PROJECT MANUAL

Issued For Construction

March, 2023

FOGARTY MEMORIAL SCHOOL
Boilers Replacement

736 Snake Hill Road
North Scituate, Rhode Island 02857

AHARONIAN & ASSOCIATES, INC. - ARCHITECTS

310 George Washington Highway - Suite 100 - Smithfield, Rhode Island 02917 T 401-232-5010 F 401-232-5080

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FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island AA23018

TABLE OF CONTENTS

FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

DOCUMENT 00 11 16
INVITATION TO BID

ARCHITECT: **AHARONIAN & ASSOCIATES, INC**
310 George Washington Highway
Smithfield, Rhode Island 02917
T (401)232-5010 F (401) 232-5080

PROJECT: **Fogarty Memorial School**
Boiler Replacement
736 Snake Hill Road
N. Scituate, Rhode Island 02857

Sealed Bids are invited on a General Contract for the above referenced project for the Boiler Replacement at the Fogarty Memorial Elementary School. All Bids must be on a **Lump Sum Basis**; segregated Bids will not be accepted. Electronic copies of the **Contract Documents** are available at www.glocesterri.org

A **Non-Mandatory Pre-Bid Conference** for this Project will be held on **5/24/23 at 3:00pm at the Fogarty Memorial Elementary School Office**. Contractors will be required to visit the job site and be completely familiar with all existing conditions as they relate to the Project.

All questions must be submitted by the end of day **5/26/23** and will be responded to on **5/31/23. All questions or concerns should be communicated to Gary Gras at garygras@glocesterri.org**

All Bids must be mailed or delivered to the Finance Director, Glocester Town Hall, 1145 Putnam Pike, Chepachet, RI 02814. Bids must be submitted in a sealed envelope plainly marked on the exterior of the envelope "**BID FOR the FOGARTY MEMORIAL ELEMENTARY SCHOOL - BOILER REPLACEMENT". The Business Office** will receive bids until **10:00am**, **6/9/23.** Bids received after this time will not be accepted. Faxed Bids will not be accepted. Bids will be opened publicly.

The Bidder must submit a **Bid Bond** in the amount of 5% of the Bid. The successful Bidder must furnish a **Labor and Material Bond and a Performance Bond** equal to 100% of the total Bid Price and a **Certificate of Insurance** naming the Town of Glocester as the additional insured on the policy and so stated on the certificate. The Performance Bond and Certificate of Insurance must be provided to the Owner within 7 calendar days after notification of award or the Owner reserves the right to cancel said award. The successful Bidder shall be required to provide Contractor's Liability Insurance and all other required insurance in the amounts and limits in accordance with the "General Conditions of the Contract for Construction".

The Bidder shall stipulate the amount of time in calendar days required to complete the Work. The Bidder shall submit a preliminary Construction Progress Schedule reflecting the ability to complete the Work the date established by the Owner.

The Contractor shall be responsible for the cost of obtaining a Building Permit. All other required permits shall be obtained and paid for by the General Contractor or its subcontractors. The successful Bidder shall commence the work within fourteen (14) days of a written Notice to proceed from the Owner. Following the Owner's Notice to Proceed, the successful bidder shall not begin construction until a copy of the Building Permit is submitted to the Owner.

END OF DOCUMENT 00 11 16

AHARONIAN & ASSOCIATES INC. - ARCHITECTS

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FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

DOCUMENT 00 21 13
INSTRUCTIONS TO BIDDERS

AIA DOCUMENT A701 - Latest Edition
INSTRUCTION TO BIDDERS

Document not bound herewith. The Contractor and Subcontractors may review the Document at the Office of the Architect. The document is also available, for purchase, from the American Institute of Architects.

Failure to review this document will not relieve parties of the contractual requirements contained herein.

END OF DOCUMENT 00 21 13

FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 00 22 13
SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

SUPPLEMENTS

The following supplements modify, change, delete from or add to AIA Document A701, Latest Edition. Where any Article of the Instructions to Bidders is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these supplements, the unaltered provision of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

ARTICLE 2 - BIDDER'S REPRESENTATIONS

Delete subparagraph 2.1.4 in its entirety and substitute the following:

"2.1.4 The Bidder has inspected the site, has familiarized him/herself with the actual conditions under which the Work is to be performed, has correlated the Bidder's personal observations with the requirements of the Contract Documents and has full knowledge of the work required;"

Add the following subparagraph:

"2.1.7 After award of Contract, no claim for additional compensation resulting from misunderstanding of the Contract Documents or resulting from errors in or conflicts within the Contract Documents will be entertained unless interpretations of the Contract Documents specifically relating to the portions thereof, which appear to the Bidder to be in question, error or conflict, are brought to the Owner's attention during the Bidding Period."

ARTICLE 3 - BIDDING DOCUMENTS

Add the following at the end of subparagraph 3.2.2

"Request for clarification and interpretation may be submitted either as paper copy by mail or electronic copy by email."

Add subparagraph 3.2.4:

"3.2.4 No interpretation of the meaning of the Contract Documents will be made to any Bidder orally. Neither the Owner or Architect will be responsible for any oral instructions."

Add subparagraph 3.2.5:

"3.2.5 Failure of any Bidder to receive any such addendum shall not relieve such bidder from any obligation under this bid as submitted."

Add subparagraph 3.3.6:

"3.3.6 Refer to Division 1 specification sections for additional provisions of this document."

ARTICLE 4 - BIDDING PROCEDURES

Delete subparagraph 4.2.1 in its entirety and substitute the following:

"4.2.1 Each bid shall be accompanied by a bid security in the form and amount required [Five Percent (5%)] as stipulated in the Advertisement for Bids."

Delete subparagraph 4.2.2. in its entirety and substitute the following:

"4.2.2. The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and will, if required, furnish bonds covering the faithful performance of the Contract and Payment of all obligations arising thereunder. In addition, the Owner shall have any other legal remedies that it is entitled, including but not limited to, any excess of the bid security in relation to the next lowest and qualified bidder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds as required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty."

Subparagraph 4.2.4 in the last sentence after the word " beginning" insert ***"sixty(60)"***

Delete subparagraph 4.3.1 in its entirety and substitute the following:

"4.3.1 A bidder shall submit its bid as indicated within the Invitation to Bid".

ARTICLE 5 - CONSIDERATION OF BIDS

At the end of paragraph 5.1 add the following:

"No award will be made on the date of Bid Opening."

Add subparagraph 5.2.1:

5.2.1 The Owner may reject any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids. Conditional bids will not be accepted."

Subparagraph 5.3.1 Delete the word ***"lowest"*** and insert ***"most"*** in its place in the first sentence.

Subparagraph 5.3.1 in the first sentence after the word "Bidder" insert ***"in the opinion of Owner."***

Add subparagraph 5.3.1.1:

"5.3.1.1 The Owner does not obligate him/herself to accept the lowest or any other bid."

Add subparagraph 5.3.1.2:

"5.3.1.2 If the Base Bid exceeds the amount of funds available to finance the construction Contract, the Owner may reject all Bids or may award the Contract to that responsible Bidder submitting the lowest Bid."

Add subparagraph 5.3.1.3:

"5.3.1.3 Notice of Owner's Method of Award:

1. The Owner will use several factors in determining the method of award to the "Responsive Bidder" as follows:

a. Lowest responsible Lump Sum
b. Contractor's qualifications with respect to projects of similar scope.
c. Timely completion"

ARTICLE 6 – POST-BID INFORMATION

Refer to Paragraph 6.1 Contractor's attention is called to submission of a Contractor's Qualification Statement. Such statement shall illustrate Contractor's previous experience.

Contractor's Qualification Statement shall be submitted with his/her proposal.

Delete subparagraph 6.2 in its entirety.

ARTICLE 7 - PERFORMANCE BOND AND PAYMENT BOND

Delete subparagraph 7.1.1 in its entirety and substitute the following:

"7.1.1 The Bidder shall furnish a Performance Bond in the amount of one hundred percent (100%) of the contract amount and a Labor and Material Bond in the amount of one hundred percent (100%) of the contract amount as security for faithful performance of this Contract and for the payment of persons performing labor on the project under contract.

Delete subparagraph 7.1.2 in its entirety and substitute the following:

"7.1.2 The cost of such bonds shall be included in the Bid."

Delete subparagraph 7.1.3 in its entirety and substitute the following:

"7.1.3 The surety on such bonds shall be a duly authorized surety company satisfactory to the Owner and authorized to do business in the State of Rhode Island."

Delete subparagraph 7.1.4 in its entirety.

Subparagraph 7.2.1 Delete the first sentence in its entirety and substitute the following:

"Simultaneously with his/her delivery of the executed contract, the Contractor shall deliver the required bonds to the Owner."

ARTICLE 8 – ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

Delete paragraph 8.1 and all subparagraphs & replace with the following:

"8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consists of the Documents set forth in the Solicitation and Article 9 of AIA Document A101-2017."

ARTICLE 9 - SUPPLEMENTARY INSTRUCTIONS

Add the following paragraphs:

"9.1 CONDITIONS OF WORK"

"9.1.1 Each bidder must inform him/herself of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his/her obligation to furnish all material and labor necessary to carry out the provisions of his/her contract. Insofar as possible, the Contractor, in carrying out his/her work, must employ such methods or means as will not cause any interruption with the work of any other Contractor."

"9.2 LAWS AND REGULATIONS"

"9.2.1 The bidder's attention is directed to the fact that all applicable State Laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full."

"9.3 LIEN RIGHTS"

"9.3.1 The project is municipal property owned by the Towns of Foster, Rhode Island and is thus exempt from liens."

"9.4 STATE SALES AND USE TAX EXEMPTION"

"9.4.1 Bidders and their subcontractors and material suppliers shall not include in their Bids any Rhode Island State Sales and Use Taxes relative to the performance of the Work that is covered by the exemption. The Owner will furnish tax exempt numbers required."

END OF DOCUMENT 00 22 13

AHARONIAN & ASSOCIATES INC. - ARCHITECTS

310 George Washington Highway - Suite 100 - Smithfield, Rhode Island 02917 T 401-232-5010 F 401-232-5080

FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island AA23018

DOCUMENT 00 41 02
BID FORM

Date: _____

To: **Finance Director**
Glocester Town Hall
1145 Putnam Pike
Chepachet, Rhode Island 02814

Project: Boilers Replacement at **Fogarty Memorial School**
736 Snake Hill Road
North Scituate, Rhode Island 02857

Submitted By: _____

_____

_____

_____

_____

(Include in the above spaces, the firm's legal name, address, telephone and fax numbers, contact and e-mail address. All information should be typed or printed)

NOTE: The Owner's Selection Criteria shall determine the lowest evaluated or responsive Bid.

1. BASE BID

Having thoroughly examined the Project Site and all matters referred to in the Information for Bidders and in the Bid, Documents prepared by Aharonian & Associate, Inc., Architects for the above referenced Project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the sum of:

$			**,**				**,**				**.**		

(Numeric)

$ _____ **Dollars**

(Written)

In case of discrepancy, the amount shown in words shall govern. Failure to fill out the above item, if providing a Base Bid, will establish the Bid as non-responsive.

WE HAVE INCLUDED THE 5% BID SURETY AS REQUIRED BY THE INVITATION FOR BIDS.

2. ADDENDA

The following Addenda have been received. The modifications to the Bid Documents noted therein have been considered and all costs thereto are included in the Bid Sum.

Addendum #____Dated _____ Addendum #____Dated _____

Addendum #____Dated _____ Addendum #____Dated _____

3. BASE BID BREAKOUT COSTS

The following line-item costs ARE INCLUDED IN THE BASE BID amount and are broken out for use by the Owner.

A. Include list of all Subcontractors with Schedule of Values

4. BID ALTERNATES

The following Bid Alternates may be accepted or rejected by the Owner as deemed in the best interest of the Owner without regard to the order of listing or cost of the Alternate. The cost of all Alternates shall be based on the work as described and/or shown in the Contract Documents (Drawings and Project Manual).

ALTERNATE #1: Add/Deduct **$** _____

5. SCHEDULE – CONTRACT TIME

If the Bid is accepted, unless otherwise indicated on the Bid Form, Bidder hereby agrees to commence the Work under this Contract within fourteen (14) calendar days after issuance of a written "Notice to Proceed" by the Owner. (NOTE: The successful bidder shall not begin construction until a copy of the Building Permit is submitted to Owner.)

Bidder hereby agrees to achieve Substantial Completion of the Work on or before August 16, 2023, and to achieve Final Completion of the Work on or before August 31, 2023.

6. ADDITIONAL WORK - OVERHEAD AND PROFIT

The Bidder agrees to be bound by the following percentages of cost basis for overhead, supervision, bond and profit and other general expenses for any additional work. If accepted by the Owner in the award of this Contract, these percentages shall be used in establishing the adjustment to the Contract Sum for additions to or deductions from the Work in accordance with the applicable sections of the General Conditions.

A. To the Contractor for Work performed by its own forces: Maximum ____ percent of the cost.

B. To Subcontractors for Work performed by its own forces: Maximum ____ percent of the cost.

C. The combined overhead and profit for Contractor and Subcontractors: Maximum ____ percent of the cost.

7. ALLOWANCES

The above Base Bid Price **INCLUDES** the costs for the following allowances as outlined in Section 012100 "Allowances".

A. CONTINGENCY ALLOWANCE:

1 Provide a $10,000.00 allowance for additional scope or for any hazardous material abatement services required during the course of the work as a result of positive hazardous material testing results.

B. INSPECTION AND TESTING ALLOWANCE:

1 Provide a $2,000.00 allowance for hazardous material testing services and the preparation of an abatement plan as necessary pending testing results.

8. UNIT PRICES

A. If accepted by the Owner in the award of this Contract, Unit Prices shall be used in establishing the adjustment to the Contract Sum for additions to or deductions from the Work in accordance with the applicable sections of the General Conditions. The Unit Prices listed shall include all costs, overhead and profit and no further surcharges are to be added to any Unit Price item of Work that may be done. Work deleted from the Contract will be calculated at 100% of the additional work Unit Prices.

B. Bidder agrees that the Unit Prices will not contain anything to alter or void the Lump Sum Bid submitted herein and that applicable contents of this Bid shall be binding on the Unit Prices and the Work involved whether or not specifically stated.

C. Unit Prices for fabricated items shall include all necessary connections and fastenings required to produce a complete assembly.

D. Unit Price Schedule: No Unit Price requirements are established for the Project.

9. BIDDER ACKNOWLEDGMENTS

A. The Bidder understands that the Owner reserves the right to reject any or all Bids and to waive any formalities in the bidding.

B. The Bidder agrees that this Bid shall be good and may not be withdrawn for a period of sixty (60) calendar days after the scheduled closing time for receiving Bids.

C. Upon written notice of the acceptance of its Bid by the Owner and in accordance with Article 14 of the Information for Bidders, the Bidder shall provide a Certificate of Insurance covering all operations under this Contract. The certificate meeting all conditions set forth therein shall be submitted to the Owner prior to formal execution of the Contract.

D. Upon written notice of the acceptance of its Bid by the Owner, the Bidder shall execute the formal Contract (Document 00 52 00 of the Project Manual) within ten (10) calendar days and deliver to the Owner a Performance Bond and a Payment Bond (Document 00 61 13 of the Project Manual) as required by the General Conditions.

E. The Bid Surety, in the amount of 5% of the Base Bid, is to become the property of the Owner in the event the Contract and Bonds are not executed within the timeframe set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

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

G. The Foster School Committee reserves the right to waive any informality in any, or in all proposals and reject any and all proposals if deemed to be in their best interest to do so. The Foster School Department reserves the right to negotiate with any or all contractors who submit proposals if it determines that such negotiation is in the best interest of the School Department and its constituents. The Foster School Department also reserves the right to negotiate an extension of the contract with the successful company that is selected.

10. REQUIREMENT FOR LICENSE NUMBER

A. In compliance with the requirements of Rhode Island General Law, Section 5-65-23, my Rhode Island license number for the Work to be performed by this firm as Prime Contractor is:

LICENSE TYPE:_____LICENSE NUMBER:_____

11. BID FORM SIGNATURE(S)

The undersigned declares: that the only person interested in this proposal as principals are named herein as such; that no official of the Owner and no person acting for or employed by the Owner is interested directly or indirectly in this proposal or any contract which may be made under it or in any expected profits to arise there from; that the proposal is made in good faith, without fraud, collusion or connection with any other person bidding or refraining from bidding for the same work; that the Contract Documents relating to the Contract covered by this proposal and in regard to all conditions pertaining to the Work have been examined and has carefully checked the estimates of cost and from them makes this proposal.

Respectively Submitted,

_____
Name of Firm

SEAL (if Bid is by a corporation)

_____
Signature

_____
Title

_____
Business Address

_____
Telephone Number and Fax Number

The Bidder shall provide an affidavit that the person who has affixed his or her signature to this Bid Form is actively and legally authorized to bind the firm contractually. This affidavit MUST be submitted with and attached to the Bid Form.

END OF DOCUMENT 00 41 02

AHARONIAN & ASSOCIATES INC. - ARCHITECTS

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FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

DOCUMENT 00 43 13
BID SECURITY FORM

AIA DOCUMENT A310 – Latest Edition
BID BOND

Document not bound herewith. Contractors and Subcontractors may review the document at the Office of the Architect. The document is also available, for purchase, from the American Institute of Architects.

Failure to review this document will not relieve parties of the contractual requirements contained herein.

END OF DOCUMENT 00 43 13

AHARONIAN & ASSOCIATES INC. - ARCHITECTS

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FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

DOCUMENT 00 45 10
CONTRACTOR'S QUALIFICATION STATEMENT

AIA DOCUMENT A305 - Latest Edition
CONTRACTOR'S QUALIFICATION STATEMENT

Document not bound herewith. The Contractor and Subcontractors may review the Document at the Office of the Architect. The document is also available, for purchase, from the American Institute of Architects.

Failure to review this document will not relieve parties of the contractual requirements contained herein.

END OF DOCUMENT 00 45 10

AHARONIAN & ASSOCIATES INC. - ARCHITECTS

310 George Washington Highway - Suite 100 - Smithfield, Rhode Island 02917 T 401-232-5010 F 401-232-5080

DOCUMENT 00 52 00
AGREEMENT FORM

AIA DOCUMENT A101 - Latest Edition
STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR WHERE THE BASIS OF PAYMENT IS A STIPULATED SUM

A copy of this Document, as amended, is bound herewith following this page. Agreement made as of the date of issue of the Purchase Order for this work and is assumed as executed once the Purchase Order is issued.

Failure to review this document will not relieve parties of the contractual requirements contained herein.

END OF DOCUMENT 00 52 00

SECTION 00 61 13
PERFORMANCE AND PAYMENT BOND FORM

AIA DOCUMENT A312 – Latest Edition
PERFORMANCE AND PAYMENT BOND

Document not bound herewith. Contractors and Subcontractors may review the document at the Office of the Architect. The document is also available, for purchase, from the American Institute of Architects.

Failure to review this document will not relieve parties of the contractual requirements contained herein.

END OF DOCUMENT 00 61 13

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FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 00 72 00
GENERAL CONDITIONS

AIA DOCUMENT A201 - 2017 Edition
GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

Document not bound herewith. Contractors and Subcontractors may review the document at the Office of the Architect. The document is also available, for purchase, from the American Institute of Architects.

Failure to review this document will not relieve parties of the contractual requirements contained herein.

END OF DOCUMENT 00 72 00

AHARONIAN & ASSOCIATES INC. - ARCHITECTS

310 George Washington Highway - Suite 100 - Smithfield, Rhode Island 02917 T 401-232-5010 F 401-232-5080

FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

DOCUMENT 00 73 00
SUPPLEMENTARY CONDITIONS

SUPPLEMENTS

A. The following supplements modify the "General Conditions of the Contract for Construction", AIA Document A201-2017. Where a portion of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

B. These Supplementary General Conditions are of the abbreviated or "stream-lined" type and include incomplete sentences. Omission of words or phrases such as "the Contractor shall", "in conformity therewith", "shall be", "as noted on the Drawings", "according to the plans", "a", "an", "the", and "all" are intentional. Omitted words and phrases shall be supplied by inference in the same manner as they are when a note occurs on the Drawings. Words "shall be" or "shall" will be supplied by inference when colon (:) is used within sentences or phrases.

C. The Contractor shall provide all items, articles, materials, operations or methods listed, mentioned or scheduled on the Drawings and/or herein, including all labor, materials, equipment and incidentals necessary and required for their completion.

ARTICLE 2 - OWNER

2.1 GENERAL

2.1.1 Delete the first sentence in Paragraph 2.1.1 and substitute the following *"The Owner is the person or entity identified as such in the Agreement between the Owner and the Contractor and is referred to throughout the Contract Documents as if singular in number "*.

2.3 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.3.4 At the end of the first sentence in Paragraph 2.3.4, delete *"and a legal description of the site "*.

ARTICLE 3 – CONTRACTOR

3.1 GENERAL

3.1.1 Delete the first sentence of Subparagraph 3.1.1 and substitute the following: *"The Contractor is the person or entity identified in the Agreement between the Owner and Contractor and is referred to throughout the Contract Documents as if singular in number.*

3.4 LABOR AND MATERIALS

3.4.2 Add the following Subparagraphs 3.4.2.1and 3.4.2.2 to Paragraph 3.4.2:

3.4.2.1 After the Contract has been executed, the Owner and the Architect will consider a formal request for the substitution of products in place of those specified only under the conditions set forth in the General Requirements (Division 1 of the Specifications).

3.4.2.2 By making requests for substitutions based on Subparagraph 3.4.2. above, the Contractor:

3.4.2.2.1 represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal to or superior in all respects to that specified.

3.4.2.2.2 represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified.

3.4.2.2.3 certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect's redesign costs, and waives all claims for additional costs related to the substitution which subsequently become apparent; and

3.4.2.2.4 will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.

3.8 ALLOWANCES

3.8.2.2 Add the following to the end of Subparagraph 3.8.2.2: *"except when installation is specified as part of the allowance in the General Requirements (Division 1 of the Specifications). "*

ARTICLE 5 - SUBCONTRACTORS

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 Add the following Subparagraph 5.2.1.1 to Paragraph 5.2.1:

5.2.1.1 Not later than 15 days after the date of commencement, the Contractor shall furnish in writing to the Owner, through the Architect, the names of persons or entities proposed as manufacturers for each of the products identified in the General Requirements (Division 1 of the Specifications) and, where applicable, the name of the installing Subcontractor.

ARTICLE 7 – CHANGES IN THE WORK

7.3 CONSTRUCTION CHANGE DIRECTIVES

7.3.4 In the first sentence, delete the words *"a reasonable amount "*and substitute *"an allowance for overhead and profit in accordance with Subparagraph 7.3.11 below: "*

7.3.11 In Subparagraph 7.3.4, the allowance for the combined overhead and profit included in the total cost to the Owner shall be based on the following schedule:

7.3.11.1 For the Contractor, for Work performed by the Contractor's own forces, (10) ten percent of the cost.

7.3.11.2 For the Contractor, for Work performed by the Contractor's Subcontractor, (10) ten percent of the amount due the Subcontractor.

7.3.11.3 For each Subcontractor or Sub-subcontractor involved, for Work performed by that Subcontractor's or Sub-subcontractor's own forces, (12) twelve percent of the cost.

7.3.11.4 For each Subcontractor, for Work performed by the Subcontractor's Sub-subcontractors, (10) ten percent of the amount due the Sub-subcontractor.

7.3.11.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.4.

7.3.11.6 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and Sub-contracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Sub-contracts, they shall be

itemized also. In no case will a change involving over $500.00 be approved without such itemization.

ARTICLE 9 – PAYMENTS AND COMPLETION

9.3 APPLICATIONS FOR PAYMENT

9.3.1 Add the following sentence to Subparagraph 9.3.1: *"The form of Application for Payment shall be a notarized AIA Document G702, Application and Certification for Payment, supported by AIA Document G703, Continuation Sheet. "*

9.8 SUBSTANTIAL COMPLETION

9.8.5 Add the following sentence to Subparagraph 9.8.5: *"The payment shall be sufficient to increase the total payments to 95 percent of the Contract Sum, less such amounts the Architect shall determine for incomplete work or unsettled claims. "*

ARTICLE 10 – PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1 Add the following Subparagraphs 10.1.2 and 10.1.3 to Paragraph 10.1:

10.1.2 If reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop work in the affected area and report the condition to the Owner and the Architect in writing. The Owner, Contractor and Architect shall then proceed in the same manner described in Subparagraph 10.1.3.

10.1.3 The Owner shall be responsible for obtaining the services of a licensed laboratory to verify a presence or absence of the material or substance reported by the Contractor and, in the event the material or substance is found to be present, to verify that it has been rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or the Architect has reasonable objection to the persons or entities proposed by the Owner, the Owner shall propose another to whom the Contractor or the Architect has no reasonable objection.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.3 Add the following Subparagraph 10.2.3.1 to Paragraph 10.2.3:

10.2.3.1 When the use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary, the Contractor shall give the Owner reasonable advance notice.

ARTICLE 11 – INSURANCE AND BONDS

11.1.1 Delete the first sentence and replace with the following:
"The Contractor shall purchase and maintain insurance & provide bonds of the types and units of liability, containing the endorsements, and subject to the items and conditions as set forth in the Solicitation, Agreement, Section 00 73 16 Insurance Requirements, or elsewhere in the Contract Documents."

ARTICLE 13 – MISCELLANEOUS PROVISIONS

Add the following Paragraphs to Article 13:

13.6 EQUAL OPPORTUNITY

13.6.1 The Contractor shall maintain policies of employment as follows:

13.6.1.1 The Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, or national origin. The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

13.6.1.2 The Contractor and the Contractor's Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to their race, religion, color, sex, or national origin.

13.7 STATE SALES AND USE TAX EXEMPTION

13.7.1 Bidders and their Subcontractors and material suppliers shall not include in their Bids any Rhode Island State Sales and Use Taxes relative to the performance of the Work that is covered by the exemption. The Owner will furnish tax exempt numbers required.

13.8 NOTICE OF DEFINITION OF OWNER

13.8.1 The "Owner" as referred to in these specifications is the Foster School District

END OF DOCUMENT 00 73 00

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DOCUMENT 00 73 16
INSURANCE REQUIREMENTS

The successful Bidder shall be required to provide Contractor's Liability Insurance and all other required insurance in the amounts and limits in accordance with the General Conditions contained in Document 00 52 00 Agreement Form and the following:

1.01 CONTRACTOR'S LIABILITY INSURANCE

A. Liability insurance shall include all major divisions of coverage and be on a comprehensive basis, including:

1. Premises Operations (including X-C and U as applicable).
2. Independent Contractors' Protective.
3. Products and Completed Operations.
4. Personal Injury Liability with Employment Exclusion deleted.
5. Contractual, including specified provision for Contractor's obligation under Paragraph 3.18.
6. Owned, non-owned and hired motor vehicles.
7. Broad Form Property Damage, including Completed Operations.
8. Owner's Protective.

B. If the General Liability coverages are provided by a Commercial General Liability Policy on a claims-made basis, the policy date or Retroactive Date shall predate the Contract; the termination date of the policy or applicable extended reporting period shall be no earlier than the termination date of coverage's required to be maintained after final payment.

C. The insurance required shall be written for not less than the following, or greater if required by law:

1. Workers' Compensation:

a. State	Statutory
b. Applicable Federal (e.g., Longshoremen's)	Statutory
c. Employer's Liability	$500,000 per Accident $500,000 Disease, Policy Limit $100,000 Disease, Each Employee

2. Comprehensive or Commercial General Liability (including Premises-Operations; Independent Contractors' Protective; Products and Completed Operations; Broad Form Property Damage):

a. Bodily Injury:

$1,000,000	Each Occurrence
$1,000,000	Annual Aggregate

b. Property Damage:

$1,000,000	Each Occurrence
$1,000,000	Annual Aggregate

c. Products and Completed Operations to be maintained for two years after final payment.
d. Property Damage Liability Insurance shall provide X, C or U coverage.

3. Broad Form Liability Insurance shall provide X, C and U coverage. Contractual Liability:

   a. Bodily Injury:
      $2,000,000 Each Occurrence
      $2,000,000 Aggregate
   b. Property Damage:
      $2,000,000 Each Occurrence
      $2,000,000 Aggregate

4. Personal Injury, with Employment Exclusion deleted:

   a. Personal Injury:
      $1,000,000 Aggregate

5. Business Auto Liability (including owned, non-owned and hired vehicles):

   a. Bodily Injury:
      $1,000,000 Each Person
      $1,000,000 Each Occurrence
   b. Property Damage:
      $1,000,000 Each Occurrence

6. Umbrella Excess Liability:

   a. Excess Liability:
      $2,000,000 Over Primary Insurance

D. If this insurance is written on the Comprehensive General Liability policy form, the Certificates shall be AIA Document G715, ACORD Certificate of Insurance. If this insurance is written on the Commercial General Liability policy form, ACORD Form 25S will be acceptable.

1.02 PROPERTY INSURANCE

A. If this insurance is written on the Comprehensive General Liability policy form, the Certificates shall be AIA Document G715, ACORD Certificate of Insurance. If this insurance is written on the Commercial General Liability policy form, ACORD Form 25S will be acceptable.

B. The insurance required is not intended to cover machinery, tools or equipment owned or rented by the Contractor which are utilized in the performance of the Work but not incorporated into the permanent improvements. The Contractor shall, at the Contractor's own expense, provide insurance coverage for owned or rented machinery, tools or equipment.

END OF DOCUMENT 00 73 16

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DOCUMENT 00 73 39
MINORITY BUSINESS ENTERPRISE REQUIREMENTS

It is the policy of the State of Rhode Island that minority business enterprises (MBEs) shall have the maximum opportunity to participate in the performance of all procurements and projects funded in whole or in part with state funds. Rhode Island General Law 37-14.1-6 states that "Minority business enterprises shall be included in all procurements and construction projects under this chapter and shall be awarded a minimum of ten percent (10%) of the dollar value of the entire procurement or project."

The bidder's compliance with MBE/WBE participation requirements will be evaluated based on a percentage of the total contract. Bidders agree that the participation commitment shall apply to the total contract price, inclusive of all modifications and amendments, if awarded.

Prior to the approval and issuance of a contract, a letter of approval from the Office of Diversity, Equity and Opportunity (ODEO), Minority Business Enterprise Compliance Office that you have satisfied the requirements of RIGL 37-14.1 will be required. To initiate this process, you must submit a completed "MBE Utilization Plan" form to Dorinda Keene at the Office of Diversity, Equity and Opportunity, MBE Compliance Office, One Capitol Hill, 3rd Floor, Providence, RI 02908. Plans may be submitted electronically to Dorinda.Keene@doa.ri.gov . For further information, call (401) 574-8670, or visit the MBE website located at www.mbe.ri.gov .

The Contract will be awarded to the responsible Bidder submitting the lowest proposal complying with the conditions of the Invitation to Bid provided the Bid is reasonable and it is in the interest of the Owner to accept it. The Bidder to whom the award is made will be notified at the earliest practicable date. The Owner reserves the right to reject any and all Bids and to waive any informality in Bids received whenever such rejection or waiver is in the interest of the Owner. No Bidder may withdraw its bid within sixty (60) calendar days after the actual date of opening thereof.

END OF DOCUMENT 00 73 39

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Boilers Replacement
North Scituate, Rhode Island **AA23018**

DOCUMENT 00 73 46
WAGE DETERMINATION SCHEDULE

The State of Rhode Island Department of Labor, Division of Professional Regulation General Decision Modification document, in effect at the time of the Bid issuance for this Project, is an integral part of the Bid Documents for use in fulfilling prevailing wage rate requirements. A copy is available on the web site of the State of Rhode Island Department of Administration, Division of Purchases.

The Division of Purchases Web Site Address:

www.purchasing.ri.gov

Click on “Information”; click on “Prevailing Wage Table”.

Documents are not contained within this Project Manual but may be obtained from the State of Rhode Island, Department of Labor and Training, Division of Professional Regulations, 1511 Pontiac Avenue, Cranston, RI 02920-4407, Tel. No. 401-462-8580.

The Foster School District will require copies of certified payrolls to be submitted with the monthly application for payment. Said Certified payrolls must be submitted to Foster Finance Office, 181 Howard Hill Road, Foster, RI 02825.

END OF DOCUMENT 00 73 46

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FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

DOCUMENT 00 91 13
ADDENDA

PART 1 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. As of the time of publication of this project manual no addenda had been issued.

B. Should Addenda be issued during the Bid Period, they will augment this Document and become a part of the Project Manual.

C. Such Addenda and Modifications when issued, with reference to the Project Manual, the General Conditions, Supplemental General Conditions, Drawings or Specifications, shall be inserted following this page and become integral parts of the Contract Documents.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 00 91 13

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Boilers Replacement
North Scituate, Rhode Island AA23018

DOCUMENT 00 92 00

LIST OF DRAWING SHEETS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work specified in this Document.

1.02 REFERENCE

A. The Drawings hereinafter listed represent an integral part of the Contract Documents. They should not be considered as a separate entity, as along with the technical specifications, form a process of disseminating information required to perform the Work of this Project.

B. The Drawings may be issued in multiple packages or phases. The Schedule below will be modified as these packages are issued.

1.03 SCHEDULE

A. The following schedule indicates the Drawings of this Contract. The manner of listing and respective order is for convenience only and do not obligate the Contractor to perform the Work in any specific sequence. The work indicated on each drawing should not be construed as specific work for a specific trade, subcontractor or supplier.

B. SCHEDULE OF DRAWINGS:

Number	Title
A1.1	MECHANICAL ROOM DEMO & CONST FLOOR PLANS
M1.1	PARTIAL ROOF PLAN & DETAILS

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF DOCUMENT 00 92 00

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Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 01 11 00
SUMMARY OF WORK

PART 1 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. The Project consists of demolition and construction activities associated with the replacement of existing boilers located at the Mechanical Room, as indicated in the Contract Documents.

B. Coordination with Owner's separate concurrent contracts, if any.

C. The Work will be constructed under a single prime construction contract.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.03 FUTURE WORK

A. FUTURE CONTRACT: The Owner reserves the right to award contracts for additional work to be performed at the site during construction and following the Substantial Completion. Completion of that future work depends on the progress of, and the successful and timely completion of, the preparatory and related Work of this Contract.

1.04 CONTRACTOR AND CONTRACTOR USE OF PREMISES

A. GENERAL: During the construction period, the Contractor shall have use of the premises for construction operations, including use of the site, to the extent as directed by the Owner. Their use of the premises is also limited by the Owner's right to perform work or to retain other contractors on portions of the Project.

B. USE OF THE SITE: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated or as allowed by the Owner.

1.05 OCCUPANCY REQUIREMENTS

A. PARTIAL OWNER OCCUPANCY: The Owner reserves the right to occupy and to place and install equipment in completed areas of the building prior to Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.

1. The Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner occupancy.

2. Obtain a Certificate of Occupancy from local building officials prior to Owner occupancy.

3. Prior to partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon occupancy, the Owner will operate and maintain mechanical and electrical systems serving occupied portions of the building.

4. Upon occupancy, the Owner will assume responsibility for maintenance and custodial service for occupied portions of the building.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTIONS (Not Applicable)

END OF SECTION 01 11 00

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Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

D. Defect assessment.

E. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

A. Section 00 52 00 – Agreement Form: Contract Sum, retainages, and monetary values of unit prices.

B. Section 00 72 00 – General Conditions: Additional requirements for progress payment, final payment, changes in the Work.

C. Section 01 20 00 – Unit Prices: Monetary values of unit prices; Payment and modification procedures relating to unit prices.

D. Section 01 21 00 – Allowances: Payment procedures relating to allowances.

E. Section 01 23 00 – Alternates.

F. Section 01 31 13 – Project Coordination.

G. Section 01 33 00 – Submittal Procedures.

H. Section 01 78 00 – Closeout Procedures Submittals: Project Record Documents.

1.03 SCHEDULE OF VALUES

A. Use Schedule of Values Form: AIA G703, edition stipulated in the Agreement.

B. Forms filled out by hand will not be accepted.

C. Submit Schedule of Values in duplicate within 15 days after date established in Notice to Proceed.

D. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization, bonds and insurance, general conditions and closeout.

E. Include in each line item, the amount of Allowances specified in Section 01 21 00 Allowances. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.

F. Include separately from each line item, a direct proportional amount of Contractor's overhead and profit.

G. Revise schedule to list approved Change Orders, with each Application for Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Use form AIA G702 and Form AIA G703, edition stipulated in the Agreement.
   1. Prepare a draft version "pencil copy" of each application and distribute via email 5 days prior to due date for review by Architect and Owner's Representative.
   2. After making agreed revisions, individually sign and notarize with notary's official seal, all copies. Deliver to Owner's Representative for further processing and distribution.
   3. For each item, provide a for each item, provide a column for listing: Item Number; Description of Work; Scheduled Value. Previous Applications: Work in Place and Stored Materials under this Application: Authorized Change Orders; Total Completed and Stored to Date of Application; Percentage of Completion; Balance to Finish; and Retainage.

C. Forms filled out by hand will not be accepted.

D. Execute certification by signature of authorized officer.

E. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.

F. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.

G. Submit three hard copies of each Application for Payment.

H. Include the following with the application:
   1. Transmittal letter as specified for submittals in Section 01 33 00.
   2. Construction progress schedule, revised, updated and current.
   3. Partial release of liens from major subcontractors and vendors.
   4. Project record documents as specified in Section 01 78 39, for review by Owner which will be returned to the Contractor.
   5. Affidavits attesting to off-site stored products.
   6. Copies of any/all inspection reports, by the authorities having jurisdiction performed since submission of previous requisitions are to be submitted to Architect prior to or coinciding with applications for payment. Failure to submit inspection reports will be considered grounds for withholding payments.

I. When Architect requires substantiating information, submit data justifying dollar amounts in questions. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.05 CHANGE PROCEDURES

A. The Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum/Price or Contract Time as authorized by AIA A201/CM Article 12.4 by issuing supplemental instructions on AIA Form G710 Architect's Supplemental Instruction or other similar form.

B. The Architect may issue a Proposal Request which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change. Contractor will prepare and submit an estimate within 7 days.

C. The Contractor may propose a change by submitting request for change to the Architect, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Sum/Price and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 60 00.

D. STIPULATED SUM/PRICE CHANGE ORDER: Based on Proposal Request and Contractor's fixed or maximum price quotation or Contractor's request for a Change Order as approved by Architect.

E. UNIT PRICE CHANGE ORDER: For pre-determined unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of work which are not pre-determined, execute Work under a Construction Change Authorization. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.

F. CONSTRUCTION CHANGE AUTHORIZATION: Architect may issue a directive, on AIA Form G713 Construction Change Authorization or similar form, signed by the Owner, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute the change.

G. TIME AND MATERIAL CHANGE ORDER: Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract. Architect will determine the change allowable in Contract Sum/Price and Contract Time as provided in the Contract Documents.

H. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.

I. CHANGE ORDER FORMS: AIA G701 Change Order.

J. EXECUTION OF CHANGE ORDERS: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

1.06 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of the Architect, it is not practical to remove and replace the work, The Architect will direct an appropriate remedy or adjust payment.

C. The defective Work may remain, but the unit sum will be adjusted to a new sum at the discretion of the Architect.

D. The defective Work will be partially repaired to the instructions of the Architect, and the unit sum will be adjusted to a new sum at the discretion of the Architect.

E. The individual Specification Sections may modify these options or may identify a specific formula or percentage sum reduction.

F. The authority of the Architect to assess the defect and identify a payment adjustment is final.

G. Non-Payment for Rejected Products: Payment will not be made for rejected products for any of the following:
   1. Products wasted or disposed of in a manner that is not acceptable.
   2. Products determined as unacceptable before or after placement.
   3. Products not completely unloaded from the transporting vehicle.
   4. Products placed beyond the lines and levels of the required Work.
   5. Products remaining on hand after completion of the Work.

1.07 APPLICATION FOR FINAL PAYMENT

A. Reference the General Conditions, and as may otherwise be required in the Contract Documents.

B. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments and sum remaining due.

C. Application for Final Payment will not be considered until the following have been accomplished:
   1. All closeout procedures specified in Section 017800.
   2. Insurance certificates for products and completed operations where required and proof that taxes, fees and similar obligations were paid.
   3. AIA Document G706, "Contractor's Affidavit of Payment and Debts and Claims".
   4. AIA Document G706A, "Contractor's Affidavit of Release of Liens".
   5. AIA Document G707, "Consent of Surety to Final Payment".
   6. Evidence that claims have been settled.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTIONS (NOT USED)

END OF SECTION 01 20 00

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North Scituate, Rhode Island **AA23018**

SECTION 01 21 00
ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cash allowances.

1. Lump Sum Allowances

2. Unit-Cost Allowances

B. Contingency allowances.

C. Inspection and testing allowances.

D. Selection & Purchase.

E. Unused materials.

1.02 RELATED SECTIONS

A. Section 01 20 00 – Price and Payment Procedures.

B. Section 01 22 00 – Unit Prices.

1.03 CASH ALLOWANCES

A. COSTS INCLUDED IN ALLOWANCES: Cost of Product to Contractor, or Subcontractor, less applicable trade discounts; delivery to site and applicable taxes.

B. COSTS NOT INCLUDED IN THE ALLOWANCE: Product handling at the site, including unloading uncrating and storage; protection of Products from elements and from damage and labor for installation and finishing.

C. ARCHITECT RESPONSIBILITIES:

1. Consult with Contractor in consideration and selection of Products, suppliers and installers.

2. Select Products in consultation with Owner and transmit decision to Contractor.

3. Prepare Change Order.

D. CONTRACTOR RESPONSIBILITIES:

1. Obtain proposals from suppliers and installers and offer recommendations. Assist Architect in selection of Products, suppliers and installers.

2. On notification of selection by Architect, execute purchase agreement with designated supplier and installer.

3. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.

4. Promptly inspect Products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

E. Funds will be drawn from Cash Allowances only by Change Order.

1.04 CONTINGENCY ALLOWANCES

A. Contractor's costs for Products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Allowance.

B. Funds will be drawn from Contingency Allowance only by Change Order.

C. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

1.05 INSPECTION AND TESTING ALLOWANCES

A. COSTS INCLUDED IN ALLOWANCES: Cost of engaging an inspection or testing firm, execution of inspection or tests, reporting results.

B. COSTS NOT INCLUDED IN THE ALLOWANCE

1. Incidental labor and facilities required to assist inspection or testing firm.

2. Costs of testing laboratory services required by Contractor separate from Contract Document requirements.

3. Costs of retesting upon failure of previous tests as determined by Architect.

C. PAYMENT PROCEDURES

1. Submit one copy of the inspection or testing firm's invoice with next application for payment.

2. Pay invoice on approval by Architect.

D. Funds will be drawn from inspection and testing allowances only by Change Order.

E. At Project closeout, credit unused amounts remaining in the inspection and testing allowance to Owner by Change Order.

1.06 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise the Architect of the date when the final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At the Architect's request, obtain proposals for each Allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by the Architect from the designated supplier.

1.07 UNUSED MATERIALS

A. Return unused materials to the manufacturer or supplier for credit to the Owner, after installation has been completed and accepted.

1. When requested by the Architect, prepare unused material for storage by Owner where it is not economically practical to return the material for credit. When directed by the Architect, deliver unused material to the Owner's storage space. Otherwise, disposal of unused material is the Contractor's responsibility.

1.08 SCHEDULE OF ALLOWANCES

A. CASH ALLOWANCES.

1 No cash allowances have been established to date.

B. CONTINGENCY ALLOWANCES.

1 Provide a $10,000.00 allowance for additional scope related to any hazardous material abatement services required during the course of the work as a result of positive hazardous material testing results.

C. INSPECTION AND TESTING ALLOWANCES.

1 Provide a $2,000.00 allowance for hazardous material testing services and the preparation of an abatement plan as necessary pending testing results.
   a. Owner has no knowledge of the presence of any hazardous materials within the proposed project work area at this time.
   b. Should any suspect materials be discovered by the G.C. during the course of the Work, the G.C. must notify the Architect and Owner immediately upon discovery.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Used)

END OF SECTION 01 21 00

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Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 01 22 00
UNIT PRICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes administrative and procedural requirements for unit prices.

1.02 RELATED SECTIONS

A. Section 01 20 00 – Price and Payment Procedures.

B. Section 01 21 00 - Allowances

1.03 DEFINITIONS

A. Unit Price: An amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1. The Owner may or may not accept the unit prices proposed by the Contractor at the time of bid.

2. Owner reserves the right to negotiate or renegotiate the unit prices at any time during the contract time.

1.04 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. A list of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

1.05 MEASUREMENT – GENERAL

A. Reference the General Conditions for additional requirements on Unit Price Work.

B. All unit prices which are specified for measurement by the linear foot (LF) shall be measured from the beginning to the termination point of the unit being measured.

C. Units of measure shall be as follows unless specified otherwise.

Item	Method of Measurement
LS	Lump Sum - Unit is one; no measurement will be made.
EA	Each - Field count by Engineer.
LF	Linear Foot - Field measure by Engineer.
SF	Square Foot - Field measure by Engineer.
SY	Square Yard - Field measured by Engineer.
CY	Cubic Yard – Field measure by Engineer using the Average-End-Area Method to calculate volume.
TON	Ton - Certified truck scale.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 SCHEDULE OF UNIT PRICES

A. No unit prices have been established to date.

END OF SECTION 01 22 00

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Boilers Replacement
North Scituate, Rhode Island AA23018

SECTION 01 23 00
ALTERNATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for alternates.

1.02 RELATED DOCUMENTS AND SECTIONS

A. Division 00 Documents and Division 01 Sections.

1.03 DEFINITIONS

A. Alternate: An amount proposed by Bidders and noted on the Bid Form for certain Work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems or installation methods described in the Contract Documents.

1. The cost or credit for each Alternate is the net addition to or deduction from the Contract Sum to incorporate the Alternate into the Work. No other adjustments are made to the Contract Sum.

1.04 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the Alternate into Project.

1. Include as part of each Alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of Alternate.

B. Immediately following award of the Contract, notify each party involved, in writing, of the status of each Alternate. Indicate if Alternates have been accepted, rejected or deferred for later consideration. Include a complete description of negotiated modifications to Alternates.

C. Execute accepted Alternates under the same conditions as other work of the Contract.

D. A Schedule of Alternates is included at the end of this Section.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTIONS

3.01 SCHEDULE OF ALTERNATES

A. Alternate #1: Add/Deduct:

Remove: Removal of abandoned domestic hot water tank from scope, hazmat abatement shall remain in the project scope.

END OF SECTION 01 23 00

AHARONIAN & ASSOCIATES INC. - ARCHITECTS

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FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 01 25 00
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

1.03 RELATED SECTIONS

A. Section 01 60 00 –Product Requirements.

1.04 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by General Contractor.

B. Substitutions for Cause: Changes proposed by General Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.

C. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to General Contractor or Owner. No substitutions for convenience are permitted.

1.05 ACTION SUBMITTALS

A. Substitution Requests: Submit one (1) copy of each request, in PDF format, for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section Number and Title, and Drawing Numbers and Titles.

1. Substitution Request Form: Use form provided at the end of this section.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
   a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
   b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
   c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.

e. Samples, where applicable or requested.

f. Certificates and qualification data, where applicable or requested.

g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.

h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.

i. Detailed comparison of General Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

j. Cost information, including a proposal of change, if any, in the Contract Sum.

k. General Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.

l. General Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Owner's Representative Action: If necessary, Owner's Representative will request additional information or documentation for evaluation within five (5) working days of receipt of a request for substitution. Owner's Representative will notify General Contractor of acceptance or rejection of proposed substitution within ten (10) working days of receipt of request, or five (5) working days of receipt of additional information or documentation, whichever is later.

   a. Forms of Acceptance: Change Order, Construction Change Order, or Owner's Representative Supplemental Instructions for minor changes in the Work.

   b. Use product specified if Owner's Representative does not issue a decision on use of a proposed substitution within time allocated.

1.06 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.07 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 PRODUCTS

2.01 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than fifteen (15) days prior to the time required for preparation and review of related submittals.

1. Conditions: Owner's representative will consider General Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Owner's Representative will return requests without action, except to record noncompliance with these requirements:

   a. Requested substitution is consistent with the Contract Documents and will produce indicated results.

b. Requested substitution provides sustainable design characteristics that specified product provided.
c. Substitution request is fully documented and properly submitted.
d. Requested substitution will not adversely affect General Contractor's construction schedule.
e. Requested substitution has received necessary approvals of authorities having jurisdiction.
f. Requested substitution is compatible with other portions of the Work.
g. Requested substitution has been coordinated with other portions of the Work.
h. Requested substitution provides specified warranty.
i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Not permitted.

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION 01 25 00

Request Phase Pre-Tender □ Post Tender □
(If Pre-tender only) Current Tender Due Date: _____ Request No.: _____ Dated: _____
Project No.: _____ Contract No.: _____
Project Name/Location: _____

References: Specification(s): Section(s): _____ Paragraph(s): _____
Drawing(s): Drawing(s) No.(s): _____ Detail(s) No.(s):_____

Contractually Specified Product: _____
Contractor Proposed Product: _____

Proposed Product is: Equal: □ Substitute: □

*See attached data for **both** specified and proposed products as required by Section 01 60 00.*

Data attached: Drawings: □ Product Data: □ Reports: □ Samples: □
Tests: □ Other: _____

Reason(s) for not providing the Specified Product:

Similar Installation:
Project: Architect:
Address: Owner:
Date Installed:

Post-Tender:

Will proposed substitution impact other parts of the Work? No □ Yes □ *If yes attach explanation by*
Will proposed substitution increase Contract Time? No □ Yes □ *number of Days.* _____

Actual Dollar Savings if substitution is accepted: $_____

The undersigned Certifies that the proposed Request for an Equal or Substitute conforms to all of the requirements of Division 01 General Requirements, Section 01 25 00 Substitution Procedures.

Request Submitted by General Contractor: _____
(Firm's Name)

By: _____ _____ _____ _____
(Print Name) *(Title)* *(Signature)* *(Date)*

Owner's Representative Review – This Substitution Request is: Request Received on (Date): _____

□ **Approved:** (*Submittals in accordance with Div. 01 General Requirements, Section 01 33 00 Submittal Procedures.)*
□ **Approved as Noted:** (*Submittals in accordance with Div. 01 General Requirements, Section 01 33 00 Submittal Procedures.)*
□ **Rejected:** **Use Specified Materials.**
□ **Rejected:** **Request Not Received Within Specified Time Period – Use Specified Materials.**

Reviewed issue By: _____ _____ _____
(Print Name) *(Signature)* *(Date)*

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FOGARTY MEMORIAL SCHOOL
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SECTION 01 31 13
PROJECT COORDINATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:

1. General project coordination, administrative procedures and conservation.

2. Submittals.

3. Field engineering.

4. Cleaning and protection.

1.02 RELATED SECTIONS

A. Section 01 31 19 - Project Meetings: Progress and coordination meetings, pre-installation conferences.

B. Section 01 33 00 – Submittal Procedures: Contractor's Construction Schedule.

C. Section 01 60 00 – Product Requirements: Materials and Equipment.

D. Section 01 78 00 – Closeout Procedures and Submittals.

E. Section 01 78 39 - Project Record Documents.

1.03 COORDINATION

A. Coordinate construction operations included in various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection and operation.

1. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.

3. Make provisions to accommodate items scheduled for later installation.

B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports and attendance at meetings.

1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.

C. ADMINISTRATIVE PROCEDURES: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules.

2. Installation and removal of temporary facilities.

3. Delivery and processing of submittals.

4. Progress meetings.

5. Project closeout activities.

D. CONSERVATION: Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work.

1.04 SUBMITTALS

A. COORDINATION DRAWINGS: Prepare coordination drawings where careful coordination is needed for installation of products and materials fabricated by separate entities. Prepare coordination drawings where limited space availability necessitates maximum utilization of space for efficient installation of different components.

1. Show the relationship of components shown on separate Shop Drawings.

2. Indicate required installation sequences.

3. Comply with requirements contained in Section 01 33 00 – Submittal Procedures.

B. STAFF NAMES: Within 15 days of commencement of construction operations, submit a list of the Contractor's principal staff assignments, including the superintendent and other personnel in attendance at the Project Site. Identify individuals and their duties and responsibilities. List their addresses and telephone numbers.

1. Post copies of the list in the Project meeting room, the temporary field office and each temporary telephone.

1.05 FIELD ENGINEERING

A. Employ a Land Surveyor registered in the State of Rhode Island and acceptable to the Architect.

B. Contractor to locate and protect survey control and reference points.

C. Control datum for survey is that shown on Drawings.

D. Provide field engineering services. Establish elevations, lines and levels utilizing recognized engineering survey practices.

E. Submit a copy of registered site drawing and certificate signed by the Land Surveyor that the elevations and locations of the Work are in conformance with the Contract Documents.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 GENERAL COORDINATION PROVISIONS

A. INSPECTION OF CONDITIONS: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

3.02 CLEANING AND PROTECTION

A. Clean and protect construction in progress and adjoining materials in place, during handling and installation. Apply protective covering where required to assure protection from damage or deterioration at Substantial Completion.

B. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period.

C. LIMITING EXPOSURES: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:

1. Excessive static or dynamic loading; Excessive internal or external pressures.
2. Excessively high or low temperatures; Thermal shock; Excessively high or low humidity; Water or ice.
3. Air contamination or pollution; Solvents, chemicals, light, radiation; Excessive weathering.
4. Puncture, abrasion, heavy traffic.
5. Soiling, staining and corrosion.
6. Bacteria; Rodent and insect infestation.
7. Combustion; Electrical current.
8. High-speed operation; Improper lubrication; Unusual wear or other misuse; Misalignment.
9. Contact between incompatible materials.
10. Destructive testing.
11. Unprotected storage, improper shipping or handling.
12. Theft or vandalism.

END OF SECTION 01 31 13

FOGARTY MEMORIAL SCHOOL
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North Scituate, Rhode Island **AA23018**

SECTION 01 31 19
PROJECT MEETINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pre-Construction Conference and Progress Meetings

1.02 REQUIREMENTS INCLUDED

A. The Contractor shall schedule and administer the Pre-Construction Conference and shall:

1. Prepare the agenda for the meeting.
2. Notify all parties required to attend meeting.
3. Make physical arrangements for meeting.
4. Preside at meeting.
5. Record the minutes, including significant proceedings and decisions.
6. Reproduce and distribute copies of minutes within seven (7) calendar days after the meeting to participants in the meeting and other parties affected by decisions made at the meeting.

B. The Contractor shall schedule and administer periodic progress meetings, and specially called meetings throughout the progress of the work. The Contractor shall:

1. Prepare agenda for meetings.
2. Make physical arrangements for meetings.
3. Preside at meetings.
4. Record the minutes, including significant proceedings and decisions.
5. Reproduce and distribute copies of minutes within five (5) calendar days after each meeting to participants in the meeting and other parties affected by decisions made at the meeting.

C. Representatives of Contractors, Subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

1.03 PRE-CONSTRUCTION CONFERENCE

A. ATTENDANCE: Owner and/or representative, Architect, Contractor, Contractor's Superintendent, major Subcontractors, major suppliers and others as appropriate.

B. SUGGESTED AGENDA:

1. Distribution and discussion of

    a. List of major Subcontractors and suppliers.

    b. Projected construction schedules.

2. Critical work sequencing.

3. Major equipment deliveries and priorities.

4. PROJECT COORDINATION: Designation of responsible personnel.

5. Procedures and processing of Field decisions, Proposal requests, Submittals, Change Orders and Applications for Payment.

6. Adequacy of distribution of Contract Documents.

7. Procedures for maintaining Project Record Documents.

8. USE OF PREMISES:

    a. Office, work and storage areas.

    b. Owner's requirements.

9. Construction facilities, controls and construction aids.

10. Traffic Maintenance Plan.

11. Temporary utilities.

12. Safety and first-aid procedures.

13. Security procedures.

14. Housekeeping procedures.

15. Place, date and time for regular progress meetings.

1.03 PROGRESS MEETINGS

A. Conduct regular scheduled progress meetings at place, dates and times agreed upon at the Pre-Construction Conference.

B. Conduct additional meetings as progress of the work dictates.

C. ATTENDANCE: Architect and his professional consultants as needed, Owner or representative (when required), Contractor, Contractor's Superintendent, Subcontractors as appropriate to the agenda, suppliers as appropriate to the agenda and others as required.

D. SUGGESTED AGENDA

1. Review approval of minutes of previous meeting.

2. Review of work progress since previous meeting.

3. Field observations, problems and conflicts.

4. Problems that impede construction schedule.

5. Review of off-site fabrication, delivery schedules.

6. Corrective measures and procedures to regain projected schedule.
7. Revisions to construction schedule.
8. Progress schedule during succeeding work period.
9. Maintenance of quality standards.
10. Pending changes and substitutions.
11. Coordination of schedules.
12. Review submittal schedules; expedite as required.
13. Review proposed changes for:
    A. Effect on Construction Schedule and on completion date.
    B. Effect on subcontracts of the project.
14. Other business.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01 31 19

FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedural requirements for non-administrative Submittals, including shop drawings, product data, samples and other miscellaneous work-related submittals. Shop drawings, product data, samples and other work-related submittals are required to amplify, expand and coordinate the information contained in the Contract Documents.

1. Refer to other Division 1 Sections and other Contract Documents for specifications on administrative, non-work-related submittals. Such submittals include, but are not limited to the following items:
   a. Permits; Written consents; Manifests.
   b. Payment applications; Performance and payment bonds; Insurance certificates.
   c. Inspection and test reports; Progress reports.
   d. Listing of subcontractors; Construction schedules.

B. SHOP DRAWINGS: Technical drawings and data that have been specially prepared for this Project, including but not limited to the following items:

1. Fabrication and installation drawings; Coordination drawings (for use on-site).
2. Schedules.
3. Design-mix formulas.

C. PRODUCT DATA: Standard printed information on manufactured products that has not been specially prepared for this Project, including but not limited to the following items:

1. Manufacturer’s product specifications and installation instructions; Catalog cuts.
2. Roughing-in diagram and templates; Standard wiring diagrams; Operational range diagrams.
3. Printed performance curves.

D. SAMPLES: Physical examples of work, including but not limited to the following items:

1. Partial sections of manufactured or fabricated work.
2. Small cuts or containers of materials.
3. Complete units of repetitively used materials.

E. MISCELLANEOUS SUBMITTALS: Work-related, non-administrative submittals that do not fit in the three previous categories, including, but not limited to the following:

1. Specially prepared and standard printed warranties; Testing and certification reports.
2. Project photographs; Record Drawings; Field measurement data.
3. Keys and other security protection devices.

1.02 RELATED DOCUMENTS

A. Drawings, General Provisions of the Contract and Division 1 Specification Sections apply to work of this Section.

1.03 SUBMITTAL PROCEDURES

A. GENERAL: Refer to the General Conditions for basic procedures for submittal handling.

B. COORDINATION: Coordinate the preparation and processing of submittals with the performance of the work. Coordinate each separate submittal with other submittals and related activities such as testing, purchasing, fabrication, delivery and similar activities that require sequential activity.

1. Coordinate the submittal of different units of interrelated work so that one submittal will not be delayed by the Architect's need to review a related submittal. The Architect reserves the right to withhold action on any submittal requiring coordination with other submittals until related submittals are forthcoming.

C. SCHEDULING: In each appropriate administrative submittal, such as the Progress Schedule, show the principal work-related submittals and time requirements for coordination of submittal activity with related work.

D. COORDINATION OF SUBMITTAL TIMES: Prepare and transmit each submittal to the Architect sufficiently in advance of the scheduled performance of related work and other applicable activities. Transmit different kinds of submittals for the same unit of work so that processing will not be delayed by the Architect's need to review submittals concurrently for coordination.

E. REVIEW TIME: Allow sufficient time so that the installation will not be delayed as a result of the time required to properly process submittals, including time for re-submittal, if necessary. Advise the Architect on each submittal, as to whether processing time is critical to the progress of the work, and if the work would be expedited if processing time could be shortened.

1. Allow Fourteen (14) calendar days for the Architect's initial processing of each submittal. Allow a longer time period where processing must be delayed for coordination with subsequent submittals. The Architect will advise the Contractor promptly when it is determined that a submittal being processed must be delayed for coordination.
2. Allow seven (7) calendar days for reprocessing each submittal.
3. No extension of time will be authorized because of the Contractor's failure to transmit submittals to the Architect sufficiently in advance of the work.

F. SUBMITTAL PREPARATION: Mark each submittal with a permanent label for identification. Provide the following information on the label for proper processing and recording of action taken.

1. Project name; Date.
2. Name and address of Owner, Contractor and Supplier.
3. Name of manufacturer; Number and title of appropriate Specification Section; Drawing number and detail references, as appropriate; Similar definite information as necessary.
4. Provide a space on the label for the Contractor's review and approval markings, and a space for the Architect's "Action" marking.

G. SUBMITTAL TRANSMITTAL: Package each submittal appropriately for transmittal and handling. Transmit four (4) copies, plus the number of copies the Contractor wants returned to him after review of each submittal by the Architect, and to other destinations as required, by use of a transmittal form. Prepare a separate transmittal form for each division of work and identify each submittal by Specification Section number on the transmittal form. Submittals received from sources other than the Contractor will be returned to the sender "without action".

1. Record relevant information and requests for data on the transmittal form. On the transmittal form, or on a separate sheet attached to the form, record deviations from the requirements of the Contract Documents, if any, including minor variations and limitations.
2. Submittals will be accepted by the Architect if transmitted via E-mail.
3. **No submittals will be accepted by the Architect if transmitted via FAX machine.**
4. Include the Contractor's signed certification stating that information submitted complies with requirements of the Contract Documents.
5. Sequentially number the transmittal forms; re-submittals to have original number with an alphabetic suffix.

H. CONTRACTOR'S REVIEW: Stamp of approval indicates to Owner and Architect that all quantities, dimensions, field construction criteria, materials, catalog numbers and similar data have been determined and verified, and that each submittal has been reviewed or coordinated with requirements of Work and Contract Documents. **Failure to provide the Contractor's Review Stamp shall be grounds for the Submittal to be returned to the Contractor with no action taken.**

I. No portion of Work requiring shop drawings shall be started or any materials be fabricated, delivered to site or installed prior to approval of such items. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved shop drawings and data shall be at Contractor's risk. Owner will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.

J. Project work, materials, fabrications and installation shall conform to approved shop drawings.

1.04 PERFORMANCE REQUIREMENTS

A. MISCELLANEOUS SUBMITTALS

1. INSPECTION AND TEST REPORTS: Classify each inspection and test report as being either "shop drawings" or "product data" depending on whether the report is specially prepared for the project, or a standard publication of workmanship control testing at the point of production. Process inspection and test reports accordingly.
2. SURVEY DATA: Provide copies of all survey data collected for property surveys, field measurements, and quantitative records of actual work, damage surveys and similar data required by the individual Sections of these specifications. None of the specified copies will be returned.
3. STANDARDS: Where submittal of a copy of standards is indicated, and except where copies of standards are specified as an integral part of a "Product Data" submittal, submit a single copy of standards for the Architect's use. Where workmanship, whether at the project site or elsewhere, is governed by a standard, furnish additional copies of the standard to installers, Owner's field representative and others involved in the performance of the Work.
4. CLOSEOUT SUBMITTALS: Refer to section "Closeout Procedures and Submittals" and to individual Sections of these specifications for specific submittal requirements of project closeout information, materials, tools and similar items.
   a. RECORD DOCUMENTS: Furnish set of original documents as maintained on the project site.
5. GENERAL DISTRIBUTION: Provide additional distribution of submittals to Subcontractors, suppliers, fabricators, installers, governing authorities and others as necessary for the proper performance of the Work. Include such additional copies of submittals in the transmittal to the Architect where the submittals are required to receive "Action" marking before final distribution. Record distributions on transmittal forms.

1.05 ARCHITECT'S ACTION

A. GENERAL: Except for submittals for the record and similar purposes, where action and return on submittals is required or requested, the Architect will review each submittal, mark with appropriate "Action", and where possible return within fourteen (14) calendar days of receipt. Where the submittal must be held for coordination, the Architect will so advise the Contractor without delay.

B. ACTION STAMP: The Architect will stamp, sign and date each submittal copy to be returned to Contractor and indicate disposition of each submittal in accordance with the following grading requirements:

1. "Approved" or "Reviewed" indicates that Architect notes no exception to the intent of the Contract Documents. Fabrication of item may commence.
2. "Approved as Noted" or "Furnish as Corrected" indicates that Contractor may begin implementing the Work method or incorporating the material and equipment covered by the submittal in accordance with the noted corrections. Where submittal information will be incorporated in Operation and Maintenance data, a corrected copy shall be provided.
3. "Revise and Resubmit" indicates nonconformance with the Contract requirements or that too many corrections would be necessary. Except at its own risk, Contractor shall not undertake Work covered by this submittal until it has been revised, resubmitted, and returned marked either "Approved" or "Furnish as Corrected".
4. "Rejected" indicates nonconformance with the Contract requirements. The Architect will state the reasons for rejections.

C. ARCHITECT'S REVIEW

1. Architect's review of submitted drawings and data will cover only general conformity to drawings and specification, external connections and dimensions which affect layout.
2. Architect's review does not indicate thorough review of all dimensions.
3. **Architect's review of submittals does not relieve Contractor's responsibility for errors, omissions or deviations, field verification of all dimensions nor responsibility for compliance with Contract Documents.**

1.06 RESUBMISSION REQUIREMENTS

A. Make any corrections or changes in the submittals required by the Architect and resubmit until they are denoted "Approved", "Reviewed", "Approved as Noted" or "Furnish As Corrected" by the Architect. Resubmission requirements specified in individual specifications Sections, which differ from these requirements, will take precedence over these requirements.

B. SHOP DRAWINGS AND PRODUCT DATA

1. Revise initial drawings or data and resubmit as specified for the initial submittal.
2. Indicate any changes which have been made other than those requested by the Architect.

C. SAMPLES: Submit new samples as required for initial submittal

1.07 DISTRIBUTION

A. Distribute reproductions of shop drawings and copies of product data which carry the Architect's stamp denoting "Approved", "Reviewed", "Approved as Noted" or "Furnish As Corrected" to:

1. Job site file; Record documents file.
2. Subcontractors; Supplier or fabricator.

B. Distribute samples which carry the Architect's stamp denoting "Approved", "Reviewed", "Approved as noted" or "Furnish as Corrected" as directed by the Architect.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01 33 00

FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 01 45 00
QUALITY CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Quality assurance and control of installation.

B. References.

C. Field samples.

D. Mock-up.

E. Inspection and testing laboratory services.

F. Manufacturers' field services and reports.

1.02 RELATED SECTIONS

A. Section 01 33 00 – Submittal Procedures: Submission of Manufacturers' Instructions and Certificates.

B. Section 01 45 29 – Testing Laboratory Services.

C. Section 01 60 00 – Product Requirements: Requirements for material and product quality.

1.03 QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions and workmanship, to produce Work of specified quality.

B. Comply fully with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.

E. Perform work by persons qualified to produce workmanship of specified quality.

F. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.04 REFERENCES

A. Conform to reference standard by date of issue current on date of Contract Documents.

B. Obtain copies of standards when required by Contract Documents. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.05 FIELD SAMPLES

A. Install field samples at the site as required by individual specifications Sections for review.

B. Acceptable samples represent a quality level for the Work.

C. Where field sample is specified in individual Sections to be removed, clear area after field sample has been accepted by Architect.

1.06 MOCK-UP

A. Assemble and erect specified items, with specified attachment and anchorage devices, flashings, seals and finishes.

B. Where mock-up is specified in individual Sections to be removed, clear area after mock-up has been accepted by Architect.

1.07 INSPECTION AND TESTING LABORATORY SERVICES

A. The Contractor will appoint and employ services of an independent firm, acceptable to the Owner and Architect, to perform inspection and testing. Contractor shall pay for services from an Allowance specified in Section 01 21 00 – Allowances.

B. The independent firm will perform inspections, tests and other services specified in individual specification Sections and as required by the Architect.

C. Reports will be submitted by the independent firm to the Architect, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.

1. Notify Architect and independent firm 48 hours prior to expected time for operations requiring services.

2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

E. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Architect. Payment for retesting will be charged to the Contractor by deducting inspection or testing charges from the Contract Sum.

1.08 MANUFACTURERS' FIELD SERVICES AND REPORTS

A. Submit qualifications of observer to Architect 30 days in advance of required observations. Observer subject to approval of Architect/Owner.

B. When specified in individual specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

C. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

D. Submit report in duplicate within 30 days of observation to Architect for review.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTIONS (Not Applicable)

END OF SECTION 01 45 00

FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 01 45 29
TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selection and payment.

B. Contractor submittals.

C. Laboratory responsibilities.

D. Laboratory reports.

E. Limits on testing laboratory authority.

F. Contractor's responsibilities.

G. Schedule of inspections and tests.

1.02 RELATED SECTIONS

A. Document 00 72 00 - General Conditions: Inspections, testing and approvals required by public authorities.

B. Section 01 33 00 – Submittal Procedures: Manufacturer's certificates.

C. Section 01 75 00 - Starting and Adjusting.

D. Section 01 78 00 – Closeout Procedures and Submittals: Project Record Documents.

E. Individual Specification Sections: Inspections and tests required and standards for testing.

1.03 REFERENCES

A. ANSI/ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

B. ANSI/ASTM E329 - Recommended Practice for Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as Used in Construction.

1.04 SELECTION AND PAYMENT

A. Contractor will employ services of an independent testing laboratory, acceptable to the Owner and Architect, to perform specified inspection and testing.

B. Contractor shall pay costs of services from an allowance specified in Section 01 21 00 – Allowances on approval of invoices by Architect.

C. Employment of testing laboratory shall in no way relive Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.05 QUALITY ASSURANCE

A. Comply with requirements of ANSI/ASTM E329 and ANSI/ASTM D3740.

B. LABORATORY: Authorized to operate in State in which Project is located.

C. LABORATORY STAFF: Maintain a full-time registered Engineer on staff to review services.

D. TESTING EQUIPMENT: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards (NBS) Standards or accepted values of natural physical constants.

1.06 CONTRACTOR'S SUBMITTALS

A. Prior to start of Work, submit testing laboratory name, address and telephone number, and names of full time registered Engineer and responsible officer.

B. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards (NBS) during most recent tour of inspection, with memorandum of remedies of any deficiencies reported by the inspection.

1.07 LABORATORY RESPONSIBILITIES

A. Test samples of mixes submitted by Contractor.

B. Provide qualified personnel at site. Cooperate with Architect/Engineer and Contractor in performance of services.

C. Perform specified inspection, sampling and testing of products in accordance with specified standards.

D. Ascertain compliance of materials and mixes with requirements of Contract Documents.

E. Promptly notify Architect/Engineer and Contractor of observed irregularities or non-conformance of Work or products.

F. Perform additional inspections and tests required by Architect.

G. Attend pre-construction conferences and progress meetings.

1.08 LABORATORY REPORTS

A. After each inspection and test, promptly submit two copies of laboratory report to Architect and to Contractor.

B. INCLUDE:

1. Date issued.

2. Project title and number.

3. Name of inspector.

4. Date and time of sampling or inspection.

5. Identification of product and Specifications Section.

6. Location in the Project.
7. Type of inspection or test.
8. Date of tests.
9. Results of tests.
10. Conformance with Contract Documents.

C. When requested by Architect/Engineer, provide interpretation of test results.

1.09 LIMITS ON TESTING LABORATORY AUTHORITY

A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.

B. Laboratory may not approve or accept any portion of the Work.

C. Laboratory may not assume any duties of Contractor.

D. Laboratory has no authority to stop the Work.

1.10 CONTRACTOR'S RESPONSIBILITIES

A. Deliver to laboratory, at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.

B. Cooperate with laboratory personnel and provide access to the Work.

C. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.

D. Notify Architect/Engineer and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

E. Arrange with laboratory and pay for additional samples and tests required by Contractor beyond specified requirements.

1.11 SCHEDULE OF INSPECTIONS AND TESTS

A. See individual specification Section for inspection and testing requirements.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01 45 29

FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Mobilization and demobilization.

B. Temporary Utilities.

C. Construction facilities.

D. Vehicular access and parking.

E. Temporary barriers and enclosures.

F. Protection of Work.

G. Temporary controls.

H. Project identification.

1.02 RELATED SECTIONS

A. Drawings, General Provisions of the Contract and Division 1 Sections apply to work of this Section.

1.03 GENERAL

A. The limits of the site are shown on the Drawings. Areas designated for Contractor staging shall be coordinated with the Owner in the field.

B. The limits of the Owner's property are shown on the Drawings.

C. In the event additional space is required for the Contractor's operations, the Contractor shall make its own arrangements and pay for such additional space.

1.04 PRIVATE LAND

A. The Contractor shall not enter or occupy private land outside of easements, except by written permission of the property Owner. Furnish Architect with copies of all agreements the Contractor has with property Owners to enter or occupy private lands.

1.05 PERMITS AND TEMPORARY FACILITIES

A. The Contractor shall obtain necessary permits, coordinate and provide all temporary facilities as required

for performing the work, including any facilities specified for the Owner's or the Architect's use.

1.06 CONTROL OF TEMPORARY FACILITIES

A. All temporary facilities shall be subject to the control and direction of the Owner.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 MOBILIZATION

A. Provide all work necessary to move in personnel and equipment, set up Contractor's temporary offices, buildings, facilities, utilities, prepare the site for construction.

B. Set up construction facilities in a neat and orderly manner within the Contractor's staging area and at a location acceptable to the Architect. Accomplish all required work in accordance with applicable portions of these Specifications. Confine operations within the general work limits shown or established.

3.02 REMOVAL OF TEMPORARY FACILITIES AND CONTROLS

A. Completely remove temporary above grade or buried utilities, equipment, facilities, materials and equipment prior to Substantial completion or when their use is no longer required.

B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.

C. Temporary sheds, utilities, barricades, signs and other appurtenances related to prosecution of the Work and not incorporated in the permanent construction shall be completely removed from the site prior to acceptance of work by Owner.

D. Upon completion of work of all trades and before final acceptance of entire Project, each trade shall remove, at its own expense, all wiring, appurtenances and accessories used in performance of its respective work.

E. Clean and repair damage caused by installation or use of temporary work.

F. Restore permanent facilities used during construction to specified condition.

3.03 DEMOBILIZATION

A. At the completion of the work and immediately prior to final inspection, clean the entire project area removing all debris, soil and rubbish.

1. Should Contractor not remove rubbish or debris or not clean the facilities and site as specified above, the Owner reserves the right to have final cleaning done by others at the sole expense of the Contractor.

B. The Contractor shall:

1. Employ experienced workers or professional cleaners for final cleaning.

2. Conduct final inspection of concealed spaces in preparation for Contract completion.

3. Remove from the property temporary structures and materials, equipment and appurtenances not required as part of, or appurtenant to, the completed work.

4. Leave watercourse, gutters and ditches open and in condition satisfactory to Architect.

3.04 TEMPORARY UTILITIES

A. The Contractor shall coordinate for and obtain the necessary permits for connection to these services.

3.05 TEMPORARY HEATING AND VENTILATION

A. Provide temporary heating when temperature falls below 50 deg. F and as otherwise required to:

1. Maintain working conditions acceptable to Architect.

2. Protect all work, materials and equipment against damage from dampness or cold.

3. Dry out structures. Maintain proper conditions for installation and curing of materials.

B. Ensure that heating equipment and fuels are compatible for particular purpose and include safety devices in accordance with industry standards.

C. Do not use combustion type heaters without proper venting nor in areas where such equipment might introduce a hazard.

D. Ensure that all enclosed areas are ventilated (using forced-draft equipment when necessary) as required to maintain proper conditions for personnel, and work, and to avoid any accumulation of hazardous dust or fumes.

E. Pay costs associated with furnishing, installing, maintaining, operating and removing of heating and ventilation equipment.

3.06 TEMPORARY WATER

A. Owner will provide water supply as required for used in connection with Work to be done under this Contract.

B. The Contractor shall pay for the cost of the water usage.

3.07 TEMPORARY ELECTRICITY AND/OR LIGHTING

A. Arrange with utility company and Owner to provide all power for heating, lighting, operation of equipment or for any other required use. Pay costs for service and for power used.

B. Install circuit and branch wiring, with area distribution boxes located so that power and lighting is available throughout construction by use of construction-type power cords.

C. Provide artificial lighting for areas of work when natural light is not adequate for work, and for areas accessible to public.

D. Furnish all extension cords, sockets, lamps, motors and accessories for work. Ground all outlets.

E. All temporary wiring, service equipment and accessories thereto installed shall be removed at expense of Contractor after serving its purpose.

F. Contractor is required to pay for replacement of all lamps broken and/or removed from premises during construction period and until date of Substantial Completion of Work and written acceptance by Owner.

3.08 TELEPHONE SERVICE

A. Provide, maintain and pay for telephone service to field office at time of project mobilization.

3.09 INTERFERENCE WITH EXISTING STRUCTURES

A. Whenever it may be necessary to cross or interfere with existing culverts, drains, water pipes or fixtures, guardrails, fences, or other structures needing special care, due notice shall be given to the Architect and to the various public and private agencies or individuals responsible for the utility or structure that is interfered with.

B. Whenever required, all objects shall be strengthened to meet any additional stress that the work herein specified may impose upon it, and any damage caused shall be thoroughly repaired.

C. The entire Work shall be the responsibility of the Contractor and the Work shall be performed at no additional expense to the Owner.

D. All damaged items of Work or items required to be removed and replaced due to construction shall be replaced or repaired by the Contractor to the complete satisfaction of the property Owners and/or the Architect at no additional expense to the Owner.

3.10 FIELD OFFICES AND SHEDS

A. OFFICE: Weather-tight, with lighting, electrical outlets, heating, cooling and ventilating equipment, and equipped with sturdy furniture and drawing display table.

B. Provide space for Project meetings, with table and chairs to accommodate 8 persons.

C. Provide separate private office, similarly, equipped and furnished, for use of Owner. This office may be located in a job trailer, shared with the Contractor.

D. Coordinate locations of offices and sheds with the Owner and Architect.

E. Contractor’s project signage shall be subject to the direction and control of the Owner.

3.11 TEMPORARY SANITARY FACILITIES

A. Furnish temporary sanitary facilities at site for needs of all construction workers and others performing work or furnishing services on project.

B. Ensure that sanitary facilities are:

1. Of a capacity acceptable to Architect and authorities having jurisdiction over the Project.

2. Maintained throughout construction period.

3. Obscured from public view to greatest extent possible and secured to prevent vandalism.

C. Furnish at least one toilet for each 20 workers if toilets of chemically treated type are used.

D. Service, clean and maintain facilities and enclosures.

E. Enforce use of such sanitary facilities by all personnel at site.

F. Pay costs associated with furnishing, installing, maintaining, operating and removing sanitary facilities.

3.12 VEHICULAR ACCESS

A. Construct and maintain temporary roads accessing public thoroughfares to serve construction area.

B. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.

3.13 PARKING

A. Provide parking facilities for Contractor, Owner and Architect personnel working on the project.

B. Arrange for and provide temporary parking areas to accommodate construction personnel as required.

C. When site space is not adequate, provide additional off-site parking as required.

3.14 EXTERIOR ENCLOSURES

A. Provide temporary insulated weather-tight closure of exterior openings to accommodate acceptable working conditions and protection for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification Sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

B. Provide temporary roofing as required.

3.15 INTERIOR ENCLOSURES

A. Provide temporary partitions and ceilings as required to separate work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas and to prevent damage to existing materials and equipment.

B. CONSTRUCTION: Framing, plywood and gypsum board sheet materials with closed joints and sealed edges at intersections with existing surfaces; insulated to R-13, STC rating of 35 in accordance with ASTM E90 and maximum Flame Spread Rating of 75 in accordance with ASTM E84.

C. Paint surfaces exposed to view from Owner occupied areas.

3.16 BARRICADES

A. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

B. Provide protection for plant life designated to remain. Replace damaged plant life.

C. Protect non-owned vehicular traffic, stored materials, site and structures from damage.

3.17 FENCING

A. Construct temporary fence as required for the protection of the Contractor's materials, tools and equipment. Maintain fence during construction.

B. CONSTRUCTION: Commercial grade chain link fence, six feet in height.

C. Provide 6-foot high vehicular and gates with locks at access roads into site.

3.18 SECURITY BARRIERS

A. Provide security barriers to prevent unauthorized entry to construction areas to allow for Owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. The Contractor shall take all precautions necessary to prevent loss or damage caused by vandalism, theft, burglary, pilferage or unexplained disappearance of property of the Owner or Contractor, whether or not forming part of the Work, located within the limits of Work. The Contractor shall have full responsibility for the security of such property located in such areas and shall reimburse the Owner for any such loss, damage or injury, except such as may be directly caused by agents or employees of the Owner.

C. Coordinate with Owner's security program.

3.19 PUBLIC SAFETY

A. At all times until final acceptance of Work by Owner, the Contractor shall protect Work and shall take all precautions of preventing injuries to persons or damage to property on or about site.

B. Contractor shall comply with all applicable laws, ordinances, rules and regulations regarding safety of persons or property or with regard to protecting them from damage, injury or loss and shall not load or permit any part of Work to be placed so as to endanger safety of Work.

C. If Contractor constructs temporary bridges or provides temporary crossing of streams, Contractor's responsibility for accidents shall include roadway and sidewalk approaches as well as structure of such crossings.

D. Conduct work such that abutters shall have reasonable access to their property. Contractor shall be responsible for providing such reasonable safe means of access to public way as Architect deems essential. When it is necessary to leave materials and equipment upon highway or city or town way, place them so as to cause least possible obstruction to drainage, pedestrian and other travel.

3.20 CARE AND PROTECTION OF PROPERTY

A. The Contractor shall be responsible for the preservation of all public and private property and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect or misconduct in the execution of the Work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in other manner acceptable to the Architect.

B. All sidewalks which are disturbed by the Contractor's operations shall be restored to their original condition by the use of similar or comparable materials. All curbing shall be restored in a condition equal to the original construction and in accordance with the best modern practice.

C. Along the location of this Work, all fences, walks, bushes, trees, shrubbery and other physical features shall be protected and restored in a thoroughly workmanlike manner. All grass areas beyond the limits of construction which have been damaged by the Contractor shall be regraded and seeded, subject to the approval of the Architect.

D. Trees close to the work shall be boxed or otherwise protected against injury. The Contractor shall trim all branches that are likely to be damaged because of his operations, but in no case shall any tree be cut or removed without prior notification of the Architect. All injuries to bark, trunk, limbs and roots of trees shall be repaired by dressing, cutting and painting according to approved methods, using only approved tools and materials, subject to the approval of the Owner.

E. The protection, removal and replacement of existing physical features along the line of Work shall be a part of the Work under the Contract, and all costs in connection therewith shall be included in the unit and/or lump sum prices established under the items in the proposal.

3.21 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. The Contractor shall assume full responsibility for the protection of all buildings, structures and utilities, public or private, including poles, signs, services to buildings, utilities in the street, gas pipes, water pipes, hydrants, sewers, drains, electric and telephone cables and cesspools adjacent to trench excavations, whether or not they are shown on the Drawings. The Contractor shall carefully support and protect all such structures and utilities from injury of any kind. Any damage resulting from the Contractor's operations shall be repaired by him at his expense, to the damaged items original condition.

B. The Contractor shall bear full responsibility for obtaining all locations of underground structures and utilities (including existing water, gas, electric and telephone services, drain lines and sewers). Services to buildings shall be maintained, and all costs or charges resulting from damage thereto shall be paid by the Contractor.

C. Protection and temporary removal and replacement of existing utilities and structures as described in this section shall be a part of the work under the Contract and all costs in connection therewith shall be included in the unit prices established in the proposal.

3.22 PROTECTION OF WORK

A. The Contractor shall at all times protect excavations, trenches, new construction, old construction, all job materials, apparatus and fixtures from rain, wind, snow, ice, dust, dirt, mud, groundwater, back-up or leakage of sewers, drains or other piping, and from water of any other origin, and shall remove promptly any accumulation of the above. He shall provide and operate all pumps, piping and other equipment necessary to this end at no additional cost to Owner.

B. Thoroughly protect all completed work and all stored materials.

C. Provide boards, cloths, planks, waterproof paper, canvas or other approved protection and use as necessary to prevent any damage.

D. Provide protective measures to prevent damage to lawns, trees and shrubs to remain after Project is complete.

E. Protect, at end of each day's work, such Work that may be liable to damage by the elements.

F. Replace or rectify work or materials damaged by workmen, by the elements or by any other cause, to the satisfaction of the Architect and at no additional expense to the Owner.

G. Repair streets, curbs, sidewalks, poles, grass, shrubs, trees or other existing site features, if disturbed by building operations. Leave them in as good condition as they were before being disturbed.

H. Do not allow workmen, including those of any Subcontractor or supplier, to mark finish surfaces with marking pens or other such devices that are not readily erasable.

I. Protect installed Work and provide special protection where specified in individual specification Sections.

J. Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.

K. Provide protective coverings at walls, projections, jambs, sills and soffits of openings.

L. Protect finished floors, stairs and other surfaces from traffic, dirt, wear, damage or movement of heavy objects by protecting with durable sheet materials.

M. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

N. Prohibit traffic from landscaped areas.

3.23 OPEN EXCAVATIONS

A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons and damage to property.

B. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access to private property during construction shall be removed when no longer required.

C. The length of open trench will be controlled by the particular surrounding conditions but shall always be confined to the limits prescribed by the Architect and/or the local authorities having jurisdiction over the Project.

D. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Architect and/or the local authority may require special construction procedures such as limiting the length of open trench, prohibiting stacking excavated material in the street, and requiring that the trench shall not remain open overnight.

E. The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment or other obstacles which could be dangerous to the public shall be well lighted at night.

3.24 LENGTH OF TRENCH TO BE OPENED, MAINTAINING PREMISES FREE FROM OBSTRUCTIONS, CROSSOVERS, DIRECTIONAL SIGNS AND LIGHTS

A. The length of trench opened at any time, from the point where ground is being broken to completed backfill and also the amount of space in streets or public and private lands occupied by equipment, trench and supplies, shall not exceed the length or space considered reasonably necessary for installation of Work.

B. In determining the length of open trench or spaces for equipment, materials, supplies and other necessities, the Contractor will consider the nature of the lands or streets where work is being done, types and methods of construction and equipment being used, inconvenience to the public or to private parties, possible dangers and other proper matters.

C. All Work must be constructed with a minimum of inconvenience and danger to the public and all other parties concerned. Trench excavations shall be completely backfilled at the end of each day, or covered with steel traffic plates, as directed by the Architect and/or as required by authorities having jurisdiction over the Project.

D. Whenever any trench obstructs pedestrian and vehicular traffic in or to any public street, private driveway or property entrance, or on private driveway or property entrance, or on private property, the Contractor shall take such means as may be necessary to maintain pedestrian and vehicular traffic and access.

E. Until such time as the Work may have attained sufficient strength to support backfill, or if for any other reason it is not expedient to backfill the trench immediately, the Contractor shall construct and maintain suitable plank crossings and bridges to carry essential traffic in or to the street, driveway or property in question as specified or directed.

F. Suitable signs, lights and such required items to direct traffic shall be furnished and maintained by the Contractor.

G. The Contractor must keep streets and premises free from unnecessary obstructions, debris and all other materials.

H. The Architect or local authority may, at any time, order all equipment, materials, surplus from excavations, debris and all other materials lying outside that length of working space promptly removed, and should the Contractor fail to remove such material within 24 hours after notice to remove the same, the Architect or local authority may cause any part or all of such materials to be removed by such persons as he may employ, at the Contractor's expense, and may deduct the cost thereof from payment which may be or may become due to the Contractor under the Contract. In special cases, where public safety urgently demands it, the Architect or local authority may cause such materials to be removed without prior notice.

3.25 EROSION AND SEDIMENT CONTROL

A. GRADE SITE TO DRAIN. Maintain excavations free of water. Provide, operate and maintain pumping equipment.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion and accumulation of sediment in utility structures or other similar undesirable locations.

3.26 REMOVAL OF WATER AND PROTECTION FROM FLOODING

A. The Contractor shall construct and maintain, at no additional expense to the Owner, all pumps, drains, well points or any other facility for the control and collection of groundwater and/or surface water and provide all pumps and piping for the removal of water from the trenches and excavations so that all trenches and excavations may be kept free from water at all times and so that all construction work may be performed in the dry.

B. Any damage resulting from the failure of the dewatering operations of the Contractor and any damage resulting from the failure of the Contractor to maintain the areas of all work in a suitable dry condition shall be repaired by the Contractor as directed by the Architect at no additional expense to the Owner.

C. The Contractor's pumping and dewatering operations shall be carried out in accordance with RIDEM regulations and in such a manner as to prevent damage to existing structures and utilities and the contract Work and so that no loss of ground will result from these operations.

D. Precautions shall be taken to protect existing and new Work from flooding during storms or from other causes. Pumping shall be continuous where directed by the Architect to protect the Work and/or to maintain satisfactory progress.

E. All pipelines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected.

F. Water from the trenches, excavations and drainage operations shall be disposed of downstream of the water course in such a manner as will neither cause public nuisance, nor cause injury to public health nor to public or private property nor to the Work completed nor to the Work in progress.

G. No extra payment will be made for the removal of water, protection from flooding, drainage work, diversion of existing water courses and such other work, but compensation therefore shall be considered as having been included in the prices stipulated for the appropriate items of work as listed in the bid.

H. The Contractor shall, at his own cost, maintain the flow of water courses during the progress of the work.

3.27 SURFACE AND STORM WATER CONTROL

A. Provide for drainage of storm water and such water as may be applied or discharged on site in performance of Work.

B. Ensure that drainage facilities are adequate to prevent damage to Work, site and adjacent property.

1. Clean, enlarge or supplement existing drainage channels to carry all increased runoff attributable to operation.

2. Construct dikes to:

a. Divert increased runoff from entering adjacent property (except in natural channels).

b. Protect the Work.

c. Direct water to drainage channels or conduits.

3.28 DUST CONTROL

A. At no additional cost to the Owner, take measures to prevent unnecessary dust.

1. Keep earth surfaces subject to dusting moist with water only.

2. Cover dusty materials in piles or in transit to prevent blowing.

B. Protect buildings or operating facilities that may be affected adversely by dust.

C. Protect existing or new machinery, motors, instrument panels or similar equipment with dust screens. Include proper ventilation with dust screens.

3.29 NOISE CONTROL

A. The Contractor shall employ all reasonable measures to avoid unnecessary noise and ensure that noise is appropriate for normal ambient sound levels in the work area during working hours. Where required by agencies having jurisdiction, certain noise-producing work may have to be performed during specified periods only. Noise control measures during normal work hours shall include but not be limited to:

1. Operate machinery in a manner to cause least noise consistent with efficient performance of work.

2. Equip all construction machinery and vehicles with sound-muffling devices.

3. During construction adjacent to or near occupied buildings, erect screens or barriers to reduce noise in building to limits in accordance with applicable codes. Conduct operations in such a manner as to avoid unnecessary noise which might interfere with activities of building occupants.

B. When the Contractor's work extends beyond normal working hours, the Contractor shall incorporate to the complete satisfaction of the Owner and Architect, adequate noise prevention measures to insure minimum noise impact on the surrounding areas. Noise prevention measures shall include, but not be limited to:

1. Insulated enclosures.

2. Hospital grade silencers or mufflers.

3. Equipment modification.

4. Special equipment, as necessary to meet Town noise guidelines.

5. Any other noise prevention measures.

C. Should at any time the Owner and/or Architect determine that noise prevention measures are inadequate, the Contractor shall suspend all such work in question until acceptable measures are incorporated. Suspension of work due to inadequate noise prevention shall not be a cause for additional cost to the Owner.

D. Prior to the start of any Work outside normal work hours, the Contractor shall submit a Noise Control plan to the Owner and Architect for review. Noise Control plans shall be submitted for:

1. Night work.

2. All Pumping operations and work that may extend beyond normal work day.

3. Any other work as determined by the Architect that warrants special noise prevention measures.

E. All costs associated with noise control measures shall be considered part of the bid price for appropriate work being completed.

3.30 POLLUTION CONTROL

A. Prevent pollution of drains and watercourses by sanitary wastes, sediment, debris and other substances resulting from construction activities.

1. Do not allow sanitary wastes to enter any drain or watercourse other than sanitary sewers.

B. Do not allow sediment, debris or other substance to enter sanitary sewers and take measures to prevent such materials from entering any drain or watercourse.

C. All earthwork, grading, moving of equipment, water control and other operations likely to create silting, shall be planned and conducted so as to avoid pollution of any water courses. Water used for any purpose that has become contaminated with oil, bitumen, salt or other pollutions shall be discharged so as to avoid affecting nearby waters. Under no circumstances shall pollutants be discharged directly into any water courses.

D. All concrete repair work requiring cleaning and removal of debris is to be contained as not to contaminate the surrounding environment.

3.31 PROJECT IDENTIFICATION

A. Provide 8-foot-wide x 6-foot-high project sign of exterior grade plywood and wood frame construction, painted, with exhibit lettering by professional sign maker, to Architect's design and colors.

B. List title of Project, names of Owner, Architect, professional sub-consultants and Contractor.

C. Erect on site at location established by Owner and/or Architect.

D. No other signs are allowed without Owner permission except those required by law.

END OF SECTION 01 50 00

AHARONIAN & ASSOCIATES INC. - ARCHITECTS

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FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Products, materials and equipment.

B. Transportation and handling.

C. Storage and protection.

D. Product options.

E. Substitutions.

1.02 RELATED SECTIONS

A. Document 00 21 13 - Instructions to Bidders: Product options and substitution procedures.

B. Document 00 22 13 – Supplementary Instructions to Bidders.

C. Section 01 45 00 - Quality Control: Product quality monitoring.

1.03 MANUFACTURED AND FABRICATED PRODUCTS

A. Design, fabricate and assemble in accordance with the best engineering and shop practices.

B. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.

C. Two or more items of the same kind shall be identical, by the same manufacturer.

D. Products shall be suitable for service conditions.

E. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically reviewed by Architect.

F. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.04 MATERIAL AND EQUIPMENT INCORPORATED INTO THE WORK

A. Conform to applicable specifications and standards.

B. Comply with size, make, type and quality specified or as specifically reviewed by the Architect.

1.05 MANUFACTURER'S INSTRUCTIONS

A. When the Contract Documents require that installation of Work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, as specified in Section 01 33 00 – Submittal Procedures.

B. Maintain one set of complete instructions at the job site during installation and until completion.

C. Handle, install, connect, clean, condition and adjust products in strict accordance with such instructions and in conformity with specified requirements.

D. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Architect for further instructions.

E. Do not proceed with Work without clear instructions.

F. Perform Work in accordance with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by the Contract Documents.

1.06 CERTIFICATES OF CONFORMANCE AND MANUFACTURE

A. In addition to other requirements specified herein, the Contractor shall furnish to the Architect, as specified in Section 01 33 00 - Submittals, notarized certificates of conformance and manufacture that all materials and/or equipment to be furnished under this Contract meet the specification requirements. When directed, each shipment of material shall be accompanied by the manufacturer's notarized certificates of conformance and manufacture. Unless otherwise specifically specified, all testing of materials shall be provided by the Contractor at no additional expense to the Owner.

B. Each manufacturer's certificate shall be endorsed or accompanied by the Contractor's certificate that the material certified by the manufacturer will be the material incorporated in the Work.

1.07 TRANSPORTATION AND HANDLING

A. Arrange deliveries of products in accordance with construction schedules, coordinate to avoid conflict with Work and conditions at the site and also when two or more trades, contractors or suppliers are involved.

B. Transport all materials and equipment on legally approved conveyances as required or recommended by the respective manufacturer or supplier.

C. Deliver products in undamaged condition, in manufacturer's original containers or packaging with identifying labels intact and legible.

D. Receive and handle all materials and equipment, at the Project site, by conveyances or methods as recommended by the respective manufacturer or supplier to prevent damage to products.

E. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and reviewed submittals, and that products are properly protected and undamaged.

F. Remove from the site any material or item of equipment damaged during the transportation or handling process, and immediately replace at no additional cost to the Owner.

1.08 STORAGE AND PROTECTION

A. Store products in accordance with the manufacturer's instructions, with seals and labels intact and legible.

B. Store products subject to damage by the elements in weathertight enclosures.

C. Maintain temperature and humidity within the ranges required by manufacturer's instructions.

D. Maintain all storage areas in a clean and orderly condition at all times.

1.09 EXTERIOR STORAGE

A. Store fabricated products above the ground, on blocking or skids. Prevent soiling or staining. Cover products that are subject to deterioration with impervious sheet coverings and provide adequate ventilation to avoid condensation.

B. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions and are free from damage or deterioration.

D. Replace any material or item of equipment damaged due to inadequate storage or protection and immediately replace at no additional cost to the Owner.

1.10 PROTECTION AFTER INSTALLATION

A. Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

1.11 PRODUCT OPTIONS

A. PRODUCTS SPECIFIED BY REFERENCE STANDARDS OR BY DESCRIPTION ONLY: Any product meeting those standards or description.

B. PRODUCTS SPECIFIED BY NAMING ONE OR MORE MANUFACTURERS: Products of manufacturers named and meeting specifications, no options or substitutions allowed.

C. PRODUCTS SPECIFIED BY NAMING ONE OR MORE MANUFACTURERS WITH A PROVISION FOR SUBSTITUTIONS: Submit a request for substitution for any manufacturer not named.

1.12 SUBSTITUTIONS

A. Instructions to Bidders specify time restrictions for submitting requests for Substitutions during the bidding period to requirements specified in this Section.

B. Thereafter, Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.

C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

D. A REQUEST CONSTITUTES A REPRESENTATION THAT THE CONTRACTOR:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.

2. Will provide the same warranty for the Substitution as for the specified product.

3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete, with no additional cost to Owner.

4. Waives claims for additional costs or time extension that may subsequently become apparent.

5. Will reimburse Owner for review or redesign services associated with re-approval by authorities.

E. **Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.**

F. SUBSTITUTION SUBMITTAL PROCEDURE

1. Submit four copies of request for Substitution for consideration. Limit each request to one proposed Substitution.

2. Submit shop drawings, product data and certified test results attesting to the proposed product equivalence.

3. The Architect will notify the Contractor, in writing, of decision to accept or reject request.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01 60 00

FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 01 73 29
CUTTING AND PATCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for cutting and patching.

1.02 RELATED SECTIONS

A. Section 01 31 13 – Project Coordination: Procedures for coordinating cutting and patching with other construction activities.

B. Section 02 41 13 - Selective Demolition: Demolition of selected portions of the building for alterations.

C. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.03 SUBMITTALS

A. CUTTING AND PATCHING PROPOSAL: Submit a proposal describing procedures well in advance of the time cutting and patching will be performed if the Owner requires approval of these procedures before proceeding. Request approval to proceed. Include the following information, as applicable, in the proposal:

1. Describe the extent of cutting and patching required. Show how it will be performed and indicate why it cannot be avoided.

2. Describe anticipated results in terms of changes to existing construction. Include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.

3. List products to be used and firms or entities that will perform Work.

4. Indicate dates when cutting and patching will be performed.

5. UTILITIES: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

6. Where cutting and patching involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with the original structure.

7. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of unsatisfactory work.

1.04 QUALITY ASSURANCE

A. REQUIREMENTS FOR STRUCTURAL WORK: Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:
   a. Foundation construction; Bearing and retaining walls.
   b. Structural concrete; Structural steel and structural decking; Lintels; Miscellaneous structural metals.
   c. Stair systems.
   d. Exterior wall construction.
   e. Equipment supports, Piping, ductwork, vessels and equipment.

B. OPERATIONAL LIMITATIONS: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:
   a. Primary operational systems and equipment.
   b. Air or smoke barriers; Water, moisture or vapor barriers.
   c. Membranes and flashings.
   d. Fire protection systems.
   e. Noise and vibration control elements and systems.
   f. Electrical wiring systems; Control systems; Communication systems.

C. VISUAL REQUIREMENTS: Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of cutting and patching. Remove and replace construction cut and patched in a visually unsatisfactory manner.

1. If possible, retain the original Installer or fabricator to cut and patch the exposed Work. If it is impossible to engage the original Installer or fabricator, engage another recognized experienced and specialized firm.

1.05 WARRANTY

A. EXISTING WARRANTIES: Replace, patch and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required or existing.

PART 2 PRODUCTS

2.01 MATERIALS - GENERAL

A. Use materials identical to existing materials. For exposed surfaces, use materials that visually fully match existing adjacent surfaces, if identical materials are unavailable or cannot be used. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 EXECUTION

3.01 INSPECTION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.

1. Before proceeding, meet at the Project Site with parties involved in cutting and patching. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.02 PREPARATION

A. TEMPORARY SUPPORT: Provide temporary support of work to be cut.

B. PROTECTION: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Avoid cutting existing utilities serving the building but scheduled to be removed or relocated until provisions have been made to bypass them.

3.03 PERFORMANCE

A. GENERAL: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. CUTTING: Cut existing construction using methods least likely to damage elements retained or adjoining construction. Where possible, review proposed procedures with the original Installer; comply with the original Installer's recommendations.

1. In general, where cutting, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

3. Cut through concrete and masonry using a cutting machine, such as a carborundum saw or a diamond-core drill.

4. Comply with requirements of applicable Division 31 Sections where cutting and patching requires excavating and backfilling.

5. Where services are required to be removed, relocated, or abandoned, by-pass utility services, such as pipe or conduit before cutting. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

C. PATCHING: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.

2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.

3. Where removing walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform color and

appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch after the area has received primer and second coat.

4. Patch, repair or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

3.04 CLEANING

A. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

END OF SECTION 01 73 29

FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 01 74 00
CLEANING AND WASTE MANAGEMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Provide all necessary material, labor and equipment to maintain the job site free of debris and waste material during construction and to perform final cleaning.

1.02 RELATED SECTIONS

A. Section 01 78 00 – Closeout Procedures and Submittals.

B. Cleaning and protection requirements as described in other Sections of this Project Manual.

1.03 REQUIREMENTS OF REGULATORY AGENGIES

A. SAFETY STANDARDS: Maintain project in accordance with the following safety and insurance standards: Federal Occupational Safety and Health Act of 1970.

B. FIRE PROTECTION: Store volatile waste in covered metal containers and remove from premises daily.

C. POLLUTION CONTROL: Conduct clean-up and disposal operations to comply with local ordinances and anti-pollution laws.

1. Burning or burying of rubbish and waste materials on the Project site is not permitted.

2. Disposal of volatile fluid waste (such as mineral spirits, oil or paint thinner) in storm sanitary sewer systems or into streams or waterways is not permitted.

PART 2 PRODUCTS

2.01 CLEANING MATERIALS

A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.01 DURING CONSTRUCTION

A. Oversee cleaning and ensure that buildings and grounds are maintained free from accumulations of waste material and rubbish.

B. Do not allow waste materials, rubbish and debris to accumulate and become an unsightly or hazardous condition. At reasonable intervals or as directed by the Architect during the progress of work, clean up site and access and dispose of waste materials, rubbish and debris from the site and legally dispose of at public or private dumping areas off the Owner's property.

C. Immediately after unpacking, remove and dispose of all packing materials, case lumber, excelsior, wrapping or other rubbish from site.

D. Remove all wastes from site and dispose in a manner complying with local ordinances and antipollution laws.

E. Store volatile wastes in covered metal containers and remove daily.

F. Vacuum clean interior building areas when ready to receive finish painting and continue vacuum cleaning on an as-needed basis until building is ready for acceptance or occupancy.

G. Lower waste materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.

H. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet newly painted surfaces.

I. Provide trash receptacles about site and empty containers daily.

J. Neatly stack construction materials, such as concrete forms and scaffolding, when not in use.

K. Promptly remove splattered concrete, asphalt, oil, paint, corrosive liquids and cleaning solution from surfaces to prevent marring or other damage to satisfaction of Architect.

L. Sprinkle dusty debris with water and calcium chloride as needed.

M. Ensure that wastes are not buried or burned on site or disposed into storm drains, sanitary sewers, steams or waterways.

N. Cleanup as determined by Architect will be a condition for recommendation of progress payment application.

1. Contractor shall have full responsibility for cleaning up during and immediately upon completion of work. Remove all rubbish, waste, tools, equipment and appurtenances caused by and used in execution of work, leaving site clean, free of debris and in condition acceptable to Architect.

2. Equipment or material shall not be left within any work area after acceptance of Contract without written permission of Architect. Do not abandon any material at or near site regardless of its value.

3.02 FINAL CLEANING

A. Use experienced workmen or professional cleaners for final cleaning.

B. At completion of construction and just prior to acceptance or occupancy, conduct a final inspection of exposed exterior and interior surfaces.

C. Execute final cleaning prior to final inspection.

D. Remove grease, dust, dirt, stains, labels, fingerprints and other foreign materials from interior and exterior surfaces.

E. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum resilient, carpeted and soft surfaces.

F. Repair, patch and touch-up marred surfaces to match adjacent surfaces.

G. Clean equipment and fixtures to a sanitary condition.

H. Replace filters of operating equipment.

I. Replace air conditioning filters if units were operated during construction.

J. Clean ducts, blowers and coils if air conditioning units were operated without filters during construction.

K. Clean debris from roofs, gutters, downspouts and drainage systems.

L. Broom clean paved surfaces; rake clean other surfaces of grounds.

M. Remove waste and surplus materials, rubbish and construction facilities from the site.

N. Maintain cleaning until the building or portion is accepted by the Owner.

END OF SECTION 01 74 00

FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT & DISPOSAL

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous demolition and construction waste.
2. Recycling nonhazardous demolition and construction waste.
3. Disposing of nonhazardous demolition and construction waste.

B. Related Requirements:

1. Section 02 41 13 “Selective Demolition” for disposal of waste resulting from partial demolition of building materials.

1.3 DEFINITIONS

A. CONSTRUCTION WASTE: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. DEMOLITION WASTE: Building materials resulting from selective demolition operations.

C. DISPOSAL: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. RECYCLE: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. SALVAGE: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

1.4 PERFORMANCE REQUIREMENTS

A. GENERAL: Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total non-hazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including the following:

1. Construction Waste:

    a. Masonry.
    b. Lumber.
    c. Wood sheet materials.
    d. Wood trim.
    e. Metals.
    f. Roofing.
    g. Insulation.
    h. Piping.
    i. Electrical conduit.
    j. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:

        1) Paper.
        2) Cardboard.
        3) Boxes.
        4) Plastic sheet and film.
        5) Polystyrene packaging.
        6) Wood crates.
        7) Plastic pails.

1.5 ACTION SUBMITTALS

A. Waste Management Plan: Submit plan within 7 days of date established for the Notice of Award.

1.6 INFORMATIONAL SUBMITTALS

A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Use Form CWM-7 for construction waste and Form CWM-8 for demolition waste. Include the following information:

1. Material category.
2. Generation point of waste.
3. Total quantity of waste in tons (tonnes).
4. Quantity of waste salvaged, both estimated and actual in tons (tonnes).
5. Quantity of waste recycled, both estimated and actual in tons (tonnes).
6. Total quantity of waste recovered (salvaged plus recycled) in tons (tonnes).
7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

G. LEED Submittal: LEED letter template for Credit MR 2, signed by Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.

H. Qualification Data: For waste management coordinator and refrigerant recovery technician.

I. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.7 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: Experienced firm, with a record of successful waste management coordination of projects with similar requirements, that employs a LEED-Accredited Professional, certified by the USGBC, as waste management coordinator.

B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

C. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

D. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:

1. Review and discuss waste.
2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review waste management requirements for each trade.

1.8 WASTE MANAGEMENT PLAN

A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of site-preparation and construction waste generated by the Work. Use Form CWM-1 for construction waste and Form CWM-2 for site preparation waste. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Use Form CWM-3 for construction waste and Form CWM-4 for site preparation waste. Include points of waste generation, total quantity of

each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
2. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
3. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
4. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
5. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Use Form CWM-5 for construction waste and Form CWM-6 for site preparation waste. Include the following:

1. Total quantity of waste.
2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
3. Total cost of disposal (with no waste management).
4. Revenue from salvaged materials.
5. Revenue from recycled materials.
6. Savings in hauling and tipping fees by donating materials.
7. Savings in hauling and tipping fees that are avoided.
8. Handling and transportation costs. Include cost of collection containers for each type of waste.
9. Net additional cost or net savings from waste management plan.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

1. Comply with operation, termination, and removal requirements in Division 01 Section "Temporary Facilities and Controls."

B. Waste Management Coordinator: This can be the contractor's project manager, superintendent or other qualified individual acceptable to the Engineer. Waste management coordinator shall be responsible for implementing, monitoring, and reporting status of waste management work plan.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.

1. Distribute waste management plan to everyone concerned within three days of submittal return.

2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
2. Comply with Division 01 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Sale and Donation: Not permitted on Project site.

3.3 RECYCLING WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.

D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.

1. Contractor’s Option: As this construction site is very limited in area the use of a co-mingled collection system with off site separation is acceptable.
2. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.

    a. Inspect containers and bins for contamination and remove contaminated materials if found.

3. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
4. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
5. Store components off the ground and protect from the weather.
6. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.

2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

C. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.

D. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.

3.5 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

3.6 ATTACHMENTS

A. Form CWM-1 for construction waste identification.

B. Form CWM-2 for demolition waste identification.

C. Form CWM-3 for construction waste reduction work plan.

D. Form CWM-4 for demolition waste reduction work plan.

E. Form CWM-5 cost/revenue analysis of construction waste reduction work plan.

F. Form CWM-6 cost/revenue analysis of demolition waste reduction work plan.

G. Form CWM-7 for construction waste

H. Form CWM-8 for demolition waste.

END OF SECTION 01 74 19

FORM CWM-1: CONSTRUCTION WASTE IDENTIFICATION							
MATERIAL CATEGORY	**GENERATION POINT**	**EST. QUANTITY OF MATERIALS RECEIVED* (A)**	**EST. WASTE - % (B)**	**TOTAL EST. QUANTITY OF WASTE* (C = A x B)**	**EST. VOLUME CY (CM)**	**EST. WEIGHT TONS (TONNES)**	**REMARKS AND ASSUMPTIONS**
Packaging: Cardboard							
Packaging: Boxes							
Packaging: Plastic Sheet or Film							
Packaging: Polystyrene							
Packaging: Pallets or Skids							
Packaging: Crates							
Packaging: Paint Cans							
Packaging: Plastic Pails							
Site-Clearing Waste							
Masonry or CMU							
Lumber: Cut-Offs							
Lumber: Warped Pieces							
Plywood or OSB (scraps)							
Wood Forms							
Wood Waste Chutes							
Wood Trim (cut-offs)							
Metals							
Insulation							
Roofing							
Joint Sealant Tubes							
Gypsum Board (scraps)							
Carpet and Pad (scraps)							
Piping							
Electrical Conduit							
Other:							

* Insert units of measure.

FORM CWM-2: DEMOLITION WASTE IDENTIFICATION				
MATERIAL DESCRIPTION	**EST. QUANTITY**	**EST. VOLUME CY (CM)**	**EST. WEIGHT TONS (TONNES)**	**REMARKS AND ASSUMPTIONS**
Asphaltic Concrete Paving				
Concrete				
Brick				
CMU				
Lumber				
Plywood and OSB				
Wood Paneling				
Wood Trim				
Miscellaneous Metals				
Structural Steel				
Rough Hardware				
Insulation				
Roofing				
Doors and Frames				
Door Hardware				
Windows				
Glazing				
Acoustical Tile				
Carpet				
Carpet Pad				
Demountable Partitions				
Equipment				
Cabinets				
Plumbing Fixtures				
Piping				
Piping Supports and Hangers				
Valves				
Sprinklers				
Mechanical Equipment				
Electrical Conduit				
Copper Wiring				
Light Fixtures				
Lamps				
Lighting Ballasts				
Electrical Devices				
Switchgear and Panelboards				
Transformers				
Other:				

FORM CWM-3: CONSTRUCTION WASTE REDUCTION WORK PLAN						
MATERIAL CATEGORY	GENERATION POINT	TOTAL EST. QUANTITY OF WASTE TONS (TONNES)	DISPOSAL METHOD AND QUANTITY			HANDLING AND TRANSPORTION PROCEDURES
			EST. AMOUNT SALVAGED TONS (TONNES)	EST. AMOUNT RECYCLED TONS (TONNES)	EST. AMOUNT DISPOSED TO LANDFILL TONS (TONNES)	
Packaging: Cardboard						
Packaging: Boxes						
Packaging: Plastic Sheet or Film						
Packaging: Polystyrene						
Packaging: Pallets or Skids						
Packaging: Crates						
Packaging: Paint Cans						
Packaging: Plastic Pails						
Site-Clearing Waste						
Masonry or CMU						
Lumber: Cut-Offs						
Lumber: Warped Pieces						
Plywood or OSB (scraps)						
Wood Forms						
Wood Waste Chutes						
Wood Trim (cut-offs)						
Metals						
Insulation						
Roofing						
Joint Sealant Tubes						
Gypsum Board (scraps)						
Carpet and Pad (scraps)						
Piping						
Electrical Conduit						
Other:						

FORM CWM-4: DEMOLITION WASTE REDUCTION WORK PLAN						
MATERIAL CATEGORY	GENERATION POINT	TOTAL EST. QUANTITY OF WASTE TONS (TONNES)	DISPOSAL METHOD AND QUANTITY			HANDLING AND TRANSPORTION PROCEDURES
			EST. AMOUNT SALVAGED TONS (TONNES)	EST. AMOUNT RECYCLED TONS (TONNES)	EST. AMOUNT DISPOSED TO LANDFILL TONS (TONNES)	
Asphaltic Concrete Paving						
Concrete						
Brick						
CMU						
Lumber						
Plywood and OSB						
Wood Paneling						
Wood Trim						
Miscellaneous Metals						
Structural Steel						
Rough Hardware						
Insulation						
Roofing						
Doors and Frames						
Door Hardware						
Windows						
Glazing						
Acoustical Tile						
Carpet						
Carpet Pad						
Demountable Partitions						
Equipment						
Cabinets						
Plumbing Fixtures						
Piping						
Supports and Hangers						
Valves						
Sprinklers						
Mechanical Equipment						
Electrical Conduit						
Copper Wiring						
Light Fixtures						
Lamps						
Lighting Ballasts						
Electrical Devices						
Switchgear and Panelboards						
Transformers						
Other:						

FORM CWM-5: COST/REVENUE ANALYSIS OF CONSTRUCTION WASTE REDUCTION WORK PLAN								
MATERIALS	TOTAL QUANTITY OF MATERIALS (VOL. OR WEIGHT) (A)	EST. COST OF DISPOSAL (B)	TOTAL EST. COST OF DISPOSAL (C = A x B)	REVENUE FROM SALVAGED MATERIALS (D)	REVENUE FROM RECYCLED MATERIALS (E)	LANDFILL TIPPING FEES AVOIDED (F)	HANDLING AND TRANSPORTATION COSTS AVOIDED (G)	NET COST SAVINGS OF WORK PLAN (H = D+E+F+G)
Packaging: Cardboard								
Packaging: Boxes								
Packaging: Plastic Sheet or Film								
Packaging: Polystyrene								
Packaging: Pallets or Skids								
Packaging: Crates								
Packaging: Paint Cans								
Packaging: Plastic Pails								
Site-Clearing Waste								
Masonry or CMU								
Lumber: Cut-Offs								
Lumber: Warped Pieces								
Plywood or OSB (scraps)								
Wood Forms								
Wood Waste Chutes								
Wood Trim (cut-offs)								
Metals								
Insulation								
Roofing								
Joint Sealant Tubes								
Gypsum Board (scraps)								
Carpet and Pad (scraps)								
Piping								
Electrical Conduit								
Other:								

FORM CWM-6: COST/REVENUE ANALYSIS OF DEMOLITION WASTE REDUCTION WORK PLAN								
MATERIALS	TOTAL QUANTITY OF MATERIALS (VOL. OR WEIGHT) (A)	EST. COST OF DISPOSAL (B)	TOTAL EST. COST OF DISPOSAL (C = A x B)	REVENUE FROM SALVAGED MATERIALS (D)	REVENUE FROM RECYCLED MATERIALS (E)	LANDFILL TIPPING FEES AVOIDED (F)	HANDLING AND TRANSPORTATION COSTS AVOIDED (G)	NET COST SAVINGS OF WORK PLAN (H = D+E+F+G)
Asphaltic Concrete Paving								
Concrete								
Brick								
CMU								
Lumber								
Plywood and OSB								
Wood Paneling								
Wood Trim								
Miscellaneous Metals								
Structural Steel								
Rough Hardware								
Insulation								
Roofing								
Doors and Frames								
Door Hardware								
Windows								
Glazing								
Acoustical Tile								
Carpet								
Carpet Pad								
Demountable Partitions								
Equipment								
Cabinets								
Plumbing Fixtures								
Piping								
Supports and Hangers								
Valves								
Sprinklers								
Mech. Equipment								
Electrical Conduit								
Copper Wiring								
Light Fixtures								
Lamps								
Lighting Ballasts								
Electrical Devices								
Switchgear and Panelboards								
Transformers								
Other:								

FORM CWM-7: CONSTRUCTION WASTE REDUCTION PROGRESS REPORT								
MATERIAL CATEGORY	GENERATION POINT	TOTAL QUANTITY OF WASTE TONS (TONNES) (A)	QUANTITY OF WASTE SALVAGED		QUANTITY OF WASTE RECYCLED		TOTAL QUANTITY OF WASTE RECOVERED TONS (TONNES) (D = B + C)	TOTAL QUANTITY OF WASTE RECOVERED % (D / A x 100)
			ESTIMATED TONS (TONNES)	ACTUAL TONS (TONNES) (B)	ESTIMATED TONS (TONNES)	ACTUAL TONS (TONNES) (C)		
Packaging: Cardboard								
Packaging: Boxes								
Packaging: Plastic Sheet or Film								
Packaging: Polystyrene								
Packaging: Pallets or Skids								
Packaging: Crates								
Packaging: Paint Cans								
Packaging: Plastic Pails								
Site-Clearing Waste								
Masonry or CMU								
Lumber: Cut-Offs								
Lumber: Warped Pieces								
Plywood or OSB (scraps)								
Wood Forms								
Wood Waste Chutes								
Wood Trim (cut-offs)								
Metals								
Insulation								
Roofing								
Joint Sealant Tubes								
Gypsum Board (scraps)								
Carpet and Pad (scraps)								
Piping								
Electrical Conduit								
Other:								

FORM CWM-8: DEMOLITION WASTE REDUCTION PROGRESS REPORT								
MATERIAL CATEGORY	GENERATION POINT	TOTAL QUANTITY OF WASTE TONS (TONNES) (A)	QUANTITY OF WASTE SALVAGED		QUANTITY OF WASTE RECYCLED		TOTAL QUANTITY OF WASTE RECOVERED TONS (TONNES) (D = B + C)	TOTAL QUANTITY OF WASTE RECOVERED % (D / A x 100)
			ESTIMATED TONS (TONNES)	ACTUAL TONS (TONNES) (B)	ESTIMATED TONS (TONNES)	ACTUAL TONS (TONNES) (C)		
Asphaltic Concrete Paving								
Concrete								
Brick								
CMU								
Lumber								
Plywood and OSB								
Wood Paneling								
Wood Trim								
Miscellaneous Metals								
Structural Steel								
Rough Hardware								
Insulation								
Roofing								
Doors and Frames								
Door Hardware								
Windows								
Glazing								
Acoustical Tile								
Carpet								
Carpet Pad								
Demountable Partitions								
Equipment								
Cabinets								
Plumbing Fixtures								
Piping								
Supports and Hangers								
Valves								
Sprinklers								
Mechanical Equipment								
Electrical Conduit								
Copper Wiring								
Light Fixtures								
Lamps								
Lighting Ballasts								
Electrical Devices								
Switchgear and Panelboards								
Transformers								
Other:								

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Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 01 75 00
STARTING AND ADJUSTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Starting systems.

B. Demonstration and instructions.

C. Testing, adjusting and balancing.

1.02 RELATED SECTIONS

A. Section 01 45 00 - Quality Control: Manufacturers field reports.

B. Section 01 78 00 – Closeout Procedures and Submittals: System operation and maintenance data and extra materials.

C. Division 23 Sections pertaining to HVAC systems.

D. Division 26 Sections pertaining to Electrical systems.

1.03 STARTING SYSTEMS

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify Architect and Owner seven days prior to start-up of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence or other conditions which may cause damage.

D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of responsible Contractors' personnel in accordance with manufacturers' instructions.

G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up and to supervise placing equipment or system in operation.

H. Submit a written report in accordance with Section 01 45 00 that equipment or system has been properly installed and is functioning correctly.

1.04 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of final inspection.

B. Demonstrate Project equipment, instructed by qualified Contractor's representative who is knowledgeable about the Project.

C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owners' personnel in detail to explain all aspects of operation and maintenance.

E. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance and shutdown of each item of equipment at agreed-upon times, at equipment location.

F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

G. The amount of time required for instruction on each item of equipment and system is that specified in individual Sections.

1.05 TESTING, ADJUSTING AND BALANCING

A. Contractor will appoint and employ services of an independent firm, acceptable to the Owner and Architect, to perform testing, adjusting and balancing. Contractor shall pay for services specified in Section 01 21 00 Allowances.

B. The independent firm will perform services specified in Division 23 Sections.

C. Reports will be submitted by the independent firm to the Architect indicating observations and results of tests and indicating compliance or non-compliance with specified requirements and with the requirements of the Contract Documents.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01 75 00

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North Scituate, Rhode Island **AA23018**

SECTION 01 78 00
CLOSEOUT PROCEDURES AND SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Closeout Procedures.

B. Requirements.

C. Substantial Completion.

D. Final Review.

E. Additional Reviews.

F. Submittals.

G. Final Adjustment of Accounts.

H. Final Application for Payment.

I. Adjusting.

J. Operation and Maintenance Data.

K. Warranties.

L. Spare Parts and Maintenance Materials.

1.02 RELATED SECTIONS

A. Section 01 20 00 – Price and Payment Procedures

B. Section 01 21 00 – Allowances.

C. Section 01 75 00 - Starting and Adjusting: System start-up, testing, adjusting and balancing.

D. Section 01 78 39 – Project Record Documents.

1.03 REQUIREMENTS

A. Comply with requirements stated in conditions of the Contract and in specifications for administrative procedures in closing out the Work.

1.04 SUBSTANTIAL COMPLETION

A. When Contractor considers the work is Substantially Complete, he shall submit to the Architect:

1. A written notice that the Work or designated portion thereof, is Substantially Complete.

2. A list of items to be completed or corrected.

B. Within a reasonable time after receipt of such notice, Architect will review the Work to determine the status of completion.

C. Should Architect determine that the Work is not Substantially Complete:

1. Architect will promptly notify the Contractor in writing, giving the reasons therefor.

2. Contractor shall remedy the deficiencies in the work and send out another written notice of substantial completion to the Architect.

3. Architect will again review the work.

D. When Architect concurs that the Work is Substantially Complete, he will:

1. Prepare a Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the Architect.

2. Submit the certificate to Owner, Contractor and manufacturer for their written acceptance of the responsibilities assigned to them in the certificate.

1.05 FINAL REVIEW

A. When Contractor considers the Work is complete, he shall submit written certification that:

1. Contract documents have been reviewed.

2. Work has been inspected for compliance with Contract Documents.

3. Work has been completed in accordance with Contract Documents.

4. Equipment and systems have been tested in the presence of the Owner's representative and are operational.

5. Work is completed and ready for final review.

B. Architect will make final review to verify the status of completion with reasonable promptness after receipt of such certification.

C. Should Architect consider that the Work is incomplete or defective:

1. Architect will promptly notify the Contractor in writing, listing the incomplete or defective work.

2. Contractor shall take immediate steps to remedy the stated deficiencies and send out another written certification to Architect that the work is complete.

3. Architect will again review the Work.

4. Should Architect consider that the Work is still incomplete or defective, all subsequent reviews shall be considered as Additional Reviews, subject to the provisions listed in 1.06 below.

D. When the Architect finds that the Work is acceptable under the Contract Documents and that all Punch List items have been accomplished to his satisfaction, he shall request the Contractor to make closeout submittals.

1.06 FEES FOR ADDITIONAL REVIEWS

A. Should Architect perform additional reviews due to failure of the Work to comply with the claims of status of completion made by the Contractor:

1. Owner will compensate Architect for such additional services.

2. Owner will deduct the amount of such compensation from the final payment to the Contractor.

1.07 CONTRACTOR'S CLOSEOUT SUBMITTALS TO ARCHITECT

A. Provide (2) original copies & (2) digital copies (USB or CD) of all Closeout Documents as described below.

B. OPERATING AND MAINTENANCE DATA: Submit documentation as described in 1.11 below.

C. WARRANTIES, GUARANTEES AND BONDS: Submit documentation as described in 1.12 below.

D. SPARE PARTS AND MAINTENANCE MATERIALS FOR OWNER: Submit documentation as described in 1.13 below.

E. Contractor's affidavit of payment of debts and claims.

F. Contractor’s affidavit of release of liens.

G. Consent of surety to final payment.

H. Certificate of insurance for products and completed operations.

I. PROJECT RECORD DRAWINGS: Submit documentation as described in Section 01 78 39.

1.08 FINAL ADJUSTMENT OF ACCOUNTS

A. Submit a final statement of accounting to Architect.

B. Statement shall reflect all adjustments to the Contract Sum:

1. The original Contract Sum.

2. Additions and deductions resulting from:

a. Previous Change Orders, allowances and unit prices.

b. Deductions for uncorrected work, liquidated damages and re-inspection payments.

c. Other adjustments.

3. Total Contract Sum, as adjusted.

4. Previous payments.

5. Sum remaining due.

C. Architect will prepare a final change order reflecting approved adjustments to the Contract sum that were not previously made by Change Orders.

1.09 FINAL APPLICATION FOR PAYMENT

A. Contractor shall submit the final application for payment in accordance with procedures and requirements stated in the General Conditions.

1.10 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

1.11 OPERATION AND MAINTENANCE DATA

A. Submit one copy of completed volumes in final form 5 days prior to final inspection. This copy will be returned with Architect/Engineer comments. Revise content of documents as required prior to final submittal.

B. Submit Operation and Maintenance Data bound in 8-1/2 x 11-inch text pages, three D side-ring capacity expansion binders with durable plastic covers. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project and subject matter of binder when multiple binders are required.

C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

D. CONTENTS: Prepare a Table of Contents for each volume, with each Product or system description identified, type on 24-pound white paper.

E. PART 1: Directory, listing names, addresses and telephone numbers of Architect, Engineers, Contractor, Subcontractors and major equipment suppliers.

F. PART 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses and telephone numbers of Subcontractors and suppliers. Identify the following:

1. Significant design criteria.

2. List of equipment.

3. Parts list for each component.

4. Operating instructions.

5. Maintenance instructions for equipment and systems.

6. Maintenance instructions for all finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.

G. PART 3: Project documents and certificates, including the following:

1. Shop drawings and product data.

2. Air and water balance reports.

3. Certificates.

4. Photocopies of warranties and bonds.

H. Submit final volumes revised, within ten days after final inspection.

1.12 WARRANTIES

A. Provide duplicate notarized copies.

1. In addition to the Warranty and Guarantee Requirements of the General Conditions, provide all other guarantees, bonds, affidavits and certifications required throughout the Project Manual.

B. Execute and assemble documents from Subcontractors, suppliers and manufacturers.

C. Provide Table of Contents and assemble in three D side-ring binder with durable plastic cover.

D. Submit prior to final Application for Payment.

E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

1.13 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 as directed by the Owner; obtain receipt prior to final payment.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01 78 00

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SECTION 01 78 39
PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents required for Contract closeout.

1.02 RELATED SECTIONS

A. Section 01 78 00 – Closeout Procedures and Submittals.

1.03 REQUIREMENTS

A. Maintain at the site for the Owner one record copy of:

1. Drawings
2. Specifications
3. Addenda
4. Change Orders and other modifications to the Contract.
5. Architect field orders or written instructions
6. Reviewed shop drawings, product data and samples.
7. Field test records

B. The Contractor will be required to furnish, at no additional expense to the Owner, the services of a surveyor and/or Engineer registered in the state where the project is located and under whose direction shall be obtained and recorded all surveys, measurements and such other data required for the determination of the as-built records of the construction of all site work.

1.04 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Store documents and samples in Contractor's field office apart from documents used for construction.

B. Provide locked file cabinet for storage of documents and samples.

C. File documents and samples in accordance with CSI/CSC format.

D. Maintain documents in a clean, dry, legible condition and in good order. Do not use Record Documents for construction purposes.

E. Always make documents and samples available for inspection by Architect and Owner.

1.05 MARKING DEVICES

A. Provide felt tip marking pens for recording information in the color code designated by Architect.

1.06 RECORDING

A. Label each document "Project Record" in neat large, printed letters.

B. Record information concurrently with construction progress.

C. Do not conceal any work until required information is recorded.

D. DRAWINGS: Principal dimensions, elevations and other data as required shall be recorded for all work, such as:

1. Deviations of any nature made during construction.

2. Location of underground utilities.

3. Field changes of dimension and detail.

4. Changes made by field order or by Change Order.

5. Details not on original Contract Drawings.

E. The marked-up prints shall be inspected weekly by the Architect and shall be corrected immediately if found either inaccurate or incomplete.

F. SPECIFICATIONS AND ADDENDA: Legibly mark each Section to record:

1. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.

2. Changes made by field order or by Change Order.

1.07 FINAL MEASUREMENTS

A. The Contractor shall provide qualified personnel and equipment for taking final measurements for quantities and Record Documents.

1.08 RECORD DRAWINGS

A. At the completion of the Project, the Record Drawings shall be submitted to the Architect for final review and comment.

B. The Contractor shall correct, amplify and do all other work as may be required by the Architect to complete the drawings in a manner satisfactory to the Architect and at no additional cost to the Owner.

C. Upon approval, the Contractor shall provide a final Record Drawing set to the Architect on heavyweight bond and electronic format (PDF). The bond and electronic version shall be submitted to the Owner by the Architect.

1.09 SUBMITTAL

A. At Contract close-out, deliver Record Documents to Architect for the Owner.

B. Accompany submittal with transmittal letter in duplicate, containing:

1. Date.
2. Project title and number.

3. Contractor's name and address.

4. Title and number of each record document.

5. Signature of Contractor or his authorized representative.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01 78 39

AHARONIAN & ASSOCIATES INC. - ARCHITECTS

310 George Washington Highway - Suite 100 - Smithfield, Rhode Island 02917 T 401-232-5010 F 401-232-5080

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SECTION 01 81 13
NE-CHPS SUSTAINABLE DESIGN REQUIREMENTS

PART 1 GENERAL

1.01 GENERAL PROVISIONS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this section..

B. Northeast Collaborative for High Performance Schools (NE-CHPS) New Construction and Major Renovations Version 3.0 applies to this Section.

1.02 SUMMARY

A. This Section includes general requirements and procedures for achieving NE-CHPS credits.

B. Sustainable Design Intent: Comply with project requirements intended to achieve NE-CHPS credits, measured and documented according to the NE-CHPS Rating.

1. Refer to NE CHPS Scorecard
2. Refer to individual Specification Sections for additional requirements

C. Contractor is responsible for compliance with and completion of all required documentation for all the following NE-CHPS Requirements:

1. Indoor Environmental Quality EQ7.0: Low Emitting Materials.
2. Material and Waste Management MW 2.0: Minimum Construction site waste management.

1.03 RELATED WORK

A. Examine Contract Documents for requirements that affect the work of this Section. Other Specification Sections that relate directly to work of this Section include, but not limited to:

1. Section 017419: Construction Waste management and Disposal.
2. Section 099100: Painting

1.04 DEFINITIONS

A. Construction and Demolition Waste: Includes solid wastes, such as building materials, packaging, rubbish, debris, and rubble resulting from construction, remodeling, repair and demolition operations. A construction waste management plan is to be provided by the Contractor as defined in section 017419.

B. NE-CHPS: Northeast Collaborative for High Performance Schools New Construction and Major Renovations Versions 3.0.

C. Sealant: Any material that fills and seal gaps between other materials.

D. Volatile Organic Compounds (VOC's): Any compound of carbon, excluding carbon monoxide, carbon dioxide, carbon acid, metallic carbides or barbonates, and ammonium carbonate, which participates in atmospheric photochemical reaction. Compounds that have negligible photochemical reactivity, listed in EPA 40 CFR 51, 100(s), are also excluded from this regulatory definition.

1.05 SUBMITTALS

A. GENERAL: Additional Sustainable Design Submittal requirements are included in other section of the Specification

B. SUSTAINABLE DESIGN SUBMITTALS:

1. Interior Paints and Coatings: Submittal for all field-applied paints and coatings, which have a potential impact on indoor air, must include manufacturer's MSDS's or other Product data highlighting VOC Content.

1.06 QUALITY ASSURANCE

A. Preconstruction Meeting: After award of Contract and prior to the commencement of the Work, schedule and conduct meeting with Owner, Engineer, and all Subcontractors to discuss the Construction Waste Management Plan, the required Construction Indoor Air Quality (IAQ) Management Plan, and all other Sustainable Design Requirements. The purpose of this meeting is to develop a mutual understanding of the Project's Sustainable Design Requirements and coordination of the Contractor's management of these requirements.

B. Construction Job Conferences: the status of compliance with the Sustainable Design Requirements of these specifications will be an agenda item at all regular job meetings conducted during the course of work at the site.

PART 2 PRODUCTS – (Not Used)

PART 3 EXECUTION – (Not Used)

END OF SECTION 01 81 13

Collaborative for High Performance Schools (CHPS)

Project Scorecard: NE-CHPS Version 3.0

School Name: Ponaganset High School - Agricultural Building Addition

Expected Completion:	**Current Phase:**
School District:	**Website:**
School Address: 137 Anan Wade Road	**City:** North Scituate **State:** RI **Zip:**
School Contact:	**Phone:** **E-mail:**
Student Capacity:	**Notes:**
Approximate Square Feet:	

Verification

Is this the final CHPS Scorecard?

Registered Principal Architect (Signature) **Project Manager** (Signature)

Name, Title, Date (Please print) **Name, Title, Date** (Please print)

Use this scorecard to track expected scores. Note that prerequisites have points associated with them even though they are required. This enables project teams to talk more meaningfully about the effort being put into each section of the Criteria. Prerequisite point columns are also highlighted for reference. Mark each credit as ready for review by using the appropriate column for each phase of the review.

Key: P - Prerequisite; **PS -** CHPS Plan Sheet Required; **CD -** Construction Documents Required; **A -** Attachment Required

Criteria	Title	Prerequisite	Points Possible	Points Targeted	Points Claimed	Responsible Team Member	Design Review Requirements	Ready for Design Review	Construction Review Requirements	Ready for Construction Review	Performance Review Requirements	Ready for Performance Review	Documentation
Integration and Innovation													
II 1.0	Integrated Design	P	3				CD		A				
II 1.1	Enhanced Integrated Design		2					A					
II 2.1	District Level Commitment		1					A					
II 3.1	School Master Plan		1					A					
II 4.1	High Performance Transition Plan		1					A		A			
II 5.0	Educational Display	P	1				CD			A			
II 5.1	Demonstration Area		1				CD			A			
II 6.1	Educational Integration		2					A		A			
II 7.1	Climate Change Action / Carbon Footprint Reporting		3					A		A			
II 8.0	Crime Prevention through Environmental Design	P	2					A		A			
II 9.1	Innovation		4				VARIES		VARIES		VARIES		
	Subtotal												
Operations & Metrics													
OM 1.0	Facility Staff and Occupant Training	P	3				CD			A			
OM 2.1	Post Occupancy Transition		2					A		A			
OM 3.0	Performance Benchmarking	P	2					A		A	A		
OM 4.1	High Performance Operations		4					A		A	A		
OM 5.1	Systems Maintenance Plan	P	1							A			
OM 6.0	Indoor Environmental Management Plan	P	2							A			
OM 7.1	Green Cleaning		2							A	A		
OM 8.0	Integrated Pest Management	P	1				PS			A			
OM 9.0	Anti-Idling Measures	P	1				CD			A			
OM 10.1	Green Power		2					A					
OM 11.0	ENERGY STAR Equipment and Appliances	P	2					A					
OM 12.1	Computerized Maintenance Management System		1				PS			A			
	Subtotal												
Indoor Environmental Quality													
EQ 1.0	HVAC Design - ASHRAE 62.1	P	8	8			PS						
EQ 1.1	Enhanced Filtration		2				CD			A			
EQ 1.2	Dedicated Outdoor Air System		3				CD			A			
EQ 2.1	Pollutant and Chemical Source Control	P	2				CD	A		A			
EQ 3.0	Outdoor Moisture Management	P	1				CD			A			
EQ 4.1	Ducted Returns		2				CD						
EQ 5.1	Construction Indoor Air Quality Management		5				CD			A			
EQ 5.2	Construction Moisture Management		1				CD			A			
EQ 6.1	Post Construction Indoor Air Quality		1				CD			A			
EQ 7.0	Low Emitting Materials	P	2	2			PS	CD	PS	A			
EQ 7.1	Additional Low Emitting Materials		5				PS	CD	PS	A			
EQ 8.1	Low Radon		1					CD		A			
EQ 9.1	Thermal Comfort - ASHRAE 55		4	4			PS	CD					
EQ 10.1	Individual Controllability		1	1				CD		A			
EQ 10.2	Controllability of Systems		1					CD		A			
EQ 11.0	Daylighting: Glare Protection	P	4					CD	A	A			
EQ 11.1	Daylight Availability		5				PS	CD	A	A			
EQ 12.0	Views	P	3				PS	CD					
EQ 13.1	Electric Lighting Performance		3					CD	A				
EQ 13.2	Superior Electric Lighting Performance		5					CD		A			
EQ 14.0	Acoustical Performance	P	7				PS	CD	A	A	A		
EQ 14.1	Enhanced Acoustical Performance		6				PS	CD	A	A	A		
EQ 15.1	Low-EMF Wiring		1					CD		A			
EQ 15.2	Low-EMF Best Practices		2					CD	A	A			
EQ 16.1	High Intensity Fluorescent Fixtures		1					CD		A			
	Subtotal			15									

Energy																		
EE 1.0	Energy Performance	P	6					CD	A									
EE 1.1	Superior Energy Performance		40					CD	A									
EE 2.1	Zero Net Energy Capable		3					CD										
EE 3.0	Commissioning	P	4					CD	A				A					
EE 3.1	Additional Commissioning Qualifications		1					CD	A				A					
EE 3.2	Building Envelope Commissioning		1					CD	A				A					
EE 3.3	Enhanced Commissioning		1					CD	A				A		A			
EE 4.0	Enviornmentally Preferable Refrigerants	P	1					CD										
EE 5.1	Energy Management System		2					CD										
EE 5.2	Advanced Energy Management System and Submetering		2					CD										
EE 6.1	Natural Ventilation and Energy Conservation Interlocks		2				PS	CD					A					
EE 7.0	Local Energy Efficiency Incentive and Assistance	P	2						A				A					
EE 8.1	Variable Air Volume Systems		1					CD										
EE 9.1	Renewable Energy Performance Monitoring		1					CD					A					
EE 10.1	Electric Vehicle Charging		1					CD					A					
	Subtotal																	
Water																		
WE 1.0	Minimum Reduction in Indoor Potable Water Use	P	5				PS	CD					A					
WE 2.1	Reduce Potable Water Use for Sewage Conveyance		3				PS	CD					A					
WE 3.1	Irrigation and Exterior Water Budget - Use Reduction		3					CD					A					
WE 4.1	Reduce Potable Water Use for Non-Recreational Landscaping		3					CD	A				A					
WE 5.1	Recuce Potable Water Use for Recreational Landscaping		2					CD					A					
WE 6.0	Irrigation Systems Commissioning	P	1						A				A					
WE 7.1	Rainwater Collection and Storage		2				PS	CD										
WE 8.1	Water Management System		2					CD					A					
	Subtotal																	
Sites																		
SS 1.0	Site Selection	P	2						A									
SS 2.1	Enviornmentally Sensitive Land		3				PS	CD	A									
SS 3.1	Minimize Site Distrubance		1				PS	CD										
SS 4.1	Construction Site Runoff Control and Sedimentation		1					CD					A					
SS 5.1	Poste Construction Stormwater Management		1				PS	CD					A					
SS 6.1	Central location		2				PS		A									
SS 7.1	Located Near Public Transportation		1						A									
SS 8.1	Joint-Use of Facilities		1					CD	A									
SS 9.1	Human-Powered Transportation		2				PS	CD					A					
SS 10.1	Reduce Heat Islands - Landscaping and Sites		1					CD										
SS 11.1	Reduce Heat Islands - Cool Roofs and Green Walls		1					CD					A					
SS 12.1	Avoid Light Pollution and Unnecessary Lighting		2					CD					A					
SS 13.1	School Gardens		1					CD	A				A					
SS 14.1	Use Locally Native Plants for Landscape		1				PS	CD										
SS 15.0	Site and Building Best Practices	P	2				PS	CD	A									
	Subtotal																	
Materials and Waste Management																		
MW 1.0	Storage and Collection of Recyclables	P	2					CD					A					
MW 2.0	Minimum Construction Site Waste Management	P	2	2				CD					A					
MW 2.1	Construction Site Waste Management		2					CD					A					
MW 3.1	Single Attribute - Recycled Content		2					CD			PS	A						
MW 4.1	Single Attribute - Rapidly Renewable Materials		1					CD			PS	A						
MW 5.1	Single Attribute - Certified Wood		1					CD			PS	A						
MW 6.1	Single Attribute - Materials Reuse		1					CD			PS	A						
MW 7.1	Multi-Attribute Materials Selection		2				PS	CD			PS	A						
MW 8.1	Building Reuse - Exterior		2					CD			PS	A						
MW 9.1	Building Reuse - Interior		1					CD			PS	A						
MW 10.1	Health Product Related Information Reporting		1					CD			PS	A						
MW 11.1	Locally Produced Materials		2					CD			PS	A						
	Subtotal			2														
	Total		**250**	17														

AHARONIAN & ASSOCIATES INC. - ARCHITECTS

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FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island AA23018

SECTION 02 41 13
SELECTIVE DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Demolition and removal of selected portions of building elements.

B. Patching and repairs.

1.02 RELATED SECTIONS

A. Section 01 10 00 – Summary of Work: Use of the building.

B. Section 01 31 13 – Project Coordination

C. Section 01 50 00 – Temporary Facilities and Controls.

1.03 DEFINITIONS

A. REMOVE: Remove and legally dispose of items except those indicated to be reinstalled, salvaged or to remain the Owner's property.

B. REMOVE AND SALVAGE: Items indicated to be removed and salvaged remain the Owner's property. Remove, clean and pack or crate items to protect against damage. Identify contents of containers and deliver to Owner's designated storage area.

C. REMOVE AND REINSTALL: Remove items indicated; clean, service and otherwise prepare them for reuse; store and protect against damage. Reinstall items in the same locations or in locations indicated.

D. EXISTING TO REMAIN: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Architect, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

1.04 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.

1.05 QUALITY ASSURANCE

A. REGULATORY REQUIREMENTS: Comply with governing EPA/RI DEM/RI DOH notification regulations before starting selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. PRE-DEMOLITION CONFERENCE: Conduct conference at Project site to comply with pre-installation conference requirements of Section 01 31 19 - Project Meetings.

1.06 PROJECT CONDITIONS

A. Owner assumes no responsibility for actual condition of building elements to be selectively demolished.

B. Storage or sale of removed items or materials on-site will not be permitted.

1.07 SCHEDULING

A. Arrange selective demolition schedule so as not to interfere with Owner's on-site operations.

1.08 WARRANTY

A. EXISTING SPECIAL WARRANTY: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 PRODUCTS

2.01 REPAIR MATERIALS

A. Use repair materials identical to existing materials.

1. Where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually fully match existing adjacent surfaces.
2. Use materials, whose installed performance equals or surpasses that of existing materials.

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 the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Architect.

E. Survey the condition of the building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective demolition.

F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.02 PREPARATION

A. Drain, purge or otherwise remove, collect and dispose of chemicals, gases, explosives, acids, flammables or other dangerous materials before proceeding with selective demolition operations.

B. Employ a certified, licensed exterminator to treat building and to control rodents and vermin before and during selective demolition operations.

C. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks and other adjacent occupied and used facilities.

1. Do not close or obstruct adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.

D. Conduct demolition operations to prevent injury to people and damage to adjacent buildings, spaces and facilities to remain. Ensure safe passage of people around selective demolition area.

1. Protect walls, ceilings, floors and other existing finish work that are to remain and are exposed during selective demolition operations.
2. Cover and protect furniture, furnishings and equipment that have not been removed.

3.03 POLLUTION CONTROLS

A. Use water mist, temporary enclosures and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.

1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding and pollution.

B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

1. Remove debris from elevated portions of building by chute, hoist or other device that will convey debris to grade level.

C. Clean adjacent structures and improvements of dust, dirt and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.

3.04 SELECTIVE DEMOLITION

A. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete Work within limitations of governing regulations and as follows:

1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
2. Maintain adequate ventilation when using cutting torches.
3. Remove decayed, vermin-infested or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
4. Dispose of demolished items and materials promptly. On-site storage or sale of removed items is prohibited.
5. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.

B. Remove resilient floor coverings and adhesive according to recommendations of the Resilient Floor Covering Institute's (RFCI) "Recommended Work Practices for the Removal of Resilient Floor Coverings" and Addendum.

C. Remove residual adhesive and prepare substrate for new floor coverings by one of the methods recommended by RFCI.

3.05 PATCHING AND REPAIRS

A. Promptly patch and repair holes and damaged surfaces caused to adjacent construction by selective demolition operations.

B. Patching is specified in Section 01 73 29 Cutting and Patching.

C. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

1. Completely fill holes and depressions in existing masonry walls to remain with an approved masonry patching material, applied according to manufacturer's printed recommendations.

D. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction to remain in a manner that eliminates evidence of patching and refinishing.

E. Patch, repair or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

3.06 DISPOSAL OF DEMOLISHED MATERIALS

A. GENERAL: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. BURNING: Do not burn demolished materials.

C. DISPOSAL: Transport demolished materials off Owner's property and legally dispose of them.

3.07 CLEANING

A. Sweep the building broom clean on completion of selective demolition operation.

B. Change filters on air-handling equipment on completion of selective demolition operations.

END OF SECTION 02 41 13

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FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 22 07 00
PLUMBING INSULATION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Piping insulation.

B. Jackets and accessories.

1.02 RELATED WORK

A. Section 22 10 00 - Plumbing Piping.

1.03 QUALITY ASSURANCE

A. Applicator: Company specializing in piping insulation application with three years minimum experience.

B. Materials: Flame spread/fuel contributed/smoke developed rating in accordance with NFPA 255 and UL 723. Fiberglass insulation shall have flame spread rating of 25/smoke developed rating of 50; calcium silicate insulation shall have a flame spread rating of 0/smoke developed rating of 0.

PART 2 - PRODUCTS

2.01 INSULATION

A. Molded pipe insulation shall be manufactured to meet ASTM C 585 for sizes required in the particular system. It shall be of a type suitable for installation on piping systems. Molded fibrous glass pipe insulation shall comply with the requirements of ASTM C 547.

B. For indoor systems operating at temperatures from zero to +450F: Heavy density Fiberglas pipe insulation with factory applied all-service jacket (ASJ) and Doublesure two component adhesive closure system, rated for a maximum service temperature of 850F. For large pipe sizes where SSL-II is not available, the single adhesive SSL closure may be substituted. Circumferential joints shall be sealed by butt strips having a two-component sealing system. Stapling is not required to complete the closure. When self sealing lap systems are used, sufficient thickness of insulation shall be used to maintain the outer surface temperature of the operating system below +150F. Manufacturer's data regarding thickness constraints in relation to operating temperature shall be followed. When multiple layers are required, all inner layer(s) shall be unjacketed. On cold systems, vapor barrier performance is extremely important. All penetrations of the ASJ and exposed ends of insulation must be sealed with vapor barrier mastic. If humidities in excess of 90% are expected, the ASJ shall be protected with either a mastic coating or a suitable vapor retarding outer jacket. Vapor seals at butt joints shall be applied at every fourth pipe section joint and at each fitting to provide isolation of water incursion.

C. Fittings and valves shall be insulated with pre-formed fiberglass fittings, fabricated sections of Fiberglas pipe insulation, Fiberglas pipe and tank insulation, Fiberglas blanket insulation, or insulating cement. Thickness shall be equal to adjacent pipe insulation. Finish shall be with pre-formed PVC fitting covers or as otherwise specified on contract drawings. Flanges, couplings and valve bonnets shall be covered with an oversized pipe insulation section sized to provide the same insulation thickness as on the main pipe section. An oversized insulation section shall be used to form a collar between the two insulation sections with low density blanket insulation being used to fill gaps. Jacketing shall match that used on straight pipe sections. Rough cut ends shall be coated with a suitable weather or vapor resistant mastic as dictated by the system location and service. On hot systems where fittings are to be left exposed, insulation ends should be beveled away from bolts for easy access. On cold systems, particular care must be given to vapor sealing the fitting cover or finish to the pipe insulation vapor barrier. All valve stems must be sealed with caulking which allows free movement of the stem but provides a seal against moisture incursion.

D. All piping shall be supported in such a manner that neither the insulation or the vapor/weather barrier is compromised by the hanger or the effects of the hanger. In all cases, hanger spacing must be such that the circumferential joint may be made outside the hanger. On cold systems, vapor barrier must be continuous, including material covered by the hanger saddle.

E. Piping systems 3" in diameter or less, insulated with Fiberglas insulation, may be supported by placing saddles of the proper length and spacing, under the insulation.

F. Thermal expansion and contraction of the piping and insulation system can generally be taken care of by utilizing double layers of insulation and staggering both longitudinal and circumferential joints. Where long runs are encountered, expansion joints may be required where single layers of insulation are being used and should be so noted on the contract drawings.

G. On vertical runs, insulation support rings shall be used as indicated on contract drawings.

PART 3 - EXECUTION

3.01 SITE INSPECTION

A. Before starting work under this section, carefully inspect the site and installed work of other trades and verify that such work is complete to the point where installation of materials and accessories under this section can begin.

B. Verify that all materials and accessories can be installed in accordance with project drawings and specifications and material manufacturers' recommendations.

C. Verify, by inspecting product labeling, submittal data, and/or certifications which may accompany the shipments, that all materials and accessories to be installed on the project comply with applicable specifications and standards and meet specified thermal and physical properties.

3.02 PREPARATION

A. Ensure that all pipe and equipment surface over which insulation is to be installed are clean and dry.

B. Ensure that insulation is clean, dry, and in good mechanical condition with all factory applied vapor or weather barriers intact and undamaged. Wet, dirty, or damaged insulation shall not be acceptable for installation.

3.03 INSTALLATION

A. Install all insulation materials and accessories in accordance with manufacturer's published instructions and recognized industry practices to ensure that it will serve its intended purpose.

B. Install insulation on piping subsequent to installation of heat tracing, painting, testing, and acceptance tests.

C. Install insulation materials with smooth and even surfaces. Insulate each continuous run of piping with full-length units of insulation, with single cut piece to complete run. Do not use cut pieces or scraps abutting each other. Butt insulation joints firmly to ensure complete, tight fit over all piping surfaces.

D. Maintain the integrity of factory-applied vapor barrier jacketing on all pipe insulation, protecting it against puncture, tears or other damage.

E. Fittings: Cover valves, fittings, and similar items in each piping system using one of the following: Mitered sections of insulation equivalent in thickness and composition to that installed on straight pipe runs, or Insulation cement equal in thickness to the adjoining insulation, or PVC fitting covers insulated with material equal in thickness and composition to adjoining insulation.

F. Penetrations: Extend piping insulation without interruption through walls, floors, and similar piping penetrations, except where otherwise specified.

G. Joints: Butt pipe insulation against hanger inserts. For hot pipes, apply 3" wide vapor barrier tape or band over butt joints. For cold piping apply wet coat of vapor barrier lap cement on butt joints, and seal joints with 3" wide vapor barrier tape or band. All pipe insulation ends shall be tapered and sealed, regardless of service.

3.04 FIELD QUALITY ASSURANCE

A. Upon completion of all insulation work covered by this specification, visually inspect the work and verify that it has been correctly installed. This may be done while work is in progress, to assure compliance with requirements herein to cover and protect insulation materials during installation.

3.05 PROTECTION

A. Replace damaged insulation which cannot be satisfactorily repaired, including insulation with vapor barrier damage and moisture-saturated insulation.

B. The insulation contractor shall advise the general and/or the mechanical contractor as to requirements for protection of the insulation work during the remainder of the construction period, to avoid damage and deterioration of the finished insulation work.

3.06 SAFETY PRECAUTIONS

A. Insulation contractor's employees shall be properly protected during installation of all insulation. Protection shall include proper attire when handling and applying insulation materials and shall include (but not be limited to) disposable dust respirators, gloves, hard hats, and eye protection.

B. The insulation contractor shall conduct all jobsite operations in compliance with applicable provisions of the Occupational Safety and Health Act, as well as with all state and/or local safety and health codes and regulations that may apply to the work.

3.07 SCHEDULE

A. Domestic Hot and Cold Water - use the following thicknesses of insulation:

Pipe Size	Insulation Thickness
Runouts (to 1-1/4")	1 inch
1-1/2” to 4"	1-1/2 inch

B. Condensate Waste Piping, Exposed Copper Waste Piping, Exterior Gas Piping, Piping Concealed Within Concrete Block Walls or Buried Within Floor Slab - use 1/2-inch-thick insulation for all pipe sizes.

END OF SECTION 22 07 00

FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 22 10 00
PLUMBING PIPING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Pipe and pipe fittings.

B. Valves.

C. Domestic water piping system.

D. Natural gas piping system.

1.02 RELATED WORK

A. Section 22 07 00 - Piping Insulation.

B. Section 22 40 00 - Plumbing Fixtures.

1.03 QUALITY ASSURANCE

A. Valves: Manufacturer's name and pressure rating marked on valve body. All valves shall be totally lead-free.

B. Fittings: All domestic water piping fittings shall be totally lead-free.

C. Welding Materials and Procedures: Conform to ASME Code and applicable state labor regulations.

D. Welders Certification: In accordance with ANSI/ASME Sec 9.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site.

B. Store and protect products.

C. Deliver and store valves in shipping containers with labelling in place.

PART 2 PRODUCTS

2.01 WATER PIPING AND CONDENSATE WASTE PIPING, ABOVE GRADE

A. Copper Tubing: ASTM B88, Type L, hard drawn. Fittings: ANSI/ASME B16.29, wrought copper. Joints: Use lead-free solder on all joints.

B. Copper Tubing: ASTM B88, Type K, hard drawn. Fittings; ANSI/ASME B16.29, wrought copper. Joints: Use

lead-free solder on all joints. Use one-piece Type K copper for water piping installed within concrete block walls.

C. PVC Pipe: ASTM D2729, Schedule 40. Fittings: PVC. Joints: ASTM D2855, solvent weld. May be used only for condensate waste piping, if approved by local authority having jurisdiction.

D. CPVC Pipe and Fittings: Schedule 40 / Schedule 80 pipe and fittings shall be manufactured from a Type IV, Grade I Chlorinated Polyvinyl Chloride (CPVC) compound with a Cell Classification of 23447 per ASTM D1784. The pipe shall be manufactured in strict compliance to ASTM F441, consistently meeting the quality assurance test requirements of this standard with regard to material, workmanship, burst pressure, flattening, and extrusion quality. The pipe shall be produced in the USA using domestic materials, by an ISO 9001 certified manufacturer, and shall be stored indoors after production, at the manufacturing site, until shipped from factory. This pipe shall carry the National Sanitation Foundation (NSF) seal of approval for potable water applications.

2.02 NATURAL GAS PIPING, ABOVE GRADE

A. Steel Pipe: ASTM A53 or A120, Schedule 40 black. Fittings: ANSI/ASME B16.3, malleable iron, or ASTM A234, forged steel welding type. Joints: Screwed for pipe two inches and under; ANSI/AWS D1.1, welded, for pipe over two inches.

2.03 FLANGES, UNIONS, AND COUPLINGS

A. Pipe Size 2 Inches and Under: 150 psig malleable iron unions for threaded ferrous piping; lead-free bronze unions for copper pipe, soldered joints.

B. Pipe Size Over 2 Inches: 150 psig forged steel slip-on flanges for ferrous piping; lead-free bronze flanges for copper piping; neoprene gaskets for gas service; 1/16 inch thick preformed neoprene bonded to asbestos.

C. Grooved and Shouldered Pipe End Couplings: Malleable iron housing clamps to engage and lock, designed to permit some angular deflection, contraction, and expansion; "C" shape composition sealing gasket; steel bolts, nuts, and washers; galvanized couplings for galvanized pipe.

D. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.04 GLOBE VALVES

A. Up to 2 Inches: Bronze body, bronze trim, rising stem and handwheel, inside screw, renewable composition disc, solder or screwed ends, with backseating capacity.

B. Over 2 Inches: Iron body, bronze trim, rising stem, handwheel, OS&Y, plug-type disc, flanged ends, renewable seat and disc.

2.05 BALL VALVES

A. Up to 2 Inches: Bronze one piece body, stainless steel ball, teflon seats and stuffing box ring, lever handle, and balancing stops where required or shown on drawings, solder or threaded ends.

B. Over 2 Inches: Cast steel body, chrome plated steel ball, teflon seat and stuffing box seals, lever handle, flanged.

2.06 PLUG COCKS (GAS COCKS)

A. Up to 2 Inches: Bronze body, bronze tapered plug, non-lubricated, teflon packing, threaded ends, with one wrench operator for every ten plug cocks.

B. Over 2 Inches: Cast iron body and plug, pressure lubricated, teflon packing, flanged ends, with wrench operator with set screw.

2.07 SWING CHECK VALVES

A. Up to 2 Inches: Bronze 45-degree swing disc, solder or screwed ends.

B. Over 2 Inches: Iron body, bronze trim, 45-degree swing disc, renewable disc and seat, flanged ends.

2.08 RELIEF VALVES

A. Bronze body, teflon seat, steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labelled.

PART 3 EXECUTION

3.01 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale, oil and dirt, on inside and outside, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION

A. Provide non-conducting dielectric connections wherever jointing dissimilar metals.

B. Route piping in orderly manner and maintain gradient.

C. Install piping to conserve building space and not interfere with use of space.

D. Group piping whenever practical at common elevations.

E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

F. Provide clearance for installation of insulation and access to valves and fittings.

G. Provide access where valves and fittings are not exposed.

H. Slope water piping and arrange to drain at low points.

I. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

J. Prepare pipe, fittings, supports, and accessories not prefinished, ready for finish painting.

K. Install valves with stems upright or horizontal, not inverted.

L. Provide one plug cock wrench for every ten plug cocks sized 2 inches and smaller, minimum of one. Provide each plug cock sized 2-1/2 inches and larger with a wrench with set screw.

M. Use lead-free solder and flux for all domestic hot and cold water piping joint connections.

N. Use Type K, one-piece copper piping insulated with 1/2 inch thick flexible closed-cell polyethylene insulation for all water piping which is installed within concrete block walls or buried within the floor slab.

O. Install condensate waste piping from equipment waste connection to outdoors or nearest indirect waste connection, with P-trap at outlet connection on each piece of equipment. Condensate waste piping, with P-traps, shall be provided and installed for all air conditioning equipment with cooling coils, and wherever else required or indicated. Provide cleanouts in condensate waste piping system at all changes in direction greater than 45

degrees and not more than 50 feet apart on horizontal runs of condensate waste piping. Contractor shall be responsible for so locating required cleanouts, although cleanouts have not been explicitly identified on the Drawings due to space limitations.

P. Install all piping at elevations indicated on Project Drawings. Where no elevations are indicated, install piping as high as possible.

3.03 APPLICATION

A. Use mechanical couplings and fasteners only in accessible locations. Provide adequate clearances for service.

B. Install unions downstream of valves and at equipment or apparatus connections.

C. Install lead-free bronze male adapters each side of valves in copper piped system. Sweat solder adapters to pipe.

D. Install gate or ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.

E. Install globe or ball valves for throttling, bypass, or manual flow control services.

F. Provide spring loaded check valves on discharge of water pumps.

3.04 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Prior to starting work, verify system is complete, flushed and clean.

B. Ensure PH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).

C. The complete piping system, or parts thereof, shall be filled with a water/chlorine solution containing at least 50 mg/l (ppm) of chlorine, and then the piping system, or parts thereof, shall be valved off and allowed to stand for 24 hours.

D. Bleed water from outlets and flush system with clean potable water until chlorine does not remain in the water coming from the system.

E. Take samples no sooner than 24 hours after flushing from 5 percent of outlets and from water entry, and analyze in accordance with methods prescribed by the health authority having jurisdiction. Repeat the entire procedure if it is shown by a bacteriological examination made by the testing authority that contamination is still present in the system.

3.05 SERVICE CONNECTIONS

A. Connect new to existing natural gas service.

B. Connect new to existing water service piping.

END OF SECTION 22 10 00

FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 22 30 00
PLUMBING EQUIPMENT

PART 1 GENERAL

1.01 WORK INCLUDED

A. Water heaters.

1.02 QUALITY ASSURANCE

A. Ensure products and installation of specified products are in conformance with recommendations and requirements of the following organizations:

1. National Sanitation Foundation (NSF).
2. American Society of Mechanical Engineers (ASME).
3. National Board of Boiler and Pressure Vessel Inspectors (NBBPVI).
4. National Electrical Manufacturers' Association (NEMA).
5. Underwriters Laboratories (UL).

1.03 REGULATORY REQUIREMENTS

A. Conform to UL 174 requirements for water heaters.

B. Conform to ANSI/ASME Section 8D for manufacture of pressure vessels for heat exchangers.

C. Conform to ANSI/NFPA 30 for tanks.

1.04 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Division 1 Specifications.

B. Include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Division 1 Specifications.

B. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

1.06 WARRANTY

A. Provide one year manufacturer's warranty.

B. Warranty: Include coverage of domestic water heaters.

PART 2 PRODUCTS

2.01 COMMERCIAL ELECTRIC WATER HEATERS

A. Automatic, vertical storage type, 150 psig maximum working pressure. Capacities and ratings shall be as indicated on the Project Drawings, or as noted below:

B. Glass lined welded steel tank, with tank inspection port, thermally insulated with rigid polyurethane foam insulation, encased in corrosion-resistant steel jacket; baked-on enamel finish; floor shield and legs.

C. Surface-mounted thermostat, brass water connections, drain valve, high-density magnesium anode, and ASME rated temperature and pressure relief valve.

D. Unit approved by UL as automatic storage water heater.

E. Automatic direct immersion thermostat with adjustable temperature range, minimum 175 degrees F differential, integral manual reset high temperature limiting thermostat, factory set at 205 degrees F.

PART 3 EXECUTION

3.01 WATER HEATER INSTALLATION

A. Install water heaters in accordance with manufacturer's instructions and to UL requirements.

B. Coordinate with plumbing piping and related electrical work to achieve operating system.

C. Install storage tanks in accordance with manufacturer's instructions.

D. Provide angle legs or skirt support for tanks independent of building structural framing members.

E. Clean and flush tank after installation. Seal until pipe connections are made.

F. Apply insulation as close as possible to storage tank by grooving, scoring, and beveling insulation, if necessary. Secure insulation to tank with studs, pins, clips, adhesive, wires, or bands. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. Cover insulation with metal mesh and finish with heavy coat of insulating cement. Do not insulate over nameplate or ASME stamps. Bevel and seal insulation around such.

G. Contractor shall provide all control devices and wiring, as required, to put each water heater in proper operational mode.

END OF SECTION 23 30 00

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FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 23 03 00
BASIC MECHANICAL REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Basic Mechanical Requirements specifically applicable to Division 23 Sections, in addition to Division 1 - General Requirements.

1.02 WORK SEQUENCE

A. Install work in phases to accommodate Owner's occupancy requirements during the construction period. Coordinate mechanical schedule and operations with Architect/Engineer.

1.03 ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at the Owner's option. Accepted Alternates will be identified in Owner-Contractor Agreement.

B. Coordinate related work and modify surrounding work as required.

C. Schedule of Alternates - see Division 1 Specifications.

1.04 SUBMITTALS

A. Submit under provisions of Division 1 Specifications. Provide submittals, including specifications, design data, and calculations (as required) for all equipment and materials relating to Division 23 Specifications which are proposed for use on the project. No work will be allowed to proceed until the Architect/Engineer's submittal review is completed.

B. Submit shop drawings and product data grouped to include complete submittals of related systems, products, and accessories in a single submittal.

C. Mark dimensions and values in units to match those specified.

D. Products which are submitted for use on the Project must be equal in quality, performance and serviceability to the products as shown on the Project Drawings and Specifications, including any accessories as noted or specified. It shall be the mechanical contractor's responsibility to verify product equality to the Architect/Engineer's satisfaction before substitution of products will be allowed. If requested, the contractor shall furnish samples of any submitted equipment and materials for general inspection to check for conformity with the requirements of the Specifications.

E. Where the contractor proposes to use items and equipment other than those specified and/or detailed on the Project Drawings, which may require any redesign of the structure, partitions, foundation, piping, wiring, or any other parts of the mechanical, electrical, and/or architectural layouts, all such required redesign, including new drawings and detailing necessary, shall be prepared by the contractor at the contractor's expense, and shall be approved by the Architect/Engineer.

F. The mechanical contractor shall prepare and submit As-Built drawings of all systems and equipment at the completion of all systems installation. These drawings shall be provided to the Architect/Engineer for review and approval. Any deviations from the original Project Drawings shall be so noted.

G. If requested, the mechanical contractor shall submit a schedule of values, reflecting reasonable and true line-item costs, to the Architect/Engineer as part of the Project records. This schedule of values will be submitted prior to the start of construction.

1.05 REGULATORY REQUIREMENTS

A. Obtain permits, and request inspections from authorities having jurisdiction. All permits, inclusive of their associated costs, are the responsibility of the contractor who performs the related work. The contractor shall verify availability of utility services, including water and natural gas pressures required, invert elevations for connection to sanitary waste systems, etc., and obtain authorization and approval from the respective utility for connections as required for this Project. Any fees required by the respective utilities for installation and connection to these services shall be the responsibility of the contractor. Satisfactory proof of final inspection and approval by all authorities having jurisdiction shall be presented to the Architect/Engineer before work is accepted.

B. All materials and equipment shall be designed, constructed, installed and tested in strict accordance with these specifications and the latest editions of all of the following applicable standards:

Rhode Island State Building Code	RISBC
National Environmental System Contractors Assoc.	NESCA
American Society of Mechanical Engineers	ASME
American Society of Testing Materials	ASTM
National Electric Code	NEC
National Fire Code	NFC
National Fire Protection Association	NFPA
Underwriters Laboratories, Inc.	UL
National Electrical Manufacturers Association	NEMA
Occupational Health and Safety Act	OSHA
Air Conditioning and Refrigeration Inst.	ARI
Air Moving and Conditioning Association	AMCA
American Society of Heating, Refrigeration and Air Conditioning Engineers	ASHRAE
Environmental Protection Agency	EPA
Building Officials Conference of America	BOCA
Federal Construction Safety Standards	FCSS
American Gas Association	AGA
Sheet Metal and Air Conditioning Contractors National Association	SMACNA
All applicable local ordinances and codes	

C. The above listed codes and standards shall be followed as minimum requirements and shall not relieve the mechanical contractor from any additional requirements as indicated on the Project Drawings or as herein specified. Where provisions of pertinent codes and standards conflict with Division 23 Specifications, the more stringent provisions shall govern and shall be conformed to.

D. Any materials or workmanship called for in the above referenced requirements not specified or shown on the Drawings shall be furnished and installed by the contractor as though same had been specifically indicated or mentioned. Any work installed in conflict with these requirements shall become the sole responsibility of the contractor, who shall assume the expense to rectify the installation to the Architect/Engineer's satisfaction.

E. The contractor shall notify the Architect/Engineer of any deviations from the above referenced requirements pertaining to work indicated or specified before the installation of this work is affected.

F. The contractor is strongly urged to visit jobsite and review existing conditions which may affect contractor's work, prior to submission of bid. Contractor shall be advised that no extra compensation will be provided for any additional work required to be done to provide complete functional systems if a site review would have identified the necessity for the additional work. This condition will be strictly conformed to, even if all

required work is not explicitly indicated on the Project Drawings.

1.06 PROJECT/SITE CONDITIONS

A. Install Work in locations shown on Drawings, unless prevented by Project conditions. As the drawings are diagrammatic and approximate, unless fixed by dimensions, actual field conditions shall govern the exact location of ductwork and piping installation locations. Do not scale Drawings for exact locations. Maintain all required clearances from and around all new and existing mechanical and electrical equipment and apparatus, as noted in equipment or apparatus manufacturer's installation requirements or applicable standards and codes.

B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Architect/Engineer before proceeding. No additional compensation will be allowed for these changes as required by Project conditions.

C. It shall be the contractor's responsibility to review all Project Drawings which may affect the location of any equipment and apparatus installation locations and/or permit full coordination of work with other trades. The right to make any reasonable change in location of apparatus and equipment up to the time of rough-in is reserved by the Architect/Engineer. Such changes shall be made without additional expense to the Owner.

1.07 SEQUENCING AND SCHEDULING

A. Construct Work in sequence under provisions of Division 1 Specifications.

1.08 TESTING, ADJUSTING AND BALANCING

A. The general contractor shall be responsible for providing the services of an AABC or NEBB certified testing, adjusting and balancing firm. This balancing firm shall be responsible for testing, adjusting and balancing all systems and equipment to the satisfaction of the Architect/Engineer. This work shall be performed by a firm that is not directly or indirectly employed by the mechanical contractor.

B. All required tests shall be made in the presence of the Architect/Engineer, or their representatives.

1.09 SPECIFIC REQUIREMENTS

A. Only the latest editions and revisions of standards and codes referenced in Division 23 Specifications shall apply to the work.

B. The Specifications and Project Drawings are complementary, one to the other. Any items mentioned or called for by one shall be considered as being indicated in both the Specifications and the Project Drawings.

C. The contractor shall provide all labor, materials, tools and equipment required for complete and satisfactory installation.

D. All materials and equipment shall be delivered to the job site wrapped in protective covering, and shall be stored in a clean, dry location free from dust and water, in such a manner to permit easy access for inspection and handling. Damaged items shall be replaced at no additional cost to the Owner. Any items subject to moisture or condensation shall be completely replaced at no additional cost to the Owner.

E. The mechanical contractor shall be responsible for providing starters and disconnects for all equipment specified under Division 15 Specifications, unless explicitly stated otherwise. Starters shall be Cutler Hammer or equal with push buttons, HAND-OFF-AUTO switches, overload and low voltage protection, and auxiliary contacts as required by operational sequences. Starters for three-phase motors shall be magnetic type, unless stated otherwise. When automatic or interlocking control of single-phase motors is required, provide with magnetic starters. Starters for two-speed motors shall be two-speed consequent pole type, with decelerating time delay relay for 30 second delay when switching from high to low speed. Manually controlled single-phase motors shall be provided with two-pole manual thermal switch. Starters and disconnects for outdoor use shall be of weatherproof type (NEMA Type 3R).

1.10 DEFINITIONS

A. "Contractor" means specifically sub-contractor working under his respective section of specifications.

B. "Furnish" and/or "Provide" means to supply, erect, install and connect up complete in readiness for regular operation, particular work referred to, unless otherwise specified.

C. "Piping" includes in addition to pipe, all fittings, valves, hangers and other accessories relating to such piping.

D. "Ductwork" includes in addition to pipe, all fittings, valves, hangers and other accessories relating to such piping.

E. "Concealed" means hidden from view, in chases, walls or underground.

F. "Exposed" means not installed underground or concealed as defined above.

G. "Supply" means purchase and delivery of material to the site.

H. "Install" means to erect in place the supplied item.

1.11 GUARANTEE

A. The mechanical contractor shall guarantee, in writing, the quality of all materials, equipment and workmanship furnished and installed by the mechanical contractor for a period of one year from the date of final acceptance of this installation by the Owner, and shall replace any defective apparatus, material and equipment at the mechanical contractor's expense. This guarantee shall be endorsed and shall be submitted to the Owner by the General Contractor.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 23 03 00

FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 23 05 93
TESTING, ADJUSTING AND BALANCING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Testing, adjustment, and balancing of hydronic systems.

B. Measurement of final operating condition of HVAC systems.

1.02 REFERENCES

A. AABC - National Standards for Field Measurement and Instrumentation, Total System Balance.

B. ASHRAE - 1984 Systems Handbook: Chapter 37, Testing, Adjusting and Balancing.

C. NEBB - Procedural Standards for Testing, Balancing and Adjusting of Environmental Systems.

1.03 SUBMITTALS

A. Submit name of adjusting and balancing agency for approval within 30 days after award of Contract.

B. Submit test reports as a submittal under provisions of Division 1 Specifications.

C. Prior to commencing work, submit draft reports indicating adjusting, balancing, and equipment data required.

D. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Architect/Engineer and for inclusion in operating and maintenance manuals.

E. Provide reports in soft cover, letter size, 3-ring binder manuals, complete with index page and indexing tabs, with cover identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets and indicating thermostat locations.

F. Include detailed procedures, agenda, sample report forms prior to commencing system balance.

1.04 REPORT FORMS

A. Submit reports on AABC National Standards for Total System Balance forms.

B. Forms shall include the following information:
1. Title Page:
   a. Company name
   b. Company address
   c. Company telephone number
   d. Project name
   e. Project location
   f. Project Architect
   g. Project Engineer

h. Project Contractor
i. Project altitude

2. Instrument List:
   a. Instrument
   b. Manufacturer
   c. Model
   d. Serial number
   e. Range
   f. Calibration date

3. Electric Motors:
   a. Manufacturer
   b. HP/BHP
   c. Phase, voltage, amperage; nameplate, actual, no load.
   d. RPM
   e. Service factor
   f. Starter size, rating, heater elements

4. Pump Data:
   a. Identification/number
   b. Manufacturer
   c. Size/model
   d. Impeller
   e. Service
   f. Design flow rate, pressure drop, BHP
   g. Actual flow rate, pressure drop, BHP
   h. Discharge pressure
   i. Suction pressure
   j. Total operating head pressure
   k. Shut off, discharge and suction pressures
   l. Shut off, total head pressure

1.05 PROJECT RECORD DOCUMENTS

A. Submit record documents under provisions of Division 1 Specifications.

B. Accurately record actual locations of balancing valves and rough setting.

1.06 QUALITY ASSURANCE

A. Agency shall be company specializing in the adjusting and balancing of systems specified in this Section with minimum three years documented experience certified by AABC or NEBB. Perform Work under supervision of Certified Test and Balance Engineer.

B. Total system balance shall be performed in accordance with AABC National Standards for Field Measurement and Instrumentation, Total System Balance.

1.07 SEQUENCING AND SCHEDULING

A. Sequence work to commence after completion of systems and schedule completion of work before Substantial Completion of Project.

1.08 PRE-INSTALLATION CONFERENCE

A. Convene a conference one week prior to commencing work of this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 EXAMINATION

A. Before commencing work, verify that systems are complete and operable.

B. Report any defects or deficiencies noted during performance of services to Architect/Engineer.

C. Promptly report abnormal conditions in mechanical systems or conditions which prevent system balance.

D. If, for design reasons, system cannot be properly balanced, report as soon as observed.

E. Beginning of work means acceptance of existing conditions.

3.02 PREPARATION

A. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to Architect/Engineer to facilitate spot checks during testing.

B. Provide additional balancing devices as required.

3.03 INSTALLATION TOLERANCES

A. Adjust hydronic systems to plus or minus 10 percent of design conditions indicated.

3.04 ADJUSTING

A. Recorded data shall represent actually measured or observed condition.

B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.

C. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.

D. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

E. Check and adjust systems approximately six months after final acceptance and submit report.

3.05 WATER SYSTEM PROCEDURE

A. Adjust water systems to provide required or design quantities.

B. Use calibrated Venturi tubes, orifices, or other metered fittings and pressure gages to determine flow rates for system balance. Where flow metering devices are not installed, base flow balance on temperature difference across various heat transfer elements in the system.

C. Adjust systems to provide specified pressure drops and flows through heat transfer elements prior to thermal testing. Perform balancing by measurement of temperature differential in conjunction with air balancing.

D. Effect system balance with automatic control valves fully open to heat transfer elements.

E. Effect adjustment of water distribution systems by means of balancing cocks, valves, and fittings. Do not use service or shut-off valves for balancing unless indexed for balance point.

F. Where available pump capacity is less than total flow requirements or individual system parts, full flow in one part may be simulated by temporary restriction of flow to other parts.

END OF SECTION 23 05 93

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SECTION 23 07 19
PIPING AND EQUIPMENT INSULATION

PART 1 GENERAL

1.01 WORK INCLUDED

A. Piping and equipment insulation.

B. Jackets and accessories.

1.02 RELATED WORK

A. Section 23 21 13 - Hydronic Piping.

B. Section 23 51 00 – Breeching, Chimneys and Stacks

1.03 QUALITY ASSURANCE

A. Applicator: Company specializing in piping insulation application with three years minimum experience.

B. Materials: Flame spread/fuel contributed/smoke developed rating in accordance with NFPA 255 and UL 723. Fiberglass insulation shall have flame spread rating of 25/smoke developed rating of 50; calcium silicate insulation shall have a flame spread rating of 0/smoke developed rating of 0.

PART 2 PRODUCTS

2.01 PIPING INSULATION

A. Molded pipe insulation shall be manufactured to meet ASTM C 585 for sizes required in the particular system. It shall be of a type suitable for installation on piping systems. Molded fibrous glass pipe insulation shall comply with the requirements of ASTM C 547.

B. For indoor systems operating at temperatures from zero to +450F: Heavy density Fiberglas pipe insulation with factory applied all-service jacket (ASJ) and Doublesure two component adhesive closure system, rated for a maximum service temperature of 850F. For large pipe sizes where SSL-II is not available, the single adhesive SSL closure may be substituted. Circumferential joints shall be sealed by butt strips having a two-component sealing system. Stapling is not required to complete the closure. When self sealing lap systems are used, sufficient thickness of insulation shall be used to maintain the outer surface temperature of the operating system below +150F. Manufacturer's data regarding thickness constraints in relation to operating temperature shall be followed. When multiple layers are required, all inner layer(s) shall be unjacketed. On cold systems, vapor barrier performance is extremely important. All penetrations of the ASJ and exposed ends of insulation must be sealed with vapor barrier mastic. If humidities in excess of 90% are expected, the ASJ shall be protected with either a mastic coating or a suitable vapor retarding outer jacket. Vapor seals at butt joints shall be applied at every fourth pipe section joint and at each fitting to provide isolation of water incursion.

C. Fittings and valves shall be insulated with pre-formed fiberglass fittings, fabricated sections of Fiberglas pipe insulation, Fiberglas pipe and tank insulation, Fiberglas blanket insulation, or insulating cement. Thickness shall be equal to adjacent pipe insulation. Finish shall be with pre-formed PVC fitting covers or as otherwise specified on contract drawings. Flanges, couplings and valve bonnets shall be covered with an oversized pipe insulation section sized to provide the same insulation thickness as on the main pipe section. An oversized insulation section shall be used to form a collar between the two insulation sections with low density blanket insulation being used to fill gaps. Jacketing shall match that used on straight pipe sections. Rough cut ends shall be coated with a suitable weather or vapor resistant mastic as dictated by the system location and service. On hot systems where fittings are to be left exposed, insulation ends should be beveled away from bolts for easy access. On cold systems, particular care must be given to vapor sealing the fitting cover or finish to the pipe insulation vapor barrier. All valve stems must be sealed with caulking which allows free movement of the stem but provides a seal against moisture incursion.

D. Piping located outdoors and exposed to the weather shall be insulated as indicated above except the thickness shall be determined according to the worst weather extremes expected. The insulation shall then be protected with one of the following weatherproof finishes as indicated on contract drawings:

1. Metal jacketing shall be 0.016" (0.6 mm) minimum aluminum or stainless steel with moisture barrier, secured in accordance with the jacket manufacturer's recommendations. Longitudinal joints shall be applied so they will shed water and shall be sealed completely. Circumferential joints shall be closed using preformed butt strips following manufacturer's recommendations for securement.

2. UV resistant PVC jacketing may be applied in lieu of metal jacketing provided jacketing manufacturer's limitations regarding pipe size, surface temperature and thermal expansion and contraction are followed.

3. Fittings shall be insulated as prescribed above, jacketed with preformed fitting covers matching outer jacketing used on straight pipe sections, with all joints weather sealed.

4. On outdoor chilled water and refrigerant lines, the insulation system shall be completely vapor sealed before the weather-resistant jacket is applied. The outer jacket shall not compromise the vapor barrier by penetration of fasteners, etc. Vapor stops at butt joints shall be applied at every fourth pipe section joint and at each fitting to provide isolation of water incursion.

E. All piping shall be supported in such a manner that neither the insulation or the vapor/weather barrier is compromised by the hanger or the effects of the hanger. In all cases, hanger spacing must be such that the circumferential joint may be made outside the hanger. On cold systems, vapor barrier must be continuous, including material covered by the hanger saddle.

F. Piping systems 3" in diameter or less, insulated with Fiberglas insulation, may be supported by placing saddles of the proper length and spacing, under the insulation.

G. Thermal expansion and contraction of the piping and insulation system can generally be taken care of by utilizing double layers of insulation and staggering both longitudinal and circumferential joints. Where long runs are encountered, expansion joints may be required where single layers of insulation are being used and should be so noted on the contract drawings.

H. On vertical runs, insulation support rings shall be used as indicated on contract drawings.

2.02 EQUIPMENT INSULATION

A. Vessels, tanks, and equipment operating at temperatures up to 450F shall be insulated with glass fiber or calcium silicate insulation selected to conform readily to the surface to which it will be applied. For temperatures over +400F, insulation shall be applied in double layers, staggering the joints of both the insulation and the lagging (if used) wherever practical. Observe manufacturer recommendations on maximum temperature/thickness combinations. Outdoor installations require weather protection of insulation jacketing. Insulation may be one of the following types, depending on project requirements:

1. Small diameter tanks and vessels with diameters less than 30" in diameter may be insulated with any of the following, depending on the service class required:

    a. Heavy density Fiberglas pipe insulation, 2" thick, with factory applied all-service jacket (ASJ) and Doublesure two-component adhesive closure system, rated for a maximum service temperature of 850F. For large pipe sizes where SSL-II is not available, the single adhesive SSL closure may be substituted.

    b. Unjacketed Fiberglas heavy density pipe insulation, 2" thick, rated for maximum operating temperature of 850F may be installed using appropriate banding and then covered with metal or PVC jacketing or otherwise jacketed and/or finished in accordance with details shown.

    c. Fiberglas pipe and tank insulation, heavy density fiber glass insulation, 3" thick, with end-grain factory applied to ASJ all-service jacket, for systems operating at temperatures to +650F and where moderate abuse resistance is required.

    d. Calcium Silicate, rigid hydrous asbestos-free calcium silicate insulation, 3" thick, for systems operating at temperatures from +300F to +1200F, where the equipment is expected to be exposed to impact or abuse. The insulation shall be protected from the effects of weather, water, moisture, or mechanical and chemical abuse with either metal or PVC jacketing.

2. Breeching and stacks with diameters less than 30" in diameter shall be insulated with the following:

    a. Calcium Silicate, rigid hydrous asbestos-free calcium silicate insulation, 3" thick, for systems operating at temperatures from +300F to +1200F, where the equipment is expected to be exposed to impact or abuse. The insulation shall be protected from the effects of weather, water, moisture, or mechanical and chemical abuse with metal or PVC jacketing.

3. If required, boards shall be scored to allow them to conform to curved or irregular surfaces.

4. Mechanical fasteners shall be utilized to hold insulation to surface with bands as required to hold the curvature of the material.

5. Support rings shall be provided to support the top head insulation where required.

6. Outdoor installations require a weather barrier for protection of the insulation jacketing.

PART 3 EXECUTION

3.01 SITE INSPECTION

A. Before starting work under this section, carefully inspect the site and installed work of other trades and verify that such work is complete to the point where installation of materials and accessories under this section can begin.

B. Verify that all materials and accessories can be installed in accordance with project drawings and specifications and material manufacturers' recommendations.

C. Verify, by inspecting product labeling, submittal data, and/or certifications which may accompany the shipments, that all materials and accessories to be installed on the project comply with applicable specifications and standards and meet specified thermal and physical properties.

3.02 PREPARATION

A. Ensure that all pipe and equipment surface over which insulation is to be installed are clean and dry.

B. Ensure that insulation is clean, dry, and in good mechanical condition with all factory-applied vapor or weather barriers intact and undamaged. Wet, dirty, or damaged insulation shall not be acceptable for installation.

C. Ensure that pressure testing of piping or duct systems has been completed prior to installing insulation.

3.03 INSTALLATION

A. Install all insulation materials and accessories in accordance with manufacturer's published instructions and recognized industry practices to ensure that it will serve its intended purpose.

B. Install insulation on piping subsequent to installation of heat tracing, painting, testing, and acceptance tests.

C. Install insulation materials with smooth and even surfaces. Insulate each continuous run of piping with full-length units of insulation, with single cut piece to complete run. Do not use cut pieces or scraps abutting each other. Butt insulation joints firmly to ensure complete, tight fit over all piping surfaces.

D. Maintain the integrity of factory-applied vapor barrier jacketing on all pipe insulation, protecting it against puncture, tears or other damage.

E. Fittings: Cover valves, fittings, and similar items in each piping system using one of the following: Mitered sections of insulation equivalent in thickness and composition to that installed on straight pipe runs, or Insulation cement equal in thickness to the adjoining insulation, or PVC fitting covers insulated with material equal in thickness and composition to adjoining insulation.

F. Penetrations: Extend piping insulation without interruption through walls, floors, and similar piping penetrations, except where otherwise specified.

G. Joints: Butt pipe insulation against hanger inserts. For hot pipes, apply 3" wide vapor barrier tape or band over butt joints. For cold piping apply wet coat of vapor barrier lap cement on butt joints, and seal joints with 3" wide vapor barrier tape or band. All pipe insulation ends shall be tapered and sealed, regardless of service.

H. Vertical Piping: All insulated, exposed vertical piping within the building and all insulated piping exposed to the outdoors shall be additionally jacketed with 0.016" thick (minimum) aluminum. Vertical piping shall be protected to a height of 8'-0" above the floor.

3.04 FIELD QUALITY ASSURANCE

A. Upon completion of all insulation work covered by this specification, visually inspect the work and verify that it has been correctly installed. This may be done while work is in progress, to assure compliance with requirements herein to cover and protect insulation materials during installation.

3.05 PROTECTION

A. Replace damaged insulation which cannot be satisfactorily repaired, including insulation with vapor barrier damage and moisture-saturated insulation.

B. The insulation contractor shall advise the general and/or the mechanical contractor as to requirements for protection of the insulation work during the remainder of the construction period, to avoid damage and deterioration of the finished insulation work.

3.06 SAFETY PRECAUTIONS

A. Insulation contractor's employees shall be properly protected during installation of all insulation. Protection shall include proper attire when handling and applying insulation materials and shall include (but not be limited to) disposable dust respirators, gloves, hard hats, and eye protection.

B. The insulation contractor shall conduct all jobsite operations in compliance with applicable provisions of the Occupational Safety and Health Act, as well as with all state and/or local safety and health codes and regulations that may apply to the work.

3.07 PIPING INSULATION SCHEDULE

A. Heating Hot Water and Dual-Temperature Piping - use the following thicknesses of insulation:

Pipe Size	Insulation Thickness
Up to 1-1/4”	1-1/2 inch
1-1/2" to 8"	2 inch

B. Condensate Waste Piping, Refrigerant Suction and Hot Gas Piping, Piping Concealed Within Concrete Block Walls or Buried Within Floor Slab - use 1/2-inch-thick insulation for all pipe sizes.

3.08 EQUIPMENT INSULATION SCHEDULE

Equipment	Insulation Thickness
Flue Gas Breeching	3 inch
Stacks	3 inch
Boiler and Flue Boxes	2 inch

END OF SECTION 23 07 19

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SECTION 23 21 13
HYDRONIC PIPING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Pipe and pipe fittings.

B. Valves.

C. Heating water and dual-temperature piping system.

1.02 RELATED WORK

A. Section 23 07 19 - Piping Insulation.

B. Section 23 21 14 - Hydronic Specialties.

1.03 REGULATORY REQUIREMENTS

A. Conform to ANSI/ASME B31.9.

1.04 QUALITY ASSURANCE

A. Valves: Manufacturer's name and pressure rating marked on valve body.

B. Welding Materials and Procedures: Conform to ANSI/ASME SEC 9 and applicable state labor regulations.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Division 1 Specifications.

B. Store and protect products.

C. Deliver and store valves in shipping containers with labelling in place.

PART 2 PRODUCTS

2.01 HEATING WATER AND DUAL-TEMPERATURE PIPING, ABOVE GROUND

A. Steel Pipe: ASTM A53 or A120, Schedule 40, 0.375-inch wall for sizes 12 inch and over, black.
   1. Fittings: ANSI/ASTM B16.3, malleable iron or ASTM A234, forged steel welding type fittings.
   2. Joints: Screwed, or ANSI/AWS D1.1, welded.

B. Copper Tubing: ASTM B88, Type L, hard drawn.
   1. Fittings: ANSI/ASME B16.23 cast brass of ANSI/ASME B16.29 solder wrought copper.
   2. Joints: ASTM B32, solder.

2.02 EQUIPMENT DRAINS AND OVERFLOWS

A. Steel Pipe: ASTM A53 or A120, Schedule 40 galvanized.
   1. Fittings: Galvanized cast iron, or ANSI/ASTM B16.3 malleable iron.
   2. Joints: Screwed or grooved mechanical couplings.

B. Copper Tubing: ASTM B88, Type L, hard drawn.
   1. Fittings: ANSI/ASME B16.23 cast brass, or ANSI/ASME B16.29 solder wrought copper.
   2. Joints: ASTM B32, solder.

2.03 FLANGES, UNIONS, AND COUPLINGS

A. Pipe Size 2 Inches and Under: 150 psig malleable iron unions for threaded ferrous piping; bronze unions for copper pipe, soldered joints.

B. Pipe Size Over 2 Inches: 150 psig forged steel slip-on flanges for ferrous piping; bronze flanges for copper piping; 1/16-inch-thick preformed neoprene bonded to asbestos.

C. Grooved and Shouldered Pipe End Couplings: Malleable iron housing clamps to engage and lock, designed to permit some angular deflection, contraction, and expansion; C-shape elastomer composition sealing gasket for operating temperature range from -30 degrees F to 230 degrees F; steel bolts, nuts, and washers; galvanized couplings for galvanized pipe.

2.04 GLOBE VALVES

A. Up to 2 Inches: Bronze body, bronze trim, rising stem and handwheel, inside screw, renewable composition disc, solder or screwed ends, with backseating capacity.

B. Over 2 Inches: Iron body, bronze trim, rising stem, handwheel, OS&Y, plug-type disc, flanged ends, renewable seat and disc.

2.05 BALL VALVES

A. Up to 2 Inches: Bronze one piece body, stainless steel ball, Teflon seats and stuffing box ring, lever handle, and balancing stops where required or shown on drawings, solder or threaded ends.

B. Over 2 Inches: Cast steel body, chrome plated steel ball, Teflon seat and stuffing box seals, lever handle, flanged.

2.06 SWING CHECK VALVES

A. Up to 2 Inches: Bronze 45-degree swing disc, solder or screwed ends.

B. Over 2 Inches: Iron body, bronze trim, 45-degree swing disc, renewable disc and seat, flanged ends.

2.07 SPRING LOADED CHECK VALVES

A. Iron body, bronze trim, stainless steel spring, renewable composition disc, screwed, wafer or flanged ends.

2.08 RELIEF VALVES

A. Bronze body, Teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labelled.

PART 3 EXECUTION

3.01 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale, oil and dirt on inside and outside before assembly.

C. Prepare piping connections to equipment with flanges or unions.

D. After completion, fill, clean, and treat systems.

3.02 INSTALLATION

A. Route piping in orderly manner, plumb and parallel to building structure, and maintain gradient.

B. Install piping to conserve building space, and not interfere with use of space and other work.

C. Group piping whenever practical at common elevations.
D. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

E. Provide clearance for installation of insulation, and access to valves and fittings.

F. Provide access where valves and fittings are not exposed.

G. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.

H. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

I. Prepare pipe, fittings, supports, and accessories for finish painting.

J. Install valves with stems upright or horizontal, not inverted.

K. Provide non-conducting dielectric connections wherever joining dissimilar metals.

L. Use lead-free solder for all copper piping joint connections, where required by authority having jurisdiction.

M. Install all piping at elevations indicated on Project Drawings. Where no elevations are indicated, install piping as high as possible.

3.03 APPLICATION

A. Install unions downstream of valves and at equipment or apparatus connections. Automatic control valves shall have unions installed at valve outlet and bypass (three-way control valves only).

B. Install brass male adapters each side of valves in copper piped system. Sweat solder adapters to pipe.

C. Install gate, ball or butterfly valves for shut-off and to isolate equipment, part of systems, or vertical risers.

D. Install ball or globe valves for throttling or bypass services.

E. Provide spring loaded check valves on discharge of pumps.

F. Provide 3/4-inch gate or ball drain valves at main shut-off valves, low points of piping, bases of vertical risers, and at equipment.

END OF SECTION 23 21 13

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FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island AA23018

SECTION 23 21 14
HYDRONIC SPECIALTIES

PART 1 GENERAL

1.01 WORK INCLUDED

A. Combination fittings.

B. Balancing valves.

1.02 RELATED WORK

A. Section 23 21 13 - Hydronic Piping.

1.03 REFERENCES

A. ANSI/ASME - Boilers and Pressure Vessels Code.

1.04 REGULATORY REQUIREMENTS

A. Conform to ANSI/ASME Boilers and Pressure Vessels Code Section 8D for manufacture of tanks.

1.05 QUALITY ASSURANCE

A. Manufacturer: For each product specified, provide components by same manufacturer throughout.

1.06 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Division 1 Specifications.

B. Include installation instruction, assembly views, lubrication instructions, and replacement parts list.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site.

B. Store and protect products.

PART 2 PRODUCTS

2.01 COMBINATION PUMP DISCHARGE VALVES

A. Valves: Straight or angle pattern, threaded or flanged cast-iron valve body with bolt-on bonnet for 175 psig operating pressure, non-slam check valve with spring-loaded bronze disc and seat, stainless steel stem, with Schrader valve metering connections with adjustment permitting flow regulation.

2.02 MANUAL BALANCING VALVES (COMBINATION BALANCING/SHUT-OFF VALVES)

A. Construction: Brass or bronze body, construction to allow valve to function as both a balancing valve and shut-off (service duty) valve, with pipe threads or sweat connections as required, Schrader valve test connections, calibrated nameplate, precision machined orifice, 100% shutoff capability; equal to Taco Circuit-Setter.

B. Calibration: Control flow within 5 percent of selected rating, over operating pressure range of 10 times minimum pressure required for control.

2.03 RELIEF VALVES

A. Bronze body, Teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labelled.

PART 3 EXECUTION

3.01 INSTALLATION AND APPLICATION

A. Install specialties in accordance with manufacturer's instructions to permit intended performance.

B. Provide manual air vents at system high points and as indicated.

C. Provide combination pump discharge valve on discharge side of all pumps or where indicated.

D. Provide balancing valves on water outlet side of terminal units, coils, etc. or as indicated on the Drawings.

END OF SECTION 23 21 14

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North Scituate, Rhode Island **AA23018**

SECTION 23 21 23
HVAC PUMPS

PART 1 GENERAL

1.01 WORK INCLUDED

A. In-line circulators.

1.02 RELATED WORK

A. Section 23 07 19 - Piping Insulation.

B. Section 23 21 13 - Hydronic Piping.

C. Section 23 21 14 - Hydronic Specialties.

1.03 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacture, assembly, and field performance of pumps with minimum three years experience.

1.04 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data.

B. Include installation instructions, assembly views, lubrication instructions, and replacement parts list.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site.

B. Store and protect products.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Grundfos.

B. Bell & Gossett.

C. Tacvo.

2.02 GENERAL CONSTRUCTION REQUIREMENTS

A. Balance: Rotating parts, statically and dynamically.

B. Construction: To permit servicing without breaking piping or motor connections.

C. Pump Motors: Operate at 1750 rpm unless specified otherwise.

D. Pump Connections: Flanged.

2.03 IN-LINE CIRCULATORS

A. Type: Horizontal shaft, single stage, direct connected, with resiliently mounted motor for in-line mounting, oil lubricated, for 175 psig maximum working pressure.

B. Casing: Cast iron.

C. Impeller: Brass or bronze, keyed to shaft.

D. Bearings: Two, oil lubricated bronze sleeves.

E. Shaft: Alloy steel with stainless steel sleeve, integral thrust collar.

F. Seal: Carbon rotating against a stationary ceramic seat, viton fitted, 225 degrees F maximum continuous operating temperature.

G. Drive: Flexible coupling.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install pumps in accordance with manufacturer's instructions.

B. Provide access space around pumps for service. Provide no less than minimum as recommended by manufacturer.

C. Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, and operate within 25 percent of midpoint of published maximum efficiency curve.

D. Provide air cock and drain connection on pump casings.

E. Provide drains for bases and seals, piped to and discharging into floor drains.

F. Lubricate pumps before start-up.

END OF SECTION 23 21 23

FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 23 51 00
BREECHING, CHIMNEYS AND STACKS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured double wall chimneys for No. 2 fuel oil-fired equipment.

1.02 RELATED SECTIONS

A. Section 23 52 23 – Cast Iron Boilers

1.03 QUALIFICATIONS

A. Manufacturer: Company specializing in the manufacture of products specified in this Section with minimum three years experience.

1.04 REGULATORY REQUIREMENTS

A. Conform to applicable code for installation of No. 2 fuel oil burning appliances and equipment.

PART 2 PRODUCTS

2.01 VENTS FOR CONDENSING AND NON-CONDENSING APPLIANCES

A. Double-wall, factory-built type for use on appliances or pressurized venting systems serving Category II, III or IV appliances or as specified by the equipment manufacturer. Maximum temperature shall not exceed 550°F (288°C). Vent shall be constructed with an inner and outer wall, with a 2-inch-thick ceramic insulation in annular space between inner and outer walls. The inner wall (vent) shall be constructed of AL29-4C stainless steel. The outer wall (casing) shall be constructed of aluminized steel.

2.02 DOUBLE WALL POSITIVE PRESSURE VENTS AND BREECHING

A. Manufacturers: Selkirk Metalbestos, Metal-Fab, Van Packer, Stacks Inc., General Products Co., or approved equal.

B. Stack, breeching, and accessory fittings to be double wall type with minimum 2-inch-thick ceramic insulation between walls, U.L.-listed for continuous operation at 1400°F under positive pressure.

C. Inner pipe to be type 304 stainless steel of 0.035" minimum thickness for sizes through 36" ID and minimum thickness of 0.048" for sizes over 36" ID.

D. Construct outer jacket of aluminized steel where located inside building, and Type 304 stainless steel where located outside building. Minimum thickness of outer jacket to be 24 gage for sizes 10 inches to 24 inches and 20 gage for sizes 28 inches to 48 inches.

E. Ceramic insulation (1", 2", 3" or 4")
   a. 4" clearance for 1400°F (760°C) Chimney
   b. 2" clearance for Building Heating Appliance Chimney
   c. 2" clearance for Type "L" Vent
   Rated For:
   a. Continuous operation at zero-inch (0") clearance to non-combustibles.
   b. Venting negative, neutral, and positive pressure applications.
   c. Venting flue gasses from gas, liquid, and solid fuel fired appliances.
   d. Positive pressures up to 60 inches water column.

F. Join sections with high temperature acid-resistance joint cement and steel drawbands. Stacks to be self-supporting and mounted on a concrete foundation. Allow for expansion of stacks from -20°F. to 1100°F.

G. Provide all necessary accessories including flashing, counterflashing, cable guys where required, cleanout, drain, exit cone, roof thimble and necessary supports. Coat all external welded joints and seams with galvanized paint. Provide expansion guides for stacks over 40 feet in height.

PART 3 EXECUTION

3.01 CONDENSING AND NON-CONDENSING APPLIANCE VENTING:

A. Install stack, breeching, and accessories in accordance with the manufacturer's recommendations, maintaining minimum clearances from combustibles specified in UL listing.

B. Support breechings from building structure with suitable ties, braces, hangers and anchors to hold shape and prevent buckling. Minimum support for vertical sections shall be at all floor penetrations. Support from floor structure, roof structure, or adjacent structural surfaces. Verify load bearing capacity of support points with Architect/Engineer.

C. Install breechings with a minimum of joints. Align connections accurately and maintain smooth internal surfaces.

D. Install concrete inserts for support of breechings, chimneys, and stacks in coordination with formwork.

E. Maintain UL listed minimum clearances from combustibles.

F. Install stacks plumb. Pitch breeching upward from fuel-fired equipment to chimney or stack.

G. Provide drain points as shown and per the manufactures recommendation to allow proper draining of condensate. Provide Flue Gas Condensate pH Neutralization at each drain piping termination point.

H. Clean breechings, chimneys, and stacks during installation, removing dust and debris.

I. At appliances, provide slip joints to allow removal of appliances without removal or dismantling of breechings, chimneys, or stacks.

J. Seal all joints of positive pressure stacks and breeching in accordance with manufacturer's recommendations, using only sealants recommended by stack manufacturer.

3.02 CLEANING AND PROTECTION

A. Clean breeching internally during installation to remove dust and debris. Clean external surfaces to remove welding slag and mill film.

B. At ends of breeching and chimneys which are not completed or connected to equipment, provide temporary closure which will prevent entrance of dust and debris until final connections are made.

END OF SECTION 23 51 00

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Boilers Replacement
North Scituate, Rhode Island **AA23018**

SECTION 23 52 23
CAST IRON BOILERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Boilers.

B. Controls and boiler trim.

C. Hot water connections.

D. No. 2 fuel oil connection.

E. Circulator.

1.02 RELATED SECTIONS

A. Section 23 21 14 - Hydronic Specialties.

1.03 REFERENCES

A. ANSI/ASME SEC4 - Boiler and Pressure Vessel Codes - Rules for Construction of Heating Boilers.

B. ANSI/ASME SEC8D - Boilers and Pressure Vessel Codes -Rules for Construction of Pressure Vessels.

C. ANSI/NFPA 70 - National Electrical Code.

D. HI (Hydronics Institute) - Testing and Rating Standard for Cast Iron and Steel Heating Boilers.

1.04 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Division 1 Specifications.

B. Include manufacturer's descriptive literature, operating instructions, cleaning procedures, replacement parts list, and maintenance and repair data.

1.05 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum three years documented experience.

1.06 REGULATORY REQUIREMENTS

A. Conform to applicable code for internal wiring of factory wired equipment.

B. Conform to ANSI/ASME SEC4 and SEC 8D for boiler construction. Boiler shall meet ANSI/ASME CSD-1 approval, have National Board certification and be UL approved.

C. Units: ASME-rated construction, with ASME stamp on boiler.

1.07 WARRANTY

A. Provide ten-year pro-rated warranty under provisions of Division 1 Specifications.

B. Warranty: Include coverage for cast iron boiler sections.

1.08 GENERAL

A. Furnish and install low pressure, wet base, cast iron sectional boiler(s) with power burner(s) that pressurize the firebox and operate under forced and balanced draft.

B. Assemble and install boiler-burner unit(s) in compliance with manufacturer's installation instructions.

C. Boilers shall be triple-pass hot water heating boiler as manufactured by Viessmann or approved equal; furnish boiler(s) with burner(s) capable of burning No. 2 fuel oil.
1. (B) Boiler-burner unit Field assembled (standard).
2. (A) Boiler-burner unit with factory assembled sections.
3. (P) Boiler-burner unit completely packaged, and fire tested
4. No. 2 fuel oil.
5. Water boiler.
6. Forced or balanced draft; furnish with barometric damper as required by boiler manufacturer.

D. Boiler(s) shall have rated output(s) at 100% firing rate of capacities as noted on the Project Drawings.

E. Boiler(s) shall be manufactured to conform to Section IV of the ASME Boiler and Pressure Vessel Code.
1. Individual sections (and section assembly) to be hydrostatically pressure tested at factory in accordance with ASME requirements.
2. Maximum 80 PSIG allowable working pressure as part of section with ASME symbol.

F.Submittals
1. Submit shop drawings and product data.
2. Submittal packet to include boiler (and burner) manufacturer descriptive literature, installation instructions, operating instructions, and maintenance instructions.

PART 2 PRODUCTS

2.01 BOILER

General: The hot water heating boiler shall incorporate a triple-pass cast iron heat transfer design. The boiler design shall allow for #2 fuel oil, natural gas and propane gas. Venting shall be standard Category I, non-condensing and negative draft. The control packages shall come pre-wired for the boiler/burner combination.

Combustion efficiency on natural gas and propane shall not be below 85%, as tested in accordance with the harmonized standard ANSI Z21.13.CSA 4.9. Combustion efficiency on #2 fuel oil shall not be below 88%. ASME maximum allowable working pressure (MAWP): 75 psig; ASME maximum water temperature fixed High Limit): 248°F (120°C).

The heat exchanger filled with water shall weigh no less than 4652 lbs (2110 kg) excluding the burner, controls and jacketing. Input rate per heat exchanger surface area shall not exceed 8.1 MBH/ft^2 (25.7 kW/m^2) for oil, and 8.4 MBH/ft^2 (26.5 kW/m^2) for gas, based on input at full fire.

No additional safety devices shall be required to safeguard against low flow conditions.
The boiler shall be able to supply a temperature of up to 210°F (99°C) at 75 psig.

Boiler minimum return water temperature shall not be below 104°F (40°C) on oil and 127°F (52.8°C) on gas.

Supply/return piping shall incorporate one of the following two methods for protecting the boiler against flue gas condensation: a 100% bypass valve or a 30% bypass pump.

A return water distribution tube shall be standard equipment, for reducing thermal stress associated with uneven water flow between sections.

The standard control options shall be able to operate independently, or integrate with building management system protocols as referenced in the control section.

Construction: The combustion chamber and flue gas passageways shall be constructed of sectional cast iron, and shall have a triple-pass design. The grade of cast iron shall be lamellar graphite.

The water side of the heat exchanger shall use a press-nipple design between sections to allow transportation of individual sections and reliable field assembly.

The heat exchanger shall have a full-swing door, left- or right-hinge, to allow for easy inspection and cleaning.

The R-value of the insulation shall be equivalent to 4" (100 mm) fiberglass with nylon backing.

Certifications: All individual components shall be accepted as part of the system under the governing body having jurisdiction. Field approval shall not be required for any component. Boiler shall be CSA approved and shall be built in compliance with ASME Section IV, carrying the "H" stamp.

The boiler shall have the following approvals and listings, or be in compliance with:
CSA, CRN, ASME, I=B=R, NY City approval, MA State approval

2.02 BOILER BURNER

Burner: Weishaupt WM-L10/2; fully modulating.

General: The burner shall be a forced draft automatic burner designed to burn #2 fuel oil.

Burner Housing: The burner housing shall be made of cast aluminum, and shall be capable of hinging open to the left or to the right.

The burner housing shall incorporate the following features:
- A flange safety interlock switch to prevent the burner from starting when in the open position
- A self-checking differential air pressure switch
- A large sight glass for viewing the flame
- A removable cover to allow free access to serviceable components

Fan: The blower wheel shall be statically and dynamically balanced.

Air Intake: The air intake shall consist of multiple aluminum air intake vanes on the suction side for combustion air regulation. Air louvers shall be controlled by a dedicated stepper motor having 900 settable increments from 90 angular degrees (open) to 0 angular degrees (closed). Air louvers shall be driven to the fully closed position during the "off" cycle to minimize draft losses. The air intake shall include sound attenuating material, and a screen to reduce the likelihood of foreign material entering the blower.

Combustion Head: The flame tube and diffuser assembly shall be made of stainless-steel alloy, and shall have a temperature rating of 1470°F. The diffuser, nozzle assembly and all serviceable components shall be accessible without need for burner removal. The combustion head shall be adjustable such that the pressure drop across the diffuser can be optimized to match the maximum firing rate of the burner.

Burner Management System: The burner management system shall integrate fuel/air ratio control, flame safeguard functions, load control and communications into one control system. The burner management system shall have four levels of password protection.
The fuel/air ratio control system shall be free of linkages which connect fuel control and air control functions into a common servomotor or actuator. Fuel and air control components shall be individually controlled by dedicated stepper motors programmable via the keypad. The fuel/air ratio shall be infinitely adjustable

throughout the firing range.

The burner shall have independent ignition position (independent of any other firing position).

All functions including burner history, commissioned values, operating parameters and pressure/temperature settings shall be accessible/adjustable without the need for a laptop computer or other special tools.

Both the programming pad and the main control module shall hold programmed data with capability of uploading/downloading from one to the other.

The flame safeguard system shall be integrated into the control system and shall include sensor electrode (standard) or QRI infrared flicker detector (option). The combustion control system shall include built-in PID pressure/temperature control and time/temperature adjustable cold start function to protect the boiler from thermal shock.

The control system shall have selectable operating modes to allow for the following:
- Direct modulation via the building automation system using either a 4-20 mA, 2-10V or floating type operating signal.
- Set-point adjustment via the building automation system using either a 4-20 mA, 2-10V or floating type operating signal.

The burner control system shall be capable of providing the following functions and data signals via a MODBus interface:
- Burner ON/OFF
- Load signal
- Set-point and process value
- Operating information
- Actual load position of burner
- Lock-out with failure code
- Actual position (on/off) of air pressure switch, valves, fan, gas pressure, flame supervision
- Start-up counter
- Actual operating hours

The control system shall incorporate a 4-line, 64 character LCD display (ABE). The ABE display shall be capable of being mounted either on the burner or in a remote control panel. ABE shall be easy to remove from its mounting while remaining connected to the wiring harness enabling a technician to have "hand held" adjustment capability.

Motor: The burner shall have a three-phase (or single-phase) TEFC blower motor fully compatible for use with variable frequency drive.

Certifications: All individual components shall be accepted as part of the system under the governing body having jurisdiction. Field approval shall not be required for any component.

The minimum standards for #2 fuel oil burners are:
CAN/CSA B139 Installation Code For Oil Burning Equipment (for Canada)
CSA C22.1 Canadian Electrical Code and/or local electrical codes (for Canada)
NFPA 31 Standard for the Installation of Oil Burning Equipment (for U.S.)
ANSI/NFPA 70 National Electrical Code (for U.S.)

2.03 BOILER CONTROLS

Vitotronic 300-K, MW1B
General: The control unit shall provide control for up to 4 boilers in a system with one high temperature circuit and two mixing valve circuits with weather responsive reset. Additional circuits shall be added with the order of a mixing valve controller or a custom control panel. They shall use the LON communication protocol. A maximum of 5 systems shall be connected to the LON bus for monitoring by a building automation system. The outdoor reset supply temperature of every heating circuit shall result from the outside temperature, the set room temperature, the operating mode and the heating curve.

General Requirements: The controller shall have the following features:
Menu driven graphical user interface.
EPROM memory is maintained without main power.
Control algorithms are PID-based.
LON ready with integrated Viessmann LON communication Module.
Quick connect plug & play system for low voltage controls.
Communication with other protocols such as Modbus, BacNet and Ethernet/IP shall be available through an external gateway.

The controller shall be factory tested and approved by CSA as part of a package with the compatible boilers.

The controller shall be able to support the following output devices:
(1) Domestic hot water pump.
(1) High temperature Heating loop circulation pump without mixing valve.
(2) Low Temperature heating loop circulation pumps in conjunction with mixing valves.
(2) Heating loop modulating mixing valves.
(1) DHW re-circulation pump.
(1) System circulation pump.

Construction
Control Interface: The control shall be a multiple line graphic user interface (°F or °C) and shall have the following features:
Able to display all system temperatures and set points.
Displays unique fault message during an alarm.
A program selection function.
Domestic hot water temperature set point adjustment function.
Information indicator with confirmation function.
Operating status check button.
Emission test switch.
Adjust the display contrast.
Temporary occupied mode function.
Slope and shift adjustment for heating curve.

Additional Features: The controller shall have the following additional features:
On/Off switch.
Default factory settings reset function.
Operating status indication light.
Manual override switch.
Fault Indicator light.
Operating condition scans.
Maintenance requirement status.
Relay test function.
Participant check (LON nodes).
Quick heat up and quick set-back functions.
Start-up and shut-down optimization functions.
Warm weather shutdown.
Energy savings mode.
Ability to restore the control to factory defaults.

Boiler System Supply Water Temperature Control: Each controlled zone shall have a calculated heating curve which describes the required supply water temperature at different outside air temperatures. The slope and shift of each heating curve shall be adjusted to fit any type of building or system. The highest required temperature of all zones shall be used together with bias from an optional room temperature sensor to determine the common boiler supply temperature set point. The boilers shall be sequenced to maintain this temperature, configured as having either two-stage or modulating burners.

Separate control strategies for condensing and non-condensing boilers shall be available.
Subject to the system design, there shall be a choice of three different start-up and shut-down programs, one gross calorific strategy and two net calorific strategies.

In the unoccupied mode, the supply water temperature set-point shall be reduced by a pre-determined amount. A call for domestic hot water or an external demand signal shall override this set-point to pre-determined values.

Control logic shall be equipped to protect the heating system from freeze-up if left powered during the off season.

Domestic Hot Water Control: The DHW temperature shall be controlled through starting and stopping the DHW circulation pump. An automatic or individual time program shall be selected for the control of the DHW and the DHW tank re-circulating pump. An individual time program shall enable up to four switching periods per day to be set to control the DHW heating and the DHW re-circulation pump.

The DHW control sequence shall use an adaptive algorithm that takes into account the rate at which the temperature changes and whether the boiler will be required to supply heat after the DHW tank has been heated or whether residual boiler heat should be transferred to the DHW tank. Available domestic hot water strategies shall include: priority control (supply water set-point increases, the mixing valve closes and the heating circuit pumps are shut off on a call for DHW), modulating priority (the supply water set-point of the mixing valve circuits shall be reduced until the DHW supply temperature requirements have been met), or no priority at all.

A frost protection function shall energize the DHW production should the supply water temperature drop below a pre-determined value. An optional second temperature sensor placed in the cold water inlet can be incorporated to determine if DHW production should begin prematurely. If required, a solar heating control strategy using an extra temperature sensor in the solar system shall be selected.

Boiler Rotation: The boilers shall be rotated once a month according to an equal run-time strategy or on a schedule every 200 to 2000 hours. A dry contact shall be incorporated to make the current lead boiler the lag boiler whenever contact is closed. If the system has both condensing and non-condensing boilers, the condensing boiler shall be programmed to always be the lead.

Fault Management: If a fault occurs on a boiler, the fault code shall be indicated in the display window and by the flashing red fault lamp. A compiled failure alarm contact shall close in order to signal the alarm condition to a Building Automation System (BAS). The message shall also be broadcasted on the LON communication bus. The error history shall be saved to memory. An optional Output Module connected to the LON bus shall close a set of potential-free contacts for each of the following conditions: burner status, burner failure, high boiler temperature and low water cut-off alarm.

Scheduling: There shall be separate time schedules for central heating, DHW heating and the DHW re-circulation pump. Each device shall be able to be scheduled to switch between occupied and unoccupied modes up to four times per day.

Auxiliary Inputs: The following dry contact inputs shall be available to be wired to each boiler to control the following functions:

System disable.
External heat demand.
Change lead boiler into the lag boiler.

Building Management System Interface: The controller shall use the LON communication protocol and shall be able to be fully integrated into a building automation system running on the LON protocol without having to use a gateway.

The controller shall have the ability, through the use of an Input Module, to accept a 0-10V signal from a Building Management System for the purpose of allowing remote control of the boiler supply water temperature set point.

The controller shall be able to fully integrate with Building Management Systems running on the BacNet or N2 communication protocols via a gateway.
Remote Communication Interface: The controller shall have the ability to be connected to a phone dialer, enabling remote control of any of the functions listed in the Auxiliary inputs section.

The controller shall have the ability to be connected to an Internet server interface, which shall allow access to all programming and operating parameters over the World Wide Web.

Certifications: All individual components shall be accepted as part of the system under the governing body having jurisdiction. Field approval shall not be required for any component.

All electrical wiring is to be done in accordance with the latest editions of:
CSA C22.1 Canadian Electrical Code and/or local electrical codes (for Canada)
ANSI/NFPA 70 National Electrical Code (for U.S.)

Vitotronic 100, GC1B
General: The control unit shall provide control for a single boiler with one high temperature heating circuit. Temperature control of the heating circuit shall be from internal set point control, optional 0-10VDC interface input into boiler control, dry contact 143/146 demand inputs or optional LON communication card. The control shall operate either a single-stage, two-stage or modulating burner as a function of set point boiler water temperature.

General Requirements: The controller shall have the following features:
Compatible with single-stage, two-stage and modulating burners.
EPROM memory is maintained without main power.
Control algorithms are PID-based.
LON ready with the addition of optional Viessmann LON communication module.
Quick connect plug & play system for low voltage controls.
Communication with other protocols such as Modbus, BacNet and Ethernet/IP shall be available.

The controller shall be factory tested and approved by CSA as part of a package with the compatible boilers.

The controller shall be able to support the following output devices:
(1) Domestic hot water pump.
(1) Boiler Pump.
(1) Shunt pump for boiler return water temperature elevation.
(1) Operation with Single Stage, Two Stage or modulating Burner.
(1) Motorized modulating valve output for boiler isolation or return temperature elevation.

Construction
Control Interface: The control interface shall be menu driven with an alpha-numeric display (°F or °C) and shall have the following features:
Able to display all system temperatures and set points.
Displays unique fault message during and alarm.
A program selection function.
Domestic hot water temperature set point adjustment function.
Information indicator with confirmation function.
Boiler operating hours display.
Number of burners starts display.
Operating status check function.
Emission test switch.
Boiler supply water temperature set point adjustment function.

Additional Features: The controller shall have the following additional features:
On/Off switch.
Default factory settings reset function.
Operating status indication light.
Tamper-proof adjustable high limit.
Manual override switch.
TUV service switch (overrides AHL).
Manual reset fixed high limit.
Fault Indicator light.
Integration of individual combustion air dampers or blowers using the Combustion Air Device Adapter.
Operating condition scans.

Maintenance requirement status.
Relay test function.
Option to incorporate a flue gas temperature sensor.
Ability to restore the control to factory defaults.

The fixed high limit shall have the following tamper-proof feature: A locking mechanism which allows for lower temperature adjustments only. Once a lower temperature setting is adjusted, the limit cannot revert back to a higher temperature setting.

Domestic Hot Water Control: The DHW temperature shall be controlled through starting and stopping the DHW circulation pump. An automatic or individual time program shall be selected for the control of the DHW.

The DHW control sequence shall use an adaptive algorithm that takes into account the rate at which the temperature changes and whether the boiler will be required to supply heat after the DHW tank has been heated or whether residual boiler heat should be transferred to the DHW tank.

Fault Management: If a fault occurs on a boiler, the fault code shall be indicated in the display window and by the flashing red fault lamp. A compiled failure alarm contact shall close in order to signal the alarm condition to a Building Automation System (BAS). If a LON card is installed, the message shall also be broadcasted on the LON communication bus. The error history shall be saved to memory. An optional Output Module connected to the LON bus shall close a set of potential-free contacts for each of the following conditions: burner status, burner failure, high boiler temperature and low water cut-off alarm.

Auxiliary Inputs: The following dry contact inputs shall be available to be wired to each boiler to control the following functions:
Boiler disable.
Change between modulating to staged burner control.
External heat demand.

Building Management System Interface: The controller shall use the LON communication protocol and shall be able to be fully integrated into a building automation system running on the LON protocol without having to use a gateway.

The controller shall have the ability, through the use of an Input Module, to accept a 0-10V signal from a Building Management System for the purpose of allowing remote control of the boiler supply water temperature set point.

The controller shall be able to fully integrate with Building Management Systems running on the BacNet or N2 communication protocols via a gateway.

Remote Communication Interface: The controller shall have the ability to be connected to a phone dialer, enabling remote control of any of the functions listed in the Auxiliary inputs section.

The controller shall have the ability to be connected to an Internet server interface, which shall allow access to all programming and operating parameters over the World Wide Web.

Certifications: All individual components shall be accepted as part of the system under the governing body having jurisdiction. Field approval shall not be required for any component.

All electrical wiring is to be done in accordance with the latest editions of:
CSA C22.1 Canadian Electrical Code and/or local electrical codes (for Canada)
ANSI/NFPA 70 National Electrical Code (for U.S.)

Vitogate 300 BN/MB
General: The Vitogate 300 BN/MB is a communication gateway that allows for data transfer between the Viessmann LON System, used with Viessmann equipment, and a Building Management System or Building Automation System using either BACnet or Modbus communication protocols. The Vitogate 300 shall offer a combination of both readable and readable/writable points available from the Viessmann equipment within the system.

The Vitogate 300 shall be capable of communicating with up to 1 Viessmann cascade control, and up to 8 boilers within a single system. The Vitogate 300 shall be capable of communicating with up to 4 Viessmann systems. The Vitogate 300 shall be offered in 2 versions, one version complete with an enclosure for remote mounting applications, the other as a DIN rail mountable version for installation into select equipment junction boxes.

General Requirements: The gateway shall have the following features:
Communication with up to 1 cascade control and 8 boilers in a single system.
Enclosure for remote mounting or wall mounting.
Shipped complete with 24VDC Power Supply Unit.
USB configuration back-up port.
LAN connection port for communication with PC/Laptop, BACnet IP, or Modbus TC/IP
RS485 port for communication using BACnet MS/TP or Modbus 485.
Two LON communication ports for integration into the Viessmann LON system.

The gateway shall be factory tested and approved by CSA as part of a package with the compatible series of boilers.

Construction: Control Interface: The control interface shall be web browser driven, capable of displaying both metric and imperial units, and shall have a language selection menu. Menu driven selection functions, providing access to (but are not limited to) the following operating points:
Able to display all system temperatures and set points.
Displays unique fault message during an alarm.
A program selection mode.
Domestic hot water temperature set point adjustment.
Operating status check.
Slope and shift adjustment for heating curve.

Fault Management: If a fault occurs within the Viessmann system, the fault code shall be transmitted to the Building Management System or Building Automation System. Any fault will be displayed as a unique fault code relative to the fault generated.

Certifications: All individual components shall be accepted as part of the system under the governing body having jurisdiction. Field approval shall not be required for any component.

The gateway shall be CSA Certified for U.S. and Canada.

All electrical wiring is to be done in accordance with the latest editions of:
CSA C22.1 Canadian Electrical Code and/or local electrical codes (for Canada)
ANSI/NFPA 70 National Electrical Code (for U.S.)

2.04 CIRCULATOR

A. Type: Horizontal shaft, single stage, direct connected, with resiliently mounted motor for inline mounting, oil lubricated, for 125 psig maximum working pressure.

B. Casing: Cast iron.

C. Impeller: Cadmium plated steel, keyed to shaft.

D. Bearings: Two, oil lubricated bronze sleeves.

E. Shaft: Alloy steel with copper sleeve, integral thrust collar.

F. Seal: Carbon rotating against a stationary ceramic seat, 225 degrees F maximum continuous operating temperature.

G. Drive: Flexible coupling.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Provide for connection to electrical service.

C. Provide connection of fuel oil service in accordance with applicable codes.

D. Pipe relief valves to nearest floor drain.

E. Provide a fire-matic switch over the burner(s), arranged to shut down the burner(s) upon activation.

F. Install circulator and diaphragm expansion tank on boiler.

3.02 MANUFACTURER'S FIELD SERVICES

A. Prepare and start systems under provisions of applicable Specification Sections.

B. Submit written report after start-up including control settings and performance chart of control system.

3.03 BOILER CONTROL SYSTEM – SEQUENCE OF OPERATION

A. Hot water system to be in operation whenever the outside air temperature is below 60 degrees F. (adj.). System enable/disable to be performed automatically, by an outside air temperature controller. When enabled, the pump selected as the "primary" pump is to run continuously. Selection of the primary pump is an automatic procedure, performed by the existing Building Energy Management System. Upon failure of the primary pump, the backup pump is to automatically start. Provide water flow switch in boiler return piping loop; water flow must be proven before boiler(s) are allowed to fire.

B. Boiler "inner loop" circulating pumps operate to maintain constant flow and consistent temperature through the boilers. Pumps are controlled by simple ON-OFF switches, and both should be in operation whenever the boiler system is enabled.

C. Boiler sequencing panel controls the operation of both boilers, in order to achieve and maintain hot water temperature setpoint. Setpoint is to be a function of outside air temperature. As the outside air temperature increases, the hot water temperature setpoint is "reset" downwards. Hot water temperature sensor is located in the hot water supply piping common to both boilers.

D. Boiler sequencing panel has the capability of boiler lead/lag alternation. Upon initial call for boiler operation, i.e., if the hot water temperature falls below setpoint, sequencing panel signals the combustion air damper to open. When the damper is substantially open, the lead boiler is allowed to operate. Sequencing panel controls the proportional firing rate of the lead boiler in order to maintain setpoint. If the temperature continues to drop, then the lag boiler is allowed to operate as well, with the sequencing panel controlling this boiler in the same manner as the lead boiler.

E. As the hot water temperature rises toward setpoint, the boilers are disengaged in the reverse order that they were engaged. When the call for boiler operation ceases altogether, the combustion air damper motor is de-energized, and the damper springs shut.

F. With the boiler system enabled (i.e. whenever the outside air temperature is below 60 degrees F (adj.)) operation of the lead boiler is preceded by the operation of the combustion air damper(s). Upon a call for boiler operation, combustion air damper actuator(s) are energized, and the combustion air damper(s) begin to stroke open. Only after the damper(s) have stroked substantially open is the lead boiler allowed to fire.

END OF SECTION 23 52 23

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FOGARTY MEMORIAL SCHOOL
Boilers Replacement
North Scituate, Rhode Island AA23018

SECTION 26 00 00
ELECTRICAL

PART 1 GENERAL

1.01 RELATED DOCUMENTS

The General Conditions of the Contract for Construction including Supplementary Conditions and General Requirements shall apply fully to the work specified in this section and to all work specified under all sections of Electrical. Examine all other sections of the specifications and drawings for any alternates that may affect this section. Examine all other sections of the specifications and drawings for work to be performed in connection therewith.

1.02 DESCRIPTION OF WORK

A. The work to be provided under this section shall include, but not necessarily be limited to all complete and operational electrical systems and items in accordance with these specifications and the accompanying drawings. Provide all supervision, labor, materials, equipment, machinery and any and all other items necessary, but not limited to, completing the following systems:

1 Equipment connections.
2 Feeds from existing panels to equipment locations.
3 Removal of existing electrical wiring, equipment and devices.
4 Miscellaneous outlets and wiring.

B. All items of equipment are specified in the singular; however, the Contractor shall provide and install the number items of equipment as indicated on the drawings and as required for complete systems.

C. With submission of bid, give written notice to the Architect of any materials or apparatus believed inadequate or unsuitable, in violation of laws, ordinances, rules, and any necessary items or work omitted. In the absence of such written notice, it is mutually agreed that the Contractor has included the cost of all required items in his proposal, and that he will be responsible for the approved satisfactory functioning of all systems, equipment and devices without extra compensation.

D. It is the Electrical Contractors responsibility to verify all conditions relating to equipment dimensions and locations. Any and all construction methods required due to low ceilings in equipment locations, obstructions, routing of conduit/wiring runs in or around the structure, obstructions which have to be overcome, etc. are the responsibility of the Electrical Contractor. All equipment locations on the drawings are diagrammatic, exact and final locations shall be determined and coordinated in the field by this Contractor. The electrical contractor is responsible for all field conditions and shall include such in his bid.

E. All electrical equipment and components furnished by other sections of the specifications and delivered for installation under this section of the specifications shall be clearly marked for location. The section supplying the equipment and components shall be responsible for all required tests after the electrical connections are completed.

1.03 ADDITIONAL WORK UNDER THIS SECTION

A. The following items of work shall be provided under THIS section of the specifications and drawings.

B. All wooden mounting boards, PAINTED BY THE ELECTRICAL CONTRACTOR with two coats of GRAY fire-retardant paint, where required and called for. Wooden mounting boards shall be provided for all surface mounted panelboards, for main service equipment, telephone service board and other locations for mounting of equipment. Minimum thickness of plywood backboards shall be (3/4") three quarters of an inch and THERE SHALL BE (1) ONE FINISHED SIDE for the equipment. Where required due to obstructions and conditions backboards shall be installed on standoffs of unistrut, blocking or other suitable means to provide required and desired final locations of panelboards, etc. in cases where they cannot be mounted directly to walls. Plywood shall be grade APA C-D PLUGGED EXPOSURE 1.

C. Panelboards may be mounted on unistrut supports in lieu of wooden backboards. Where required, unistrut shall be mounted from floor to ceiling and secured to both surfaces if the panelboard has to be mounted away from walls to avoid obstructions. All conduits and/or wireways shall be racked on unistrut up wall.

D. Cutting and patching as applicable to this section of the specification.

E. Installation of fireproofing material in and around all sleeves, at fire rated wall and floor penetrations and other areas as required by the Building and Electric Codes.

1.04 DEFINITIONS

A. The word "provide" is defined to mean "furnish and install complete with all accessories."

B. The word "wiring" is defined to mean "wire installed in raceway or surface metal raceway including boxes and fittings" and/or Metal Clad Cable and/or as defined in other portions of this section of the specifications.

C. The word "contractor" or "this contractor" is defined as the electrical contractor.

D. The words "by others" are defined to mean "not by this division but by another division of the contract documents."

E. The word "equal" is defined to mean "to posses the same performance qualities and characteristics and fulfill the utilitarian function without any decrease in quality, durability and longevity."

F. The words "satisfactory operation" is defined to mean "operation as specified."

G. "UL" is defined to mean "Underwriters Laboratories Inc.".

H. "R.S.C." or "RSC" is defined to mean threaded thick-walled rigid galvanized steel conduit. "E.M.T. or EMT is defined to mean electric metallic tubing (thin-walled steel conduit).

1.05 INTENT

A. It is the intent to cover all work and materials necessary for installing complete, ready for continuous use, all electrical systems as shown on the accompanying drawings, or as hereinafter described.

B. In the event that there is a conflict on the drawings, between the drawings and the specifications or within the specifications, the most stringent requirements with the highest cost and value shall be carried in the bid. Upon award of the contract the electrical contractor shall ask for a review of the conflict for a formal interpretation.

C. Sizes of conduit/wiring and running of it may be shown but it is not intended to show every offset and fitting, nor every structural difficulty that will be encountered during the installation of the work. If the alignment of the conduit/wiring has to be varied from that shown on the drawings, where necessary because of slight architectural changes, structural or Architectural conditions or to avoid the work of other trades, it

shall be done without extra expense to the Owner. It is the Contractors responsibility to coordinate and layout the building wiring system to suit field conditions. Provide all necessary fittings, J.B.'s, etc. as required. Where wiring is not indicated the Contractor is responsible for correctly wiring the equipment, lighting, devices, etc. in accordance with the Electric Code and other sections of this specification. Circuit numbers are indicated to show the intent of the wiring system and to indicate the limit of the number of items per circuit.

D. This Contractor is responsible to examine the Architectural, Structural and other drawings, and investigate field conditions, in order to determine any height restrictions, structural difficulties, etc. which may be encountered and include the cost of overcoming same in the bid for any and all required equipment, fittings and construction methods necessary to install the equipment in the general locations indicated on the drawings. In instances where equipment cannot be installed where indicated on the drawings the Contractor shall contact the Engineer, prior to construction in order to review other possible locations.

1.06 LEGAL AUTHORITIES, CODES AND REGULATIONS

A. Where the term "Electric Code" or "Code" is used in this section of the specifications and drawings, it shall mean the MOST current published edition of the National Electric Code and the latest edition of the State Electric Code. In addition, all work pertaining to Life Safety System shall be done in accordance with the Life Safety Code NFPA 101- most current published edition, NFPA 72 Fire Codes and all other applicable NFPA Standards. All controls, signage, systems, equipment, etc. shall conform to the requirements of "ADA", "UFAS" and all other applicable civil laws and codes pertaining to the handicap.

B. All work shall be executed in accordance with the Electric Code, State Building and Fire Safety Codes, Federal, State and Local Rules and Regulations each Authority having jurisdiction enforces. Also, inspection forms, permits and approvals required for this section of work shall be obtained and all associated fees and charges required by all Authorities and Utility Companies, shall be included in this section of work.

1.07 COOPERATION AND COORDINATION

A. Cooperate and coordinate with all work of other divisions of the contract documents in executing the work of this division. Refer to other sections of the contract documents for the location of equipment in relation to this work. Coordinate all work of the Utility Companies (electric and telephone and cable TV) required in this project.

1.08 QUALITY ASSURANCE

A. For the actual fabrication, installation and testing of the work of this section use only thoroughly trained and experienced personnel who are completely familiar with the requirements for the work and with the installation recommendations of the manufacturers of the specified items.

B. In acceptance or rejection of installed electrical work, no allowance will be made for lack of skill on the part of the installers. Retain the services of a foreman who shall be in attendance at the project site during the progress of the work. The foreman assigned to the project at the start of construction shall remain until construction completion, unless circumstances arise which necessitate a replacement foreman - the Engineer and Architect shall be notified in advance of any change of foremen during the project.

C. All material shall be new and shall conform to requirements of, and be listed by, the Underwriters' Laboratories, Inc., or Factory Mutual, for that which standards have been established.

D. Industrial standards pertinent to electrical work being installed shall be considered minimum requirements, over and above those required by federal, state, and local Authorities.

E. It is this Contractors responsibility to check and verify all electrical equipment and components for correct characteristics that are provided from other sections of the specifications for installation under this section such as starters, fan speed control switches, etc.

F. Storage of equipment such as switches, fixtures, panelboards, wire, etc. is not to remain outside, exposed to weather, in damp locations, but shall be stored in warm, dry, safe storage until ready for use.

G. This Contractor shall be responsible for their workers to protect all walls, floors, ceilings, including existing, and other work installed under other sections of the specifications while installing this work, and protect this work from damage during and after installation and deliver clean and in first class condition. Repair or replace any of this work or work of other sections of the specifications damaged by workmen employed under this section, without causing additional costs to the owner.

1.09 TEST AND MAINTENANCE

A. Apply such tests as to insure the proper and desired operation of all electrical equipment, controls and wiring after all electrical materials and equipment are in place and connected. Replace all defective work and adjust such systems as the Architect shall direct or as required for proper and satisfactory operation. All meters, equipment and tools used for testing shall be provided under this section of the specifications. Instruct in use of all systems and apparatus, such persons as the Owner shall designate.

B. Tests for systems such as Fire Alarm System, Emergency Lighting System, Sound, Hearing Impaired, Emergency Generator, Computer/Wiring System, Telephone System, Internal Communications Systems, and others where specified, shall be made in the presence of the manufacturer's representative and the Owner when applicable. The Architect and Engineer shall be notified a minimum of two (2) weeks in advance of all preliminary and final testing of all systems. Upon completion of satisfactory tests, a separate report of each system shall be submitted to the Architect for review, comment and/or approval.

C. Operate each circuit breaker in each panelboard in the presence of the Owner and/or Owners Maintenance crew/Representative (other than the Architect) to indicate accuracy and completeness of the panelboard schedules. During the final observation of the project a random sampling of the circuit breakers will be taken by the Engineer and/or OWNER. If the schedules prove to be inaccurate from the random selection The Electrical Contractor shall make all necessary corrections to the panelboard schedules, contact the Engineer to arrange for a demonstration that circuit breakers are properly scheduled, and the Electrical Contractor shall reimburse the Engineer for all time spent during this review process at the Engineers standard hourly rates, without additional cost to the Owner or the Project - a retainer fee will be required prior to the site visit.

1.10 GUARANTEES AND WARRANTIES

A. Guarantee all material, equipment, labor and systems as required by the General Conditions, Supplementary Conditions and General Requirements of the Contract for Construction and thereafter as per common law. Minimum Guarantees and Warranties for basic materials and labor shall not be less than a period of one year from date of project completion and acceptance by the Owner, Architect and Engineer. Guarantees and Warrantees in excess of one year by the equipment suppliers shall be in effect for their entire duration.

B. Upon determination that work covered by Warranty has failed, replace or rebuild the work to an acceptable condition complying with the requirements of the Contract Documents. The Electrical Contractor is responsible for the cost of replacing or rebuilding defective work regardless of whether the Owner has benefited from use of the work through a portion of its anticipated useful life (labor and material cost). Refer to other portions and sections of the specifications for additional requirements.

C. See other portions and sections of the specifications for additional systems and equipment that require a guarantee or warrantee that is longer than one year.

1.11 OPERATING AND MAINTENANCE MANUALS

A. At the completion of the project, furnish for delivery to the Owner, at no additional cost, two (2) bound sets of operating and maintenance manuals. These manuals shall include manufacturer's data, maintenance requirements, shop drawings, installed equipment catalog cuts, wiring device catalog data sheets, and operating instructions on all electrical equipment installed, including lighting fixtures with lamp sizes clearly indicated.

B. Also include the names, addresses and telephone numbers of repair and service companies for each of the major systems installed under this section and the telephone number of this Contractor including a 24-hour telephone number for emergency calls.

1.12 DRAWINGS

A. The accompanying drawings are intended to be supplementary to the specifications, but any work indicated, mentioned or implied in either, is to be considered as specified in both.

B. All work shown on the drawings is intended to be approximately correct to scale, but detailed drawings, calculated and measured dimensions are to be followed in all cases. The Electrical Contractor shall check locations of all equipment and check dimensions with the proposed locations so all obstacles to be overcome will be figured into the bid. Refer to Architectural, Structural, Mechanical, Fire Protection, Plumbing, and other contract drawings for building construction details and dimensions. Refer to Architectural reflected ceiling plans, when available, for exact locations of lighting fixtures. If this Contractor finds a conflict with equipment locations notify the Engineer immediately. The electrical contractor is responsible for all field conditions and shall include such in his bid.

C. The electrical systems and equipment layouts are generally diagrammatic, exact and final locations shall be determined and coordinated in the field by this Contractor. In most cases equipment circuitry is indicated by panelboard designation and circuit number. It is this Contractors responsibility to wire the system in accordance with the National Electric Code. No more than (4) Four current carrying conductors (excluding the ground conductors) shall be installed in any raceway or cable assembly - see other portions of the specifications. The routing of wiring, in some cases is indicated, but it is not intended to show every offset and fitting, nor every structural difficulty or obstacle that will be encountered during the installation of the work. If the alignment of conduit has to be varied from that shown on the drawings, where necessary on account of slight architectural changes, structural conditions, field conditions, space restrictions or to avoid the work of any other trades, it shall be done without extra expense to the Owner. Provide all necessary equipment, fittings, L.B.'s, Junction Boxes, Wireways, etc. which are required to overcome space restrictions, special construction, obstacles, height restrictions, etc.

D. The work outlined on these drawings is subject to actual field conditions.

E. In the event that the drawings or specifications are revised to indicate changes in the work, either by sketch or written form, this Contractor shall evaluate changes promptly. Before installation of any item or performance of any work indicated by revisions this Contractor shall notify, in accordance with other sections of the specification, of any addition or deduction to the Contract Price. Contractor shall not proceed with changes without proper authorization. All changes to the Contract Price shall have the following information forwarded: Each different item of material itemized as line items with unit costs including Quantities listed as Each, L.F. (lineal foot), CLF (hundred lineal feet) or other accepted abbreviations, and cost extensions for both material and labor charges and the hourly rate of labor. Lists which only indicate the items as "material" and "labor" without a breakdown of each item of material with associated labor cost will not be acceptable. If the Electrical Contractor fails to provide the information in the requested format and the electrical engineer is required to do a partial or full estimate (formal or informal) the electrical contractor will be responsible for compensating the electrical engineer for all time spent estimating the revisions to verify pricing at the engineer's standard hourly rates.

1.13 RECORD DRAWINGS

A. Maintain accurate records of all deviations in work as actually installed from work indicated on the drawings. On completion of the project, two (2) complete sets of marked-up prints shall be delivered to the Architect.

1.14 MATERIAL AND EQUIPMENT SCHEDULES

A. Within 10 days after date of award of contract and before any materials, fixtures, devices or equipment are purchased, submit in writing to the Architect, a complete list in triplicate, of specified materials, fixtures, devices and equipment to be incorporated in the work. After one copy of this list is returned showing items approved or rejected, submit within 15 days catalog numbers, cuts, diagrams, drawings and such other descriptive data as outlined in the specifications.

B. Substitutions will not be accepted on Fire Alarm, Lighting, emergency lighting, sound system, hearing impaired system, and other items of equipment which are designated as "shall be as manufactured by...", or do not have the designation "or equivalent".

C. No consideration will be given to partial lists submitted from time to time. Approval of materials shall be based on manufacturer's published ratings and data. Any materials, fixtures, devices and equipment listed that are not in accordance with specified requirements may be rejected. Upon expiration of the above specified period (for submitting or subsequent data submission) or any authorized extension thereof, the Contractor fails to submit the list as specified above, the Engineer will select a complete line of materials, fixtures, devices and equipment and this selection shall be final and binding and all items shall be furnished and installed without change in contract price or time of completion.

D. If the Electrical Contractor submits a substitution all time spent will be billed to the Electrical Contractor at the Engineers standard hourly rates, with no additional cost to the Owner or Project. All costs for all labor and miscellaneous expenses arising from comparisons of substitute equipment, including any and all meetings requested or required, will be billed to the Electrical Contractor, with no additional cost to the project or the Owner.

E. With substitute equipment submission the Electrical Contractor shall provide a letter of agreement that the equipment will be replaced at no additional cost if in the opinion of the Engineer the equipment is unsatisfactory in its performance. Shop drawings will not be processed without this letter and will be returned with no action taken. The Contractor assumes all repercussions of the project schedule in relation to this requirement.

F. It is the Contractors responsibility to meet the entire intent of the specifications. Deviations from the specified items shall be at the risk of the Contractor until the date of final acceptance by the Engineer. Approved submittals on substitute equipment shall only allow the Contractor to proceed with installing a substituted item and said item shall not be considered equal until such time as the Engineer has completely accepted the substituted item. All cost for removal, relocation or replacement of a substituted item shall be at the risk of and completely paid for, including work required by other Divisions of the specifications, by the Electrical Contractor (this Contractor).

1.15 UTILITY COMPANY REBATES

A. ANY AND ALL UTILITY COMPANY REBATES FOR ALL ELIGIBLE ENERGY EFFICIENT LIGHTING, BALLAST, LAMPS, OCCUPANCY SENSORS, LED EXIT SIGNS, ETC. SHALL BE PAID DIRECTLY TO THE OWNER. THE CONTRACTOR SHALL NOT RECEIVE THE REBATE OR DEDUCT THE AMOUNT FROM HIS BID IN ANTICIPATION OF A REBATE.

1.16 EQUIPMENT IDENTIFICATION

A. Identify each item of equipment, including panelboards, switchboards and cabinets 12 inch square and larger, disconnect switches and starters furnished by this division or any other division of the specification, Fire Alarm Control Panel Zones and separate fire alarm system cabinets and junction boxes 6 inch square and larger, and other equipment as designated on the drawings or elsewhere in this specification, including existing equipment where called for. Identifications shall be by a permanently attached nameplate (secured with screws or rivets, with sharp edges filed smooth) made of a black surface, white core, laminated bakelite with engraved letters. Fire Alarm System nameplates shall be red with white core. Nameplates shall be minimum of 3" long by 1-1/2" wide and shall bear the equipment name. All nameplates shall be secured with screws; adhesive back will not be accepted. ALL NAMEPLATES SHALL BE SECURED WITH SCREWS OR RIVETS, WITH ALL SHARP EDGES FILED SMOOTH, TO THE EQUIPMENT, ADHESIVE BACK NAMEPLATES WILL NOT BE ACCEPTED AND WILL BE REPLACED AT THIS CONTRACTORS EXPENSE.

B. Provide typed directories under clear plastic, in directory card holders, in each panelboard, showing the utilization of each circuit. When panelboards are odorless (Power panelboards) the Contractor shall provide screw mounted lamacoid nameplates indicating the utilization of each circuit. The directory shall indicate the circuit breaker number, equipment served and the area/location of the equipment. Area/location designations shall be as designated on the Architectural drawing(s), (i.e., c.b. #1: lighting

room 101, c.b. #6: receptacles room 101, 102). OR Area/location designations shall be as designated by the Owners representative, (i.e., c.b. #1: lighting, Office #1 Room 10, c.b. #6: receptacles Lounge). Area designations shall be reviewed with the Owners representatives, so all areas are identified as understood by the personnel. This Contractor shall mark up a print with the Owners room/area designations and use these designations in the panelboard schedule.

C. As part of the base bid the Contractor shall operate all existing branch circuit breakers in all existing panelboards to identify the equipment and/or load served. All existing panelboards shall have an updated schedule installed in them which shall indicate all the new work and additions to the panel and all existing loads on existing circuit breakers not affected by the new work. Directory information shall be the same format as indicated in the previous paragraph. Directory card holders shall be installed in existing panels if there is not one existing. Coordinate this work with the Owners representative so as not to interfere with the operation of the facility.

D. Once the work has been completed the Contractor shall operate all circuit breakers in all panelboards, new and existing, in the presence of the Owner and/or their designated personnel to show correctness of the new panelboard schedules.

1.16 EXISTING CONDITIONS AND CONSTRUCTION SITE AND BUILDING CONDITIONS

A. Visit the project site, prior to bidding, and be thoroughly acquainted with the provisions of the contract documents and all surrounding conditions with reference to the various phases of work to be performed. Failure to do so shall not be justification for relief from responsibility of performing the work necessary for a complete and proper installation.

B. It is the Electrical Contractors responsibility to verify all conditions relating to equipment dimensions and locations. Any and all construction methods required due to low ceilings in equipment locations, obstructions, routing of conduit/wiring runs in or around the structure, obstructions which have to be overcome, etc. are the responsibility of the Electrical Contractor. All equipment locations on the drawings are diagrammatic, exact and final locations shall be determined and coordinated in the field by this Contractor. The electrical contractor is responsible for all field conditions and shall include such in his bid.

C. Remove such existing accessories and equipment as directed in the work area, in areas to be demolished or applicable to new work and required under the work. All salvaged-surplus material, which the Owner has requested to keep, is to remain his property and shall be stored on the site, by this Contractor, where directed. All other salvaged or surplus material shall become the property of this Contractor and shall be promptly removed from the site.

D. Upon completion of each phase of the electrical installation, remove all surplus and salvaged material and debris, clean, polish and leave in perfect condition all electrical components and equipment.

1.17 WORK IN EXISTING BUILDING

A. Portions of the building will be occupied by the Owner through-out the construction. All work shall be performed in such a manner that there shall be no interference with the operation of the existing facilities. All required shut downs of the electric service or any other system, such as fire alarm, shall be scheduled with the Owner so as not to interfere with the Owners operation of the facility. The Contractor shall perform these shutdowns when the building is not occupied, unless otherwise instructed by the Owner, and shall complete the work prior to the building being occupied the next day of normal operation. Also schedule all shutdowns with the Authorities having jurisdiction (i.e., Fire Dept., Utility Co., etc.) so proper precautions and procedures are followed (fire watch, etc.). See Architectural specifications and drawings for additional information and sequence of work.

B. Deliveries shall be scheduled so as to avoid the storage of materials and equipment in the way of vehicular and personnel traffic required for the proper operation of the existing facilities.

PART 2 PRODUCTS

A. Materials provided under this section shall be new, be the best of their respective kinds and shall comply with the specifications.

B. Samples and shop drawings of all material shall be submitted for approval as required by the Architect. See section "SUBMITTALS" for additional INFORMATION.

1.01 WIRE AND CABLE

A. All wire and cable shall be copper and shall comply with the standards of and be listed by the Underwriters' Laboratories, Inc. (UL), the ASTM and the I.P.C.E.A. as applicable. Wire and cable for interior lighting and power systems shall be type THWN/THHN insulation for 600 volts. Wire and cable for EXTERIOR lighting and power systems shall be type XHHW insulation for 600 volts All wire shall be marked on the jacket with the type of insulation, gauge of wire and manufacturers name and designation.

B. WIRE SHALL BE SUPPLIED IN DIFFERENT COLORS FOR THE DIFFERENT PHASES IN ACCORDANCE WITH THE LATEST PUBLISHED EDITION OF THE ELECTRIC CODE, ARTICLES 210-4(D), 210-5, AND OTHER PERTINENT ARTICLES. CONDUCTORS #8 AND LARGER SHALL HAVE COLORED TAPE ON EACH END OF THE CONDUCTORS AND IN EACH JUNCTION BOX IDENTIFYING THE PHASE IT IS CONNECTED TO.

C. WHERE TERMINAL STRIPS ARE USED FOR VARIOUS SYSTEMS (ELECTRIC, FIRE ALARM, LOW TENSION SYSTEMS, ETC.) BRADY TAGS SHALL BE INSTALLED ON EACH CONDUCTOR TO IDENTIFY THE CORRESPONDING CONDUCTOR ON EACH SIDE OF THE TERMINAL STRIP (TO INSURE PROPER RETERMINATION IF CONDUCTORS ARE REMOVED FROM THE TERMINAL STRIP FOR ANY REASON).

D. 120/208 volt, 3 phase, 4 wire systems, Black, Red and Blue for the ungrounded conductors and white for neutral.

E. 120/240 volt, 1 phase, 3 wire systems, Black and red for the ungrounded conductors and white for neutral.

F. Green shall be used for ground.

G. Isolated ground shall be green with a yellow stripe or other identifying stripe and a tag identifying it at each junction box (provide Thomas Betts TY-RAP identification cable ties), panelboard and/or outlet box and at the main system ground.

H. Conductors of different voltage systems, emergency wiring systems and other systems shall not be installed in the same raceway, junction box, pull box, etc.

I. All wire and cable shall be as manufactured by Triangle Wire and Cable, P.W.C., Collyer Insulated Wire Company or American Flexible Conduit Co. (AFC) or equivalent. All conductors No. 10 gauge or smaller shall be solid and No. 8 gauge and larger shall be stranded unless otherwise noted. All joints and splices of No. 10 AWG or smaller wire and cable shall be made with UL listed wire nuts or compression type connectors. All joints or splices for No. 8 AWG or larger shall be made with UL listed mechanical compression connectors - see section "WIRE AND CABLE CONNECTORS". After the conductors have been made mechanically and electrically secure, the entire joint or splice shall be covered with two layers of UL listed rubber tape and two layers of UL listed PVC electrical tape to provide a minimum insulation value of 600 volts.

J. Wiring for the Life Safety Systems Feeders, Elevator Feeder, Fire Pump Feeder, and others where required by the Electric Code, Life Safety Code or other applicable codes and standards shall be type "MI" CABLE WITH A 2 HOUR FIRE RATING. It shall be installed in all areas required by the Electric Code and in accordance with the Electric Code.

K. Wiring runs shall be concealed in finished areas of the building.

L. Wiring method for ALL EXPOSED vertical wiring runs and horizontal wiring runs in unfinished areas, wiring which may be subject to physical damage and boiler wiring shall be E.M.T. or R.S.C. as applicable - see conduit section.

M. ALL FIRE ALARM WIRING SHALL BE IN E.M.T. OR R.S.C. CONDUIT - CABLE SHALL NOT BE USED – PROVISIONS SHALL BE MADE BY THIS CONTRACTOR FOR INSTALLING CONDUIT CONCEALED ABOVE ALL CEILINGS AND WITHIN ALL WALLS IN ALL FINISHED AREAS. Note that if the Authority having Jurisdiction approves the use of type RED ARMOR "FPL/MC" cable, in writing, they may be used. Provide letter from the Department to the Architect

N. Wiring which is located above ceilings in areas used for environmental air (air plenums) shall be type "MC" cable, conduit and wire or other types of cable/wire complying with the requirements of the Electric Code for use in air plenums.

O. Metal-clad sheathed cable, Type "MC", with full size green ground wire may be used on interior branch circuits, where run concealed (except in concrete or block walls), unless otherwise indicated - BX IS NOT ACCEPTABLE. The outer jacket of type "MC" cable shall be listed for use as a supplemental ground path.

P. Support all cable type "MC" from the structure at regular intervals so there will be NO sagging of cables to provide a neat mechanical appearance. The cable shall be installed so as NOT to lay on the ceiling or ceiling tiles, ductwork, piping, etc. Supports shall be secured at intervals not exceeding 6 feet and within 12 inches of outlet/junction box. Support of cable SHALL NOT BE from the suspended ceiling wire system. Cables shall be installed in conformance with the Electric Code. All type "MC" cables shall be UL listed.

Q. Branch circuit wiring in all common spaces and areas as required by the Electric Code shall be metal-clad sheathed copper cable, Type MC, with green (full size) ground.

1.02 WIRE AND CABLE CONNECTORS

A. All joints and splices of No. 10 AWG or smaller wire and cable shall be made with UL listed wire nuts or compression type connectors.

B. All joints and splices for Fire Alarm System Conductors, where allowed and/or required (equipment with pigtail connections), shall be made on U.L. Listed approved terminal strips - see Fire Alarm section of the specifications.

C. All joints or splices for No. 8 AWG through # 4/0 AWG shall be made with UL listed mechanical compression connectors. Connectors shall have a spacer to physically maintain a separation between the conductors but shall maintain electrical continuity. Connectors shall be BURNDY type "KSA" tritap servit or equal. Provide shop drawings.

D. Feeder and Branch circuit conductors 250 MCM AWG through 750 MCM AWG which require splicing provide BURNDY "SPLICE BLOCK" CONNECTORS" or BURNDY "U-BLOCK CONNECTORS" as applicable. The type of assembly used shall be for junction box or wireways as applicable. The assembly shall consist of a system of an insulating platform and connectors as required for the wire sizes to be terminated. The Electrical Contractor may install the system in either a wireway or junction box - order appropriate system and connectors. Provide quantity and type of power distribution connectors as required for the number of conductors terminated - EACH CONDUCTOR SHALL TERMINATE IN ITS OWN CONNECTOR - CONDUCTORS SHALL NOT BE DOUBLED UP IN A SINGLE CONNECTOR.

E. After the conductors have been made mechanically and electrically secure, the entire joint or splice shall be covered with two layers of UL listed rubber tape and two layers of UL Listed PVC electrical tape.

F. If the Electrical Contractor combines wiring runs in conduit without consulting the Engineer and installation of the proper Gauge conductor to compensate for derating, the wiring run will be determined unusable and shall be removed and all wiring properly installed at the expense of the Electrical Contractor. Multiple conductors in conduit down to panelboards WILL NOT BE ALLOWED - WIREWAYS SHALL BE USED or multiple conduits with no more than (4) four conductors shall be installed. Where flush mounted panelboards are installed all conduit and cable runs shall be installed individually down to the panelboard - do not combine runs in larger conduits with more than four conductors. Note: All conductor ampacity ratings shall be based on 60-degree rating for 100 amp Circuit Breakers and Below and 75 degree for Circuit Breaker frames larger than 100 ampere.

1.03 CONDUIT AND FITTINGS

A. Steel conduit (RSC or R.S.C.) shall be UL listed and shall be used in wet or damp locations, in concrete, outside, through exterior walls or roofs, where conduit may be subject to physical damage and for feeders. The conduit shall be rigid, standard weight, thick-walled, threaded, mild steel, hot-dipped galvanized with an interior coating, as manufactured by Wheatland, Republic, Allied Tube and Conduit, or equivalent. Threaded fittings such as elbows, bends, etc., shall be made of full weight material and treated with the same protective coating required for rigid conduit. All thick-walled rigid steel conduits shall have double locknuts (one inside and one outside the box, enclosure, etc.). All conduits 1.5 inch and larger shall have grounding bushings properly installed and terminated in accordance with the Electric Code.

B. Conduit for interior systems, where required or called for, for boiler wiring, wiring runs where exposed in unfinished areas not subject to physical damage, in dry locations and within block walls shall be UL listed and shall be thinwall Electric Metallic Tubing (EMT or E.M.T.). EMT shall be mild steel, hot-dipped galvanized, with interior coating, as manufactured by Wheatland, Republic, Allied Tube and Conduit, or equivalent. All EMT fittings shall be standard steel setscrew concrete tight type. All connectors shall have insulated throats. Cast alloy fittings will not be accepted and shall NOT be used. EMT SHALL NOT BE INSTALLED IN, UNDER OR THROUGH CONCRETE SLABS. All conduits 1.5 inch and larger shall have grounding bushings properly installed and terminated in accordance with the Electric Code.

C. Where PVC is called for on the exterior systems the Electrical Contractor shall install it with all required expansion fittings and other required and necessary accessories per the manufacturer's recommendations. All PVC conduits shall be SCHEDULE 80 concrete encased where called for or required and shall be UL listed and approved for the installation of electric conductors. Also, a DETECTABLE marker tape with the legend "CAUTION BURIED ELECTRIC BELOW" shall be installed above ALL PVC conduit runs at approx. 9 inches below grade. The detectable underground tape shall have a solid aluminum foil core for identification and detection. PVC conduit shall not be used where run exposed, through floors or concrete walls, EXCEPT WHERE SPECIFICALLY NOTED OR CALLED FOR. All elbows, stubs through floors, penetration of concrete walls, through roofs, etc. shall be Rigid Steel Conduit (R.S.C.). Provide PVC to RSC adapter at the elbows or fittings. PVC CONDUIT SHALL NOT BE USED WITHIN THE BUILDING OR WHERE EXPOSED, UNLESS SPECIFICALLY NOTED ON THE DRAWINGS. Where wiring runs are indicated to be underfloor, below concrete floor slab, Schedule 80 or 40 P.V.C. conduit may be used. ALL ELBOWS, STUBS THROUGH FLOORS, PENETRATION OF CONCRETE WALLS, ETC. SHALL BE RIGID STEEL CONDUIT (R.S.C.). PVC conduit shall be as manufactured by Carlon or equivalent.

D. Where PVC conduit is run exposed, it shall be SCHEDULE 80 and shall be supported to provide adequate lineal movement to allow for expansion and contraction of conduit due to temperature changes. Expansion joints shall be installed in all runs, the number and spacing of expansion joints shall be as recommended by manufacturer. Provide adequate number of support clips, angles, brackets, etc. to prevent distortion of the PVC conduit (bending, warping, drooping, ETC.). The Contractor shall replace at his expense any PVC which distorts within a one-year period of time from date of final acceptance of the project by the Engineer. All PVC shall be installed in accordance with the Electric Code and manufacturers recommendations. PVC conduit shall be as manufactured by Carlon or equivalent.

E. Flexible metal conduit is a raceway of circular cross section and shall be constructed of continuous interlocking bands of zinc coated steel and shall be complete with fittings, couplings and connectors and be UL listed and approved for the installation of electric conductors. When used an additional green bond wire shall be used to bond each end of the conduit to provide continuity. Flexible metal conduit may only be used for connection of lighting fixtures or similar use. It shall not be used for connection to motors or equipment that vibrates - Liquidtite Flexible metal conduit shall be used for that purpose. Flexible conduit shall not exceed six (6) feet in length in any given branch circuit wiring run. Provide grounding/bonding connectors at each termination point of the flexible conduit.

F. Liquidtight flexible metal conduit is a raceway of circular cross section and shall be constructed having an outer liquidtight, nonmetallic, sunlight-resistant jacket over the inner flexible metal core, with associated couplings, connectors and fittings, and be UL listed and approved for the installation of electric conductors. When used an additional green bond wire shall be used to bond each end of the conduit to provide continuity. Liquidtight flexible metal conduit shall be used for connections to motors, HVAC equipment,

HV equipment, exterior equipment which requires flexible connection, equipment which vibrates and other connections which require a flexible, watertight connection, in Boiler and Mechanical Rooms and as required by the Electric Code. Liquidtight Flexible conduit shall not exceed six (6) feet in length in any given branch circuit wiring run. Provide grounding/bonding connectors at each termination point of the flexible conduit.

G. All fittings for conduits shall be steel. Where type "MC" cable is used the fittings shall be steel and be the proper type for the box and be Listed for use with type "MC" cable.

1.04 OUTLET BOXES

A. All outlet boxes for all wiring methods shall be UL listed and shall be galvanized 4" square with proper raised covers, unless otherwise required for the device or equipment to be mounted on or in the box. Where the boxes are cut into existing walls for flush mounting and type "MC" cable is used 2" x 4" or gang boxes may be used, unless otherwise noted, called for or required. WHERE BOXES ARE CUT INTO EXISTING WALLS, THEY SHALL BE PROPERLY SECURED SO THERE IS NO MOVEMENT WHEN THE DEVICE IS OPERATED OF A PLUG INSERTED. All wall outlet boxes shall be set in wall to match finish line of walls. Wall outlets for wall mounted lighting fixtures (wall sconces, etc.) shall be 3-1/2" or 4" octagon with stud and plaster ring unless otherwise required by the fixture to be installed - Contractor shall verify the type, size and style of box required for wall mounted fixtures prior to installation. Outlet boxes shall be UL listed for their use.

B. Ceiling outlets shall be 4-inch octagon boxes, or 3-1/2 inch if required, with stud and plaster ring unless otherwise required. Ceiling fan outlets shall be type specifically manufactured and rated for use with ceiling fans. Ceiling outlet boxes shall be installed so they do not protrude below the ceiling surface. Contractor shall verify the type, size and style of the ceiling outlet box required with the type of equipment to be mounted and connected (fire alarm detector, lighting fixture, etc.). Outlet boxes shall be UL listed for their use.

C. At outlets of all descriptions, for all systems, there shall be provided a suitable fitting, which shall be either a box or device, especially designed to receive the type of fittings to be mounted thereon.

D. Outlet boxes for ground fault interrupter receptacles and surge suppresser receptacles shall be a <u>minimum</u> 2-1/2 inches in depth or deeper and be 4-inch square with raised cover.

E. All outlets on exposed work subject to the weather or in damp or wet locations shall be threaded cast device "FS" or "FD" outlet boxes of proper type and shall be flush mounted in new walls and other areas where possible. "FS"/"FD" boxes shall be as manufactured by Crouse Hinds, Killark, Appleton, or equivalent.

F. Tile type raised covers, depth as required, shall be used in all walls where masonry, dry wall or wood paneling will remain as finished surface. All boxes shall be as manufactured by RACO, Steel City, Appleton, or equivalent.

G. In unfinished areas where outlet boxes are exposed, 4" square boxes with rounded edges and with exposed work raised covers shall be used. This shall apply to all Fire Alarm devices, controls, and all other types of equipment to be mounted on outlet boxes. Panelboard covers shall not overhang the backbox installed on.

H. Outlet boxes shall be increased where necessary to provide conductor space for number of conductors and devices installed in conformance with the code and/or conduits 1 inch and larger. Any and all boxes with open knockouts shall have knockout seals installed in conformance with the Electric Code.

1.05 JUNCTION AND PULL BOXES

A. Junction or pull boxes shall be UL listed and shall be galvanized, code gauge steel and minimum size as required by the Electric Code. Junction or pull boxes larger than 4-inch square shall be furnished without knockouts with holes being field cut as required. Covers shall be secured with bronze button head screws. This Contractor is responsible for proper sizing of all junctions and pull boxes in accordance with the number of conduits, conductors, etc. to meet the requirements of the National Electric Code. Any and all boxes with open knockouts shall have knockout seals installed in conformance with the Electric Code.

1.06 WIREWAY TROUGHS

A. Wireway troughs shall be UL listed and shall be constructed of code gauge sheet metal with hinged covers and be approved for housing and protecting electric wires and cables. Where wireway is installed with the cover in other than the upright (top of wireway) position wire clips shall be installed to secure and prevent conductors from hanging out of wireway when the cover is opened or removed. Couplings, elbows, end plates, mounting supports and accessories shall be provided where required. Wireway size shall be based on the quantity and size of conductors installed and shall be in accordance with the National Electric Code.

B. Where the number of conductors exceeds that allowed by the National Electric Code (30 conductors maximum inclusive of neutral conductors) additional wireways shall be installed. In no case shall there be more than a 20 percent fill in any wireway. For purposes of conductor quantities, the NEUTRAL conductor is considered current carrying and shall be included in the quantity count. The Ground wire(s) are NOT current carrying and shall not be included in the quantity count.

1.07 SAFETY SWITCHES

A. Where called for on the drawings and elsewhere as required by the Electric Code, safety switches shall be UL listed and shall be heavy duty type, 240 Volt or 600 Volt with number of poles necessary for the intended use, fusible or non-fusible as required for the equipment served or for the intended use, weatherproof where installed exterior to the building, ampacity and/or horsepower rated as required and/or as indicated on the drawings. All safety switches shall have provisions to lock the handle in the "OFF" position.

B. All safety switches used on systems with neutral conductors shall have an insulated solid neutral block installed within the enclosure for connection of neutral conductors. A ground lug, bonded to the enclosure, shall be provided in all safety switch enclosures for connection of ground conductors. Safety switches shall be rated as "suitable for use as service entrance equipment" when used for this application.

C. Safety switches shall be as manufactured by Siemens or Square "D".

D. Enclosures shall be NEMA type 1 where installed indoors, NEMA type 3R or 4 (watertight) where installed exterior or in unheated spaces, unless otherwise required due to the location of the safety switch. When used in an environment that is in a constantly humid state all safety switches shall be either stainless steel or fiberglass enclosure type. Where the environment is of a corrosive nature, or requires special considerations, the proper NEMA style safety switch shall be used in accordance with the hazard or corrosive nature of the space. This Contractor is responsible for verifying the type of space and hazard and providing the proper style safety switch.

E. This Contractor shall furnish to the Owner three (3) spare fuses for EACH type of fuse used and/or called for, and a spare fuse cabinet of sufficient size to store ALL spare fuses supplied.

1.08 INDIVIDUAL CIRCUIT BREAKERS

A. All individual circuit breakers shall be UL listed and shall be size as noted on the drawings or required with number of poles necessary for the intended use Circuit breakers shall be 250 volt or 600 volts rated in accordance with the electrical system voltage.

B. NO MORE THAN ONE CONDUCTOR PER PHASE SHALL BE PLACED ON ANY LUG OF CIRCUIT BREAKERS FROM 10 AMPERE TO 400 AMPERE UNLESS CIRCUIT BREAKERS ARE FACTORY EQUIPPED WITH DOUBLE LUGS PER PHASE. THIS CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE LUG CONFIGURATION WITH THE WIRE SIZE SPECIFIED AND ORDERING THE CIRCUIT BREAKER APPROPRIATELY.

C. Enclosures shall be NEMA type 1 where installed indoors, NEMA type 3R or 4 (watertight) where installed exterior or in unheated and/or humid spaces, unless otherwise required due to the location of the circuit breaker. Enclosures shall have provisions to PADLOCK the Circuit Breaker in either the "ON" or "OFF" position. This provision shall be a standard option of the manufacturer and shall be purchased with the Circuit Breaker.

D. All individual circuit breakers shall have provisions for locking the circuit breaker in the "OFF" position. All circuit breakers used on systems with neutral conductors shall have an insulated solid neutral block installed within the enclosure for connection of the neutral conductors. A ground lug, bonded to the enclosure, shall be provided in all circuit breaker enclosures for connection of ground conductors. Circuit breakers shall be U.L. listed and rated as "suitable for use as service entrance equipment" when used for this application. Circuit breakers shall be as manufactured by Siemens or Square "D".

1.09 RECEPTACLES AND MISCELLANEOUS DEVICES

A. Receptacles and miscellaneous devices shall be as specified in the symbol list on the drawings and shall be UL listed. ALL RECEPTACLES SHALL BE HARD USE OR EXTRA HARD USE SPECIFICATION GRADE, COMMERCIAL GRADE AND RESIDENTIAL GRADE WILL NOT BE ACCEPTED AND WILL BE REMOVED AND REPLACED BY THE ELECTRICAL CONTRACTOR AT THEIR EXPENSE IF INSTALLED. They shall be of the type, rating and number of poles indicated and required for the anticipated purpose. They shall be as manufactured by Leviton, Hubbell or Pass and Seymour (P & S).

B. Receptacles shall be installed with the grounding connection up above the hot and neutral connections.

C. Receptacles shall be installed securely in the outlet box, so there will be no movement of the device. If the device moves, when pressed on, the Contractor shall correct the problem. Where required, provide shims (such as "B-Line "Retainer Leveler") between the device and the outlet box to hold the device firmly in place flush with wall surface. The plate shall not be used as the means of holding the device in place.

D. All colors of receptacles and miscellaneous devices shall be as selected by the Architect. Catalog numbers represent the type and style of the device specified for installation and does not represent the color choice. If the color installed by this Contractor is not acceptable to the Architect they shall be replaced at no additional cost to the Owner, at the Contractors expense. Colors selected shall be of the standard colors of GRAY, IVORY, WHITE, BROWN. Colors shall vary in accordance with the room or space finish. The Architect reserves the option of choosing multiple colors for use in the various spaces in accordance with the various color schemes used within the structure.

1.10 WIRING DEVICE PLATES

A. Device plates shall be UL listed and shall be unbreakable type, Leviton "80700" or "80400-N" (decorator style) unbreakable nylon series, Pass and Seymour (P & S) "SRP" unbreakable nylon series or Hubbell "P" unbreakable nylon series, or stainless steel type 302. Stainless Steel type 302 shall be used in areas where plates may be subject to damage such as equipment storage rooms, mechanical rooms, warehouse spaces, etc. Special plates and plates requiring engraving shall be stainless steel type 302. Plates shall be as manufactured by Leviton, Pass and Seymour (P & S) or Hubbell.

B. When prints are being submitted the initial submittal shall consist of 3 sets of prints and 1 sepia. The sepia will be marked up and returned for corrections and/or record prints, to the Vendor. There shall be a second submittal which shall consist of prints in the quantity specified under SUBMITTALS and the additional quantities required for distribution as indicated in previous paragraphs, for record purposes. This does not negate the responsibility of prior submission to the Fire Alarm Authority having jurisdiction.

PART 3 EXECUTION

A. The electrical systems and equipment layouts are generally diagrammatic, exact and final locations shall be determined and coordinated in the field by this Contractor. In most cases equipment circuitry is indicated by panelboard designation and circuit number. It is this Contractors responsibility to wire the system in accordance with the National Electric Code. No more than (4) Four conductors shall be installed in any raceway or cable assembly - see other portions of the specifications. The routing of wiring, in some cases is schematically indicated, but it is not intended to show every offset and fitting, nor every structural difficulty or obstacle that will be encountered during the installation of the work. If the alignment of conduit/wiring has to be varied from that shown on the drawings, where necessary on account of slight architectural changes, structural conditions, field conditions, space restrictions or to avoid the work of any other trades, it shall be done without extra expense to the Owner. Provide all necessary equipment, fittings,

LB's, Junction Boxes, Wireways, etc. which are required to overcome space restrictions, special construction, obstacles, height restrictions, low ceilings, high ceilings requiring staging, etc. All exposed conduits shall be secured tight to the ceiling and/or wall surfaces and shall be run at right angles to and parallel with the directions of the walls - diagonal runs will not be accepted and will be replaced at the Electrical Contractors expense. It is the Electrical Contractors responsibility to verify routing of all wiring runs and install same so as not to interfere with the structure or the work of other trades.

B. It is the Electrical Contractors responsibility to verify all conditions relating to equipment dimensions and locations. Any and all construction methods required due to low ceilings in equipment locations, obstructions, routing of conduit/wiring runs in or around the structure, obstructions which have to be overcome, etc. are the responsibility of the Electrical Contractor. All equipment locations on the drawings are diagrammatic, exact and final locations shall be determined and coordinated in the field by this Contractor. The electrical contractor is responsible for all field conditions and shall include such in his bid.

3.01 UNDERGROUND CONDUIT

A. All conduit called for to be installed underground shall be installed a minimum of (36") thirty-six inches below finished grade. All Electric Primary Service conduits shall be installed in accordance with Utility Company requirements (including concrete encasement). All other Utility Underground conduits shall be installed in accordance with the Utilities(y) standards (Telephone, Cable TV, Fire Alarm, etc.) unless the drawings are more stringent - then the conduit system shall be installed in accordance with the drawings. Concrete encasement shall be provided for all underground conduits that are installed under roadways, parking lots or other areas where there is vehicular traffic. Schedule 80 thick-walled PVC shall be used unless otherwise specified or required by the different Utility services - Schedule 40 PVC is not acceptable unless concrete encased. All elbows through floors and/or pads or penetrations through walls shall be Thick-walled Rigid Threaded Steel Conduit (RSC). Provide concrete encasement where required by the Utility Companies, by the Electric Code and where called for on the drawings or elsewhere in the specifications.

B. A marker tape with the legend "CAUTION ELECTRIC LINES BURIED BELOW" shall be installed above ALL underground metal or PVC conduit runs and low voltage direct burial cable.

3.02 FEEDERS AND BRANCH CIRCUITS

A. As part of this contract this Contractor shall operate each circuit breaker in each existing panelboard to identify the load/equipment served (lighting, receptacles, etc.). Provide new typed directories in the panelboards showing the utilization of each circuit and new stick-on numbers on each circuit breaker. Directory shall contain information as outlined in the "equipment identification" section of this specification. The Contractor shall mark up a print with the Owners room/area designations and use these designations in the panelboard schedule.

B. All necessary fittings, LB's, condulets, junction and pull boxes shall be installed in runs to facilitate wire pulling and conduit installation and shall be in accordance with the Electric Code. These boxes and fittings shall be provided whether or not shown.

C. All conduits and fittings on exposed work shall be secured by means of metal clips, held in place by means of Polyset Solid Masonry type anchors (for use on CMU, concrete or other masonry or solid type construction) and machine screws. When installed over concrete surfaces, the screws shall be held in place by means of Polyset Solid Masonry type anchors or other acceptable means - the installation shall not depend on the screw alone. PLASTIC ANCHORS ARE NOT ACCEPTABLE AND SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE IF INSTALLED.

D. All conduit on exposed work shall be run at right angles to and parallel with the surrounding walls and shall conform to the shape of the ceiling. Conduit shall be secured tight to the wall and/or ceiling surfaces and shall not hang down from these surfaces. No diagonal runs shall be permitted. Bends and offsets shall be avoided as far as possible. Where bends cannot be avoided, condulet fittings shall be used. Conduit in all cases shall be run straight and true, satisfactory to the Architect. Where conduits must pass through structural members, permission shall be first obtained from the Architect and then a provision will be made by the General Contractor. All thick-walled rigid steel conduits shall have double locknuts (one inside and

one outside the box, enclosure, etc.). All conduits (Rigid Steel and/or E.M.T.) 1.5 inch and larger shall have grounding bushings properly installed and terminated in accordance with the Electric Code.

E. All type "MC" cable shall be properly secured in accordance with the Code, utilizing U.L. Approved cable staples specifically made for the type of cables installed. These cables may only be used in areas designated in other parts of this specification. Support cable from the structure at regular intervals so there will be NO sagging of cables to provide a neat mechanical appearance. The cable shall be installed so as NOT to lay on the ceiling or ceiling tiles, ductwork, piping, etc.

F. All cable types "MC" shall be secured at intervals not exceeding 6 feet and within 12 inches of the outlet/junction box which the cable is terminated at. All terminations shall be made utilizing U.L. Approved connectors made specifically for the type of cables installed.

G. Raceways shall be installed and terminated to exclude dirt, plaster, moisture and foreign material from entering, while the project is in the process of construction. All thick-walled rigid steel conduits shall have double locknuts (one inside and one outside the box, enclosure, etc.). All conduits (Rigid Steel and/or E.M.T.) 1.5 inch and larger shall have grounding bushings properly installed and terminated in accordance with the Electric Code.

H. All raceways shall be complete in every respect before electrical conductors and/or cables are installed. No splices or joints will be permitted in either feeders or branches except at outlets or at accessible junction boxes.

I. Provide expansion fittings in all conduits passing through all building expansion joints and in other areas in accordance with manufacturers recommendations for the type of conduit used and the length of the conduit run.

J. Provide sleeves for the installation of wiring runs (raceways, cables, etc.) through Fire Rated and bearing walls, all ceilings, all floors, etc. Seal openings between wiring run and inside surface of sleeve and around sleeve with a U.L. listed (3) three hour rated fire proofing material approved for this purpose. Install fireproofing material as instructed by the manufacturer and to meet the requirements of the fire rating required at the penetration. Fireproofing material shall be type acceptable to the Architect - It is the Electrical Contractors responsibility to meet the required fire rating regardless of acceptance of material by the Architect.

K. Wiring runs shall be installed concealed in all finished portions of the building even if runs have to be relocated. Relocation of wiring runs shall be reviewed with the Architect.

L. At all surfaces mounted panelboards branch circuits shall be brought to wireways which shall be installed from the top of the panelboard to above the accessible hung ceiling or near the structural ceiling where there is no hung ceiling. Where panelboards contain 24 poles or less provide 2 - 2-1/2-inch wireways, panelboards with more than 24 poles shall have 3 - 2-1/2-inch wireways installed. Cable outer coverings shall be terminated at the wireway; conductors shall be brought down the wireway into the panelboard unspliced. Provide a nipple connection from the wireways into the panelboard consisting of a maximum 3-inch-long nipple, maximum diameter possible (the panelboard backbox does not have to be cut for the wireway entrance). Provide proper connectors for termination of cables to the wireway. All wireways shall have hinged covers. Where larger conductors (other than #12 or #10) are to be installed the Electrical Contractor shall not exceed the 30 conductor or 20% fill limit of the wireway. FEEDERS TO OTHER PANELBOARDS AND/OR LARGER THAN #8 GAUGE WIRE SHALL BE INSTALLED IN SEPARATE CONDUITS AND SHALL NOT BE INSTALLED IN THESE WIREWAYS.

M. All branch circuit conductors shall be #12 AWG size, SOLID copper, except as otherwise indicated on the drawings or required. All No. 12 AWG conductors shall be increased to #10 AWG if the length to center of load is more than 100 feet. All color codes for conductors shall comply with Articles 200 and 210 of the Latest Published Edition of the National Electric Code and shall be identified at the panelboard as indicated in Article 210-4(d) where there is more than one voltage in the building, see section "WIRE AND CABLE". Conductors of the different voltage systems shall NOT be installed in the same raceways, junction boxes, pull boxes, wireways, etc. Wire insulation to be type THHN/THWN where used for the interior systems and type XHHW where used for the exterior systems.

N. Outlets shall be located approximately where indicated on the drawings and shall be properly centered where located in paneled work or other special interior finish. The Architect reserves the right to relocate outlets, using the same amount of material, before actual construction begins, without expense to the Owner. See general notes for additional requirements.

O. Verify all dimensions, electrical characteristics, location and method of connection to all types of equipment, devices, appliances and accessories prior to installing any runs - see other portions of the specifications for Contractor responsibilities. When indicated, verify the number of wires indicated on the various systems wiring runs and report any discrepancies to the Engineer. For circuitry indicated by circuit number only the Contractor is responsible for layout with the proper number of conductors in accordance with the Electric Code and these specifications. For appliances and equipment furnished under other divisions of work verify the type and characteristics of the wiring runs. Responsibility to see that all systems and equipment function correctly and as intended is included in this division of the contract documents.

P. For equipment furnished with a cord and plug provide a matching receptacle. Equipment with direct connection provide final connection. Wiring connections to equipment shall include connection to all the associated accessories. The Electrical Contractor is responsible to verify the type of final connection and the equipment and accessories required for the connections. Provide flexible conduit or liquid tight flexible conduit where required. Provide disconnects where required by the Electric Code and/or where called for.

3.03 GROUNDING

A. Bond all raceways, outlets and all exposed non-current carrying metallic parts of the electrical equipment in accordance with the Electric Code. Each system shall be properly grounded by means of separate grounding conductors installed with branch circuit wiring and feeders and by means of bonding jumpers sized in accordance with the Electric Code. All conduits, nipples, locknuts, bushings and EMT fittings shall be tightly made up to form a continuous bond throughout. All thick-walled rigid steel conduits shall have double locknuts (one inside and one outside the box, enclosure, etc.). All conduits (Rigid Steel and/or E.M.T.) 1.5 inch and larger shall have grounding bushings properly installed and terminated in accordance with the Electric Code.

B. Where type “MC” cable is used the armor shall be type approved as a supplemental ground path. IN NO CASE SHALL A CABLE ASSEMBLY WHICH DOES NOT HAVE THE UNDERWRITERS’ LABORATORIES INC. (UL) LISTING FOR THE OUTER JACKET MEETING THE REQUIREMENTS FOR A SUPPLEMENTAL GROUND PATH BE USED. IN ADDITION TO THE OUTER JACKET THERE SHALL BE A FULL-SIZE GROUND WIRE AS PART OF THE CABLE ASSEMBLY.

C. Provide conduit(s) with bare copper stranded wire(s) from the main service(s) to the street side of the water meter and sprinkler service and to a grounding grid of driven ground rods as required by Section 250-81 of the Electric Code. In the event that the exterior water pipe is non metallic or determined as not suitable for grounding purposes a 20 foot or longer grounding electrode encased in the building concrete foundation shall be installed in accordance with the Electric Code Article 250-81(c). Provide sleeve for mechanical protection where this electrode penetrates the foundation. The metal frame of the building shall be grounded in accordance with the Electric Code

D. Provide grounding of the Fire Alarm System as described in the Fire Alarm section of this specification.

E. Ground shall be tested to verify that the resistance is not more than called for by the Electric Code. If resistance is higher, additional ground rods shall be added as necessary.

3.04 HEATING, VENTILATING AND MISCELLANEOUS POWER

A. Motors, in general, unless otherwise specified, will be supplied by other sections of the specification with the various items of equipment requiring same. Connect the motors to the source of supply. Motors furnished under this section of the specification shall be energy efficient type conforming to the energy conservation section of the State Building Code. Motors furnished under other sections of the specification shall be checked and if found to be non-energy efficient shall be brought to the attention of the Architect and Engineers.

B. All motors shall be checked to verify they have been supplied in the voltage and phase indicated on the electrical drawings. Multi tap motors (200/240/480) shall be checked to verify the tap is the correct current characteristics for the building voltage - change tap if necessary to match building voltage and phase, change overload heaters in the starters as required. If other motors are found to be different than what is described on the drawings, the Architect and Engineer shall be notified immediately to determine if the motor, circuit breaker(s), safety switch (es), disconnect switch (es) or any other equipment/controls are to be changed. If this Contractor does not notify the Architect, it shall be the Contractors responsibility to provide all necessary changes to panelboard circuit breaker(s), controls, safety switch (es), etc. If provided in the wrong voltage for the building the contractor supplying the motor is to be notified by this contractor so the equipment/motor can be replaced with the correct voltage and characteristics for the building system.

C. All motor starters, push buttons, pilot lights and other miscellaneous controls for all motors and equipment shall be furnished under other sections of the specification and installed and connected under this section, unless otherwise noted. All safety switches, disconnects, thermal switches and toggle switches shall be furnished and installed under this section. All motors shall be connected from outlets through Liquidtite flexible metal conduit. In damp or wet locations, flexible metal conduit to be liquid tight. All starters and similar controls shall be installed in an accessible location, verify exact location with the Architect and Engineer.

D. All thermal elements for motor protection shall be provided by the Electrical Contractor and shall be correct type for protecting each type of motor.

E. Wire multiple runs of electric baseboard on the same thermostat by connecting to the LINE side of the internal limit switch. Note: wiring from the load side of a limit switch to the next limit switch will cause improper operation of the baseboard and reduced heat output.

F. Provide temperature control and power wiring called for on the electrical drawings. All other control and power wiring not shown on the electrical drawings, but required, shall be provided under other sections of the specifications.

3.05 SUBMITTALS

A. After first checking for compliance and making all necessary notations and corrections, submit for approval ten (10) sets (unless other quantity of data is required by the Architectural Specifications) of shop drawings, product data, wiring diagrams (where applicable) on all component parts of the following equipment and systems:

1 Service equipment.
2 Safety Switches
3 Motor disconnect switches and enclosures.
4 Wire connectors.
5 Fuses with type and rating indicated and spare fuse cabinet.
6 Individual circuit breakers.
7 Timeclocks, photocells, relays and accessories.

END OF SECTION 26 00 00