PROJECT MANUAL

for

GIDEON WELLES SCHOOL
BOILERS REPLACEMENT

1029 NEIPSIC ROAD
GLASTONBURY, CONNECTICUT 06033

BID # GL-2022-29

Bemis Associates LLC
185 Main Street
Farmington, Connecticut 06032

February 14, 2022

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TOWN OF GLASTONBURY
INVITATION TO BID
GL-2022-29

Gideon Welles School Boiler Replacement

1029 Neipsic Road
GLASTONBURY, CT 06033

DATE OF ISSUANCE: February 14, 2022

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LEGAL NOTICE – INVITATION TO BID
TOWN OF GLASTONBURY
GIDEON WELLES SCHOOL BOILER REPLACEMENT
GL-2022-29

The Town of Glastonbury (the "Town") is requesting proposals from licensed, qualified general contractors for replacing boilers and controls (the "Project") at the premises known as Gideon Welles School, 1029 Neipsic Road Glastonbury, CT 06033 (the "Premises"). Bids can be submitted at the following link: https://app.negometrix.com/buyer/2832 under the BID title "GL-2022-29 – Gideon Welles School Boiler Replacement. Bidders will be required to create a profile before submitting their bid. Step-by-step instructions on how to register as a vendor are available at this website: https://help.negometrix.com/en/support/solutions/articles/9000177626-register-on-negometrix4. Bids for the Project shall be submitted no later than 11:00 A.M. on March 8, 2022, after which time the bids will be publicly opened. No late bids will be accepted.

The Project will include the following: Boilers, circulating pumps and domestic water heater replacement, and heating plant temperature control upgrades.

A **mandatory pre-bid meeting** will be held at _Gideon Welles School, Neipsic Road, Glastonbury, CT 06033, on February 24, 2022 at 2:30 PM. All bidders must attend in order for their bid to be considered. Due to the current pandemic attendees must comply with social distancing guidelines and wear a mask at all times during the meeting.

This Invitation to Bid, Instructions to Bidders, and other Bidding Documents (as defined in the Instruction to Bidders) are available for viewing and downloading on the State Contracting Portal at www.das.state.ct.us, and the Town of Glastonbury website www.glastonburyct.gov at no cost.

Each Bid must be accompanied by a bid security in the form of a Bid Bond, certified in an amount not less than 10% of the base bid except as otherwise expressly provided in the Instruction to Bidders. If the base bid amount of the successful bidder exceeds One Hundred Thousand Dollars ($100,000), the successful bidder will be required to provide performance and labor and material payment bonds in the full amount of the agreed contract price.

Bidders are further advised that this project is subject to the prevailing wage requirements of Connecticut General Statutes Section 31-53.

The Town of Glastonbury is An Affirmative Action/Equal Opportunity Employer. Minority/Women's Business Enterprises are encouraged to bid.

The Town reserves the right to amend or withdraw this Invitation to Bid for any reason, to accept or reject any or all Bids, to waive any formalities or non-material deficiencies in any Bid, and to make such award (or make no award) of a contract in connection with this Invitation to Bid all as determined by the Town, in its discretion, to be in the best interest of the Town. A Bid may be rejected for irregularities of any kind, including without limitation, alteration of form, additions not called for, conditional proposals, and incomplete Bids. A Bid may also be rejected if, in the opinion of the Town, the Bid does not meet the standard of quality established by the Bidding Documents. Any or all Bids may be rejected if there is any reason to believe that collusion exists among two or more Bidders. The foregoing provisions are for illustrative purposes and shall in no way limit the right of the Town to reject any and all Bids, in whole or in part.

INSTRUCTIONS TO BIDDERS

PART 1 – PROJECT DESCRIPTION AND SCHEDULE

1.1 Project Description:

The Project entails boiler replacement having an address of 1029 Neipsic, Glastonbury, Connecticut 06033. The scope of Work for the Project will include all materials, labor, services, equipment, systems and machinery described in, and as may be reasonably inferable from the Bidding Documents.

Generally the work will include Boiler Replacement and associated work at the Gideon Welles Schook, including controls, piping, insulation and other work described in the project documents.

1.2 Project Schedule

It is anticipated that the successful Bidder will be required to commence work on or about April 1, 2022 and achieve substantial completion of the Project no later than August 19, 2022.

PART 2 – GENERAL INFORMATION

2.1 Definitions

A. Addenda/Addendum: Written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.
B. Engineer: BEMIS Associates
C. Architect's Representative: Lucian Dragulski, Tel. No. (860) 667-3233 ext 113; Email address: luciand@bemisassociates.com.
D. Base Bid Amount: The total sum for which the Bidder offers to perform the Work described in the Bidding Documents.
E. Bid: The complete submission provided by a Bidder in response to the Invitation to Bid.
F. Bid Form: The form to be submitted by each Bidder attached hereto as Attachment 1.
G. Bidder: A person or entity who submits a Bid. A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment and/or labor for a portion of the Work.
H. Bidding Documents: All of the documents listed on Attachment 2.
I. Bid Timeline: The dates applicable to this solicitation and the Bid submission process in connection with the Invitation to Bid and set forth in Section 5.1 of these Instructions to Bidders.
J. Contract Documents: All of the documents identified as Contract Documents in the Form of Contract for Construction and such other documents as may be identified as Contract Documents in the Contract.
K. Contract: The Contract for Construction entered into by the Town and the Contractor for the Project.
L. Contract Price: The Contract Sum set forth in the Contract.
M. Contractor: The successful Bidder selected by the Town for the Project in connection with this Invitation to Bid.
N. DAS Website: www.das.state.ct.us

O. Form of Contract for Construction: The Town of Glastonbury Construction Contract attached hereto as Attachment 3.

P. Invitation to Bid: Legal Notice - Invitation to Bid included in this Request for Proposals.

Q. Purchasing Agent: Mary F. Visone, Purchasing Agent, 2155 Main Street, Glastonbury, CT 06033; (860) 652-7588; purchasing@glastonbury-ct.gov.

R. Statement of Qualifications: Modified version of the AIA A305 Statement of Qualifications attached hereto as Attachment 8.

S. Submission Deadline: The date and time by which all Bids must be submitted as set forth in Section 5.1 of these Instructions to Bidders.

T. Submission Documents: The documents required to be submitted as part of the Bid listed on Attachment 4.

U. The Town's Representative: David Sacchitella, Building Superintendent, 2143 Main Street, P.O. Box 6523, Glastonbury, CT 06033, (860) 652-7706, dave.sacchitella@glastonbury-ct.gov.

V. Town's Website: www.glastonburyct.gov

2.2 Bidding Documents

A. Bidding Documents will be posted on the DAS Website located under the State Contracting Portal. These Bidding Documents will also be available on the Town's Website.

B. Bidders shall use complete sets of Bidding Documents in preparing Bids. Neither the Town nor the Architect assume any responsibility for errors or misinterpretations resulting from a Bidder's use of incomplete sets of Bidding Documents.

C. Access to and copies of the Bidding Documents are made available by the Town for the sole purpose of obtaining Bids for the Project. No license or permission is granted to any person or entity for any other use of the Bidding Documents.

D. The Town reserves the right to amend the Bidding Documents by issuance of Addendum if the Town deems it to be necessary, appropriate or otherwise in the best interest of the Town.

2.3 Requests for Information/Clarification

A. Any ambiguities or inconsistencies in the Bidding Documents of which a Bidder becomes aware, all requests for clarification and interpretation of Bidding Documents and technical questions shall be emailed to the Town's Representative no later than the date and time indicated in Section 5.1 Bid Timeline. For administrative questions regarding this Bid, please contact the Purchasing Agent.

B. No interpretation of any part of the Bidding Documents shall be provided to a Bidder verbally and only written interpretations posted on the State Contracting Portal and the Town's Website will be binding. All responses to requests for clarification or interpretation and all addenda and amendments to the Bidding Documents will be posted on the State Contracting Portal and the Town's Website. **Bidders are strongly encouraged to periodically access the DAS Website/State Contracting Portal and the Town's Website for updates and information related to this solicitation.**

C. The Town reserves the right to respond or not to respond to specific questions, clarifications or requests concerning the solicitation and selection process.

2.4 Substitutions

A. The materials, products and equipment described in the Bidding Documents establish the standard required for the function, dimension, appearance and quality to be met by any proposed substitution.

B. No substitution will be considered unless the written request for approval of such substitution has been received by the Architect by the date for substitution requests stipulated in the Bid Timeline, as it may be extended by Addendum in the discretion of the Town. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for a thorough evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work would require shall be included. The burden of proof of the merit of the proposed substitution is upon the Bidder. The Architect's decision to approve or disapprove a proposed substitution shall be final.

C. If the Architect approves a timely submitted request for a substitution, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

2.5 Addenda

A. Addenda will be issued by the Town in accordance with the Bid Timeline (as it may be adjusted in the discretion of the Town).

B. Each Bidder shall confirm in writing as required on the Bid Form submitted as part of its Bid that the Bidder is aware of and has reviewed all Addenda issued.

2.6 Bid Security

A. Each Bid must be accompanied by a copy of a fully and properly executed bid bond in the form attached hereto as Attachment 5 in an amount equal to Ten Percent (10%) of the Base Bid Amount associated with such Bid. Original bid bonds from all bidders shall be mailed or hand delivered to the following address:

If by USPS mail:

Town of Glastonbury

P.O. Box 6523

Glastonbury, CT 06033-6523

Attn: Mary F. Visone, Purchasing Agent

If by Hand Delivery:

Town of Glastonbury

2155 Main Street

Glastonbury, CT 06033

Attn: Mary F. Visone, Purchasing Agent

The original Bid Bond shall be submitted in a sealed envelope that is clearly marked with the Bidder's company name and address, the Bid number, Bid title and Bid Submission Deadline. Original bid bonds shall be received by the Town of Glastonbury Purchasing Agent within 24 hours after the opening of the Bids.

B. Failure of the Contractor to execute the Contract in accordance with its Bid shall result in the forfeiture of the Contractor's bid security.

2.7 Performance and Payment Bond Requirements

A. If the Contract Price exceeds $100,000, the Contractor will be required to provide Performance and Labor and Material Payment Bonds each in an amount not less than 100% of the Contract Price.

1. The bonds must be issued by a surety rated A minus or better by A.M. Best and listed on the U.S. Department of Treasury's Listing of Approved Sureties. The bonds must be submitted to the Town prior to or upon the execution of the Contract. The cost of such bonds shall be separately identified on the Bid Form but included in the Base Bid Amount. The bonds shall also comply with the following requirements:

   a. The bonds must comply with the requirements of CGS §49-41.

   b. It is preferred that the bonds be written on the AIA Document 312 forms. Both bonds shall be written in the full amount of the Contract Price.

   c. The bonds shall be dated the same date as the Contract.

   d. The Town of Glastonbury shall be named as the obligee on all bonds provided for the Project.

   e. The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

B. Each Bidder shall furnish with its Bid, satisfactory evidence from its surety of such Bidder's ability to obtain the required Performance and Labor and Materials Payment Bonds in the full amount of the Base Bid Amount.

2.8 Insurance Requirements

A. The Contractor shall submit evidence of compliance with the insurance requirements set forth on Attachment 6 when and as provided in such Attachment.

B. The cost of the required insurance to the extent attributable to the Project shall be separately identified on the Bid Form but included in the Base Bid Amount.

2.9 Prevailing Wage Requirements

A. Prevailing wages are required on this Project in accordance with the rates attached hereto as Attachment 7, pursuant to Connecticut General Statutes Section 31-53 (a) through (h), as amended. For further information on prevailing wage requirements, visit the Connecticut Department of Labor's website.

B. The Contractor and each subcontractor shall be subject to provisions of the Connecticut General Statutes, Section 31-55a concerning annual adjustments to prevailing wages.

C. Wage Rates will be posted each July 1st on the Department of Labor website: https://www.ctdol.state.ct.us/wgwkstnd/prevailwage.htm. Such prevailing wage adjustments shall not be considered a matter for any contract amendment or adjustment to the Contract Price. No escalation clauses shall be included in any Bid submission.

D. The Contract shall provide, and the Contractor and subcontractors for the Project shall comply with the following: "The wages paid on an hourly basis to any person performing the work of any mechanic, laborer or worker on the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of each such person to any employee welfare fund, as defined in subsection (i) of Connecticut General Statutes Section 31-53, shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the town in which such public works project is being constructed. Any contractor who is not obligated by agreement to make payment or contribution on behalf of such persons to any such employee welfare fund shall pay to each mechanic, laborer or worker as part of such person's wages the amount of payment or contribution for such person's classification on each pay day."

E. Certified Payrolls: In accordance with Connecticut General Statutes, 31-53 Certified Payrolls with a statement of compliance shall be submitted monthly by the Contractor to the Town's Representative and certified payrolls for the Contractor and all subcontractors working during the period shall be submitted with each Application for Payment submitted by the Contractor, covering all activities relating to such Application for Payment. Contractor shall provide pay scale verification as may be required by the Connecticut Department of Labor.

F. Each Bidder shall confirm prior to submission of its Bid that the Bidder is carrying in its Bid and Base Bid Amount the proper trade classification for all work required for the Project including composite crews of different trade classifications if needed, as required by the State of Connecticut Department of Labor and/or union agencies if applicable.

G. Forms and additional information can be found on the Connecticut Department of Labor's website.

2.10 Non-Resident Contractors

A. If the successful Bidder is a Non-Resident Contractor the successful Bidder shall be required to provide upon award of the Contract a certificate from the Connecticut Commissioner of Revenue Services which evidences that the Bidder has complied with the requirements of Connecticut General Statutes §12-430(7). For further information, contact the Connecticut Department of Revenue Services.

2.11 Incurring Cost

A. Each Bidder is solely responsible for any and all costs and expenses incurred in the preparation and submission of its Bid.

2.12 Code of Ethics

A. Bidder shall acknowledge that they have reviewed the document in the area provided on the Bid Form. The selected Bidder will also be required to complete and sign an Acknowledgement Form prior to award. The Code of Ethics and the Acknowledgement Form can be accessed on the Town's Website. Upon entering the website click on Bids & Proposals Icon, which will bring you to the links for the Code of Ethics and the Acknowledgement Form.

PART 3 – COMPLIANCE REQUIREMENTS AND CERTIFICATIONS

3.1 Non-Discrimination in Employment

A. All provisions of all applicable State Labor Standards must be complied with under this Contract. The Town is an Affirmative Action Equal Opportunity Employer.

B. The Contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, sex, gender identity or expression, marital status, national origin, ancestry, present or past history of mental disability, intellectual disability, learning disability, physical disability, including, but not limited to, blindness or status as a veteran except as permitted by law in the case of a bona fide occupational qualification or need. The Contractor shall provide the Connecticut Human Rights and Opportunities Commission with such information requested by the Commission concerning the employment practices and procedures of the Contractor. The Bidder confirms and represents that it is an Affirmative Action/Equal Opportunity Employer.

3.2 Freedom of Information Requirements

A. Contractor acknowledges that the Town is a "public agency" for the purposes of the Connecticut Freedom of Information Act (the "FOIA") and that information relating to Contractor and its affairs received or maintained by the Town shall constitute "public records or files" for the purposes of the FOIA subject to public access and disclosure in the manner provided in the FOIA, unless another specific exemption from public access and disclosure requirements of the FOIA is available in connection with particular records or files received or maintained by the Town.

PART 4 – GENERAL AND SPECIAL CONDITIONS

4.1 Taxes:

A. Tax Exempt Project: The Project is tax exempt. A certificate of tax exemption will be provided by the Town to the Contractor. State sales and use taxes are excluded except for taxes on rentals, tools, and other incidentals as determined by the state Department of Revenue and for which the Contractor is responsible.

4.2 Contract

A. Form of Contract: The Form of Contract includes a modified version of the AIA Document A101-2017 Agreement (as so modified, the "Agreement") and a modified version of the AIA Document A201-2017 General Conditions (as so modified, the "General Conditions"). The Town intends to use the Form of Contract as the Contract for the Project, further modified as appropriate to conform to and insert the Project requirements, incorporate the acceptable terms of the Contractor's Bid and to identify the Contractor. Contractor agrees to execute the Contract in such form as so modified within five days (Saturdays, Sundays and legal holidays excluded) after presentation by the Town to the Contractor and agrees that the provisions of the Contract shall be included in each subcontract issued by the Contractor for the Project, with the applicability of terms to be adjusted appropriately. **The Form of Contract contains many important terms and conditions such as, among other things, the Contractor's obligations and liabilities for background checks (See Section 13.6 of the General Conditions), indemnification, liquidated damages (See section 4.3 F below and Section 4.5 of the Agreement) and limitations on markups on change order work (See Section 7.3.3.1 of the General Conditions). Bidders are cautioned to refer to the Form of Contract for information regarding the terms and conditions that will be applicable to the Project.**

Notwithstanding the foregoing, the Town reserves the right to modify the terms and conditions of the Form of Contract (and the Contract) prior to execution of the Contract as deemed by the Town to be in the best interest of the Town.

4.3 Miscellaneous:

A. OSHA Training: Pursuant to the requirements of Connecticut General Statutes Sec. 31-53b, the Town must include in each contract for a public works project the following provision: Each contractor shall furnish proof with the weekly certified payroll form for the first week each employee begins work on such project that any person performing the work of a mechanic, laborer or worker pursuant to the classifications of labor under section 31-53 on such public works project, pursuant to such contract, has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, has completed a new miner training program approved by the Federal Mine Safety and Health Administration in accordance with 30 CFR 46 or, in the case of telecommunications employees, has completed at least ten hours of training in accordance with 29 CFR 1910.268, and, on or after July 1, 2012, that any plumber or electrician subject to the continuing education requirements of section 20-334d, who has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration five or more years prior to the date such electrician or plumber begins work on such public works project, has completed a supplemental refresher training course of at least four hours in duration in construction safety and health taught by a federal Occupational Safety and Health Administration authorized trainer.

B. Project Meetings:

1. Pre-Construction Meeting - Soon after the award of the Contract (but in any event prior to the start of construction), authorized representatives of the Contractor shall, if required by the Town, attend a Pre-construction Conference at a location, time and date to be determined by the Town at the time of (or shortly after) the award of the Contract. Representatives of the Contractor attending such meeting shall be familiar with the Project and authorized to act on behalf of the Contractor as regards the Project. The Contractor will be required to submit its Schedule of Values for the Project at the Pre-Construction Meeting. The Schedule of Values must accurately reflect job costs and include a complete breakdown of material and labor costs as further described in the Form of Contract.

2. Project Meetings – During the course of construction of the Project, weekly or bi-weekly meetings will be scheduled as needed with the Town, Architect and Contractor's superintendent and/or project manager for the Project.

C. Waste Disposal: Contractor will be responsible for removal and legal disposal of all construction waste/debris generated by the Project including dumpsters.

D. Toilet Facilities: The Contractor shall provide temporary portable toilets as required.

E. Hours of Operation: The normal hours of work on the Project site shall be 7:00am until 3:30pm unless other arrangements are made in advance with the Town.

F. Liquidated Damages:

___X___ No liquidated damages are established for this Project.

_____ Liquidated damages in the amount of $_____ per diem for failure to timely complete the Work shall apply to this Project.

PART 5 – BID TIMELINE, PROCEDURES AND SUBMISSION REQUIREMENTS

5.1 BID TIMELINE

Item	Date
Bidding Documents Available	2-14-2022
Mandatory Pre-Bid Meeting	2-24-2022 at 2:30 PM
Deadline for Submission of RFI/Clarifications	3-3-2022
Deadline for Requests for Substitutions	3-3-2022
Deadline for issuance of Addenda	3-4-2022
Bid Submission Deadline (and Bid Opening)	3-8 2022 at 11:00 AM
Scope Reviews (on or about)	TBD
Contract Award (on or about)	TBD
Start Construction (on or about)	TBD
Substantial Completion	8-19-2022

The Town shall be entitled to adjust/extend the above dates and times as best serves the interests of the Town. Any such adjustment/extension will be set forth in an Addendum and posted on the State Contracting Portal and the Town's Website.

5.2 Pre-Bid Meeting

A **mandatory** pre-bid meeting will be held with all prospective Bidders as indicated in the Bid Timeline above. Bids will not be accepted from any Bidder that fails to attend such meeting.

5.3 Preparation and Submission of Bid

A. The form and style of Bids must conform to the Bid Form.

1. Bids shall be submitted on the Bid Form without modifications, revisions, conditions or deletions thereto except for the purpose of inserting information requested of the Bidder per the Bid Form. Modifications, revisions, conditions or deletions may be grounds for rejection of the Bid.
2. Each Bidder shall provide all requested information and completely fill in all blanks on the Bid Form using a typewriter or printed in ink. The submission of an incomplete or illegible Bid Form may be grounds for rejection of the Bid.
3. Interlineations, alterations and erasures made to the Bid Form must be clearly legible and initialed by the individual signing the Bid Form on behalf of the Bidder.
4. On each copy of the Bid Form submitted, the Bidder shall insert the legal name of the Bidder and the Bidder's current business address, email address, and telephone number for communication and notice purposes. The name and title of each person signing the Bid Form on behalf of the Bidder shall be typed or printed below the signature.

a. If the Bidder is a corporation, the Bid Form shall be signed on behalf of the corporation by a duly authorized officer of the corporation.

b. If the Bidder is a limited liability company, the Bid Form shall be signed by a duly authorized Member or Manager of the company.

c. If the Bidder is a partnership, the Bid Form shall be signed on behalf of the partnership by one or more duly authorized partners of the partnership.

d. If the Bidder is an individual, that individual shall sign the Bid Form as an individual noting, as applicable, the name under which that individual is doing business.

B. Bid Submission:

1. Bidders submitting a response for this solicitation are directed to respond online through a secure e-Procurement portal. Bids can be submitted at the following link: https://app.negometrix.com/buyer/2832 under the BID title "**GL-2022-29- Gideon Welles School Boiler Replacement**". Bidders will be required to create a profile before submitting their bid. Step-by-step instructions on how to register as a vendor are available at this website: https://help.negometrix.com/en/support/solutions/articles/9000177626-register-onnegometrix4. Bids for the Project shall be submitted no later than 11:00 A.M. on March 8, 2022, after which time the bids will be publicly opened. No late bids will be accepted.

Bidders will be required to upload their bid response **as one consolidated pdf document** in the following file located in the bid portal:

- Bid Response & Related Documents

2. Bidders will be permitted to attend the virtual bid opening via Zoom and information will be made available at a later date on the Town's Website for those interested in attending.

5.4 Modification or Withdrawal of Bid

A. Bid Withdrawal: Bids may only be withdrawn by written request of the Bidder received by the Purchasing Agent prior to the Submission Deadline. No Bidder may withdraw its Bid within ninety (90) days after the date that Bids are actually opened (the "Bid Holding Period"). Bids withdrawn prior to the Submission Deadline may be resubmitted up to the Submission Deadline provided such resubmitted Bids are then fully in conformance with these Instructions to Bidders.

B. Extension: Bids shall be valid until the expiration of the Bid Holding Period. If for some reason the Contract cannot be awarded and the Contract executed within the Bid Holding Period, the Bid Holding Period may be extended by mutual agreement between the Town and the Contractor.

C. Bid Modification: Bids may be modified by written notice signed by the Bidder prior to the Submission Deadline. Such notice shall be accepted only via the online procurement portal identified in the Bidding Documents.

D. Bid Clarification: The Town reserves the right to request clarifications from any Bidder. Such clarifications shall be provided at the Bidder's sole cost and expense.

5.5 Consideration of Bids

A. Bids submitted timely and in accordance with the requirements of theses Instruction to Bidders will be opened publicly.

B. The Town reserves the right to do any of the following without liability, including but not limited to:

1. Award in whole or in part;
2. Reject any and all Bids in whole or in part for misrepresentation or if the Bidder is not deemed to be qualified to perform the Project, or if the Bid limits, conditions or modifies any of the terms and conditions and/or specifications of the Bid;
3. Cancel the award or decide not to execute the Contract subsequent to award;
4. Terminate the solicitation and rebid the Project by advertising for new bids;
5. Waive technical defects, irregularities and omissions in a Bid if, in the Town's judgment, the best interest of the Town would be served;
6. Revoke the award of the Contract if such award was made on the basis of inaccuracies and clerical errors; and
7. Reject a Bid as non-responsive if the Bidder does not make all required pre-award submittals within the timeframes designated by the Town.

5.6 Sub-bidders/Subcontractors

A. Prior to the award of the Contract, the Town will notify the apparent successful Bidder in writing if the Town has reasonable objection to any Sub-bidder/Subcontractor proposed by such Bidder for the Project. If the Town has reasonable objection to a proposed Sub-bidder/Subcontractor, the Bidder may, at the Bidder's option, (1) withdraw its Bid, or (2) submit an acceptable substitute to the Town. Provided the Sub-bidder/Subcontractor rejected by the Town was willing, qualified and capable of performing in accordance with the terms of its sub-bid and all applicable terms of the Bidding Documents, the Contractor will be entitled to an adjustment in the Base Bid Amount to cover the difference in cost occasioned by the substitution. The Town may accept the adjusted Base Bid Amount or disqualify the apparent successful Bidder. Sub-bidders/Subcontractors proposed by a Bidder and to whom the Town has made no reasonable objection must be engaged by the successful Bidder to perform the Work for which such Sub-bidders/Subcontractors were proposed and shall not be changed except with the written consent of the Town.

5.7 Post Bid Scope Review Meeting

A. After the opening of Bids, the Town will hold scope review meetings with some or select Bidders as deemed necessary by the Town. These meetings will be held at a location, date and time as determined by the Town. Bidders ~~to~~ will be notified by the Town and shall make themselves available to attend these meetings.

PART 6 – SELECTION PROCESS

6.1 Basis for Selection

A. Lowest Responsible and Responsive Qualified Bidder: It is the intent of the Town to award the Contract to the "lowest responsible and responsive qualified Bidder" which is the Bidder (i) whose Bid is the lowest of those Bidders possessing the skill, ability and integrity necessary to faithful performance of the Work based on objective criteria considering past performance and financial responsibility; and (ii) whose Bid was submitted in accordance with the requirements set forth in the Bidding Documents. The Bidder will be required to

establish to the satisfaction of the Town that the persons or entities proposed to furnish and perform the Work described in the Bidding Documents are reliable, responsible and capable. To the extent that the Bid Form asks for alternate bids, the Town's determination of the lowest Bid will be based on the sum of the base bid amount and the alternate bid prices for the alternates that are selected by the Town for acceptance as determined by the Town to be in its best interest.

B. Qualifications: To assist the Town in its determination as to whether or not a Bidder is qualified to perform the Work for the Project, each Bidder shall complete and submit the Statement of Qualifications attached hereto as Attachment 8 along with the required supporting documentation. To be qualified for this Project, a Bidder must meet the following minimum criteria:

(i) Bidder shall be engaged primarily in the business of construction for a minimum of five (5) consecutive years;

(ii) Bidder must hold a valid contractor's license in the State of Connecticut as appropriate for the performance of the work for the Project;

(iii) Bidder shall have previous experience with Boiler Replacements and controls.

(iv) Bidder must have successfully completed at least five (5) similar projects within the last three (3) years.

C. The Selection Criteria to be employed by the Town shall include, without limitation, the following:

1. Bidder's experience as a general contractor in the successful completion of projects of similar scope and size within budget and on time;

2. Bidder's capacity to perform the Project in light of Bidder's ongoing and future obligations;

3. Bidder's credit history and financial stability;

4. The experience of the Bidder's project team proposed to be used for the Project in the successful completion of projects of similar scope and size within budget and on time;

5. The ability of the Bidder to provide the required bonds.

6. Past performance on previous projects with the Town based on the Town's evaluation of the skill, ability and integrity of the Bidder in terms of the Bidders' fulfillment of contract obligations and of the Bidders' experience or lack of experience with projects of the nature and scope of the project for which the Bid is submitted.

D. Interviews: the Town reserves the right to conduct interviews with one or more of the Bidders at a time and date to be determined by the Town. If a Bidder is requested by the Town to attend an interview, the attendees representing the Bidder shall include one or more representatives of the Bidder capable of responding to questions regarding the Bid submitted as well as the proposed superintendent/project manager for the Project.

E. Negotiations: the Town reserves the right to negotiate with the Lowest Responsive Responsible Qualified Bidder as determined by the Town to serve the best interest of the Town.

6.2 Selection and Award

A. The Bidder selected for the Project must be determined by the Town, in its discretion, based on the Selection Criteria set forth in Section 6.1 and the entirety of the Bid submission, to be

qualified and capable of performing the Project in accordance with the requirements of the Bidding Documents. The Town shall be under no obligation to select the Bidder submitting the Bid with the lowest Base Bid Amount if the Town deems the Bidder to be not responsive, not responsible, or not qualified.

B. Upon identifying the successful Bidder, the Town will send a written notice of intent to award to such Bidder. Notwithstanding receipt of such notice of intent to award, the Town shall have no obligation to such Bidder until such time as the Contract is fully executed.

The Town of Glastonbury is An Affirmative Action/Equal Opportunity Employer. Minority/Women's Business Enterprises are encouraged to bid.

ATTACHMENT 1
BID FORM (6 pages)

Project: Town of Glastonbury
Gideon Welles School Boiler Replacement
1029 Neipsic Road, Glastonbury, CT
GL-2022-29

Submitted to: Town of Glastonbury
Attention: Mary F. Visone, Purchasing Agent
All bids shall be submitted electronically through the
secure e-procurement portal identified in the Bidding Documents

Bidder: _____ (Co. Name)
_____ (Address)
_____
_____ (Authorized Individual)
_____ (Title)
_____ (Tel. No.)
_____ (Email Address)

Dated: _____, 2022

In compliance with the Bidding Documents as defined in the Instructions to Bidders issued by the Town of Glastonbury (the "Town") on February 14, 2022 (the "Bidding Documents"), the undersigned Contractor (the "Bidder") hereby proposes and agrees to fully perform the work described in the Bidding Documents within the time stated and in strict accordance with the Bidding Documents for the above referenced Project, for the following sum of money:

Base Bid Amount:
Lump Sum in the amount of _____ Dollars
($_____).
(Provide amount in words and numbers)

Base Bid Items: All labor, materials, equipment, fixtures, systems, supplies, tools, temporary facilities, transportation, supervision and other services necessary to complete the Work for the Project as described in the Bidding Documents inclusive of, without limitation all charges such as overhead, profit, general conditions, general requirements, insurance and permits.

Alternates:
Add Alternate No. 1: ___N/A_____
Lump Sum in the amount of _____ Dollars
($_____).
(Provide amount in words and numbers)

Unit Prices:
Unit-Price No. 1: _____N/A_____
_____per _____.

Bid Price Itemization:
Submitted herewith as Bid Form Schedule A is the Bid Price Itemization which includes an amount for each component of the Work for the Project required by and described in the Bidding Documents. The sum of all listed components shall equal the Base Bid Amount. Bidder acknowledges that, should conditions make it necessary to revise the scope of the Work for the Project, the Bid Price Itemization shall serve as the basis for adjustments to the Base Bid Amount.

Subcontractors:
Submitted herewith as Bid Form Schedule B is a list of the names and addresses of all Subcontractors proposed to be utilized on the Project.

Receipt of Addenda Acknowledged:

Signature

Addendum No. 1 dated _____, 2022 _____
Addendum No. 2 dated _____, 2022 _____
Addendum No. 3 dated _____, 2022 _____

Code Of Ethics:
I / We have reviewed a copy of the Town of Glastonbury's Code of Ethics and agree to submit a Consultant Acknowledgement Form if I /We are selected. Yes _____ No _____ *
*Bidder is advised that effective August 1, 2003, the Town of Glastonbury cannot consider any bid or proposal where the bidder has not agreed to the above statement.

Contract Execution:
The Bidder agrees and warrants that, if selected as the Contractor for the Project, Bidder shall, within five days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the Town, execute a contract in accordance with the Bidding Documents, the terms of this Bid Form and such other terms and conditions as may be mutually agreed by the Town and the Bidder.

Bidder's Representations:
By submission of this Bid Form and its Bid, the Bidder represents and acknowledges that:

1. The Bidder has carefully examined and is familiar with the Bidding Documents and all of the requirements set forth in the Bidding Documents. A Bidder's failure to gain such familiarity with the Bidding Documents shall in no way relieve the Bidder of responsibility for all aspects of its Bid and the obligations set forth in the Bidding Documents.
2. The Bidder understands the requirements of the Bidding Documents and the scope of Work represented by the Bidding Documents to be performed by or on behalf of a Bidder.
3. The Bidder has checked all of the figures set forth in this Bid Form and the Schedules attached hereto and understands that the Town will not be responsible for any errors or omissions on the part of the Bidder in preparing this Bid.
4. The Bidder and appropriate Sub-bidders have visited the Premises, have become familiar with local conditions under which the Work is to be performed, site conditions, logistics and have correlated the Bidder's personal observations with the requirements of the Bidding Documents.
5. The Bidder is familiar with and agrees to comply with all federal, state and local laws, regulations, ordinances, codes and orders as relate to this solicitation and/or the performance of the scope of Work described in the Bidding Documents.

6. The Bidder has reviewed the Town of Glastonbury Code of Ethics adopted July 8, 2003 and effective August 1, 2003 and revised October 29, 2013 effective November 8, 2013 and, if requested by the Town will submit an acknowledgement form provided by the Town if selected for award of the Contract.

7. The Base Bid Amount set forth in its Bid Form includes all labor, materials, equipment, fixtures, systems, supplies, tools, temporary facilities, transportation, supervision and other services necessary to complete the Work for the Project as described in the Bidding Documents, inclusive of, without limitation, overhead, profit, general conditions, general requirements and insurance and bond costs, all without exception or qualification.

8. The Bidder has confirmed and incorporated into its Bid and Base Bid Amount the proper prevailing wage rate for its industry.

9. The following are the names and prices of the subcontractors proposed by the Bidder to perform the identified classes of work:

Name of Subcontractor	Class of Work	Subcontractor Price
	Masonry	$
	Electrical	$
	Plumbing	$
	HVAC	$

10. The Bidder agrees that each of the subcontractors listed on this Bid Form will be used for the work indicated at the amount stated, unless a substitution is permitted by the Town.

11. In submitting this Bid, it is understood that the right is reserved by the Town to reject any or all Bids and waive all technicalities and informalities in connection therewith, including negotiating with the selected bidder or bidders, all as may be in the best interest of the Town. It is agreed that this Bid may not be withdrawn for a period of ninety (90) days after the actual date the Bids are opened.

The Bidder certifies, under the penalty of false statement, that the information in this Bid Form and its Bid is true, and accurate, that the copy of the Bid Bond submitted with this Bid Form is a true, accurate and unmodified copy of the original bond issued by the Bidder's surety for the Project, and that the Bid was made without fraud or collusion with any person.

The undersigned declares that the person or persons signing this Bid is/are fully authorized to sign on behalf of the Bidder.

Signed this _____ day of _____, 2022

_____ (Name of Bidder)
By _____ (Signature of individual signing on behalf of Bidder)
_____ (Print name of individual signing on behalf of Bidder)
Its _____ (Title of such individual such as President, Member, etc.)

BID FORM SCHEDULE A (part of Attachment 1)

Bid Price Itemization

Bidder's Name and Address: _____
_____

Trade Contracts:	$_____
General Conditions Costs:	$_____
Insurance Costs:	$_____
Bond Premiums:	$_____
Base Bid Amount	$ _____

Signed this _____ day of _____, 2022

_____ (Name of Bidder)

By _____(Signature of individual signing on behalf of Bidder)
_____(Print name of individual signing on behalf of Bidder)
Its _____(Title of such individual such as President, Member, etc.)

Date: _____

BID FORM SCHEDULE B (part of Attachment 1)

SUBCONTRACTOR LIST

Bidder's Name and Address: _____
_____
_____

NAME OF SUBCONTRACTOR	ADDRESS	WORK SCOPE

(Add Additional Pages as necessary)

Signed this _____ day of _____, 2022

_____(Name of Bidder)

By_____(Signature of individual signing on behalf of Bidder)
_____(Name of individual signing on behalf of Bidder)
Its _____(Title of such individual such as President, Member, etc.)

ATTACHMENT 2

BIDDING DOCUMENTS

The following forms and documents constitute the Bidding Documents:

1. Invitation to Bid
2. Instructions to Bidders and all Attachments thereto:

   Attachment 1, Bid Form (incl. Bid Form Schedule A and Bid Form Schedule B)

   Attachment 3, Form of Contract

   Attachment 4, Submission Documents

   Attachment 5, Bid Bond Form

   Attachment 6, Insurance Requirements

   Attachment 7, Wage Rates

   Attachment 8, Statement of Qualifications

   Attachment 9, Drawings prepared by the Architect dated January 31, 2022.

   Attachment 10, Specifications prepared by the Architect dated January 31, 2022.

   Attachment 11, Certification re: CGS §31-57b

   Attachment 12, Internal Revenue Service Form W-9

   Attachment 13, Glastonbury Board of Education Contractor Compliance Form

   Attachment 14, Glastonbury Board of Education School Calendars

   Attachment 15 - Affirmative Action Statement

   Attachment 16, Covid Related Requirements

3. Department of Revenue Services registration information for out of state contractors if required. Forms may be found at: http://www.ct.gov/drs/cwp/view.asp?a=1454&q=506012
4. The Prevailing Wage Bid Package and forms which can be found at: http://www.ctdol.state.ct.us/wgwkstnd/BidPack.htm and include:

   - Prevailing Wage Law Poster
   - Section 31-53b: Construction safety and Health Course. Proof of completion required for employees on public building projects.
   - Informational Bulletin - The 10-Hour OSHA Construction Safety and Health Course (PDF, 20KB)
   - Notice For All Mason Contractors (PDF, 5KB)
   - CT General Statute 31-55a
   - Contractor's Wage Certification Form (PDF, 11KB)
   - Payroll Certification - Public Works Projects
   - Information Bulletin - Occupational Classifications
   - Footnotes (Rev. 07/17) (PDF, 101KB)

DRAFT

AIA® Document A101™ – 2017

Standard Form of Agreement Between Owner and Contractor

where the basis of payment is a Stipulated Sum

Rev. Date 3/24/21
No State Funding

AGREEMENT made as of the « » day of « » in the year ««»
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

«Town of Glastonbury»« »
«P.O. Box 6523
2155 Main Street»
«Glastonbury, CT 06033-6523 »
«GL-_____»

and the Contractor:
(Name, legal status, address and other information)

«
»« »
« »
« »
« »

for the following Project:
(Name, location and detailed description)

« »Gideon Welles School Boiler Replacement
« »1029 Neipsic Road
«Glastonbury, CT
GL 2022-29»

The Architect:
(Name, legal status, address and other information)

« »«BEMIS Associates »
«185 Main Street
»Farmington, CT

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101™–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201™–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

TABLE OF ARTICLES

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, AIA Document A201-2017, as modified by the Owner (the "General Conditions"), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT AND CONTRACTOR'S STANDARD OF CARE

§ 2.1 The Contractor shall fully execute the Work described in, reasonably inferable from and as necessary to produce the results intended by, the Contract Documents including, but not limited to, the furnishing of (1) all materials, supplies, equipment, fixtures, tools, implements, and other items and facilities required for, or in connection with, or for inclusion or incorporation into, the Project and (2) all labor, supervision, transportation, utilities, storage and all other services required for or in connection with the Project, except as specifically indicated in the Contract Documents to be the responsibility of others.

§ 2.2 CONTRACTOR'S STANDARD OF CARE, CONDITIONS AND LEGAL REQUIREMENTS

§ 2.2.1 The Contractor shall be responsible for the performance of the Work as an independent contractor and in a good and workmanlike manner (i) consistent with the Contract Documents; (ii) consistent with the instructions, guidance and direction of the Owner and Architect; (iii) consistent with the with the prevailing applicable professional or industry standards; (iv) consistent with sound practices; (v) as expeditiously as is consistent with such professional skill and care and the orderly progress of the Work and with the Contract Documents and the instructions, guidance and direction of the Owner and Architect; and (vi) in a manner that will not exceed the Contract Sum as set forth in the Contract (the standards of this Section 2.2.1 shall be referred to herein as the "Contractor's Standard of Care"). The Contractor shall exercise the Contractor's Standard of Care in performing all aspects of the Work. All references in the Contract Documents to the knowledge, inference, reliance, awareness, determination, belief, observation, recognition or discovery of the Contractor or reference to any similar term shall include the constructive knowledge, inference, reliance, awareness, determination, belief, observation, recognition attributed to the Contractor ("Constructive Knowledge"). Such Constructive Knowledge shall include the knowledge, inference, reliance, awareness, determination, belief, observation and recognition the Contractor would have obtained upon the exercise of the Contractor's Standard of Care.

§ 2.2.2 The Contractor shall be responsible for the performance of the Work in accordance with the Contract Documents and all guidelines, standards and conditions of imposed on the Work and/or Project by the Agencies, as

defined hereinafter. "Legal Requirements" as defined in Section 3.7.2 of the General Conditions includes all of such standards, guidelines and conditions..

§ 2.2.3 The "Agencies" are the governmental authorities having regulatory or administrative jurisdiction over the Work and/or the Project and all representatives or designees of such governmental authorities.

§ 2.2.4 Legal Requirements

Without limiting the responsibility of the Contractor under other provisions of the Contract Documents, the Contractor shall conduct the Work in accordance with all Legal Requirements which include, without limitation:

.1 Contractor's compliance with the requirements of Connecticut Regulation Sections 16a-38k-1 through 9 (High Performance Building Requirements), including any waste stream management requirements to the extent such High Performance Building Requirements are specified in the Contract Documents;

.2 Contractor's provision of Change Orders and supporting documents and other required documentation in the form required by the Agency providing funding for the Project; and

.3 Contractor's maintenance of records and reports as required by the Agency providing funding for the Project and other Agencies, as applicable.

§ 2.2.5 Notwithstanding anything to the contrary in this Agreement, the Contractor shall attend such meetings and site-visits, and make such submissions, as are necessary to comply with applicable Legal Requirements.

§ 2.2.6 Any information obtained by the Contractor from the Owner or Architect may not be used, published, distributed, sold or divulged by the Contractor, its Subcontractors, or any Sub-subcontractors for such party's own purposes or for the benefit of any person, firm, corporation or other entity other than the Owner, without the prior written consent of the Owner. Any information obtained by the Contractor or its Subcontractors or any Sub-subcontractors that is designated by the Owner in accordance with applicable Legal Requirements as confidential shall not be disclosed to any other parties without the prior written consent of the Owner.

§ 2.3 THE CONTRACTOR'S PROJECT TEAM

§ 2.3.1 The Contractor accepts the relationship of trust and confidence established by this Agreement and covenants with the Owner to cooperate with the Architect and exercise the Contractor's reasonable skill and judgment in furthering the interests of the Owner. The Contractor agrees to furnish efficient business administration and supervision and to use Contractor's best efforts to furnish, at all times, an adequate supply of skilled workers and materials, and to perform the Work in the most expeditious and economical manner consistent with the Owner's interests.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[« »] The date of this Agreement.

[« X »] A date set forth in a notice to proceed issued by the Owner.

[« »] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work in accordance with the Contract Documents and the construction schedule attached hereto as Exhibit B (the "Construction Schedule"):
(Check one of the following boxes and complete the necessary information.)

[« »] Not later than « » (« ») calendar days from the date of commencement of the Work.

[« X »] By the following date: «_____»

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5. **TIME IS OF THE ESSENCE** in the completion of the Work.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be «_____ and 00/100 Dollars» ($ «_____.00»), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
Add Alternate No. 1 –	$_____.00
Add Alternate No. 2 –	$_____.00
Add Alternate No. 3 –	$_____.00
Deduct Alternate No. 1 –	($_____.00)
Deduct Alternate No. 2 -	($_____.00)

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price

§ 4.4 Unit prices applicable to the Work, if any, are set forth below (the "Unit Prices"). Unit Prices shall be valid for the life of the Project and are inclusive of all costs associated with the complete performance, furnishing, and installation of the portion of the Work subject to Unit Prices including, without limitation, labor, materials, equipment, machinery, services, engineering, transportation, taxes and insurance as well as overhead and profit. Unit Prices shall be applicable to both additions to and deductions from the Work.

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.5 Liquidated damages, if any:

«It is acknowledged that the Contractor's failure to achieve Substantial Completion of the Work within the Contract Time provided by the Contract Documents will cause the Owner to incur substantial economic damages and losses of types and in amounts which are impossible to compute and ascertain with certainty as a basis for recovery by the Owner of actual damages, and that liquidated damages represent a fair, reasonable and appropriate estimate thereof. Accordingly, in lieu of actual damages for such delay, the Contractor agrees that liquidated damages may be assessed and recovered by the Owner as against Contractor and its Surety in the event of delayed completion, without the Owner being required to present any evidence of the amount or character of actual damages sustained by reason thereof. Therefore, Contractor shall be liable to the Owner for payment of liquidated damages in the amount of **_____ Dollars ($_____.00)** for each day that Substantial Completion is delayed beyond the date set forth herein for the achievement of Substantial Completion, as adjusted for time extensions as may have been granted pursuant to the terms and conditions of the Contract Documents. Such liquidated damages are intended to represent estimated actual damages and are not intended as a penalty, and Contractor shall pay them to Owner without limiting Owner's right to terminate this Agreement as provided elsewhere herein.

The collection of liquidated damages by the Owner under this Section 4.5 shall be in addition to, and not in lieu of, the Owner's right to recover from the Contractor the Owner's increased costs to complete the Project arising from the Contractor's delay. Further, such liquidated damages shall in no way limit the Owner's other rights under this Agreement or the Owner's entitlement to damages for any other injury, damage or loss, other than for delay, for which Contractor may be responsible.»

§ 4.6 Other:

«**§ 4.6.1** The Contractor represents and warrants that the Drawings and Specifications and other materials and information furnished to the Contractor are sufficiently detailed to enable the Contractor to firmly establish the Contract Sum, subject to clarifications and assumptions (if any) expressly herein set forth.

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall, upon its determination that the Work or a portion of the Work, as applicable, has been completed in a manner consistent with the Contract Documents, make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

« »

§ 5.1.3 The Contractor shall submit final versions of Applications for Payment, along with all required Supporting Documentation, on a monthly basis to the Architect (with a copy to the Owner) not later than the «1st » day of each month for Work completed in accordance with the Contract Documents in the prior month. The Owner shall, subject to the provisions of Section 9.6.8 of the General Conditions, make payment of the amount certified by the Architect to be due to the Contractor not later than thirty (30) days after the Architect receives the final version of the Application for Payment and all required Supporting Documentation.

§ 5.1.3.1 Commencing with the second Application for Payment, and continuing with each Application for Payment submitted thereafter, Supporting Documentation shall include, without limitation, a properly executed release and waiver of mechanics liens from the Contractor and each Subcontractor and material supplier whose Work was included on the previous Application for Payment for which payment by Owner was made to the Contractor. In addition to the foregoing, commencing with the first Application for Payment and continuing with each Application for Payment submitted thereafter, the Contractor shall provide a properly executed conditional release and waiver of mechanics liens in form acceptable to the Owner from the Contractor and each Subcontractor and material or equipment supplier whose Work is included on the Application for Payment subject only to receipt of payment under such Application for Payment. The requirements under the Contract Documents for the submission

of releases and waivers of lien are not intended to indicate or imply that the Owner's property may be the subject of a valid mechanics lien under Connecticut law.

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents and approved by the Owner and the Architect pursuant to Section 9.2 of the General Conditions (the "Schedule of Values"). The Schedule of Values shall allocate the entire Contract Sum among the various portions of the Work. The Schedule of Values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This Schedule of Values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment. Each Application for Payment shall include a statement showing the status of all pending change orders, other pending change directives and approved changes to the Contract. Such statement shall identify the pending change orders and other pending change directives, and shall include the date such change orders and directives were initiated, the costs associated with their performance, and a description of any work completed.

§ 5.1.6 In accordance with the General Conditions, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

.1 That portion of the Contract Sum properly allocable to completed Work based on the Schedule of Values;

.2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of the General Conditions;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of the General Conditions; and

.5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

«Five percent (5%) of each progress payment.»

§ 5.1.7.1.1 The following items are not subject to retainage:

« »

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:

« »

§ 5.1.7.3 The Owner shall not be required to release any part of the retainage until the Contractor has fulfilled all of its obligations under the Contract Documents. Release of any portion of the retainage prior to that time shall be in the sole discretion of the Owner.

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, any Subcontractor, Sub-subcontractor or any other person or entity for whom or which any of them is responsible, the Owner shall pay the Contractor any additional amounts to the extent required under Article 9 of the General Conditions.

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.1.10 Contractor shall use payments made under this Agreement solely for the purpose of performance of the Work pursuant to the Contract Documents. Contractor shall pay for all labor and services performed and materials, equipment and machinery supplied by others in connection with the performance of the Work in accordance with the Contract Documents and as required by applicable Legal Requirements (as defined in Section 3.7.2 of the General Conditions).

§ 5.1.11 Contractor shall pay any amounts due a Subcontractor or supplier, whether for labor or services performed or materials, equipment or machinery furnished, not later than ten (10) days after the date the Contractor receives payment from the Owner which encompasses such labor or services performed or materials, equipment or machinery furnished by such Subcontractor or supplier. The Contractor shall include in all of its Subcontracts with its Subcontractors and suppliers a requirement that the Subcontractors and suppliers pay any amounts due any sub-subcontractors or suppliers not later than ten (10) days after the Subcontractor or supplier receives a payment from the Contractor which encompasses labor or services performed or materials, equipment or machinery furnished by such sub-subcontractor or supplier.

Retainage withheld by the Contractor on amounts due any Subcontractor or supplier shall not exceed five percent (5%) of such amount due.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

.1 the Contractor has fully performed the Work and all of its obligations under the Contract Documents except for the Contractor's responsibility to correct Work as provided in Section 12.2.2.1 of the General Conditions, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 45 days after the issuance of the Architect's final Certificate for Payment. The Architect's final Certificate for Payment shall not be issued until such time as all required Supporting Documentation and such additional information as reasonably requested by the Owner have been submitted to the Architect by the Contractor.

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest only to the extent required by Connecticut law and, if so required, at the minimum required rate.

§ 5.4 Any provision herein to the contrary notwithstanding, the Owner shall not be obligated to make payment to the Contractor hereunder to the extent any one or more of the following conditions exist:

.1 The Contractor is in default of any of its obligations hereunder or otherwise is in default under any of the Contract Documents;

.2 Any part of such payment is attributable to Work which the Owner or Architect determines that, because of the fault or neglect of the Contractor, is defective or not performed in accordance with the Contract Documents; provided, however, such payment shall be made as to the part thereof attributable to the Work which is performed in accordance with the Contract Documents and is not otherwise defective; or

.3 The Contractor has failed to make payments properly to Subcontractors or for material or labor used in the Work for which the Owner has made payment to the Contractor.

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of the General Conditions, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of the General Conditions, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

[« »] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

[« »] Litigation in a court of competent jurisdiction

[« X »] Other *(Specify)*

«The parties agree that the Owner, in its sole discretion, may elect to have the Claim resolved by arbitration in accordance with Section 15.4 of the General Conditions. If the Owner does not make such election, such Claim, dispute, or other matter in controversy will be resolved by litigation in a court of competent jurisdiction and the venue for such action shall be the Connecticut Superior Court, Judicial District of Hartford, at Hartford, Connecticut.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of the General Conditions.

§ 7.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of the General Conditions, then the Owner shall pay the Contractor as provided in Article 14 of the General Conditions.

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of the General Conditions.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of the General Conditions or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:
(Name, address, email address, and other information)

«_David Sacchitella
Building Superintendent
2143 Main Street, P.O. Box 6523
Glastonbury, CT 06033-6523
Tel. No. (860)_652-7706
Email Address: dave.sacchitella@glastonbury-ct.gov »
« »

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

« »
« »
«
»
« »
«Tel. No. _____»
«Email Address: _____»

§ 8.4 The Contractor's representative shall not be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as required and set forth in Exhibit A, Insurance and Bonds attached hereto, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in Exhibit A, Insurance and Bonds attached hereto, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of the General Conditions, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

«Notice pursuant to Section 1.6.1 of the General Conditions may be delivered by electronic mail to the email address for the recipient's representative identified in Sections 8.2 and 8.3 above. The subject line of the email shall include the address of the Project and be electronically flagged as "urgent".

§ 8.7 Other provisions:

«**§ 8.7.1** The Contractor hereby represents and warrants (in addition to other representations and warranties contained in the Contract Documents), as an inducement to the Owner to enter into the Contract, which representations and warranties shall survive the final completion of the Work:

.1 that it is financially solvent, able to pay its debts as they mature and possessed of sufficient working capital to complete the Work and perform its obligations under the Contract Documents;

.2 that it, through its Subcontractors or otherwise, is able to furnish the tools, materials, supplies, equipment and labor required to complete the Work and perform its obligations hereunder in a timely manner and has sufficient experience and competence to do so;

.3 the Contractor is authorized to do business in the State of Connecticut and is properly licensed by all necessary governmental authorities having jurisdiction over the Contractor and the Project; and

.4 the Contractor has visited the site of the Project and become familiar with the condition of the site and the Contract Documents, and knows of no reason why the Work cannot be performed as set forth in, and in the timeframe required by, the Contract Documents.

§ 8.7.2 Execution in Counterparts. This Agreement may be signed in two or more counterparts, each of which shall be treated as an original but which, when taken together, shall constitute one and the same instrument. Signed copies of this Agreement may be faxed and e-mailed with the same force and effect as if the originally executed Agreement had been delivered.»

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 This Agreement

.2 Exhibit A, Insurance and Bonds

.3 The General Conditions

.4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:

(Insert the date of the E203-2013 incorporated into this Agreement.)

« »

.5 Drawings - See Exhibit D attached hereto.

Number	Title	Date

.6 Specifications - See Exhibit E attached hereto.

Section	Title	Date	Pages

.7 Addenda, if any:

Number	Date	Pages
Addendum No. 1 Addendum No. 2 Addendum No. 3		

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[« »] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

« »

[« »] The Sustainability Plan:

Title	Date	Pages

[« »] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents, if any, listed below:

«Project Manual for the Project prepared by the Architect and dated _____.
Exhibit B - Construction Schedule
Exhibit C - Unit Prices
Exhibit D - Drawings
Exhibit E - Specifications
Exhibit F - Wage Rates »

This Agreement entered into as of the day and year first written above.

Town of Glastonbury

OWNER *(Signature)*	**CONTRACTOR** *(Signature)*

«Richard J. Johnson»« Its Town Manager»	« »« Its »
(Printed name and title)	*(Printed name and title)*
Date:_____	Date;_____
APPROVED AS TO FORM:	**APPROVED AS TO FUNDING:**
« »« »	« »« »
(Signature) Bruce A, Chudwick, Partner Shipman & Goodwin LLP As Town Attorney, Town of Glastonbury	*(Signature)* Julie Twilley, Director of Finance and Administrative Services, Town of Glastonbury
(Printed name and title)	*(Printed name and title)*

DRAFT

AIA® Document A201™ – 2017

General Conditions of the Contract for Construction

Rev. 2/12/21
For use with All Projects with General Contractor

for the following PROJECT:
(Name and location or address)

«_Gideon Welles School Boiler Replacement_»
«_1029 Neipsic Road»
«Glastonbury, CT »
«GL-2022-29»

THE OWNER:
(Name, legal status and address)

«Town of Glastonbury»
«P.O. Box 6523
2155 Main Street»
«Glastonbury, CT 06033-6523 »« »« »

THE ARCHITECT:
(Name, legal status and address)

« »« »
«BEMIS Associates
185 Main Street
»Farmington, CT

DRAFT

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

TABLE OF ARTICLES

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INDEX
(Topics and numbers in bold are Section headings.)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, these General Conditions of the Contract for Construction, Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor, supplier, or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor.

§ 1.1.3 The Work

The term "Work" means the construction and services required by, reasonably inferable from, and as necessary to produce the results intended by, the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

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

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

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

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. If the Contractor discovers any inconsistency within or among parts of the Contract Documents, or

between the Contract Documents and applicable standards, codes or ordinances, the Contractor shall promptly give notice to the Owner and the Architect of such inconsistency and shall, unless otherwise instructed in writing by the Architect or the Owner, provide work or materials of the better quality, greater quantity, or that otherwise comply with applicable standards, codes or ordinances.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the reserved rights of the owner of such Instruments of Service.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties may use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner's representative shall be the person designated as such in the Agreement, or a successor to such person designated by the Owner in writing from time to time, which person shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization, subject to such limitations as Owner may specify in writing to Contractor from time to time. Any action taken on Owner's behalf other than by the representative so designated by Owner will not be binding upon the Owner. The Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 Intentionally Omitted.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work, upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. If such evidence is so requested, the Contractor shall have no obligation to commence the Work until the Owner provides such evidence.

§ 2.2.2 Intentionally Omitted.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits, related fees and filings that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure, file and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor, provided the services of the Architect are still needed for the Project at the time of termination.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project. The Contractor acknowledges that utilities, if/where shown on the plans, are at approximate locations. These locations are subject to possible errors in the source of information and errors in transcription. The

Contractor shall make certain of the exact location of all mains, ducts, poles, and services prior to excavation. The Contractor shall exercise proper precautions relating to the safe performance of the Work. Any data provided by the Owner to the Contractor concerning the physical characteristics or measurements of the components that comprise the Project site; access to the Project site or staging and storing at the Project site; present obstructions and conditions of structures on or near the Project site; locations and depths of sewers, conduits, pipes, and gas lines on or near the Project site; positions of sidewalks, curbs and pavements on or near the Project site and other data concerning the conditions of the Project site and its surroundings (collectively, "Site Data"), have been obtained from sources the Owner believes to be reliable. Accuracy of the Site Data, however, is not guaranteed and is furnished solely for accommodation of the Contractor.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall furnish such information and services with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a five (5) day period after receipt of notice from the Owner to commence and continue correction of such default or neglect, and all deficiencies in the Work arising therefrom, with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect and the deficiencies in the Work arising therefrom. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the Owner's cost of correcting the default or neglect and the deficiencies in the Work arising therefrom, including, without limitation, expenses, attorneys' fees, and compensation for the Architect's additional services made necessary by such default, neglect, failure and deficiencies. The Contractor shall also be responsible for all of Owner's other costs, damages, delays, and associated impacts arising in the event that the Owner exercises its rights under this Section 2.5. The Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent necessary to pay the Owner the amounts due under this Section 2.5. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15. The right of the Owner to carry out the Work pursuant to this Section 2.5 shall not give rise to any duties on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity. In performing any work pursuant to this Section 2.5, the Owner shall have the right to take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor or any Subcontractor.

§ 2.6 ADDITIONAL RIGHTS

§ 2.6.1 The rights stated in this Article 2 shall be in addition to, and not in limitation of, any other rights of the Owner provided in the Contract Documents, or as may be available to the Owner at law or in equity.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor, Subcontractors and Sub-subcontractors shall be lawfully licensed to the extent and as required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.
§ 3.1.2.1 Unless explicit quality or standards for materials or workmanship are established in the Contract Documents for any portion of the Work, the Contractor shall perform such Work in a good and workman like manner, in a manner of good quality for the intended use, and consistent with the quality of the surrounding Work and of the construction of the Project generally.

§ 3.1.2.2 All manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the manufacturer's written or printed directions and instructions unless otherwise specifically indicated in the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.1.4 The Contractor shall comply, and shall cause Subcontractors, Sub-subcontractors and suppliers to comply, with all accounting procedures and record retention policies reasonably requested by the Owner.

§ 3.1.5 NONRESIDENT CONTRACTOR

If the Contractor is a "nonresident contractor" as defined in Section 12-430(7)(A) of the Connecticut General Statutes, as revised, the Contractor shall provide evidence to the Owner prior to commencement of the Work that Contractor has complied fully with the provisions of Section 12-430(7). The Contractor is hereby notified that, if any subcontractor or supplier performing any part of the Work under the Contract Documents is a nonresident unverified contractor, the Contractor will withhold 5% of all payments to such subcontractor or supplier unless and until such subcontractor or supplier provides to the Contractor a Certificate of Compliance issued by the Connecticut Department of Revenue Services as defined in the Connecticut General Statutes §12-430(7). A nonresident unverified contractor is a contractor without an office in the State of Connecticut that is continuously maintained, occupied and used by the contractor's regular employees regularly in attendance to carry on the contractor's business in the contractor's own name and which contractor has not been verified pursuant to the requirements of the Connecticut Department of Revenue Services. The amount withheld pursuant to CGS §12-430(7) shall be in addition to, and not in lieu of, the retainage held by the Contractor under its subcontract with the subcontractor or supplier.

§ 3.1.6 Notwithstanding anything to the contrary in the Contract Documents, the Contractor shall attend such meetings and site-visits, and make such submissions, as are necessary to comply with applicable Legal Requirements.

§ 3.1.7 Nondiscrimination

§ 3.1.7.1 The Contractor agrees and warrants that in the fulfillment of the Contract it will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, sex, gender identity or expression, marital status, national origin, ancestry, present or past history of mental disability, intellectual disability, learning disability, physical disability, including, but not limited to, blindness or status as a veteran except as permitted by law in the case of a bona fide occupational qualification or need. The Contractor shall provide the Connecticut Human Rights and Opportunities Commission with such information requested by the Commission concerning the employment practices and procedures of the Contractor.

§ 3.1.7.2 By execution of the Contract, the Contractor confirms that it and its Subcontractors are Affirmative Action/Equal Opportunity Employers.

§ 3.1.7.3 In addition, if the Project is funded in whole or in part by the State of Connecticut (or any of its Agencies, as defined in the Agreement), the requirements of this Section 3.1.7.3 below shall apply:

§ 3.1.7.3.1 Pursuant to the requirements of CGS §4a-60:
(a)(1) The Contractor agrees and warrants that in the performance of the Contract the Contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, status as a veteran, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such

Contractor that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the state of Connecticut; and the Contractor further agrees to take affirmative action to ensure that applicants with job-related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, status as a veteran, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such contractor that such disability prevents performance of the work involved;

(2) The Contractor agrees, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, to state that it is an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the Commission on Human Rights and Opportunities;

(3) The Contractor agrees to provide each labor union or representative of workers with which such contractor has a collective bargaining agreement or other contract or understanding and each vendor with which such contractor has a contract or understanding, a notice to be provided by the Commission on Human Rights and Opportunities advising the labor union or workers' representative of the contractor's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment;

(4) The Contractor agrees to comply with each provision of this section and sections 46a-68e and 46a-68f and with each regulation or relevant order issued by said commission pursuant to sections 46a-56, 46a-68e, 46a-68f and 46a-86; and

(5) The Contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the contractor as relate to the provisions of this section and section 46a-56.

(b) If the Contract is a public works contract, municipal public works contract or contract for a quasi-public agency project, the Contractor agrees and warrants that he or she will make good faith efforts to employ minority business enterprises as subcontractors and suppliers of materials on such public works or quasi-public agency project.

(c) The Contractor shall include the provisions of subsections (a) and (b) of this section in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the state, and in every subcontract entered into in order to fulfill any obligation of a municipal public works contract or contract for a quasi-public agency project, and such provisions shall be binding on a subcontractor, vendor or manufacturer, unless exempted by regulations or orders of the Commission on Human Rights and Opportunities. The Contractor shall take such action with respect to any such subcontract or purchase order as the commission may direct as a means of enforcing such provisions, including sanctions for noncompliance in accordance with section 46a-56; provided, if such Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the commission regarding a state contract, the Contractor may request the state of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the state and the state may so enter.

§ 3.1.7.3.2 Pursuant to the requirements of CGS §4a-60a:
(a)(1) The Contactor agrees and warrants that in the performance of the Contract the Contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of sexual orientation, in any manner prohibited by the laws of the United States or of the state of Connecticut, and that employees are treated when employed without regard to their sexual orientation;

(2) The Contractor agrees to provide each labor union or representative of workers with which such Contractor has a collective bargaining agreement or other contract or understanding and each vendor with which the Contractor has a contract or understanding, a notice to be provided by the Commission on Human Rights and Opportunities advising the labor union or workers' representative of the Contractor's commitments under Connecticut General Statutes §4a-60a, and to post copies of the notice in conspicuous places available to employees and applicants for employment;

(3) The Contractor agrees to comply with each provision of Connecticut General Statutes §4a-60a and with each regulation or relevant order issued by said Commission on Human Rights and Opportunities pursuant to Connecticut General Statutes §46a-56; and

(4) The Contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Contractor which relate to the provisions of Connecticut General Statutes §4a-60a and Connecticut General Statutes §46a-56.

(b) The Contractor shall include the provisions of subsection (a) of this section in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the state, and in every subcontract entered into in order to fulfill any obligation of a municipal public works contractor contract for a quasi-public agency project, and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the Commission on Human Rights and Opportunities. The Contractor shall take such action with respect to any such subcontract or purchase order as the commission may direct as a means of enforcing such provisions, including sanctions for noncompliance in accordance with section 46a-56; provided, if such contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the commission regarding a state contract, the Contractor may request the state of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the state and the state may so enter.

(c) The Contractor agrees to comply with the regulations referred to in this Section 3.1.7 as they exist on the date of this Contract and as they may be adopted or amended from time to time during the term of this Contract and any amendments thereto.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has (i) visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents, and (ii) evaluated and satisfied itself and will cause its Subcontractors to satisfy themselves as to the conditions and limitations under which the Work is to be performed, including, without limitation (1) the location, condition, layout and physical conditions of the Project site and surrounding areas, (2) generally prevailing climatic conditions, (3) anticipated labor supply and costs, (4) anticipated availability and costs of materials, tools and equipment, and (5) except as provided in Section 10.3, and subject to the provisions of Section 3.7.4, anticipated soil and subsurface conditions of the Project site. The Owner shall not be required to pay any amount, including any increase in the Contract Sum, or make any adjustment in the Contract Time in connection with any failure by the Contractor or any Subcontractor to comply with the requirements of this Section. The provisions of this Section 3.2.1 shall not be construed to limit the investigative and review responsibilities of the Contractor under any other provisions of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations and the Contractor shall be responsible for associated delays and impacts. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences

between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.2.5 If the Contractor fails to fulfill its obligations to report to the Architect or Owner under this Article 3, such failure shall preclude the Contractor from any subsequent Claim arising from, or relating to the factors giving rise to the Contractor's obligation to make such report.

§ 3.2.6 The Owner assumes no contractual liability or responsibility for the physical condition or safety of the Project site or of any improvements thereon. Except as set forth in Section 10.3, the Contractor shall be solely responsible for providing safe conditions for the performance of the Work.

§ 3.2.7 The Contractor shall give the Architect notice of any additional Drawings, Specification or instructions required to define the Work in greater detail, or to permit the proper progress of the Work. Requests for such information shall be made by the Contractor sufficiently in advance of the time such information is needed by the Contractor so as to permit the Architect a reasonable time for responding to such requests without affecting the progress of the Work.

§ 3.2.8 The execution of the Contract shall constitute:

§ 3.2.8.1 A representation by the Contractor that the Contractor has carefully reviewed the Contract Documents, and that the Contract Documents are sufficiently detailed and complete to permit the Contractor, (i) to complete the Project for an amount not in excess of the Contract Sum; and (ii) complete the Work within the Contract Time and in accordance with the Contract Documents and all applicable Legal Requirements (as defined in Section 3.7.2). The Contractor shall not perform any construction activity it knows constitutes a recognized error, inconsistency or omission. If the Contractor performs any construction activity knowing it involves a recognized error, inconsistency or omission in the Contract Documents without reporting the error, inconsistency or omission to the Architect, the Contractor shall assume appropriate responsibility for such performance and shall bear an appropriate amount of the costs of correction.

§ 3.2.8.2 A certification by the Contractor that it has taken all steps necessary to ascertain the nature and location of the Work, and the general and reasonably observable conditions which can or may affect the Work and/or the cost thereof. Failure by the Contractor to fully acquaint itself with conditions which may affect the Work and/or the cost thereof, including, but not limited to, conditions relating to transportation, handling, storage of materials, availability of labor, water, other known projects in the region, applicable provisions of law, and the character and availability of equipment and facilities needed preliminary to and during the prosecution the Work, shall not relieve the Contractor of its responsibilities under the Contract Documents and shall not constitute a basis for extension of the Contract Time or any increase in the Contract Sum. Owner assumes no responsibility for any representations concerning conditions made by any of its officers, or employees or representatives, prior to the execution of the Contract, unless such representations are expressly stated in the Contract Documents.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures. In no event shall the Contractor employ construction means, methods, techniques, sequences or procedures that violate (1) requirements of any warranties applicable to the Work; or (2) any Legal Requirements.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.3.4 The Contractor shall furnish sufficient forces, plant and equipment as may be necessary to insure the progress of the Work in accordance with the Construction Schedule. If, in the opinion of the Owner, the Contractor has fallen behind the Construction Schedule, the Contractor shall submit its proposal demonstrating the manner in which the desired rate of progress may be achieved and Contractor shall take such steps as may be necessary to meet the Construction Schedule. Unless the Contractor has fallen behind schedule due to delays which entitle Contractor to an adjustment in the Contract Time in accordance with the terms and conditions of the Contract Documents, the taking of such steps shall be at the sole costs and expense of the Contractor. It shall be the responsibility of the Contractor to maintain its schedule so as not to delay the progress of the Work or the scheduled work of Separate Contractors.

§ 3.3.5 Contractor's coordination of Work shall include, without limitation, review of all shop drawings (including, without limitation, architectural, civil, structural, mechanical, and electrical shop drawings) submitted by Subcontractors for various trades or subdivisions of work, as indicated by Contractor's approval in accordance with Section 3.12.

§ 3.3.6 The Contractor shall be solely responsible for properly laying out the Work, and for all lines, elevations and measurements for all of the Work. Contractor shall verify the figures shown on the Drawings before laying out the Work and will be responsible for any errors or inaccuracies resulting from Contractor's failure to do so. In the event that the Contractor shall, while laying out the Work, become aware of: (1) any conflicts between (a) the Drawings, the Specifications or any Modification to the Drawings or the Specifications and (b) the actual layout of the Work, or (2) any conflicts or inconsistencies in the Drawings, the Specifications or any Modification to the Drawings or the Specifications themselves, Contractor shall promptly notify the Architect. If the Contractor proceeds without the Architect's clarification and instruction on the matter, the Contractor shall proceed at Contractor's own risk.

§ 3.4 Labor and Materials

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

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 All labor shall be performed by workmen skilled in their respective trades, and workmanship shall be of good quality so that first class work in accordance with the standards of construction set forth in the Contract Documents and the Contractor's Standard of Care will be achieved. The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.4.3.1 As required under Section 31-53 of the Connecticut General Statutes, the wages paid on an hourly basis to any person performing the work of any mechanic, laborer or worker on the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of each such person to any employee welfare fund, as defined in subsection (i) of Section 31-53 of the Connecticut General Statutes shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the town in which such public works project is being constructed. Any contractor who is not obligated by agreement to make such payment or contribution on behalf of such persons to any such employee welfare fund shall pay to each mechanic, laborer or worker as part of such person's wages the amount of payment or contribution for such person's classification on each pay day.

§ 3.4.3.2 As required under Section 31-53b of the Connecticut General Statutes, the Contractor shall furnish proof, and shall cause its Subcontractors to furnish proof, with the weekly certified payroll form for the first week each employee begins work on the Project that any person performing the work of a mechanic, laborer or worker pursuant to the classifications of labor under section 31-53 on the Project, pursuant to the Contract, has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, has completed a new miner training program approved by the Federal Mine Safety and Health Administration in accordance with 30 CFR 46 or, in the case of telecommunications employees, has completed at least ten hours of training in accordance with 29 CFR 1910.268, and that any plumber or electrician subject to the continuing education requirements of section 20-334d, who has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration five or more years prior to the date such electrician or plumber begins work on the Project, has completed a supplemental refresher training course of at least four hours in duration in construction safety and health taught by a federal Occupational Safety and Health Administration authorized trainer.

§ 3.4.3.3 To the extent consistent with any provision regarding residence requirements contained in a collective bargaining agreement to which the Contractor is a party, in the employment of labor to perform the work specified herein, preference shall be given to citizens of the United States, who are, and continuously for at least three months prior to the date hereof have been, residents of the labor market area, as established by the Labor Commissioner, in which such work is to be done, and if no such qualified person is available, then to citizens who have continuously resided in the county in which the work is to be performed for at least three months prior to the date hereof, and then to citizens of the state who have continuously resided in the state at least three months prior to the date hereof.

§ 3.4.4 If the Contractor desires to substitute a product or method in lieu of what has been specified or shown in the Contract Documents, the Contractor may propose to do so in a written request delivered to the Architect and the Owner setting forth the following:

.1 Full explanation of the proposed substitution and submittal of all supporting data including technical information, catalog cuts, warranties, test results, installation instructions, operating procedures, and other like information necessary for a complete evaluation of the substitution and relevant materials prepared as part of pre-construction services.

.2 Reasons why the substitution is advantageous and necessary, including the benefits to the Owner and the Work in the event the substitution is acceptable.

.3 The adjustment, if any, in the Contract Sum, in the event the substitution is acceptable.

.4 The adjustment, if any, in the Contract Time and any milestone dates in the event the substitution is acceptable.

.5 The Contractor shall submit a written request for any substitution, together with complete substantiating data and information, to the Architect and the Owner not later than thirty (30) days prior to the time that such substitute product or method would be incorporated into the Work. No substitution shall be made by the Contractor, or considered or approved by the Architect or the Owner, without the Contractor's submittal of a written request with respect to such substitution as provided above. The Contractor may make a substitution only: (1) upon the written approval of the Architect and the Owner of such written request therefor after evaluation by them of such request and all accompanying data and information; and (2) in accordance with a Change Order.

.6 Any written request for a substitution by the Contractor shall be a representation by the Contractor to the Owner that: (1) the Contractor has investigated the product or method proposed to be substituted and found it to be equivalent to or better than the product or method specified in the Contract Documents, (2) except to the extent otherwise expressly stated in such request, the Contractor is waiving any Claim for additional costs related to such substitution; (3) the Contractor will provide the same warranty for the substitution that the Contractor would for that specified; (4) the substitution will not entail changes in detail and construction of related Work; and (5) the Contractor shall coordinate the installation of the accepted substitution, making such changes as may be required for the Work to be complete in all respects.

§ 3.4.5 Notwithstanding the fact that the Contract Documents may specify a particular brand or make of material or equipment "or equal", if the Contractor elects to utilize "equal" materials or equipment rather than the specified materials or equipment, the "equal" materials or equipment will be subject to the prior written approval of the Owner.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by or on behalf of the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 The Contractor shall procure and assign to the Owner at the time of Substantial Completion of the Work any and all Subcontractor, manufacturer and supplier warranties relating to any materials and labor used in the Work. Such warranties shall supplement the warranties provided by the Contractor in Section 3.5.1. All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.5.3 Substitutions not properly approved and authorized and work, materials or equipment which fail to perform under the proper use and normal wear for intended purposes shall be considered defective. If required by the Architect or the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment to be incorporated in the Work.

§ 3.5.4 The Contractor further agrees that each Subcontract shall contain a warranty of the portion of the Work performed thereunder in the same form as the above stated warranty of Contractor. Included in said warranty shall be the statement that it shall be enforceable directly by the Owner, if the Owner so elects. The warranty of any Subcontractor shall not relieve the Contractor of its warranty as set forth above and the Owner may look to the Contractor, directly, and in the first instance to correct any defects in the Work.

§ 3.5.6 The representations and warranties under this Section 3.5 shall be in addition to, and not a substitute for, any other rights of the Owner under the Contract Documents or existing in law or equity.

§ 3.5.7 The representations and warranties set forth in this Section 3.5 shall survive final payment and termination of the Contract.

§ 3.6 Taxes

The Owner is tax exempt as regards sales, consumer, use and similar taxes and the Contract Sum shall not include any such taxes.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, certifications and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and required by applicable Legal Requirements as of the effective date of this Contract. The Contractor shall provide the Owner and Architect with reproductions of all permits, licenses, permissions, certifications and receipts for payments and, upon submission of the final Application for Payment, shall deliver all originals of such documents to the Owner with copies to the Architect. Notwithstanding the foregoing, the fee for the building permit will be waived and shall not be included in the Contract Sum.

§ 3.7.2 The Contractor shall comply with, be responsible for performance of the Work in accordance with, and give notices required by all applicable local, state and federal laws, statutes, ordinances, codes, building codes, rules, regulations, permits, and orders enacted, promulgated, issued or ordered by any governmental body or public or quasi-public authority having jurisdiction over the Work, the Contractor and/ or the site of the Project (collectively, the "Legal Requirements"). Legal Requirements shall include, without limitation, those relating to equal opportunity, labor, wages and employment.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable Legal Requirements, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than fourteen (14) days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands or other conditions that would warrant a suspicion that such matters are being encountered during the performance of the Work although they are not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- **.1** allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- **.2** Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- **.3** whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site at all times during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed upon written request in each case.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within fourteen (14) days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the

proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the fourteen (14) day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed. The list of all supervisory personnel, including the project manager and superintendent that the Contractor intends to use on the Project shall be submitted to the Owner for approval prior to the commencement of the Work. The Contractor shall not engage supervisory personnel other than as approved by Owner in writing and shall not change such personnel without the prior written approval of the Owner.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's approval, a proposed construction schedule for the Work. The proposed construction schedule (i) shall comply with all of the applicable requirements of, and shall not exceed time limits current under, the Contract Documents, (ii) shall be in such form and detail and include such content as required by the Owner, (iii) shall be related to the entire Project to the extent required by the Contract Documents, (iv) shall provide for expeditious and practicable execution of the Work for completion within the time limits current under the Contract Documents; (v) shall include the date of commencement of the Work, interim schedule milestone dates, and the date required for Substantial Completion; and (vi) shall include an apportionment of the Work by construction activity and the time required for completion of each portion of the Work . If the Owner requires a precedence-style critical path method (CPM) schedule, the proposed construction schedule shall also: (a) provide a graphic representation of all activities and events that will occur during performance of the Work: (b) identify each phase of construction and occupancy (if applicable): and (c) set forth dates that are critical in ensuring the timely and orderly completion of the Work (hereinafter referred to as "Milestone Dates"). If the proposed construction schedule is not accepted by the Owner, the Contractor shall promptly modify the proposed construction schedule in accordance with the recommendations of the Owner and the Architect and resubmit the revised schedules for acceptance. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. The Contractor shall meet with the Architect in a timely fashion to discuss the schedule of submittals required under this Section 3.10.2. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent construction schedule submitted to and accepted by the Owner and Architect (as so accepted, the "Construction Schedule").

§ 3.10.4 The Contractor shall monitor the progress of the Work for conformance with the requirements of the Construction Schedule and shall promptly advise the Owner of any delays or potential delays. The Construction Schedule shall be updated to reflect actual conditions ("Progress Reports") (which updated schedule shall be subject to the acceptance of the Owner and the Architect) at appropriate intervals as determined by the Contractor and as required by the conditions of the Work and the Project (but in no event less frequently than monthly) or as otherwise requested by the Owner. In the event any Progress Report indicates any delays, the Contractor shall propose an affirmative plan to correct the delay, including overtime and/or additional labor, if necessary. In no event shall any Progress Report constitute an adjustment in the Contract Time, any Milestone Date or the Contract Sum unless any such adjustment is agreed to by the Owner and authorized pursuant to a Change Order.

§ 3.10.5 In the event the Owner determines that the performance of the Work as of a Milestone Date has not progressed or reached the level of completion required by the Contract Documents, the Owner shall have the right, but not the obligation, to order the Contractor to take corrective measures necessary to expedite the progress of construction, including, without limitation, (1) working additional shifts or overtime, (2) supplying additional manpower, equipment, and facilities, and (3) other similar measures (hereinafter referred to collectively as "Extraordinary Measures"). Such Extraordinary Measures shall continue until the progress of the Work complies

with the stage of completion required by the Contract Documents. The Owner's right to require Extraordinary Measures is solely for the purposes of ensuring the Contractor's compliance with the accepted construction schedule as adjusted for time extensions granted pursuant to Section 8.3. Unless expressly provided for in Section 8.3, the Contractor shall not be entitled to an adjustment in the Contract Sum in connection with Extraordinary Measures required by the Owner pursuant to this Section 3.10.5. The Owner may exercise the rights furnished the Owner under or pursuant to this Section 3.10.5 as frequently as the Owner deems necessary to ensure that that Contractor's performance of the Work will comply with any Milestone Date or the Substantial Completion Date, as the same may be extended by Change Order.

§ 3.10.6 The Owner shall have the right to direct a postponement or rescheduling of any date or time for the performance of any part of the Work that may interfere with the Owner's operations. Any postponement, rescheduling or performance of the Work under this Section 3.10.6 may be grounds for an extension of the Contract Time, if permitted under Section 8.3, and an equitable adjustment in the Contract Sum, to the extent permitted under the Contract Documents, if: (1) the performance of the Work was properly scheduled by the Contractor in compliance with the requirements of the Contract Documents; and (2) such rescheduling or postponement is requested by or required for the convenience of the Owner. Without limiting the foregoing, the Contractor will not be entitled to an extension of the Contract Time or an adjustment of the Contract Sum to the extent the interfering Work so interferes as a result of the negligent act or omission of the Contractor or any Subcontractor or Sub-subcontractor or the failure of any of the same to perform the Work in a manner consistent with the Contract Documents, including Section 3.10.3 hereof.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including a record set of Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. The record set of documents shall reflect all deviations from the Drawings and Specifications and shall be updated in detail from time to time to reflect the actual progress of the Work. The Owner and the Architect shall have free and complete access to such documents during the construction of the Work. Upon Substantial Completion of the Work, the Contractor shall furnish to the Owner through the Architect one set of "as built" plans in such form as the Owner shall require. Such plans shall completely record all Work in place and serve as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

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

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

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

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. Submittals shall be marked as reviewed by the Contractor for compliance with the Contract Documents and approved by the Contractor. Those that are not so marked may be returned by the Architect without action.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, who has been approved by the Owner and that carries such professional liability insurance coverage as required by the Owner and whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable Legal Requirements and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.13.2 The Contractor shall contact the Owner to determine if any specific locations will be designated, or gain Owner's approval prior to using any area for storage of equipment, materials or trailers during the construction of the Project. The Contractor shall confine the Work/storage to the areas designated or approved by the Owner and Contractor shall be responsible for the security of the such Work/storage area. Upon completion of the Work, the

Contractor shall restore the Work/storage area to its original condition to the satisfaction of, and at no cost to, the Owner.

§ 3.13.3 The Contractor shall locate, protect and save from damage and disruption utilities and utility services lines of all kinds, either above or below grade found in the areas affected by the Work. The Contractor shall be responsible for all damage caused to such utilities by the operation of equipment or machinery, the delivery of materials, or as the direct or indirect result of any of the Work, and shall repair all such damage at its expense and as part of the Work included in the Contract Documents.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.14.3 Unless authorized in writing by the Owner and the Architect, structural elements of the Work shall not be cut, patched, or otherwise altered or repaired. Existing work that is cut, damaged, disturbed or otherwise interfered with by the Contractor, a Subcontractor, or any person or entity for whom or which any of them is responsible shall be fully, properly and carefully repaired by the responsible Contractor, Subcontractor or Sub-subcontractor. All such repairs shall be completed to the satisfaction of the Architect, and shall match similar existing adjoining work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. The Contractor must remove all debris of every description as the Work progresses and leave the surroundings in a neat and orderly condition ***at the end of each day***, to the satisfaction of the Owner. At completion of the Work and as a condition of final payment, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work and Access to the Property

§ 3.16.1 The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.16.2 The Contractor shall take all proper precautions to protect persons from injury or unnecessary inconvenience and leave an unobstructed way along the public and private places for travelers, vehicles, and access to hydrants.

§ 3.16.3 The Contractor shall make arrangements with the adjacent property owners for such trespass as Contractor may reasonably anticipate in the performance of the work. All such arrangements shall be reported, in writing, to the Owner.

§ 3.16.4 The Contractor shall take all proper precautions to protect from injury or unnecessary interference, and provide proper means of access to, abutting property where the existing access is obstructed by the Contractor.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights, or failure to pay such royalty and license fees, and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or

where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify, defend and hold harmless the Owner, the Owner's designated representative, the Architect, the Architect's consultants, and all of their respective directors, members of governing boards, committee members, officials, officers, partners, employees, shareholders, members, managers, beneficiaries, agents and representatives (each an "Indemnitee" and collectively, the "Indemnitees") from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, but only to the extent caused by the negligent acts or omissions, violations of Legal Requirements, or breach of contract by the Contractor, a Subcontractor, Sub-subcontractor or anyone directly or indirectly employed by them, or anyone for whose acts they may be liable. The obligations of the Contractor under the foregoing indemnity shall include, without limitation, to the fullest extent permitted by law, any and all claims (including attorneys' fees resulting therefrom) directly or indirectly arising or alleged to arise (1) out of the performance of or the failure to perform the Work, or the condition of the Work, the job site, adjoining land or driveways, or streets or alleys used in connection with the performance of the Work, and from any and all claims by workmen, suppliers or Subcontractors who are involved in the performance of the Work, and (2) under any scaffolding, structural work or safe place law or any law with respect to the protection of adjacent landowners. These indemnification obligations are not intended to include liability for damage arising out of bodily injury to person or damage to property to the extent caused by or resulting from the negligence of the Indemnitee seeking indemnification hereunder, such Indemnitee's agents or employees, nor shall such obligations be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.1.1 If the Project is funded in whole or in part by the **State of Connecticut** (or any of its Agencies), the State of Connecticut and its directors, members of governing boards, committee members, officials, officers, employees, managers, beneficiaries, agents and representatives shall also be considered Indemnitees under this Section 3.18 and under Section 10.3.5. If the Project is to take place on school grounds (and regardless of whether or not the Project is funded in whole or in part by the State of Connecticut or its Agencies), the **Glastonbury Board of Education** and its directors, members of governing boards, committee members, officials, officers, employees, managers, beneficiaries, agents and representatives shall also be considered Indemnitees under this Section 3.18 and under Section 10.3.5.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

§ 3.18.3 To the fullest extent permitted by law, the Contractor shall further indemnify, defend and hold harmless each Indemnitee from and against (1) all claims for payment by any Subcontractor, Sub-subcontractor or supplier, (2) any and all actions, lawsuits, claims and proceedings brought against the Indemnitee as a result of liens filed against the Work, the Project site or any improvements thereon (referred to collectively as "Liens") by the Contractor, any Subcontractor, Sub-subcontractor or anyone claiming by, through or under them, and (3) all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any Lien, claim or other claim for payment by any Subcontractor, Sub-subcontractor or supplier. The Contractor shall pay any judgment or Lien resulting from any such actions, lawsuits or proceedings. Upon receipt of notice of a Lien claim or other claim for payment, the Owner shall notify the Contractor. The Contractor's obligations under this Section 3.18.3 are conditioned upon Owner having fulfilled its payment obligations to the Contractor with respect to the Work that is the subject of the Lien or claim and for which indemnification is sought.

§ 3.18.4 The Contractor shall bear any and all reasonable expenses incurred by any Indemnitee because of any claim or other matter indemnified against under this Section 3.18, including without limitation, attorneys' and consultants' fees and expenses, court costs, and costs related to the defense of, or preparing for the defense against, any such claim. If any such claim has not been settled or discharged or bonded at the time of final completion of the Work,

and if such claim is not covered in full by a policy of insurance then in effect from a reputable and financially sound insurance company which has not declined or reserved the right to decline coverage of such claim, the Owner may withhold an amount equal to two hundred percent (200%) of the outstanding claim until any such claim is paid or settled or the Contractor provides a bond, acceptable to the Owner, to satisfy such claim.

§ 3.19 MEETINGS

§ 3.19.1 A qualified representative of the Contractor shall attend periodic progress meetings held at such time and as such place as the Architect or the Owner shall designate.

§ 3.19.2 A Preconstruction Meeting will be held with the Owner, Architect, Contractor, and any other interested parties prior to commencing any Work. The Owner shall arrange the meeting based on a mutually convenient time.

§ 3.19.3 The Contractor shall schedule and conduct progress meetings at the Project site on a bi-weekly basis (or more frequently as appropriate for the level of jobsite activity). Attendance is required of each Subcontractor, supplier or other entity whose portion of the Work is currently the subject of concern or discussion or planning of future construction activities. Contractor shall provide the Owner and Architect with forty-eight (48) hours prior notice of each such progress meetings and be permitted to attend and participate in the meetings.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that such portion of the Work is, and when the Work is fully completed the entirety of the Work will be, in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and

suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract Documents and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site and, unless expressly provided otherwise, refers to subcontractors or any and all tiers other than Subcontractors. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents or otherwise required as part of the bidding process pursuant to the Request for Proposals issued by the Owner for the Project, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design, plus such other information as may be required under the Agreement. The Owner shall have the right to reject a proposed subcontractor or supplier by written notice to the Contractor.

§ 5.2.1.1 If requested by the Owner, the Contractor shall provide to the Owner copies of all subcontracts and supply agreements entered into by the Contractor for the Work.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution. If the Contractor wishes to substitute a different person or entity for a person or entity previously selected and approved as a Subcontractor pursuant to this Section 5.2, the procedure set forth in Section 5.2.1 and the Agreement (if applicable) shall be followed.

§ 5.3 Subcontractual Relations

Any part of the Work performed by a Subcontractor shall be pursuant to a written Subcontract between the Contractor and Subcontractor, which form of Subcontract shall be reasonably satisfactory to the Owner in all respects. Copies of all Subcontractor bids or proposals shall, upon request of Owner, be submitted to the Owner and Architect. All Subcontracts shall provide that each Subcontractor, to the extent of the Work to be performed by the Subcontractor, be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract and supply agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner pursuant to and in accordance with Section 14 of these General Conditions and only for those subcontract and supply agreements that the Owner accepts by notifying the Subcontractor or supplier and Contractor; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract to the extent such rights and obligations arise subsequent to Owner's written acceptance of the assignment. The Contractor agrees to execute any and all other documents required to effect this assignment.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than sixty (60) days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract and/or supply agreement to a successor contractor or other entity.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall coordinate the Work with the work being done by others so that the construction will proceed in an efficient and logical manner. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Intentionally Omitted.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, disruption of the work of such Separate Contractor, improperly timed activities or defective construction. The Owner shall have the right to off-set such costs against any amounts owed to the Contractor by the Owner to the extent related to the Project and such off-sets are consistent with unit pricing (if applicable).

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.2.6 Upon the Owner's request, the Contractor shall defend any proceedings brought against the Owner by any Separate Contractor on account of any damage alleged to have been caused by the Contractor which arises from the Contractor's failure to comply with the terms and conditions of this Section 6.2.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible, as the Architect deems appropriate in its sole discretion.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, only by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.1.4 Upon the request of the Owner or the Architect (with the Owner's approval), the Contractor shall submit to the Architect, in such form as the Architect may require, an accurate written estimate of the cost of any proposed extra Work or change in the Work. Such estimates shall be provided without cost to the Owner. The Contractor's estimate shall indicate the description, quantity and unit cost of each item of material, and the number of hours of work and hourly rate for each class of labor, as well as all other costs chargeable under the terms of this Article 7. Unit labor costs for the installation of each item of materials shall be provided if required by the Architect. The Contractor shall promptly revise and resubmit such estimate if the Architect determines that it is not in compliance with the requirements of this Section, or that it contains errors of fact or mathematical errors. If required by the Architect, in order to establish the exact cost of new Work added or of previously required Work omitted, the Contractor shall obtain and furnish to the Architect bona fide proposals from recognized suppliers for furnishing any material included in such Work. Such estimates shall be furnished promptly so as to occasion no delay in the Work. The Contractor shall also state in the estimate any change in the Contract Time that would result from the change or extra work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- **.1** The change in the Work;
- **.2** The amount of the adjustment, if any, in the Contract Sum; and
- **.3** The extent of the adjustment, if any, in the Contract Time.

§ 7.2.2 A Change Order executed by the Owner and the Contractor shall constitute a final settlement of all matters relating to the subject matter of the Change Order including, without limitation, compensation to be paid to the Contractor in connection with any change in the Work required by the Change Order (provided that the Work that is the subject of such change is performed in a manner consistent with the provisions of the Contract Documents and the applicable Change Order), including but not limited to all direct and indirect costs, profit, overhead, extended overhead, loss of productivity and general conditions associated with such change, and any and all adjustments to the Contract Sum, the Construction Schedule, and to the Contract Time. In the event a Change Order affects an increase in the Contract Sum, Contractor shall include the work covered by such the Change Order in Applications for Payment for such work as if the work were originally part of the Work as set forth in the Contract Documents.

§ 7.2.3 Notwithstanding anything to the contrary set forth in these General Conditions, if the Agreement sets forth the methodology for calculating adjustments in the Contract Sum associated with a change in the Work, and if, under the terms of the Contract Documents, an adjustment in the Contract Sum would be required, then the adjustment will be based on such methodology unless otherwise mutually agreed by the parties. This paragraph shall be applicable in the case of a change in the Work effected by a Change Order as well as a Construction Change Directive.

§ 7.2.4 Unless otherwise instructed by the Owner, Change Orders shall be prepared on the form AIA G-701.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

(i) Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
(ii) Unit prices stated in the Contract Documents or subsequently agreed upon;
(iii) Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
(iv) As provided in Section 7.3.4.

§ 7.3.3.1 Notwithstanding anything to the contrary contained in the provisions of the Contract Documents, in the case of a change in the Work for which the Contractor is entitled to an adjustment in the Contract Sum under the terms and conditions of the Contract Documents, such adjustment shall be limited as follows:

(i) For that portion of the change in the Work that is self-performed by the Contractor, the Contractor's overhead and profit on such Work shall not exceed fifteen percent (15%) of the Contractor's direct costs incurred in the performance of such Work;

(ii) For that portion of the change in the Work that is performed by Subcontractors, the Contractor's markup on such subcontracted Work shall not exceed ten percent (10%) of the amount invoiced to the Contractor by the Subcontractors for that Work and a Subcontractor's overhead and profit on its portion of the change in the Work shall not exceed ten percent (10%) of the Subcontractor's direct costs incurred in the performance of such Work; and

(iii) The total markup of the Contractor, Subcontractors and Sub-subcontractors for the work performed under a Change Order shall not, in the aggregate, exceed twenty percent (20%) of the net increase in the direct costs incurred in the performance of the Work resulting from the change in the Work.

These limitations shall apply to both additions to and deductions from the Contract Sum.

For change order Work that is the subject of Unit Prices under the Contract Documents, there will be no markup permitted on the applicable Unit Prices.

The Contractor shall include the markup limitations set forth in this Section 7.3.3.1 in all Subcontracts and require in all Subcontracts that the Subcontractors include such limitations in all lower tier Subcontracts.

§ 7.3.3.2 All Change Orders and Construction Change Directives shall provide itemized accounting that provides a detailed break-out of all materials and labor rates applicable thereto:

.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

.2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

.3 Fair market rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others provided, if rented from the Contractor, such rental and the rental rates have been approved by the Owner;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes directly related to the change in the Work, if applicable;

.5 Additional costs of supervision and field office personnel directly attributable to the change to the extent permitted under the Contract Documents.

§ 7.3.3.3 The costs described in Section 7.3.3.2 shall not include any of the following:

.1 Salaries and other compensation of the Contractor's personnel stationed at the Contractor's principal office or offices other than the site office, except as specifically approved by the Owner;

.2 Expenses of the Contractor's principal office and offices other than the site office;

.3 Overhead and general expenses, except to the extent expressly permitted under Section 7.3.3.1;

.4 The Contractor's capital expenses, including interest on the Contractor's capital employed for the Work;

.5 Costs due to the negligence or failure of the Contractor, Subcontractors, Sub-subcontractors, suppliers, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, to fulfill a specific responsibility of the Contract Documents; or

.6 Any cost not described in Section 7.3.3.2.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit subject to the limitations set forth in Section 7.3.3. In such case, and also under Section 7.3.3(iii), the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to those set forth in Section 7.3.3.2 and not excluded by Section 7.3.3.3.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and, prior to proceeding with such Work, advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment actual costs incurred by the Contractor as a result of such Construction Change Directive; provided, however, to the extent such Construction Change Directive is made necessary by the act or omission of the Contractor or of anyone for whom the Contractor is responsible, the Architect shall certify for payment the amount, if any, that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date Substantial Completion is achieved in accordance with Section 9.8.1.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion of the Work in accordance with the Contract Documents within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work by the Owner, which changes were not necessitated by the fault of the Contractor, a Subcontractor, a Sub-subcontractor, a material or equipment supplier or any person or entity for whom or which any of them is responsible; (3) area-wide labor disputes not directed at the Contractor or any of its Subcontractors or by illegal labor actions or disputes; (4) fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (5) by delay authorized by the Owner pending mediation and binding dispute resolution; or (6) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended by Change

Order for such reasonable time as the Architect may determine **provided that** (i) any such delay has the effect of delaying completion of components of the Work on any critical path indicated in the Construction Schedule; (ii) any such delay is not caused by, or could not have been avoided by the exercise of reasonable efforts of the Contractor; (iii) any such delay could not be limited or avoided by the Contractor's timely notice to the Owner of the delay; and (iv) such delay has an impact of at least one (1) day.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 No Damage for Delay. Notwithstanding anything to the contrary set forth in the Contract Documents, the Owner shall not be liable to the Contractor, any Subcontractor, Sub-subcontractor or supplier for Claims or damages of any nature caused by or arising out of delays. The sole remedy against the Owner for delays shall be the allowance of additional time for completion of the Work, the amount of which shall be subject to the procedures set forth in the Contract Documents. Except to the extent, if any, expressly prohibited by law, the Contractor expressly agrees not to make and hereby waives any Claim for damages for any delay, including, but not limited to, those resulting from increased labor or material costs; directions given or not given by the Owner or Architect, including scheduling and coordination of the Project Work; the Architect's preparation of drawings and specifications or review of shop drawings and requests for instruction(s); or, on account of any delay, obstruction or hindrance for any cause whatsoever by the Owner, Architect, or any other contractor on the Project, whether or not foreseeable or anticipated. The Contractor agrees that its sole right and remedy therefore shall be an extension of the Contract Time, if appropriate.

§ 8.3.4 It is expressly understood that notwithstanding anything to the contrary set forth in the Contract Documents, no Subcontractor shall be entitled to make any Claim for additional compensation, costs or damages against the Contractor (nor may the Contractor assert against Owner such Claims as pass-through claims of Subcontractor or otherwise) for delay. Unless agreed by Owner in writing, Contractor shall include in every Subcontract a 'No-Damage-For-Delay' provision in a form reasonably approved by the Owner.

§ 8.3.5 Intentionally Omitted.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is defined in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 Intentionally Omitted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, upon the approval thereof by the Owner and the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten (10) days before the date established for submission of a final version of an Application for Payment pursuant to the Agreement, the Contractor shall submit to the Architect and the Owner a draft itemized Application for Payment prepared in accordance with the Contract Documents and the schedule of values, if required under Section 9.2, for completed portions of the Work for review and consideration. The Application shall be notarized, if required, and submitted along with all data, information and documentation substantiating the Contractor's right to payment as required under the Contract Documents and as may otherwise be required by the Owner or Architect (collectively, the "Supporting Documentation"). Subsequent to the Architect's and the Owner's review and comment, the Contractor shall make all necessary changes to the Application for Payment and resubmit a final version of the Application for Payment to the Architect and the Owner for payment.

§ 9.3.1.1 "Supporting Documentation" shall include, without limitation, payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, releases and waivers of liens from Subcontractors, Sub-subcontractors and suppliers, and other evidence required by the Owner or Architect to demonstrate that cash disbursements already made by the Contractor on account of the Cost of the Work equal or exceed progress payments already received by the Contractor.

§ 9.3.1.2 Applications for Payment shall reflect retainage as provided for in the Contract Documents.

§ 9.3.1.3 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.4 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, or prohibited by any state agency providing funding for the Project, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, and not prohibited by any state agency providing funding for the Project, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site for such materials and equipment stored off the site. The insurance for such stored materials shall include coverage naming the Owner, and such others as may be identified by the Owner from time to time, as additional insureds, and which shall specify and relate to the address where the stored materials and equipment are located including, if applicable, the Project Site. In addition, if the Project is funded in whole or in part by the State of Connecticut (or any of its Agencies), the State of Connecticut shall also be named as an additional insured in regard to such insurance. Further, if the Project is to take place on school grounds (and regardless of whether or not the Project is funded in whole or in part by the State of Connecticut or any of its Agencies), the Glastonbury Board of Education shall also be named as an additional insured in regard to such insurance.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.3.4 Unless otherwise required by the Owner, Applications for Payment shall be on AIA documents G702 and G703.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within ten (10) days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment and Supporting Documentation submitted therewith, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of

subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- **.3** failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- **.4** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- **.5** damage to the Owner or a Separate Contractor;
- **.6** reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
- **.7** repeated failure to carry out the Work in accordance with the Contract Documents;
- **.8** amounts previously paid to the Contractor in excess of amounts properly due the Contractor; or
- **.9** failure of the Contractor to comply with any of the Contractor's indemnification obligations under the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. The Contractor will properly endorse any such joint checks upon Owner's request and, unless the Owner instructs otherwise, the Contractor shall thereafter promptly deliver the joint check(s) to the appropriate subcontractors and suppliers. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 Contractor shall use payments made under the Contract solely for the purpose of performance of the Work pursuant to the Contract Documents. Contractor shall pay for all labor and services performed and materials, equipment and machinery supplied by others in connection with the performance of the Work in accordance with the Contract Documents and as required by applicable Legal Requirements.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven (7) days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that, and subject to the same requirements as are, provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents or applicable Legal Requirements.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Any provision in the Contract Documents to the contrary notwithstanding, the Owner shall not be obligated to make payment to the Contractor hereunder to the extent that the Contractor has not performed the Work or supplied the materials, for which payment is requested, in accordance with the Contract Documents.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment in accordance with the requirements of the Contract Documents, through no fault of the Contractor, within ten (10) days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven (7) days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon ten (10) additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown and start-up, plus interest if provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 The Work shall be considered to be "Substantially Complete(d)" or to have reached "Substantial Completion" on the date as determined by the Architect when (1) the entirety of the Work is sufficiently complete in accordance with the Contract Documents so that the Owner can utilize the Work for the use for which it is intended (subject only to items on the Punchlist described in Section 9.8.2, the completion of which can be accomplished within thirty (30) days without interfering with the actual use of the Work by the Owner or those claiming by, through or under the Owner), (2) the Contractor has obtained a temporary or permanent certificate of occupancy for the Work permitting the lawful occupancy of the entire Project and any other permits, approvals, licenses, and other documents from any governmental authority having jurisdiction thereof necessary for the beneficial occupancy thereof, and (3) the Architect has issued a Certificate of Substantial Completion for the entirety of the Work pursuant to Section 9.8.4 of these General Conditions.

Without limitation of the foregoing, Substantial Completion of the Work shall not be deemed to have occurred until construction and installation of all facilities and systems (including but not limited to instrumentation and controls) are complete in all respects as required for the issuance of all required use and occupancy permits and approvals by all applicable governmental authorities, excluding only the final landscaping work (if applicable). Further, if and to the extent applicable given the Work to be performed hereunder, Substantial Completion shall require full

commissioning and operation of all automatic systems, including but not limited to testing of individual system components and equipment and full operational startup and certification testing.

§ 9.8.2 When the Contractor considers that the Work, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment (the "Punchlist"). Failure to include an item on the Punchlist does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Punchlist, the Architect will make an inspection to determine whether the Work or designated portion thereof is Substantially Complete (with the exception of the Architect's issuance of the Certificate of Substantial Completion) and to review the items on the Punchlist. If the Architect's inspection discloses any item, whether or not included on the Punchlist, which is not sufficiently complete in accordance with the Contract Documents as required under Section 9.8.1, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion along with a revised Punchlist, if applicable.

§ 9.8.4 When the Work is Substantially Complete (with the exception of the issuance of the Certificate of Substantial Completion), the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the Punchlist accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Unless otherwise required by applicable Legal Requirements, the Owner shall not be obligated to release any portion of retainage held by the Owner under the Contract Documents until such time as the Work is finally complete pursuant to Section 9.10 of these General Conditions..

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit the Punchlist to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance

with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled. All warranties and guarantees required under or pursuant to the Contract Documents not previously delivered shall be assembled and delivered by the Contractor to the Owner and Architect as part of the final Application for Payment. The final Certificate for Payment will not be issued by the Architect until all warranties and guarantees and all other close-out deliverables (including those set forth in Section 9.10.2 below) have been received and accepted by the Owner.

§ 9.10.2 The Contractor shall be required to submit the following to the Owner and the Architect, as preconditions to the issuance of a final Certificate for Payment and delivery of final payment:
(1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect which shall include, without limitation product liability and completed operations, for the six year period following final completion, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) all guarantees and warranties to which the Owner is entitled hereunder including documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) satisfactory proof that all claims, including taxes, arising out of the Work (including any claims of Subcontractors or suppliers) have been released or bonded and other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract including releases and final waivers of liens arising out of the Contract conditioned only upon receipt of final payment, the amount of which is consistent with the final Application for Payment, all to the extent and in such form as may be designated by the Owner, **(7)** final documents of similar nature to those required by the Contract Documents for any monthly payments hereunder, **(8)** all final permits, approvals (including, without limitation, the approval of the Owner's insurance company, if required and requested in a timely fashion) certificates (including, without limitation, certificates in respect of electrical systems and life safety systems) and authorizations for use and occupancy of the Project required by any authority having jurisdiction, including any building permits, temporary and unconditioned permanent and full certificate of occupancy and any other necessary occupancy and use permits, **(9)** formally prepared "as built" drawings, records and related data including all field notes of all the Work (such drawings shall be in the form of "mylar" reproducible drawings, or as otherwise called for in the Contract Documents), **(10)** the Operating and Maintenance Manual for the Project as provided below, **(11)** a final statement of accounting for all allowances in form satisfactory to the Owner and the Owner's lender, and **(13)** delivery of all spare parts required to be submitted pursuant to the Contract Documents.

§ 9.10.2.1 The "Operating and Maintenance Manual" for the Project shall contain, as applicable to the Work, (1) full information for each item of mechanical, electrical, or other operating equipment, copies of warranties therefor, schematic diagrams of control systems, circuit directories for each electric and communications panel board, and charts showing the tagging of all valves; and (2) complete keying schedules, paint color schedules, and paint color samples. Each volume of the manual shall be clearly indexed, and shall include a directory of all Subcontractors and maintenance contractors, indicating the area of responsibility of each, and the name and telephone number of the responsible member of each organization. The volumes shall be bound in book form.

§ 9.10.2.2. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If no such bond is provided, the Owner may, without limiting its remedies under law, in equity, or under the Contract Documents, withhold a portion of final payment equal to the amount claimed by the relevant Subcontractor or supplier to be due, until such lien, claim, security interest, or encumbrance is resolved. The Contractor shall refund to the Owner all money that the Owner may be compelled to pay in resolving such lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.2.3 If the final documentation submitted by the Contractor is not deemed complete by the Owner or if the Owner deems the Work incomplete in any respect, the Contractor shall promptly complete any such Work and shall promptly resubmit the final documentation.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor, any Subcontractor, Sub-subcontractor, supplier or any other person or entity for whom or which any of them is responsible, or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 Intentionally Omitted. .

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs required by the applicable Legal Requirements, the Contract Documents, and as reasonably requested by the Owner in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- **.1** employees on the Work and other persons who may be affected thereby;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- **.3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable Legal Requirements bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards. The Contractor shall also be responsible for all measures necessary to protect any property adjacent to the Project and improvements thereon. Any damage to such property or improvements shall be promptly repaired by the Contractor at its cost and expense.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall obtain all necessary permits from regulating agencies, exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss, at its cost and expense (other than damage or loss insured under property insurance required by the Contract Documents), to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor, a Subcontractor, a supplier, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. The

foregoing obligations of the Contractor are separate from and in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding twenty-one (21) days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.2.9 In the event the Contractor identifies activities or conditions during performance of the Work or at the Project site, which, in the Contractor's good faith opinion, pose an unreasonable risk of bodily injury or property damage, whether immediate or in the future, the Contractor shall have the right to immediately take steps to protect its personnel and Subcontractors and stop Work and remove its personnel from the affected area.

§ 10.2.10 The Contractor shall at all times provide protection against weather (rain, wind, storms or heat) so as to maintain all Work, materials, apparatus and fixtures free from damage. At the end of the day's work, all new Work likely to be damaged shall be reasonably protected against such weather.

§ 10.2.11 The Contractor shall provide adequate fire protection for all operations associated with the Work, and such protection must meet all applicable federal (including OSHA), State and municipal regulations.

§ 10.2.12 The Contractor shall remove and replace with new work, at the Contractor's own expense, any Work damaged by failure to provide protection pursuant to Sections 10.2.10 and 10.2.11.

§ 10.2.13 The Contractor shall be responsible, to the extent not covered by insurance, for damage, loss or liability due to theft or vandalism to the Work and stored materials, whether the same occurs while work is in progress or not, and during the day or at night, or on weekdays, weekends or holidays.

§ 10.2.14 The Contractor shall protect and prevent damage to all finished and unfinished phases of the Work during the course of the Project as well as any existing improvements on the Project site.

§ 10.2.15 Securing the Site
The Contractor is responsible for securing, and preventing access by unauthorized individuals to, the Project site from such date as the Contractor, Subcontractors, suppliers, consultants, or agents commence the Work until the date of Final Completion, unless the Owner and Contractor agree in writing to an earlier date.

§ 10.2.16 The Contractor shall be responsible for any loss, cost or damage of the Owner that results from the failure of the Contractor to comply with its obligations under Sections 10.1 and 10.2. The Contractor shall repair and correct any damage to property so as to restore such property to its original condition, at the sole cost and expense of the Contractor.

§ 10.3 Hazardous Materials and Substances
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding any material, substance, chemical, waste, product, derivative, compound, mixture, solid, liquid, mineral or gas, whether naturally occurring or manmade, that is hazardous, toxic, or words of similar import or regulatory effect, and any petroleum or petroleum-derived products, radon, radioactive materials or wastes, asbestos in any form, lead or lead-containing materials, urea formaldehyde foam insulation, and polychlorinated biphenyls (collectively, "Hazardous Materials"). If the Contractor believes its Work will disturb or otherwise implicate any actual or suspected Hazardous Material or encounters a Hazardous Material not addressed in the Contract Documents, the Contractor shall not disturb any such Hazardous Material, immediately report the condition to the

Owner and the Architect in writing and take all necessary precautions to prevent release of and exposure to the Hazardous Materials and foreseeable bodily injury or death to persons resulting from such Hazardous Material. If such reasonable precautions will be inadequate to prevent release of and exposure to Hazardous Materials, or foreseeable bodily injury and death, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area.

§ 10.3.2 Upon receipt of the Contractor's notice pursuant to Section 10.3.1, of the existence of actual or suspect Hazardous Materials not addressed in the Contract Documents, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the Hazardous Material or substance reported by the Contractor and, in the event such Hazardous Material or substance is found to be present, to cause it to be rendered harmless or otherwise abated. 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 tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the 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 Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the Hazardous Material has been rendered harmless and/or otherwise abated in accordance with all applicable Legal Requirements, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown and start-up.

§ 10.3.3 Intentionally Omitted.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor any Subcontractor, Sub-subcontractor or supplier, or any person or entity for whom or which any of them is responsible, brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances or its failure to comply with the Contract Documents. The Contractor agrees not to use any fill or other materials to be incorporated into the Work which are hazardous, toxic or comprised of any items that are hazardous or toxic except to the extent required by the Contract Documents.

§ 10.3.5 To the fullest extent permitted by law, the Contractor shall indemnify, defend and hold harmless the Indemnitees against claims, damages, losses and expenses, including but not limited to attorney's fees, resulting from (1) an actual or suspect Hazardous Material the Contractor, or any party for whose acts the Contractor is responsible, brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the claims, damages, losses, costs and expenses are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence or fault on the part of the Contractor, or any party for whose acts the Contractor is responsible, the Contractor is held liable by a government agency for the cost of remediation of a Hazardous Material or substance solely by reason of properly performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.3.7 The Contractor shall perform all required procedures necessary to insure that there will be no actual or threatened release, discharge, spillage, uncontrolled loss, seepage or filtration (each a "Release") of any Hazardous Material on the site caused by Contractor's operations. The Contractor is responsible for any and all costs and liabilities associated with the investigation and remediation of any such Release, or as required by regulating authorities having jurisdiction under any of the applicable Legal Requirements, and holds the Owner, its employees and agents, and the fee owner of the Project site (if other than the Owner), harmless against any current or future liabilities resulting from such incidents.

§ 10.3.8 All material and equipment furnished under the Contract Documents shall be free of asbestos, lead based paint, and PCBs. Unless otherwise specified in the Contract Documents, any material or equipment containing these, or any other Hazardous Materials shall be considered defective and shall be removed by the Contractor at the Contractor's sole cost and expense.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7. The Contractor shall promptly notify insurers and the Architect and the Owner of the nature of the emergency. Immediately thereafter, the Contractor shall submit to the Architect and the Owner a written report including a description of the circumstances of the emergency and details of actions taken.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, the Architect, Architect's consultants, and such other parties as are identified in the Agreement shall be named as additional insureds as provided in to the Agreement.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized and properly licensed to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. In the event of such suspension, the Contractor shall be responsible for, and shall not receive an extension of the Contract Time in connection with, the delay in the Work arising from the suspension. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as customarily maintained by the Owner.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner is required under the Contract Documents to maintain the Builders Risk insurance for the Project, and fails to purchase and maintain such insurance with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work, in which case, the cost of the insurance shall be charged to the Owner by a Change Order.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. If the Owner is required under the Contract Documents to maintain the Builders Risk insurance for the Project, the Owner shall, within five (5) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of such insurance, provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor, Subcontractor, Sub-subcontractor or any other person or entity for whom or which any of them is responsible, the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement

coverage by either the Owner or the Contractor. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 Intentionally Omitted.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§ 11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner and made payable to the Owner for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have five (5) days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner may settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or after the date for commencement of warranties established under Section 9.8.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor by the end of such one-year period and, thereafter, give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to modify the Contractor's obligations under Section 3.5 or to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.2.6 AUDITS

Upon request of the Owner, the Contractor will cooperate, and secure the cooperation of all Subcontractors, suppliers and Sub-subcontractors, and assist the Owner during any audit of the Project conducted by the Owner or any of the Agencies at any time after Substantial Completion at no cost to the Owner. Such cooperation shall include providing the Owner and any such Agencies with access to all records related to the Project.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents that arise subsequent to the effective date of such assignment. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law or in equity.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.3.3 No provision contained in the Contract Documents shall create or give to third parties any claim or right against the Owner or the Contractor except as specifically provided herein.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable Legal Requirements. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. Unless otherwise provided in the Contract Documents, the Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense. If the inspections and tests conducted under Section 13.4.1 or this Section 13.4.2 reveal failure in a portion of the Work, the Owner may order the inspection and testing at the Contractor's expense of any and all portions of the Work that are identical or similar to the failing portion.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest as provided in the Agreement.

§ 13.6 Prohibited Activities and Background Check Requirements which shall be Applicable if Project is to Take Place on School Grounds

§ 13.6.1 Contractor shall comply with all applicable Legal Requirements including**,** without limitation**,** Connecticut General Statutes Section 10-222c, as applicable.

§ 13.6.2 Interaction with School Community. The scope of the Work does not, and will not under any circumstances, require any contact with students or any other minors physically present in the facilities of, or the grounds surrounding, the school where the Project is located (the "School Grounds"). None of the Contractor, Subcontractors, Sub-subcontractor, or any of their respective employees, agents or representatives shall, under any circumstances, converse or interact in any manner, with students or any minors physically present on the School Grounds. None of the Contractor, Subcontractors, Sub-subcontractor, or any of their respective employees, agents or representatives shall interact with any adult members of the school community (including, without limitation, employees, officials, or visitors, including parents of students enrolled in the Owner's schools) with respect to the Project with the exception of the Owner's Designated Representative as provided in the Contract. All of the Contractor, Subcontractors, Sub-subcontractors, and their respective employees, agents or representatives shall, while on the School Grounds, refrain from use of vulgar language, obscene gestures, or any other behavior inappropriate for a school environment and/or property on which minor children are or may be present.

§ 13.6.3 Background and Employment History Checks.

§ 13.6.3.1 To the extent permitted by law, the Contractor shall perform (or cause to be performed) as regards all of its employees, agents, and representatives (each, a "Contractor Employee"), and all of the employees, agents, and representatives of Subcontractors and Sub-subcontractors (each, a "Subcontractor Employee"), who will be physically present on the School Grounds in connection with the Project, appropriate background checks on all such Contractor Employees and Subcontractor Employees. Such background checks shall include, at a minimum and without limitation, a search of both the Connecticut Department of Emergency Services and Public Protection's sexual offender registry and the Abuse and Neglect Registry of the Connecticut Department of Children and Families. For those Contractor Employees and Subcontractor Employees who are to be physically present on the School Grounds in connection with the Project and whose current or most recent employment occurred out of state, the out-of-state equivalent of the Connecticut Department of Emergency Services and Public Protection's sexual offender registry and the Abuse and Neglect Registry of the Connecticut Department of Children and Families registry shall be checked. The Contractor shall complete (or cause to be completed) background checks as to each Contractor Employee and Subcontractor Employee prior to such Contractor Employee or Subcontractor Employee being permitted to be physically present on the School Grounds. If the Contractor receives any information indicating that any Contractor Employee or Subcontractor Employee may be registered as a sexual offender, may have a record of abuse or neglect, or is, in any other manner, unfit to perform services which could involve direct contact with minor children, or which may involve working in or near property on which minor children may be present, the Contractor shall immediately forward such information to the Owner, to the extent permitted by law, and shall immediately remove the individual from the School Grounds and from participation in the Project.

§ 13.6.3.2 Contractor represents and warrants that, in its best professional judgment, each Contractor Employee and each Subcontractor Employee maintains the appropriate qualifications and is fit to perform services which could involve direct contact with minor children, or which may involve working in or near property on which minor children may be present. The Contractor shall immediately remove any Contractor Employee or Subcontractor Employee from the School Grounds and from the Project if requested to do so by the Owner (which request shall be made in the Owner's sole discretion) or if it becomes known to the Contractor that such Contractor Employee or Subcontractor Employee may be a danger to the health, safety or well-being of the school community, its students, or any minor children.

§ 13.6.3.3 The Contractor shall include, and shall require all Subcontractors to include this Section 13.6 in all subcontracts for the Project.

§ 13.6.3.4 By execution of the Contract, the Contractor represents and warrants that it has fully complied with the requirements of this Section 13.6. To the extent permitted by law, the Contractor agrees that upon the Owner's request, Contractor shall promptly provide the Owner with any documentation related to such compliance, including, without limitation, the results of the background and employment history checks required by this Section 13.6. Failure by the Contractor to comply with its obligations under this Section 13.6 shall constitute a material breach of the Contract.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of sixty (60) consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- **.1** Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- **.2** An act of government, such as a declaration of national emergency, that requires all Work to be stopped; or
- **.3** Because the Owner has repeatedly defaulted, beyond any applicable notice and cure periods, in its payment obligations to the Contractor under the Contract Documents.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, supplier or any of their respective agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than one hundred percent (100%) of the total number of days scheduled for completion, or One Hundred and Twenty (120) days in any Three Hundred and Sixty-Five (365) day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven (7) days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment pursuant to the Contract Documents for Work executed in accordance with the Contract Documents, along with direct costs incurred by the Contractor by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of sixty (60) consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, supplier or their agents or employees or any other persons or entities performing portions of the Work by or on behalf of any of them because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important and critical to the progress of the Work, the Contractor may, upon seven (7) additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.1.5 The notice of termination delivered pursuant to Section 14.1.3 or 14.1.4 must state with specificity the means by which the Owner may cure its nonperformance, and the Contractor shall not terminate the Contract if, within the applicable ten (10) day period, the Owner substantially takes such curative measures.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may, without prejudice and without waiving any other rights or remedies the Owner may have, terminate the Contract if the Contractor

- **.1** repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- **.2** fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- **.3** repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;
- **.4** otherwise is guilty of substantial breach of a provision of the Contract Documents;
- **.5** institutes proceedings or consent to proceedings requesting relief or arrangement under the Federal Bankruptcy Act or similar or applicable federal or state law, or a petition under any federal or state bankruptcy or insolvency law is filed against the Contractor and such petition is not dismissed within

sixty (60) days from the date of said filing, or the Contractor admits in writing its inability to pay its debts as they become due, or it makes a general assignment for the benefit of its creditors, or a receiver, liquidator, trustee, or assignee is appointed, or a receiver of all or any substantial portion of the Contractor's properties is appointed;

.6 abandons the Work;

.7 submits an Application for Payment, sworn statement, waiver of lien, affidavit or document of any nature whatsoever which is intentionally falsified;

.8 fails to make prompt payment to Subcontractors or for materials or labor in accordance with the respective subcontracts or otherwise breaches its obligations under any subcontract with a Subcontractor; or

.9 disregards any provision of any lease with which the Contract Documents require the Contractor to comply, or

.10 if a mechanics or materialman's lien or notice of lien is filed against any part of the Work or the Project site and the lien and underlying claim are not promptly resolved as required under the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven (7) days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be retained by the Owner. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause and without prejudice and without waiving any other rights or remedies the Owner may have, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

.1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed in accordance with the Contract Documents and direct costs incurred by reason of the termination, including direct costs attributable to termination of Subcontracts.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within Twenty-One (21) days after occurrence of the event giving rise to such Claim or within Twenty-One (21) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Work and its obligations under the Contract Documents and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of the probable effect of the delay on the progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Intentionally Omitted.

§ 15.1.8 Notwithstanding anything to the contrary herein or in the Contract Documents, neither the Contract Sum nor the Contract Time shall be adjusted if the increased costs or delay underlying the Contractor's claim for adjustment stems from the negligent act or omission of the Contractor, any Subcontractor, Sub-subcontractor, or supplier or of any other person or entity for whom or which any of them is responsible, or as a result of the error of any of the same or of the failure of any of the same to comply with, and fulfill their responsibilities under, the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within thirty (30) days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten (10) days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten (10) days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within thirty (30) days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within thirty (30) days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Section 9.10.5, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of sixty (60) days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within thirty (30) days from the date that mediation has been concluded without resolution of the dispute or sixty (60) days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within sixty (60) days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the Owner elects arbitration as the method for binding dispute resolution in regard to a Claim (pursuant to Section 6.2 of the Agreement), any such Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under the Contract with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under the Contract.

ATTACHMENT 4

SUBMISSION DOCUMENTS

The following forms and documents must be completed and submitted as part of each Bid:

1. Bid Form (including Bid Form Schedule A and Bid Form Schedule B) (use Attachment 1)
2. Letter from Bidder's bonding company stating that the Bidder, if awarded the Contract, can obtain the required Performance and Labor and Materials Payment Bonds in the full amount of the Base Bid Amount.
3. Statement of Qualifications (use Attachment 8)
4. Certification re: CGS §31-57b (Attachment 11)
5. Internal Revenue Service Form W-9 (Attachment 12)
6. Bid Security - Bid Bond (use Attachment 5)
7. Department of Revenue Services registration information for out of state contractors if required. Forms may be found at: http://www.ct.gov/drs/cwp/view.asp?a=1454&q=506012

ATTACHMENT 5

STANDARD BID BOND FORM

KNOW ALL MEN BY THESE PRESENTS, That we,_____, hereinafter called the Principal, of_____, as Principal, and, _____ hereinafter called the Surety, a corporation organized and existing under the laws of the State of _____, and duly authorized to transact a surety business in the State of Connecticut, as Surety, are held and firmly bound unto the **Town of Glastonbury**, as Obligee, in the penal sum of ten (10) percent of the amount of the bid set forth in a proposal hereinafter mentioned, lawful money of the United States of America, for the payment of which, well and truly to be made to the Obligee, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, That, whereas the Principal has submitted or is about to submit a proposal to the Obligee related to a contract for the Gideon Welles School Boiler Replacement Project at 1029 Neipsic Road, Glastonbury, Connecticut, GL-2022-29.

NOW, THEREFORE, if the said contract be awarded to the Principal and the Principal shall, within such time as may be specified, enter into the said contract in writing with the Town of Glastonbury and give the required bonds, with surety acceptable to the Obligee, or if the Principal shall fail to do so, pay to the Obligee the damages which the Obligee may suffer by reason of such failure not exceeding the penalty of this bond, then this obligation shall be void, otherwise to remain in full force and effect.

SIGNED, SEALED AND DELIVERED this_____ day of _____, 2022

Principal:_____(Name of Contractor)

By _____ (Contractor as Principal)
Name:_____(Print Name)
Title: _____

Surety: _____(Name of Surety)

By_____
Name:_____(Print Name)
Title:_____

ATTACHMENT 6
INSURANCE REQUIREMENTS

Contractor shall purchase and maintain without interruption from the date of commencement of the work under the Contract until the date of final payment and for the additional periods specified herein, the following minimum insurance, and all insurance that may be required under any applicable laws, written by insurance companies with a rating of at least an "A- VIII" in the latest addition of A.M. Best. If Contractor fails to obtain and keep in force the insurance required hereunder, the Town of Glastonbury (the "Town") may obtain and maintain the required insurance in the name of Contractor and the cost thereof shall be payable by Contractor to the Town on demand. Failure to maintain the insurance coverage required or failure to comply fully with any of the insurance provisions as may be necessary to carry out the terms and provisions of the Contract Documents shall be deemed to be a material breach of the Contract. Insurance requirements are independent of, and in addition to, Contractor's liability under the Contract Documents. Nothing in the Contract Documents shall be deemed to limit Contractor's liability under the Contract Documents to the limits of the insurance coverages required hereunder. Contractor shall be solely responsible for payment of all deductible or retention amounts pertaining to any insurance required hereby.

The Contractor shall provide the Town with sixty (60) days' advance written notice of any cancellation, non-renewal or modification of any of the insurance policies required to be maintained hereunder.

The insurance limits and coverages set forth in this Attachment are the minimum requirements under the Contract Documents. The inclusion of these minimum requirements shall not be interpreted to restrict the rights of the Additional Insureds (defined below) to the stated minimum coverage amounts in the event the Contractor maintains coverage at higher limits.

A. Contractor's Insurance

1. **Commercial General Liability** insurance on an "occurrence" basis for bodily injury and property damage that may arise out of or result from Contractor's operations and completed operations under the Contract Documents, whether such operations be by Contractor or by a subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. Such insurance shall include each of the following:

    (a) At a minimum, the following limits and coverages:
    - $1,000,000 each occurrence
    - $1,000,000 personal and advertising injury
    - $2,000,000 general aggregate
    - $2,000,000 products-completed operations aggregate

    (b) Coverage for ongoing operations, independent contractors, and any persons or entities performing work on behalf of Contractor.

    (c) Products and completed operations coverage, which coverage shall be maintained in effect for a period equivalent to the applicable statute of repose.

    (d) An endorsement stating that "limits apply per project."

    (e) Contractual liability coverage.

    (f) Contain a severability or separation of insureds clause.

(g) An additional insured endorsement (on ISO form CG 20 10 or CG 20 26 and form CG 20 37, or equivalent acceptable to the Town) naming the Additional Insureds (defined below) as additional insureds.

(h) The insurance maintained by Contractor shall be primary with respect to the interest of the Town, and any other insurance or self-insurance maintained by the Town or the other Additional Insureds is in excess and shall not contribute to Contractor's insurance in all instances regardless of any like insurance that the Town or the other Additional Insureds may have.

(i) Waiver of Subrogation endorsement in favor of the Town and, if the Project is to take place on school grounds, the Glastonbury Board of Education.

2. **Commercial Automobile Liability** coverage to include owned, hired and non-owned automobile liability insurance covering all use of all automobiles, trucks and other motor vehicles utilized by Contractor or its subcontractors, including each of the following:

(a) A combined single limit for bodily injury and property damage of $1,000,000 per accident.

(b) Coverage for upset, overturn and collision coverage related to pollution events (applying to the vehicle, trailer or other attachments to vehicle and extend to cargo/waste carried and to Subcontractors or others providing services to Contractor).

(c) Waiver of Subrogation endorsement in favor of the Town and, if the Project is to take place on school grounds, the Glastonbury Board of Education.

3. **Contractor's Pollution Liability** coverage with policy limits of not less than $1,000,000 per claim and $2,000,000 in the aggregate (with coverage for asbestos related claims).

4. Follow-form **umbrella (excess) liability** insurance with a limit of $2,000,000 each occurrence in excess of the general liability, employer's liability and business automobile liability coverages required of Contractor under this Schedule. Such insurance shall contain a provision that it will not be more restrictive than the primary insurance. Aggregate limits of liability shall apply separately with respect to the Work. Waiver of Subrogation endorsement in favor of the Town and, if the Project is to take place on school grounds, the Glastonbury Board of Education.

5. **Workers' Compensation insurance,** including employer's liability, for all persons whom Contractor employs (or uses as subcontract labor if the subcontractor is uninsured) in carrying out any Work. Such insurance shall be in strict compliance with the requirements of the most current and applicable workers' compensation insurance laws in effect from time to time in the state(s) where the Work is performed, and shall include the following:

(a) Coverage A (Workers' Compensation) - Statutory

(b) Coverage B (Employer's Liability)
At a minimum, the following limits and coverages:

- $1,000,000 for each accident, for bodily injury by accident
- $1,000.000 for each employee, for bodily injury by disease
- $1,000,000 for each disease policy limit

(c) Waiver of Subrogation endorsement in favor of the Town and, if the Project is to take place on school grounds, the Glastonbury Board of Education.

(d) Contain endorsements that provide: Voluntary Compensation

6. **Property insurance** on all property used in and for the Project until such time as the Work is approved and accepted by the Town. Coverage may by on an Installation Floater or equivalent form, insuring property to be installed while in transit, at off-site storage, on site awaiting installation and after installation until job completion and acceptance by the Town. Coverage must be on an all risk or Special form, replacement cost valuation, no coinsurance, with a minimum limit of $1,000,000. The Town must be named as loss payee with ISO form CP 12 18 10 12 Loss Payable Provisions, Clause C.2., Lender's Loss Payable, or equivalent acceptable to the Town, and the policy must provide for a minimum of ten (10) days' notice to the Town in the event of cancellation or nonrenewal.

B. Subcontractor's Insurance

Unless otherwise agreed by the Town in its discretion on a case by case basis, Contractor shall require that each subcontractor comply with the insurance requirements set forth in this Attachment. Before permitting any of its subcontractors to perform any Work, Contractor shall obtain a certificate of insurance from each such subcontractor evidencing that such subcontractor has obtained the required minimum insurance and has the Additional Insureds as additional insureds with respect to the Commercial General Liability and Commercial Automobile Liability insurance as required herein. All policies of subcontractors shall include a waiver of any right of subrogation of the insurers thereunder as against Contractor and the Additional Insureds. Contractor shall be responsible for any subcontractor's failure to comply with the requirements of this Attachment as they apply to such subcontractor.

C. Additional Insureds

To the fullest extent permitted by law, the Contractor shall cause the primary and excess or umbrella polices for Commercial General Liability, Automobile Liability and Contractor's Pollution Liability to include the **Town of Glastonbury, and its directors, trustees, officials, officers, committee members, agents, employees, consultants and representatives, and the Architect (collectively, the "Additional Insureds")** as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions. The additional insured coverage shall be primary and non-contributory to any of the Additional Insured's insurance policies and shall apply to both ongoing and completed operations. The Contractor shall provide the Town with an additional insured endorsement evidencing the Contractor's compliance with its obligations to name additional insureds pursuant to this Section which endorsement shall be ISO Endorsement satisfactory to the Town. If the Project is to take place on school grounds, **the Glastonbury Board of Education and its directors, trustees, officials, officers, committee members, agents, employees, consultants and representatives shall also be named as Additional Insureds as provided above.**

D. Builder's Risk Insurance [Check One]

[_____] The Contractor shall obtain property insurance for the Project written on a builder's risk "all-risk" or equivalent policy form in the amount of the Contract Price, plus the value of subsequent contract modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made or until no person or entity other than the Town has an insurable interest in the property, whichever is later. This insurance shall include interests of the Town, the Contractor, Subcontractors and Sub-subcontractors in the Project and such parties shall be named as additional insureds under such builder's risk coverage.

[__X__] The Town's property insurance shall provide for Builder's Risk insurance coverage for the Project.

Project: Gideon Welles Boiler Replacement (Glastonbury)

Minimum Rates and Classifications for
Heavy/Highway Construction

ID#: 22-31486

Connecticut Department of Labor
Wage and Workplace Standards Division

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Project Number: GL-2022-29
Project Town: Glastonbury
State#: GL-2022-29
FAP#: Glastonbury

Project: Gideon Welles Boiler Replacement (Glastonbury)

CLASSIFICATION	Hourly Rate	Benefits
1) Boilermaker	33.79	34% + 8.96
1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	38.27	34.47
2) Carpenters, Piledrivermen	35.57	25.65
2a) Diver Tenders	35.57	25.65
3) Divers	44.03	25.65
03a) Millwrights	36.32	26.81
4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	54.0	22.90
4a) Painters: Brush and Roller	36.42	22.90
4b) Painters: Spray Only	39.42	22.90
4c) Painters: Steel Only	38.42	22.90
4d) Painters: Blast and Spray	39.42	22.90
4e) Painters: Tanks, Tower and Swing	38.42	22.90

As of: February 9, 2022

5) Electrician (Trade License required: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	40.75	30.47+3% of gross wage
6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection	38.17	38.02 + a
7) Plumbers (Trade License required: (P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2) and Pipefitters (Including HVAC Work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4 G-1, G-2, G-8, G-9)	45.83	33.50
----LABORERS---- -		
8) Group 1: Laborer (Unskilled), Common or General, acetylene burner, concrete specialist	31.5	23.25
9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	31.75	23.25
10) Group 3: Pipelayers	32.0	23.25
11) Group 4: Jackhammer/Pavement breaker (handheld); mason tenders (cement/concrete), catch basin builders, asphalt rakers, air track operators, block paver, curb setter and forklift operators	32.0	23.25
12) Group 5: Toxic waste removal (non-mechanical systems)	33.5	23.25
13) Group 6: Blasters	33.25	23.25
Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	32.5	23.25
Group 8: Traffic control signalmen	18.0	23.25
Group 9: Hydraulic Drills	32.25	23.25
----LABORERS (TUNNEL CONSTRUCTION, FREE AIR). Shield Drive and Liner Plate Tunnels in Free Air.----		
13a) Miners, Motormen, Mucking Machine Operators, Nozzle Men, Grout Men, Shaft & Tunnel Steel & Rodmen, Shield & Erector, Arm Operator, Cable Tenders	33.73	23.25 + a
13b) Brakemen, Trackmen	32.76	23.25 + a
----CLEANING, CONCRETE AND CAULKING TUNNEL----		

14) Concrete Workers, Form Movers, and Strippers	32.76	23.25 + a
15) Form Erectors	33.09	23.25 + a
----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:----		
16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers	32.76	23.25 + a
17) Laborers Topside, Cage Tenders, Bellman	32.65	23.25 + a
18) Miners	33.73	23.25 + a
----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: ----		
18a) Blaster	40.22	23.25 + a
19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	40.02	23.25 + a
20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	38.04	23.25 + a
21) Mucking Machine Operator	40.81	23.25 + a
----TRUCK DRIVERS----(*see note below)		
Two axle trucks	30.16	27.16 + a
Three axle trucks; two axle ready mix	30.27	27.16 + a
Three axle ready mix	30.33	27.16 + a
Four axle trucks, heavy duty trailer (up to 40 tons)	30.39	27.16 + a
Four axle ready-mix	30.44	27.16 + a
Heavy duty trailer (40 tons and over)	30.66	27.16 + a

Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	30.44	27.16 + a
----POWER EQUIPMENT OPERATORS----		
Group 1: Crane handling or erecting structural steel or stone, hoisting engineer (2 drums or over), front end loader (7 cubic yards or over), Work Boat 26 ft. & Over, Tunnel Boring Machines. (Trade License Required)	43.88	25.80 + a
Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver ($3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)	43.53	25.80 + a
Group 3: Excavator/Backhoe under 2 cubic yards; Cranes (under 100 ton rated capacity), Gradall; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar);Grader Operator; Bulldozer Fine Grade (slopes, shaping, laser or GPS, etc.). (Trade License Required)	42.72	25.80 + a
Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper)	42.3	25.80 + a
Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Spreader; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24	41.65	25.80 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	41.65	25.80 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	41.31	25.80 + a
Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24	40.94	25.80 + a
Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine.	40.51	25.80 + a
Group 9: Front End Loader (under 3 cubic yards), Skid Steer Loader regardless of attachments (Bobcat or Similar); Fork Lift, Power Chipper; Landscape Equipment (including hydroseeder).	40.04	25.80 + a
Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc.	37.81	25.80 + a
Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment.	37.81	25.80 + a
Group 12: Wellpoint Operator.	37.74	25.80 + a

Group 13: Compressor Battery Operator.	37.11	25.80 + a
Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain).	35.87	25.80 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	35.43	25.80 + a
Group 16: Maintenance Engineer/Oiler	34.72	25.80 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	39.42	25.80 + a
Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	36.77	25.80 + a
**NOTE: SEE BELOW		
----LINE CONSTRUCTION----(Railroad Construction and Maintenance)--- -		
20) Lineman, Cable Splicer, Technician	48.19	6.5% + 22.00
21) Heavy Equipment Operator	42.26	6.5% + 19.88
22) Equipment Operator, Tractor Trailer Driver, Material Men	40.96	6.5% + 19.21
23) Driver Groundmen	26.5	6.5% + 9.00
23a) Truck Driver	40.96	6.5% + 17.76
----LINE CONSTRUCTION----		
24) Driver Groundmen	30.92	6.5% + 9.70
25) Groundmen	22.67	6.5% + 6.20
26) Heavy Equipment Operators	37.1	6.5% + 10.70
27) Linemen, Cable Splicers, Dynamite Men	41.22	6.5% + 12.20

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28) Material Men, Tractor Trailer Drivers, Equipment Operators	35.04	6.5% + 10.45

As of: February 9, 2022

Project: Gideon Welles Boiler Replacement (Glastonbury)

Welders: Rate for craft to which welding is incidental.

**Note: Hazardous waste removal work receives additional $1.25 per hour for truck drivers.*

***Note: Hazardous waste premium $3.00 per hour over classified rate*

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra $4.00 premium in addition to the hourly wage rate and benefit contributions:

1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)

2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson

3) Cranes (under 100 ton rated capacity)

Crane with 150 ft. boom (including jib) - $1.50 extra
Crane with 200 ft. boom (including jib) - $2.50 extra
Crane with 250 ft. boom (including jib) - $5.00 extra
Crane with 300 ft. boom (including jib) - $7.00 extra
Crane with 400 ft. boom (including jib) - $10.00 extra

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyperson instructing and supervising the work of each apprentice in a specific trade.

~~Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing

The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.

Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.

It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.

The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol. For those without internet access, please contact the division listed below.

The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.

All subsequent annual adjustments will be posted on our Web Site for contractor access.

Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage

All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

As of: February 9, 2022

Project: Gideon Welles Boiler Replacement (Glastonbury)

~~Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

As of: February 9, 2022

Important Information:

For use with Building, Heavy/Highway, and Residential

Welders: Rate for craft to which welding is incidental.

*Note: Hazardous waste removal work receives additional $1.25 per hour for truck drivers.

**Note: Hazardous waste premium $3.00 per hour over classified rate.

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra $4.00 premium in addition to the hourly wage rate and benefit contributions:

1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)
2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson
3) Cranes (under 100 ton rated capacity)

Crane with boom including jib, 150 feet - $1.50 extra.

Crane with boom including jib, 200 feet - $2.50 extra.

Crane with boom including jib, 250 feet - $5.00 extra.

Crane with boom including jib, 300 feet - $7.00 extra.

Crane with boom including jib, 400 feet - $10.00 extra.

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

- Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyperson instructing and supervising the work of one apprentice in a specific trade.

Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing state work

- The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.
- Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.
- It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.
- The annual adjustments will be posted on the Department of Labor's Web page: www.ctdol.state.ct.us.
- The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.
- All subsequent annual adjustments will be posted on our Web Site for contractor access.

Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage.

- All Persons who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.
- All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)
- Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

DRAFT

AIA® Document A305™ – 1986

Contractor's Qualification Statement

The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading.

SUBMITTED TO: «Town of Glastonbury»

ADDRESS: « Office of the Purchasing Agent at Glastonbury Town Hall, 2155 Main Street, Glastonbury, CT 06033»

SUBMITTED BY: «_____ »

NAME: « _____ »

ADDRESS: « _____ »

PRINCIPAL OFFICE: « »

[« »] Corporation

[« »] Partnership

[____] Limited Liability Company

[« »] Individual

[« »] Joint Venture

[« »] Other « »

NAME OF PROJECT: *(if applicable)* «Gideon Welles School Boiler Replacement 1029 Neipsic Road Glastonbury, CT 06033»

TYPE OF WORK: *(file separate form for each Classification of Work)*

[« X »] General Construction

[« »]HVAC

[« »] Electrical

[« »] Plumbing

[« »] Other: *(Specify)* « »

§ 1 ORGANIZATION

§ 1.1 How many years has your organization been in business as a commercial Contractor? « _____ »

§ 1.2 How many years has your organization been in business under its present business name? « _____ »

§ 1.2.1 Under what other or former names has your organization operated?

« _____ »

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This form is approved and recommended by the American Institute of Architects (AIA) and The Associated General Contractors of America (AGC) for use in evaluating the qualifications of contractors. No endorsement of the submitting party or verification of the information is made by AIA or AGC.

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§ 1.3 If your organization is a corporation, answer the following:

§ 1.3.1 Date of incorporation: « »

§ 1.3.2 State of incorporation: « »

§ 1.3.3 President's name: « »

§ 1.3.4 Vice-president's name(s)

« »

§ 1.3.5 Secretary's name: « »

§ 1.3.6 Treasurer's name: « »

§ 1.4 If your organization is a partnership, answer the following:

§ 1.4.1 Date of organization: « »

§ 1.4.2 Type of partnership (if applicable): « »

§ 1.4.3 Name(s) of general partner(s)

« »

§ 1.5 If your organization is a limited liability company, answer the following:

§ 1.5.1 Date of organization: « »

§ 1.5.2 Names of members and managers:

« _____ »

§ 1.6 If your organization is individually owned, answer the following:

§ 1.5.1 Date of organization: « »

§ 1.5.2 Name of owner:

§ 1.7 If the form of your organization is other than those listed above, describe it and name the principals:

« »

§ 2 LICENSING

§ 2.1 List jurisdictions and trade categories in which your organization is legally qualified to do business in the State of Connecticut, and indicate registration or license numbers, if applicable, including the contractor's license(s) applicable to the perform of the work for the Project.

« _____ »

§ 2.2 List jurisdictions in which your organization's partnership or trade name is filed.

« »

§ 3 EXPERIENCE

§ 3.1 List the categories of work that your organization normally performs with its own forces.

« _____ »

§ 3.2 Claims and Suits. (If the answer to any of the questions below is yes, please attach details.)

§ 3.2.1 Has your organization ever failed to complete any work awarded to it?

« _____ »

§ 3.2.2 Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers, members or managers, as applicable?

« _____ »

§ 3.2.3 Has your organization filed any law suits or requested arbitration with regard to construction contracts within the last five years?

« _____ »

§ 3.3 Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.)

«_____ »

§ 3.4 On a separate sheet, list major construction projects your organization has in progress, giving the name of project, owner, architect, contract amount, percent complete and scheduled completion date.

§ 3.4.1 State total worth of work in progress and under contract:

«_____ »

§ 3.5 On a separate sheet, list the major projects your organization has completed in the past three years, giving the name of project, owner, contact information for project coordinator (name, title, address, phone number), architect, contract amount, date of completion and percentage of the cost of the work performed with your own forces. Specifically identify those which are similar in size, scope and complexity to the Project..

§ 3.5.1 State average annual amount of construction work performed during the past five years:

«_____ »

§ 3.6 On a separate sheet, list the construction experience and present commitments of the key individuals of your organization including, in particular, the superintendent and project manager Bidder intends to assign to this Project.

«_____ »

§ 4 REFERENCES

§ 4.1 Trade References:

«_____ »

§ 4.2 Bank References:

«_____ »

§ 4.3 Surety:

§ 4.3.1 Name of bonding company:

« _____ »

§ 4.3.2 Name and address of agent:

« _____ »

§ 5 FINANCING

§ 5.1 Financial Statement.

§ 5.1.1 Attach a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory and prepaid expenses);

Net Fixed Assets;

Other Assets;

Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries and accrued payroll taxes);

Other Liabilities (e.g., capital, capital stock, authorized and outstanding shares par values, earned surplus and retained earnings).

§ 5.1.2 Name and address of firm preparing attached financial statement, and date thereof:

« _____ »

§ 5.1.3 Is the attached financial statement for the identical organization named on page one?

« _____ »

§ 5.1.4 If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsidiary).

« _____ »

§ 5.2 Will the organization whose financial statement is attached act as guarantor of the contract for construction?

« _____ »

§ 6 SIGNATURE

§ 6.1 Dated at this « _____ » day of « _____ » «2020»

Name of Organization: « _____ »

By: « _____ »

Title: « _____ »

§ 6.2

« »

M « _____ » being duly sworn deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading.

Subscribed and sworn before me this « _____ » day of « _____ » « 2020»

Notary Public: « _____ »

My Commission Expires: « _____ »

SECTION 200050 - GENERAL CONDITIONS FOR MECHANICAL AND ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The General provisions of the Contract, including General and Supplementary Conditions, and Division 1, General Requirements apply to the work specified in this Section.

B. Scope of Work: This Section contains special provisions for Divisions 22, 23 and 26.

1.2 EXAMINATION OF SITE AND DRAWINGS:

A. Before submitting his bid, Contractor shall visit site with plans and specifications in hand, shall consult with the Engineer and shall become thoroughly familiar with all conditions under which his work will be done since he will be held responsible for any assumptions he may make in regard thereto.

B. The Contractor shall verify and obtain all necessary dimensions at the building.

C. Certain present building clearances are available for handling equipment.

1.3 INTENT:

A. Finished Work: The intent of the specifications and drawings is to call for finished work, completed, tested and ready for operation.

B. Good Practice: It is not intended that the drawings show every pipe, fitting or minor detail and it is understood that while the drawings must be followed as closely as circumstances will permit, the systems shall be installed according to the intent and meaning of the Contract Documents and in accordance with good practice.

C. Work under each Section shall include giving written notice to the Town within 15 days after the Award of the Contract of any materials of apparatus believed inadequate or unsuitable or in violation of any laws or codes, or items of work omitted. In the absence of such written notice, it is mutually agreed that work under each Section has included the cost of all required items and labor for the satisfactory functioning of the entire system without extra compensation.

D. Any apparatus, appliance, material or work not shown on drawings but mentioned in specifications or vice versa, or any incidental accessories necessary to make the work complete and perfect in all respects and ready for operation, even if not particularly specified, shall be furnished and installed by Contractor at no additional cost to the Town.

E. Prior to receipt of bids, Contractors shall give written notice to Engineer of any materials or apparatus believed inadequate, unsuitable or in violation of laws, ordinances, rules or regulations of authorities having jurisdiction and any necessary items or work omitted. In the absence of such written notice, it is mutually agreed that Contractor has included the cost of all required items in his proposal and that he will be responsible for approved satisfactory functioning of systems without further compensation.

F. In all cases where apparatus is herein referred to in singular number, it is intended that such reference include as many such items as are required to complete work.

G. If not otherwise specified or shown on plans, apparatus and materials shall be installed in accordance with manufacturer's published recommendations and instructions and to the complete satisfaction of the Engineer.

H. It is the intent of these specifications for Mechanical and Electrical Contractors and/or their subcontractors or equipment suppliers to furnish all equipment complete with all accessories.

1.4 REGULATIONS:

A. Codes: All work shall be done in strict accordance with the 2018 Connecticut State Building Code, 2018 Connecticut State Fire Safety Code, 2015 IBC, 2015 IPC, 2015 IMC, Connecticut Public Health Code, 2015 NFPA 101, all applicable NFPA Codes, NEC, UL, NEMA, O.S.H.A., with all requirements of local utility companies and the requirements of all governmental departments having jurisdiction. Codes: All work shall be done in strict accordance with the 2016 Connecticut State.

B. Precedence: Requirements of the above shall take precedence over plans and specifications.

C. Equipment construction standards shall be as follows: Pressure vessels shall be constructed in accordance with the ASME Code, all electrical equipment shall be UL listed and approved and conform to the N.E.C., gas equipment shall be approved by A.G.A. and conform to N.F.P.A. Codes, piping materials, fittings, valves and accessories shall be constructed in accordance with A.S.T.M. and A.N.S.I. standards for class of work involved. All equipment and materials shall be new and of domestic manufacture. All the above codes shall be referenced and dated in the Connecticut Basic Building Code.

D. Wherever discrepancies occur between above regulations and agencies and contract drawings and specifications, the requirements of above shall take precedence, except that the contract drawings and specifications shall be minimum requirements and that contractors shall advise engineer of any required changes before proceeding with work.

1.5 APPROVED FITTINGS:

A. No material other than that contained in the "Latest List of Electric Fittings" approved by the Underwriters' Laboratories, Inc., shall be used in any part of the work.
All wiring, conduit, switches and other material for which label service has been established, shall bear the label of the Underwriters' Laboratories, Inc.

1.6 PERMITS, FEES:

A. Include all necessary notices, obtain all permits and pay all governmental taxes, fees, and other costs. File all necessary plans, prepare all documents and obtain all necessary approvals of all governmental departments having jurisdiction. Obtain all required Certificates of the Town before request for acceptance and final payment for the work.

1.7 DEFINITIONS:

A. Words "finish" or "finished" refer to all rooms and areas listed in Finished Schedule on Drawings. All rooms and areas not covered in Schedule, including underground tunnels and areas above ceilings, shall be considered not finished except as otherwise noted.

B. The word "provide" means to "furnish and install" reference item.

1.8 PROTECTION:

A. Work under each section shall include protecting the work and materials of all other sections from damage by work or workmen, and shall include making good any and all damage thus caused.

B. Each section shall be responsible for work and equipment until finally inspected, tested and accepted. Protect work against theft, weather, injury or damage and carefully store material and equipment received on site which is not immediately installed. Close open ends of work with temporary covers or plugs during construction to prevent entry of obstructing materials.

C. If so specified under the respective section, work may include receiving, unloading, uncrating, storing, protecting, setting in place and connecting up completely of any motor starters, control equipment having mechanical/electrical service connections which may be furnished by Town or furnished under another section. Work under each section shall include exercising special care in handling and protecting equipment and fixtures. Any of the above equipment and fixtures which are missing or damaged by reason of mishandling or failure to protect shall be replaced at no additional cost to the Town.

1.9 EQUIPMENT SUBSTITUTIONS AND DEVIATIONS:

A. Wherever more than one manufacturer is mentioned in specifications and drawings, any of these named are considered equally acceptable to that on upon which design was based and, providing all requirements are met, insofar as performance, space requirements, noise levels and special accessories or materials are concerned, any of those named may be included in Contractor's bid.

B. Where Contractor proposes to use an item of equipment which differs from that upon which design was based, which required any redesign of structure, partitions, foundations, piping, wiring or of any other part of Mechanical or Electrical Layout, all such redesign, new drawings or detailing required shall be prepared by Contractor at his own expense for approval of Engineer.

C. Where approved substitutions or deviations require a different quantity, size or arrange of structural supports, wiring, conduit, piping, ductwork, and equipment from that upon which design was based, all additional items required by the systems shall, with the approval of Engineer, be furnished by Contractor at no additional cost to Town.

1.10 ELECTRICAL WORK:

A. The Electrical Section includes all power wiring for all electrical switches, motor starters and unmounted motors, furnished at the job site by other sections or furnished under the Electrical Sections as stated in other sections of the specifications.

B. The Electrical Section shall install and wire all starters, switches and controls, as specified and/or shown on drawings. This shall include all operating and safety controls. Refer to sections 260000 and 260500 for additional information.

C. Electrically operated equipment supplied by other sections which will be installed and wired by Electrical Section shall be delivered to him with detailed instructions for their installation and wiring in sufficient time and proper sequence to enable him to meet his work schedule.

D. Control devices that include mechanical elements, such as float switches, shall be installed by the section furnishing them, but be wired by the Electrical Sections.

E. Equipment which includes a number of correlated electrical control devices mounted in a single enclosure or on a common base with equipment shall be supplied for installation completely wired as unit with terminal boxes and ample leads and/or terminal strips, ready for electrical wiring.

F. Electrical Contractor shall furnish local disconnect switch for all equipment and manual motor starter for fractional HP motors.

1.11 DRAWINGS:

A. The mechanical and electrical drawings are intended to supplement each other and are to be considered as a unit which, taken together in conjunction with the specifications, completely describes the work to be done. All drawings shall be checked to verify spaces in which work will be installed. Where headroom or space conditions appear inadequate, notification shall be given to Engineer before proceeding with installation.

B. The Engineer may without charge, make modifications in the layout as needed to prevent conflict with work of other trades or for proper execution of the work.

C. Note that the drawings are diagrammatic and indicate the general arrangement of the Mechanical and Electrical Equipment and systems, without showing every detail and fitting.

D. Where conflicts occur between drawings and specifications or within either, the item or arrangement of better quality, greater quality or highest cost shall be included in Contract price. Engineer shall determine the manner or item with which work shall be installed.

E. Keep one complete set of all drawings, specifications, shop drawings and addenda on the premises at all times in good condition and available to the Engineer and Town.

1.12 REVIEWS:

A. The materials, workmanship, design and arrangement of all work installed under the Mechanical and Electrical sections shall be subject to the review of the Engineer.

B. Where any specific material process of method of construction or manufactured article is specified by name or by reference to the catalog number of a manufacturer, the specifications are to be used as a guide and not intended to take precedence over the basic duty and performance specified or noted on drawings. In all cases, the specific

characteristics of the equipment offered for approval, shall be indicated on the shop drawings.

C. All component parts of each item of equipment or device shall bear the manufacturer's nameplate, giving name of manufacturer, description, size, type, serial or model number, electrical characteristics, etc. in order to facilitate maintenance or replacement. The nameplate of a subcontractor or distributor will not be acceptable.

D. If material or equipment is installed before it is reviewed, it shall be removed and replaced at no extra charge to the Town if, in the opinion of the Engineer, the material or equipment does not meet the intent of the drawings and specifications.

1.13 SHOP DRAWINGS:

A. Contractor shall submit for review electronic shop drawings of all new equipment, materials, piping, lighting fixtures, devices, panels, wiring and reports. Engineer's review of shop drawings must be completed before any equipment is purchased or any work is installed.

B. Shop drawings shall consist of manufacturer's certified scale drawings, cuts or catalog, including descriptive literature and complete certified characteristics of equipment, showing dimensions, capacity, code requirements, motor and drive testing as indicated on the drawings or specifications. Also, sheet metal fabrication drawings drawn to scale of 1/4" to the foot or larger.

C. Certified performance curves for all pumping equipment shall be submitted for review.

D. Samples, drawings, specifications, catalogs, etc. submitted for review shall be properly labeled indicating specific service for which material or equipment is to be used, division and article number of specifications governing Contractor's name and name of job.

E. Catalog, pamphlets or other documents submitted to describe items on which review is being requested, shall be specific and identification in catalog, pamphlet, etc. of item submitted shall be clearly made in ink. Data of a general nature will not be accepted.

F. Review stamp rendered on shop drawings shall not be considered as a guarantee of measurements of building conditions.

Where drawings are reviewed, said review does not mean that drawings have been checked in detail. Said review does not in any way relieve the Contractor from his responsibility or necessity of furnishing material or performing work as required by the Contract Drawings and Specifications.

G. Failure by the Contractor to submit shop drawings in ample time for checking shall not entitle him to an extension of Contract and no claim for extension by reason of such default will be allowed.

H. Prior to submission to shop drawings, the Contractor shall thoroughly check each shop drawing, reject those not conforming to the specifications and indicate by his signature that the shop drawings submitted in his opinion meet Contract requirements.

1.14 CUTTING AND PATCHING:

A. All cutting of openings in walls, floors, partitions, etc. must be done by the Electrical and/or Mechanical Contractor as required to install the work including all cutting of existing construction work. Cutting shall be neatly done and limited to the minimum size necessary. Contractor shall patch and restore to its original condition any work disturbed as a result of work under this Contract.

PART 2 - PRODUCTS

2.1 MATERIALS AND WORKMANSHIP:

A. All materials and apparatus used shall be new, of first class quality and shall be furnished, delivered, erected, connected and finished in every detail. No materials or apparatus used shall be discontinued or about to be discontinued items.

B. The Engineer shall have the right to reject any part of the work in case material or workmanship is not of satisfactory quality.

C. Any unacceptable work and material shall be replaced with acceptable work and material at no additional expense to the Town.

D. In case there is any doubt of the acceptability of any material, submit samples to the Engineer for approval and only definite approval in writing from the Engineer shall be evidence of such approval.

E. Such approval shall also be subject to the satisfactory installation of the material.

F. The work in each of these sections shall be constantly under the direction of a competent superintendent who shall be on the premises during such period as the work is in progress. The superintendent shall familiarize himself with the work of all other sections involved insofar as they relate to or in any way affect the work of these sections, and shall coordinate the work.

G. Unless otherwise noted, all equipment and materials shall be installed and/or applied in accordance with the recommendations of the manufacturer of said equipment, including the performance of any tests recommended by the manufacturer.

2.2 EQUIPMENT VARIATIONS:

A. In these specifications and on the accompanying drawings, one or more makes of materials, apparatus or appliances have been specified for use in this installation.
This has been done for convenience in fixing the standard of workmanship performance of any materials, apparatus or appliance which shall be substituted for those mentioned herein shall also conform to these standards.

B. Where no specified make or material, apparatus or appliance is mentioned, any first class product made by a reputable manufacturer may be used, providing it conforms to the requirements of these specifications and meets the approval of the Engineer prior to installation.

C. Refer to Article 15 of the General Conditions of the contract for substitution procedures.

D. To substitute other makes of materials, apparatus or appliance, than those mentioned under the mechanical or electrical sections, a request in writing to be allowed to make the substitution shall be made. This request shall be accompanied by complete plans and specifications of the substitution offered. If so requested by the Engineer, also submit samples of both the specified material or appliance and the substitute.

2.3 MOTOR CONTROL:

A. All motors will be fed from a motor starter. Motor starters shall be furnished by each respective trade for motor driven equipment provided by them. The Electrical Contractor shall install the starters and shall provide all power wiring to the starters, and from the starters to the motors they control. Where required, remote pushbuttons, plates and pilots will be furnished with the starter and will be installed by the Electrical Contractor, unless otherwise called for under the Temperature Control Section of these specifications. All starters for motors which are to be interlocked with another motor shall have suitable auxiliary contacts.

B. All small motors without built-in thermal protection shall be furnished with thermal switches. These switches and pilots shall be furnished by the Electrical Contractor.

2.4 ELECTRIC MOTORS:

A. All motors 1/2 h.p. and above shall be integral horsepower polyphase induction motors conforming to NEMA standards MG-1-1967 and shall be T-frame design in sizes 143 T through 445 T. Each shall be NEMA design B with minimum torque valves per MG 1-12.37 and 12.38.

B. Duty shall be continuous, ambient temperature 40 degrees maximum, allowable temperature rise for open drip-proof -90 degrees, TEFC, 80 degrees C with Class B insulation rating all per MG 1-12.42.

C. Horsepower, speed and frame sized per MG 1-10, 32, 13.02 and 13.06a.

D. Enclosures - open drip-proof and TEFC per MG 1-1.25, 1.26 and 1.27.

E. All dimensions per MG 1-11.31a, 11.32a and 11.34a. All motors shall have stainless steel nameplates with NEMA voltage standards shown.

F. Locked rotor KVA per horsepower shall be designated by proper NEMA code letter per MG 1.10.37.

G. All motors shall be premium efficiency type with a full load efficiency range of 80 percent to 95 percent. High efficiency motor rating shall meet Northeast Utilities Energy Action Program in accordance with the following schedule:

MINIMUM NOMINAL MOTOR EFFICIENCIES

HP	OPEN DRIP PROOF MINIMUM EFFICIENCY			HP	TOTALLY ENCLOSED MINIMUM EFFICIENCY		
	1200	1800	3600		1200	1800	3600
1	82.5%	85.5%	80.0%	1	82.5%	85.5%	78.5%
1.5	86.5%	86.5%	85.5%	1.5	87.5%	86.5%	85.5%
2	87.5%	86.5%	86.5%	2	88.5%	86.5%	86.5%
3	89.5%	89.5%	86.5%	3	89.5%	89.5%	88.5%
5	89.5%	89.5%	89.5%	5	89.5%	89.5%	89.5%
7.5	91.7%	91.0%	89.5%	7.5	91.7%	91.7%	91.0%
10	91.7%	91.7%	90.2%	10	91.7%	91.7%	91.7%
15	92.4%	93.0%	91.0%	15	92.4%	92.4%	91.7%
20	92.4%	93.0%	92.4%	20	92.4%	93.0%	92.4%
25	93.0%	93.6%	93.0%	25	93.0%	93.6%	93.0%
30	93.6%	94.1%	93.0%	30	93.6%	93.6%	93.0%
40	94.1%	94.1%	93.6%	40	94.1%	94.1%	93.6%
50	94.1%	94.5%	93.6%	50	94.1%	94.5%	94.1%
60	95.0%	95.0%	94.1%	60	94.5%	95.0%	94.1%
75	95.0%	95.0%	94.5%	75	95.0%	95.4%	94.5%
100	95.0%	95.4%	94.5%	100	95.4%	95.4%	95.0%

H. Service Factors - open-drip-proof, 1 h.p. through 200-1.15 TEFC all horsepower - 1.0.

I. Noise level within NEMA standard MG 1-12.49.

J. In addition to the above, all motors 1 through 20 h.p. shall be TEFC with drain holes for both horizontal and vertical positions. Each shall be equipped with deep groove double shielded ball bearings prelubricated with provisions for regreasing.

K. Motors smaller than 1/2 h.p. shall be capacitor-start or split-phase type designed for 120 volts, single phase, 60 cycles alternating current.

2.5 ELECTRICAL MOTOR STARTERS:

A. Motor starters shall be furnished by each respective trade for motor driven equipment provided by them. The Electrical Contractor shall install the starters and shall provide all power wiring to the starters, and from the starters to the motors they control.

B. Motor starters shall conform to requirements of NEC, NEMA, UL, CSA, and ANSI and shall be suitable for the required horsepower, duty, voltage, phase, frequency, service, and location. All starters shall be furnished in NEMA enclosures suitable for the environment in which they are to be located.

C. All starters shall be of the same manufacture and shall be furnished in Cutler-Hammer, Square D, General Electric, or Allen Bradley.

D. Thermal Overloads:

1. All motors 1/8 horsepower or larger shall be provided with thermal-overload protection. Thermal overloads shall be melting alloy ambient temperature compensating type.
2. Thermal overloads shall be sized in accordance with NEC requirements for the nameplate data of the motor(s) as actually delivered to the site.

E. Starters for manual control of single phase motors up to one (1) horsepower furnished without integral thermal overloads shall be combination manual disconnect switch and starters with thermal overload protection for each ungrounded leg. Starters shall be inoperable if a thermal unit is removed. These starters shall be 2-pole and shall be provided with green neon pilot light and handle guard/lock-off.

F. Starters for three phase motors shall be full voltage, circuit breaker combination magnetic starters. All circuit breaker combination magnetic starters shall include melting alloy type thermal overload protection, low voltage protection, and two (2) sets of auxiliary normally open and normally closed contacts. Thermal overload protection shall be provided in each ungrounded leg. Starters shall be inoperable if a thermal unit is removed.

All circuit breaker combination magnetic starters shall be equipped with control power circuits. Provide starters with control power transformers of secondary voltage required for the control power circuitry. Provide control power transformers with secondary fusing.

The disconnect handle on circuit breaker combination magnetic starters shall always be in control of the disconnect device with the door opened or closed. The disconnect handle shall be clearly marked as to whether the disconnect device is "on" or "off", and shall include a two-color handle grip, the black side visible in the "off" position, and the red side visible in the "on" position.

1. All circuit breaker combination magnetic starters for manual control of three phase motors shall have start-stop push buttons in the cover and shall be provided with red and green pilot lights.
2. All circuit breaker combination magnetic starters for automatic or interlocking control of three phase motors shall have hand-off-automatic selector switches in the cover and shall be provided with red and green pilot lights.

G. Starters shall be furnished as part of respective equipment furnished under each Division.

PART 3 - EXECUTION

3.1 CONNECTING TO EXISTING UTILITIES:

A. Connections to existing utilities that will interrupt the service to the present buildings shall be made at a time agreed upon by the Town,

B. If it is necessary to make connections to existing utilities outside the regular working hours, this shall be noted on the written work order and the respective Contractor will be paid for the additional cost of labor over and above what it would cost at regular day time rates.

3.2 FREIGHT, CARTING AND RIGGING:

A. Contractor shall pay all freight and carting charges necessary to deliver all equipment furnished under his Contract to the site and furnish all necessary rigging to properly rig and set the apparatus on the foundations, frames, etc.

B. All scaffolding, blocks and tackle, ropes and chains and other equipment necessary to rig and set the apparatus shall be furnished by the Contractor.

C. The Contractor shall set, level and align all equipment before starting operations.

3.3 SEISMIC RESTRAINTS:

A. It is the intent of this seismic restraint portion of the specification to provide restraint of all non-structural building system components provided in Sections 15 and 16 in Seismic Zone II. Restraint systems and devices are intended to withstand, without failure, the "G" forces detailed in the chart below:

Design Level of Acceleration At Equipment Center of Gravity Seismic Zone 2)
(Av - >0.1 to 0.19)

Elevation (feet rel. to grade level)	Rigid* Mnt'd Equip	Non-Struct. Architect Component	Flexible* Mnt'd Equip	Pipe, Duct, Cable trays, Conduit, Etc.	Life Safe. Equip
Below Grade up to 20 feet above grade	0.125 "g"	0.250 "g"	0.500 "g"	0.350 "g"	1.000 "g"
21 ft. - 300 ft.	0.500 "g"	0.550 "g"	0.750 "g"	0.650 "g"	1.000 "g"
301 ft. - 600 ft.	0.750 "g"	0.900 "g"	1.000 "g"	1.000 "g"	1.000 "g"

* Rigid mounted equipment is any equipment mounted directly to structure. Flexible mounted equipment is any equipment mounted on resilient supports, ceiling suspended, roof supported or mounted on an independent frame with any primary natural frequency below 16 Hz.

B. Seismic restraints shall be as required by 2012 IBC, Chapter 16 and State of Connecticut Building Code, 2016 edition.

C. Seismic Certificant and Analysis

1. Seismic restraint calculations must be provided for all connections of equipment to the structure.
2. Calculations to support seismic restraint designs must be stamped by a registered professional engineer licensed in the State of Connecticut.
3. Analysis must indicate dead loads, derived loads, and materials used for connections to equipment and structure. Analysis must detail anchoring methods, bolt diameters, embedment, and weld length.
4. A seismic design errors and omissions insurance certificate must accompany submittals.

D. Submit drawings showing locations of all seismic restraints for equipment, piping, and conduit provided under Sections 15 and 16:

1. The term EQUIPMENT includes ALL non-structural components. These specifications are applicable within the facility and 5 feet outside of the foundation wall. Equipment buried underground is excluded but entry of services through the foundation wall is included. Equipment referred to below is a partial list; (equipment not listed is still included in this specification).

Air Separators	Water Heater
Light Fixtures	Bus Ducts
Piping	Boiler
Pumps (All types)	Cable Trays
Switching Gear	Tanks (All types)
Conduit	All Electrical Panels

E. Submittals shall include a listing of all isolated and non-isolated equipment to be restrained.

F. Seismic restraints shall not be required for the following installations:

1. Piping in mechanical rooms less than l 1/4-inch inside diameter.
2. All other piping less than 2 1/2-inch inside diameter.
3. All electrical conduit less than 2 1/2-inch inside diameter.
4. All rectangular air-handling ducts less than 6 square feet in cross-sectional area.
5. All round air-handling ducts less than 28 inches in diameter.
6. All piping suspended by individual hangers 12 inches or less in length from the top of the pipe to the bottom of the support for the hanger.
7. All ducts suspended by hangers 12 inches or less in length from the top of the duct to the bottom of the support for the hanger.

G. Life safety systems defined:

1. All systems involved with fire protection including sprinkler piping, service water supply piping, fire dampers and smoke exhaust systems.
2. All systems involved with and/or connected to emergency power supply including all generators, transfer switches, transformers and all flowpaths to fire protection and/or emergency lighting systems.
3. Fresh air relief systems on emergency control sequence including air handlers, conduit, duct, dampers, etc.

3.4 COOPERATION WITH OTHER TRADES:

A. No piping, conduit, valves, boxes, etc., shall be installed until the entire run has been checked for clearance and the work has been coordinated between all the trades. Each tradesman shall be responsible for taking his own field measurements and maintaining proper clearance from the Town's equipment and the work of other trades, and for coordinating his work with that of other Contractors and Town. Furnish all necessary information, dimensions, templates, etc. in order that a perfectly coordinated job will result.

B. Contractor shall carry out his work in conjunction with other trades and shall give full cooperation to other trades. Contractor shall furnish all information necessary to permit work of all trades to be installed in a satisfactory manner.

C. Where space is so limited that Contractor's work shall be installed in close proximity to the work of other trades or where it is evident that Contractor's work will interfere with other trades, he shall assist in working out space conditions to make satisfactory adjustments.
If required or directed by Engineer, the Contractor shall prepare composite working drawings and sections of not less than 3/4" -1'-0" scale clearly showing how his work is to be installed in conjunction with other trades; he shall make corrections necessary to satisfactorily complete installation at no additional cost to Town.

D. All supports for hanging material to be connected to steel structure shall be installed prior to installation of fire proofing material. Any damage to fireproofing caused by late installation of hanging material shall be repaired by the Fire-proofing Contractor at the expense of the Contractor responsible.

E. The Heating Contractors shall give to the Electrical Contractor all information on switches, controls, pilots, etc. furnished under the Heating Contracts, together with makes and catalog numbers where required to permit the Electrical Contractor to leave the proper boxes to receive same. This information shall be given well in advance so that the Electrical Contractor may install his work as construction progresses. In the event that this information is not given in time to permit the Electrical Contractor to leave proper boxes, etc. as construction progresses, it shall be the responsibility of the Contractor to pay all costs of cutting and patching.

3.6 INFORMATION FOR ELECTRICAL CONTRACTOR:

A. Deliver to the Electrical Contractor all information on motors and controls furnished under the Mechanical Contract, together with makes and catalog numbers, to permit the Electrical Contractor to leave the proper boxes and wiring.

3.7 SLEEVES, INSERTS AND ANCHOR BOLTS:

A. All pipes and conduits passing through floors, walls or partitions shall be provided with sleeves sized to give a minimum of 1/2" clearance between sleeve and the outside diameter of the pipe, conduit or insulation, enclosing the pipe or conduit.

B. Sleeves through concrete floors or interior masonry walls shall be Schedule 40 steel pipe, set flush with finished wall or ceiling surfaces, but extending 2 inches above finished floors or shall be in accordance with details on drawings. In all mechanical equipment rooms sleeves shall extend 6 inches above finished floor.

C. Inserts shall be individual or strip type of steel or malleable iron construction for removable nuts and threaded rods up to 3/4" diameter, permitting lateral adjustment.

3.8 FIRE STOPPING:

A. General

1. Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in fire rated wall and floor assemblies.

B. General Description of The Work

1. Only tested firestop systems shall be used in specific locations as follows:
Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.

C. References

1. Test Requirements: ASTM E-814, "Standard Method of Fire Tests of Through Penetration Fire Stops" (July 1997).
2. Underwriters Laboratories (UL) of Northbrook, IL runs ASTM E-814 under their designation of UL 1479 and publishes the results in their "FIRE RESISTANCE DIRECTORY" that is updated annually.
3. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments
4. Test Requirements: ASTM E 84-96, "Surface burning characteristics".
5. All major building codes: ICBO, SBCCI, BOCA, and IBC.
6. Test Requirements: ASTM E-119, “Fire Test of Building Construction and Materials” (UL 263)

D. Quality Assurance

1. Firestop System installation must meet requirements of ASTM E-119, ASTM E-814, ASTM E-84-96, UL 236, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.
2. Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

E. Submittals

1. Submit Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of UL firestop systems to be used and manufacturer's installation instructions to comply with Section 1300.
2. Submit material safety data sheets provided with product delivered to job-site.

F. Installer Qualifications

1. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacture's products per specified requirements.

G. Products, General

1. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.
2. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.
3. Firestopping Materials are either "cast-in-place" (integral with concrete placement) or "post installed." Provide cast-in-place firestop devices prior to concrete placement.

H. Acceptable Manufacturers

1. Subject to compliance with through penetration firestop systems (XHEZ) and joint systems (XHBN) listed in Volume II of the UL Fire Resistance Directory, provide products of the following manufacturers as identified below:

    a. Hilti, Inc., Tulsa, Oklahoma 800-879-8000
    b. Other manufacturers listed in the U.L. Fire Resistance Directory – Volume 2

I. Materials

1. Use only firestop products that have been UL 1479, ASTM E-814, or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.
2. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.
3. Provide a firestop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction being penetrated.

J. Preparation

1. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

    a. Verify penetrations are properly sized and in suitable condition for application of materials.

b. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may effect proper adhesion.
c. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
d. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
e. Do not proceed until unsatisfactory conditions have been corrected.

K Coordination

1. Coordinate location and proper selection of cast-in-place Firestop Devices with trade responsible for the work. Ensure device is installed before placement of concrete.
2. Responsible trade to provide adequate spacing of field run pipes to allow for installation of cast-in-place firestop devices without interferences.

L. Installation

1. Regulatory Requirements: Install firestop materials in accordance with UL Fire Resistance Directory.
2. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration and construction joint materials.

a. Seal all holes or voids made by penetrations to ensure an air and water resistant seal.
b. Consult with project manager, and damper manufacturer prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
c. Protect materials from damage on surfaces subjected to traffic.

M. Field Quality Control

1. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.
2. Keep areas of work accessible until inspection by applicable code authorities.
3. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.

N. Adjusting and Cleaning

1. Remove equipment, materials and debris, leaving area in undamaged, clean condition.
2. Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

3.9 ACCESSIBILITY:

A. Locate all equipment which must be serviced, operated or maintained in fully accessible positions. Equipment shall include but not be limited to motors, controllers, switchgear, drain points, etc.

B. In the event that any equipment is not installed to permit convenient servicing, disassemble, removal of parts, etc. the Contractor shall, at his own expense, make all corrections necessary to accomplish this.

3.10 LUBRICATION:

A. All equipment having moving parts and requiring lubrication which is installed under this Contract, shall be properly lubricated according to manufacturer's recommendations prior to testing and operation. Any such equipment discovered to have been operated before lubrication is subject to rejection and replacement at no cost to the Town. Units furnished with sealed bearings are accepted.

3.11 TAGS, CHARTS AND NAMEPLATES:

A. Each valve, control, switch, electrical panel, motor and any piece of apparatus installed under these sections shall be properly identified.

B. Each sectional shutoff valve shall have a brass tag with identifying number. Tag shall be secured to valve stem with sufficient length of copper coated jack chain to allow tag to be easily read.

C. All other equipment, including panels and switches, shall be proved with a suitable laminated plastic nameplate fastened with screws or rivets. Small equipment labels may use a pressure sensitive tape.

D. All nameplates and labels shall identify components by proper nomenclature and numbered according to equipment schedule or as designated.

E. Charts shall be furnished in duplicate and shall include the valve identification number, location and purpose. One chart shall be mounted in frame with a clear glass front and secured to wall in location directed.
Second chart shall be for use throughout building and shall be provided with transparent plastic closure for top and attached 8" bead chain for hanging. Holes to be reinforced with brass grommets. Tags and closures as manufactured by Seton Name Plate Corp., New Haven, Conn., or approved equal.

3.12 INSTRUCTIONS:

A. Prepare written instructions frames for the proper maintenance and operation of any special equipment furnished and installed under this Contract.

B. Personally instruct the Town's Custodian or official representative in addition to furnishing all manuals, diagrams, etc. in the proper operation and maintenance of all equipment and piping installed under this Contract.

C. Prepare a portfolio with all tags, operating manuals, parts lists, guarantees, etc. that are packed with all equipment furnished under this Contract and submit same to the Engineer.

3.13 PIPING CODE MARKERS:

A. All service piping which is accessible for maintenance operations shall be identified with vinyl plastic color bands and legends at each branch and riser take-off, at each passage through wall, floor and ceiling, adjacent to each valve and on all pipe runs marked each 20'-0". Pipe markers to conform to A.S.A. Bulletin A-13. Where pipes are too small for legends, brass identification tags 1-1/2" in diameter with depressed 1/2" high black filled letters shall be fastened with chain. Pipe markers and tags as manufactured by the Seton Name Plate Corp., New Haven, Conn., or equal approved.

3.14 CLEANING PIPING, CONDUITS AND EQUIPMENT:

A. Thoroughly clean all piping and equipment of all foreign substances inside and out before being placed in operation.

B. If any part of a system should be stopped by any foreign matter after being placed in operation, the system shall be disconnected, cleaned and reconnected wherever necessary to locate and remove obstructions.
Any work damaged in the course of removing obstructions shall be repaired or replaced when the system is reconnected at no additional cost to the Town.

C. During the course of construction, all pipe and electrical conduits shall be capped in an approved manner to insure adequate protection against the entrance of foreign matter.

3.15 CLEANING UP:

A. After completion of the work, remove all waste, rubbish and other materials left as a result of operations and leave the premises in clean condition.

B. All fixtures, equipment, etc. installed under the Mechanical and Electrical Sections shall be free of dirt, grease and other foreign material and left in perfectly clean condition and ready to use.

3.16 GUARANTEE:

A. All parts of the work and all equipment shall be guaranteed for a period of 18 months from the date of substantial completion.

B. If during that period of general guarantee, any part of the work installed fails, becomes unsatisfactory or does not function properly due to any fault in material or workmanship, whether or not manufactured or job built, each section shall upon notice from the Town, promptly proceed to repair or replace such faulty material or workmanship without expense to the Town, including cutting, patching and painting or any other work involved and including repair or restoration of any damaged sections of the premises resulting from such faults.

C. In the event, that a repetition of any one defect occurs, indicating the probability of further failure, and which can be traced to faulty design, material or workmanship, then repairs or replacement shall not continue to be made but, the fault shall be remedied by a complete replacement of the entire defective unit.

D. In addition to the general guarantee, obtain and transmit to the Town any guarantees or warranties from manufacturers of specialties but only as a supplement to the general guarantee which will not be invalidated by same.

3.17 TOWN'S INSTRUCTIONS AND SYSTEM OPERATION:

A. At the time of the job's acceptance by the Town, Contractor shall furnish maintenance and operating instructions for all equipment including parts list. These instructions shall be written in layman's language and shall be inserted in vinyl covered three-ring loose leaf binder. This information in binder shall be first sent to the approved by the Engineer before turning over to the Town.

B. Upon completion of all work and of all tests, each Division shall furnish the necessary skilled labor and helpers for operating the system and equipment for a period of one (1) day of eight (8) hours, or in two (4) hours separate sessions. During this period, instruct the Town or his representative fully in operation, adjustment and maintenance of all equipment furnished. Give at least forty-eight (48) hours notice to the Town in advance of this period.

3.18 TOWN'S ACCEPTANCE TEST:

A. After the various systems are complete as determined by preliminary operating tests, the Contractor shall arrange for the Town's final acceptance tests.

B. The Contractor shall have present at each acceptance test, representatives of the several Contractors whose work is directly or indirectly involved, with instruments as necessary in accordance with the design and to include the following.

1. All equipment installed and operating in accordance with manufacturer's instructions and performance guarantee.
2. All systems operating in accordance with specifications.
3. All distribution systems properly adjusted for distribution to equipment as specified.
4. The various systems properly flushed, cleaned, and free of entrapped air and dirt.
5. All motors installed with proper thermal overload protection and not operating under overload conditions as determined by ammeter readings.
6. All valve charts, etc. as specified in various parts of the specifications installed or ready for delivery to the Town.

C. The date of the Town's acceptance of the equipment shall be the start of the one year guarantee period.

3.19 TEST:

A. Conducting Tests: Conduct all tests called for under the various sections or as required and repair or replace any defects. Perform all tests in the presence of and to the satisfaction of the Engineer and such other parties as may have legal jurisdiction.

B. Defective Work: The Town shall have the privilege of stopping any of the work not being properly installed. All such defective work shall be repaired or replaced and the tests shall be repeated.

C. Repair Damaged Work: Repair all damages resulting from tests and replace damaged materials.

END OF SECTION 200050

SECTION 220500 COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

B. The General Requirements in Section 200050 shall also govern the work under this section.

1.2 SCOPE OF WORK:

Gas systems
Domestic water systems

A. This contract includes all labor, material, equipment, tests and appliances required to furnish and install all plumbing as shown on drawings, implied and herein specified.

B. The location of the building will be as shown on drawings. A visit to the site and examination of other Mechanical trades showing all details of construction is a requirement before submitting a proposal.

C. The drawings are diagrammatic and indicate the general arrangement of piping and equipment, and do not show all minor details and fittings. Such items shall be included, as well as reasonable modifications, in the layout as directed to prevent conflict with other trades.

D. Connect all equipment shown on drawings. Check all Mechanical drawings and coordinate all the work accordingly.

E. Provide seismic restraints in accordance with Section 230548.

1.3 QUALITY ASSURANCE:

A. Codes and Standards: All work shall comply with the Connecticut State Building Code, BOCA Plumbing Code, and NFPA Standards.

1. 2018 Connecticut State Building Code with all the Amendments.
2. 2015 International Building Code
3. 2015 Life Safety Code- NFPA 101
4. 2015 International Plumbing Code
5. 2015 International Mechanical Code
6. 2015 National Fuel Gas Code-NFPA 54.
7. 2015 International Energy Conservation Code
8. State of Connecticut Public Health Code
8. Current State of Connecticut Public Health Code
9. 2009 Accessible and Usable Buildings and Facilities - ICC/ANSI A117.1
10. Americans with Disabilities Act – ADA

1.4 SUBMITTALS:

A. Shop Drawings: Submit the following shop drawings:

Valves
Pipes, fittings and couplings
Hangers and supports
Gas fired condensing domestic water heater

1.5 PLUMBING SYSTEM DESCRIPTION:

A. Furnish and install all plumbing equipment shown on the drawings and herein specified. All equipment shall be complete and perfect and properly connected to water supply as required and left in complete operation.

B. Before ordering equipment, Contractor shall submit brochures of all equipment and trim to the Engineer for review.

C. Contractor shall include all permit fees and connection charges.

1.6 WATER SERVICE:

A. Refer to drawings for service location. This Contractor shall make closing connection to existing water service. All work shall comply with the Local Water Company requirements.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS:

A. Listed below are references to the specification standards or recognized authorities to which pipe and fitting materials must conform.

B. All reference shall be the current edition as recognized by the active codes. Each pipe length shall have the manufacturer's name cast, stamped or rolled on. Each fitting shall have the manufacturer's symbol and pressure rating cast, stamped or rolled on.

C. Copper Tubing: shall be Type "K" or "L" seamless conforming to ASTM B 88. Cast bronze fittings to conform to ANSI B16.18 and wrought copper fittings to conform to ANSI B16.22.

D. Solder: To be 95% tin, 5% antimony (lead free) conforming to ASTM B-32, grade 5A.

E. Gas Piping:

1. The pipe shall be steel pipe, Schedule 40 complying with the ASTM A 53 Specification for Pipe, Steel, Black and hot–dipped, Zinc–Coated Welded and Seamless. The fittings shall be steel, malleable iron or ductile iron.

2. Gas pipe shall be clear and free from cutting burrs and defects. Any defective pipe or fitting shall be replaced and shall not be repaired.

3. Provide gas valves at all pressure regulators, at each piece of equipment, as shown on drawings and as required by codes. Gas solenoid valve for Kitchen is to be normally closed. Size as indicated on drawings.

4. No branch lines shall be taken from the bottom of horizontal runs.

5. Provide drips at any points in line where condensate may collect.

6. All gas piping shall be graded not less than 1/4" in 15'-0". All horizontal piping shall be graded to risers; provide capped drip at bottom of riser.

7. Provide dirt legs, gas valves, and unions at each equipment connection.

2.2 HANGERS:

A. Securely hang and anchor pipe as shown and required with proper provision for expansion, contraction and elimination of undue stress and strain on piping.

B. Provide a pipe hanger within two (2) feet of each elbow, tee, wye, valve, strainer and similar device.

C. Secure and support runs at base and at sufficiently close intervals to hold pipe at alignment and to carry safely the weight of piping and contents without undue stress thereon.

D. Except as indicated to the contrary, secure and support all horizontal piping as follows and required to prevent sagging, undue pipe movement and preserve proper alignment in each run.

Piping	Size	Maximum Interval
Steel	2" & smaller	Six (6) feet
Steel	2 1/2" & larger	Ten (10) feet
Copper Tubing	1 1/4" & smaller	Five (5) feet
Copper Tubing	1 1/2" & larger	Eight (8) feet

E. Hangers up to and including 2" shall be the adjustable band type equal to Empire. Figure 310 for iron pipe and Fig. 310CT for copper tubing.

F. Hangers for piping 2-1/2" and up shall be the clevis type, equal to Empire. Figure 11 for iron pipe and Figure 110CT for copper tubing.

G. Hangers shall be suspended from one of the following devices:

1. "C" clamps.
2. Trapeze hanger assemblies consisting of back-to-back horizontal steel channels with end-type rod hangers.
3. Expansion shield embedded into concrete or masonry.

H. Provide seismic restraints in accordance with Section 230548.

2.3 INSULATION:

A. Refer to Section 230700.

2.4 VALVES:

A. This Contractor shall furnish and install valves where shown on plans and also wherever necessary to make the system complete in its operation. All valves shall be as manufactured by Stockham, Jamesbury, Appollo, Centerline or Milwaukee as specified.

Hot water and cold water (domestic)

2" and smaller	
Ball valves	Apollo - 71-100/200
Check valves	Stockham B-310-T

2-1/2" and larger	
Butterfly valves	Stockham - LG712-BS3-B (Lug Style)
Check valves	Centerline - CLC - S.S. plates and spring nypalon seats

Furnish all valve materials suitable for service intended.

2.5 BACKFLOW PREVENRTERS:

A. 4" Reduced pressure Zone Assembly: Watts Model 957RPDA with non-rising stem gate valves, UL classified and FM approved. Provide with air gap fitting.

B. ¾", 1", & 2" Reduced pressure Zone Assemblies: Watts Model 909 with ball valves. Provide with air gap fitting.

C 1/2" Reduced pressure Zone Assembly: Watts Model 009 with ball valves valves, UL classified. Provide with air gap fitting.

2.6 GAS FIRED WATER HEATER:

A. The water heater shall be A.O. Smith Cyclone model BTH-199A having an input rating of 199,000 BTU/HR, a recovery capacity of 235 gallons per hour at 100° temperature rise, 97% extra high thermal efficiency and shall be operated on Natural Gas. Water heater shall be ASME rated. Heater shall have modulating gas burner that automatically adjusts the input based on demand, powered anodes that are not sacrificial and maintenance free. Unit shall have a down fired burner designed for precise mixing of air and gas for optimum efficiency, requiring no special calibration on start-up. Water heater shall incorporate the iCOMM system for remote monitoring, leak detection and fault alert. This contractor shall coordinate with the Temperature Control Contractor. Other acceptable manufacturers are Lochinvar, Viessmann or Aerco.

B. The control shall be an integrated solid state temperature and ignition control device with integral diagnostics, LED fault display capability, fault history display and a digital display of temperature settings.

C. The water heater shall be sealed direct vented with 4"PVC intake and exhaust. Unit manufacturer shall provide vent termination kit. Venting for the Water Heater shall be furnished and installed by this Contractor.

D. The water heater tank shall be foam insulated and equipped with ASME rated temperature pressure relief valve. The water heater shall be UL listed.

2.7 RECIRCULATING PUMP:

A. Provide circulating pump in Bell & Gossett Series PR 3/4" x 3/4" x 8 1/2" - 10 gpm at 16' HD 1/6 HP, 1 PH, 115 V. Pump shall be all bronze. Other acceptable manufacturers are Taco or Armstrong.

B. Pump to run continuously and be excluded from energy conservation measures per OSHA Technical Manual Section III, Chapter 7 – Legionnaires' Disease.

2.8 THERMOSTATIC MIXING VALVE:

A. Symmons Tempcontrol Thermostatic water controller shall match existing performance. ASSE Standard 1017 certified and meeting ASSE Standard 1016 anti-scold requirements. Other acceptable manufacturers are Lawler, Leonard or Bradley.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Check all plumbing and electrical drawings to make sure that this piping will not conflict with other work.

B. All piping work shall be installed with provisions to allow for expansion and contraction of lines so as to prevent any undue strains on pipe and fittings, any trapping of lines or lifting or dislocating of any appliances.
Rectify without cost to the Town any conditions of noisy circulation due to trapped or air bound lines, including the expense of cutting and repairing of the building structure incident to making such alterations.

C. Install the work to conform to space conditions and the work of other trades. The drawings indicate generally the runs and the sizes of piping and although the size must not be decreased, nor the drawings deviated from except as unforeseen space conditions may require, the right is reserved to make minor changes in the arrangement of the work to meet the conditions arising during construction.

3.2 TESTS:

A. Furnish all labor and materials for the performance of all tests as required by codes and by the authorized inspectors having jurisdiction.

3.3 COLD WATER PIPING:

A. All water piping shall be run concealed in ceilings and in pipe spaces in ceilings and in finished area.

B. At low points, provide valved drain with hose connection. Arrange piping to pitch to low points or fixtures so that entire system may be drained.

C. Provide ball valves on all branches off main and sectional valves on main. Provide stops at each individual fixture. All valves shall be tagged.

D. All cold water piping shall be Type "L" hard tempered copper tubing with wrought copper sweat fittings or pro-press fittings

E. All exposed un-insulated water piping to individual fixtures in finished rooms shall be chrome plated.

3.4 HOT WATER PIPING:

A. Extend the hot water piping as shown on plans which, in general, will follow the cold water.

B. At low points, provide valved drain with hose connection with vacuum breaker.

C. Pipe shall be copper Type “K” or “L” with wrought copper sweat fittings.

3.5 HOT WATER RECIRCULATING PIPING:

A. Install recirculation from ends of hot water supply back to the recirculating pump properly valved and provide with check valves to prevent back circulation. At recirculating loop connections provide balance valve assemblies on start of each loop.

A. All recirculation lines shall be Type "L" copper tubing hard tempered.

3.6 FUEL GAS PIPING:

A. Pressure Testing

1. The customer piping shall be pressure tested in accordance with the National Fuel Gas Code (NFPA_54), current edition. The test medium shall be nitrogen (N2), carbon dioxide (CO2) or air. The test pressure and duration shall conform to NFPA-54 Section 4.14 and must be approved by the local authority having jurisdiction and the Local Gas Distribution Company (LDC).

B. Purging and Placing Gas Piping into Operation

1. Upon notification and meter being turned on by Local Distribution Gas Company, the house line can be placed in operation. All purging shall be done in accordance with NFPA-54 Section 4.3.2.

    a. The air can be safety displaced with natural gas provided that a moderately rapid and continuous flow of gas is introduced at the meter and air is vented to the outside of the building by means of connecting a rigid pipe or a semi-rigid metallic tubing with appropriate fittings.
    b. The purge piping must be located outside of the building at a safe distance away from fresh air intakes and away from any source of ignition. The end of the purge riser must be equipped with a flash back arrestor. The purge riser must be manned at all times. A fire extinguisher must be placed nearby while purging is in operation. A combustion gas indicator (CGI) can be used to assure the house line is purged properly to 100% gas.
    c. In the event of multi-floor house lines, the longest house line (furthest from the meter) must be purged first, followed by the next longest, until all sections of house lines have been purged to 100% gas.

C. Odorant Level

1. All house lines must be continuously purged until such time that the Odorant level is sufficiently detachable by smell and confirmed with an ordinary level instrument such as Bacharach Model 5110-200, or equivalent.
The instrument shall have a range of to 1.2% gas in air. The line must be purged until a readily detachable Odorant reading of 0.25% or less gas in air is maintained.

    a. As soon as the acceptable level reading is maintained at all purging locations, turnoff the ends of house lines, disconnect the purging tubing, permanently plug all ends and leak test all plugs. Gas utilization equipment can now be purged and placed into operation.
    b. Odorant level readings shall be re-taken periodically to ensure proper level of Odorant is maintained. Odorant level may decay especially in low flow house lines. If this occurs purling procedure must be repeated as needed.

3.7 PIPING JOINTS:

A. Soldered Joints in Copper Tube: Cut the ends of tubes square, remove burrs, clean tube ends and fitting sockets with emery cloth, and remove all particles before applying flux and making the joint. Insert tubes to full socket depth. Use the following solders at the given conditions.

B. All solder joints shall be made up with 95/5 solder.

C. Plumbing Contractor shall be held responsible for any damages caused by water from poorly made joint.

3.8 REAMING OF PIPES:

A. All pipes to be carefully reamed after cutting and threading.

B. All steel pipe lines shall be reamed carefully before they are threaded. They shall be reamed smooth on the inside to give the full area of pipe in all cases.

C. All copper tubing shall be carefully cut square and true, carefully reamed and thoroughly cleaned. The inside of fittings shall be carefully cleaned. All tubing shall be inserted fully to the shoulder of fittings.

3.9 TESTING:

A. All piping testing to be performed in accordance with all applicable Codes including, but not limited to IFC and CT Health Code.

B. All involved parties are to be notified at least two weeks in advance of a scheduled test.

3.10 DISINFECTION:

A. Disinfect new water piping in accordance with AWWA C601.

1. The pipe system shall be flushed with clean, potable water until dirty water does not appear at the points of outlet.
2. The system or part thereof shall be filled with a water/chlorine solution containing at least 50 parts per million (50mg/L) of chlorine, and the system or part thereof shall be valved off and allowed to stand for 24 hours; or the system or part thereof shall be filled with water/chlorine solution containing at least 200 parts per million (200mg/L) of chlorine and allowed to stand for 3 hours.
3. Following the required standing time, the system shall be flushed with clean potable water until the chlorine is purged from the system.
4. The procedure shall be repeated where shown by a bacteriological examination that contamination remains present in the system.
5. After completion take bacteriological samples to provide a record by which the effectiveness of the procedure can be determined.

END OF SECTION 220500

SECTION 230548 VIBRATION & SEISMIC CONTROLS FOR HVAC PIPING & EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The General Provisions of the Contract, including General and Supplementary Conditions and Division 1, General Requirements, apply to the work specified in this Section.

B. The General Requirements in Section 200050 shall also govern the work under this Section.

1.2 SECTION INCLUDES:

A. Vibration isolation and seismic restraints for all mechanical and electrical system including equipment, piping, conduit and ductwork within the building.

B. The work of this section includes but is not limited to the following:

1. Vibration isolation elements.
2. Equipment isolation bases.
3. Piping flexible connections.
4. Seismic restraints for isolated and non-isolated mechanical and electrical items.

1.3 REFERENCES:

A. State of Connecticut Building Code.

B. NFPA 13 - Installation of Sprinkler Systems.

C. SMACNA - Seismic Restraint Manual Guidelines for Mechanical Systems.

D. Mason Industries, Inc. Seismic Restraint Guidelines

1.4 QUALIFICATIONS:

A. Qualifications: Only firms having five years experience designing and manufacturing seismic devices shall be capable of work in this specification.

1.5 SUBMITTALS:

A. Submit under provisions of Section 200050.

B. The submittal material shall include copies of descriptive data for all products and materials including but not limited to the following:

1. Descriptive Data:

a. Catalog cuts and data sheets.
b. An itemized list showing the items to be isolated and/or seismically restrained, product type or model number to be used and loading and deflection data.
c. Seismic restraint calculations.
d. (Structural or civil engineer's State of Connecticut professional engineer's seal verifying design and calculations for seismic restraining system used.)

2. Shop Drawings:

a. Drawings showing equipment base construction for each machine, including dimensions, structural member sizes, and support point locations.
b. Drawings showing methods of suspension, support guides for conduit, piping and ductwork.
c. Drawings showing methods for isolation of conduits, pipes and ductwork penetrating walls and floor slabs.
d. Concrete and steel details for bases including anchor bolt locations.
e. Number location of seismic restraints and anchors for each piece of equipment.
f. Specific details of restraints including anchor bolts for mounting and maximum loading at each location, for each piece of equipment and/or pipe and duct locations.

1.6 GENERAL (MANUFACTURER) RESPONSIBILITIES:

A. Contractor shall have the following responsibilities:

1. Determine vibration isolation and seismic restraint sizes and locations per specifications.
2. Provide and install isolation systems and seismic restraints as scheduled or specified.
3. Guarantee specified isolation system deflection.
4. Provide installation instructions, drawings and field supervision to assure proper installation and performance.
5. Substitution of "Internally Isolated" mechanical equipment in lieu of the specified isolation of this section may be acceptable provided that all specified deflections and stamped seismic calculations are supplied by the equipment manufacturer.

1.7 PROJECT RECORD DOCUMENTS:

A. Submit under provisions of Section 200050.

B. Record actual locations and installation of vibration isolators and seismic restraints including attachment points.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Mason Industries Inc. models listed below.

B. Other approved manufacturers providing equivalent products include:

1. Vibration Eliminator Co. 2. Amber/Booth Co.

2.2 SEISMIC RESTRAINT TYPES:

A. General: Installations shall be designed to safely accept external forces of one-half "G" load in any direction for all rigidly supported equipment without failure and permanent displacement of the equipment. Life safety equipment such as (fire pumps, sprinkler piping and emergency generators) shall be capable of safely accepting external forces up to one "G" load in any direction without permanent displacement of the supported equipment. Seismic restraints shall not short circuit vibration isolation systems or transmit objectionable vibration or noise.

B. Type I (spring mount): Shall comply with general characteristics of spring isolators having a minimum o.d. to o.h. of .8 to 1 and minimum runout of 50% to solid. Shall incorporate snubbing restraint in all directions. Shall be capable of supporting equipment at a fixed elevation during equipment erection. Cast housings shall be ductile iron or aluminum. System to be field bolted or welded to deck with I G acceleration capability. Mason Type SSLFH or as approved.

C. Type II (snubber): Each corner of side shall incorporate a seismic restraint having a minimum 5/8" thick resilient pad limit stops working in all directions. Restraints shall be made of plate, structural members, or square metal tubing concentric within a welded assembly incorporated resilient pads. Angle bumpers are not acceptable. System to be field bolted or welded to a deck with 1 G acceleration capability. Mason Type Z-1011 and Z-1225.

D. Type III (cable braces): Metal cable type with approved end fastening devices to equipment and structure. System to be field bolted to deck or overhead structural members using two sided beam clamps to steel or appropriately designed insert for concrete. All parts of system including cables, clamps, excluding fastenings are to be single vendor furnished to assure seismic compliance. Mason Type SCB.

E. Type IV (neoprene mount): Double deflection neoprene isolator encased in ductile iron or steel casing minimum .30 static deflection. System to be field bolted or welded to deck with 1 G acceleration capacity. Mason Type BR, RBA.

F. Type V: Non-isolated equipment to be field bolted or welded (powder shots not acceptable) to resist seismic forces unless under 100 lb. Shear force required. Mason Type SAS, SAB.

2.3 VIBRATION ISOLATION – GENERAL:

A. Vibration Isolation shall control excessive noise and vibration in the building due to the operation of machinery or equipment, and/or due to interconnected piping, ductwork, or conduit. (The installation of all vibration isolation units, and associated hangers and bases, shall be under the direct supervision of the vibration isolation manufacturer's representative.)

B. All vibration isolators shall have either known non-deflected heights or calibration markings so that, after adjustment, when carrying their load, the deflection can be verified.

C. All isolators shall operate in the linear portion of their load versus deflection curve. Load versus deflection curves shall be furnished by the manufacturer and must be linear over a deflection range of not less than 50% above the design deflection.

D. The theoretical vertical natural frequency for each support point, bases upon load per isolator and isolator stiffness, shall not differ from the design objectives for the equipment as a whole by more than +/- 10%.

E. All neoprene mountings shall have a Shore hardness of 30 to 60 +/- 5, after minimum aging of 20 days or corresponding oven aging.

2.4 VIBRATION ISOLATOR TYPES:

A. Type A: Spring isolators:

1. Minimum diameter of 0.8 of the loaded operating height.

2. Corrosion resistance where exposed to corrosive environment with:

   a. Springs cadmium plated or electro-galvanized.
   b. Hardware cadmium plated.
   c. All other metal parts hot-dip galvanized.

3. Reserve deflection (from loaded to solid height) of 50% of rated deflection.

4. Minimum ¼" thick neoprene acoustical base pad on underside, unless designated otherwise.

5. Designed and installed so that ends of springs remain parallel and all springs installed with adjustment bolts.

6. Non-resonant with equipment forcing frequencies or support structure natural frequencies.

7. Mason Type SLF.

8. When used in conjunction with seismic bracing, seismic restraint Type II shall be installed.

B. Type B: Spring isolators shall be same as Type A, except:

1. Provide built-in vertical limit stops with minimum ¼" clearance under normal operation.

2. Tapped holes in top plate for bolting to equipment when subject to wind load.

3. Capable of supporting equipment at a fixed elevation during equipment erection. Installed and operating heights shall be identical.

4. Adjustable and removable spring pack with separate neoprene pad isolation.

5. Capable of accepting 1 G of acceleration.

6. Mason Type SLR.

C. Type C: Spring hanger rod isolators:

1. Spring element seated on a steel washer within a neoprene cup incorporating a rod isolation bushing.
2. Steel retainer box encasing the spring and neoprene cut.
3. When used in conjunction with seismic bracing, seismic restraint Type III shall be installed.
4. Mason Type HS.

D. Type D: Seismic Restraint, Type IV: Double deflection neoprene isolator encased in ductile iron or steel casing minimum .30 static deflection. System to be field bolted or welded to deck with 1 G acceleration capacity. Mason Type BR, RBA.

E. Type E: Elastomer hanger rod isolators:

1. Molded unit type neoprene element with projecting bushing lining rod clearance hole.
2. Neoprene element to be minimum 1-3/4" thick.
3. Steel retainer box encasing neoprene mounting.
4. Clearance between mounting hanger rod and neoprene bushing shall be minimum of 1/8".
5. Minimum static deflection of 0.35".
6. When used in conjunction with seismic bracing, seismic restraint Type III shall be installed.
7. Mason Type HD.

F. Type F: Combination spring/elastomer hanger rod isolators:

1. Spring and neoprene isolator elements in a steel box retainer. Neoprene double deflection type. Single deflection is unacceptable. Spring seated in a neoprene cup with extended rod bushing.

2. Characteristics of spring and neoprene as described in Type A and Type E isolators.

3. When used in conjunction with seismic bracing, seismic restraint Type III shall be installed.
4. Mason Type DNHS.

G. Type G: Pad type elastomer mountings:

1. ¾" Minimum thickness.
2. 50 PSI maximum loading.
3. Waffled design.
4. Deflection per pad thickness.
5. Galvanized steel plate between multiple layers or pad thickness.
6. Suitable bearing plate to distribute load.
7. Mason Type Super W.

H. Type H: Grommet type elastomer bushings:

1. One piece molded bridge bearing neoprene.
2. Washer / bushing shall surround the anchor bolt.
3. Flat washer face to avoid metal to metal contact.
4. Mason Type HG.

I. Type K: Pipe Anchors: All-directional acoustical pipe anchor consisting of a telescopic arrangement of two sizes of steel tubing separated by a minimum one-half inch thickness of heavy-duty neoprene and duck or neoprene isolation material. Vertical restraints shall be provided by similar material arranged to prevent vertical travel in either direction. Allowable loads on the isolation material travel in either direction. Allowable loads on the isolation material shall not exceed 500 psi and the design shall be balanced for equal resistance in any direction. Isolation to be bolted or welded depending on structure. Mason Type ADA.

2.5 EQUIPMENT BASES:

A. Integral Structural Steel Base, Type B-1:

1. Reinforced as required to prevent base flexure at start-up and misalignment of drive and driven units. Centrifugal fan bases complete with motor slide rails.
2. Drills for drive and driven unit mounting template.
3. Must be utilized with seismic restraint Type I, II, or IV.
4. Mason Type M, WFB.

B. Concrete Inertia Base, Type B-2:

1. Vibration isolator manufacturer shall furnish rectangular structural concrete forms for floating foundation. Bases for split case pumps shall be large enough to provide support for suction and discharge base ells. The base depth shall be a minimum of 1/10 of the longest span but not less than 6" or greater than 14".

   Forms shall include minimum concrete reinforcement consisting of ½" bars or angles in place in 6" centers running ways and a layer 1 ½" above the bottom and a top layer of reinforcing steel as above for all bases exceeding 120" in one direction. Isolators shall be set into pocket housings which are an integral part of the base construction and set at the proper height to maintain a 1" clearance below the base. Bases shall be furnished with templates and anchor bolt sleeves as part of this system.

2. Must be utilized with seismic restraint Type I, II or IV.

3. Mason Type K, BMK.

C. Isolated Curb, Type B-3:

1. Curb mounted rooftop equipment shall be mounted on structural spring isolation curbs that directly sit on roof construction and are flashed and waterproofed into roof's membrane waterproofing system. Manufacturer's curb shall not be used.

2. All spring locations shall have removable waterproof covers to allow for spring adjustment and/or removal. All curbs shall be pitched. Contractor shall coordinate required pitch with the structural.

3. Curbs shall have a provision for an optional sound barrier kit.

4. All spring mounts shall be as Isolator Type A.

5. Curbs shall have static deflection.

6. Curbs shall be rated for 1 G of acceleration and shall be wind restrained for 110 mph wind loads.

7. Curbs shall have California OSHPD approval.

8. Sound barrier package, SBC-3. Two layers of waterproof sheetrock and sound insulating material shall be supplied and installed by this contractor.

9. Curbs to be welded to building steel or bolted to concrete decks to attain acceleration criteria.

10. Mason Type RSC.

D. Roof Isolation Rail System, Type B-4: Rooftop fans, condensing units, exterior ducted air handling units, etc., shall be installed on continuous equipment support piers which shall combine a regular equipment support and an isolation system into one assembly. The system shall be designed with 2" or 3" static deflection steel springs which are both adjustable, removable, and interchangeable after equipment has been installed. The system shall maintain the same operating and installed height both with and without the equipment load and shall be fully restrained during wind load conditions allowing no more than ¼" motion in any direction. The isolation pier shall be designed to accept the membrane waterproofing. The entire assembly shall be cold spray galvanized or plastic coated.

System design permits minimum 1 G of acceleration. Curbs to be welded to building steel or bolted to concrete decks to attain acceleration criteria. Mason Industries Model RSR.

E. Non-isolated seismic roof curbs, Type B-5:

1. Curb sections shall be either structural steel channels or 12GA. sheet metal.
2. Field assembled joints shall include a minimum of 2 rows of three bolts at each connection.
3. Curb to have a factory installed wood nailer.
4. System to be bolted or welded to deck.
5. System shall be designed for minimum 1/2G. of acceleration.
6. Mason Type RRC.

F. Dunnage steel mounted rooftop equipment. Type B-6:

1. Rooftop equipment shall be mounted on structural tubular steel boxed rail assembly.
2. Tubular steel rails shall be attached to seismic rated spring vibration isolators.
3. Isolators shall be bolted or welded to dunnage steel to meet seismic criteria of 1/2G acceleration.
4. Entire assembly shall be hot dipped galvanized.

5. Mason Type RSLR.

2.6 FLEXIBLE CONNECTORS:

A. Elastomer Type FC-1:

1. Manufactured of Kevlar reinforcement and EPDM, both molded and cured with hydraulic presses.
2. Straight connectors to have two spheres reinforced with a molded-in external ductile iron ring between spheres.
3. Elbows shall be long radius type.
4. Rated 250 psi at 170 degrees F. Dropping in a straight line to 170 psi at 250 degrees F for sizes 1-1/2" to 12" elbows. Elbows shall be rated no less than 90% of straight connections.
5. Sizes 10" to 12" to employ control cables with neoprene end fittings isolation from anchor plates by means of ½" bridge bearing neoprene bushings.
6. Minimum safety factor, 4:1 at maximum pressure ratings.
7. Systems bolted to victaulic type couplings or gate, butterfly, or check valves to have a minimum 5/8" flange spacer installed between conductor and coupling on flange.
8. Submittals to include test reports.
9. Mason Type Safeflex SFDEJ.

B. Flexible Stainless Hose, Type FC-2:

1. Type 321 stainless steel braided flexible metal hose.
2. 2" pipe size and smaller: threaded carbon steel fittings.
3. 1 ½" pipe size and larger: Class 150 carbon steel flanges.
4. Suitable for operating pressure with 4:1 minimum safety factor.
5. Flexible Metal Hose Company type DFC and MFC.

C. Unbraided Exhaust Hose, Type FC-3:

1. Low pressure stainless steel annularly corrugated.
2. Fitted with flanged ends.
3. Maximum temperature 1,500 degrees F.
4. Mason Type SDL-RF.

D. 60 Degree VEE assembly:

1. Type 304 stainless steel hose and braid.
2. 4" motion in all directions.
3. ASA 150 carbon steel flanges.

PART 3 - EXECUTION

3.1 GENERAL SEISMIC RESTRAINT REQUIREMENTS:

A. Install seismic restraints in accordance with manufacturers recommendations.

B. Seismic restraining system Type III: Install taut for non-isolated equipment and slack with ½" cable deflection for isolated systems.

C. Seismically restrain all piping, conduit and ductwork with Type III or Type V seismic restraint in accordance with guidelines outlined below. Restraints which are to be used in conjunction with vibration isolators shall be Type III.

1. Carbon steel piping shall be braced at maximum 40' intervals and at turns of more than 4'. Lateral bracing at maximum 80' intervals. No-hub piping to be braced at maximum 20' intervals or maximum 40' using ½ G acceleration rated couplings.
2. Ductwork shall be braced at maximum 30' and at every turn and duct run end. Lateral bracing at maximum 60'.

D. Equipment mounted on housekeeping pads: Pads shall be properly doweled or expansion shielded to deck to meet acceleration criteria. Mason Type HPA.

E. Seismic Restraints are not required for the following:

1. Piping in mechanical rooms or penthouses less than 1-1/4" O.D, except fire protection piping.
2. Piping in other areas less than 2-1/2" O.D. except fire protection piping.
3. Ducts which have a cross sectional area less than 6 square feet.
4. All piping suspended by individual hanger 12" or less in length from the top of the pipe to the bottom of the support for the hanger, except fire protection piping.
5. Fire protection feed mains and cross mains suspended by individual hangers 6" or less in length from the top of the pipe to the bottom of the support for the hanger.
6. All top supported ducts suspended by hangers 12" or less in length from the top of the duct to the bottom of the support for the hanger.
7. Electrical conduit less than 1-1/2" I.D.

F. For overhead supported equipment, over stress of the building structure must not occur. Bracing can occur from:

1. Flanges to structural beams.
2. Upper or lower truss chords in bar joist construction at panel points.
3. Cast-in-place inserts or drilled and shielded inserts in concrete structures.

G. Building seismic and expansion joints: Install hinged joints at piping crossing expansion and seismic joints and anchor the piping either side.

Anchors on each end are to be capable of accepting 1.5 times the operating pressure multiplied by the projected area of the pipe.
Fittings shall be able to compensate for 4"motions in all directions.

1. Offset shall be accomplished by the annular motion of a double sphere connector (TYPE FC-1) bolted to each end of an intermediate steel pipe. Bracket each joint with hinged steel connections. Hinge shall have a pin / slot assembly on both sides. The completed assembly shall be Mason Type Safeflex SFDEJ-HE.

3.2 GENERAL VIBRATION ISOLATION REQUIREMENTS:

A. Install isolators in accordance with manufacturer's recommendations. Vibration isolators shall not cause any change of position resulting in stresses or misalignment.

B. Mechanical equipment shall be isolated from the building structure by means of noise and vibration isolators.

C. Each fan and motor assembly shall be supported on a single structural steel frame (where noted on the isolation and seismic schedule). Flexible duct connections shall be provided at inlet and discharge ducts.

D. Provide pairs of horizontal limit springs (Thrust restraints) on fans with more than 6.0 inch static pressure, and on hanger supported, horizontally mounted axial fans where indicated

E. Provide resiliently mounted equipment, piping, and ductwork with seismic snubbers. Each inertia base shall have minimum of four seismic snubbers located close to isolators. Snub equipment designated for post disaster use to 0.05 inch (1.5 mm) maximum clearance. Other snubbers shall have clearance between 0.15 inch (4 mm) and 0.25 inch (7mm).]

F. Ductwork connected to rotating equipment shall be supported with Type C or Type F isolators for the first three support points.

G. Installation of piping vibration isolators:

1. All piping, except fire protection standpipe systems, is included under this section.

2. Vibration isolators shall be installed on all piping outside the shafts as follows:

a. Piping in mechanical rooms.
b. Piping where exposed on roof.
c. Piping connected to rotating equipment and pressure reducing stations.

3. Horizontal suspended pipe 2" and smaller and all steam piping shall be suspended by Type E isolator with a minimum 3/8" deflection. Water pipe larger than 2" shall be supported by Type C or Type F isolator with minimum 1" whichever is greater.

4. Horizontal pipe floor supported at slab shall be supported via Type A with a minimum static deflection of 1" or same deflection as isolated equipment to which pipe connects, whichever is greater.

5. Vertical riser pipe supports under 2" diameter shall utilize Type G isolation pads.
6. Vertical riser guides, if required, shall avoid direct contact of piping with building.

7. Pipe anchors or guides, where required, shall utilize resilient pipe anchors, Mason Industries Type ADA, or equivalent, to avoid direct contact of piping with building.

8. Isolated piping which requires sway bracing shall utilize two neoprene elements, Type G to accommodate tension and compression forces.

9. Pipe extension and alignment connectors: Provide connectors at riser takeoffs, cooling and heating coils, and elsewhere as required, to accommodate thermal expansion and misalignment.

H. Pipe Isolation Schedule

PIPE SIZE - INCH (MM)	ISOLATED DISTANCE FROM EQUIPMENT
1 (25)	120 diameters (3.0m)
2 (50)	90 diameters (4.5m)
3 (80)	80 diameters (6.0m)
4 (100)	75 diameters (7.5m)
6 (150)	60 diameters (9.0m)
8 (200)	60 diameters (12.0m)
10 (250)	54 diameters (13.5m)
12 (300)	50 diameters (15.0m)
16 (400)	45 diameters (18.0m)
24 (600)	38 diameters (23.0m)

3.3 EQUIPMENT INSTALLATION:

A. Requirements for installation on concrete inertia bases shall be as follows:

1. Minimum operating clearance between concrete inertia and base and housekeeping pad or floor shall be 1".
2. The equipment structural steel or concrete inertia base shall be placed in position and supported temporarily by blocks or shims, as appropriate, prior to the installation of the machine or isolators.
3. The isolators shall be installed without raising the machine and frame assembly.

4. After the entire installation is complete and under full operational load, the isolators shall be adjusted so that the load is transferred from the blocks to the isolators. When all isolators are properly adjusted, the blocks or shims shall be barely free and shall be removed.
5. Install equipment with flexibility in wiring connection.
6. Verify that all installed isolator and mounting systems permit equipment motion in all directions. Adjust or provide additional resilient restraints to flexibly limit start-up equipment lateral motion to ¼".
7. Prior to start-up, clean out all foreign matter between bases and equipment. Verify that there are no isolation short circuits in the base, isolators, or seismic restraints.

3.4 INSPECTION:

A. Upon completion of the installation of all vibration isolation, flexible connections and seismic restraints, the manufacturer's local representative shall visit the project job site, visibly inspect all installations and report, in writing, any and all deficiencies from the specifications. Any additional corrective measures required to put the system in total compliance shall be the responsibility of the installing contractor.

END OF SECTION 230548

SECTION 230593 TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

B. The General Requirements in Section 200050 shall also govern the work under this Section.

C. Examine all drawings and data and coordinate the work of this Section with all related and adjoining work.

1.2 SCOPE OF WORK:

A. Provide all labor, materials, equipment and tools required to complete the work described and shown on the contract drawings.

PART 2 -PRODUCTS

2.1 PRODUCTS:

A. None required.

PART 3 - EXECUTION

3.1 GENERAL:

A. Work shall be performed only by a firm which employs certified testing, adjusting and balancing technicians as listed by the Sheet Metal Industry National Certification Board of TAB Technicians. The work may be performed by a certified Test, Adjusting and Balancing technician who may be assisted by other TAB technicians. This firm shall provide personnel trained and experienced in system balancing. This requirement will not be waived under any condition.

B. Before submitting system performance data for approval or acceptance, the firm shall perform all necessary tests and make all necessary adjustments as required to obtain the flow as called for on the Contract Documents.

C. The balance reports shall include the names, signatures and registration numbers of the technicians assigned to the project. Submit reports prior to final payment.

3.2 ACCEPTABLE FIRMS:

A. The following listed firms are approved to perform this work:

Environmental Testing and Balance
James Brennan Company
Wing's Testing and Balancing

RK Wing Company
Technical Associates Group, Inc.

B. Request to employ any other balancing and testing firm must be accompanied by a complete brochure of the firm listing previous installations successfully balanced, length of time in business, names and qualifications of employees and list of instruments available for use on the project.

3.3 HYDRONIC SYSTEMS:

A. Prior to the start of balancing, the firm shall check the rotation of all pumps.

B. The firm shall compile the following data for each pump insofar as they apply and shall include it on the final submittal:

PUMP DESCRIPTIVE DATA

Pump Number
System Served
Pump Size
Pump Make
Pump Horsepower
Motor Safety Factor
Motor Manufacturer & Size
Voltage & Phase

PUMP DESIGN & DELIVERED CONDITIONS

Pump Rpm
Pump Inlet & Outlet Pressure
Amperage
Brake Horsepower
Gpm Supply

SYSTEM DESIGN & DELIVERED CONDITIONS

Flow (Gpm) through each pump
Inlet & Outlet temperature at 3-way valve
Flow (Gpm) through each coil
Inlet & Outlet Pressure at each coil
Inlet & Outlet temperature at each coil
Type of instrument and method used

3.4 INSTALLATION TOLERANCES:

A. Adjust heating system to the following tolerances:

1. Supply water temperature 80 degree F to 120 deg. F 0% to +10% of design value.

2. Supply water temperature 120 degree F to 160 deg. F -5% to +10% of design value.

3. Supply water temperature above 160 degree F -10% to +10% of design value.

3.5 FIELD VERIFICATION:

A. The design Engineer may request verification of data contained in the balancing report. If requested the TAB technician whose initials appear on the data sheets shall take outlet and inlet readings selected at random by the Engineer who will compare these readings to those in the submitted report. If the field verification is not satisfactory, the firm doing the TAB work shall completely rebalance the system and a new report shall be prepared and submitted for approval.

END OF SECTION 230593

SECTION 230700 INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The General Provisions of the Contract, including General and Supplementary Conditions and Division 1, General requirements, apply to the work specified in this Section.

B. The General Requirements in Section 200050 shall also govern the work under this Section.

C. Scope of Work: This Section contains details for the insulation of pipe, ductwork and equipment installed under Division 22 and 23.

1.2 SUBMITTALS:

A. In accordance with Section 200050, the following items shall be submitted for approval.

Piping insulation
Fitting insulation
Equipment insulation

1.3 MECHANICAL SYSTEMS INSULATION:

A. Furnish and install all thermal and protective insulation as specified herein for piping, and equipment as shown on the drawings.

B. The following mechanical items shall be insulated:
Domestic Hot, Cold, Recirculated Hot
Piping - hot and cold
Fittings - Valve bodies, Victaulic couplings, elbows, tees, etc.
Equipment insulation

1.4 SYSTEM PERFORMANCE

A. Insulation materials furnished and installed hereunder should meet the minimum thickness requirements of ASHRAE 90.1 (2001), "Energy Efficient Design of New Buildings," of the American Society of Heating, Refrigeration, and Air Conditioning Engineers. However, if other factors such as condensation control or personnel protection are to be considered, the selection of the thickness of insulation should satisfy the controlling factor.

B. Insulation materials furnished and installed hereunder shall comply with NFPA 255 and shall have a maximum flame spread index of 25 and a maximum smoke developed index of 50 when tested in accordance with the following testing standard:

Underwriters' Laboratories, Inc. UL 723
Adhesives used for applying the sealed jackets shall also conform to these same ratings. The use of wheat paste or any other material not meeting these requirements will not be allowed.

1.5 QUALITY ASSURANCE

A. Insulation materials and accessories furnished and installed hereunder shall, where required, be accompanied by manufacturers' current submittal or data sheets showing compliance with applicable specifications.

B. Insulation materials and accessories shall be installed in a workmanlike manner by skilled and experienced workers who are regularly engaged in commercial insulation work.

C. All covering and insulating materials shall be manufactured by Owens-Corning, Knauf, Johns Manville or Armstrong.

1.6 SEAMS:

A. On exposed insulation, all longitudinal seams shall be kept at the top and back of the pipe and circumferential joints shall be kept to a minimum. Raw end of insulation shall be concealed by neatly folding the ends of the jackets. Fittings, valve bodies and flanges shall be furnished with the same jacket materials used on adjoining insulation.

1.7 PRIOR TESTING:

A. Covering shall not be applied until all parts of the work have been tested by the Contractor and reviewed by the Engineer.

1.8 VAPOR BARRIER:

A. Vapor barrier shall be applied in accordance with the manufacturer's instructions to maintain the integrity of the vapor barrier on cold systems.

B. An approved vapor retarder mastic compatible with PVC must be applied between pipe insulation and fitting cover, and on fitting cover and throat overlap seam.

C. For fittings where operating temperature is below 45 deg. For where pipe insulation thickness is greater than 1 ½", two or more layers of Hi-Lo temp insulation inserts shall be installed beneath fitting cover.

1.9 METAL SHIELDS:

A. Metal shields, 16 gauge galvanized, shall be applied between hangers or supports and the pipe insulation. Shields shall be roll formed to fit the insulation and shall extend up to the center line of the pipe and the length specified for the insert. Insulation shall be rigid type for length of shield to prevent crushing.

1.10 DELIVERY AND STORAGE OF MATERIALS

A. All of the insulation materials and accessories covered by this specification shall be delivered to the job site and stored in a safe, dry place with appropriate labels and/or other product identification.

B. The contractor shall use whatever means are necessary to protect the insulation materials and accessories (wick material, sealing tape, etc) before, during, and after installation. No insulation material shall be installed that has become damaged in any way. The contractor shall also use all means necessary to protect work and materials installed by other trades.

PART 2 - PRODUCTS

2.1 PIPING:

A. Insulate all domestic hot water, recirculating hot water lines and supply and return hot water heating lines in the Boiler Room, with Owens-Corning Fiberglass ASJ with S.S.L. II, pipe insulation with double self-sealing lap having a factory applied jacket. All horizontal and vertical insulated piping located below 8'-0" AFF level and not protected with enclosures shall be protected with Zeston 2000 P.V.C. 30 Mil jacketing. All horizontal and vertical insulated pipes located in the Boiler Room shall be protected with color coded Zeston 300 Series 30 Mil jacket. Acceptable equals are by SpeedLine or Proto.

B. All piping shall be covered as follows: Apply insulation to clean dry pipe with side and end joints butted tightly. Seal lap of jacket and butt joint strips with Benjamin Foster 82-07 vapor barrier lap adhesive.

Insulate fittings, flanges and valves of piping with mitered pipe insulation, or F/G premolded fittings made smooth with insulating cement and jacket with glass cloth saturated with Benjamin Foster 30-60 lagging adhesive. Vinyl or plastic fitting jackets will be allowed.

C. Insulate domestic cold water, in the same as for hot piping above except vapor seal all joints, seams, elbows and fittings.

D. Foam insulation:

1. Piping and Fittings. MicroLok plain pipe insulation shall be wired or taped in place over clean, dry pipe with all joints butted firmly together. Vapor retarder shall be Micro-Lok AP-T plus.
2. The insulation shall be finished with metal jacketing with a laminated moisture retarder. Metal jacketing shall be overlapped 2 to 3 inches (51 to 76 mm) and held in place with sheet metal screws or metal bands.
3. Elbows and tees shall be finished with matching metal fitting covers. Other fittings in metal-jacketed systems shall be finished with conventional weather-resistant insulating materials with painted aluminum finish.

E. Provide minimum insulation thickness in accordance with the following table.
Minimum Pipe Insulation

Piping System Types	Fluid Temp. Range	Runouts 2 in +	1 in. and less	1-1/4 to 2 in.	2-1/2 to 4 in.	5 and Larger
	F	in.	in.	in.	in.	in.
Heating Systems						
Low Temp	120-200	0.5	1.0	1.0	1.5	1.5
Plumbing Systems						
Hot & Recic. Hot Water	100-200	1.0	1.0	1.0	1.5	1.5
Cold Water	Below 70	0.5	1.0	1.5	1.5	1.5

2.2 FITTING COVERS:

A. Fitting covers may be used in lieu of insulating cement and jacket. Provide fitting covers in Zeston - 2000 P.V.C. (20 Mil thickness) by Johns Manville. Provide color coded fitting covers in Zeston 300 Series 30 Mil jacket for fittings located in the Boiler Rooms. Acceptable substitutions are by SpeedLine or Proto.

B. General - The matching insert (fiberglass) should either be wrapped completely around the fitting or snugly positioned inside the fitting for proper fit. The insert shall cover the full inner surface area of the fitting cover. The fitting cover is then to be applied over the fitting and insert, and the throat secured by either tack fastening, taping, or banding.

C. Cold Pipe - Fitting systems below ambient temperature must have a continuous vapor barrier, either with pressure sensitive PVC Tape, or an approved adhesive system. When PVC Tape is used, a 2" downward lap is required. On cold lines in severe ambient temperatures, the fiberglass insert shall be the same thickness as the adjacent pipe insulation. All joints shall then be sealed with PVC Tape.

D. Hot Pipe - For hot piping which requires pipe insulation over 1-1/2" wall, an extra inch of wall thickness in the pipe insulation shall be applied. If the surface temperature of insulation exceeds 155 degrees F. fitting covers should not be used. The throat seam shall be riveted or tacked on hot piping.

2.3 DUCTWORK:

A. Insulate all plenums, intake ducts, air conditioning ducts and warm air supply ducts in concealed locations with 1" thick fiberglass faced duct wrap type IV with factory applied flame retardant foil reinforced Kraft (FRK-25 U.L. labeled). Exhaust duct in the locker

rooms shall be insulated the same as the supply ducts (including steam and sauna rooms exhaust ducts).

B. Insulation shall be wrapped tightly on the ductwork with all circumferential joints butted and longitudinal joints overlapped a minimum 2". Adhere insulation with 4" strips of Benjamin Foster 85-15 bonding adhesive at 8" o.c.

Additionally secure insulation to the bottom of concealed rectangular ductwork over 24" wide with suitable mechanical fasteners at not more than 18" o.c.

C. On circumferential joints, the 2" flame on the facing shall be stapled with 9/16" flare-door staples on 6" centers and taped with minimum 3" wide foil reinforced Kraft tape. On longitudinal joints, the overlap shall be stapled on 6" centers and taped with minimum 3" wide foil reinforced Kraft tape. All pin penetrations or punctures in facing shall also be taped.

D. Insulate air conditioning ducts or warm air ducts, all fresh air intake ducts, louver blanks, plenums in finished spaces, Boiler Room or Mechanical Equipment Rooms, with 1" thick fiberglass ASJ-25 equipment insulation.

E. Insulation shall be cut to fit the shape and contour of the equipment. All voids between equipment surface and insulation shall be packed with light density fiberglass. Impale insulation over welded pins on 12" centers and secure in place with speed washers.

F. The insulation shall be vapor sealed to provide a complete airtight envelope. Vapor barrier shall consist of one layer of Ludlow Foil Barrier Paper smoothly adhered to the insulation or cement surface with Benjamin Foster 82-07 Vapor Barrier Lap Adhesive.

Lap all joints a minimum of 3" and seal with B.F. 82-07.

G. It is not necessary to cover exhaust ductwork, return duct or ductwork which is called for to be lined. However, exhaust ductwork from motorized damper to exhaust louver shall be covered as called for above, or exhaust ductwork located on cold side of building insulation shall be covered as called for above.

H. Supply ducts located in vented/unvented attic shall be insulated with duct insulation with min. R-8 value. Return ducts and exhaust ducts associated with energy recovery systems located in vented/unvented attics shall be insulated with R-3.5 insulation.

2.6 HIGH TEMPERATURE INSULATION:

A. Insulate grease ducts and other hot equipment not factory insulated with O.C.F. pink calcium silicate block 1 1/2" thick.

B. Insulation shall be cut or mitered and banded in place with 3/4" 0.015" thick galvanized steel bands on 18" centers. Point up all joints with insulating cement. Cover insulation with 1" galvanized hexagonal wire mesh secured to bands or weld pins. Lace edges of wire mesh. Install corner beads at all 90 degree corners. Apply 1/2" thickness of insulating cement in two coats. Over cement, when dry, apply presized glass cloth with Benjamin Foster 30-36 lagging adhesive.

C. Thermal Ceramics FireMaster FastWrap+, 2000DegreeF rated, passive, low Biopersistant fiber, single layer, 2" thick, totally encapsulated on all sides with aluminum foil to provide a grease, water and condensation vapor. All exposed edges should also be sealed to prevent grease and moisture wicking. FireMaster FastWrap+ to provide 2 Hours protection for commercial kitchen grease ducts, 1 or 2 Hours air ventilation ducts, and chemical exhaust ducts in lieu of a shaft per Omega Point Laboratories Listings GD 513F, GD 514F, (Grease Ducts), VAD 516F, (Air Ducts), FS 548F, FS 549F, (Fire Stop), SBCCI 9424D, or BOCA 21.51. Thermal Ceramics FireMaster FastWrap+ to be applied directly to the duct as tested per manufacturer's (Thermal Ceramics) instructions by a qualified installer and can be installed at zero clearance to combustibles at the overlaps.

PART 3 – EXECUTION

3.1 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 manufacturer's 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.

3.2 PREPARATION

A. Ensure that insulation is clean, dry, and in good mechanical condition and that all factory-applied facings are intact and undamaged. Wet, dirty, or damaged insulation is not acceptable for installation.

B. Ensure that pressure testing of piping and fittings has been completed prior to installing insulation.

3.3 INSTALLATION

A. General

1. 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.

2. Install insulation on piping subsequent to painting, and acceptance tests.

3. 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.

B. Fittings

1. Wrap valves, fittings, and similar items in each piping system with wicking material to ensure a continuous path (100% coverage) for the removal of condensation.

2. Cover valves, fittings, and similar items in each piping system using one of the following:

   a. Mitered sections of insulation equivalent in thickness and composition to that installed on straight pipe runs.

   b. PVC Fitting Covers insulated with material equal in thickness and composition to adjoining insulation.

3. Seal all fitting joints with contractor supplied VaporWick Sealing Tape or approved vapor retarder mastic compound.

C. Penetrations

Extend piping insulation without interruption through walls, floors and similar piping penetrations.

3.4 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.

3.5 PROTECTION

A. Replace damaged, removed or disturbed insulation with appropriate fiberglass 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.

3.6 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 job site 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.

END OF SECTION 230700

SECTION 230913 INSTRUMENTATION AND CONTROLS FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

B. The General Requirements in Sections 200050 shall also govern the work under this Section.

C. Examine all drawings and data and coordinate the work of the Section with all related and adjoining work.

1.2 GENERAL REQUIREMENTS

A. The Automatic Temperature Control Contractor shall furnish all material, engineering, and labor for the proper installation of a totally native BACnet-based system, based on a distributed control system in accordance with this specification. All building controllers, application, controllers, and all input/output devices shall communicate using the protocols and network standards as defined by ANSI/ASHRAE Standard135-2001, BACnet. In other works, all workstations and controllers, including unitary controllers, shall be native BACnet devices. No gateways shall be used for communication to controllers installed under this section. New system shall communicate with the EMS installed in the building at the present time.

B. Provide all necessary BACnet-compliant hardware and software to meet the system's functional specifications. Provide an open communications system. System shall be capable of utilizing standard protocols as follows as well as be able to integrate third-party systems via existing vendor protocols. Systems shall be BACnet communication according to ASHRAE Standard DPC 135A/95.

C. The intent of this specification is to provide a Building Automation System to control the system as defined for the project and to allow all objects (objects as defined in ASHRAE Standard SPC-135A/95) to be sent to the existing Alerton BACtalk system school server.

D. The control system shall be as manufactured by:

1. Alerton Technology Inc.

E. Prepare individual hardware layouts, interconnection drawings, and software configuration from project design data.

F. Implement the detailed design for all analog and binary objects, system databases, graphic displays, logs, and management reports based on control

descriptions, logic drawings, configuration data, and bid documents.

G. Design, provide, and install all equipment cabinets, panels, data communication network cables needed, and all associated hardware.

H. Provide and install all interconnecting cables between supplied cabinets, application controllers, and input/output devices.

I. Provide and install all interconnecting cables between all operator's terminals and peripheral devices (such as printers, etc.) supplied under this section.

J. Provide complete manufacturer's specifications for all items that are supplied. Include vendor name of every item supplied.

K. Provide supervisory specialists and technicians at the job site to assist in all phases of system installation, startup, and commissioning.

L. Provide a comprehensive operator and technician training program as described herein. Provide as-built documentation, operator's terminal software, diagrams, and all other associated project operational documentation (such as technical manuals) on approved media, the sum total of which accurately represents the final system.

M. The latest edition of the following standards and codes in effect and amended as of supplier's proposal date, and any applicable subsections there of, shall govern design and selection of equipment and material supplied:

1. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).
2. ANSI/ASHRAE Standard 135-2001, BACnet.
3. Uniform Building Code (UBC), including local amendments.
4. UL 916 Underwriters Laboratories Standard for Energy Management Equipment. Canada and the US.
5. National Electrical Code (NEC).
6. FCC Part 15, Subpart J, Class A

1.3 SCOPE

Provide all necessary BACnet compliant hardware and software to meet the system's functional specifications. The control system operating software and hardware shall be fully interoperable and interfaced with the existing Town Wide Alerton BACtalk Integrator Global Controller. The new control system shall connect to the Head End located at the Glastonbury High School and at the same time, it shall provide the capability for on site control. Provide full color graphics. Control shall be furnished for the following:

Hot water system control
Unit heater/cabinet unit heater control

1.4 CONTROL WIRING

All Direct Digital Control wiring will be installed and terminated by the Temperature Control Contractor. Control wiring shall be defined as follows:

All wiring of electric/electronic/DDC temperature controls as shown on the drawings.

All temperature control panel wiring to terminal strips and field wiring from terminal strips to field mounted devices.

All wiring to the "Auto" side of the hand-off-auto switches on the units being controlled by the Temperature Control Contractor.

All wiring shall comply with National, State, and Local electrical codes.

1.5 POWER WIRING

All power wiring will be installed and terminated by the Electrical Contractor. Power wiring shall be defined as follows:

Wiring of all devices and circuits carrying voltages greater than 120 V.
Wiring of power feeds to all disconnects starters, and electric motors.
Wiring of 120VAC power feeds to all temperature control panels.
Power wiring to 120 V single phase motors.

1.6 WORK UNDER OTHER SECTIONS

The following work shall be preformed by the designated Contractor under the supervision of the Temperature Control Contractor.
The Heating, Ventilating, and Air Conditioning Contractor shall:
Install all water flow monitoring valves and separable wells furnished by the Temperature Control Contractor.
Furnish and install all necessary piping connections required for flow indication devices.
Furnish and install all necessary valve pressure taps and water drain and overflow connections and piping.
Provide, on magnetic starters furnished, all necessary auxiliary contacts with buttons and switches in the required configurations.

The Electrical Contractor shall:
Be responsible for the work as outlined under power wiring.

The Sheet Metal Contractor shall:
Install all control dampers.

1.7 MATERIALS

All materials and equipment used shall be standard components, regularly manufactured for this and/or other systems, and shall not be custom designed especially for this project. All components shall have been thoroughly tested and proven in actual use.

The control system shall be manufactured by Alerton Technologies, Inc.

1.8 SUBMITTALS AND DRAWINGS

Electronic submittals of the following shall be submitted for approval prior to the system installation.
Control drawings with detailed wiring diagrams, including bill of material and description of operation for all systems.
Panel layouts.
Valve Schedules showing size, configuration, capacity, and location.
Data sheets for all control system components.
Upon completion of these installation and final system adjustments, the Control Contractor shall provide three (3) full sets of as-built drawings of the installation.

PART 2 - PRODUCTS

2.1 BUILDING CONTROLLER

A. General

1. Building controller shall incorporate as a minimum, the functions of a 3-way BACnet router. Controller shall route BACnet messages between the high-speed LAN (Ethernet 10/100MHz), at least 4 master slave token passing (MS/TP) LANs, a point-to-point (PTP – RS-232) connection and an on-board modem.
   a. Each MS/TP LAN must be software configurable from 9.6 to 76.8Kbps.
   b. The RJ-45 Ethernet connection must accept either 10Base-T or 100Base-TX BACnet over twisted pair cable (UTP).
   c. The direct access port must be a female DB-9 connector supporting BACnet temporary PTP connection of a portable BACnet operator terminal at 9.6 to 115.2 Kbps over RS-232 null modem cable.
2. Building controller shall be capable of providing global control strategies for the system based on information from any objects in the system regardless if the object is directly monitored by the controller or by another controller. The program that implements these strategies shall be completely flexible and user definable. Any systems utilizing factory pre-programmed global strategies that cannot be modified by field personnel on-site or downloaded via remote communications are not acceptable. Changing global strategies via firmware changes is also unacceptable.
3. Programming shall be object-oriented using control function blocks, supporting DDC functions, 1000 Analog Values and 1000 Binary Values. All flowcharts shall be generated and automatically downloaded to controller. Programming tool shall be resident on workstation and the same tool used for all controllers.

4. Provide means to graphically view inputs and outputs to each program block in real-time as program is executing. This function may be performed via the operator's workstation or field computer.

5. Building controller shall provide battery-backed real-time (hardware) clock functions.

6. Controller shall have a memory needed to ensure high performance and data reliability. Battery shall retain static RAM memory and real-time clock functions for a minimum of 1.5 years (cumulative).

7. Global control algorithms and automated control functions should execute via 32-bit processor.

8. Controller installation shall include memory-free gel-cell battery providing ongoing power conditioning and noise filtering for operation data integrity. It shall provide up to 5 minutes of powerless operation for orderly shutdown and data backup.

B. BACnet Conformance

1. Building Controller shall as a minimum support Point-to-Point (PTP), MS/TP and Ethernet BACnet LAN types. It shall communicate directly via these BACnet LANs as a native BACnet device and shall support simultaneous routing functions between all supported LAN types. Global controller shall be a BACnet conformance class 3 device and support all BACnet services necessary to provide the following BACnet functional groups:

   a. Clock Functional Group

   b. Files Functional Group

   c. Reinitialize Functional Group

   d. Device Communications Functional Group

   e. Event Initiation Functional Group

2. Please refer to section 22.2, BACnet Functional Groups, in the BACnet standard for a complete list of the services that must be directly supported to provide each of the functional groups listed above. All proprietary services, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

3. Standard BACnet object types supported shall include as a minimum: Analog Value, Binary Value, Calendar, Device, File, Group, Notification Class, Program and Schedule object types. All proprietary object types, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

4. The Building Controller shall comply with Annex J of the BACnet

specification for IP connections. This device shall use Ethernet to connect to the IP internetwork, while using the same Ethernet LAN for non-IP communications to other BACnet devices on the LAN. Must support interoperability on wide area networks (WANs) and campus area networks (CANs) and function as a BACnet Broadcast Management Device (BBMD).

C. Remote Communications

1. Provide all functions that will allow remote communications via modem to off-site locations. Include one modem along with all cabling necessary for installation for the system. It shall be possible to use the onboard modem or a separate modem connected via the PTP / RS-232 connection.

2. Provide Windows XP software for off-site computer that allows operator to view and change all information associated with system on color graphic displays. Operator shall be able to change all parameters in this section from off-site location including all programming of building controllers and all programmable application controllers including all terminal unit controllers.

3. Building controller shall have capability to call out alarm conditions automatically. If desired, controller may also send encoded message to digital pager. If an alphanumeric pager is in use by the operator, building controller shall be capable of sending a text or numeric string of alarm description. All building controllers connected to the local LAN shall be capable of calling out alarm messages through one or more shared modems connected to one or more of the building controllers on the local LAN.

4. Building controller shall have capability to call a minimum of 20 different phone numbers. Numbers called may be controlled by type of alarm or time schedule.

5. Owner shall provide standard voice-grade phone line for remote communication function.

6. Building controller and internal modem shall be capable of modem-to-modem baud rates of 33.6 Kbps minimum over standard voice-grade phone lines. Lower baud rates shall be selectable for areas where local phone company conditions require them.

D. Schedules

1. Each building controller shall support a minimum of 250 BACnet Schedule Objects and 250 BACnet Calendar Objects.

E. Logging Capabilities

1. Each building controller shall log as minimum 1000 trendlogs. Any object in the system (real or calculated) may be logged. Sample time interval shall be adjustable at the operator's workstation.

2. Logs may be viewed both on-site or off-site via remote communication.

3. Building controller shall periodically upload trended data to networked operator's workstation for long term archiving if desired.

4. Archived data stored in database format shall be available for use in third-party spreadsheet or database programs.

F. Alarm Generation

1. Alarms may be generated within the system for any object change of value or state either real or calculated. This includes things such as analog object value changes, binary object state changes, and various controller communication failures.

2. Each alarm may be dialed out as noted in paragraph 2 above.

3. Alarm log shall be provided for alarm viewing. Log may be viewed on-site at the operator's terminal or off-site via remote communications.

4. Controller must be able to handle up to 1500 alarm setups stored as BACnet event enrollment objects – system destination and actions individually configurable.

2.2 CENTRAL PLANT AND AIR HANDLER APPLICATION CONTROLLERS

A. Provide one or more native BACnet application controllers for each air handler and provide native BACnet application controllers as needed for central plant control that adequately cover all objects listed in object list. All controllers shall interface to building controller via MS/TP LAN using BACnet protocol. No gateways shall be used. Controllers shall include input, output and self-contained logic program as needed for complete control of units. Controllers shall be fully programmable using graphical programming blocks. Programming tool shall be resident on operator workstation and be the same tool as used for the building controller. No auxiliary or non-BACnet controllers shall be used.

B. BACnet Conformance

1. Application controllers shall as a minimum support MS/TP BACnet LAN types. They shall communicate directly via this BACnet LAN at 9.6, 19.2, 38.4 and 76.8 Kbps, as native BACnet devices. Application controllers shall be of BACnet conformance class 3 and support all BACnet services necessary to provide the following BACnet functional groups:

a. Files Functional Group

b. Reinitialize Functional Group

c. Device Communications Functional Group

2. Please refer to section 22.2, BACnet Functional Groups, in the BACnet standard, for a complete list of the services that must be directly supported to provide each of the functional groups listed above. All

proprietary services, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

3. Standard BACnet object types supported shall include as a minimum—Analog Input, Analog Output, Analog Value, Binary Input, Binary Output, Binary Value, Device, File, and Program object types. All proprietary object types, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

C. Application controllers shall include universal inputs with 10-bit resolution that accept 3K and 10K thermistors, 0–10VDC, 0–5 VDC, 4–20 mA and dry contact signals. Any input on a controller may be either analog or digital with a minimum of 3 inputs that accept pulses. Controller shall also include support and modifiable programming for interface to intelligent room sensor with digital display. Controller shall include binary and analog outputs on board. Analog outputs shall be switch selectable as either 0–10VDC or 0–20mA. Software shall include scaling features for analog outputs. Application controller shall include 24VDC voltage supply for use as power supply to external sensors.

D. All program sequences shall be stored on board application controller in EEPROM. No batteries shall be needed to retain logic program. All program sequences shall be executed by controller 10 times per second and capable of multiple PID loops for control of multiple devices. All calculations shall be completed using floating-point math and system shall support display of all information in floating-point nomenclature at operator's terminal. Programming of application controller shall be completely modifiable in the field over installed BACnet LANs or remotely via modem interface.

Operator shall program logic sequences by graphically moving function blocks on screen and tying blocks together on screen. Application controller shall be programmed using programming tools as described in operator's terminal section.

E. Application controller shall include support for intelligent room sensor (see section 2.9.B.) Display on intelligent room sensor shall be programmable at application controller and include an operating mode and a field service mode. All button functions and display data shall be programmable to show specific controller data in each mode based on which button is pressed on the sensor. See sequence of operation for specific display requirements at intelligent room sensor.

2.3 TERMINAL UNIT APPLICATION CONTROLLERS

A. Provide one native BACnet application controller for each piece of unitary mechanical equipment that adequately covers all objects listed in object list for unit. All controllers shall interface to building controller via MS/TP LAN using BACnet protocol. No gateways shall be used. Controllers shall include input, output and self-contained logic program as needed for complete control of unit.

B. BACnet Conformance

1. Application controllers shall as a minimum support MS/TP BACnet LAN types. They shall communicate directly via this BACnet LAN at 9.6, 19.2, 38.4 and 76.8 Kbps, as a native BACnet device. Application controllers shall be of BACnet conformance class 3 and support all BACnet services necessary to provide the following BACnet functional groups:

   a. Files Functional Group

   b. Reinitialize Functional Group

   c. Device Communications Functional Group

2. Please refer to section 22.2, BACnet Functional Groups in the BACnet standard for a complete list of the services that must be directly supported to provide each of the functional groups listed above. All proprietary services, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

3. Standard BACnet object types supported shall include as a minimum– Analog Input, Analog Output, Analog Value, Binary Input, Binary Output, Binary Value, Device, File and Program Object Types. All proprietary object types, if used in the system, shall be thoroughly documented and provided as part of the submittal data. All necessary tools shall be supplied for working with proprietary information.

C. Application controllers shall include universal inputs with 10-bit resolution that can accept 3K and 10K thermistors, 0–5 VDC, 4–20 mA, dry contact signals and a minimum of 3 pulse inputs. Any input on controller may be either analog or digital. Controller shall also include support and modifiable programming for interface to intelligent room sensor. Controller shall include binary outputs on board with analog outputs as needed.

D. All program sequences shall be stored on board controller in EEPROM. No batteries shall be needed to retain logic program. All program sequences shall be executed by controller 10 times per second and shall be capable of multiple PID loops for control of multiple devices. Programming of application controller shall be completely modifiable in the field over installed BACnet LANs or remotely via modem interface. Operator shall program logic sequences by graphically moving function blocks on screen and tying blocks together on screen. Application controller shall be programmed using same programming tools as building controller and as described in operator workstation section. All programming tools shall be provided and installed as part of system.

E. Application controller shall include support for intelligent room sensor (see Section 2.9.B.) Display on room sensor shall be programmable at controller and include an operating mode and a field service mode. All button functions and display data shall be programmable to show specific controller data in each mode based on which button is pressed on the sensor. See sequence of operation for

specific display requirements at intelligent room sensor.

2.4 SENSORS/INPUT/OUTPUT DEVICES

A. Temperature Sensors

1. All temperature sensors to be solid state electronic, factory-calibrated to within 0.5°F, totally interchangeable with housing appropriate for application. Wall sensors to be installed as indicated on drawings. Mount 48 inches about finished floor. Duct sensors to be installed such that the sensing element is in the main air stream. Immersion sensors to be installed in wells provided by control contractor, but installed by mechanical contractor. Immersion wells shall be filled with thermal compound before installation of immersion sensors. Outside air sensors shall be installed away from exhaust or relief vents, not in an outside air intake and in a location that is in the shade most of the day.

2. Room Sensor: All space temperature sensors shall be the thermistor types. The range shall be -30 to 100 degrees F, at a factory calibration point of 77 degrees F. Accuracy shall be +/- 0.36 degrees F, at calibration point. Sensors where identified, shall contain push-button bypass switches and shall be of the SS plate type when located in student accessible areas. Areas such as teachers lounges and Administrative areas shall be standard sensors with bias levers and push-button bypass switches.

3. All space temperature sensors shall be the thermistor types. The range shall be -30 to 100 degrees F, at a factory calibration point of 77 degrees F. Accuracy shall be +/- 0.36 degrees F, at calibration point. Sensors where identified, shall contain push-button bypass switches and shall be of the SS plate type when located in student accessible areas. Areas such as teachers lounges and Administrative areas shall be standard sensors with bias levers and push-button bypass switches.

B. Rigid Element: Single point duct temperature sensors shall be the thermistor type. The range shall be 32 to 158 degrees F, with a factory calibration point of 77 degrees F. Accuracy shall be +/- 0.36 degrees F, at calibration point. These sensors shall be used in unit discharge and well sensor.

C. The outside air temperature sensor shall be the thermistor type. The range shall be –30 to 140 degrees F and have an accuracy, at the calibration point, of +/- 0.36 degrees.

D. Differential Pressure Switches: The differential pressure range of the switches shall be selected to suit the application, and shall have an adjustable setpoint. The switches shall have SPDT contacts. Dwyer AFS-262 for air and Penn P74 for liquid, or equal. The switches shall be mounted with the diagram in a vertical plan.

E. Current sensors shall have: fixed setpoint, .25A to 200A, shall be 100% solid-state, no moving parts to fail Veris series H-800 or equal.

F. Stainless Steel Pressure Transmitter: Utilizes a thin film strain-gauge bridge and stainless steel diaphragm to provide a highly accurate, stable means of measuring pressures up to 2000psig. Splash-proof cable connections protect the wiring, allowing the model PTX1 to be mounted near the medium being measured.

G. Two-Position Room Thermostat: Line or low voltage tamperproof without thermometers, concealed adjustment setpoints, sensing element (liquid charged or bimetal). Cooling thermostats to have sub-base with fan on-off and off-cool switches.

H. Low limit Thermostat: Shall have heavy-duty temperature cut-out controls incorporating a vapor-charged sensing element. It shall have a four-wire, two-circuit contact block that contains two isolated sets of contacts. The contacts are designed to transfer at setpoint so that when the main contact opens, the auxiliary contact closes simultaneously. Shall be manual reset.Temperature range of 15-55 degrees F with averaging capillary Penn model A70HA-1 or equal.

I. Two and Three- Way Screwed Valves:

Valves ½" through 2" shall be forged brass body with nickel plating, NPT screw type. The operating temperature range shall be 0 degrees to 212 degrees F/

The valves shall have an ISO type 4 bolt flange for mounting actuator in any orientation parallel or perpendicular to the pipe. A non-metallic thermal isolation adapter shall separate flange from actuator with high temperature materials rated for continual use at greater than application temperature. Valve assemblies without thermal isolation as described are not acceptable.

The isolation adapter shall also provide stable direct coupled mechanical connection between the valve body and actuator and prevent lateral or rotational forces from affecting the stem and its packing O-rings.

All control ball valves shall be furnished with a stainless steel ball & stem and fiberglass reinforced Teflon seats and seals. The valves shall have a blow out proof stem design. Each valve shall be tested by the valve manufacturer.

Flow type for modulating two-way valves shall be equal percentage. All control ball valves shall have a flow characterizing disc in the inlet of the valve to provide this equal percentage flow response. Three-way valves shall have equal percentage control port. They shall have a modified linear bypass port which will yield 70% of the flow of the A port. The total flow remains near constant. Three-way valves shall be applicable for both mixing and diverting.

Characterizing disc shall be held securely by a keyed ring.

The stem packing shall consist of 2 O-rings designed for on-off modulating service and requiring no maintenance.

Manufacturer shall provide a two-year unconditional warranty from date of substantial completion.

K. Valve Actuators:

The actuator manufacturer shall have ISO 9001 quality certification.

Actuators shall be Underwriters Laboratories Listed under Standard 873 and Canadian Standards Association Class 4813 02. Actuators shall have European Community (CE) certification.

Actuators used near outdoor air streams shall have NEMA type 2 (IP54) housing for water and moisture resistance.

Actuators shall be direct coupled to the valve with a single screw.

Actuators shall be applied according to the manufacturer's specifications.

The valve actuator shall be capable of providing the minimum torque required for proper valve close-off for the required application.

Each actuator shall have current limiting circuitry or microprocessor overload protection incorporated in its design to prevent damage to the actuator.

Applications that require fail safe operation of the valve assembly shall use actuators with mechanical spring return.

The actuator shall be proportional, floating (Tri-state), or two position with spring return as called out in the control sequence of operation. All proportional valves shall be positive positioning, and respond to a 2-10 VDC or 4-20mA with load resistor. These proportional units will each have position feedback signal corresponding to the actual valve position which can be wired back to the control system.

All control valve shall have a visual position indicator and an attached 3 foot cable for easy installation to a junction box. Manufacturer shall provide a two year unconditional warranty from date of installation.

L. Damper Actuators: Shall be of the electronic type and shall be either fully proportional spring return or two-position spring return as described in the sequence of operation and as shown on the control drawings. Damper operators shall be located outside of the air stream whenever possible. Damper actuators shall be sufficient size to operate their respective dampers effectively.

M. Control Dampers: Will be furnished by the Temperature Control Contractor and shall be single or multiple blade, as required. All dampers frames are to be constructed of #13 gauge galvanized sheet metal with flanges for duct mounting. Where dampers sizes are not indicated on the plans, dampers shall be properly sized by the Temperature Control Contractor, for minimum pressure drop, from two sheets of #22 gauge galvanized sheet metal spot-welded together and not exceeding 6" replaceable seals along with inside surface of top, bottom, sides of the frames, and along each blade edge.

Air leakage through the damper shall not exceed ½ of 1 percent of system capacity at 4" water static. Characteristics will be reviewed by the

Architect/Engineer prior to approving dampers.

N. Occupancy Sensors: Will be furnished by the Temperature Control Contractor for the gym, and Cafeteria area only. All other occupancy sensors will be provided and installed by the electrical contractor with auxiliary contacts for monitoring by the DDC system. The Gym and Cafeteria area occupancy sensors will be ceiling mounted and have passive infrared dual sensing technology.

PART 3 - EXECUTION

3.1 INSTRUCTION AND ADJUSTMENTS

Upon completion of the project, the Temperature Control Contractor shall: Check, validate, and calibrate, where required, all controllers, controlled devices, valves, actuators, auxiliary devices, relays, etc. provided under this section.

3.2 COORDINATION

Coordinate the controls furnished under this section with the controls furnished with the boilers and chillers resulting in a complete system properly interfaced.

3.3 SYSTEM TURN OVER

Upon completion of the installation, the Control Contractor shall start-up the system and perform all necessary testing and run diagnostics to ensure proper operation. An acceptance test in the presence of the Owner's Representative, the Architect, or the Engineer shall be preformed. The acceptance test shall consist of a point-to-point check-out within each terminal unit controller to insure proper operation of all system components.

When the system is deemed satisfactory in whole or in part by these observers, the system parts will be accepted for beneficial use and place under warranty.

Problems which occur within approved hardware or software shall be corrected in an appropriate fashion under warranty. Any such occurrence shall not void previous approval; however, the Control Contractor shall be responsible to attend to, and remedy, such items within the warranty period. Appropriate logs, schedules, and reports shall be maintained to reflect these items and their redress.

3.4 TRAINING/OWNER'S INSTRUCTION

A. The Control Contractor shall provide two (2) copies of an operator's manual describing all operating and routine maintenance service procedures to be used with the system. The Control Contractor shall instruct the owner's designated representative in these procedures during the start-up and test period. The duration of the instruction are to be conducted during normal working hours and shall be no less than sixteen (16) hours divide in (4), four hours sessions.

3.5 WARRANTY

A. The entire building control system shall be warranted for a period of (18) months following the date of substantial completion. Any manufacturing defects arising

during this period shall be corrected without cost to the owner. This warranty shall become effective starting the date the owner begins to receive beneficial use of the system.

END OF SECTION 230913

SECTION 230993 SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

B. The General Requirements in Sections 20 00 50 shall also govern the work under this Section.

C. Examine all drawings and data and coordinate the work of the Section with all related and adjoining work.

1.2 SUMMARY

A. This Section includes control sequences for HVAC systems, subsystems, and equipment.

B. Related Sections include the following:

1. Section 23 09 13 “Instrumentation and Controls for HVAC” for control equipment and devices and for submittal requirements.

1.3 DEFINITIONS

A. DDC: Direct Digital Control

1.4 HOT WATER CONTROL

A. Boiler Hot Control:

1. Below 65°F (adjustable) the DDC system shall enable the boiler package control panel. Wiring of the boiler control panel and its control components is the responsibility of the control contractor. The control contractor will interface all available control points and alarms from the boiler control panel into the DDC system through BACnet. It is the boiler manufacturer responsibility to supply a control panel capable of sending this information to the control system via BACnet.

2. Building Heating Hot water Pump Control:
Whenever the outside air temperature is 65°F or below, or there is a call for heat at one of the AHU heating coils or other heating terminal, the heating hot water system shall be enabled and the BAS shall signal the lead hot water pump to start.

The lead pump's variable frequency drive (VFD) shall modulate the lead pump's motor speed to maintain the differential pressure set point of 15 psig as sensed by the differential pressure sensor.

The BAS shall alternate the lead / lag position of the pumps every 200

hours. Upon change over from an operating lead pump to an idle lag pump, the idle lag pump shall be started and its operation proven prior to the stopping of the operating lead pump. If the lead pump fails to establish and/or maintain flow, as determined by the differential pressure sensor across the pump, the lag pump shall be started and an alarm shall be issued.

Coordinate and direct the installation of the differential pressure sensor in the piping with the Mechanical Contractor. Locate the pressure controller approximately 2/3 the longest hydraulic distance from the discharge of the pumps. Refer to piping plans. Review and coordinate sensor location with the Owner and Engineer.

1.5 CABINET & UNIT HEATERS

A. A space senor shall cycle the cabinet/unit heater fan as need to maintain the space temperature. A strap-on aquastat shall prevent fan operation if hot return temperature fall below 85 degrees F.

PART 2 - PRODUCTS

None

PART 3 - EXECUTION

3.1 INSTRUCTION AND ADJUSTMENTS

A. Upon completion of the project, the Temperature Control Contractor shall: Check, validate, and calibrate, where required, all controllers, controlled devices, valves, actuators, auxiliary devices, relays, etc. provided under this section.

3.2 COORDINATION

A. Coordinate the controls furnished under this section with the controls furnished with the boilers and chillers resulting in a complete system properly interfaced.

3.3 SYSTEM TURN OVER

A. Upon completion of the installation, the Control Contractor shall start-up the system and perform all necessary testing and run diagnostics to ensure proper operation. An acceptance test in the presence of the Owner's Representative, the Architect, or the Engineer shall be performed. The acceptance test shall consist of a point-to-point check-out within each terminal unit controller to insure proper operation of all system components.

B. When the system is deemed satisfactory in whole or in part by these observers, the system parts will be accepted for beneficial use and place under warranty.

C. Problems which occur within approved hardware or software shall be corrected in an appropriate fashion under warranty. Any such occurrence shall not void previous

approval; however, the Control Contractor shall be responsible to attend to, and remedy, such items within the warranty period. Appropriate logs, schedules, and reports shall be maintained to reflect these items and their redress.

3.4 TRAINING/OWNER'S INSTRUCTION

A. The Control Contractor shall provide two (2) copies of an operator's manual describing all operating and routine maintenance service procedures to be used with the system. The Control Contractor shall instruct the owner's designated representative in these procedures during the start-up and test period. The duration of the instruction are to be conducted during normal working hours and shall be no less than sixteen (16) hours, divided in (4) four hours sessions or as directed by the Owner.

3.5 WARRANTY

A. The entire building control system shall be warranted for a period of (18) months following the date of beneficial use. Any manufacturing defects arising during this period shall be corrected without cost to the owner. This warranty shall become effective starting the date the owner begins to receive beneficial use of the system.

END OF SECTION 23 09 93

SECTION 233000 HVAC AIR DISTRIBUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

B. The General Requirements in Section 200050 shall also govern the work under this Section.

C. Examine all drawings and data and coordinate the work of this Section with all related and adjoining work.

1.2 SCOPE OF WORK:

A. Contract includes all labor, material, equipment accessories and test required to furnish and install all air distribution systems as shown on drawings, implied and herein specified, complete and ready to operate.

B. Contractor is requested to examine all of the plans and all details of construction and visit the site of the proposed addition and alterations so as to thoroughly acquaint himself with all conditions before submitting his bid.

C. Work shall include but is not limited to the following:

1. Ductwork

D. Refer to Section 230548 for Seismic Restraints.

E. Contractor shall be responsible for wiring of all temperature controls.

1.3 SUBMITTALS:

A. Refer to Section 200050.

B. Submit the following shop drawings.

Ductwork

1.4 AIR DISTRIBUTION SYSTEM DESCRIPTION:

A. Furnish and install all combustion air system as indicated on the drawings. Systems to be complete with insulation and other accessories to make the system complete and ready to operate to the full intent of the plans and specifications.

B. All ductwork shall be run on warm side of building insulation.

C. Design is based on equipment as described in the drawing equipment schedules. Any changes in foundations, connections, piping, controls, electrical equipment, wiring and connections and openings required by alternate equipment submitted and approved shall be made at no additional cost to the Town.

PART 2 - PRODUCTS

2.1 DUCTWORK:

A. All sheet metal used throughout, except as specifically noted, shall be constructed of galvanized steel sheets as follows:

Rectangular Ducts		Alum.		Copper
Duct up to 12"	26 ga.		24 ga.	16 oz.
Duct 13" to 30"	24 ga.		22 ga.	24 oz.
Duct 31" to 60"	22 ga.		20 ga.	32 oz.
Duct 60" and beyond		20 ga.		
Casings up to 72"		16 ga.		
Casings beyond 72"		14 ga.		

Bracings for Ducts

Up to 24" None
25" to 40 1" x 1" x 1/8" 4 ft. from joint
41" to 60" 1-1/2" x 1-1/2" x 1/8" 4 ft. from joint
61" to 90" 1-1/2" x 1-1/2" x 1/8" diagonal angles
or 1-1/2" x 1-1/2" x 1/8" angles 2 ft. from joint

B. All fittings, joints, seams and connections shall be made up in accordance with standard recommended practice as described in Air Duct Design, latest ASHRAE Guide and SMACNA Low Pressure Standards, using Class B construction with all seams sealed. Snap lock joints will not be permitted.

2.2 JOINT SEALING:

A. Round duct joints in diameter through 60" shall be assembled and sealed as follows:

B. Approved sealer is applied to the male end of the couplings and fittings. After the joint is slipped together, sheet metal screws are place 1/2" from the joint bead for mechanical strength. Sealer is applied to the outside of the joint extending 1" on each side of the joint bead and covering the screw heads. Plastic-backed tape is immediately applied over the wet sealer.

C. The duct sealer must be specifically formulated for the job of sealing the field joints for high pressure systems. The sealer shall be compatible with plastic-backed duct tape so the two shall cure and bond together. Samples of sealer and tape and the specification data sheets shall be submitted to the engineer for approval.

D. Flanged joints shall be sealed by Neoprene Rubber gaskets.

2.3 ACCESS DOORS IN DUCTWORK:

A. Furnish hinged and reinforced access doors with wire glass observation port in door in sheet metal work for observation or maintenance of all dampers, controls in sheet metal ducts and housings. This applies to fresh air ducts, return air ducts, exhaust ducts, etc. Furnish doors of tight fitting construction. All duct access doors shall be furnished in Ventlok or equal in Air balance, Advanced Air, Inc. or Louvers & Dampers, Inc.

B. For access doors in architectural finishes refer to Section 200050.

2.4 VOLUME DAMPERS:

A. Volume dampers with locking quadrants shall be provided on all supply, exhaust and return ducts, on all branches and at all take-off's to registers and diffusers.

B. Dampers shall be constructed of #20 gauge steel properly stiffened and to have locking quadrants outside covering of ducts. Opposed blade multi-lead dampers shall be used wherever damper blade is larger than 12".

2.5 SPLITTERS AND DUCTURNS:

A. Furnish and install splitter dampers in ductwork made of #20 gauge steel for proper control of air, where ductwork branches off from main supply ducts.

B. Refer to "Access Doors" for type of access doors required for access to ceiling dampers.

C. Install ducturns based on Barber Colman non-adjustable 90 degree double wall type in all square elbows.

D. Provide on all branch duct takeoffs as shown in Barber Colman adjustable airturns.

2.9 OUTSIDE WALL LOUVERS:

A. All outside louvers for air handling units, fan inlets and exhaust fan outlets in outside wall shall be furnished complete with 1/2" mesh copper screens.

B. On outside air intake louvers serving air handling units, provide manual opposed blade balancing damper between louver and motorized damper.

PART 3 - EXECUTION

3.1 GENERAL FOR EQUIPMENT:

A. Refer to schedule on drawings for size, type, design capacities and characteristics of fans. Also required accessories shall be indicated in schedule or listed herein.

B. Provide and install all additional structural supports not provided for by the General Contractor.

C. All equipment on base drawings have been dimensionally coordinated with the existing conditions. If this Contractor proposes to substitute any equipment other than which is on the basic bid drawings, for review, he shall first verify that the proposed equipment will fit dimensionally.

This Contractor shall be responsible for any additional costs to changes incurred because of the above substitution even after review by the Engineer.

3.2 STRUCTURAL SUPPORT:

A. Main dunnage steel shall be provided under another section; however, this Contractor shall provide all supplementary steel for the complete support of equipment.

3.3 DESCRIPTION OF MAKE-UP AIR SYSTEM:

A. Furnish and install the complete horizontal and vertical ducts for each system between all boilers and louvers.

B. Sizes and approximate locations of all ducts are shown on the drawings. Check carefully with the existing conditions to make sure that there will be no conflict between these trades and the ducts.

C. All ductwork shall be installed as shown on drawings and is to be rigidly braced and supported to prevent vibration and sagging.

D. All hangers and supports are to be fastened securely to concrete, wood or steel construction. Under no circumstances will hangers be inserted supported on suspended ceilings, conduits or pipe be permitted.

END OF SECTION 233000

SECTION 235000 HEATING EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

B. The General Requirements in Section 200050 shall also govern the work under this Section.

C. Examine all drawings and data and coordinate the work of this Section with all related and adjoining work.

1.2 SCOPE OF WORK:

A. This Contract includes all labor, material, equipment, tests and appliances required to furnish and install all HVAC as shown on drawings, implied and herein specified.

B. The present location of the building will be as shown on drawings. Visit the site and examine the Mechanical trades showing all details of construction before submitting proposal.

C. Connect new boilers and pumps to existing and leave ready to operate. Check all Mechanical and Electrical drawings and coordinate all work accordingly.

D. Refer to Section 230548 for Seismic Restraints.

E. Drawings are diagrammatic and indicate the general arrangement of piping and do not show all minor details and fittings. Such items shall be included, as well as reasonable modification, in the layout as directed to prevent conflict with other trades.

1.3 SUBMITTALS:

A. In accordance with Section 200050, the following items shall be submitted for review.

Pipe and fittings Pumps
Hydronic Equipment and Specialties
Boiler

1.4 MOTOR CONTROL:

A. Each electric motor of 3 phase characteristics shall be furnished with an automatic starter as specified in Section 200050, Motor Control.

PART 2 -PRODUCTS

2.1 PIPE AND FITTINGS:

A. Copper Tubing:

1. Type "L", ASTM Specifications B88, shall be used for water lines.
2. Fittings shall be wrought copper or cast brass solder- joint pressure rated type.
3. Type "K" shall be used for underground piping with flared fittings.

B. Steel Piping:

1. Pipe shall be Standard Wall (Sch. 40) black carbon steel, ASTM A-120, Grade B, with threaded ends for sizes 1/2" through 2", for hot water heating piping.
2. All steam condensate return piping shall be run in (SCH 80) black steel.
3. Fittings shall be standard weight (125 lbs.), cast iron screwed, ASTM A126, Class A, for sizes 1/2" through 2". Piping 2" and under shall be screwed.
4. Victaulic Grade E couplings, fittings and accessories in conjunction with grooved end schedule 40 piping will be permitted in existing and new construction for hot water heating system.

2.2 PIPE AND FITTINGS:

A. All fittings on welded lines shall be furnished in accordance with ASTM A105 Specification designed for welding. Branch outlets on mains 2-1/2" and smaller to be made with Weldolets or Threadolets. Welding fittings on mains and branches 3" and larger are to be full size of reducing tube designed for welding.
All flanged valves 3" and larger and special equipment connections to be installed with weld neck flanges for welded construction.

B. All nipples shall be extra strong as follows: Pipe size 1/2" to 4" - 6" close. Pipe size 5" - 12" - 12" close and of the same material as the piping they are used with.

C. All copper tubing shall be furnished in Type "L" using sweat fittings unless otherwise noted. Copper tubing shall be furnished in Chase, Anaconda, Bridgeport or Revere.

D. All black steel over 4" or other welded pipe shall have long radius welding ells and tees of the same wall thickness as the pipe. Welding tees will not be required where the mains and branches comply with the following schedule:

Min. Size of Mains	Max. Size of Branch
2 1/2"	3/4"
3"	1 1/4"
4"	2"
5"	3"
6"	4"
8"	6"
10"	8"
12"	10"

E. Welding flanges shall be slip-on or welding neck type, 300 psig forged steel conforming to ANSI Specification B-16.5.

F. All necessary precautions shall be taken when welding in the new building to prevent combustion of structure.

2.3 GROOVE PIPING:

A. Victaulic couplings may be used in lieu of welding, thread or flanging on 2 1/2" through 30" carbon steel pipe, on heating water services from -30 deg. F. to 230 deg. F. within the manufacturer's rated working pressures. Pipe grooving shall be cut grooved and/or rolled grooved as per manufacturer's latest spec. Installation is per manufacturer's latest recommendations. All piping shall be Schedule 40. grooved piping shall be used only in concealed or service areas. Grooved piping will not be accepted in finished areas with no ceiling.

B. Piping Components - Grooved couplings consisting of two or more pieces of ductile or malleable iron. Coupling gaskets will be a synthetic rubber gasket with a central cavity pressure responsive design. Coupling bolts and nuts shall be heat treated carbon steel, track head conforming to physical properties of ASTM-A-183. All grooved couplings shall be as manufactured by Victaulic Co. Style 77, 07 or equal.

C. For piping 2 1/2" and larger, full size branch connections shall be made with manufactured grooved end tees. Branch connections for less than full size shall be made with Victaulic hole cut products. Style 920 or Style 921 branch connections with locating collar engaging into hole or style 72 outlet coupling used to join grooved pipe and to create a branch connection. Gaskets for branch connection shall be Victaulic Grade "E" EPDM Compound with working temperature of -30 deg. F. to 230 deg. F.

D. Flanges - Vic-Flange Style 741 (2-24") for connection to ANSI class 125 and 150 flanged components.

E. Fittings - Fittings shall be full flow cast fittings, steel fittings or segmentally welded fittings with grooves or shoulders designed to accept Victaulic grooved end couplings.

1. Standard Fittings - shall be cast of ductile iron conforming to ASTM A-536 (Grade 65-45-12) or malleable iron conforming to ASTM A-47, Grade 32510, painted with a rust inhibiting modified vinyl Alkyd enamel or hot-dip galvanized to ASTM A-153 or zinc electroplated to ASTM B-633, as required.
2. Standard Steel Elbow Fittings - (14" - 24"), shall be forged steel conforming to ASTM A-106 Grade B (0.375" wall), painted with rust inhibiting modified vinyl Alkyd enamel or hot-dip galvanized to ASTM A-153.
3. Standard Segmentally Welded Fittings - shall be factory fabricated, by fitting manufacturer, of carbon steel pipe as follows, 3/4" - 4" conforming to ASTM A-53, Type F; 5" - 6" Sch. 40 conforming to ASTM A-53, Type E or S, Grade B; 8" - 12" Sch. 30 conforming to ASTM A-53, Type E or S, Grade B; 14" - 24" 0.375" wall conforming to ASTM A-53, Type E or S, Grade B, painted with rust inhibiting modified vinyl Alkyd enamel or hot-dip galvanized to ASTM A-153, as required.

F. Victaulic Pipe Hanging (Victaulic Hanging Standard A-130)

1. Style 07 Zero-Flex for rigid piping systems should be supported as per Building Services B31.9 Hanging.
2. Style 77 flexible piping systems are supported as per Victaulic Hanging Standard A-130.

2.4 PIPING JOINTS:

A. Welded Joints shall be fusion welded in accordance with American Standard B31.1, Section 6, except as modified hereinafter. Changes in direction of piping shall be made with welding fittings only. Mitering, notching or direct welding of pipe to the main in order to form tees or ells will not be permitted. Branch connections may be made with welding tees or forced branch outlet fittings, as manufactured by Bonney Forge, either being acceptable without size limitation. Bonney Thredolets shall be used in lieu of Hald couplings when reducing from a welded run to a screwed branch. Outlet fittings where used shall be forged, flared for improved flow where attached to the run, reinforced against external strains and designed to maintain full pipe bursting strength.
Fillet welds shall be used for welding screwed and slip-on steel flanges to pipes. Where lateral connections are to be used, either lateral fittings or Bonney Latrolets are acceptable. Wedded joints shall be used in finished areas with no ceiling.

B. Screwed Joints: The ends of pipes to be threaded shall be cut square and reamed. Pipe threads shall be standard taper, shall be cut straight and clean and to full depth, and shall be free from dirt, chips and burrs when the joint is made. Pipe joint lubricant or compound shall be selected for the pipe line service and shall be applied to male threads only. Screwed joints shall not be caulked.

C. Flanged Joints: This heading covers flanged joints of all types, including those made with flange unions. Flanged joints shall be made with suitable reinforced gaskets. Clean all parts and align the joint before assembling; support pipes or heavy parts independently. Opposite bolts shall be pulled up successively. Screwed steel flanges shall be welded to pipes; slip-on steel flanges shall be welded front and back.

Cast iron flanges shall not be welded to pipes. If raised face flanges are to be bolted against plain face flanges, the raised face shall be removed and a full face gasket used. Where flanged base elbows are installed, the base shall not be used for anchoring the line or otherwise subjected to tension or shear.

D. Soldered Joints in Copper Tubing: Cut the ends of tubes square, remove burrs, clean tube ends and fitting sockets with emery cloth and remove all particles before applying flux and making the joint. Insert tubes to full socket depth. Use the following solders at the given conditions.

95 - 5% Tin-Antimony/all services/high pressure 250 degrees F. Max.
Silver - 35 to 45% alloy-refrigerant piping/high pressure and temperature.

2.5 PIPE HANGERS:

A. Securely hang and anchor pipe as shown and required with proper provision for expansion, contraction and elimination of undue stress and strain on piping.

B. Provide a pipe hanger within two (2) feet of each elbow, tee, wye, valve, strainer and similar device.

C. Secure and support runs at base and at sufficiently close intervals to hold pipe at alignment and to carry safely the weight of piping and contents without undue stress thereon.

D. Except as indicated to the contrary, secure and support all horizontal piping as follows and required to prevent sagging, undue pipe movement and preserve proper alignment in each run.

Piping	Sizes	Maximum Interval
Cast Iron	All sizes	At each hub or joint
Steel	2" & smaller	Six (6) feet
Steel	2 1/2" & larger	Ten (10) feet
Copper Tubing	1 1/4" & smaller	Five (5) feet
Copper Tubing	1 1/2" & larger	Eight (8) feet

E. Hangers up to and including 2" shall be the adjustable band type equal to Empire. Figure 310 for iron pipe and Fig. 310CT for copper tubing.

F. Hangers for piping 2-1/2" and up shall be the clevis type, equal to Empire. Figure 11 for iron pipe and Figure 110CT for copper tubing.

G. Hangers shall be suspended from one of the following devices:

1. "C" clamps.
2. Trapeze hanger assemblies consisting of back-to-back horizontal steel channels with end-type rod hangers.
3. Expansion shield embedded into concrete or masonry.

H. On hot water systems, provide over-sized hangers.

I. Refer to Section 15010 for Seismic Restraints.

2.6 VALVES:

A. This Contractor shall furnish and install valves where shown on plans and also wherever necessary to make the system complete in its operation. All valves shall be as manufactured by Stockham, Jamesbury, Centerline, Appollo, Milwaukee and Victaulic.

Hot Water Heating

2" and smaller

Ball valves	Apollo 71-100/200
Check valves	Stockham B-310-T
Vertical check valves	Stockham B-310-T

2-1/2" and larger

Butterfly valves	Stockham - LG712-BS3-B (Lug Style)
Check valves	Centerline - Series 800 S.S. plate and spring, and nypalon seats.

Furnish all valve materials suitable for service intended. No gate valves shall be allowed. Provide all valves with factory installed extension stems.

2.7 UNIONS:

A. All unions shall be furnished in Nibco-633 or equal in Chase, Revere, Jefferson and Anaconda.

2.8 GASKETS:

A. Where flanges occur, they shall be packed with Klinger or approved equivalent high quality non-asbestos material composed of fibers for industrial maintenance service with high chemical stability and heat resistance. Nitrile rubber bonded.

Temperature	750 deg. F. max.
Pressure	1450 psi max.
Compressibility	ASTM F36A
Tensile Strength	ASTM F152

2.9 REAMING OF PIPES:

A. All pipes to be carefully reamed after cutting and threading.

2.10 PIPE ANCHORS:

A. Furnish and install all steel clamps around mains not less than 1/4" thick and welded to pipe and necessary angle braces to substantial construction to meet job conditions. Anchored mains shall be properly guided.

B. Vertical risers, if any, shall be anchored by similar clamps secured to floor, concealed in wall construction.

2.11 HANGERS AND SLEEVES:

A. All horizontal piping shall be supported in a good, firm and substantial manner. No chains, horizontal pieces of pipe or hangers formed by means of perforated steel bands, pipe rings and hooks will be permitted. All hangers shall be oversized

B. All pipes passing through walls or partitions shall be provided with sleeves sized to give a minimum of 1/2" clearance between sleeve and the outside diameter of the pipe or insulation enclosing the pipe.

2.12 SPECIALTIES FOR HOT WATER SYSTEM:

A. Furnish and install all hot water equipment in Bell & Gossett as specified below and as shown on the drawings.

1. Pressure reducing valve for each closed system.
2. B & G Triple Duty flow control valves shall be furnished in either the angle type or straightaway to suit each individual location and full size of each main or branch main.
3. Furnish all pumps as called for in schedule and following paragraph.
4. Provide B&G circuit setter plus calibrated balancing valves Model C.B. on air handling equipment.

B. Furnish and install the following accessories and equipment in make other than Bell & Gossett.

1. Thermometers: Install Ashcroft Fig. 7173T BI-Metal "Every Angle" thermometers where shown and/or called for on plans or in specifications.
2. Thermometers shall have 5" aluminum hermeticism sealed case with stainless steel stem with 1/2" NPT connection. Install in separable well in brass with lagging extension neck. Stem length and dial range shall be 6" and 0 degrees to 250 degrees F., respectively.
3. Furnish and install on non-critical systems, gauges suitable for use on hot water where indicated on drawings or called for in specifications. Gauge shall be Ashcroft Fig. 2070 with silver brazed boudon tube, aluminum back flange type epoxy coated case, chrome ring, 1/4" NPT lower connection, stainless steel movement with 1% accuracy. Pressure range shall be as required. Furnish 1/4" needlepoint valve in Crane #88 for each gauge. Where sharp pressure fluctuations may occur, mount gauge on a 1/4" Fig. 1106B pulsation dampener. Provide compound gauges where required or called for.
4. Furnish and install gauges on all pump discharge and compound gauges on all pump suctions.
5. Furnish and install balancing valves on air handling unit coil, etc., runouts 2" and smaller in Tour Andersson STA-D Series with ""A metal"" construction. Branch mains 2 1/2" and larger shall be provided with Tour Andersson STA-F Series balancing valve.
6. Furnish and install dielectric fittings.

2.13 IN-LINE MOUNTED CENTRIFUGAL PUMPS:

A. Furnish and install the in-line centrifugal pumps complete with motors and trim meeting the performance, size, electrical requirements as scheduled or otherwise specified in Bell & Gossett Taco or Armstrong. Maximum operating temperature shall be 225 degrees F with a maximum working pressure of 175 PSI.

B. All in-line centrifugal pumps shall be furnished complete with motor and trim suitable for service indicated on plans or otherwise specified. Pump volute shall be of cast iron design. Volute shall include gauge, vent and drain ports. The connection style shall be flanged. The mechanical contractor shall coordinate system connection sizes with trim and pump size and provide all fittings and hardware necessary to connect pump to system piping. . The pump internals shall be capable of being serviced without disturbing piping connections to the pump.

C. Furnish motors for all in-line centrifugal pumps meeting the electrical requirements scheduled and specified in accordance with specification section 15010. All 120 volt motors shall be supplied with built in thermal overload protection.
All three phase motors of 1HP or greater shall be supplied as premium efficiency motors. Motors shall be selected to be non-overloading at any point along the pump curve and shall meet NEMA specifications.

D. Pumps shall be of the maintainable design. Provide owner with complete parts list with service information.

E. Each pump shall be factory tested per Hydraulic Institute standards and name-plated prior to shipment. Impeller shall be both hydraulically and dynamically balanced, keyed to the shaft and secured by a locking cap screw or nut.

F. Each pump shall have a three year warranty from the date of installation.

G. Each pump shall be factory primed and painted to prevent rust and corrosion of the pump exterior surfaces.

H. Provide seismic restraints and vibration isolation for each pump in accordance with specification section 15010.

I. Pump shall be installed, aligned and started in accordance with manufacturer's recommendations

J. Long-Coupled In-Line Pump (B&G Series 60)

1. Long-Coupled In-Line centrifugal pumps shall be horizontal, permanently lubricated and specifically designed and guaranteed for quiet operation. The pump shall be single stage, vertical split case design in cast iron bronze fitted construction
2. The pump shall be composed of three separable components: a motor, bearing assembly and pump end (wet end). The motor shaft shall be connected to the pump via a replaceable flexible coupler. The pump shall have a solid SAE 1144 steel shaft supported by two sealed ball bearings. A non-ferrous shaft sleeve shall be employed to completely cover the wetted area under the seal. The pump shall be equipped with an internally flushed mechanical seal assembly. Seal assembly shall have a brass housing, Buna bellows and seal gasket, stainless steel spring, and be of carbon ceramic design with the carbon face rotating against the stationary ceramic face.

3 A flexible-type coupling shall be employed between the pump and motor. To ensure alignment, the motor shall be mounted to the bearing assembly via a bolted motor bracket assembly with a rubber motor mount.

4. The pump shall be designed to allow for true back pull-out access to the pumps working components.

K. Close-Coupled In-Line Pump (B&G Series 80 & 90)

1. Close-Coupled In-Line centrifugal pumps shall be single stage design suitable for installation in vertical or horizontal positions, permanently lubricated and specifically designed and guaranteed for quiet operation.
2. Pump casing shall be Class 30 cast iron, bronze fitted. The impeller shall be cast bronze, closed type
3. The liquid cavity shall be sealed off at the motor shaft by an internally-flushed mechanical seal with ceramic seal seat and carbon seal ring, suitable for continuous operation. A bronze shaft sleeve shall completely cover the wetted area under the seal.

2.14 CHEMICAL FEEDING EQUIPMENT :

A. For each closed system the Contractor shall furnish and install the following apparatus (including isolation and drain valves):

1. One shot combination filter feeder, minimum five gallon capacity with quarter turn cap and 3 ½" opening. The feeder shall be rated for 200 psi service.

B. The Contractor shall provide ports to test the chemical concentration.

C. Furnish one year's supply of filters and the formulas for control of scale and corrosion in the closed hot water recirculating system. Formulations shall not contain any ingredients which may be harmful to system materials of construction. Provide MSD sheets on all chemical products. No system shall be operated without the benefit of chemical protection. Once the recommended chemical residual is achieved, any additional chemicals required to re-treat the system due to water loss or to accomplish other work shall be provided by the Mechanical Contractor.

2.15 DIELECTRIC FITTINGS

A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.

B. Dielectric Unions:
Description:

Standard: ASSE 1079.
Pressure Rating: 150 psig minimum at 180 deg F
End Connections: Solder-joint copper alloy and threaded ferrous.

C. Dielectric Flanges:
Description:

Standard: ASSE 1079.
Factory-fabricated, bolted, companion-flange assembly.

Pressure Rating: 150 psig minimum at 180 deg F
End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.

D. Dielectric-Flange Insulating Kits:
Description:

Nonconducting materials for field assembly of companion flanges.
Pressure Rating: 150 psig.
Gasket: Neoprene or phenolic.
Bolt Sleeves: Phenolic or polyethylene.
Washers: Phenolic with steel backing washers.

E. Dielectric Nipples:
Description:

Standard: IAPMO PS 66.
Electroplated steel nipple, complying with ASTM F 1545.
Pressure Rating: 300 psig at 225 deg F.
End Connections: Male threaded or grooved.
Lining: Inert and noncorrosive, propylene.

2.16 CONDENSING BOILERS

A. Furnish and install, where shown on the plans, two factory packaged hot water boilers as manufactured by Harsco Industrial/Patterson-Kelley. Each factory "packaged" boiler shall be complete with an *NUROControl System* and all other components required for a complete and operable boiler as specified herein. Each boiler shall be a factory assembled package ready for field wiring and piping. Acceptable substitutions are Aerco Benchmark or Viessmann

B. The boiler manufacturer shall be responsible for all parts assembled and furnished by them as components of the boiler regardless of the manufacturer.

C. Boiler specifications

1. The maximum input shall be 3,000,000 BTU per hour. Each boiler shall be capable of operating continuously at its rated capacity while maintaining a CSA certified efficiency of not less than 96 %.

2. Boiler shall comply with ASME Section IV for ____ psig (Max 200º F)

3. Boiler relief valve setting shall be 50 psig.

4. Boiler outlet water temperature shall be a maximum of 200º F.

5. Fuel shall be natural gas with an assumed higher heating value of 1,030 Btu/Cu Ft Natural gas shall be supplied at a pressure of no less than 3.5” W.C. at the inlet gas valve. The maximum inlet gas pressure shall not exceed 14” W.C.

6. Power voltage shall be 208VAC, 3-phase, 60 hertz. Control voltage shall be 24 VAC (transformer to be supplied by boiler manufacturer).

D. Boiler design

1. Each hot water boiler shall consist of a horizontal, stainless steel, sectional heat exchanger complete with trim, valve trains, burner, and boiler *NURO Control System*.

2. Each boiler heat exchanger shall be stainless steel, counter-flow design for maximum heat transfer with the multiple sections arranged in a reverse return configuration to assure balanced water flow through each section.

3. All boiler pressure parts shall be constructed in accordance with the latest revision of the ASME Boiler and Pressure Vessel Code, Section IV, and shall be so stamped.

4. Boiler heat exchanger headers shall be fabricated steel and be completely removable for inspection. Seals shall be EPDM, rated for 400 deg F service. The boiler design shall not employ use of push nipples or gaskets between the sections.

5. Boiler shall be enclosed with a single wall outer casing. The casing shall be airtight for pressurized operation and be fabricated from 16-gauge carbon steel. The front and top wall shall be secured in place with 1/4" -20 NC machine bolts not sheet metal screws. The complete outer casing shall be finished, inside and out, with a powder coat finish. The composite structure of the boiler combustion chamber, insulating air gap and outer casing shall be of such thickness and materials to assure an outer casing temperature of not more than 50^{o}F above ambient temperature when the boiler is operated at full rated load.

6. An observation port shall be provided on the boiler to allow full observation of the burner flame pattern.

7. The flue gas outlet and combustion air intake shall be located at the boiler rear. Boiler shall be CSA certified for Category IV venting (stack) as defined in NFPA 54 (ANSI Z221), latest edition.

8. All venting material shall be certified for installation on a Category IV appliance. Copies of a computer design and detailed drawing of the venting system shall be submitted for review and approval.

E. Coiler Connections

1. Each boiler shall be provided with the following connections:
   One (1) 4 "-Victaulic water-inlet. (A companion fitting to be supplied by contractor)
   One (1) 4 "-Victaulic water-outlet. (A companion fitting to be supplied by contractor)
   One (1) relief valve outlet
   One (1) flue gas vent outlet,

One (1) 1" FPT, fuel-gas inlet.

F. Boiler Trim

1. Each boiler shall be provided with the following trim compliant with CSD-1:
   a. Pressure relief valve sized to comply with both ASME and local codes.
   b. Water pressure and temperature gauge.
   c. Primary low water flow fuel cutoff, probe type with manual reset.
   d. High water temperature limit control to stop burner at 200° F. with manual reset.
   e. Operating temperature control to control the sequential operation of the burner.
   f. Separate inlet and outlet water temperature sensors capable of monitoring flow
   g. Exhaust temperature sensor
   h. Outdoor reset control as required for single boiler installation.

G. Boiler Fuel Burning System

1. Each boiler shall be supplied with an integral, power type, straight gas, fully automatic fuel burner. The fuel burner shall be an assembly of gas burner, combustion air blower, valve train, and ignition system. The burner shall be fully coordinate for interaction of its elements with the boiler heat exchanger and the boiler control system to provide the required capacities, efficiencies, and performance as specified.

2. Each burner shall be provided with an integral gas firing combustion head.

3. Each burner shall provide adequate turbulence and mixing to achieve proper combustion without producing smoke or producing combustibles in the flue gases.

4. Each boiler shall be provided with an integral variable speed power blower to premix combustion air and fuel within the blower. The combustion air blower shall have sufficient capacity at the firing rate to provide air for stoichiometric combustion plus required excess air. Static and total pressure capability shall comply with the requirements of the boiler. The blower shall be a maximum of 300 watts and operate at 7000 RPM maximum without vibration or noise and shall be designed and constructed for exposure to temperatures in its normal location on the boiler. The operating fan speed will be tachometer sensed and be capable of being displayed at the LED display.

5. Each burner shall of the down-fired type and constructed of steel with a horizontal, stainless steel inner and stainless steel mesh outer screen.

6. Each boiler shall be provided with a "Full Modulating" firing control system whereby the firing rate is infinitely proportional at any firing rate between 20% and 100% as determined by the pulse width modulation input control signal. Both fuel input and air input must be sequenced in unison to the appropriate firing rate without the use of mechanical linkage.

7. Each boiler shall have *NURO Control System* control to determine the firing rate and have all the following capabilities allowing all inputs and reporting in text base English:

    a. Maintain single set point
    b. Reset the set point based on outdoor air temperature.
    c. Boiler shutdown based on outdoor air temperature
    d. Internal dual set point program with an integral switchover to night setback.
    e. Alarm relay for any manual reset alarm function including blocked flue and frost protection.
    f. Programmable Low Fire Delay to prevent short cycling based on a time and temperature factor for release to modulation.
    g. LED Display showing current supply and return temperatures, current set points as well as differential set points. It shall also display any faults whether automatically reset or manually reset and report all errors in text base English.
    h. Provide local Manual Operation in low or high fire for start up and testing and retain a record of the number of hours of operation at high, low and mid-fire hours.
    i. The *NURO Control System* boiler control shall be capable of accepting input and output signals to a building management system via MODBUS RS-485 protocol or 10 VDC analog signals to control boiler operation by Gateway for BACnet, LonWorks or Metasys N2.
    j. On board Domestic Hot Water Priority capable of changing from the heating pump to the DHW pump as well as temporarily changing the boiler set point from a heating temperature to a higher set point temperature to satisfy the DHW system and then returning to the heating mode.
    k. The *NUROControl System* shall vary the speed of the blower based on load demand. The blower shall apply a varying negative pressure on the gas valve, which will open or close to maintain zero pressure at the valve orifice, thereby increasing or decreasing the firing rate. Both the air and gas shall be premixed in the blower.
    l. The *NUROControl System* shall be capable of cascading and controlling all functions of up to a total of 24 boilers while rotating the lead boiler to even load distribution overall system boilers.

H. Main Gas Valve Train

1. Each boiler shall be provided with an integral main gas train, factory assembled, piped, and wired. The gas valve train shall include at least the following:
    a. One (1) manual shutoff valve at gas train inlet connection.
    b. Two (2) safety shutoff valves equipped with dual solenoids for independently energizing for leak testing.
    c. Air - Gas ratio control (maximum inlet pressure 14" W.C.)
    d. One (1) low gas pressure switch (manual reset).
    e. One (1) high gas pressure switch (manual reset).

f. Two (2) pressure test ports

I. Ignition System

1. Each boiler shall be equipped for direct spark ignition

J. Burner Control System

1. The control system shall be supplied with a 24 VAC transformer to reduce the 120 VAC, single phase, 60 hertz primary. The 120/1/60 power supply to each boiler shall be protected by a 15 amp fused disconnect switch supplied by the electrical contractor..

2. The boiler must include an electric spark ignition system. Main flame shall be monitored and controlled by flame rod, rectification system.

3. Each boiler shall be provided with all necessary controls, all required programming sequences, and all safety interlocks. Each boiler control system shall be properly interlocked with all safety devices.

4. Each boiler control system shall provide a timed sequence pre-ignition air purge of boiler combustion chamber. The combustion airflow sensor shall monitor and prove the airflow purge.

K. Boiler Control Panel

1. The boiler manufacturer shall provide each boiler with an integral, factory pre-wired control panel. The control panel shall contain at least the following components, all pre-wired to a numbered terminal strip:

a. One (1) - Burner "on-off" switch.
b. One (1) - Electronic combination temperature control, flame safeguard and system control.
c. One (1) - Control circuit breaker, 5 amp
d. All necessary control switches, pushbuttons, relays, timers and terminal strips.
e. LED Display Panel to adjust set points and control operating parameters. LED displays to indicate burner sequence, all service codes (0-65), fan speed, boiler set point, sensor values including inlet and outlet flue gas and outdoor air temperature.
f. Isolation valve position

L. Factory Testing - Hydrostatic

1. Each boiler shall be a complete factory packaged, hydrostatically tested and bear the ASME - “H” stamp.

M. Factory Testing – Fire testing

1. Each boiler shall be factory fire tested. The boiler manufacturer shall perform this fire test under simulated operating conditions, with the boiler attached to a working chimney system and with water circulating through the boiler. The manufacturer shall provide a fire test report, including fuel and air settings and combustion test results permanently affixed to the boiler.

N. Warranties

1. The boiler manufacturer shall warranty each boiler, including boiler trim, boiler control system, and all related components, accessories, and appurtenances against defects in workmanship and material for a period of eighteen (18) months after the Owner took beneficial use of the installation. The heat exchanger and burner shall be warranted for a period of five (5) years from date of shipment.

O Installation

1. Contractor shall install boilers in strict compliance with manufacturer's written Installation and Owner's Manual.
2. Contractor shall install boilers in strict compliance with all state and local codes.
3. Contractor shall maintain manufacturer's designated clearances around all sides and top of boilers.
4. Contractor shall install boiler components that may have been removed for shipping purposes.
5. Contractor shall install boiler components that were furnished loose for field installation.
6. Electric contractor shall provide all electrical control and power interconnect wiring.
7. The control contractor shall provide all interconnections between boilers and to the building management system.
8. Contractor shall provide all fuel gas vent and service piping.
9. Contractor shall provide all boiler piping connections.
10. Contractor shall install all combustion air intake and exhaust venting as specified.

P. Field Testing

1. The boiler manufacturer representative shall test the *NUROControl System*, burner interlocks, actuators, valves, controllers, gauges, thermometers, pilot lights, switches, etc. for proper function. Any malfunctioning component shall be replaced.
2. All adjustments to the *NURO Control System* and other boiler components shall be performed by the boiler manufacturer's local representative.

R. Start-up, Instructions and Warranty Service

1. The boiler manufacturer's representative shall provide start-up and (18) months warranty of parts and service after the Owner took beneficial use of the installation.

PART 3 -EXECUTION

3.1 INSTALLATION:

A. Furnish and install the hot water piping as shown on plans and required for a complete installation. Furnish and install all control valves, flow valves, air vents, gate valves and/or balancing valves and drain valves.

B. Provide hot water shutoff valves and combination shutoff and balancing cock for all equipment, hose cocks and drain valves at all low points. Provide air vents on all air handling equipment where they are required for proper operation of the system. Furnish and install balancing cocks on return flow of each and air handling unit.

C. All piping work shall be installed with proper provision to allow for expansion and contraction of lines so as to prevent any undue strains on pipe and fittings, any trapping of lines or lifting or dislocating of any appliances.

Rectify without cost to the Town any conditions of noisy circulation due to trapped or air bound lines, including the expense of cutting and repairing of the building structure incident to making such alterations.

F. Install the work to conform to space conditions and the work of other trades. The drawings indicate generally the runs and sizes of piping and, although the size must not be decreased, nor the drawings deviated from, except as unforeseen space conditions may require, the right is reversed to make minor changes in the arrangement of the work to meet conditions arising during construction.

G. Whenever the documents indicate for new piping to connect to an existing piping system, the contractor shall install a temporary corrosion inhibitor system to treat the existing piping. The system shall consist of an injector, piping modifications, and the applicable chemicals required to treat the existing system for a minimum of three weeks prior to any new connections. Upon the installation of the new piping system, the entire system (new and existing) shall be flushed with a chemical cleansing agent."

3.2 TESTING:

A. All flow piping shall be tested and made tight.

B. All piping, including hot water piping, shall be tested and made tight at 100 psi or 50 psi above the city pressure before any piping is concealed or approved.

C. After the system is thoroughly cleaned, it shall be put into operation by this Contractor. All parts of the system shall be thoroughly tested and this Contractor shall carefully instruct the Town's authorized representative as to the proper operation and are of the entire system.

D. All low pressure piping shall be tested and made tight at 100 lbs. per square inch hydrostatic pressure before any piping is concealed or covered.

3.3 BALANCING AND VENTING OF HOT WATER SYSTEM:

A. Contractor shall provide all labor and materials as required to assist the Balancing Contractor in proper balancing of the water systems. Contractor shall return to the job and shall make necessary adjustments and corrections to the systems as required by the Balancing Contractor in order to achieve satisfactory system performance in accordance with design parameters.

B. Contractor shall carefully vent the system when filling same and return to the job during the eighteen months guarantee period as required to assure the Town of a proper operating system.

C. System shall be slowly filled with cold water to purge air and shall maintain 4 psig on a gauge located conveniently near the top of the system.

END OF SECTION 235000

SECTION 235123 TYPE "B" VENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

B. The General Requirements in Section 200050 shall also govern the work under this Section.

C. Examine all drawings and data and coordinate the work of this Section with all related and adjoining work.

1.2 SCOPE

A. This Section includes specifications for furnishing and installing Type B Vent.

1.3 SUBMITTALS

Submit the following in accordance with Section 200050:

A. Catalog cuts
B. Installation drawings C. Installation instructions
D. Sample of warranty

1.4 QUALITY ASSURANCE

A. APPLICABLE STANDARDS

B-Vent products shall be listed to UL-441 and carry the appropriate UL or cUL listing mark or label. The installation of B-Vent products shall conform to the requirements of NFPA-54, NFPA-211 and the manufacturer's installation instructions.

B. WARRANTY

Type B Vent shall be warranted by the manufacturer against defects in material and workmanship for a period of (18) Months from the date of the original installation.

PART 2 PRODUCTS

2.1 TYPE B VENT

A. The vent shall be of the double-wall, factory-built type for use with approved Category I appliances burning natural or LP gas, which produce flue gases exhausted at temperatures not exceeding 550º F.

B. The vent shall be constructed of an outer wall of galvanized steel, .018" thick G-90 for sizes 3" to 14" diameter, and .024" thick G-90 for sizes 16" to 30" diameter.

The inner wall shall be constructed of aluminum alloy, .012" thick for sizes 3" to 8" diameter and .018" thick for sizes 10" to 30" diameter.

The vent shall include an integral, annular insulating air space, 1/4" thick for sizes 3" to 6" diameter and 1/2" thick for sizes 7" to 30" diameter.

C. Edges of inner and outer walls shall be hemmed prior to final assembly to prevent pipe and fittings from having exposed sharp edges. Walls shall be attached to maintain spacing and prevent separation of inner and outer walls.

D. The vent pipe shall incorporate a push-tab locking system to prevent disassembly of vent during or after installation.

E. All fittings, flashing, storm collar, cap, and appliance adapter required to install the vent shall be included.

F. Vent shall be tested and listed for a minimum clearance to combustibles of 1" for sizes 3" to 24" diameter and 2" for sizes 26" to 30" diameter.

G. Vent shall terminate as required by code.

H. B-Vent shall be installed in accordance with the vent manufacturer's installation instructions, UL listing and state or local codes.

2.2 AVAILABLE MANUFACTURERS

Vent pipe shall be Model M with Sure Lock B-Vent Locking System as manufactured by Metal-Fab Inc.

PART 3 - EXECUTION

A. Store delivered materials inside, out of the weather. Protect materials from accidental damage or vandalism.

B. Installation shall conform to the manufacturer’s installation instructions, UL listing and state or local codes.

C. Support chimney from building structure using rigid structural shapes for attachment of fixed point supports (Plate Support Assembly). Anchor supports to structure by welding, bolting, steel expansion anchors, or concrete inserts. Size of structural shapes shall be in accordance with manufacturer’s recommendations.

D. Coordinate installation of dampers or fans. Dampers or fans shall be supported independently from the chimney sections. Protect chimney from twist or movement due to fan torque or vibration.

E. Protect incomplete chimney installations by attaching temporary closures over open ends of sections.

F. Clean all chimneys and breechings of dust and debris prior to final connection to appliances.

END OF SECTION 235123

SECTION 235133 - BREECHINGS, CHIMNEY, AND STACKS FOR CONDENSING APPLIANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

B. The General Requirements in Section 200050 shall also govern the work under this Section.

C. Examine all drawings and data and coordinate the work of this Section with all related and adjoining work.

1.2 SUMMARY

A. Section Includes:
1. Venting for the removal of products of combustion for Category II, III, IV gas burning appliances

1.3 REFERENCES

A. Underwriters Laboratories (UL):
1. UL1738

B. National Fire Protection Association (NFPA):
1. NFPA 54 – National Fuel Gas Code

1.4 QUALITY ASSURANCE

A. Comply with NFPA 54
B. Must install duct in accordance to manufacturer's listings and installation instructions.
C. Components coming in contact with the products of combustion shall carry the appropriate UL or CUL listing, mark or label.

1.5 WARRANTY

A. Condensing Appliance vent listed to UL1738 shall have a limited lifetime warranty to begin at the date of installation. Any portion of the vent repaired or replaced under warranty shall be warranted for the remainder of the original warranty period.

PART 2- PRODUCTS

2.1 AVAILABLE MANUFACTURERS

A. Listed Double-Wall vent for condensing appliances, as manufactured by Metal-Fab, Inc.

2.2 LISTED VENTING FOR CONDENSING APPLIANCES

A. The condensing appliance vent shall be double-wall for use with Category II natural draft appliances and Category III or IV positive pressure appliances.

B. Maximum temperature shall not exceed 550˚ F (288˚ C).

C. Vent shall be listed for an internal static pressure of 6" w.g. and tested to 15" w.g. for diameters 6-36 inches and 10" w.g. for diameters 3-5.

D. Vent shall be constructed of a material tested to UL1738, .015 thickness for 3"-12" diameters, .024 thickness for 14" to 24" diameters, and .035 thickness for 26" to 36" diameters.

E. Outer casing shall be constructed of aluminized steel, type 430, 304, 316 stainless steel of .018 thickness for 3"to 12" diameters, .024 thickness for 14" to 24" diameters, and .035 thickness for 26" to 36" diameters.

PART 3 - EXECUTION

3.1 STORAGE AND CONSTRUCTION

A. Protect materials from accidental damage.

B. All supports, roof or wall penetrations, terminations, appliance connectors and drain fittings required to install the vent system shall be included.

C. Joint assembly utilizes flanged mating surfaces with a factory supplied gaskets for diameters 6" through 24", for diameters 26" to 36" P070 sealant will be used on the flange surface. Flanges are joined with a vee band secured by tightening draw bolts. Diameters 3-5 inch utilize a snap-lock, gasketed connection.

D. Where exposed to weather, the outer closure band shall be sealed to prevent moisture from entering the space between the walls.

E. All parts exposed to the weather shall be protected by one (1) coat of corrosion and heat resistant base primer and one (1) coat of heat resistant paint unless constructed of 430, 304 or 316 stainless steel.

F. Vent shall terminate in accordance with installation instructions and local codes.

G. Installation shall conform to manufacturers installation instructions.

END OF SECTION 235133

SECTION 260000 GENERAL ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The General Provisions of the Contract, including General and Supplementary Conditions and Division 1, General Requirements, apply to the work specified in this Section.

B. Section 260000, General Electrical, shall govern the work under all Sections of Division 26.

1.2 DESCRIPTION:

A. Work Included: The electrical work shall consist of all labor, equipment and services required to complete, ready for correct operation, all of the work called for by the accompanying drawings and these specifications.

B. The work shall include, but is not limited to:

1. Demolition.
2. Raceways and Boxes.
3. Branch Circuit Wiring.
4. Wiring Devices.
5. Circuit Breakers.

1.3 SITE CONDITIONS:

A. Prior to submitting bid, visit the site and identify existing conditions and difficulties that will affect work called for by the Contract Documents.

B. No compensation will be granted for additional work caused by unfamiliarity with site conditions that are visible or readily construed by experienced observers. Include in the bid amount all demolition work required.

C. The Contractor shall verify and obtain all necessary dimensions at the site.

1.4 DEFINITIONS:

A. Furnish: The word "furnish" is used to mean "supply and deliver the referenced item to the project site, ready for unloading, unpacking, assembly, and installation".

B. Install: The word "install" is used to describe operations at the project site involving the referenced item including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations".

C. Normally Occupied: The words "normally occupied" are used to mean "all rooms within a building except for crawlspaces, underground tunnels, attic spaces, mechanical rooms, telephone rooms, data distribution rooms, and electrical rooms".

D. Or Approved Equal: The words "or approved equal" are used to mean "any product which in the opinion of the Engineer is essentially equal in quality, size, arrangement, appearance, construction, and performance to that product specified or shown on the drawings".

E. Provide: The word "provide" means "to furnish and install the referenced item, complete and ready for the intended use".

F. Remove: The word "remove" means "to disconnect from its present position, remove from the project site, and to dispose of in a legal manner".

1.5 QUALITY ASSURANCE:

A. Codes and Standards

1. All work under this section shall comply with the applicable requirements of the National Electrical Code, local electrical and other codes, laws, regulations and standards including those of all state authorities. Where references are made in laws codes regulation and standards, these documents, including the latest revisions and amendments in effect as of the date of bid opening, shall form part of these specifications. Upon completion of the work, the contractor shall furnish Certificates of Approval from the local inspection authorities having jurisdiction for approving materials, equipment, installation pertaining to the electrical work as may be required by the local and/or state authority for the issuance of a permanent Certificate of Occupancy. All expenses arising from the procurement of these Certifications shall be paid by the contractor and shall be included in the lump sum contract price.

2. In addition to complying with the specified requirements, comply with all Federal, State and Local Codes wherever applicable including the following: 2018 Connecticut State Building Code, 2015 IBC, 2018 Connecticut Fire Safety Code , 2015 International Fire Code, 2013 NFPA 72 National Fire Alarm Code, 2017 NFPA 70 National Electrical Code as amended by the State Building Code , 2015 International Energy Conservation Code, ICC/ANSI A117.1-2009 Accessible and Usable Buildings and Facilities, and ADA.
3. Comply with the requirements of the Local Authority Having Jurisdiction.
4. Materials and equipment shall be UL listed where standard has been established.
5. Perform tests required by specifications, Engineer's instructions, laws, ordinances or public authorities, approvals, and give Owner timely notice. Notify the Owner of dates for inspection by other authorities.
6. In the event of conflict between or among specified requirements and pertinent regulations, the more stringent requirement will govern.
7. Reference made to codes and standards shall be interpreted as minimum requirements. Provide and perform work in excess of codes and standards as indicated by drawings or specifications.

B. Submittals

1. The contractor shall submit for approval a complete list of materials, fixtures and equipment to be incorporated in the work. The list shall include manufacturer's names

and catalog numbers, descriptive data, manufacturer's ratings and application recommendations, cuts, diagrams, performance curves and such other information as may be required by the Owner to judge compliance with the requirements of the contract and suitability to the application. Items on the list shall be clearly identified as to proposed application. Approval of materials and equipment will be based on manufacturer's published ratings. Submittal procedures shall be in accordance with Division 1 of these specifications.

2. When directed by the Owner, the contractor shall submit in approved form for record, a Certificate of Compliance with a cited code or standard for the designated materials and equipment; such certificates may be accepted in lieu of samples. Any materials or equipment submitted for approval, which are not in accordance with the specifications requirements may be rejected.

3. As part of the coordination work required of the contractor, installation drawings shall be prepared by the contractor as necessary. It is intended that these drawings be used to coordinate the work of the various trades and to clarify details of proposed assembly, erection and installation. Installation drawings shall be prepared when indicated in these specifications or on the electrical drawings, or when directed by the Owner for comment or approval when an installation condition or problem arises which the contractor wishes the Owner to review. All installation drawings submitted for review will be considered and treated as shop drawings and the requirements pertaining to shop drawings shall govern.

C. Equipment alternates, substitutions, and deviations:

1. Wherever more than one manufacturer is mentioned in the specifications or on the drawings, any of those named shall be considered equally acceptable to that on upon which design was based, and providing all aspects of the specification are met insofar as quality, construction, performance, space requirements, noise levels and special accessories or materials, any of those named may be included in Contractor's bid.

2. Bidders wishing to obtain approval on brands other than those specified by name shall submit their request to the Engineer not less than ten (10) business days before the date fixed for opening of bids. Approval by the Engineer will be in the form of an Addendum to the specifications issued to all prospective bidders, indicating that the additional brand or brands are approved as equal to those specified so far as the requirements of the project are concerned.

3. Wherever a single manufacturer is used in the specifications or on the drawings and is followed by the words "or approved equal" the Contractor must use the item named or he may apply for an alternate equipment deviation.

4. Alternate equipment to that specified or shown on the drawings, as proposed to be provided by the contractor, must be essentially equal in quality, size, construction, and performance to that item specified or shown on the drawings.

5. Submittals for alternate equipment shall list all deviations and differences from the specified equipment. Failure to submit this list will result in rejection of the submittal.

Any deviations and differences not listed but discovered after installation shall be rectified as directed by the Engineer at the Contractor's cost.

6. Furnish samples of alternate equipment proposed to be provided when so requested by the Engineer.

7. Where the Contractor proposes to use an item of equipment which differs from that upon which design was based, which requires any redesign of the structure, partitions, foundations, piping, wiring or of any other part of Mechanical, Electrical Layout, all such redesign, new drawings or detailing required shall be prepared by Contractor at his own expense for approval of the Engineer.

8. Where approved substitutions or deviations require a different quantity, size or arrangement of structural supports, wiring, conduit, piping, ductwork, and equipment from that upon which design was based, all additional items required by the systems shall, with the approval of the Engineer, be furnished by Contractor at no additional cost to Owner.

D. Allow sufficient time so that the delivery and installation of equipment will not be delayed as a result of the time required to review, process and transmit submittals, including resubmittals. Failure by the Contractor to transmit submittals to the Engineer in ample time for review and processing shall not entitle him to an extension of the Contract Time and no claim for an extension of time by reason of such default will be allowed.

E. Submittals, shop drawings, and samples will be reviewed with reasonable promptness and will be stamped indicating appropriate action as follows:

1. "No Exceptions Taken" means that fabrication, manufacture, or construction may proceed providing submittal complies with contract documents.
2. "Amend as Noted" means that fabrication, manufacture, or construction may proceed, providing the submittal complies with Engineer's notations and contract documents.
3. "Resubmit" means that submittal, or equipment proposed to be provided, does not comply fully with the contract documents and that fabrication, manufacture, or construction shall not proceed. Resubmit in accordance with the Engineer's notations and contract documents.
4. "Rejected" means that submittal does not comply with contract documents, or that equipment proposed to be provided does not comply with the specified requirements or is not equal or better in quality and performance than that item specified. Fabrication, manufacture, or construction shall not proceed. Resubmit in accordance with the contract documents and specified requirements.

F. If material or equipment is installed prior to review, or without review, it shall be removed and replaced at no extra charge to the Owner if, in the opinion of the Engineer, the material or equipment is not in compliance with the Contract Documents.

G. Record Drawings

1. The contractor shall maintain an accurate record of all deviations in work as actually installed from work as indicated. This record shall be kept current and shall be kept available at the site for inspection. Upon completion of the work, and before final payment

is authorized, marked prints with signed certifications of accuracy shall be delivered to the engineer.

H. Manuals

1. The contractor shall furnish to the Owner operating and maintenance instructions for each piece of equipment and each device.

2. The instructions shall provide detailed descriptions of the operation and maintenance of the equipment or device and shall include manufacturer's literature, detailed wiring diagrams, device internal wiring diagrams, characteristics curves and graphs, data sheets and descriptive literature. The instructions shall be furnished to the Owner 30 days prior to the completion of the building work.

I. Product Handling

1. All work, materials and equipment, whether incorporated into the building or not, shall be protected from damage due to moisture, dirt, plaster, concrete, or from carelessness.
2. All material and equipment which is damaged, including installed work, shall be repaired or replaced to the satisfaction of the Owner.

3. After work is complete, all equipment, including switchboards, transformers, panelboards, lighting fixtures and lamps, shall be cleaned of all construction dirt.

1.6 INTENT OF SPECIFICATIONS:

A. It is the intent of these Specifications each subcontractor or equipment suppliers to furnish all equipment complete with all motors, drives and magnetic starters throughout for all equipment furnished under these specifications. The above shall also apply to any additions to this Contract, either as covered by and Addenda or Change Orders.

B. The Electrical Contractor shall provide overload and short circuit protection for all motors unless provided by equipment supplier for packaged type equipment.

1.7 GUARANTEE FOR EQUIPMENT AND SYSTEMS:

A. Refer to Specifications.

B. The entire Electrical System included under this Section of the Specifications shall be guaranteed by this Contractor against original defects of equipment and workmanship for a period of 18 months from date of acceptance, unless otherwise specified.

1.8 CUTTING AND PATCHING:

A. Cutting and patching for all electrical work inside building shall be done in accordance with Division 1.

1.9 SLEEVES AND OPENINGS:

A. This Electrical Contractor shall furnish and install all necessary sleeves and openings as required to permit the installation of the electrical systems.

1.10 ACCESS PANELS:

A. Provide access panels to make all junction and pull boxes accessible as required by The National Electrical Code.

1.11 PAINTING:

A. All painting of electrical work will be done in accordance with Division 9 unless otherwise specified.

1.12 RUBBISH AND CLEANING:

A. This Contractor shall be responsible for removal of all rubbish and trash created by the installation of the electrical systems and equipment from the job site. Contractor shall sweep clean all areas.

1.14 INSTRUCTIONS:

A. The Superintendent of the electrical work for this particular project shall spend all necessary time required to instruct the custodians of the building, together with representatives from the Maintenance Department, in the installation including all special controls and devices installed or connected under this contract.

1.15 POWER SHUTDOWNS:

A. Any power shutdown required for the completion of the electrical work shall be scheduled with the owner at least ten working days in advance and shall be done at owner's convenience.

1.17 SEISMIC:

A. Provide seismic restraining devices on all required items of electrical equipment in accordance with ICC Chapter 16. Refer to specification Section 200050 and details on mechanical drawings.

END OF SECTION 260000

SECTION 260500 BASIC ELECTRICAL MATERIALS & METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The Bidding Requirements, Contract Forms and Conditions of the Contract, including General Conditions of the Contract for Construction, and Division 1 - General Requirements, apply to the work specified in this Section.

B. Section 260000, General Electrical, shall also govern the work under this Section.

C. This Section includes requirements that are binding on other Sections of Division 26.

1.2 SCOPE:

A. Scope of work consists of installation of materials to be furnished under this Section, and without limiting generality thereof consists of furnishing labor, materials, equipment, hoisting, plant, transportation, rigging, staging, appurtenances, and services necessary and/or incidental to properly complete all electrical work as shown on the drawings, as described in these specifications or as reasonably inferred from either as being required in opinion of the Owner.

B. Work Included: Provide complete electrical services where shown on the drawings, as specified herein and as needed for a complete and proper installation including but not necessarily limited to:

1. General
2. Conduits & Raceways
3. Identification
4. Wire and Cables
5. Wiring Devices
6. Outlet Boxes, Junction Boxes, Pull Boxes
7. Supporting Devices
8. Disconnect Switches
9. Grounding.
10. Circuit Breakers.

1.3 QUALITY ASSURANCE:

A. Refer to Section 260000.

1.4 SUBMITTALS:

A. Shop Drawings: Submit for all items listed in Paragraph 1.2.B.

PART 2 - PRODUCTS

2.1 GENERAL:

A. Provide only materials that are new and of type and quality specified, or approved equal. Where Underwriters' Laboratories, Inc. has established standards for such materials, provide only materials bearing the UL label.

B. Provide materials and equipment necessary to make installation complete in every detail, and to conform to manufacturers' latest installation instructions, under this contract whether or not specifically shown on drawings or specified herein.

2.2 TEMPORARY FACILITIES:

A. Refer to the requirements of Division 1 regarding temporary facilities.

B. Scaffolding and other temporary construction shall be rigidly built in accordance with Local and State requirements. Remove from premises upon completion of work.

C. Provide temporary construction required for electrical work as directed by the Owner.

2.3 RACEWAYS:

A. Electrical Metallic Tubing:

1. Shall be manufactured from high grade mild strip steel, shall be hot dipped galvanized, and shall be chromated and lacquered to form additional protective layer. EMT conduit shall conform to UL 797 and ANSI C80.3 and shall be as manufactured by Allied Tube and Conduit, or approved equal.
2. Connectors and couplings shall be galvanized steel set screw type. Provide gland compression type couplings and connectors for exposed work in wet locations.
3. Shall be used all branch circuit wiring.

B. Flexible Steel Conduit:

1. Shall be manufactured from high grade strip steel and shall be hot dipped in a molten zinc bath. The steel strip shall be formed into interlocking convolutions that are continuously joined, metal to metal, assuring continuous grounding contact. Flexible steel conduit shall be UL listed and shall be as manufactured by AFC Cable Systems, or approved equal.
2. May be used in short lengths where EMT cannot be installed due to interferences and obstacles.
3. Provide for final connections to motor driven equipment or where subject to vibration.

C. Liquid tight Flexible Steel Conduit:

1. Shall be similar to flexible steel conduit, but with pressure-extruded moisture and oil-proof outer jacket of gray polyvinyl chloride plastic. Liquid tight flexible steel conduit shall be UL listed (UL 360) and shall be as manufactured by AFC Cable Systems, or approved equal.

2. Fittings, couplings and connectors shall be hot dipped galvanized and threaded, liquid tight type.
3. Provide where located outdoors or in damp or wet areas for final connections to motor driven equipment or where subject to vibration.

2.4 IDENTIFICATION:

A. Identify all junction boxes and pull boxes installed above ceilings and in unfinished spaces with branch circuit designations. Identification shall be done with black felt tip permanent marker in a neat and readily legible manner.

2.5 SAFETY SWITCHES:

A. Furnish and install disconnect switches where shown on the drawings..

2.6 CONDUCTORS:

A. All branch circuit conductors shall be copper rated 600 volts, 90 deg. C., Type THWN-2.

B. Grounding electrode conductors and bonding conductors shall be soft drawn copper, ASTM B3 solid bare copper for sizes smaller than #8AWG, ASTM B8 stranded bare copper for sizes #8AWG and larger.

C. Minimum gauge conductors for power and lighting shall be #12 AWG. Increase to #10 AWG for runs exceeding 75'-0", and #8AWG for runs exceeding 150'-0".

D. Wire Size #8 AWG and larger shall be stranded. Wire of size smaller than #8 AWG shall be solid.

E. Wire and cable conductors shall be soft drawn copper with conductivity of not less than 98 percent of ANSI Standard for annealed copper. Aluminum conductors shall not be used.

2.7 OUTLET, JUNCTION AND PULL BOXES:

A. Provide outlet boxes as required for a complete installation.

B. Outlet boxes shall be code gauge galvanized steel and shall be of shapes and sizes to suit their respective locations and installations, and shall be provided with covers to suite their function and installation. Outlet boxes shall be equipped with fixture stud or straps where required.

C. The minimum box size for all wall outlet boxes shall be nominal 4” square x 2 1/8” deep (2-gang). Provide larger size outlet boxes, or gangable type boxes where required for the installation.

D. For exposed work in normally unoccupied (unfinished) areas, provide pressed steel boxes with galvanized or cadmium plated steel covers with rounded corners. Provide cast boxes for work exposed to wet locations and where called for on the drawings.

E. For above ground pull boxes, provide galvanized code-gauge sheet steel units with screwed on covers, of size and shape required to accommodate wires without crowding, and to suit the location. Provide pull boxes as specified herein, as required for job conditions, and as follows:

1. Indoors: NEMA Type 1.
2. Outdoors or Damp or Wet Locations: NEMA Type 3R.
3. Hosedown and Splashing Water Locations: NEMA Type 4.

H. Wireways shall be code gauge galvanized steel, manufactured standard sections and fittings, with hinged and/or screw covers, indoors NEMA Type 1/Outdoors NEMA Type 3R. Wireways shall be sized to code conductor fill requirements and shall be provided as required for job conditions.

2.8 WIRING DEVICES:

A. All devices shall be furnished in Hubbell or approved equal in Pass & Seymour, or Leviton. Devices specified herein are based on Hubbell unless otherwise noted.

B. Lighting Switches:

1. Toggle Type: Institutional Heavy Duty specification grade, flush mounting, quiet operation AC type with abuse resistant colored nylon toggle operator, heat resistant composition plastic housing, silver cadmium oxide contacts and copper alloy spring contact arm. Rated at 120-277 VAC, capable of full capacity on tungsten or fluorescent lamp load. Designed for side or back wiring with up to No. 10 wire, and with #8 brass terminal screws.

	20 AMP	30 AMP
Single Pole	#HBL1221	#HBL3031
Two Pole	#HBL1222	#HBL3032
Three way	#HBL1223	#HBL3033
Four way	#HBL1224	-

C. Receptacles:

1. Duplex convenience receptacles shall be heavy duty specification grade, 2 pole, 3 wire grounding, NEMA 5-20R, rated 20AMP at 125 Volts AC.

2. Receptacles shall have a one-piece nickel plated brass wrap around mounting strap with integral ground contacts and ground tension retaining clips, tandem bypass contact, heat resistant thermoplastic rynite base, and high impact thermoplastic polyester face. Receptacles shall be back and side wired, shall have a back wired green ground terminal, automatic ground clip, and threaded bronze square head center rivet assembly. Duplex Receptacle #HBL5362

3. Ground Fault Duplex convenience receptacles shall be heavy duty specification grade, 2 pole, 3 wire grounding, NEMA 5-20R, rated 20AMP at 125 volts AC. Receptacles shall have a solid brass wrap around mounting strap with pre-tensioned ground contacts, tandem modified bypass contacts, all glass circuit board with conformal coating for superior moisture immunity, 7 noise filtering capacitors, heat resistant thermoplastic base and high impact nylon face. Receptacles shall be side wired and shall have a green ground terminal. Duplex GFCI Receptacle #GF5362.

D. Cover Plates:

1. Cover plates shall be specification grade non-magnetic Type 302 stainless steel, brushed finish. Where multiple devices are ganged together they shall be mounted under a common cover plate. Provide switch and receptacle combination plates where switches and receptacles are located together. Cover plates shall be furnished in same Manufacturer as devices.

2.9 CIRCUIT BREAKERS:

A. Provide circuit breakers as noted on the drawings.

2.10 ACCESS PANELS:

A. Provide access panels for electrical equipment and wiring splices which are not readily accessible. This includes electrical equipment and wiring splices installed above hung ceilings which are not readily removable, within walls, inside chases, or inside dead cavity spaces.

B. Access panels shall be prime painted steel, with screwdriver lock, shall bear the same fire rating as the wall or ceiling in which they are installed, and shall be of sufficient size for wiring splice access or electrical equipment removal and replacement.

Access panels shall be provided in Milcor manufacture, or approved equal. Provide Milcor Type A in acoustical tile surfaces, Type K for plastered surfaces, and Type M for masonry construction.

2.11 OTHER MATERIALS:

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the contractor subject to the approval of the engineer.

PART 3 - EXECUTION

3.1 GENERAL:

A. Unless specifically noted or shown otherwise, install all equipment and material specified herein or shown on drawings whether or not specifically itemized herein. PART 3 covers particular installation methods and requirements peculiar to certain items and classes of materials and equipment.

B. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until satisfactory conditions are corrected.

C. The electrical drawings are diagrammatic, but are required to be followed as closely as actual construction and work of other trades will permit. Where deviations are required to conform with actual construction and the work of the other trades, make such deviations without additional cost to the Owner.

D. Data indicated on the drawings and in theses specifications are as exact as could be secured, but their absolute accuracy is not warranted. The exact locations, distances, levels and other conditions will be governed by actual construction and the drawings and specifications should be used only for guidance in such regard.

E. Verify all measurements at the building. No extra compensation will be allowed because of differences between work shown on the drawings and actual measurements at the site of construction.

F. Do not scale drawings. Scale indicated on drawings is for establishing reference points only. Actual field conditions shall govern all dimensions.

G. Coordinate:

1. Coordinate as necessary with other trades to assure proper and adequate provisions in the work of those trades for interface with the work of this Section.
2. Coordinate delivery of electrical equipment to project prior to installation. Equipment stored for an extended period of time prior to installation may be subject to rejection by Engineer.
3. Coordinate the installation of electrical items with the schedule for work of other trades to prevent unnecessary delays in the total work.
4. Where electrical items are shown in conflict with locations of structural members and mechanical or other equipment, provide required supports and wiring to clear the encroachment.
5. Prior to roughing, the contractor shall obtain exact fixture and device locations from the Engineer. Outlet and fixture locations shown on the drawings are to be used for general reference only. Roughing of fixtures and outlets shall not proceed until exact locations, heights, and orientations of fixtures and outlets have been agreed upon with the Engineer and Owner.
6. Arrange installation to provide access to equipment for easy maintenance and repair.

3.2 INSTALLATION OF RACEWAYS AND FITTINGS:

A. Install wire and cable in approved raceways as specified and as approved by authorities having jurisdiction.

B. All conduits shall be concealed from view above ceilings, in chases, and in walls. Conduits may only be installed exposed to view in mechanical and electrical rooms and where run overhead in rooms without ceilings.

C. Run conduit and cable parallel to or at right angles with lines of the building, to present a neat appearance.

1. Make bends with standard conduit elbows or conduit bent to not less than the same radius.
2. Make bends free from dents and flattening.

D. Provide code sized conduit unless a larger size is shown on the drawings or specified herein. Minimum size shall be ¾".

E. Securely and rigidly support conduit throughout the work with approved conduit clips and hangers all in conformance with code seismic requirements.

1. Do not use mechanics wire for supporting conduit.
2. Do not support conduits on hung ceilings or from mechanical or electrical equipment.

3. Steel supports and racks shall be galvanized steel channel and fittings, unistrut or approved equal.
4. Provide clamps and support rods as required.
5. Steel support rods or support bolts for conduits shall be 1/8 inch diameter for each inch or fraction thereof of diameter of conduit size, but no rod or bolt shall be less than ¼" in diameter.
6. Horizontal and vertical conduit supports shall not be more than 10' apart or more than 1' from any fitting.

F. Do not install conduit runs exposed on the building exterior.

G. Maintain at least 3" clearance between conduits and heating pipes when running parallel to these pipes, and at least 1" clearance when running perpendicular to these pipes.

H. Provide double locknuts on all conduits terminating in sheet metal enclosures.

I. Provide expansion couplings for rigid metallic and non-metallic conduits where such conduits are subject to thermal expansion and contraction.

J. Provide full wall steel flexible conduit for all conduit penetrations through fire walls. Full wall steel flexible conduit shall be 3-hour through penetration fire wall rated and shall be as manufactured by AFC Cable Systems, or approved equal.

K. Provide necessary sleeves and chases where conduits and cables pass through floors, walls, ceilings, and roofs, and provide other necessary openings and spaces, all arranged for in proper time to prevent unnecessary cutting. Perform cutting and patching in accordance with the provisions for the original work.

L. Provide offsets prior to entrance into outlet boxes and other electrical equipment for proper adjustment to finished building surfaces.

M. Seal around all conduit and cable penetrations through fire rated walls and ceilings with 3M Brand CP25N/S fire barrier caulking.

N. Carefully clean and dry all conduit before installation of conductors. Plug conduit ends to exclude dust, moisture, plaster, or mortar while building is under construction. Lubricants or cleaning agents which might have deleterious effect on conductor coverings shall not be used for drawing conductors into raceways.

O. All wiring shall be installed in electrical metallic tubing unless otherwise specified herein or called for on the drawings.

3.3 SLEEVES:

A. Provide EMT sleeves for each conduit and cable passing through walls, partitions, and floors.

1. Set pipe sleeves in place before wall, floor, or partition is finished. Seal between sleeves and wall, partition, or floor.
2. Support conduit and cable free from sleeves.

3. Provide sleeves two pipe sizes larger than the conduit or cable passing through, or provide a minimum of ½" clearance.

B. Caulk the space between sleeve and conduit or cable using 3M Brand OP25N/S fire barrier caulking.

C. Fireproof all penetrations made in fire rated walls or floors with UL approved materials to prevent passage of fire and smoke and maintain original fire rating of floors or walls.

D. Provide chrome plated escutcheon plates for each sleeve where exposed to view in finished areas.

3.4 CONDUCTOR INSTALLATION:

A. General:

1. The interior of all conduits shall be cleared of burrs, moisture, dirt and obstructions before wires are pulled.

2. Lubricant for pulling wires shall be inert to cable and conduit, shall not in any way restrict ease of pulling through conduit with passage of time, and shall be special lubricant designed specifically for cable pulling and shall be chemically compatible with cable.

B. Color Coding:

1. Consistent phase identification of all conductors shall be maintained as follows:

	120/208V
Phase A	Black
Phase B	Red
Phase C	Blue
Neutral Wire	White

Provide colored plastic tape of specified color code identification for large size conductors available only in black. Wrap tape three complete turns around conductor, at ends and at connections and splices. Provide same color coding for switch legs as corresponding phase conductor.

C. Minimum Conductor Sizes:

1. The minimum branch circuit conductor size shall be #12AWG. Provide #10AWG conductors for branch circuits where the conductor run exceeds 75 feet, and #8AWG conductors where the conductor run exceeds 150 feet.

D. Provide the number of conductors required for a given branch circuit, or as required for circuitry, whether indicated on the drawings or not.

E. Neutral Conductors:

1. All branch circuits shall be installed with a separate neutral conductor. Shared neutrals for groups of branch circuits shall not be permitted.

F. Provide each circuit with a dedicated ground wire. Use #12 minimum size.

G. Identify conductors passing through pull boxes, junction boxes, and wireways to indicate circuit designation. Identify pull boxes and junction boxes as specified herein.

H. Branch circuit wiring and arrangement of home runs have been designed for maximum economy consistent with adequate sizing for voltage drops, circuit ampacities and other considerations.

1. Install the wiring with circuits arranged as shown on the drawings, except as otherwise approved in advance by the Engineer.

2. Do not make changes and rearrange circuits without prior approval.

3. If more than 3 current carrying conductors are installed in one conduit they shall be derated in accordance with the National Electric Code.

4. Do not install more than three 30 Amp single phase or four 20 Amp single phase circuits in the same conduit. Do not run emergency and normal power wiring in the same conduit.

I. Splices and Connections:

1. Makes splices electrically and mechanically secure with pressure-type connectors.

   a. For wires size #8AWG and smaller, provide solderless, screw-on connectors, "Scotch-Lock" or equal, 600V rating, of size and type to manufacturer's recommendation, with temperature ratings equal to the conductor insulation.
   b. Make splices and terminations to conductors #6AWG and larger with corrosion-resistant, high conductivity, pressure indent, hex screw or bolt clamp connectors, with or without tongues, designed specifically for intended service.

2. Insulate splices with a minimum of two layers of scotch brand No. 33 vinyl-plastic electrical tape where insulation is required.

3. Tape joints as required with rubber tape 1 ½ times the thickness of the conductor insulation, then cover with the vinyl-plastic electrical tape specified above.

4. Provide high conductivity copper alloy bolt-on lugs with pressure plate and socket set screw or hex head screw to attach wire and cable to disconnect switches, transformers, and other electrical equipment as required.

3.5 OUTLET BOXES:

A. All outlet boxes in finished areas shall be concealed from view above hung ceilings or recessed (flush) in walls and floors. Outlet boxes may only be exposed to view or surface mount type in mechanical and electrical rooms, or for feeding items overhead in rooms without ceilings.

C. Install outlet boxes at uniform heights and straight and true with reference to walls, floors, ceilings and casework.

D. Provide knockout plugs in boxes with unused openings.

E. Secure all outlet boxes to building structure with metal straps, rods, or bolts independently of entering conduits or cables.

F. Provide bar hanger outlets in hollow framed partitions with bar hanger secured to partition studs with self-threading screws, or drill through hangers with Caddy or equal clips.

G. Provide horizontal separation for outlet boxes mounted on opposite sides of common wall. Back to back or thru-wall boxes will not be permitted.

3.6 PULL BOXES AND JUNCTION BOXES:

A. Provide pull boxes and junction boxes where shown on the plans and where required to facilitate proper pulling of wires and cables. Install pull boxes or pull fittings no less than one every 100 ft. of straight horizontal conduit run, or three 90 degree bends, unless otherwise noted.

3.7 WIRING DEVICES:

A. Wherever possible install switches directly adjacent to the strike side of door. Check drawings for door swing.

B. Device mounting heights indicated below are general. Refer to drawings for special cases. Mounting heights are to centerline of device whether shown on plans or indicated below.

Receptacles	1’-6” AFF
Switches	4’-0” AFF

C. Where receptacles and outlets are shown over counters, refer to drawings for mounting heights.

D. Install receptacles vertically with grounding posts at top of device, except locate grounding post to left for horizontal mounting.

3.8 WIRING DEVICE PLATES:

A. Set plates so that all edges are in contact with mounting surface. Provide common device plate for multi-device locations.

B. Provide electric outlet and switch sealers for all receptacles, switches and technology outlets installed at exterior walls.

C. Align all wall plate screws with screw slots aligned in the vertical position.

3.9 MOTOR POWER AND CONTROL WIRING:

A. Contractor shall provide and be responsible for the complete power wiring of all motors and motorized equipment.

B. Furnish proper overload and short circuit protection for all new motors. Provide a combination thermal overload and disconnect for switch all equipment using fractional horsepower motors.

C. Check electrical connections and sizing of motor circuit protection and prevent damage to motor and equipment from incorrect direction of rotation.

D. Provide mounting for motor and equipment disconnect switches adjacent to motor and supported independent of motor.

E. Connections to miscellaneous building equipment:

1. Wire to and connect to, all items of building equipment not specifically described in this Section but to which electrical power is required.

2. Coordinate as necessary with other trades and suppliers to verify types, numbers and locations of equipment.

3.10 GROUNDING SYSTEM:

A. Provide a complete grounding system which will thoroughly ground the non-current carrying metal parts of every piece of installed equipment, as described herein and as indicated on the drawings.

B. System shall be mechanically and electrically connected to provide an independent return path to the grounding sources.

C. Each grounding conductor shall have a minimum capacity of 25 percent of the rated capacity of the equipment it grounds, unless otherwise indicated.

D. The minimum size of grounding conductors shall be No. 12 AWG copper. Insulation color of grounding conductors shall be green.

E. Provide a separate green ground conductor for each branch circuit.

3.11 SPECIAL REQUIREMENTS:

A. Wiring shall be bundle tied where passing through pull boxes, wireways, and panelboards in neat and orderly manner with plastic cable ties. Cable ties shall be Ty-Raps as manufactured by Thomas & Betts, or equal.

B. Provide miscellaneous hardware and support accessories, including support rods, nuts, bolts, screws, and other such items, with galvanized or cadmium plated finish, or other approved rust inhibiting coatings.

C. Unload electrical equipment and materials delivered to site. Pay cost for rigging, hoisting, lowering and moving electrical equipment on site, in building or on roof. During construction provide additional protection against moisture, dust accumulation and physical damage of electrical equipment. Provide temporary heaters within units, as approved to evaporate excessive moisture and provide ventilation as required.

3.12 TESTING AND INSPECTION:

A. Provide personnel and equipment, make required tests, and secure required approvals from the Engineer and governmental agencies having jurisdiction.

B. When material and/or workmanship is found to not comply with the specified requirements, within three days after receipt of notice of such non-compliance remove the non-complying items from the job site and replace them with items complying with the specified requirements, all at no additional cost to the Owner.

C. Perform all required adjustments and settings. Verify and correct deficiencies as necessary including voltages, tap settings, trip settings and phasing of equipment from distribution system to point of use.

D. Provide all necessary testing equipment.

E. In the Owner's Presence:

1. Test all parts of the electrical system and prove that all such items provided under this Section function electrically in the required manner.

3.13 PROJECT COMPLETION:

A. Upon completion of the work of this Section, thoroughly clean all exposed portions of the electrical installation, removing all traces of soil, labels, grease, oil and other foreign material, and using only the type cleaner recommended by the manufacturer of the item being cleaned.

B. Equipment with damage to painted finish shall be repaired to satisfaction of the Engineer.

C. On the first day the facility is in operation, for at least eight hours, at a time directed by the Engineer, provide a qualified foreman and crew to perform such electrical work as may be required by the Engineer.

E. Thoroughly indoctrinate the Owner's operation and maintenance personnel in the contents of the operations and maintenance manual required to be submitted under these Specifications.

3.14 EQUIPMENT SPECIFIED:

A. Contractor shall furnish equipment or systems in manufacturers specified or named herein or on the drawings. No other manufacturers shall be considered.

END OF SECTION 260500

SECTION 262923 VARIABLE FREQUENCY MOTOR CONTROLLER

PART 1-GENERAL

1.1 RELATED DOCUMENTS:

A. The Bidding Requirements, Contract Forms and Conditions of the Contract, including General Conditions of the Contract for Construction, and Division 1 - General Requirements, apply to the work specified in this Section.

B. Sections 200050, General Conditions, and 260100 General Electrical, shall also govern the work under this Section.

C. Section 260500, Basic Electrical Materials & Methods, includes requirements that are binding on this Section.

D. Examine all drawings, data, and coordinate the work of this Section with all related and adjoining work.

1.2 SECTION INCLUDES:

A. Variable Frequency Drives (VFD).

1.3 SCOPE AND DESCRIPTION:

A. This specification is to cover a complete Adjustable Frequency motor Drive (AFD) consisting of a pulse width modulated (PWM) inverter designed for use on a standard NEMA Design B induction motor. It is required that the drive manufacturer have an existing:

1. Sales representative exclusively for HVAC products, with expertise in HVAC systems and controls.

2. An independent service organization within 50 miles of the jobsite.

B. The drive manufacturer shall supply the drive and all necessary controls as herein specified. The manufacturer shall have been engaged in the production of this type of equipment for a minimum of twenty years.

1.4 REFRENCES AND QUALITY ASSURANCE:

A. Referenced Standards:
1. Institute of Electrical and Electronic Engineers (IEEE)
2. Standard 519-1992, IEEE Guide for Harmonic Content and Control.
3. Underwriters laboratories: UL508C
4. National Electrical Manufacturer's Association (NEMA): ICS 7.0, AC Adjustable Speed Drives
5. IEC 16800 Parts 1 and 2

B. Qualifications:

1. AFDs and options shall be UL listed as a complete assembly. AFD's that require the customer to supply external fuses for the AFD to be UL listed are not acceptable. The base AFD shall be UL listed for 100 KAIC without the need for input fuses.

1.5 SUBMITTALS:

A. Submittals shall include the following information:

1. Outline dimensions, conduit entry locations and weight.
2. Customer connection and power wiring diagrams.
3. Complete technical product description include a complete list of options provided

1.6 WARRANTY:

A. Provide a minimum of 18 month warranty on all parts and labor specified under this section with start date of owner's acceptance of job. The warranty shall include all parts, labor, and associated costs incurred by the manufacturer to provide factory authorized on-site service.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. ABB

B. Danfoss Graham VLT 6000 Series

C. Eton – Cuttler Hummer

2.2 ADJUSTABLE FREQUENCY DRIVES:

A. Furnish complete variable frequency drives as scheduled or otherwise specified within the contract documents for the fans and pumps designated for variable speed service. All standard and optional features shall be included within the VFD enclosure, unless

otherwise specified. VFD shall be housed in a NEMA metal enclosure with suitable rating for location and service.

B. The AFD package as specified herein shall be enclosed in a UL Listed Type 1 enclosure, completely assembled and tested by the manufacturer in an ISO9001 facility. The AFD tolerated voltage window shall allow the AFD to operate from a line of +30% nominal, and -35% nominal voltage as a minimum. Environmental operating conditions: 0 to 40°C continuous. Altitude 0 to 3300 feet above sea level, less than 95% humidity, non-condensing.

C. All AFDs shall have the following standard features:

1. All AFDs shall have the same customer interface, including digital display, and keypad, regardless of horsepower rating. The keypad shall be removable, capable of remote mounting and allow for uploading and downloading of parameter settings as an aid for start-up of multiple AFDs.

2. The keypad shall include Hand-Off-Auto selections and manual speed control. The drive shall incorporate "bumpless transfer" of speed reference when switching between "Hand" and "Auto" modes. There shall be fault reset and "Help" buttons on the keypad. The Help button shall include "on-line" assistance for programming and troubleshooting.

3. There shall be a built-in time clock in the AFD keypad. The clock shall have a battery back up with 10 years minimum life span. The clock shall be used to date and time stamp faults and record operating parameters at the time of fault. There shall be four (4) separate, independent timer functions that have both weekday and weekend settings.

4. The AFD shall have cooling fans that are designed for easy replacement. The fans shall be designed for replacement without requiring removing the AFD from the wall or removal of circuit boards. The AFD cooling fans shall operate only when required. To extend the fan and bearing operating life, operating temperature will be monitored and used to cycle the fans on and off as required.

5. The AFD shall be capable of starting into a coasting load (forward or reverse) up to full speed and accelerate or decelerate to setpoint without safety tripping or component damage (flying start).

6. The AFD shall have the ability to automatically restart after an over-current, over-voltage, under-voltage, or loss of input signal protective trip. The number of restart attempts, trial time, and time between attempts shall be programmable.

7. The overload rating of the drive shall be 110% of its normal duty current rating for 1 minute every 10 minutes, 130% overload for 2 seconds. The minimum FLA rating shall meet or exceed the values in the NEC/UL table 430-150 for 4-pole motors.

8. The AFD shall have an integral 5% impedance line reactors to reduce the harmonics to the power line and to add protection from AC line transients.

9. The AFD shall include a coordinated AC transient protection system consisting of 4-120 joule rated MOV's (phase to phase and phase to ground), a capacitor clamp, and 5% impedance reactors.

10. The VFD shall be capable of sensing a loss of load (broken belt / broken coupling) and signal the loss of load condition. The drive shall be programmable to signal this condition via a keypad warning, relay output and/or over the serial communications bus.

11. If the input reference (4-20mA or 2-10V) is lost, the AFD shall give the user the option of either (1) stopping and displaying a fault, (2) running at a

programmable preset speed, (3) hold the AFD speed based on the last good reference received, or (4) cause a warning to be issued, as selected by the user.

12. The AFD shall have programmable "Sleep" and "Wake up" functions to allow the drive to be started and stopped from the level of a process feedback signal.

D. All AFDs to have the following adjustments:

1. Three (3) programmable critical frequency lockout ranges to prevent the AFD from operating the load continuously at an unstable speed.

2. Two (2) PID Setpoint controllers shall be standard in the drive, allowing pressure or flow signals to be connected to the AFD, using the microprocessor in the AFD for the closed loop control. The AFD shall have 250 ma of 24 VDC auxiliary power and be capable of loop powering a transmitter supplied by others. The PID setpoint shall be adjustable from the AFD keypad, analog inputs, or over the communications bus. There shall be two parameter sets for the first PID that allow the sets to be switched via a digital input, serial communications or from the keypad for night setback, summer/winter setpoints, etc. There shall be an independent, second PID loop that can utilize the second analog input and modulate one of the analog outputs to maintain setpoint of an independent process (ie. valves, dampers, etc.). All setpoints, process variables, etc. to be accessible from the serial communication network. The setpoints shall be set in Engineering units and not require a percentage of the transducer input.

3. Two (2) programmable analog inputs shall accept current or voltage signals.

4. Two (2) programmable analog outputs (0-20ma or 4-20 ma). The outputs may be programmed to output proportional to Frequency, Motor Speed, Output Voltage, Output Current, Motor Torque, Motor Power (kW), DC Bus voltage, Active Reference, and other data.

5. Six (6) programmable digital inputs for maximum flexibility in interfacing with external devices, typically programmed as follows:

6. There shall be a run permissive circuit for damper or valve control. Regardless of the source of a run command (keypad, input contact closure, time-clock control, or serial communications) the AFD shall provide a dry contact closure that will signal the damper to open (AFD motor does not operate). When the damper is fully open, a normally open dry contact (end-switch) shall close.
The closed end-switch is wired to an AFD digital input and allows AFD motor operation. Two separate safety interlock inputs shall be provided. When either

safety is opened, the motor shall be commanded to coast to stop, and the damper shall be commanded to close. The keypad shall display "start enable 1 (or 2) missing". The safety status shall also be transmitted over the serial communications bus. All digital inputs shall be programmable to initiate upon an application or removal of 24VDC.

7. Three (3) programmable digital Form-C relay outputs. The relays shall include programmable on and off delay times and adjustable hysteresis. Default settings

shall be for run, not faulted (fail safe), and run permissive. The relays shall be rated for maximum switching current 8 amps at 24 VDC and 0.4 A at 250 VAC; Maximum voltage 300 VDC and 250 VAC; continuous current rating 2 amps RMS. Outputs shall be true form C type contacts; open collector outputs are not acceptable.

8. Seven (7) programmable preset speeds.

9. Two independently adjustable accel and decel ramps with 1 – 1800 seconds adjustable time ramps.

10. The AFD shall include a motor flux optimization circuit that will automatically reduce applied motor voltage to the motor to optimize energy consumption and audible motor noise.

11. The AFD shall include a carrier frequency control circuit that reduces the carrier frequency based on actual AFD temperature that allows the highest carrier frequency without derating the AFD or operating at high carrier frequency only at low speeds.

12. The AFD shall include password protection against parameter changes.

13. The Keypad shall include a backlit LCD display. The display shall be in complete English words for programming and fault diagnostics (alpha-numeric codes are not acceptable). The keypad shall utilize the following assistants:

    1. Start-up assistants.
    2. Parameter assistants
    3. Maintenance assistant
    4. Troubleshooting assistant

E. All applicable operating values shall be capable of being displayed in engineering (user) units. A minimum of three operating values from the list below shall be capable of being displayed at all times.

The display shall be in complete English words (alpha-numeric codes are not acceptable):

Output Frequency
Motor Speed (RPM, %, or Engineering units)
Motor Current
Calculated Motor Torque
Calculated Motor Power (kW)
DC Bus Voltage
Output Voltage

F. The VFD shall include a fireman's override input. Upon receipt of a contact closure from the fireman's control station, the VFD shall operate at an adjustable preset speed. The mode shall override all other inputs (analog/digital, serial communication, and all keypad commands) and force the motor to run at the adjustable, preset speed. "Override Mode" shall be displayed on the keypad. Upon removal of the override signal, the AFD shall resume normal operation.

G. Serial Communications

1. The AFD shall have an RS-485 port as standard. The standard protocols shall be Modbus, Johnson Controls N2 bus, and Siemens Building Technologies FLN. Optional protocols for LonWorks, BACnet, Profibus, Ethernet, and DeviceNet shall be available. Each individual drive shall have the protocol in the base AFD. The use of third party gateways and multiplexers is not acceptable. All protocols shall be "certified" by the governing authority. Use of non-certified protocols is not allowed.

2. Serial communication capabilities shall include, but not be limited to; run-stop control, speed set adjustment, proportional/integral/derivative PID control adjustments, current limit, accel/decel time adjustments, and lock and unlock the keypad. The drive shall have the capability of allowing the DDC to monitor feedback such as process variable feedback, output speed / frequency, current (in amps), % torque, power (kW), kilowatt hours (resettable), operating hours (resettable), and drive temperature. The DDC shall also be capable of monitoring the AFD relay output status, digital input status, and all analog input and analog output values. All diagnostic warning and fault information shall be transmitted over the serial communications bus. Remote VFD fault reset shall be possible. The following additional status indications and settings shall be transmitted over the serial communications bus – keypad "Hand" or "Auto" selected, bypass selected, the ability to change the PID setpoint, and the ability to force the unit to bypass (if bypass is specified). The DDC system shall also be able to monitor if the motor is running in the AFD mode or bypass mode (if bypass is specified) over serial communications. A minimum of 15 field parameters shall be capable of being monitored.

3. The AFD shall allow the DDC to control the drive's digital and analog outputs via the serial interface.
This control shall be independent of any AFD function. For example, the analog outputs may be used for modulating chilled water valves or cooling tower bypass valves. The drive's digital (relay) outputs may be used to actuate a damper, open a valve or control any other device that requires a maintained contact for operation.
In addition, all of the drive's digital and analog inputs shall be capable of being monitored by the DDC system.

4. The VFD shall include an independent PID loop for customer use. The independent PID loop may be used for supply/return fan tracking, cooling tower bypass value control, chilled water value control, etc. Both the VFD control PID

loop and the independent PID loop shall continue functioning even if the serial communications connection is lost. The VFD shall keep the last good set-point command and last good DO & AO commands in memory in the event the serial communications connection is lost.

H. EMI / RFI filters. All AFD's shall include adjustable output EMI/RFI filters. All AFD's shall be capable of remote location away from the motor controlled. Refer to the contract drawings.

I. All AFD's through 50HP shall be protected from input and output power mis-wiring. The AFD shall sense this condition and display an alarm on the keypad.

J. OPTIONAL FEATURES – Optional features to be furnished and mounted by the drive manufacturer. All optional features shall be UL Listed by the drive manufacturer as a complete assembly and carry a UL508 label.

1. A complete factory wired and tested bypass system consisting of an output contactor and bypass contactor. Overload protection and shall be provided in both drive and bypass modes.

2. Door interlocked, padlockable circuit breaker that will disconnect all input power from the drive and all internally mounted options.

3. Fused AFD only disconnect (service switch). Fast acting fuses exclusive to the AFD – fast acting fuses allow the AFD to disconnect from the line prior to clearing upstream branch circuit protection, maintaining bypass capability. Bypass designs, which have no such fuses, or that incorporate fuses common to both the AFD and the bypass will not be accepted. Three contactor bypass schemes are not acceptable.

4. The drive / bypass shall provide single-phase motor protection in both the AFD and bypass modes.

5. The following operators shall be provided:

   a. Bypass Hand-Off-Auto
   b. Drive mode selector
   c. Bypass mode selector
   d. Bypass fault reset

6. The following relay (form C) outputs from the bypass shall be provided:

   a. System started
   b. System running
   c. Bypass override enabled
   d. Drive fault

   e. Bypass fault (motor overload or underload (broken belt))
   f. Bypass H-O-A position

7. The digital inputs for the system shall accept 24V or 115VAC (selectable). The bypass shall incorporate internally sourced power supply and not require an external control power source.

8. Customer Interlock Terminal Strip – provide a separate terminal strip for connection of freeze, fire, smoke contacts, and external start command. All external safety interlocks shall remain fully functional whether the system is in Hand, Auto, or Bypass modes (not functional in Fireman's Override 2). The remote start/stop contact shall operate in AFD and bypass modes.

9. Dedicated digital input that will transfer motor from AFD mode to bypass mode upon dry contact closure for fireman's override. Two modes of operation are required.

   One mode forces the motor to bypass operation and overrides both the AFD and bypass H-O-A switches and forces the motor to operate across the line (test mode). The system will only respond to the digital inputs and motor protections.

   The second fireman's override mode remains as above, but will also defeat the overload and single-phase protection for bypass and ignore all keypad and digital inputs to the system (run until destruction).

10. The AFD shall include a "run permissive circuit" that will provide a normally open contact whenever a run command is provided (local or remote start command in AFD or bypass mode). The AFD system (AFD or bypass) shall not operate the motor until it receives a dry contact closure from a damper or valve end-switch. When the AFD system safety interlock (fire detector, freezestat, high static pressure switch, etc) opens, the motor shall coast to a stop and the run permissive contact shall open, closing the damper or valve.

11. Class 20 or 30 (selectable) electronic motor overload protection shall be included.

12. There shall be an internal switch to select manual or automatic bypass.

13. There shall be an adjustable current sensing circuit for the bypass to provide loss of load indication (broken belt) when in the bypass mode.

PART 3 – EXECUTION

3.1 INSTALLATION:

The mechanical contractor shall coordinate the electrical and physical requirements for each VFD and furnish to electrical contractor for mounting and wiring. The mechanical contractor and Temperature Controls contractor shall coordinate the controls, operation and testing of each unit.

3.2 START-UP SERVICE:

A. The manufacturer shall provide start-up commissioning of the variable frequency drive and its optional circuits by a factory certified service technician who is experienced in start-up and repair services. The commissioning personnel shall be the same personnel that will provide the factory service and warranty repairs at the customer's site. Sales personnel and other agents who are not factory certified technicians for VFD field repair shall not be acceptable as commissioning agents.

Start-up services shall include checking for verification of proper operation and installation for the VFD, its options and its interface wiring to the building automation system. Start-up shall include customer operator training at the time of the equipment commissioning.

B. Warranty

3.3 EXAMINATION:

A. Contractor to verify that job site conditions for installation meet factory recommended and code-required conditions for VFD installation prior to start-up, including clearance spacing, temperature, contamination, dust, and moisture of the environment. Separate conduit installation of the motor wiring, power wiring, and control wiring, and installation per the manufacturer's recommendations shall be verified.

B. The VFD is to be covered and protected from installation dust and contamination until the environment is cleaned and ready for operation. The VFD shall not be operated while the unit is covered.

END OF SECTION 262923

ATTACHMENT 11
Certification re: CGS §31-57b

CERTIFICATE

Of Compliance With

Connecticut General Statute Section 31-57b

I hereby certify that all of the statements herein contained below have been examined by me, and to the best of my knowledge and belief are true and correct.

The _____ **has/has not** *(circle one)* been cited for three or more willful or serious violations of any occupational safety and health act or of any standard, order or regulation promulgated pursuant to such act, during the three year period preceding the bid, provided such violations were cited in accordance with the provisions of any state occupational safety and health act of 1970, and not abated within the time fixed by the citation and such citation has not been set aside following the appeal to the appropriate agency or court having jurisdiction or **has/has not** *(circle one)* received one or more criminal convictions related to the injury or death of any employee in the three year period preceding the bid.

The list of violations (if applicable) is attached.

_____
Name of Firm, Organization or Corporation

Signed: _____
Name Seal

Title: _____

Date: _____

State of)
) ss: A.D.,20___
County of)

Sworn to and personally appeared before me for the above,_____

_____ , Signer and Sealer of the foregoing instrument and acknowledged the same to be the free act and deed of _____ , and his/her free act and deed as _____.

My Commission expires: _____
Notary Public Seal

Project No(s).:

ATTACHMENT 12

IRS FORM W-9

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

Request for Taxpayer Identification Number and Certification

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

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

Print or type. See Specific Instructions on page 3.

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

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

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

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

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

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

☐ Other (see instructions) ►

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

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

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

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

Requester's name and address (optional)

6 City, state, and ZIP code

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

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

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

Social security number

☐☐☐ – ☐☐ – ☐☐☐☐

or

Employer identification number

☐☐ – ☐☐☐☐☐☐☐

Part II Certification

Under penalties of perjury, I certify that:

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

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

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

General Instructions

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

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

Purpose of Form

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

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

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

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

Cat. No. 10231X Form **W-9** (Rev. 10-2018)

ATTACHMENT 13

GLASTONBURY BOARD OF EDUCATION CONTRACTOR COMPLIANCE FORM

ATTENTION CONTRACTORS AND COMMUNITY USE GROUPS

☐ APPROVED PERMIT APPLICATION FOR YOUR FILES-NOTE ANY COMMENTS ON BOTTOM OF PAGE 3 – APPROVAL REQUIREMENTS

☐ PERMIT APPLICATION DENIED - SEE BOTTOM PAGE 3

GLASTONBURY PUBLIC SCHOOLS

OFFICE OF DIRECTOR OF ENVIRONMENTAL HEALTH AND SAFETY

Dr. Kenneth Roy
Safety Compliance Officer
Director of Environmental Health and Safety
Email: royk@glastonburyus.org

Glastonbury High School
330 Hubbard Street
Glastonbury, CT 06033
Phone (860) 652-7200 Ext. 12002
Fax: (860) 652-7275

SAFETY COMPLIANCE PERMIT APPLICATION (SCPA)

Notice to Contractors and Community Use Groups:
In concert with, but not limited to, all OSHA General Industry and Construction standards, EPA, NFPA, AHERA, and building codes, contractors and community use groups conducting work activities at/on any Glastonbury Public Schools District property are required to provide the following information to Lori Pacifici (pacificil@glastonburyus.org).

NOTICE: **THIS APPLICATION MUST BE COMPLETED AND APPROVED A MINIMUM OF 3 DAYS PRIOR TO COMMENCING ANY OPERATIONS. ALL CONTRACTORS AND SUB CONTRACTORS MUST SUBMIT THEIR OWN PERMIT APPLICATION.**

Once approved, the permit application will be returned to the originator. Approval is conditional relative to noted specifications by Director of Environmental Health and Safety.

PLEASE NOTE: Any changes required in the project scope must be submitted for additional approval to Dr. Kenneth Roy PRIOR to effecting those changes.

1. Project Information:

Project Description:

Location:		
Start Date:	**Completion Date:**	
Contractor Safety Officer or Community Use Applicant:	**Phone:**	**Fax:** **Email:**

Permit Prepared By: **Date Prepared:**

Project Scope	**Yes**	**No**	**Comments**
Wood Fabrication (temporary walls, structures & painting)[8]	☐	☐	
Confined Spaces[1]	☐	☐	
Electrical Work[2]	☐	☐	
Forklift	☐	☐	
Hazardous Materials/Chemicals[7]	☐	☐	

Project Scope (Cont.)	Yes	No	Comments
Respirators	☐	☐	
Ladders/Scaffolds/Aerial Lifts (list those included)	☐	☐	
Rigging/Lifting[5]	☐	☐	
Welding[3]	☐	☐	
Asbestos Management[4]	☐	☐	
Polychlorinated Biphenyls (PCBs) Management – Gideon Welles School only[6]	☐	☐	
Other:			

1. Contractors need to secure, complete and submit a "Confined Space Permit" from a GPS safety compliance officer for approval 3 days PRIOR to doing any work in a Permit Required Confined Space Area.
2. Contractors need to secure, complete and submit an "Energized Electrical Work Permit" from a GPS safety compliance officer for approval 3 days PRIOR to doing any energized electrical work.
3. Contractors or community use groups are required to secure, complete and submit a "Hot Work Permit" from a GPS safety compliance officer for approval 3 days PRIOR to doing any hot work (e.g., welding, etc.).
4. Contractors need to secure the Asbestos Management Plan from the Director of Environmental Health and Safety prior to all construction/demolition work.
5. A safety plan must be submitted and approved for use of cranes. Copies of current completion documents or certifications of training/operation must be provided.
6. Contractors need to secure the PCB Management Plan from the Director of Environmental Health and Safety prior to all construction/demolition work at Gideon Welles.
7. Contractors need to secure hazardous chemical information from the Director of Environmental Health and Safety prior to all construction/demolition work in hazardous chemical areas such as chemical storerooms, laboratories, AC refrigerant lines, etc.
8. All temporary/fabricated structures and painting/staining (e.g. temporary walls) for community use groups (e.g. theater, musical events) and general contractor work.

---

2. A copy of the "Completion Document" for 10 Hour OSHA training within the last five years for contractor employees working on-site must be provided as appropriate for publicly funded projects. Additional training certificates may be required.
3. Provide district safety officer with Safety Data Sheets (SDS) for all materials used on-site.

LIST EITHER CHEMICAL OR TRADE NAME OF EACH ATTACHED SDS SHEET BELOW	

4. In cases of hazardous waste production, a written disposal plan must be provided to and approved by the district safety officer, 5 days prior to initiation of work for those materials disposed of on site.
5. All contractors and/or their personnel and, community use groups are required to be in compliance with all EPA, NFPA, AHERA and OSHA and other appropriate legal safety standards and better professional safety practices when working on site (under the direction of a contractor's project supervisor or community use group applicant).
6. All on-site activities carried out by contractors, and/or their employees and, community use groups must be done in such a manner as to maintain a safer working environment for all Glastonbury Public Schools' employees, students and visitors.
7. Contractor employees or community use group workers found to be in non-compliance may be removed from the District worksite by the District Safety Officer.
8. Contractors found to be in non-compliance will be subject to forfeiture of payment and/or contract termination.
9. The district reserves the right to inspect the worksite at any time for safety compliance.
10. The district may require review of a contractor's OSHA 200/300 log for a period of three (3) previous years.

11. All contractors' employees and community use group workers are to follow CDC and State pandemic on-site safety protocols – e.g. face masks, social distancing, etc. as appropriate.
12. Contact Dr. Roy with any changes in the project requiring additional approval.

Please type company name and address below

	RETURN TO: Lori Pacifici Secretary – Safety Compliance Office E-mail: pacificil@glastonburyus.org

By signature, the contractor or community use applicant agrees to adhere to all components and the spirit of this document.

Signature of Contractor or Community Use Applicant	Title	Date

INTERNAL USE ONLY
APPROVAL STATUS:

Dr. Kenneth Roy
Director of Environmental Health and Safety

_____ Date:
Signature

☐ YES
☐ NO

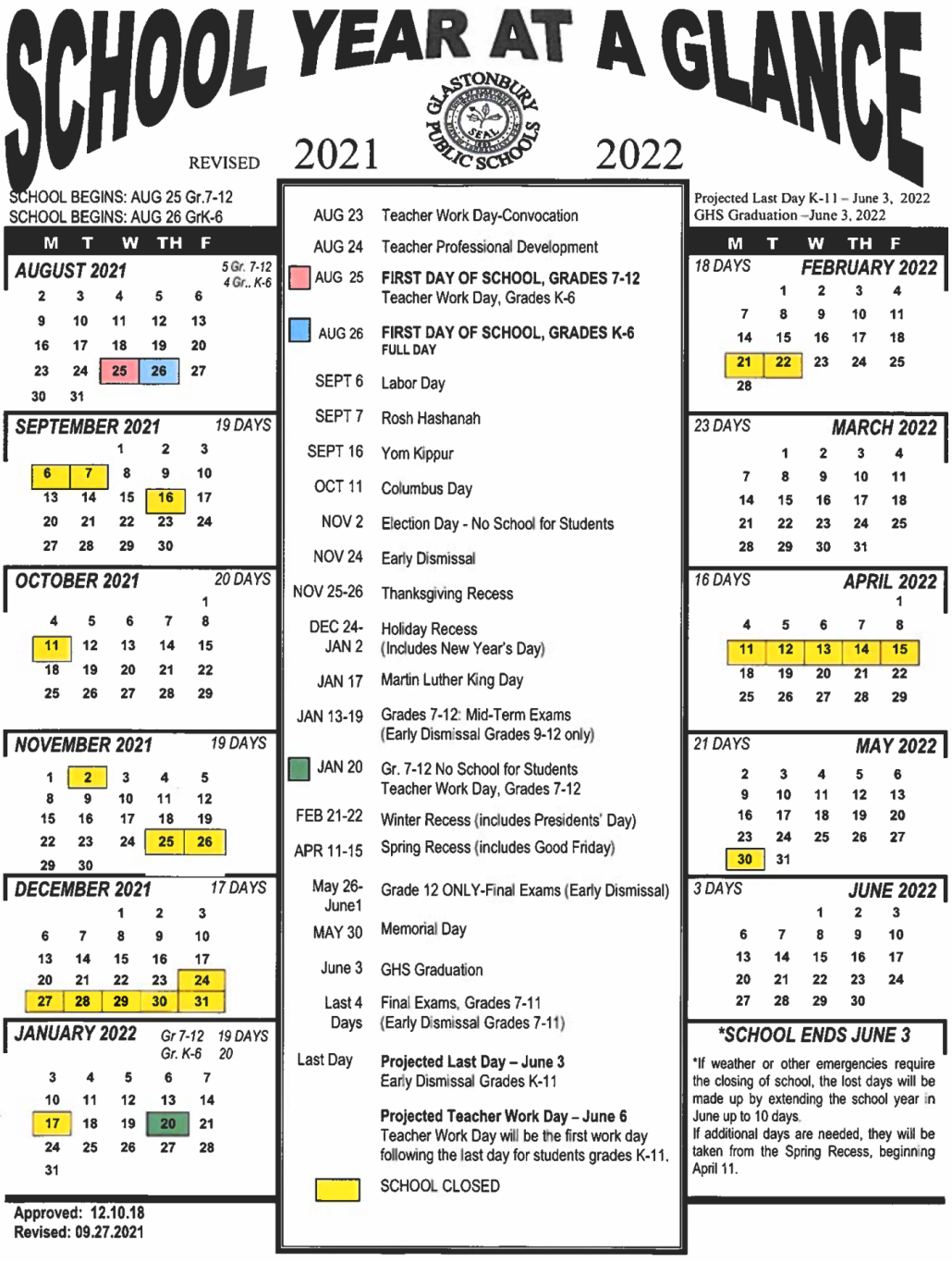
cc: ☐ Building Principal/Supervisor
☐ Contractor or Community Use Applicant
☐ Maintenance Office File
☐ Director of Environmental Health and Safety
- Dr. Kenneth Roy
☐ Other

Revised: 6/18/21

NOTE TO CONTRACTOR OR COMMUNITY USE APPLICANT: APPROVAL CONTINGENT ON THE FOLLOWING ITEMS:

ATTACHMENT 14

GLASTONBURY BOARD OF EDUCATION SCHOOL CALENDAR



SCHOOL YEAR AT A GLANCE

2022 2023

GLASTONBURY PUBLIC SCHOOLS

SCHOOL BEGINS: AUG 24th Gr.7-12
SCHOOL BEGINS: AUG 25th Gr.K-6

M T W TH F

AUGUST 2022 — 6 Days Gr. 7-12, 5 Days Gr.K-6

1	2	3	4	5
8	9	10	11	12
15	16	17	18	19
22	23	24	25	26
29	30	31		

SEPTEMBER 2022 — 20 DAYS

			1	2
5	6	7	8	9
12	13	14	15	16
19	20	21	22	23
26	27	28	29	30

OCTOBER 2022 — 19 DAYS

3	4	5	6	7
10	11	12	13	14
17	18	19	20	21
24	25	26	27	28
31				

NOVEMBER 2022 — 19 DAYS

	1	2	3	4
7	8	9	10	11
14	15	16	17	18
21	22	23	24	25
28	29	30		

DECEMBER 2022 — 17 DAYS

			1	2
5	6	7	8	9
12	13	14	15	16
19	20	21	22	23
26	27	28	29	30

JANUARY 2023 — Gr 7-12 19 DAYS, Gr. K-6 20

2	3	4	5	6
9	10	11	12	13
16	17	18	19	20
23	24	25	26	27
30	31			

Approved: 02.08.2021

AUG 22	Teacher Work Day-Convocation
AUG 23	Teacher Professional Development
AUG 24	**FIRST DAY OF SCHOOL, GRADES 7-12** Teacher Work Day, Grades K-6
AUG 25	**FIRST DAY OF SCHOOL, GRADES K-6** **FULL DAY**
SEPT 5	Labor Day
SEPT 26	Rosh Hashanah
OCT 5	Yom Kippur
OCT 10	Columbus Day
NOV 8	Election Day - No School for Students
NOV 23	Early Dismissal
NOV 24-25	Thanksgiving Recess
DEC 26-JAN 2	Holiday Recess (Includes New Year's Day)
JAN 16	Martin Luther King Day
JAN 12-18	Grades 7-12: Mid-Term Exams (Early Dismissal Grades 9-12 only)
JAN 19	Gr. 7-12 No School for Students Teacher Work Day, Grades 7-12
FEB 20-21	Winter Recess (includes Presidents' Day)
APR 7-14	Spring Recess (includes Good Friday)
MAY 29	Memorial Day
May 26-June1	Grade 12 ONLY-Final Exams (Early Dismissal)
Last 4 Days	Final Exams, Grades 7-11 (Early Dismissal Grades 7-11)
JUNE 5	GHS Graduation (projected)
Last Day Grades K-11	**Projected Last Day – June 5** Early Dismissal Grades K-11
	Projected Teacher Work Day – June 6 Teacher Work Day will be the first work day following the last day for students grades K-11.
	SCHOOL CLOSED

Projected
GHS Graduation-June 5, 2023

Projected Last Day Grades K-11
June 5, 2023

M T W TH F

FEBRUARY 2023 — 18 DAYS

		1	2	3
6	7	8	9	10
13	14	15	16	17
20	21	22	23	24
27	28			

MARCH 2023 — 23 DAYS

		1	2	3
6	7	8	9	10
13	14	15	16	17
20	21	22	23	24
27	28	29	30	31

APRIL 2023 — 14 DAYS

3	4	5	6	7
10	11	12	13	14
17	18	19	20	21
24	25	26	27	28

MAY 2023 — 22 DAYS

1	2	3	4	5
8	9	10	11	12
15	16	17	18	19
22	23	24	25	26
29	30	31		

JUNE 2023 — 3 DAYS

			1	2
5	6	7	8	9
12	13	14	15	16
19	20	21	22	23
26	27	28	29	30

***SCHOOL ENDS JUNE 5**
Grades K-11
*If weather or other emergencies require the closing of school, the lost days will be made up by extending the school year in June up to 14 days.
If additional days are needed, they will be taken from the Spring Recess, beginning April 10.

ATTACHMENT 15

AFFIRMATIVE ACTION STATEMENT

AFFIRMATIVE ACTION STATEMENT

NOTE: IF YOUR COMPANY HAS LESS THAN 10 EMPLOYEES, OR HAS COMPLETED THIS SAME FORM WITHIN 1 YEAR, YOU MAY DISREGARD THE FOLLOWING EQUAL EMPLOYMENT/AFFIRMATION ACTION SECTION, EXCEPT AS NOTED.

OR: (1) The number of employees _____

(2) Completed this form within one year _____Yes _____ No

FOR SEALED BIDS: If your company has completed this form within one year please forward a photocopy of the initial form with your bid. If significant changes have taken place within the past year; please update the information on this form.

REQUIREMENT: Any vendor/bidder seeking to do business with the Town of Glastonbury must, upon request, supply the Town and/or the Glastonbury Human Relations Commission with any information concerning the Affirmative Action/Equal Employment practices of the vendor/bidder, which the Town and/or Commission deems necessary in fulfilling its charge. Failure to supply such information, when requested, will result in the termination of any further transactions between the vendor/bidder and the Town of Glastonbury.

COMPANY NAME AND ADDRESS: _____

TYPE OF BUSINESS: _____

TYPE OF ORGANIZATION: _____ Corporation _____ Partnership _____ Individual

If unit filing this application is not the above-named company, give the name, address and telephone number of reporting unit. (Branch, agent, representative)

_____

_____

AFFIRMATIVE ACTION/EQUAL EMPLOYMENT ACTIVITIES

Please indicate the name and address of the company official(s) responsible for carrying out the Equal Employment Opportunity/Affirmation Action Program for your company.

_____

_____

If your company does not have a written affirmation action plan, please estimate the number of vacancies during the next 12 months, and indicate the numerical or percentage goals you have set for the employment of minority people and females to make your labor force reflective of the labor market in which you operate.

_____

_____

The vendor/bidder understands that failure to complete the above form in satisfactory manner will preclude such vendor from being actively considered for contract with the Town of Glastonbury. The vendor/bidder also understands that the Affirmation Action statements will become part of any contract, and that breach of such statements will constitute a breach of the contract subject to such remedies as provide by law.

I certify that there are no misrepresentations, omissions, or falsifications in the foregoing statements and answers, and that the entries above are true, complete and correct to the best of my knowledge and belief.

_____ _____ _____

Date Signature Title

Subscribed and sworn to before me at _____, Connecticut, this _____ Day of _____ 20____.

ATTACHMENT 16

COVID RELATED REQUIREMENTS

At the time of the execution of this Agreement, there is an ongoing global COVID-19 pandemic (the "Pandemic"). Various governmental orders, laws, regulations and guidelines have been issued, enacted and/or adopted in relation to the Pandemic which effect the construction industry and the operations of construction managers, contractors, subcontractors and material and equipment suppliers to the construction industry (the "COVID Related Requirements").

The Contractor shall comply, and require all of its Subcontractors, Sub-subcontractors and material and equipment suppliers to comply, with all COVID Related Requirements (as they may be supplemented, modified or newly established during the course of the Project) as are applicable to the performance of the Work and the performance of the Contractor's obligations under the Contract Documents.

The execution of the Agreement constitutes confirmation by the Contractor that the Contract Time and the Construction Schedule for the Project provided in, or attached as an Exhibit to, the Agreement are based on and include compliance with all COVID Related Requirements in effect as of the effective date of the Agreement (the "Current Requirements"). The Contractor shall not be entitled to any adjustment in the Contract Time in connection with delays arising from compliance by the Contractor, Subcontractors, Sub-subcontractors, or material and equipment suppliers with the Current Requirements. To the extent that, after the effective date of this Agreement, the Current Requirements are modified or supplemented, or new COVID Related Requirements are established, and provided compliance with such modified, supplemented or newly established COVID Related Requirements causes a delay in the performance of the Work, such delay shall constitute a delay due to a cause "beyond the Contractor's control" under Section 8.3.1(4) of the AIA Document A201-2017. As with any request for an extension of the Contract Time, it will be the responsibility of the Contractor to substantiate the delay, the cause of the delay and its right to an extension of the Contract Time under the terms and conditions of the Contract Documents.