RED CLAY CONSOLIDATED SCHOOL DISTRICT
FACILITES AND SPECIAL PROJECTS

VOLUME 1

SPECIFICATIONS
FOR

MAJOR CAPITAL PROGRAM MECHANICAL PRE-PURCHASE

NOT FOR BIDDING

PREPARED
BY

STUDIOJAED ARCHITECTS & ENGINEERS
2500 WRANGLE HILL ROAD
BEAR, DE 19701
STUDIOJAED PROJECT #24079

ISSUED FOR BIDDING
MAY 22, 2025

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INVITATION TO BID

Sealed bids for **Red Clay Consolidated School District Contract No. 2-25-36 – Major Capital Program Mechanical Pre-Purchase** will be received by the Red Clay Consolidated School District **until 1:00 PM local time on July 16, 2025**, at which time they will be publicly opened and read aloud in the Conference Room at the **Red Clay Consolidate School District Facilities Offices, located at 1798 Limestone Road, Wilmington, DE 19804**. Bidder bears the risk of late delivery. Any bids received after the stated time will be returned unopened.

Sealed bids shall be addressed to the Red Clay Consolidated School District. The outer envelope should clearly indicate: **"RED CLAY CONSOLIDATED SCHOOL DISTRICT – MAJOR CAPITAL PROGRAM MECHANICAL PRE-PURCHASE – SEALED BID - DO NOT OPEN."**

The project involves the pre-purchase of equipment for the forthcoming major capital improvement program. Equipment includes:

- Select HVAC equipment

A **MANDATORY** Pre-Bid Meeting will be held on June 24, 2025, at 8:30 AM at Red Clay Consolidate School District Facilities Offices, located at 1798 Limestone Road, Wilmington, DE 19804 for the purpose of establishing the listing of subcontractors and to answer questions. Representatives of each party to any Joint Venture must attend this meeting. **ATTENDANCE OF THIS MEETING IS A PREREQUISITE FOR BIDDING ON THIS CONTRACT.**

Contract documents may be obtained at Reprographics Center, Inc., 298 Churchmans Road, New Castle, DE 19720, phone (302) 328-5019 upon receipt of $75.00 per electronic set non-refundable. Checks are to be made payable to “StudioJAED”.

Bidders will not be subject to discrimination on the basis of race, creed, color, sex, sexual orientation, gender identity or national origin in consideration of this award, and Minority Business Enterprises, Disadvantaged Business Enterprises, Women-Owned Business Enterprises and Veteran-Owned Business Enterprises will be afforded full opportunity to submit bids on this contract. Each bid must be accompanied by a bid security equivalent to ten percent of the bid amount and all additive alternates. The successful bidder must post a performance bond and payment bond in a sum equal to 100 percent of the contract price upon execution of the contract. The Owner reserves the right to reject any or all bids and to waive any informalities therein. The Owner may extend the time and place for the opening of the bids from that described in the advertisement, with not less than two calendar days’ notice by certified delivery, facsimile machine or other electronic means to those bidders receiving plans.

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INSTRUCTIONS TO BIDDERS

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ARTICLE 1: GENERAL

1.1 DEFINITIONS

1.1.1 Whenever the following terms are used, their intent and meaning shall be interpreted as follows:

1.2 STATE: The State of Delaware.

1.3 AGENCY: Contracting State Agency as noted on cover sheet.

1.4 DESIGNATED OFFICIAL: The agent authorized to act for the Agency.

1.5 BIDDING DOCUMENTS: Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement for Bid, Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders (if any), General Conditions, Supplementary General Conditions, General Requirements, Special Provisions (if any), the Bid Form (including the Non-collusion Statement), and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, as well as the Drawings, Specifications (Project Manual) and all Addenda issued prior to execution of the Contract.

1.6 CONTRACT DOCUMENTS: The Contract Documents consist of the, Instructions to Bidders, Supplementary Instructions to Bidders (if any), General Conditions, Supplementary General Conditions, General Requirements, Special Provisions (if any), the form of agreement between the Owner and the Contractor, Drawings (if any), Specifications (Project Manual), and all addenda.

1.7 AGREEMENT: The form of the Agreement shall be AIA Document A101, Standard Form of Agreement between Owner and Contractor where the basis of payment is a STIPULATED SUM. In the case of conflict between the instructions contained therein and the General Requirements herein, these General Requirements shall prevail.

1.8 GENERAL REQUIREMENTS (or CONDITIONS): General Requirements (or conditions) are instructions pertaining to the Bidding Documents and to contracts in general. They contain, in summary, requirements of laws of the State; policies of the Agency and instructions to bidders.

1.9 SPECIAL PROVISIONS: Special Provisions are specific conditions or requirements peculiar to the bidding documents and to the contract under consideration and are supplemental to the General Requirements. Should the Special Provisions conflict with the General Requirements, the Special Provisions shall prevail.

1.10 ADDENDA: Written or graphic instruments issued by the Owner/Architect prior to the execution of the contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

1.11 BIDDER OR VENDOR: A person or entity who formally submits a Bid for the material or Work contemplated, acting directly or through a duly authorized representative who meets the requirements set forth in the Bidding Documents.

1.12 SUB-BIDDER: A person or entity who submits a Bid to a Bidder for materials or labor, or both for a portion of the Work.

1.13 BID: A complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

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1.14 BASE BID: The sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids (if any are required to be stated in the bid).

1.15 ALTERNATE BID (or ALTERNATE): An amount stated in the Bid, where applicable, to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents is accepted.

1.16 UNIT PRICE: An amount stated in the Bid, where applicable, as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.

1.17 SURETY: The corporate body which is bound with and for the Contract, or which is liable, and which engages to be responsible for the Contractor's payments of all debts pertaining to and for his acceptable performance of the Work for which he has contracted.

1.18 BIDDER'S DEPOSIT: The security designated in the Bid to be furnished by the Bidder as a guaranty of good faith to enter into a contract with the Agency if the Work to be performed or the material or equipment to be furnished is awarded to him.

1.19 CONTRACT: The written agreement covering the furnishing and delivery of material or work to be performed.

1.20 CONTRACTOR: Any individual, firm or corporation with whom a contract is made by the Agency.

1.21 SUBCONTRACTOR: An individual, partnership or corporation which has a direct contract with a contractor to furnish labor and materials at the job site, or to perform construction labor and furnish material in connection with such labor at the job site.

1.22 CONTRACT BOND: The approved form of security furnished by the contractor and his surety as a guaranty of good faith on the part of the contractor to execute the work in accordance with the terms of the contract.

1.23 CUSTOM FABRICATION: As defined in 29 Del. C. § 6902, the term “custom fabrication” means the offsite fabrication, assembly, or other production of non-standard goods or materials, including components, fixtures or parts thereof, specifically for a public works project. Such goods and materials shall include those used in the following trades or systems: (1) Plumbing or pipe fitting systems, including heating, ventilating, air-conditioning, refrigeration systems, sheet metal or other duct systems; (2) Electrical systems; (3) Mechanical insulation work; (4) Ornamental iron work; and (5) Commercial signage that does not attempt or appear to direct the movement of traffic on highways or roadways or interfere with, imitate, or resemble any official traffic sign, signal or device.

ARTICLE 2: BIDDER'S REPRESENTATION

2.1 PRE-BID MEETING

2.1.1 A pre-bid meeting for this project will be held at the time and place designated. Attendance at this meeting is a pre-requisite for submitting a Bid, unless this requirement is specifically waived elsewhere in the Bid Documents.

2.2 By submitting a Bid, the Bidder represents that:

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2.2.1 The Bidder has read and understands the Bidding Documents and that the Bid is made in accordance therewith.

2.2.2 The Bidder has visited the site, become familiar with existing conditions under which the Work is to be performed, and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.

2.2.3 The Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception.

2.3 JOINT VENTURE REQUIREMENTS

2.3.1 For Public Works Contracts, each Joint Venturer shall be qualified and capable to complete the Work with their own forces.

2.3.2 Included with the Bid submission, and as a requirement to bid, a copy of the executed Joint Venture Agreement shall be submitted and signed by all Joint Venturers involved.

2.3.3 All required Bid Bonds, Performance Bonds, Material and Labor Payment Bonds must be executed by both Joint Venturers and be placed in both of their names.

2.3.4 All required insurance certificates shall name both Joint Venturers.

2.3.5 Both Joint Venturers shall sign the Bid Form.

2.3.6 Both Joint Venturers shall include their Federal E.I. Number with the Bid.

2.3.7 In the event of a mandatory Pre-bid Meeting, each Joint Venturer shall have a representative in attendance.

2.3.8 Due to exceptional circumstances and for good cause shown, one or more of these provisions may be waived at the discretion of the State.

2.4 ASSIGNMENT OF ANTITRUST CLAIMS

2.4.1 As consideration for the award and execution by the Owner of this contract, the Contractor hereby grants, conveys, sells, assigns and transfers to the State of Delaware all of its right, title and interests in and to all known or unknown causes of action it presently has or may now or hereafter acquire under the antitrust laws of the United States and the State of Delaware, relating to the particular goods or services purchased or acquired by the Owner pursuant to this contract.

ARTICLE 3: BIDDING DOCUMENTS

3.1 COPIES OF BID DOCUMENTS

3.1.1 Bidders may obtain complete sets of the Bidding Documents from the Architectural/Engineering firm designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein.

3.1.2 Bidders shall use complete sets of Bidding Documents for preparation of Bids. The issuing Agency nor the Architect assumes no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

3.1.3 Any errors, inconsistencies or omissions discovered shall be reported to the Architect immediately.

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3.1.4 The Agency and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall report any errors, inconsistencies, or ambiguities discovered to the Architect.

3.2.2 Bidders or Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request to the Architect at least seven days prior to the date for receipt of Bids. Interpretations, corrections and changes to the Bidding Documents will be made by written Addendum. Interpretations, corrections, or changes to the Bidding Documents made in any other manner shall not be binding.

3.2.3 The apparent silence of the specifications as to any detail, or the apparent omission from it of detailed description concerning any point, shall be regarded as meaning that only the best commercial practice is to prevail and only material and workmanship of the first quality are to be used. Proof of specification compliance will be the responsibility of the Bidder.

3.2.4 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all permits, labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work.

3.2.5 The Owner will bear the costs for all impact and user fees associated with the project.

3.3 SUBSTITUTIONS

3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of quality, required function, dimension, and appearance to be met by any proposed substitution. The specification of a particular manufacturer or model number is not intended to be proprietary in any way. Substitutions of products for those named will be considered, providing that the Vendor certifies that the function, quality, and performance characteristics of the material offered is equal or superior to that specified. It shall be the Bidder's responsibility to assure that the proposed substitution will not affect the intent of the design, and to make any installation modifications required to accommodate the substitution.

3.3.2 Requests for substitutions shall be made in writing to the Architect at least ten days prior to the date of the Bid Opening. Such requests shall include a complete description of the proposed substitution, drawings, performance and test data, explanation of required installation modifications due the substitution, and any other information necessary for an evaluation. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect’s decision of approval or disapproval shall be final. The Architect is to notify Owner prior to any approvals.

3.3.3 If the Architect approves a substitution prior to the receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding.

3.3.4 The Architect shall have no obligation to consider any substitutions after the Contract award.

3.4 ADDENDA

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3.4.1 Addenda will be mailed or delivered to all who are known by the Architect to have received a complete set of the Bidding Documents.

3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

3.4.3 No Addenda will be issued later than 2 calendar days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which extends the time or changes the location for the opening of bids.

3.4.4 Each bidder shall ascertain prior to submitting his Bid that they have received all Addenda issued, and shall acknowledge their receipt in their Bid in the appropriate space. Not acknowledging an issued Addenda could be grounds for determining a bid to be non-responsive.

ARTICLE 4: BIDDING PROCEDURES

4.1 PREPARATION OF BIDS

4.1.1 Submit the bids on the Bid Forms included with the Bidding Documents.

4.1.2 Submit the original Bid Form for each bid. Bid Forms may be removed from the project manual for this purpose.

4.1.3 Execute all blanks on the Bid Form in a non-erasable medium (typewriter or manually in ink).

4.1.4 Where so indicated by the makeup on the Bid Form, express sums in both words and figures, in case of discrepancy between the two, the written amount shall govern.

4.1.5 Interlineations, alterations or erasures must be initialed by the signer of the Bid.

4.1.6 BID ALL REQUESTED ALTERNATES AND UNIT PRICES, IF ANY. If there is no change in the Base Bid for an Alternate, enter “No Change”. The Contractor is responsible for verifying that they have received all addenda issued during the bidding period. Work required by Addenda shall automatically become part of the Contract.

4.1.7 Make no additional stipulations on the Bid Form and do not qualify the Bid in any other manner.

4.1.8 Each copy of the Bid shall include the legal name of the Bidder and a statement whether the Bidder is a sole proprietor, a partnership, a corporation, or any legal entity, and each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current Power of Attorney attached, certifying agent's authority to bind the Bidder.

4.1.9 Bidder shall complete the Non-Collusion Statement form included with the Bid Forms and include it with their Bid.

4.1.10 In the construction of all Public Works projects for the State of Delaware or any agency thereof, preference in employment of laborers, workers or mechanics shall be given to bona fide legal citizens of the State who have established citizenship by residence of at least 90 days in the State.

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4.1.11 Each bidder shall include a signed Affidavit for the Bidder certifying compliance with OMB Regulation 4104 - "Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on "Large Public Works Projects." "Large Public Works" is based upon the current threshold required for bidding Public Works as set by the Purchasing and Contracting Advisory Council.

4.1.12 Hard copy Bids, in duplicate, must be prepared upon an exact duplicate of the Bid Form included in these Specifications. All amounts shall be submitted in both script and numerals. All signatures shall be in longhand. The Bid Form shall be completed without alterations or erasures. Bidder shall include a sufficient amount in the Bid to cover the cost of any and/or all work called for by any Addenda or other instructions issued during the bidding period. Such work shall automatically become a part of the Contract.

In addition to the hard copy Bids, each Bidder must submit the Bid Form in electronic format. An electronic copy of the Bid Form (**without formulas**), has been provided in the Appendix of the Bidding Documents. The electronic submission of the Bid Form shall be provided by the Bidder in ELECRONIC FORMAT VIA E-MAIL.

Hard copy Bids will take precedence over the electronic version of the Bid Form in the Bid evaluation and award.

4.2 BID SECURITY

4.2.1 All bids shall be accompanied by a deposit of either a good and sufficient bond to the agency for the benefit of the agency, with corporate surety authorized to do business in this State, the form of the bond and the surety to be approved by the agency, or a security of the bidder assigned to the agency, for a sum equal to at least 10% of the bid plus all add alternates, or in lieu of the bid bond a security deposit in the form of a certified check, bank treasurer's check, cashier's check, money order, or other prior approved secured deposit assigned to the State. The bid bond need not be for a specific sum, but may be stated to be for a sum equal to 10% of the bid plus all add alternates to which it relates and not to exceed a certain stated sum, if said sum is equal to at least 10% of the bid. The Bid Bond form used shall be the standard OMB form (attached).

4.2.2 The Agency has the right to retain the bid security of Bidders to whom an award is being considered until either a formal contract has been executed and bonds have been furnished or the specified time has elapsed so the Bids may be withdrawn or all Bids have been rejected.

4.2.3 In the event of any successful Bidder refusing or neglecting to execute a formal contract and bond within 20 days of the awarding of the contract, the bid bond or security deposited by the successful bidder shall be forfeited.

4.3 SUBCONTRACTOR LIST

4.3.1 In accordance with Title 29, Chapter 69, Section 6962(d)(10)b of the Delaware Code, each Bidder shall submit with their Bid a completed List of Sub-Contractors included with the Bid Form. NAME ONLY ONE SUBCONTRACTOR FOR EACH TRADE. The bidder must list **in each category** the full name and address (City & State) of the sub-contractor that the Bidder will be using to perform the work and provide material for that subcontractor category. Should the Bidder's listed subcontractor intend to provide any of their subcontractor category of work through a third-tier contractor, the Bidder shall list that third-tier contractor's full name and address (City & State). **If the Bidder intends to perform any category of work itself, it must list its full name and address.** For clarification, if the Bidder intends to perform the work themselves, the Bidder **may not** insert "not applicable", "N/A", "self" or anything other than its own full name and address

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(City & State). To do so shall cause the bid to be rejected. In addition, the failure to produce a completed subcontractor list with the bid submittal shall cause the bid to be rejected. If you have more than three (3) third-tier contractors to report in any subcontractor category, print out additional page(s) containing the appropriate category, complete the rest of your list of third-tier contractors for that category, notate the addition in parentheses as (CONTINUATION) next to the subcontractor category and an asterisk (*) next to any additional third-tier contractors, and submit it with your bid.

4.3.2 It is the responsibility of the Contractor to ensure that their Subcontractors are in compliance with the provisions of this law. Also, if a Contractor elects to list themselves as a Subcontractor for any category, they must specifically name themselves on the Bid Form and be able to document their capability to act as Subcontractor in that category in accordance with this law.

4.4 AFFIDAVIT OF CONTRACTOR QUALIFICATIONS

4.4.1 In accordance with Title 29, Chapter 69, Section 6962(d)(10)b.3 of the Delaware Code, each Bidder shall submit with their Bid the Affidavit of Contractor Qualifications certifying that the Bidder will abide by the contractor's qualifications outlined in the construction bid specifications for the duration of the contract term. After a contract has been awarded the successful bidder shall not substitute another subcontractor whose name was submitted on the Subcontractor Form except for the reasons in the statute and not without written consent from the awarding agency. Failure to utilize the subcontractors on the list will subject the successful bidder to penalties as outlined in the General Requirements Section 5.2 of the contract.

4.5 AFFIDAVIT OF CRAFT TRAINING COMPLIANCE

4.5.1 In accordance with Title 29, Chapter 69, Section 6962(c)(13) of the Delaware Code, contractors and subcontractors must provide craft training for journeyman and apprentice levels if **all** of the following apply:

A. A project meets the prevailing wage requirement under Title 29, Chapter 69, Section 6960 of the Delaware Code.
B. The contractor employs 10 or more total employees.
C. The project is not a federal highway project

Failure to provide required craft training on the project may subject the successful contractor and/or subcontractor(s) to penalties as outlined in Title 29, Chapter 69, Section 6962(c)(13) of the Delaware Code.

Bidders shall submit the Affidavit of Craft Training Compliance prior to contract execution.

4.6 EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

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

A. The Contractor will not discriminate against any employee or applicant for employment because of race, creed, sex, color, sexual orientation, gender identity or national origin. The Contractor will take affirmative action to ensure the applicants are employed, and that employees are treated during employment, without regard to their race, creed, sex, color, sexual orientation, gender identity or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in

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conspicuous places available to employees and applicants for employment notices to be provided by the contracting agency setting forth this nondiscrimination clause.

B. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, sex, color, sexual orientation, gender identity or national origin."

4.7 PREVAILING WAGE REQUIREMENT

4.7.1 Wage Provisions: For renovation and new construction projects whose costs exceed the thresholds contained in Delaware Code, Title 29, Section 6960, the minimum wage rates for various classes of laborers and mechanics shall be as determined by the Department of Labor, Division of Industrial Affairs of the State of Delaware.

4.7.2 The employer shall pay all mechanics and labors employed directly upon the site of work, or engaged in custom fabrication work, as that term is defined in Article 1.23 herein and as also as defined in 29 Del. C § 6902 and described in 29 Del. C. § 6960(b), regardless of where the work is performed, unconditionally and not less often than once a week and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage rates not less than those stated in the specifications, regardless of any contractual relationship which may be alleged to exist between the employer and such laborers and mechanics.

4.7.3 As per 29 Del. C. § 6960(b), the scale of the wages to be paid must be posted by the employer in a prominent and easily accessible place at the site of the work. There may be withheld from the employer so much of accrued payments as may be considered necessary by the Department of Labor to pay laborers and mechanics employed by the employer the difference between the rates of wages required by the contract to be paid laborers and mechanics on the work and rates of wages received by such laborers and mechanics to be remitted to the Department of Labor for distribution upon resolution of any claims.

4.7.4 Every contract based upon these specifications shall contain a stipulation that sworn payroll information, as required by the Department of Labor, be furnished weekly. The Department of Labor shall keep and maintain the sworn payroll information for a period of 6 months from the last day of the work week covered by the payroll.

4.8 SUBMISSION OF BIDS

4.8.1 Enclose the Bid, the Bid Security, and any other documents required to be submitted with the Bid in a sealed opaque envelope. Address the envelope to the party receiving the Bids. Identify with the project name, project number, and the Bidder's name and address. If the Bid is sent by mail, enclose the sealed envelope in a separate mailing envelope with the notation "BID ENCLOSED" on the face thereof. The State is not responsible for the opening of bids prior to bid opening date and time that are not properly marked.

4.8.2 Deposit Bids at the designated location prior to the time and date for receipt of bids indicated in the Advertisement for Bids. Bids received after the time and date for receipt of bids will be marked “LATE BID” and returned.

4.8.3 Bidder assumes full responsibility for timely delivery at location designated for receipt of bids.

4.8.4 Oral, telephonic or telegraphic bids are invalid and will not receive consideration.

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4.8.5 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids, provided that they are then fully in compliance with these Instructions to Bidders.

4.9 MODIFICATION OR WITHDRAW OF BIDS

4.9.1 Prior to the closing date for receipt of Bids, a Bidder may withdraw a Bid by personal request and by showing proper identification to the Architect. A request for withdraw by letter or fax, if the Architect is notified in writing prior to receipt of fax, is acceptable. A fax directing a modification in the bid price will render the Bid informal, causing it to be ineligible for consideration of award. Telephone directives for modification of the bid price shall not be permitted and will have no bearing on the submitted proposal in any manner.

4.9.2 Bidders submitting Bids that are late shall be notified as soon as practicable and the bid shall be returned.

4.9.3 A Bid may not be modified, withdrawn or canceled by the Bidder during a thirty (30) day period following the time and date designated for the receipt and opening of Bids, and Bidder so agrees in submitting their Bid. Bids shall be binding for 30 days after the date of the Bid opening.

ARTICLE 5: CONSIDERATION OF BIDS

5.1 OPENING/REJECTION OF BIDS

5.1.1 Unless otherwise stated, Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids will be made available to Bidders.

5.1.2 The Agency shall have the right to reject any and all Bids. A Bid not accompanied by a required Bid Security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

5.1.3 If the Bids are rejected, it will be done within thirty (30) calendar day of the Bid opening.

5.2 COMPARISON OF BIDS

5.2.1 After the Bids have been opened and read, the bid prices will be compared and the result of such comparisons will be made available to the public. Comparisons of the Bids may be based on the Base Bid plus desired Alternates. The Agency shall have the right to accept Alternates in any order or combination.

5.2.2 The Agency reserves the right to waive technicalities, to reject any or all Bids, or any portion thereof, to advertise for new Bids, to proceed to do the Work otherwise, or to abandon the Work, if in the judgment of the Agency or its agent(s), it is in the best interest of the State.

5.2.3 An increase or decrease in the quantity for any item is not sufficient grounds for an increase or decrease in the Unit Price.

5.2.4 The prices quoted are to be those for which the material will be furnished F.O.B. Job Site and include all charges that may be imposed during the period of the Contract.

5.2.5 No qualifying letter or statements in or attached to the Bid, or separate discounts will be considered in determining the low Bid except as may be otherwise herein noted. Cash or separate discounts should be computed and incorporated into Unit Bid Price(s).

5.2.6 In determining the successful Bidder, consideration will be given to the base bid, escalation fees and any alternates accepted by the Owner. For purposes of Bid comparison, the Bid

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price will be the aggregate price for all specified Products on all Projects, plus any alternates accepted by the Owner, as the Owner may in its sole discretion determine.

5.2.7 In the case of numeric and math extension errors in the Bid Form, precedence will be as follows:

1. Written unit prices will take precedence over numeric unit prices.
2. Unit prices per piece of Products will take precedence over extended prices.

5.3 DISQUALIFICATION OF BIDDERS

5.3.1 An agency shall determine that each Bidder on any Public Works Contract is responsible before awarding the Contract. Factors to be considered in determining the responsibility of a Bidder include:

A. The Bidder's financial, physical, personnel or other resources including Subcontracts;

B. The Bidder's record of performance on past public or private construction projects, including, but not limited to, defaults and/or final adjudication or admission of violations of the Prevailing Wage Laws in Delaware or any other state;

C. The Bidder's written safety plan;

D. Whether the Bidder is qualified legally to contract with the State;

E. Whether the Bidder supplied all necessary information concerning its responsibility; and,

F. Any other specific criteria for a particular procurement, which an agency may establish; provided however, that, the criteria be set forth in the Invitation to Bid and is otherwise in conformity with State and/or Federal law.

5.3.2 If an agency determines that a Bidder is nonresponsive and/or nonresponsible, the determination shall be in writing and set forth the basis for the determination. A copy of the determination shall be sent to the affected Bidder within five (5) working days of said determination.

5.3.3 In addition, any one or more of the following causes may be considered as sufficient for the disqualification of a Bidder and the rejection of their Bid or Bids.

5.3.3.1 More than one Bid for the same Contract from an individual, firm or corporation under the same or different names.

5.3.3.2 Evidence of collusion among Bidders.

5.3.3.3 Unsatisfactory performance record as evidenced by past experience.

5.3.3.4 If the Unit Prices are obviously unbalanced either in excess or below reasonable cost analysis values.

5.3.3.5 If there are any unauthorized additions, interlineation, conditional or alternate bids or irregularities of any kind which may tend to make the Bid incomplete, indefinite or ambiguous as to its meaning.

NOT FOR BIDDING

5.3.3.6 If the Bid is not accompanied by the required Bid Security and other data required by the Bidding Documents.

5.3.3.7 If any exceptions or qualifications of the Bid are noted on the Bid Form.

5.4 ACCEPTANCE OF BID AND AWARD OF CONTRACT

5.4.1 A formal Contract shall be executed with the successful Bidder within twenty (20) calendar days after the award of the Contract.

5.4.2 Per Section 6962(d)(13)a., Title 29, Delaware Code, “The contracting agency shall award any public works contract within thirty (30) days of the bid opening to the lowest responsive and responsible Bidder, unless the Agency elects to award on the basis of best value, in which case the election to award on the basis of best value shall be stated in the Invitation To Bid. Any public school district and its board shall award public works contracts in accordance with this section’s requirements except it shall award the contract within 60 days of the bid opening.”

5.4.3 Each Bid on any Public Works Contract must be deemed responsive by the Agency to be considered for award. A responsive Bid shall conform in all material respects to the requirements and criteria set forth in the Contract Documents and specifications.

5.4.4 The Agency shall have the right to accept Alternates in any order or combination, and to determine the low Bidder on the basis of the sum of the Base Bid, plus accepted Alternates.

5.4.5 The successful Bidder shall execute a formal contract, submit the required Insurance Certificate, and furnish good and sufficient bonds, unless specifically waived in the General Requirements, in accordance with the General Requirement, within twenty (20) days of official notice of contract award. The successful Bidder shall provide, at least two business days prior to contract execution, copies of the Employee Drug Testing Program for the Bidder and all listed Subcontractors. Bonds shall be for the benefit of the Agency with surety in the amount of 100% of the total contract award. Said Bonds shall be conditioned upon the faithful performance of the contract. Bonds shall remain in affect for period of two (2) years after the date of the Certificate of Final Payment.

5.4.6 If the successful Bidder fails to execute the required Contract, Bond and all required information, as aforesaid, within twenty (20) calendar days after the date of official Notice of the Award of the Contract, their Bid guaranty shall immediately be taken and become the property of the State for the benefit of the Agency as liquidated damages, and not as a forfeiture or as a penalty. Award will then be made to the next lowest qualified Bidder of the Work or readvertised, as the Agency may decide.

5.4.7 Each bidder shall supply with its bid its taxpayer identification number (i.e., federal employer identification number or social security number) and should the vendor be awarded a contract, such vendor shall provide to the agency the taxpayer identification license numbers of such subcontractors. Such numbers shall be provided on the later of the date on which such subcontractor is required to be identified or the time the contract is executed. The successful Bidder shall provide to the agency to which it is contracting, within 30 days of entering into such public works contract, copies of all Delaware Business licenses of subcontractors and/or independent contractors that will perform work for such public works contract. However, if a subcontractor or independent contractor is hired or contracted more than 20 days after the Bidder entered the public works contract the Delaware Business license of such subcontractor or independent contractor shall be provided to the agency within 10 days of being contracted or hired.

NOT FOR BIDDING

5.4.8 The Bid Security shall be returned to the successful Bidder upon the execution of the formal contract. The Bid Securities of unsuccessful bidders shall be returned within thirty (30) calendar days after the opening of the Bids.

ARTICLE 6: POST-BID INFORMATION

6.1 CONTRACTOR'S QUALIFICATION STATEMENT

6.1.1 Bidders to whom an award of a Contract is under consideration shall, if requested by the Agency, submit a properly executed AIA Document A305, Contractor's Qualification Statement, unless such a statement has been previously required and submitted.

6.2 Bidders to whom an award of a Contract has been made must produce their Delaware Business License before the Contract can be executed.

ARTICLE 7: PERFORMANCE BOND AND PAYMENT BOND

7.1 BOND REQUIREMENTS

7.1.1 The cost of furnishing the required Bonds, that are stipulated in the Bidding Documents, shall be included in the Bid.

7.1.2 If the Bidder is required by the Agency to secure a bond from other than the Bidder's usual sources, changes in cost will be adjusted as provide in the Contract Documents.

7.1.3 The Performance and Payment Bond forms used shall be the standard OMB forms (attached).

7.2 TIME OF DELIVERY AND FORM OF BONDS

7.2.1 The bonds shall be dated on or after the date of the Contract.

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

7.2.3 Within twenty (20) days after the receipt of notice of intent to award of the contract, the Bidder to whom the award is made shall furnish a Performance Bond and Payment Bond, each equal to twenty-five percent (25%) of the aggregate amount of the Contract Price to guarantee the faithful performance of all terms, covenants, and conditions of the same. The Bonds are to be issued by an acceptable bonding company licensed to do business in the State of Delaware and shall be issued in triplicate.

7.2.4 The Bonds shall be maintained in full force for a period of thirty (30) months after the last of the Delivery Dates under the Contract. The Performance Bond shall guarantee the Vendor's performance of its obligations under the Contract, including without limitation the obligation to make good any faults or defects in the Products furnished which may develop during the period of said guarantee as a result of improper or defective workmanship, material, or apparatus, whether furnished by the Vendor or his subcontractors. The Payment Bond shall guarantee that the Vendor shall pay in full all persons, firms, or corporations who furnish labor, material, or both labor and materials for, or on account of, the work included herein. The Bonds shall be paid for by this Vendor. The Owner shall have the right to demand proof that the parties signing the Bonds are duly authorized to do so.

NOT FOR BIDDING

ARTICLE 8: FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

8.1 Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment is a Stipulated Sum.

END OF SECTION

NOT FOR BIDDING

Major Capital Program Mechanical Pre-Purchase
1798 Limestone Road
Wilmington, DE 19804

BID FORM

For Bids Due: _____ **To:** Red Clay Consolidated School District

(Date)

District Administration Building
2916 Duncan Road
Wilmington, Delaware 19808

Name of Bidder: _____

Delaware Business License No.: _____ **Taxpayer ID No.:** _____

(Other License Nos.): _____

Phone No.: ( ) _____ - _____ **Fax No.: ( ) _____ - _____**

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

Bid breakdown of the Projects within the Program:

1. A.I. DuPont High School $_____
2. A.I. DuPont Middle School $_____
3. Baltz Elementary School $_____
4. Brandywine Springs Elementary School $_____
5. Conrad Middle School $_____
6. Dickinson High School $_____
7. Forest Oak Elementary School $_____
8. H.B. DuPont Middle School $_____

NOT FOR BIDDING

9.	Heritage Elementary School	$_____
10.	Johnson / Highlands Elementary School	$_____
11.	Lewis Elementary School	$_____
12.	Linden Hill Elementary School	$_____
13.	Marbrook Elementary School	$_____
14.	McKean High School	$_____
15.	Meadowood School	$_____
16.	Mote Elementary School	$_____
17.	North Star Elementary School	$_____
18.	Richardson Park Elementary School	$_____
19.	Richey Elementary School	$_____
20.	Shortlidge Elementary School	$_____
21.	Skyline Middle School	$_____
22.	Stanton Middle School	$_____
23.	Warner Elementary School	$_____
24.	Wilmington Campus / Cab Calloway	$_____

Total of All Projects $_____

Total of All Projects in Written Form: $_____

NOT FOR BIDDING

ALLOWANCES

Not Used

ALTERNATES

Not Used

UNIT PRICES

Not Used

ESCALATION COST

The undersigned agrees that for any Notice to Proceed and Project Purchase Order released between **June 1, 2025 and May 31, 2026** will remain as bid, without adjustment for escalation.

Any Notice to Proceed and Project Purchase Order released after **May 31, 2026** shall be adjusted as follows:

The undersigned agrees that for any **Notice to Proceed** and **Project Purchase Order** released after **twelve (12)** months from the date of Major Capital Improvement Program Contract signing the material and /or equipment price will remain as bid for any **Notice to Proceed** and **Project Purchase Order** released after the **twelve (12)** months the price will be calculated as follows:

1. Price Adjustment Schedule
The pricing of equipment and material under this Agreement shall be subject to an annual escalation rate of X% (e.g., 3%-5%) effective on the anniversary date of the Agreement to be calculated as described below. The escalation shall apply to the unit cost of equipment and any associated labor or installation services, unless otherwise specified.

2. Index-Based Adjustment Calculation
The parties agree to adjust pricing annually based on the Producer Price Index (PPI) for Equipment or another mutually agreed industry index as reported by the *Federal Reserve Bank of St. Louis*: https://fred.stlouisfed.org/.
The annual price adjustment shall be calculated as follows:

A. The percentage change in the selected index over the prior 12-month period, not to exceed 6%.
B. If the index shows a negative change, prices shall remain unchanged (no downward adjustment).
C. The Producer Price Index Values shall be as follows:
   1) Generators: PCU335312335312
   2) Electrical Panels, Switchgear, and Transformers: WPS117
   3) HVAC Equipment: PCU3334133341
   4) Door Hardware: WPU10410104
   5) Plumbing Equipment: WPU11490205

3. Extraordinary Market Conditions Clause
If during the term of this Agreement, the cost of raw materials essential to HVAC, Electrical Component, Plumbing Component, or Door Hardware manufacturing (such as copper, aluminum, refrigerants, steel, etc.) increases by more than 6% in a single year, the Vendor may request an extraordinary price adjustment. The Vendor must provide verifiable documentation of cost increases, and both parties shall negotiate an equitable adjustment.

4. Renegotiation and Termination Rights
If price escalations exceed 15% over any consecutive two-year period, either party may request a renegotiation of terms. If the parties cannot reach a mutual agreement within 30 days, the Purchaser shall have the right to terminate the Agreement without penalty. The vendor shall continue to honor the current contract until negotiations are completed.

5. Notice Requirement
The Vendor must provide written notice of any proposed price adjustments at least 60 days before the effective date of the adjustment.

NOT FOR BIDDING

Major Capital Program Mechanical Pre-Purchase

BID FORM

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for thirty (30) days from the date of opening of bids (60 days for School Districts and Department of Education), and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid.

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work within __calendar days of the Notice to Proceed.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

_____
(State of Corporation)

Business Address:_____
_____
_____
_____

Witness: _____ **By:** _____
(Authorized Signature)

(SEAL)

_____
(Title)

Date: _____

ATTACHMENTS

Sub-Contractor List
Non-Collusion Statement
Affidavit of Employee Drug Testing Program
Affidavit of Contractor Qualifications
Bid Security
Excel Spreadsheets with Equipment Information and Quantities
(Others as Required by Project Manuals)

NOT FOR BIDDING

Major Capital Program Mechanical Pre-Purchase
1798 Limestone Road
Wilmington, DE 19804

BID FORM

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b of the Delaware Code, the following subcontractor listing must accompany any bid submittal. The bidder must list **in each category** the full name and address (City & State) of the sub-contractor that the bidder will be using to perform the work and provide material for that subcontractor category. Should the bidder's listed subcontractor intend to provide any of their subcontractor category of work through a third-tier contractor, the bidder shall list that third-tier contractor's full name and address (City & State). **If the bidder intends to perform any category of work itself, it must list its full name and address.** For clarification, if the bidder intends to perform the work themselves, the bidder **may not** insert "not applicable", "N/A", "self" or anything other than its own full name and address (City & State). To do so shall cause the bid to be rejected. In addition, the failure to produce a completed subcontractor list with the bid submittal shall cause the bid to be rejected. If you have more than three (3) third-tier contractors to report in any subcontractor category, print out additional page(s) containing the appropriate category, complete the rest of your list of third-tier contractors for that category, notate the addition in parentheses as (CONTINUATION) next to the subcontractor category and an asterisk (*) next to any additional third-tier contractors, and submit it with your bid.

Subcontractor Category	Subcontractor	Address (City & State)	Subcontractor's tax-payer ID # or Delaware Business license #
1.			
A.			
B.			
C.			
2.			
A.			
B.			
C.			

NOT FOR BIDDING

Major Capital Program Mechanical Pre-Purchase
1798 Limestone Road
Wilmington, DE 19804

BID FORM (Continued)

3.				
	A.			
	B.			
	C.			
4.				
	A.			
	B.			
	C.			
5.				
	A.			
	B.			
	C.			

NOT FOR BIDDING

Major Capital Program Mechanical Pre-Purchase
1798 Limestone Road
Wilmington, DE 19804

BID FORM

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date *(to the Office of Management and Budget, Division of Facilities Management)*.

All the terms and conditions of Major Capital Program Pre-Purchase Services have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE (TYPED): _____

AUTHORIZED REPRESENTATIVE (SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

_____

_____

E-MAIL: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

NOT FOR BIDDING

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite, including subcontractors, that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

NOT FOR BIDDING

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

Major Capital Program Mechanical Pre-Purchase
1798 Limestone Road
Wilmington, DE 19804

AFFIDAVIT OF CONTRACTOR QUALIFICATIONS

We hereby certify that we will abide by the contractor's qualifications outlined in the construction bid specifications for the duration of the contract term.

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b.3 of the Delaware Code, after a contract has been awarded the successful bidder shall not substitute another subcontractor whose name was submitted on the Subcontractor Form except for the reasons in the statute and not without written consent from the awarding agency. Failure to utilize the subcontractors on the list will subject the successful bidder to penalties as outlined in the General Requirements Section 5.2 of the contract.

Contractor Name: _____

Contractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

NOT FOR BIDDING

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

STATE OF DELAWARE
OFFICE OF MANAGEMENT AND BUDGET

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: _____ _____ of _____ in the County of _____ and State of _____ as **Principal**, and _____ of _____ in the County of _____ and State of _____ as **Surety**, legally authorized to do business in the State of Delaware ("**State**"), are held and firmly unto the **State** in the sum of _____ Dollars ($_____), or _____ percent not to exceed _____ Dollars ($_____) of amount of bid on Contract No. 4-23-01, to be paid to the **State** for the use and benefit of the Department of Management and Budget, Division of Facilities Management for which payment well and truly to be made, we do bind ourselves, our and each of our heirs, executors, administrators, and successors, jointly and severally for and in the whole firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bonded **Principal** who has submitted to the Department of Management and Budget a certain proposal to enter into this contract for the furnishing of certain material and/or services within the **State**, shall be awarded this Contract, and if said **Principal** shall well and truly enter into and execute this Contract as may be required by the terms of this Contract and approved by the Red Clay Consolidated School District this Contract to be entered into within twenty days after the date of official notice of the award thereof in accordance with the terms of said proposal, then this obligation shall be void or else to be and remain in full force and virtue.

Sealed with _____ seal and dated this _____ day of _____ in the year of our Lord two thousand and _____ (20___).

SEALED, AND DELIVERED IN THE
Presence of

_____
Name of Bidder (Organization)

Corporate Seal

By: _____
Authorized Signature

Attest _____

_____
Title

_____
Name of Surety

Witness: _____

By: _____

_____
Title

NOT FOR BIDDING

SECTION 00 52 13

STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR A101-2017

The contract to be utilized on this project shall be the “Standard Form of Agreement Between Owner and Contractor” AIA Document A101-2017, including AIA Document A101 – 2017 Exhibit A, as well as Supplements to A101-2017 and Exhibit A and the State of Delaware’s General Requirements.

NOT FOR BIDDING

SECTION 00 52 13

STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

CONTRACT
(Contract No. XXX-XXX)

THIS CONTRACT, executed this _____ day of _____, 2025 by and between the Red Clay Consolidated School District, having offices at 2916 Duncan Road, Wilmington, DE 19808 (hereinafter called "Owner"), and _____, a _____ having offices at _____ (hereinafter called "Vendor").

WHEREAS, the Owner has advertised for proposals as required by law and has awarded Contract No. _____ (hereinafter called the "Contract"), for certain work (hereinafter called the "Work") described below, to the Contractor, who was the lowest responsible bidder.

WHEREAS, Contractor has given Performance and Payment Bonds to the Owner with sufficient surety in the sums determined by said Owner, which bonds are attached hereto; and

WHEREAS, Owner has retained _____, as Architect of Record for the work of this Contract.

NOW, THEREFORE, THIS CONTRACT WITNESSETH: that for, and in consideration of mutual promises, covenants, and agreements made by each of the parties and hereinafter set forth, the parties hereto do covenant, promise and agree as follows:

FIRST: Vendor's Scope of Supply. Vendor and Owner agree that the Vendor's scope of supply under this Contract will be as set forth in Project Purchase Orders issued by the Owner under this Contract. Except to the extent that the Owner has issued a Project Purchase Order, the Owner shall have no liability under this Contract.

SECOND: Time of Commencement and Completion. Vendor agrees to furnish and deliver Products as set forth in each Project Purchase Order in accordance with the Delivery Date(s) and Delivery Schedule set forth therein.

THIRD: Owner's Remedy for Delays. Vendor further agrees that if it shall fail to deliver Products strictly in accordance with the Delivery Schedule and Delivery Dates as set forth in each Project Purchase Order, then the Vendor shall be liable to the Owner for any actual damages incurred by the Owner as a result, and agrees to a deduction from any funds due to the Vendor from the Owner, in the amount of such damages.

FOURTH: Payments to Vendor. The Owner agrees, in consideration of the performance by the Vendor of the scope of supply described in each Project Purchase Order, the corresponding Purchase Order Price as set forth on the face of the Project Purchase Order, payment to be made as set forth in the General Conditions; provided, however, that deductions from or additions to said sum to be paid will be made under the circumstances and upon the basis set forth in the General Conditions.

It is agreed that if quantity of Products to be supplied shall be increased or decreased, additions to or deductions from the corresponding Purchase Order Price shall be made in the manner set forth in the General Conditions and further that the Owner shall have no liability, and Vendor shall have and make no claims for loss of anticipated profits or otherwise, if the quantities of any items of Work actually ordered to be done shall be less than, or entirely omitted from, those set forth in the Bidding Documents, the General Conditions and Specifications.

NOT FOR BIDDING

FIFTH: No Liens. The Vendor will not at any time suffer or permit any lien, attachment or other encumbrance, under any laws of this State or any other State or Commonwealth, or the Federal Government, by any persons whomsoever to be put or remain on the building or premises into or upon which any Work is done or materials are furnished under this Contract, or by reason of any other claim or demand against the Vendor. The Vendor will not put any materials on said building or premises to which he has not obtained absolute title. Until it is removed, any such lien, attachment, or other encumbrance or claims of a third party shall entitle the Owner to withhold payment otherwise owing under or by virtue of this Contract in an amount equal to two times the amount of such lien, attachment, encumbrance or claim, and in the event that same is not removed, Owner may remove the same at the expense, including legal fees, of the Vendor.

SIXTH: Warranty, Remedy of Defects. The Vendor covenants and agrees to remedy without cost to the Owner, any defect in the Products work which may develop within the period of the warranty furnished by the Vendor under the Contract Documents.

SEVENTH: Modifications to Contract. Modifications or changes in this Contract shall not be made except by written instrument, duly authorized by the Owner, as more fully provided in the Conditions.

EIGHTH: Governing Law. The Contract shall be governed as to its construction, interpretation and application, by the laws of the State of Delaware , notwithstanding the applicability of any other laws under the principles of conflicts of laws.

NINTH: Definitions. Terms used in this Contract which are defined in the General Conditions shall have the meanings set forth in the General Conditions.

TENTH: Binding Nature: Assignability. This Contract shall be binding on the parties hereto, their successors and permitted assigns and shall not be assignable except by the written instrument executed by all parties hereto.

ELEVENTH: Contract Documents: Integration. Each and every one of the Contract Documents is hereby incorporated into and made part of this Contract to the same extent as if it was fully set forth herein. The Contract represents the entire agreement of the Owner and the Vendor with respect to the Vendors scope of supply, and supersedes all prior negotiations, representations or agreements, either written or oral.

TWELFTH: Notwithstanding anything contained in any of the Contract Documents to the contrary, (a) all products must be shipped F.O.B. destination to the Project Contractor at the Project Site Location, and (b) all risk of loss or damage to the Products procured under the Contract, or any part thereof, prior to both (i) delivery of such Products to the Project Contractor at the Project Site location and (ii) inspection and written acceptance of such Products by the Project Contractor after delivery to the Project Site Location, shall be borne by the Vendor. Prior to shipment, the Vendor shall contact the Project Contractor to confirm shipping information. Any loss or damage to any such Product incurred at any time prior to both (a) delivery of such Products to the Project Contractor at the Project Site location and (b) inspection and written acceptance of such Products by the Project Contractor after deliver to the Project Site location shall not alleviate the Vendor from the conformance with the terms and conditions of the Contract. Unless the Contract specified otherwise the Vendor shall ship all Products in accordance with the following instructions:

(a) Shipments to the Vendor or its subcontractors must include packing sheets containing the Owner's Contract No., Project Purchase Order No., description and quantity of Products shipped, part number or size, if applicable, and appropriate evidence of inspections. The Vendor shall not include vermiculite or other hazardous substances in any packing included with the Products shipped. Products shipped on the same day must be consolidated on one bill of lading or airbill unless the Owner authorizes otherwise. The total number of shipping containers must be referenced on all shipping documents.

NOT FOR BIDDING

(b) The Vendor shall label each shipping container with the Contract No., the Project Purchase Order No., and the number that each container represents of the total number being shipped (e.g., Box 1 of 2, Box 2 of 2).

(c) The Vendor shall include copies of documentation supporting prepaid freight charges (e.g., carrier invoices or UPS shipping log/manifest), if any, with its invoices.

(d) If the Vendor is unable to comply with the shipping instructions in the Contract, the Vendor shall promptly notify the Owner and the Architect/Engineer of Record.

Thirteenth: Delivery. All Products shall be delivered in good condition, complete and ready for operation or use, and in conformity with all of the requirements of the Contract. The Vendor shall coordinate with the Project Contractor at the Project Site location at 14 days in advance to arrange for receipt, inspection and acceptance of the Products as set forth in Section TWELFTH above.

NOT FOR BIDDING

IN WITNESS WHEREOF, the parties hereto have executed this Contract the day and year aforesaid written.

RED CLAY CONSOLIDATED SCHOOL DISTRICT

By:_____
Title:

By:_____
Title:

_____

VENDOR (Individual)

Witness:
_____
Name:

By:_____
Name:
Address: _____
_____
_____

_____

VENDOR (Partnership)

Witness:
_____
Name:

By:_____
Name:
Address: _____
_____
_____

_____

VENDOR (Corporation)

Witness:
_____
Name:

By:_____
Name:
Address: _____
_____
_____

(Corporate Seal)

NOT FOR BIDDING

[Sample of Purchase Order Form is available by Request from Red Clay Consolidated School District]

NOT FOR BIDDING

SECTION 00 54 13

SUPPLEMENT TO AGREEMENT BETWEEN OWNER AND CONTRACTOR A101-2017

The following supplements modify the "Standard Form of Agreement Between Owner and Contractor," AIA Document A101-2017. Where a portion of the Standard Form of Agreement is modified or deleted by the following, the unaltered portions of the Standard Form of Agreement shall remain in effect.

ARTICLE 3: DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

3.1 Delete paragraph 3.1 in its entirety and replace with the following:

"The date of Commencement of the Work shall be a date set forth in a notice to proceed issued by the Owner."

ARTICLE 5: PAYMENTS

5.1 PROGRESS PAYMENTS

5.1.3 Delete paragraph 5.1.3 in its entirety and replace with the following:

"Provided that a valid Application for Payment is received by the Architect that meets all requirements of the Contract, payment shall be made by the Owner not later than 30 days after the Owner receives the valid Application for Payment."

5.3 Insert the interest rate of "1% per month not to exceed 12% per annum."

ARTICLE 6: DISPUTE RESOLUTION

6.2 BINDING DISPUTE RESOLUTION

Check the box "Other" – and add the following sentence:

"Any remedies available in law or in equity."

ARTICLE 7: TERMINATION or SUSPENSION

7.1.1.1 Delete paragraph 7.1.1.1 in its entirety.

ARTICLE 8: MISCELLANEOUS PROVISIONS

8.4 Delete paragraph 8.4 in its entirety and replace with the following:

"The Contractor's representative shall not be changed without ten days written notice to the Owner."

END OF SECTION

NOT FOR BIDDING

SECTION 00 54 14

SUPPLEMENT TO A101-2017 – EXHIBIT A – INSURANCE AND BONDS

The following supplements modify the "Standard Form of Agreement Between Owner and Contractor," AIA Document A101-2017 Exhibit A Insurance and Bonds. Where a portion of the Standard Form of Agreement is modified or deleted by the following, the unaltered portions of the Standard Form of Agreement shall remain in effect.

ARTICLE A.2 OWNER'S INSURANCE

A.2.1 General

Delete paragraph A.2.1 in its entirety.

A.2.2 Liability Insurance

Delete paragraph A.2.2 in its entirety, except in the case of school projects this paragraph shall remain.

A.2.3 Required Property Insurance

Delete paragraph A.2.3 in its entirety.

A.2.4 Optional Extended Property Insurance

Delete paragraph A.2.4 in its entirety.

A.2.5 Other Optional Insurance

Delete paragraph A.2.5 in its entirety.

ARTICLE A.3 CONTRACTORS INSURANCE AND BONDS

A.3.1.1 Strike the last sentence of the paragraph.

A.3.1.3 Additional Insured Obligations

In the first sentence after "coverage to include (1)" delete "(1) the Owner,".

Strike the remainder of the first sentence beginning at the semicolon "; and (2) the Owner" through the end of the sentence.

Delete the second sentence in its entirety.

A.3.2.2.1 Insert "$1,000,000.00" in the blank for each occurrence.
Insert "$3,000,000.00" in the blank for general aggregate.
Insert "$3,000,000.00" in the blank for aggregate for products-completed operations hazard.

A.3.2.3 Insert "$1,000,000.00" in the blank for per accident.

A.3.2.6 Insert "$500,000.00" in the blank for each accident.
Insert "$500,000.00" in the blank for each employee.

NOT FOR BIDDING

Insert “$500,000.00” in the blank for policy limit.

A.3.2.8 Insert “$1,000,000.00” in the blank for per claim.
Insert “$3,000,000.00” in the blank for in the aggregate.

A.3.2.9 Insert “$1,000,000.00” in the blank for per claim.
Insert “$3,000,000.00” in the blank for in the aggregate.

A.3.2.10 Insert “$2,000,000.00” in the blank for per claim.
Insert “$4,000,000.00” in the blank for in the aggregate.

A.3.2.11 Strike in its entirety.

A.3.2.12 Strike in its entirety.

A.3.3.2.1 Delete paragraph 3.3.2.1 in its entirety

A.3.3.2.2 Strike in its entirety.

A.3.3.2.3 Insert “$1,000,000.00” in the blanks for per claim.
Insert “$3,000,000.00” in the blanks for in the aggregate.

A.3.4 Insert the actual contract price in both the Payment Bond and the Performance Bond Penal Sum blanks. It must be 100% of the contract price.

Strike the last sentence in this section and replace with “Payment and Performance Bonds shall be in the standard form issued by the Delaware Office of Management and Budget.”

END OF SECTION

NOT FOR BIDDING

STATE OF DELAWARE
OFFICE OF MANAGEMENT AND BUDGET

PERFORMANCE BOND

Bond Number: _____

KNOW ALL PERSONS BY THESE PRESENTS, that we, _____, as principal ("**Principal**"), and _____, a _____ corporation, legally authorized to do business in the State of Delaware, as surety ("**Surety**"), are held and firmly bound unto the Office of Management and Budget, Division of Facilities Management ("**Owner**"), in the amount of _____ ___ ($_____), to be paid to **Owner**, for which payment well and truly to be made, we do bind ourselves, our and each and every of our heirs, executors, administrations, successors and assigns, jointly and severally, for and in the whole, firmly by these presents.

Sealed with our seals and dated this _____ day of _____, 20__.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH, that if **Principal**, who has been awarded by **Owner** that certain contract known as Contract No. 4-23-01 dated the _____ day of _____, 20__ (the "Contract"), which Contract is incorporated herein by reference, shall well and truly provide and furnish all materials, appliances and tools and perform all the work required under and pursuant to the terms and conditions of the Contract and the Contract Documents (as defined in the Contract) or any changes or modifications thereto made as therein provided, shall make good and reimburse **Owner** sufficient funds to pay the costs of completing the Contract that **Owner** may sustain by reason of any failure or default on the part of **Principal**, and shall also indemnify and save harmless **Owner** from all costs, damages and expenses arising out of or by reason of the performance of the Contract and for as long as provided by the Contract; then this obligation shall be void, otherwise to be and remain in full force and effect.

Surety, for value received, hereby stipulates and agrees, if requested to do so by **Owner**, to fully perform and complete the work to be performed under the Contract pursuant to the terms, conditions and covenants thereof, if for any cause **Principal** fails or neglects to so fully perform and complete such work.

Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of **Surety** and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition or change in or to the Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any work to be performed or any monies due or to become due thereunder; and **Surety** hereby waives notice of any and all such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other

NOT FOR BIDDING

transferees shall have the same effect as to **Surety** as though done or omitted to be done by or in relation to **Principal**.

Surety hereby stipulates and agrees that no modifications, omissions or additions in or to the terms of the Contract shall in any way whatsoever affect the obligation of **Surety** and its bond.

Any proceeding, legal or equitable, under this Bond may be brought in any court of competent jurisdiction in the State of Delaware. Notices to **Surety** or Contractor may be mailed or delivered to them at their respective addresses shown below.

IN WITNESS WHEREOF, **Principal** and **Surety** have hereunto set their hand and seals, and such of them as are corporations have caused their corporate seal to be hereto affixed and these presents to be signed by their duly authorized officers, the day and year first above written.

PRINCIPAL

Name: _____

Witness or Attest: Address: _____

_____ By: _____(SEAL)
Name: Name:
Title:

(Corporate Seal)

SURETY

Name: _____

Witness or Attest: Address: _____

_____ By: _____ (SEAL)
Name: Name:
Title:

(Corporate Seal)

NOT FOR BIDDING

STATE OF DELAWARE
OFFICE OF MANAGEMENT AND BUDGET

PAYMENT BOND

Bond Number: _____

KNOW ALL PERSONS BY THESE PRESENTS, that we, _____, as principal ("**Principal**"), and _____, a _____ corporation, legally authorized to do business in the State of Delaware, as surety ("**Surety**"), are held and firmly bound unto the Department of Management and Budget, Division of Facilities Management ("**Owner**"), in the amount of _____ ($_____), to be paid to **Owner**, for which payment well and truly to be made, we do bind ourselves, our and each and every of our heirs, executors, administrations, successors and assigns, jointly and severally, for and in the whole firmly by these presents.

Sealed with our seals and dated this _____ day of_____, 20__.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH, that if **Principal**, who has been awarded by **Owner** that certain contract known as Contract No. 4-23-01 dated the _____ day of _____, 20__ (the "Contract"), which Contract is incorporated herein by reference, shall well and truly pay all and every person furnishing materials or performing labor or service in and about the performance of the work under the Contract, all and every sums of money due him, her, them or any of them, for all such materials, labor and service for which **Principal** is liable, shall make good and reimburse **Owner** sufficient funds to pay such costs in the completion of the Contract as **Owner** may sustain by reason of any failure or default on the part of **Principal**, and shall also indemnify and save harmless **Owner** from all costs, damages and expenses arising out of or by reason of the performance of the Contract and for as long as provided by the Contract; then this obligation shall be void, otherwise to be and remain in full force and effect.

Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of **Surety** and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition or change in or to the Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any work to be performed or any monies due or to become due thereunder; and **Surety** hereby waives notice of any and all such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to **Surety** as though done or omitted to be done by or in relation to **Principal**.

Surety hereby stipulates and agrees that no modifications, omission or additions in or to the terms of the Contract shall in any way whatsoever affect the obligation of **Surety** and its bond.

NOT FOR BIDDING

Any proceeding, legal or equitable, under this Bond may be brought in any court of competent jurisdiction in the State of Delaware. Notices to **Surety** or Contractor may be mailed or delivered to them at their respective addresses shown below.

IN WITNESS WHEREOF, **Principal** and **Surety** have hereunto set their hand and seals, and such of them as are corporations have caused their corporate seal to be hereto affixed and these presents to be signed by their duly authorized officers, the day and year first above written.

PRINCIPAL

Name: _____

Witness or Attest: Address: _____

_____ By: _____(SEAL)
Name: Name:
Title:

(Corporate Seal)

SURETY

Name: _____

Witness or Attest: Address: _____

_____ By: _____(SEAL)
Name: Name:
Title:

(Corporate Seal)

NOT FOR BIDDING

APPLICATION AND CERTIFICATE FOR PAYMENT FORMS

The Application and Certificate for Payment are as stated in the American Institute of Architects Document AIA G702 & AIA G703 (1992 version) entitled Application and Certificate for Payment and is part of this project manual as if herein written in full. A draft sample has been included for reference.

NOT FOR BIDDING

SECTION 00 65 01

CLOSEOUT DOCUMENT CHECKLIST

Project: Major Capital Program Pre-Purchase Services

Date:

1. 2 original Form G704 Substantial Completion
2. 2 original Form G706 Affidavit of Payment of Debts and Claims
3. 2 original Form 706A Release of Liens Contractor / Subcontractor
4. 2 original Form 707 Consent of Surety Company
5. 3 original Final Payment App
6. Meeting Minutes
7. General Correspondence
8. Certificate of Occupancy
9. Environmental Certificates
10. 2 original of Warranties (Letter of Guarantee and Warranty Info)
11. 2 O&M Manuals
12. 2 Hard Copy of As-Built Drawings
13. 2 sets of drawing discs. Updated CAD files
14. Occupancy Permits
15. Test & Balancing Reports
16. Field Reports/Inspection Reports
17. Pest Control Final Inspection Report & Warranty (Slabs over 400SF)
18. 2 original Substantial Completion Form
19. 2 sets of Record Shop Drawings and submittals
20. Affidavit of Discharge of State Tax Liability
21. Copy of completed final punch list signed off on by Owner's Rep
22. Punch list Closeout Letter.

END OF SECTION

NOT FOR BIDDING

SECTION 00 72 13

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION
A201-2017

The General Conditions of this Contract are as stated in the American Institute of Architects Document AIA A201 (2017 Edition) entitled General Conditions of the Contract for Construction as revised by the Supplementary General Conditions and is part of this project manual as if herein written in full.

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SECTION 00 73 13

SUPPLEMENTARY GENERAL CONDITIONS A201-2017

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

TABLE OF ARTICLES

NOT FOR BIDDING

ARTICLE 1: GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

Strike the last sentence of Section 1.1.1 in its entirety and replace with the following:

"The Contract Documents also include Advertisement for Bid, Instructions to Bidder, sample forms, the Bid Form, the Contractor's completed Bid and the Award Letter."

Add the following Section:

"1.1.1.1 In the event of conflict or discrepancies among the Contract Documents, the Documents prepared by the State of Delaware, Division of Facilities Management shall take precedence over all other documents.

Before the Vendor commences performance under the Contract, the Vendor shall check the Specifications and should any errors, discrepancies, ambiguities or omissions be found in the Specifications the Vendor shall notify the Architect/Engineer of Record, in writing, immediately. The Architect/Engineer of Record shall direct the Vendor as to how to proceed. Any Products furnished after such discovery, but prior to receipt of written direction from the Architect/Engineer of Record, shall be at the sole risk of the Vendor . The Vendor shall not take advantage of any error, omission, or discrepancy in the Specifications or the Contract Documents.

Products, material, equipment, supplies, components, other products, and workmanship specified by reference to the number, symbol, or title of a published standard must comply with the latest edition or revision thereof and all amendments and supplements thereto in effect on the date of Invitation for Bids for the Contract, except where a specific issue is specified. In case of a conflict between the Specifications and the standard referred to, the Specifications shall govern. The Owner will not give consideration to any claimed ignorance of a cited standard. Vendor is responsible to be knowledgable and familiar with its own trade's generally accepted, published standards of quality and workmanship.

The words "as shown," "as indicated," "as detailed," and all words of similar import must be understood to refer to the Specifications and Bidding Documents, unless otherwise expressly provided."

1.1.8 INITIAL DECISION MAKER

Strike the last sentence of Section 1.1.8 in its entirety and add the following to the end of the remaining sentence:

" and certify termination of the Agreement under Section14.2.2."

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

1.2.1.1 Insert "if possible" at the end of the second sentence.

Add the following Sections:

NOT FOR BIDDING

"1.2.4 In the case of an inconsistency between the Drawings and the Specifications, or within either document not clarified by addendum, the better quality or greater quantity of work shall be provided in accordance with the Architect's interpretation."

"1.2.5 The word "PROVIDE" as used in the Contract Documents shall mean "FURNISH AND INSTALL" and shall include, without limitation, all labor, materials, equipment, transportation, services and other items required to complete the Work."

"1.2.6 The word "PRODUCT" as used in the Contract Documents means all materials, systems and equipment."

1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

Strike Section 1.5.1 in its entirety and replace with the following:

"All pre-design studies, drawings, specifications and other documents, including those in electronic form, prepared by the Architect under this Agreement are, and shall remain, the property of the Owner whether the Project for which they are made is executed or not. Such documents may be used by the Owner to construct one or more like Projects without the approval of, or additional compensation to, the Architect. The Contractor, Subcontractors, Sub-subcontractors, and Material or Equipment Suppliers are authorized to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants appropriate to and for use in the execution of their Work under the Contract Documents. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor or Material and Equipment Supplier on other Projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and Architect's consultants.

The Architect shall not be liable for injury or damage resulting from the re-use of drawings and specifications if the Architect is not involved in the re-use Project. Prior to re-use of construction documents for a Project in which the Architect is not also involved, the Owner will remove from such documents all identification of the original Architect, including name, address and professional seal or stamp."

Strike Section 1.5.2 in its entirety.

1.7 DIGITAL DATA USE AND TRANSMISSION

Strike Section 1.7 in its entirety and replace with the following:

"The parties shall agree upon protocols governing transmission and use of Instruments of Service or any other information or documentation in digital form."

1.8 BUILDING INFORMATION MODELS USE AND RELIANCE

Strike Section 1.8 in its entirety.

ARTICLE 2: OWNER

2.2 EVIDENCE OF THE OWNERS FINANCIAL ARRANGEMENTS

Strike Section 2.2 in its entirety.

NOT FOR BIDDING

2.3 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.3.3 Strike 2.3.3 in its entirety.

2.3.4 Add the following sentence at the end of the paragraph:

"The Contractor, at their expense shall bear the costs to accurately identify the location of all underground utilities in the area of their excavation and shall bear all cost for any repairs required, out of failure to accurately identify said utilities."

Strike Section 2.3.6 in its entirety and replace with the following:

"2.3.6 The Contractor shall be furnished free of charge (1) electronic set of the Drawings and Project Manuals. Additional sets will be furnished at the cost of reproduction, postage and handling."

2.5 OWNER'S RIGHT TO CARRY OUT THE WORK

Add ", except as outlined in Section 3.15" after the reference to "Article 15" at the end of the last sentence of the Section.

ARTICLE 3: CONTRACTOR

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

3.2.2 Add "and Owner" after "report to the Architect" in the second sentence.

3.2.4 Strike "subject to Section 15.1.7" in the second sentence.

3.2.4 Strike the third sentence.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

Add the following Sections:

"3.3.2.1 The Contractor shall immediately remove from the Work, whenever requested to do so by the Owner, any person who is considered by the Owner or Architect to be incompetent or disposed to be so disorderly, or who for any reason is not satisfactory to the Owner, and that person shall not again be employed on the Work without the consent of the Owner or the Architect."

"3.3.4 The Contractor must provide suitable storage facilities at the Site for the proper protection and safe storage of their materials, or as otherwise identified by the specifications. Consult the Owner and the Architect before storing any materials."

"3.3.5 When any room is used as a shop, storeroom, office, etc., by the Contractor or Subcontractor(s) during the construction of the Work, the Contractor making use of these areas will be held responsible for any repairs, patching or cleaning arising from such use."

3.4 LABOR AND MATERIALS

Add the Following Sections:

NOT FOR BIDDING

"3.4.4 Before starting the Work, each Contractor shall carefully examine all preparatory Work that has been executed to receive their Work. Check carefully, by whatever means are required, to insure that its Work and adjacent, related Work, will finish to proper contours, planes and levels. Promptly notify the Architect & Owner of any defects or imperfections in preparatory Work which will in any way affect satisfactory completion of its Work. Absence of such notification will be construed as an acceptance of preparatory Work and later claims of defects will not be recognized."

"3.4.5 Under no circumstances shall the Contractor's Work proceed prior to preparatory Work having been completely cured, dried and/or otherwise made satisfactory to receive this Work. Responsibility for timely installation of all materials rests solely with the Contractor responsible for that Work, who shall maintain coordination at all times."

3.5 WARRANTY

Add the following Sections:

"3.5.3 The Contractor will guarantee all materials and workmanship against original defects, except injury from proper and usual wear when used for the purpose intended, for two years after Acceptance by the Owner, and will maintain all items in perfect condition during the period of warranty."

"3.5.4 Defects appearing during the period of warranty will be made good by the Contractor at his expense upon demand of the Owner, it being required that all work will be in perfect condition when the period of warranty will have elapsed."

"3.5.5 Upon notification by the Owner of a defect covered by the Contractor's warranty, the Contractor shall respond within 4 hours of the notification."

"3.5.6 In addition to the General Warranty there are other warranties required for certain items for different periods of time than the two years as above, and are particularly so stated in that part of the specifications referring to same. The said warranties will commence at the same time as the General Warranty."

"3.5.7 If the Contractor fails to remedy any failure, defect or damage within a reasonable time after receipt of notice, the Owner will have the right to replace, repair, or otherwise remedy the failure, defect or damage at the Contractor's expense."

3.8 ALLOWANCES

Add the following Section:

"3.8.1.1 For costs to be covered under a project allowance, (included in the schedule of values) the Contractor shall submit a summary of those costs anticipated and an Allowance Access Authorization Form to the Architect and Owner, reflecting the projected costs. The Allowance Access Authorization Form must be signed by the Owner prior to initiating any work associated with the allowance."

3.10 CONTRACTOR'S CONSTRUCTION AND SUBMITTAL SCHEDULES

3.10.1 Add "estimated" after "and the" and before "date of" in the second sentence.

3.10.2 Strike "and thereafter as necessary to maintain a current submittal schedule" in the first sentence.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

NOT FOR BIDDING

Add the following Sections:

"3.11.1 During the course of the Work, the Contractor shall maintain a record set of drawings on which the Contractor shall mark the actual physical location of all piping, valves, equipment, conduit, outlets, access panels, controls, actuators, including all appurtenances that will be concealed once construction is complete, etc., including all invert elevations."

"3.11.2 At the completion of the project, the Contractor shall obtain a set of the conformed contract drawings from the Architect, and neatly transfer all information outlined in 3.11.1 to provide a complete record of the as-built conditions."

"3.11.3 Upon completion of the work noted in 3.11.2 the contractor shall schedule a meeting with the Architect/Engineer and Owner to review the final record drawings and closeout documents prior to submission. After this meeting the Contractor shall make adjustments per the review, and submit one (1) original markup and (2) copies of the red line drawings (as-built conditions, to the Owner and one (1) print to the Architect. In addition, attach one complete set of the as-built documents to each of the Operating and Maintenance Instructions/Manuals. The Contractor will include (2) USB drives, each containing all "red line drawings (as-built) and Closeout Documents properly tabbed in accordance with closeout requirements as defined elsewhere in the contract documents."

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

3.12.10.2 Strike "If the Contract Documents require" from the beginning of the sentence.

3.12.10.2 Strike "to" between "professional" and certify" and replace with "shall".

3.17 Insert "indemnify and" between "shall" and "hold" in the second sentence.

ARTICLE 4: ADMINISTRATION OF THE CONTRACT

4.2 ADMINISTRATION OF THE CONTRACT

4.2.7 Strike the first sentence and replace with the following:

"The Architect will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples for the purpose of checking for conformance with the Contract Documents."

4.2.7 Strike the second sentence and replace with the following:

"The Architect's action will be taken with such reasonable promptness as to cause no delay in the Work in the activities of the Owner, Contractor or separate Contractors, while allowing sufficient time in the Owner's professional judgment to permit adequate review."

Add the following Section:

"4.2.10.1 There will be no full-time Project Representative provided by the Owner or Architect on this project."

"4.2.13 Add "and in compliance with all local requirements." to the end of the sentence."

ARTICLE 5: SUBCONTRACTORS

NOT FOR BIDDING

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

5.2.3 Strike Section 5.2.3 in its entirety and replace with the following:

"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, subject to the statutory requirements of 29 Delaware Code § 6962(d)(10)b.3 and 4."

5.2.4 Strike Section 5.2.4 in its entirety and replace with the following:

"The Contractor may not substitute any Subcontractor listed in its Bid unless the Contractor complies with the requirements of 29 Delaware Code § 6962(d)(10)b.3 and 4. Failure to comply with this requirement shall subject the Contractor to a penalty as outlined in Section 5.2 of the Owner's General Requirements."

Add the following Section:

"5.2.5 The Contractor shall comply and shall ensure all Subcontractors comply with all requirements for drug testing as set forth in TITLE 19 LABOR DELAWARE ADMINISTRATIVE CODE 4000 Office of Management and Budget 4100 Division of Facilities Management **4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects."**

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 Strike "and waiver of subrogation" from the end of the second sentence.

6.1.4 Strike Section 6.1.4 in its entirety.

6.2 MUTUAL RESPONSIBILITY

6.2.3 Strike "shall" and replace with "may" in the second sentence.

ARTICLE 7: CHANGES IN THE WORK

(SEE ARTICLE 7: CHANGES IN WORK IN THE STATE OF DELAWARE DIVISION OF FACILITIES MANAGEMENT GENERAL REQUIREMENTS)

7.3.4.1 Strike "and other employee costs approved by the Architect" after "worker's compensation insurance,"

7.3.4.4 Add "work attributable to the" before "change" at the end of the sentence.

7.4 MINOR CHANGES IN WORK
Add "unless such changes are approved" at the end of the third sentence.

ARTICLE 8: TIME

NOT FOR BIDDING

8.2 PROGRESS AND COMPLETION

8.2.1 Add the following Section:

"8.2.1.1 Refer to Project Specifications Section SUMMARY OF WORK for Contract time requirements."

8.2.2 After "by the Contractor" strike "and" and insert "to".

8.2.4 Add the following Section:

"8.2.4 If the Work falls behind the Progress Schedule as submitted by the Contractor, the Contractor shall employ additional labor and/or equipment necessary to bring the Work into compliance with the Progress Schedule at no additional cost to the Owner."

8.3 DELAYS AND EXTENSION OF TIME

8.3.1 Strike "binding dispute resolution" and insert "any and all remedies at law or in equity".

Add the following Section:

"8.3.2.1 The Contractor shall update the status of the suspension, delay, or interruption of the Work with each Application for Payment. (The Contractor shall report the termination of such cause immediately upon the termination thereof.) Failure to comply with this procedure shall constitute a waiver for any claim for adjustment of time or price based upon said cause."

Strike Section 8.3.3 in its entirety and replace with the following:

8.3.3 "Except in the case of a suspension of the Work directed by the Owner, an extension of time under the provisions of Section 8.3.1 shall be the Contractor's sole remedy in the progress of the Work and there shall be no payment or compensation to the Contractor for any expense or damage resulting from the delay."

Add the following Section:

"8.3.4 By permitting the Contractor to work after the expired time for completion of the project, the Owner does not waive their rights under the Contract."

ARTICLE 9: PAYMENTS AND COMPLETION

9.2 SCHEDULE OF VALUES

Add the following Sections:

"9.2.1 The Schedule of Values shall be submitted using AIA Document G703, Continuation Sheet to G702."

"9.2.2 The Schedule of Values is to include a line item for Project Closeout Document Submittal. The value of this item is to be no less than 1.5% of the initial contract amount."

9.3 APPLICATIONS FOR PAYMENT

9.3.1 Strike Section 9.3.1 in its entirety and replace with the following:

NOT FOR BIDDING

"At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values for completed portions of the Work. The application shall be notarized, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage."

Add the following Sections:

"9.3.1.3 Application for Payment shall be submitted on AIA Document G702 "Application and Certificate for Payment", supported by AIA Document G703 "Continuation Sheet". Said Applications shall be fully executed and notarized."

"9.3.4 Until Closeout Documents have been received and outstanding items completed the Owner will pay 95% (ninety-five percent) of the amount due the Contractor on account of progress payments."

"9.3.5 The Contractor shall provide a current and updated Progress Schedule to the Architect with each Application for Payment. Failure to provide Schedule will be just cause for rejection of Application for Payment."

9.5 DECISIONS TO WITHHOLD CERTIFICATION

Add the following Subsections to 9.5.1:

.8 failure to provide a current Progress Schedule;
.9 a lien or attachment is filed;
.10 failure to comply with mandatory requirements for maintaining Record Documents.

9.6 PROGRESS PAYMENTS

9.6.1 Strike Section 9.6.1 in its entirety and replace with the following:

"9.6.1 After the Architect has approved and issued a Certificate for Payment, payment shall be made by the Owner within 30 days after Owner's receipt of the Certificate for Payment."

9.6.8 Strike "Provided the Owner has fulfilled its payment obligations under the Contract Documents," in the first sentence.

9.7 FAILURE OF PAYMENT

Strike Section 9.7 in its entirety and replace with the following:

"If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within fourteen days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within thirty days after the date established in the Contract Documents, the amount certified by the Architect, then the Contractor may, upon thirty 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, delay and start-up, plus interest as provided for in the Contract Documents."

9.8 SUBSTANTIAL COMPLETION

9.8.3 At the end of Section 9.8.3, add the following sentence:

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"If the Architect is required to make more than 2 inspections of the same portion of work, the Contractor shall be responsible for all costs associated with subsequent inspections including but not limited to any Architect's fees."

9.8.5 Strike "shall" and insert "may" in the second sentence.

9.8.5 Insert "1/2 of the" after "make payment of" in the second sentence.

9.9 PARTIAL OCCUPANCY OR USE

9.9.1 Strike the the first sentence and replace with the following (the remainder of the Section remains as written):
"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 authorized by public authorities having jurisdiction over the Project."

9.10.2 Strike "to remain in force after final payment is currently in effect" after "required by the Contract Documents" and replace with "shall remain in force until final payment is completed" in the first sentence.

9.10.4.4 Strike "if permitted by the Contract Documents,"

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

Add the following Sections:

10.1.1 Each Contractor shall develop a safety program in accordance with the Occupational Safety and Health Act of 1970. A copy of said plan shall be furnished to the Owner and Architect prior to the commencement of that Contractor's Work.

10.1.2 Each Contractor shall appoint a Safety Representative. Safety Representatives shall be someone who is on site on a full time basis. If deemed necessary by the Owner or Architect, Contractor Safety meetings will be scheduled. The attendance of all Safety Representatives will be required. Minutes will be recorded of said meetings by the Contractor and will be distributed to all parties as well as posted in all job offices/trailers etc.

10.2 SAFETY OF PERSONS AND PROPERTY

Add the following Section:

10.2.4.1 As required in the Hazardous Chemical Act of June 1984, all vendors supplying any material that may be defined as hazardous must provide Material Safety Data Sheets for those products. Any chemical product should be considered hazardous if it has a caution warning on the label relating to a potential physical or health hazard, if it is known to be present in the work place, and if employees may be exposed under normal conditions or in foreseeable emergency situations. Material Safety Data Sheets shall be provided directly to the Owner, along with the shipping slips that include those products.

10.2.5 Strike the second sentence in its entirety.

10.3 HAZARDOUS MATERIALS AND SUBSTANCES

10.3.3 Strike Section 10.3.3 in its entirety.

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10.3.4 Insert “hazardous” in the last sentence after “handling of such” .

10.3.6 Strike Section 10.3.6 in its entirety.

ARTICLE 11: INSURANCE AND BONDS

11.1 CONTRACTOR’S INSURANCE AND BONDS

11.1.1 Strike “Owner” from the third sentence.

11.2 OWNER’S LIABILITY INSURANCE

Strike 11.2 in its entirety, except that in the case of school projects in which case Section 11.2 shall remain.

11.3 WAIVERS OF SUBROGATION

Delete Section 11.3 in its entirety

11.4 LOSS OF USE, BUSINESS INTERRUPTION, AND DELAY IN COMPLETION INSURANCE

Delete Section 11.4 in its entirety

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

12.2.2 AFTER SUBSTANTIAL COMPLETION

Add the following Section:

“12.2.2.1.1 At any time during the progress of the Work, or in any case where the nature of the defects will be such that it is not expedient to have corrected, the Owner, at its option, will have the right to deduct such sum, or sums, of money from the amount of the Contract as it considers justified to adjust the difference in value between the non-conforming work and that required under contract including any damage to the structure.”

12.2.2.1 Strike all references to “one year” or “one-year” and replace with “two years”.

12.2.2.2 Strike “one-year” and replace with “two years”.

12.2.2.3 Strike “one-year” and replace with “two years”.

12.2.5 Strike “one-year” and replaced with “two years”.

ARTICLE 13: MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

Strike the last sentence.

13.4 TESTS AND INSPECTIONS

13.4.1 Strike the last sentence and replace with the following:

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"The Owner shall pay for tests, inspections, or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor."

13.5 INTEREST

Strike "the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located" and replace with "30 days of presentment of the authorized Certificate of Payment at the annual rate of 12% or 1% per month."

Insert the following Section:

"13.6 CONFLICTS WITH FEDERAL STATUTES OR REGULATIONS

13.6.1 If any provision, specifications or requirement of the Contract Documents conflict or is inconsistent with any statute, law or regulation of the government of the United State of America, the Contractor shall notify the Architect and Owner immediately upon discovery."

13.7 PACKING AND SHIPPING

13.7.1 The Vendor shall pack all Products to prevent damage or deterioration.

13.7.2 No charge for packing, boxing, crating, or storage by Vendor will be allowed unless stated herein. Owner is not responsible for containers or other packing materials for which charge is made by Vendor if not returned unless such returnable articles are shown on packing lists and invoices.

13.7.3 Notwithstanding anything contained in any of the Contract Documents to the contrary, (a) all Products must be shipped F.O.B. destination to the Project Contractor at the project site location, and (b) all risk of loss or damage to the Products procured under the Contract, or any part thereof, prior both (i) delivery of such Products to the Project Contractor at the Project Site Location and (ii) inspection and written acceptance of such Products by the Project Contractor after delivery to the Project Site location shall be borne by the Vendor . Prior to shipment, the vendor shall contact the Project Contractor to confirm shipping information. Any loss or damage to any such Product incurred at any time prior to both (a) delivery of such Products to the Project Contractor at the Project Site Location and (b) inspection and written acceptance of such Products by the Project Contractor after delivery to the Project Site location shall not alleviate the Vendor from the conformance with the terms and conditions of the Contract. Unless the Contract specifies otherwise the Vendor shall ship all Products in accordance with the following instructions:

13.7.3.1 Shipments by the Vendor or its subcontractors must include packing sheets containing the Owner's Contract No., Project Purchase Order No. description and quantity of Products shipped, part number or size, if applicable, and appropriate evidence of inspections. The Vendor shall not include vermiculite or other hazardous substance in any packing included with the Products shipped. Products shipped on the same day must be consolidated on one bill-of-lading or airbill unless Owner authorizes otherwise. The total number of shipping containers must be referenced on all shipping documents.

13.7.3.2. The Vendor shall label each shipping container with the Contract No., the Project Purchase Order No., and the number that each container represents of the total number being shipped (e.g., Box 1 of 2, Box 2 of 2).

13.7.3.3 The Vendor shall include copies of documentation supporting prepaid freight charges (e.g., carrier invoices or UPS shipping log/manifest), if any, with its invoices.

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13.7.3.4 If the Vendor is unable to comply with the shipping instructions in the Contract, the Vendor shall promptly notify the Owner and the Architect/Engineer.

13.7.3.5 All products shall be delivered in good condition, complete and ready for operation or use, and in conformity with all of the requirements of the Contract. The Vendor shall coordinate with the Project Contractor at the Project Site Location at least 14 days in advance to arrange for receipt, inspection, and acceptance of the Product as set forth in Section 13.7.3 above.

13.8 TIME

13.8.1 Delivery Schedule.

13.8.1.2 It is understood and agreed that TIME IS OF THE ESSENCE OF THE CONTRACT AND EACH PROJECT PURCHASE ORDER ISSUED PURSUANT TO THE CONTRACT, and the Vendor agrees to perform its obligations under the Contract in a timely manner and to prosecute the same with all due diligence, so as to deliver the Products and complete any related work or services in strict accordance with the Delivery Schedule specified in the Project Purchase Order.

13.8.2 Delays; Force Majeure.

13.8.2.1 Vendor shall in the event of a delay or threat of delay, due to any cause in the production or delivery of Products hereunder, immediately notify Owner and shall include with such notice all relevant information with respect to such delay or threatened delay. Vendor shall be liable for any damages resulting from failure to make delivery within the time called for by the Project Purchase Order or by any written instructions of Owner, except where: (i) such delay in delivery shall be due to causes beyond the reasonable control of Vendor , and (ii) Vendor notifies Owner as aforesaid. If Vendor for any reason cannot comply with the Delivery Schedule, Owner, in addition to any other rights or remedies available to it by law or under these terms and conditions, may terminate the corresponding Project Purchase Order or cancel any shipments thereunder without further liability to Vendor . The phrase “cause which is beyond the Vendor ’s control” is hereby limited to causes that satisfy all of the following four elements:
(a) It must be a cause not reasonably expected to occur in connection with or during the performance of the Contract;
(b) It must in no way directly or substantially be caused by an act or omission of the Vendor, a subcontractor or any of their agents;
(c) It must cause a significant delay in the anticipated Delivery Date, and
(d) It must be a cause that could not have been adequately guarded against by the Vendor by contractual or legal means.

13.8.2.2 Any delay or failure of either party to perform its obligations hereunder shall be excused if, and to the extent that it is caused by an event or occurrence beyond the reasonable control of the party and without its fault or negligence, such as, by way of example and not by way of limitation, acts of God, action by any governmental authority (whether valid or invalid), fires, floods, windstorms, explosions, riots, natural disasters, wars or sabotage, provided that written notice of such delay (including the anticipated duration of the delay) shall be given by the affected party to the other party within fourteen (14) days. During the period of such delay or failure to perform by Vendor, Owner at its option, may purchase Products from other sources and reduce its schedules and/or releases to Vendor by such quantities, without any liability to Vendor , or have Vendor provide the Products from other sources in quantities and at times requested by Owner and at the price set forth in the Contract or any agreed-upon amendment hereto. If requested by the Owner, Vendor shall, within ten (10) days of such request, provide adequate assurances that the delay shall not exceed thirty (30) days. If the delay lasts more than thirty (30) days or Vendor does not provide adequate assurance that the delay will cease within thirty (30) days, Owner may immediately cancel the corresponding Project Purchase Order, without any further liability to Vendor.

13.8.3. Notice of Delay.

13.8.3.1 A request for extending the time in the Delivery Schedule due to an unavoidable delay must be made in writing and submitted to the Managing Architect and the Architect/Engineer of Record

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within seven days after the delay commences. No time extension will be granted for the period between the time when notice was required and the time when notice was given. Within 14 days after such delay, the Vendor shall furnish detailed information concerning the circumstances of the delay, the number of days actually delayed, the measures taken to prevent or minimize the delay, and a proposed revised Delivery Schedule. Failure to submit such information will be sufficient cause for denying the request for an extension of time in the Delivery Schedule. The Vendor agrees to supply any other reasonable proofs as are requested by the Architect/Engineer of Record or the Managing Architect to make a decision on the request. The Architect/Engineer of Record will examine the request and any documents supplied by the Vendor and will determine if the Vendor is entitled to an extension of the Delivery Schedule. The Architect/Engineer of Record will notify the Vendor of the decision in writing and that decision will be final and binding, subject only to the claims and disputes provision Article 13.

13.8.3.2 The Vendor expressly consents to both the time requirements and notice content requirements for requesting an extension of the Delivery Schedule set forth in the preceding paragraph. The Vendor acknowledges that the notice requirements set forth in the preceding paragraph will be strictly enforced and agrees that any failure on the part of the Vendor to provide notice strictly in accordance with those requirements constitutes a waiver of the Vendor 's right to seek an extension of the Delivery Schedule or to submit a dispute to the Owner, under Article 13 hereof. The Vendor further understands and agrees that, regardless of any case law decision to the contrary, the notice requirements of the preceding paragraph shall not be diminished or avoided by any claim on the part of the Vendor that the Architect/Engineer of Record or any other person acting on behalf of the Owner had actual or constructive knowledge of any request for extension of time, entitlements to an extension of the time in the Delivery Schedule, or any facts or circumstances supporting an extension of the time in the Delivery Schedule. The Vendor further acknowledges that the time requirements and content requirements of the preceding paragraph have the purpose, among others, of allowing the Architect/Engineer of Record to evaluate the requests for an extension of time in the Delivery Schedule contemporaneously with the event that has been alleged to cause the delay.

13.8.3.3 The Vendor shall agree or disagree, in writing, with the Architect/Engineer of Record's decision within seven days receipt of the decision. If the Vendor and Architect/Engineer of Record agree on the extension of the Delivery Schedule to be granted, the Architect/Engineer of Record will request approval of a Change Order from the Owner. If the Owner approves the time extension request, such approval will be in the form of a signed Change Order. If the Vendor and Managing Architect do not agree on the time extension to be granted, the Vendor may forward any time extension request to the Owner for a decision, in accordance with Article 13.

13.8.4 No Damages for Delay.

13.8.4.1 Except for increases or decreases for escalation as specified in the Contract Documents, the Vendor will not be entitled to any damages, compensation or adjustment from the Owner, resulting from any delays.

13.8.5. Acceleration.

13.8.5.1 Acceleration claims will be considered on a Project by Project basis, only under the following two circumstances:

(a) The Owner may direct the Vendor in writing to furnish the Products ahead of the schedule defined in the Delivery Schedule for the Project. The Vendor shall take all reasonable action to comply with the Owner's direction. Any request for additional compensation due to acceleration must be made by a change request submitted to the Architect/Engineer of Record in accordance with Section 10.2. The Owner will pay the Vendor only for the Vendor 's extra labor costs, including fringe benefits, insurance, taxes, and subcontractor costs that directly result from the direction to accelerate. Nothing in the Contract Documents shall be construed as direction by the Owner to accelerate.

(b) If the Vendor has requested an extension of the time in the Delivery Schedule, and the Managing Architect has denied the request, a claim for acceleration will be considered only if it is later determined that the request was mistakenly denied. The Owner will pay the Vendor only for the Vendor 's extra labor and material costs, including fringe benefits, insurance and taxes,

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that directly result from the denial. The Vendor shall submit a claim for such acceleration within 14 days after the Owner refuses to grant the requested extension.
(c) In no event will the adjustment of the Delivery Schedule for one Project be construed to give rise to an acceleration claim or a delay claim on any other Project. In addition, the change in sequencing of the Projects prior to issuance of Notice to Proceed for each Project, shall not give rise to an acceleration claim or a delay claim on any other Project.

13.8.6 Time for Changed Work.
13.8.6.1 If the Owner directs changes to the Vendor's Scope of Supply, and if the Vendor requests a time extension, then the allotted time in the Delivery Schedule may be extended for such reasonable time as determined by the Managing Architect.

ARTICLE 14: TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

14.1.1.4 Insert ", upon the Contractors' request," after "furnish to the Contractor".

14.1.3 Strike "and profit on Work not executed, and" after "as well as reasonable overhead" and replace with ", profit, and reasonable"

14.3 SUSPENSION BY OWNER FOR CONVENIENCE

14.3.2 Strike "Adjustment of the Contract Sum shall include profit".

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

14.4.3 Strike Section 14.4.3 in its entirety and replace with the following:

"In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and reasonable costs incurred by reason of such termination along with reasonable overhead."

ARTICLE 15: CLAIMS AND DISPUTES

15.1 CLAIMS

15.1.2 TIME LIMITS ON CLAIMS

Strike the last sentence.

15.1.3 NOTICE OF CLAIM

Strike all references to "21" and replace with "45".

15.1.5 CLAIMS FOR ADDITIONAL COSTS

Strike the first sentence and replace with the following:

"Contractor shall not proceed to execute any portion of the Work that is subject to the Claim without prior approval of the costs or method of payment for the costs associated with the Claim as determined by the Architect and approved by the Owner."

15.1.7 WAIVER OF CLAIMS FOR CONSEQUENTIAL DAMAGES

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Strike Section 15.1.7 in its entirety.

15.2 INITIAL DECISION

15.2.1 Strike “and binding dispute resolution” in the fourth sentence and replace with “or any and all remedies at law or in equity”.

15.2.5 Strike Section 15.2.5 in its entirety and replace with the following:

“The Architect will approve or reject Claims by written decision, which shall state the reasons therefore and shall notify the parties of any change in the Contract Sum or Contract Time or both. The approval or rejection of a Claim by the Architect shall be subject to mediation and any or all remedies at law or in equity.”

15.2.6 Strike Section 15.2.6 and its sub-Sections in their entirety.

15.3 MEDIATION

15.3.1 Strike “binding dispute resolution” and replace with “any or all remedies at law or in equity”.

15.3.2 Strike “, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedure in effect on the date of the Agreement,” in the first sentence.

15.3.2 Strike all references to “binding dispute resolution” and replace with “any or all remedies at law and in equity”.

15.3.3 Strike Section 15.3.3 in its entirety.

15.4 ARBITRATION

Strike Section 15.4 and its Subsections in their entirety.

END OF SECTION

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GENERAL REQUIREMENTS

TABLE OF ARTICLES

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ARTICLE 1: GENERAL

1.1 DEFINITIONS

Term	Definition
Addendum:	Written change to the Bid Documents issued by the District prior to award of the Contract. Multiple such changes are referred to as "Addenda."
Architect/Engineer of Record	The architect or engineer preparing final Construction Documents for each Project. The Architect/Engineer of Record shall, among its other duties, make a final determination of the types and quantities of Products to be used on each Project.
District	The Red Clay Consolidated School District. The District is also referred to in the Contract Documents as the "Owner" and includes the District and its authorized agents and representatives.
Beneficial Occupancy	The taking possession by the District of a portion of any particular Project for its use and/or occupancy on other than a temporary or emergency basis.
Bid	A complete and properly signed written proposal of the Bidder, submitted on the Bid Proposal Form included in the Bid Documents, to furnish the necessary materials and to perform the Work in accordance with the Contract Documents and for the sum stipulated, verified for mathematical correctness in accordance with the terms set forth in the Instructions to Bidders, supported by the data called for by the bidding requirements for such Work.
Bid Bond	The Bid Bond furnished by the Bidder as Bid Security.
Bidder	An individual, firm, partnership, corporation or combination thereof, submitting a Bid for the Contract work.
Bidding Documents	The documents listed on the Table of Contents, Section A on which the Bid is based.
Bid Security	The cashier's check, certified check or U.S. currency, or Bid Bond, accompanying the Bid submitted by the Bidder, as a guarantee that the Bidder will enter into the Contract with the District for the performance of the Work and will furnish all other Bonds and insurance if the Contract is awarded to it.
Bonds	The Bid Bond given as Bid Security, if any, and the Performance Bond and Payment Bond, and any other Bonds required to be furnished by the Contract Documents.
Change Order	A written order to the Vendor signed by the District and the Vendor (except in the case of a Directive Order), issued after execution of a Contract and pursuant to a Change Order Request, authorizing a change in the Products to be furnished by the Vendor, or an adjustment in the Purchase Order Price or the Delivery Schedule, or other changes in, or a written interpretation of the Contract Documents. A Change Order may be agreed to by all parties in all respects or may be a Directive Order.

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Change Order Request	A document submitted by the Vendor by the Architect/Engineer of Record requesting that a Change Order be issued to the Vendor and describing the events and circumstances giving rise to the request, the effect that the requested change will have on the Purchase Order Price and/or the Delivery Schedule.
Contract	The Contract Documents
Contract Documents	Invitation to Bid Instructions to Bidders Bid Proposal Contract Project Purchase Order(s) Performance Bond Payment Bond General Conditions Supplemental General Conditions General Requirements Incorporated Forms Therein
Contractor	The entity providing the pre-purchased material for this contract. For the purposes of this contract, Contractor and Vendor shall be interchangeable and synonymous, and shall not be confused with "Project Contractor" or "General Contractor".
Days	Unless otherwise designated, days mean calendar days.
Delivery Date	The date or dates measured in weeks after the effective date of the Notice to Proceed issued by the District by which the Vendor shall deliver the Products under each Project Purchase Order for the corresponding Project.
Delivery Schedule	The schedule of all Delivery Dates for Products for each separate Project.
Directive Order	A kind of Change Order resulting where the District wishes to direct the Vendor to proceed with the performance of changed work prior to the Project Contractor's submittal of a Change Order Request or where the District and the Vendor do not agree that there is a change being made and which requires the Vendor to perform the work and maintain records from which to determine whether any additional costs are incurred or extensions of time are required.
Final Completion	The date upon which the Architect of Record certifies to the District that the Work of each Project, including Punch List items, has been completed in accordance with the Contract Documents and that the District has received all required documents, manuals, certificates and submittals provided for under the Contract. for each Project.
Hazardous Materials	Hazardous Materials means any and all materials identified as hazardous by any federal, state, county or municipal law, statute, ordinance, order or regulation related to the protection of the environment or worker safety and health. The term "Hazardous Materials" is sometimes used interchangeably with the term "Hazardous Substances".

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Indicated or As Indicated	A term meaning, "as shown on the Drawings, as specified in the Technical Specifications and/or as required by or reasonably inferable from the Contract Documents."
Inspector	An authorized representative of the District, or if authorized by the District, a representative of the Project Contractor assigned to make inspections and/or tests of the work performed or being furnished by the Project Contractor.
Invitation to Bid	The invitation to make a Bid issued by the District to Bidders.
Notice of Award	Written notice to the successful Bidder that the District is awarding the Contract to that Bidder.
Notice to Proceed	Written notice from the District to the Vendor to proceed with the Work. Separate Notice to Proceed shall be issued for each separate Project Purchase Order.
Owner	The District.
Product or Products	The equipment furnished and delivered by the Vendor pursuant to the Contract and the separate Project Purchase Orders issued by the District pursuant to the Contract.
Product Data	Illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Vendor to illustrate a material, product or system for some portion of the Work.
Program	The Owner's Major Capital Program for the renovation and improvement of up to 24 existing schools and construction of one new school. The Program is comprised of multiple separate Projects.
Project	All design, construction and other work necessary to construct the construction, improvements and or renovations at each location.
Project Contractor	The individual, firm, partnership or corporation, or combination thereof, including joint ventures, which, as an independent contractor, has entered into a contract with the District for the performance of the work of a particular Project. Vendor shall deliver the Products to the Project Contractor at the Project Site
Project Site	The area enclosed within the project limits indicated in the Drawings and boundaries of local streets and public easements in which the Project Contractor is to perform the Work under the Contract, either exclusively or in conjunction with others performing other work as part of the Project. Products furnished by the Vendor under each Project Purchase Order shall be delivered to the respective Project Site.
Project Purchase Order	The purchase order or purchase orders issued by the District for each separate Project, pursuant to the terms of the Contract.

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Project Purchase Order Modification	A written order to the Vendor signed by the District and the Vendor (except in the case of a Directive Order), issued after execution of a Project Purchase Order, authorizing a change in the Products to be furnished by the Vendor, or an adjustment in the Purchase Order Price or the Delivery Schedule, or other changes in, or a written interpretation of the Contract Documents.
Project Purchase Order Price	The price set forth in each of the respective Project Purchase Orders issued by the District to the Vendor pursuant to the terms of the Contract. Purchase Order Price can be adjusted only by written Change Order accompanies by a written Project Purchase Order Modification.
Project Schedule	The schedule for each Project prepared and maintained by the Project Contractor. The Vendor's Delivery Schedule shall comply with the delivery requirements of the Bid Documents and shall be coordinated with the Project Schedule.
Samples	Physical examples which illustrate materials, equipment, fixtures and workmanship and which establish standards by which the Work may be judged, provided that the Work is otherwise in conformity with the Contract Documents.
Shop Drawings	Drawings, diagrams, illustrations, schedules, performance charts and other data specifically prepared for the Project by the Vendor or any subcontractor, manufacturer, supplier or distributor, which are representative of the quality of materials to be used in the Products, and which illustrate (a) the proposed fabrication and assembly of structural elements; and (b) the installation (form, fit, and attachment details) of materials or equipment and submitted to the District by the Vendor. Shop Drawings shall be deemed to include Product Data, literature, and performance and test data.
Specifications	The portion of the Contract Documents consisting of written descriptions of materials, equipment, construction systems, design standards and quality of the Project, and other written directions and requirements for completing the Work. Specifications are sometimes referred to as Technical Specifications.
Substantial Completion of the Work	Substantial Completion of the Work for each Project means the date certified by the Architect of Record and approved by the District as the date upon which (a) construction is sufficiently complete in accordance with the Construction Documents and functionally suitable for its intended purpose; and (b) a certificate of occupancy has been issued.
Technical Specifications interchangeably.	The term "Specifications" and "Technical Specifications" are used
Vendor	The entity providing the pre-purchased material for this contract. For the purposes of this contract, Contractor and Vendor shall be interchangeable and synonymous, and shall not be confused with "Project Contractor" or "General Contractor".

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1.2 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 to an extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results.

1.2.2 Work including material purchases shall not begin until the Contractor is in receipt of a bonafide State of Delaware Purchase Order. Any work performed or material purchases prior to the issuance of the Purchase Order is done at the Contractor's own risk and cost.

1.3 EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

1.3.1 For Public Works Projects financed in whole or in part by state appropriation the Contractor agrees that during the performance of this contract:

1. The Contractor will not discriminate against any employee or applicant for employment because of race, creed, sex, color, sexual orientation, gender identity or national origin. The Contractor will take positive steps to ensure that applicants are employed and that employees are treated during employment without regard to their race, creed, sex, color, sexual orientation, gender identity or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting agency setting forth this nondiscrimination clause.

2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, sex, color, sexual orientation, gender identity or national origin."

ARTICLE 2: OWNER

(NO ADDITIONAL GENERAL REQUIREMENTS – SEE SUPPLEMENTARY GENERAL CONDITIONS)

ARTICLE 3: CONTRACTOR / VENDOR

3.1 Subcontracts: Upon approval of Subcontractors, the Contractor/Vendor shall award their Subcontracts as soon as possible after the signing of their own contract and see that all material, their own and those of their Subcontractors, are promptly ordered so that the work will not be delayed by failure of materials to arrive on time.

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

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3.3 Unless otherwise provided, the Contractor shall pay all sales, consumer, use and other similar taxes, and shall secure and pay for required permits, fees, licenses, and inspections necessary for proper execution of the Work.

3.4 The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on performance of the Work. The Contractor shall promptly notify the Owner if the Drawings and Specifications are observed to be at variance therewith.

3.5 The Contractor shall be responsible to the Owner for the acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons performing portions of the Work under contract with the Contractor.

3.5 STATE LICENSE AND TAX REQUIREMENTS

3.5.1 Each Contractor and Subcontractor shall be licensed to do business in the State of Delaware and shall pay all fees and taxes due under State laws. In conformance with Section 2503, Chapter 25, Title 30, Delaware Code, "the Contractor shall furnish the Delaware Department of Finance within ten (10) days after entering into any contract with a contractor or subcontractor not a resident of this State, a statement of total value of such contract or contracts together with the names and addresses of the contracting parties."

3.6 The Contractor shall comply with all requirements set forth in Section 6962, Chapter 69, Title 29 of the Delaware Code.

3.7 During the contract Work, the Contractor and each Subcontractor, shall implement an Employee Drug Testing Program in accordance with OMB Regulation 4104 - "Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on "Large Public Works Projects". "Large Public Works" is based upon the current threshold required for bidding Public Works as set by the Purchasing and Contracting Advisory Council.

ARTICLE 4: ADMINISTRATION OF THE CONTRACT

4.1 CONTRACT SURETY

4.1.1 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

4.1.2 All bonds will be required as follows unless specifically waived elsewhere in the Bidding Documents.

4.1.3 Contents of Performance Bonds – The bond shall be in the form approved by the Office of Management and Budget. The bond shall be conditioned upon the faithful compliance and performance by the successful bidder of each and every term and condition of the contract and the proposal, plans, specifications, and bid documents thereof. Each term and condition shall be met at the time and in the manner prescribed by the Contract, Bid documents and the specifications, including the payment in full to every person furnishing materiel or performing labor in the performance of the Contract, of all sums of money due the person for such labor and materiel. (The bond shall also contain the successful bidder's guarantee to indemnify and save harmless the State and the agency from all costs, damages and expenses growing out of or by reason of the Contract in accordance with the Contract.)

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4.1.4 Invoking a Performance Bond – The agency may, when it considers that the interest of the State so requires, cause judgement to be confessed upon the bond.

4.1.5 Within twenty (20) days after the date of notice of award of contract, the Bidder to whom the award is made shall furnish a Performance Bond and Labor and Material Payment Bond, each equal to the full amount of the Contract price to guarantee the faithful performance of all terms, covenants and conditions of the same. The bonds are to be issued by an acceptable Bonding Company licensed to do business in the State of Delaware and shall be issued in duplicate.

4.1.6 Performance and Payment Bonds shall be maintained in full force (warranty bond) for a period of two (2) years after the date of the Certificate for Final Payment. The Performance Bond shall guarantee the satisfactory completion of the Project and that the Contractor will make good any faults or defects in his work which may develop during the period of said guarantees as a result of improper or defective workmanship, material or apparatus, whether furnished by themselves or their Sub-Contractors. The Payment Bond shall guarantee that the Contractor shall pay in full all persons, firms or corporations who furnish labor or material or both labor and material for, or on account of, the work included herein. The bonds shall be paid for by this Contractor. The Owner shall have the right to demand that the proof parties signing the bonds are duly authorized to do so.

4.2 FAILURE TO COMPLY WITH CONTRACT

4.2.1 If any firm entering into a contract with the State, or Agency that neglects or refuses to perform or fails to comply with the terms thereof, the Agency which signed the Contract may terminate the Contract and proceed to award a new contract in accordance with this Chapter 69, Title 29 of the Delaware Code or may require the Surety on the Performance Bond to complete the Contract in accordance with the terms of the Performance Bond. Nothing herein shall preclude the Agency from pursing additional remedies as otherwise provided by law.

4.2.2 In the event of any successful Bidder refusing or neglecting to execute a Contract and Bonds within twenty (20) days of the awarding of the Contract, the Bid Bond or security deposited by the successful Bidder shall become the absolute property of the Owner as liquidated damages, and not as a forfeiture or as a penalty, and shall be deposited with the Owner and the Owner may award the Contract to the next lowest responsible Bidder or re-advertise for new bids.

4.3 PROJECT PURCHASE ORDERS

4.3.1 Project Purchase Orders will be issued separately by the Owner (on a Project-by-Project basis). The Project Purchase Orders will include associated escalation costs as specified in Section F, Page 2, of the Bidding Documents. A Notice to Proceed will not be issued until the Project Purchase Order has been issued by the Owner and executed by the Vendor. The Owner reserves all rights to terminate the Contract for the convenience of the Owner as set forth in the General Conditions.

4.3.2 Each Project Purchase Order shall be based on the final quantity of Products required for the Project as determined by the Architect/Engineer of Record in consultation with the Project Contractor. To the extent that the final qualities of Products vary from those included in the Bidding Documents, the Project Purchase Order Price shall be determined on the basis of the unit prices as bid, extended by the final quantities of Products, all subject to escalation as more fully set forth in the Bid Form.

4.3.3 To the extent that the final types of Products required for the Project differ from that for which a unit price was provided at the time of bidding, upon the request of the Owner, the

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Vendor shall price such additional Products, and the Purchase Order Price shall include such Products at a price mutually acceptable to the Owner and the Vendor.

4.4 CONTRACT INSURANCE AND CONTRACT LIABILITY

4.4.1 In addition to the bond requirements stated in the Bid Documents, each successful Bidder shall purchase adequate insurance for the performance of the Contract and, by submission of a Bid, agrees to indemnify and save harmless and to defend all legal or equitable actions brought against the State, any Agency, officer and/or employee of the State, for and from all claims of liability which is or may be the result of the successful Bidder's actions during the performance of the Contract.

4.4.2 The purchase or nonpurchase of such insurance or the involvement of the successful Bidder in any legal or equitable defense of any action brought against the successful Bidder based upon work performed pursuant to the Contract will not waive any defense which the State, its agencies and their respective officers, employees and agents might otherwise have against such claims, specifically including the defense of sovereign immunity, where applicable, and by the terms of this section, the State and all agencies, officers and employees thereof shall not be financially responsible for the consequences of work performed, pursuant to said contract.

4.5 RIGHT TO AUDIT RECORDS

4.5.1 The Owner shall have the right to audit the books and records of a Contractor or any Subcontractor under any Contract or Subcontract to the extent that the books and records relate to the performance of the Contract or Subcontract.

4.5.2 Said books and records shall be maintained by the Contractor for a period of seven (7) years from the date of final payment under the Prime Contract and by the Subcontractor for a period of seven (7) years from the date of final payment under the Subcontract.

4.6 CONTRACT INTERPRETATION

4.6.1 Any headings of the Contract are for convenience of reference only and do not define or limit the provisions. Words importing persons will include firms, associations, partnerships, trusts, corporations, joint ventures, and other legal entities, including public bodies, as well as natural persons. Words of gender will be deemed and construed to include correlative words of other genders. Words importing the singular number will include the plural and vice versa, unless the context otherwise indicates. All references to any exhibit or document will be deemed to include all supplements and amendments to any such exhibits or documents entered into in accordance with the terms and conditions of the Contract. All references to any person or entity will be deemed to include any person or entity succeeding to the rights, duties, and obligations of such persons or entities in accordance with the terms and conditions of the Contract.

4.6.2. Products, material, equipment, supplies, components, other products, and workmanship specified by reference to the number, symbol, or title of a published standard must comply with the latest edition or revision thereof and all amendments and supplements thereto in effect on the date of Invitation for Bids for the Contract, except where a specific issue is specified. In case of a conflict between the Specifications and the standard referred to, the Specifications shall govern. The Owner will not give consideration to any claimed ignorance of a cited standard. Vendor is responsible to be knowledgable and familiar with its own trade's generally accepted, published standards of quality and workmanship.

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4.6.3 The words “as shown,” “as indicated,” “as detailed,” and all words of similar import must be understood to refer to the Specifications and Bidding Documents, unless otherwise expressly contradicted.

4.7 SEVERABILITY

4.7.1 If any provision of the Contract is held or deemed inoperative or unenforceable because it conflicts with any other provision or provisions hereof, or any constitution, statute, ordinance, rule of law, public policy, or any other reason, the circumstances will not render the provision in question inoperative or unenforceable in any other case or circumstances, or render any other provision herein contained invalid, inoperative, or unenforceable to any extent. The invalidity of any one or more phrases, sentences, clauses, or sections contained in the Contract will not affect the remaining portions of the Contract or any part thereof.

4.8 INTERPRETATION / RULES

4.8.1 The intent of the Specifications is to describe the Products and related work and services that the Vendor shall provide to fulfill the requirements of the Contract. The Vendor shall furnish all additional, collateral, and incidental work or services as required and necessary to deliver the Products in accordance with the Contract. The Vendor shall furnish all required materials, equipment, tools, labor, and submittals including Shop Drawings, working drawings, and all incidentals.

4.8.2 Wherever the imperative form of address is used, such as “deliver Products,” “provide equipment required” and “furnish reinforcing steel bars,” it is understood and agreed that such direction is addressed to the Vendor.

4.8.3 Except as otherwise specified, the definitions applicable to the Contract are provided in Section 1.1 above.

4.9 ORDER OF PRECENDENCE

4.9.1 In case of any conflict or inconsistency that cannot otherwise be resolved, the governing order of precedence of the Contract Documents shall be as follows:

(a) Executed Change Orders, accompanied by executed Project Purchase Order Modifications
(b) Project Purchase Orders
(c) Contract
(d) General Conditions
(e) Submittals as approved by the Owner, but only to the extent that a deviation from the Specifications have been called to the attention of the Architect/Engineer of Record and expressly approved
(f) Specifications
(g) Payment and Performance Bonds
(h) Insurance

4.9.2 A Change Order more recently executed will take precedence over any prior Change Order wherever it conflicts therewith.

4.10 AUTHORITY TO EXECUTE CONTRACT

4.10.1 Execution of the Contract by the Vendor is authorized and signature(s) of each person signing on behalf of the Vendor have been made with complete and full authority to commit the Vendor to all terms and conditions of the Contract, including each and every representation, certification, and warranty contained herein, attached hereto, and

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collectively incorporated by reference herein, or as may be required by the terms and conditions hereof. If other than a sole proprietorship, the Vendor shall provide satisfactory evidence that the execution of the Contract is authorized in accordance with the business entity's rules and procedures.

4.10.2 Execution of the Contract by the Owner is authorized by the laws of the State of Delaware and accounting procedures approved by the State Division of Accounting.

4.11. SETOFF

4.11.1 The Owner shall have the right of setoff of any claim of the Owner against any payments due or to become due to the Vendor or the retention under the Contract, or any Project Purchase Order, or any other contract or obligation of the Vendor to the Owner.

4.12 INDEPENDENT CONTRACTOR

4.12.1 The Vendor shall perform its obligations under the Contract as a non-exclusive independent contractor, and nothing herein is intended or shall be construed to create any partnership, agency, or joint venture relationship between the Owner and Vendor . Neither Vendor nor its subcontractors, or the employees of any of them, shall be deemed for any purpose to be employees of the Owner. Vendor shall be solely responsible for the withholding or payment of all applicable federal, state, and local personal income taxes, social security taxes, unemployment and sickness disability insurance, and other payroll taxes with respect to Vendor's employees.

ARTICLE 5: SUBCONTRACTORS

5.1 SUBCONTRACTING REQUIREMENTS

5.1.1 All contracts for the construction, reconstruction, alteration or repair of any public building (not a road, street or highway) shall be subject to the following provisions:

1. A contract shall be awarded only to a Bidder whose Bid is accompanied by a statement containing, for each Subcontractor category, the name and address (city or town and State only – street number and P.O. Box addresses not required) of the subcontractor whose services the Bidder intends to use in performing the Work and providing the material for such Subcontractor category.

2. A Bid will not be accepted nor will an award of any Contract be made to any Bidder which, as the Prime Contractor, has listed itself as the Subcontractor for any Subcontractor unless:

   A. It has been established to the satisfaction of the awarding Agency that the Bidder has customarily performed the specialty work of such Subcontractor category by artisans regularly employed by the Bidder's firm;

   B. That the Bidder is duly licensed by the State to engage in such specialty work, if the State requires licenses; and

   C. That the Bidder is recognized in the industry as a bona fide Subcontractor or Contractor in such specialty work and Subcontractor category.

5.1.2 The decision of the awarding Agency as to whether a Bidder who list itself as the Subcontractor for a Subcontractor category shall be final and binding upon all Bidders,

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and no action of any nature shall lie against any awarding agency or its employees or officers because of its decision in this regard.

5.1.3 After such a Contract has been awarded, the successful Bidder shall not substitute another Subcontractor for any Subcontractor whose name was set forth in the statement which accompanied the Bid without the written consent of the awarding Agency.

5.1.4 No Agency shall consent to any substitution of Subcontractors unless the Agency is satisfied that the Subcontractor whose name is on the Bidders accompanying statement:

A. Is unqualified to perform the work required;

B. Has failed to execute a timely reasonable Subcontract;

C. Has defaulted in the performance on the portion of the work covered by the Subcontract; or

D. Is no longer engaged in such business.

5.1.5 Should a Bidder be awarded a contract, such successful Bidder shall provide to the agency the taxpayer identification license numbers of such subcontractors. Such numbers shall be provided on the later of the date on which such subcontractor is required to be identified or the time the contract is executed. The successful Bidder shall provide to the agency to which it is contracting, within 30 days of entering into such public works contract, copies of all Delaware Business licenses of subcontractors and/or independent contractors that will perform work for such public works contract. However, if a subcontractor or independent contractor is hired or contracted more than 20 days after the Bidder entered the public works contract the Delaware Business license of such subcontractor or independent contractor shall be provided to the agency within 10 days of being contracted or hired.

5.1.6 The Contractor may employ additional Subcontractors on the jobsite only after submitting a copy of the Subcontractor's Employee Drug Testing Program to the Owner for approval. A Contractor or Subcontractor shall not commence work until the Owner has concluded its review and determined that the submitted Employee Drug Testing Program complies with OMB Regulation 4104.

5.2 PENALTY FOR SUBSTITUTION OF SUBCONTRACTORS

5.2.1 Should the Contractor fail to utilize any or all of the Subcontractors in the Contractor's Bid statement in the performance of the Work on the public bidding, the Contractor shall be penalized in the amount of (project specific amount*). The Agency may determine to deduct payments of the penalty from the Contractor or have the amount paid directly to the Agency. Any penalty amount assessed against the Contractor may be remitted or refunded, in whole or in part, by the Agency awarding the Contract, only if it is established to the satisfaction of the Agency that the Subcontractor in question has defaulted or is no longer engaged in such business. No claim for the remission or refund of any penalty shall be granted unless an application is filed within one year after the liability of the successful Bidder accrues. All penalty amounts assessed and not refunded or remitted to the contractor shall be reverted to the State.

*one (1) percent of contract amount not to exceed $10,000

5.3 CONTRACT PERFORMANCE

5.3.1 Any firm entering into a Public Works Contract that neglects or refuses to perform or fails to comply with its terms, the Agency may terminate the Contract and proceed to award a

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new Contract or may require the Surety on the Performance Bond to complete the Contract in accordance with the terms of the Performance Bond.

5.4 NO THIRD PARTY BENEFICIARIES

5.4.1 The parties agree that the Contract is solely for the benefit of the parties and nothing herein is intended to create any third party beneficiary rights for subcontractors or other third parties, except that the parties further agree that all warranties given by the Vendor to the Owner, shall also run in favor of the respective Project Contractor for each Project, who shall have the authority to enforce such warranties for the benefit of the Owner until Final Completion of each Project.

ARTICLE 6: CONSTRUCTION BY OWNER OR SEPARATE CONTRACTORS

6.1 The Owner reserves the right to simultaneously perform other construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other Projects at the same site.

6.2 The Contractor shall afford the Owner and other Contractors reasonable opportunity for access and storage of materials and equipment, and for the performance of their activities, and shall connect and coordinate their activities with other forces as required by the Contract Documents.

ARTICLE 7: CHANGES IN THE WORK

7.1 The Owner, without invalidating the Contract, may order changes in the Work consisting of Additions, Deletions, Modifications or Substitutions, with the Contract Sum and Contract completion date being adjusted accordingly. Such changes in the Work shall be authorized by written Change Order signed by the Professional, as the duly authorized agent, the Contractor and the Owner.

7.2 The Contract Sum and Contract Completion Date shall be adjusted only by a fully executed Change Order.

7.3 The additional cost, or credit to the Owner resulting from a change in the Work shall be by mutual agreement of the Owner, Contractor and the Architect. In all cases, this cost or credit shall be based on the “invoice price” of the materials/equipment needed or prices determined on equipment and material during the bidding process.

7.3.1 “Invoice price” of materials/equipment shall be defined to mean the actual cost of materials and/or equipment that is paid by the Contractor, (or subcontractor), to a material distributor, direct factory vendor, store, material provider, or equipment leasing entity. Rates for equipment that is leased and/or owned by the Contractor or subcontractor(s) shall not exceed those listed in the latest version of the “Means Building Construction Cost Data” publication.

7.4 CHANGES INITIATED BY OWNER.

7.4.1 The Owner, acting through the Architect/Engineer of Record may at any time or from time to time, order additions, deletions, or revisions to the Vendor’s Scope of Supply. (“Changed Work”). With respect to Changed Work initiated by the Owner, the Architect/Engineer of Record shall request the Vendor to submit a proposal for Changed Work by issuing a written request. The request will describe the scope of the Changed Work. The Vendor shall submit a written change proposal within fourteen (14) days after receipt of the request or such shorter time as the Architect/Engineer of Record may set

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forth in the request. The proposal must set forth any changes to the Purchase Order Price or the Delivery Schedule required to perform the Change Order. The Owner may or may not choose to authorize the Vendor to perform the Changed Work as identified in the request.

7.5 CHANGES INITIATED BY THE VENDOR

7.5.1 Except for changes initiated by the Owner by request, the Vendor shall provide prompt written notification to the Architect/Engineer or Record upon discovering any conditions or circumstances that the Vendor believes entitiles the Vendor to an adjustment to the Purchase Order Price and/or the Delivery Schedule. The Vendor shall submit a written change proposal within fourteen (14) days after giving notice to the Architect/Engineer of Record. The proposal must set forth any changes to the Purchase Order Price Price or the Delivery Schedule required to perform the Change Order.

7.6 PRICING CHANGED WORK

7.6.1 The Vendor and the Owner agree that approved Change Orders may be priced on any of the following three bases, subject to the approval of the Owner:
(a) on the basis of unit prices included in the Vendor's Bid, as adjusted to account for escalation increases or decreases, or
(b) on the basis of other unit prices agreed to by the Owner and the Vendor ; or
(c) on the basis of allowable time and material cost actually and properly incurred, subject to an agreed maximum not-to-exceed price.

7.6.2 After the Vendor and the Owner have agreed to the pricing of a Change Order, and a Change Order has been issued by the Owner and executed by the Vendor , the Vendor shall be paid on account of such Change Order work. The Owner and the Vendor acknowledge and agree that a Change Order includes payment for all costs associated with the change both with respect to changed Work and unchanged Work, whether direct, indirect, impact, or consequential in nature and any and all claims that the Vendor may have relating to the change, including but not limited to, delay, acceleration, interference, hindrance and/or impact claims.

7.7 VENDOR 'S CHANGE PROPOSAL.

7.7.1 The Vendor 's Change Proposal shall include the following information:
(a) Documents to substantiate costs for Changed Work in the form specified in Section 10.3, Pricing of Changed Work .
(b) Documents to substantiate impacts to the Delivery Schedule prepared in accordance with Section 8.3 if time or delays are relevant to the Change Proposal.

7.8 AGREED CHANGE ORDERS.

7.8.1 If the Vendor and the Owner agree on an adjustment, if any, to the Purchase Order Price and/or the Delivery Schedule, arising from Changed Work, whether initiated by the Owner or the Vendor , the Owner will issue a Change Order. The Owner's agreement as to price or time is subject to final approval as required by the Owner's ordinances, regulations, and rules. The Owner may issue a Change Order as authorization for the Changed Work and/or for payment, or time extension, or both. The Owner may also issue a Change Order to modify the terms of the Contract.

7.9. DIRECTIVE ORDER.

7.9.1 If the Vendor and the Owner cannot agree as to whether there has been a change or if the parties agree that there has been a change, but cannot agree on an adjustment, if

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any, to the Purchase Order Price and/or the Delivery Schedule, arising from Changed Work, whether initiated by the Owner or the Vendor, the Owner shall issue a Directive Order. The Owner shall determine an adjustment to the Purchase Order Price and/or Delivery Schedule for the Changed Work, if any. The Vendor shall proceed in accordance with a Directive Order, which shall be final and binding, subject only to Article 13, Claims and Disputes. The Vendor 's refusal or failure to proceed promptly in accordance with a Directive Order constitutes an event of default.

ARTICLE 8: TIME

8.1 Time limits, if any, are as stated in the Project Manual. By executing the Agreement, the Contractor confirms that the stipulated limits are reasonable, and that the Work will be completed within the anticipated time frame.

8.2 If progress of the Work is delayed at any time by changes ordered by the Owner, by labor disputes, fire, unusual delay in deliveries, abnormal adverse weather conditions, unavoidable casualties or other causes beyond the Contractor's control, the Contract Time shall be extended for such reasonable time as the Owner may determine.

8.3 Any extension of time beyond the date fixed for completion of the construction and acceptance of any part of the Work called for by the Contract, or the occupancy of the building by the Owner, in whole or in part, previous to the completion shall not be deemed a waiver by the Owner of his right to annul or terminate the Contract for abandonment or delay in the matter provided for, nor relieve the Contractor of full responsibility

8.4 SUSPENSION AND DEBARMENT

8.4.1 Per Section 6962(d)(14), Title 29, Delaware Code, “Any Contractor who fails to perform a public works contract or complete a public works project within the time schedule established by the Agency in the Invitation To Bid, may be subject to Suspension or Debarment for one or more of the following reasons: a) failure to supply the adequate labor supply ratio for the project; b) inadequate financial resources; or, c) poor performance on the Project.”

8.4.2 “Upon such failure for any of the above stated reasons, the Agency that contracted for the public works project may petition the Director of the Office of Management and Budget for Suspension or Debarment of the Contractor. The Agency shall send a copy of the petition to the Contractor within three (3) working days of filing with the Director. If the Director concludes that the petition has merit, the Director shall schedule and hold a hearing to determine whether to suspend the Contractor, debar the Contractor or deny the petition. The Agency shall have the burden of proving, by a preponderance of the evidence, that the Contractor failed to perform or complete the public works project within the time schedule established by the Agency and failed to do so for one or more of the following reasons: a) failure to supply the adequate labor supply ratio for the project; b) inadequate financial resources; or, c) poor performance on the project. Upon a finding in favor of the Agency, the Director may suspend a Contractor from Bidding on any project funded, in whole or in part, with public funds for up to 1 year for a first offense, up to 3 years for a second offense and permanently debar the Contractor for a third offense. The Director shall issue a written decision and shall send a copy to the Contractor and the Agency. Such decision may be appealed to the Superior Court within thirty (30) days for a review on the record.”

8.5 RETAINAGE

8.5.1 Per Section 6962(d)(5) a.3, Title 29, Delaware Code: The Agency may at the beginning of each public works project establish a time schedule for the completion of the project. If

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the project is delayed beyond the completion date due to the Contractor's failure to meet their responsibilities, the Agency may forfeit, at its discretion, all or part of the Contractor's retainage.

8.5.2 This forfeiture of retainage also applies to the timely completion of the punchlist. A punchlist will only be prepared upon the mutual agreement of the Owner, Architect and Contractor. Once the punchlist is prepared, all three parties will by mutual agreement, establish a schedule for its completion. Should completion of the punchlist be delayed beyond the established date due to the Contractor's failure to meet their responsibilities, the Agency may hold permanently, at its discretion, all or part of the Contractor's retainage.

ARTICLE 9: PAYMENTS AND COMPLETION

9.1 APPLICATION FOR PAYMENT

9.1.1 Applications for payment shall be made upon AIA Document G702. There will be a five percent (5%) retainage on all Contractor's monthly invoices until completion of the project. This retainage may become payable upon receipt of all required closeout documentation, provided all other requirements of the Contract Documents have been met.

9.1.2 A date will be fixed for the taking of the monthly account of work done. Upon receipt of Contractor's itemized application for payment, such application will be audited, modified, if found necessary, and approved for the amount. Statement shall be submitted to the Owner.

9.1.3 Section 6516, Title 29 of the Delaware Code annualized interest is not to exceed 12% per annum beginning thirty (30) days after the "presentment" (as opposed to the date) of the invoice.

9.2 PARTIAL PAYMENTS

9.2.1 Any public works Contract executed by any Agency may provide for partial payments at the option of the Owner with respect to materials placed along or upon the sites or stored at secured locations, which are suitable for use in the performance of the contract.

9.2.2 When approved by the agency, partial payment may include the values of tested and acceptable materials of a nonperishable or noncontaminative nature which have been produced or furnished for incorporation as a permanent part of the work yet to be completed, provided acceptable provisions have been made for storage.

9.2.2.1 Any allowance made for materials on hand will not exceed the delivered cost of the materials as verified by invoices furnished by the Contractor, nor will it exceed the contract bid price for the material complete in place.

9.2.3 If requested by the Agency, receipted bills from all Contractors, Subcontractors, and material, men, etc., for the previous payment must accompany each application for payment. Following such a request, no payment will be made until these receipted bills have been received by the Owner.

9.3 SUBSTANTIAL COMPLETION

9.3.1 When the building has been made suitable for occupancy, but still requires small items of miscellaneous work, the Owner will determine the date when the project has been substantially completed.

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9.3.2 If, after the Work has been substantially completed, full completion thereof is materially delayed through no fault of the Contractor, and without terminating the Contract, the Owner may make payment of the balance due for the portion of the Work fully completed and accepted. Such payment shall be made under the terms and conditions governing final payment that it shall not constitute a waiver of claims.

9.3.3 On projects where commissioning is included, the commissioning work as defined in the specifications must be complete prior to the issuance of substantial completion.

9.4 FINAL PAYMENT

9.4.1 Final payment, including the five percent (5%) retainage if determined appropriate, shall be made within thirty (30) days after the Work is fully completed and the Contract fully performed and provided that the Contractor has submitted the following closeout documentation (in addition to any other documentation required elsewhere in the Contract Documents):

9.4.1.1 Evidence satisfactory to the Owner that all payrolls, material bills, and other indebtedness connected with the work have been paid,

9.4.1.2 An acceptable RELEASE OF LIENS,

9.4.1.3 Copies of all applicable warranties,

9.4.1.4 As-built drawings,

9.4.1.5 Operations and Maintenance Manuals,

9.4.1.6 Instruction Manuals,

9.4.1.7 Consent of Surety to final payment.

9.4.1.8 The Owner reserves the right to retain payments, or parts thereof, for its protection until the foregoing conditions have been complied with, defective work corrected and all unsatisfactory conditions remedied.

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

10.1 The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall take all reasonable precautions to prevent damage, injury or loss to: workers, persons nearby who may be affected, the Work, materials and equipment to be incorporated, and existing property at the site or adjacent thereto. The Contractor shall give notices and comply with applicable laws ordinances, rules regulations, and lawful orders of public authorities bearing on the safety of persons and property and their protection from injury, damage, or loss. The Contractor shall promptly remedy damage and loss to property at the site caused in whole or in part by the Contractor, a Subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable.

10.2 The Contractor shall notify the Owner in the event any existing hazardous material such as lead, PCBs, asbestos, etc. is encountered on the project. The Owner will arrange with a qualified specialist for the identification, testing, removal, handling and protection against exposure or environmental pollution, to comply with applicable regulation laws and ordinances. The Contractor and Architect will not be required to participate in or to perform this operation. Upon completion of this work, the Owner will notify the Contractor and Architect in writing the area has been cleared and approved by the authorities in order for

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the work to proceed. The Contractor shall attach documentation from the authorities of said approval.

10.3 As required in the Hazardous Chemical Information Act of June 1984, all vendors supplying any materials that may be defined as hazardous, must provide Material Safety Data Sheets for those products. Any chemical product should be considered hazardous if it has a warning caution on the label relating to a potential physical or health hazard, if it is known to be present in the work place, and if employees may be exposed under normal conditions or in any foreseeable emergency situation. Material Safety Data Sheets must be provided directly to the Owner along with the shipping slips that include those products.

10.4 The Contractor shall certify to the Owner that materials incorporated into the Work are free of all asbestos. This certification may be in the form of Material Safety Data Sheet (MSDS) provided by the product manufacturer for the materials used in construction, as specified or as provided by the Contractor.

ARTICLE 11: INSURANCE AND BONDS

11.1 The Contractor shall carry all insurance required by law, such as Unemployment Insurance, etc. The Contractor shall carry such insurance coverage as they desire on their own property such as a field office, storage sheds or other structures erected upon the project site that belong to them and for their own use. The Subcontractors involved with this project shall carry whatever insurance protection they consider necessary to cover the loss of any of their personal property, etc.

11.2 Upon being awarded the Contract, the Contractor shall obtain a minimum of two (2) copies of all required insurance certificates called for herein, and submit one (1) copy of each certificate, to the Owner, within 20 days of contract award.

11.3 Bodily Injury Liability and Property Damage Liability Insurance shall, in addition to the coverage included herein, include coverage for injury to or destruction of any property arising out of the collapse of or structural injury to any building or structure due to demolition work and evidence of these coverages shall be filed with and approved by the Owner.

11.4 The Contractor's Property Damage Liability Insurance shall, in addition to the coverage noted herein, include coverage on all real and personal property in their care, custody and control damaged in any way by the Contractor or their Subcontractors during the entire construction period on this project.

11.5 Builders Risk (including Standard Extended Coverage Insurance) on the existing building during the entire construction period, may be provided by the Contractor under this contract. The Owner shall insure the existing building and all of its contents and all this new alteration work under this contract during entire construction period for the full insurable value of the entire work at the site. Note, however, that the Contractor and their Subcontractors shall be responsible for insuring building materials (installed and stored) and their tools and equipment whenever in use on the project, against fire damage, theft, vandalism, etc.

11.6 Certificates of the insurance company or companies stating the amount and type of coverage, terms of policies, etc., shall be furnished to the Owner, within 20 days of contract award.

11.7 The Contractor shall, at their own expense, (in addition to the above) carry the following forms of insurance:

11.7.1 Contractor's Contractual Liability Insurance

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Minimum coverage to be:

Bodily Injury		
	$1,000,000	for each occurrence
	$3,000,000	aggregate
Property Damage	$1,000,000	for each occurrence
	$3,000,000	aggregate

11.7.2 Contractor's Protective Liability Insurance

Minimum coverage to be:

Bodily Injury		
	$1,000,000	for each occurrence
	$3,000,000	aggregate
Property Damage	$1,000,000	for each occurrence
	$3,000,000	aggregate

11.7.3 Automobile Liability Insurance

Minimum coverage to be:

Bodily Injury	$1,000,000	for each person
	$1,000,000	for each occurrence
Property Damage	$500,000	per accident

11.7.4 Prime Contractor's and Subcontractors' policies shall include contingent and contractual liability coverage in the same minimum amounts as 11.7.1 above.

11.7.5 Workmen's Compensation (including Employer's Liability):

11.7.5.1 Minimum Limit on employer's liability to be as required by law.

11.7.5.2 Minimum Limit for all employees working at one site.

11.7.6 Certificates of Insurance must be filed with the Owner guaranteeing fifteen (15) days prior notice of cancellation, non-renewal, or any change in coverages and limits of liability shown as included on certificates.

11.7.7 Social Security Liability

11.7.7.1 With respect to all persons at any time employed by or on the payroll of the Contractor or performing any work for or on their behalf, or in connection with or arising out of the Contractor's business, the Contractor shall accept full and exclusive liability for the payment of any and all contributions or taxes or unemployment insurance, or old age retirement benefits, pensions or annuities now or hereafter imposed by the Government of the United States and the State or political subdivision thereof, whether the same be measured by wages, salaries or other remuneration paid to such persons or otherwise.

11.7.7.2 Upon request, the Contractor shall furnish Owner such information on payrolls or employment records as may be necessary to enable it to fully comply with the law imposing the aforesaid contributions or taxes.

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11.7.7.3 If the Owner is required by law to and does pay any and/or all of the aforesaid contributions or taxes, the Contractor shall forthwith reimburse the Owner for the entire amount so paid by the Owner.

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

12.1 The Contractor shall promptly correct Work rejected by the Owner or failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed, and shall correct any Work found to be not in accordance with the requirements of the Contract Documents within a period of two years from the date of Substantial Completion, or by terms of an applicable special warranty required by the Contract Documents. The provisions of this Article apply to work done by Subcontractors as well as to Work done by direct employees of the Contractor.

12.2 At any time during the progress of the work, or in any case where the nature of the defects shall be such that it is not expedient to have them corrected, the Owner, at their option, shall have the right to deduct such sum, or sums, of money from the amount of the contract as they consider justified to adjust the difference in value between the defective work and that required under contract including any damage to the structure.

ARTICLE 13: MISCELLANEOUS PROVISIONS

13.1 DIMENSIONS

13.1.1 All dimensions shown shall be verified by the Contractor by actual measurements at the project site. Any discrepancies between the drawings and specifications and the existing conditions shall be referred to the Owner for adjustment before any work affected thereby has been performed.

13.2 LABORATORY TESTS

13.2.1 Any specified laboratory tests of material and finished articles to be incorporated in the work shall be made by bureaus, laboratories or agencies approved by the Owner and reports of such tests shall be submitted to the Owner. The cost of the testing shall be paid for by the Contractor.

13.2.2 The Contractor shall furnish all sample materials required for these tests and shall deliver same without charge to the testing laboratory or other designated agency when and where directed by the Owner.

13.3 WARRANTY

13.3.1 For a period of two (2) years from the date of substantial completion, as evidenced by the date of final acceptance of the work, the contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect of equipment, material or workmanship performed by the contractor or any of his subcontractors or suppliers. However, manufacturer's warranties and guarantees, if for a period longer than two (2) years, shall take precedence over the above warranties. The contractor shall remedy, at his own expense, any such failure to conform or any such defect. The protection of this warranty shall be included in the Contractor's Performance Bond.

13.3.2 ALL GUARANTEES AND WARRANTIES MUST BE FURNISHED BY THE VENDOR IN STRICT ACCORDANCE WITH THE SPECIFICATIONS. GUARANTEES AND WARRANTIES MUST BE DELIVERED TO THE ARCHITECT/ENGINEER OF RECORD

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OR HIS DESIGNEE BEFORE FINAL PAYMENT ON EACH PROJECT PURCHASE ORDER IS ISSUED.

13.3.3 IN ADDITION, FOR ANY EQUIPMENT OR PRODUCTS SOLD OR SUPPLIED BY VENDOR, VENDOR EXPRESSLY WARRANTS TO OWNER THAT AT THE TIME START-UP (A) THE PRODUCTS WILL CONFORM TO THE APPLICABLE SPECIFICATIONS, CONTRACT DRAWINGS, SAMPLES AND/OR DESCRIPTIONS FURNISHED TO OR BY OWNER, AS APPROVED BY THE OWNER, (B) THE PRODUCTS WILL BE MERCHANTABLE, FREE FROM DEFECTS IN DESIGN (TO THE EXTENT THE DESIGN IS NOT DEVELOPED AND FURNISHED BY OWNER), MATERIALS AND WORKMANSHIP, AND (C) WILL BE SUITABLE FOR THE PURPOSES INTENDED, WHETHER EXPRESSED OR REASONABLY IMPLIED.

13.3.4 FOR ANY RELATED INCIDENTAL WORK OR SERVICES PERFORMED BY VENDOR , VENDOR WARRANTS (1) THAT IT WILL DELIVER AND PERFORM THE WORK OR SERVICES AS SPECIFIED IN THE CONTRACT, IN A THOROUGH, EFFICIENT, WORKMANLIKE AND PROFESSIONAL MANNER, PROMPTLY WITH DUE DILIGENCE AND CARE, (2) THAT IT WILL PERFORM THE WORK OR SERVICES WITHIN THE TIME SPECIFIED, AND (3) THE WORK OR SERVICES WILL BE PERFORMED IN COMPLIANCE WITH ALL APPLICABLE PROVISIONS OF LAW AND INDUSTRY STANDARDS.

13.3.5 VENDOR SHALL HANDLE AND BE RESPONSIBLE FOR EVERY CLAIM OR DAMAGE OR INJURY THAT IS BASED UPON A BREACH OF ANY OF THE FOREGOING WARRANTIES OR, AT OWNER'S OPTION, VENDOR SHALL PROVIDE ALL REASONABLE ASSISTANCE TO OWNER IN OWNER'S HANDLING OF ANY SUCH CLAIMS BUT VENDOR SHALL REMAIN RESPONSIBLE FOR, INDEMNIFY ,AND HOLD HARMLESS OWNER WITH RESPECT TO ALL SUCH CLAIMS, DAMAGE, AND INJURES WHETHER OR NOT CLAIMS ARE HANDLED OR MANAGED BY OWNER. THE PROVISIONS OF THIS SECTION 4.5 SHALL SURVIVE ACCEPTANCE AND PAYMENT PURSUANT TO THE TERMS OF THE CONTRACT.

PACKING AND SHIPPING

13.4.1 The Vendor shall pack all Products to prevent damage or deterioration.

13.4.2 No charge for packing, boxing, crating, or storage by Vendor will be allowed unless stated herein. Owner is not responsible for containers or other packing materials for which charge is made by Vendor if not returned unless such returnable articles are shown on packing lists and invoices.

13.4.3 All Products must be shipped F.O.B. designation Project Site location to the Project Contractor. Prior to shipment, the Vendor shall contact the Project Contractor to confirm shipping information. All risk of loss or damage to the Products procured under the Contract, or any part thereof, prior to delivery to the Project Contractor shall be borne by the Vendor . Any loss or damage incurred during shipment shall not alleviate the Vendor from the conformance with the terms and conditions of the Contract. Unless the Contract specifies otherwise the Vendor shall ship all Products in accordance with the following instructions:

13.4.3.1 Shipments by the Vendor or its subcontractors must include packing sheets containing the Owner's Contract No., Project Purchase Order No. description and quantity of Products shipped, part number or size, if applicable, and appropriate evidence of inspections. The Vendor shall not include vermiculite or other hazardous substance in any packing included with the Products shipped. Products shipped on the same day must be consolidated on one

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bill-of-lading or airbill unless Owner authorizes otherwise. The total number of shipping containers must be referenced on all shipping documents.

13.4.3.2. The Vendor shall label each shipping container with the Contract No., the Project Purchase Order No., and the number that each container represents of the total number being shipped (e.g., Box 1 of 2, Box 2 of 2).

13.4.3.3 The Vendor shall include copies of documentation supporting prepaid freight charges (e.g., carrier invoices or UPS shipping log/manifest), if any, with its invoices.

13.4.3.4 If the Vendor is unable to comply with the shipping instructions in the Contract, the Vendor shall promptly notify the Owner and the Architect/Engineer.

13.5 PRODUCTS; SUBSTITUTION.

13.5.1 Products are generally specified by ASTM, ANSI, ARA, ASME, ASHREA, or other reference standard, or by manufacturer's names and model numbers or trade names. When specified only by reference standard, the Vendor may select any product meeting the standard, by any manufacturer. If several products or manufacturers are specified as being equally acceptable, the Vendor may exercise the option of using any product or manufacturer combination listed.

13.5.2 The Vendor shall ensure that all Products furnished under the Contract is new, unless otherwise specifically stated, and that the Products is subject at all times during the manufacture, fabrication, and delivery to inspection by the Owner and the Owner's authorized representative, to assure the Owner that the terms of the Specifications are complied with in all respects.

13.5.3. The Products specified forms the basis of the Contract. Substitutions after the execution of the Contract will only be considered under the following limited circumstances:
(a) They are required for compliance with subsequent interpretation of code requirements.
(b) The Products specified in the Contract have become unavailable through no fault of the Vendor.
(c) Subsequent information discloses the inability of the Products specified in the Contract to perform properly or to fit in the designated space.
(d) The manufacturer or fabricator refuses to certify or guarantee performance of the Products specified in the Contract.
(e) If it is determined by the Owner that a substitution is in the Owner's best interests in terms of cost, time, or other considerations.

13.5.4 When one or more of the above reference conditions exist, the Vendor may submit a request for substitution to the Architect/Engineer of Record for review, and acceptance or rejection, subject to compliance with all requirements in this Article and the Contract. The request must include complete data on the proposed substitution that substantiates compliance with the Contract, such as product identification and description, performance and test data, references and samples where applicable, and an itemized comparison of the proposed substitution with the Products specified. The request for substitution must also include data relating to the Delivery Schedule, design, and artistic effect where applicable. The Owner's decision on acceptance or rejection of a requested substitution shall be final. The Vendor shall submit a request for substitution in writing, with all pertinent technical and cost data.

13.5.5 By submitting a request for substitution, the Vendor represents to the Architect/Engineer of Record that:
(a) The proposed substitution has been completely investigated by the Vendor;

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(b) The proposed substitute item carries the same or better guarantee as the specified item, and
(c) The proposed substitute item does not increase the price of the Products to the Owner.

13.6 VENDOR 'S QUALITY PROGRAM

13.6.1 The Vendor shall be responsible for quality assurance and for assuring that the Products conform to Specifications and the requirements of the Contract. The Vendor shall maintain an effective and economical quality control program planned and developed in conjunction with other Vendor functions necessary to satisfy the Contract requirements. The quality control program must establish and implement procedures to ensure that only acceptable Products are presented to the Architect/Engineer of Record and the Owner, and must demonstrate both recognition of the quality requirements of the Contract and an organized approach to satisfy these requirements. The program must ensure that quality requirements are determined and satisfied throughout all phases of Contract performance, including, as applicable, design development, purchasing, fabrication, processing, assembly, inspection, testing, packaging, delivery, storage and systems check and must provide for the early and prompt detection of actual or potential deficiencies, errors, trends, or conditions that could result in unsatisfactory quality. The Vendor shall promptly notify the Architect/Engineer of Record and the Owner of any violation of or deviation from the Vendor 's quality control system and advise the Owner of the quantity and specific identity of any Products delivered to the Owner during the period of any such violation or deviation. The Vendor shall be prepared to demonstrate to the satisfaction of the Architect/Engineer of Record and the Owner that the program is effective and in operation.

13.7 GENERAL INSPECTION.

13.7.1 The Architect/Engineer of Record and the Owner's representatives will at all times have the right, but not the obligation, to inspect and test the Products procured under the Contract, to assure the Owner that the terms of the specifications are complied with in all respects. Accordingly, the Vendor shall provide reasonable facilities and safe access to its premises to allow proper inspection of the Products, at no additional charge to the Owner. Owner's inspection of the Products, no matter when occurring, shall not be construed to be acceptance of any work in progress or finished Products. All Products are subject to final inspection by the Owner, notwithstanding the results of preliminary inspections or inspections of unfinished Products.

13.7.2 If the Specifications, Owner's instructions, laws, ordinances or any public authority require certain Products to be tested or approved, the Vendor shall give the Owner and the Architect/Engineer of Record timely notice of its readiness for inspection and notify the them of the inspection date.

13.7.3 The Owner and the Architect/Engineer of Record will have free access to the part of any manufacturer's plant where the Products required under the Contract are being manufactured, assembled, or prepared.

13.7.4 The Vendor or its authorized testing and inspection agency, approved by the Owner, must perform inspection and testing of the Products furnished under the Contract, except as otherwise expressly stated in the Contract.

13.7.5 The Vendor shall perform inspections and tests at the point of manufacture, or as otherwise designated by the Owner. When making inspections or tests at the point of manufacture, the Vendor shall notify the Owner and the Architect/Engineer of Record, in writing, at least five days prior, to allow performance of inspection and tests before shipment. The Vendor

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shall furnish to the Owner and the Architect/Engineer of Record three copies of all notices for inspection, and all shop orders to facilitate identifying the Products to be inspected.

13.7.6 The Vendor shall take samples for analysis and tests in a manner that is truly representative of the entire lot under test. The Vendor shall not work on samples in any way that alters the quality before testing. Where allowed in writing by the Owner, for Products taken from stock for use in minor parts, the Vendor shall supply certified analysis and tests of the manufacturer. If the records of physical and chemical tests of stock Products are not available, the Vendor shall furnish a reasonable number of tests to the Architect/Engineer of Record free of charge, at the Architect/Engineer of Record's request, to satisfy the Owner as to their qualities.

13.7.7 The Vendor shall make inspection and tests of fabricated parts and manufactured articles by methods and at times as will ensure compliance with the Specifications in all respects.

ARTICLE 14: TERMINATION OR SUSPENSION OF THE CONTRACT

14.1. TERMINATION FOR DEFAULT.

14.1.1. If the Vendor fails to perform any of its obligations under the Contract, the Owner may notify the Vendor and its surety, if applicable, in writing that the Vendor is in default. The giving of such notice shall start the running of a cure period of up to 14 days. Unless the Vendor cures such default within the cure period, the Owner may terminate the Contract for default. If the default cannot be cured within the cure period, and the Vendor requests additional time to cure, the Owner may extend the cure period in writing. If the Vendor fails to cure within the extended cure period, the Owner may terminate the Contract by sending a notice of termination for default. Termination for default will be effective upon receipt of the written notice of termination by the Vendor . Upon termination for default, the Vendor will only be paid the Purchase Order Price for Products delivered and accepted in accordance with the manner of performance set forth in the Contract.

14.1.2. In the event that the Vendor is terminated for default, the Owner may procure, upon such terms and in such manner as the Owner may deem appropriate, supplies or services similar to those terminated, and the Vendor shall be liable to the Owner for any excess costs for such similar supplies or services.

14.2. NON-EXCLUSIVITY

14.2.1. The remedies under the terms of the Contract are not exclusive of any other remedy. Each and every remedy is cumulative and in addition to any other remedy, existing now or hereafter, at law, or in equity.

14.3. COURT DETERMINATION.

14.3.1. If the Contract is terminated by the Owner for default, and it is subsequently determined by a court that such termination was not justified, such termination will be deemed a termination for convenience, effective as of the date the Vendor received the original notice of termination for default, and the provisions applicable to termination for convenience will apply.

14.4. TERMINATION FOR CONVENIENCE.

14.4.1. The Owner may terminate the Contract, in whole or in part, at any time by written notice to the Vendor when Owner decides to do so, for any reason, or no reason at all, in Owner's

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sole and absolute discretion. Upon reciept of written notice of termination, all services and any performance hereunder by the Vendor shall cease to the extent specified in the notice of termination. In the event of termination in whole, the Vendor shall submit a final invoice, within 30 days of such termination, reflecting the Products material and services actually furnished pursuant to the Contract and any Project Purchase Orders issued by the Owner. This final invoice shall be to the satisfaction of the Owner and for which no previous invoice was submitted.

14.4.2. The Vendor will be paid its costs, including Contract close-out costs, and profit on Work performed up to the time of termination. The Vendor shall promptly submit its termination Claim to the Owner. The parties must negotiate a settlement of the termination claim. If the Vendor has property in its possession belonging to the Owner, the Vendor shall account for all of that property, and dispose of it in the manner the Owner directs.

14.4.3. If the Contract is terminated in part, the Vendor shall continue the performance of the Contract to the extent not terminated under the provisions of this Section.

END OF SECTION

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SECTION 00 73 46

WAGE RATE DETERMINATION SCHEDULE

The Delaware Department of Labor Division of Industrial Affairs has established the category and associated prevailing wage rate for this project. The project approved prevailing wage rate determination schedule follows.

Material Purchase Only. No Labor Involved

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EMPLOYEE DRUG TESTING REPORT FORM
Period Ending:_____

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds maintain testing data that includes but is not limited to the data elements below.

Project Number: _____

Project Name: _____

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____
_____
_____

Number of employees who worked on the jobsite during the report period:_____

Number of employees subject to random testing during the report period:_____

Number of Negative Results _____ Number of Positive Results _____

Action taken on employee(s) in response to a failed or positive random test:
_____
_____
_____

Date: _____

This form is not required to be submitted to the Owner. Included as a reference to show information required to be maintained by the Contractor. The Owner shall have the right to periodically audit all Contractor and Subcontractor test results at the Contractor's or Subcontractor's offices (or by other means to make the data available for inspection by the Owner).

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EMPLOYEE DRUG TESTING
REPORT OF POSITIVE RESULTS

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds to notify the Owner in writing of a positive random drug test.

Project Number: _____

Project Name: _____

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____
_____
_____

Name of employee with positive test result: _____

Last 4 digits of employee SSN: _____

Date test results received: _____

Action taken on employee in response to a positive test result:
_____
_____
_____

Authorized Representative of Contractor/Subcontractor: _____
(typed or printed)

Authorized Representative of Contractor/Subcontractor: _____
(signature)

Date: _____

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This form shall be sent by mail to the Owner within 24 hours of receipt of test results.

Enclose this test results form in a sealed envelope with the notation "Drug Testing Form – DO NOT OPEN" on the face thereof and place in a separate mailing envelope.

Major Capital Program Pre-Purchase Services
2916 Duncan Road
Wilmington, DE 19808

AFFIDAVIT OF CRAFT TRAINING COMPLIANCE

We, the contractor, hereby certify that we and all applicable subcontractors will abide by the contractor and subcontractor craft training requirements outlined below for the duration of the contract. Craft training must be provided by a contractor and/or subcontractor for each craft on a project for which there are Delaware Department of Labor approved and registered training programs or, if the contractor and/or subcontractor meets the requirements under Title 29, Chapter 69, Section 6960A.(b)(1)c.1.-3., payment may be made in accordance with Title 29, Chapter 69, Section 6960A.(b)(1)d. A list of crafts for which there are approved and registered training programs is maintained by the Delaware Department of Labor and can be found at: https://laborfiles.delaware.gov/main/det/apprenticeship/DE%20Craft%20Training%20Occupation%20List%20Effective%20March%201%202022.pdf. If you have questions regarding craft training programs, please submit all questions in writing to the Delaware Department of Labor at: apprenticeship@delaware.gov. ***This Affidavit of Craft Training Compliance must be submitted prior to contract execution***.

In accordance with Title 29, Chapter 69, Section 6960A.(a)(1), a contract relating to a public works project under § 6962 of Title 29 must include a craft training program for each craft in the project if at the time the contractor executes a public works contract, all of the following apply:

a. A project meets the prevailing wage requirement under Section 6960 of Title 29.
b. The contractor employs 10 or more total employees.
c. The project is not a federal highway project, except for the project under Section 6962(c)(11) of Title 29.
d. There is an apprenticeship program for a craft in the project on the list of crafts under Section 204(b)(2) of Title 19.

Pursuant to Title 29, Chapter 69, Section 6960A.(a)(2), ***a contractor must commit that all subcontractors provide craft training*** if paragraph (a)(1) of this section applies to the subcontractor. Failure to provide required craft training or payment on the project may subject the successful contractor and/or subcontractor(s) to penalties as outlined in Title 29, Chapter 69, Section 6960A.(d)(1)-(3).

Craft(s): _____

Contractor Name: _____

Contractor Address: _____

_____

_____

Contractor Program Registration Number(s) _____

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On this line also indicate whether DE, Other State (identify) or US Registration Number

Or

☐ **A payment has been made in the amount established under Section 204(b)(2)b.2. of Title 19, for the craft into the Delaware Department of Labor's Apprenticeship and Training Fund.**

Or

☐ **Craft Training requirements are not applicable because:**

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

State of Delaware)
) ss:
County of _____)

Before me, a notary public, in and for said county and state, personally appeared, _____, who acknowledged to me that she/he did execute the foregoing instrument on behalf of _____.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed my official seal this ____ day of _____ 20___.

_____
Notary Public

Commission Expires _____

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THIS PAGE MUST BE SIGNED AND NOTARIZED TO BE CONSIDERED.

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SECTION 01 10 00
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: Mechanical Equipment Pre-Purchase.

B. Owner's Name: Red Clay Consolidated School District.

C. Architect / Engineer's Name: Studio JAED (SJ)

D. The Project consists of the pre-purchasing of mechanical equipment for installtion under separate contract

1.02 CONTRACT DESCRIPTION

A. Lump-sum, material pre-purchase contract as defined by the documents herein.

1.03 GENERAL STANDARDS

A. Mechanical Systems
   1. Manufacturers of all coils shall ensure that the coils are clean and free of any residue from the manufacturing and shipping process. If coils are found to be dirty or smoke when hot water is provided to them, the contractor will be responsible for cleaning of the coils, as well as, cleaning the building from smoke, coil emanations, or vapors.
   2. The contractor shall be responsible for all additional costs incurred as a result of substitutions or deviations from the basis of design shown on these drawings.

B. Electrical Systems
   1. Material and equipment shall be UL, NEMA, ANSI, IEEE, ADA & CMB approved for intended purpose. Material and installation shall meet requirements of national and local electrical code.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

NOT FOR BIDDING

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

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

B. Change procedures.

1.02 SCHEDULE OF VALUES

A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.

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

1.03 APPLICATIONS FOR PROGRESS PAYMENTS

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

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

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

D. Execute certification by signature of authorized officer.

1.04 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor.

B. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Price or Contract Time.
   2. Promptly execute the change.

C. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the changewith a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 5 days.

D. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

E. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals for review, information, and project closeout.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Architect or Engineer of record for review for the limited purpose of checking for compliance with information given and the design concept expressed in the contract documents.

3.02 SUBMITTALS FOR PROJECT CLOSEOUT

A. When the following are specified in individual sections, submit them at project closeout as follows:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.

END OF SECTION

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SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufacturers' field services.

1.02 RELATED REQUIREMENTS

A. Section 01 42 16 - Definitions.

PART 3 EXECUTION

2.01 MANUFACTURERS' FIELD SERVICES

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

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

END OF SECTION

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SECTION 01 42 16

DEFINITIONS

PART 1 GENERAL

1.01 SUMMARY

A. Other definitions are included in individual specification sections.

1.02 DEFINITIONS

A. Furnish: To supply, deliver, unload, and inspect for damage.

B. Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use.

C. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.

D. Project Manual: The book-sized volume that includes the procurement requirements (if any), the contracting requirements, and the specifications.

E. Provide: To furnish and install.

F. Supply: Same as Furnish.

G. Addendum: Written change to the Bid Documents issued by the District prior to award of the Contract. Multiple such changes are referred to as “Addenda.”

H. Architect/Engineer of Record: The architect or engineer preparing final Construction Documents for each Project. The Architect/Engineer of Record shall, among its other duties, make a final determination of the types and quantities of Products to be used on each Project.

I. District: The Red Clay Consolidated School District. The District is also referred to in the Contract Documents as the “Owner” and includes the District and its authorized agents and representatives.

J. Beneficial Occupancy: The taking possession by the District of a portion of any particular Project for its use and/or occupancy on other than a temporary or emergency basis.

K. A complete and properly signed written proposal of the Bidder, submitted on the Bid Proposal Form included in the Bid Documents, to furnish the necessary materials and to perform the Work in accordance with the Contract Documents and for the sum stipulated, verified for mathematical correctness in accordance with the terms set forth in the Instructions to Bidders, supported by the data called for by the bidding requirements for such Work.

L. Bid Bond: The Bid Bond furnished by the Bidder as Bid Security.

M. Bidder: An individual, firm, partnership, corporation or combination thereof, submitting a Bid for the Contract work.

N. Bidding Documents: The documents listed on the Table of Contents, Section A on which the Bid is based.

O. Bid Security: The cashier’s check, certified check or U.S. currency, or Bid Bond, accompanying the Bid submitted by the Bidder, as a guarantee that the Bidder will enter into the Contract with the District for the performance of the Work and will furnish all other Bonds and insurance if the Contract is awarded to it.

P. Bond: The Bid Bond given as Bid Security, if any, and the Performance Bond and Payment Bond, and any other Bonds required to be furnished by the Contract Documents.

Q. Change Order: A written order to the Vendor signed by the District and the Vendor (except in the case of a Directive Order), issued after execution of a Contract and pursuant to a Change

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Order Request, authorizing a change in the Products to be furnished by the Vendor, or an adjustment in the Purchase Order Price or the Delivery Schedule, or other changes in, or a written interpretation of the Contract Documents. A Change Order may be agreed to by all parties in all respects or may be a Directive Order.

R. Change Order Request: A document submitted by the Vendor by the Architect/Engineer of Record requesting that a Change Order be issued to the Vendor and describing the events and circumstances giving rise to the request, the effect that the requested change will have on the Purchase Order Price and/or the Delivery Schedule.

S. Contract: The Contract Documents

T. Contract Documents:
   1. Invitation to Bid
   2. Instructions to Bidders
   3. Bid Proposal
   4. Contract
   5. Project Purchase Order(s)
   6. Performance Bond
   7. Payment Bond
   8. General Conditions

U. Days: Unless otherwise designated, days mean calendar days.

V. Delivery Date: The date or dates measured in weeks after the effective date of the Notice to Proceed issued by the District by which the Vendor shall deliver the Products under each Project Purchase Order for the corresponding Project.

W. Delivery Schedule: The schedule of all Delivery Dates for Products for each separate Project.

X. Directive Order : A kind of Change Order resulting where the District wishes to direct the Vendor to proceed with the performance of changed work prior to the Project Contractor's submittal of a Change Order Request or where the District and the Vendor do not agree that there is a change being made and which requires the Vendor to perform the work and maintain records from which to determine whether any additional costs are incurred or extensions of time are required.

Y. Final Completion: The date upon which the Architect of Record certifies to the District that the Work of each Project, including Punch List items, has been completed in accordance with the Contract Documents and that the District has received all required documents, manuals, certificates and submittals provided for under the Contract. for each Project.

Z. Hazardous Materials: Hazardous Materials means any and all materials identified as hazardous by any federal, state, county or municipal law, statute, ordinance, order or regulation related to the protection of the environment or worker safety and health. The term "Hazardous Materials" is sometimes used interchangeably with the term "Hazardous Substances".

AA. Indicated or As Indicated: A term meaning, "as shown on the Drawings, as specified in the Technical Specifications and/or as required by or reasonably inferable from the Contract Documents."

AB. Inspector: An authorized representative of the District, or if authorized by the District, a representative of the Project Contractor assigned to make inspections and/or tests of the work performed or being furnished by the Project Contractor.

AC. Invitation to Bid: The invitation to make a Bid issued by the District to Bidders.

AD. Architect or Engineer: Studio JAED, and its successors and permitted assigns.

AE. Notice of Award: Written notice to the successful Bidder that the District is awarding the Contract to that Bidder.

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AF. Notice to Proceed: Written notice from the District to the Vendor to proceed with the Work. Separate Notice to Proceed shall be issued for each separate Project Purchase Order.

AG. Owner: The District.

AH. Product or Products: The equipment furnished and delivered by the Vendor pursuant to the Contract and the separate Project Purchase Orders issued by the District pursuant to the Contract.

AI. Product Data: Illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Vendor to illustrate a material, product or system for some portion of the Work.

AJ. Program: The Owner's Program for the renovation and improvement of the schools listed in the bid documents. The Program is comprised of multiple separate Projects.

AK. Project: All design, construction and other work necessary to construct the construction, improvements and or renovations at each location.

AL. Project Contractor: The individual, firm, partnership or corporation, or combination thereof, including joint ventures, which, as an independent contractor, has entered into a contract with the District for the performance of the work of a particular Project. Vendor shall deliver the Products to the Project Contractor at the Project Site

AM. Project Site: The area enclosed within the project limits indicated in the Drawings and boundaries of local streets and public easements in which the Project Contractor is to perform the Work under the Contract, either exclusively or in conjunction with others performing other work as part of the Project. Products furnished by the Vendor under each Project Purchase Order shall be delivered to the respective Project Site.

AN. Project Purchase Order: The purchase order or purchase orders issued by the District for each separate Project, pursuant to the terms of the Contract.

AO. Project Purchase Order Modification: A written order to the Vendor signed by the District and the Vendor (except in the case of a Directive Order), issued after execution of a Project Purchase Order, authorizing a change in the Products to be furnished by the Vendor, or an adjustment in the Purchase Order Price or the Delivery Schedule, or other changes in, or a written interpretation of the Contract Documents.

AP. Project Purchase Order Price: The price set forth in each of the respective Project Purchase Orders issued by the District to the Vendor pursuant to the terms of the Contract. Purchase Order Price can be adjusted only by written Change Order accompanies by a written Project Purchase Order Modification.

AQ. Project Schedule: The schedule for each Project prepared and maintained by the Project Contractor. The Vendor's Delivery Schedule shall comply with the delivery requirements of the Bid Documents and shall be coordinated with the Project Schedule.

AR. Samples: Physical examples which illustrate materials, equipment, fixtures and workmanship and which establish standards by which the Work may be judged, provided that the Work is otherwise in conformity with the Contract Documents.

AS. Shop Drawings: Drawings, diagrams, illustrations, schedules, performance charts and other data specifically prepared for the Project by the Vendor or any subcontractor, manufacturer, supplier or distributor, which are representative of the quality of materials to be used in the Products, and which illustrate (a) the proposed fabrication and assembly of structural elements; and (b) the installation (form, fit, and attachment details) of materials or equipment and submitted to the District by the Vendor. Shop Drawings shall be deemed to include Product Data, literature, and performance and test data.

AT. Specifications: The portion of the Contract Documents consisting of written descriptions of materials, equipment, construction systems, design standards and quality of the Project, and

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other written directions and requirements for completing the Work. Specifications are sometimes referred to as Technical Specifications.

AU. Substantial Completion of the Work: Substantial Completion of the Work for each Project means the date certified by the Architect of Record and approved by the District as the date upon which (a) construction is sufficiently complete in accordance with the Construction Documents and functionally suitable for its intended purpose; and (b) a certificate of occupancy has been issued.

AV. Technical Specifications: The term “Specifications” and “Technical Specifications” are used interchangeably.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

NOT FOR BIDDING

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Transportation, handling, storage and protection.

B. Product option requirements.

C. Substitution limitations.

D. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

2.02 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.03 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

C. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the substitution as for the specified product.

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3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension that may subsequently become apparent.

D. Substitution Submittal Procedure:
1. Submit three copies of request for substitution for consideration at least 10 days prior to the bid, unless otherwise stated. Limit each request to one proposed substitution.
2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
3. The Architect will notify Contractor in writing of decision to accept or reject request.

3.02 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery with the contractor assigned to the project, to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

I. All Products must be shipped F.O.B. designation Project Site location to the Project Contractor. Prior to shipment, the Vendor shall contact the Project Contractor to confirm shipping information. All risk of loss or damage to the Products procured under the Contract, or any part thereof, prior to delivery to the Project Contractor shall be borne by the Vendor . Any loss or damage incurred during shipment shall not alleviate the Vendor from the conformance with the terms and conditions of the Contract. Unless the Contract specifies otherwise the Vendor shall ship all Products in accordance with the following instructions:

J. Shipments by the Vendor or its subcontractors must include packing sheets containing the Owner's Contract No., Project Purchase Order No. description and quantity of Products shipped, part number or size, if applicable, and appropriate evidence of inspections. The Vendor shall not include vermiculite or other hazardous substance in any packing included with the Products shipped. Products shipped on the same day must be consolidated on one bill-of-lading or airbill unless Owner authorizes otherwise. The total number of shipping containers must be referenced on all shipping documents.

K. The Vendor shall label each shipping container with the Contract No., the Project Purchase Order No., and the number that each container represents of the total number being shipped (e.g., Box 1 of 2, Box 2 of 2).

L. The Vendor shall include copies of documentation supporting prepaid freight charges (e.g., carrier invoices or UPS shipping log/manifest), if any, with its invoices.

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M. If the Vendor is unable to comply with the shipping instructions in the Contract, the Vendor shall promptly notify the Owner and the Architect/Engineer.

END OF SECTION

NOT FOR BIDDING

SECTION 01 78 00
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Section 00 72 13 - General Conditions: Performance bond and labor and material payment bonds, warranty and correction of work.

B. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

C. Section 01 70 00 - Execution and Closeout Requirements: Contract closeout procedures.

D. Individual Product Sections: Specific requirements for operation and maintenance data.

E. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
   4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Addenda.
   3. Change Orders and other modifications to the Contract.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

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D. Record information concurrent with construction progress.

E. Record Drawings: Legibly mark each item to record actual construction including:
   1. Field changes of dimension and detail.
   2. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

D. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

E. Provide servicing and lubrication schedule, and list of lubricants required.

F. Include manufacturer's printed operation and maintenance instructions.

G. Include sequence of operation by controls manufacturer.

H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

I. Additional Requirements: As specified in individual product specification sections.

3.04 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

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E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.

I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

3.05 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

END OF SECTION

NOT FOR BIDDING

SECTION 01 79 00
DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

A. Demonstration of products and systems where indicated in specific specification sections.

B. Training of Owner personnel in operation and maintenance is required for:
   1. Pre-Purchased systems and equipment.

1.02 RELATED REQUIREMENTS

A. Section 01 78 00 - Closeout Submittals: Operation and maintenance manuals.

B. Other Specification Sections: Additional requirements for demonstration and training.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

1.04 QUALITY ASSURANCE

A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
   1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
   2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 DEMONSTRATION - GENERAL

A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.

B. Demonstration may be combined with Owner personnel training if applicable.

C. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.
   2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

D. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.02 TRAINING - GENERAL

A. Conduct training on-site unless otherwise indicated.

B. Owner will provide classroom and seating at no cost to Contractor.

C. Provide training in minimum two hour segments.

D. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.

E. Review of Facility Policy on Operation and Maintenance Data: During training discuss:

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1. The location of the O&M manuals and procedures for use and preservation; backup copies.
2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
3. Typical uses of the O&M manuals.

F. Product- and System-Specific Training:
1. Review the applicable O&M manuals.
2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
4. Provide hands-on training on all operational modes possible and preventive maintenance.
5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
6. Discuss common troubleshooting problems and solutions.
7. Discuss any peculiarities of equipment installation or operation.
8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
9. Review recommended tools and spare parts inventory suggestions of manufacturers.
10. Review spare parts and tools required to be furnished by Contractor.
11. Review spare parts suppliers and sources and procurement procedures.

G. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION

NOT FOR BIDDING

SECTION 23 52 17

CONDENSING HIGH EFFICIENCY STAINLESS STEEL FIRETUBE BOILERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes gas-fired, condensing stainless steel firetube boilers for heating hot water.

1.03 SUBMITTALS

A. Product Data: Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories for each model indicated.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, required clearances, and method of field assembly, components, and location and size of each field connection.
   1. Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer installed and field installed wiring.

C. Source Quality Control Tests and Inspection Reports: Indicate and interpret test results for compliance with performance requirements before shipping.

D. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

E. Maintenance Data: Include in the maintenance manuals specified in Division 1. Include parts list, maintenance guide, and wiring diagrams for each boiler.

1.04 QUALITY ASSURANCE

A. Listing and Labeling: Provide electrically operated components specified in this Section that are listed and labeled.
   1. The Terms “Listed” and “Labeled”: As defined in NFPA 70, Article 100.
   2. Listing and Labeling Agency Qualifications: A “Nationally Recognized Testing Laboratory” as defined in OSHA Regulation 1910.7.

B. ASME Compliance: Boilers shall bear ASME “H” stamp and be National Board listed.

C. FM Compliance: Control devices and control sequences according to requirements of FM.

D. Comply with NFPA 70 for electrical components and installation.

E. IRI Compliance: Control devices and control sequences according to requirements of IRI (GE GAP).

F. CSD-1

G. SCAQMD Rule 1146.2 for low NOx equipment

1.05 COORDINATION

A. Coordinate size and location of concrete bases. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section “Cast-in-Place Concrete.”

1.06 WARRANTY

A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents. Installing contractor shall provide one year of warranty parts and labor.

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B. Special Warranty: Submit a written warranty, executed by the contractor for the heat exchanger.
   1. Warranty Period: The heat exchanger assembly shall carry a ten (10) year warranty with an additional twenty one (21) year thermal shock warranty on heat exchanger.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Available Manufacturers: Manufacturer shall be a company specializing in manufacturing the products specified in this section with minimum five (5) years experience. Subject to compliance with requirements, manufacturers offering boilers that may be incorporated into the Work include, but are not limited to, the following:
   1. Design: Boilers shall be CSA design certified as a condensing boiler. Boilers shall be designed for a minimum of 5:1 continuous turn down with constant CO2 over the turndown range. The boiler shall operate with natural gas and have a CSA International certified input rating as noted on the drawings, and a thermal efficiency rating up to 99% at minimum input. The boiler shall be symmetrically air-fuel coupled such that changes in combustion air flow or flue flows affect the BTUH input without affecting combustion quality. The boiler will automatically adjust input for altitude and temperature induced changes in air density. The boiler will use a proven pilot interrupted spark ignition system. The boiler shall use a UL approved flame safeguard ignition control system using UV detection flame sensing. The UV detector shall be air cooled to prevent condensate formation and so designed as to prevent misalignment. The design shall provide for silent burner ignition and operation. The boiler shall be down-fired counter-flow such that formed condensate always moves toward a cooler zone to prevent re-evaporation. A corrosion resistant condensate drain designed to prevent pooling and accessible condensate trap shall be provided. In some jurisdictions, a means of neutralizing the condensate pH levels may be required. Boiler shall be able to vent a horizontal distance of 100 equivalent feet, 30.5m with a vent diameter equivalent to the combustion chamber outlet diameter.
   2. Service Access: The boilers shall be provided with access covers for easily accessing all serviceable components. The boilers shall not be manufactured with large enclosures, which are difficult to remove and reinstall. All accesses must seal completely as not to disrupt the sealed combustion process. All components must be accessible and able to adjust with the removal of a single cover or cabinet component.
   3. Indicating lights: Each boiler shall include a diagnostic control panel with a full text display indicating the condition of all interlocks and the BTUH input percentage. Access to the controls shall be through a completely removable cover leaving diagnostic panel intact and not disrupted.

B. Manufacturers: RBI (a Mestek Company) is the basis of design. Listed acceptable manufacturers shall be subject to compliance with requirements. Provide boilers by one of the following:
   1. Viessman - Vitocrossal 300 CA3B
   2. Lochinvar - Crest series

2.02 COMPONENTS

A. Combustion Chamber: The combustion chamber shall be constructed of stainless steel. It shall be a down-fired design.

B. Heat Exchanger: Boilers shall be a stainless steel firetube unit designed for pressure firing and shall be constructed and tested for 160 P.S.I water working pressure and 210°F, 99°C maximum operating temperature, in accordance with the A.S.M.E. Section IV Rules for the Construction of Heating Boilers. The firetubes shall be of a down-fired counter-flow single- pass design. Stainless steel tubes will be rounded, rectangular tubes with an integral dimpled design. The tube sheet is fully symmetrical and conical in shape to allow it to act as a piston to reduce

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the intra-tubular stresses. This allows the unit to absorb expansion and contraction evenly across the tube sheet. The design will provide for equal temperature rise across the heat exchanger. The heat exchanger design should have no restrictions to inlet water temperature, a maximum temperature rise of 100 deg (f) and a Cv of 166

C. Jackets: Painted Carbon Steel.

D. Gas Burner: The burner shall be metal fiber mesh construction, allowing high turndown of the fuel-air mixture. The burner flame shall burn horizontally and be of the pre-mix type with a forced draft fan. Burner shall fire to provide equal distribution of heat throughout the entire heat exchanger. The burner shall be easily removed for maintenance without the disruption of any other major component of the boiler. A window view port shall be provided for visual inspection of the boiler during firing.

E. Ignition components: Ignition system shall incorporate the ‘sure fire’ Turbo Pilot design. The Turbo Pilot is completely independent of the burner system and installed as a single pilot ‘gun’ type arrangement. This pilot system shall provide a strengthened pin point flame. Pilot systems utilizing hot surface ignition or direct spark to burner design shall not be accepted. The ignition hardware shall consist of Alumina ceramic insulated ignition electrodes and UV sensing tube permanently arranged to ensure proper ignition electrode and UV alignment.

F. Rated Capacity: The boiler shall be capable of operating at rated capacity with pressures as low as 3” W.C. at the inlet to the burner gas valve.

G. High Altitude: Boiler shall operate at altitudes up to 6,000 feet above sea level without additional parts or adjustments.

H. The burner and gas train shall be provided with the following trim and features:
   1. The burner shall be a premix design and constructed of woven stainless steel.
   2. The burner shall be capable of and provide variable modulating firing rates.
   3. The burner shall be capable of operating with repeatable CO2 at both low fire and high fire modulating firing rates.
   4. The burner shall be capable of operating without exceeding 20ppm of NOx
   5. The boiler shall be supplied with a zero governor gas valve coupled with a variable speed blower system, to precisely control the fuel/air mixture for maximum combustion efficiency.
   6. Burner Ignition: Pilot with Intermittent spark
   7. Safety Controls: Energize ignition, limit time for establishing flame, prevent opening of gas valve until pilot flame is proven, stop gas flow on ignition failure, and allow gas valve to open.
   8. Flue Gas Collector: Enclosed combustion chamber with integral combustion air blower and single venting connection.
   9. Gas Train: Manual ball type gas valves (2), main gas valve, manual leak test valve, pilot gas pressure regulator, and automatic pilot gas valve. All components to be factory mounted and CSD-1 compliant.
   10. Safety Devices: Low gas pressure switch, air flow switch, and blocked flue detection switch, low water cutoff (manual reset), high temperature manual reset. All safeties to be factory mounted.

2.03 BOILER TRIM

A. Controls: The boiler control package shall be a HeatNet or equivalent, integrated boiler management system. The control system must be integral to each boiler, creating a control network that eliminates the need for a “wall mount” stand-alone boiler system control. Additional stand-alone control panels, independent of a Building Management System (BMS), shall not be allowed to operate the boiler network.
   1. The HeatNet control shall be capable of operating in the following ways:

NOT FOR BIDDING

a. As a stand-alone boiler control system using the HeatNet protocol, with one “Master” and multiple “Member” units.
b. As a boiler network, enabled by a Building Management System (BMS), using the HeatNet protocol, with one “Master” and multiple “Member” units.
c. As “Member” boilers to a Building Management System (BMS) with multiple input control methods.
d. Failsafe mode - When a Building Automation System is controlling set point, if communications are lost, the boiler/ system will run off the Local set point.
e. Adaptive Modulation - Lowers the modulation rate of all currently operating boilers before a newly added boiler enters operation.
f. Priority Firing - Allows mixing of condensing, non-condensing base load and/or other combination of (2) functional boiler types utilizing (2) priority levels.
g. Available priority start/stop qualifiers shall be done using any combination of: A) Modulation Percentage B) Outdoor Air Temperature or C) Return Water Temperature.
h. Base Loading - Provides the ability to control (1) base load boiler with enable/disable and 4-20mA modulating signal (if required).

2. MASTER: A boiler becomes a Master when a resistance type 10K sensor is connected to the J10 “SYS/ DHW HEADER” terminals. The sensor shall be auto-detected. The Master senses and controls the header/loop temperature utilizing a system set point. It uses any boilers it finds “HeatNet Members” or those defined in the control setup menus to accomplish this. The “Master” shall also have the option of monitoring Outside Air Temperature “OA” to provide full outdoor air reset functionality. Only one master shall be allowed in the boiler network.
3. When operating as a “Master”, the HeatNet control provides a stand-alone method using a PID algorithm to regulate water temperature. The algorithm allows a single boiler “Master” or multiple “Master + Member” boilers in a network of up to 16 total boilers.
4. The control algorithm is based upon a control band, at the center of which is the set point. While below the control band, boilers are staged on and modulated up until the control band is entered. Once in the control band, modulation is used to maintain set point. Optimized system efficiency is always accomplished by setting the Modulation Maximum “Mod-Max” setting to exploit each boiler in the network’s inverse efficiency curve. The control shall operate so that the maximum number of boilers required, operate at their lowest inputs until all boilers are firing. Once all boilers are firing, the modulation clamp is removed and all boilers are allowed to fire above this clamped percentage up to 100%. This “boiler efficiency” clamp is defaulted to 80% and thus limits all the boilers individual outputs to 80% until the last boiler fires. The 80% default must be field adjustable for varying operating conditions. All boilers modulate up and down together always at the same modulation rate. Boilers are shut down only when the top of the band is breached, or before the top of the band, if the control anticipates that there is a light load. Timers shall also be included in each control in the network to prevent any boiler from short cycling.
5. MEMBER: Additional boilers in the network always default to the role of member. The lack of sensors connected to the J10 terminals “SYS/DHW Header” on each additional boiler shall ensure this.
6. Each “Member” shall sense its supply outlet water temperature and modulate based on signals from a Building Management System (BMS) or “Master” boiler. When operating as a member, starting, stopping, and firing rate shall also be controlled by the “BMS” or “Master” boiler.
7. When using the HeatNet protocol, the system setpoint shall be sent from the “Master”, along with the modulation value to control firing rate. It also receives its command to start or stop over the HeatNet cable. Each “Member” will continuously monitor its supply outlet temperature against its operating limit. If the supply temperature approaches the operating

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limit temperature (adjustable), the boilers input control rate is limited and its modulation value decreases to minimize short cycling. If the operating limit is exceeded, the boiler shall shut off.

8. Each HeatNet control in the boiler network shall have the following standard features:
   a. Digital Communications Control.
      1) Boiler to Boiler: HeatNet
      2) Building Management System (BMS): MODBUS standard protocol. (BACnet, LONWORKS and N2 optional protocols)
   b. Analog 4:20 and 0-10vdc also supported.
   c. Distributed control using HeatNet protocol for up to 16 total boilers.
   d. English text display.
   e. Interlock, Event, and System logging with a time stamp.
   f. Advanced PID algorithm optimized for FlexCore boilers.
   g. Four dedicated temperature sensor inputs for: Outside Air Temperature, Supply (Outlet Temperature, Return Temperature (Inlet)), and Header Temperature.
   h. Automatically detects the optional temperature sensors on start up.
   i. Touch Screen Display.
   j. (8) Dedicated 24vac interlock monitors and 8 dedicated 120vac system monitors used for diagnostics and providing feedback of faults and system status.
   k. Multiple boiler pump or motorized boiler valve control modes.
   l. Combustion Air Damper control with proof time.
   m. Optional USB/RS485 network plug-in to allow firmware updates or custom configurations.
   n. Optional BACnet, LONWORKS and N2 interface.
   o. Alarm contacts.
   p. Runtime hours.
   q. Outdoor Air Reset with programmable ratio.
   r. Time of Day clock to provide up to four (4) night setback temperatures.
   s. Failsafe mode when a Building Management System (BMS) is controlling set point. If communications are lost, the boiler/ system shall run off the Local Set point.
   t. Support for domestic hot water (DHW) using a 10k sensor or a dry contact input from a tank thermostat and a domestic hot water relay (pump/valve).
   u. Continuous Daily Runtime Restart feature that monitors the runtime of each boiler and if any in the network have exceeded the maximum hours of continuous runtime, the boiler will restart to protect the UV flame scanner.
   v. Allows for selection of any boiler in the network to act as Lead Boiler.
   w. Adaptive Modulation feature in which the Master boiler adjusts the system modulation rate to a lower value when a new boiler in the network is started to compensate for the added BTU's to the system. Once the newly added boiler fires and the adjustable time expire, the Master resumes control of the system modulation to maintain set-point temperature.
   x. Priority firing - Allows mixing of condensing and non-condensing, base load and/or other combination of (2) functional boiler types utilizing (2) priority levels.
   y. Available priority start/stop qualifiers shall be done using any combination of: A) modulation percentage, B) outdoor air temperature, (or) C) return water temperature.
   z. Base Loading - Provides the ability to control (1) base load boiler with enable/disable and 4-20mA modulating signal (if required).
   aa. Boiler(s) shall be equipped with an integrated web based monitoring system.
      1) Monitoring system shall provide an email or SMS text message notification upon detecting an out of tolerance condition.

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2) The integrated monitoring system shall provide a web portal with performance dashboard displaying key data points for the system and each boiler in the system.
3) The web portal shall provide the following capabilities;
   (a) Detailed status of data points and system set-points
   (b) Boiler and System runtime and cycle count
   (c) Intelligent diagnostics and troubleshooting guide
   (d) Provide original factory test data including as built bill of materials
   (e) The ability to enter field service records with file upload capabilities
   (f) The ability to view time stamped history of data points and settings
   (g) The ability to view detailed event log entries
   (h) Video tutorials explaining each section of the web portal
4) The monitoring system shall have the capability of connecting directly to a 10/100mbps TCP/IP network Optionally when a facility network connection is not available the system shall be capable of utilizing wireless cellular network
5) The monitoring system shall utilize a non-public proprietary data encryption algorithm
6) Secure data transmission shall be directly to the cloud from HeatNet enabled system(s) without third party integration

B. Safety Relief Valve: ASME rated, factory set to protect boiler and piping as per schedule/drawings. 160 psi maximum allowable working pressure.

C. Gauge: Combination water pressure and temperature shipped factory installed. LCD outlet temperature readout to be an integral part of the front boiler control panel display to allow for consistent easy monitoring of temperatures factory mounted and wired.

D. Flow Sensor: Boiler shall be provided with a digital flow sensing device integral to the boiler control system, mounted in a by-pass and mapped to indicate the boiler flow in (gpm), the flow sensor utilizes vortex technology which is then converted to an electronic signal sent directly to the Boiler Control System for real time flow annunciation. The set-point is fully adjustable throughout the boiler model operating range.

E. Burner Controls: Boiler shall be provided with a Honeywell RM7800 series digital flame safe guard with UV rectification. The flame safe guard shall be capable of both pre and post purge cycles.

F. High Limit: Temperature control with manual reset limits boiler water temperature in series with the operating control. High Limit shall be factory mounted and sense the outlet temperature of the boiler through a dry well.

G. PROVIDE THE FOLLOWING STANDARD TRIM:
1. Low Air Pressure Switch
2. Blocked Flue Switch
3. Modulation Control
4. Temperature/Pressure Gauge
5. Manual Reset High Limit (CSD-1 Factory Mounted and Wired)
6. Low Gas Pressure Switch (Above 2500 MBH)
7. Low Water Cutoff with Manual Reset (CSD-1 Factory mounted and wired)
8. Supply Outlet Temperature Display
9. Full Digital Text LCD Touch Screen Display for all Boiler Series of Operation and Failures
10. Air Inlet Filter
11. Combustion Air Fan with Safety Interlock
12. Condensate Drain

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13. High Gas Pressure Switch (Above 2500 MBH)
14. Flow Sensor Mounted & Wired
15. Relief Valve

H. PROVIDE THE FOLLOWING JOB SPECIFIC TRIM AND FEATURES:
1. Valve Proving Switch
2. Isolation Valve Wiring
3. 208V 3PH
4. JJM Boiler Works NB5LP Condensate Neutralizer

2.04 MOTORS

A. Boiler Blower Motor: The Blower shall be a variable speed blower.

2.05 SOURCE QUALITY CONTROL

A. Test and inspect boilers according to the ASME Boiler and Pressure Vessel Code, Section IV. Boilers shall be test fired in the factory with a report attached permanently to the exterior cabinet of the boiler for field reference.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine area to receive boiler for compliance with requirements for installation tolerances and other conditions affecting boiler performance. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install boilers level and plumb, according to manufacturer's written instructions and referenced standards.

B. Install gas fired boilers according to NFPA 54.

C. Support boilers on a minimum 4 inches (100 mm) thick concrete base, 4 inches (100 mm) larger on each side than base of unit.

D. Install electrical devices furnished with boiler, but not specified to be factory mounted.

3.03 CONNECTIONS

A. Connect gas piping full size, to boiler gas train inlet with union.

B. Connect hot water piping to the inlet and outlet boiler connections with shutoff valve and union or flange at each connection.

C. Install piping from safety relief valves to nearest floor drain.

D. Connect breeching to boiler outlet, full size of outlet. The boiler shall operate under positive (Category IV) or negative (Category II) stack pressure. Vent material must be listed AL29-4C Stainless Double Wall Stack for condensing appliances.

E. A vent kit must be supplied by the manufacturer when utilizing the non metallic (PVC, PP) option.

F. Electrical: Comply with applicable requirements in Division 16 Sections.

G. Ground equipment.
1. Tighten electrical connectors and terminals according to manufacturer's published torque tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

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3.04 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory authorized service representative to supervise the field assembly of components and installation of boilers, including piping and electrical connections. Report results in writing.
   1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment. Boiler shall be commissioned by factory authorized technician. Contact local representative for factory authorized technician information.

B. Manufacturer's representative shall supply a factory authorized service technician to start up the boilers.

3.05 CLEANING

A. Flush and clean boilers on completion of installation, according to manufacturer's written instructions.

B. After completing boiler installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finishes including chips, scratches, and abrasions with manufacturer's stainless steel polish.

3.06 COMMISSIONING

A. Engage a factory authorized service representative to provide startup service. Startup to be performed only after complete boiler room operation is field verified to offer a substantial load, and complete system circulation. One-year warranty shall be handled by factory authorized tech.

B. Verify that installation is as indicated and specified.
   1. Verify that electrical wiring installation complies with manufacturer's submittal and installation requirements in Division 16 Sections. Do not proceed with boiler startup until wiring installation is acceptable to equipment Installer.

C. Complete manufacturer's installation and startup checklist and verify the following:
   1. Boiler is level on concrete base.
   2. Flue and chimney are installed without visible damage.
   3. No damage is visible to boiler jacket, refractory, or combustion chamber.
   4. Pressure reducing valves are checked for correct operation and specified relief pressure. Adjust as required.
   5. Clearances have been provided and piping is flanged for easy removal and servicing.
   6. Heating circuit pipes have been connected to correct ports.
   7. Labels are clearly visible.
   8. Boiler, burner, and flue are clean and free of construction debris.
   9. Pressure and temperature gauges are installed.
   10. Control installations are completed.

D. Ensure pumps operate properly.

E. Check operation of gas pressure regulator device on gas train, including venting.

F. Check that fluid level, flow sensor, and high temperature interlocks are in place.

G. Start pumps and boilers, and adjust burners to maximum operating efficiency.
   1. Fill out startup checklist and attach copy with Contractor Startup Report.
   2. Check and record performance of factory provided boiler protection devices and firing sequences.
   3. Check and record performance of boiler fluid level, flow sensor, and high temperature interlocks.
   4. Operate boilers as recommended or required by manufacturer.

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H. Perform the following tests for maximum and minimum firing rates for modulating burner. Adjust boiler combustion efficiency at maximum and minimum modulation rates. Perform combustion flue gas test at minimum and maximum modulation rate. Measure and record the following:
   1. Differential pressure across air / gas orifice.
   2. Combustion air temperature at inlet to burner.
   3. Flue gas temperature at boiler discharge.
   4. Flue gas carbon dioxide, oxygen, and carbon monoxide concentration.
   5. Flue gas NOx emissions where applicable.
   6. Natural flue draft.

I. Measure and record temperature rise through each boiler.

J. Provide factory representative to inspect and certify that the boiler is installed and properly operating in accordance with manufacturer installation instructions and recommendations as well as in accordance with contract documents. Factory representative shall provde certification on boiler manufacturer letterhead that states that the boiler is insttalled and operating in accordance with manufacturer installation instructions and recommendations as well as in accordance with contract documents. Provide the certification in triplicate to the Architect/Engineer for review. Architect/Engineer will forward at least one copy to the Owner for their records.

3.07 DEMONSTRATION AND TRAINING

A. Engage a factory authorized service representative to train Owner's maintenance personnel as specified below:
   1. Operate boiler, including accessories and controls, to demonstrate compliance with requirements.
   2. Train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, and preventive maintenance.
   3. Review data in the maintenance manuals. Refer to Division 1 Section "Contract Closeout."
   4. Review data in the maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."
   5. Schedule training with Owner with at least 7 days advance notice.

END OF SECTION

NOT FOR BIDDING

SECTION 23 64 23
SCROLL WATER CHILLERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Factory-assembled packaged chiller.

B. Charge of refrigerant and oil.

C. Controls and control connections.

D. Chilled water connections.

E. Condenser water connections for heat recovery module (where scheduled)

F. Electrical power connections.

1.02 REFERENCE STANDARDS

A. AHRI 550/590 (I-P) - Performance Rating of Water-Chilling and Heat Pump Water-Heating Packages Using the Vapor Compression Cycle; 2023.

B. ASHRAE Std 15 - Safety Standard for Refrigeration Systems; 2022, with Errata (2023).

C. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. ASME BPVC-VIII-1 - Boiler and Pressure Vessel Code, Section VIII, Division 1: Rules for Construction of Pressure Vessels; 2023.

E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.

F. UL 1995 - Heating and Cooling Equipment; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate physical size, weight and location of major pieces of equipment to be installed. Notify Architect of any major deviations from the equipment originally specified prior to ordering equipment.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide rated capacities, weights, specialties and accessories, electrical requirements and wiring diagrams.

C. Shop Drawings: Indicate components, assembly, dimensions, weights and loadings, required clearances, and location and size of field connections. Indicate equipment, piping and connections, valves, strainers, and thermostatic valves required for complete system.

D. Manufacturer's Certificate: Certify that components furnished but not produced by manufacturer meet or exceed manufacturer's requirements.

E. Manufacturer's Performance Data: Indicate energy input versus cooling load output from 0 to 100 percent of full load at specified and minimum condenser water temperature for water-cooled chillers and at specified and minimum outdoor air temperature for air-cooled chillers.

F. Manufacturer's Instructions: Submit manufacturer's complete installation instructions.

G. Sustainable Design Documentation: Submit manufacturer's product data on refrigerant used, showing compliance with specified requirements.

H. Operation and Maintenance Data: Include start-up instructions, maintenance data, parts lists, controls, and accessories; include trouble-shooting guide.

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I. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Refrigerant: One container.
   3. Extra Lubricating Oil: One container.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

B. When required, provide certification of inspection for conformance to requirements of authority having jurisdiction.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Conform to manufacturer's written installation instructions for rigging, unloading, and transporting units.

B. Deliver units to the job site completely assembled and charged with refrigerant and oil by manufacturer.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Manufacturer's Warranty: Provide minimum Five year warranty to include coverage for materials and labor for compressor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Trane, Inc: www.trane.com.

B. Daikin: www.daikin.com.

C. York/JCI: www.york.com.

D. Substitutions: See Section 01 60 00 - Product Requirements.
   1. The chilled water system has been designed based on specific capacities and characteristics of equipment specified in this section and other sections.
   2. When substitution of a different manufacturer or model number is desired, submit sufficient information to demonstrate to Architect that the substitute will have the same or better performance as that specified AND that the related equipment in the system will perform acceptably with the substitute.
   3. If the related equipment must be modified to perform acceptably with the substitute, the entity proposing the substitution is responsible for all additional costs due to re-design and provision of different related equipment.

2.02 CHILLERS

A. Chillers: Factory assemble and test chiller consisting of compressor(s), compressor motor(s), evaporator, condenser, enclosure, refrigeration circuits(s) and specialties, interconnecting piping, starters, and microprocessor-based controls.
   1. Rating: AHRI 550/590 (I-P).
   2. Safety: UL 1995 and ASHRAE Std 15.
   3. Construction & Testing: ASME BPVC-VIII-1 as applicable for construction type.
   4. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
   5. Energy Efficiency: ASHRAE Std 90.1.
   6. Enclosures:

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a. Frame:
   1) Heavy gage steel.
   2) Factory apply hot-dipped galvanized or air-dried paint finish.
b. Steel Chiller Cabinets:
   1) Factory apply baked on enamel or baked on powder paint finish.
c. Electrical Equipment: NEMA 250 or UL 1995 as applicable.
   1) NEMA 3R/12 rain/dust tight enclosure, power coated steel with hinged, latched, and gasket seal. Provide main power connection, control power connection, compressor and fan motor start contactors, current overloads, and factory wiring.
   2) Single point power connection. See schedule for requirements.
   3) Provide disconnect as recommended by manufacturer.

7. Provide low-sound kit for the unit. Include decibel rating in submittal package.

2.03 COMPRESSORS AND EVAPORATOR

A. Compressors: Hermetic scroll type.
1. Unit: Fully hermetic type with multiple, direct drive compressors with discharge and suction service valves.
2. Vibration Control: Factory installed internal isolators or field installed external isolators.
3. Oil Lubrication System: Initial oil charge, oil sump, heater, oil level, and sight glass.
4. Capacity Reduction System: Compressor staging with control down to 12 percent of full load without the activation of hot gas by-bass. Hot-gas bypass capacity control to 5% loading.
5. Motor: 3600 or 3500 rpm, suction gas-cooled, with thermal or current overload protection.

B. Evaporator: Provide brazed plate type.
1. Brazed plate type.
   a. Plate Material: 316 stainless steel.
   b. Refrigerant Working-Side Pressure Rating: 430 psig minimum.
   c. Water Working-Side Pressure Rating: 150 psig minimum.
   d. Provide with flanged connections.
   e. Insulation for all cold surfaces.
      1) Insulation is factory installed on evaporator, connections, and suction piping.
      2) 0.75 inches minimum thick, closed cell, expanded polyvinyl chloride, polyurethane, or Armaflex II insulation with a maximum k value of 0.28.
   f. Provide factory or field installed vents and water drain connections on evaporator or piping.
   g. Provide factory or field installed fittings for temperature control sensors on evaporator or piping.
   h. Freeze Protection for Outdoor Locations: Provide thermostatically controlled electric heater to protect from freezing at ambient temperatures down to -20 degrees F.

2.04 AIR-COOLED CONDENSER AND FANS

A. Provide finned-tube, brazed one-piece, or flat tube-plate-manifold type.
1. Finned-tube type.
   a. Mechanically bond aluminum fins to copper tubing and protect with corrosion resistant materials or coatings.
   b. Clean, dehydrate and test.
   c. Leak Test: 650 psig minimum.
2. Brazed one-piece type.
   a. Construct of same material to avoid galvanic corrosion.
   b. Braze coils and headers as one assembly.
   c. Clean, dehydrate and test.
   d. Leak Test: 650 psig minimum.

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B. Coil Guards: Provide corrosion proof, louvered panels, heavy gage wire panels, or grilles, factory installed. Provide coil protection for shipping by enclosing entire condenser coil with heavy plastic to prevent coil damage during shipping or rigging.

C. Fans and Motors:
   1. Fans: Dynamically balanced, low-noise airfoil type fans of reinforced polymer or glass fiber reinforced composite corrosion resistant construction equipped with sealed, permanently lubricated ball bearings.
   2. Discharge Fan Guards: Corrosion resistant, heavy gage, steel wire.
   3. Discharge Direction: Vertical.
   4. Motors: Direct drive, totally enclosed for outdoor use with current overload protection.

2.05 REFRIGERATION CIRCUITS

A. Provide multiple independent refrigeration circuit(s) with multiple compressor(s) per circuit.

B. Provide liquid line shut-off valve, filter-drier, expansion valve, and refrigerant relief device for each independent circuit.

C. Low-temperature process glycol setpoint:10 degrees F to 50 degrees F

2.06 INTEGRATED MICROPROCESSOR BASED DDC CONTROLS PACKAGE

A. Pre-wire, assemble, factory mount, and test operating and safety BACnet-native control system consisting of a digital display or gauges, on-auto-off switch, motor starters, disconnect switches, power and control wiring.
   1. Automatic Adjustable Operating Controls:
      a. Temperature of chilled water leaving chiller.
      b. Chiller system capacity control based on set-points and system load.
      c. Compressor short-cycling prevention.
      d. Lead/lag for multiple compressors.
      e. Automatic reset on power source failure.
      f. Load limiting.
      g. Outdoor aimbient temperature control
      h. Sequencing of condenser fans.
   2. Normal Operation Monitoring and Open Cover-less Displays:
      a. Hours of operation.
      b. Suction and discharge refrigerant pressures.
      c. Automatic diagnostics.
      d. Number of starts.
      e. On/off compressor status.
      f. Entering and leaving chilled water temperatures.
      g. Status of operation.
      h. Weekly purge cycle totalization if applicable.
      i. Oil pressure.
   3. Set-Points:
      a. Leaving chilled water temperature.
      b. Date/time.
   4. Automatic Chiller Shut-Down Safety Controls and Alarm:
      a. Automatic Reset:
         1) Chilled water flow interlock.
         2) Voltage protection (over/under).
         3) Phase reversal protection.
      b. Manual Reset:
         1) Evaporator low pressure.
         2) High motor winding temperature.

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3) Low chilled water temperature.
4) Low chilled water flow.
5) High condenser refrigerant discharge pressure.
6) Motor current overload and phase loss.
7) Low oil flow.

c. Remote Alarm: Activate remote, audible bell upon safety shutdown of chiller.

5. Building Automation System (BAS) Communications via Shielded Cable:
   a. Minimum Data Transmission to BAS:
      1) All system operating conditions.
      2) Capacity control information.
      3) Safety shutdown conditions.
      4) Heat recovery module status, temperatures, etc.
   b. Minimum Operating Commands from BAS:
      1) Remote unit start/stop.
      2) Remote chilled water reset.
      3) Heat recovery module start/stop
      4) Heat recovery module temperature

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Align chiller package on steel or concrete foundations.

C. Install units on vibration isolators.

D. Connect to electrical service.

E. Connect to chilled water piping.

F. Arrange piping for easy dismantling to permit tube cleaning and removal.

3.02 MANUFACTURER'S FIELD SERVICES

A. Perform factory startup of the chiller by factory trained and authorized servicing technicians confirming equipment has been correctly installed prior to equipment becoming operational and covered under the manufacturer's warranty.

B. Supply initial charge of refrigerant and oil if not completely factory charged.

C. Demonstrate system operations and verify specified performance.

3.03 CLOSEOUT ACTIVITIES

A. Demonstrate proper operation of equipment to Owner's designated representative.

B. Demonstration: Demonstrate operation of system to Owner's personnel.
   1. Use operation and maintenance data as reference during demonstration.
   2. Briefly describe function, operation, and maintenance of each component.

C. Training: Train Owner's personnel on operation and maintenance of system.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide minimum of two hours of training.
   3. Instructor: Manufacturer's training personnel.
   4. Location: At project site.

3.04 MAINTENANCE

A. Provide a separate maintenance contract for specified maintenance service.

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B. Provide a separate maintenance contract for the service and maintenance of chiller package for 2 years from Date of Substantial Completion.

END OF SECTION

NOT FOR BIDDING

SECTION 23 64 26
ROTARY-SCREW WATER CHILLERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Factory-assembled packaged chiller.
B. Charge of refrigerant and oil.
C. Controls and control connections.
D. Chilled water connections.
E. Variable frequency drives.
F. Electrical power connections.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete housekeeping pads.
B. Section 23 05 48 - Vibration and Seismic Controls for HVAC.
C. Section 23 05 53 - Identification for HVAC Piping and Equipment.
D. Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC.
E. Section 23 08 00 - Commissioning of HVAC.
F. Section 23 09 23 - Direct-Digital Control System for HVAC.
G. Section 23 09 93 - Sequence of Operations for HVAC Controls.
H. Section 23 21 13 - Hydronic Piping.
I. Section 23 21 14 - Hydronic Specialties.
J. Section 26 05 83 - Wiring Connections.

1.03 REFERENCE STANDARDS

A. AHRI 550/590 (I-P) - Performance Rating of Water-Chilling and Heat Pump Water-Heating Packages Using the Vapor Compression Cycle; 2023.
B. ASHRAE Std 15 - Safety Standard for Refrigeration Systems; 2022, with Errata (2023).
C. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
D. ASME BPVC-VIII-1 - Boiler and Pressure Vessel Code, Section VIII, Division 1: Rules for Construction of Pressure Vessels; 2023.
E. UL 1995 - Heating and Cooling Equipment; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate physical size, weight and location of major pieces of equipment to be installed. Notify Architect of any major deviations from the equipment originally specified prior to ordering equipment.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide rated capacities, weights, specialties and accessories, electrical requirements and wiring diagrams.
C. Shop Drawings: Indicate components, assembly, dimensions, weights and loadings, required clearances, and location and size of field connections. Indicate equipment, piping and connections, valves, strainers, and thermostatic valves required for complete system.

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D. Manufacturer's Certificate: Certify that components furnished but not produced by manufacturer meet or exceed manufacturer's requirements.

E. Manufacturer's Performance Data: Indicate energy input versus cooling load output from 0 to 100 percent of full load at specified and minimum condenser water temperature for water-cooled chillers and at specified and minimum outdoor air temperature for air-cooled chillers.

F. Manufacturer's Instructions: Submit manufacturer's complete installation instructions.

G. Operation and Maintenance Data: Include start-up instructions, maintenance data, parts lists, controls, and accessories; include trouble-shooting guide.

H. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Refrigerant: One container.
   3. Extra Lubricating Oil: One container.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

B. When required, provide certification of inspection for conformance to requirements of Authority Having Jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Conform to manufacturer's written installation instructions for rigging, unloading, and transporting units.

B. Deliver units to the job site completely assembled and charged with refrigerant and oil by manufacturer.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Manufacturer's Warranty: 2 year parts and labor warranty for entire system. Provide minimum five year warranty to include coverage for materials only for compressor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Daikin Applied: www.daikinapplied.com

B. Trane, a brand of Ingersoll Rand: www.trane.com

C. York International Corporation/Johnson Controls, Inc: www.york.com

D. Substitutions: Not Permitted.

2.02 CHILLER REQUIREMENTS

A. Chillers: Factory assemble and test air-cooled chiller consisting of compressor(s), compressor motor(s), motor starter(s) or variable frequency drives as indicated, evaporator, condenser, enclosure, refrigeration circuits(s) and specialties, interconnecting piping, microprocessor-based controls, readouts, and diagnostics.
   1. Rating: AHRI 550/590 (I-P).
   2. Safety: ASHRAE Std 15 and UL 1995.
   3. Construction & Testing: ASME BPVC-VIII-1.
   4. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

NOT FOR BIDDING

5. Energy Efficiency: 1.

2.03 CHILLERS

A. Foundation: Provide rigid, non-warping mounting pads or a concrete foundation of sufficient strength and mass to support the applicable operating weight (i.e. including completed piping, and full operating charges of refrigerant, oil and water). Once in place, the unit must be level within 1/4" across the length of the unit.

B. General:
1. Units are leak and pressure tested at 390 psig (2689 kPa) high side, 250 psig (1724 kPa) low side, then evacuated and charged. All Air-cooled chillers are factory tested to confirm operation prior to shipment.
2. Standard power connections include main three phase power to the compressors, condenser fans and control power transformer.
3. A separate field supplied low voltage power source is required to power the evaporator freeze protection and convenience outlet.
4. Unit panels, structural elements and control boxes are constructed of galvanized steel and mounted on a bolted galvanized steel base. Unit panels, control boxes and the structural base are finished with a baked on powder paint.
5. Anytime water only is present in the evaporator, the Trane UC800 controller must have flow control of the chilled water system. Flow control can be done either directly or through an input to a building automation system to conduct an action resulting in minimum flow through the chiller evaporator barrel to avoid potentially catastrophic damage to the evaporator due to freezing. If the system has sufficient glycol to protect down to the lowest expected ambient, flow control is optional.

C. Factory Refrigerant Charge (HFC-134a): Packaged units ship with a full operating charge of oil and HFC-134a refrigerant.

D. Evaporator: The evaporator is a tube-in-shell heat exchanger design with internally and externally finned copper tubes roller expanded into the tube sheet. The evaporator is designed, tested and stamped in accordance with ASME Pressure Vessel Code Section VIII for a refrigerant side working pressure of 200 psig (1379 kPa). The evaporator is designed for a water side working pressure of 150 psig (1034 kPa). Water connections are grooved pipe. Each shell includes a vent, a drain and fittings for temperature control sensors and is insulated with UV resistant 0.75 inch Armaflex II or equal insulation (K=0.28). Insulation also covers the liquid and suction line and evaporator heads. Heaters, with thermostat, are provided to help protect the evaporator from freezing at ambient temperatures down to -20 F (-29 C), depending on application.

E. Operating Temperature: Unit is designed for operation in standard leaving evaporator temperature (equal to or greater than 40.0 F).

F. Pressure Vessel Code: Chiller complies with ASME Pressure Vessel Code Section VIII. ASME nameplates are attached to applicable pressure vessels including oil separators.

G. Condenser and Fans:
1. Air-cooled condenser coils have aluminum fins mechanically bonded to internally finned aluminum tubing. The tubing is a long life alloy designed to deliver corrosion performance that meets or exceeds microchannel coils. The condenser coil has an integral subcooling circuit. Condensers are factory proof tested at 525.00 psi and leak tested with helium in a mass spectrometer chamber at 150.00 psi. All tube connections are mechanical except the brazed copper to aluminum inlet and outlet connections.
2. Condenser fans are direct-drive vertical discharge. The condenser fan motors are permanent magnet motors with integrated drive to provide variable speed fan control for all fans. They are designed with permanently lubricated ball bearings, internal temperature and current overload protection, and customer fault feedback as a standard product

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offering. The fan impeller is a nine bladed-shrouded fan made from heavy-duty molded plastic.

3. Wide ambient units will start and operate between 0.0 F to 125.0 F ambient.

H. InvisiSound Ultimate: Each rotary screw compressor will have a muffler as standard and each condenser fan will be low noise as standard. In addition to these sound reducing features, InvisiSound Ultimate adds insulating sound material to the suction and discharge lines of each refrigerant circuit; adds a flexible, metallic connection at the suction and discharge of each compressor and a pre-formed `sound box' encapsulating each compressor and reduces the maximum speed of each condenser fan.

I. Compressor and Lube Oil System: The rotary screw compressor is semi-hermetic, direct drive with capacity control via an adaptive frequency drive, rolling element bearings, differential refrigerant pressure oil pump and oil heater. The motor is a suction gas cooled, hermetically sealed, permanent magnet motor. An oil separator is provided separate from the compressor. Oil filtration is provided internal to the compressor. Check valves in the compressor discharge and lube oil system are also provided.

J. Drive Cooling System: Each refrigeration circuit has a compressor drive cooling circuit.

K. Refrigeration Circuits: Each unit has two refrigerant circuits, with one rotary screw compressor per circuit. Each refrigerant circuit includes a compressor suction and discharge service valve, liquid line shutoff valve, removable core filter, liquid line sight glass with moisture indicator, charging port and an electronic expansion valve. Fully modulating compressors and electronic expansion valves provide variable capacity modulation over the entire operating range.

L. Unit Controls:

1. All unit controls are housed in an outdoor rated weather tight enclosure with removable plates to allow for customer connection of power wiring and remote interlocks. All controls, including sensors, are factory mounted and tested prior to shipment. Microcomputer controls provide all control functions including startup and shut down, leaving chilled water temperature control, evaporator flow proving, compressor staging and speed control, electronic expansion valve modulation, condenser fan sequencing and speed control, anti-recycle logic, automatic lead/lag compressor starting and load limiting.
2. Control shall be BACnet native, utilizing Adaptive Control microprocessor, automatically takes action to avoid unit shut-down due to abnormal operating conditions associated with low refrigerant pressure, high condensing pressure, AFD/Compressor current overload, low oil return or low AFD cooling, low discharge superheat, and high compressor discharge temperature. Should the abnormal operating condition continue until a protective limit is violated, the unit will be shut down. Unit protective functions of the UC800, include loss of chilled water flow, evaporator freezing, loss of refrigerant, low refrigerant pressure, high refrigerant pressure, high compressor motor temperature, and loss of oil to the compressor.

M. Unit Display:

1. A full color TD-7 touch screen display indicates all important unit and circuit parameters, in logical groupings on various screens. The parameters including chilled water set point, leaving chilled water temperature, demand limit set point, evaporator and condenser refrigerant temperatures and pressures, compressor and fan speeds, and all pertinent electrical information. The display also provides on screen trending graphs of predefined parameters as well as customizable trend graphs based on user defined parameters from a list of all available parameters. The display also provides indication of the chiller and circuits top level operating modes with detailed sub-mode reports available with a single key press, as well as diagnostics annunciation and date and time stamped diagnostic history. The standard color display is fully outdoor rated, and, can be viewed in full daylight without opening any control panel doors.

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2. The display is outdoor capable including an UV resistant touchscreen with removable cover.

N. Chilled Water Reset: This provides the control logic and factory installed sensors to reset leaving chilled water temperature. The set point can be reset based on ambient temperature or return evaporator water temperature.

O. Factory Mounted Flow Proving: The factory installed evaporator water flow switch is provided with the control logic and relays to turn the chilled water flow on and off as the chiller requires for operation and protection.

P. Adaptive Frequency Drive: The compressors on the ACRA chillers are driven by Adaptive Frequency Drives (AFD). The drives are hybrid cooled by both water/glycol through the chillplate to cool the power electronics and also forced air for other components in the drive. The drives include custom programming for Trane application to provide chiller specific protections and stable compressor operation across the operating map. Protections include compressor overload, low or high line voltage, output phase loss, input phase loss, drive overheating, and more. The drives communicate over a serial connection (Modbus) to the Tracer® UC800 unit control module for run-time control, real-time data feedback, and diagnostics.

Q. High Fault Circuit Breaker: A molded case high interrupting capacity circuit breaker, factory wired with terminal block power connections and equipped with a lockable external operator handle, is available to disconnect the chiller from main power.

R. Autotransformer: Factory installed UL listed (for outdoor use) autotransformer is installed to allow job site input voltage of 200/60/3.

S. BACnet BCI-C Interface: BACNet Interface allows the user to easily interface with using BACNet MS/TP via a single twisted-pair wiring to a factory-installed and tested communication board.

T. Control Inputs: Building Automation System Communication Interface permits permits remote leaving evaporator temperature set point and remote current limit set point by accepting a 4-20 mA or 2-10 Vdc analog signal.

U. Control Outputs: Relay board and percent capacity output will be provided to notify a Building Automation System of certain events or states of the chiller. Requires separate field supplied power source.

V. Architectural Louvered Panels: Louvered panels cover the complete condensing coil and service area beneath the condenser.

W. Convenience Outlet: Provides a 15 amp, 115 volt (60 Hz) convenience outlet on the unit.

PART 3 EXECUTION

3.01 MANUFACTURER'S FIELD SERVICES

A. Perform factory startup of the chiller by factory trained and authorized servicing technicians confirming equipment has been correctly installed prior to equipment becoming operational and covered under the manufacturer's warranty.

B. Supply initial charge of refrigerant and oil if not completely factory charged.

C. Demonstrate system operations and verify specified performance.

3.02 CLOSEOUT ACTIVITIES

A. Demonstrate proper operation of equipment to Owner's designated representative.

B. Demonstration: Demonstrate operation of system to Owner's personnel.
1. Use operation and maintenance data as reference during demonstration.
2. Briefly describe function, operation, and maintenance of each component.

C. Training: Train Owner's personnel on operation and maintenance of system.

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1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
2. Provide minimum of two hours of training.
3. Instructor: Manufacturer's training personnel.

3.03 MAINTENANCE

A. See Section 01 70 00 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.

B. Provide a separate maintenance contract for the service and maintenance of chiller for 2 years from Date of Substantial Completion.

END OF SECTION

NOT FOR BIDDING

SECTION 23 73 13
MODULAR INDOOR CENTRAL-STATION AIR-HANDLING UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Casing construction.
B. Fan section.
C. Coil section.
D. Filter and air cleaner section.
E. Damper section.
F. Access section.
G. Controls.

1.02 RELATED REQUIREMENTS

A. Section 23 34 13 - Axial HVAC Fans.
B. Section 25 14 00 - Integrated Automation Local Control Units.

1.03 REFERENCE STANDARDS

A. ABMA STD 9 - Load Ratings and Fatigue Life for Ball Bearings; 2015 (Reaffirmed 2020).
B. AHRI 410 - Forced-Circulation Air-Cooling and Air-Heating Coils; 2001, with Addenda (2011).
C. AMCA (DIR) - (Directory of) Products Licensed Under AMCA International Certified Ratings Program; 2015.
D. AMCA 99 - Standards Handbook; 2016.
E. AMCA 210 - Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating; 2016, with Errata (2018).
F. AMCA 300 - Reverberation Room Methods of Sound Testing of Fans; 2024.
G. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data; 2022.
H. AMCA 500-D - Laboratory Methods of Testing Dampers for Rating; 2018.
I. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating; 2023.
J. ASHRAE Std 62.1 - Ventilation for Acceptable Indoor Air Quality; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
K. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
L. ASHRAE Std 135 - A Data Communication Protocol for Building Automation and Control Networks; 2020, with Errata (2023).
M. ASTM B177/B177M - Standard Guide for Engineering Chromium Electroplating; 2011 (Reapproved 2021).
N. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.
O. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.
P. UL 508 - Industrial Control Equipment; Current Edition, Including All Revisions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Daikin Applied: www.daikinapplied.com/#sle.

NOT FOR BIDDING

B. Trane Technologies, PLC: www.trane.com/#sle.
C. York, a brand of Johnson Controls International, PLC: www.york.com/#sle.
D. VTS
E. Ingenia
F. Air Enterprises

2.02 CASING CONSTRUCTION

A. Full Perimeter Base Rail:
   1. Construct of galvanized steel.
   2. Provide base rail of sufficient height to raise unit for external trapping of condensate drain pans.
B. Casing:
   1. Construct of one piece, insulated, double wall panels.
   2. Provide mid-span, no through metal, internal thermal break.
   3. Construct outer panels of galvanized steel and inner panels of galvanized steel.
   4. Casing Air Pressure Performance Requirements:
      a. Able to withstand up to 8 in-wc positive or negative static pressure.
      b. Not to exceed 0.0042 inches per inch deflection at 1.5 times design static pressure up to a maximum of plus 8 in-wc in positive pressure sections and minus 8 in-wc in negative pressure sections.
C. Access Doors:
   1. Construction, thermal and air pressure performance same as casing.
   2. Provide surface mounted handles on hinged, swing doors.
D. Outside Air and Exhaust Air Weather Hood:
   1. Fabricate from same material as casing outer panel.
   2. Extend hood past perimeter of unit casing opening so as not to instruct airflow path.
   3. Paint hoods with same finish as external surface of outdoor units.
   4. Provide inlet hood for each fresh air damper with a sine wave moisture eliminator to prevent entrainment of water into the unit from outside air.
   5. Provide exhaust hoods for each exhaust air opening.
   6. Size each hood for 100 percent of nominal fresh air damper capacities.
   7. Protect each hood with bird screen to prevent nesting at intake or exhaust airflow paths.
E. Unit Flooring: Construct with sufficient strength to support expected people and equipment loads associated with maintenance activities.
F. Casing Leakage: Seal joints and provide airtight access doors so that air leakage does not exceed one percent of design flow at the specified casing pressure.
G. Insulation:
   1. Provide minimum thermal thickness of 12 R throughout.
   2. Completely fill panel cavities in each direction to prevent voids and settling.
   3. Comply with NFPA 90A.
H. Drain Pan Construction:
   1. Provide cooling coil and humidifier sections with an insulated, double wall, galvanized steel drain pan complying with ASHRAE Std 62.1 for indoor air quality and sufficiently sized to collect all condensate.
   2. Slope in two planes to promote positive drainage and eliminate stagnate water conditions.
   3. Locate outlet of sufficient diameter at lowest point of pan to prevent overflow at normal operating conditions.

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4. Provide threaded drain connections constructed of drain pan material, extended sufficient distance beyond the base to accommodate field installed, condensate drain trapping.

I. Louvers: Stationary, of galvanized steel, 4 inches deep with plenum, nylon bearings, 1/2-inch mesh, 0.04-inch galvanized wire bird screen in aluminum frame, and bearing AMCA Certified Ratings Seal in accordance with AMCA 500-L. Furnish adjustable louvers with hollow vinyl bulb edging on blades and foam side stops to limit leakage to maximum 2 percent at 4 in-wc differential pressure when sized for 2000 fpm face velocity.

J. Finish:
1. Outdoor Units:
   a. Coat external surface of unit casing with primer and minimum 1.5 mil, enamel paint finish.
   b. Comply with salt spray test in accordance with ASTM B177/B177M.
   c. Color: Manufacturer's standard color.
2. Indoor Units:
   a. Provide exterior, galvanized steel panels without paint.

2.03 FAN SECTION

A. Type: Forward curved, single width, single inlet, centrifugal plug fan, in accordance with AMCA 99. See Section 23 34 13.

B. Performance Ratings: Determined in accordance with AMCA 210 and labeled with AMCA Certified Rating Seal.

C. Sound Ratings: AMCA 301; tested to AMCA 300 and label with AMCA Certified Sound Rating Seal.

D. Bearings: Self-aligning, grease lubricated, with lubrication fittings extended to exterior of casing with plastic tube and grease fitting rigidly attached to casing.

E. External Motor Junction Box: Factory mount NEMA 4 external junction box and connect to extended motor leads from internally mounted motors.

F. Motor Wiring Conduit: Factory wire fan motor wiring to the unit mounted starter-disconnect, variable frequency drive, and external motor junction box.

G. Fan Accessories:

H. Flexible Duct Connections:
1. For separating fan, coil, and adjacent sections.

I. Drives:
1. Comply with AMCA 99.
2. Bearings: Heavy duty pillow block type, ball bearings, with ABMA STD 9, L-10 life at 50,000 hours.
3. Shafts: Solid, hot rolled steel, ground and polished, with key-way, and protectively coated with lubricating oil.
4. V-Belt Drive: Cast iron or steel sheaves, dynamically balanced, bored to fit shafts, and keyed. Variable and adjustable pitch sheaves for motors 15 hp and under selected so required rpm is obtained with sheaves set at mid-position; fixed sheave for 20 hp and over, matched belts, and drive rated as recommended by manufacturer or minimum 1.5 times nameplate rating of the motor.
5. Belt Guard: Fabricate to SMACNA (DCS); 0.106 inch thick, 3/4 inch diamond mesh wire screen welded to steel angle frame or equivalent, prime coated. Secure to fan or fan supports without short circuiting vibration isolation, with provision for adjustment of belt tension, lubrication, and use of tachometer with guard in place.

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2.04 COIL SECTION

A. Casing: Provide access to both sides of coils. Enclose coils with headers and return bends exposed outside casing. Slide coils into casing through removable end panel with blank off sheets and sealing collars at connection penetrations.

B. Drain Pans: 24 inch downstream of coil and down spouts for cooling coil banks more than one coil high.

C. Eliminators: Three break of galvanized steel, mounted over drain pan.

D. Air Coils:
   1. Certify capacities, pressure drops, and selection procedures in accordance with AHRI 410.

E. Fabrication:
   1. Tubes: 5/8 inch OD seamless copper expanded into fins, brazed joints.
   2. Fins: Aluminum.
   3. Casing: Die formed channel frame of galvanized steel.

2.05 FILTER AND AIR CLEANER SECTION

A. General: Provide filter sections with filter racks, minimum of one access door for filter removal, and filter block-offs to prevent air bypass.

B. Differential Pressure Gauge:
   1. Provide factory installed dial type differential pressure gauge, flush mounted with casing outer wall, and fully piped to both sides of each filter to indicate status.
   2. Maintain plus/minus 5 percent accuracy within operating limits of 20 degrees F to 120 degrees F.

2.06 DAMPER SECTION

A. Mixing Section: Provide a functional section to support the damper assembly for modulating the volume of outdoor, return, and exhaust air.

B. Damper Blades:
   1. Double-skin airfoil design with metal, compressible jamb seals and extruded-vinyl blade-edge seals on each blade.
   2. Self-lubricating stainless steel or synthetic sleeve bearings.
   3. Comply with ASHRAE Std 90.1 I-P for rated maximum leakage rate.
   4. Provide leakage testing and pressure ratings in compliance with AMCA 500-D test methods.
   5. Arrange in parallel or opposed-blade configuration.

C. Barometric Relief Dampers:
   1. Frame: Roll formed galvanized steel.
   2. Blades: Roll formed galvanized steel.
   3. Blade Seals: Extruded vinyl, mechanically attached to the blade edge.
   4. Material:
      a. Galvanized steel, single tie bar linkage for damper sections up to 24 inches wide.

2.07 ACCESS SECTION

A. Provide where indicated on drawings to allow for inspection, cleaning, and maintenance of field-installed components.

B. Construct access doors same as previously specified within this Section.

2.08 CONTROLS

A. Combination VFD - Disconnects:
   1. Provide factory mounted, combination VFD - disconnect for each fan motor.

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2. Factory mount in full metal enclosure and wire to fan motor.
3. Mount VFD-disconnect on fan section externally in a NEMA 1 enclosure within a dedicated controls section or housed fan section.
    a. Internal Enclosure Construction Characteristics:
4. Include circuit breaker disconnect with through-the-door interlocking handle for externally mounted starters, spring loaded, and designed to rest only in the full and lockable ON or OFF state.
5. Include control transformer with sufficient capacity to support the following items:
    a. VFD and controls.
    b. Binary output on-off wiring.
    c. Analog output speed-signal wiring.
    d. Wires that interface between VFD and direct digital controller.

B. Factory Installed Direct Digital Control (DDC) System:
1. DDC Controller:
    a. Provide panel-mounted, factory wired, application-specific (ASC) or advanced application-programmable controller (APC).
    b. ASC or APC: See Section 25 14 00 except for manufacturer-provided units that are fully compatible with site BAS, BMS, SCADA, or Integrated Automation System.
    c. Include built-in or provide local screen push-button interface for local monitoring, adjustment, tuning, data logging, and troubleshooting.
    d. Factory configured to handle internal equipment using manufacturer's specific instructions unless directly specified on listed sequence of operation.
    e. Factory wired into panel-mounted auxiliary relay(s) to handle scheduled or interlocked cycle-duty operation of externally linked equipment as indicated on drawings.
    f. Factory installed, wired, programmed, and tested, including each component.
    g. BAS, SCADA, or other Integrated Automation Link: ASHRAE Std 135, BACnet MS/TP.
2. Mixing Section Dampers:
    a. Outdoor Air Damper: Fail closed using spring-return actuator.
    b. Return Air Damper: Fail open using spring-return actuator.
3. Temperature Sensors: Provide for fan discharge, supply, return, mixed air, and coil section. Use averaging type for coil sections.
4. Low Limit Switches:
    a. Factory wire to momentary push-button reset circuit.
    b. Provide separate low limit for each coil in a coil stack.
5. Fan Status: Provide pressure switch to determine running status.
6. Loaded Filter Section: Tube to filter section to indicate sectional filter status.
7. Condensate Overflow Switches:
    a. Comply with UL 508; shut down unit in the event of primary drain blockage.
    b. Factory install float switch in drain pan to detect high water condensate level.
    c. Locate float switch above primary drain line connection and below drain pan rim.
8. Relays, Unit-Mounted, Output-Linked: Provide for external loads including motor starters, relief dampers, pumps, condensing units, and other equipment as specified in the drawings.

C. BAS, SCADA, or other Integrated Automation Link: ASHRAE Std 135, BACnet MS/TP.

D. External Point Mapping: Provide mapping table for each parameter included in the local visual interface with software-toggle flag to allow reduced mapping of available points.

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PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Final Acceptance Requirements:
   1. Use dial indicator gauges to demonstrate fan and motor are aligned.

3.02 SYSTEM STARTUP

A. Provide manufacturer's field representative to perform systems startup.

B. Prepare and start equipment and systems in accordance with manufacturers' instructions and recommendations.

C. Adjust for proper operation within manufacturer's published tolerances.

3.03 CLOSEOUT ACTIVITIES

A. Demonstration: Demonstrate operation of system to Owner's personnel.
   1. Use operation and maintenance data as reference during demonstration.
   2. Briefly describe function, operation, and maintenance of each component.

B. Training: Train Owner's personnel on operation and maintenance of system.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide minimum of two hours of training.

3.04 WARRANTY

A. Provide a two (2) year warranty on entire system.

END OF SECTION

NOT FOR BIDDING

SECTION 23 74 13
PACKAGED OUTDOOR CENTRAL-STATION AIR-HANDLING UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Packaged roof top unit.

B. Unit controls.

C. Remote panel.

D. Mounting curb and base.

E. Maintenance service.

1.02 REFERENCE STANDARDS

A. AHRI 210/240 - Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment; 2023.

B. AHRI 270 - Sound Performance Rating of Outdoor Unitary Equipment; 2015, with Addendum (2016).

C. ASHRAE Std 135 - A Data Communication Protocol for Building Automation and Control Networks; 2020, with Errata (2023).

D. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.

1.03 SUBMITTALS

A. See Section 01 33 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.

C. Shop Drawings: Indicate capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.

D. Manufacturer's Instructions: Indicate assembly, support details, connection requirements, and include start-up instructions.

E. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.

F. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum five years of documented experience.

B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect units from physical damage by storing off site until roof mounting curbs are in place, ready for immediate installation of units.

1.06 WARRANTY

A. Provide a five year warranty to include coverage for refrigeration compressors and heat exchangers.

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1.07 MAINTENANCE SERVICE

A. Furnish service and maintenance of packaged roof top units for one year from Date of Substantial Completion.

B. Provide maintenance service with a two month interval as maximum time period between calls. Provide 24-hour emergency service on breakdowns and malfunctions.

C. Include maintenance items as outlined in manufacturer's operating and maintenance data, including minimum of six filter replacements, minimum of one fan belt replacement, and controls check-out, adjustments, and recalibration.

D. Submit copy of service call work order or report, and include description of work performed.

1.08 EXTRA MATERIALS

A. Provide two sets of filters.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. York/JCI/Fraser Johnston

B. Trane Horizon

C. Daikin

2.02 AIR CONDITIONING UNITS

A. General: Roof mounted packaged units having gas burner as scheduled and electric refrigeration heat pumps for heating and cooling.

B. Description: Self-contained, packaged, factory assembled and prewired, consisting of cabinet and frame, supply fan, return fan, heat exchanger and burner, , energy recovery section (where noted in the schedule), factory-mounted controls, air filters, gas heating coil, refrigerant cooling coil, variable-capacity compressors and hot-gas reheat circuits, condenser coil and condenser fan as scheduled.

C. Disconnect Switch: Factory mount disconnect switch on equipment under provisions of Section 26 27 17.

2.03 FABRICATION

A. Cabinet: Galvanized steel with baked enamel finish, factory finished in custom color as selected by the architect including access doors with piano hinges and locking handle. Structural members shall be minimum 18 gage, with access doors or panels of minimum 20 gage.

B. Insulation: two inch thick minimum glass fiber or injected foam, double-walled unit construction.

C. Heat Exchangers: Stainless steel, of welded construction.

D. Supply and Return and Exhaust Fan as scheduled: Backward inclined or airfoil type, resiliently mounted with V-belt drive and adjustable variable pitch motor pulley, and rubber isolated hinge mounted high efficiency motor or direct drive as indicated. Isolate complete fan assembly. Provide factory-mounted variable-frequency drives for all fan motors.

E. Air Filters: Minimum efficiency reporting value (MERV) of at least 13 on OA and 8 on RA air streams.

F. Vibration Isolation: Units are to be mounted on steel dunnage. Provide enclosed spring isolators having minimum 2" static deflection.

G. Provide 120V convenience receptacle and vapor-tight LED light fixtures in fan sections. Outlet and lights are to receive power directly from unit-mounted transformer.

H. Provide unit as side-discharge or downflow arrangement as noted on drawings.

NOT FOR BIDDING

2.04 BURNER

A. Gas Burner: Forced draft type burner with adjustable combustion air supply, pressure regulator, gas valves, manual shut-off, intermittent spark or glow coil ignition, flame sensing device, and automatic 100 percent shut-off pilot. Provide turndown ratio as indicated in the schedule.

B. Gas Burner Safety Controls: Energize ignition, limit time for establishment of flame, prevent opening of gas valve until pilot flame is proven, stop gas flow on ignition failure, energize blower motor, and after air flow proven and slight delay, allow gas valve to open.

C. High Limit Control: Temperature sensor with fixed stop at maximum permissible setting, de-energize burner on excessive bonnet temperature and energize burner when temperature drops to lower safe value.

D. Supply Fan Control: Temperature sensor sensing bonnet temperatures and independent of burner controls, with provisions for continuous fan operation.

2.05 EVAPORATOR COILS

A. Provide copper tube aluminum fin coil assembly with stainless steel drain pan and connection for cooling coils.

B. Provide thermostatic expansion valves for units of 6 tons capacity and less, and thermostatic expansion valves and alternate row circuiting for units 7.5 tons cooling capacity and larger.

2.06 COMPRESSOR

A. Provide hermetic compressors, 3600 rpm maximum, resiliently mounted with positive lubrication, crankcase heater, high and low pressure safety controls, motor overload protection, suction and discharge service valves and gage ports, and filter drier.

B. Five minute timed off circuit to delay compressor start.

C. Outdoor thermostat to energize compressor in cooling mode above 35 degrees F ambient or heating mode below 70 degrees F ambient.

D. Provide modulating capacity control by variable-capacity scroll technology and/or adjusting variable-speed compressors.

E. For heat pump units, provide reversing valve, suction line accumulator, discharge muffler, flow control check valve, and solid-state defrost control utilizing thermistors.

F. Provide hot-gas reheat coil for humidity control.

2.07 CONDENSER OR OUTDOOR COIL

A. Provide copper tube aluminum or copper fin coil assembly with subcooling rows and coil guard.

B. Provide factory-applied marine / coastal-rated coating over entire coil and fin assembly approved for highly corrosive environments.

C. Provide direct drive propeller fans, resiliently mounted with fan guard, motor overload protection, wired to operate with compressor. Provide high efficiency fan motors.

D. Provide refrigerant pressure switches to cycle condenser fans.

E. Provide variable frequency drives on all condenser fans for active head pressure control.

2.08 MIXED AIR CASING

A. Dampers: Provide outside, return, and relief dampers with damper operator and control package to automatically vary outside air quantity. Outside air damper to fall to closed position.

B. Gaskets: Provide tight fitting dampers with edge gaskets.

C. Damper Operator, Units 7.5 Ton Cooling Capacity and Larger: 24 volt with gear train sealed in oil with spring return on.

NOT FOR BIDDING

D. Outdoor airflow monitoring station: Provided at intake of the unit.

E. Mixed Air Controls: Maintain selected supply air temperature and return dampers to minimum position on call for heating and above 70 degrees (F) ambient, or when ambient air enthalpy exceeds return air enthalpy.

2.09 OPERATING CONTROLS

A. Provide factory controller and all necessary sensors and components for operation of refrigerant system, fan VFDs based on single-zone VFD control, energy recovery wheel, humidity control function, and economizer function. The humidity control (dehumidification sequence) shall be capable of being enabled when the unit is in both heating and cooling modes. The humidistat setpoint shall govern control of this sequence.

B. Provide BACnet interface on unit for connection of operating controls for BAS control. Control shall allow for modulating heating via the gas-fired burner and modulating stages cooling, fan, and damper control. See section 23 09 93 for required data to be relayed to the BAS for monitoring and control.

C. Provide remote mounted fan control switch for smoke-purge for each unit (on-auto) to activate only the exhaust fan at each unit, keep the outdoor air damper closed, and de-engerize the energy wheel.

D. See Specification Section 230993 - Sequence Of Operations, for required operatiing capabilities of the units.

E. BAS, SCADA, or other Integrated Automation Link: ASHRAE Std 135, BACnet MS/TP.

F. Control Valves: Field-installed, modulating, ball type with position tracking; see Section 25 35 19.

2.10 HEAT RECOVERY

A. The heat recovery module shall be provided as shown on the drawing and shall have a factory mounted and tested energy recovery wheel or solid-core heat exchanger as indicated in the schedule. If a wheel is noted, energy recovery wheel shall be mounted in a rigid frame containing the wheel drive motor, drive belt, wheel seats and bearings.

B. The energy recovery cassette shall be rated in accordance with ARI Standard 1060 and shall bear the ARI certification symbol.

C. The energy recovery cassette shall contain a total energy heat wheel or solid core constructed of a light weight polymer material with permanently bonded desiccant coating. The energy recovery section media shall be capable of removal from the unit and be cleanable using hot water or light detergent without degrading the latent efficiency.

D. Provide variable frequency drive on energy recovery wheel.

E. Provide bypass dampers for economizer function.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that roof is ready to receive work and opening dimensions are as indicated on shop drawings.or illustrated by the manufacturer.

B. Verify that proper power supply is available.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with NFPA 90A.

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C. Mount units on factory built roof mounting curb providing watertight enclosure to protect ductwork and utility services. Install roof mounting curb level.

D. Locate remote panels where identified in field coordination meeting.

E. Tie unit into BAS as specified.

F. All units are to be painted. Color to be selected by architect.

3.03 SYSTEM STARTUP

A. Prepare and start equipment. Adjust for proper operation.

3.04 CLOSEOUT ACTIVITIES

A. Demonstrate operation to Owner's maintenance personnel (minimum 8 hours)

3.05 MAINTENANCE

A. Provide service and maintenance of packaged roof top units for 2 years year from Date of Substantial Completion.

B. Provide routine maintenance service with a three month interval as maximum time period between calls.

C. Include maintenance items as outlined in manufacturer's operating and maintenance data, including minimum of six filter replacements, minimum of one fan belt replacement, and controls check-out, adjustments, and recalibration.

D. After each service call, submit copy of service call work order or report that includes description of work performed.

END OF SECTION

NOT FOR BIDDING

SECTION 23 81 01
TERMINAL HEAT TRANSFER UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fan-coil units.

B. Blower Coil Units.

C. Unit ventilators.

1.02 RELATED REQUIREMENTS

A. Section 23 05 13 - Common Motor Requirements for HVAC Equipment.

B. Section 23 21 13 - Hydronic Piping.

C. Section 23 21 14 - Hydronic Specialties.

D. Section 23 09 93 - Sequence of Operations for HVAC Controls.

E. Section 26 05 83 - Wiring Connections: Electrical characteristics and wiring connections. Installation of room thermostats. Electrical supply to units.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide typical catalog of information including arrangements.

C. Shop Drawings:
   1. Indicate cross sections of cabinets, grilles, bracing and reinforcing, and typical elevations.
   2. Submit schedules of equipment and enclosures typically indicating length and number of pieces of element and enclosure, corner pieces, end caps, cap strips, access doors, pilaster covers, and comparison of specified heat required to actual heat output provided.
   3. Indicate mechanical and electrical service locations and requirements.,

D. Manufacturer's Instructions: Indicate installation instructions and recommendations.

E. Project Record Documents: Record actual locations of components and locations of access doors in radiation cabinets required for access or valving.

F. Operation and Maintenance Data: Include manufacturers descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listings.

G. Warranty: Submit manufacturer's warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum 5 years documented experience.

B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.05 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturers warranty for all motors.

C. Provide two year parts and labor warranty for enitre unit, from substitute and completion.

PART 2 PRODUCTS

2.01 FAN-COIL UNITS

A. Manufacturers:

NOT FOR BIDDING

1. Daikin Applied: www.daikinapplied.com/#sle.
2. Trane Inc: www.trane.com/#sle.
3. Enviro-tec.
4. Rittling (Hydro Air, Inc.): www.rittling.com
5. Airtherm

B. Coils: Evenly spaced aluminum fins mechanically bonded to copper tubes, designed for 200 psi and 220 degrees F. Provide drain pan under cooling coil, easily removable for cleaning, with drain connection.

C. Cabinet: 0.0598 inch steel with exposed corners and edges rounded, easily removed panels, glass fiber insulation and integral air outlet as scheduled.

D. Finish: Factory apply baked for exposed units enamel of color as selected on visible surfaces of enclosure or cabinet.

E. Fans: Centrifugal forward-curved double-width wheels, statically and dynamically balanced, direct driven.

F. Motor: ECM Motor.

G. Control: Multiple speed switch, factory wired, located in cabinet, prepped for control by BAS.

H. Filter: Easily removed throw-away type with minimum efficiency reporting value (MERV) of at least 8.

I. Drain Pan: The drain pan shall be made of white plastic that is sloped in both directions and is fully drainable. The coil shall mount above the drain pan, not in the drain pan thus allowing the drain pan to be fully inspected and cleaned. The drain pan shall also be removable for cleaning. The drain pan connection shall be ¾" schedule 40 PVC for solvent bonding.

J. Mixing Dampers: Where indicated, mixing sections with dampers. Refer to Section 23 09 93 for operating sequence.

K. Capacity: As Scheduled.

2.02 BLOWER COIL UNITS

A. Manufacturers:
1. York/JCI
2. McQuay International
3. The Trane Company
4. Airtherm

B. Units shall consist of hydronic coil, drain pan, centrifugal fan with motor and drive mounted in a common cabinet.

C. Casing: Casings shall be constructed of 18 gauge, galvanized steel, insulated with one inch 1.5 lb density tuf-skin fire resistant and odorless glass fiber material to provide thermal and acoustical insulation. Fan housing sides shall be directly attached to the air handler top and bottom panels. Coil access panels shall be located on both sides of the air handler to allow for easy removal of the internal coils and drain pan. Main access panels shall provide generous access to the fan, motor, and drive from both sided of air handler.

D. Water Coil: The coil shall be either four, or six row, as necessary to meet performance requirements. All coils shall be highly efficient Trane Wavy 3BS Aluminum or approved equal which are mechanically bonded to seamless copper tubes. All coils shall be specifically designed and circuited for water use. All coils shall be factory tested with 450 PSI air under water. Maximum standard operating conditions are 200 PSI, 200 degrees F. Sweat type connection are acceptable.

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E. Fan: The fans shall be forward curved, centrifugal blower type equipped with heavy-duty adjustable speed V-belt drive. The fan shaft shall be supported by heavy-duty, permanently sealed ball bearings. Fans shall be dynamically balanced.

F. Filters: For units which are scheduled to receive air filters, the filters shall be throw away type, with a minimum efficiency reporting value (MERV) of at least 10. A filter rack shall be provided to hold the filters and allow for easy replacement through bottom access.

G. Motors: Motors shall have a plus or minus 10 percent voltage utilization range. Motors shall be either ECM motors or be provided with Variable Frequency Drives for open drip-proof motors with permantely sealed ball bearings, internal current and thermal overload protection, a minimum 1.15 service factor and 56 frame resilient bases. Motors shall be factory installed and wired to the air handler junction box and factory set to the specified voltage.

H. Mixing Box: If called for on the schedule, a mixing box shall be provided. Mixing boxes shall be constructed of heavy gauge, galvanized steel, and insulated with one inch 1.5 lb density tuf-skin fire resistant and odorless glass fiber material to provide thermal and acoustical insulation. External insulation is not required. They shall be complete with two low-leak parallel blade dampers that are factory linked together. A ½" extendible drive rod shall be provided to be used for actuator connection, either inernally or externally. Damper blades shall be extruded aluminum having interlocked PVC extruded edge seals. Damper frame seals shall be PVC extruded forms interlocked to the damper frame and provided with the blade seals shall be a continuous edge seal to the blades. Dampers shall be stable in the temperature range of -50 degrees F to 230 degrees F. Mixing boxes shall have two side access panels to allow for access to the units' internal components.

2.03 UNIT VENTILATORS

A. Manufacturers:
   1. Daikin Applied: www.daikinapplied.com/#sle.
   2. McQuay International: www.mcquay.com.
   3. Trane Inc: www.trane.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Coils: Copper tubes mechanically expanded into evenly spaced aluminum fins tested to operate at 150 psi. Provide drain pan under cooling coil, easily removable for cleaning, with drain connection.

C. Electric Heating Coil: Enclosed copper tube, aluminum finned element of coiled nickel-chrome resistance wire centered in tubes and embedded in refractory material.

D. Cabinet: 0.0747 inch steel on solid base pan with exposed edges rounded. Provide removable front panels with quick-acting, key-operated cam locks. Provide removable die-cast or fabricated steel discharge grilles. For units having cooling coils, insulate internal parts and surfaces exposed to conditioned air stream with moisture resistant insulation.

E. Cabinet Accessories: Matching steel construction, reinforced, for use with unit ventilators or finned radiation, with steel alignment pins, adjustable kick plates with leveling bolts, shelves and sliding doors as indicated, corner, end, and wall filler sections as required.

F. Finish: Factory apply baked enamel of color as selected on visible surfaces of enclosure or cabinet.

G. Fans: Centrifugal forward-curved double-width wheels, statically and dynamically balanced, direct driven, arranged to draw air through coil.

H. Wall Louvers: Anodized aluminum wall intake box and louvers removable from frame with 1/2 inch square mesh galvanized screen in back of louver.

I. Motor: Tap wound multiple speed permanent split capacitor color selected by architect, with sleeve bearings, resiliently mounted.

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J. Air Cooled Condensing Unit: Corrosion resistant cabinet, with hermetically sealed compressor with internal spring isolation, external isolation, permanent split capacitor motor and overload protection, copper tube aluminum fin condenser coil, direct drive propeller fan with permanently lubricated ball bearing single phase motor with internal overload protection.

K. Control - Hydronic Units: Multiple speed switch, factory wired, located in cabinet, prepped for control by BAS.

L. Control - DX Units: Factory-provided BACnet / Niagra based control system capable of controlling fan speed, compressor/refrigerant system, electric backup heat, and outdoor air systems.

M. Filter: Easily removed 1 inch thick glass fiber throw-away type, located to filter air before coil.

N. Mixing Dampers: Multi-blade with compressible seal, capable of varying proportion of mixed air from 100 percent room air to 100 percent outside air.

O. Capacity: As Scheduled.

PART 3 EXECUTION

3.01 INSTALLATION

A. Protection: Provide finished cabinet units with protective covers during balance of construction.

B. Provide Owner demonstration and training of not less than 4 hours.

END OF SECTION

NOT FOR BIDDING

SECTION 23 84 19
INDOOR POOL DEHUMIDIFICATION UNITS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Furnish and install where indicated, factory-assembled, indoor or outdoor (as scheduled) swimming pool heat pump dehumidification system. System shall include compressor(s), evaporator coil(s), air side condenser reheat coil(s), supply fan, air control dampers, auxiliary heating capability, moisture disposal, complete solid state logic control system, factory-installed and wired in a single unit enclosure.

B. The unit shall be specifically designed, manufactured and tested for enclosed swimming pool duty. Field-assembled or modified, standard, commercial grade equipment is not acceptable. Complete unit shall be suitable for indoor or outdoor, weatherproof mounting.

C. The complete unit shall be listed by an industry recognized, third-party, safety code agency under the title of “Special Purpose Air Conditioners” and carry the appropriate label.

D. Manufacturer shall have a minimum of ten years prior experience making similar equipment as described in this specification.

1.02 INTENT

A. It is the intent of this section of the specifications to provide a complete, operable, adjusted natatorium dehumidification system as shown and scheduled on the plans.

1.03 MANUFACTURER

A. PoolPak LLC - PoolPak® PCP-3500-RL-X

B. Desert Air

C. Dectron

D. Innovent

PART 2 - PRODUCT

2.01 PRINCIPLE OF OPERATION

A. The unit shall control space temperature and relative humidity, pool water temperature and shall provide ventilation. Warm moist air from the natatorium is drawn over the evaporator coil by the return fan and latent and sensible heat is removed from the air. The heat captured by this process and the heat generated from the compressor power consumption are absorbed by a mechanical refrigeration system.

B. The code required amount of ventilation air is introduced between the evaporator and reheat condenser. The mixed air is drawn over a reheat condenser coil and auxiliary heating coil by the supply fan.

C. The refrigeration system may be activated if any of the following occur:
1. Space temperature drops below the set point
2. Space relative humidity rises above the set point
3. Space temperature rises above the set point

D. The unit shall monitor space and outside air temperature, space relative humidity, pool water temperature and building surface temperature.

E. The thermal energy absorbed by the refrigeration system is distributed as follows:
1. First priority is given to maintaining the natatorium space temperature. No supplementary space heating system external to the unit is required.
2. All heat is then transferred to a remote air-cooled condenser.

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2.02 SCOPE

A. Furnish and install, where indicated, a factory-assembled, fully-enclosed, packaged environmental control system with energy recovery feature(s) designed for natatorium environment control

B. Features shall include:
   1. Dehumidification by means of a direct expansion evaporator coil
   2. Space heating by means of a packaged indirect-fired natural gas duct furnace module
   3. Cooling mode with heat rejection to a packaged outdoor air cooled condenser
   4. Packaged minimum exhaust fan
   5. Integral minimum outdoor air connection
   6. Internet connectivity for 2 years via cell based technology

C. Quality and Safety Assurance
   1. The system shall be ETL listed
   2. The system shall be completely assembled, wired, piped, and test-run at the factory prior to shipping. All controls shall be factory adjusted to satisfy the design conditions.
   3. Manufacturer shall have a minimum of ten-plus years prior experience making similar equipment as described in this specification
   4. Wherever possible, the system shall have a mechanical vestibule where the electrical panel, compressor(s), pool water heat exchanger(s), receiver(s) and most of the refrigeration controls are out of the process air stream
   5. The system shall have a microprocessor controller with unit-mounted refrigerant pressure transducers on each refrigeration circuit, multiple temperature sensors and an Ethernet connection for factory logging and parameter adjustment via the Internet. The refrigerant pressure transducers shall be actively used for system control. The customer (or their authorized representative) shall be provided access to the online logging and parameter adjustment interface, upon request.
   6. Demonstration of these capabilities must be carried out at the engineer's office prior to bid day
   7. The system shall have remote factory start-up assistance capability, when connected to a network with Internet access
   8. The system shall have 24-7 remote computer logging capability with automated alarm notifications and system performance alerts transmitted via e-mail to authorized users, when connected to a network with Internet access
   9. Warranty: The entire system shall have a 24-month limited parts warranty from the factory ship date
      a. A 1-year labor warranty shall be provided by the manufacturer when the system is connected to the factory via an Internet monitoring system from the date of initial commissioning
      b. The compressor(s) shall have a 5-year warranty from the factory ship date
      c. The internal airside heat exchanger coils shall have a 5-year warranty from the factory ship date
      d. The drive line shall have a 5-year warranty from the factory ship date
   10. When connected to a network with Internet access, the system shall have remote service capability with the ability for fieldservice technicians to receive service and trouble alerts by e-mail and make parameter adjustments via a browser interface on any Internet-capable device

2.03 PRODUCT

A. The natatorium control system shall include:
   1. Mechanical process dehumidification
   2. Indoor or Outdoor cabinet configuration as scheduled

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3. Packaged outdoor air-cooled condenser for AC heat rejection
4. A packaged indirect-fired natural gas duct furnace module installed downstream of the blower, sized as specified by the design engineer to meet the skin losses and outdoor air heating loads
5. Pool water heater via rejected heat (as scheduled)
6. Air filtration via MERV-13 pleated panel filters for return
7. Minimum outdoor air connection
8. Minimum exhaust fan(s)
9. Programmable microprocessor controller with remote Internet logging and parameter adjustment
10. Remote operator panel(s)
11. A service vestibule where the compressor, refrigeration specialties, control valves and all electronics are outside of process air stream

B. Sequence of Operation
   1. The system shall be designed and sized to maintain the specified space conditions
      a. System Startup
         1) Power is turned on or the system is restarted
         2) After a short initial delay to allow the sensors to stabilize, the blower starts and operates continuously
         3) Based on sensor feedback, the system shall begin or resume operation based on the sequence below
      b. Airside Configuration
         1) The system continuously delivers the specified supply air volume to the natatorium
         2) The minimum exhaust air volume is set to meet the engineer's schedule.
         3) The minimum outdoor air volume is set to meet the engineer's schedule.
      c. Dehumidification Mode
         1) The return air relative humidity is above the humidity setpoint
         2) Return air dewpoint is above dewpoint setpoint.
         3) The compressor enters the Compressor Start sequence
         4) Initially, 100% of compressor hot gas discharge will be diverted to condense at the air reheat coil. The supply air temperature will be higher than the return air temperature
      d. Air Conditioning Mode
         1) The return air temperature is above the room temperature setpoint
         2) The compressor starts, if not already operating in Dehumidification Mode
         3) Excess compressor hot gas is diverted to the outdoor air cooled condenser for up to 100% heat rejection at summer design ambient conditions
      e. Space Heating Mode
         1) The return air temperature is below the room temperature setpoint
         2) The microprocessor space heating output signal (0-10 volts) is sent to the heating coil controller. The signal output will regulate based on the return air temperature
      f. Freeze Protection
         1) The supply air temperature falls below the freezestat setpoint
         2) Exhaust fan(s) are stopped and outdoor air damper(s) are fully closed
         3) When the freezestat alarm is tripped, it must be manually cleared by the operator

C. Cabinet
   1. Cabinet Construction: All cabinet 16, 20 and 24 gauge sheet metal shall be galvanized G90 steel or GalvalumeTM alloywith mill-applied zinc phosphate primer followed by an exterior grade white silicone modified polyester top coat. The sheet metal is engineered to

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form a cabinet with maximum strength and rigidity. All seams shall be caulked with silicone to prevent air and water leakage or infiltration

2. Base Rails: The cabinet shall have a base frame comprised of 2 layers of 10 gauge mill galvanized G90 steel. Lifting lugs shall be provided on the base frame for rigging the system.
3. The cabinet walls shall be of double-wall construction using 20 gauge pre-painted steel with a fully painted inner metal liner and 2 inches of fiberglass insulation
4. The cabinet floor shall be of 2-inch double-wall construction using 20-gauge pre-painted steel engineered with structural bends for maximum rigidity, mechanically fastened to the base frame
5. The cabinet roof shall be 20-gauge pre-painted steel, 2-inch double wall engineered with structural bending for maximum rigidity and be mechanically fastened to the base walls of the unit
6. The cabinets shall be mechanically assembled with stainless steel 5/32" sealed blind rivets. Where bolts are required bright zinc plated bolts shall be used
7. Access doors shall be supported on multiple hinges, held shut by compression latches for quick access. Doors shall be provided for entrance to all sections housing components requiring routine maintenance. Full height access doors shall have "hold back" latches to prevent door closure during the performance of service procedures
8. The unit shall have non-corroding protective mesh screens on all air intake openings

D. Outdoor Air Intake:
   1. Minimum Outdoor Air connection: motorized damper, filter and time clock

E. Insulation: The unit shall be insulated per the following standards:
   1. All exterior cabinet sections shall be insulated with two (2) inch thick fiberglass inside the double walled cabinet
   2. Fire resistant rating to conform to NFPA Standard 90A and 90B
   3. Sound attenuation coefficient shall not be less than 1.02 at a frequency of 1,000 Hz as per ASTM Standard C423
   4. Thermal conductivity shall not exceed 0.26 Btu/hr-sqft-ft at 75 °F

F. Cabinet configuration shall include:
   1. A filter rack with separate access doors shall be provided for the return air and minimum outdoor air streams
   2. Unit shall be equipped with duct collars to admit the minimum outdoor air as scheduled. The outdoor air intake assembly shall have a built in air filter rack with separate access door, manual air balancing device and motorized 2 position extruded aluminum, Insulated, silicone side-sealed damper operated by 24-hour time clock
   3. Mechanical vestibule: The unit shall have the compressor, receiver, solenoid valves and the electrical panel in a separate compartment out of the processed air stream. All components shall be serviceable while the unit is in operation without disturbing the airflow
   4. Electrical panel: The unit shall have a built-in electrical control panel in a separate compartment in order not to disturb the airflow within the dehumidifier during electrical servicing. All electrical components shall be mounted on a 16 gauge galvanized sub-panel

G. Filters
   1. Wherever possible, air filters shall be standard sized, replaceable, off-the-shelf filters including:
   2. Return Air: 2-Inch MERV 13, 90% pleated filters with rust-free non-metallic structure on a slide-in or face-loading rack
   3. Outside Air: 2-Inch MERV 13, 90% pleated filters with rust-free non-metallic structure.
   4. Dirty air filter switches included on the return air filter for indicating an alarm when pressure drop exceeds a set point.

H. Coils

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1. Evaporator/dehumidifier coils shall be designed for maximum moisture removal capacity
2. Coils shall be fully dipped and coated with a polyester/enamel coating for maximum corrosion protection. Coating shall comply with ASTM B117/D1654 and ASTM D2126 for corrosion resistance against common acids, salt and gases
3. Coil shall have galvanized casing and end plates
4. Aluminum fin and copper tubes mechanically bonded to assure high heat transfer.
5. Coils shall have a 3-year warranty extension for a total of 5 years coverage

I. Drain Pans
1. Each evaporator coil shall be provided with a positive draining, compound-sloped, baked powder paint coated aluminum drain pan with fully-welded corners to ensure zero water retention. In no way will stainless steel or galvanized drain pans be acceptable

J. Blowers and Blower Motors
1. Supply blowers:
   a. Supply Blower shall consist of a steel backward airfoil; a three phase, enhanced performance cast aluminum, premium efficient NEMA design motor; and a general purpose, variable frequency drive (VFD)
   b. The impeller and motor shall both have a corrosion resistant coating.
   c. Each fan assembly shall be suitable for a maximum temperature of 121°F.
   d. The supply blower will allow for fans to reduce speed in unoccupied hours saving operating costs.
   e. Machines without this built-in supply fan array with redundancy and operating costs shall not be accepted.
2. Exhaust blowers:
   a. The packaged exhaust blower (EF1) shall be sized to maintain the negative pressure requirement in the space during normal operation and its operation tied to the system's occupancy scheduler
   b. The blower shall be impeller plenum fan complete with backward curved, three-dimensional, profiled blades made of high performance composite material. The blower shall be completely corrosion resistant and be maintenance free a direct drive via a direct current (DC) electronic commuted (EC) motor. The EC-Motor shall have zero slippage design and have continuously variable speed control when connected to the unit's controller. Fans that are not direct drive or EC are not acceptable.
   c. The fan assembly shall be balanced in Class G 6.3 acc DIN ISO 1940, dynamic on two levels
   d. The fan assembly shall be suitable for ambient temperatures of -40°C to max. +70°C
   e. Thermal contacts installed in the windings compliant with THCL 155
   f. Drive motor in external rotor principle, sealed in protection class IP54 with moisture protection impregnation of the windings, topical protection
   g. High corrosion resistance design with high quality and reliability
   h. The exhaust fan shall be controlled from an end switch on the power open of the exhaust air damper. The exhaust dampers shall be protected by louvers to divert rain from the face of the dampers

K. Dampers
1. Internal dampers shall be made from extruded anodized aluminum with a parallel blade configuration and neoprene double-seal tips to minimize leakage. Damper blades shall be mounted on steel rods which rotate on nylon bushings. All damper hardware shall be corrosion resistant
2. The system shall be provided with normally closed outside air and exhaust air dampers equipped with spring-return actuators The dampers adjust between 0% to 100% open position.

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3. The outdoor air and exhaust air dampers shall be of opposed blade configuration. Dampers shall have 0.750-inch insulated blades made from extruded anodized aluminum with neoprene double-seal tips to minimize leakage. Damper leakage shall be less than 1% of maximum flow at 4-inch water column differential. Damper blades shall be mounted on steel rods which rotate on nylon bushings. All damper hardware shall be corrosion resistant

L. Compressors
1. Hermetic, scroll action compressor, suction gas cooled, suitable for refrigerant R-410A
2. The compressor(s) shall be equipped with an internal solid-state thermal protection sensor
3. Access: Service access valves for convenient servicing.
4. The compressor(s) shall be mounted on rubber-in-shear isolators to limit the transmission of noise and vibration
5. The compressor(s) shall be equipped with removable crankcase heater(s) for liquid migration protection
6. The compressor(s) shall be located outside the conditioned air stream in the system's service vestibule
7. Compressors shall have a 3-year warranty extension for a total of 5 years coverage
8. The compressor manufacturer must have a wholesale outlet for replacement parts in the nearest major city

M. Refrigeration Circuit
1. The system shall consist of one factory-sealed refrigeration circuit for dehumidification and sensible cooling. No site refrigeration work shall be required
2. Each refrigeration circuit shall have pressure transducers monitoring the refrigerant discharge (high) and suction (low)
3. pressures. The refrigeration circuit shall be accessible for diagnostics, adjustment and servicing without the need for service manifold gauges
4. All refrigeration circuits shall have refrigerant control valves, a liquid line filter-drier, a liquid and moisture indicator, an expansion valve, head pressure control feature and pump down feature
5. All refrigeration circuits shall have an electronic expansion valve
6. The system shall have an externally adjustable balanced port design mechanical thermostatic expansion valve. The valve shall have a removable power head
7. Tamper proof, hermetically sealed non-adjustable high and low pressure switches and refrigeration service valves shall be installed using Schrader type valves. Refrigeration service valves shall be located outside of the airstream
8. The suction line shall be fully insulated with 0.500-inch closed cell insulation

N. Control Panel
1. The electrical contractor shall be responsible for external power wiring and disconnect switch fusing. Power block terminals shall be provided
2. The system shall include a factory-installed non-fused disconnect
3. Main control panel shall be mounted inside the service vestibule outside of the process air stream
4. Blower motors shall be protected with thermal trip overloads
5. The system shall have a voltage monitor with phase protection
6. Available dry contacts shall include:
   a. Alarm
   b. Blower interlock
   c. Stage 1 & 2 heating
   d. Outdoor air damper control
   e. Remote exhaust fan #1
   f. Remote exhaust fan #2

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g. Outdoor-air cooled equipment
h. System on
i. Heat recovery

7. Terminals shall be provided to send 24-volt power to the outdoor air cooled condenser or fluid cooler fan contactor
8. All wiring shall be installed in accordance with UL or CSA safety electrical code regulations and shall be in accordance with the NFPA All components used in the system shall be UL or CSA listed
9. Wiring diagrams shall be located near the electrical panel(s) on the system. These diagrams shall provide colour-coding
10. and wire numbering for easy troubleshooting. All wires shall be contained in a wire duct.
11. The compressor(s) shall have a time delay on start to prevent short cycling
12. Pressure transducers for measuring refrigerant discharge (high) pressure and suction (low) pressure shall be provided.
13. An airflow switch and a dry contact for alarm(s) shall be provided and factory-mounted.

O. Microprocessor Control
1. A microprocessor controller with the following characteristics will be provided:
   a. All set points and parameter adjustments are pre-programmed at the factory during quality control testing
   b. The microprocessor program shall be stored on updatable FLASH memory
   c. A minimum of 11 analogue inputs, 4 analogue outputs, 24 digital inputs and 16 digital outputs
   d. Four serial interface ports including both RS232 and RS485 types
   e. An Ethernet port with RJ-45 connector and LED activity indicator
   f. A real time clock to time-stamp the system operation log and to enable a programmable 7-day occupation schedule
   g. Two manual demand forced modes to allow the user to manually bypass the microprocessor in the event of controller failure
   h. The local and remote operator panel(s) shall have a backlit graphic liquid crystal display with touch controls
2. The system shall have pressure transducers monitoring the refrigerant discharge (high) and suction (low) pressures. The refrigeration circuit shall be accessible for diagnostics, adjustment and servicing without the need of service manifold gauges
3. The following status LEDs shall be on the controller:
   a. Alarm - indicates there has been a failure requiring service.
   b. Dehumidification - indicates that the system is dehumidifying the space.
   c. Cooling - indicates that the air-conditioning mode.
   d. Space Heat - indicates that the space heating is operating.
   e. Maintenance - indicates whether or not maintenance is required.
   f. Manual - indicates that the system has been set to manual operation.
4. The following set points shall be accessible and adjustable from the operator panel:
   a. Space temperature
   b. Space relative humidity
5. The following sensors shall be unit-mounted and monitored at the operator panel. All information from these items shall be actively used in the system control and operation strategies:
   a. Refrigerant high pressure
   b. Refrigerant low pressure
   c. Return air temperature
   d. Supply air temperature
   e. Return air relative humidity

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f. Evaporator leaving air temperature
g. Suction temperature
h. Discharge temperature

6. System Fault: Shall indicate via text message to the display what systems require attention or servicing. Built-in monitoring and diagnostics shall allow the user to view the following:
   a. Power failure
   b. Dirty air filter
   c. Refrigerant high and low pressure
   d. System off
   e. Anti-short cycle delay

P. Air Heating - Gas
1. The packaged indirect-fired natural gas duct furnace module shall be sized to meet the scheduled heating capacity and have the following characteristics:
   a. Modulating (0-10V) auxiliary air heat control
   b. The duct furnace module shall be a natural gas indirect-fired type using spark ignition with a heating capacity as shown in this submittal and is installed in a 'blow through' configuration downstream from the blower. The heat exchanger tubes are constructed of formed and welded 16-gauge series 409 stainless steel suitable for installation downstream of the cooling coil and satisfactory for air inlet temperatures below 40 °F. The burner is the power firing type and incorporates a primary combustion air blower and spark ignition transformer
   c. Standard controls shall include a modulating gas valve, intermittent spark ignition, overheat control, rollout flame supervision, combustion air flow proving switch, positive burner safety switch, pilot cock, main gas cock with 100% shut off, adjustable main and pilot pressure regulators
   d. The natural gas duct furnace module shall be an ETL recognized component. The gas train shall be complete with all controls factory mounted to comply with requirements of ETL. The gas train is complete with a modulating main gas valve and is ready for connection to a natural gas supply with pressure between 7 in and 14 in WC
   e. The complete system shall be test-fired and preliminary adjustments made prior to leaving the factory

Q. Air Heating - Hot Water
1. The unit shall include an integral hot water coil sized to meet the scheduled heating. Include modulating (0-10V) control valve and DAT sensor as required.

R. Air Conditioning
1. Air-cooled air conditioning via outdoor condenser
   a. The system shall be equipped with an air conditioning mode where excess compressor heat is rejected to a factory-packaged, integral outdoor air-cooled condenser. The outdoor air-cooled condenser shall be capable of rejecting 100% of the compressor heat rejection with an air-on temperature at summer design conditions. The outdoor condenser shall be equipped with a 24VAC controls, including a contactor for the fan motor
      1) Where scheduled, the unit shall be equipped with an optional pool water heat exchanger to provide supplemental pool water heating.
   b. The system shall be provided with a dry contact rated for 5A at 24VAC to operate the remote outdoor condenser controls
   c. Each refrigeration circuit shall include refrigerant valves, a receiver with pressure relief valve set to 650 psig, a pressure control valve and a pressure differential valve, and two manual shutoff valves to isolate the outdoor condenser

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d. Coils shall be tested at 600 PSIG and mounted vertically for complete surface utilization. Coils shall be counter flow with a minimum of 10 degrees of liquid sub-cooling and have adequate capacity to dissipate the total heat rejection of the system at design conditions. Condensers shall have guards to protect the coils from vandalism and weather-related damage
e. The fan(s) shall be direct driven axial fan(s) made of aluminum in which the motor and controller are integrated. The fan includes an EC commutated direct-current external rotor motor to provide maximum efficiency and the quietest performance. The EC motor shall have maintenance-free electronic circuitry, a rotor with permanent magnets and an integral controller to provide the windings with electrical current so that the motor rotates continuously and quietly. The fan has an aerodynamically-optimized, sickle-blade profile, patterned with serrated trailing edge and winglets on the blade outer edge for energy and noise-optimized operation
    1) The fan assembly shall be balanced in Class G 6.3 acc DIN ISO 1940, dynamic on two levels
    2) The fan assembly shall be suitable for ambient temperatures of -40°C to max. +70°C
    3) Thermal contacts installed in the windings compliant with THCL 155
    4) Drive motor in external rotor principle, sealed in protection class IP54 with moisture protection impregnation of the windings, topical protection
    5) High corrosion resistance design with high quality and reliability

S. Roof Curb
    1. The roof curb shall be a prefabricated, perimeter type curb made of 12-gauge galvanized steel with stiffeners, 2.000 in x 2.000 in treated wood nailer strip and not less than 1.500 in of rigid acoustical and thermal fiberglass insulation, knocked-down for shipment. 1.000 in x 0.250 in adhesive gasketing and all necessary hardware shall be provided for field assembly of the curb on the roof decking prior to system shipment

T. Factory Performance Testing
    1. The system shall be thoroughly tested under factory test conditions.

2.04 POOL WATER CONDENSER

A. The internal pool water condenser shall be capable of rejecting 100% of the heat recovered from the compressor and the evaporator. Refer to the equipment schedule for required MBH capacity of the pool water condenser.

B. Pool water condenser shall be counter-flow, tube-in-tube type. Waterside shall be Type L, cupro-nickel. For units located outdoors, the pool water condenser shall be equipped with self-regulating electric heat tape and insulation for freeze protection.

C. Pool water condenser shall be of double-wall, vented construction with removable plugs for inspection and cleaning.

D. Pool water heating is controlled by a refrigerant solenoid valve that directs hot refrigerant gas into the pool water condenser as a response from the control system. Water circuit shall be supplied with schedule 80 CPVC pipe stub-outs.

2.05 HOT WATER COIL

A. The coil and fins shall have shall Electro-Guard® corrosion resistance Electro coating. Coil shall have a flexible, epoxy polymer, E-coated in a total submersion bath, uniformly applied to all coil surface area without material bridging between fins. Coating process shall ensure complete coil encapsulation and a uniform dry film thickness from 0.5-1.5 mil on all surface areas including fin edges, end plates, structural frames, “u” bends and headers. Coating surface shall have superior hardness characteristics of 2H per ASTM D3363 and across-hatch adhesion of 4B-5B per ASTM B3359. Impact resistance shall be up to 100 in/lb per ASTM D2794. Humidity and water immersion resistance shall be up to a minimum 1000 and 250 hours respectively

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(ASTM D1735 and ASTM D870). Corrosion durability shall be confirmed through testing to no less than 3,000 hours salt spray per ASTM B117 using scribed aluminum test coupons.

1. Coil shall have a 10-year (total) extended warranty underwritten by manufacturer, unconditional of pool water chemistry.

B. All tubes shall be expanded into fin collars. All joints shall be brazed. The coil shall be tested to 320 PSIG while submerged in water. The coil shall be dried and sealed. Inside of tubes shall be commercially free of oxides and foreign matter. Coil assembly shall have 1600 PSIG ultimate strength.

1. Hot water flowing through or bypassing this coil shall be controlled by a factory installed three-way control valve. This valve shall be controlled by the PoolPak® control system. The valve actuator shall have NEMA 2 housing with GoreTex vents and auto open on power failure.

2.06 DAMPERS

A. Dampers shall be parallel blade, less than 1% leakage, neoprene tipped, anodized-aluminum air foil cross-section dampers. Each damper section shall be operated by a separate motor, factory mounted and wired into the unit control panel.

2.07 DRAIN PAN

A. The floor of the evaporator section shall be constructed of 316 stainless steel. The other airside sections shall be constructed of galvanized steel and powder-coat painted with a protective coating providing a chlorine and pool chemistry resistant finish. The floor sections shall be fully insulated. The floor sections under condensate producing coils shall be sloped toward the drains and piped to a common drain accessible from either side of the unit. All drain lines within the unit shall be insulated with a minimum 1/2 inch closed-cell foam with self-regulating electric heat tape for freeze protection.

2.08 SEQUENCE OF OPERATION

A. SEE SPECIFICATION SECTION 23 09 93.

2.09 BACNET MS/TP

A. The dehumidifier control panel shall be capable of direct connection to a BACnet MS/TP-based building automation system. With proper connection to the RS-485 network, the dehumidifier shall appear as a native BACnet device.

PART 3 - EXECUTION

3.01 FUNCTIONAL FACTORY TEST AND VERIFICATION

A. The completed unit shall be completely tested for functionality in the factory before shipment.

B. The functional test shall consist of an in-unit test of the controller, inputs, outputs, safeties and the basic sequence of operation. Also, part of the functional test will be verification of the operation of compressor(s), fan(s), associated electrical components and if furnished, gas furnace controls and the valve actuators for coils. The functional test shall not be construed as a performance or capacity test.

C. Each unit will have a record of the test documented with the unit serial number. Field testing of components or the sequence of operation is not a substitute for factory testing.

D. A copy of the functional test report shall be maintained on file at the factory and can be furnished upon request.

3.02 INSTALLATION

A. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified and where manufacturer's technical representative directs otherwise.

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B. Install unit where shown on drawings. Provide 3’ feet clearance around sides and 4’ feet around compressor compartment of unit for airflow and service. Provide a means for access to all sides of the unit.

3.03 BUILD ON-SITE OPTION

A. Provide factory personnel to field erect unit. All materials to complete the unit shall be assembled at factory when complete they shall be trucked to the site for assembly. Others will clear the area for assembly of the new unit. Others are responsible for moving all the dehumidifier materials into the mechanical room. Others will be responsible to provide labor and a gantry or other means to lift heavy pieces into place. Factory personnel shall build in place the dehumidifier in compliance with the specification. When the unit assembly is completed, refrigerant lines shall be vacuumed and the unit charged with refrigerant. Others will then connect the ducts, electrical wiring, cold wall sensor, pool water piping and OA sensor if required. Others will install a new air conditioning remote heat rejection condenser and replace all interconnecting refrigerant lines. The lines must be vacuumed and oil and refrigerant added per dehumidifier’s current service manual requirements.

B. Start-up of the unit shall be by factory authorized and trained personnel. Owner training will be provided. All standard warranties will apply.

C. Split Units shall not be allowed.

3.04 START-UP, OWNER TRAINING & WARRANTY

A. All units shall be thoroughly cleaned by the installing contractor in accordance with the manufacturer's instructions, prior to being placed into service.

B. Start-up service shall be provided by the equipment manufacturer's authorized representative and shall include complete testing of all controls and unit operation. The agency responsible for start-up shall record the refrigeration system pressures and electrical operating data. Copies of this data are to be supplied to the owner. US - Standard

C. A complete operating and maintenance manual, including wiring diagrams, start-up and operating sequence and material list shall be provided to the owner. The owner shall be provided with complete instruction of operating and maintenance procedures.

D. Manufacturer shall provide owner with on site training by factory-trained service personnel. Training shall cover the operation and maintenance requirements of this unit. This training session shall be held at time of factory start up.

E. Manufacturer shall provide to the owner a web-based, instructional video program for use by field personnel.

F. Manufacturer shall provide a 30-day labor and 25-month parts warranty on the entire unit.

G. Manufacturer shall provide a 3-5 year extended compressor part warranty.

END OF SECTION

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