. Elevator car frame and platform:
 - 1. Car frame and auxiliary supports.
 - a. Structural steel members.
 - b. Welded, riveted or bolted to form rigid unit.
 - 2. Platform:
 - a. Designed for Class for loading specified.

- b. Steel frame with steel subfloor or structural steel frame filled with:
 - c. Double wood flooring, each floor, minimum 3/4 inch thick marine grade plywood.
 - d. Underside: fireproofed with minimum No. 27 USSG sheet steel.
 - e. Mount on neoprene pads.
 - f. Support pads with auxiliary steel frame, fastened to car frame forming isolated cushion between car and frame.
- 3. Toe guard:
 - a. Minimum No. 16 USSG cold rolled sheet steel on entrance side.
 - b. Full width of entrance.
 - c. As required by Code.
- 4. Sill:
 - a. Extruded Aluminum, approved nonslip surface.
 - b. Length to accommodate door in fully open position.
 - c. Minimum thickness 7/16 inch.
 - d. Grooves machine planed, minimum guide clearance.
 - e. Machine rabbetted to receive toe guard.
 - f. Securely fastened to platform.
 - g. Shimmed to be level.
 - h. Parallel to centerline elevator guiderails.
- B. Cab Enclosure (Refer to Architectural Drawings A1.01 and A1.03)
 - 1. Entrance columns, return panel and transom:
 - a. Full Width, reinforced transom.
 - b. Finish to be 16 GA satin stainless steel #4 satin finish.
 - 2. Cab Shell: Wood core Class A fire rated 3/4" particle board.
 - 3. Cab Interior:
 - a. Vertical Side Wall Panels shall be textured satin stainless steel.

- 1) Add ¼" Vertical satin stainless steel bar inlays for panelized design.
 - b. Reinforced strike jamb, entrance column, full width reinforced transom. Finish to be satin stainless steel #4.
 - 1) Minimum ¾" plywood backing.
 - 2) Hoistway side to be fireproofed with minimum No. 26 USSG galvanized sheet steel.
 - 3) Required spacing to be provided for installation of finished flooring.
 - c. Base:
 - 1) 4" in height.
 - 2) Straight type, surface applied.
4. Canopy:
 - a. Minimum No. 12 USSG cold rolled stretcher leveled furniture steel, painted black finish.
 - b. Reinforced to support weight of five workmen minimum as required by Code.
 - c. Sound deadened.
 - d. Top emergency exit, concealed hinges, chain stops, hair line joints, operable from top of car only.
 - 1) Lock and contact to prevent operation of car with exit door open.
 - 2) Locked in accordance with MA 524 CMR (3502key).
 - e. Provide guard rail at car tops. Provide toe board in accordance with code.
5. Ventilation:
 - a. Grille of stainless steel of vandal resistant design as approved by Owner.
 - b. Provide two (2) speed fan.
 - c. Provide proper insulation to minimize sound and vibration.
 - 1) Mount on isolated rubber grommets with diffuser and grille.
6. Handrails
 - a. #4 satin Stainless Steel, each side.
 - b. General Requirements.
 - 1) Provide on side walls.

- 2) Inconspicuous fastenings with backer plate.
 - 3) 1" in diameter stainless steel spacers.
 - 4) Fastenings shall not protrude from brackets or form rough edges.
 - 5) Ends turned back to wall.
 - 6) Height above finished floor to suit ADA code requirements.
7. Lighting and Ceiling Type (Refer to Drawings A1.01 and A1.03)
 - a. Satin Stainless Steel Island ceiling with recessed LED Downlights.
 - b. Provide high-efficiency, low profile, LED, soft-light down lights.
8. Pad hooks:
 - a. Provide on front and side panels.
 - b. Aluminum.
 - c. Threaded.
9. Protection pads:
 - a. Provide for front, sides and rear panels.
 - b. Pads shall be fitted, quilted, fire retardant canvas.
 - c. Adequately filled to provide proper protection.
 - d. Arrange stitching to prevent sagging.
 - e. Openings, in area of operating and indication devices securely finished.
 - f. Heavy duty eyelets properly spaced to suit pad hooks.
 - g. Color as selected by Architect.
10. Flooring:
 - a. Resilient Flooring
 - b. By other trades.

2.11 DOORS AND DOOR EQUIPMENT

A. Passenger Elevator entrances:

1. Frames shall be of mitered and welded construction for complete one piece assembly. All frames shall be securely fastened to fixing angles mounted in the hoistway and shall be of 14 gauge sheet steel.
 2. Sills shall be extruded aluminum.
 3. Doors: Entrance doors shall be of hollow metal construction with vertical internal channel reinforcements.
 4. Fire Rating: Entrance and doors shall be UL fire rated for 1 ½ hour.
 5. Entrance Finish: Brushed Satin Stainless Steel.
 6. Entrance Markings Plates: Entrance jambs shall be marked with 4" x 4" plates having raised floor markings with Braille located adjacent to the floor marking. Marking plates shall be provided on both sides of the entrance.
 7. Medical Emergency entrance jamb "Star of Life" plate to be applied to each side of doorway jamb in accordance with code for Elevator #2.
 - a. Braille plates shall be in contrasting colors.
- B. Hangers and tracks:
1. Cab and hoistway door: two-point suspension sheave type hangers with provisions for vertical and lateral adjustment.
 2. Hangers:
 - a. Resilient tread sheaves.
 - b. Sheave diameter: minimum (2¼ inch).
 - c. Ball or roller bearings.
 - d. Sealed to retain lubrication.
 - e. Mount sheaves on steel or malleable iron hangers.
 - f. Hangers mounted to door with two cap screws.
 - g. Hardened steel ball bearings up thrust roller: beneath each sheave with means for fine vertical adjustment.
 - h. Hanger mounting brackets steel or malleable iron.
 3. Tracks:
 - a. High carbon cold rolled or drawn steel.
 - b. Shaped and finished to permit free movement of sheaves.
 - c. Bottom of track: in contact with upthrust roller.
- C. Door Control Features:

1. Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.

D. Door Reversal Device:

1. Electronic detector:
 - a. Electronic type with enclosed antenna located on leading edge of car door including tenite shields for each entrance. Edge shall contain colored lighting: 'GREEN' for open; 'RED' for close. Janus Systems.
 - b. When detection zone is interrupted, doors:
 - 1) Shall be prevented from closing from fully open position.
 - 2) Shall stop and reverse from closing.
 - 3) Shall reopen only distance of detection zone.
 - 4) Shall resume normal closing speed when zone is cleared.
 - c. Door-open time: to be less for car button call stop than corridor button call stop.
 - d. Door prevented from closing for 20 seconds will close at reduced speed and cause buzzer to sound.

E. Door Operator:

1. For each cab opening: high speed master electric power door operator in a closed loop design to automatically open and close cab and hoistway doors at landings. Closed loop design.
2. Doors:
 - a. Smooth operation without slam or shock.
 - b. Mechanically or electrically checked in final movement in both directions.
 - c. Hoistway doors with sill mounted auxiliary closers to automatically close doors if car leaves landing zone.
 - d. Motion transmitted between doors: linkage, chain or cable gearing.
 - e. Pivot points: equipped with ball or roller bearings or bronze bushings.
 - f. Door operator shall function properly under prevailing building conditions.

F. Car Door Contact and Interlocks:

1. Electrical contact to prevent operation of elevator by normal operating devices, unless car doors are closed.
2. Hoistway entrance with: positive electromechanical interlock to prevent normal operation of elevator, unless all hoist way doors are locked in closed position.

3. Interlock to prevent opening hoist way doors from landing side, unless car is within landing zone and is either stopping or stopped.
4. Interlocks: unlockable from elevator car in case of power failure.
5. Provide sill mounted auxiliary door closers.
6. Provide hoistway door unlocking devices as required by code.
 - a. In accordance with 524 CMR, Section 35.00: 17.07: Hoistway Doors: provide instruction on use to local fire department.
 - b. The unlocking device shall be "secured at a location in the building that is readily accessible to the fire department.
7. Bottom of doors: two demountable adjustable, non-metallic guides to fit sill grooves.
8. Provide required fire stops.
9. Provide hoistway door safety retainers, top and bottom, in accordance with code.
 - a. Refer to A17.1: 2.11.11.8
 - b. Prevents displacement of the door panel top and bottom when door panel is subjected to force.
 - c. The retaining means shall not be subjected to wear or stress during normal door operation or maintenance.
10. Install rubber bumpers on side opening doors; recessed astragals on center opening doors.
11. Sight guards on doors formed of No. 16 USSG cold rolled furniture steel. Finish to match doors.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All work performed shall be by competent, licensed and experienced personnel in their respective trades. All workmanship and materials shall meet the Commonwealth of Massachusetts Board of Elevator Regulations 524 CMR, ASME A17.1 and all regulatory codes.
- B. Painting:
 - 1. Paint:
 - a. Best grade for purpose; rustinhibitive.
 - b. Deliver in original sealed containers.
 - c. Apply in accordance with manufacturer's instructions.
 - d. Color: as directed by Engineer or Owner.
 - 2. Preparation:
 - a. Clean, de-grease, de-burr.
 - 3. Repair scratches and other damage in field. Use same prime and finish materials.
 - 4. Structural steel, miscellaneous iron, sheet metal;
 - a. Prime and finish coat in factory.
 - 5. Motors, Machinery.
 - a. Prime coat and finish coat in factory.
 - b. Finish to be smooth.
 - 6. Prime coat and finish coat in factory; touch up in field. Control room equipment, pit equipment and nonplated surfaces (not applicable to polished, milled surfaces, faces of guide rails).
 - 7. Repair scratches and other damage in field. Use same prime and finish materials.

3.2 EQUIPMENT AND MATERIALS

- A. Guards and railings:
 - 1. Provided OSHA approved guards for cables and rotating equipment.
 - 2. Furnish guards, railings as indicated and/or as required by authorities
- B. Nameplates:

1. In addition to manufacturer's standard identification plates, provide:
 - a. Fastened with epoxy cement, screws or rivets, engraved, with (3/4 inch) white lettering.
 - b. Inscription: subject to review, indicating equipment and voltage.
 - c. Provide for:
 - 1) Disconnect switches.
 - 2) Control panels.
 - 3) Selector panels.
 - 4) Machines.

C. Elevator Control Room:

1. Mount permanent sign: "MRL – CONTROL ROOM LOCATED ON ROOF"
 - a. Sign shall be mounted on the head jamb at the main floor elevator entrance.
 - b. Sign shall be a minimum of 3/4" high letters and shall be of a contrasting color with that of the background

D. Identification of Equipment

1. If more than one (1) elevator in the building. Provide 3" in height elevator number on elevator entrance at the designate level.

3.3 ADJUSTING AND CLEANING

A. All equipment shall be adjusted, prior to final testing, to obtain peak operation from all equipment.

1. Initial cleaning prior to State Acceptance Testing.
2. Final cleaning of all equipment prior to building occupancy including control room, pits and hoistway.

B. Cleaning:

1. Brush, clean work prior to concealing and painting. Perform in stages, if directed.
2. Remove debris from inside and outside of materials and equipment.
3. All equipment shall be cleaned prior to final inspection.
4. Provide final clean down of hoistways, control rooms, cabs, pits and all equipment prior to occupancy.

3.4 FIELD QUALITY CONTROL

A. Tests:

1. Perform as required by Code and as hereinafter noted and in presence of:
 - a. Authorities having jurisdiction.
 2. Provide required labor, material, equipment and connections.
 3. Document results and submit for approval.
 4. Repair or replace defective work, as directed.
 5. Pay for restoring or replacing damaged work of others, due to tests, as a result of the Contractor's negligence.
- B. Prior to expiration of maintenance service included in contract, make a thorough check of all equipment including but not limited to:
1. Car rails and Car sling
 2. Car alignment.
 3. Car and landing doors.
 4. Make adjustments as required for a car ride acceptable to Owner.
- C. Noise and vibration:
1. Due to faulty equipment or workmanship: correct required without additional charge.
 2. Provide isolation for all panels, drive machines, drives, etc. Submit isolation details for approval. Provide all sound suppression equipment to ensure noise and vibration free operation.
- D. Final Inspection:
1. When all work is completed, and tested to the satisfaction of the Contractor, the Contractor shall notify the Owner and Engineer in writing that the elevator is ready for final inspection and acceptance test. A testing and inspection date shall then be arranged. The proper operation of every part of the elevator system and compliance with contract requirements, including compliance with all applicable requirements of the Code, shall be demonstrated. Furnish all test instruments and materials, required at the time of final inspection.
 2. The Contractor shall perform the following tests on the elevator at the time of pre-inspection:
 - a. Test Period:
 - 1) The elevator shall be subjected to a test for a period of one hour continuous run, with full specified load in the car. During the test run, the car shall be stopped at all floors in both directions of travel for a standing period of 10 seconds per floor.
 - b. Speed Load Tests:
 - 1) The actual speed of the elevator car shall be determined in both directions of travel with full contract load and with no load in the elevator car. Speed shall be determined by applying a tachometer to the car hoisting cables. The

actual measured speed of elevator car with full load in the UP direction shall be within 5 percent of rated speed. The maximum difference in the actual measured speeds obtained under the various conditions outlined between the "UP" and the "DOWN" directions shall be checked.

- c. Car Leveling Tests:
 - 1) Elevator car leveling devices shall be tested for accuracy of landing at all floors with no load in car, symmetrical load in car, and with full load in car, in both directions of travel. Accuracy of floor landing (plus or minus 1/4 in.) shall be determined both before and after the full-load run test.
- d. Dynamic System Balancing Test:
 - 1) The car and counterweight suspension system shall be dynamically balanced so that the total weight of the counterweight and its frame shall be equal to the total weight of the unloaded car and its sling plus 40 percent of the contract load with an accuracy of plus or minus 50 pounds.
- e. Five Year Type Elevator Safety Test:
 - f. Five year elevator safety test shall be performed as required by Code. A metal tag shall be attached to the safety-releasing carrier and the governor in a permanent manner, giving the date of the safety test, type of safety test and the name of the firm who performed the test.
 - g. After completion of the required safety test post Certificate of Use.
- E. Final System Tests for Smoke Detection/Elevator Recall and Emergency Generator Operation: After work is completed, conduct a final test of entire system under the supervision of the Alarm Systems Contractor for the Building Alarm System as well as all applicable trades. This test is to be also conducted under emergency power conditions.
- F. Reinspection:
 - 1. If any equipment is found to be damaged or defective, or if the performance of the elevator does not conform with the requirements of the contract specifications or the Safety Code, no approval or acceptance of elevators shall be issued until all defects have been corrected. When the repairs and adjustments have been completed and the discrepancies corrected, the Engineer shall be notified and the elevator will be reinspected. Rejected elevators shall not be used until they have been reinspected and approved.
- G. Additional Requirements:
 - 1. Testing of all elevator equipment prior to expiration of final one year Warranty/Maintenance period.
 - a. In sufficient time prior to the expiration of the Certificates of Use during the warranty/ full preventive maintenance on the elevators, file required straight time permits for annual and/or five year weight safety test, firefighters' testing, emergency generator testing and all applicable testing of the elevator equipment.
 - b. Include in base bid all costs (permits, labor, load testing) to conduct this testing.
 - c. Correction of all cited violations, including costs for filling repair permit(s), is to be completed prior to expiration of final one year warranty/maintenance term.

- d. It is the Elevator Contractor's responsibility to obtain and post the new Certificate of Use in the Certificate Frame in the elevator.

3.5 SCHEDULE

A. Elevator Number:	1
1. Detail	VT.01
2. Type:	Passenger/Service (MRL)
3. Contract Load in Pounds:	4,000 lbs.
4. Contract Speed in FPM:	150
5. Number of Stops:	Five (5) Front, Rear
6. Number of Openings:	Five (5): B (rear), 1, 2, 3, 4
7. Control Room Location:	Adjacent, Roof
8. Machine Location:	Overhead, In Hoistway (M.R.L.) Building Supported Machine Application
9. Machine Type:	AC Gearless M.R.L Traction
10. Type of Motor Drive:	Regenerative ACVF
11. Car and Hoistway Door Type:	Two Speed Side Opening
12. Opening:	4'-0" wide x 7'-0" high, Front and Rear
13. Call Registration Indication:	Car and Hall Buttons, LED Lights
14. Car Operating Panel:	Main and Auxiliary, Vandal Proof
15. Car Position Indicator:	Digital, In Car Stations
16. Corridor Position and Direction Indicator:	At Main Landing
17. Car Traveling Lantern:	Each Side, Vandal Resistant
18. Hall Push Button Stations:	One (1) Each Landing
19. Emergency Communication:	ADA Telephone
20. Communications Failure Monitoring:	Required
21. Emergency Source:	Emergency Generator

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22. Firefighters' Service:	Required
23. Medical Emergency:	Required
24. Annunciator Panel:	Required
25. Card Reader	Wiring provisions, Car and Hall
26. Camera	Wiring provisions only
27. Cab Detail	Refer to A1.01 and A1.03

END OF SECTION

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**NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS
NEW BEDFORD, MASSACHUSETTS**

Mount Vernon Group Architects, Inc., Project No. 02014.43

June 12, 2019

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SECTION 22 00 01

PLUMBING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All the Contract Documents, including Drawings, General Conditions, Supplementary Conditions, and all Sections of Division 1- General Requirements, apply to the Work of this Section.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Section which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. DIVISION 06 – WOOD AND PLASTICS; including all Sections contained therein
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 60 13 – Wire Mesh Partitions
 - 11. Section 21 00 00 – Fire Protection
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. DIVISION 31 – EARTHWORK; including all Sections contained therein

1.03 PRE-INSTALLATION MEETING

- A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

1.04 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris daily and dispose in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

1.05 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

- B. Carefully examine all of the Contract Documents for requirements, which affect the work of this section. The exact scope of work of this section cannot be determined without a thorough review of all specification sections and other Contract Documents.

1.06 WORK INCLUDED

The work under this Section shall include the furnishing of all material, labor, equipment, core drilling, staging, hoisting, rigging, and supplies and the performance of all operations to provide a complete working system as required by the Drawings and details and as specified herein, in general, to include the following items:

- A. A Complete (Interior) Storm Water Roof Drain Collection System: This System shall be as designed and indicated on Plumbing Documents. This System shall connect to each and every Roof Drain and extend to 10'-0" beyond foundation wall.

1.07 RELATED WORK IN OTHER SECTIONS

- A. The following work is not included as work in this Section and is to be performed under other Sections:

- 1) All Cutting and Patching
- 2) Temporary Heat
- 3) Temporary Light and Power
- 4) Excavation and Backfilling
- 5) Foundations and Trenching
- 6) Concrete Bases for Equipment
- 7) Flashing and Caulking
- 8) Painting
- 9) Heating, Ventilating and Air Conditioning
- 10) Electrical
- 11) Utilities Beyond 10'-0" from the Building (except services for Out Building under Alternate #1))

1.08 INTERPRETATION OF DRAWINGS

- A. All work shown on the Drawings is intended to be approximately correct to scale, but figured dimensions and detail Drawings are to be followed in every case. The Drawings shall be taken in a sense as diagrammatic. Size of pipes or conduits and methods of running them are shown but it is not intended to show every offset and fitting, nor every structural difficulty that may be encountered.
- B. To carry out the true intent and purpose of the Drawings, all necessary parts to make complete, approved working systems ready for use shall be furnished without extra charge.
- C. Locations shown on the Drawings are approximate and it is intended that all equipment shall be located in accordance with the general and detail Drawings of the construction proper. All measurements shall be taken at the building before fabrication commences.

1.09 OBTAINING INFORMATION

- A. Obtain from the manufacturer the proper method of installation and connection of the equipment that is to be furnished and installed. Obtain all information that is necessary to facilitate the work and to complete the project.

1.10 CO-OPERATION 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 and not 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 directed.
- B. 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.
- C. All distribution systems which require pitch or slope such as plumbing drains 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.
- D. Plumbing Shop Drawings shall be prepared by the Plumbing Subcontractor, or as directed by the Architect, and sepiá transparencies, or as directed by Architect, of these Drawings shall be used to work out the coordination of all work of all trades as specified in each applicable Section. Mechanical, fire protection and electrical systems shall be shown and coordinated on these transparencies in the order listed by the respective Subcontractors.
- E. Prepare and submit for approval plans and sections clearly showing how the work is to be installed in relation to the work of other trades. Work that is installed before coordination with other trades or that causes interference with the work of other trades shall be changed to correct condition.

1.11 RECORD DRAWINGS

- A. Purchase and maintain at the job site a complete and separate black line set of prints of the approved Working Drawings on which to accurately indicate daily progress by coloring materials and apparatus as installed. Schedules shall be modified to reflect data consistent with that of the installed equipment. Clearly show all changes to the work as a result of change orders, instructions issued by the Architect or conditions encountered in the field. Accurately indicate the location, size, type and elevation of new utilities and their relationship to existing utilities.
- B. The marked-up and colored-in prints will be used as a guide for determining the progress of the work installed. They shall be inspected weekly by the General Contractor and Architect and shall be corrected immediately if found inaccurate or incomplete. Requisitions for payment will not be approved until the Drawings are accurate and up-to-date.
- C. At the completion of the work, submit one (1) set of the marked-up prints for review and approval by the General Contractor and Architect. After approval these marked-up prints shall be used in the preparation of the Record Documents.
- D. Obtain and pay for one (1) set of Plumbing electronic files (AutoCAD 2012 or later) and obtain the As-Built architectural backgrounds from the Architect. Make all modifications to these documents as shown on the marked up prints. Remove all superseded data to show the completed installation.
- E. The electronic Plumbing files may be obtained from the Engineer. Arrange with the Architect to obtain As-Built architectural electronic files for correct up to date backgrounds.

- F. Deliver the completed Record Documents properly titled and dated to the Architect. These shall become the property of the Owner.
- G. Refer to General Conditions and Supplementary General Conditions for additional requirements which may be required.
- H. Provide hard copies of the Record Documents as directed by Architect or Owner.

1.12 PERMITS, FEES, RULES AND REGULATIONS

- A. Give the proper Authorities all requisite notices and information relating to the work under this Section. Obtain and pay for all fees, licenses, permits and certificates. Comply with the rules and regulations of all Local, State and Federal Authorities having jurisdiction, the rules and regulations of the National Board of Fire Underwriters and the Public Utilities Companies serving the building.

1.13 COMMISSIONING REQUIREMENTS

- A. An independent Commissioning Agent (CxA) has been retained for this project. The commissioning process will be implemented in accordance with industry standard commissioning protocols and procedures.
- B. This contractor shall assist and support the CxA as necessary in accordance with the requirements of specification section 01440 – COMMISSIONING REQUIREMENTS

1.14 PROTECTION OF WORK AND PROPERTY

- A. Be responsible for the care and protection of all work included under this Section until it has been tested and accepted.
- B. Protect all equipment and materials from damage from all causes including theft. All materials and equipment damaged or stolen shall be repaired or replaced with equal material or equipment.
- C. Protect all equipment, outlets and openings with temporary plugs, caps and covers. Protect work and materials of other trades from damage that might be caused by work or workmen and make good damage thus caused.
- D. Exterior of this building is considered wetlands and is to be treated and protected as such. Collect and dispose of all construction debris created by this trade in an appropriate manner. Do not allow fluids such as cutting oil, anti-freeze, gasoline and/or other fluids used during construction to spill, seep or contaminate the ground. Environmentally assessed fines and penalties created by this contractor shall be paid by this contractor.

1.15 SUBMITTAL REQUIREMENTS

- A. Refer to General Conditions and Supplementary General Conditions for requirements all of which shall be included as part of these Specifications.
- B. Submit for approval, within thirty (30) days after signing the Contract and prior to the submission of any shop drawings, an itemized list of manufacturers of material and equipment and of Subcontractors proposed to be used under this Section.
- C. After approval of the list, provide for review a minimum of six (6) sets of detailed shop drawings (confer with Architect and provide additional sets if required). All shop drawing information for equipment and fixtures submitted shall include complete specification, fixture or equipment identification tag or number as indicated on contract documents. Descriptions shall include type of materials, operating pressures and temperatures, capacities, performance and power requirements to determine compliance with Contract Documents. All data submitted shall be complete for all equipment and shall apply only to this specific project. Blanket type generic submittals not clearly identifying Specified and required information will not be accepted. Non pertinent information to this project shall be removed if possible and crossed out
- D. Regardless of any information included in the shop drawings submitted for review, the requirements of the Drawings and Specifications shall not be superseded in any way by the shop drawings review.
- E. Each submittal shall be reviewed, stamped and certified prior to submission to the Architect. Such certification shall be made by the Owner of the company or Corporate Officer of the Plumbing Subcontractor or by a person duly authorized to sign binding agreements for the Plumbing Subcontractor. The certification shall state that the data and details contained on each shop drawings, layout drawings, catalog data and brochure has been reviewed by the Plumbing Subcontractor and that it complies with the Contract Documents in all respects. Shop drawings, layout drawings, catalog data and brochures will not be reviewed and will be returned to the Plumbing Subcontractor unchecked unless they are certified.
- F. It is intended that the Plumbing Subcontractor submit complete and accurate data at the first submission. If the shop drawing is returned marked "Resubmit," or "Not Accepted," only one (1) additional submission will be permitted.

- G. Equipment shall be of proper size for its allotted space. Equipment shall be disassembled as required, without invalidating the manufacturers' warranty, so that it can be installed through regular window, door, and/or louver openings.
- H. The shop drawings and manufacturer's data shall be submitted in a timely manner sufficiently in advance to give ample time for checking, correcting, resubmitting and rechecking if necessary. No claim for delay will be granted for failure to comply with this requirement.
- I. A minimum period of two weeks, exclusive of transmittal time, will be required in the Engineer's office each time shop drawings, layout drawings, and catalog data and brochures are submitted or resubmitted for review. This time period shall be considered by the Plumbing Subcontractor when scheduling his work.

1.16 MATERIAL AND EQUIPMENT STANDARD

- A. Refer to General Conditions and Supplementary General Conditions regarding substitution of materials as it relates to this project.
- B. Where materials or equipment are specified by patent proprietary name, or name of the manufacturer, such Specification shall be deemed to be used for the purpose of establishing a standard for that particular item. Substitutions may be offered for review provided the material, equipment or process offered for consideration is equal in every respect to that indicated or specified and only if the term "approved equal" appears.

1.17 GUARANTEE

- A. Refer to General Conditions and Supplementary General Conditions for requirements all of which shall be included as part of this Specification.
- B. Manufacturers shall provide their standard warranties for material and equipment furnished under this Section. Such warranties shall be in addition to and not in lieu of all liabilities which the manufacturer and Plumbing Subcontractor may have by law or by provisions of the Contract Documents.
- C. All materials, equipment and work furnished under this Section shall be guaranteed against all defects in materials and workmanship for a period of one (1) year commencing with the date of Final Completion. Any failure due to defective material, equipment or workmanship which may develop shall be corrected at no expense to the Owner including all damage to areas, materials and other systems resulting from such failures.
- D. Upon receipt of notice from the Owner of failure of any part of the systems during the guarantee period, the affected parts shall be replaced. Any equipment requiring excessive service shall be considered defective and shall be replaced.

1.18 CERTIFICATES OF APPROVAL

- A. Upon completion of all work, furnish in duplicate, certificates of inspections from the hot water heater, electric water cooler and plumbing fixture manufacturers stating that authorized factory engineers have inspected and tested the operation of their respective equipment and found same to be in satisfactory operating condition.

1.19 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

- A. Give detailed instructions, prior to the completion of the work, to the responsible personnel designated by the Architect in the operation and maintenance of all work installed under this Section. A letter with two (2) copies containing the name of the person or persons to whom the instructions were given and the dates of the instruction period shall be submitted to the Architect at the completion of the project.
- B. In addition, prepare three (3) sets of manufacturer's catalogs, other similar data including the necessary photographic equipment cuts and wiring diagrams covering all mechanical equipment and devices furnished and installed under this Section. These manuals shall provide complete instructions for the proper operation and use of the equipment together with instructions for lubrication and periodic maintenance and for trouble shooting. Operating instructions shall be specific for each system and shall include copies of posted specific instructions. This manual shall contain only that information which specifically applies to this project and all unrelated material shall be deleted. During the instruction period, this manual shall be used and explained. The material shall be bound in notebook form and indexed.
- C. Provide name, address and telephone number of the manufacturer's representative and Service Company for each piece of equipment so that the source of replacement parts and service for each item of equipment can be readily obtained.

1.20 VALVE TAGS AND LISTS

- A. The Plumbing Subcontractor shall provide on each ball valve, gate valve, globe valve, and on all automatic control valves installed under this Section, a 2" diameter brass tag with stamped numerals and letters painted white. The tags shall be attached to the valve handle or stem with brass chains and properly secured. All numbers shall be prefixed by letters corresponding to those listed for piping identification.
- B. These numbers shall correspond with numbers indicated for valves and controls on the Record Drawings and on a minimum of two (2) printed valve lists. These printed lists shall state the number and locations of each valve and the section, fixture or equipment which it controls and other necessary information, such as requiring the opening or closing of another valve where one (1) valve is to be opened or closed.
- C. Printed lists shall be prepared in a form to meet the approval of the Architect, framed under glass and displayed in rooms designated by the Architect.

1.21 PIPE IDENTIFICATION

- A. Label each piece of mechanical equipment with a 1 1/2" x 4" long aluminum nameplate with a black enamel background and with the designated equipment and area or system served engraved in natural aluminum letters. Secure with two (2) "Phillips head" brass screws or machine bolt with locknuts. Nameplates shall be manufactured by Seton Nameplate Company, by Dennison Manufacturing Company, Markem Company or approved equal.
- B. Identify piping as specified herein. Identification markers for piping 3/4" up to and including 5" shall be Setmark Type SNA. Piping 6" and above shall be identified with Setmark Type STR laminated plastic markers.
- C. Exposed piping and piping above removable ceilings shall be identified at intervals of 20'-0" and on each side of wall, if wall extends to floor above and at each change of direction and on each side of wall, if wall extends to floor above together with an arrow showing the direction of flow.

- D. Legend and colors shall conform to the following, with all lettering and arrow colored black:

<u>Service</u>		<u>Band Color</u>		<u>Legend</u>
Cold water		Blue		CW
Hot water		Red		HW
Hot Water re-circulating	Red		HWR	
Non potable water		Brown		NPW
Gas		Yellow		GAS
Sanitary		Brown		SAN
Vent		Brown		VENT
Gasoline/Sand Interceptor Waste	Orange		GSW	
Gasoline/Sand Interceptor Vent	Orange		GSV	
Compressed Air General use		Blue		CA
Storm / Rainwater leaders		Cyan		RWL

1.22 RESPONSIBILITY OF BIDDERS

- A. Bidders shall examine all Drawings and Specifications issued and must be familiar with the codes, rules, and regulations (and the local interpretations) in effect at the site of the work.
- B. Where any of the above is at variance with the Drawings and Specifications, the code requirements shall take precedence, and any cost necessary to meet these shall be included in the bid price.
- C. The Plumbing Subcontractor is assumed to be skilled in the trade and is solely responsible for compliance with health and safety regulations, performing the work in a safe and competent manner and in installation procedures required for the work as outlined in these documents.
- D. Address questions regarding Drawings/Specifications in writing to the Architect before award of contract; otherwise, Architect's interpretation of meaning and intent of all shall be final.

1.23 SCHEDULE OF VALUES

- A. The Plumbing Subcontractor must submit a breakdown of his contract price to aid the Architect in determining the value of work installed, as the job progresses.
- B. No requisitions will be paid to the Plumbing Subcontractor until after the breakdown is delivered to the Architect.

END PART ONE

PART 2 – PRODUCTS

2.01 PIPE AND FITTINGS

- A. Type A: 3" diameter pipe and smaller: Type 'K' hard drawn copper tubing with wrought copper sweat joint fittings joined with silver solder joints. Type A: 4 " diameter pipe and larger: Cement Lined Ductile Iron pipe with mechanical joints.
- B. Type B: Type 'L' hard drawn copper tubing with copper sweat fittings joined with 95/5 tin antimony solder, lead free.
- C. Type C: Service weight hubless cast iron soil pipe and fittings joined with approved stainless steel mechanical couplings with neoprene gaskets (except for urinal waste).
- D. Type D: Service weight bell and spigot tarred or coated cast iron soil pipe and fittings joined with neoprene resilient gaskets.
- E. Type E: Type DWV hard drawn seamless copper tubing with wrought copper drainage fittings joined with 50/50 solder (except for urinal/waste).
- F. Type F: Schedule 40 black steel pipe with standard weight malleable iron threaded fittings with approved joint compound or Massachusetts approved Pro press fittings.
2" and smaller may be threaded or Pro-press at contractors' option.
2-1/2" may be welded, threaded or Pro-press at contractors' option
- G. Type G: Schedule 40 black steel pipes with beveled ends with standard weight carbon steel beveled end fittings joined by welding, long sweep elbows and flanged connections.
3" and above shall be welded.
2-1/2" may be welded threaded or Pro-press at contractors' option.
- H. Type H: Type 'L' hard drawn copper tubing, copper sweat fittings with silver solder joints purged with nitrogen during procedure.
- I. Type I: Schedule 40 CPVC pipe and fittings.
- J. Pipe and fittings shall be in accordance with the following:

<u>Service</u>	<u>Type</u>
Exterior water service	Type A
Interior cold water	Type B
Hot water & recirculating	Type B
Non potable water	Type B
Natural Gas 2" and dn	Type F
Natural Gas 3" and up	Type G
Natural Gas 2-1/2"	Type F or G
Sanitary w&v (below grade)	Type D
Sanitary w&v (above grade)	Type C
Rainwater leader (below grade)	Type D
Rainwater leader (above grade)	Type C
2"Ø & smaller w&v (above grade)	Type E
Gasoline/Sand w&v (below grade)	Type D
Gasoline/Sand Vent (below Grade)	Type D
Gasoline/Sand Vent (above Grade)	Type C

Compressed Air General use	Type F
Compressed Air Make up Air	Type F or I
Storm Drain Above Ground	Type C
Storm Drain Underground	Type D

- J. Provide dielectric fitting, couplings, adapters or other similar and approved devices between dissimilar metals (for corrosion control).

2.02 INSULATION

- A. Insulate all water piping, roof drain hubs and roof conductor piping. Provide PVC jackets in wet areas.
- B. Furnish all accessories and materials necessary for the installation of all insulation for the piping systems including all related equipment. All insulation shall be as manufactured by Owens Corning, Johns Manville, Certain Teed, Knauf or approved equal.
- C. Insulation shall have composite (insulation, jacket or facing, and adhesive used to adhere the facing or jacket to the insulation) fire and smoke hazard ratings as tested by Procedure ASTM-E-84, NFPA 255, and UL-723, not exceeding a flame spread of twenty-five (25), fuel contribution of fifty (50), and smoke developed of fifty (50).
- D. Accessories such as adhesives, mastics, cements and tapes shall have the component ratings as listed above for composite insulation in a wet as well as dry state. Any supplemental treatment of jackets or facings to impart increased flame and smoke safety ratings to meet the Specification is prohibited.
- E. The jacket shall have a pressure sealing lap adhesive to eliminate the use of staples, adhesives or bands. Installation shall be in accordance with manufacturer's recommendations.
- F. Valves and fittings shall be insulated with Zeston Hi-Lo Temp insulation of thickness equal to adjacent piping and covered with Zeston one (1) piece PVC insulated fitting covers and bound with Zeston Z-tape of a width recommended by manufacturer.
- G. Insulation shall be in accordance with the following schedule:

<u>Service</u>	<u>Insulation Thickness</u>
Cold water	1"
Non Potable	1"
Hot Water	1"
Horizontal Roof Conductors	1-1/2"

2.03 PIPE HANGERS AND SUPPORTS

- A. Unless noted otherwise, all hangers and support figure numbers referred to are Carpenter Patterson, Incorporated, Grinnell, Walworth or approved equal. All hangers must be Underwriters' Laboratories, Inc., U.S.A. approved design.
- B. Hangers and supports for drainage, vent, gas and air piping shall be of the following types.

- 1) Steel clevis hangers, Figure No. 100, attached to steel rod with two (2) nuts for piping 3" and larger.
 - 2) For piping 2 1/2" and smaller, steel clevis hanger Figure No. 100SH or steel band adjustable swivel ring hanger Figure No. 800.
 - 3) Beam clamps shall be Figure No. 196 with Figure No. 22 retaining clip.
 - 4) Riser clamps shall be Figure No. 126CT. Riser clamps shall be installed and all risers through floors, at each floor.
- C. Hangers and supports for water piping shall be of the following types:
- 1) Steel clevis hangers Figure No. 100 SH attached to steel rod with two (2) nuts for piping 3 inch and larger.
 - 2) For piping 2-1/2 inch and smaller, steel clevis hanger Figure No. 100SH or steel band adjustable swivel ring hanger Figure No. 800 with Figure No. 265P shield.
 - 3) Beam clamps shall be Figure No. 196 with Figure No. 22 retaining clip.
 - 4) In lieu of individual hangers, Figure No. 342 gang hangers, clips and shields may be used.
- D. Each hanger shall be equipped with an insulation shield to support the insulation and prevent the hanger from deforming the insulation.
- E. Each hanger shall be oversized so that the hanger will allow the insulation to pass through undisturbed and uncut.
- F. Each hanger that has direct contact with pipe shall be vinyl coated for rust protection.
- G. Fixture Supports:
1. All fixtures and equipment shall be supported and fastened in a satisfactory manner. Where wall hung fixtures are secured to masonry or tile walls or partitions, they shall be fastened with 1/4" through bolts provided with nuts and washers or plates at back, except where chair carriers are used. Bolt heads and nuts shall be hexagon and exposed bolts, nuts, washers and screws shall be chromium plated brass. Where secured to concrete or brick walls, they shall be fastened with brass bolts or machine screws in lead sleeve type expansion shields and shall extend at least 2" into solid concrete or brick.
 2. Where chair carriers are required, they shall be completely concealed in the building construction and shall rigidly support the fixture from the floor. Chair carriers shall be adjustable both vertically and horizontally and shall support fixtures in such a manner that no part of the fixtures shall be supported by the wall or partition. All wall hung fittings and chair carriers furnished complete with foot. These fittings shall be cast iron, vertical type, except as otherwise indicated on the Drawings, fitted with face plate of the proper style to accommodate the water closet specified, furnished complete with the necessary bolts, nuts and washers as well as connecting nipples of the proper length with gaskets for the closet connection.

2.04 CLEANOUTS

Cleanouts shall be as manufactured by Josam Manufacturing Company, J.R. Smith Manufacturing Company, Zurn Industries, Inc., or approved equal. The following series numbers are intended to establish a level of quality and comparison.

- A. Type A: JR Smith Fig. 4020-U Duco cast iron floor cleanout. Round adjustable scoriated secured nickel bronze top.
- B. Type B: JR Smith Fig. 4472 cast bronze taper thread plug with stainless steel cover and screw.
- C. Type C: JR Smith Fig. 4470 recessed bronze NPT threaded plug for use in conjunction with standard pipe fittings.
- D. Type D: JR Smith Fig. 4240 or 4237 Duco cast iron cleanout with round adjustable scoriated secured nickel bronze type outlet to match piping material. Heavy Duty for vehicle traffic.
- E. Cleanouts shall be in accordance with the following:

Sanitary, Waste Buried: General Floor Areas	Type A
Sanitary, Waste in Walls:	Type B
Sanitary, Waste at Base of Stacks:	Type C
Sanitary, Waste at Changes in Directions:	Type C
Sanitary Waste in Sallyports Room	Type D

See DRAINAGE SPECIALTY SCHEDULES on Drawings for additional information

2.05 VALVES

- A. In general, all valves shall be of the same manufacturer and placed in accessible locations and set in a vertical position with the valve stems and handles facing upward. All valves shall be Watts Regulator Co., Apollo, Nibco or approved equal.
- B. Shut Off Valves (Domestic Water and Compressed Air 2" and Smaller): Watts No. B-6081 two (2) piece full port bronze ball valve with solder ends and stainless steel ball and stem.
- C. Check Valves (2" and Smaller): Watts CVS series straight pattern bronze check valve with solder ends.
- D. Drain Valves: Watts Model BD-1 cast brass drain valve with cast iron hand wheel, 1/2 inch sweat or male threaded end, 3/4" hose thread outlet with cap and chain.
- E. All ball valves for installation in insulated piping shall have valve extensions to suit insulation thickness.
- F. Shut off Valves (Natural Gas 2" and Smaller): Watts No. B-6000-UL-MASS two (2) piece bronze ball valve with threaded ends, approved for natural gas use. Connections shall be made with a union, gas shut-off valve and 24" long approved flexible hose.
- G. Provide valves at all mains, branches and risers.

2.06 FLOOR DRAINS / ROOF DRAINS

- A. All floor/roof drains shall be the product of one manufacturer such as Jay R. Smith, Josam, Zurn or approved equal. For specific types refer to the Schedule on the Drawings DRAINAGE SPECIALTIES.

2.07 DOMESTIC WATER HEATER AND ACCESSORIES

- A. Water Heater (s): shall be as manufactured by HTP, A.O. Smith, Rheem Ruud, Bradford White or approved equal. Water heater shall meet or exceed all applicable energy codes and shall have a working pressure of no less than 150 psi. Heater shall be design certified by A.G.A. for 180 deg. service. Heater Design shall be 94% thermal efficiency. Heater shall be provided with an automatic gas/fuel shutoff device and safety shutoff in event pilot flame is extinguished; a gas pressure regulator set for the type of gas/fuel supplied; an approved draft diverter, an extruded anode rod rigidly supported for cathodic protection. Refer to all contract drawings, documents, schedules and details for design specifics (input, output, recovery, storage, etc).
- B. Water Heater: Shall be provided with fully illustrated instruction manual and parts list. Heater shall have a three year limited warranty against corrosion and tank failure due to sediment build-up as outlined in the written warranty.
- C. Water Heater Pressure and Temperature Relief Valve: (P&T) pressure and temperature relief valve shall be furnished with the heater and installed by the Contractor.
Provide ASME rated P&T if required by code or design (see contract documents)
- C. Recirculating Pump: All bronze construction shall be furnished by the Contractor.
Provide ASME rated pump if required by code or design (see contract documents)

2.08 PLUMBING FIXTURES

- A. Each type of Plumbing Fixture shall be by the same manufacturer.
- B. China Fixtures shall be: Eljer, American Standard, Kohler, Crane or approved equal.
- C. General Stainless Steel fixtures shall be: by Elkay, Just, American Standard or approved equal
- C. Penal Style: shall be by Metcraft, Acorn, Willoughby or approved equal.
- D. Other style or types of fixtures shall be as scheduled or approved equal.
- E. All exposed trim, fittings, valves and piping shall be chrome-plated brass or stainless steel.
- F. Brand names and model numbers are intended to establish a standard of quality expected.
Model numbers are for specific for specific types refer to the Drawings. SCHEDULE – PLUMBING FIXTURES & PIPE SIZES.

2.09 ACCESS PANELS

- A. Furnish access panels for access to all concealed parts of the plumbing systems that require accessibility for the proper operation and maintenance of the system. Locations shall be approved by the Architect prior to installation. Coordinate locations with all other trades prior to seeking Architect approval.
- B. Size shall be sufficient for the purpose, but no less than 12" x 18".
- C. Access doors shall be prime coated of rust inhibitive paint, continuous hinge and manufactured by J. R. Smith Mfg. Co., Mifab or Walsh-Hannon-Gladwin, Inc., "Way Lector." Type shall be as follows:
 - 1) Acoustical Tile Ceilings: Style A with 16-gauge frame, 18 gauge panel and flush screwdriver operated cam locks.

2) Suspended Drywall Lath and Plaster Ceilings: Style K with 16-gauge frame, 14 gauge panel and flush screwdriver operated cam locks if applicable.

3) Masonry Non-rated Walls: Style M with 16-gauge frame, 14 gauge panel and flush screwdriver operated cam locks.

D. Refer to the Contract Architectural Reflected Ceiling Drawings for plaster ceiling locations where the above panels are applicable.

E. Point out to the Ceiling Subcontractor exactly which tile units are to be marked with a colored button to indicate equipment above.

2.10 HOSE BIBS

A. Hose bibs shall be Chicago Faucet, sill faucet with vacuum breaker and tee handle, chromium plated or approved equal. For specific types refer to the Drawings - SCHEDULES.

2.11 WATER HAMMER ARRESTORS

A. Maintenance free water hammer arresters shall be furnished and installed at all locations in the water systems where quick acting valves are installed as well as wherever water hammer may occur.

B. Water hammer arresters shall be as manufactured by Josam Manufacturing Company, J.R. Smith Manufacturing Company, Zurn Systems or Precision Plumbing Products, Incorporated. Arresters shall be installed at each and every item as listed above. Where a single branch water pipe serves a multiple of fixtures or items as listed above, water hammer arresters may serve groups of fixtures. Sizing and placement shall be in accordance with PDI Standard PDI-WH 201 and the manufacturer's recommendations.

2.12 WALL HYDRANTS

A. J.R. Smith, Josam, Zurn or equal bronze wall hydrant with bronze face, stainless steel casing, T-handle key, and vacuum breaker. For specific types refer to the Drawing Schedule and Plans.

2.13 WATER METER

A. Water meter shall be as manufactured of the type approved by the Water Department and furnished and installed in accordance with Water Department requirements.

2.14 REDUCED PRESSURE BACKFLOW PREVENTER

A. Backflow preventer shall be similar to Watts No. 909S reduced pressure principle backflow preventer. The unit shall be a complete assembly including shut-off valves before and after the device and shall include a strainer, test cocks and pressure differential relief valve. Furnish test kit No. TK-9A and spare parts for backflow preventer. The Plumbing Subcontractor shall submit all necessary data to DEQE, and obtain approval prior to installation.

2.15 COMPRESSED AIR SYSTEM

A. See Contract Documents and Schedules.

B. Furnish and install as indicated on the Drawings.

END PART TWO

PART 3 - EXECUTION

3.01 DOMESTIC WATER SYSTEMS

- A. All copper tubing shall be cut accurately to measurements obtained at the site and shall be installed without springing or forcing.
- B. Branch lines from service or main lines may be taken off the top or bottom of main using such crossover fittings as may be required by structural or installation conditions. All service pipes, fittings and valves shall be kept at sufficient distance from other work to permit not less than 1/2" from finished coverings and such other work and not less than 1/2" between finished coverings on the different services.
- C. All piping shall be supported from the building structure with pipe hangers. In general, all lines shall be installed concealed above ceilings in finished spaces where they may occur.
- D. All copper tubing shall be cut true with cutters; the ends shall be reamed out to the full inside diameter of the pipe. Cap all open ends to prevent the entrance of debris.
- E. Provide shock absorbers (water hammer arresters) as required.
- F. Provide valves on every branch, to groups of fixtures and wherever indicated on the Drawings.
- G. Pipes shall be run parallel and graded evenly to draining points. Provide a drain valve with cap and chain at each low point in piping so that all parts of the systems can be drained down.

3.02 STERILIZATION

Disinfection and Sterilization of Domestic Water Supply and Distribution System

The Potable Water System shall be disinfected in accordance with one of the following methods before it is placed in operation:

- A. The system, or part thereof, shall be filled with a water and chlorine solution which contains 50 parts per million of available chlorine; and the same shall then be allowed to stand six hours before the system or part thereof, is flushed and returned to service.
- B. The system, or part thereof, shall be filled with a solution which contains 100 parts per million of available chlorine; and the same shall then be allowed to stand two hours before the system, or part thereof, is flushed and returned to service.
- C. Where it is not possible to disinfect a potable water storage tank as provided by 248 CMR 10.14(13) (a) or (b), the entire interior of the tank shall be swabbed with a solution which contains 200 parts per million of available chlorine; and the solution shall then be allowed to stand two hours before the tank is flushed and returned to service. For a potable water filter or similar device, the Massachusetts Department of Environmental Protection shall determine the dosage.
- D. The disinfection process shall be performed, witnessed and signed off on by the Contractor. All documentation shall be forwarded for project closeout and final acceptance. This shall include acceptance by the Local Board of Health or other governing agencies.

3.03 COMPRESSED AIR SYSTEM

- A. All piping shall be cut accurately to measurements obtained at the site and shall be installed without springing or forcing.
- B. Branch lines from service or main lines may be taken off the top or bottom of main using crossover fittings as may be required by structural or installation conditions. All service pipes, fittings and valves shall be kept at sufficient distance from other work to permit not less than 1/2 inch from finished coverings and such other work and not less than 1/2 inch between finished coverings on the different services.
- C. All piping shall be supported from the building structure with pipe hangers. In general, all lines shall be installed concealed above ceilings in finished spaces where they may occur.
- D. All piping shall be cut true with cutters; the ends shall be reamed out to the full inside diameter of the pipe. Cap all open ends to prevent the entrance of debris.
- E. Provide valves on every branch and wherever indicated on the Drawings.
- F. Pipes shall be run parallel and graded evenly to draining points. Provide a drain valve or drain cock at each low point in piping so that moisture in all parts of the systems can be removed.

3.04 NATURAL GAS SYSTEMS

- A. Gas Utility provider shall bring a new gas service to the building and install a new gas meter where shown. This Contractor shall contact the Local Gas Company and shall include all changes and or charges by the Utility Company for installing the gas service and meter.
- B. All piping shall be cut accurately to measurements obtained at the site and shall be installed without springing or forcing.
- C. Branch lines from service or mains shall be taken off the top of main using such crossover fittings as may be required by structural or installation conditions. All service pipes, fittings and valves shall be kept at sufficient distance from other work to permit not less than 1/2-inch clearance between finished coverings on the different services.
- D. All piping shall be supported independently from the building structure with pipe hangers.
- E. All piping shall be cut true and threaded. Cap all open ends to prevent the entrance of debris.
- F. Provide valves on every branch and where indicated on the Drawings.
- G. All pipes shall be run parallel and graded evenly to low points. Provide a drip leg at each low point and at the base of each riser.
- H. Purge all gas piping as required by applicable code.
- I. Provide for each gas equipment connection, a union, gas shut-off valve and gas flexible hose connection or hard pipe connection.
- J. Paint all gas piping with two coats of yellow paint.

3.05 SANITARY SYSTEMS

- A. Soil, waste and vent piping inside the building shall be run as indicated on the Drawings, properly secured to the building structure with iron hangers. Extend to roof all lines of soil, waste and vent piping in stacks with all branches and fittings required and extension through roofs as required by the Local Plumbing Code. Where an end circuit vent pipe from any fixture or line of fixtures is connected to a vent line serving other fixtures, the connection shall be at least 3' or sufficiently above the floor on which the fixtures are located to prevent the use of the vent line as a waste.
- B. All changes in pipe size and direction on soil and waste lines shall be made with Y's and cleanouts, reducing fittings or recessed reducers. Y's and 45 degree fittings or 45 degree combination fittings shall be used wherever possible. Use long sweep bends at the bottom of stacks.
- C. All fixtures and drains on the sanitary drainage system shall be separately trapped and each trap shall be vented.
- D. Sanitary long sweep bends and Y's shall be used for connections to branch lines for fixtures and T.Y's on vertical runs of pipe only. Long turn fittings shall be used wherever conditions permit. Short radius fittings may be installed where in conformity with the Plumbing Code. Furnish and install cleanouts at the bottom of all soil and waste stacks, at every change in direction on soil and waste piping. Plug all temporary open ends to prevent the entrance of debris.
- E. This Contractor shall ensure that underground piping is installed properly in trenches. Sufficiently tamped earth, free of rocks and debris at required depths and grades is imperative to maintain proper drainage. See Mass State Plumbing Code, Section 10.05 (5) a, b, c, d.

3.06 INSULATION

- A. All pipe covering and insulation shall be carefully applied by mechanics skilled in the trade. All insulation shall be as manufactured by Owens Corning or approved equal.
- B. Pipe coverings and insulation shall be installed on all piping, valves and fittings except piping, valves and fittings designated to be chrome-plated. Provide PVC jackets in wet areas.
- C. All systems shall be tested and approved prior to installing pipe covering and insulation.
- D. Staples are not to be used.
- E. All pipe covering and insulation shall pass through all walls, ceiling and floor continuously. The only area where the insulation shall not pass continuously shall be at riser clamps. Hangers shall be installed with insulation shields on the outside of the insulation.

3.07 PIPE, HANGERS AND SUPPORTS

- A. All piping shall be rigidly supported from the building structure by means of approved hangers and supports. Pipes shall be supported to maintain required grading and pitching of lines to prevent vibration and to secure piping in place and shall be arranged so as to provide for proper expansion and contraction of pipe.
- B. All horizontal piping shall be hung with approved adjustable, malleable iron pipe hangers, unless otherwise specified and spaced not over the following distances:

Cast Iron	5'-0" at Joint
Copper Tubing and Brass Pipe	6'-0" on Center
Steel Pipe	10'-0" on Center

- C. Rod size shall be the same as that approved for use with the hanger assembly, and the size of the rods shall not be less than given in the following table:

1/2" to 4" Pipe	3/8" Rod
5" and larger	1/2" Rod

- D. All auxiliary framing required supporting plumbing piping between structural frames or grids where they occur will be a part of this Section.

3.08 SLEEVES AND ESCUTCHEONS

- A. All pipes passing through floors, walls, or partitions shall be provided with sleeves having an internal diameter 1 1/2" (3/4" annular space) larger than the outside diameter of the pipe or insulation on covered lines, except as otherwise specified herein.
- B. Sleeves for all pipes through walls, beams, and partitions shall finish flush with the finish line of the walls, beams and partitions.
- C. Where pipes pass through exterior walls above grade, the space between pipe and sleeve (surface of insulation and sleeve for insulated lines) shall be filled with a suitable non-combustible insulation and the exterior face fully sealed against the weather.
- D. Sleeves for all piping shall extend 2 inches above finish floor (except where under partitions, the sleeves shall be flush with bottom of the partition) and after the installation of pipe shall be packed and made watertight with fire retardant sealant.
- E. Where pipes pass under footings and exterior concrete walls, and through exterior walls, sleeves shall be galvanized iron pipe and shall be not less than 2 inches larger than the pipe being sleeved. Sleeves shall be made watertight where passing through waterproofed surfaces, exterior walls below grade and floor slabs on grade. Waterproofing shall be done by means of a steel slip-on welding flange, continuously welded at the center of the sleeve and shall be painted with one coat of bitumastic paint inside and outside. The space between sleeve and pipe shall be packed with oakum to within 2 inches of each face of the wall (to within 2 inch of top of sleeve at floors). The remaining space shall be packed and made watertight with waterproof mastic.
- F. Sleeves through floors or interior masonry walls shall be of galvanized iron pipe or wrought iron pipe, except where located in concealed pipe spaces they shall be of 22 gauge galvanized sheet steel.
- G. Sleeves for piping to receive insulation shall be large enough to allow continuous insulation through sleeves.
- H. Spacing between or location of pipe sleeves in floor slabs, structural beams or structural walls shall be subject to the Engineer's approval.

- I. Escutcheons shall be provided around all exposed insulated or bare pipe passing through walls, partitions, ceilings, and floors. Escutcheons shall be of sufficient outside diameter to cover the sleeve opening and shall fit snugly to the wall, partition, floor or ceiling.
- J. Provide firesafing for all pipes at fire rated walls, floors, ceilings, etc. of the same rating as those penetrated as per The Massachusetts State Building Code 6th Edition.

3.09 CLEANOUTS

- A. All cleanouts shall be set flush with walls or floors. Finish shall be protected during construction with proper covering.

3.10 VALVES

- A. All valves furnished and installed under this Section shall be located in a manner to allow proper access for service and repair.
- B. In no case shall valve stem and handle be installed below the center line of the pipe it serves.

3.11 FLOOR DRAINS

- A. Floor drains shall be furnished and installed by the Plumbing Subcontractor; he shall be responsible for correctly setting these drains at the proper grade to assure proper drainage from all surrounding areas. These drains shall be as manufactured by J.R. Smith, Zurn, Josam or approved equal. Sizes of drains shall be the same size as the pipe they serve.

3.12 WALL HYDRANTS

- A. Hydrants shall be placed as indicated. Loose key stops shall be turned over to the Owner prior to completion.

3.13 ACCESS PANELS

- A. Furnish and deliver access panels for access to all concealed parts of the plumbing systems that require accessibility for the proper operation and maintenance of the system. Access panels shall be installed by the General Contractor.
- B. Provide information to the General Contractor for all required access panels in walls, ceilings and floors, for access to concealed plumbing equipment and valves. The exact sizes and physical locations shall be to suit accessibility and construction conditions, and shall be approved by the Architect.

3.14 PLUMBING FIXTURES

- A. All plumbing fixtures, except as otherwise noted, shall be furnished and installed by the Plumbing Subcontractor; he shall be responsible for correctly setting these fixtures as shown on the Contract Drawings and interior elevations.
- B. Fixtures designated as handicapped use shall be mounted in accordance with Local Codes.

3.15 PIPE IDENTIFICATION

- A. Exposed piping and piping above removable ceilings, shall be labeled at 20'-0" intervals, at each change in direction and on either side of a floor or wall penetration.
- B. All labels should be placed so that they can be easily read from the floor.

3.16 VALVE TAGS

- A. Tags shall be attached to the valve handles or stem necks with brass hooks or chains and properly secured. All numbers shall be prefixed by letters corresponding to those listed for pipe identification.
- B. These numbers shall correspond with numbers indicated for valves and controls on the Record Drawings and on a minimum of two (2) printed valve lists. These printed lists shall state the number and locations of each valve and control and the section, fixtures or equipment which it controls and other necessary information, such as requiring the opening or closing of another valve when one (1) valve is to be opened or closed.

3.17 PRESSURE GAUGES

- A. Install pressure gauges in such a manner as to be easily accessible and visible at the following locations.
 - 1) At water meter.
 - 2) As indicated on plans

3.18 THERMOMETERS

- A. Furnish and install Ashcroft No. T-7173T "every angle" bi-metal thermometers of suitable range having 1% accuracy at middle scale and 2% at scale ends. Similar and equal thermometers as manufactured by Palmer or Terrace will be acceptable for approval.
- B. Thermometers shall have 5" dial, aluminum case hermetically sealed with gasketed glass front and stainless steel thread connection and stem, complete with brass separable socket. Dial shall be rotatable thru 360 degrees and stem positionable thru 180 degrees. On insulated lines provide minimum of 2" lagging extension on separable socket.

3.19 TESTS AND APPROVALS

- A. Pipe lines shall be blown or flushed clean before piping tests are applied. All plumbing work shall be tested as herein specified. No portion shall be covered, concealed, used or made inaccessible to testing, inspection, repair, correction or replacement until tests thereof have been satisfactorily completed in the presence of the Architect's Authorized Representatives and the Owner's Representative. The Plumbing Subcontractor must accommodate his testing operations to the progress of the project as a whole. Correct all defects appearing under test and repeat the tests until all parts of the work have withstood them successfully.
- B. Furnish all labor, material and services for testing, including testing plugs, pumps and compressors. Make and remove all temporary piping connections required for the tests and dispose of test water and all wastes after tests. Leave all work in good order, ready for full use.
- C. Tests on all plumbing systems shall be made in accordance with the requirements of the Plumbing Code.

END OF SECTION

**NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS
NEW BEDFORD, MASSACHUSETTS**

Mount Vernon Group Architects, Inc., Project No. 02014.43

June 12, 2019

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**NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS
NEW BEDFORD, MASSACHUSETTS**

June 12, 2019

Mount Vernon Group Architects, Inc., Project No. 02014.35

SECTION 23 00 00

**HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)
(Filed Sub-Bid Required)**

PART 1 - GENERAL

1.01 FILED SUB-BID REQUIREMENTS

- A. The Work of this Section is stipulated as a filed Sub-Bid under Paragraph D, Item 2 of the Form for General Bid.
- B. All sub-bids shall be submitted on the Form for Sub-Bid, included as Section 00 03 25 of these Specifications, in accordance with requirements of Section 44F of Chapter 149 of the General Laws, as amended.
- C. Sub-bidders must be DCAM Certified in the listed trade and shall include a current DCAM Sub-Bidder Certificate of Eligibility and a signed DCAM Sub-Bidders Update Statement with the bid.
- D. Sub-bids must be filled with the Awarding Authority in a sealed envelope, before twelve o'clock (noon), Boston time, on the date stipulated in the Advertisement.
- E. Specific information relating to the sub-bidders is set forth in the Contract Documents, under the heading "Notice to All Bidders, Including Sub-Bidders" and the attention of sub-bidders is directed thereto.
- F. The Trade Contractor for this Section shall examine all drawings and specification sections for requirements that may affect the Work of this Section. The Work of this Section is shown primarily on the following listed Drawings: MD1.01, MD1.02, MD1.03, M1.01, M1.02, M1.03, M2.01.
- G. Sub-Sub-Bid Requirements:
 - 1. Sub bidder's attention is directed to Massachusetts G.L. Chapter 149 Section 44F, as amended, which provides in part as follows:
 - a. Each sub bidder shall list in Paragraph E of the "Form of Sub bid" 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 sub trade 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.
 - 1) Ductwork – 23 00 00
 - 2) Insulation – 23 00 00
 - 3) Testing and Balancing – 23 00 00

1.02 RELATED DOCUMENTS

- A. All the Contract Documents, including Drawings, General Conditions, Supplementary Conditions, and all Sections of Division 1- General Requirements, apply to the Work of this Section.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.
- B. Other Specification Section which directly relate to the Work of this Section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein

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4. DIVISION 04 – MASONRY; including all Sections contained therein
5. DIVISION 05 – METALS; including all Sections contained therein.
6. DIVISION 06 – WOOD AND PLASTICS; including all Sections contained therein
7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
9. DIVISION 09 – FINISHES; including all Sections contained therein.
10. Section 10 60 13 – Wire Mesh Partitions
11. Section 21 00 00 – Fire Protection
12. Section 22 00 00 – Plumbing
13. Section 23 00 00 – HVAC
14. Section 26 00 00 – Electrical
15. DIVISION 31 – EARTHWORK; including all Sections contained therein

1.04 CUTTING AND CORING

A. The installation of new Work that requires coring of floors, walls, and/or roof penetrations measuring 4-1/2 in. or less shall be performed by the Subcontractor of this Section. The General Contractor shall cut and core floors, walls, and/or roof penetrations for sizes not indicated by the Filed Sub-Bid sections.

1.05 SCAFFOLDING AND EQUIPMENT

A. Provide, maintain, and remove safe and adequate interior and exterior staging, scaffolding, hoists, and all other related equipment, necessary 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 and codes.

B. Staging, scaffolding, hoists, and all other related equipment shall be maintained to complete the Work and removed when no longer required.

1.06 PRE-INSTALLATION MEETING

A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related Subcontractors.

1.07 RUBBISH REMOVAL

A. The Subcontractor of this Section shall stock pile and drop all waste and debris daily to the floor. The General Contractor shall remove all waste and debris daily and dispose in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

1.08 WORK INCLUDED

A. The work under this Section shall include the furnishing of all material, labor, equipment and supplies and the performance of all operations to provide a complete working system as required by the Drawings and details and as specified herein, in general, to include the following items:

1. Refer to Demolition Drawings. Demolition to be performed by Demolition Contractor. Remove in their entirety, unless otherwise indicated on the Drawings, equipment, including controls, ductwork and all appurtenances.
2. Ductless split system heat pump.
3. Elevator hoist way louver.
4. Painting of the existing hot water convector heating element covers.
5. Duct systems and accessories.
6. Piping
7. Insulation
8. Temporary location of the existing condensing unit to allow building cooling during construction.

B. The work required by this Section is shown on the Drawings.

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1.09 RELATED WORK IN OTHER SECTIONS

A. The following work is not included as work in this Section and is to be performed under other Sections:

1. Cutting and Patching.
2. Temporary Water.
3. Temporary Light and Power.
4. Excavation and Backfill.
5. Foundations and Trenching.
6. Concrete Bases for Equipment.
7. Flashing and Caulking.
8. Setting of Frames for Registers and Access Panels.
9. Painting.
10. Plumbing.
11. Power Wiring to all Equipment.

1.10 INTERPRETATION OF DRAWINGS

A. All work shown on the Drawings is intended to be approximately correct to scale, but figured dimensions and detail Drawings are to be followed in every case. The Drawings shall be taken in a sense as diagrammatic. Size of pipes or conduits and methods of running them are shown but it is not intended to show every offset and fitting, nor every structural difficulty that may be encountered.

B. To carry out the true intent and purpose of the Drawings, all necessary parts to make complete, approved working systems ready for use shall be furnished without extra charge.

C. Locations shown on the Drawings are approximate and it is intended that all equipment shall be located in accordance with the general and detail Drawings of the construction proper. All measurements shall be taken at the building before fabrication commences.

1.11 OBTAINING INFORMATION

A. Obtain from the manufacturer the proper method of installation and connection of the equipment that is to be furnished and installed. Obtain all information that is necessary to facilitate the work and to complete the project.

1.12 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 and not 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 directed.

B. 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.

C. All distribution systems which require pitch or slope such as plumbing drains, 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.

1.13 RECORD DRAWINGS

A. Purchase and maintain at the job site a complete and separate black line set of prints of the approved Working Drawings on which to accurately indicate daily progress by coloring materials and apparatus as installed. Schedules shall be modified to reflect data consistent with that of the installed equipment. Clearly show all changes to the work as a result of

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change orders, instructions issued by the Architect or conditions encountered in the field. Accurately indicate the location, size, type and elevation of new utilities and their relationship to existing utilities.

B. The marked-up and colored-in prints will be used as a guide for determining the progress of the work installed. They shall be inspected weekly by the General Contractor and Architect and shall be corrected immediately if found inaccurate or incomplete. Requisitions for payment will not be approved until the Drawings are accurate and up-to-date.

C. At the completion of the work, submit one (1) set of the marked-up prints for review and approval by the General Contractor and Architect. After approval these marked-up prints shall be used in the preparation of the Record Documents.

D. Obtain and pay for one (1) set of Mechanical electronic files (AutoCAD 2018 or later) and obtain the As-Built architectural backgrounds from the Architect. Make all modifications to these documents as shown on the marked up prints. Remove all superseded data to show the completed installation.

E. The electronic Mechanical files may be obtained from the Engineer. Arrange with the Architect to obtain As-Built architectural electronic files for correct up to date backgrounds.

F. Deliver the completed Record Documents properly titled and dated to the Architect. These shall become the property of the Owner.

G. Refer to General Conditions and Supplementary General Conditions for additional requirements which may be required.

H. Provide hard copies of the Record Documents as directed by Architect or Owner.

1.14 PERMITS, FEES, RULES AND REGULATIONS

A. Give the proper Authorities all requisite notices and information relating to the work under this Section. Obtain and pay for all fees, licenses, permits and certificates. Comply with the rules and regulations of all Local, State and Federal Authorities having jurisdiction, the rules and regulations of the National Board of Fire Underwriters and the Public Utilities Companies serving the building.

1.15 PROTECTION OF WORK AND PROPERTY

A. Be responsible for the care and protection of all work included under this Section until it has been tested and accepted.

B. Protect all equipment and materials from damage from all causes including theft. All materials and equipment damaged or stolen shall be repaired or replaced with equal material or equipment.

C. Protect all equipment, outlets and openings with temporary plugs, caps and covers. Protect work and materials of other trades from damage that might be caused by work or workmen and make good damage thus caused.

1.16 SUBMITTAL REQUIREMENTS

A. Refer to General Conditions and Supplementary Conditions for requirements all of which shall be included as part of this Specifications.

B. Submit for approval by the Architect, within thirty (30) days after signing the Contract and prior to the submission of any Shop Drawings, an itemized list of manufacturers of material and equipment and of Subcontractors proposed to be used under this Section.

C. After approval of the list, submit for review a minimum of eight (8) sets of detailed Shop Drawings. All Shop Drawings for equipment submitted for review shall include complete Specifications, including type of materials, operating pressures and temperatures, capacities, performance and power requirements to determine compliance with Contract Documents. All date

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submitted including wiring diagrams submitted shall be complete for all equipment and shall apply only to this specific project. All extraneous information shall be deleted.

D. Regardless of any information included in the Shop Drawings submitted for review, the requirements of the Drawings and Specifications shall not be superseded in any way by the Shop Drawings review.

E. Each submittal shall be reviewed, stamped and certified prior to submission to the Architect. Such certification shall be made by a Corporate Officer of the Mechanical Subcontractor, or by a person duly authorized to sign binding agreements. The certification shall state that the data and details contained on each shop drawing, layout drawing, catalog data and brochure has been reviewed by the Mechanical Subcontractor and that it complies with the Contract Documents in all respects. Shop drawings, layout drawings, catalog data and brochures will not be reviewed by the Engineer and will be returned to the Mechanical Subcontractor unchecked unless they are certified.

F. It is intended that Shop Drawing data be complete and accurate at the first submission. If the Shop Drawing is returned marked "Resubmit," or "Not accepted," only one (1) additional submission will be permitted.

G. A minimum period of two weeks, exclusive of transmittal time, will be required in the Engineer's office each time Shop Drawings, layout drawings, and catalog data and brochures are submitted or resubmitted for review. This time period shall be considered when scheduling the work.

H. The Shop Drawings and manufacturers' data shall be submitted in a timely manner sufficiently in advance to give ample time to checking, correcting, resubmitting and rechecking if necessary. No claim for delay will be granted for failure to comply with this requirement.

I. Equipment shall be of proper size for its allotted space. Equipment shall be disassembled as required, without invalidating the manufacturer's warranty, so that it can be installed through regular window, door, and/or louver openings.

1.17 MATERIAL AND EQUIPMENT STANDARD

A. Refer to General Conditions and Supplementary General Conditions regarding substitution of materials as it relates to this project.

B. Where materials or equipment are specified by patent proprietary name, or name of the manufacturer, such Specification shall be deemed to be used for the purpose of establishing a standard for that particular item. No equipment or material shall be used unless previously approved by the Architect.

C. Substitutions may be offered for review provided the material, equipment or process offered for consideration is equal in every respect to that indicated or specified and only if the term "approved equal" appears. The request for each substitution must be accompanied by complete specifications together with drawings or samples to properly appraise the materials, equipment or process.

D. If a substitution of materials or equipment in whole or in part is made, the Mechanical Subcontractor shall bear the cost of any changes necessitated by any other trade as a result of said substitution.

1.18 GUARANTEE

A. Refer to General Conditions and Supplementary Conditions for requirements all of which shall be included as part of this Specification.

B. Manufacturers shall provide their standard replacement warranties for material and equipment furnished under this Section. Such warranties shall be in addition to and not in lieu of all liabilities which the manufacturer and the Mechanical Subcontractor may have by law or by provisions of the Contract Documents. All refrigeration compressors shall have the manufacturer's extended replacement warranty for a total of five (5) years.

C. All materials, equipment and work furnished under this Section shall be guaranteed against all defects in materials and workmanship for a period of one (1) year commencing with the date of Substantial Completion. Any failure due to defective material, equipment or workmanship which may develop, shall be corrected at no expense to the Owner including all damage to areas, materials and other systems resulting from such failures.

D. Upon receipt of notice from the Owner of failure of any part of the systems during the guarantee period, the effected parts shall be replaced. Any equipment requiring excessive service shall be considered defective and shall be replaced.

1.19 CERTIFICATES OF APPROVAL

A. Upon completion of all work, furnish, in duplicate, certificates of inspections from the manufacturers stating that authorized factory engineers have inspected and tested the operation of their respective equipment and found same to be in satisfactory operating condition.

1.20 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

A. Give detailed instructions, prior to the completion of the work, to the responsible personnel designated by the Architect in the operation and maintenance of all work installed under this Section. A letter with two (2) copies containing the name of the person or persons to whom the instructions were given and the dates of the instruction period shall be submitted to the Architect at the completion of the project.

B. In addition, prepare three (3) sets of manufacturer's catalogs, other similar data including the necessary photographic equipment cuts, and wiring diagrams covering all mechanical equipment and devices furnished and installed under this Section. These manuals shall provide complete instructions for the proper operation and use of the equipment together with instructions for lubrication and periodic maintenance and for trouble shooting. Operating instructions shall be specific for each system and shall include copies of posted specific instructions. This manual shall contain only that information which specifically applies to this project and all unrelated material shall be deleted. During the instruction period, this manual shall be used and explained. The material shall be bound in notebook form and indexed.

C. Provide name, address and telephone number of the manufacturer's representative and service company for each piece of equipment so that the source of replacement parts and service for each item of equipment can be readily obtained.

1.21 RESPONSIBILITY OF BIDDERS

A. Bidders shall examine all Drawings and Specifications issued and must be familiar with the codes, rules, and regulations (and the local interpretations) in effect at the site of the work.

B. Where any of the above are at variance with the Drawings and Specifications, the code requirements shall take precedence, and any cost necessary to meet these shall be included in the bid price.

C. This Mechanical Subcontractor is assumed to be skilled in the trade and is solely responsible for compliance with health and safety regulations, performing the work in a safe and competent manner, and in installation procedures required for the work as outlined in these documents.

END OF PART 1

PART 2 - PRODUCTS

2.01 ELEVATOR CONTROL CLOSET WALL MOUNTED DUCTLESS SPLIT SYSTEM HEAT PUMP

GENERAL

RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

SUMMARY

- A. This section includes ductless AC & heat pump systems

INFORMATIONAL SUBMITTALS

- A. Product Data: For each type of ductless systems indicated. Include rated capacities, operating characteristics, and accessories.
- B. Shop Drawings: For ductless systems.
 - 1. Detail equipment assemblies and indicate dimensions, weights, required clearances, components, and location and size of each field connection
 - 2. Wiring Diagrams: Power and control wiring.

MAINTENANCE MATERIAL SUBMITTALS

- A. Operation and Maintenance Data: For ductless systems include, installation, operation, and maintenance manuals.

QUALITY ASSURANCE

- A. Equipment, Electrical Components, Devices, and Accessories: Listed and labeled as defined by Intertek's ETL certification.
- B. The units shall be rated in accordance with Air-conditioning, Heating, and Refrigeration Institute's (AHRI) Standards.

WARRANTY

- A. The unit shall have a manufacturer's parts and defect warranty for a period five (5) year from date of installation. The compressor shall have a warranty of seven (7) years from date of installation. If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer. This warranty does not include labor.

PRODUCTS

MANUFACTURES

- A. Available Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
 - 1. Haier America
 - 2. Mitsubishi
 - 3. Daikin
 - 4. Approved equal

GENERAL

- A. Furnish and install, where indicated or scheduled on plans, ductless systems. Unit shall be factory assembled, piped and wired.

CAPACITIES AND PERFORMANCE

- A. Unit performance shall be the sizes, capacities and configurations as scheduled on drawings.
- B. System efficiency shall meet or exceed SEER / HSPF values indicated on the scheduled drawings.

OUTDOOR UNIT (HSU09VHB(DB)-W, HSU12VHB(DB)-W, HSU18VHB(DB)-W, HSU24VHB(DB)-W)

- A. The Heat Pump system shall be a Haier America split system with Variable Speed Inverter Compressor technology. The system shall consist of a horizontal discharge, single phase outdoor unit, a matched capacity indoor section that shall be equipped with a wired wall-mounted controller.
- B. The outdoor unit shall be pre-charged with R-410a refrigerant for 25 feet of refrigerant tubing PER ZONE.
- C. The outdoor unit shall be compatible with the following compatible indoor units.
 - a. Model HSU(09,12,18 or 24)VHG(DB)-G High Wall unit
- D. The outdoor unit shall be equipped with an electronic control board that interfaces with the indoor unit to perform all necessary operation functions.
- E. The outdoor unit shall be capable of cooling operation down to 14 (Fourteen) °F ambient temperature without additional low ambient controls. Wind baffles are not allowed.
- F. The outdoor unit shall be heat pump rated to 5°F ambient temperature. The outdoor unit will not cease in operation below the rated outside ambient temperature at any time.
- G. The outdoor unit shall be able to operate with a maximum line set height difference and length as indicated on the schedule between indoor and outdoor units.
- H. The casing shall be constructed from galvanized steel, finished with an electrostatically applied powder coating for corrosion protection.
- I. The L shaped condenser coil shall be of copper tubing with flat aluminum fins to reduce debris build up and allow maximum airflow. The coil shall be protected with an integral metal guard.
- J. Outdoor coil shall be Blue Fin coated and does not require special factory coatings for sea coast installations.
- K. Easy access service panels shall be provided to allow ease of service to all internal components and controls.
- L. Fan shall be constructed of ABS plastic and aerodynamic designed for quiet operation. A single DC volt fan motor shall be utilized.
- M. The outdoor unit shall have horizontal discharge airflow.
- N. Refrigerant flow from the condenser shall be controlled by means of an electronic expansion valve (EEV) metering device. The EEV shall be control by a microprocessor controlled step motor.
- O. All refrigerant lines between outdoor and indoor units shall be of annealed, refrigeration grade copper tubing and insulated according to all applicable codes.
- P. The electrical power of the unit shall be 208 or 230 volts, single phase, 60 hertz. The unit shall be capable of satisfactory operation within voltage limits of 187 volts to 253 volts.
- Q. Power for the indoor unit(s) shall be supplied from the outdoor unit via three (3) fourteen (14) gauge AWG conductors plus ground wire.
- R. The outdoor unit shall be controlled by the microprocessor located in the indoor unit.

INDOOR UNITS

- A. Model HSU(09,12,18,24)VHG(DB)-G High Wall Unit
 - 1. The indoor unit shall be factory assembled, wired and tested. Contained within the unit shall be all factory wiring and internal piping, control circuit board and fan motor. The unit, in conjunction with the wired wall-mounted controller shall have a self-diagnostic function. Indoor unit and refrigerant pipes shall be purged and charged with nitrogen before shipment from the factory.
 - 2. The cabinet shall be formed from high strength molded plastic with smooth finish, slightly curved front panel design with access for filter. The unit shall be wall mounted by means of a factory supplied, pre-drilled, mounting plate.
 - 3. The front cabinet door shall have an illuminated display indicating the room and set point temperatures, diagnostic error codes and system mode icons.
 - 4. The unit shall have motorized horizontal and manual vertical airflow louvers to maximize airflow coverage in the space.
 - 5. Coil shall be coated with Blue Fin coating to allow ease of condensate run off and provide a self-cleaning action to the coil.
 - 6. Unit shall perform in accordance to the ratings indicated on the schedule.
 - 7. Return air shall be filtered by means of an easily removable washable filter.

2.02 ELEVATOR HOISTWAY LOUVER

Buckley elevator shaft louver model EAL4-ES.

- A. Acceptable Manufacturers, or equal:
 - 1. Greenheck
 - 2. Buckley
 - 3. Ruskin
 - 4. Approved equal

Single pane breakable glass. 2/3 glass and 1/3 louver in the center with equal glass portions on either side.

Construction: 0.085 extruded aluminum frame. Standard mill finish and under cut by 1/4" unless other Otherwise specified.

Selected options: flanged; drainable blade louver.

2.03 PAINTING OF THE EXISTING HOT WATER CONVECTOR HEATING ELEMENT COVERS

- A. Remove the existing covers of the heaters at the first, second and third floor corridors as shown on the drawings. Refer to the detail on Dwg. M2.01 for additional information.
- B. Send out to be stripped and powder coated, smooth finish. Color selection by the Architect.
- C. Thoroughly clean all fin tube elements and install at the new locations.
- D. Re-install all covers at the relocated fin tube element locations.

2.04 LOW PRESSURE DUCTWORK

- A. Furnish all low pressure sheet metal ductwork required for the various supply, return and exhaust air systems. All low pressure ductwork and sheet metal plenums shall be constructed of galvanized steel of U.S. Standard Gauge unless otherwise specified.
- B. Ductwork, except where specified otherwise, shall be fabricated in accordance with the "HVAC Duct Construction Standards" published by the Sheet Metal and Air Conditioning Contractors National Association, Incorporated for 1" W.C. positive or negative static pressure. Submit shop standards booklet showing the types of joints and construction, the various items and sheet metal appurtenances to be employed for this project, as well as Fabrication Drawings for all of the systems.
- C. Ducts shall be true to the dimensions indicated on the Drawings. Ducts shall be straight and smooth on the inside with neatly finished joints.
- D. All elbows and offsets shall be fabricated with inside radius equal to the dimension of the duct in the pane of the elbow. Where elbows may be required to have shorter radius, they shall be constructed with full curvature turning vanes spaced to divide the elbow into air passages that have equal curve ratios. Short radius elbows: with outside radius of less than 20" shall have one (1) inner splitter; with outside radius of less than 36" and more than 20" shall have two (2) inner splitters; and with outside radius of more than 36" shall have three (3) inner splitters. Inside radius shall not be less than 4". Where square-heeled, vaned elbows are shown, the vanes shall have a spacing of 2 1/4" and shall be fabricated as shown in SMACNA Manual.
- E. Transitions shall be made with sides sloping at not more than 1" in 7 inches on the side of the transformation. Transitions in ductwork of pieces of equipment shall be made with a 20 degree maximum angle projected from the duct side on the downstream side. Any conditions requiring deviations from the above shall be brought to the attention of the Architect for approval.
- F. All notches for connecting sections of duct, including longitudinal seam notches, shall not be cut any deeper than 1 7/8" to insure tight corners in a 2" deep slip joint. Any notched corners not meeting with

the approval of the Architect shall be removed and reinstalled or sealed to the satisfaction of the Architect.

- G. Slips shall be at least two (2) gauges heavier than the duct and all joints must be made in a neat and workmanlike manner and in all cases joints must be tight. All ducts shall have all joints sealed with EC-800 as manufactured by 3M.
- H. Reinforcing angles shall be galvanized and shall be attached to ducts with sheet metal screws or rivets 6" on center.
- I. If companion angles are used, a neoprene gasket shall be used between angles. Companion angles shall be used to join ducts of different material.
- J. Furnish and install Ventlock No. 699 Instrument Test Hole in ducts adjacent to all temperature control instruments and at all points required to balance the system.
- K. During construction, all openings in ductwork shall be covered to prevent entrance of foreign material.
- L. All exposed ductwork shall be spiral ribbed prepared for field painting by Painting Contractor.

2.05 DAMPERS AND SPLITTERS

- A. Provide manual volume dampers as shown and required with indicating and locking quadrants to properly balance the air supply, return and exhaust systems. Dampers shall be two (2) gauges heavier than the ducts in which they are installed. Damper blades shall be riveted to the supporting rods. Cast or malleable brackets riveted to the sides of the duct shall be used to support the damper positioner rod.
- B. Provide splitter dampers at all split duct fittings in supply duct. Splitter dampers shall be sufficiently long to extend full width of the branch duct to which they are attached. Where necessary, they shall be curved to get the air out of the main duct air stream. These dampers do not obviate volume dampers in the resulting branch ducts.
- C. Provide a manually operated, opposed blade, volume damper in each branch duct from a main duct. Provide a single blade, butterfly type damper at the inlet to each diffuser.

2.06 SHEET METAL ACCESS PANELS (WHEN REQUIRED)

- A. Provide access panels of the proper size and at all locations in ductwork necessary to service fire dampers, smoke dampers, fusible links, automatic dampers, control devices, fan bearings and as required to service all systems.
- B. Access panels shall have foam gasketing, fixed hinges and compression type latches as furnished by Ventlok, Duro-Dyne or approved equal manufacturer. Access doors for insulated ducts shall be insulated with 1" thick 1 1/2 lb. density coated duct liner.
- C. Provide information to the General Contractor for all required access panels in walls, ceilings and floors, for access to concealed mechanical equipment and control devices. The exact sizes and

physical locations shall be to suit accessibility and construction conditions, and shall be approved by the Architect.

2.07 INSULATION

- A. Insulate all hot water supply and return piping with fiber glass pipe insulation jacketed with a reinforced vapor retarder facing. The entire system shall be covered with PVC jacketing.
- B. Insulate all refrigerant piping with 1" thick rubber tube pipe insulation. Seal all joints vapor tight. Interior systems shall be provided with PVC jacking. Exterior systems shall be provided with aluminum jacketing.
- C. The existing generator exhaust pipe from the muffler in the Boiler Room to the roof is being removed and replaced with new pipe, size and material of the new pipe to match that of the existing. The new pipe in the Boiler Room shall be insulated with Johns Manville Thermo-1200 Calcium Silicate Pipe and Block insulation, or approved equal. Thermo-1200 is a water resistant, Type I calcium silicate pipe and block insulation, designed for applications that operate at temperatures up to 1200°F (650°C).

Fire Safety: Surface Burning Characteristics. When tested in accordance with ASTM E84, NFPA 255, and UL 723, Thermo-1200 has flame spread/smoke developed ratings of 0/0.

Non-Combustible. When tested in accordance with ASTM E136 as defined by NFPA 255 and NFPA 101.

ISO 9000 Certification: Thermo-1200 is manufactured and tested in our own facilities under implemented Quality Management Systems which are certified to be in accordance with ISO 9001 quality standards. This certification, along with regular, independent third-party auditing of our plant and records for compliance, is your assurance that this product consistently delivers high quality performance.

- Non-combustible, cementitious insulation
- Temperature range: Ambient to 1200°F
- Asbestos, lead, and mercury-free
- 3" thick; 205 deg. F surface temperature.
- Dimensional Standard: ASTM C 585 Rigid.

2.08 PIPING MATERIALS

- A. Unless otherwise noted, all pipe and fittings, including nipples shall be of new material, absolutely perfect throughout, scale free, and of the best grade guaranteed full weight. All piping shall conform to ASA "Code for Pressure Piping". All nipples and fittings shall be of the same material and thickness as the pipe which they are used, as otherwise noted and/or where screwed fittings are used on steel pipe, in which case they shall have heavy band and clean cut, full taper thread. All ferrous to non-ferrous piping connections shall be made with dielectric union.
- B. Refrigerant piping systems:
 - 1. All refrigerant pipe shall be seamless copper type ACR, hard drawn temper copper tubing, wrought copper fittings. Solder joints using silver solder or equal. All external pipe and fittings surfaces shall be degreased and free from flux and dirt. Provide each refrigerant piping system with a full charge of proper type of freon as recommended by the equipment manufacturer.
 - 2. All pipe sizes shall be calculated by the Mechanical Contractor.

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- C. Air conditioning/Heat Pump condensate:
 - 1. Schedule 40 in chase and schedule 80 at Boiler Rm. floor.
- D. Hot Water Piping
 - 1. Type "L" hard drawn copper with wrought copper joints and fittings. Make joints with lead-free solder.

2.09 VALVES

- A. All valves shall be B&G, Crane, Hammond or approved equal. All stop valves for hot water and cold water systems shall be ball type.
- B. Bronze valves shall be of a material having physical properties conforming to ASTM Specifications B-62 or to ASTM Specifications B-61 for temperatures to 550 degrees F if pressure rating exceeds 125 psig. Stems for bronze valves shall be of ASTM-B-584, Alloy 876.

2.10 BALANCING VALVES

- A. All balancing valves for piping 2 inches and smaller and for all copper tubing runouts shall be B&G Circuit Sentry Flo-Setter II or equal. Field adjustable pressure independent flow limiter that maintains set flow rates regardless of pressure fluctuations in the system.
- B. Brass Body (1/2' to 1-1/4"). Stainless steel spring.

2.11 MOTORS, DRIVES AND STARTERS

- A. All motors shall conform to NEMA Standards and shall be suitable for load, duty, service and location. Motors shall have nameplates giving manufacturer's name, series number, horsepower, speed and current characteristics. Motors shall be General Electric, Westinghouse, Reliance, Allis-Chalmers, Gould or approved equal.
- B. Motors 1/2 HP and larger shall be squirrel-cage induction or wound-rotor induction type, ball or roller bearings with pressure-grease lubrication, specifically wound for 208 volts, single-phase, 60 Hertz alternating current.
- C. Motors less than 1/2 HP shall be capacitor start or split-phase type, designed for 120 volt, single phase, 60 Hertz alternating current.
- D. Drives for belted motors shall be as manufactured by Dodge Manufacturing Company, Browning Manufacturing Company or T.B. Woods Company with adjustable motor sheaves and adjustable sliding bases. The drive belts shall be as short as practicable. V-belt drives for all fans and fan units shall be sized for 150% of the design drive capacity. All multiple belt drives shall have matched sets of belts.
- E. All equipment shall be furnished complete with motors, drives and motor starters. All packaged equipment shall have motors, drives and starters installed, pre-wired, and tested at the factory. All

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starters not integral with the equipment shall be a combination-type with unfused, disconnect switch furnished by the HVAC Subcontractor. All single-phase motors shall have manual starters with thermal overload elements. Thermal overload elements for all motors shall be selected and sized to satisfy the actual nameplate data of the motor rather than by use of NEMA horsepower/ampere standard charts. All starters shall conform to the NEMA Industrial Control Standards and shall be a product of one manufacturer, Cutler-Hammer, Square D, Arrow-Hart, or approved equal.

- F. Starters for single-phase motors, manually controlled, shall be of the thermal, toggle-type with red pilot light. Automatically controlled, single-phase motors may be controlled directly by the automatic control device (thermostat, pressures switch, etc.) provided these devices have an adequate ampere pilot-light for all automatically controlled motors. If the automatic control device does not have an adequate ampere rating, or if the motor is interlocked with another motor starter, provide a magnetic starter with HOA selector switch and pilot light in cover.

2.12 AUTOMATIC TEMPERATURE CONTROLS

- A. Furnish and install automatic temperature controls utilizing equipment and materials as hereinafter specified and as shown on the plans.
- B. All wiring and conduit in connection with the control function of the temperature control system will be furnished by the Mechanical Subcontractor. Furnish all electronic cable.
- C. Heating and air conditioning: Furnish and install manufacturer's standard controls.
- D. All 24 volt controls and devices are the responsibility of the Mechanical (HVAC) Sub Contractor.

END OF PART 2

PART 3 - EXECUTION

3.01 CORE DRILLING

- A. Core drilling of all holes in masonry walls for the installation of pipes required for the work in this Section of the Specification shall be performed by the General Contractor.

3.02 HANGERS AND SUPPORTS

- A. Install all hangers, coach screw threaded rods in wood construction and supports for the various parts of the system. Piping shall be hung and/or supported at intervals of not over 10'. Ducts shall be hung at intervals of not over 8'. Install riser clamps or spring hangers at tops of risers as required. Piping hung from wall shall have offset rods or brackets to support hangers.
- B. All hanger rods shall be hung from coach screw threaded rods inserted in building wood beams or joists. Clamps shall have retaining clips and locknut. When pipe or equipment is hung or supported, no part of any equipment nor any part of the building shall be stressed beyond its normal allowable working strength.
- C. All steel framework and supports installed under this Section shall conform to the latest revisions of the Standard Specifications for Steel for Bridges and Buildings of the American Society for Testing Materials. All shop-fabricated framework shall have a shop-coat of Lead Oxide Metal Primer, except steel in concrete shall not be painted.

3.03 SHEETMETAL WORK INSTALLATION

- A. Install all sheet metal ductwork required for the various supply, return and exhaust air systems. All ducts and sheet metal plenums shall be constructed of galvanized iron of U.S. Standard Gauge unless otherwise specified and all shall be fabricated and installed in accordance with the "HVAC Duct Construction Standards" as published by Sheet Metal and Air Conditioning Contractors' National Association, Inc.
- B. Ducts shall be true to the inside clear dimensions indicated on the drawings. Ducts shall be straight and smooth on the inside with neatly finished joints and shall be sealed as specified herein.
- C. 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. Horizontal ducts shall be hung with hangers of same material as the duct from concrete inserts, beam clamps or from expansion shields. Vertical ducts shall be supported at each floor. Provide all necessary supports and cross framing as required.
- D. No pipes or conduits shall pass through any duct without written approval of the Architect. Where it is impossible to re-route such pipe or conduit, the duct shall be increased at that point to maintain a constant cross-sectional area and a streamline enclosure for the pipe shall be provided. Coordinate the sheet metal installation with the work of all other trades.

3.04 INSULATION

- A. The installation of all insulation shall be performed in a workmanlike manner and shall conform to the Code of Workmanship of the International Association of Heat and Frost Insulators and Asbestos Workers. Furnish all labor, equipment, accessories and materials, and perform all operations necessary for the installation of all insulation for the duct systems including all related equipment and accessories.

3.05 IDENTIFICATION OF EQUIPMENT AND MATERIAL

- A. Label each piece of mechanical equipment with a 1-1/2 inch by 4 inch long aluminum nameplate with a black enamel background and with the designated equipment and area or system served engraved in natural aluminum letters. Secure with two "Phillips head" brass screws or machine bolt with locknuts. Nameplates shall be manufactured by Seton Nameplate Company, or approved equal by Dennison Manufacturing Company or Markem Company.
- B. Identify ductwork and piping as specified herein. Identification markers for piping up to and including 5 inch shall be Setmark Type SNA. Piping 6 inch and above and all ductwork shall be identified with Setmark Type STR laminated plastic markers.
- C. Exposed ductwork and ductwork above removable ceilings shall be identified at intervals of 20'-0" and at each change of direction with the number of the fan or unit to which the duct is attached and the zone number together with an arrow showing the direction of flow.
- D. Painted letters or nameplates to suit conditions shall be affixed to remote control stations, motor starters and dampers. Controlled dampers shall be labeled open/closed.

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- E. All other items or systems requiring identification and not mentioned above shall be properly identified and labeled.

3.06 TESTING, ADJUSTING AND PUTTING IN SERVICE

- A. Test, adjust, and put in service all adjustments as required to make them operate as specified. Put mechanical equipment specified herein in operation in the presence of the Architect with forty-eight (48) hours notice given for each appointment. Give instructions to a designated representative of the Owner, together with persons specifically designated by the Architect, in the operation and routine maintenance of all parts of the various systems.
- B. Operate duct systems with filters in place. Cover all air outlets with cloth or blow out the air systems. Test all duct systems at one (1) inch pressure and repair all leaks in the ducts and casings of equipment and make air-tight prior to the installation of the insulation.
- C. Keep filters in place in all units operating during construction and replace with new filters and/or new media, immediately after Owner occupies the building, as directed.
- D. Operate all motor-driven equipment in the presence of the Architect or his representatives. Correct all defects, including noise, vibration, misalignment and unbalance. Replace all motors and bearings that are noisy or overheat.
- E. Employ an independent engineering firm, acceptable to and approved by the Architect, to test, adjust and balance the air-handling systems. Prior to the start of balancing, check the rotation of all fans, air conditioning units, propeller fans and power roof exhaust fans. Check to verify that all dampers are free to open and close. All filters must be checked and replaced if operated during construction, before commencing balancing so as not to create excessive resistance to the system. Make any necessary changes in the fan speed to obtain design system conditions and realign all belts as necessary. Change the size of pulleys and belts as required to obtain proper air delivery and provide additional dampers, splitters and other devices as necessary to obtain the correct air balance, all as directed by the Architect. Furnish qualified workmen as required to cut openings in ducts for air readings, adjust fan speeds as directed and to do such other work as required to assist in balancing the systems. Cut neat round holes with no sharp edges in belt guards. The temperature control system must be completely installed before balancing is started. Calibrate the temperature control system simultaneously with the balancing operation.
- F. Make air measurements with Velometer and/or Anemometer as directed by the Architect. Use special shielding devices as recommended by the manufacturer when measuring the air flows from diffusers.
- G. Use tong ammeter when adjusting fan speeds to avoid overloading motor. Replace drives as required to obtain proper air flow.
- H. Make final adjustment of air flows as directed to obtain comfortable conditions in all spaces after approved air quantities are obtained. Adjust deflection of all adjustable deflection grilles and registers as directed to minimize drafts.
- I. Submit a complete report of the air balancing operation including: design and actual air flow from diffusers, registers and grilles listed and tabulated by room; complete fan performance data at design and actual operating conditions; ampere readings of all motors together with nameplate data; and pressure and temperature drops or rises across all heating or cooling equipment items together with

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required and actual flows and a tabulation of flows throughout the systems obtained from the flow indicators.

- J. Make ammeter reading on each phase of lead to all motors after final adjustments are made. Supply list motors with nameplate amperes and readings taken.
- K. Upon completion of the work, certify that all systems are properly balanced and are delivering the required amount of air within 5% of design. Deliver six (6) copies of the test report for transmittal to the Architect, Consulting Engineer and the Owner.

END OF PART 3

SECTION 26.00.00
ELECTRICAL

PART 1 - GENERAL

1.00 RELATED DOCUMENTS

- A. The BIDDING REQUIREMENTS, CONTRACTING REQUIREMENTS, and applicable parts of DIVISION 1 - GENERAL REQUIREMENTS, as listed in the Table of Contents, shall be included in and made a part of this Section.
- B. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Trade. Refer to the proposed Alternates as indicated in the general conditions.

1.01 FILED SUB-BIDS REQUIREMENTS

- A. The work of this Section is stipulated as a filed Sub-Bid under paragraph D, item 2 of the Form for General Bid.
- B. All Sub-Bids shall be submitted on the Form for Sub-Bid, included as section 26 00 00 of these specifications, in accordance with requirements of Section 44F of Chapter 149 of the General Laws, as amended.
- C. The attention of the Bidders is directed to Section 00 01 00 – Instructions to Bidders. Sub-Bids shall be filed with the Awarding Authority in accordance with requirements stipulated herein.
- D. The Work of the Filed Sub-Bid for Section 26 00 00 shall include the Work of the following Specification Section in its entirety:
 - a. Section 26 00 00 – ELECTRICAL
- E. The Trade Contractor for this Section shall examine all drawings and specification sections for requirements that may affect the Work of this Section. The Work of this Section is shown primarily on the following listed Drawings:
 - a. ED.1, E1.1, E1.2, E2.1, E3.1, E4.1

1.02 WORK INCLUDED

- A. Work under this Section shall include, but not be limited to providing all electrical work required as indicated on the Drawings pertaining to the existing conditions and proposed work and as specified herein, including:
 - 1. Providing all labor, supervision, materials, tools, scaffolding, equipment, supplies, transportation, and services for a complete and operational electrical system as specified.
- B. Materials and equipment shall be installed in accordance with standards of the National Electrical Code, local codes, safety codes and ordinances.
- C. Work under this Section shall include, but not be limited to:
 - 1. Disconnect and removal of the existing electrical systems within the proposed areas of renovation as indicated on the electrical plans.
 - 2. Disconnect and removal of three existing branch circuit panels.
 - 3. Relocation of the power requirements for the exterior courtyard chiller system. Temporarily extend the existing power currently supporting the chiller to the new designated location as shown on the electrical plans.
 - 4. Electrical systems requirements necessary to support the new elevator.
 - 5. All necessary branch circuit power to support the areas affected by the renovation.

6. Interior LED lighting systems and branch circuit wiring systems with related controls. Lighting shall be energy efficient and meet the requirements of the Utility Energy Rebate Programs as well as IECC.
7. Power Wiring.
8. Emergency Lighting System composed of remote battery units and internal lighting fixture LED drivers.
9. Grounding.
10. Wiring Devices.
11. Electrical connections for the new and relocated HVAC systems.
12. Any other system hereinafter called for or shown on the drawings.

PART I – GENERAL

- 1.0 RELATED DOCUMENTS
- 1.1 FILED SUB-BIDS REQUIREMENTS
- 1.2 WORK INCLUDED
- 1.3 EXAMINATION OF SITE
- 1.4 DRAWINGS AND SPECIFICATIONS
- 1.5 INSURANCE
- 1.6 CHANGES AND REVISIONS
- 1.7 WORKMANSHIP
- 1.8 MANUFACTURERS' NAMES AND TRADE NAMES
- 1.9 MATERIAL STORAGE AND OFFICE SPACE
- 1.10 GUARANTEE
- 1.11 RELATED WORK
- 1.12 CUTTING AND PATCHING
- 1.13 OPERATING INSTRUCTIONS
- 1.14 PERMITS
- 1.15 RECORD DRAWINGS
- 1.16 TEMPORARY LIGHT AND POWER
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- 1.18 PRODUCT DELIVERY, STORAGE AND HANDLING
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PART 2 - PRODUCTS

- 2.1 RACEWAYS AND FITTINGS
- 2.2 FIRE PROOFING AND CONDUIT SEAL
- 2.3 WIRING SYSTEM
- 2.4 WIRE
- 2.5 GROUNDING
- 2.6 OUTLET BOXES
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- 2.12 FIRE ALARM SYSTEM
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- 2.14 CIRCUIT BREAKERS
- 2.15 PANELS
- 2.16 DRY TYPE TRANSFORMER
- 2.17 OCCUPANCY LIGHTING SENSORS

PART 3 – EXECUTION

- 3.1 INSPECTION AND COORDINATION

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- 3.2 INSTALLATION
- 3.3 RACEWAYS AND FITTINGS
- 3.4 WIRING
- 3.5 WIRE
- 3.6 OUTLET BOXES
- 3.7 PULL AND JUNCTION BOXES
- 3.8 WIRING DEVICES
- 3.9 LOCATION OF OUTLETS
- 3.10 INSTRUCTIONS TO OWNER
- 3.11 CLEANUP
- 3.12 FIRESTOPPING

1.04 EXAMINATION OF SITE

- A. Before submitting a Bid, this Contractor must visit the job site to determine the conditions under which the work is to be done.

1.05 DRAWINGS AND SPECIFICATIONS

- A. Drawings and specifications are complementary to each other. Any labor and material which is called for by either, whether or not by both, or which is necessary for the successful operation of all systems, shall be furnished and installed. Discrepancies should be brought immediately to the attention of the Architect.
- B. Plans and specifications for this project should be examined to determine the scope and character of the work, the building design and function, and the required coordination with the General Contractor and other Trades before and during construction.
- C. Any questions regarding the plans and specifications shall be addressed in writing to the Architect five (5) days before Bids close; otherwise, after the closing of the Bids, the Architect's interpretation of the meaning and intent of the plans and specifications shall be final.
- D. Shop drawings and submissions of materials shall be made within thirty (30) days after the signing of the Contract; they are to be bound by section and submitted as a complete section. Seven (7) copies for approval shall be provided: one (1) copy for the General Contractor; two (2) copies for the Electrical Contractor; one (1) copy for the Architect; one (1) copy for the Electrical Engineer; and two (2) copies to be held by the Electrical Contractor until job completion, at which time they are to be bound in two (2) binders and transferred to the Owner.
- E. This Contractor shall prepare an electrical set of coordination drawings to overlay with all other Trades. Drawings shall be prepared on translucent drawings to properly coordinate all of the other equipment to be installed. Prior to any installations, the Electrical Contractor must receive approval of drawings from the Architect.

1.06 INSURANCE

- A. Insurance is to conform to the provisions and requirements as set forth in Division 1.

1.07 CHANGES AND REVISIONS

- A. Costs for changes and/or revisions shall be submitted to the General Contractor with material and labor breakdown of charges and credits clearly itemized.
- B. Work shall not be executed until approval has been received in writing from the Architect.

1.08 WORKMANSHIP

- A. Materials shall be new and shall conform with the standards of UL, Inc., in every case where such a standard has been established for the particular type of material in question. Work shall be executed in a workmanlike manner and a competent Foreman shall be provided for the entire project.
- B. After wires are pulled in and fixtures and equipment are installed, this Contractor shall make tests for performance, grounds, etc., and shall immediately remedy any defects. Equipment for tests shall be provided by this Contractor.
- C. Work under this Contract must be so performed that the progress of the entire project, including work of all Trades, shall not cause delays or interference. Materials and apparatus shall be installed as fast as the condition of the building will permit.
- D. It will be the responsibility of the Electrical Foreman to instruct the Owner in the function, operation and maintenance of electrical systems and equipment. This is to be done upon completion of the installation, before leaving the job site and to the satisfaction of the Owner, Engineer, and Architect.

1.09 MANUFACTURERS' NAMES AND TRADE NAMES

- A. Throughout the specification types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of performance and quality, and not to limit competition.

1.10 MATERIAL STORAGE AND OFFICE SPACE

- A. This Contractor shall maintain at his own expense, where directed on the premises, neat covered storage for material and equipment, and office space where drawings and specifications shall be kept for records.
- B. Equipment or material damaged during the construction period shall be replaced at this Contractor's expense.

1.11 GUARANTEE

- A. Materials and labor incorporated in the work are to be guaranteed against defects for a period of one (1) year from date of substantial completion. This Contractor shall correct such defects that occur within the guarantee period and to the satisfaction of the Architect without cost to the Owner, within a twenty-four (24) hour period.
- B. This Contractor shall not be responsible for failures through normal usage, nor for those caused by neglect or abuse on the part of the Owner or his employees.

1.12 RELATED WORK

- A. Following related work is not included in this Section and will be performed under designated Sections.
 - 1. Motorized equipment will be furnished complete with motors under other Sections. Control wiring for these motors shall be the responsibilities of others. See Section, HVAC; Section, PLUMBING; and Section, FIRE PROTECTION.
 - 2. Major cutting and patching; refer to Section, CUTTING AND PATCHING.
 - 3. Starters and controls are furnished under Section, PLUMBING and Section, HVAC. The Electrical Contractor shall be responsible to install and wire all starters.
 - 4. Starters for HVAC units shall be furnished under Section, HVAC and installed by this Contractor under the supervision of the HVAC Contractor.
 - a. Electrical Subcontractor to coordinate with HVAC Subcontractor for delivery of starters to the site.
 - 5. Except as shown on the Drawings, Automatic Temperature Control wiring for HVAC equipment and related power wiring beyond supply point and indicated on drawings and heating burner control wiring: refer to Section, HVAC.
 - 6. Fire stopping of all penetrations in rated walls and ceilings: Section, FIRESTOPPING for acceptable material to be

used on the exterior of the sleeve and around wires to be used by this Contractor. The Electrical Contractor shall be responsible for all firestopping of the interior and exterior of raceways installed through walls and floors.

1.13 CUTTING AND PATCHING

- A. This Contractor as part of his work, and without extra charge, shall do fitting and minor cutting required for conduit four (4) inches and under. Cutting over four (4) inches and patching will be by the General Contractor. Costs for openings required due to lack of coordination shall be the responsibility of this Contractor.

1.14 OPERATING INSTRUCTIONS

- A. This Contractor shall furnish two (2) Operating and Maintenance Manuals outlining in detail the operational features of the following systems:
 - 1. Fire Alarm Devices – Provisions only – fire alarm devices to be installed under a separate contract.
 - 2. Panels and circuit breakers
 - 3. Light fixtures.
 - 4. Occupancy sensors.
 - 5. Wiring devices.
 - 6. Devices and cover plates.
 - 7. Cable.

1.15 PERMITS

- A. This Contractor shall obtain and pay for permits the electrical systems on this project. Contact the City of New Bedford Inspectional services department to determine if the fees will be waived.

1.16 RECORD DRAWINGS

- A. A set of record drawings shall be maintained at the job site for reference by the Engineer and Architect. Weekly, the Electrical Foreman will note changes and review drawings periodically with the Engineer. Changes, including feeders, lighting, power, panel schedules and other schedules shall be recorded on the drawings. At the conclusion of the construction this Contractor shall order from the General Contractor a compact disc with all drawing files. All changes shall be made on the disc and shall be compatible to that of AutoCad 2018. Final payment for electrical work is contingent upon receipt of the approved digital as-built plans. Cost of record drawings will be borne by this Contractor. See GENERAL CONDITIONS and Division 1, Section, PROJECT RECORD DOCUMENTS.

1.17 TEMPORARY LIGHT AND POWER

- A. This Contractor shall furnish, install, maintain and remove at completion of work all necessary temporary electrical distribution wiring.
- B. Temporary service shall be fed from the existing main distribution equipment currently located within the facility.
- C. Temporary light shall be based on 100W lamp for rooms up to 500 sq. ft. and two (2) 200W lamps for every 1000 sq. ft. or fraction thereof. All lamps shall be furnished and replaced by this Contractor.
- D. Panelboards, switches, receptacles, and related accessories required for temporary light and power installation shall be provided.
- E. Outlets shall be located at convenient points so that extension cords of not over fifty (50) feet will reach work requiring temporary light and power.
- F. The General Contractor and Subcontractors, individually, shall furnish cords, sockets, motors and accessories for their

work.

- G. Temporary wiring, service equipment and accessories thereto installed, shall be removed at the expense of this Contractor after they have served their purpose.

- H. Temporary work shall be furnished and installed in conformance with OSHA, local codes and ordinances.

1.18 DEFINITIONS

- A. The terms "This Contractor", "Electrical Contractor", "Electrical Subcontractor", or "This Section" all refer to the work of this Section 26.00.00, ELECTRICAL.

1.19 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. The General Contractor shall provide and pay for all dumpster services during the entire construction period. Suppliers and Sub-Contractors to bring all rubbish and debris to the dumpster location daily. No costs are to be assessed to the suppliers or Sub-Contractors by the General Contractor for this service.
- B. The General Contractor, Sub-Contractors and suppliers, individually, shall furnish their own staging, scaffolding, and hoisting equipment to get workers, material and equipment from the point of delivery at the project site to the point of use or installation within the building and project site.

1.20 WORK CONDITIONS/SEQUENCE

- A. If Sub-Contractors find that conditions are not appropriate for them to begin the work of their trade or if they are directed to perform their work out of sequence by the General Contractor, or if the General Contractor directs Sub-Contractors to start and continue regardless of job conditions, the Sub-Contractor shall notify the Architect in writing by certified mail immediately.

PART 2 - PRODUCTS

2.01 RACEWAYS AND FITTINGS

- A. Minimum size of conduit used shall be 3/4" with no more than 9-#12 conductors. All circuits shall have separate neutrals and grounds.
- B. Electrical Metallic Tubing (EMT) shall be mild steel, electrically welded, galvanized, Midland-Ross, Wheatland or Republic. Set screws or indentations will not be acceptable as a method of attachment of fittings to conduit or EMT. Compression type only will be accepted.
- C. Conduit shall be kept at least six (6) inches away from adjacent copper piping or other copper work on the project.
- D. During construction, ends of conduit shall be kept tightly plugged to exclude plaster, dirt, dust, moisture and debris.
- E. Ends of conduit entering boxes shall be equipped with galvanized locknuts or bushings. Cut ends of conduit shall be reamed free of burrs and sharp edges.
- F. Furnish and install a 1" empty conduit with pull string to look into the nearest accessible ceiling for the owner provided communications cabling and related jacks. Install a two gang junction box with a blank cover plate.

2.02 FIREPROOFING AND CONDUIT SEAL

- A. The Electrical Contractor is responsible for all fireproofing of raceways through the walls.

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- B. The material to be used for firestopping shall be 3M moldable fire rated putty or 3M #CP25WB caulk to firestop penetrations in fire rated areas of walls and floors.

2.03 WIRING SYSTEM

- A. Wiring shall be installed concealed in the construction.
- B. Joints in wiring shall be made with approved type solderless connectors of the self-insulating type with an insulation equal to that of the conductors being joined. They shall be Minnesota Mining & Manufacturing Co., Type "Y", "R" or "B" Scotchlok, T&B Twist-on-Piggy or TUB one-piece, pressure type, self-insulating wire joint.
- C. All branch circuits shall have separate grounds and neutrals.

2.04 WIRE

- A. Unless otherwise specified, conductors installed in conduit shall be Type THW or THHN, 600V, 90 degree C. – Rome Cable. Conductors shall be copper.
- B. MC shall be Type THHN #12 copper conductors or as noted on the drawings.
- C. Covering of wires and cables designed to meet the above specifications shall have distinctive markings as required by the latest standards of UL, Inc., making them readily identifiable in the field.

208Y/120V

Phase	Color
A	Black
B	Red
C	Blue
Neutral	White
Ground	Green/Bare

2.05 GROUNDING

- A. The entire system shall be grounded in accordance with the National Board of Fire Underwriters', State and local requirements.
- B. This Contractor shall furnish and install an equipment ground wire in feeder runs to meet requirements of the National Electrical Code.
- C. All branch circuits shall have separate neutrals and grounds.

2.06 OUTLET BOXES

- A. Outlet boxes shall be Steel City, Appleton, or Raco, galvanized of a type best adaptable to their respective use and in general four (4) square or octagon. Boxes in plaster areas shall be equipped with plaster rings or trim. Studs of suitable size for proper support shall be provided in boxes from which fixtures are to be hung.
- B. Boxes installed in tile, block or similar finished walls shall be solid flush type, square cornered, without ears, 1-2-3 and 4-gang as required - Raco, Steel City or Appleton.
- C. Outlet boxes shall be provided with only the holes necessary to accommodate conduit connected. Boxes shall be furnished with lugs, ears, covers and/or outlet devices for attachment.
- D. Plastic boxes are NOT acceptable.

2.07 PULL AND JUNCTION BOXES

- A. Pull and junction boxes shall conform to requirements of the National Electrical Code. They shall be galvanized code gauge steel construction with removable cover plate secured by 1/4" brass machine screws. Junction boxes shall be supported to the building structure.

2.08 SLEEVES

- A. It shall be the responsibility of this Contractor to furnish and install sleeves through floors, walls, rated assemblies, etc., where necessary.
- B. Sleeves shall be sealed with UL, Inc., approved fire rated material after wires have been installed.
- C. Furnish and install three (3) four inch conduit sleeves through the floor to access the new Tel/Data Room.

2.09 WIRING DEVICES

- A. Switches shall be Hubbell Co. #1221-I, Leviton, General Electric or Pass & Seymour.
- B. Switch and pilot units shall be Hubbell #1297-I or equal manufacturer as listed above.
- C. Receptacles shall be 5362-I or equal manufacturer as listed above.
- D. Plates in general shall be stainless steel.
- E. Grounded type duplex receptacles shall be used. Provide ground path either by continuous metal conduit or separate conductor.
- F. Flush mounted receptacles shall have ground connection from terminal screw of the receptacle to the outlet box.
- G. Ground fault receptacles shall be Hubbell GF5352-I or equal.
- H. Mounting height from center to finish floor, unless otherwise noted, shall be as follows for wiring devices:
 - Switches, in general - 48"
 - Receptacles, in general - 18"
 - Receptacles with X - See Architectural details for mounting height above counter.
- I. All device plates for all switch controls, receptacles, etc., shall be labeled on the outside of the device plate indicating the panel designation, circuit number and voltage using a Brady style adhesive lettering tool. Hand written designations on the front face will not be acceptable.

2.10 SYSTEM OF LIGHT AND POWER

- A. Secondary distribution system is 120/208V, 3 phase, 4 wire, 60 HZ AC.

2.11 LIGHTING SYSTEM

- A. Provide and install the complete lighting system from the lighting outlets including wire, conduit, feeders, flexible wiring system, outlet boxes, junction boxes, wiring devices, remote control relays, dimming switches, lighting fixtures and lamps.

- B. Include labor and fittings necessary for the complete installation of fixtures. Steel rod, support wire, or chain hangers and mechanical suspension channel shall be furnished and installed. Light fixtures are to be hung to the building structure and not to the metal roof or floor decking.
- C. Where recessed lighting fixtures are to be installed in plaster ceiling, plaster rings and frames shall be installed under this Section of the specification.
- D. Recessed LED lighting fixtures shall be supported by wire or chain hangers by this Contractor and shall not depend on the ceiling hangers to support the weight of the fixtures
- E. Unless otherwise detailed on the electrical Drawings, a framed opening shall be provided under another section of the specification for recessed lighting fixtures to be installed in the ceiling.
- F. Flexible wiring system is approved method of wiring, subject to approved method of product wiring.
- G. Drivers shall meet applicable ANSI Standards for harmonic distortion surge protection. Drivers shall not be affected by lamp failure and shall be rated at 90% high power factor or higher.

2.12 FIRE ALARM SYSTEM

- A. The fire alarm system will be installed under a separate contract. This Contractor shall be responsible to furnish and install the necessary junction boxes and related conduit pathways to allow for the necessary wiring and devices to be installed

2.13 SAFETY DISCONNECT SWITCHES

- A. Safety type disconnect switches shall be fused heavy duty EATON., Siemens Co., Square D or General Electric. Boxes exposed to rain or wet conditions shall be rain-tight.
- B. Switches shall be rated for the voltage as required by the voltage of the circuit on which they are utilized and shall be rated in horsepower; each shall be capable of interrupting the locked rotor current of the motor for which it is to be used, which current shall be assumed as six (6) times the full rated load current. There are two speed two winding starters for many of the motors, as noted on the drawings. All starters are to be furnished by the HVAC Contractor and wired by the Electrical Contractor.
- C. Switches shall be fused, quick-make, quick-break type and parts shall be mounted on insulating boxes to permit replacement of any part from the front of the switch. Current-carrying parts shall be high conductivity copper designed to carry the rated load without excessive heating. Switch contacts shall be silver tungsten type or plated to prevent corrosion, pitting and oxidation and to assure suitable conductivity.

2.14 CIRCUIT BREAKERS

- A. Circuit breakers for lighting and small power loads shall be bolt-on thermal magnetic, quick-make, quick-break, trip free and sized as designated on panel schedules.
- B. Circuit breakers for distribution and power panels shall be bolt-on quick-make, quick-break, trip free, molded case type and sized as shown on panel schedules.
- C. Circuit breakers shall be manufactured by EATON. Siemens Co., Square D, General Electric or equal.

2.15 PANELS

- A. Panels shall be circuit breaker type, sized as indicated on drawings.
- B. Panels shall be mounted in code gauge steel cabinets having not less than six (6) inch gutters, equipped

with hinged doors, flush catch lock and keys, having surface or flush trims as designed on schedules and drawings.

- C. Provide engraved bakelite nameplate on trim of panels, indicating number and voltage.
- D. Panels shall have equipment ground buss isolated from the system ground buss to receive the fifth wire, which is the equipment ground wire.
- E. Strip cabinets used for low tension system shall be furnished by the panel manufacturer. Cabinets shall have the entire door hinged, with lock and key to match panels, 3/4" plywood backing, terminal strips as required and engraved nameplates on face of cabinet indicating purpose.
- F. Panels shall have typewritten legends.
- G. Panels shall be EATON, Siemens Co., General Electric, Square D, or equal.
- H. All panels shall have a door on door with locking devices.

2.16 DRY TYPE TRANSFORMER

A. MANUFACTURERS

- A. Transformers shall be as manufactured by EATON, Square D Company, General Electric Company or approved equal.
- B. Approved manufacturers shall be registered firms in accordance with ISO 9001:1994 SIC 3612 (US); which is the design and manufacture of low voltage dry type power, distribution and specialty transformers.

A. RATINGS INFORMATION

- A. All insulating materials are to exceed NEMA ST20 standards and be rated for 220°C UL component recognized insulation system.
- B. Transformers 15kVA and larger shall be 150°C temperature rise above 40°C ambient. Transformers 25kVA and larger shall have a minimum of 4 - 2.5% full capacity primary taps. Exact voltages and taps to be as designated on the plans or the transformer schedule.
- C. The maximum temperature of the top of the enclosure shall not exceed 50°C rise above a 40°C ambient.
- D. Transformers shall be low loss type with minimum efficiencies per NEMA TP1 when operated at 35% of full load capacity. Efficiency shall be tested in accord with NEMA TP2.
Three Phase

kVA	Efficiency
45	98.0%
- E. The transformer(s) shall be rated as indicated in the following schedule:
Identification Number(s)
kVA Rating
Voltages
Phase
Frequency

F. Transformers 750kVA and smaller shall be listed by Underwriters Laboratories.

1. Conform to the requirements of ANSI/NFPA 70.
2. Transformers are to be manufactured and tested in accordance with NEMA ST20.
3. Transformers losses shall conform to NEMA TP1 requirements
4. Transformers losses shall be tested in accord with NEMA TP2 procedures

C. CONSTRUCTION

A. Transformer coils shall be of the continuous wound construction and shall be impregnated with nonhygroscopic, thermosetting varnish.

B. All cores to be constructed with low hysteresis and eddy current losses. Magnetic flux densities are to be kept well below the saturation point to prevent core overheating. Cores for transformers greater than 500kVA shall be clamped utilizing insulated bolts through the core laminations to ensure proper pressure throughout the length of the core. The completed core and coil shall be bolted to the base of the enclosure but isolated by means of rubber vibration-absorbing mounts. There shall be no metal-to-metal contact between the core and coil and the enclosure except for a flexible safety ground strap. Sound isolation systems requiring the complete removal of all fastening devices will not be acceptable.

C. The core of the transformer shall be visibly grounded to the enclosure by means of a flexible grounding conductor sized in accordance with applicable UL and NEC standards.

D. The transformer enclosures shall be ventilated and be fabricated of heavy gauge, sheet steel construction. The entire enclosure shall be finished utilizing a continuous process consisting of degeasing, cleaning and phosphatizing, followed by electrostatic deposition of polymer polyester powder coating and baking cycle to provide uniform coating of all edges and surfaces. The coating shall be UL recognized for outdoor use. The coating color shall be ANSI 49.

D. SOUND LEVELS

A. Sound levels shall be warranted by the manufacturer not to exceed the following:
15 to 50KVA - 45dB; 51 to 150kVA - 50dB.

2.17 OCCUPANCY LIGHTING SENSORS

A. Occupancy motion sensors installed in the ceiling grid shall be EATON Greengate model number VAC-DT-2000-R series.

PART 3 - EXECUTION

3.01 INSPECTION AND COORDINATION

- A. This Contractor shall inspect surfaces and areas that will receive his material and the job conditions as they exist, and report any conditions that may adversely affect his work. Notify Architect or General Contractor of unsuitable conditions.
- B. Coordinate work with construction schedule and job progress.
- C. This Contractor shall confer with the General Contractor and other Trades to coordinate his work and to properly locate systems to avoid conflict and interference.

- D. Any interference with the work of other Trades or with architectural or structural details shall be brought to the attention of the Architect for decision before installation. Contractor's failure to so coordinate his work will not relieve him of the responsibility to correct work to suit building conditions.

3.02 INSTALLATION

- A. Installation shall be by skilled workmen using proper equipment. Commencement of work shall be deemed as acceptance of existing conditions by installer.
- B. Entire application shall be in strict accordance with manufacturer's recommendations and the standards of the National Electrical Code, local codes and ordinances, OSHA safety codes and regulations.
- C. After wires are pulled in and all fixtures are installed, this Contractor shall make tests for performance, grounds, etc., and shall immediately remedy defects. Equipment for tests shall be borne by this Contractor.
- D. Work under this Contract must be so performed that the progress of the entire project, including work of all Trades shall not cause delays or interference. Material and apparatus shall be installed as fast as condition of the building will permit.

3.03 RACEWAYS AND FITTINGS

- A. Conduit and wiring shall be installed concealed in the construction where possible. Conduit shall be installed in a neat, workmanlike manner and run parallel to building walls. Conduit size shall be minimum 3/4".
- B. During building construction ends of conduit shall be tightly plugged to exclude plaster, dirt, dust and moisture.
- D. Ends of conduit entering boxes shall be equipped with galvanized locknuts and bushings. Cut ends of conduit shall be reamed free of burrs and sharp edges.
- E. Electrical metallic tubing couplings and terminations in outlet boxes, junction boxes, panelboard cabinets, etc., shall be secured thereto for grounding by means of raintight and concrete-tight fittings of the interlocking compression ring or stainless steel, multiple joint locking type. Set screws or indentations will not be acceptable as a method of attachment of fittings to conduit or EMT.

3.04 WIRING

- A. Joints in wiring shall be made with approved type solderless connectors.
- B. All branch circuits shall have separate neutrals and grounds.

3.05 WIRE

- A. Wire #8 and larger shall be stranded and no wire less than #12 shall be used, unless otherwise noted.
- B. This Contractor may use MC cable with THHN conductors where allowed by code. No wiring less than #12 AWG shall be used.
- C. NM Type cable shall NOT be used.

3.06 OUTLET BOXES

- A. Ceiling boxes shall be supported to carry the weight of fixtures which are to be hung.
- B. Outlet boxes shall be provided with only the holes necessary to accommodate the conduits being connected. Boxes

shall be furnished with lugs or ears for attachment of covers and/or outlet devices.

3.07 PULL AND JUNCTION BOXES

- A. Pull and junction boxes shall be supported to the building structure or floor slab by suitable hangers to meet National Electrical Code.

3.08 WIRING DEVICES

- A. Grounded type duplex receptacles shall be used. Provide ground path either by continuous metal conduit or separate conductor.
- B. Receptacles with X typical for above counter or special mounting height. Refer to the Architectural Drawings for these locations and details before installation.

3.09 LOCATION OF OUTLETS

- A. Outlets shall line up with items above and be centered on wall. Add supports as required for this purpose. Do not mount on nearest studs.
- B. Architect or Engineer has the right to move outlets a reasonable distance.
- C. This Contractor shall check any questionable outlet before installation.
- D. This Contractor shall review drawings for exact location of receptacles and raceway systems mounted above counter or for special purpose. Dimensions shall be taken from Architectural drawings not from Electrical.

3.10 INSTRUCTIONS TO OWNER

- A. It shall be the responsibility of the Electrical Foreman to instruct the Owner in the function, operation and maintenance of electrical systems and equipment.

3.11 CLEANUP

- A. Stains and/or damage to the finish of the building caused by faulty workmanship and/or improper handling of material in regard to installation shall be cleaned or removed and replaced at no cost to the Owner.
- B. Panels and like shall be cleaned and left in a neat manner and where required shall be painted if any finish material has been removed.
- C. Temporary wiring shall be removed.
- D. Lighting fixtures shall be left clean. Lenses shall not be installed until areas are completed and free from dust and dirt.

3.12 FIRESTOPPING

- A. The Electrical Contractor shall be responsible to fire stop all the raceways and the interior and exterior of all sleeves through which wires penetrate walls, floors or any other penetrations requiring firestopping material under this Section.

END OF SECTION

**NEW BEDFORD CITY HALL – NEW ELEVATOR RENOVATIONS
NEW BEDFORD, MASSACHUSETTS**

Mount Vernon Group Architects, Inc., Project No. 02014.43

June 12, 2019

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SECTION 31 20 00

EARTH MOVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All the Contract Documents, including Drawings, General and Supplementary Conditions and Division 1 – General Requirements, apply to the Work of this Section.

1.02 SPECIAL INSTRUCTIONS

- A. The Contractor shall become familiar with other Sections of the Specifications to determine the type and extent of work there under which affects the work of this section whether, or not such work is specifically mentioned.

1.03 DESCRIPTION OF WORK

- A. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
 - 1. Excavation, stockpiling, and removal of FILL within the proposed footprint of the elevator pit and vestibule, 50 cubic yards.
 - 2. Removal of ledge and boulders 2 cubic yards and larger in open cut and legally crushed on site within the proposed footprint of the elevator pit and vestibule that is more than or less than the 50 cubic yards.
 - 3. All materials, equipment, labor and services required for all Earth Moving work, including all items incidental thereto, as specified herein and as shown on the Drawings.
 - 4. Pumping and/or bailing necessary to maintain excavated spaces free from water from any source whatsoever.
 - 5. Provide graded materials, as specified, for fills, base courses and backfills as required.
 - 6. Protect all existing buildings, utilities, roads, pavements, lawns, planting and other improvements from damage due to construction.
 - 7. Dust control and clean up.

1.04 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all the Contract Documents for requirements that effect the Work of this Section.
- B. Other Specification Sections which directly relate to the Work of this section include, but are not limited to, the following:
 - 1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein
 - 2. Section 02 41 13 – Selective Demolition
 - 3. DIVISION 03 – CONCRETE; including all Sections contained therein
 - 4. DIVISION 04 – MASONRY; including all Sections contained therein
 - 5. DIVISION 05 – METALS; including all Sections contained therein.
 - 6. Section 06 10 00 – Rough Carpentry
 - 7. DIVISION 07 – THERMAL AND MOISTURE PROTECTION; including all Sections contained therein.
 - 8. DIVISION 08 – DOORS AND WINDOWS; including all Sections contained therein.
 - 9. DIVISION 09 – FINISHES; including all Sections contained therein.
 - 10. Section 10 14 00 – Signage
 - 11. Section 14 21 00 – Traction Elevators
 - 12. Section 22 00 00 – Plumbing
 - 13. Section 23 00 00 - HVAC
 - 14. Section 26 00 00 – Electrical
 - 15. Section 31 20 00 – Earth Moving

1.05 REFERENCE SPECIFICATIONS

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements govern.
 - 1. American Society for Testing and Materials (ASTM):
 - a. ASTM C136, Sieve Analysis of Fine and Coarse Aggregates.
 - b. ASTM D1556, Density of Soil In Place by the Sand-Cone Method
 - c. ASTM D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
 - d. ASTM D6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
 - e. ASTM D422, Particle Size Analysis of Soils.
 - 2. Commonwealth of Massachusetts:
 - a. Massachusetts Highway Department, "Standard Specifications for Highways and Bridges" (S.S.H.B.) latest edition.
 - b. Commonwealth of Massachusetts State Building Code.
 - 3. American Association of State Highway and Transportation Officials (AASHTO):
 - a. AASHTO T-11, Standard Method of Test for amount of material finer than 0.075 mm sieve in aggregate.
 - b. AASHTO T-27, Standard Method of Test for sieve analysis of fine and coarse aggregates.
 - 4. Occupational Safety and Health Act (OSHA):
 - a. Occupational Safety and Health Act of 1970 (Public Law 91-596 of the United States, 29 USC Section 651 et seq.).

1.06 FINISHED GRADES

- A. The words "finished grades" as used herein mean the required final grade elevations indicated on the Drawings. Where not otherwise indicated, areas outside of buildings shall be given uniform slopes between points, for which finished grades are shown, or between such points and existing grade except that vertical curves or roundings shall be provided at abrupt changes in slope.

1.07 GRADES AND ELEVATIONS

- A. The Contractor shall verify dimensions and elevations on the ground and report any discrepancies immediately to the Architect. Any discrepancies not reported prior to construction shall not be the basis for claims for extra compensation.
- B. The Drawings indicate, in general, the alignment and finished grade elevations and sewer and drain invert grades. The Architect, however, may make such adjustments in grades and alignment as are found necessary in order to avoid interference between utilities and to adapt the piping to other special conditions encountered.

1.08 PROTECTION

- A. All rules and regulations governing the respective utilities shall be observed in executing all work under this Section.
- B. All work shall be executed in such a manner as to prevent any damage to existing buildings, streets, curbs, paving, service utility lines, structures and adjoining property. Monuments and bench marks shall be carefully maintained and, if disturbed or destroyed, replaced as directed.
- C. The Contractor shall furnish all facilities and materials necessary to prevent the earth at the bottom of excavation from becoming frozen or unsuitable to receive footing or other load bearing units.
- D. The Contractor, under this Section, shall provide at his own expense adequate pumping and drainage facilities to keep the excavation sufficiently dry as not to affect adversely the quality or time of placement of concrete or other materials to be installed in the excavated areas.

- E. The Contractor shall assume full responsibility for damages caused by him or his Subcontractor's equipment and personnel to the existing buildings and grounds as well as adjoining private property.
- F. The work of this Section shall be performed in such a manner as to cause no interference with access by the abutters, Subcontractors or other Contractors to all portions of the site as is necessary for the normal conduct of their work.

1.09 DEFINITION

- A. Backfill: Soil materials used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Fill: Soil materials used to raise existing grades. Types of fill are further defined in Paragraph 2.01.
- C. Base Course: Layer placed between the subbase course and proposed improvement.
- D. Processed Gravel for Subbase, SSHB M1.03.1 shall be used as a subbase material for paved areas, including but not limited to roadways, parking lots, asphalt berms, reinforced concrete pads, unit pavers, asphalt walks, concrete walks, and curbs.
- E. Utility Bedding Material: Course placed over the excavated subgrade in a trench before laying pipe.
- F. Unsuitable Material: Existing fill, topsoil, subsoil, organic soil, frozen soil, soil containing debris, existing asphalt, utilities, foundations, and structures which is located within the zone of influence of buildings, slabs, footings and site structures. Unsuitable material under proposed pavement areas consists of topsoil, subsoil, organic soil, frozen soil, soil containing debris, existing fill which has not been densified in place, existing asphalt, utilities, foundations, and structures.
- G. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill. Imported fill shall meet the gradation requirements set forth in Section 2.01.
- H. Excavation: Removal of material encountered above subgrade elevations.
 - 1. Additional Excavation: Excavation below subgrade elevation as directed by Architect. Additional excavation and replacement material will be paid for according to contract provision as for changes in work.
 - 2. Excavation: Excavation more than 8 feet in width and pits more than 30 feet in either length or width.
 - 3. Unauthorized Excavation: Excavation below subgrade elevations beyond indicated dimensions without direction by Architect, shall be without additional compensation.
- I. Rock: Excavated material in beds, ledges, unstratified masses, and conglomerate deposits that cannot be removed by rock excavating equipment equivalent to the following size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted.
- J. Excavation of Footings Trenches, and Pits: Late-model, track mounted hydraulic excavator; Caterpillar 325D or equal, equipped with a 42-inch wide, short-tip-radius rock bucket.
 - 1. Excavation: Late-model, track mounted loader; Caterpillar 963C or equal; or later-model, track-mounted hydraulic excavator; Caterpillar 325D or equal, equipped with a 42-inch wide, short-tip-radius rock bucket.
 - a. Boulder: An excavated, individual rock fragments or natural stone with a volume of 1.5 c.y. to 3 c.y. All boulders exceeding 3 c.y. shall be classified as "rock" and shall fall within "mass" or "trench" subcategory based on definitions in this section. Material classified as "Rock" and excavated and paid for shall not be eligible to be classified as "boulders" for additional payment purpose.
- K. Trench: An excavation of any length where the width is less than twice the depth and where the shortest distance between payment lines does not exceed ten (10') feet. All other excavations shall be defined as open excavations.
- L. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- M. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

- N. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.
- O. Zone of Influence: The area bounded by a one horizontal to one vertical (1H:1V) line sloping downward and outward from the bottom edge of the footings and foundations nearest to the excavation.
- P. SSHB: "Standard Specification for Highways and Bridges", Commonwealth of Massachusetts, Massachusetts Highway Department, 1988 edition, including supplements.

1.10 SUBMITTALS

- A. Provide submittals in accordance with requirements of Section 01 33 00 – Submittal Procedures in accordance with requirements of the Contract Documents.
 - 1. Submit a detailed construction sequence plan for project excavation indicating temporary stockpile areas, side slopes of excavations, limits of required temporary excavation support and sequence, and procedures for subgrade protection, excavation, concrete placement, moisture conditioning of onsite excavated soils used as fill, filling, backfill, and compaction.
 - 2. Backfill Materials: Submit a 50-pound sample for each backfill material from each proposed source including onsite materials. Submit a grain-size analysis and distribution curve performed in accordance with ASTM D422 for each proposed backfill material for review by the Geotechnical Engineer. Additional samples and analysis shall be submitted if a change in material occurs at the borrow source. Material that is processed by crushing of onsite materials shall be tested for compliance with the gradation requirements specified herein at the Contractor's expense. The Geotechnical Engineer will review the suitability of fill materials. Installation of materials prior to testing and/or review and response by Architect is at Contractor's risk.
 - 3. Submit the name of each material supplier and specific type and source of each material. Any change in source throughout the job requires approval of the Architect. No fill material shall be delivered to the site or placed until the material has been approved.
 - 4. If approval is based on a sample delivered from the source, additional tests, including grain-size analysis and a laboratory compaction test should be performed on the material delivered to the site.
 - 5. Soil Samples:
 - a. Classification in accordance with ASTM D2487 for each onsite or borrow soil material proposed for use onsite.
 - b. Laboratory compaction curve in accordance with ASTM D1557 for each onsite or borrow soil material.
 - c. The Contractor shall submit a scale plan daily that defines the location, limits, and depths of the area excavated.
 - d. Particle size analysis in accordance with ASTM D422 with gradation curves and envelope corresponding to the specified material. Materials will be considered meeting the required specifications, if the gradation curve fits entirely within the specified envelope.
 - 6. Submit a dewatering plan for review by the Architect at least two weeks before the start of construction.
 - 7. Excavation and Excavation Support Plan: Submit at least 10 calendar days prior to the start of the work a detailed plan for the sequence of excavation, and methods to be used for excavation support and dewatering of excavations. Submit engineering calculation stamped by a Massachusetts Registered Professional Engineer and shop drawings for earth support systems to be used. Dewatering and groundwater control systems shall be designed to keep excavations free of water and to avoid disturbance of the subgrade.
 - 8. Filter fabric/Separation Fabric: Submit the manufacturer's information and a one square foot representative sample of the fabrics.
 - 9. Within one week after making field adjustments, resubmit revised working drawings as necessary to reflect changes required by field conditions.
 - 10. Obtain required permits for discharge of dewatering effluent. Submit two copies of all permits obtained at least one week prior to system installation.

1.11 EXAMINATION OF SITE AND DOCUMENTS

- A. It is hereby understood that the Contractor has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of a lack of knowledge of existing conditions as indicated in the Contract Documents, or obvious from observation of the site.
- B. Plans, surveys, measurements, and dimensions under which the work is to be performed are believed to be correct, but the Contractor shall have examined them for himself during the bidding period and formed his own conclusions as to the full requirements of the work involved.

1.12 QUALITY ASSURANCE

- A. Comply with available requirements of NFPA 495, "Explosive Materials Code" and SSHA Section 120 and State Fire Codes.
- B. Seismic Survey Agency: An independent testing agency, acceptable to authorities having jurisdiction, experience in seismic surveys and blasting procedures to perform the following:
 - 1. Prepare plan report types of explosive and sizes of charge to be used in each area of rock removal, type of blasting mats, sequence of blasting operations, and procedures that will prevent damage to site improvements and structures on project site and adjacent properties.
 - 2. seismographic monitoring services during blasting operations.
 - 3. Prepare a pre-blast survey of all adjacent properties, including a structural inspection of the building and properties and shall include a written and photographic record of the existing conditions.
 - 4. Blast operation shall not commence until all reports and plans are received and approved by the owner and the Architect.
- C. Pre-excavation Conference: Conduct conference at Project Site to comply with requirement in Section "Project Coordination".
 - 1. Before commencing earthwork, meet with representatives of the governing authorities, Owner, Architect, Engineer, consultants, independent testing agency, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.
- D. Testing: Compaction tests will be required by the Owner and will be paid for by the owner. No specific testing schedule has been established at this time. If tests indicate that density requirement have not been achieved, the contractor continue compacting the tested material. All retesting in these areas shall be paid for by the contractor.
- E. Density and Compaction Testing: The contractor is responsible to schedule compaction tests and allow adequate time for the proper execution of said tests.
- F. The Owners Testing Agency will perform water content, gradation and compaction tests at a frequency and at locations as required. The results of these tests will be submitted to the Architect, and a copy submitted to the Contractor, on a timely basis so that the Contractor can take such action as is required to remedy the indicated deficiencies.
- G. The presence onsite of the Owner's Geotechnical Consultant's and Testing Agency does not include supervision or direction of work by the Contractor, his/her employees or agents. Neither the presence of the Owner's Geotechnical Consultant nor any observations performed by him/her, or any notice or failure to give notice, shall excuse the Contractor from deficiencies in the work.
- H. Protect all benchmarks, monuments, and property boundary pins. Replace if destroyed by contractor's operation.

1.13 PROJECT CONDITION

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by the Owner or others unless permitted in writing by the Architect and then only after arranging to provide temporary utility services according to requirements indicated.
 - 1. Notify Architect not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Architect's written permission.

3. Contact utility-locator service for area where Project is located before excavating.
 - B. Protect nearby structures from damage. All construction induced damage shall be repaired by the Contractor at no additional expense to the Owner.
 - C. The Contractor shall obtain and pay for all permits and licenses required to complete the work of this Section.
 - D. In case of conflict between regulations or between regulations and Specifications, the Contractor shall comply with the strictest applicable codes, regulations, or Specifications.
 - E. The contractor may perform additional test borings and other explorations at no cost to the Owner.
- 1.14 SEQUENCING AND SCHEDULING
- A. As construction proceeds, notify the Architect prior to the start of earthwork operations which require observations and testing. A minimum of 72 hours notification shall be provided for work that requires observation or testing.
 - B. Coordinate the installation of the new utilities with existing utility locations. Notify Architect if a conflict with existing utilities restricts the installation of new utilities.
- 1.15 MEASUREMENTS
- A. If unsuitable soils are encountered and/or rock excavation is required within the zone of influence of any proposed structure. Measurement will be completed in the following manner:
 1. Employ a Registered Land Surveyor to survey the surface remaining following removal of the vegetation, topsoil, subsoil, organic material, asphalt, curbing, and structures within the building footprint or structure and a minimum of 20 feet beyond the footprint. The area surveyed shall include all areas of over-excavation. Maximum spacing for survey points is 10 feet. Submit to Architect.
 2. Remove unsuitable soils or rock as directed by the Owner's Geotechnical Consultant.

PART 2 - PRODUCTS

- 2.01 FILL MATERIAL
- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from on-site excavations. Recycled construction materials, including crushed concrete and masonry, and pulverized pavement, are
 - B. prohibited for use as backfill.
 - C. Material containing organic matter, topsoil, organic silt or peat is unsuitable for use as fill or backfill in building or paved areas or for fill or backfills for structures or utilities.
 - D. Fill material shall be free from frost/ice and snow, rocks with a diameter greater than 2/3 of the loose lift thickness as specified herein, and foreign matter, such as construction debris, asphalt, trash, wood, roots, leaves, sod, and organic matter. All fill material shall be maintained by the contractor at suitable moisture contents for proper placement and compaction as specified herein.
 - E. Off-site pulverized pavement and off-site crushed concrete are not acceptable for fill material. On-site crushed concrete is not an acceptable fill material.
 - F. Crushed stone - Crushed stone to be placed under and around underground storm water chambers and leaching basins as shown on the Drawings and as specified shall be washed, graded free of organic materials 1-1/2 in. to 3/4 in. size. Gradation shall conform to S.S.H.B., Section M2.01.3 as follows
 - G. Crushed stone – Clean, sound material, free of debris, waste, frozen materials and organic material to be used as shown on the Drawings. Gradation shall conform to S.S.H.B., Sections M2.01.0 through M2.01.6 size as indicated in the Drawings.

- H. Structural Fill, Ordinary Fill, Processed Gravel for Subbase, and Utility Bedding Material shall consist of inert, hard, durable sand and gravel, free from organic matter, clay, surface coatings and deleterious materials, and shall conform to the gradation requirements shown below.
- I. The Structural Fill should have a plasticity index of less than 6, and shall meet the gradation requirements shown below. Structural Fill shall be compacted in maximum 9 inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ± 2 percentage points of optimum moisture content. Structural Fill shall be used within the building footprint and under structures, including retaining walls, exterior slabs, and pads.

H.U.S. Bureau of Standards Sieve Size and Number	Percent Passing	
	Minimum	Maximum
3- inches	100 %	
1 ½ inch	80%	100%
1/2 inch	50 %	100 %
No.4	30%	85%
No.10	20%	75%
No.60	5%	35%
No.200	0 %	*10 %

* 5% under sidewalks

1. Material falling within the above Specifications, encountered during the excavation, shall be stored in segregated stockpiles for reuse as Compacted Structural Fill. All material shall be subject to approval by the Architect.
 2. Fill placed in the top 12 inches beneath sidewalks shall consist of Structural Fill with less than 5 percent fines.
- J. Ordinary Fill should have a plasticity index of less than 6. It shall be Well-graded, natural inorganic soil approved by the Architect and meeting the following requirements to be used for general filling to subgrades in lawn areas and to the bottom of the subbase beneath pavements and sidewalks, and conforming to the following gradation requirements. Soil finer than the No. 200 sieve shall be nonplastic. Ordinary Fill shall meet the gradation requirements shown below. Ordinary Fill shall be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ± 2 percentage points of optimum moisture content.

M.U.S. Bureau of Standards Sieve Size and Number	Percent Passing	
	Minimum	Maximum
6-inches	100 %	----
1 inch	50%	100%
No.4	20%	100%
No. 20	10%	70%
No.60	5%	45%
No.200	0 %	20 %

1. It shall be free of organic or other weak or compressible materials, of frozen materials, trash or other deleterious materials and of stones larger than six (6) inches maximum dimension.
2. It shall be of such nature and character that it can be compacted to the specified densities in a reasonable length of time.
3. It shall be free of highly plastic clays, of all materials subject to decay, decomposition or dissolution and of cinders or other materials which will corrode piping or other metal.
4. It shall have a maximum dry density of not less than 100 pounds per cubic foot.
5. Material from excavation on the site may be used as ordinary fill if it meets the above requirements.
6. Excavated rock and boulders not to exceed two cubic yards may be used only in fill areas under lawns, provided they are at a minimum of 24 inches below subgrades, placed and compacted in layers with no voids and all interstices filled.
7. Processed Gravel for Subbase, conforming to SSHB, section SSHB M1.03.1.

8. Utility Bedding Material: Sand or sandy soil free of debris, waste, frozen materials and organics with 100 percent passing a 3/8-inch sieve and no more than 10% passing a No. 200 sieve or as specially required by applicable authority.
9. Structural fills, Ordinary fill, Processed Gravel for Subbase, and Utility Bedding Material shall be tested for gradation using wash sieves using the appropriate ASTM Standards. The gradation curves shall fit entirely within the envelopes defined by the limits.

2.02 TEMPORARY STEEL SHEETING

- A. Steel materials shall be of such size and strength as required by the excavation support design prepared and submitted by the Contractor's Professional Engineer. Steel sheet piling may be new or used material but shall not contain splices, cutouts, patches or other alterations which would impair its integrity or strength.
- B. Steel sheeting shall be on approved standard section, weighing not less than 22 pounds per square foot of wall and conforming to ASTM A6 and A328.
- C. Where soldier piles and lagging are used, the steel piles shall conform to ASTM A6."

2.03 FLOWABLE FILL

- A. Flowable fill or Controlled Low Strength Materials (CLSM) shall be a mixture of cement, water, aggregate and fly ash with a slump greater than eight inches. The in-place-density to be between 115 and 145 lbs./cubic foot and a compressive strength of 200 PSI. Penetration resistance to be 500-1500 as tested in accordance with ASTM C 403.

2.04 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
 1. Red: Electric
 2. Yellow: Gas
 3. Orange: Telephone and other communications.
 4. Blue: Water System
 5. Green: Sewer System.
- B. Geotextile for Infiltration System: Non-woven polypropylene fabric having a Puncture Resistance (ASTM D4833) of at least 65 pounds, a permeability (ASTM D4491) of at least 130 gal/min/sf, and an Apparent Opening Size (ASTM D4751) of 0.15 to 0.22 millimeters, such as Mirafi 140N, Contech C-40NW, or Geotex 401 by Propex
- C. Separation Fabric: Woven geotextile, specifically manufactured for use as separation geotextile; made from polyester, or polyamides, and with the following minimum properties determined according to ASTM D 4759 and referenced standard methods:
 1. Grab Tensile Strength: 200 lbs. – ASTM D 4632
 2. Tear Strength: 75 lbs. – ASTM D 4533
 3. Puncture Resistance: 90 lbs. – ASTM D 4833

PART 3 - EXECUTION**3.01 TEMPORARY STEEL SHEETING**

- A. The contractor is responsible for the adequacy of the excavation support system and shall retain the services of a Professional Engineer registered in the Commonwealth of Massachusetts to design the required excavation support systems. The contractor's Professional Engineer shall practice in a discipline applicable to excavation work, shall have experience in the design of excavation support system and shall design in conformance with OSHA requirements. The contractor's Professional Engineer shall provide sufficient on-site inspection and supervision to assure that the excavation support system is installed and functions in accordance with his design. Criteria listed here in defining the responsibilities of the construction manager's Professional Engineer are minimum requirements.
- B. The contractor shall submit the attached Certificate of Design completed and signed by the contractor and the Professional Engineer, identifying the Contractor's Professional Engineer who will be responsible for design of the excavation support system, and including, for record purposes only:
 - 1. An overall time schedule for construction of the braced excavation system.
 - 2. A description of the anticipated sequence of construction.
 - 3. Submit three (3) copies to the Architect of:
 - a. Complete details of braced excavation methods, equipment and sizes and lengths of materials proposed to be used.
 - b. Details of vibration monitoring devices and reports.
 - c. Details of the means and methods that will be used in monitoring the integrity of the support system during its entire period of use to insure the safety of the excavation.
 - d. Complete computations of the design of the braced excavation system bearing the seal of the responsible Registered Professional Engineer duly registered licensed to practice within a discipline applicable to excavation work, in the state where the project is located.
 - e. Any other pertinent data required for record purposes by the Engineer.
- C. Receipt of the information by the Architect will not relieve the contractor of the sole responsibility for the adequacy of the braces excavation system, and for assuring that there will be no resulting damage to adjacent existing pavement, utilities or structures, and for providing safe conditions within the sheeted areas.
- D. Further for the record, upon completion of the work of this section, the contractor shall submit three copies of all records of survey, vibration monitoring and inspection of existing structures to the Architect.
- E. Work shall not be started until all materials and equipment necessary for construction are either on the site of the work or satisfactorily available for immediate use as required.
- F. The sheeting shall be sufficiently tight to minimize any resulting lowering of the groundwater level outside the excavation.
- G. The sheeting shall be driven by approved means to the design elevation. No ends or edges of sheeting shall be left exposed in a manner, which could create a possible had to safety of the public or a hindrance to traffic of any kind.
- H. The satisfactory construction and maintenance of the excavation support system, complete in place, shall be the responsibility of the contractor.

3.02 EXCAVATION

- A. General
 - 1. Excavate all materials to the elevations, dimensions and form as shown on the Drawings and as specified for the construction of segmental retaining walls, utility structures, utilities, site improvements and other structures necessary for the completion of the building, utilities and site work. All unsuitable materials within the indicated and specified limits shall be excavated and removed. Any quantities involving an extra or other adjustment of the Contract Price shall be subject to measurement verification and approval by the Architect prior to the excavation and removal of such materials. Measurement of quantities for payment purposes shall be by means of survey of the subgrade as described in item 3.04.C. Unsuitable materials shall include the following:

- a. Pavements, utility structures, building foundations and other man-made structures.
 - b. Peat, organic silt and other organic materials subject to decomposition, consolidation or decay.
 - c. Miscellaneous fill including sand, gravel, cinders, ash, glass, wood and metal
 - d. Ledge or boulders except as specified for fills herein.
 2. The removal of unsuitable material extended beyond the limits of the proposed building a distance equal to the distance between the bottom of the proposed footings and the bottom of the fill or 5 feet, whichever is greater.
 3. Cobble s and boulders shall be removed at least 6 inches from beneath footings, i.e., 4.5 feet beneath the proposed FFE within the entire building footprint, and 2 feet beneath the bottom of paved areas. The resulting excavations should be backfilled with compacted Structural Fill under the building and with Ordinary Fill under the subbase of paved areas.
 4. Minimum depth of excavation in rock shall be performed in accordance with the requirements in Section 3.04 E.
 5. The Contractor shall obtain from the proper authority locations of all utilities within the scope of this work so that there will be no damage done to such utilities. Neither the Owner nor the Architect will be responsible for any such damage, and the Contractor shall restore any structure or utility so damaged without additional compensation. Written notifications to the appropriate utility agencies shall be made at least ten (10) days prior to the commencement of any work.
 6. Excess Material - Suitable excavated material which is required for fill and backfill shall be separately stockpiled as directed by the Architect. All surplus fill other than that required to complete the intent of the Contract shall become the property of the Contractor and shall be disposed of off the property by the Contractor. All excavated materials which, in the opinion of the Architect, are not suitable for fill or backfill shall be removed and disposed of off the property.
 7. Any unsanitary conditions encountered, such as broken sewer mains or uncovered garbage shall be corrected or removed entirely as directed by the Architect.
- B. Excavation for Utilities and Utility Structures
1. Construct surface subgrades including filling prior to excavation for utilities and utility structures. Excavate to the lines and grades shown on the Drawings and as specified herein to obtain the subgrade for the following items of work:
 - a. Utility structures - to grades shown on the Drawings. Remove by excavating all unsuitable materials; including buried organics, from under drainage structures and backfill with specified fills compacted in place to subgrades.
 - b. Excavation for structures and other accessories shall have twelve (12) inch minimum and twenty-four (24) inch maximum clearance on all sides.
 - c. All utility lines - to 12 inches below bottom of utility lines or structures.
 - d. Trench for water pipe to provide a minimum of five feet of cover above top of pipe.
 - e. Unless otherwise shown, provide separate trenches for each utility. Lay all piping in open trenches except where tunneling is required. Excavation for structures and other accessories shall have 12 in. minimum and 24 in. maximum clearance on all sides.
 - f. Grade the bottom of trenches evenly to have a constant pitch in the direction of flow and to insure a uniform compacted thickness of selected material as called for.
 2. Existing services and utilities encountered shall be immediately repaired, protected and maintained in use until relocation of same has been completed or be cut and capped where directed or be prepared for connections when so required. All existing water mains are to be protected to remain in place for future use.

3.03 ROCK EXCAVATION

- A. Should highly fractured or weathered bedrock be encountered during excavation, the following shall apply:
 - 1. When rock is encountered within the building footprint and its zone of influence, in trenching operations or under retaining walls, site utilities and site improvements it shall be excavated or ripped with a hydraulic excavator. When it is demonstrated to the satisfaction of the Architect and the Geotechnical Engineer that this material can no longer be removed with a hydraulic excavator and requires drilling and blasting, this material shall be classified as Rock Excavation.
- B. Intermittent drilling and ripping performed to increase production and not necessary to permit excavation of material.
- C. Measurements:
 - 1. When, during the process of excavation, rock is encountered, it shall be uncovered and exposed in such a manner that the unbroken ledge surface is clearly visible, and the Architect shall be notified by the Contractor, before proceeding further. The areas in question shall then be cross-sectioned as hereinafter specified.
 - 2. The contractor shall perform rock probes at the site in a grid pattern before the start of excavations. At a minimum, the results of the probes should include the ground surface elevation and the elevation of the top of the rock. The probes should extend at least 10 feet beyond the perceived top of rock to make sure that the perceived top of rock is not a boulder.
 - 3. Failure on the part of the Contractor to perform the probes and identify the depth to top of the rock surface and to notify the Architect and proceeding by the Contractor with the rock excavation before cross-sections are taken, will forfeit the Contractor's right of claim towards the stated allowance or additional payment over and above the stated allowance at the quoted unit price.
 - 4. The Contractor shall employ and pay for a licensed Registered Civil Engineer or Land Surveyor to take cross-sections of rock before removal and to make computations of volume of rock encountered within the Payment Lines. Cross-sections shall be taken in the presence of the Geotechnical Engineer and the computations approved by the Architect. The Owner has the option to perform independent cross-sections and computations of rock quantities.
 - 5. Where removal of boulder or ledge is required outside the established payment lines, the extent of this removal and basis of payment shall be determined by the Architect.
- D. Blasting
 - 1. Blasting: Obtain written permission and approval of method from local authorities before proceeding with rock excavation. Explosives shall be stored, handled, and employed in accordance with state and local regulations or, in the absence of such, in accordance with the provisions of the "Manual of Accident Prevention of Construction" of the Associated General Contractors of America, Inc.
 - 2. Notify the Architect at least 48 hours before any intended blasting and do no blasting without his specific approval of each blasting operation.
 - 3. Contractor shall present evidence that his insurance includes coverage for blasting operations before doing any blasting work. A pre and post survey shall be performed for all buildings and utilities within 250 feet of the nearest blasting operations, conforming to the Municipal ordinance governing blasting and the Municipal Fire Department regulations.
 - 4. All rock blasting shall be well covered with heavy mats or timbers chained together and the Contractor shall take great care to do no damage to existing structures, utility lines and trees to remain.
 - 5. Any damage caused by the work of this Contractor shall be repaired to the full satisfaction of the Architect at no additional cost to the Owner.
 - 6. Any rock fragments or loose material from blasting operations shall be removed. All voids shall be filled with a leveling layer of Structural Fill, Ordinary Fill or lean concrete as recommended by the Geotechnical Engineer.
 - 7. Additional blasting requirements:
 - a. Comply fully with National and City of New Bedford Regulations.

- b. All documentation submitted with application for "Use and Handling" PERMIT. 527 CMR 13:04 (11) E-1 states "A Use and Handling" Permit may be suspended or revoked by the head of the Fire Department or the Marshal or their designees for any violation of 527 CMR 13:00, or MGL c. 148"
 - c. Meet all requirements of 527 CMR 13:00
 - d. All Pre-Blast Surveys completed per 527 CMR 13:00
 - e. Hours of Blasting 09:00 hrs. through 16:00 hrs., Mon. through Fri.
 - f. No Blasting Saturdays, Sundays or Holidays.
 - g. All shots to be double matted unless approved in advance by the City of New Bedford Fire Chief.
 - h. Shot size limited to 500 lbs. unless approved in advance by the City of New Bedford Fire Chief.
 - i. Blast warning signals to be sounded in accordance with 527 CMR 13:00
 - j. 24 hours notification to the fire department of intent to blast
 - k. In or near residential areas, written notification must be distributed to homes advising of intent to blast at least three (3) days prior to blasting operations. Such written notification to include time frame of blasting operations and description of warning signals. The area of distribution shall be determined by the Fire Chief during pre-blast conference. A Fire Department detail will be required unless waived by the Fire Chief.
 - l. Two or more seismographs required on all shots.
 - m. All seismographs to be calibrated and certified according to manufactures specifications and 527 CMR 13:00
- E. Rock should be cut at least 12 inches beneath the bottom of footings, 2 feet beneath the bottom of slabs, 18 inches beneath the bottom of paved areas, and 12 inches below the bottom of utilities. Laterally, the rock should be removed at least 1 foot beyond the limits of footings and 2 feet beyond the limits of walls. Rock should be cut a minimum of 12 inches outside utility structures and a minimum of 18 inches on each side of utility pipes
- F. Rock surfaces for foundations and slabs shall be carefully examined. Loose, shaken rock, or excess of heaved rock shall be removed to solid bearing, and the rock surface leveled, or shelved to a slope not exceeding one inch per two feet, or as directed. Depressions in the rock surface shall be filled with compacted Structural Fill within building footprint and Ordinary Fill underneath Processed Gravel for Subbase in paved areas.
- G. If rock excavation is carried beyond the depth and dimensions to subgrade in other areas, the Contractor shall, at his own expense, furnish and install suitable compacted fill to subgrade as directed by the Architect.
- H. Granular fill shall not be placed directly on rock surfaces containing voids between fractures. Suitably sized crushed stone or a geotextile shall be placed on the fractured surface prior to placing the fill to limit migration of smaller particles into the voids. Geotextile separation fabric should also be used for separation between the crushed stone and the fill.

Rock surfaces that heave due to blasting should be compacted with a vibratory roller that imparts a minimum of 40 kips to the rock surface, prior to placing fill. Where rock has heaved more than 2 feet, the heaved rock should be removed and replaced with suitable fill.

To reduce the magnitude of rock heave, drilling for blast holes should extend no more than 2 feet beneath footing bearing elevations; and beneath floor slab, roadways, and athletic fields.

To reduce the amount of overblast Contractor shall use pre-splitting or controlled blasting. Rock cuts more than 25 feet in height should be pre-split in stages.

Complaints:

1. Report all blasting complaints to the Architect within 24 hours of receipt thereof. Include the name, address, date, time received, date and time of blast complained about, and a brief description of the alleged damages or other circumstances upon which the complaint is predicated. Assign each complaint a number, and number all complaints consecutively in order of receipt.
2. Submit a summary report to the Architect each week which indicates the date, time and name of person investigating the complaint, and the amount of damage, if any.
3. When settlement of a claim is made, furnish the Architect with a copy of the release of claim by the claimant.

4. Immediately notify the Architect, throughout the statutory period of liability, of any formal claim or demands made by attorneys on behalf of claimants, or of serving of any notice, summons, subpoena, or other legal documents incidental to litigation, and of any out-of-court settlement or court verdict resulting from litigation.
5. Immediately notify the Architect of any investigations, hearings, or orders received from any governmental agency, board or body claiming to have authority to regulate blasting operations.

Basis of Payment: The total amount of rock excavation will be based upon the volume of rock excavated within and/or above the lines referred to in the next paragraph as "Payment Lines". The payment lines are only to be used as a basis of payment, and are not to be used as limits of excavation. Limits of excavation area as shown on the Drawings and as specified herein.

Payment Lines for Rock Excavation:

1. Payment lines for rock excavation outside of the building shall be 24 inches below respective subgrades.
2. Payment lines for rock excavation within the building footprint shall be 24 inches below bottom of slabs and 12 inches below bottom of footings.
3. Payment lines for rock excavation for utility trenches outside the building footprint shall in no case be calculated as greater in width than the outside diameter of the pipe plus two feet for pipes up to 18 inches. For pipes 18 inches and larger payment lines shall in no case be calculated as greater in width than the outside diameter of the pipe plus three feet. Payment lines at bottom of all pipe and utility trenches shall be six inches below subgrade.
4. Payment lines for manholes and catch basins shall be one foot outside of the outer wall and six inches below subgrade beneath the structure.

3.04 PROTECTION, SHORING AND DEWATERING

- A. Protect open excavations with steel plates, fencing, warning lights and other suitable safeguards.
- B. Shore and brace excavations as required to maintain them secure and provide sheet piling as necessary to prevent cave-ins. Remove shoring and piling before backfilling is completed and as specified herein.
- C. Frost Protection - Make no excavations to the full depth indicated when freezing temperature may be expected unless the footing or slabs can be poured immediately after the excavation has been completed. Protect the bottoms as excavated from frost, if placing of concrete is delayed, with straw, tarpaulins or temporary heat until footings or slabs are poured and sufficient backfill is placed.
- D. Provide all pumps and pumping facilities, including a well point system as necessary with attendants, to keep all excavations free from water from whatever source at all times, when work is in progress or when necessary for protection and integrity of the work in place. Trenches shall be kept water-free during jointing and for sufficient time thereafter to allow the jointing material to become fully set and completely resistant to water penetration.
- E. Maintain ground water in the bearing soil strata at a safe level at all times by methods which prevent loss of fines or other disturbances to these strata. If the methods employed have not been adequate and the bearing value of the soil has been reduced, remove disturbed soil as directed and replace with compacted Structural Fill within building footprint and Ordinary Fill underneath Processed Gravel for Subbase in paved areas. at no expense to the Owner.
- F. Any ditching required to keep the site free from water during construction is the responsibility of the Contractor and will be repaired, topsoiled and seeded before completion of work.
- G. Groundwater. The Contractor shall design and submit a plan to collect and remove groundwater to the Architects prior to the start of excavations. Pump water removed from the excavation into settling tanks before being discharges. Obtain any required discharge permits from the City of New Bedford to discharge the water into the public drain system. Test ground water samples for possible contamination.

3.05 FILLS, BACKFILLS AND COMPACTION

- A. Samples and Testing
 1. All fill material and its placement shall be subject to quality control testing. A qualified laboratory will be selected

2. by the Owner to perform tests on materials. All costs of testing will be paid for by the Owner. Test results and laboratory recommendations shall be available to the Architect.
3. Provide samples of each fill material from the proposed source of supply including on-site sources. Allow sufficient time for testing and evaluation of results before material is needed. Submit samples from alternate source if required.
4. Architect will be sole and final judge of suitability of all material.
5. The laboratory will determine maximum dry density and optimum water content in accordance with A.S.T.M. D-1557, Method D and the in-place density in accordance with A.S.T.M. D-1556.
6. Tests of material as delivered shall be made from time to time. Materials in question shall not be used, pending test results. Tests of compacted materials will be made regularly. Remove rejected materials and replace with approved material.
8. Cooperate with laboratory in obtaining field samples of in-place materials after compaction. Furnish incidental field labor in connection with these tests.

B. Placing Fills and Compacting

1. Fill material shall be placed in horizontal layers not exceeding the maximum loose lift thickness with the minimum number of passes of compaction equipment as summarized on the table below.

Each layer shall be compacted to the percentage of maximum dry density specified for the particular type of fill and at a water content equal to optimum water content plus or minus two (2) percent.

The maximum dry density and optimum water content shall be as specified herein:

Compaction Method	Max. Stone Size Max.	Thickness Below Structures & Pavement	Less Critical Areas	Passes Below Structures & Pavement	Less Critical Areas
Hand-operated vibratory plate or light roller in confined areas	4 in.	8 in.	8 in.	6	4
Hand-operated Vibratory drum rollers weighing at 6 in. least 1,000# in confined areas	6 in.	8 in.	10 in.	6	4
Light vibratory drum Roller, minimum weight at drum 5,000#, minimum Dynamic force 10,000#	6 in.	10 in.	12 in.	6	4
Medium to heavy Vibratory drum roller, Minimum weight at Drum 10,000#, minimum Dynamic Force 20,000#	8 in.	12 in.	12 in.	6	4

2. Areas to be filled or backfilled shall be free of construction debris, refuse, compressible or decayable materials and standing water. Do not place fill when fill materials or layers below it are frozen.
3. Notify the Architect when excavation is ready for inspection. Filling and backfilling shall not be started until conditions have been approved by the Architect.

4. Before backfilling against walls, the permanent structures must be completed and sufficiently aged to attain strength required to resist backfill pressures without damage. Temporary bracing will not be permitted except by written permission from the Architect. When filling on both sides of a wall or pier, place fill simultaneously on each side. Correct any damage to the structure caused by backfilling operations at no cost to the Owner. Place no stones closer than 18 inches to wall surfaces.
5. In confined areas adjacent to footings and foundation walls and in utility trenches beneath floor slab, the fill shall be compacted with hand operated vibration tampers. The maximum lift thickness shall be four inches. The degree of compaction attained shall be equivalent to that attained in the adjacent open areas where heavy rolling equipment is used.
6. After the subgrade under concrete slabs and paved areas has been shaped to line, grade and cross-sections, it shall be rolled with an approved power roller weighing not less than six tons until thoroughly compacted. This operation shall include any reshaping, refilling or wetting required to obtain proper compaction. Any areas that subsequently settle shall be refilled to true subgrade and properly compacted.
7. In freezing weather, a layer of fill shall not be left in an un-compacted state at the close of a day's operations. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment.

C. Placing Fills

1. In the building footprint Structural Fill shall be placed under the concrete footings and slabs. Ordinary Fill shall be placed under Processed Gravel for Subbase in paved areas. The material shall be placed and compacted in layers as described in the above table and compacted to at least 95 percent of maximum dry density as determined by A.S.T.M. Test D1557 with moisture contents within ± 2 percentage points of optimal moisture content. Incidental compaction due to traffic by construction equipment will not be credited toward the required minimum coverages.
2. Placement of structural fill should not be conducted when air temperatures are low enough to cause freezing of the moisture in the fill during or before placement, approximately 32 degrees F., or below. Fill materials should not be placed on snow, ice or un-compacted frozen soil. Structural fill should not be placed on frozen soil. No fill should be allowed to freeze prior to compaction. At the end of each day's operations, the last lift of fill, after compaction, should be rolled by a smooth-wheeled roller to eliminate ridges of un-compacted soil and protected from freezing.

D. Deficiency of Fill Materials

1. Provide required additional fill materials as specified if a sufficient quantity of suitable materials is not available from the required excavation on the project site at no additional cost to the Owner.
2. Where water content of the fill must be adjusted to meet this Specification, the fill shall be thoroughly disked to insure uniform distribution of any water added.

E. Fill and Backfill for Utilities

1. Backfill trenches only after pipe and leaching chambers have been inspected, tested and locations of pipes and appurtenances have been recorded.
2. Each pipe section shall be laid on a 12 inches minimum bed of crushed stone as specified herein above. In addition, the water line shall be set in a six inches bed of sand. Bed shall be shaped by means of hand shovels to give full and continuous support to the lower 1/3 of each pipe. Backfill by hand around pipe, and for a depth of 12 inches above pipe, use sand or crushed stone and tamp firmly in layers not exceeding six inches in thickness. Take care not to disturb the pipe. Compact the remainder of the backfill thoroughly with a rammer of suitable weight or with an approved mechanical tamper to achieve compaction of 95 percent as specified.
3. Trenches and utility structures shall be backfilled with greatest care; fill materials required for backfilling to subgrades shall be Structural Fill or Ordinary Fill as specified. Backfill shall be compacted to 95 percent as specified. No mud, frozen earth or stone more than six inches in greatest diameter or other objectionable material shall be used for refilling. Any selected material required for filling shall be furnished and placed by the Contractor.

3.06 UTILITY SERVICES LINES

- A. Trenches for utility lines shall be excavated of Fill and other materials which the Architect deems not stable and backfilled to form a stable foundation for laying the utility lines.

3.07 SUBGRADE PREPARATION

- A. Bring all areas to required subgrade levels as specified and as determined from the Drawings.
- B. Maintain all subgrades for site improvements in satisfactory condition, protected against traffic and properly drained, until the surface improvement is placed. In areas to receive pavement or other surface materials, at top and bottom of embankments, along swales and elsewhere, place sufficient grade stakes to facilitate checking the subgrade levels. Correct all irregularities, compacting thoroughly any fill materials.
- C. Check all manhole covers, grates, valve boxes and similar structures for correct elevation and position and make, or have made any necessary adjustments in such structures.
- D. All subgrades must be inspected and approved by the Architect before site improvements are made.
- E. The topsoil/subsoil, root balls, organic soil, existing fill, and other deleterious matter should be entirely removed from within the proposed building footprint.
- F. Topsoil/subsoil, organic material, root balls, and other deleterious material should be entirely removed from within the paved areas.
- G. The base of the footing excavations in the natural soil should be compacted with a dynamic vibratory compactor weighing at least 200 pounds and imparting a minimum of 4 kips of force to the subgrade, before placing concrete.
- H. The subgrades of slabs and paved areas in the natural soil should be compacted with a heavy vibratory roller compactor imparting a dynamic effort of at least 40 kips.
- I. Where soft zones are revealed by the compaction effort and where organic soil is exposed, the soft materials or organic soil should be removed and replaced with Structural Fill within the building and with Ordinary Fill beneath the subbase of paved areas
- J. Due to the high susceptibility of the natural soil for disturbance under foot and vehicular traffic, we recommend placing a minimum of 6 inches of Structural Fill under footings on top of the natural soil to provide a firm working surface during placement of formwork and rebar.
- K. Fill placed within the footprint of the proposed building shall meet the gradation and compaction requirements of Structural Fill.
- L. Fill placed under the subbase of paved areas, shall meet the gradation and compaction requirements of Ordinary Fill.
- M. Fill placed in the top 12 inches beneath sidewalks shall consist of Structural Fill with less than 5 percent fines.
- N. When crushed stone is required in the drawings or it is used for the convenience of the contractor, it shall be wrapped in a geotextile fabric for separation.

3.08 DUST CONTROL

- A. The Contractor shall employ all possible methods and/or materials to prevent the spread of dust. Chemical materials shall not be used on subgrades of areas to be seeded or planted.

3.09 RUBBISH REMOVAL

- A. The General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

