



Flour Bluff Independent School District
A RECOGNIZED SCHOOL DISTRICT



FBISD ECC HVAC PACKAGED ROOFTOP UNIT REPLACEMENTS - 2024

RFP# ECC-2024151-3

**FLOUR BLUFF INDEPENDENT SCHOOL DISTRICT
EARLY CHILDHOOD CENTER**

617 PURDUE ROAD, CORPUS CHRISTI, TEXAS

(Prepared by)
Stridde, Callins and Associates, Inc.
342 South Navigation BLVD
Corpus Christi, Texas 78405
Texas Firm No. F-006328
361-883-9199



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**FEBRUARY 29, 2024
SCA Project No. 2024151**

**FBISD ECC PACKAGED ROOFTOP UNIT REPLACEMENTS - 2024
FLOUR BLUFF INDEPENDENT SCHOOL DISTRICT**

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**FBISD ECC PACKAGED ROOFTOP UNIT REPLACEMENTS - 2024
FLOUR BLUFF INDEPENDENT SCHOOL DISTRICT**

REQUEST FOR PROPOSAL

PUBLIC NOTICE:

Competitive Sealed Proposals for **“FBISD ECC HVAC PACKAGED ROOFTOP UNIT REPLACEMENTS - 2024”** for the Flour Bluff Independent School District, Corpus Christi, Texas, will be received by the Flour Bluff School District, Arti Bhakta – Purchasing Agent, at the FBISD Administration Building at 2505 Waldon Road, Corpus Christi, Texas 78418 **Thursday at 2:00 o'clock p.m., March 14, 2024.**

(Offerors are encouraged to deliver proposals early. Any late proposals received will be rejected.)

Pre-Proposal Conference and Site Visit will be held at the Transportation and Maintenance Office, 2510 Waldon Road, Corpus Christi, Texas 78418 on **Tuesday at 9:00 o'clock a.m., March 5, 2024.**

Project consists of: Replacement and installation of Ten (10) packaged HVAC rooftop units and related work as indicated on drawings and specifications created by Stridde, Callins and Associates, Inc.

The Instructions for Offerors, Proposal Form, Conditions of the Contract, Construction Contract, Performance Bond, Payment Bond, Technical Specifications, Technical Drawings and other Contract Documents may be obtained via digital download. Electronic Proposal Documents are available for download from the engineer's office upon request.

All Offerors must register with Engineer's office to receive documents download link, status updates for addendums, clarifications, and the like: Stridde, Callins, and Associates, Inc.; 342 S. Navigation Blvd, Corpus Christi, Texas 78405, Telephone 361-883-9199; Patty Garcia (p.garcia@scaengineering.com).

The Flour Bluff Independent School District reserves the right to waive any informality or to reject any or all Proposals. Alteration or modification of the Proposal Forms shall be cause for rejection of the Proposal.

Each Offeror must deposit with their Proposal, a Proposal Security in the amount, form and subject to the conditions provided in the Instructions to Proposers.

No Offeror may withdraw his Proposal within sixty (60) days after the actual date of the opening thereof.



INSTRUCTIONS FOR OFFERORS

Article 1. Nature of Project:

1. The Flour Bluff Independent School District, Corpus Christi, Texas (hereafter called the "Owner") will receive Competitive Sealed Proposals for:

FBISD ECC HVAC PACKAGED ROOFTOP UNIT REPLACEMENTS - 2024
FLOUR BLUFF INDEPENDENT SCHOOL DISTRICT

(hereafter called the "Project") in accordance with the Drawings, Specifications, and other Contract Documents prepared by Stridde, Callins and Associates, Inc. (hereafter called "Engineer").

2. Time is of the essence. The completed Project must be delivered to Owner substantially completed on or before July 31, 2024, except as such date may be extended by delays approved by Engineer in accordance with the terms of the Contract Documents governing the construction of such Project. On-site work may begin on or after the date of Notice to Proceed and after the Pre-Construction meeting is conducted. Failure to complete such Project within the time prescribed will subject the Offerors to whom the contract is awarded (hereafter called "Contractor") to liability for liquidated damages, as provided in the Supplementary General Conditions of the Contract.

Article II. Form of Proposals:

1. Lump-sum proposals, designated "Competitive Sealed Proposal", for construction of the complete and entire Project will be considered.

2. Proposals must be submitted on the forms promulgated by Owner and accompanied by bid proposal security as set out in Paragraph 1 of Article III below. No Proposal, or modification to a Proposal, shall be made orally or by telephone or by telegraph or by facsimile transmission ("fax").

3. All blank spaces in the Proposal form should be filled out completely, and all numbers set forth both in words and in figures. If the Offerors does not desire to submit a proposal on any part of the Proposal or any alternate, they should insert the words "**none**" or "**no proposal**".

4. Proposals must be submitted in sealed opaque envelopes plainly marked showing the Project for which the Proposal is intended, the type of Proposal contained, and the name and address of the Offerors. Proposals are to be addressed to the Board of Trustees, Flour Bluff Independent School District, Corpus Christi, Texas, and are to be delivered to the office of the Purchasing Agent - Arti Bhakta, Flour Bluff I.S.D. Administration Building, 2505 Waldron Road, Corpus Christi, Texas prior to 2:00 o'clock P.M., March 14, 2024. At approximately 2:15 pm on the same day, or as soon thereafter as the Owner considers feasible, the Proposals will be opened and read aloud publicly.

Offerors shall submit with their Proposal the following:

- a. Additional criteria as required by Article VIII, Competitive Sealed Proposal Selection Criteria.
- b. Conflict of Interest form.
- c. Felony Conviction Notification form.
- d. Proposal security.

- e. The successful Offerors, upon award of a contract, shall execute a Certificate of Interested Parties (Form 1295) with the Texas Ethics Commission.

5. Proposal may be withdrawn by written or telegraphic request received by Owner prior to the time fixed for opening. Two signed copies of any such telegraphic withdrawal should be forwarded immediately to Owner in a sealed opaque envelope properly marked to identify the contents. Faxed proposals, bid/proposal bonds, etc., are not acceptable.

6. All proposals shall be computed exclusive of the Texas Sales Tax. That is, such tax shall not be added to the amount bid for the construction of such project.

7. Unless the Owner rejects all proposals, the Owner intends to award a contract to the Offerors that offers the best value to the Owner based upon the listed selection criteria and its ranking evaluation. In determining best value, Owner is not restricted to considering price alone, but may consider any other factors stated in the selection criteria. If the Owner is unable to reach a contract agreement with the selected Offerors, the Owner shall formally and in writing, terminate further discussions and proceed to the next Offeror in the order of the selection ranking until a contract agreement is reached or all proposals are rejected. Time is of the essence, and the award of the contract to the successful Offeror is expressly conditioned upon (i) the Offeror's execution and delivery of the contract, and delivery of all required payment and performance bonds and evidence of insurance, within ten (10) calendar days after the successful Offerors is notified of the acceptance of its proposal, and (ii) the Offeror's timely fulfillment of any and all other preconditions expressly set forth in the Contract Documents. Should the Offeror fail to timely execute and deliver the contract, required bonds, evidence of insurance, or fail to timely fulfill any other such preconditions, the Owner may, at its option and discretion, without releasing, impairing or affecting its right to receive the security as damages for such failure, rescind the award and thereafter negotiate with and award the contract to the next ranked Offeror, or may reject all proposals.

Article III. Bid Bond/Proposal Security:

1. A certified or cashier's check, or bid bond/proposal security acceptable to Owner, in the amount of at least five percent (5%) of the largest amount bid must accompany each Proposal submitted. Such bid proposal security is to protect Owner against the withdrawal of proposals following the opening of proposals, and to further protect Owner against the failure, neglect or refusal of any Offeror awarded a contract to execute the required Contract and furnish the required Bonds within ten (10) days after notification of the acceptance of their proposal.

2. If any Offeror withdraws their proposal, they shall forfeit such proposal security to Owner as liquidated damages for such default. If any Offeror whose proposal is accepted by Owner fails or refuses to enter into the Contract provided for by Owner or fails or refuses to furnish the required Contract and required Bonds within ten (10) days after notification of such acceptance, he shall forfeit such proposal security to Owner as liquidated damages for such default.

3. The proposal security of all bidders, except the three lowest, shall be returned promptly after the tabulation of proposal. All proposal security will be returned at such time as the Construction Contract has been executed by the successful Offeror. However, if Owner fails to accept any proposal within sixty days after the date scheduled for opening of proposals and an Offeror withdraws their proposal, their proposal security shall also be returned.

Article IV. Financial Condition of the Offerors:

1. Any Offerors, in order to be eligible to submit a proposal, must be able to demonstrate to the satisfaction of the Owner that they have the financial capacity to carry on the work until such time as they receive the first payment under the Contract, and that they are able to finance the work between payments until the construction is completed and accepted.

Article V. Examination of Contract Documents & Site:

1. Each Offeror, before submitting their Proposal, shall fully examine and acquaint themselves with the Contract Documents and the site of the proposed Project. They shall make such investigation as they may deem necessary to fully inform themselves of the existing conditions, facilities, difficulties, restrictions and requirements incident to completion of the Project under the terms of the Contract.

2. Failure of the Offerors to acquaint themselves adequately with the site and such conditions, facilities, difficulties, restrictions and requirements will not relieve him of their obligation to perform the entire Contract at the price set forth in this proposal.

Article VI. Contract Documents:

1. Drawings and Specifications and General Conditions incorporated by reference are on file at the offices of the Executive Director of Operations, Transportation and Maintenance Building, Flour Bluff Independent School District, 2510 Waldron Road, Corpus Christi, Texas, and at the offices of the Engineer, Stridde, Callins and Associates, Inc., 342 South Navigation Blvd, Corpus Christi, Texas 78405, where they may be inspected by qualified Offerors without charge. Any interested Offerors will be given an electronic copy of the Contract Documents at no charge via digital download link with documents in PDF format. (Request all documents from engineer's office; Mrs. Patricia Garcia (361) 883-9199, p.garcia@scaengineering.com.)

2. Any qualified Offerors who desires to obtain a paper set of Contract Documents is able to print a set at their own expense.

3. If any Offeror is in doubt as to the meaning of any part of the Drawings, Specifications, or other Contract Documents, or if he discovers what he considers to be a discrepancy, omission or conflict in such Contract Documents, they shall immediately call the Engineer's attention to same by written notice or request for an interpretation of same. If such written notice or request is delivered to the Engineer prior to 72 hours before the time set for opening proposals, the Engineer shall issue a written addendum, forwarded to all persons who, to the knowledge of the Engineer, are prospective bidders setting out any corrections to such Contract Documents or the Engineers' interpretation thereof, as the case may be. Any opinion expressed by Engineer in interpreting the Contract Documents shall not be binding upon Owner, nor does Engineer warrant that the Owner will accept their interpretation of such documents.

Article VII. Addenda:

1. Changes in or official interpretations of the Contract Documents will be made only by written addenda.

2. Receipt of all addenda issued by Engineer shall be acknowledged in each Offeror's proposal, and shall constitute a part of the final contract. It is the duty of each Offeror to obtain any and all addenda via contacting Stridde, Callins and Associates, Inc. to be placed on the Offerors List. Failure of an Offeror to receive any addenda will not release them from any obligation under his Proposal. However, if any Offerors fails to receive any addenda, and their proposal is otherwise determined to the Owner to be the best proposal, the contract may be awarded to the Offeror and the changes in the work set out in the addenda will be incorporated into the contract by a change order, with a corresponding adjustment in the contract price to be made as provided in the Conditions of the Contract.

Article VIII. Competitive Sealed Proposal Selection Criteria:

1. Owner reserves the right to reject any or all Proposals, to accept the Proposal or Proposals it considers most advantageous, and to waive irregularities or informalities in the proposal, and to hold all Proposals for sixty (60) days after the date scheduled for opening such proposals.

2. Award of the contract resulting from this request for Competitive Sealed Proposal shall be under the selection process described herein. A committee appointed by Owner will evaluate Proposals submitted in response to this request for Competitive Sealed Proposals. The criteria are as follows:

- a) Price of Proposals: 40% (400 possible points)
- b) Relevant Experience and Capability: 20% (200 points maximum)
- c) Past Performance on Related Work: 10% (100 points maximum)
- d) Quality Assurance/Warranty: 10% (100 points maximum)
- e) Proposed Subcontractors: 7.5% (75 points maximum)
- f) Reputation for Schedule/Punchlist Completion: 7.5% (75 points maximum)
- g) Other Considerations: 5% (50 points maximum)
- h) Historically Underutilized Business "HUB": 5% (50 points)
- i) A schedule of values: 0% (Zero points but is required for evaluation)

Article IX. Performance & Payment Bonds:

1. Contractor shall furnish a Performance Bond (if the project cost exceeds \$100,000.00) and a Payment Bond (if the project cost exceeds \$25,000.00), as required by law, each in the amount of the full contract price, and each on the forms promulgated by Owner. Such bonds must be written by a Company, or companies, acceptable to and approved by Owner. Owner will not accept a bond written by any company which does not meet all of the following requirements:

- a. The bond must be executed by a corporate surety or corporate sureties duly authorized and admitted to do business in the State of Texas and licensed by the State of Texas to issue surety bonds.
- b. The surety or sureties executing such bond must be listed in the most current issue of the U. S. Department of Treasury Circular 570 (hereinafter called "Circular 570") as an acceptable surety to execute bonds for federal project.
- c. The amount for which the bond is written shall not exceed the underwriting limitation prescribed by Circular 570 for the surety or sureties executing such bond.

2. Contractor will be responsible for bonding the entire job at the time of execution of the Construction Contract and shall include the premium for such bonds in his bid.

Article X. Wage Scale:

1. The construction of this Project is subject to Chapter 2258, Government Code, as amended (the "Act"), the terms of which require that not less than the general prevailing rate of current per diem wages for work of a similar character in the locality in which the work is performed, and not less than the general prevailing of per diem wages for legal holidays and overtime work, shall be paid by Contractor to all laborers, workmen and mechanics employed under this contract.

2. Owner has ascertained that the general prevailing rate of per diem wages in this locality for each craft or type of workman or mechanic needed to carry out the Contract are those set out in Appendix A, attached hereto and made a part hereof.

3. A contractor, or subcontractor, in violation of this Act is liable for the penalties provided in the Act, reference is here made.

Article XI. Permits & Fees:

1. The Contractor shall include within his proposal the cost of all required permits and fees at applicable.



AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

FBISD ECC HVAC Packaged Rooftop Unit
Replacement - 2024
2510 Waldron Road
Corpus Christi, Texas 78418

THE OWNER:

(Name, legal status and address)

Flour Bluff Independent School District
2505 Waldron Road
Corpus Christi, Texas 78418

THE ARCHITECT:

(Name, legal status and address)

Stridde, Callins and Associates, Inc.
342 S. Navigation Blvd.
Corpus Christi, Texas 78405

The term "Architect" shall have the same meaning as
"Engineer" where indicated in this document

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ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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

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

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User Notes:

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

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

§ 1.1.2 The Contract

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

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project. **The Work includes all labor, parts, supplies, skill, supervision, transportation, services, and other facilities and things necessary, proper or incidental to the carrying out and completion of the terms of the Contract Documents and all other items of cost or value needed to produce, construct and fully complete the Work identified by the Contract Documents.**

§ 1.1.4 The Project

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

§ 1.1.5 The Drawings

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

§ 1.1.6 The Specifications

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

§ 1.1.7 Instruments of Service

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

§ 1.1.8 Initial Decision Maker

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

§ 1.1.9 Addenda

Addenda are written or graphic instruments issued by the Owner prior to the receipt of bids or proposals, which modify or interpret the bidding or proposal documents, including Drawings and Specifications, by additions, deletions, clarifications, or corrections. Addenda will become part of the Contract Documents when the Agreement is executed. The Contractor and subcontractors shall include all addenda items on their copies of the Drawings and Specifications.

§ 1.2 Correlation and Intent of the Contract Documents

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

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

§ 1.2.1.2 The most recently issued Contract Document takes precedence over previously issued forms of the same document. Figures given on Drawings govern scale management, and large scale details govern smaller scale Drawings. If an item is shown one place in the Drawings, but not another, or called for in a schedule or the specifications but not shown on the Drawings, or shown on the Drawings but not in a schedule, it is to be included. Existing conditions take precedence over Drawings and Specifications for dimensions. The order of precedence is as follows with the highest authority listed first: A. The Agreement, B. Addenda, C. Supplemental Conditions, D. General Conditions, E. Specifications and F. Drawings.

§ 1.2.1.3 In the event of inconsistencies within or between parts of the Contract Documents, or between the Contract Documents and applicable standards, codes and ordinances, the Contractor shall (1) provide the better quality or greater quantity of Work or (2) comply with the more stringent requirement, either or both in accordance with the Architect's interpretation. The terms and conditions of this Clause 1.2.1.2, however, shall not relieve either party of any of the obligations set forth in Paragraphs 3.2 and 3.7, and this provision shall not be considered to be more important than Subparagraph 1.2.1.1.

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

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

§ 1.2.4 Product and Reference Standards

When specific products, systems or items of equipment are referred to in the Contract Documents, any ancillary devices which the Contractor knows, or in accordance with the standard of care for a General Contractor should have known, is necessary for proper functioning shall also be provided. When standards, codes, manufacturer's instructions and guarantees are required and no edition is specified by the Contract Documents, the current edition at the time of Contract execution shall apply whether or not the proper edition was set out in the Contract Documents. References to standards, codes, manufacturer's instructions and guarantees shall apply in full, except:

- .1 they do not supersede more stringent standards set out in the Contract Documents, and
- .2 any exclusions or waivers that are inconsistent with the Contract Documents do not apply.

§ 1.2.5 Relation of Specifications and Drawings

General Requirements in the Specifications govern the execution of all Work. Summary paragraphs present a brief indication of the Work, but do not limit the Work as later detailed. Should the Drawings and Specifications have internal inconsistencies, then the Contractor shall base the bids and construction on the most expensive combination of quality and quantity of work indicated. For purposes of construction, the

Architect shall determine the appropriate Work, after the Contractor brings the inconsistency to the Architect's attention. Failure to report an inconsistency shall be evidence that Contractor has elected to proceed in the more expensive manner.

§ 1.3 Capitalization

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

§ 1.4 Interpretation

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

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

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

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

§ 1.6 Notice

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

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

§ 1.7 Digital Data Use and Transmission

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

§ 1.8 Building Information Models Use and Reliance

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

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. **The Owner shall designate in writing a representative who is authorized to**

speak on behalf of the Owner. The Board of Trustees, by majority vote, is the only representative of the Owner, an independent school district, having the power to enter into a contract, to approve a Change Order requiring an increase in the Contract Sum, or agree to an extension to the contractual Completion Date, unless this authority is lawfully delegated. Neither the Architect nor Contractor may rely on the direction of any employee of Owner who has not been designated in writing by the Owner. Owner shall not be financially responsible for actions taken by the Architect or Contractor in reliance upon direction from unauthorized personnel.

§ 2.1.2 Not Used

§ 2.1.3 The Owner, being a public body under the laws of the State of Texas, must have funds in the full amount of the Contract on hand prior to award and execution of the Contract. Furthermore, no Contract exists between the Owner and the Contractor until the formation of the Contract is approved by a majority of the Board of Trustees of the Owner in open session at a duly held Board meeting, and the Contract is signed by an authorized Owner's representative.

§ 2.1.4 At any time prior to the Owner's receipt of the executed Agreement with the required bonds and insurance, the Owner may, at its sole option and without cause, reject the offer described in the Agreement by delivering to the Contractor a written notice stating so. Such notice shall be signed by the Owner's designee, and shall be effective on receipt by the Contractor. The rejection of the offer described in this Agreement shall cause no obligation or duty to the District save return of bid or proposal security, if any, if rejection is without cause. This paragraph does not pertain to rejection for cause by the Owner, or for the Contractor's failure to provide required bonds or insurance.

§ 2.2 Evidence of the Owner's Financial Arrangements (Deleted)

(Paragraphs deleted)

§ 2.3 Information and Services Required of the Owner

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

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

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 If requested to do so, in writing, by Contractor, prior to start of the Work, the Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations **which are known to the Owner** for the site of the Project, and a legal description of the site. The Contractor **may** rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work. **The survey shall not relieve Contractor from its obligations to examine the site.**

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Contractor will be furnished, free of charge, five (5) copies of Drawings and Project Manuals. The Contractor will be furnished, at its sole cost and expense, as many additional copies as it may require.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has

been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

§ 2.5.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

§ 2.5.2 After the Work is complete the Owner may make emergency repairs to the Work if necessary to prevent further damage, or if the Contractor does not promptly respond to a notice of a condition requiring repairs. Contractor shall be responsible to Owner for this cost if the reason for the repairs is defects in Contractor's Work. If payments then or thereafter due the Contractor are not sufficient to cover such costs, the Contractor shall pay the difference to the Owner.

§ 2.6 Owner's Occupancy

Contractor agrees that the Owner may place and install as much equipment and furnishings during the progress of the building construction as is possible before completion of various parts of the Work, or may occupy portions of the Work before substantial completion of the entire Work, and further agrees that such placing and installing of equipment and furnishings or occupancy of portions of the Work shall not in any way evidence the substantial completion of the entire Work, or signify Owner's acceptance of the Work, nor does it affect claims for liquidated damages in case Substantial Completion is not achieved as required unless the failure to reach Substantial Completion is the result of the early move-in or occupancy.

ARTICLE 3 CONTRACTOR

§ 3.1 General

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

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

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

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 The Contractor shall not be entitled to any additional time or compensation for any additional work caused by the Contractor's fault, improper construction, or by Contractor's failure to carefully study and compare the Contract Documents to actual observable site conditions prior to execution of the Work. Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information

furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents. Neither the Owner nor the Contractor is required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations, but any nonconformity discovered by or made known to the Contractor shall be reported promptly to the Architect.

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

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.2.5 Prior to performing any Work, and only if applicable, Contractor shall locate all utility lines as shown and located on the Drawings and Specifications, including telephone company lines and cables, sewer lines, water pipes, gas lines, electrical lines, including, but not limited to, all buried pipeline and buried telephone cables, and shall perform any Work in such a manner so as to avoid damaging any such lines, cables, pipes, and pipelines. In addition, Contractor shall independently determine the location of same. Contractor shall be responsible for any damage done to such utility lines, cables, pipes and pipelines during its construction work, and shall be responsible for any loss, damage, or extra expense resulting from such damage. The Contractor and each Subcontractor shall evaluate and satisfy themselves as to the conditions and limitations under which the Work is to be performed, including

- .1 the location, condition, layout and nature of the Project site and surrounding areas,
- .2 generally prevailing climatic conditions,
- .3 anticipated labor supply and costs,
- .4 availability and cost of materials, tools and equipment and
- .5 other similar issues.

§ 3.2.6 Notwithstanding the delivery of a survey or other document by the Owner, Contractor shall perform all work in such a non-negotiated manner so as to avoid damaging any utility lines, cables, pipes or pipeline on the property. Contractor shall be responsible for any damage done to such lines, cables, pipes and pipelines during its construction work resulting from its negligent conduct.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects

to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

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

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

§ 3.3.4 The Contractor and subcontractor shall ensure that on-site fraternization shall not occur between personnel under the Contractor's or subcontractor's direct or indirect supervision and students, school employees and the general public.

§ 3.4 Labor and Materials

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

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

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

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

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

§ 3.6.1 The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.6.2 The Contractor shall cooperate with Owner, take such action and execute such documents as may be necessary so that Owner may utilize its exception from the Texas Sales and Use Tax for materials used in such Project. Owner's tax exempt number will be furnished to the Contractor.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.1.1 The Contractor shall pay directly all temporary utility charges, tap charges, and water meter charges, without reimbursement from Owner.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

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

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

§ 3.8 Allowances

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

§ 3.8.2 Unless otherwise provided in the Contract Documents,

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

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

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.1.1 The superintendent shall remain on the Project until final acceptance.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

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

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, one record copy of the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one record copy of the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form and paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

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

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

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

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

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

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

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

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

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

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

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

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect. The Contractor stipulates and agrees that the Owner has no duty to discover any design errors or omissions in the Drawings, Plans, Specifications and other Construction Documents and has no duty to notify Contractor of same. By entering into the Contract Documents or any other agreement with any Architect, Owner does not warrant the adequacy of any Drawings, Plans, Specifications or other Construction Documents.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

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

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

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

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

§ 3.16 Access to Work

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

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

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

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement. **The term "Architect" means the Architect or the Architect's authorized representative.**

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

§ 4.2 Administration of the Contract

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

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

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

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

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

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

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the

Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

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

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

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

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

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

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

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

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

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

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

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

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

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

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.2.5 The Contractor shall disclose to the Owner any ownership interest or affiliation between the Contractor and any potential subcontractor prior to entering into a subcontract and the Owner shall have the right, in its sole discretion and pursuant to 5.2.3, to reject any such affiliated subcontractor. Further, Contractor shall not subcontract the work as a whole.

The approval of subcontractors in no way relieves the Contractor from full responsibility for performance and completion of the Work and its obligations under the Contract Documents. The Contractor shall be fully responsible for the performance of its subcontractors, including those recommended or approved by the Owner.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

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

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor;
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract;
- .3 **such assignment shall not constitute a waiver by Owner of its right against Contractor, because of defaults, delays and defects for which a subcontractor or material vendor may also be liable; and**
- .4 **the subcontractor provides bonds as required by law of Prime Contractors, and by Owner.**

§ 5.4.2 Owner shall only be responsible for compensating subcontractors for Work done or materials furnished when the Owner gives written notice of its acceptance of the subcontract agreement. Owner shall be responsible for compensating subcontractors for undisputed amounts not previously paid to the Owner.

§ 5.4.3 Each subcontract shall specifically provide that the Owner shall only be responsible to the subcontractor after written notice for undisputed amounts not previously paid to Contractor subsequent to the Owner's exercise of any rights under this conditional assignment.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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

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

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

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

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12. **It shall be the responsibility of the Contractor to assist, review, coordinate, and schedule work performed by any of Owner's separate contractors including the hazardous materials abatement contractor.**

§ 6.2 Mutual Responsibility

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

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

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

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

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

§ 6.3 Owner's Right to Clean Up

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

§ 6.3.2 Job site cleanup will be performed on a daily basis. The Owner and/or Program Manager will periodically check the site to see that all construction areas, nearby roads, walkways and/or grounds are maintained in a clean and safe manner. The cost to clean up the site will be assessed to the Contractor each time the Owner is required to clean the area due to failure of the Contractor or his designee to satisfactorily perform or enforce this site's cleanup requirements. The Owner will assess the cost. Before assessing the cost, the Contractor shall be given notice of the failure to clean the site and one business day after the date of the notice to clean up the site. If the Contractor fails to clean up the site, after notice, the Owner may assess the cost for clean up.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

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

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

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work. **Except as permitted in Paragraph 7.3 or 15, a change in the Contract Sum or the Contract Time shall be accomplished only by Change Order.**

§ 7.2 Change Orders

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

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

§ 7.3 Construction Change Directives

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

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

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

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

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing

the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

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

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

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

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

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

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

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor. **The Contractor shall carry out such written orders promptly.** If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

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

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

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

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

§ 8.2 Progress and Completion

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

§ 8.2.1.1 If Contractor fails to achieve Substantial Completion of the Work on or before the date(s) specified for Substantial Completion in this Contract and the other Contract Documents, Contractor shall pay to the Owner, as liquidated damages, the sum set out in the Contract between Owner and Contractor for each calendar day that Substantial Completion is delayed after the date(s) specified for Substantial Completion. The total liquidated damage claim is determined by multiplying daily-liquidated damage amounts stated in the Contract by the number of days late. A fraction of a day shall be counted as a full day. It is hereby agreed that the actual damages which Owner will suffer by reason of later completion would be difficult to ascertain, and the liquidated damages to which Owner is entitled hereunder are a reasonable forecast of just compensation for the harm that would be caused by Contractor's failure to achieve Substantial Completion of the Work on or before the date(s) specified for Substantial Completion, and not a penalty. Liquidated damages shall be paid as they accrue and may be adjusted from any progress payment due.

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

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.1.1 In planning his construction schedule within the agreed Contract Time, it shall be assumed that the Contractor has anticipated the amount of adverse weather conditions and normal conditions expected at the site of the Work for the season or seasons of the year involved. Only those weather delays attributable to other than normal weather conditions and expected adverse weather conditions will be considered by the Architect.

§ 8.3.1.2 Contractor shall anticipate the following number of calendar days lost due to rain or inclement in executing the contract. No extensions of time will be granted until the number of calendar days listed have been exceeded. The allowed number of calendar days for each month cannot be carried over to the following months.

January	3 Days	May	4 Days	September	7 Days
February	3 Days	June	4 Days	October	4 Days
March	2 Days	July	3 Days	November	3 Days
April	3 Days	August	4 Days	December	3 Days

Init.

§ 8.3.1.3 When the Contract Time has been extended, as provided under this Paragraph 8.2, such extension of time shall not be considered as justifying extra compensation to the Contractor for administrative costs or other such reasons.

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

§ 8.3.2.1 On or before the fifteenth (15th) day of each month of the Work, Contractor shall submit in writing a request for all time extensions to which it believes itself to be entitled for the preceding month, other than time extensions for changes in the Work, which are to be submitted in accordance with the requirements of Article 7.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

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

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

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

§ 9.3 Applications for Payment

§ 9.3.1 At least ten 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, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, 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 if provided for in the Contract Documents. **The Contractor shall submit Applications for Payment in triplicate, using AIA Document G702 and G703 as referred to in Subparagraph 1.6.1.** **§ 9.3.1.1** As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

(Paragraph deleted)

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

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage,

and transportation to the site, for such materials and equipment stored off the site. **Upon payment by the Owner of the invoiced cost, title to all such materials and equipment shall irrevocably pass to the Owner. The Contractor warrants that title to all materials and equipment covered by an Application for Payment will pass to Owner upon the receipt of payment by the Contractor. Such title shall be free and clear of all liens, claims, security interests or encumbrances. No work, material or equipment covered by an Application for Payment shall be subject to an agreement under which an interest is retained or an encumbrance is attached by the seller, the Contractor, or other party. CONTRACTOR AGREES TO INDEMNIFY OWNER FROM AND LOSS RESULTING FROM A BREACH OF THIS SECTION. Any off-site storage shall be in a bonded warehouse, suitably marked for the individual project, in addition to the requirements above.**

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

§ 9.4 Certificates for Payment

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

§ 9.4.1.1 A retainage in the amount of five percent (5%) shall be withheld from the Certificates for Progress Payments, in accordance with the Agreement.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

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

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
- .7 repeated failure to carry out the Work in accordance with the Contract Documents; or
- .8 **failure to submit a written plan indicating action by the Contractor to regain the time schedule for completion of Work within the Contract Time.**

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

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

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect. **If the Owner becomes aware that Contractor is not current in its legitimate obligations to suppliers, laborers and/or subcontractors on the Project, Owner may (but is not obligated to) withhold payment sufficient to cover the current legitimate obligations until it receives reasonable proof from the Contractor that this situation no longer exists. Payments to the Contractor shall not be construed as releasing the Contractor or his Surety from any obligation under the Contract Documents.**

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

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

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

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

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

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

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

§ 9.7.1 If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written 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.

§ 9.7.2 If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to the Contract Documents, such payment shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due to Owner, or the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective Work, pursuant to the Contract the Owner shall have an absolute right to offset such amount against the Contract Sum and may, in the Owner's sole discretion, elect either to:

- .1 deduct an amount equal to that which the Owner is entitled from any payment then or thereafter due to Contractor from the Owner, or
- .2 issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.1.1 The only remaining Work shall be minor in nature, so that the Owner or Owner's tenants could occupy the applicable portion of the Project on that date, and the completion of the work by the Contractor would not materially interfere with or hamper the Owner or Owner's tenants normal school operations or other intended use. As a further condition of Substantial Completion of the whole or designated portion thereof, the Contractor shall certify that all remaining Work with respect thereto will be completed within the time specified by the Contract Documents for Final Completion.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion. **Except with the consent of the Owner, the Architect shall perform no more than two inspections to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Architect for any additional inspections.**

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

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner may make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.8.6 The Contractor shall keep all required insurance in full force, and utilities on, until the Certificate of Substantial Completion is issued, and accepted by the Owner in writing, regardless of the stated date of Substantial Completion. Acceptance shall not be unreasonably withheld.

§ 9.9 Partial Occupancy or Use

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

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

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

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond

satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

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

§ 9.10.4 The making of final payment
(Paragraphs deleted)

does not constitute a waiver of any claims by the Owner.

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

§ 10.1.1 The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.1.2 Contractor's employees, agents, subcontractors, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, shall not perform any service for Owner while under the influence of any amount of alcohol or any controlled substance, or use, possess, distribute, or sell alcoholic beverages while on Owner's premises. No person shall use, possess, distribute, or sell illicit or unprescribed controlled drugs or drug paraphernalia; misuse legitimate prescription drugs; or act in contravention of warnings on medications while performing the Work or on Owner's premises.

§ 10.1.3 Contractor has adopted or will adopt its own policy to assure a drug-free and alcohol-free workplace while on Owner's premises or performing the Work. Contractor will remove any of its employees, agents, subcontractors, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, from performing the Work any time there is suspicion of alcohol and/or drug use, possession, or impairment involving such person, and at any time an incident occurs where drug or alcohol use could have been a contributing factor, Owner has the right to require Contractor to remove any person from performing the Work any time cause exists to suspect alcohol or drug use. In such cases, the person so removed may only be considered for return to work after the Contractor certifies as a result of a for-cause test, conducted immediately following removal, that said person was in compliance with this Contract. Contractor will not use any person to perform the Work who fails or refuses to take, or tests positive on, any alcohol or drug test.

§ 10.1.4 Contractor will comply with all applicable federal, state and local drug and alcohol-related laws and regulations. Owner has also banned the presence of all weapons on the Project site, whether or not the Owner thereof has a permit for a concealed weapon, and Contractor agrees that Contractor's representatives, employees, agents, and subcontractors will abide by same.

§ 10.2 Safety of Persons and Property

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

- .1** employees on the Work, school personnel, students, and other persons on Owner's premises, and other persons who may be affected thereby, including the installation of fencing between the Work site and the occupied portion of a connecting or adjacent educational facility;

- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- .3 other property at the site or adjacent thereto, such as **other buildings, fencing**, trees, shrubs, lawns, walks, **athletic fields, facilities and tracks**, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

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

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

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

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

§ 10.2.7.1 When all or a portion of the Work is suspended for any reason, the Contractor shall do all things necessary to protect the Owner's premises and all persons from damage and injury.

§ 10.2.7.2 The Contractor shall be responsible for the protection and security of the Work until it receives written notification that the Substantial Completion of the Work has been accepted by the Owner.

§ 10.2.8 Injury or Damage to Person or Property

§ 10.2.8.1 If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of the injury or damage, whether or not insured, shall be given to the other party. The written notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.2.8.2 The Contractor shall promptly report in writing to the Owner and Architect all accidents arising out of or in connection with the Work which cause death, personal injury, or property damage, giving full details and statement of any witnesses. In addition, if death, serious personal injuries, or serious property damages are caused, the accident shall be reported immediately by telephone or messenger to the Owner and the Architect.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not

addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect in writing of the condition.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time may be extended appropriately and the Contract Sum may be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 Deleted

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

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

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

§ 11.1.2.1 If the Contract amount is \$100,000 or more, the Contractor shall furnish a Performance Bond equal to one hundred percent (100%) of the Contract Sum. If the Contract amount is \$25,000 or more, the Contractor shall furnish a Payment Bond equal to one hundred percent (100%) of the Contract Sum. There shall be separate bonds, the terms of which and the sureties of which are satisfactory to the Owner and which

comply with Chapter 2253, Texas Government Code, Title 10 (Vernon Supp. 1999), and all other applicable law.

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

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

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 **Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 **Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide written notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of written notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of written notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

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

contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

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

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

§11.5 Adjustment and Settlement of Insured Loss

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

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

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

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

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

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

§ 12.2.1.2 The Owner may make emergency repairs to the Work or take such other measures necessary under the circumstances, if the Contractor does not promptly respond to a Notice of Defect or nonconforming Work. Contractor shall be responsible to Owner for this cost if the reason for the repairs is attributable to the Contractor. If payments then or thereafter due to the Contractor are not sufficient to cover such costs, then the Contractor shall pay the difference to the Owner on demand.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

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

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2. **Any corrective Work performed or to be performed under or pursuant to Paragraph 12.2 shall be warranted to the same extent as the Work is warranted hereunder for the greater of the remainder of the applicable warranty (corrective) period or ninety (90) days from the date such corrective Work has been completed.**

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

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

§ 12.2.4.1 Where nonconforming Work is found, the entire area of work involved shall be corrected unless the Contractor can completely define the limits to the Architect's satisfaction. Additional testing, sampling, or inspecting needed to define nonconforming Work shall be at the Contractor's expense, and performed by the Owner's testing laboratory if such services are reasonably required by the Architect. All corrected Work shall be retested at the Contractor's expense. Reasonable Architectural services required to analyze nonconforming Work shall be paid for by the Contractor.

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

§ 12.3 Acceptance of Nonconforming Work

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

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. **The Contractor shall not assign the Contract as a whole, or in part, without written consent of the Owner.**

§ 13.2.2 **The Owner may, without consent of the Contractor, assign the Contract in whole or in part. In such event, the assignee shall assume the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignments.**

§ 13.3 Rights and Remedies

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

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

§ 13.3.3 **Neither Contractor nor any of its materialmen, laborers, or subcontractors shall have any lien rights against the Owner's lands, building funds, materials or other property. No materialmen, laborers or subcontractors of the Contractor shall have any enforceable rights against the Owner on this Contract. Materialmen, laborers and subcontractors of the Contractor may have rights under any Payment Bond provided by the Contractor, but cannot look to the Owner for any help in enforcement of those rights.**

§ 13.4 Tests and Inspections

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

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

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

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

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

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

(Paragraphs deleted)

§ 13.5 Prevailing Wage Rates

§ 13.5.1 In compliance with laws of the State of Texas relating to labor, the building construction wage rates listed in the Contract Documents have been ascertained and determined by the Owner as the general prevailing rates in the locality of the District for the classifications listed. The Contractor and each subcontractor shall pay to all laborers, workers and mechanics employed by them in the execution of this Contract not less than such rates for each craft or type of worker or mechanic needed to execute the Contract. If it becomes necessary to employ any person in a trade or occupation not herein listed, such person shall be paid not less than an hourly rate fairly comparable to the rates shown hereinafter.

§ 13.5.2 This determination of prevailing wages shall not be construed to prohibit the payment of more than the rates named.

§ 13.5.3 The Contractor shall forfeit, as a penalty to the Owner, Sixty Dollars (\$60.00) for each laborer, worker or mechanic employed, for each calendar day, or portion thereof, such laborer, worker or mechanic is paid less than the rates stipulated hereinafter for any Work done under this Contract by him or by any subcontractor under him.

§ 13.6 Certification Of Asbestos-Free Project

§ 13.6.1 Contractor shall submit to the Architect a letter addressed to the Owner certifying that all materials used in the construction shall be asbestos free. The General Contractor shall provide certification for himself, all subcontractors, vendors, suppliers, and other entities, stating that materials and/or equipment used in the construction of the project do not contain asbestos in any form or concentration. Certification letters shall be dated, shall reference this specific Project, and shall be signed by an officer of the construction company.

§ 13.6.2 Final payment shall not be made until this letter of certification has been received.

§ 13.7 Certification Of Lead-Free Potable Water System

§ 13.7.1 Contractor shall submit to the Architect a letter, addressed to the Owner, stating that any components of the potable water system installed by the Contractor are lead-free as defined by the Safe Drinking Water Act Amendment of 1986 and the Lead Contamination Control Act of 1988.

§ 13.8 Family Code Child Support Certification

By signing this Agreement, the Contractor certifies a follows: "Under Section 321.006, Texas Family Code, the vendor or applicant certifies that the individual or business entity named in this Contract, bid, or application is not ineligible to receive the specified grant, loan, or payment and acknowledges that this Contract may be terminated and payment may be withheld if this certification is inaccurate.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped; or
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents.

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

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon fourteen business days' written notice to the Owner and Architect, terminate the Contract.

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

§ 14.1.5 Notwithstanding anything to the contrary contained herein or in the other Contract Documents, neither the Owner or any other party shall be responsible for damages for loss of anticipated profits on Work not performed on account of any termination described in Subparagraphs 14.1.1, 14.1.2, and 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents;
- .5 **fails to furnish the Owner, upon request, with assurances satisfactory to the Owner evidencing the Contractor's ability to complete the Work in compliance with all the requirements of the Contract Documents;**
6. **engages in conduct that would constitute a violation of state or federal criminal law, including, but not limited to, the laws prohibiting certain gifts to public servants, or engages in conduct that would constitute a violation of the Owner's ethics or conflict of interest policies; or**
7. **fails to proceed continuously and diligently with the construction and completion of the Work, except as permitted under the Contract Documents.**

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

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

§ 14.2.4 Deleted

§ 14.2.5 If a Performance Bond has been furnished and the Contractor is declared by the Owner to be in default under the Contract, the Surety shall promptly remedy the default by completing the Contract in accordance with its terms and conditions, or by obtaining a bid or bids in accordance with its terms and conditions. At Owner's election, upon determination by the Owner and the Surety of the lowest responsible

bidder, the Surety will complete the Work or will arrange for a Contract between such bidder and the Owner, and make available as Work progresses sufficient funds to pay the cost of completion less the balance of the Contract Sum, but not exceeding the Penal Sum of the bond and other costs and damages for which the Surety may be liable under the bond. The phrase "balance of the Contract Sum" as used herein shall mean the total amount payable by the Owner to the Contractor under the Contract and amendments thereto less the amount previously paid by the Owner to the Contractor.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

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

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

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

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

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

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

§ 15.1.2 Time Limits on Claims

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

§ 15.1.3 Notice of Claims

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

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

§ 15.1.4 Continuing Contract Performance

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

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

§ 15.1.5 Claims for Additional Cost

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

§ 15.1.6 Claims for Additional Time

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

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction. Claims for additional time shall be documented in a written report submitted with each Application for Payment as periodically scheduled in the Contract. Claims for additional time due to adverse weather conditions will not be considered at the end of the Project unless so previously documented.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

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

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

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

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

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

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

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

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

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

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation.

§ 15.3.3 Deleted

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

(Paragraphs deleted)

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SUPPLEMENTARY GENERAL CONDITIONS

The Conditions of the Contract, consisting of the General Conditions (AIA A201-2017) and the Supplementary General Conditions, shall Govern the construction of the entire Project. In the event of conflict between the provisions of the General Conditions and the Supplementary General Conditions, the provisions of the Supplementary General Conditions shall control.

ARTICLE 1. TEXAS SALES TAX:

Contractor shall cooperate with Owner, take such action and execute such documents as may be necessary so that Owner may utilize its exemption from the Texas Sales and Use Tax for materials used in such Project. The tax-exempt identification number for the Flour Bluff Independent School District is 1-74-6000593-1.

ARTICLE 2. LAYING OUT BUILDING:

Where applicable, Owner shall employ an experienced and competent licensed surveyor or civil engineer to establish a permanent bench mark to which easy access may be had during the progress of the Work, determine all lines and grades, and verify same from time to time during the progress of the Work.

ARTICLE 3. COOPERATION WITH OWNER & CITY BUILDING OFFICIALS:

When required, Contractor shall notify the proper official of the City of Corpus Christi in advance of all stopping and starting of construction. Contractor shall cooperate with the City officials at all times. If any authorized City official, or authorized representative of Owner, should deem an inspection necessary, Contractor shall provide the proper facilities to ensure that such official, or representative, can conveniently examine and inspect the Work. The Contractor shall document all City inspections by recording the date and time of the inspection and the name of the inspector. This information shall be submitted by the Contractor to the Engineer on a monthly basis along with Contractor's request for payment.

ARTICLE 4. MATERIALS:

Unless otherwise indicated in the Contract Documents, all materials shall be new, in strict compliance with the Specifications and the best of their respective kinds.

Before ordering any materials or doing any work, Contractor shall verify all measurements at the site and shall be responsible for the correctness of same. No extra charge or compensation will be allowed on account of any difference between actual dimensions and the measurements indicated on the Drawings. Any differences which may be found shall be submitted to Engineer for his consideration and instructions before proceeding with the work.

Materials shall be furnished at such times and in such quantities as to insure the uninterrupted progress of the work according to schedule. Materials stored shall be properly protected from weather and damage.

Upon receipt of notice from Engineer that any material placed in the Project or on the site is not of the quality specified or has been improperly placed, Contractor shall remove same from the site or have same replaced, as the case may be, within seventy-two (72) hours after receipt of such notice.

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ARTICLE 5. INSPECTION & TESTING of MATERIALS:

All testing of materials and equipment used in the construction of the Project shall be conducted at the discretion of Owner and at Owner's expense, unless otherwise specifically provided in the Contract Documents. Any re-testing of material or equipment that fails to meet the requirements of the specifications will be at Contractor's expense.

ARTICLE 6. HANDLING MATERIALS:

Contractor shall be responsible for the proper care and protection of all materials, tools and equipment delivered to the site for his use.

When any room of the Project is used as a shop, storeroom, or otherwise, the Contractor will be held responsible for any repairs, patching or cleaning arising from such use.

Contractor shall protect and be responsible for any damage to his work or materials, from the date of the Contract until the final payment is made, and shall make good without cost to Owner, any damage or loss that may occur during this period.

Cement, lime, gypsum and other materials affected by the weather shall be covered and protected to keep them free from damage at all times.

Contractor shall store all materials as directed, in a manner that will allow the Engineer or Owner's representative to inspect them. Should any material be found defective or in any way not in accordance with the Contract, such material, without regard to the stage of completion, may be rejected by Engineer and, if so rejected, shall be removed at once from the premises by Contractor installing same.

ARTICLE 7. SALVAGED MATERIALS:

Used materials belonging to Owner or obtained from demolition or excavation operations at the site of the Project and reconditioned for incorporation into the Project area is hereafter termed "salvaged materials". Similar materials, owned by parties other than Owner and purchased, or to be purchased, for incorporation into the Project, are termed "second hand material".

Salvaged materials may be incorporated into the Project only if allowed in the Contract Documents.

ARTICLE 8. INSURANCE:

- A. Contractor's Liability Insurance
Contractor shall purchase and maintain the liability insurance required by Paragraph 11.1 of the General Conditions with minimum limits as follows:
- | | | |
|----|--|-------------|
| 1. | General Aggregate Limit
Applies to all bodily injury and property damage
(other than products/completed operations)
personal injury and advertising injury. | \$1,000,000 |
| 2. | Products/Completed Operations Aggregate
Applies to all bodily injury and property
damage included in products/completed
operations. | \$1,000,000 |

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|----|---|-------------|
| 3. | Personal & Advertising Injury
Applies to all claims by one person or organization. | \$1,000,000 |
| 4. | Each Occurrence Limit
Applies to all bodily injury and property damage incurred in one occurrence. | \$1,000,000 |
| 5. | Umbrella (excess liability policy)
or additional limits on all risks. | \$1,000,000 |

All insurance must be written by insurance companies that are rated in the A.M. Best Key Rating Guide -- Property & Casualty with a policy holder's rating of A and a financial size category of Class VII. A Designated Project or Premises Endorsement (CG 25 01 11 85) that applies the general aggregate to the project must be provided. The Owner is to be named as additional insured in the policy and a waiver of subrogation shall be provided to the Owner. No policy shall contain any exclusion for explosion, collapse, or underground coverage.

B. Builder's Risk or Installation Floater Insurance

Provide coverage against the perils of fire, lightning, windstorm, hail, explosion, smoke, theft, vandalism, malicious mischief, pollution clean-up, debris clean up and all other perils in the amount of one hundred percent (100%) of the value of the improvements including on-site material storage, transit and materials stored off site. Additionally, this coverage shall provide protection to the full replacement value for machinery or equipment altered and repaired, up to installation, during testing, and until acceptance by Owner. Coverage shall be extended to any Owner furnished equipment from the point of delivery to Contractor to the point of installation at the project location in its final resting place.

C. Workers' Compensation Insurance Certificate

1. Definitions:

Certificate of coverage ("certificate"). A copy of a certificate of insurance, a certificate of authority to self-insure issued by the Texas Workers' Compensation Commission, or a coverage agreement (TWCC-81, TWCC-83, or TWCC-84), showing statutory worker's compensation insurance coverage for the person's or entity's employees providing services on a project, for the duration of the project.

Duration of the project - includes the time from the beginning of the work on the project until the Contractor's/person's work on the Project has been completed and accepted by the Owner.

Persons providing services on the Project ("subcontractor" in 406.096, Texas Labor Code) - includes all persons or entities performing all or part of the services the Contractor has undertaken to perform on the Project, regardless of whether that person contracted directly with the Contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the Project. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. "Services" does not

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include activities unrelated to the Project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

2. The Contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all employees of the Contractor providing services on the Project, for the duration of the Project.
3. The Contractor must provide a certificate of coverage to the Owner prior to being awarded the contract.
4. If the coverage period shown on the Contractor's current certificate of coverage ends during the duration of the Project, the Contractor must, prior to the end of the coverage period, file a new certificate of coverage with the Owner showing that coverage has been extended.
5. The Contractor shall obtain from each person providing services on the Project, and provide to the Owner:
 - (a) a certificate of coverage, prior to that person beginning work on the Project, so the Owner will have on file certificates of coverage showing coverage for all persons providing services on the Project; and
 - (b) no later than seven days after receipt by the Contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the Project.
6. The Contractor shall retain all required certificates of coverage for the duration of the Project and for one year thereafter.
7. The Contractor shall notify the Owner in writing by certified mail or personal delivery, within 10 days after the Contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the Project.
8. The Contractor shall post on the Project site a notice, in the text, form and manner prescribed by the Texas Workers' Compensation Commission, informing all persons providing services on the Project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.
9. The Contractor shall contractually require each person with whom it contracts to provide services on the Project, to:
 - (a) provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all of its employees' providing services on the Project, for the duration of the Project;
 - (b) provide to the Contractor, prior to that person beginning work on the Project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the Project, for the duration of the Project;
 - (c) provide the Contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period

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shown on the current certificate of coverage ends during the duration of the Project.

(d) obtain from each other person with whom it contracts, and provide to the Contractor:

(1) a certificate of coverage, prior to the other person beginning work on the Project; and

(2) a new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the Project;

(e) retain all required certificates of coverage on file for the duration of the Project and for one year thereafter;

(f) notify the Owner in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the Project; and

(g) contractually require each person with whom it contracts, to perform as required by paragraphs a-f, with the certificates of coverage to be provided to the person for whom they are providing services.

10. By signing the Construction Contract or providing or causing to be provided a certificate of coverage, the Contractor is representing to the Owner that all employees of the Contractor who will provide services on the Project will be covered by workers' compensation coverage for the duration of the Project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of the self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the Contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.
11. The Contractor's failure to comply with any of these provisions is a breach of contract by the Contractor which entitles the Owner to declare the contract void if the Contractor does not remedy the breach within ten days after receipt of notice of breach from the Owner.
12. The coverage requirement recited above does not apply to sole proprietors, partners, and corporate officers who are excluded from coverage in an insurance policy or certificate of authority to self-insure that is delivered, issued for delivery, or renewed on or after January 1, 1996. 28 TAC 110.110(i).

D. Business Automobile Liability Insurance

Contractor shall purchase and maintain business automobile liability insurance, covering all owned, and hired, and non-owned vehicles, with a minimum combined single limit of bodily injury (including death) and property damage to \$1,000,000 per occurrence. Such insurance is to include coverage for loading and unloading hazards.

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ARTICLE 9. ABSENCE of LIEN:

Under the laws of the State of Texas, neither the Contractor nor any sub-contractor, mechanic, materialman or laborer, is entitled to acquire or attempt to acquire or contract for any lien upon the improvements covered by this Contract or the land upon which they are to be situated.

ARTICLE 10. DAMAGES:

If the Project is not substantially completed in accordance with the Contract Documents within the Contract Time, then Owner shall be entitled to recover from the Contractor, at Owner's sole election: (a) all loss or damage incurred or sustained by Owner, including but not limited to additional construction costs, fees, interest, loss of revenue, professional fees and attorneys fees; or (b) liquidated damages in the amount of One Thousand Hundred Dollars (\$1,000.00) per day for each calendar day thereafter until the Project is completed.

ARTICLE 11. ASBESTOS:

The Engineer has, to the best of his knowledge, included no new materials or components that contain asbestos. The Contractor and, in turn, his Sub-contractors and suppliers, shall be responsible for verifying same prior to all material orders and shall, if asbestos is determined to be present, identify same to Engineer prior to ordering. Asbestos containing materials may not be used in this contract.

ARTICLE 12. PROGRESS PAYMENTS – RETAINAGE:

AIA Document A201 - 2017, General Conditions of the Contract for Construction, Section 9.4 CERTIFICATES FOR PAYMENT shall be amended to reflect 10% retainage for all progress payments in lieu of 5% as currently stated in the General Conditions. This means that Owner will pay contractor no more than 90% of completed work until Final Completion and acceptance of the project.

ARTICLE 13. THE ARCHITECT

AIA Document A201 - 2017, General Conditions of the Contract for Construction, Article 4 Engineer shall be amended to reflect the Engineer to take the responsibilities of the Engineer at all locations referenced in the document. Replace the word "Architect" with "Engineer". Replace the word "Architecture" with "Engineering".

ARTICLE 11. CHANGE ORDER COSTS:

When the Engineer establishes that the method of valuation for Changes in the Work will be net cost-plus percentage fee in accordance with General Conditions, the percentage fee will be;

Ten (10) percent overhead and profit on the net cost of our own Work;

Five (5) percent on the cost of work done by any subcontractor.

ARTICLE 12. Substantial Completion:

AIA Document A201 - 2017, General Conditions of the Contract for Construction, Article 9.8.1 Substantial Completion. Add the following:

To be considered substantially complete, Contractor shall be complete with all required testing, HVAC Test, Adjust and Balancing, and Commissioning of electrical systems, HVAC systems, Building Automation Control Systems and other systems as applicable as required by the Contract Documents (including project manual), project specifications and drawings and the International Energy Conservation Code with Preliminary Report(s) being issued to Engineer and Owner for acceptance. Reports shall include a complete list of any deferred testing or deficiencies that require further remediation.

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ARTICLE 13. Final Completion and Final Payment:

AIA Document A201 - 2017, General Conditions of the Contract for Construction, Article 9.10 Final Completion and Final Payment. Add the following:

The project Architect/Engineer for this project will not issue a Final Certificate for Payment and release of retainage unless all testing, HVAC Test, Adjust, and Balance, and Commissioning reports required by the Contract Documents (including project manual), project specifications and drawings and the International Energy Conservation Code are provided in their FINAL format showing that all findings of noncompliance have been corrected.

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**COMPETITIVE SEALED PROPOSAL
RFP# ECC-2024151-3**

**BOARD OF TRUSTEES
FLOUR BLUFF INDEPENDENT SCHOOL DISTRICT
CORPUS CHRISTI, TEXAS**

Offerors:

This Proposal is submitted by _____
_____, whose address is _____
_____ (hereafter called "Offeror"), for the
construction of **"FBISD ECC HVAC PACKAGED ROOFTOP UNIT REPLACEMENTS - 2024"**, Flour
Bluff I.S.D.,
Corpus Christi, Texas, (hereafter called "Project").

BASE Proposal: Proposer agrees to furnish for the total sum of

_____ Dollars (\$_____), all labor, services,
materials, tools, equipment and supervision necessary to the full and final completion of the project,
and everything incidental thereto, as shown on the Drawings, stated in the Specifications, or properly
inferable therefrom, all in accordance with the Contract Documents governing the construction of
such project prepared by Stridde, Callins and Associates, Inc., (hereafter called the "Engineer").

Contractor's Base Proposal includes a \$5,000.00 Contingency Allowance as required by Specification
Section 01 20 00.

BASE PROPOSAL COST BREAKDOWN:

HVAC	\$ _____
Electrical	\$ _____
Test, Adjust and Balance	\$ _____
General Construction	\$ _____
General Overhead	\$ _____
Contingency Allowance:	<u>\$5,000.00</u>
(Total Base Proposal Sum)	\$ _____

ITEM OF WORK

HVAC
ELECTRICAL
ROOFING
TEST AND BALANCE "TAB"
GENERAL CONSTRUCTION

PROPOSED CONTACTOR LIST

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ALTERNATE NO. 1 (Additive) – New Windstorm Support Cables: Offeror agrees that if this additive Alternate No. 1 is accepted by the Owner, then they will provide new 316 stainless steel RTU windstorm support cables and accessories to replace the existing galvanized steel cables as specified and shown on drawings for the AAON RTUs. If this Alternate No. 1 item is not accepted by the Owner, then the Offeror shall reinstall and reuse existing support cable systems with the installation of the new equipment as shown on the drawings and specified for the AAON RTUs. The amount to be Added to the Base Proposal amount for Alternate No. 1 is

_____ Dollars

(\$_____)

ALTERNATE NO. 2 (Additive) – Existing AAON Curb Adapter Painting: Offeror agrees that if this additive Alternate No. 2 is accepted by the Owner, then they will remove rust, rust protect and paint existing RTU curb adapters as specified and shown on drawings. If this Alternate No. 2 item is not accepted by the Owner, then the Offeror shall remove RTU units off of the existing curb adapters and allow the Owner a minimum of 7-days to rust protect and paint the existing roof curbs as shown on the drawings and specified before new AAON RTU units are installed on existing curbs. The amount to be Added to the Base Proposal amount for Alternate No. 2 is

_____ Dollars

(\$_____)

ALTERNATE NO. 3A (Additive) – HVAC BAS JCI Metasys: Offeror agrees that if this Alternate No. 3A is accepted by the Owner, then they will provide Building Automation System “BAS” as manufactured by Johnson Controls Metasys installation sub-contracted to _____ (Contractor Selected BAS Provider) as noted on the drawings and as specified. The amount to be **Added** to the Base Proposal amount for Alternate No. 3A is

_____ Dollars

(\$_____)

ALTERNATE NO. 3B (Additive) – HVAC BAS JCI FX: Offeror agrees that if this Alternate No. 3B is accepted by the Owner, then they will provide Building Automation System “BAS” as manufactured by Johnson Controls Facility Explorer installation sub-contracted to _____ (Contractor Selected BAS Provider) as noted on the drawings and as specified. The amount to be **Added** to the Base Proposal amount for Alternate No. 3B is

_____ Dollars

(\$_____)

The criteria for evaluation and selection of the successful Offeror, will be based upon process identified in the Instructions for Offerors.

**FBISD ECC PACKAGED ROOFTOP UNIT REPLACEMENTS - 2024
FLOUR BLUFF INDEPENDENT SCHOOL DISTRICT**

Offeror represents that, prior to preparing this Proposal, they have carefully read the Contract Documents, examined the site of the Project, and had made an investigation such that he is fully informed of the conditions, facilities, difficulties, restrictions and requirements which they will, or may encounter in the completion of the Project in accordance with the terms of the Contract Documents.

Accompanying this Proposal is a certified or cashier's check or proposal bond payable to the order of the Flour Bluff Independent School District, Corpus Christi, Texas (hereafter called "Owner"), for not less than five percent (5%) of the largest amount for which a contract can be awarded under this proposal.

Offeror agrees that if they are awarded the contract, they will execute and deliver to Owner, within ten (10) days after they are notified of the acceptance of his proposal, a Contract for the construction of such Project, plus required project insurance and Bonds, in the forms acceptable to the Owner.

Should Offeror fail to execute such contract or furnish such Bonds within the prescribed time, Offeror agrees that the accompanying proposal security shall become the property of the Owner as liquidated damages for the additional delay and the expense which will be incurred by Owner as a result thereof.

Offeror agrees that if their Proposal is accepted by the Owner, Offeror will Substantially Complete all work called for in the Contract Documents on or before July 31, 2024 for all work, and if the work is not completed by such time, proposer agrees to pay to Owner, as liquidated damages, the sum of One Thousand Dollars (\$1,000.00) for each calendar day after such time that the work remains incomplete, calculated in accordance with the provisions of the Contract Documents.

Offeror acknowledges receipt of Addenda No(s). ____ through ____.

Executed on _____, 2024.

Offeror _____

(If Offeror is a Corporation
complete the following:)

Signed By _____

Sole Owner, or
Partner, or
President of

ATTEST:

Whose Address is:

(Corporate Seal)

FLOUR BLUFF INDEPENDENT SCHOOL DISTRICT
Corpus Christi, Texas

PERFORMANCE BOND

THE STATE OF TEXAS *

KNOW ALL MEN BY THESE PRESENTS:

COUNTY OF NUECES *

That we, _____, Contractor, as Principal, and
_____, as Surety, are hereby
held and firmly bound unto the FLOUR BLUFF INDEPENDENT SCHOOL DISTRICT,
Corpus Christi, Texas (hereinafter called "Owner") in the full and just sum of _____
_____ for
the payment of which the said Principal and Surety bind themselves, their heirs, executors,
administrators, successors and assigns, jointly and severally, firmly by these presents.

The conditions of this obligation are such that: WHEREAS the Principal entered into a certain Contract, which Contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein, with the Owner acting by and through its Board of Trustees, dated _____, for the construction of the **"FBISD ECC HVAC PACKAGED ROOFTOP UNIT REPLACEMENTS – 2024"** Flour Bluff I.S.D., Corpus Christi, Texas, in accordance with the Drawings, Specifications and other Contract Documents thereto, prepared by Stridde, Callins and Associated Inc. ("Engineer").

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform the Contract in accordance with the Drawings, Specifications, and other Contract Documents pertaining thereto, as well as any changes, extensions, deletions or modifications thereof which may be made by Owner, with or without notice to the Surety, and shall fully indemnify and save harmless the Owner from all costs and damage which it may suffer by reason of Principal's default or failure so to do, shall fully reimburse and repay Owner all outlay and expense which Owner may incur in making good any such default, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

PROVIDED that any additions, deletions, alterations or changes which may be made in the terms of the Contract or in the Drawings, Specifications or other Contract Documents, or in the work to be done thereunder, or the making by the Owner of any payment or pre-payment under the Contract, or the giving by the Owner of any extension of time for the performance of the Contract, or the granting of any other forbearance on the part of either the Owner or the Principal to the other shall not in any way release the Principal or the Surety, or either of them, their heirs, executors, administrators, successors or assigns, from their liability or the liability of any of them hereunder, notice to the Surety of any such addition, deletion, alteration, change, payment, pre-payment, extension or forbearance being hereby expressly waived.

PROVIDED FURTHER, that this bond is made and entered into solely for the protection of the Owner pursuant to the provisions of Chapter 2253, Government Code, as amended, and all liabilities on this bond are to be determined in accordance with the provisions thereof.

EXECUTED on _____, 2024.

PRINCIPAL

SURETY

Contractor

(Corporate Name)

By _____

By _____

Name: _____

Attorney-in-Fact

Title: _____

Name: _____

ATTEST:

By _____

Name: _____

Title: _____

Address of Contractor:

Address of Surety:

(Corporate Seal)

**FLOUR BLUFF INDEPENDENT SCHOOL DISTRICT
Corpus Christi, Texas**

PAYMENT BOND

THE STATE OF TEXAS *

KNOW ALL MEN BY THESE PRESENTS:

COUNTY OF NUECES *

That we, _____, Contractor, as Principal, and
_____, as Surety, are hereby held
and firmly bound unto the FLOUR BLUFF INDEPENDENT SCHOOL DISTRICT,
Corpus Christi, Texas (hereinafter called "Owner") in the full and just sum of _____
_____ for
the payment of which the said Principal and Surety bind themselves, their heirs, executors,
administrators, successors and assigns, jointly and severally, firmly by these presents.

The conditions of this obligation are such that: WHEREAS the Principal entered into a certain Contract, which Contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein, with the Owner acting by and through its Board of Trustees, dated _____, for the construction of **"FBISD ECC HVAC PACKAGED ROOFTOP UNIT REPLACEMENTS – 2024"**, Flour Bluff I.S.D., Corpus Christi, Texas, in accordance with the Drawings, Specifications and other Contract Documents thereto, prepared by Stridde, Callins, and Associates, Inc ("Engineer").

NOW, THEREFORE, if the Principal shall promptly make payment to all claimants as defined in Chapter 2253, Government Code, as amended, supplying labor and materials in the prosecution of the work provided for in said Contract, as well as any changes, extensions, deletions or modifications thereof which may be made by Owner, with or without notice to Surety, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

PROVIDED that any additions, deletions, alterations or changes which may be made in the terms of the Contract or in the Drawings, Specifications or other Contract Documents, or in the work to be done thereunder, or the making by the Owner of any payment or pre-payment under the contract, or the giving by the Owner of any extension of time for the performance of the contract, or the granting of any other forbearance on the part of either the Owner or the Principal to the other shall not in any way release the Principal or the Surety, or either of them, their heirs, executors, administrators, successors or assigns, from their liability of any of them hereunder, notice to the surety of any such addition, deletion, alteration, change, payment, pre-payment, extension or forbearance being hereby expressly waived.

PROVIDED FURTHER, that this bond is made and entered into solely for the protection of all claimants as defined in Chapter 2253, Government Code, as amended, supplying labor and material in the prosecution of the work provided for in said Contract, and each claimant shall have a direct right of action under the bond as provided in such Chapter 2253, Government Code, as amended.

EXECUTED on _____, 2024.

PRINCIPAL

SURETY

Contractor

(Corporate Name)

By _____

By _____

Name: _____

Attorney-in-Fact

Title: _____

Name: _____

ATTEST:

By _____

Name: _____

Title: _____

Address of Contractor:

Address of Surety:

(Corporate Seal)

AIA[®] Document A101[®] – 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the X day of April in the year two thousand twenty-four
(In words, indicate day, month and year.)

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

Flour Bluff Independent School District
2505 Waldron Road
Corpus Christi, Texas 78418

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

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

FBISD ECC HVAC Packaged Rooftop Unit Replacement - -2024
2510 Waldron Road
Flour Bluff Independent School District

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

Stridde, Callins and Associates, Inc.
342 S. Navigation Blvd.
Corpus Christi, Texas 78405

The term "Architect" shall have the same meaning as "Engineer" where indicated in this document.

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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

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

TABLE OF ARTICLES

1	THE CONTRACT DOCUMENTS
2	THE WORK OF THIS CONTRACT
3	DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
4	CONTRACT SUM
5	PAYMENTS
6	DISPUTE RESOLUTION
7	TERMINATION OR SUSPENSION
8	MISCELLANEOUS PROVISIONS
9	ENUMERATION OF CONTRACT DOCUMENTS

ARTICLE 1 THE CONTRACT DOCUMENTS

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

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:

(Check one of the following boxes.)

- ☐ The date of this Agreement.
- ☒ A date set forth in a notice to proceed issued by the Owner.
- ☐ Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

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

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

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall diligently prosecute and achieve Substantial Completion of the entire Work:

(Check one of the following boxes and complete the necessary information.)

- ☐ Not later than () calendar days from the date of commencement of the Work.

Init.

[√] By the following date: July 31, 2024.

§ 3.3.2

(Paragraphs deleted)

Deleted

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

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

§ 4.2 Alternates

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

Item	Price
------	-------

(Table deleted)

(Paragraphs deleted)

§ 4.3 Allowances, if any, included in the Contract Sum:

(Identify each allowance.)

Item	Price
1. Contingency Allowance	\$5,000.00

§ 4.4

(Paragraphs deleted)

Deleted

(Table deleted)

§ 4.5 Liquidated damages, if any:

(Insert terms and conditions for liquidated damages, if any.)

Contractor agrees to liquidated damages of \$1,000.00 for each calendar day Substantial Completion is not achieved.

(Paragraphs deleted)

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the day designated by the Owner:

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the 10th day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the 7th day following the Board approval. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than thirty (30) days after the Architect receives the Application for Payment. The Board of Trustees shall approve the monthly application for payment on the last Thursday of the month.

(Federal, state or local laws may require payment within a certain period of time.)

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

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

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

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified, to the extent approved by the Owner in writing.

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

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
- .5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner shall withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

10%

(Paragraphs deleted)

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

(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

Full retainage shall be held by Owner until final acceptance of the project, except as agreed to by Owner and Contractor.

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:

(Insert any other conditions for release of retainage upon Substantial Completion.)

N/A

§ 5.1.8 Deleted

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

§ 5.1.10 If Owner is entitled to deduct liquidated damages, or any other damages or amounts provided in the contract documents, then Owner shall be entitled to deduct such liquidated damages, amounts and fees at any time.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, minus disputed sums, authorized deductions and liquidated damages, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect and Owner's Board of Trustees or the Board's designee has accepted the work and approved final payment.

§ 5.2.2 The Owner's final payment of undisputed sums to the Contractor shall be made no later than 30 days after the Owner's Board of Trustees or the Board's designee approved Final Payment of the final work. The parties understand that Final Payment will not occur until the entire project as outlined in the Contract Documents and in Section 3.3.1 and Article 4 is complete.

(Paragraphs deleted)

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:

(Check the appropriate box.)

- ☐ Arbitration pursuant to Section 15.4 of AIA Document A201–2017
- ☒ Litigation in a court of competent jurisdiction (See Section 8.7)
- ☐ Other *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

(Paragraphs deleted)

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner’s representative:

(Name, address, email address, and other information)

Joseph Guidry
Executive Director of Operations
Flour Bluff Independent School District
2510 Waldron Road
Corpus Christi, Texas 78418
PH: (361) 694-9703
Email: JGuidry@flourbluffschoools.net

§ 8.3 The Contractor’s representative:

(Name, address, email address, and other information)

§ 8.4 Neither the Owner’s nor the Contractor’s representative shall be changed without ten days’ prior notice to the other party.

§ 8.5 Insurance and Bonds (Refer to Article 10)

§ 8.5.1 Deleted

§ 8.5.2 Deleted

§ 8.6

(Paragraphs deleted)

Deleted

§ 8.7 Other Provisions:

- .1 The Agreement shall be governed by the laws of the State of Texas, and any litigation shall be conducted in state district court. Mandatory and exclusive venue shall be in Nueces County, Texas.
- .2 Contractor stipulates that Owner is a political subdivision of the State of Texas, and, as such, enjoys immunity from suit and liability as provided by the laws of the State of Texas. By entering into this Agreement, Owner does not waive any of its immunities from suit or liability, except as specifically provided herein, and as specifically authorized by law.
- .3 Notwithstanding anything to the contrary in this Agreement, or in any document forming a part thereof, there shall be no mandatory arbitration for any dispute arising hereunder.
- .4 The Contractor may not assign its responsibilities, duties, obligations and rights under this Agreement, without the express written consent of the Owner. This does not prevent Contractor from engaging subcontractors to perform various phases of the Project, but Contractor shall be fully responsible to Owner for the work, actions and omissions of all such subcontractors.
- .5 This Agreement, in its entirety, shall be binding upon all the parties thereto, their respective successors,

Init.

heirs, executors, administrators or assigns.

- .6 This Agreement is subject to all applicable federal and state laws, rules, and regulations. Invalidity of any portion of this Agreement under the laws of the State of Texas or of the United States shall not affect the validity of the remainder of this Agreement.

§ 8.8 Contractor stipulates that Owner is a political subdivision of the State of Texas, and, as such, enjoys immunity from suit and liability as provided by the laws of the State of Texas. By entering into this Agreement, Owner does not waive any of its immunities from suit or liability, except as specifically provided herein, and as specifically authorized by law.

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor (with Owner modifications)
- .2 Deleted
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction (with Owner Modifications).

Refer to Document bound in Project Manual dated February 29, 2024.

- .4 Deleted
- .5 Drawings

Refer to Exhibit "A"

(Paragraphs deleted)

- .6 Specifications

Refer to Exhibit " B"

- .7 Addenda, if any:

Number	Date	Pages
--------	------	-------

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

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

[
(Paragraphs deleted)

✓] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
Project Manual	Conditions of the Contract		

[✓] Competitive Sealed Proposal Dated _____. Refer to Exhibit "C".

(Paragraphs deleted)

- .9 Other documents, if any, listed below:

(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™-2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor’s bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

- Invitation to Bid
- Instructions for Offerors
- Performance Bond
- Payment Bond
- Conflict of Interest Questionnaire
- Felony Conviction Notification
- Prevailing Wage Schedules
- Ozone Action Days Notice
- Certificate of Interested Parties – Form 1295
- Non-Collusion Affidavit

ARTICLE 10 INSURANCE AND BONDS

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A201–2017 and Supplementary General Conditions.
(State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document (A201-2017).)

Type of insurance or bond	Limit of liability or bond amount (\$0.00)
Payment and Performance Bonds on Owner’s forms.	100% of contract amount for each bond
Insurance	As specified in Project Manual

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

OWNER (Signature)

Tomas Molina
Chief Financial Officer

(Printed name and title)

CONTRACTOR (Signature)

(Printed name and title)

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor or other person doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 1491, 80th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code by a person who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the person meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the person becomes aware of facts that require the statement to be filed. See Section 176.006, Local Government Code.

A person commits an offense if the person knowingly violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor.

OFFICE USE ONLY

Date Received

1 Name of person who has a business relationship with local governmental entity.

2 ☐ Check this box if you are filing an update to a previously filed questionnaire.

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date the originally filed questionnaire becomes incomplete or inaccurate.)

3 Name of local government officer with whom filer has employment or business relationship.

Name of Officer

This section (item 3 including subparts A, B, C & D) must be completed for each officer with whom the filer has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the filer of the questionnaire?

☐ Yes

☐ No

B. Is the filer of the questionnaire receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

☐ Yes

☐ No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership of 10 percent or more?

☐ Yes

☐ No

D. Describe each employment or business relationship with the local government officer named in this section.

4

Signature of person doing business with the governmental entity

Date

Felony Conviction Notification

*EDUCATION CODE
TITLE 2. PUBLIC EDUCATION
SUBTITLE I. SCHOOL FINANCE AND FISCAL MANAGEMENT
CHAPTER 44. FISCAL MANAGEMENT
SUBCHAPTER A. SCHOOL DISTRICT FISCAL MANAGEMENT*

Sec. 44.034. NOTIFICATION OF CRIMINAL HISTORY OF CONTRACTOR. (a) A person or business entity that enters into a contract with a school district must give advance notice to the district if the person or an owner or operator of the business entity has been convicted of a felony. The notice must include a general description of the conduct resulting in the conviction of a felony.

(b) A school district may terminate a contract with a person or business entity if the district determines that the person or business entity failed to give notice as required by Subsection (a) or misrepresented the conduct resulting in the conviction. The district must compensate the person or business entity for services performed before the termination of the contract.

(c) This section does not apply to a publicly held corporation.

I, the undersigned agent for the firm named below, certify that the information concerning notification of felony convictions has been reviewed by me and the following information furnished is true to the best of my knowledge.

Vendor's Name: _____

Authorized Company Official's Name
(Printed): _____

A. My firm is a publicly-held corporation; therefore, this reporting requirement is not applicable.

Signature of Company Official: _____

B. My firm is not owned nor operated by anyone who has been convicted of a felony:

Signature of Company Official: _____

C. My firm is owned or operated by the following individual(s) who has/have been convicted of a felony:

Name of Felon(s): _____

Details of Conviction(s): _____

Signature of Company Official: _____



FLOUR BLUFF INDEPENDENT SCHOOL DISTRICT PREVAILING WAGE SCHEDULES

County: Nueces

BUILDING CONSTRUCTION TRADES

Revised: 10/23 - 10/24

CLASSIFICATION	RATE	NOTES
Acoustic Ceiling Installer	15.10	
Asbestos Abatement Worker	12.53	
Carpenter	15.31	
Concrete – Pour and Finish	14.78	
Crane Operator	25.34	
Driver	13.89	
Drywall Installer	15.55	
Electrician – Journeyman	24.67	
Electrician – Apprentice	19.54	
Elevator Mechanic – Journeyman	53.59	
Elevator Mechanic – Apprentice	46.18	
Fire Protection – Controls	17.01	
Fire Protection – Pipefitter	19.79	
Formwork Builder	13.99	
Glazier	16.98	
HVAC – Journeyman	24.09	
HVAC – Apprentice	15.18	
HVAC – Controls	20.93	
Insulator	15.37	
Ironworker	16.72	
Laborer/Helper	12.22	
Mason	18.37	
Equipment Operator – Light	14.37	
Equipment Operator – Heavy	16.09	
Painter	12.66	
Pipefitter – Journeyman	31.20	
Pipefitter – Apprentice	18.58	
Plasterer	14.89	
Plumber – Journeyman	29.51	
Plumber – Apprentice	19.50	
Reinforcing Steel Worker	15.15	
Roofer	19.14	
Stone Mason	17.40	
Terrazzo Installer	12.56	
Tile Setter	15.10	
Waterproofer	14.31	

Note: Listed minimum prevailing wage rate is the base hourly wage rate including fringes.

OZONE ACTION DAYS NOTICE

Maintaining Corpus Christi's air quality attainment status is of prime importance to the Flour Bluff Independent School District. In order to keep emissions or generation of ozone precursors, such as VOC's (volatile organic compounds) and NOx (oxides of nitrogen) to a minimum, all Contractors and Subcontractors working on Flour Bluff I.S.D. projects are requested to adhere to the following recommendations at all times.

- A. Properly maintain all construction equipment and keep tires properly inflated to promote fuel efficiency.
- B. Encourage car pooling of employees to and from the Project site.
- C. Minimize idling of vehicles or equipment.
- D. Minimize vehicle trips as much as possible.
- E. Limit the use of internal combustion engines (ICEs) driven by gasoline or diesel, such as generators, compressors, welders and other gas-operated small equipment.
- F. Use clean burning fuels (*i.e.*, compressed natural gas, propane, low Reid vapor pressure gasoline, reformulated gasoline, and low emissions high performance diesel, etc.) for on- and off-road vehicles and equipment.

On days when the Texas Commission on Environmental Quality issues an ozone alert (via the City of Corpus Christi), the Owner, Flour Bluff I.S.D., may require that the Contractor either stop all operations or discontinue certain activities that lead to formation of ozone until the ozone alert is over. No additional monies will be paid to the Contractor for this interruption of the Work. However, the Owner will grant the Contractor an extension of time (day for day) for this delay. The following activities must be severely curtailed or stopped during ozone action days:

- A. Fueling of equipment between the hours of 7:00 a.m. and 6:00 p.m.
- B. Sandblasting and painting activities.
- C. Use of solvents and varnishes.
- D. Excessive use of ICE-powered vehicles and equipment that do not use clean-burning fuels.
- E. Idling of vehicles or equipment.

CERTIFICATE OF INTERESTED PARTIES**FORM 1295****OFFICE USE ONLY**

Complete Nos. 1 - 4 and 6 if there are interested parties.
Complete Nos. 1, 2, 3, 5, and 6 if there are no interested parties.

1 Name of business entity filing form, and the city, state and country of the business entity's place of business.

2 Name of governmental entity or state agency that is a party to the contract for which the form is being filed.

3 Provide the identification number used by the governmental entity or state agency to track or identify the contract, and provide a description of the services, goods, or other property to be provided under the contract.

4 Name of Interested Party	City, State, Country (place of business)	Nature of Interest (check applicable)	
		Controlling	Intermediary

5 Check only if there is **NO** Interested Party. ☐

6 UNSWORN DECLARATION

My name is _____, and my date of birth is _____.

My address is _____, _____, _____, _____, _____.
(street) (city) (state) (zip code) (country)

I declare under penalty of perjury that the foregoing is true and correct.

Executed in _____ County, State of _____, on the _____ day of _____, 20____.
(month) (year)

Signature of authorized agent of contracting business entity
(Declarant)

ADD ADDITIONAL PAGES AS NECESSARY

NON-COLLUSION AFFIDAVIT OF PRIME OFFEROR

State of TEXAS:

County of NUECES:

_____, being first duly sworn, deposes and says this:

(1) He is _____ of _____
(a partner or an officer) (the firm of, etc.)
the Offeror who has submitted the attached proposal.

(2) He is fully informed respecting the preparation and contents of the attached Proposal(s) and of all pertinent circumstances respecting each such Proposal.

(3) That Proposal is genuine and is not a collusive or sham Proposal.

(4) Neither the said Offeror nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly, with another Offeror, firm or person, to submit a collusive or sham Proposal in connection with the Contract for which the attached Proposal has been submitted or to refrain from proposing in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion, or communication or conferences, with any other Offeror, firm or person to fix the price or prices with the attached Proposal or of any other Offeror, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Flour Bluff Independent School District of Corpus Christi, Texas or any person interested in the proposed contract; and,

(5) The price or prices quoted in the attached Proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Proposer or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(Offeror's Business Name) _____

(Offeror's Representative Signature) _____

(Offeror's Representative Title) _____

**FBISD ECC PACKAGED ROOFTOP UNIT REPLACEMENTS - 2024
FLOUR BLUFF INDEPENDENT SCHOOL DISTRICT**

SECTION 01 10 00 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 SECTION INCLUDES:

- A. Work Covered by Contract Documents.
- B. Construction Timing.
- C. Phasing of Construction.
- D. Contractor use of site and premises.
- E. Owner occupancy.
- F. Project Management and Coordination.

1.2 WORK COVERED BY CONTRACT DOCUMENTS:

- A. Project Identification: FBISD ECC Packaged Rooftop Unit Replacements - 2024
- B. Project Location: Early Childhood Center.
- C. Owner: Flour Bluff Independent School District.
 - 1. Owners Representative: Mr. Joseph Guidry.
- D. Engineer: Stridde, Callins, and Associates, Inc. 342 S. Navigation Blvd, Corpus Christi, Texas 78405.
 - 1. Engineer's Representative: Jared Merdes, P.E., MBA, LEED AP.
- E. Project consists of replacing Ten (10) existing HVAC packaged rooftop units and associated work indicated on drawings and specifications.
- F. Work performed under this contract will be performed under a single prime contract; Mechanical Contractor or General Contractor.
- G. Owner Furnished Equipment:
 - 1. FBISD has pre-purchased the RTUs as indicated on the drawings for installation by the Contractor.
 - 2. Contractor shall install all Owner furnished equipment and shall provide any additional components and materials as needed for a complete and turn key installation, fully functional.
 - 3. Equipment Delivery and Pickup: Contractor shall contact manufacturer and shall confirm the shipping address for the Contractor's bonded warehouse or the project location as applicable.

1.3 CONSTRUCTION TIMING:

- A. Timing and Construction Schedule:
 - 1. Physical Start of Work: June 2024
 - 2. Substantial Completion: Project shall be Substantially Completed on or before July 31, 2024.
- B. Estimated Owner Furnished Equipment Deliverables:

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1. Lennox Equipment Delivery: Owner furnished Lennox equipment is estimated to ship by May 6, 2024. Updates will be provided to contractor upon request from Perry Mechanical Systems. Contact Johnathan Feuchtenberger (361) 935-6741.
2. AAON Equipment Delivery: Owner furnished AAON equipment is estimated to arrive at project location by June 14, 2024. Updates will be provided to contractor upon request from Texas Air Systems. Contact Ken Wertz (210) 573-5156.

1.4 PHASING OF CONSTRUCTION: Phasing of work shall be performed to maximize work completion as soon as possible.

1.5 OWNER OCCUPANCY AND CONTRACTOR USE OF SITE AND PREMISES:

- A. Summer Work; June -July 2024:
 1. Project location will generally be unoccupied and will only have limited staff for administration and custodial.
 2. Contractor will be allowed to work 7-days a week from 7:00 am to 7:00 pm.
- B. Fall Session; August and After 2024:
 1. Project location will be generally occupied by Owner during the day from 7:00 a.m. to approximately 5:00 p.m., Monday through Friday and special hours on Saturdays and Sundays for educational purposes.
 2. Contractor will not be allowed to work in the facility on any testing days. Contractor is required to confirm all testing dates prior to the start of construction.
- C. After hours work at night, holidays, and weekends shall be pre-approved by Owner with a minimum of One (1) weeks' notice.
- D. Schedule construction with Owner to minimize interference with Owner regular operations.
- E. All active MEP systems shall remain fully operational at all times unless authorized by Owner.
- F. Cooperate with Owner to minimize conflict and to facilitate Owner's operations. The Contractor shall construct all required temporary appropriate physical barriers to help separate the project work area from the students using school campuses.
- G. Cooperate with Owner to minimize conflicts and to facilitate Owner's operations.

1.6 PROJECT MANAGEMENT AND COORDINATION:

- A. Refer to Section 01 31 00 Project Management and Coordination requirements for project coordination meetings.

PART 2 - PRODUCTS

2.1 Not Applicable.

PART 3 - EXECUTION

3.1 Not Applicable.

END OF SECTION 01 10 00

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FLOUR BLUFF INDEPENDENT SCHOOL DISTRICT**

SECTION 01 20 00 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

- A. This Section includes administrative and procedural requirements governing allowances.
- B. Contractor shall include in his proposal a contingency allowance as scheduled herein to be utilized solely at Owner's discretion for repair, refurbishment or replacement of existing systems, equipment or installations as may be required due to latent or unforeseen field conditions. If necessary, additional requirements will be issued by Change Order.
- C. Types of allowances include the following:
 - 1. Lump-sum allowances.
 - 2. Unit-cost allowances.
 - 3. Contingency allowances.
 - 4. Testing and inspecting allowances.
- D. Related Sections include the following:
 - 1. Division 1 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders for allowances.
 - 2. Division 1 Section "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.
 - 3. Divisions 1 through 26 Sections for items of Work covered by allowances.

1.3 SELECTION AND PURCHASE:

- A. At the earliest practical date after award of the Contract, advise Engineer of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Engineer's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Engineer from the designated supplier.

1.4 SUBMITTALS:

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
- B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

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1.5 COORDINATION:

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.6 LUMP-SUM AND UNIT-COST ALLOWANCES:

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner under allowance and shall include taxes, freight, and delivery to Project site.
- B. Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.

1.7 CONTINGENCY ALLOWANCES:

- A. Use the contingency allowance only as directed by Engineer for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.
- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.8 UNUSED MATERIALS:

- A. Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
- B. If requested by Engineer, prepare unused material for storage by Owner when it is not economically practical to return the material for credit. If directed by Engineer, deliver unused material to Owner's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

PART 2 - PRODUCTS

- 2.1 Not Applicable

PART 3 - EXECUTION

3.1 EXAMINATION:

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION:

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

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3.3 SCHEDULE OF ALLOWANCES:

- A. Allowances Include:
- | | |
|---------------------------|-------------|
| 1. Contingency Allowance: | \$ 5,000.00 |
|---------------------------|-------------|

END OF SECTION 01 20 00

**FBISD ECC PACKAGED ROOFTOP UNIT REPLACEMENTS - 2024
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SECTION 01 23 00 - PROPOSAL ALTERNATES

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS:

- A. Related Work of Other Sections: Divisions 22 and 26: Sections as affected by each Alternate.

1.2 PROCEDURES:

- A. Provide to the Owner alternate prices which shall state the amounts to be added to or deducted from the Base Quotation in the event that alternates described herein are accepted by the Owner. Alternates shall include all variations in profit, overhead, bonds, insurance, and all other related costs.
- B. Alternates shall include required work of every related trade whenever work of several trades is necessary and/or required for complete execution of an alternate item of Work, even though the basic description of the alternate item of Work does not specifically enumerate all trades that may be involved.
- C. Coordinate related Work and modify surrounding Work as required to complete the Work identified in each Alternate, when acceptance is designated in the Contract.
- D. If the Owner chooses to accept one or more Alternates, coordinate the work, including changes under each Alternate at no additional cost other than that indicated on the Proposal form for each Alternate.
- E. Owner reserves the right to accept or reject any or all Alternates and in any order.

1.3 SCHEDULE OF ALTERNATES:

- A. **ALTERNATE NO. 1 (Additive)** - New Windstorm Support Cables: Offeror agrees that if this additive Alternate No. 1 is accepted by the Owner, then they will provide new 316 stainless steel RTU windstorm support cables and accessories to replace the existing galvanized steel cables as specified and shown on drawings for the AAON RTUs.
- B. **ALTERNATE NO. 2 (Additive)** - Existing AAON Curb Adapter Painting: Offeror agrees that if this additive Alternate No. 2 is accepted by the Owner, then they will remove rust, rust protect and paint existing RTU curb adapters as specified and shown on drawings.
- C. **ALTERNATE NO. 3A (Additive)** - HVAC BAS JCI Metasys: Offeror agrees that if this Alternate No. 3A is accepted by the Owner, then they will provide Building Automation System "BAS" as manufactured by Johnson Controls Metasys installation sub-contracted to _____ (Contractor Selected BAS Provider) as noted on the drawings and as specified.
- D. **ALTERNATE NO. 3B (Additive)** - HVAC BAS JCI FX: Offeror agrees that if this Alternate No. 3B is accepted by the Owner, then they will provide Building Automation System "BAS" as manufactured by Johnson Controls Facility Explorer installation sub-contracted to _____ (Contractor Selected BAS Provider) as noted on the drawings and as specified.

PART 2 - PRODUCTS

- 2.1** Refer specific specification sections for each area of work impacted by the Alternates.

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PART 3 - EXECUTION

3.1 Refer specific specification sections for each area of work impacted by the Alternates.

END OF SECTION 01 23 00

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SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

1.3 MINOR CHANGES IN THE WORK:

- A. Engineer will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.4 PROPOSAL REQUESTS:

- A. Owner-Initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal Requests issued by Engineer are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
 - 2. Within 7 days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Engineer.
 - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable delivery charges, equipment rental, and amounts of trade discounts.
 - 4. Include costs of labor and supervision directly attributable to the change.
 - 5. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

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1.5 CHANGE ORDER PROCEDURES:

- A. On Owner's approval of a Proposal Request, Engineer will issue a Change Order for signatures of Owner and Contractor.

1.6 CONSTRUCTION CHANGE DIRECTIVE:

- A. Construction Change Directive: Engineer may issue a Construction Change Directive. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS

- 2.1** Not Applicable

PART 3 - EXECUTION

- 3.1** Not Applicable

END OF SECTION 01 26 00

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SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
 - 1. Division 1 Section 01 26 00 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 2. Division 1 Section 01 32 00 "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.3 DEFINITIONS:

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES:

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
 - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with Continuation Sheets.
 - b. Submittals Schedule.
 - c. Contractor's Construction Schedule.
 - 2. Submit the Schedule of Values to Engineer at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
- B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.
 - b. Name of Project.
 - c. Engineer's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 - 2. Submit draft of AIA Document G703 Continuation Sheets.
 - 3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.

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- f. Change Orders (numbers) that affect value.
- g. Dollar value.
 - 1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
- 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
- 5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
- 6. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If specified, include evidence of insurance or bonded warehousing.
 - b. Provide a separate line item for materials and associated installation labor.
- 7. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
- 8. Allowances: Provide a separate line item in the Schedule of Values for each allowance.
- 9. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
- 10. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT:

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by and paid for by Owner.
 - 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
 - 2. Provide updated project schedule with each application. Applications without schedules are subject to rejection.
- B. Payment Application Times: The period of construction Work covered by each Application for Payment shall be one calendar month with the last day of each month as the end of that work period. Contractor shall issue payment application to Engineer within 10-days.
- C. Progress Payments:
 - 1. Progress payments shall be submitted to Engineer by the first of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
 - 2. Contractor's Affidavit of Payment of Debts and Claims": Each progress payment shall include AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims".
 - 3. Updated Construction Schedule: Each progress payment shall include most up to date construction schedule that correlates to schedule of values work completion.
- D. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Incomplete applications will be returned without action.

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1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- F. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Engineer by a method ensuring receipt within 24 hours. At least one copy shall include waivers of liens.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of Values.
 3. Contractor's Construction Schedule (preliminary if not final).
 4. Products list.
 5. Submittals Schedule (preliminary if not final).
 6. Copies of building permits.
 7. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 8. Initial progress report.
 9. Report of pre-construction conference.
 10. Certificates of insurance and insurance policies.
 11. Performance and payment bonds.
 12. Data needed to acquire Owner's insurance.
 13. Initial settlement survey and damage report if required.
- I. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.

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3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims".
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens".
6. AIA Document G707, "Consent of Surety to Final Payment".
7. Evidence that claims have been settled.
8. Final, liquidated damages settlement statement.
9. Technical specification close-out requirements including contractor warranties.
10. Final Passing City of Corpus Christi Inspection notification.
11. Evidence of completion of Final Commissioning Plan as applicable.

PART 2 - PRODUCTS

2.1 Not Applicable

PART 3 - EXECUTION

3.1 Not Applicable

END OF SECTION 01 29 00

**FBISD ECC PACKAGED ROOFTOP UNIT REPLACEMENTS - 2024
FLOUR BLUFF INDEPENDENT SCHOOL DISTRICT**

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY:

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Coordination Drawings.
 - 2. Administrative and supervisory personnel.
 - 3. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.
- C. Related Sections include the following:
 - 1. Division 1 Section 01 32 00 "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.
 - 2. Division 1 Section 01 77 00 "Closeout Procedures" for coordinating Contract closeout.

1.3 COORDINATION:

- A. Coordination: Each contractor shall coordinate construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate operations with operations, included in different Sections, which depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
 - 4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's Construction Schedule.
 - 2. Preparation of the Schedule of Values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Pre-installation conferences.

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7. Project closeout activities.
8. Startup and adjustment of systems.
9. Project closeout activities.

- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

1.4 SUBMITTALS:

- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:
 - a. Indicate functional and spatial relationships of components of structural, civil, mechanical, electrical systems and the like.
 - b. Indicate required installation sequences.
 - c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Engineer for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
 2. Sheet Size: At least 8-1/2 by 11 inches but no larger than 24 by 36 inches.
 3. Format: Provide all submittal in PDF electronic format. Engineer will provide all responses electronically.
 4. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1.5 ADMINISTRATIVE AND SUPERVISORY PERSONNEL:

- A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.
1. Include special personnel required for coordination of operations with other contractors.
 2. Project superintendent must be present at construction location at all times of construction activity. Sub-contractors may not be allowed to work without supervision by Contractor's administrative and supervisory personnel.

1.6 PROJECT MEETINGS:

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Engineer of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within two days of the meeting.

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- B. Pre-construction Conference: Schedule a pre-construction conference before starting construction, at a time convenient to Owner and Engineer, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
1. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for requests for interpretations (RFIs).
 - g. Procedures for testing and inspecting.
 - h. Procedures for processing Applications for Payment.
 - i. Distribution of the Contract Documents.
 - j. Submittal procedures.
 - k. Preparation of Record Documents.
 - l. Use of the premises.
 - m. Work restrictions.
 - n. Responsibility for temporary facilities and controls.
 - o. Construction waste management and recycling.
 - p. Parking availability.
 - q. Office, work, and storage areas.
 - r. Equipment deliveries and priorities.
 - s. First aid.
 - t. Security.
 - u. Progress cleaning.
 - v. Working hours.
 3. Minutes: Engineer will record and distribute meeting minutes.
- C. Pre-installation Conferences: Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Engineer of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. The Contract Documents.
 - b. Options.
 - c. Related requests for interpretations (RFIs).
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Possible conflicts.
 - i. Compatibility problems.
 - j. Time schedules.
 - k. Weather limitations.
 - l. Manufacturer's written recommendations.
 - m. Warranty requirements.
 - n. Compatibility of materials.

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- o. Acceptability of substrates.
 - p. Temporary facilities and controls.
 - q. Space and access limitations.
 - r. Regulations of authorities having jurisdiction.
 - s. Testing and inspecting requirements.
 - t. Installation procedures.
 - u. Coordination with other work.
 - v. Required performance results.
 - w. Protection of adjacent work.
 - x. Protection of construction and personnel.
 - 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 - 4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
 - 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Contractor Coordination Meetings: Conduct Contractor Coordination meetings at weekly intervals. Coordinate dates of meetings with preparation of payment requests.
- 1. Attendees: In addition to representatives of Owner and Engineer when necessary, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Status of correction of deficient items.
 - 14) Field observations.
 - 15) Requests for interpretations (RFIs).
 - 16) Status of proposal requests.
 - 17) Pending changes.
 - 18) Status of Change Orders.
 - 19) Pending claims and disputes.
 - 20) Documentation of information for payment requests.

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3. Minutes: Record the meeting minutes.
 4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
 - a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- E. Construction Progress Meetings:
1. Engineer will schedule construction progress meetings as needed during heavy construction activity as necessary to answer Contractor questions, to review construction progress, and to coordinate with the Owner. Regular meetings will not be conducted and will be performed on an as needed basis.
 2. Attendees: Owner's representatives, Engineer, Contractor and, where appropriate, Major Sub-Contractors and other third parties.
 3. Normal Agenda Items:
 - a. Review of work completed.
 - b. Understanding of work to be done in the upcoming weeks and the coordinating of contractor and Owner activities as needed.
 - c. Review of outstanding items and determination of those responsible for resolving any concerns.
 - d. Review of monthly applications for payment or requests for extensions of time.
 - e. Scheduling of upcoming events.
 4. Engineer shall record minutes and distribute copies to participants, with copies of the minutes to Owner and Contractor.
- F. Commissioning Coordination: Contractor shall provide and coordinate construction commissioning activities in accordance with Specification Section 20 00 10 as applicable.

PART 2 - PRODUCTS

2.1 Not Applicable.

PART 3 - EXECUTION

3.1 Not Applicable.

END OF SECTION 01 31 00

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SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Construction Schedule.
 - 2. Submittals Schedule.
 - 3. Daily construction reports.
 - 4. Field condition reports.
 - 5. Special reports.
- B. Related Sections include the following:
 - 1. Division 1 Section 01 31 00 "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
 - 2. Division 1 Section 01 33 00 "Submittal Procedures" for submitting schedules and reports.

1.3 DEFINITIONS:

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Cost Loading: The allocation of the Schedule of Values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Engineer.
- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.
- F. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

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- G. Fragment: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- H. Major Area: A story of construction, a separate building, or a similar significant construction element.
- I. Milestone: A key or critical point in time for reference or measurement.
- J. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.
- K. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 SUBMITTALS:

- A. Qualification Data: For scheduling consultant.
- B. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:
 - 1. Scheduled date for first submittal.
 - 2. Specification Section number and title.
 - 3. Submittal category (action or informational).
 - 4. Name of subcontractor.
 - 5. Description of the Work covered.
 - 6. Scheduled date for Engineer's final release or approval.
- C. Construction Schedule: Submit three opaque copies.
 - 1. Approval of cost-loaded preliminary construction schedule will not constitute approval of Schedule of Values for cost-loaded activities.
- D. Daily Construction Reports: Submit three copies at weekly intervals.
- E. Material Location Reports: Submit three copies at monthly intervals.
- F. Field Condition Reports: Submit two copies at time of discovery of differing conditions.
- G. Special Reports: Submit three copies at time of unusual event.

1.5 COORDINATION:

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from parties involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

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PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE:

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
 - 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 - 2. Initial Submittal: Submit concurrently with construction schedule. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 - a. At Contractor's option, show submittals on the Construction Schedule, instead of tabulating them separately.

2.2 CONSTRUCTION SCHEDULE, GENERAL:

- A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling".
- B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- C. Activities: Treat each separate principal element of work as a separate numbered item. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 30 days, unless specifically allowed by Engineer.
 - 2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 30 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - a. Materials.
 - b. Mechanical equipment.
 - c. Electrical equipment.
 - d. General construction.
 - e. Steel fabrications.
 - f. Foundations.
 - g. Materials and equipment of other trades necessary on this project.
 - 3. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 - 4. Startup and Testing Time: Include not less than 7 days for startup and testing.
 - 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Engineer's administrative procedures necessary for certification of Substantial Completion.
- D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
 - 1. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Fabrication.

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- e. Deliveries.
 - f. Installation.
 - g. Tests and inspections.
 - h. Adjusting.
 - i. Curing.
 - j. Startup and placement into final use and operation.
- E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
- F. Cost Correlation: Refer to Division 1 Section "Payment Procedures" for cost reporting and payment procedures.
- G. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis to demonstrate the effect of the proposed change on the overall project schedule.

2.3 CONSTRUCTION SCHEDULE:

- A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within seven days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for the duration of the contract period.

2.4 REPORTS:

- A. Construction Reports: Prepare a construction report recording the following information concerning events at Project site:
- 1. List of subcontractors at Project site.
 - 2. List of separate contractors at Project site.
 - 3. Approximate count of personnel at Project site.
 - 4. Equipment at Project site.
 - 5. Material deliveries.
 - 6. High and low temperatures and general weather conditions.
 - 7. Accidents.
 - 8. Meetings and significant decisions.
 - 9. Unusual events (refer to special reports).
 - 10. Stoppages, delays, shortages, and losses.
 - 11. Meter readings and similar recordings.
 - 12. Emergency procedures.
 - 13. Orders and requests of authorities having jurisdiction.
 - 14. Change Orders received and implemented.
 - 15. Construction Change Directives received and implemented.
 - 16. Services connected and disconnected.
 - 17. Equipment or system tests and startups.
 - 18. Partial Completions and occupancies.
 - 19. Substantial Completions authorized.
- B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

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- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation on CSI Form 13.2A. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.5 SPECIAL REPORTS:

- A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE:

- A. Contractor shall employ skilled personnel with experience in scheduling and reporting techniques. Submit qualifications.
- B. Contractor's Construction Schedule Updating: At weekly intervals, update schedule to reflect actual construction progress and activities.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate Actual Completion percentage for each activity.
 - 4. Provide updated construction schedule with each payment application.
- C. Distribution: Distribute copies of approved schedule to Engineer, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01 32 00

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SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Construction Schedule, and other submittals.
- B. Related Sections include the following:
 - 1. Division 01 Section 01 31 00 "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
 - 2. Division 01 Section 01 32 00 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
 - 3. Division 01 Section 01 77 00 "Closeout Procedures" for submitting warranties.
 - 4. Divisions 2 through 26 Sections for specific requirements for submittals in those Sections.

1.3 DEFINITIONS:

- A. Action Submittals: Written and graphic information that requires Engineer's responsive action.
- B. Informational Submittals: Written information that does not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES:

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Submittals Schedule: Comply with requirements in Division 1 Section 01 32 00 "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 15 working days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.

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3. Re-submittal Review: Allow 15 working days for review of each re-submittal.
 4. Sequential Review: Where sequential review of submittals by Engineer's consultants, Owner, or other parties is indicated, allow 15 working days for initial review of each submittal.
 5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Engineer and to Engineer's consultants, allow 15 working days for review of each submittal. Submittal will be returned to Engineer before being returned to Contractor.
 6. Contractor's failure to process submittals in a timely manner does not relieve Contractor of contractual obligations for the completion of the work.
- D. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Engineer.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 23 10 10.01). Re-submittals shall include an alphabetic suffix after another decimal point (e.g., 23 10 10.01.A).
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.
- E. **Deviations: Identify deviations from the Contract Documents in letter form at the beginning of each submittal section.**
- F. The shop drawings are not intended to cover detailed quantitative lists of mechanical specialties, valves, air distribution devices, fixtures, and similar items. It is the Contractor's responsibility to procure the proper quantities required to comply with the established requirements.
- G. Coordinate exact electrical requirements of HVAC equipment and fixtures with electrical division prior to submittal of brochures.
- H. **Any material or equipment installed without the Owner Representative's prior approval shall, if so directed by the Owner's Representative, be removed and replaced with approved material or equipment at the Contractor's expense.**
- I. Test Reports: The Contractor shall submit to the Owner's representative all test reports in accordance with details specifically called for in the various Sections of the Specifications in this Division.
- J. **Means of Submittal:**
1. **Interim submittals** shall be forwarded to Engineer in **electronic format** delivered by means of e-mail, USB drive, CD, DVD, or FTP site.
 2. **Final submittals** shall be forwarded in **paper format** for record purposes with electronic copy enclosed with each. Provide three copies to Engineer; one for Engineer's records

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and two for Owner's records. Final submittals shall be included within Operation and Maintenance Manuals.

- K. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will return submittals, without review, received from sources other than Contractor.
1. Transmittal Form: Provide locations on form for the following information:
 - a. Project name.
 - b. Date.
 - c. Destination (To:).
 - d. Source (From:).
 - e. Names of subcontractor, manufacturer, and supplier.
 - f. Category and type of submittal.
 - g. Submittal purpose and description.
 - h. Specification Section number and title.
 - i. Drawing number and detail references, as appropriate.
 - j. Transmittal number, numbered consecutively.
 - k. Submittal and transmittal distribution record.
 - l. Remarks.
 - m. Signature of transmitter.
 2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.
- L. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked "No Exception Taken" or "Make Corrections Noted".
- M. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- N. Use for Construction: Use only final submittals with mark indicating "No Exception Taken" or "Make Corrections Noted" taken by Engineer.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS:

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
1. Items to be submitted shall include but shall not be limited to ductwork, pipe, valves, fittings, materials, hangers, special supports, insulation, fixtures, equipment, controls, coordination and ductwork fabrication drawings, refrigerant piping design drawings, and mechanical room layouts.
- B. Product Data: Submit information for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.

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3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Manufacturer's operation and maintenance clearances.
 - e. Equipment performance characteristics.
 - f. Equipment weights, dimensions, materials and construction details.
 - g. Motor nominal size and brake horsepower.
 - h. Electrical characteristics.
 - i. All accessories and special conditions required by schedules, drawings, and specifications.
 - j. Standard color charts.
 - k. Manufacturer's catalog cuts.
 - l. Wiring diagrams showing factory-installed wiring.
 - m. Mill reports.
 - n. Standard product operation and maintenance manuals.
 - o. Compliance with specified reference standards.
 - p. Testing by recognized testing agency.
 - q. Application of testing agency labels and seals.
 - r. Notation of coordination requirements.
 4. Information shall be presented so that line-by-line comparison may be made with Contract Documents. Deviation from Contract Documents shall be enumerated on separate sheet and so entitled. Data of general nature will not be acceptable.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Design calculations.
 - j. Compliance with specified standards.
 - k. Notation of coordination requirements.
 - l. Notation of dimensions established by field measurement.
 - m. Relationship to adjoining construction clearly indicated.
 - n. Seal and signature of professional engineer if specified.
 - o. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 24 by 36 inches.
 3. Number of Copies: Submit one interim opaque copy of each submittal, unless copies are required for operation and maintenance manuals. Submit minimum of three final copies where copies are required for operation and maintenance manuals. Engineer will return all copies to Contractor for inclusion in Project Record Documents (O&M Manuals).
- D. Contractor's Coordination Drawings: The Contractor shall prepare a complete set of coordination drawings indicating the equipment actually purchased and the exact routing for piping, conduit, and ductwork. The elevations, locations, support points, load imposed on the structure at support and anchor points, and size of all lines shall be indicated. All beam

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penetrations and slab penetrations shall be indicated and sized and shall be coordinated. This requirement for coordination drawings shall not be construed as authorization for the Contractor to make any unauthorized changes to the Contract Drawings. All Design Drawing space allocations shall be maintained, such as ceiling height, chase walls, equipment room size, and the like, unless proper written authorization is received from the Engineer to change them.

1. Contractor is responsible for the timely preparation and submission of ¼"=1'-0" ductwork shop drawings indicating all items necessary for complete coordination and fabrication/installation. Contractor is also responsible for the timely preparation and submission of ½"-1'-0" shop drawings indicating all HVAC equipment, piping, and ductwork in Central Plant, Mechanical Room, mechanical areas and or critical areas that mandate a thorough review of the systems. Engineer will review these drawings for compliance and offer comments and or suggestions.
 2. Coordination drawings prepared by Contractor to illustrate how equipment, piping, ducts, and the like are to be fitted into available spaces will be examined under the assumption that the **Contractor has verified all the conditions**, and obtaining any approval thereon shall not relieve the Contractor of responsibility in the event the material cannot be installed as shown on those Drawings.
 3. Any dimensional changes or rerouting of piping or ductwork shall necessitate submittal or shop drawings of the system under consideration prior to fabrication or erection of material. Drawings will be utilized by the Owner's representative to evaluate the effect of the proposed changes on equipment performance.
- E. Contractor's Construction Schedule: Comply with requirements specified in Division 1 Section 01 32 00 "Construction Progress Documentation" for Construction Manager's action.
- F. Submittals Schedule: Comply with requirements specified in Division 1 Section 01 32 00 "Construction Progress Documentation".
- G. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
1. Name, address, and telephone number of entity performing subcontract or supplying products.
 2. Number and title of related Specification Section(s) covered by subcontract.
 3. Drawing number and detail references, as appropriate, covered by subcontract.
 4. Number of Copies: Submit three copies of subcontractor list, unless otherwise indicated. Engineer will return two copies.
 - a. Mark up and retain one returned copy as a Project Record Document.

2.2 INFORMATIONAL SUBMITTALS:

- A. General: Prepare and submit Informational Submittals required herein or by other Specification Sections.
1. Number of Copies: Submit one electronic copy of each submittal, unless otherwise indicated.
 2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
- B. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section 01 32 00 "Construction Progress Documentation".
- C. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure

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Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

- D. **Installer Certificates:** Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- E. **Product Certificates:** Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- F. **Material Certificates:** Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- G. **Operation and Maintenance Manuals:** Upon completion of work, provide three (3) sets of complete operations and maintenance instructions of mechanical equipment, neatly bound in 3 ring binders and with electronic version on USB Flash Drive. Provide each binder with the name of Owner, Architect/Engineer, Contractor, and Title. Manuals shall provide a requirements specifically listed by 2015 International Energy Conservation Code Section C408.2.5.2 at a minimum. During the construction period, accumulate the following for inclusion in the Operating and Maintenance Manuals:
 - 1. Tabulation of equipment by manufacturer, model number, and serial number.
 - 2. All warranties and guarantees and manufacturer's directions on equipment and material covered by the Contractor.
 - 3. Approved fixture brochures, wiring diagrams, and control diagrams.
 - 4. Copies of final approved shop drawings and submittals.
 - 5. Operating instructions for all equipment and systems. Operating instructions shall include maintenance and seasonal changeover procedures. Routine maintenance actions shall be clearly identified.
 - 6. Recommended preventative maintenance procedures.
 - 7. Repair parts list of all major items and equipment including name, address, and telephone number of local supplier or agent.
 - 8. Full version of repair manuals for each piece of equipment.
 - 9. Manufacturer's letter certifying that the equipment has been installed per manufacturer's installation manuals.
 - 10. Contractor's one (1) year warranty letter including start and finish dates.
 - 11. Name and address of at least one service agency for each piece of equipment on project.
 - 12. Control system maintenance and calibration information, including wiring diagrams, schematics and control sequence descriptions. Desired or field determined set points shall be permanently recorded on control drawings at control devices or, for digital control systems, in system programming instructions.
 - 13. A narrative of how each system is intended to operate, including recommended set points.
- H. **Operation and Maintenance instructions** shall be submitted and approved prior to instruction of Owner's personnel in the various systems operation and maintenance.
- I. **Manufacturer's Field Reports:** Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
 - 1. Name, address, and telephone number of factory-authorized service representative making report.
 - 2. Statement on condition of substrates and their acceptability for installation of product.
 - 3. Statement that products at Project site comply with requirements.
 - 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.

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6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- J. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.
- K. Material Safety Data Sheets (MSDSs): Submit information directly to Owner; do not submit to Engineer.
1. Engineer will not review submittals that include MSDSs and will return the entire submittal for resubmittal.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW:

- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ENGINEER'S ACTION:

- A. General: Engineer will not review submittals that do not bear Contractor's approval stamp or approval statement and will return them without action.
- B. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Engineer will return each submittal with comments and indication of action required.
- C. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.
- D. Partial submittals are not acceptable, will be considered non-responsive, and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.
- F. Each submittal will be reviewed by Engineer for compliance with general requirements of design and arrangement only; Engineer's comments or omission of comments do not relieve the Contractor of responsibility for performance of the work in compliance with all provisions and requirements of the Contract Documents. Job measurements and the coordination of all the dimensions for proper fit of all parts of the work and performance of all equipment supplies to meet Specification requirements are and remain specific responsibilities of the Contractor.
- G. Engineer's review of submittals does not relieve Contractor of his responsibility for deviations from Contract Documents or Contractor's errors and omissions except when acceptance of the specific deviation is given in writing.

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- H. Engineer's review is only for conformance with the design concept of the project and for compliance with the information given in the contract.
 - 1. The review shall not extend to means, methods, sequences, techniques, or procedures of construction or to safety precautions or programs incident thereto.
 - 2. The review shall not extend to review of quantities, dimensions, weight or gauges, fabrication processes or coordination with the work of other trades.

END OF SECTION 01 33 00

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SECTION 01 41 26 – PERMITS

PART 1 - GENERAL

1.1 SECTION INCLUDES:

- A. List of Contractor submission requirements for City Building Permits.

PART 2 - SUBMISSION REQUIREMENTS

2.1 CITY OF PORTLAND SUBMISSION REQUIREMENTS AND FEES:

ITEM	RESPONSIBLE PARTY
Plan Review & Fee	Contractor
Submission of Plans for Review to City	Contractor
Filing with Architectural Barriers (State)	Not Applicable
WPI-1 Windstorm Design Certification	Wilkerson and Sanders, Inc.
WPI-2-BC-6 – Inspection Verification	Wilkerson and Sanders, Inc.
Hazardous Materials Survey	Not Applicable
Electrical Lighting COMCheck	Not Applicable
Architectural COMCheck	Not Applicable
Mechanical COMCheck	Stridde, Callins and Associates, Inc.
Storm Water Pollution Prevention Plan	Not Applicable
General Permit Application and Fees to City	Contractor
TxDOT Driveway Permit and Fees	Not Applicable
Fence Permit and Fees	Not Applicable
Registration and Fees Required with City (General Contractor, Electrical Contractor, Plumbing Contractor, Mechanical Contractor, Irrigation, Backflow Testing)	Contractor

**All permits and plan review fees not specifically listed to be paid by Flour Bluff Independent School District must be paid by the Contractor as part of the Base Bid Contract. All permits required by the City of Corpus Christi for sub-contractors and tradesmen shall be paid by that sub-contractor or trade.*

PART 3 - EXECUTION

3.1 NOT APPLICABLE.

END OF SECTION 01 41 26

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SECTION 01 50 20 - CAMPUS SECURITY MEASURES

PART 1 - GENERAL

1.1 REQUIREMENTS:

- A. The Contractor, Subcontractors, their agents and all others who perform Work on any FBISD campus are required to observe the campus security.
- B. The Contractor, Subcontractors, and their agents shall perform background checks and shall guarantee and manage construction activities to prevent any person with a felony conviction or convictions for crimes of "moral turpitude" from gaining access to school property or entering any school facility. Any Covered Employee that has during the preceding Thirty (30) years, (a) been convicted of or placed on deferred adjudication community supervision for a offense for which a defendant is required to register as a sex offender under Chapter 62, Code of Criminal Procedure; or (b) been convicted of a felony offense under Title 5, Texas Penal Code if the victim of the offense was under 18 years of age at the time of the offense was committed; (c) been convicted of an equivalent offense to (a) or (b) under federal law or the laws of another state ("Disqualifying Criminal History"); shall be disqualified and prohibited from performing any contract duties or services and neither the Contractor nor its Subcontractor(s) may permit such person to provide services at an Instructional Facility. If a covered Employee is determined by the Owner's review of the CHRI to have a Disqualifying Criminal History, Contractor will exclude that person from assignment to the Project. To the extent the Owner, not the Contractor obtains the CHRI. Contractor understands that they will not have access to the results of such criminal history records check, based on statewide regulations beyond the control of the Owner, and agrees to rely solely on the judgement of the Owner as to whether the Covered must be excluded from the Project.
- C. All Contractor and sub-contractor employees are required to obtain a RAPTOR check before the start of any work and shall be required to update the check every Two (2) weeks. RAPTOR badge shall be provided by FBISD Maintenance Department for the Contractor to wear at all times.
- D. Superintendent: The Contractor project Superintendent shall be required to be on site at all times that work is taking place by the Contractors employees or any sub-contractors for the primary purpose of supervision. Superintendent shall be required to wear the RAPTOR badge and also have a Contractor issued badge that clearly notifies this employee as the "Superintendent".

1.2 CODE OF CONDUCT:

- A. Proper dress attire at all times, safety items, etc.
- B. All Contractor and sub-contractor employees shall wear a company uniform with company logo visible at all times in addition to all security badges.
- C. Interaction with students, faculty, and staff is discouraged. The District will not tolerate "cat-calling," "whistling," "profanity," or derogatory remarks.
- D. No smoking or tobacco products are allowed on campus.

1.3 SAFETY ISSUES:

- A. All construction related workers shall adhere to all FBISD safety plans, programs, and procedures.

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- B. All construction related workers shall adhere to all FBISD campus parking regulations.
- C. All worksites must be secured with construction fencing and barricades as needed to protect the public from construction activities in accordance with all OSHA requirements. Contractor shall regularly inspect all control system and maintain as needed for continuous duty.
- D. All campus incidents shall be reported.
- E. Contractor shall not use or possess any alcohol or fire arms on school property.
- F. Contractor shall check in with FBISD and shall wear FBISD issued identification badges as required at all times during construction.
- G. Safety and Security requirements shall be detailed at pre-construction meeting. FBISD shall provide badges to Contractor as needed.

1.4 POLICY STATEMENT:

- A. Student, instructor and all staff safety and campus security are a concern to FBISD. Each campus presents security concerns in terms of site access, traffic, classroom and non-classroom related functions. The construction work performed at each campus is directive in nature and work rules for each project can vary depending on the scope of work. FBISD has responsibilities to the students, staff, and others to ensure that safety measures are strictly applied on each project.

1.5 RELATED REQUIREMENTS:

- A. Section 01 31 00 – Project Management Coordination.
- B. Section 01 52 00 – Construction Facilities.

PART 2 - PRODUCTS

- 2.1** Not Applicable.

PART 3 - EXECUTION

- 3.1** Not Applicable.

END OF SECTION 01 50 20

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SECTION 01 52 00 - CONSTRUCTION FACILITIES

PART 1 - GENERAL

1.1 SECTION INCLUDES:

- A. Temporary Utilities: Electricity, telephone service, water and sanitary facilities.
- B. Temporary Controls: Barriers, enclosures, protection of the Work, and water control.
- C. Construction Facilities: Parking, progress cleaning.
- D. Fire Extinguishers: Portable fire extinguishers.

1.2 TEMPORARY ELECTRICITY:

- A. Contractor shall use Owner electrical power from power receptacles located at project sites. Provide flexible power cords as required to extend power as needed to work areas. Owner will pay the actual cost of all energy used directly for this project. Contractor shall pay for all required additional power as needed as part of contract.
- B. Make connections as needed for temporary electrical service, which is to be provided and installed as a part of this project scope.
- C. All temporary power devices must be OSHA approved.

1.3 TELEPHONE SERVICE:

- A. Contractor shall provide temporary telephone service and shall pay for all telephone service charges incurred by the contractor for this project.
- B. The use of cellular telephones is acceptable.

1.4 TEMPORARY WATER SERVICE:

- A. Provide temporary water service as required for this project. The contractor may connect to Owner's existing water sources for construction operations, where existing service is available. Coordinate final location of Sanitary Facilities and Temporary Water Service with Owner and Engineer.
- B. Owner will pay for the actual cost of water used for this project. Contractor shall pay for any conveying system installations and removals. Exercise measures to conserve water.
- C. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing where needed.

1.5 TEMPORARY SANITARY FACILITIES:

- A. Contractor shall provide portable restroom facility at the exterior of the project location. All facilities must be secured and maintained during the course of construction.
- B. Contractor shall not use any other restroom facilities located outside of the project location.

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1.6 BARRIERS AND CONSTRUCTION FENCES:

- A. Provide appropriate barriers to prevent unauthorized entry to construction areas and temporary sanitary facilities.
- B. Protect non-owned vehicular traffic, stored materials, site and structures from damage.
- C. All systems shall be regularly check and maintained by contractor on a daily basis.

1.7 PROTECTION OF INSTALLED WORK AND FACILITIES:

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings whenever appropriate.
- D. Protect finished floors, roofing and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Protect site areas, underground utilities, sidewalks, parking areas, and the like from the use of crane services to perform work on project. Crane services shall utilize pads for outriggers to reduce psi load on surfaces to prevent damages. Contractor shall identify all existing conditions prior to use of crane. Contractor shall replace or repair facilities that may be damaged by the use of cranes.

1.8 PARKING:

- A. Park in publicly designated areas only. All special parking shall be pre-authorized by Owner on a limited time basis as needed during special functions only.
- B. The contractor is encouraged to car-pool workers to the job site from other parking locations.

1.9 PROGRESS CLEANING:

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Remove waste materials, debris, and rubbish from site periodically and dispose off-site.

1.10 FIRE EXTINGUISHERS:

- A. Provide portable fire extinguishers at all construction areas. Fire extinguishers shall be UL rated with class and extinguishing agent as required by locations and classes of fire exposures.
- B. Fire watchperson shall be provided at all times that welding is taking place.

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PART 2 - PRODUCTS

2.1 Not Applicable.

PART 3 - EXECUTION

3.1 Not Applicable.

END OF SECTION 01 52 00

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SECTION 01 73 29 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including Division 01, 22, 23, 26 Specification Sections, apply to this Section.

1.2 SUMMARY:

- A. This Section includes administrative and procedural requirements for cutting and patching.
- B. Related Sections: The following Sections contain requirements that relate to this Section. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work. Requirements of this Section also apply to mechanical and electrical installations. Refer to Division 22,23,26 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.3 QUALITY ASSURANCE:

- A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.
 - 1. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:
 - a. Foundation construction.
 - b. Bearing and retaining walls.
 - c. Structural concrete.
 - d. Structural steel.
 - e. Lintels.
 - f. Structural decking.
 - g. Miscellaneous structural metals.
 - h. Equipment supports.
 - i. Piping, ductwork, vessels, and equipment.
- B. Operational Limitations: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.
 - 1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:
 - a. Primary operational systems and equipment.
 - b. Air or smoke barriers.
 - c. Water, moisture, or vapor barriers.
 - d. Membranes and flashings.
 - e. Fire protection systems.
 - f. Noise and vibration control elements and systems.
 - g. Control systems.
 - h. Communication systems.
 - i. Conveying systems.
 - j. Electrical wiring systems.
- C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the Engineer's opinion, reduce the building's aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of

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cutting and patching. Remove and replace construction cut and patched in a visually unsatisfactory manner.

1.4 WARRANTY:

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

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL:

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

PART 3 - EXECUTION

3.1 INSPECTION:

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding. Before proceeding, meet at the Project Site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.2 PREPARATION:

- A. Temporary Support: Provide temporary support of work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
- C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Avoid cutting existing pipe, conduit, or ductwork serving the building but scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 PERFORMANCE:

- A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
- B. Cutting: Cut existing construction using methods least likely to damage elements retained or adjoining construction. Where possible, review proposed procedures with the original Installer; comply with the original Installer's recommendations.
 - 1. In general, where cutting, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

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3. Cut through concrete and masonry using a cutting machine, such as a Carborundum saw or a diamond-core drill.
 4. Comply with requirements of applicable Division 2 Sections where cutting and patching requires excavating and backfilling.
 5. Where services are required to be removed, relocated, or abandoned, by-pass utility services, such as pipe or conduit, before cutting. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
- C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
1. Where feasible, inspect and test patched areas to determine integrity of the installation.
 2. Restore exposed finishes of patched area and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 3. Where removing walls or partitions extends from one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch after the area has received primer and second coat.
 4. Patch, repair, or re-hang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

3.4 ROOFING:

- A. Contractor shall protect existing roofing from damage during construction. Any damage to existing roof systems shall be repaired at the Contractor's expense by either of the following pre-approved roofing contractors.
- B. Contractor shall provide new roofing system that match existing roofing construction at each project location as applicable. Roof construction varies from PVC single ply to felt with tar and gravel, modified bitumen and the like. Contractor shall survey existing roof construction before submitting final proposal.
- C. FBISD Pre-Approved Roofing Contractors:
1. Port Enterprises.
 2. Haeber Roofing.
 3. Baldwin Roofing.
 4. DB Services, Inc.

3.5 CLEANING:

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

END OF SECTION 01 73 29

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SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Warranties.
 - 3. Final cleaning.
- B. Related Sections include the following:
 - 1. Division 1 Section 01 33 00 "Submittal Procedures".
 - 2. Divisions 2 through 26 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION:

- A. Definition: Substantial completion is the stage in the progress of Work when the entire project and all systems are fully complete and fully operable permitting Owner full and complete use of the entire Project, subject only to correction of completion of minor finish work items that value of which shall in no event exceed one percent (1%) of the Contract Sum.
- B. Preliminary Procedures: Before requesting review for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Prepare and submit Project Record Documents, Operation and Maintenance Manuals, and similar final record information.
 - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - 7. Functional Performance testing of systems as per Commissioning Plan.
 - 8. Submit test/adjust/balance records.
 - 9. Terminate and remove temporary facilities from Project site, along with construction tools, and similar elements.
 - 10. Submit changeover information related to Owner's occupancy, use, operation and maintenance.
 - 11. Complete final cleaning requirements, including touchup painting.
 - 12. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- C. Substantial Completion Review: Submit a written request for Engineer review for Substantial Completion. On receipt of request, Engineer will either proceed with review or notify Contractor

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of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 SYSTEM COMMISSIONING:

- A. Contractor shall commission all mechanical systems with Engineer in accordance with commissioning plan and 2015 International Energy Conservation Code. Refer to Specification Section 20 00 10 as applicable.

1.5 FINAL COMPLETION:

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
 1. Submit a final Application for Payment according to Division 1 Section 01 29 00 "Payment Procedures".
 2. Submit certified copy of Engineer's Substantial Completion review list of items to be completed or corrected (punch list), endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
 5. Submit evidence of successful completion of systems commissioning in accordance with Specification Section 20 00 10 as applicable.
 6. Evidence of Final Inspection Completion by AHJ.
- B. Final Completion Review: Submit a written request for Final Review for acceptance. On receipt of request, Engineer will either proceed with review or notify Contractor of unfulfilled requirements. Engineer will review a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.6 LIST OF INCOMPLETE ITEMS (PUNCH LIST):

- A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 1. Organize list of spaces in sequential order.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Contractor.
 - d. Page number.

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1.7 WARRANTIES:

- A. Submittal Time: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES", Project name, and name of Contractor.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS:

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING:

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturers written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities of rubbish, waste material, litter, and other foreign substances.
 - b. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - c. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances.
 - d. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - e. Remove labels that are not permanent.
 - f. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

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- 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - g. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - h. Replace parts subject to unusual operating conditions.
 - i. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - j. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - k. Clean ducts, blowers, coils, unit casings, and the like as needed of construction debris.
 - l. Leave Project clean and ready for occupancy.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01 77 00

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SECTION 20 00 10 - MECHANICAL SYSTEMS COMMISSIONING – COMMISSIONING PLAN

PART 1 - GENERAL

1.1 CITY OF CORPUS CHRISTI PROJECT INFORMATION:

- A. Commissioning Provider Name: Jared Merdes, P.E., Stridde, Callins and Associates, Inc.
- B. Project Name: FLOUR BLUFF ISD ECC PACKAGED ROOFTOP UNIT REMPLACEMENTS – 2024.
- C. City of Corpus Christi Application Number: _____
- D. Project Address: 617 Purdue, Road, Corpus Christi, Texas 78418.

1.2 SYSTEMS TO BE COMMISSIONED:

- A. Mechanical HVAC Systems: Packaged Rooftop HVAC Units.

1.3 SCOPE:

- A. Purpose of the Commissioning Plan:
 - 1. To perform commissioning requirements in strict accordance with the International Energy Conservation Code – 2015 Edition, Section C408.
 - 2. To provide direction for the commissioning process during construction, providing resolution for issues such as scheduling, roles and responsibilities, line of communication and reporting, approvals, and coordination for the project location.
 - 3. Commissioning shall assist Owner operational staff with training and familiarization with new systems. Shall serve as a tool to reduce post-occupancy critical systems operational difficulty and failure. Shall also be used to develop test protocol and record the associated test data in an effort to advance the building systems from a state of substantial completion to a full dynamic operation.
- B. Commissioning Goals and Objectives:
 - 1. Commissioning is a systematic process of ensuring that systems perform according to the engineered design and to the Owners operational requirements. All equipment and systems shall be installed per engineered plans and specifications and manufacturer's installation instructions and the best practices and standards of the industry.
 - 2. Commissioning will include documenting the design intent, followed by activities in the construction, acceptance, and warranty phases of the project. The participation of the contractor for commissioning activities will follow the requirements defined in this commissioning plan and related documents. The main phases of the commissioning process are as follows:
 - a. Equipment and Materials Submittal Verification.
 - b. Installation Verification.
 - c. Pre-Functional Test - System Startup.
 - d. Test, Adjust, and Balancing.
 - e. Functional Performance Testing.
 - f. Preliminary Commissioning Report:
 - 1) OW approval of Preliminary Commissioning Report.
 - 2) AHJ approval of Preliminary Commissioning Report.
 - g. Documentation Requirements, Closeout:
 - 1) Owner training.
 - 2) O&M Documentation.
 - 3) Final TAB.

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4) Final Commissioning Report.

- C. The Contractor and all sub-contractors shall include the cost of performing work as detailed in this commissioning plan within their base bid proposal. Contractor is encouraged to review project commissioning requirements prior to submitting a bid proposal.

1.4 CODES:

- A. Minimum commissioning requirements shall be performed in strict accordance with the International Energy Conservation Code – 2015 Edition, Section C408 and this Commissioning Plan. In the event of conflict between the Codes and this commissioning plan, the more stringent shall govern. AHJ has final and governing authority.

1.5 DEFINITIONS:

- A. A/E Architect or Engineer, Design Professional.
- B. CP Commissioning Provider.
- C. CC Controls Contractor.
- D. PM Contractors Project Manager.
- E. MC Mechanical Contractor.
- F. TAB Test, Adjust, and Balance Contractor.
- G. EM Equipment Manufacturer.
- H. EC Electrical Contractor.
- I. CX Commissioning.
- J. CxP Commissioning Plan, Commissioning Process.
- K. PF Pre-Functional Test.
- L. FPT Functional Performance Test.
- M. OW Owner.
- N. AHJ Authority Having Jurisdiction – City of Corpus Christi Building Official.
- O. SUBS Sub-Contractors.

1.6 RELATED SECTIONS:

- A. All Division 1 Sections as applicable.
- B. All Division 15/23 (Mechanical) Sections as applicable.
- C. All Division 16/26 (Electrical) Sections as applicable.
- D. Final engineered plans approved for construction by AHJ.

1.7 GENERAL PROJECT INFORMATION:

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- A. Location: FBISD Early Childhood Center.
- B. OW: Flour Bluff Independent School District.
- C. CP: Stridde, Callins and Associates, Inc.; Jared Merdes, P.E., MBA, LEED AP.
- D. Completion: July 31, 2024 (Scheduled Completion Date).

1.8 COMMISSIONING TEAM:

- A. Owner staff and Representatives.
- B. Commissioning Provider.
- C. A/E Team.
- D. Contractor and all related Sub-Contractors.
- E. Equipment Manufacturers' Factory Authorized Technicians.
- F. Independent TAB Contractor.
- G. Independent Control Contractor.

1.9 ROLES AND RESPONSIBILITIES:

- A. General: In general the CP coordinates the commissioning activities and reports to the Owner and AHJ. General responsibilities are as listed below. All members shall work together to fulfill contracted responsibilities and meet the objectives of the Contract Documents and approved documents by AHJ.
- B. General Description of Roles:
 - 1. **CP:** Coordinates the CX process, writes and/or reviews testing plans, and coordinates testing. Performs construction observations, reviews O&M documents provided by Contractor and coordinates resolution of problems.
 - 2. **PM:** Facilitates the CxP process, ensures that Subs perform their responsibilities and integrates the CxP into the construction process and schedule. Coordinates and schedule construction activities and schedules work with contractor personnel, sub-contractors, equipment manufacturer personnel, and owner furnished sub-contractors.
 - 3. **OW:** Facilitates and supports the CxP and gives final approval to the CX work. Coordinates maintenance staff participation in commissioning activities and training and review of O&M.
 - 4. **SUBS:** Demonstrate correct system performance.
 - 5. **EM:** Equipment manufacturers and vendors shall provide documentation to facilitate the CxP and perform contracted startup.

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1.10 GENERAL PROTOCOLS: The following protocols shall be used on this project.

Issues	Protocols
For requests for information (RFI) or formal documentation requests:	PM shall organize and manage and send to CP for response through approved channels.
For minor or verbal information and clarifications:	Each party may contact CP but must carbon copy PM and A/E Team on communications.
For notifying contractor or sub-contractors of deficiencies:	CP documents deficiencies through the A/E to PM, but may discuss deficiency issues with sub-contractors prior to notifying the A/E and PM.
For scheduling tests, training, and the like:	CP provides input and coordination but scheduling is the responsibility of the PM.
For scheduling commissioning meetings:	CP coordinates the dates/times and schedules through the PM.
For making a request for significant changes:	The CP does not have the authority to execute Change Orders unless CP is the A/E. Change Orders and modifications to the construction contract and construction documents are the responsibility of A/E.
For making minor changes in specified sequence of operations:	Any required changes in sequences of operations required to correct operational deficiencies must be approved and documented by the A/E team. The CP may only recommend changes in sequences unless CP is the A/E.
Subcontractor disagrees with requests or interpretations by the CP shall:	Resolve issues at the lowest level possible and document with PM. PM shall communicate and document with CP and A/E team as needed.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT:

- A. Contractor shall provide all test ports, gauges, photometers, instruments, test equipment, and the like as needed to accomplish work required by CxP. Instruments used for measurements shall be accurate. Calibration histories for each instrument shall be provided to CP for examination. Calibration and maintenance of instruments shall be in accordance with the requirements of NEBB, AABC standards, U.L., NTL, and the like. Test instruments shall have had a NIST certified calibration within the last 12 months unless otherwise recommended by approved agencies and standards.

2.2 TOLERANCES:

- A. Contractor shall verify the following:
1. Sensor and gauge instrument locations are appropriate and away from causes of erratic operation.
 2. Sensors with shielded cable are grounded only at one end.
 3. For sensor pairs that determine a temperature difference, ensure that they are reading within 0.1°F of each other.
 4. For sensor pairs that determine a pressure difference, ensure that they are reading within 2% of each other.
 5. Photo sensors are adjusted per manufacturer's installation instructions for project specific conditions such as locations from other light sources, reflective surfaces, paint finishes, and the like.

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- B. Calibration: Sensors and gauges shall be calibrated to tolerances listed below. Place equipment into operation. Take readings with calibration test instrument within six inches of the site sensor. Verify that sensor readings are within the tolerances in the table below of the instrument-measured value. If not, calibrate or replace sensor as needed.

<u>Sensor/Gauge/Instrument</u>	<u>Required Tolerance (+/-)</u>
Air Temperature	0.5°F
Water Temperature	0.5°F
Wetbulb or Dewpoint	1.0°F
Relative Humidity	3% or sensor range
Watt-hour, voltage, or amperage	4% of design
Pressure; air, water, or gas	3% of sensor range
Air flow rate	5% of design
Water flow rate	3% of design
Natural gas flow rate	5% of sensor range
CO2	50 PPM
Sound Level	5 Db
Light Level	5 Footcandles

- C. TAB Contractor shall adjust all equipment in accordance with the capacities show on the drawings, with permissible tolerances as follows:

Supply fans	+0% to +10%
Return	+5% to -10%
Exhaust fans	0% to -10%
Diffusers/supply grilles	-5% to +10%
Return grilles	0% to -10%
Exhaust grilles	0% to -10%
Heating gpm	0% to +10%
Cooling gpm	0% to +10%

- D. Mechanical HVAC Design Conditions

1. Indoor Conditions:
 - a. Summer: 75°F dry bulb
55% RH
 - b. Winter: 70°F dry bulb
2. Outdoor Conditions:
 - a. Summer: 96°F dry bulb
80°F wet bulb
 - b. Winter: 30°F dry bulb
3. Mechanical Systems: Design conditions for mechanical equipment shall be listed in equipment sequence of operations.

PART 3 - EXECUTION

3.1 GENERAL:

- A. The Contractor and sub-contractors shall be responsible for testing and operating equipment and collection of pertinent data during system testing. The Contractor shall submit to the CP documentation of testing as required by this commissioning plan.
- B. CP shall create CX documents based on manufacturer's installation requirements of final equipment provided on project. Testing documents and procedures shall require the following at a minimum:
1. Test Number; Date and Time of Test.

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2. Indication of whether the test document is for a first test or retest following correction of a problem or issue.
3. Identification of system, sub-system, assembly, or equipment.
4. Equipment name plate and characteristic data.
5. Conditions under which the test was conducted, including (as applicable) ambient conditions, set points, override conditions, and status and operating conditions that impact the results of the test.
6. Expected performance of the systems and assemblies at each step of the test.
7. Narrative description of observed performance of the system, equipment, or assembly.
8. Notation to indicate whether the observed performance at each step meets the expected results.
9. List of any deficiencies as applicable.
10. Issue number, if any, generated as the result of the test.
11. Dated signatures of the person performing the test and of the witness.

3.2 PRE-COMMISSIONING MEETING:

- A. CP shall coordinate and conduct a pre-commissioning meeting to bring all members of the design, construction, and operations teams together to discuss the project and the scope of the CxP. At the meeting all parties shall discuss the scope of work, tasks, schedules, deliverables, and responsibilities for implementation of CxP. CP may update CxP after pre-commissioning meeting as needed and issue revised documents to the team. PM shall be responsible for including all CxP activities on official project construction schedule.

3.3 EQUIPMENT AND MATERIALS SUBMITTAL REVIEW:

- A. PM shall provide equipment and material product submittal data to CP for review prior to placing orders. CP shall review and provide review comments as needed to PM. Refer to Specification Section 01 33 00 for submittal requirements.
- B. PM, EM, CC, MC, EC shall provide manufacturers recommended start-up, calibration, and testing procedural documents to CP during the submittal process. CA shall use these documents to create final versions of checklists used for Pre-Functional and Functional Testing performed by Contractor.

3.4 SITE REVIEWS DURING CONSTRUCTION:

- A. CP shall perform periodic construction observations and provide report of any required remedial actions needed to A/E, OW, PM during construction. The PM shall provide CP with information with regards to substitution or changes as needed to CP.
- B. PM shall include CP in regular project communications as needed to track construction progress and general project coordination.

3.5 INSTALLATION REVIEW:

- A. Pre-Installation Audit:
 1. Contractor shall be responsible for completion of work including change orders and punchlist items and shall perform an audit that shall include, but not be limited to, checking of the following:
 - a. All equipment is set and connected per manufacturer's installation instructions.
 - b. Piping specialties including balance, control, and isolation valves.
 - c. Ductwork is installed sealed and insulated.
 - d. Ductwork specialty items are installed including turning devices, balance, fire, smoke control dampers, access doors, and the like.

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- e. HVAC and Lighting control system remote sensors are mounted and wired back to systems.
 - f. Identification of piping, valves, equipment, controls, and the like.
 - g. Major equipment, pumps, valves, starters, gauges, thermometers, and the like.
 - h. Electrical power systems are connected and terminated.
 - i. Control systems are completely connected and terminated.
 - 2. Contractor shall provide written proof of audit and correct all work that is found incomplete, incorrect, or non-functional during audit before contacting CP for project review.
- B. PM shall schedule project observation review with CP once systems are installed and ready for pre-functional testing. CP shall review completed construction and provide written report to PM of any corrective actions needed. PM shall coordinate corrective actions with sub-contractors and schedule return visit with CP once work is completed.
- C. Contractor may not proceed to pre-functional testing until CP is satisfied with systems installation and any corrective actions taken.

3.6 PRE-FUNCTIONAL TESTS – SYSTEMS STARTUP:

- A. General:
- 1. Pre-Functional Checklists shall be developed for systems required to be commissioned by CP based on manufacturer's data sheets and instructions, drawings and specifications, to include the required installation, checkout, and start up procedures.
 - 2. CP shall issue draft version of recommend Checklists to PM for PM and sub-contractor review and consideration before issued final Checklists.
 - 3. Contractor shall perform testing and complete forms. All forms must include testing date, time, equipment name plate data, and technician(s) signature performing the work.
- B. Testing:
- 1. Startup shall include but not limited to the following:
 - a. Flushing and cleaning of systems.
 - b. Replace and/or clean all filters, strainers, and screens.
 - c. Verify valve and damper operations.
 - d. Mechanical test
 - e. Electrical tests
 - f. Control system tests
 - g. Pressure tests
 - h. Safeties check
 - i. Chemical treatment
 - j. Manufacturer's Recommended tests
 - k. Sensor adjustment check
 - 2. PM shall schedule PF testing upon receipt of check lists from CP and confirmation from all sub-contractors that systems are ready for testing.
 - 3. Contractor shall complete testing and deliver test documents to CP for review.
 - 4. CP shall review PF tests for completeness before PM schedules Functional Performance Testing.
 - 5. Contractor shall correct all deficiencies identified during testing before moving to next phase of work.

3.7 TEST, ADJUST, AND BALANCING:

- A. General: TAB shall start after completion of pre-functional testing. TAB work shall be performed in accordance with applicable specifications.

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- B. Air System Balancing: Air systems shall be balanced in a manner to first minimize throttling losses then fan speed shall be adjusted to meet the design flow conditions.
- C. Hydronic System Balancing: Individual hydronic heating and cooling coils shall be equipped with means of balancing and measuring flow. Hydronic system shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed or pump speed shall be adjusted to meet design flow conditions. Each hydronic system shall have either the capabilities to measure pressure across the pump, or test ports at each side of each pump.
- D. Control and Mechanical Coordination: TAB contractor will be required to assist in setting specific air volumes, static pressures and the like for both Control Systems and Mechanical equipment in response to requirements of equipment sequence of operations and manufacturer's specific requirements. TAB contractor shall work is PM during the process to assist with coordinating required activities with appropriate sub-contractors. TAB report shall include specific coordination data as required to document coordination such as:
 - 1. Fan speed %.
 - 2. Static pressure setpoint recommendations.
 - 3. Damper positions.
- E. Preliminary TAB reports shall be provided to CP before start of FPT. Reports shall include setpoint recommendations that were coordinated with control system contractor for each piece of equipment. PM shall provide confirmation that control system contractor has received reports and all recommended setpoints have been entered into the control system and appropriate sequences implemented.

3.8 FUNCTIONAL PERFORMANCE TESTING:

- A. General:
 - 1. Functional performance testing verifies the intended operation of individual components and system interaction under various conditions and modes of operation. The systems are run through all of the sequence of operation and the responses of the components are verified. Testing proceeds from components to subsystems to system, and finally to interlocks and connections between systems.
 - 2. FPT shall be developed for systems required to be commissioned by CP based on manufacturer's data, drawings and specifications, to include the required installation, checkout, and start up procedures.
 - 3. Contractor shall perform testing and complete forms. All forms must include testing date, time, and technician(s) signature performing the work.
 - 4. FPT shall not start until successful completion of the following minimum items and written documentation is provided to CP:
 - a. Pre-Functional Tests are completed in good order and received by CP with no remaining deficiencies that would affect FPT.
 - b. TAB work is complete and report is provided with no remaining deficiencies that would affect FPT.
 - c. Control contractor has verified that all control systems are completely integrated with mechanical and electrical systems and are fully functional as per equipment sequence of operations for all systems requiring commissioning.
- B. Testing:
 - 1. PM shall schedule FPT upon receipt of check lists from CP and confirmation from all sub-contractors that systems are ready for testing.
 - 2. Contractor shall complete testing and deliver test documents to CP for review. Contractor shall clearly identify any discrepancies observed during testing on reports. CP may attend complete testing or parts of testing as applicable.
 - 3. CP shall review FPT for completeness.

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4. Contractor shall take corrective actions as necessary to correct any deficiencies found during testing and document all deficiencies and repairs in a Deficiency Report. Contractor shall repeat FPT until systems operate in accordance with approved plans and specifications. Deficiency Report shall include all details of the components and systems found to be non-compliant with the parameters of the functional performance test plans and design documents. The deficiency report shall become part of the functional performance testing documentation. The report shall detail the adjustments or alterations required to correct system operation and identify the responsible party. The report shall be continuously updated as needed.
 5. CP shall schedule demonstration of final systems performance with PM after Contractor has completed functional performance testing and all documented deficiencies have been corrected.
- C. Equipment Requirements: Equipment functional performance testing shall demonstrate the installation and operation of components, system, and system-to-system interfacing relationships in accordance with approved plans and specifications such that operation, function, and maintenance serviceability for each of the commissioned system is confirmed. Testing shall include all modes and sequence of operation, including under full-load, part-load and the following emergency conditions:
1. All modes as described in the sequence of operation.
 2. Redundant or automatic back-up mode.
 3. Performance of alarms and safeties.
 4. Mode of operation upon a loss of power and restoration of power.
- D. Controls Requirements:
1. Control systems shall be tested to document the control devices, components, equipment and systems are calibrated and adjusted and operate in accordance with approved plans and specifications. Sequence of operation shall be functionally tested to document they operate in accordance with approved plans and specifications.

3.9 PRELIMINARY COMMISSIONING REPORT:

- A. CP shall provide a preliminary report of commissioning test procedures and results and provide report to Owner. Report shall be identified as "Preliminary Commissioning Report" and shall identify the following:
1. Itemization of deficiencies found during testing required by this section that have not been corrected at the time of report preparation.
 2. Deferred tests that cannot be performed at the time of report preparation because of climatic conditions.
 3. Climatic conditions required for performance of the deferred tests.
- B. Acceptance of Report: Buildings, or portions thereof, shall not be considered acceptable for a final inspection until the AHJ has received a letter of transmittal from the building owner acknowledging that the building owner has received the Preliminary Commissioning Report. A copy of the Preliminary Commissioning Report shall be provided to AHJ upon request.

3.10 DOCUMENTATION REQUIREMENTS, CLOSEOUT:

- A. The following shall be provided to OW no more than 90-days of date of receipt of Certificate of Occupancy or passing of Final Inspection by AHJ.
1. Operation and Maintenance Manuals in accordance with Specification Section 01 33 00.
 2. Owner Training in accordance with Specification Section 01 33 00 and 23 05 10.
 3. Final TAB Reports in accordance with Specification Section 23 05 93.
 4. Final Commissioning Report: CP shall create a report of test procedures and results identified as "Final Commissioning Report" and deliver to building Owner or deliver to Contractor for inclusion in final O&M manuals. The report shall be organized with

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commissioned systems findings in separate sections to allow independent review. The report shall include the following at a minimum:

- a. Results of FPT and CxP.
- b. Disposition of deficiencies found during testing, including details of corrective measures used or proposed.
- c. Actual Final Pre-Functional and Functional PT used during the commissioning process including measureable criteria for test acceptance, providing herein for repeatability.
- d. Final Test, Adjust, and Balance Reports.

END OF SECTION 20 00 10

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SECTION 23 05 00 - MECHANICAL GENERAL CONDITIONS

PART 1 - GENERAL

1.1 SCOPE:

- A. The Work to be provided under this Division of Specification shall include the furnishing, delivering, transporting, unloading, hoisting, handling, scaffolding, storing, erecting, adjusting, and testing of all materials, apparatus, and equipment required for complete, properly adjusted and operable mechanical systems for this project in accordance with the Contract Documents. Provide all labor, supervision, coordination, equipment, tools, materials, permits, fees, and connection to utilities necessary for the completion of this Work.
- B. If details or special conditions are required in addition to those shown on Drawings, provide all material and equipment usually furnished with such systems or required to complete their installation, whether noted in Contract Documents or not.
- C. The Instructions to Proposers, Notice to Proposers, General Conditions, Special Conditions, all other preface Sections, all technical divisions and all appendixes of the Specifications, and any other pertinent documents issued by Owner's representative shall be considered as part of this Division insofar as they may be applicable.
- D. The Architectural, Civil, Structural, Plumbing, Fire Protection, Heating, Ventilating and Air Conditioning (HVAC) and Electrical Plans and Specifications and any other pertinent documents issued by Owner's representative shall be considered as part of this Division insofar as they may be applicable.
- E. Refer to Division 1 Specifications for general requirements of the following items:
 - 1. Work by Owner.
 - 2. Work sequencing and phasing.

1.2 CODES AND STANDARDS:

- A. The Codes and Standards of the following organizations shall generally apply where applicable and where no specific Codes and Standards have been cited. In the event of conflict between the Codes and Standards of these organizations, the more stringent shall govern.

AABC:	Associated Air Balance Council.
ADC:	Air Diffuser Council.
AMCA:	Air Moving and Conditioning Association.
ANSI:	American National Standards Institute.
API:	American Petroleum Institute.
ARI:	American Refrigeration Institute.
ASA:	American Standard Association.
ASHRAE:	American Society of Heating Refrigeration and Air Conditioning Engineers.
ASME:	American Society of Mechanical Engineers.
ASPE:	American Society of Plumbing Engineers.
ASTM:	American Society for Testing and Materials.
AWS:	American Welding Society.
AWWA:	American Water Works Association.
CTI:	Cooling Tower Institute.
FM:	Factory Mutual Engineering Company.
IRI:	Industrial Risk Insurers.
ISA:	Instrument Society of America.
MSS:	Manufacturers Standardization Society.

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NBS:	National Bureau of Standards.
NEC:	National Electric Code.
NEMA:	National Electrical Manufacturer's Association.
NFPA:	National Fire Protection Association.
OSHA:	Occupation Safety and Health Administration.
PFI:	Pipe Fabrication Institute.
UL:	Underwriters Laboratories, Inc.

- B. All workmanship, material, and equipment shall be in accordance with all local, state, and federal codes, ordinances and regulations.

1.3 DEFINITIONS:

- A. "Contract Documents" shall refer to the complete package of Plans, Specifications, addenda, and special conditions used as a basis for the General Construction Contract for this project including but not limited to all General and Special Conditions, all Architectural and Engineering Divisions of Specifications and all Architectural and Engineering Plans.
- B. "Owner" means the entity specified in the General Construction Contract as Owner.
- C. "Contractor" means the entity contracting with the Owner for the performance of work.
- D. "Work" means all of the Contractor's obligations under the Contract.
- E. "Provide" shall mean furnished and installed, complete and ready for intended use by Contractor, except as otherwise noted.
- F. "Furnish" shall mean purchase only by Contractor; installation by others, except as otherwise noted.
- G. "Install" shall mean Contractor to set up for use, erect or construct only; purchase by others, except as otherwise noted.
- H. "Demolish" and "Remove" shall mean Contractor to disassemble, take away from site, and properly dispose of items as indicated or implied. Contractor shall patch remaining systems to match existing.
- I. "Directed" means "directed by Owner's representative". This shall not imply that Architect's or Engineer's responsibility extends into the Contractor's area of construction supervision.
- J. Where the words "similar" or "typical" are used, they shall be used in their general sense and shall not be interpreted as meaning identical. Details shall be worked out in relation to their location and connections to other parts of work.
- K. Items such as but not limited to access doors, sleeves, cleanouts, trap-primers, roof flashings, pipe supports, or balancing dampers that are to be installed repetitiously and are noted on the Plans as "typical" shall be installed at every location required by Specifications, codes, or good practice, whether specifically shown on Plans or not.
- L. Where the terms "or equal" and "or approved equal" are used they shall be defined as "approved as equal by Owner's representative".

1.4 CONTRACTOR'S RESPONSIBILITY:

- A. It shall be the responsibility of the Contractor to carefully examine all of the Contract Documents and to comply with them in every respect. Should there be omissions or discrepancies in the

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documents notify the Owner's representative prior to the bid date so a written clarification can be issued.

1. Coordinate exact electrical requirements of all mechanical equipment prior to submittal review and make all modifications necessary for full compatibility with the final electrical installation.
- B. It shall be responsibility of the Contractor to review all Divisions of the Contract Documents with respect to mechanical work that will be required by other divisions. Contractor shall thoroughly review all aspects of Mechanical Bid Proposal prior to bidding for the purpose of clearly defining the scope of Mechanical Bid Proposal with that of all other trades.
- C. It shall be the responsibility of the Contractor to provide all equipment, materials, and labor, whether specifically indicated on Plans or called for in Specifications or not, which are necessary for the proper installation and function of the mechanical systems for this project.
- D. It shall be the responsibility of the Contractor to carefully examine conditions of the project site and to check the work of other divisions that might affect the mechanical work. Include all costs of demolition, cutting, patching, and repairing of existing elements in bid proposal.
 1. Visit the proposed project site prior to bid and carefully investigate existing streets, parking lots, paved areas, sidewalks, buildings, structures, and landscaping.
- E. It shall be the responsibility of the Contractor to contact the Owner's representative prior to commencement of any trenching or site utility work for assistance in locating underground utilities. Hand dig where necessary to verify depth and location and to avoid damage to existing.
- F. It shall be the responsibility of the Contractor to coordinate work performed under the Mechanical Division of the Contract Documents with work performed under other divisions so as not to delay or damage any part of this installation.
- G. It shall be the responsibility of the Contractor to coordinate the location of chases, openings, sleeves, flashings, trenches, and the like required for the work covered by the Mechanical Division of the Contract Documents. Do so in sufficient time for proper coordination with general construction, or assume the responsibility for required cutting and patching. No cutting of structural members shall be performed without approval of the Owner's representative.
- H. It shall be the responsibility of the Mechanical Division to include minor details necessary for proper installation and operation of materials, equipment, or fixtures as if specified or shown in Contract Documents.
- I. It shall be the responsibility of the Contractor to install materials, equipment, and fixtures according to code requirements, manufacturer's recommendations or as required in Contract Documents, whichever is more stringent.

1.5 ADDITIONAL COMPENSATION:

- A. Failure to examine or to comply with Contract Documents shall not relieve Contractor of responsibility for the work or be used as basis for additional compensation.
- B. No additional compensation will be awarded for conflict with Architectural, Structural, Electrical, or Mechanical components in installation of prefabricated materials or equipment.
 1. Ductwork and piping shall be fabricated from field measurements. Adjust duct sizes as necessary to fit space available. Contractor shall advise Owner's representative of any discrepancies prior to fabrication.

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- C. No compensation will be awarded to the Contractor for minor relocations or deviations from plans. Changes in contract price will be allowed only for additions to or changes to original design intent and then only with written approval of the Owner's representative.
- D. Omission of Architectural, Civil, Structural, Electrical, or other pertinent details from Mechanical Contract Documents shall not be used as basis for additional compensation.
- E. No compensation will be awarded to the Contractor for failure to coordinate exact electrical requirements with electrical division prior to ordering equipment.

1.6 SUPERVISION, LABOR, AND WORKMANSHIP:

- A. Contractor shall provide proper supervision of mechanics and subcontractors performing work under this Division. Labor shall be performed by skilled mechanics experienced in their particular trade. Piping and equipment shall be installed square and plumb, with accessibility for proper operation and service. Any item that does not present a neat and workmanlike appearance shall be replaced or corrected at the direction of the Owner's representative and without additional cost to the Owner or Design Professionals.
- B. Submit welder's certificates and resume of experience for all mechanics on this project when directed to do so by Owner's representative.

1.7 LICENSING:

- A. Contractor shall be licensed to perform project work in accordance with Federal, State, and Local licensing requirements as applicable. HVAC Contractor shall have minimum Texas Air Conditioning Contractor Class "A" License.

1.8 FEES AND PERMITS:

- A. Contractor shall obtain and pay for all fees and permits required for the completion of the Work, including but not limited to construction permits; federal, state, and local inspection fees, connections to utilities, meter and tap fees, capitalization charges, temporary service charges, and any other associated fees or charges.

1.9 PROJECT/SITE CONDITIONS:

- A. Install Work in locations shown on Drawings, unless prevented by Project conditions.
- B. These Specifications and the accompanying Drawings are intended to describe and illustrate systems that will not interfere with the structures, which will fit into available spaces, and which will insure complete and satisfactorily operating installations. Coordinate the proper fitting of the material and apparatus into the available spaces without interfering with other building components. Prepare installation drawings at all locations where possible conflicts of HVAC, Plumbing, Fire Protection, Electrical, Structural, or Architectural components may occur. The installation drawings shall be submitted to the Owner's representative prior to commencing the Work. They should illustrate the installation of work in relation to other portions of the Work. Interferences with other portions of work, or the building structure, shall be corrected before the work proceeds. Should changes become necessary on account of failure to comply with these stipulations, make such necessary changes.

1.10 PRE-INSTALLATION CONFERENCE:

- A. Contractor shall convene a pre-installation conference one (1) week prior to commencing work of this Division and in conjunction with work of other divisions and notify Owner's representative of date and time of meeting.

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- B. Require attendance of parties directly affecting work of Division 23 and 26.
- C. Review installation procedures and coordination required with related work.
- D. Establish "right of way" and routes for conduit, wiring, cable trays, piping, ductwork, and similar elements in the available space above ceilings and vertical chases.
- E. Coordinate exact plumbing, fire protection, electrical, and service access requirements of all HVAC equipment and fixtures. Coordinate exact HVAC and service access requirements of all plumbing, fire protection, and electrical equipment, as example, ventilation and exhaust of panelboards, transformers, generators, pumps, water heaters, or boilers. Advise Owner's representative in a timely manner of any requirements that will be necessary in addition to requirements on Contract Documents.

1.11 GENERAL REQUIREMENTS:

- A. Protection of Rough Work: All openings of every description shall be securely capped or otherwise protected against debris or other foreign material entering the system until such time as the equipment is permanently attached.
- B. Cleaning and Adjusting: At the completion of the work all parts of the installation shall be thoroughly cleaned. All valves and controls shall be adjusted for proper operation. Upon completion of the work, the Contractor shall leave the building and project site in a neat condition.
- C. Defective work: If inspection or testing show defects, such defective work or materials shall be replaced and inspection and test repeated. All repairs to piping shall be made with new material. No caulking of screwed joints will be acceptable.
- D. Dielectric Connection: Where dissimilar metals are connected, provide approved dielectric connector to protect against dielectric corrosion.
- E. Vents Through Roof: Vents through roof shall be installed as closely as possible to locations shown on Drawings. However, in no case shall vents through roof be installed within ten feet of air conditioning outside air intakes. It shall be the responsibility of the Contractor to coordinate with the Plumbing and HVAC Divisions and offset vent piping as necessary. Offsets will be made at no additional cost to the Owner or Design Professionals.
- F. Surveys and Measurements: Carefully survey project site prior to bidding and installation. Dimensions, both horizontal and vertical, shall be derived from Architectural, Civil, and Structural plans. Do not "scale" plans; that is do not measure plans with Architect's or Engineer's scale and base installation dimensions on such measurements.
- G. Horizontal and vertical measurements shall be based on established benchmarks. Work shall agree with established lines and levels. Field verify measurements at project site. Check correctness of same as related to work prior to fabrication of shop made items and ordering of factory built items.
 - 1. Notify Owner's representative of discrepancies between plans and actual field conditions that will prevent the following of good practice or affect the intent of plans and Specifications. Do not proceed with installation until instructions are received from Owner's representative.
- H. The accompanying plans show diagrammatically the sizes and location of the various equipment items and the sizes of the major interconnecting piping and ductwork, without showing exact details as to elevations, offsets, control lines, and other installation details. The Contractor shall carefully lay out his work to conform to the site conditions, to avoid obstructions and provide proper grading of lines. Exact locations of outlets, apparatus, and connections

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thereto shall be determined by reference to the accompanying Plans, to all detail drawings, equipment drawings, rough-in drawings, etc., by measurements at the building, and in cooperation with other divisions, and in all cases shall be subject to the approval of the Owner's representative. Minor relocations necessitated by the conditions at the site or directed by the Owner's representative shall be made without any additional cost to the Owner.

- I. All work shall be run parallel or perpendicular to the lines of the building unless otherwise noted on the Drawings.
- J. It is the intent of the Contract Documents to provide an installation complete in every respect. In the event that additional details or special construction may be required for work indicated or specified in this Section or work specified in other Sections, it shall be the responsibility of the Contractor to provide same as well as to provide material and equipment usually furnished with such systems or required to complete the installation, whether mentioned or not.
- K. Should a discrepancy exist between the mechanical Drawings and the mechanical Specifications it is the Contractor's responsibility to include that portion or portions of the more expensive item in bid proposal. Final approval and/or directive can then be forwarded to the Contractor during the submittal process.

1.12 FIXTURE AND EQUIPMENT SIZES AND REQUIREMENTS:

- A. Space allocations in machinery spaces are based on equipment scheduled in each case. Should the Contractor offer equipment of another make that requires more space in any critical dimension, the Contractor shall submit, together with other submittal data on the equipment, prints of drawings indicating how the equipment may be installed, indicating room for servicing and revisions in piping or ducting and any other details necessary for the Owner's representative to form a judgment as to the suitability of the substitute material, as to performance, suitability for the space and other variables.
- B. Duties of certain equipment items, horsepower of driving motors and electrical characteristics are scheduled for equipment items of a particular make in each case. Should any substitute material be accepted which has other requirements that would involve allied equipment or the work of others, the Contractor shall be responsible for all modifications required at no change in contract price. As examples:
 - 1. If an accepted A/C Unit has a brake horsepower requirement above the motor horsepower scheduled, the Contractor shall be responsible for providing a larger motor and heavier drive and any change in size of the protective device, conduit run, and conductors serving that motor. The latter shall be extended through an individual branch protective device and branch circuit on through the panel, feeder, feeder protective device, etc.
 - 2. If accepted heat exchangers, coils, etc. have greater pressure drops than those on which pumping heads were based, the Contractor shall be responsible for selecting proper pumps and drive and adjusting the electrical work as required.
- C. Structural steel members are indicated to provide supports for certain specific sizes and weights of equipment. Should other equipment be offered, the spacing of the supports shall be varied to suit the equipment. Should the weight or size of a substituted item of equipment require additional supporting steel members, the Contractor shall be required to provide and install them at no change in contract price.

1.13 INTERFACE WITH OTHER PRODUCTS:

- A. Review millwork shop drawings. Confirm location and size of equipment and openings before ordering equipment, roughing-in, and installation.

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1.14 SUBMITTALS:

- A. Refer to Section 01 33 00 Submittal Procedures.

1.15 OPERATION AND MAINTENANCE INSTRUCTIONS:

- A. Refer to Section 01 33 00 Submittal Procedures.

1.16 UTILITIES:

- A. The Contract Documents reflect the general location, size, and manner of routing for all utilities known to be required on this project. It shall be the responsibility of the Contractor to visit the site, meet with the local Utility Company personnel in order to coordinate and confirm the exact requirements for all utilities. The bid submitted by the Contractor shall include costs for all such coordination work as well as any and all utility company charges and/or fees.

1.17 BUILDING CONSTRUCTION AND LAYOUT OF WORK:

- A. The Contract Documents are diagrammatic in character and cannot show every connection in detail or every line or conduit its exact location. These details are subject to the requirements of ordinances and also Structural and Architectural conditions. The Contractor shall carefully investigate structural and finish conditions and shall coordinate the separate trades in order to avoid interference between the various phases of work. Work shall be laid out so that it will be concealed in furred chases unless specifically noted or indicated to be exposed. Work shall be installed to avoid crippling of structural members; therefore, inserts to accommodate hangers shall be set before concrete is poured, and proper openings through floor, walls, beams, etc. shall be provided as hereinafter specified or as otherwise indicated or required before concrete is poured. All work shall be run parallel or perpendicular to the lines of the building unless otherwise noted.

1.18 RECORD DRAWINGS:

- A. As part of the required mechanical work, a complete set of record drawings shall be made up and delivered to the Owner's representative.
- B. The drawings shall reflect the following:
 - 1. All mechanical work installed exactly in accordance with the original design.
 - 2. All mechanical work installed as a modification or addition to the original design.
 - 3. The dimensional information necessary to delineate the exact location of all ductwork and piping runs which are so concealed as to be untraceable by inspection through the regular means of access established for inspection and maintenance. Where shop drawings have been prepared and approved, the record drawings shall be cross-referenced to the respective shop drawings. In this case dimensions need not be shown on the record drawings.
- C. Record drawings shall include the updating of all equipment schedules.
- D. The record drawings shall be of a reproducible type as directed.

1.19 WARRANTY:

- A. All materials and equipment, to be furnished and installed under this Division of the Specifications shall be warranted to meet the specified performance requirements and to be free of defects in materials and workmanship for a period of one year after the official date of Substantial Completion. The Contractor to the complete satisfaction of the Owner's

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representative shall remedy deficiencies caused by other than normal usage, without cost to the Owner or Design Professionals.

- B. If there is any indication that the equipment does not meet the specified quantities, the Contractor shall, at his expense, institute a program to demonstrate the adequacy of the installation. This program shall include all necessary testing and testing equipment. Should the Contractor not have the equipment or technical skill to perform the tests, it shall be his responsibility to employ recognized experts to perform the tests and shall provide certified laboratory tests, certified factory reports and work sheets, or other certified data to support results of any tests required.
- C. Equipment warranties extending beyond the first-year warranty generally include material only guarantees except where required by specific reference (i.e. chiller). Owner is responsible for additional expenses and the assembly of adequate record keeping during warranty period.

1.20 BILLINGS:

- A. Contractor shall provide a schedule of values of the mechanical work with each payment application. Provide a line item for labor and materials for each section of specifications. Provide additional breakdown were requested by Owner's Representative.

PART 2 - PRODUCTS

2.1 EQUIPMENT:

- A. Coordinate exact electrical requirements of mechanical equipment prior to submittal and purchase. Equipment that is not compatible with electrical installation will be removed and replaced at no expense to the Owner or Design Professionals.

2.2 MATERIALS:

- A. Unless otherwise specified, provide only new, first grade equipment and materials that comply with requirements of this Specification and applicable Standards.
- B. Furnish, if required, satisfactory evidence of kind and quality of materials proposed for use.
- C. Similar items of material and equipment shall be product of same manufacturer.

2.3 ACCEPTABLE MANUFACTURERS AND SUBSTITUTIONS:

- A. The Contract Documents (Drawings and Specifications) indicate a standard of quality for materials and equipment. Manufacturers' names and model numbers are used within the Contract Documents to establish the standard of quality. The manufacturers and products designated in schedules or notes on Drawings are used as the basis of the engineering design of mechanical systems. In addition to those scheduled or noted on Drawings, other manufacturers and products that are acceptable for use on this project are listed within the Specifications. Such listed manufacturers do not require a submittal for approval prior to bid. Contractor's bid proposal may be based on any of these manufacturers and products provided they are in compliance with all criteria set forth within Section 2.3.
- B. Contractor is responsible for all coordination and additional costs which may be required for the work to be completed on time with no additional cost to the Owner or Design Professionals.
 - 1. Costs of architectural, structural, electrical, plumbing, fire protection and HVAC modifications associated with listed manufacturers shall be included in bid proposal.

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- C. Contractor to verify during submittal that the product works dimensionally within the intent of the design.
 - 1. The ability to service components shall not be compromised.
- D. Any additional coordination due to interference with other elements of the project will be the responsibility of the Contractor with no additional cost to the Owner or Design Professionals.
- E. Substitutions:
 - 1. Manufacturers of unlisted products will be considered as substitutions only if submitted at least five (5) working days prior to the bid date and when in compliance with all criteria set forth within Section 2.03.
 - 2. It is fully the Contractor's responsibility to assemble and submit sufficient technical information to fully illustrate that the material or equipment proposed for substitution is equal or superior as the Architect or Engineer is under no obligation to perform the service for the Contractor. The proposal shall be accompanied by manufacturer's complete engineering data, specification sheet, and a sample, if practical or if requested. In no event shall a proposal for substitution be cause for delay of work.
 - 3. Substitutions and deviations shall be clearly marked, indicated, or otherwise called to attention of the Owner's representative in the submittal documents. Failure to indicate substituted materials and/or equipment or deviations from Contract Documents shall be construed as a representation that contractual obligations have not been met and the submittal shall be rejected without further review.
 - 4. Engineer reserves the right to accept or reject proposed substitutions and it is understood that his judgment shall be final.

2.4 ELECTRICAL MOTORS:

- A. All motors furnished under any of the several Sections of these Specifications shall be of recognized manufacturer, of adequate capacity for the loads involved, and wound for the electrical characteristics indicated on the Drawings or specified herein. Verify all job site voltages and power source available before installation of any motor or controls. All motors shall conform to the standards of manufacture and performance of the National Electrical Manufacturers Association (NEMA) as shown in their latest publication. All motors shall be furnished with open-frame, unless otherwise noted, or required by NEC for the service conditions encountered.
- B. Unless otherwise noted, fractional motors rated at less than 1/2 horsepower shall be single phase, the motors rated at 1/2 horsepower or larger shall be three-phase. Single-phase motors shall be arranged for across-the-line starting. Motors exposed to weather shall be totally enclosed and weatherproof. Single-phase motors shall be capacitor start, induction run type and shall be furnished with motor controller with pilot light where scheduled or indicated.
- C. Except as otherwise specified, open motors over one (1) horsepower shall be drip proof, squirrel cage, high efficiency type similar or equal to Reliance XE, Century E Plus III, Baldor Super E or General Electric Energy Saver, NEMA Design B, induction type rated for constant duty with 40 Deg. C. temperature rise. Furnish submittal data on all high efficiency motors furnished to include motor efficiencies as rated in accordance with IEEE Standard 112, Test Method B. Motors under one (1) horsepower shall be same as described herein, but standard efficiency rating.
- D. All motors shall be of the same manufacturer unless they are an integral part of the piece of equipment to which they are attached.

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2.5 MOTOR CONTROLLERS AND ELECTRIC INTERLOCKS:

- A. Except where otherwise specified or as included as an integral part of the normal and customary mechanical equipment, each starter shall be furnished by other divisions complete with the required control power transformers and auxiliary contacts necessary for control interlocks and wired by a licensed electrician in accordance to governing codes.
- B. In Fractional horsepower 120v single-phase roof or wall mounted fans, a motor rated manual starter/disconnect with on-off snap switch type with soldered ratchet overload protection shall be furnished by the Contractor furnishing the fans and wired by a licensed electrician in accordance to governing codes.
- C. When interlocking of equipment is required all wiring in excess of 50 volts to be provided by a licensed master electrician and coordinated by the Contractor. All other wiring 50 volts or less or as required by the controls/energy management system shall be fully coordinated by the Contractor to provide and assure a complete and fully operational system. All raceways for controls and or power wiring shall be in accordance with Division 26 requirements, and installed by licensed electrician and coordinated by the Contractor.
- D. Except for such items that are normally wired up to their point of manufacture and so delivered and unless specifically noted to the contrary herein, the Contractor shall do all electric wiring of every character for interlocking, pilot, and control in accordance with methods and materials described within Division 26 of these Specifications. This includes conduits and mounting of all electrical devices.
- E. Furnishing of complete wiring diagrams showing proper control and interlock wiring shall be work under the trade supplying the equipment. Diagrams shall be based on the approved equipment for this project and shall be complete integral drawings, not a series of manufacturers' individual diagrams.
- F. The electrical design and drawings are based on the equipment scheduled and shown on the mechanical Drawings and should any mechanical equipment requiring changes to the electrical design be approved, the required electrical changes shall be made at no cost to the Owner.

2.6 CONTROL POWER AND EQUIPMENT POWER FOR CONTROLS:

- A. Control power, whether it be DDC, 24 volt, or 120 volt, should be delivered to each piece of mechanical equipment, fire/smoke dampers, and/or control panels whether or not it is specifically indicated on the Contract Drawings.
- B. It is the Contractor's responsibility to include in his or her bid all costs in connection with control wiring, and/or power, whether or not it is specifically indicated. Regardless of how large in nature or how incidental, no additional compensation will be approved by the Owner's representative or Design Professionals concerning a failure on the Contractor's part to include these costs in bid proposal or a failure on the Contractor's part to properly coordinate these important functions.

2.7 SAFETY GUARDS:

- A. Provide safety guards for moving equipment such as fan belt drives and motor drive couplings.
- B. Use OSHA approved belt guards and couplings guards. Provide 1/2 inch hole in guard at center of shaft of driven equipment where belt type drives are used.

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PART 3 - EXECUTION

3.1 PRODUCT HANDLING, RECEIVING, INSPECTION, AND STORAGE:

- A. Handling and Receiving: The Contractor shall receive and handle all materials and equipment with care so as not to cause damage. Use padded or strap slings, etc. as appropriate for the items being handled. Lift materials and equipment by lift points provided or recommended by the manufacturer.
- B. Inspection: The Contractor shall upon receipt, inspect all materials and equipment for defects, damage, and compliance with the Specifications. When materials and equipment are received in acceptable condition, assume full responsibility for its storage, handling, and installation. Materials and equipment found to be incomplete or damaged shall be reported to the Carrier and Owner's representative immediately, within a maximum of three (3) days, for its replacement.
- C. Identification: Upon receipt of all materials and equipment, the Contractor shall identify and tag, stencil, or otherwise permanently identify all materials and equipment with the appropriate equipment number.
- D. Storage: Materials and equipment, which cannot be installed immediately after delivery, shall be stored in a safe, dry location provided by the Contractor. Materials and equipment damaged or stolen while in storage shall be replaced by the Contractor at no cost to the Owner.

3.2 COORDINATION WITH OTHER DIVISIONS AND OWNER:

- A. General: Cooperate to fullest extent with other Divisions and Owner to the end that all work shall be executed economically without delay and that it will not interfere with their operations.
- B. Progress Schedule: Contractor shall inform himself of progress schedules of all Divisions and shall work in accordance with schedules for completion of work.
- C. Examine work of other trades that comes in contact with or is covered by this work. Do not attach to, cover, or finish against any defective work, or install work of this Division in a manner that will prevent other trades from properly installing their work. Consult all Drawings, Specifications, and details of other Divisions of the work.
- D. Do not install equipment with electrical characteristics that are not compatible with the electrical installation.

3.3 EQUIPMENT ACCESSORY REQUIREMENT:

- A. It shall be the Contractor's responsibility to assure all packaged equipment ancillary devices shall be completely wired, piped, tubed for pneumatics, and calibrated.

3.4 INSTALLATION:

- A. Space And Equipment Arrangement:
 - 1. All equipment shall be installed in a manner to permit access to parts requiring service and to comply with code-mandated and manufacturer required clearances. Contractor shall notify Owner's representative prior to installation of any equipment where said clearances cannot be maintained for further direction.
 - 2. Any large piece of apparatus which is to be installed in any space in the building, and which is too large to permit access through stairways, doorways, or shafts shall be brought to the job and placed in the space before the enclosing structure is completed.

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Following placement in the space, such apparatus shall be thoroughly and completely protected from damage as hereinbefore specified.

- B. Materials and equipment installed under this Contract shall be new in every respect, and installed in a first-class manner in accordance with the manufacturer's recommendations and applicable codes and standards.
- C. The Contractor shall plan and coordinate his Work to provide all equipment and materials necessary to provide the Owner with a neat, functional, and serviceable installation.
- D. The Contractor shall protect all work, materials, and equipment against damage until Final Acceptance by the Owner's representative. Replace, or repair to the satisfaction of the Owner's representative, any work, materials, or equipment that becomes damaged prior to Final Acceptance.
- E. The Contractor shall make a detailed inspection of the work area and adjoining construction prior to beginning installation of any materials or equipment. Verify governing dimensions and other permissible dimensional tolerances. The Contractor shall report in writing to the Owner's representative unsatisfactory conditions encountered; do not begin installation until conditions are correct. Beginning installation signifies acceptance of conditions.

3.5 CUTTING AND PATCHING:

- A. This Contractor shall do all necessary cutting and drilling of present walls, floor, ceilings, etc. for the installation of new work or for modifications to the existing work, but no structural work shall be cut unless specifically approved by the Owner's representative. Patching and painting of surfaces as required shall be by the Contractor, unless specified hereinafter.
- B. Cutting and patching or repairing of work in place, made necessary by the negligence of the Contractor or anyone employed by him, shall be paid for by the Contractor.

3.6 EXISTING FACILITIES:

- A. The Contractor shall be responsible for loss or damage to the existing facilities as used by him and his workmen, and shall be responsible for repairing or replacing such loss or damage. The Contractor shall send proper notices and receive written permission from the Owner's representative to enter existing areas. The Contractor before beginning work in existing areas shall make necessary arrangements and perform other services required for the care, protection, and in service maintenance of all electrical, communication, plumbing, heating, air conditioning, and ventilating services for new and existing facilities. The Contractor shall erect temporary barricades with necessary safety devices, as required to protect personnel from injury, removing all such temporary protection upon completion of the work.
- B. The Contractor shall provide temporary or new services to all existing facilities as required to maintain their proper operation when normal services are disrupted as a result to the work being accomplished under this project.
- C. Where existing construction is removed to provide working and extension access to existing utilities, the Contractor shall be responsible for removing doors, piping, air conditioning ductwork, and equipment, etc. to provide this access and shall reinstall same upon completion of work in the areas affected.
- D. Where partitions, walls, floors, or ceilings of existing construction are indicated to be removed, the Contractor shall remove and reinstall in locations approved by the Owner's representative all devices required for the operation of the various electrical systems installed in the existing

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construction. This is to include but is not limited to temperature control system devices, electrical switches, relays, fixtures, piping, conduit, etc.

3.7 OUTAGES:

- A. Outages of services as required by the project will be permitted, but only at a time approved by the Owner. The Contractor shall notify the Owner in writing two weeks in advance of the requested outage in order to schedule required outages. No outages shall be taken unless written approval has first been received from the Owner. The time allowed for outages will not be during normal working hours unless otherwise approved by the Owner. All costs of outages, including overtime charges, shall be included in the contract amount.

3.8 CONNECTION OF EQUIPMENT FURNISHED BY OTHERS:

- A. The Mechanical Division shall provide all mechanical connections to equipment furnished by other Divisions or the Owner that require service connections and/or ductwork.
 - 1. The Mechanical Division shall furnish materials and labor required for the connection of equipment except where indicated on Drawings as furnished by others.
- B. The respective supplier shall furnish proper roughing-in diagrams for the installation of these items. All items shall be roughed-in and connected in strict accordance therewith.

3.9 INSPECTIONS:

- A. Contractor shall arrange for all inspections required by local building officials and state agencies. Correct deficiencies required to comply with codes and standards and to receive certificate of occupancy. Upon completion of this project, submit written evidence of compliance with the above to Owner's representative. Final acceptance will not be issued and the warranty date will not be established until such compliance is demonstrated.
- B. Contractor shall arrange for reviews by Engineer before any systems are covered up or insulation is installed on piping, ductwork and the like.

3.10 SYSTEMS START-UP:

- A. Upon completion of the installation of the work, start-up all mechanical systems and test, balance and adjust systems until they are fully operational and functioning as intended by Engineer.
- B. Do not start-up or operate HVAC systems until construction of building envelope is complete and system components will not be subjected to damage from dirt, dust, construction debris, and weather. Provide temporary caps on ductwork and piping to prevent entry of debris. Where adequate protection is not provided, all systems shall be cleaned or replaced to the satisfaction of the Owner.

3.11 COMMISSIONING OF HVAC SYSTEMS:

- A. Upon completion of the HVAC installation, Contractor shall test, balance, adjust, and operate all individual components of the HVAC system. Demonstrate that the installation is functioning in all modes of operation as a complete and integrated HVAC system and is performing in accordance with the Contract Documents. Owner's personnel shall be trained in the operation and maintenance of the system. All operating schedules, parameters, and set-points shall be entered into the Building Automation Control system.

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3.12 OPERATION OF HVAC SYSTEMS:

- A. It is the intent of the HVAC system design to operate HVAC systems continuously, 24 hours a day, 365 days a year, in either occupied or unoccupied modes of operation as described in 23 09 00 Building Automation System or 23 09 93 Sequence of Operation to provide for control of space temperature and humidity.

3.13 FINAL CONSTRUCTION REVIEW:

- A. Schedule: Upon completion of the Contract, there shall be a final construction review of the completed installation. Prior to this walk through, all work under this Division shall have been completed, tested, balanced and adjusted in final operating condition and the test report shall have been submitted to and approved by the Owner's representative.
- B. Personnel: A qualified person representing the Contractor must be present at this final construction review to demonstrate the system and prove the performance of the equipment.
- C. The building mechanical system shall have been in operation for a minimum of 15 days after Test and Balance work is complete prior to this review.

3.14 CERTIFICATIONS:

- A. Before receiving final payment, the Contractor shall certify that all equipment furnished and all work done is in compliance with all applicable codes mentioned in these Specifications and with manufacturer's requirements.
- B. Certification is specifically required from the following:
 - 1. Pressure test of all renovated and new pressure piping systems.
 - 2. Equipment performance tests.

3.15 RENOVATION OR REMODEL PROJECTS:

- A. The Contract Drawings are diagrammatic in nature and are not intended to indicate each and every fitting, offset, or other appurtenance necessary to complete the system. It is the Contractor's responsibility to visit the site and become familiar with the existing conditions and include in bid proposal all items necessary, regardless of the incidentality, in order to provide the Owner with a complete and operational system. Any discrepancies noted by the Contractor shall be brought to the attention of the engineer in writing prior to the bid date. After the bids are turned in, the Contractor is expected to complete the systems at no additional cost to the Owner.

END OF SECTION 23 05 00

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SECTION 23 05 10 - STARTING OF HVAC SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES:

- A. Starting of HVAC Systems.
- B. Commissioning of HVAC Systems.
- C. Demonstration and Instructions.
- D. Testing, Adjusting, and Balancing.

1.2 RELATED SECTIONS:

- A. Section 23 09 00 – Building Automation System
- B. Section 23 09 93 – Equipment Sequence of Operation.
- C. Section 23 05 93 – Testing, Adjusting, and Balancing.
- D. All Divisions of Contract Documents.

PART 2 - PRODUCTS

- 2.1** Not Applicable.

PART 3 - EXECUTION

3.1 STARTING OF HVAC SYSTEMS:

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Owner's representative seven (7) days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or for other conditions that may cause damage.
- D. Do not start-up or operate HVAC systems until construction of building envelope is complete and system components will not be subjected to damage from dirt, dust, construction debris, and weather.
- E. Provide temporary caps on ductwork and piping to prevent entry of debris. Where adequate protection is not provided, all systems shall be cleaned or replaced to the satisfaction of the Owner.
- F. Clear dirt, dust, and grout from equipment on exterior of casings, interior surfaces, heat exchangers, heating and cooling coils, burners, and the like, and interior surfaces of ductwork prior to acceptance by Owner.
- G. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

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- H. Adjust electrical amp draw on motors to within 80% of rated amp draw.
- I. Verify wiring and support components for equipment are complete and tested.
- J. Execute start-up under supervision of applicable manufacturer's representative in accordance with manufacturers' instructions.
- K. Activate and operate all HVAC equipment and systems and verify that the system is functioning properly in all modes and sequences of operation. When verification is complete, demonstrate all modes and sequences to Owner's representative.
- L. When specified in individual specification sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- M. Adjust return air to 500 fpm at each air unit inlet.
- N. Replace drive packages as necessary to achieve design air flows.
- O. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.2 DEMONSTRATION AND INSTRUCTIONS OF HVAC SYSTEMS:

- A. Demonstrate operation and maintenance of plumbing and HVAC equipment and systems to Owner's personnel two (2) weeks prior to date of final inspection.
- B. Demonstrate project equipment and provide instruction by a qualified manufacturers' representative who is knowledgeable about the Project.
- C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six (6) months.
- D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owners' personnel in detail to explain all aspects of operation and maintenance.
- E. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at equipment location.
- F. Prepare and insert additional data in operation and maintenance manuals when need for additional data becomes apparent during instruction.
- G. Record training sessions on video tape and provide copy to Owner.

3.3 HVAC - DEHUMIDIFICATION OF BUILDING:

- A. Start-up of HVAC cooling systems shall be accomplished in such a manner as to cool and dehumidify the space without the formation of condensation on building surfaces and elements, furniture, equipment, or appurtenances. Precautions should be taken by the contractor not to allow excessive humidity to develop in the building prior to final connection and activation of the HVAC system. Should it become necessary, the contractor shall procure the required equipment to properly dry and dehumidify the space so as not to force the HVAC to perform beyond its intended ability. Should damage occur due to start-up procedures, contractor shall be responsible for all costs associated with repair or replacement of damaged elements.

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3.4 HVAC TESTING, ADJUSTING, AND BALANCING:

- A. Mechanical Division will secure the services of an independent firm to perform testing, adjusting, and balancing, when specified in Section 23 05 93 – Testing, Adjusting, and Balancing.
- B. Reports will be submitted by the testing agency to the Owner's representative indicating observations and results of tests and indicating compliance or non-compliance with the requirements of the Contract Documents.

3.5 COMMISSIONING OF HVAC SYSTEMS:

- A. Upon completion of the HVAC installation, contractor shall test, balance, adjust, and operate all individual components of the HVAC system. Demonstrate that the installation is functioning in all modes of operation as a complete and integrated HVAC system and is performing in accordance with the Contract Documents. Owner's personnel shall be trained in the operation and maintenance of the system. All operating schedules, parameters, and set-points shall be entered into the Facility Management System.
- B. Commissioning of the HVAC systems will be performed by the Engineer. This division shall assist the commissioning agent in the performance of his duties. Refer to Division 20 00 10 for the scope of work required of Division 23.

END OF SECTION 23 05 10

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SECTION 23 05 53 - MECHANICAL IDENTIFICATION

PART 1 - GENERAL

1.1 SUMMARY:

- A. Section includes nameplates.

1.2 SUBMITTALS:

- A. Section 01 33 00 – Submittal Procedures.

1.3 CLOSEOUT SUBMITTALS:

- A. Project Record Documents: Record actual locations of tagged valves; include valve tag numbers.

1.4 QUALITY ASSURANCE:

- A. Materials: Flame spread/smoke developed rating of 25/50 or less in accordance with ASTM E84, NFPA 255, UL 723.
- B. Conform to NFPA 99 requirements for labeling and identification of medical gas piping systems and accessories.
- C. Conform to ASME A13.1 for color scheme for identification of medical gas piping systems and accessories.
- D. Maintain one copy of each document on site.

1.5 QUALIFICATIONS:

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years documented experience.

PART 2 - PRODUCTS

2.1 NAMEPLATES:

- A. Manufacturers:
 - 1. Brady.
 - 2. Seton.
 - 3. LEM.
 - 4. Brimar
 - 5. Substitutions: Section 23 05 00 - Mechanical General Conditions.
- B. Product Description: Laminated three-layer plastic with engraved black letters on light contrasting background color.

PART 3 - EXECUTION

3.1 PREPARATION:

- A. Degrease and clean surfaces to receive adhesive for identification materials.

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3.2 INSTALLATION:

- A. Install identifying devices after completion of coverings and painting.
- B. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive.
- C. Install labels with sufficient adhesive for permanent adhesion and seal with clear lacquer.
- D. Identify packaged rooftop units, BAS panels, and other mechanical equipment with plastic nameplates. Identify in-line pumps and other small devices with tags. Air devices do not require mechanical identification.
- E. Identify control panels and major control components outside panels with plastic nameplates.
- F. Tag automatic controls, instruments, and relays. Key to control schematic.
- G. Identify all equipment located above ceiling with nameplates affixed to lay-in ceiling grid frame adjacent to and right below each device.

END OF SECTION 23 05 53

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SECTION 23 05 93 - TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.1 SECTION INCLUDES:

- A. Testing, adjusting, and balancing of air systems.
- B. Measurement of final operating condition of HVAC systems.

1.2 SCOPE OF WORK:

- A. Mechanical Division shall secure the services of an independent Testing, Adjusting, and Balancing Agency to perform complete testing, adjusting and balancing of the Heating, Ventilating and Air Conditioning system.
- B. Responsibility of Mechanical Contractor:
 - 1. Mechanical Contractor shall be responsible for complete system start-up prior to testing, adjusting and balancing and shall demonstrate operation of each item of mechanical equipment.
 - 2. Motor amp draw shall be checked and adjusted to within 80% of rated amp draw during start-up procedures on all motors. Replace drive packages as necessary to achieve design conditions.
 - 3. Set return air velocity to 500 fpm at each air unit inlet during start-up procedures.
 - 4. Attend pre-balancing conference with testing agency to demonstrate operation of system.
 - 5. Install clean filters in all air units.
 - 6. Verify that systems are complete and operable. Refer to Part 3, Paragraph 3.1A.
 - 7. Cooperate with Testing and Balancing Agency to provide all necessary data on the design and proper application of the system components and furnish all labor and material required to eliminate any deficiencies or malperformance. Resolve all operational deficiencies prior to submission of final TAB report.
 - 8. Install all valves, dampers, sheaves, and miscellaneous adjustment devices in a manner that will leave them accessible and readily adjustable. The TAB Agency may be consulted if there is a questionable arrangement of a control or adjustable device.
 - 9. Cooperate with Commissioning Provider to provide all necessary assistance in demonstration and operation of all HVAC system components. Provide test reports as required by Commissioning Provider for functional performance testing.
- C. Responsibility of Testing, Adjusting and Balancing Agency (TAB):
 - 1. During construction, inspect the installation of ductwork, Facility Management System and all other components of the HVAC system. Inspection will cover that part of the work relating to proper arrangement and adequate provisions for the testing and balancing. The inspections shall be performed periodically as the work progresses with a minimum of two inspections as follows:
 - a. When 60% of ductwork is installed in each building.
 - b. When 90% of ductwork is installed in each building.
 - 2. Submit brief written report of each inspection to Owner, Architect, Engineer, and Contractor.
 - 3. Provide all instruments and equipment required to accomplish necessary testing, adjusting and balancing and as required by the Engineer to verify performance. All instruments shall be in accurate calibration and shall be calibrated in ranges that will be expected.
 - 4. Field verify equipment nameplate electrical data. Do not derive data from submittal documents.

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5. Upon completion of the installation and start-up of the mechanical equipment by the Mechanical Division, the Testing, Adjusting and Balancing Agency will test, adjust and balance the system components to obtain optimum conditions in each conditioned space in the facility. TAB Agency shall work with the Automatic Temperature Controls Contractor in commissioning the operation of all motorized/balancing duty control dampers. The TAB Agency is advised that deficiencies in HVAC construction are often encountered during final TAB services and Agency should include in bid proposal an amount it deems adequate to compensate for time in identifying the deficiencies to the Mechanical Contractor and awaiting their correction.
6. As soon as possible or a minimum of fourteen days, or earlier, prior to Owner's Final Inspection as requested by the General Contractor, the Testing and Balancing Agency shall prepare seven copies of the completed Testing and Balancing Report and submit one copy to Owner and six copies to the Architect/Engineer. The reports shall be certified accurate and complete by a principal Engineer of the Agency. Resolve all operational deficiencies prior to submission of final report.
7. Cooperate with Commissioning Provider to provide all necessary assistance in demonstration and operation of all HVAC system components. Provide test reports as required by Commissioning Provider for functional performance testing.
8. Commissioning:
 - a. Refer to Specification Section 20 00 10 for commissioning plan and commissioning requirements.
 - b. Cooperate with Commissioning Provider to provide all necessary assistance in demonstration and operation of all HVAC system components. Provide test reports as required by Commissioning Provider for functional performance testing.

1.3 REFERENCES:

- A. AABC - National Standards for Total System Balance.
- B. ADC - Test Code for Grilles, Registers, and Diffusers.
- C. ASHRAE 111 - Practices for Measurement, Testing, Adjusting, and Balancing of Building Heating, Ventilation, Air-conditioning, and Refrigeration Systems.
- D. NEBB – Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.
- E. SMACNA - HVAC Systems Testing, Adjusting, and Balancing.

1.4 SUBMITTALS:

- A. Section 01 33 00 – Submittal Procedures.
- B. Submit name of adjusting and balancing agency for approval within 30 days after award of Contract.
- C. Field Reports: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
- D. Prior to commencing work, submit report forms or outlines indicating adjusting, balancing, and equipment data required.
- E. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Architect/Engineer and for inclusion in operating and maintenance manuals.

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- F. Provide reports in 3-ring binder manuals, complete with index page and indexing tabs, with cover identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.
- G. Include detailed procedures, agenda, sample report forms prior to commencing system balance.
- H. Test Reports: Indicate data on AABC National Standards for Total System Balance forms, forms prepared following ASHRAE 111 or NEBB forms.

1.5 PROJECT RECORD DOCUMENTS:

- A. Section 01 33 00 – Submittal Procedures.
- B. Record actual locations of flow measuring stations, balancing valves and rough setting.

1.6 QUALITY ASSURANCE:

- A. Perform total system balance in accordance with AABC National Standards for Field Measurement and Instrumentation, Total System Balance or ASHRAE 111 or NEBB Procedural Standards for Testing, Balancing and Adjusting of Environmental Systems.

1.7 QUALIFICATIONS:

- A. Agency: Company specializing in the testing, adjusting, and balancing of systems specified in this Section with minimum three years documented experience certified by AABC.
- B. Perform Work under supervision of AABC Certified Test and Balance Engineer or NEBB Certified Testing, Balancing and Adjusting Supervisor.

1.8 PRE-BALANCING CONFERENCE:

- A. Convene one (1) week prior to commencing work of this section.

1.9 SEQUENCING:

- A. Sequence work to commence after completion of systems and schedule completion of work before Substantial Completion of Project.

1.10 DESIGN CONDITIONS:

- A. The HVAC systems have been designed to maintain the inside conditions indicated below when operating with the outside conditions stated. HVAC systems are intended to operate 24 hours a day, year-round, in either occupied or unoccupied mode as described in Specification 23 09 00 and 23 09 93. Install, test, adjust and balance the systems so that they will produce the inside conditions for design. Mechanical Contractor shall be prepared to provide a suitable test to prove that equipment is producing capacities scheduled.
- B. Inside Conditions:
 - 1. Summer: 75 degrees Fahrenheit dry bulb
58% relative humidity
 - 2. Winter: 70 degrees Fahrenheit dry bulb
- C. Outside Conditions:
 - 1. Summer: 100 degrees Fahrenheit dry bulb

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2. Winter: 80 degrees Fahrenheit wet bulb
30 degrees Fahrenheit dry bulb

PART 2 - PRODUCTS

- 2.1 Not Applicable.

PART 3 - EXECUTION

3.1 AGENCIES:

- A. Precision Air of Texas, Inc.
- B. Technical Air Balance, Inc.
- C. Engineered Air Balance Co., Inc.
- D. PHI Service Agency, Inc.
- E. Testing Specialties, Inc.
- F. Testing & Commissioning Services, LLC.
- G. Cleary Zimmerman Engineers, Inc.
- H. Other Acceptable Agencies: Section 23 05 00 – Mechanical General Conditions.

3.2 EXAMINATION:

- A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
 - 1. Systems are started and operating in a safe and normal condition.
 - 2. Temperature control systems are installed complete and operable.
 - 3. Proper thermal overload protection is in place for electrical equipment.
 - 4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
 - 5. Duct systems are clean of debris.
 - 6. Fans are rotating correctly.
 - 7. Fire and volume dampers are in place and open.
 - 8. Air coil fins are cleaned and combed.
 - 9. Access doors are closed and duct end caps are in place.
 - 10. Air outlets are installed and connected.
- B. Submit field reports. Report defects and deficiencies noted during performance of services that prevent system balance.
- C. Beginning of work means acceptance of existing conditions.

3.3 PREPARATION:

- A. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to Architect/Engineer to facilitate spot checks during testing.

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- B. Drive assemblies. In the event that the drive assembly requires a change in belts and pulleys, or requires an increase in motor horsepower, it shall be the responsibility of the HVAC Division to:
 - 1. Determine the size of the replacement equipment.
 - 2. Obtain and install the replacement equipment at no additional cost to Owner.
- C. Manual volume dampers:
 - 1. In all cases, air volumes shall be adjusted by means of manual dampers in the ductwork, not by integral dampers in the terminal outlets or inlets.
 - 2. Duct damper positions shall be marked with permanent-ink markers or black spray paint after the final setting has been made.

3.4 DUCT AND EQUIPMENT TEST HOLES:

- A. Temporary Test Holes: Cut or drill in ducts or equipment that will not damage equipment or ductwork. Provide caps with neoprene plugs, threaded plugs, or threaded or twist-on metal caps. All caps must be sealed vapor tight with appropriate silicone or duct sealant.
- B. Permanent Test Holes: Factory fabricated, airtight flanged fittings with screw cap. Furnish extended neck fittings to clear insulation where applicable.
- C. Double Walled Equipment: Provide caps on both sides of wall.
- D. Insulation: TAB Contractor is responsible for repairing any damaged insulation on equipment, ductwork, piping, piping specialties, and the like at completion of TAB work. TAB Contractor shall make repairs in accordance with insulation manufacturer's requirements or subcontract repairs to a company who specializes in insulating.
- E. **Do not drill holes in outdoor equipment or outdoor ductwork. If test holes are required, consult with Engineer prior to performance of work.**

3.5 INSTALLATION TOLERANCES:

- A. Contractor shall adjust all equipment in accordance with the capacities shown on the drawings, with permissible tolerances as follows:

Supply fans	-5% to +5%
Return	+5% to -5%
Diffusers/supply grilles	-5% to +5%
Return grilles	0% to -5%

3.6 ADJUSTING:

- A. Ensure recorded data represents actual measured or observed conditions.
- B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- C. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
- D. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

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- E. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Owner.
- F. Check and adjust systems approximately six months after final acceptance and submit report.

3.7 AIR SYSTEM PROCEDURE:

- A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
- B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- C. Measure air quantities at air inlets and outlets.
- D. Adjust distribution system, including supply register and diffuser blade patterns, to obtain uniform space temperatures free from objectionable drafts and noise.
- E. Use volume control devices to regulate air quantities only to extent that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
- F. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.
- G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.
- H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.
- I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
- J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.
- K. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.
- L. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain approximately 0.05 inches (12.5 Pa) positive static pressure near the building entries.

3.8 SCHEDULES:

- A. Equipment Requiring Testing, Adjusting, and Balancing:
 - 1. Packaged Rooftop Units: Adjust the air flow at the RTU's as applicable; Supply Min/Max, cooling, heating, dehumidification, and outside air with CO2 control (Minimum and Maximum). Contractor is not required to rebalance indoor zone air distribution systems.

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3.9 EXAMPLE REPORT FORMS:

- A. Title Page:
 - 1. Name of Testing, Adjusting, and Balancing Agency.
 - 2. Address of Testing, Adjusting, and Balancing Agency.
 - 3. Telephone number of Testing, Adjusting, and Balancing Agency.
 - 4. Project name.
 - 5. Project location.
 - 6. Project Architect.
 - 7. Project Engineer.
 - 8. Project Contractor.
 - 9. Report date.

- B. Summary Comments:
 - 1. Design versus final performance.
 - 2. Notable characteristics of system.
 - 3. Description of systems operation sequence.
 - 4. Summary of outdoor air and exhaust flows to indicate amount of building pressurization.
 - 5. Nomenclature used throughout report.
 - 6. Test conditions.

- C. Instrument List:
 - 1. Instrument.
 - 2. Manufacturer.
 - 3. Model number.
 - 4. Serial number.
 - 5. Range.
 - 6. Calibration date.

- D. Duct Traverse:
 - 1. Location.
 - 2. Test instrument used.
 - 3. System zone/branch.
 - 4. Duct size (I.D.) and area.
 - 5. Actual air velocity readings in grid form to represent location in duct.
 - 6. Actual average air velocity.
 - 7. Design and actual air flow rate.
 - 8. Duct static pressure.
 - 9. Air dry bulb temperature.
 - 10. Air correction factor.

- E. Packaged Rooftop Unit:
 - 1. Identification/number.
 - 2. Location.
 - 3. Manufacturer.
 - 4. Model number.
 - 5. Serial number.
 - 6. Condensing Section Data:
 - a. Entering air dry bulb DB temperature, design and actual.
 - b. Leaving air dry bulb temperature, actual.
 - c. Number of compressors.
 - 7. Direct Expansion Evaporator Coil Data:
 - a. Air flow rate, design and actual.
 - b. Entering air dry bulb DB and wet bulb WB temperatures, design and actual.

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- c. Leaving air dry bulb DB temperature, design and actual.
- d. Saturated suction temperature, design and actual.
- e. Air pressure drop, design and actual.
- 8. Electric Resistance Heater:
 - a. Design capacity kW.
 - b. Number of stages.
 - c. Phase, voltage, amperage.
 - d. Test voltage (each phase).
 - e. Test amperage (each phase).
 - f. Air flow rate, specified and actual.
 - g. Entering and leaving air dry bulb DB temperatures, specified and actual.
- 9. Evaporator Fan:
 - a. Arrangement/Class/Discharge.
 - b. Air flow rate, specified and actual.
 - c. Return air flow rate, specified and actual.
 - d. Outside air flow rate, specified and actual.
 - e. Total static pressure (total external), specified and actual.
 - f. Inlet and discharge air pressure.
 - g. Sheave Make/Size/Bore.
 - h. Number of Belts/Make/Size.
 - i. Fan RPM.

END OF SECTION 23 05 93

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SECTION 23 09 00 - BUILDING AUTOMATION SYSTEM

PART 1 - GENERAL

1.1 SUMMARY:

- A. Section includes Building Automation System (BAS) utilizing Web Based direct digital controls for the Flour Bluff Independent School District High School 2020 HVAC Maintenance Projects, Corpus Christi, Texas.
- B. BAS system shall be subcontracted directly by the Mechanical Contractor.

1.2 SCOPE OF WORK:

- A. Johnson Controls General:
 - 1. Provide new BACnet router adjacent to the existing JCI Model NAE routers as needed for control of new BACnet-IP COM connection to new RTU's.
 - 2. Project scope is to demolish existing N2 BAS and provide new BACnet-IP BAS integration to new RTU systems as described by this Specification, Project Drawings, and equipment sequence of operations.
 - 3. BAS contractor shall provide all wiring and terminations for system integration.
 - 4. BAS contractor shall update the existing BAS server to reflect system changes and new equipment.
 - 5. New control system shall be based on latest model Johnson Controls as applicable and compatible with existing systems.
- B. AAON Units: HVAC contractor shall install each RTU with AAON space and AAON duct mounted sensors and shall program unit internal controls to accomplish equipment sequence of operations. New units shall be wired to the new BACnet-IP COM and integrated with existing BAS systems to new BACnet router.
- C. Lennox Unit, RTU-18:
 - 1. Project scope is to demolish existing BAS and provide new BAS with application specific controller and new JCI space sensor. Controller shall be directly connected to RTU for heating, cooling, and dehumidification.
 - 2. New control panel shall be located indoors above the corridor ceiling directly below the RTU.

1.3 PRE-APPROVED MANUFACTURERS AND PROPOSAL STRUCTURE:

- A. The following are pre-approved control system suppliers, manufacturers, and product lines:
 - 1. Proposal Alternate No. 3A: Johnson Controls Metasys
 - 2. Proposal Alternate No. 3B: Johnson Controls Facility Explorer
- B. Proposers, not included in the list above, interested in submitting a proposal shall request approval in accordance with Supplementary General Conditions and Specification Section 23 05 00 Mechanical General Conditions.
- C. The above list does not indicate preference. Inclusion on this list does not guarantee acceptance of products or installation. Control system shall comply with the terms of this Specification.
- D. The Controls Contractor shall be a factory authorized and certified system and service provider for the control system. The Controls Contractor shall not be a Mechanical Contractor or Equipment vendor. The intent of this specification is for a full time Controls Contractor and Service provider with local engineering and service to provide the controls system. The

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successful Controls Contractor shall provide references from a minimum of five (5) school districts demonstrating satisfactory completion of similar projects.

1.4 BAS DESCRIPTION:

- A. Provide and install a complete digital control system with all software and hardware functions. System shall be completely based on ANSI/ASHRAE Standard 135, BACnet. System is to control all mechanical equipment, including all unitary equipment such as air handling units, terminal units, fans and the like. Non-BACnet compliant or proprietary equipment or system (including gateways) shall not be acceptable and are specifically prohibited. All system BACnet components shall be tested by BACnet Testing Laboratories (BTL) and shall be manufacturer's latest version.
- B. System shall be a complete system designed for use with Owner LAN (local area network) to communicate between main central Data/Web Server Operator terminal and building controllers via BACnet-IP. Communication between Building Controllers down to Unitary Controllers shall be BACnet-IP over independent BAS Communication cabling or commonly called "COM". Contractor shall be responsible for coordination with the Owner's IT staff to ensure that the BAS will perform in the Owner's environment without disruption to any of the other activities taking place on Owner LAN.
- C. All points of user interface shall be on standard personal computer, laptop, or portable electronic device such as tablets or cellular phone that do not require the purchase of any special software or licenses from the BAS manufacturer for use as a building operations terminal. The primary point of interface on BAS shall be a standard Web Browser.
- D. The BAS work shall consist of the provision of all labor, materials, tools, equipment, software, software licenses, software configurations and database entries, interfaces, wiring, tubing, installation, labeling, engineering, calibration, documentation, samples, submittals, testing, commissioning, training services, permits and licenses, transportation, shipping, handling, administration, supervision, management, insurance, temporary protection, cleaning, cutting and patching, warranties, services, and items, even though these may not be specifically mentioned in these Division documents which are required for the complete, fully functional and commissioned BAS.
- E. Provide a complete, neat and workmanlike installation. Use only manufacturer certified employees who are skilled, experienced, trained, and familiar with the specific equipment, software, standards and configurations to be provided for this Project.
- F. Manage and coordinate the BAS work in a timely manner in consideration of the Project schedules. Coordinate with the associated work of other trades so as to not impede or delay the work of associated trades.
- G. The BAS as provided shall incorporate, at minimum, the following integrated features, functions and services:
 - 1. Operator information, alarm management and control functions.
 - 2. Information management including monitoring, trending, transmission, archiving, retrieval, and reporting functions.
 - 3. Diagnostic monitoring and reporting of BAS functions.
 - 4. Offsite monitoring and management access.
 - 5. Energy Management.
 - 6. Global scheduling allowing adjustment of one Occupied/Unoccupied/Holiday time schedule that can be applied to all equipment.

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1.5 QUALITY ASSURANCE:

- A. The BAS Contractor shall be the authorized installing contractor for the manufacturer of the BACnet BAS components.
- B. Responsibility: The BAS Contractor shall be responsible for inspection and Quality Assurance for all materials and workmanship furnished.
- C. Component Testing: Maximum reliability shall be achieved through extensive use of high-quality, pre-tested components. Each and every controller, sensor, and all other DDC components shall be individually tested by the manufacturer prior to shipment.
- D. The BAS Contractor shall provide all tools, testing, and calibration equipment necessary to ensure reliability and accuracy of the system.
- E. BAS shall be engineered, programmed and supported completely by representative's local office that must be within 200 miles of project site.
- F. The BAS architecture shall consist of the products of a manufacturer regularly engaged in the production of Building Automation System, and shall be the manufacturer's latest standard of design at the time of proposal.

1.6 RELATED SECTIONS:

- A. The General Conditions of the Contract and Supplementary General Conditions are part of this specification and shall be used in conjunction with this section as part of the contract documents.
- B. The following sections constitute related work:
 - 1. Section 23 05 00 – Mechanical General Conditions.
 - 2. Section 23 05 93 – Testing, Adjusting and Balancing.
 - 3. Section 23 09 23 – Direct Digital Control Coordination.
 - 4. Section 23 09 93 – Equipment Control Sequence of Operations.
 - 5. Section 26 00 00 – Electrical Specifications.
- C. Commissioning: The Owner will secure the services of an independent Commissioning Provider. Refer to Commissioning Provider for specifications section 20 00 10 for scope of work and coordination requirements.

1.7 CODES AND STANDARDS:

- A. Work, materials, and equipment shall comply with the most restrictive of local, state, and federal authorities' codes and ordinances or these plans and specifications. At a minimum, the installation shall comply with current editions in effect 30 days prior to receipt of proposals of the following codes:
 - 1. National Electric Code (NEC).
 - 2. International Building Code 2015 (IBC).
 - a. Section 717 Ducts and Air Transfer Openings.
 - b. Section 907 Fire Alarm and Detection System.
 - c. Chapter 28 Mechanical Systems.
 - 3. International Mechanical Code 2015 (IMC).
 - 4. International Energy Conservation Code 2015 (IECC).
 - 5. ASHRAE/ANSI 135: Data Communication Protocol for Building Automation and Control System (BACnet).
 - 6. UL 916 Underwriters Laboratories Standard for Energy Management Equipment.

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1.8 SUBMITTALS:

- A. Shop Drawings:
 - 1. The BAS Contractor shall submit engineered drawings, control sequences, and bill of materials for approval.
 - 2. Drawings shall be submitted in the following standard sizes:
 - a. 8.5" x 11".
 - b. 8.5" x 14".
 - c. 11" x 17".
 - 3. Provide a minimum of eight (8) copies of submittal drawings for approval. Exact number of submittal drawings or electronic versions shall be determined at pre-construction meeting.
- B. System Documentation, Product Data, and Samples (At a minimum, submit the following):
 - 1. BAS network architecture diagrams including all nodes and interconnections in simple block format.
 - 2. System schematics, sequences, and flow diagrams.
 - 3. Points schedule for each input and output point in the BAS, including: Point Type, Object Name, Expanded ID, Display Units, Controller type, and Address.
 - 4. Samples of Graphic Display screen types and associated menus.
 - 5. Detailed Bill of Material list for each system or application, identifying quantities, part numbers, descriptions, and optional features.
 - 6. Room Schedule including a separate line for each piece of equipment indicating location and address.
 - 7. Details of all BAS interfaces and connections to the work of other trades.
 - 8. Product data sheets or marked catalog pages including part number, photo and description for all products including software.
 - 9. Manufacturer's instructions and drawings for installation, maintenance, and operation of all purchased items.
 - 10. Provide BACnet Protocol Implementation Conformance Statements (PICS) as per ANSI/ASHRAE Standard 135.
 - 11. A list of functions available and a sample of function block programming that shall be part of delivered system.
 - 12. Proposed location of all Building Level Controllers with proposed routing of all COM wiring to downstream controllers.
 - 13. Proposed locations of all BAS control panels, fan relay panels, devices, and the like.

1.9 PROJECT MANAGEMENT:

- A. The BAS Contractor shall assign one project manager that shall manage and coordinate all BAS work through project completion.
- B. The BAS Contractor shall provide a detailed project design and installation schedule with time markings and details for hardware times and software development phases. Schedule shall show all the target dates for transmission of project information and documents and shall indicate timing and dates for system installation, debugging, and commissioning.
- C. The BAS Contractor schedule shall be seamlessly coordinated with General Contractor for all required coordination with sub-contractors such as mechanical, electrical, plumbing, TAB, and commissioning.

1.10 RECORD DOCUMENTATION:

- A. Operation and Maintenance Manuals – One (1) paper copy and One (1) electronic copy of the Operation and Maintenance Manuals shall be provided to the Owner's Representative upon

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completion of the project. The entire Operation and Maintenance Manual shall be furnished on Compact Disc, DVD, or flash media, and include the following for the BAS provided:

1. Table of contents.
2. As-built system record drawings. PDF record drawings shall represent the as-built condition of the system and incorporate all information supplied with the approved submittal. Drawings shall indicate location of all controlled equipment, BAS equipment controllers, control panels, sensors, fan and interlocking relays, BAS communication cabling routing, secondary control wiring, power source locations, and the like.
 - a. Module Drawing:
 - 1) Provide an electronic wiring diagram of each control module (As shown in submittal documentation). Diagram shall display wiring schematic and terminations to end devices.
 - 2) Diagram shall display each input and output terminals and label those that are used for the control application.
 - 3) Dynamic live data shall be displayed for each control point.
 - 4) Diagram shall display module type/name and network address.
 - 5) The module drawing shall be a separate graphic that is selectable at the applicable location for the control program.
 - b. Equipment Schematic:
 - 1) Provide an electronic equipment schematic for each piece of mechanical equipment.
 - 2) The schematic shall display all mechanical equipment characterizes including fans, dampers, sensors, and other applicable control devices.
 - 3) The schematic shall show wiring terminations to each control device as shown in the submittal and as built documentation.
 - 4) Control devices shall be labeled by a symbol that can easily be identified in a bill of material that is shown on this graphic. The bill of material shall show the device symbol, description, manufacturer, and part number.
 - c. As-built schematic drawings shall be provided locally at each control device and paper copy affixed to control enclosure such as local control panels, VAC control panels, and the like.
3. Manufacturer's product data sheets or catalog pages for all products including software.
4. System Operator's manuals.
5. Archive copy of all site-specific databases and sequences.
6. BAS network diagrams.
7. Complete copy of approved Submittals.
8. Electronic Parts Reference: Contractor shall have a website that has PDF files for products installed for this project. PDF files shall consist of product cut sheets, installation manuals, and maintenance instructions for future reference. This website shall include not only DDC hardware, but all control peripheral devices including: relays, current switches, temperature sensors, transducers, actuators, valves, power supplies, and other components supplied for this project.

1.11 WARRANTY:

- A. Standard Material and Labor Warranty:
 1. Provide a one-year labor, travel, material warranty on the complete BAS. Material warranty shall include software and associated database.
 2. If within twelve (12) months from the date of Final Completion/Final Acceptance, upon written notice from the Owner, it is found to be defective in operation, workmanship or materials, it shall be replaced, repaired or adjusted at the option of the BAS Contractor at the cost of the BAS Contractor.
 3. Maintain an adequate supply of materials within 24-hours of project site.

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1.12 OWNERSHIP OF PROPRIETARY MATERIAL:

- A. Project-specific software and documentation shall become Owner's property. This includes, but is not limited to:
 - 1. Graphics.
 - 2. Record drawings.
 - 3. Database.
 - 4. Application programming code and tools.
 - 5. All application software.
 - 6. All system hardware.
 - 7. Documentation.
 - 8. Unlimited User Product Licensing.

PART 2 - PRODUCTS

2.1 GENERAL DESCRIPTION:

- A. The BAS shall use an open architecture and fully support a multi-vendor environment based on Native BACnet communication protocol. The system shall be designed for use on the Internet, or intranets using off the shelf, industry standard technology compatible with other owner provided networks. All system BACnet components shall be tested by BACnet Testing Laboratories (BTL) and shall be manufacturer's latest version.
- B. The BAS shall consist of the following:
 - 1. Central Data/Web Server Operator Terminal "Head End".
 - 2. Standalone Network Building Controller(s).
 - 3. Network routers and repeaters.
 - 4. Unit Controllers.
 - 5. Local Display Devices and Sensors.
 - 6. Network processing, data storage and communications equipment.
 - 7. Other components required for a complete and working BAS.
- C. The system shall permit expansion of both capacity and functionality through the addition of sensors, actuators, controllers and operator devices, while re-using existing controls system infrastructure.
- D. System architectural design shall eliminate dependence upon any single device for alarm reporting and control execution. The failure of any single component or network connection shall not interrupt the execution of control strategies at other operational devices.

2.2 COMMUNICATION:

- A. Control products, communication media, connectors, repeaters, hubs, and routers shall comprise a BACnet internetwork. Building controller and central data/web server operator interface communication shall conform to ASHRAE/ANSI Standard 135, BACnet-IP.
- B. Install new wiring and network devices as required to provide a complete and workable control network.
- C. Each controller shall have a communication port for temporary connection to a mobile computer or other operator interface. Connection shall support memory downloads and other commissioning and troubleshooting operations. Any special control cables needed shall be provided to Owner at project completion.

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- D. Internetwork operator interface and value passing shall be transparent to internetwork architecture.
 - 1. An operator interface connected to a controller shall allow the operator to interface with each internetwork controller as if directly connected. Controller information such as data, status, and control algorithms shall be viewable and editable from each internetwork controller.
 - 2. Inputs, outputs, and control variables used to integrate control strategies across multiple controllers shall be readable by each controller on the internetwork. Program and test all cross-controller links required to execute control strategies specified in the sequences of operation. An authorized operator shall be able to edit cross-controller links by typing a standard object address or by using a point-and-click interface.
- E. Controllers with real-time clocks shall use the BACnet Time Synchronization service. System shall automatically synchronize system clocks daily from an operator-designated controller via the internetwork. If applicable, system shall automatically adjust for daylight saving and standard time.
- F. System shall be expandable to at least twice the required input and output objects with additional controllers, associated devices, and wiring.

2.3 USER INTERFACE:

- A. Dedicated Central Data/Web Sever Operator User Interface (Head End): Connect new systems to existing JCI ADX server.
- B. Distributed Web Based User Interface:
 - 1. All features and functions of the dedicated user interface defined in this document shall be available on any computer connected directly or via a wide area or virtual private network (WAN/VPN) to the BAS Web Server and conforming to the following specifications.
 - 2. The software shall run on the Microsoft Internet Explorer, Google Chrome, Apple Safari, Mozilla Firefox, Apple I-Pad, Apple I-Phone, or Google android mobile devices.
- C. User Interface Application Components:
 - 1. Operator Interface:
 - a. An integrated browser based client application shall be used as the user operator interface program.
 - b. All Inputs, Outputs, Setpoints, and all other parameters as shown on the design drawings, or required as part of the system software, shall be displayed for operator viewing and modification from the operator interface software.
 - c. The user interface software shall provide help menus and instructions for each operation and/or application.
 - d. All controller software operating parameters shall be displayed for the operator to view/modify from the user interface. These include: setpoints, alarm limits, time delays, PID tuning constants, run-times, point statistics, schedules, and the like.
 - e. Software shall have the ability to lock input and output values for predetermined time intervals.
 - f. The Operator Interface shall incorporate comprehensive support for functions including, but not necessarily limited to, the following:
 - 1) User access for selective information retrieval and control command execution.
 - 2) Monitoring and reporting.
 - 3) Trending.
 - 4) Alarm, non-normal, and return to normal condition annunciation.
 - 5) Selective operator override and other control actions.
 - 6) Information archiving, manipulation, formatting, display and reporting.

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- 7) BAS internal performance supervision and diagnostics.
 - 8) On-line access to user HELP menus.
 - 9) Means for the controlled re-programming, re-configuration of BAS operation and for the manipulation of BAS database information in compliance with the prevailing codes, approvals and regulations for individual BAS applications.
2. Navigation Trees:
 - a. The system will have the capability to display multiple navigation trees that will aid the operator in navigating throughout all system and points connected. At minimum provide a tree that identifies all system on the networks.
 - b. Provide the ability for the operator to add custom trees. The operator will be able to define any logical grouping of system or points and arrange them on the tree in any order. It shall be possible to nest groups within other groups.
3. Alarms:
 - a. Alarms shall be routed directly from Building Controllers to PCs and Web Server. It shall be possible for specific alarms from specific points to be routed to specific PCs and servers. The alarm management portion of the user interface shall, at the minimum, provide the following functions:
 - 1) Log date and time of alarm occurrence.
 - 2) Generate a "Pop-Up" window, with audible alarm, informing a user that an alarm has been received.
 - 3) Allow a user, with the appropriate security level, to acknowledge, temporarily silence, or discard an alarm.
 - 4) Provide an audit trail on hard drive for alarms by recording user acknowledgment, deletion, or disabling of an alarm. The audit trail shall include the name of the user, the alarm, the action taken on the alarm, and a time/date stamp.
 - 5) Provide the ability to direct alarms to an e-mail address or cellular phone text message. This must be provided in addition to the pop up window described above. Systems that use e-mail and pagers as the exclusive means of annunciating alarms are not acceptable.
 - 6) Any attribute of any object in the system may be designated to report an alarm.
 - b. The BAS shall annunciate diagnostic alarms indicating system failures and non-normal operating conditions.
 - c. System shall include an Alarm Wizard for set up of alarms. Wizard shall walk user through all steps necessary for alarm generation.
 - d. The BAS shall annunciate application alarms as directed by Owner.
4. Reports and Summaries:
 - a. Reports and Summaries shall be generated and directed to the user interface displays, with subsequent assignment to printers, or disk. As a minimum, the system shall provide the following reports:
 - 1) All points in the BAS.
 - 2) All points in each BAS application.
 - 3) All points in a specific controller.
 - 4) All points in a user-defined group of points.
 - 5) All points currently in alarm.
 - 6) All points locked out.
 - 7) All BAS schedules.
 - 8) All user defined and adjustable variables, schedules, interlocks and the like.
 - b. Selection of a single menu item, tool bar item, or tool bar button shall print any displayed report or summary on the system printer for use as a building management and diagnostics tool.
 - c. The system shall allow for the creation of custom reports and queries via a standard web services XML interface and commercial off-the-shelf software such as Microsoft Access, Microsoft Excel, or Crystal Reports.

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5. Schedules:
 - a. A graphical display for time-of-day scheduling and override scheduling of building operations shall be provided. At a minimum, the following functions shall be provided:
 - 1) Daily Schedules.
 - 2) Exception Schedules.
 - 3) Monthly Calendars.
 - b. Daily schedules shall be provided for each group of equipment with a specific time use schedule.
 - c. It shall be possible to define one or more exception schedules for each schedule including references to calendars.
 - d. Monthly calendars shall be provided that allow for simplified scheduling of holidays and special days for a minimum of five years in advance. Holidays and special days shall be user-selected with the pointing device or keyboard, and shall automatically reschedule equipment operation as previously defined on the exception schedules.
 - e. Schedules and Calendars shall comply with ASHRAE/ANSI Standard 135.
 - f. Selection of a single menu item or tool bar button shall print any displayed schedule on the system printer for use as a building management and diagnostics tool.
 - g. The system shall show all information in easy-to-read daily format including calendar of this month and next. All schedules shall show actual ON/OFF times for day based on scheduling priority. Priority for scheduling shall be events, holidays and daily with events being the highest.
 - h. Holiday and special event schedules shall display data in calendar format. Operator shall be able to schedule holidays and special events directly from these calendars.
 - i. Operator shall be able to change all information for a given weekly or exception schedule if logged on with the appropriate security access.
 - j. System shall include a Schedule Wizard for set up of schedules. Wizard shall walk user through all steps necessary for schedule generation. Wizard shall have its own pull-down selection for startup or may be started by right clicking on value displayed on graphic and then selecting Schedule.
 - k. Scheduling shall include optimum start based on outside air temperature, current heating/cooling setpoints, indoor temperature and history of previous starts. Each and every individual zone shall have optimum start time independently calculated based on all parameters listed. User shall input schedules to set time that occupied setpoint is to be attained. Optimum start feature shall calculate the startup time needed to match zone temperature to setpoint. User shall be able to set a limit for the maximum startup time allowed.
 - l. Block Scheduling: General schedules shall be created for blocks and groups of systems to help speed up scheduling for similar type systems. Coordinate block zoning of schedules with Owner at project startup.
 - m. Staggered Start: All schedules and start sequences shall provide provisions for staggered start for all equipment to limit electrical inrush current and potential power demand charges. Systems shall not allow the entire project to start at one time upon a start event either regular scheduled start or re-start after power failure or the like. Staggered start time period shall be adjustable such as 5-second increments and the like.
6. BAS Security:
 - a. Multiple-level password access protection shall be provided to allow the user/manager to user interface control, display, and database manipulation capabilities deemed appropriate for each user, Based on an assigned password.
 - b. Each user shall have the following: a user name (24 characters minimum), a password (8 characters minimum), and access levels.

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- c. A minimum of five levels of access shall be supported individually or in any combination as follows:
 - 1) Level 1 = View Data.
 - 2) Level 2 = Command.
 - 3) Level 3 = Operator Overrides.
 - 4) Level 4 = Database Modification.
 - 5) Level 5 = Database Configuration.
 - 6) Level 6 = Administrative all privileges, including Password Add/Modify and Add/Modify users.
 - d. A minimum of 200 unique passwords shall be supported.
 - e. Operators shall be able to perform only those commands available for their respective passwords. Display of menu selections shall be limited to only those items defined for the access level of the password used to log-on.
 - f. The system shall automatically generate a report of log-on/log-off and system activity for each user. Any action that results in a change in the operation or configuration of the control system shall be recorded, including: modification of point values, schedules or history collection parameters, and all changes to the alarm management system, including the acknowledgment and deletion of alarms.
 - g. System shall include an automatic logout feature that shall automatically log out user when there has been no keyboard or mouse activity for a set period of time. Time period shall be adjustable by system administrator. Automatic logout shall be enable or disabled by system administrator. BAS shall display on screen that user is logged out after automatic logout occurs.
7. Dynamic Color Display Graphics:
- a. The system shall display all data associated with project in color graphical format. Graphic files shall be created using digital, full color photographs of system installation, AutoCAD or Visio drawing files of field installation drawings and wiring diagrams from as-built drawings. The system shall display all data using three-dimensional graphic representations of all mechanical equipment. System shall be capable of displaying graphic file, text, and dynamic object data together on each display and shall include animation. Information shall be labeled with descriptors and shall be shown with the appropriate engineering units. All information on any display shall be dynamically updated without any action by the user. The system shall allow user to change all field-resident BAS functions associated with the project, such as setpoints, weekly schedules, exception schedules, etc. from any screen no matter if that screen shows all text or a complete graphic display.
 - b. All displays and programming shall be generated and customized by the local BAS Contractor or Owner. System requiring factory programming for graphics or DDC logic are specifically prohibited.
 - c. Binary objects shall be displayed as ACTIVE/INACTIVE/NULL or with customized text. Text shall be justified left, right or center as selected by the user. Also, allow binary objects to be displayed as individual change-of-state graphic objects on the display screen such that they overlay the system graphic. Each binary object displayed in this manner shall be assigned up to three graphic files for display when the point is ON, OFF or in alarm. For binary outputs, toggle the object's commanded status when the graphic item is selected with the system mouse. Similarly, allow the operator to toggle the binary object's status by selecting with the mouse a graphic of a switch or light, for example, which then displays a different graphic (such as an "ON" switch or lighted lamp). Additionally, allow binary objects to be displayed as an animated graphic. Animated graphic objects shall be displayed as a sequence of multiple graphics to simulate motion. For example, when a fan is in the OFF condition, display a stationary graphic of the fan. When the operator selects the fan graphic with the mouse, the represented object's status is toggled and the graphic of the fan's blades rotates in a time-based animation. The operator shall be able to click on an animated graphical object or switch it from the OFF position to ON, or ON to OFF. Allow operator to

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change graphic file assignment and also create new and original graphics. System shall be supplied with a library of standard graphics, which may be used unaltered or modified by the operator. Systems that do not allow customization or creation of new graphic objects by the operator (or with third-party software) shall not be allowed.

- d. Analog objects shall be displayed with operator modifiable units. Analog input objects may also be displayed as individual graphic items on the display screen as an overlay to the system graphic. Each analog input object may be assigned a minimum of five graphic files, each with high/low limits for automatic selection and display of these graphics. As an example, a graphic representation of a thermometer would rise and fall in response to either the room temperature or its deviation from the controlling setpoint. Analog output objects, when selected with the mouse, shall be displayed as a prompted dialog (text only) box. Selection for display type shall be individual for each object. Analog object values may be changed by selecting either the "increase" or "decrease" arrow in the analog object spinner box without using the keypad. Pressing the button on the analog object spinner box allows direct entry of an analog value and accesses various menus where the analog value may be used, such as trendlogs.
- e. Temperature Indication: Analog objects shall also be assigned to an area of a system graphic or object, where the color of the defined area changes based on the analog object's value. Temperature value shall also be indicated on graphic. For example, an area of a floor-plan or other graphic such as an object served by a single control zone would change color with respect to the temperature of the zone or its deviation from setpoint. All editing and area assignment shall be created or modified online using simple icon tools.
- f. A customized menu label (push-button) shall be used for display selection. Menu items on a display shall allow penetration to lower level displays or additional menus. Dynamic point information and menu label push buttons may be mixed on the same display to allow sub-displays to exist for each item. Each display may be protected from viewing unless operator has appropriate security level. A security level may be assigned to each display and system object. The menu label shall not appear on the graphic if the operator does not have the appropriate security level.
- g. A mouse shall be used to move the pointer arrow to the desired item for selection of new display or to allow the operator to make changes to object data.
- h. The graphics application program shall be supplied as an integral part of the User Interface.
- i. Graphics Runtime Functions: Each graphic application shall be capable of the following functions:
 - 1) All graphics shall be fully scalable.
 - 2) The graphics shall support a maintained aspect ratio.
 - 3) Multiple fonts shall be supported.
 - 4) Unique background shall be assignable on a per graphic basis.
 - 5) The color of all animations and values on displays shall indicate if the status of the object attribute.
- j. Graphic Editing Tool: A graphic editing tool shall be provided that allows for the creation and editing of graphic files. The graphic editor shall be capable of performing/defining all animations, and defining all runtime binding.
 - 1) The graphic editing tool shall in general provide for the creation and positioning of point objects by dragging from tool bars or drop-downs and positioning where required.
 - 2) In addition, the graphic editing tool shall be able to add additional content to any graphic by importing backgrounds in the SVG, BMP, PNG or JPG file formats.
- k. Aliasing: Many graphic displays representing part of a building and various building components are exact duplicates, with the exception that the various

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- variables are bound to different field values. Consequently, it shall be possible to bind the value of a graphic display to aliases, as opposed to the physical field tags.
8. Historical Trending and Data Collection:
 - a. BAS shall store trend and point history data for all analog and digital inputs and outputs, as follows:
 - 1) Any point, physical or calculated, may be designated for trending. Two methods of collection shall be allowed:
 - a) Defined time interval.
 - b) Upon a change of value or change in state.
 - 2) BAS system shall be set up to with trending for all system points every 60 seconds or change of state and shall store data for a minimum of 365-days. BAS shall be provided with integral memory as required for trending data storage with database software unbounded on storage limits.
 - 3) BAS shall have the capability to store multiple samples for each physical point and software variable based upon available memory, including an individual sample time/date stamp. Points may be assigned to multiple history trends with different collection parameters.
 9. Trend Data Viewing and Analysis:
 - a. Provide a trend viewing utility that shall have access to all database points.
 - b. It shall be possible to retrieve any historical database point for use in displays and reports by specifying the point name and associated trend name.
 - c. The trend viewing utility shall have the capability to define trend study displays to include multiple trends.
 - d. Displays shall be able to be single or stacked graphs with on-line selectable display characteristics, such as ranging, color, and plot style.
 - e. Display magnitude and units shall both be selectable by the operator at any time without reconfiguring the processing or collection of data. This is a zoom capability.
 - f. Display magnitude shall automatically be scaled to show full graphic resolution of the data being displayed.
 - g. Trend studies shall be capable of calculating and displaying calculated variables including highest value, lowest value and time based accumulation.
 10. Field Engineering Tools:
 - a. The system software shall include field-engineering tools for programming all controllers supplied. All controllers shall be programmed using graphical tools that allow the user to connect function blocks on screen that provide sequencing of all control logic. Function blocks shall be represented by graphical displays that are easily identified and distinct from other types of blocks. Graphical programming that uses simple rectangles and squares is not acceptable.
 - b. User shall be able to pick graphical function block from menu and place on screen. Provide zoom in and zoom out capabilities. Function blocks shall be downloaded to controller without any reentry of data.
 - c. Programming tools shall include a real time operation mode. Function blocks shall display real time data and be animated to show status of data inputs and outputs when in real time operation. Animation shall show change of status on logic devices and countdown of timer devices in graphical format.
 - d. Field engineering tools shall also include a database manager of applications that include logic files for controllers and associated graphics. Operator shall be able to select unit type, input/output configuration and other items that define unit to be controlled.
 - e. Field engineering tool shall include Device Manager for automatic detection of devices connected anywhere on the BACnet network by scanning of the entire network. This function shall display device instance, network identification, model number and description of connected devices. It shall record and display software file loaded into each controller. A copy of each file shall be stored on the computer's hard drive. If needed, this file shall be downloaded to the appropriate controller by selection using the mouse.

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- f. System shall include backup/restore function that will back up entire system to selected medium and then restore system from that media.
- 11. Software:
 - a. At the conclusion of project, contractor shall leave with owner a CD/DVD or USB Flash drive that includes the complete software operation system and project graphics, setpoints, system parameters, etc. This backup shall allow the owner to completely restore the system in the case of a system malfunction.
 - b. Backups shall be provided with licensing, user names, and passwords as needed.

2.4 SUPERVISORY CONTROLLERS/ROUTERS:

- A. General:
 - 1. Johnson Control BACnet Router.
 - 2. Network Level Supervisory Controllers/Routers shall manage and supervise a network of Application Specific Controllers.
 - 3. Network Level Controllers shall be provided with designated 120-volt power and UPS at each controller location by BAS Contractor.
 - 4. Each building controller shall be provided with a minimum of 200% future expansion capability of adding additional devices per each final installed BACnet-IP communication line (COM). Minimum 200% future expansion capability shall be built into building controller system and shall not require additional control devices or licensing.
 - 5. Interface shall be through primary web access with a standard HTML5 web profile. System shall have embedded configuration tools that do not require proprietary software to configure and access.
- B. Network Communications:
 - 1. Application Specific Controller and Modular I/O Subnetworks: The Network Level Controller shall have a minimum of the following ports:
 - a. On Board:
 - 1) Two (2) Ethernet 10/100 Mbps
 - 2) Two (2) RS-485 (Isolated)
 - 3) One (1) Standard USB Type A
 - 4) One (1) Micro USB
 - 5) One (1) Fast USB Bus
 - 6) Standard Wi-Fi
 - b. Plug-in Options: (Provide as needed based on project specifics)
 - 1) Two (2) RS-485 (isolated)
 - 2) LON FT/TP-10, RS-232
- C. Programming Language:
 - 1. Network Level Controller shall support a Graphical Programming system for control program generation using graphical program modules such as PID, Timers, etc.
 - 2. Network Level Controller shall also support a standard line-based programming language, such as JavaScript or Visual Basic to facilitate the development of custom sequences on a line-by-line basis. Units not supporting both a Graphical Programming system, and a line-based programming language for control program creation will not be accepted.
 - 3. Embedded Applications:
 - a. Workbench.
 - b. Web User Interface.
 - c. Niagara Driver.
 - d. oBIX driver.
 - e. BACnet MS/TP driver.
 - f. BACnet-IP
 - g. MODBUS RTU/TCP
 - h. LonWorks FTT-10A and over IP

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- i. M-Bus
 - j. EIB/KNX
 - k. Johnson Controls N2.
 - l. Simple Network Management Protocol (SNMP)
- D. BACnet Support:
 - 1. The Network Level Controllers shall communicate using the BACnet/IP protocol over an onboard 100Mbps Ethernet connection. Contractor shall provide an Ethernet switch as needed for multiple connection requirements.
 - 2. Network Level Controller shall be configurable such that Property Reads and Writes to/from specific points or objects may be disallowed while allowing reads and writes to/from other properties or objects, if so desired by the user. System without this capability will not be accepted.
 - 3. The Network Level Controller shall contain two or more RS485 ports which shall run the MS/TP BACnet protocol to other BACnet devices.
- E. Construction shall be easily expandable by use of plug-in devices.
- F. Self-Diagnostic Routines – Shall include routines to test functionality of hardware and software at power up and any software restart. Error conditions must be displayed on an LCD or similar display panel on the Network Level Controller.
- G. Real-Time Clock: Internal clock with battery backup to maintain accurate time during a power failure, maintenance, etc., must be included.
- H. Memory: Minimum system requirements
 - 1. Flash: Removable micro-SD card with 4-GB flash total storage, 2-GB user storage.
 - 2. RAM: 1 GB, minimum DDR3 SD RAM.
- I. Processor: TI AM3352: 1000MHz ARM Cortex A8 or equal.
- J. All control programs, objects and other configuration data must be backed-up in FLASH memory. This data must be loaded into the controller in case of reset due to malfunction, power loss, or other failure.
- K. The Network Level Controller shall manage and supervise a network of Application Specific Controllers (ASCs) by passing, at a minimum, the following information between the Network Level Controller and ASCs:
 - 1. Global Strategies such as Demand Limiting, etc.
 - 2. Schedule changes.
 - 3. Related Equipment status.
 - 4. Outdoor and other temperatures, etc.
 - 5. Point changes for trending purposes.
- L. The Network Level Controller shall support a flexible system of modular Input and Output Points such that the number of inputs and outputs may be closely matched to the requirements of the equipment controlled by each Network Level Controller.
- M. In addition to the tasks enumerated above, the Network Level Controller shall also perform each of the following functions:
 - 1. Monitor or control each input/output point.
 - 2. Acquire, process, and transfer information to operator workstations and other controllers on network.
 - 3. Accept, process, and execute commands from operator workstations.
 - 4. Run both database and control functions simultaneously.

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5. Record, evaluate, and report changes of state or value that occur among controlled or monitored points. Continue to perform control functions on local points regardless of status of network.
6. Perform in stand-alone mode:
 - a. Full control using last known values for remote points or using contingencies for stale remote points.
 - b. Scanning and alarm processing.
 - c. Run time accumulation.
7. Operator/Test Mode: Inhibit scanning and calculation of input points and issue manual control of input point values from operator workstations.
8. Supervisory:
 - a. Web Interface
 - b. Scheduling
 - c. Historical trend logging
 - d. Alarm monitoring
 - e. Energy Management
 - f. Totalization
 - g. Tagging and Templating
 - h. Niagara Analytics
 - i. Algorithm Library
 - j. Intuitive Programming
 - k. Real-time, On-Premises Analytics Control
 - l. Automated-Control Strategies
 - m. Customized control logic
 - n. Customized configuration

N. Control output points from operator workstations.

2.5 BACnet COMPLIANT INPUT/OUTPUT POINT MODULES:

- A. I/O Modules shall be from the same manufacturer as the Network Level Controllers.
- B. I/O Modules shall utilize 24 Vac or less for supply power.
- C. At a minimum, all I/O modules shall operate from 32 degrees F (0 degrees C) to 140 degrees F (60 degrees C).
- D. Analog Input points must have, at a minimum, 12-bit resolution.
- E. Input Points must support each of the following signal types:
 1. 0 – 10 Vdc.
 2. 4 – 20 Ma.
 3. 10K Thermistor.
 4. 100 ohm Platinum RTD.
 5. Contact Closure.
 6. 24 Vac “wet” input.
- F. Output points must support each of the following signal types:
 1. Start/Stop Control: Relay (5 amps at up to 277 Vac).
 2. Start/Stop Control: Triac.
 3. Pulse Width Modulation: 0.1 second maximum resolution, 25.5 second minimum span.
 4. 0 – 10 Vdc.
 5. 4 – 20 mA.
- G. BACnet Compliance: Modular Input / Output System shall employ the BACnet-IP communications protocol.

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2.6 BACnet COMPLIANT PROGRAMMABLE CONTROLLERS:

- A. General:
 - 1. Johnson Control General Purpose Application Controllers
 - 2. Controllers shall be from the same manufacturer as BAS, and shall be provided for all listed RTU's, Air Handling Units, VFD's, and similar equipment. Communication protocol between controllers shall be BACnet-IP.
 - 3. BAS manufacturer shall provide controllers and expansion and extension devices as needed to provide control of equipment as detailed by Contract Document plans and specifications. The following specification lists minimum requirements and does not detail specific maximum requirements for each equipment application.
- B. The controllers shall be stand-alone devices that shall support custom user programmed sequences. Pre-programmed thermostats or controllers with fixed sequence of operation are not allowed.
- C. Memory: Controllers shall use FLASH memory to store control program sequences and configuration, so that no backup battery is required.
- D. Power:
 - 1. 24-VAC or less from independent power source.
 - 2. Provide built-in surge and transient protection circuitry from communications.
- E. Controller Functions:
 - 1. Monitor or control each input/output point.
 - 2. Perform control independently from the Network Level Controller.
 - 3. Acquire, process, and transfer information to Network Level Controllers over the network.
 - 4. Accept, process, and execute commands from Network Level Controllers.
 - 5. Run both database and control functions simultaneously.
 - 6. Perform in stand-alone mode:
 - a. Full control using last known values for remote points or using contingencies for stale remote points.
 - b. Scanning and alarm processing.
 - c. Run time accumulation.
 - d. Time schedule shall reside in controller to allow for standalone operation upon break in communication with Network Level controller or web server.
 - 7. Controllers shall directly support the temporary use of a portable service terminal that can be connected to the controller via zone temperature or directly at the controller.
 - 8. Operator/Test Mode:
 - a. Inhibit scanning and calculation of input points and issue manual control of input point values from operator workstations.
 - b. Control output points from operator workstations.
 - c. Provide LED status indicator lights for communication, operation status, alarm, power, and outputs.
 - d. Provide local display with user interface buttons.
- F. Programming Language: The software tool used to configure the controller shall employ a Wizard system to assist the designer in configuring I/O points, setpoints, and other items which define the "Personality" of the controller. PID loops and 2 position control routines must be available.
- G. Inputs:
 - 1. Size controller as needed for application.
 - 2. At a minimum, the following input types must be supported:
 - a. 3K and 10 K thermistor.

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- b. 0 – 5 VDC.
 - c. Dry Contact Closure.
 - 3. Provide a minimum of five (5) universal inputs, analog or binary.
- H. Multifunction Room Sensor: Must allow occupant to modify occupancy status and adjust temperature setpoint.
- I. Outputs:
 - 1. Size controller as needed for application.
 - 2. At a minimum, the following output types must be supported:
 - a. Binary Output.
 - b. Pulse Width Modulation (0 – 25 seconds, .1 second resolution).
 - c. 0 – 10 VDC or 0-20 mA.
 - 3. Provide a minimum of Five (5) universal outputs, analog or binary.
- J. BACnet Compliance: Controller shall employ the BACnet-IP communications protocol.

2.7 INPUT DEVICES:

- A. General Requirements: Installation, testing, and calibration of all sensors, transmitters, and other input devices shall be provided to meet the system requirements.
- B. Temperature Sensors:
 - 1. General Requirements:
 - a. Sensors and transmitters shall be provided to control equipment in accordance with sequence of operations.
 - b. The temperature sensor shall be of the resistance type, and shall be either two-wire 1000 ohm nickel RTD, or two-wire 1000 ohm platinum RTD.
 - c. The following point types (and the accuracy of each) are required, and their associated accuracy values include errors associated with the sensor, lead wire, and A to D conversion:

<u>Point Type</u>	<u>Accuracy</u>
Space Temp	0.5 °F
All Other Air Temp	0.5 °F
All Relative Humidity	3% RH
Fluid Flow (Air/Water)	3% of reading
Air Pressure (Ducts)	0.075" w.c.
Air Pressure (Space)	0.01" w.c.
Water Pressure	3% of reading
Electrical Power	5% of reading
Carbon Dioxide (CO2)	50 PPM

- 2. Room Temperature Sensors: RTU-18 ONLY
 - a. Room sensors shall be constructed for either surface or wall box mounting. Each sensor shall provide combination temperate and % relative humidity function.
 - b. Room sensors shall have the following options:
 - 1) Setpoint reset buttons providing a +2 degree (adjustable) range through software.
 - 2) A momentary override request push button for activation of after-hours operation.
 - 3) LCD display for system operation temperature, state, errors.
 - c. Mount new wall sensors no higher than 48 inches above finished floor for new sensor installations in accordance with ADA requirements.
 - d. Covers - Public Spaces: Provide with locking cover guard.

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PART 3 - PERFORMANCE / EXECUTION

3.1 BAS SPECIFIC REQUIREMENTS:

- A. Graphic Displays:
 - 1. Provide a color graphic system flow diagram display for each system with all points as indicated on the point list.
 - 2. User shall access the various system schematics via a graphical penetration scheme and/or menu selection.
- B. Custom Reports: Provide custom reports as required for this project. Coordinate with Owner at system startup.

3.2 INSTALLATION PRACTICES:

- A. BAS Wiring:
 - 1. All conduit, wiring, accessories and wiring connections required for the installation of the HVAC Building Automation System, as herein specified, shall be provided by the BAS Contractor. All wiring and raceways shall comply with the requirements of applicable portions of Division 26 and all local and national electric codes, unless specified otherwise in this section.
 - 2. All BAS wiring materials and installation methods shall comply with BAS manufacturer recommendations.
 - 3. The sizing, type and provision of cable, conduit, cable trays, and raceways shall be the design responsibility of the BAS Contractor. If complications arise, however, due to the incorrect selection of cable, cable trays, raceways and/or conduit by the BAS Contractor, the Contractor shall be responsible for all costs incurred in replacing the selected components.
 - 4. Class 2 Wiring:
 - a. All Class 2 (24VAC or less) wiring shall be installed in conduit unless otherwise specified.
 - b. Conduit is not required for Class 2 wiring in concealed accessible locations. Class 2 wiring not installed in conduit shall be supported every 4' from the building structure utilizing metal hangers designed for this application. Wiring shall be installed parallel to the building structural lines. All wiring shall be installed in accordance with local code requirements.
 - c. Color Coding: All control wiring for power or signal wiring shall have color coded wire insulators for each conductor in the bundle. Contractor shall provide wire bundles with sufficient conductors for each equipment application. Multiple parallel runs of cables to equipment is not allowed.
 - d. Indoor Applications: All conduits located indoors shall be EMT (Electrical Metallic Tubing) type with steel compression fittings in exposed areas.
 - 5. Class 2 signal wiring and 24-VAC power can be run in the same conduit. Power wiring 120-VAC and greater cannot share the same conduit with Class 2 signal wiring and shall be separated by at least 48 inches in all directions.
 - 6. Provide for complete grounding of all applicable signal and communications cables, panels and equipment so as to ensure system integrity of operation. Ground cabling and conduit at the panel terminations. Avoid grounding loops.
 - 7. COM Cabling:
 - a. All Cat6 cabling shall have Orange or Purple outer shield jacketing color. Coordinate exact color with Owner IT department to avoid conflicts. BAS shall not use common colors utilized by Owner.
 - b. The BACnet-IP sub-network COM to all of the system controllers and integrated equipment shall be configured with a loop/daisy-chain/tree type configuration that shall communicate to both ends of the network to allow for all system components

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to communicate upon a break in the COM at any single point. Provide Ethernet switch at router as needed to accomplish this requirement.

- c. Existing N2 COM: Provide new COM wiring that meets the N2 specifications as needed to patch the existing COM and reconnect existing N2 systems.
 8. Wire splices and/or extensions shall be made with screw type terminal block or solder with heat shrink tape. Use of wire nuts or solder-less crimp type connections will not be allowed.
 9. All wiring that exits and enters the building envelope shall be surge protected to prevent damage from lightening. Surge suppression systems shall be indicated on shop drawings.
 10. All control conductors shall be labeled at terminations to equipment and controller is function.
- B. BAS Identification Standards:
1. Node Identification: All nodes shall be identified by a permanent label fastened to the enclosure. Labels shall be suitable for the node location. Cable types specified in Item A above shall be color coded for easy identification and troubleshooting.
 2. Label all controllers and panels.
 3. Labels for BAS panel enclosures, cabinets, ceiling grid system, and all other exposed areas shall be constructed of laminated plastic. Laminated plastic shall be minimum 1/8" thick sized appropriately to mark label easy to read when installed. Provide black letters with light contrasting background color. Secure labels in place with permanent adhesive, screws, or rivets.

3.3 TRAINING:

- A. Training:
1. The Contractor shall provide training to Owner personnel in a classroom environment. Each student shall be provided with a dedicated computer workstation utilizing a simulated BAS software platform or the actual software that is installed for this project. The Owner shall not incur any additional costs for training classes as listed below. The following training courses shall be conducted for 4 individuals on 2 separate occasions in the first year following Final Completion. Each course shall be a minimum of 4-hours in duration.
 2. Beyond the first year following Final Completion BAS Contractor shall provide unlimited training for the life of the system via webinars, training videos, remote training classes, and the like. All services shall be free of charge to Owner. Owner will be responsible for travel, lodging and food expenses.
- B. Training Topics:
1. Operator Overview – Consists of general system navigation, scheduling functions, setpoint modifications, and parameter adjustments.
 2. Advanced Topics Overview – Detailed analysis of trend setup/configurations, trend historian, alarm setup, alarm actions (email, printing, etc.), point renaming, and detailed analysis of equipment parameters.
 3. Program/Logic Manipulation – Modify system programs as needed for additions and modifications.
 4. Graphic Manipulation – Modify system graphics as needed for additions and modifications.
 5. Hardware Troubleshooting – Classroom setup shall have HVAC mock-up system. Operators shall be able to interact with this live system through the BAS utilized for this project. Class will provide students the ability to identify and repair common problems regularly encountered.
 6. Software Troubleshooting – Classroom setup shall have HVAC mock-up system. Operators shall be able to interact with this live system through the BAS utilized for this

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project. Class will provide students the ability to identify and repair common issues that can be utilized via software modifications.

3.4 COMMISSIONING:

- A. Contractor shall fully commission all aspects of the HVAC Building Automation System and shall coordinate commissioning requirements with Commissioning Provider provided by Owner. BAS Contractor shall meet with Commissioning Provider and review commissioning plan and confirm project requirements. Refer to Specification Section 20 00 10 for Mechanical Systems Commissioning.
- B. Startup Testing: Complete startup testing to verify operation control system before notifying Owner of system demonstration. Provide Owner with schedule for startup testing. Owner may have representative present during any or all startup testing.
- C. Prepare a log documenting startup testing of each input and output device, with technician's initials and date certifying each device has been tested and calibrated. This document shall indicate proof that the following functions have been commissioned. Include this information in the as-built document:
 - 1. Short to ground check, Trend configuration, Graphic display, Point to point, Loc point on, Equipment reaction, Unlock point, Equipment reaction, Equipment location correct, Signal type, Verify damper actuator operation, Module address verification, Verify interlocks and shutdowns.
 - 2. Verify that control wiring is properly connected and freed of shorts and ground faults. Verify that terminations are tight.
 - 3. Enable control system and verify each input device's calibration. Calibrate each device according to manufacturer's recommendations.
 - 4. Verify that binary output devices such as relays, solenoid valves, two-position actuators, control valves, and magnetic starters operate properly and that normal positions are correct.
 - 5. Verify that analog output devices such as I/Ps and actuators are functional, that span and range are correct, and that direction and normal positions are correct. Check control valves and automatic dampers to ensure proper action and closure. Make necessary adjustments to valve stem and damper blade travel.
 - 6. Verify that system operates according to sequences of operation. Simulate and observe each operational mode by overriding and varying inputs and schedules. Tune PID loops and each control routine that requires tuning.
 - 7. Alarms and Interlocks:
 - a. Check each alarm with an appropriate signal at a value that will trip the alarm.
 - b. Trip interlocks using field contacts to check logic and to ensure that actuators fail in the proper direction.
 - c. Test interlock actions by simulating alarm conditions to check initiating value of variable and interlock action.
- D. Commissioning Requirements:
 - 1. Control system shall be set up and checked by factory trained competent technicians skilled in the setting up and adjustment of the BAS equipment used in this project. This technician is to be experienced in the type of HVAC system associated with this project.
 - 2. Commissioning process shall be coordinated with Owner provided commissioning authority. Commissioning authority shall approve commissioning plan prior to start of commissioning process.
 - 3. After completion of the commissioning, this contractor will demonstrate the sequence of operations for each system to the Mechanical Engineer or Owner as directed.
 - 4. Equipment checkout sheets are to be produced by this contractor showing checkboxes of complete and operations system. Sheets shall be edited for project and submitted to Engineer before start of commissioning work for approval.

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E. Control System Demonstration and Acceptance:

1. Demonstration: Prior to acceptance, perform the following performance tests to demonstrate system operation and compliance with specification after and in addition to system commissioning. Provide Engineer with log documenting completion of startup tests.
 - a. Engineer will be present to observe and review system demonstration. Notify engineer at least 10 days before system demonstration begins.
 - b. Demonstrate actual field operation of each sequence of operation as specified in sequence of operations. Provide at least two persons equipped with two-way communication. Provide laptop computer with wireless remote internet access for live interaction with Web Server during system commissioning and demonstrations. Demonstrate calibration and response of any input and output points requested by engineer. Provide and operate test equipment required to prove proper system operation.
 - c. Demonstrate System Performance:
 - 1) Demonstrate compliance with sequence of operation through each operational mode.
 - 2) Demonstrate complete operation of operator interface.
 - 3) Demonstrate each of the following:
 - a) DDC loop response. Supply graphical trend data output showing each DDC loop's response to a setpoint change representing an actuator position change of at least 25% of full range. Trend sampling rate shall be from 10 seconds to 3 minutes, depending on loop speed. Each sample's trend data shall show setpoint and actuator position. Engineer will require further tuning of each loop that displays unreasonably under- or over-damped control.
 - b) Trend logs for each system. Trend data shall indicate setpoints, operating points, and other data as specified. Each log shall cover three 48-hour periods and shall have a sample frequency not more than 2 minutes. Logs shall be accessible through system's operator interface and shall be retrievable for use in other software programs.
 - 4) Tests that fail to demonstrate proper system operation shall be repeated after contractor makes necessary repairs or revisions to hardware or software to successfully complete each test.
 - d. Acceptance:
 - 1) After tests described in this Specification are performed to the satisfaction of both Engineer and Owner, Engineer will accept control system as meeting completion requirements. Engineer may exempt tests from completion requirements that cannot be performed due to circumstances beyond contractor's control. Exempted tests shall be performed as part of warranty.
 - 2) System shall not be accepted until completed demonstration forms and checklists are submitted and approved.

PART 4 - EQUIPMENT SEQUENCE OF OPERATIONS:

4.1 Refer to Specification Section 23 09 93.

END OF SECTION 23 09 00

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SECTION 23 09 23 – BUILDING AUTOMATION SYSTEM COORDINATION

PART 1 - GENERAL

1.1 SUMMARY:

- A. BAS system shall be provided to control HVAC systems. The following specification shall assist in the coordination between trades.

1.2 SCOPE OF WORK:

- A. Control Sensors:
 - 1. AAON Units: Space Temperature/Humidity and duct mounted supply air temperature and CO2 and the like sensors shall be furnished by RTU manufacturer and installed (mounted and wired) by HVAC contractor back to each RTU controller.
 - 2. Lennox Unit: New JCI Space Temperature/Humidity sensor shall be provided and installed by the BAS contractor.
- B. Air Control Dampers: All dampers shall be integral to RTU fully wired to RTU controller.
- C. BAS AAON Integration:
 - 1. BAS Contractor shall demolish existing N2 communication wiring and install new wiring for BACnet-IP digital connection to each new RTU.
 - 2. BAS shall not directly control RTU's and shall integrate with RTU's for remote reset and overrides.
 - 3. BAS shall integrate control of RTU's back to existing JCI ADX front end server.
- D. BAS contractor shall provide all conduit and wiring as needed for a complete and functional BAS system.

END OF SECTION 23 09 23

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SECTION 23 09 93 – EQUIPMENT CONTROL SEQUENCE OF OPERATION

PART 1 - GENERAL

1.1 SECTION INCLUDES:

- A. HVAC equipment BAS sequence of operations for the FBISD ECC HVAC PACKAGED ROOFTOP UNIT REPLACEMENT - 2024, Flour Bluff Independent School District, Corpus Christi, Texas.

PART 2 - EQUIPMENT SEQUENCE OF OPERATIONS

2.1 BUILDING AUTOMATION SYSTEM (BAS):

- A. System shall energize and de-energize each component of HVAC system individually. Equipment shall operate on a predetermined schedule.
- B. Occupied Mode: The Occupied mode shall be on a totally programmable time schedule. HVAC system shall operate to maintain space thermal and moisture conditions and ventilation rates.
- C. Unoccupied Mode: The Unoccupied mode shall be on totally programmable time schedule. HVAC system shall operate to maintain space thermal and moisture conditions and ventilation rates for purposes of set-back environment.

2.2 TESTING AND CALIBRATION:

- A. After completion of installation, all controls shall be tested and calibrated to operate as required in this specification.
- B. Upon request by the Engineers' representative, demonstration of proper control system operation shall be provided prior to final job acceptance.
- C. BAS Contractor shall coordinate testing with project Commissioning Provider as needed.

2.3 GENERAL:

- A. Indoor Conditions:
 - 1. Occupied:
 - a. Cooling: 74 degrees F. (adj.)
 - b. Heating: 68 degrees F. (adj.)
 - c. Humidity: 58% RH maximum.
 - 2. After hours and Unoccupied Periods:
 - a. Cooling: 82 degrees F. (adj.); 5 degree dead band.
 - b. Heating: 55 degrees F. (adj.) 5 degree dead band.
 - c. Humidity: 65% RH maximum.
- B. All unit operations such as dead bands, offsets, and the like shall meet the minimum requirements of the 2015 International Energy Conservation Code.

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- C. Occupancy Schedules:
1. BAS Contractor shall group equipment and systems with custom scheduling for easy operation by Owner. BAS Contractor shall coordinate scheduling and grouping with Owner during construction.
 2. All spaces shall be provided with occupancy override button to override schedule with exception to corridors.
 3. Optimized starting shall be provided by varying the start time each morning to get building temperature to desired setpoint by occupancy time. BAS shall incorporate learning algorithms to control optimized starting. BAS shall allow operator to enable and disable this feature for each system individually.
- D. Space Temperature Sensors:
1. Provide wall mounted space temperature sensors with occupancy override capability, and temperature adjustment. Override buttons shall provide a maximum of 2 hours of operation for that zone, adjustable through software per zone. Operation of the override button shall enable the cooling, heating, dehumidification and ventilation systems for that zone. Space temperature sensors shall have a local temperature setpoint adjustment that can be limited in software to plus or minus 2 degrees F. adjustment range from setpoint.
 2. All sensors shall be provided by RTU manufacturer for AAON units and BAS provided sensor for Lennox unit.
- E. Duct Smoke Detectors: Existing Systems shall be reused
1. All fire alarm system components shall be provided by Fire Alarm Contractor and shall not be connected to BAS. BAS Contractor shall not interfere or modify fire alarm system connections to HVAC equipment.
 2. Coordinate with Fire Alarm Contractor and HVAC Contractor for fire alarm terminations at VFD's, motor starters, and EC motor controllers. Terminations shall be provided by Fire Alarm Contractor for immediate systems stop.
- F. Air and Water Balance:
1. Test, Adjust, and Balance services shall be provided by HVAC Contractor through sub-contract with licensed TAB firm. BAS Contractor shall not include the cost of TAB in bid proposal. BAS Contractor shall coordinate work with TAB Contractor as if they were their own direct sub-contractor.
 2. BAS Contractor shall obtain TAB reports for project and shall base BAS setpoints on TAB report requirements as starting project baseline.
 3. BAS Contractor shall update system setpoints as needed with TAB Contractor for system fine tuning.
 4. TAB Contractor shall include BAS coordination setpoints on final TAB reports.
- G. Outside and Return Air Damper Actuators: All dampers that have direct contact with the exterior environment shall be provided with spring return closed operation.

2.4 PACKAGED DX ROOFTOP UNITS (AAON):

- A. Each RTU shall consist of motor-operated modulating spring return outside air and return air dampers, filter section, direct expansion cooling coil, hot gas reheat coil and controls, modulating scroll compressor(s), multi-stage electric heating, variable speed supply fan, remote space mounted digital temperature and humidity sensors, unit mounted supply and return air temperature sensors, unit return duct mounted carbon dioxide sensor and safety controls.
- B. Each RTU shall be started and stopped under control of software.

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- C. All unit operations such as dead bands, offsets, and the like shall meet the minimum requirements of the 2015 International Energy Conservation Code.
- D. Control Intent:
 - 1. Digital integration with BAS. Refer to equipment specifications for specific equipment requirements.
 - 2. All sensors shall be directly connected to RTU controller within unit. RTU controller shall be programmed for full standalone operation. BAS contractor shall provide digital BACnet connection to unit controller and shall map all available BACnet points back to BAS for full unit control and monitoring, complete read and write capability.
- E. Optimized starting shall be provided by varying the start time each morning to get building temperature to desired set point by occupancy time. OA dampers shall remain closed until occupancy time.
- F. Occupied Mode:
 - 1. Supply Fan: Fan shall run continuously at various speeds between minimum and maximum depending on the mode of operation described below.
 - 2. Ventilation:
 - a. Minimum OA: RTU controller shall modulate return air and outside air dampers to Position-1 to provide minimum outside air of 30% of the maximum CFM (adj.) scheduled continuously during occupied times.
 - b. Maximum OA: CO2 sensor mounted in the RTU return air duct section shall, when sensing a higher value than 750 PPM (adj.), modulate the OA and return air dampers as required to maintain setpoint. BAS shall coordinate stop with TAB contractor to not allow OA to exceed maximum schedule OA volumes when the RTU is at the maximum supply air volume setpoint.
 - c. Minimum and maximum air flows shall be set into the RTU controller and shall be available via BACnet integration for adjustment.
 - 3. Cooling Mode:
 - a. Single Zone VAV: Upon sensing space temperature above setpoint, RTU shall be enabled in cooling mode of operation. RTU controller shall modulate compressor(s) as needed to maintain unit supply air temperature down stream of the cooling coil at 53-54° F. (adj.). RTU controller shall vary the fan speed between the minimum and maximum supply air volumes as scheduled as needed to maintain the space temperature cooling setpoint.
 - b. Low Load Control: If the RTU is operating at minimum fan speed and the space temperature drops below the setpoint, the RTU controller shall disable VAV operation and shall modulate the lead compressor as needed to maintain space temperature setpoint.
 - 4. Heating: Upon sensing space temperature below setpoint, RTU shall be enabled in heat mode of operation. RTU controller shall ramp the supply fan up to the scheduled heating air volume for constant air flow and shall stage electric heating ON/OFF as needed to maintain space temperature setpoint.
 - 5. Dehumidification:
 - a. Dehumidification shall start in response to space relative humidity. When space relative humidity rises above 58% RH (adj.), unit controller shall be enabled into dehumidification mode.

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- b. RTU controller shall ramp the supply fan up to 80% of the maximum cooling air volume for constant air volume and shall modulate compressors as required to maintain refrigerant suction pressure/saturated suction temperature between 38-40°F. (adj.) approximate 48-50°F evaporator LAT.
 - c. Hot gas reheat coil shall be enabled and modulate hot gas capacity as required to maintain space cooling temperature set point to prevent space overcooling.
 - d. Upon drop in space humidity below 55% RH (adj.), dehumidification mode shall be disabled and unit shall revert to normal Cooling or Heating modes of operation.
 - e. If unit is in dehumidification mode and space temperature setpoint is not maintained, RTU controller shall disable dehumidification and perform heating or cooling as needed.
- G. Unoccupied Mode: Supply fan shall stop, outside air damper shall close, return air damper shall open and unit shall not operate. Unit shall be enabled as needed same as occupied mode for heating, cooling and dehumidification modes but with after hours setback setpoints. System shall not operate as single zone VAV and shall cycle with load as needed.
- H. BAS shall provide graphics with the following minimum points with read/write capability:
 - 1. Unit Designation and Service Zone Area.
 - 2. Unit State of Operation: Occupied/Unoccupied.
 - 3. Unit Configuration that Matches the Installed Conditions.
 - 4. Unit Mode of Operation: Cooling, Heating, or Dehumidification
 - 5. Supply and Return Air Temperatures
 - 6. Cooling:
 - a. Compressor Staging and Capacity %
 - b. Cooling Coil Temperature/LAT
 - 7. Heating Staging and Capacity
 - 8. Hot Gas Reheat Coil: Capacity % and unit LAT
 - 9. Supply Fan:
 - a. Fans Status.
 - b. VFD Status, Frequency and % Operation.
 - c. Air Flow Setpoints:
 - 1) Cooling: Min/Max
 - 2) Heating: Max
 - 3) Dehumidification: 80% of Cooling Max
 - 10. OA and RA Damper Positions
 - 11. CO2 Reading and Setpoint
 - 12. Space Conditions:
 - a. Humidity Reading, Setpoint and Dehumidification Operation
 - b. Temperature Reading, Cooling/Heating Setpoints
 - 13. Alarm Notifications
- I. Alarms and Safeties: BAS shall report all alarms from RTU via BACnet integration. Provide alarm in plain text format with alarm description type.

2.5 TWO STAGE PACKAGED ROOFTOP UNIT WITH HOT GAS REHEAT (LENNOX):

- A. The unit shall consist of a packaged unit with filter section, direct expansion cooling coil, hot gas reheat coil, two stage cooling only scroll compressor, electric heating coil, two speed

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automatic operating supply fan, remote BAS sensors (space sensor(s), return air duct temperature sensor at unit inlet, supply air duct temperature sensor at unit outlet, and fan status "CT") and internal safety controls.

- B. Control Intent:
1. Unit shall be directly controlled by BAS through unitary controllers provided by BAS with all associate control devices as needed to accomplish sequence of operations.
 2. New space and duct mounted sensors shall be directly connected to BAS controllers.
 3. Primary Control: BAS shall control unit heating, cooling and dehumidification through standard thermostat control connections. Installer shall set up RTU controller for "Tstat Control" mode.
- C. Occupied Mode:
1. Supply Fan: Fan shall start and cycle with load based upon cooling or heating demand.
 2. Cooling:
 - a. Stage 1-Low Cool: Upon a call for cooling "Y1" the supply fan shall ramp up to Stage 1 cooling air volume and the compressor shall start unloaded.
 - b. Stage 2-High Cool: Upon a continued call for cooling "Y2" the supply fan shall ramp up to Stage 2 cooling air volume and the compressor shall operate at 100% of cooling capacity.
 - c. System shall stage down in reverse order.
 3. Heating: Upon a call for heating "W1 or W2" the supply fan shall ramp up to Heating supply air volume (100% scheduled air flow) and the BAS shall enable electric heating stages as needed to maintain space heating temperature setpoint.
 4. Dehumidification:
 - a. Dehumidification shall start in response to space relative humidity. When space relative humidity rises above 60% RH (adj.), BAS shall close relay contact at RTU.
 - b. RTU internal control shall operate as follows:
 - 1) No demand for Y1 or Y2: Supply fan shall start at low speed, compressor shall start and operate at 2nd stage, and hot gas reheat valve shall energize.
 - 2) Y1 Demand: Supply fan shall start at low speed, compressor shall start and operate at 2nd stage, and hot gas reheat valve shall de-energize.
 - 3) Y1 and Y2 Demand: Supply fan shall start at high speed, compressor shall start and operate at 2nd stage, and hot gas reheat valve shall de-energize.
- D. Unoccupied Mode: The system shall be enabled same as the Occupied mode but the supply fan shall cycle with load and the cooling, heating and dehumidification shall be enabled with afterhours setback setpoints.
- E. BAS shall provide graphics with the following minimum information:
1. Unit Designation and Service Zone Area
 2. Unit State of Operation: Occupied/Unoccupied
 3. Unit Configuration that Matches the Installed Conditions
 4. Unit Mode of Operation: Cooling, Heating, or Dehumidification
 5. Space Conditions: Temperature and Humidity and Setpoints
 6. Duct Mounted Sensors:
 - a. Supply Air Temperature after Reheating
 - b. Return Air Temperature
 7. Cooling Compressor:

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- a. Status: On/Off
 - b. Capacity: Stage 1 or 2
 - 8. Fan:
 - a. Command On/Off
 - b. Proof of Status through CT
 - c. Stage or % of operation
 - 9. Heating:
 - a. Status: On/Off
 - b. Capacity: Stage 1 or 2
 - 10. Dehumidification: Enabled/Disabled
 - 11. Alarm Status.
- F. Alarms and Safeties:
- 1. Fan Alarm: A current sensing relay shall prove supply fan status. If the sensor fails to prove status, the BAS shall identify the unit and report an alarm and disable unit operation.
 - 2. Cooling Alarm: BAS shall monitor the supply air temperature. If the supply air temperature is not less than the return air temperature after a minimum 10-minutes (adj) from start time, the BAS shall identify the unit and report an alarm.
 - 3. Heating Alarm: BAS shall monitor the supply air temperature. If the supply air temperature is not greater than the return air temperature after a minimum 10-minutes (adj) from start time, the BAS shall identify the unit and report an alarm.

2.6 TRENDING:

- A. Provide the following minimum system trending. BAS Contractor shall coordinate additional trending with Owner upon system startup and Owner training.
- B. Space temperature and humidity, 5-minute sample rate for each space sensor location.
- C. RTU supply and return air temperatures, 1-minute sample rate.

END OF SECTION 23 09 93

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SECTION 23 21 13 - DRAIN PIPING

PART 1 - GENERAL

1.1 SUMMARY:

- A. Section includes systems pipe, and pipe-fittings for: drains and overflows.

1.2 SYSTEM DESCRIPTION:

- A. Where more than one piping system material is specified, provide compatible system components and joints. Provide flanges, union, and couplings at locations requiring servicing.
- B. Use unions, flanges, and couplings downstream of valves and at equipment or apparatus connections. Use non-conducting dielectric connections whenever jointing dissimilar metals. Do not use direct welded or threaded connections to valves, equipment, or other apparatus.
- C. Provide pipe hangers and supports in accordance with ASME B31.1 ASME B31.9.
- D. All underground piping shall be laid with metal impregnated locator tape or a #2 copper trace wire.
- E. All fittings shall have long radius construction.

1.3 SUBMITTALS:

- A. Section 01 33 00 – Submittal Procedures.
- B. Shop Drawings: Submit schematic layout of refrigeration system, including equipment, critical dimensions, and sizes.
- C. Coordination Drawings: Provide piping coordination drawings for hot, chilled and condenser water systems. Drawings shall indicate installation details, pipe routing, elevations, etc. Drawings shall take into consideration existing below grade utilities, structural members, etc., so that drawings may be used for fabrication and erection. The drawings shall be carefully coordinated with and indicate points of existing utility crossings.
- D. Product Data: Submit data on pipe materials, pipefittings, valves, and accessories. Submit manufacturers catalog information. Indicate valve data and ratings.
- E. Design Data: Indicate pipe size. Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers.
- F. Installation and sizing of thrust and anchor blocks at pipe elbows, tees, ends of pipe, and valves: Thrust and anchor blocks must comply with the Drawings and with the requirements of the manufacturer of the piping furnished for the project. Submit calculations of trust block sizing for review by engineer prior to installation.

1.4 DELIVERY, STORAGE, AND HANDLING:

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

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- C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.5 FIELD MEASUREMENTS:

- A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 EQUIPMENT DRAINS AND OVERFLOWS:

- A. Copper Tubing: ASTM B88, Type L, hard drawn.
 - 1. Fittings: ASME B16.18, cast brass, or ASME B16.22 solder wrought copper, long radius.
 - 2. Joints: Solder, lead free, ASTM B32, 95-5 tin-antimony, or tin and silver, with melting range 430 to 535 degrees F (220 to 280 degrees C).

2.2 UNIONS, FLANGES, COUPLINGS, NIPPLES, FITTINGS:

- A. Unions for Pipe 2 inches (50 mm) and Under:
 - 1. Copper Pipe: Bronze, soldered joints.
- B. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, and water impervious isolation barrier.
- C. Pipe Nipples, Class 150, Schedule 40: 1-1/2 inches and under: Minimum 200 psig solid yellow brass, threaded; ASTM B-687.
- D. Fittings:
 - 1. All fittings shall be factory fabricated of same material as carrier pipe and shall have same pressure rating or shall exceed pressure rating of carrier pipe.
 - 2. 45 degree and 90 degree: All fittings shall be long radius type. Short radius fittings may only be allowed if approved by Engineer for instances where long radius fittings will not fit within the allowable space.

2.3 PIPE HANGERS AND SUPPORTS:

- A. Refer to Section 23 05 29 – Hangers, Supports, and Foundations.

PART 3 - EXECUTION

3.1 PREPARATION:

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.
- E. After completion, fill, clean, and treat systems. Refer to Section 23 25 00

3.2 INSTALLATION:

- A. Route piping parallel to building structure and maintain gradient.

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- B. Install piping to conserve building space, and not interfere with use of space.
- C. Condensate drain piping shall be sloped from equipment to drain termination location with minimum 1/8"/foot continuous downward slope. Provide minimum 1" air gap above termination a plumbing receptor.
- D. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 23 05 29 – Hangers and Supports.

END OF SECTION 23 21 13

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FLOUR BLUFF INDEPENDENT SCHOOL DISTRICT**

SECTION 23 74 10 - PACKAGED ROOFTOP AIR CONDITIONING UNITS

PART 1 - GENERAL

(AAON AND LENNOX PACKAGED HVAC RTU EQUIPMENT HAVE BEEN PRE-PURCHASED BY OWNER AND FURNISHED TO THE CONTRACTOR FOR INSTALLATION. CONTRACTOR SHALL NOT INCLUDE THE COST OF EQUIPMENT OR EQUIPMENT WARRANTIES IN THEIR PROPOSAL. CONTRACTOR SHALL INCLUDE THE COST OF RECEIVING EQUIPMENT AND INSTALLATION WITH THEIR PROPOSAL. REFER TO THE ATTACHED EQUIPMENT SUBMITTALS. EQUIPMENT HAS BEEN PURCHASED WITH FACTORY STARTUP SERVICES AS NOTED ON MANUFACTURER'S PROPOSAL)

1.1 SUMMARY:

- A. Section includes packaged rooftop air conditioning units for heating and cooling.

1.2 RELATED SECTIONS:

- A. Comply with Division 1 - General Requirements and referenced documents.
- B. Comply with all other Division 15 Sections as applicable. Refer to other Divisions for coordination of work with other trades as required.

1.3 SYSTEM DESCRIPTION:

- A. The scope shall include all packaged roof top air conditioning units, supports, and all appurtenances.

1.4 PRODUCT HANDLING:

- A. Cover and protect material in transit and at site. Material not properly protected and stored and which is damaged or defaced during construction shall and will be rejected.
- B. Storage and protection of materials shall be in accordance with Section 23 05 00 – Mechanical General Conditions.

PART 2 - PRODUCTS

2.1 EQUIPMENT –COMMERCIAL GRADE:

- A. New Roof Curb Adapter; RTU-18:
 - 1. Unit shall be furnished with custom built curb adapter to connect new rooftop unit to existing roof curb. Curb adapter shall be constructed of minimum 16-gage fully welded galvanized steel. Adapter shall be fully insulated with R-8 long fiber glass type insulation liner secured with both adhesive and weldpins. Seal all insulation seams with brush on type duct sealant. Base of adapter shall have perimeter flange turn down to fit over existing base curb top. Curb adapters shall have integral utility chase for through bottom control connections.
 - 2. Submit proposed curb adapter shop drawings with all dimensional and construction details identified prior to fabrication based on actual field measurements to Engineer during submittal review phase.
 - 3. Contractor shall clean curb adapter after project completion with soap and water and paint curb as follows:
 - a. Provide heavy primer coat of Uniflex 36-520 or equal.
 - b. Provide two finish coats of Uniflex 44-300 or equal; Two (2) 35-mill wet applications.

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- B. Alternate No. 2, Existing AAON Curb Adapters Painting:
 - 1. Mechanically remove all loose rust from curb adapters.
 - 2. Clean all surfaces with degreaser, brush and wash clean.
 - 3. Treat all rusted areas with Ospho.
 - 4. Provide heavy primer coat of Uniflex 36-520 or equal.
 - 5. Provide two finish coats of Uniflex 44-300 or equal; Two (2) 35-mill wet applications.

2.2 INSTALLATION:

- A. Install units in strict accordance with Manufacturer's instructions.
- B. Provide condensate drain line with trap in accordance with Manufacturer's instructions and route to nearest plumbing drain or as shown on plans.
- C. Secure unit and curb to roof structure in compliance with windstorm code requirements.
- D. Provide factory authorized technician for systems start up and commissioning including digital control coordination with BAS Contractor.
- E. Complete manufacturer's startup forms and provide to Engineer as the Pre-Functional Test Reports.

END OF SECTION 23 74 10



SUBMITTAL
FOR RECORD

AAON PACKAGED ROOFTOP SUBMITTAL DATA

FOR

FLOUR BLUFF ISD EARLY CHILDHOOD CENTER

Flour Bluff, TX

Owner: Flour Bluff ISD
Mechanical Engineer: Stridde, Callins, and Associates, Inc.

Date: 2/5/2024
Revision: Original
Submitted By: Ken Wertz, Texas AirSystems, Inc.
Equipment Manufacturer: AAON
Equipment Type: Packaged Rooftops
Unit Tags: RTU-3, 14, 15, 16, 17, 19, 20, 21, 22

(9) AAON Packaged rooftop air units complete as follows:

- Double wall construction with injected foam insulation
- Exterior paint capable of withstanding 2,500 hours ASTM B 117-95 salt spray test
- Interior corrosion protection option
- Certified and rated in accordance with AHRI 340/360
- Digital scroll compressor on the lead circuit – fixed or two step compressor on the lag circuit
- Hot gas reheat coil for dehumidification
- Polymer E-coated condenser coils
- 0-100% Economizer with outdoor and return air dampers with actuator and barometric relief
 - FDD Modulating economizer
- Stainless steel drain pan
- Staged electric heat
- Direct drive supply fans with factory mounted supply fan VFD or ECM motor
- Variable speed condenser fans
- Condenser coil hail guards
- One set of 2" thick MERV 8 filters provided with each unit
- Circuit breaker / disconnect
- Factory mounted AAON Wattmaster VCCX-IP controller with BACNET MSTP
 - Combination zone temperature / humidity sensor (Field installed and wired)
 - 75' Ebus cable with molex plugs (Field installed between zone sensor and unit-mounted VCCX2 controller)
 - CO2 sensor (Factory mounted in the unit return air section)
- Remote safety shutdown terminals
- Phase & brown out protection
- First year replacement parts warranty – labor and refrigerant excluded
- 2nd thru 5th Year replacement compressor parts warranty – labor and refrigerant excluded
- Factory Certified Startup and Controls Coordination
 - **Monday thru Friday, 8-5. One day per unit is included**

Notes: Installation/rigging, wiring, smoke detectors, other controls, windstorm provisions, additional coil coatings, and other products, options, services, and warranties are excluded. Factory pre-start checklist must be completed and turned in to Texas AirSystems by the Mechanical Contractor prior to startup. Factory Authorized Startup is provided by Texas AirSystems' technicians. To schedule, please give two weeks advanced notice to Joe Garza, 210-598-7822.

Customer agrees to inspect the units upon receipt for freight damage before signing the Bill of Lading

- For damage that is repairable on site, sign the Bill of Lading with "noted with the following damage." Have the driver co-sign the Bill of Lading and send a copy to Texas AirSystems
- For damages to extensive to repair, contact Joe Garza at Texas AirSystems 210-598-7822 to advise on whether to accept the shipment or not.



SUBMITTAL *FOR RECORD*

Texas AirSystems maintains extensive AAON parts, service, and warranty support throughout the state. San Antonio, Corpus Christi, and the Rio Grande Valley has 6 parts specialists and 11 AAON-Certified Service Technicians in the local area. Contacts are as follows:

Parts:

Email: sanparts@texasairsystems.com and copy kenw@texasairsystems.com
Phone: 210-499-0004 and ask for Parts

Service:

Email: sandispatch@texasairsystems.com and copy kenw@texasairsystems.com
Phone: 210-499-0004 and ask for Service Dispatch

Warranty:

Email: warranty@texasairsystems.com and copy kenw@texasairsystems.com
Phone: 210-499-0004 and ask for Warranty Parts



Unit Rating

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918) 583-2266
Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-011-3-A-HB89-142:A000-200-DHE-00A-0TMRHB2-00-00E0000VB

Tag: RTU-3 Design Day

Job Information

Job Name: *Flour Bluff ISD ECD*
Job Number: *Job #18*
Site Altitude: *0 ft*
Refrigerant: *R-410A*

Static Pressure

External: *0.65 in. w.g.*
Evaporator: *0.18 in. w.g.*
Filters Clean: *0.08 in. w.g.*
Dirt Allowance: *0.35 in. w.g.*
Reheat Coil: *0.03 in. w.g.*

Cooling Section

	Gross	Net
Total Capacity:	<i>128.9 MBH</i>	<i>124.0 MBH</i>
Sensible Capacity:	<i>84.2 MBH</i>	<i>79.3 MBH</i>
Latent Capacity:	<i>44.7 MBH</i>	
Mixed Air Temp (DB/WB):	<i>79.2 °F</i>	<i>67.7 °F</i>
Entering Air Temp (DB/WB):	<i>79.2 °F</i>	<i>67.7 °F</i>
Lv Air Temp (Coil) (DB/WB):	<i>53.9 °F</i>	<i>53.8 °F</i>
Lv Air Temp (Unit) (DB/WB):	<i>55.3 °F</i>	<i>54.4 °F</i>

Supply Air Fan: *1 x RN185D70 @ 1.73 BHP Ea.*
SA Fan RPM / Width: *1978 RPM / 2.898 in*
SA Fan FEI: *1.08*

Evaporator Coil: *14.6 ft² / 6 Rows / 12 FPI*
Evaporator Face Velocity: *212.6 fpm*

Unit Information

Approx. Op./Ship Weights: *1747 lbs / 1747 lbs (±5%)*
Ambient Temperature (DB/WB): *100.0 °F / 80.0 °F*
Coil Filter FV / Qty: *223.2 fpm / 4*
Supply Airflow/ESP: *3100 SCFM / 0.65 in. w.g.*
Outside Airflow: *625 SCFM*
Return Temperature (DB/WB): *74.0 °F / 64.0 °F*

Economizer: *0.23 in. w.g.*
Heating: *0.02 in. w.g.*
Cabinet: *0.13 in. w.g.*
Total: *1.66 in. w.g.*

Heating Section

Preheat Type: *Std (No Preheat)*

Auxiliary Heating Type: *Electric Heat*
Heating Airflow: *3100 SCFM*
Total Capacity: *136.5 MBH*
Entering Air Temp (DB/WB): *60.3 °F / 56.8 °F*
Leaving Air Temp (DB/WB): *100.4 °F / 70.3 °F*
Electric Heat FLA: *48*

Re-heat Coil:

Capacity: *69.9 MBH*
LA (DB/WB): *75.0 °F / 61.9 °F*
RH: *47.6%*

Rating Information

Listing Model *RN-011-2,3,4,8-*-HB**-***:*

Cooling Capacity: *126.0 MBH*
Cooling EER: *14.3 BTU/h-W*
Cooling IEER: *19.1 BTU/h-W*

**Rated in accordance with AHRI Standard 340/360 (I-P)*

Application EER @ Op. Conditions: *11.9 BTU/h-W*

Electrical Data

Circuit 1

Rating: *460V/3Ø/60Hz*
Unit FLA: *53*
SCCR: *5 KAIC*

Minimum Circuit Amp: *66*
Maximum Overcurrent: *70*

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	<i>1</i>		<i>460</i>	<i>3</i>			<i>8.1</i>
Compressor 2:	<i>1</i>		<i>460</i>	<i>3</i>			<i>7.2</i>
Condenser Fan:	<i>2</i>	<i>0.33</i>	<i>460</i>	<i>1</i>	<i>1100</i>	<i>1.6</i>	
Supply Fan:	<i>1</i>	<i>3.00</i>	<i>460</i>	<i>3</i>	<i>1760</i>	<i>4.8</i>	

Cabinet Sound Power Levels*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW (dB):	<i>86</i>	<i>85</i>	<i>88</i>	<i>85</i>	<i>78</i>	<i>75</i>	<i>72</i>	<i>66</i>
Return LW (dB):	<i>77</i>	<i>74</i>	<i>75</i>	<i>70</i>	<i>66</i>	<i>61</i>	<i>57</i>	<i>45</i>

**Sound power levels are given for informational purposes only. The sound levels are not guaranteed.*



18.5" STAR Plenum

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918) 583-2266
Ecat Version: 345.0

JOB INFORMATION:

Job Name: *Flour Bluff ISD ECD*
Job Tag: *RTU-3 Design Day*
Date: *2/5/2024 12:00:00 AM*

WHEEL SPECIFICATION:

Max RPM: 2200
Diameter x Qty: 18.5 in. x 1
CFM: 3100
Inertia: 3WR²

OPERATING CONDITIONS

Air Flow: 3100
Fan Energy Index (FEI): 1.08
Static Pressure: 1.66 in. Wg
Relief Dampers DP: 0 in. Wg
TSP: 1.66 in. Wg
Site Altitude: 0 ft
TSP @ Sea Level: 1.66 in. Wg

MOTOR SELECTION

Rated HP / Bypass: 3 x 1 / No
Frame Size: 182T
Nominal RPM: 1760
VAC/PH/HZ: 460V/3Ø/60Hz
Enclosure Type: ODP
Max Inertial Load: 0 WR²

FAN PERFORMANCE:

RPM: 1978
BHP: 1.73
Efficiency: 46.89%
Max Duct SP with Blocked Airway: 0 in. Wg @ 1978 RPM

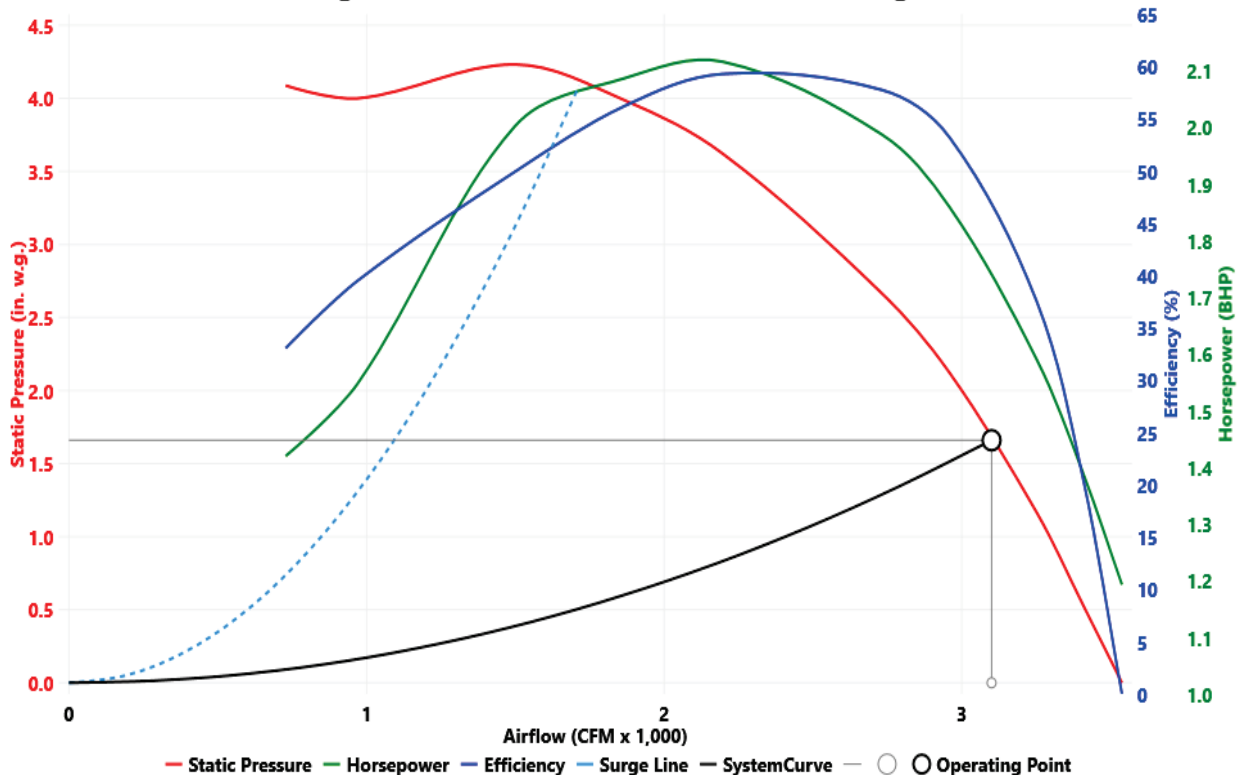
FAN SOUND POWER (Inlet/Outlet)

Octave Band:		(Re 10 ⁻¹² watts)						
1	2	3	4	5	6	7	8	
86	85	88	87	81	78	76	70	
86	85	88	87	81	78	76	70	

SOUND POWER A-Weighted: 70 dB

Max Duct SP with Blocked Airway:

Supply Fan Model: RN185D70 @ 1978 RPM and 100% Width Design Conditions: 3100 CFM @ 1.66 in. w.g. SP





Unit Submittal

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Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-011-3-A-HB89-142:A000-200-DHE-00A-0TMRHB2-00-00E0000VB

Tag: RTU-3 Design Day

Job Name: Flour Bluff ISD ECD

Unit Worksheet For:

Job Number: Job #18

Unit Worksheet Date: 2/5/2024

	Base Option	Description
RN	Generation	Rooftop - Ninth Generation
011	Unit Size	Eleven
3	Voltage	460V/3φ/60Hz
A	Interior Protection	Interior Corrosion Protection
H	Refrigerant Style	R-410A Variable Capacity Scroll Compressor + Two-Step Compressor - High Efficiency
B	Unit Configuration	Air-Cooled Cond. + 6 Row Evap. Coil
8	Coil Coating	Polymer E-Coated Condenser Coil
9	Cooling/Heat Pump Staging	Modulating - 1 VCC + 1 Staged Comp.
1	Heating Type	Electric Heat
4	Heating Designation	Heat 4 - 40 kW
2	Heating Staging	2 Stage

	Feature Option	Description
A	F1A.	RA/OA Section Economizer
0	F1B.	RA/EA Blower Configuration Standard - None
0	F1C.	RA/EA Blower Standard - None
0	F1D.	RA/EA Blower Motor Standard - None
2	F2.	OA Control FDD Fully Modulating Actuator - Enthalpy Limit + CO2 Override
0	F3.	Heat Options Standard
0	F4.	Maintenance Options Standard
D	F5A.	SA Blower Configuration 1 Blower + Premium Efficiency Motor + 1 VFD
H	F5B.	SA Blower 18.5" Direct Drive Backward Curved Plenum - 70% Width
E	F5C.	SA Motor 3.0 hp - 1760 rpm
0	F6A.	Pre Filter Type Standard - None
0	F6B.	Unit Filter Type 2" Pleated - 30% Eff
A	F6C.	Filter Options Clogged Filter Switch
0	F7.	Refrigeration Control Standard - Adj Comp. Cooling Lock Out Through Unit Controls
T	F8.	Refrigeration Options Parallel Modulating Hot Gas Reheat Microchannel Coil [MHGR-MC] - Lag Circuit
M	F9.	Refrigeration Accessories ECM Condenser Fan - Head Pressure Control + Sight Glass + Compressor Isolation Valves
R	F10.	Power Options Circuit Breaker - 70 Amps
H	F11.	Safety Options Remote Safety Shutdown Terminals
B	F12.	Controls Phase & Brownout Protection
2	F13.	Special Controls VAV Single Zone Unit Controller - VAV Cool + CAV Heat
0	F14A.	Outside Air Configuration Standard - None
0	F14B.	Preheat Sizing Standard - None
0	F15.	Glycol Percent Water or No WSHP
0	F16.	Interior Cabinet Options Standard - Double Wall + R-13 Foam Insulation + Stainless Steel Drain Pan
E	F17.	Exterior Cabinet Options Base Insulation + Cond. Coil Guards
0	F18.	Electrical Rating Standard - 5 KAIC
0	F19.	Code Options Standard - ETL U.S.A. Listing
0	F20.	Crating Standard
0	F21.	Water-Cooled Cond. Standard - None
V	F22.	Control Vendors VCC-X Controls + Integrated BACnet IP
B	F23.	Type Standard - Includes AAON Gray Paint



Controller Components

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Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-011-3-A-HB89-142:A000-200-DHE-00A-0TMRHB2-00-00E0000VB

Tag: RTU-3 Design Day

Job Name: Flour Bluff ISD ECD
Job Number: Job #18

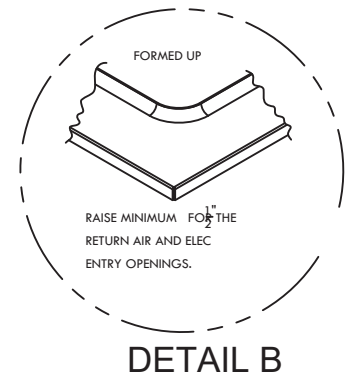
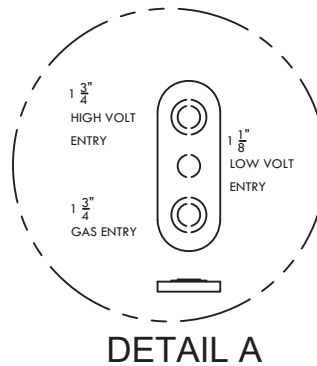
VCCX For:
VCCX Date: February 5, 2024

Part#	Included Parts	Assigned Channel	BACnet Point
ASM07424	VCCX-IP CONTROLLER		
ASM01692	OSA Temp/Hum Sensor	EBUS2 communicating sensor	AI:16,AI:17,AI:18,AI:19
ASM01820	Space Digital Temp/Hum Sensor	EBUS3 communicating sensor	AI:12,AI:13
R82890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI:9
ASM01831	Duct Mount C02	EBUS4 communicating sensor	AI:29
ASM01840	Return Air Temp/Hum	EBUS6 communicating sensor	AI:14,AI:15
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AI:22
	Economizer	VCCX control point AO 2	AI:30
R62330	Proof of Air Flow	VCCX control point BI 1	BI:6, BI:24
R64580	Dirty Filter Sensor	VCCX control point BI 2	BI:25
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay Point	BI:47
	Heat 1	Configured Relay Point	BI:48
	Heat 2	Configured Relay Point	BI:49
ASM01691	EM1 EXPANSION MODULE		
	Economizer Position Feedback (title 24)	EM1 expansion point AI4	AI:31
ASM02869	DIGITAL REFRIGERATION MODULE		
V38391	Suction Pressure Sensor A	RSMD2R SP-1	AI:48
V38410	Discharge Pressure Sensor A	RSMD2R HP-1	AI:50
V38391	Suction Pressure Sensor B	RSMD2R SP-2	AI:73
V38410	Discharge Pressure Sensor B	RSMD2R HP-2	AI:75
	Comp Discharge Temp A	RSMD2R TEMP1	AI:66
	Modulated Condenser Signal A	RSMD2R AOUT1	AI:46
	Modulated Condenser Signal B	RSMD2R AOUT2	AI:47
	Comp Status Input A	RSMD2R BIN1	BI:77
	Comp Status Input B	RSMD2R BIN2	BI:78
	Emergency Shutdown	RSMD2R BIN4	BI:83
	Comp Unload Signal A	RSMD2R COMP1	AI:44
	Comp Load Signal B2	RSMD2R COMP2	AI:45
	Comp Enable A	RSMD2R RLY1	BI:84
	Comp Enable B	RSMD2R RLY2	BI:85
ASM01670	MODULATING HOT GAS REHEAT MODULE		
	Reheat HGR Valve	MHGRV-X	AI:42

RN SERIES

B - CABINET WITH ECONOMIZER ~ 9-15 TON

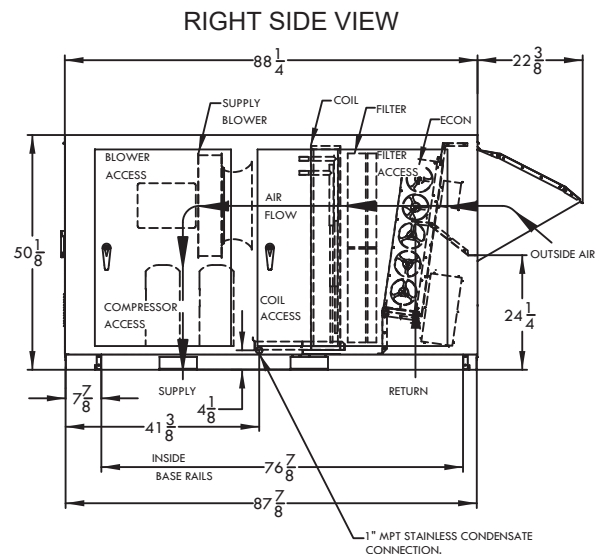
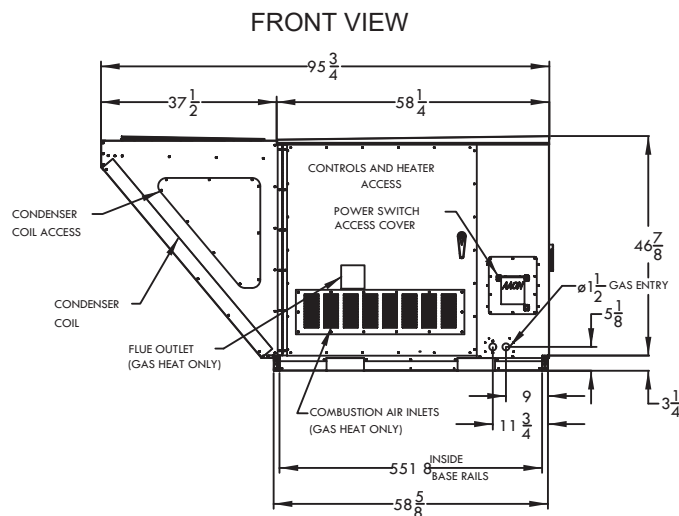
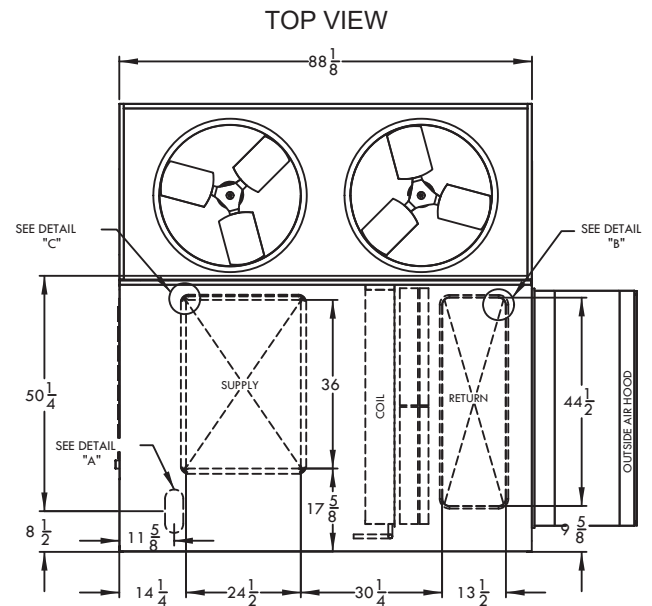
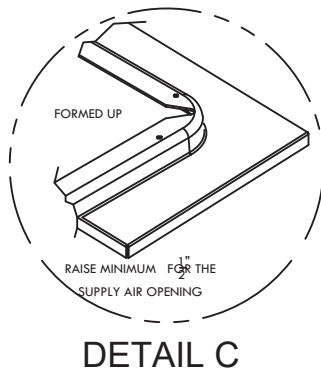
CLEARANCES	
LOCATION	• UNIT SIZE • 9 - 15 TON
OUTSIDE AIR (BACK)	48
CONTROLS SIDE (FRONT)	48
LEFT SIDE	6
RIGHT SIDE	48
TOP	UNOBSTRUCTED



NUMBER OF CONDENSER FANS

9 & 11 TON - 1 FAN

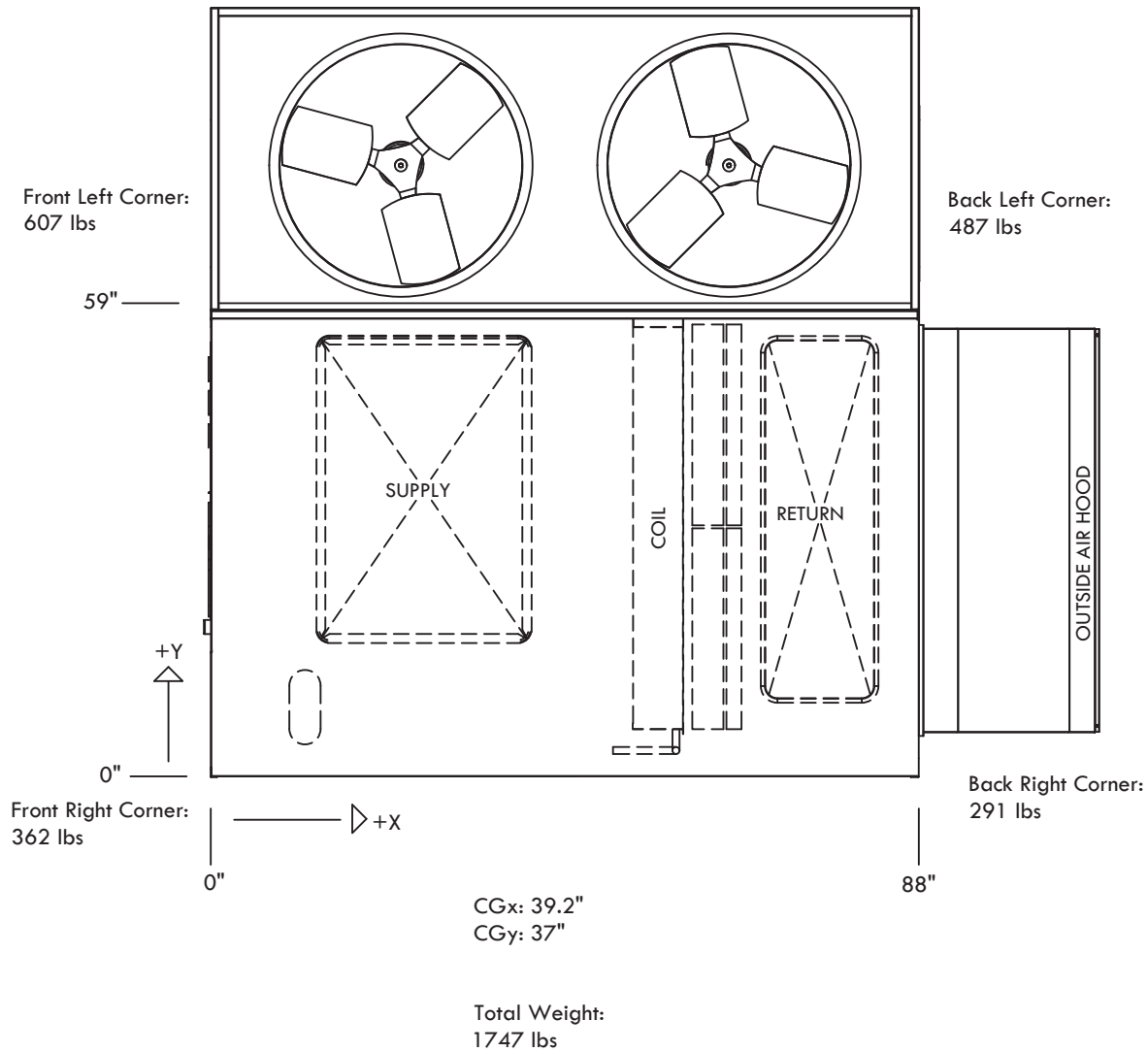
13 & 15 TON - 2 FANS



RNB CABINET AIR COOLED CONDENSING UNIT



RN-011-3-A-HB89-142:A000-200-DHE-00A-0TMRHB2-00-00E0000VB



Disclaimer:
This weight estimate does not account for any SPAs.



Unit Rating

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918) 583-2266
Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-011-3-A-HB89-142:A000-200-DHE-00A-0TMRHB2-00-00E0000VB

Tag: RTU-3
Dehumidification

Job Information

Job Name: *Flour Bluff ISD ECD*
Job Number: *Job #18*
Site Altitude: *0 ft*
Refrigerant: *R-410A*

Static Pressure

External: *0.65 in. w.g.*
Evaporator: *0.19 in. w.g.*
Filters Clean: *0.08 in. w.g.*
Dirt Allowance: *0.35 in. w.g.*
Reheat Coil: *0.03 in. w.g.*

Cooling Section

	Gross	Net
Total Capacity:	<i>139.3 MBH</i>	<i>134.3 MBH</i>
Sensible Capacity:	<i>76.9 MBH</i>	<i>72.0 MBH</i>
Latent Capacity:	<i>62.4 MBH</i>	
Mixed Air Temp (DB/WB):	<i>76.2 °F</i>	<i>68.1 °F</i>
Entering Air Temp (DB/WB):	<i>76.2 °F</i>	<i>68.1 °F</i>
Lv Air Temp (Coil) (DB/WB):	<i>53.2 °F</i>	<i>53.2 °F</i>
Lv Air Temp (Unit) (DB/WB):	<i>54.6 °F</i>	<i>53.8 °F</i>

Supply Air Fan: *1 x RN185D70 @ 1.74 BHP Ea.*
SA Fan RPM / Width: *1980 RPM / 2.898 in*
SA Fan FEI: *1.08*

Evaporator Coil: *14.6 ft² / 6 Rows / 12 FPI*
Evaporator Face Velocity: *212.6 fpm*

Rating Information

Listing Model *RN-011-2,3,4,8-HB**-***:*

Cooling Capacity: *126.0 MBH*
Cooling EER: *14.3 BTU/h-W*
Cooling IEER: *19.1 BTU/h-W*

**Rated in accordance with AHRI Standard 340/360 (I-P)*

Application EER @ Op. Conditions: *14.9 BTU/h-W*

Electrical Data

Circuit 1

Rating: *460V/3Ø/60Hz*
Unit FLA: *53*
SCCR: *5 KAIC*

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	<i>1</i>		<i>460</i>	<i>3</i>			<i>8.1</i>
Compressor 2:	<i>1</i>		<i>460</i>	<i>3</i>			<i>7.2</i>
Condenser Fan:	<i>2</i>	<i>0.33</i>	<i>460</i>	<i>1</i>	<i>1100</i>	<i>1.6</i>	
Supply Fan:	<i>1</i>	<i>3.00</i>	<i>460</i>	<i>3</i>	<i>1760</i>	<i>4.8</i>	

Unit Information

Approx. Op./Ship Weights: *1747 lbs / 1747 lbs (±5%)*
Ambient Temperature (DB/WB): *85.0 °F / 80.0 °F*
Coil Filter FV / Qty: *223.2 fpm / 4*
Supply Airflow/ESP: *3100 SCFM / 0.65 in. w.g.*
Outside Airflow: *625 SCFM*
Return Temperature (DB/WB): *74.0 °F / 64.5 °F*

Economizer: *0.23 in. w.g.*
Heating: *0.02 in. w.g.*
Cabinet: *0.12 in. w.g.*
Total: *1.67 in. w.g.*

Heating Section

Preheat Type: *Std (No Preheat)*

Auxiliary Heating Type: *Electric Heat*
Heating Airflow: *3100 SCFM*
Total Capacity: *136.5 MBH*
Entering Air Temp (DB/WB): *60.3 °F / 56.8 °F*
Leaving Air Temp (DB/WB): *100.4 °F / 70.3 °F*
Electric Heat FLA: *48*

Re-heat Coil:

Capacity: *72.6 MBH*
LA (DB/WB): *75.0 °F / 61.5 °F*
RH: *46.5%*



Cabinet Sound Power Levels*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW (dB):	86	85	88	85	78	75	72	66
Return LW (dB):	77	74	75	70	66	61	57	45

*Sound power levels are given for informational purposes only. The sound levels are not guaranteed.



18.5" STAR Plenum

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918)
583-2266
Ecat Version: 345.0

JOB INFORMATION:

Job Name: *Flour Bluff ISD ECD*
Job Tag: *RTU-3 Dehumidification*
Date: *2/5/2024 12:00:00 AM*

WHEEL SPECIFICATION:

Max RPM: *2200*
Diameter x Qty: *18.5 in. x 1*
CFM: *3100*
Inertia: *3WR²*

OPERATING CONDITIONS

Air Flow: *3100*
Fan Energy Index (FEI): *1.08*
Static Pressure: *1.67 in. Wg*
Relief Dampers DP: *0 in. Wg*
TSP: *1.67 in. Wg*
Site Altitude: *0 ft*
TSP @ Sea Level: *1.67 in. Wg*

MOTOR SELECTION

Rated HP / Bypass: *3 x 1 / No*
Frame Size: *182T*
Nominal RPM: *1760*
VAC/PH/Hz: *460V/3Ø/60Hz*
Enclosure Type: *ODP*
Max Inertial Load: *0 WR²*

FAN PERFORMANCE:

RPM: *1980*
BHP: *1.74*
Efficiency: *46.90%*
Max Duct SP with Blocked Airway: *0 in. Wg @1980 RPM*

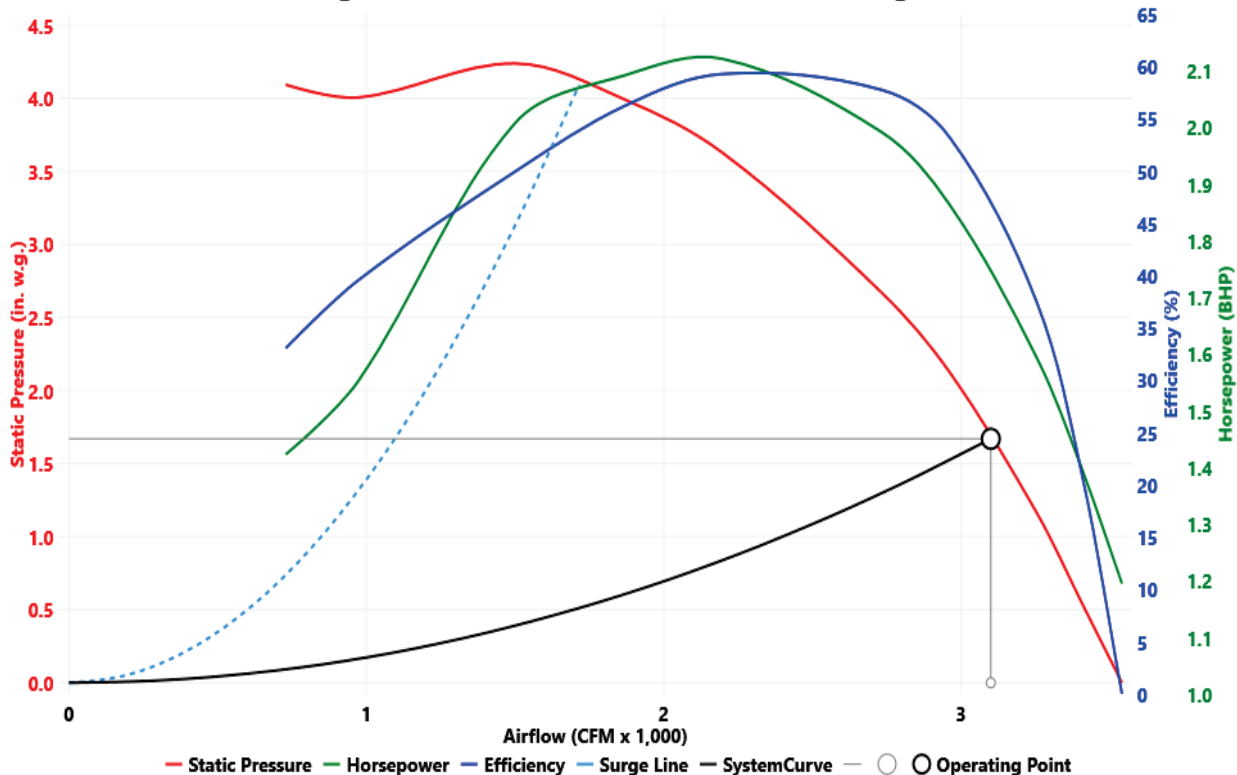
FAN SOUND POWER (Inlet/Outlet)

Octave Band: (Re 10 ⁻¹² watts)							
1	2	3	4	5	6	7	8
86	85	88	87	81	78	76	70
86	85	88	87	81	78	76	70

SOUND POWER A-Weighted: 70 dB

Max Duct SP with Blocked Airway:

Supply Fan Model: RN185D70 @ 1980 RPM and 100% Width Design Conditions: 3100 CFM @ 1.67 in. w.g. SP





Unit Submittal

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918) 583-2266
Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-011-3-A-HB89-142:A000-200-DHE-00A-0TMRHB2-00-00E0000VB

Tag: RTU-3

Dehumidification

Job Name: Flour Bluff ISD ECD

Unit Worksheet For:

Job Number: Job #18

Unit Worksheet Date: 2/5/2024

	Base Option	Description
RN	Generation	Rooftop - Ninth Generation
011	Unit Size	Eleven
3	Voltage	460V/3φ/60Hz
A	Interior Protection	Interior Corrosion Protection
H	Refrigerant Style	R-410A Variable Capacity Scroll Compressor + Two-Step Compressor - High Efficiency
B	Unit Configuration	Air-Cooled Cond. + 6 Row Evap. Coil
8	Coil Coating	Polymer E-Coated Condenser Coil
9	Cooling/Heat Pump Staging	Modulating - 1 VCC + 1 Staged Comp.
1	Heating Type	Electric Heat
4	Heating Designation	Heat 4 - 40 kW
2	Heating Staging	2 Stage

	Feature Option	Description
A	F1A.	RA/OA Section Economizer
0	F1B.	RA/EA Blower Configuration Standard - None
0	F1C.	RA/EA Blower Standard - None
0	F1D.	RA/EA Blower Motor Standard - None
2	F2.	OA Control FDD Fully Modulating Actuator - Enthalpy Limit + CO2 Override
0	F3.	Heat Options Standard
0	F4.	Maintenance Options Standard
D	F5A.	SA Blower Configuration 1 Blower + Premium Efficiency Motor + 1 VFD
H	F5B.	SA Blower 18.5" Direct Drive Backward Curved Plenum - 70% Width
E	F5C.	SA Motor 3.0 hp - 1760 rpm
0	F6A.	Pre Filter Type Standard - None
0	F6B.	Unit Filter Type 2" Pleated - 30% Eff
A	F6C.	Filter Options Clogged Filter Switch
0	F7.	Refrigeration Control Standard - Adj Comp. Cooling Lock Out Through Unit Controls
T	F8.	Refrigeration Options Parallel Modulating Hot Gas Reheat Microchannel Coil [MHGR-MC] - Lag Circuit
M	F9.	Refrigeration Accessories ECM Condenser Fan - Head Pressure Control + Sight Glass + Compressor Isolation Valves
R	F10.	Power Options Circuit Breaker - 70 Amps
H	F11.	Safety Options Remote Safety Shutdown Terminals
B	F12.	Controls Phase & Brownout Protection
2	F13.	Special Controls VAV Single Zone Unit Controller - VAV Cool + CAV Heat
0	F14A.	Outside Air Configuration Standard - None
0	F14B.	Preheat Sizing Standard - None
0	F15.	Glycol Percent Water or No WSHp
0	F16.	Interior Cabinet Options Standard - Double Wall + R-13 Foam Insulation + Stainless Steel Drain Pan
E	F17.	Exterior Cabinet Options Base Insulation + Cond. Coil Guards
0	F18.	Electrical Rating Standard - 5 KAIC
0	F19.	Code Options Standard - ETL U.S.A. Listing
0	F20.	Crating Standard
0	F21.	Water-Cooled Cond. Standard - None
V	F22.	Control Vendors VCC-X Controls + Integrated BACnet IP
B	F23.	Type Standard - Includes AAON Gray Paint



Controller Components

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Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-011-3-A-HB89-142:A000-200-DHE-00A-0TMRHB2-00-00E0000VB

Tag: RTU-3 Dehumidification

Job Name: Flour Bluff ISD ECD

VCCX For:

Job Number: Job #18

VCCX Date:

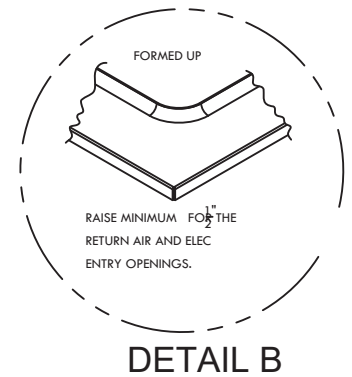
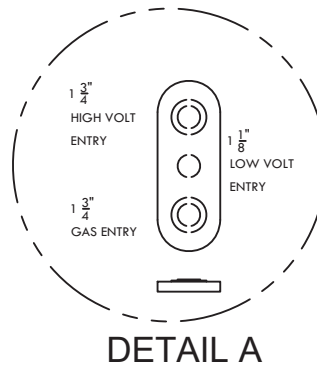
February 5, 2024

Part#	Included Parts	Assigned Channel	BACnet Point
ASM07424	VCCX-IP CONTROLLER		
ASM01692	OSA Temp/Hum Sensor	EBUS2 communicating sensor	AI:16, AI:17, AI:18, AI:19
ASM01820	Space Digital Temp/Hum Sensor	EBUS3 communicating sensor	AI:12, AI:13
R82890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI:9
ASM01831	Duct Mount C02	EBUS4 communicating sensor	AI:29
ASM01840	Return Air Temp/Hum	EBUS6 communicating sensor	AI:14, AI:15
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AI:22
	Economizer	VCCX control point AO 2	AI:30
R62330	Proof of Air Flow	VCCX control point BI 1	BI:6, BI:24
R64580	Dirty Filter Sensor	VCCX control point BI 2	BI:25
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay Point	BI:47
	Heat 1	Configured Relay Point	BI:48
	Heat 2	Configured Relay Point	BI:49
ASM01691	EM1 EXPANSION MODULE		
	Economizer Position Feedback (title 24)	EM1 expansion point AI4	AI:31
ASM02869	DIGITAL REFRIGERATION MODULE		
V38391	Suction Pressure Sensor A	RSMD2R SP-1	AI:48
V38410	Discharge Pressure Sensor A	RSMD2R HP-1	AI:50
V38391	Suction Pressure Sensor B	RSMD2R SP-2	AI:73
V38410	Discharge Pressure Sensor B	RSMD2R HP-2	AI:75
	Comp Discharge Temp A	RSMD2R TEMP1	AI:66
	Modulated Condenser Signal A	RSMD2R AOUT1	AI:46
	Modulated Condenser Signal B	RSMD2R AOUT2	AI:47
	Comp Status Input A	RSMD2R BIN1	BI:77
	Comp Status Input B	RSMD2R BIN2	BI:78
	Emergency Shutdown	RSMD2R BIN4	BI:83
	Comp Unload Signal A	RSMD2R COMP1	AI:44
	Comp Load Signal B2	RSMD2R COMP2	AI:45
	Comp Enable A	RSMD2R RLY1	BI:84
	Comp Enable B	RSMD2R RLY2	BI:85
ASM01670	MODULATING HOT GAS REHEAT MODULE		
	Reheat HGR Valve	MHGRV-X	AI:42

RN SERIES

B - CABINET WITH ECONOMIZER ~ 9-15 TON

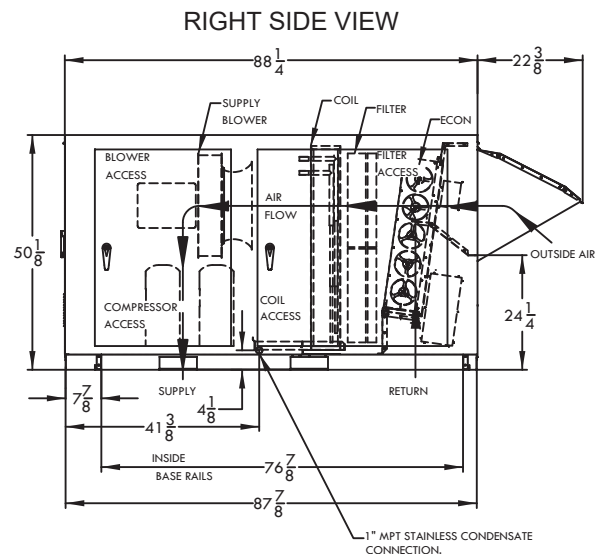
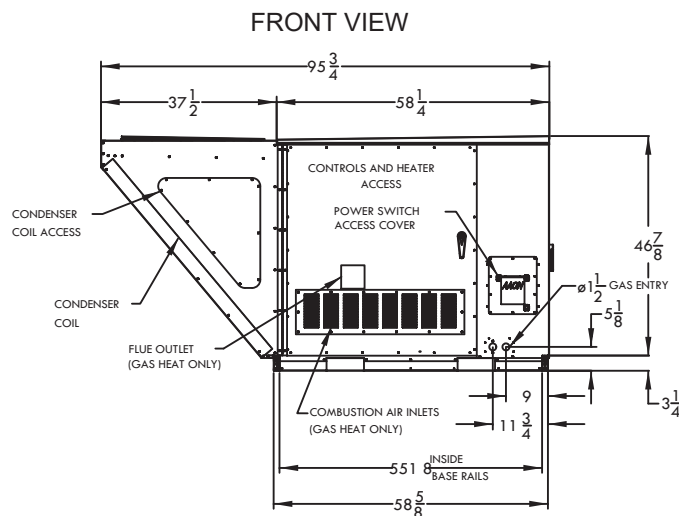
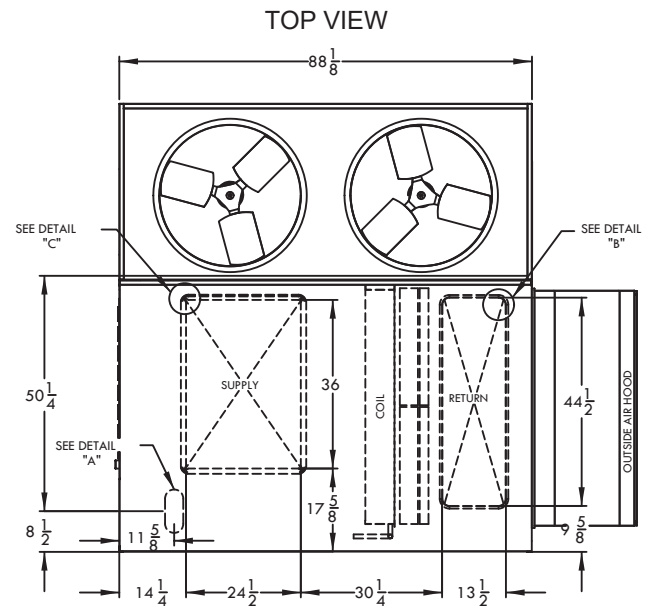
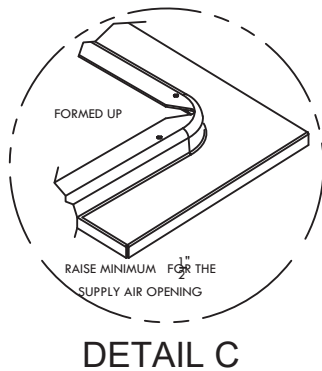
CLEARANCES	
LOCATION	• UNIT SIZE • 9 - 15 TON
OUTSIDE AIR (BACK)	48
CONTROLS SIDE (FRONT)	48
LEFT SIDE	6
RIGHT SIDE	48
TOP	UNOBSTRUCTED



NUMBER OF CONDENSER FANS

9 & 11 TON - 1 FAN

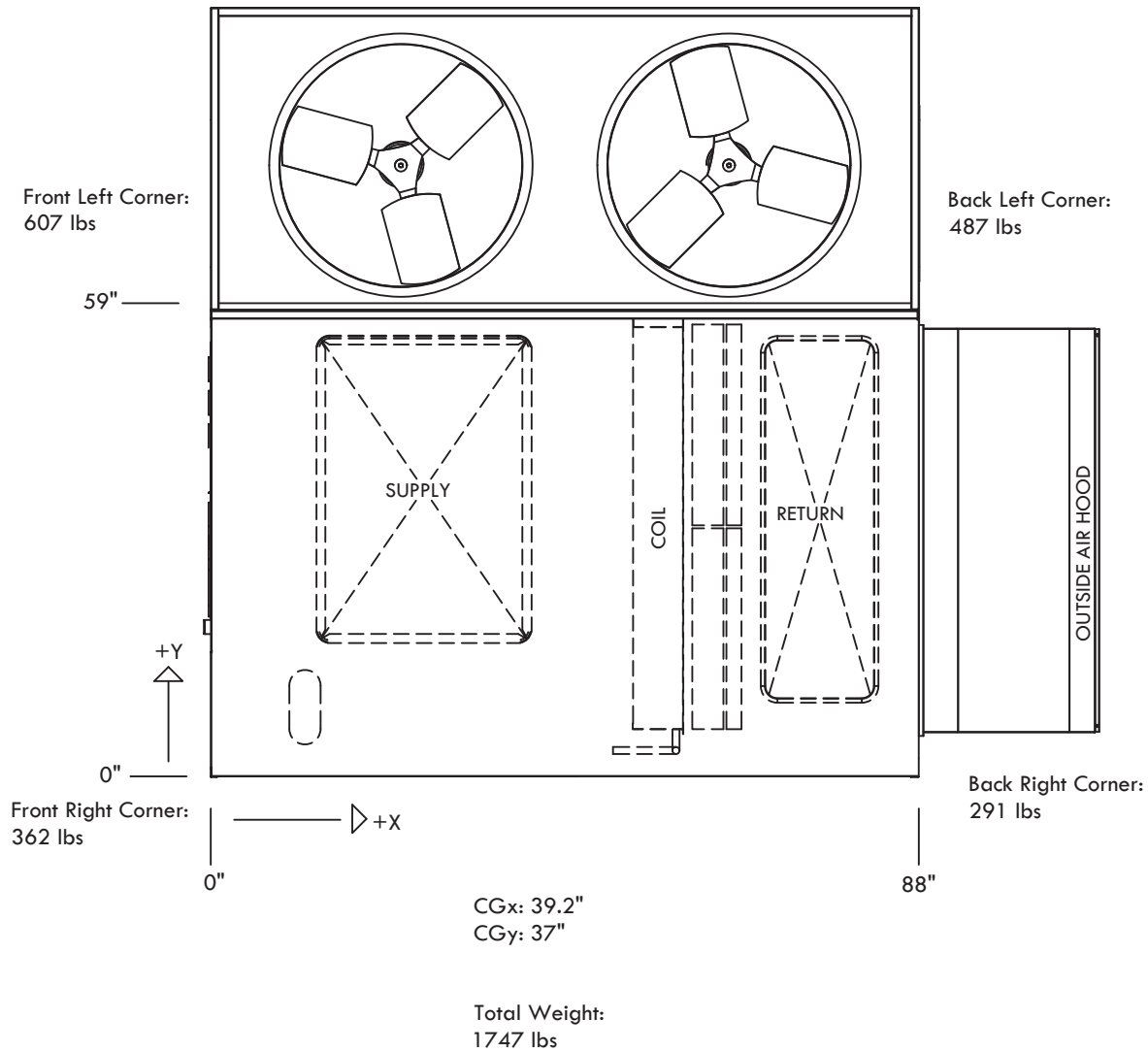
13 & 15 TON - 2 FANS



RNB CABINET AIR COOLED CONDENSING UNIT



RN-011-3-A-HB89-142:A000-200-DHE-00A-0TMRHB2-00-00E0000VB



Disclaimer:
This weight estimate does not account for any SPAs.



Unit Rating

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Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-009-3-A-HB89-122:A000-200-DRP-00A-0TMLHB2-00-00E0000VB

Tag: RTU-14 Design Day

Job Information

Job Name: *Flour Bluff ISD ECD*
Job Number: *Job #18*
Site Altitude: *0 ft*
Refrigerant: *R-410A*

Static Pressure

External: *0.65 in. w.g.*
Evaporator: *0.13 in. w.g.*
Filters Clean: *0.07 in. w.g.*
Dirt Allowance: *0.35 in. w.g.*
Reheat Coil: *0.02 in. w.g.*

Cooling Section

	Gross	Net
Total Capacity:	<i>104.7 MBH</i>	<i>100.3 MBH</i>
Sensible Capacity:	<i>69.2 MBH</i>	<i>64.7 MBH</i>
Latent Capacity:	<i>35.5 MBH</i>	
Mixed Air Temp (DB/WB):	<i>78.9 °F</i>	<i>67.4 °F</i>
Entering Air Temp (DB/WB):	<i>78.9 °F</i>	<i>67.4 °F</i>
Lv Air Temp (Coil) (DB/WB):	<i>54.0 °F</i>	<i>54.0 °F</i>
Lv Air Temp (Unit) (DB/WB):	<i>55.6 °F</i>	<i>54.6 °F</i>

Supply Air Fan: *1 x 220 @ 1.54 BHP Ea.*
SA Fan RPM / Width: *1060 RPM / 4.930 in*
SA Fan FEI: *0.98*

Evaporator Coil: *14.6 ft² / 6 Rows / 12 FPI*
Evaporator Face Velocity: *178.3 fpm*

Unit Information

Approx. Op./Ship Weights: *1746 lbs / 1746 lbs (±5%)*
Ambient Temperature (DB/WB): *100.0 °F / 80.0 °F*
Coil Filter FV / Qty: *187.2 fpm / 4*
Supply Airflow/ESP: *2600 SCFM / 0.65 in. w.g.*
Outside Airflow: *485 SCFM*
Return Temperature (DB/WB): *74.0 °F / 64.0 °F*

Economizer: *0.20 in. w.g.*
Heating: *0.02 in. w.g.*
Cabinet: *0.09 in. w.g.*
Total: *1.53 in. w.g.*

Heating Section

Preheat Type: *Std (No Preheat)*

Auxiliary Heating Type: *Electric Heat*
Heating Airflow: *2600 SCFM*
Total Capacity: *68.2 MBH*
Entering Air Temp (DB/WB): *60.9 °F / 57.2 °F*
Leaving Air Temp (DB/WB): *84.8 °F / 65.7 °F*
Electric Heat FLA: *24*

Re-heat Coil:

Capacity: *58.3 MBH*
LA (DB/WB): *75.0 °F / 62.0 °F*
RH: *47.9%*

Rating Information

Listing Model *RN-009-2,3,4,8-*-HB**-***:*

Cooling Capacity: *102.0 MBH*
Cooling EER: *14.8 BTU/h-W*
Cooling IEER: *19.1 BTU/h-W*

**Rated in accordance with AHRI Standard 340/360 (I-P)*

Application EER @ Op. Conditions: *12.1 BTU/h-W*

Electrical Data

Circuit 1

Rating: *460V/3Ø/60Hz*
Unit FLA: *28*
SCCR: *5 KAIC*

Minimum Circuit Amp: *34*
Maximum Overcurrent: *35*

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	<i>1</i>		<i>460</i>	<i>3</i>			<i>7.8</i>
Compressor 2:	<i>1</i>		<i>460</i>	<i>3</i>			<i>6.4</i>
Condenser Fan:	<i>2</i>	<i>0.33</i>	<i>460</i>	<i>1</i>	<i>1100</i>	<i>1.6</i>	
Supply Fan:	<i>1</i>	<i>2.00</i>	<i>460</i>	<i>3</i>	<i>1170</i>	<i>3.4</i>	

Cabinet Sound Power Levels*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW (dB):	<i>79</i>	<i>83</i>	<i>80</i>	<i>72</i>	<i>67</i>	<i>65</i>	<i>61</i>	<i>55</i>
Return LW (dB):	<i>70</i>	<i>74</i>	<i>69</i>	<i>58</i>	<i>57</i>	<i>53</i>	<i>46</i>	<i>35</i>

**Sound power levels are given for informational purposes only. The sound levels are not guaranteed.*



22" STAR Plenum

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918) 583-2266
Ecat Version: 345.0

JOB INFORMATION:

Job Name: *Flour Bluff ISD ECD*
Job Tag: *RTU-14 Design Day*
Date: *2/5/2024 12:00:00 AM*

WHEEL SPECIFICATION:

Max RPM: 2200
Diameter x Qty: 22 in. x 1
CFM: 2600
Inertia: 5WR²

OPERATING CONDITIONS

Air Flow: 2600
Fan Energy Index (FEI): 0.98
Static Pressure: 1.53 in. Wg
Relief Dampers DP: 0 in. Wg
TSP: 1.53 in. Wg
Site Altitude: 0 ft
TSP @ Sea Level: 1.53 in. Wg

MOTOR SELECTION

Rated HP / Bypass: 2 x 1 / No
Frame Size: 184T
Nominal RPM: 1170
VAC/PH/HZ: 460V/3Ø/60Hz
Enclosure Type: ODP
Max Inertial Load: 0 WR²

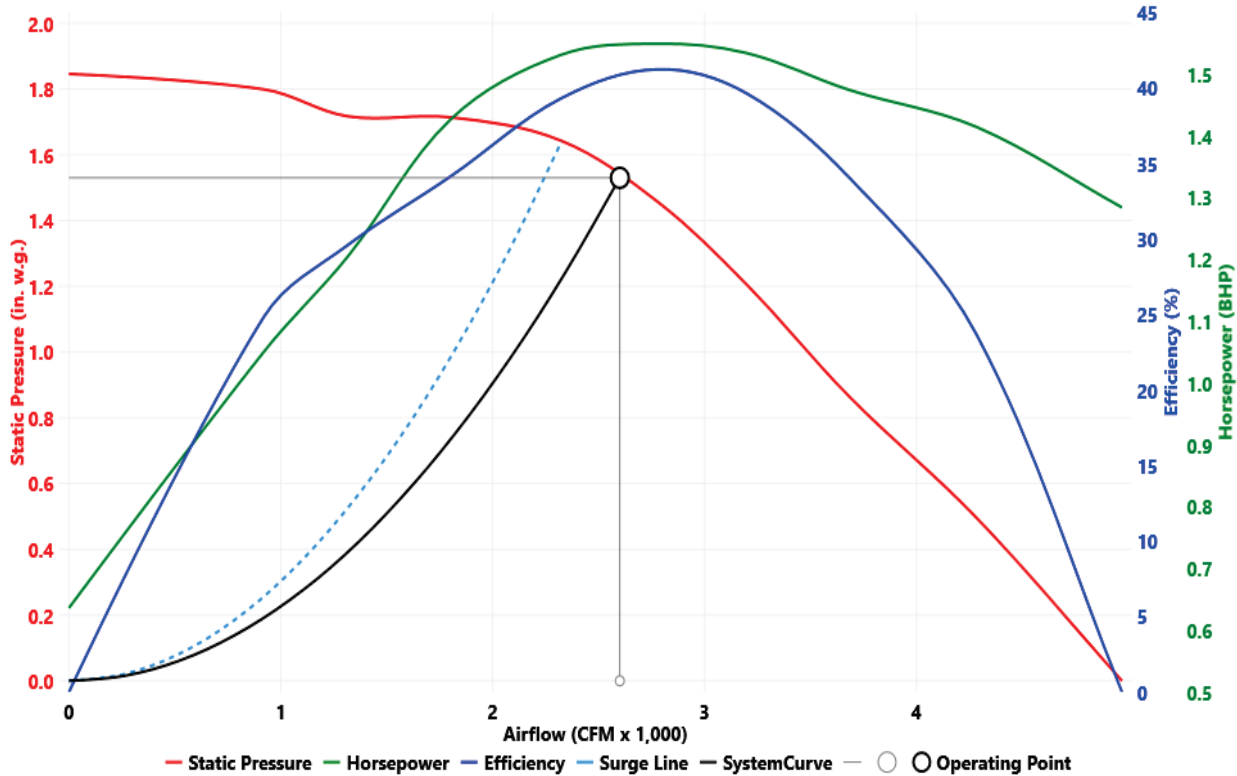
FAN PERFORMANCE:

RPM: 1060
BHP: 1.54
Efficiency: 40.72%
Max Duct SP with Blocked Airway: 0 in. Wg @ 1060 RPM

FAN SOUND POWER (Inlet/Outlet)

Octave Band:	1	2	3	4	5	6	7	8
(Re 10 ⁻¹² watts)	79	83	80	73	70	68	64	58
SOUND POWER A-Weighted: 58 dB	79	83	80	73	70	68	64	58

Supply Fan Model: 220 @ 1060 RPM and 79% Width Design Conditions: 2600 CFM @ 1.53 in. w.g. SP





Unit Submittal

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918) 583-2266
Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-009-3-A-HB89-122:A000-200-DRP-00A-0TMLHB2-00-00E0000VB

Tag: RTU-14 Design Day

Job Name: Flour Bluff ISD ECD

Unit Worksheet For:

Job Number: Job #18

Unit Worksheet Date: 2/5/2024

	Base Option	Description
RN	Generation	Rooftop - Ninth Generation
009	Unit Size	Nine
3	Voltage	460V/3φ/60Hz
A	Interior Protection	Interior Corrosion Protection
H	Refrigerant Style	R-410A Variable Capacity Scroll Compressor + Two-Step Compressor - High Efficiency
B	Unit Configuration	Air-Cooled Cond. + 6 Row Evap. Coil
8	Coil Coating	Polymer E-Coated Condenser Coil
9	Cooling/Heat Pump Staging	Modulating - 1 VCC + 1 Staged Comp.
1	Heating Type	Electric Heat
2	Heating Designation	Heat 2 - 20 kW
2	Heating Staging	2 Stage

	Feature Option	Description
A	F1A.	RA/OA Section Economizer
0	F1B.	RA/EA Blower Configuration Standard - None
0	F1C.	RA/EA Blower Standard - None
0	F1D.	RA/EA Blower Motor Standard - None
2	F2.	OA Control FDD Fully Modulating Actuator - Enthalpy Limit + CO2 Override
0	F3.	Heat Options Standard
0	F4.	Maintenance Options Standard
D	F5A.	SA Blower Configuration 1 Blower + Premium Efficiency Motor + 1 VFD
R	F5B.	SA Blower 22" Direct Drive Backward Curved Plenum
P	F5C.	SA Motor 2.0 hp - 1170 rpm
0	F6A.	Pre Filter Type Standard - None
0	F6B.	Unit Filter Type 2" Pleated - 30% Eff
A	F6C.	Filter Options Clogged Filter Switch
0	F7.	Refrigeration Control Standard - Adj Comp. Cooling Lock Out Through Unit Controls
T	F8.	Refrigeration Options Parallel Modulating Hot Gas Reheat Microchannel Coil [MHGR-MC] - Lag Circuit
M	F9.	Refrigeration Accessories ECM Condenser Fan - Head Pressure Control + Sight Glass + Compressor Isolation Valves
L	F10.	Power Options Circuit Breaker - 35 Amps
H	F11.	Safety Options Remote Safety Shutdown Terminals
B	F12.	Controls Phase & Brownout Protection
2	F13.	Special Controls VAV Single Zone Unit Controller - VAV Cool + CAV Heat
0	F14A.	Outside Air Configuration Standard - None
0	F14B.	Preheat Sizing Standard - None
0	F15.	Glycol Percent Water or No WSHP
0	F16.	Interior Cabinet Options Standard - Double Wall + R-13 Foam Insulation + Stainless Steel Drain Pan
E	F17.	Exterior Cabinet Options Base Insulation + Cond. Coil Guards
0	F18.	Electrical Rating Standard - 5 KAIC
0	F19.	Code Options Standard - ETL U.S.A. Listing
0	F20.	Crating Standard
0	F21.	Water-Cooled Cond. Standard - None
V	F22.	Control Vendors VCC-X Controls + Integrated BACnet IP
B	F23.	Type Standard - Includes AAON Gray Paint



Controller Components

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Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-009-3-A-HB89-122:A000-200-DRP-00A-0TMLHB2-00-00E0000VB

Tag: RTU-14 Design Day

Job Name: Flour Bluff ISD ECD
Job Number: Job #18

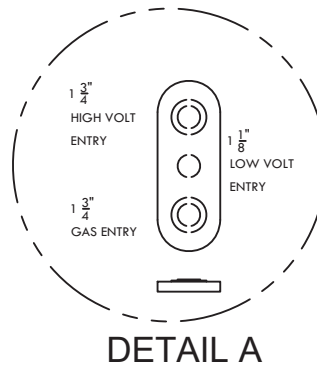
VCCX For:
VCCX Date: February 5, 2024

Part#	Included Parts	Assigned Channel	BACnet Point
ASM07424	VCCX-IP CONTROLLER		
ASM01692	OSA Temp/Hum Sensor	EBUS2 communicating sensor	AI:16,AI:17,AI:18,AI:19
ASM01820	Space Digital Temp/Hum Sensor	EBUS3 communicating sensor	AI:12,AI:13
R82890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI:9
ASM01831	Duct Mount C02	EBUS4 communicating sensor	AI:29
ASM01840	Return Air Temp/Hum	EBUS6 communicating sensor	AI:14,AI:15
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AI:22
	Economizer	VCCX control point AO 2	AI:30
R62330	Proof of Air Flow	VCCX control point BI 1	BI:6, BI:24
R64580	Dirty Filter Sensor	VCCX control point BI 2	BI:25
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay Point	BI:47
	Heat 1	Configured Relay Point	BI:48
	Heat 2	Configured Relay Point	BI:49
ASM01691	EM1 EXPANSION MODULE		
	Economizer Position Feedback (title 24)	EM1 expansion point AI4	AI:31
ASM02869	DIGITAL REFRIGERATION MODULE		
V38391	Suction Pressure Sensor A	RSMD2R SP-1	AI:48
V38410	Discharge Pressure Sensor A	RSMD2R HP-1	AI:50
V38391	Suction Pressure Sensor B	RSMD2R SP-2	AI:73
V38410	Discharge Pressure Sensor B	RSMD2R HP-2	AI:75
	Comp Discharge Temp A	RSMD2R TEMP1	AI:66
	Modulated Condenser Signal A	RSMD2R AOUT1	AI:46
	Modulated Condenser Signal B	RSMD2R AOUT2	AI:47
	Comp Status Input A	RSMD2R BIN1	BI:77
	Comp Status Input B	RSMD2R BIN2	BI:78
	Emergency Shutdown	RSMD2R BIN4	BI:83
	Comp Unload Signal A	RSMD2R COMP1	AI:44
	Comp Load Signal B2	RSMD2R COMP2	AI:45
	Comp Enable A	RSMD2R RLY1	BI:84
	Comp Enable B	RSMD2R RLY2	BI:85
ASM01670	MODULATING HOT GAS REHEAT MODULE		
	Reheat HGR Valve	MHGRV-X	AI:42

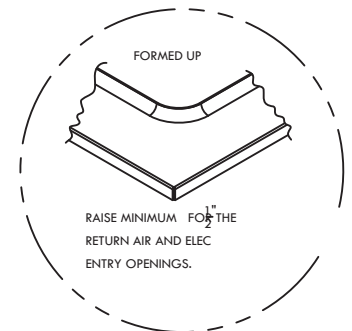
RN SERIES

B - CABINET WITH ECONOMIZER ~ 9-15 TON

CLEARANCES	
LOCATION	• UNIT SIZE • 9 - 15 TON
OUTSIDE AIR (BACK)	48
CONTROLS SIDE (FRONT)	48
LEFT SIDE	6
RIGHT SIDE	48
TOP	UNOBSTRUCTED



DETAIL A

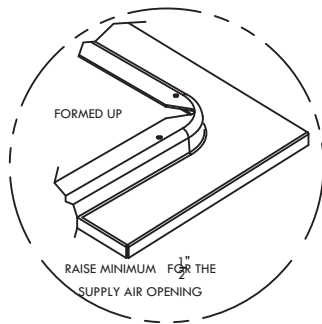


DETAIL B

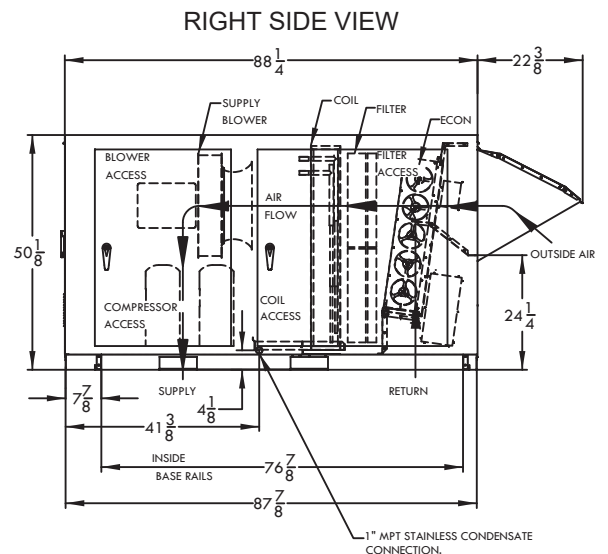
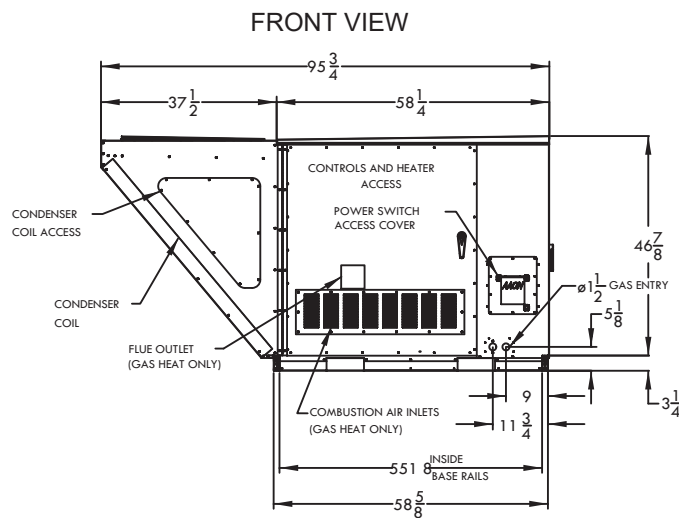
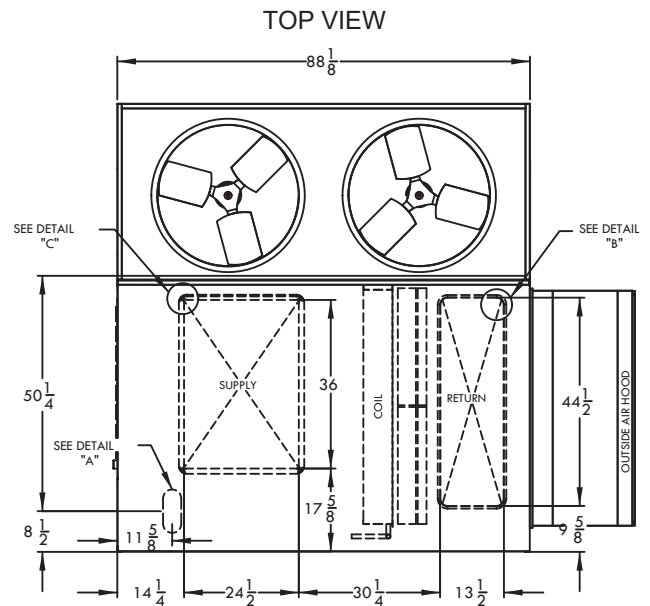
NUMBER OF CONDENSER FANS

9 & 11 TON - 1 FAN

13 & 15 TON - 2 FANS



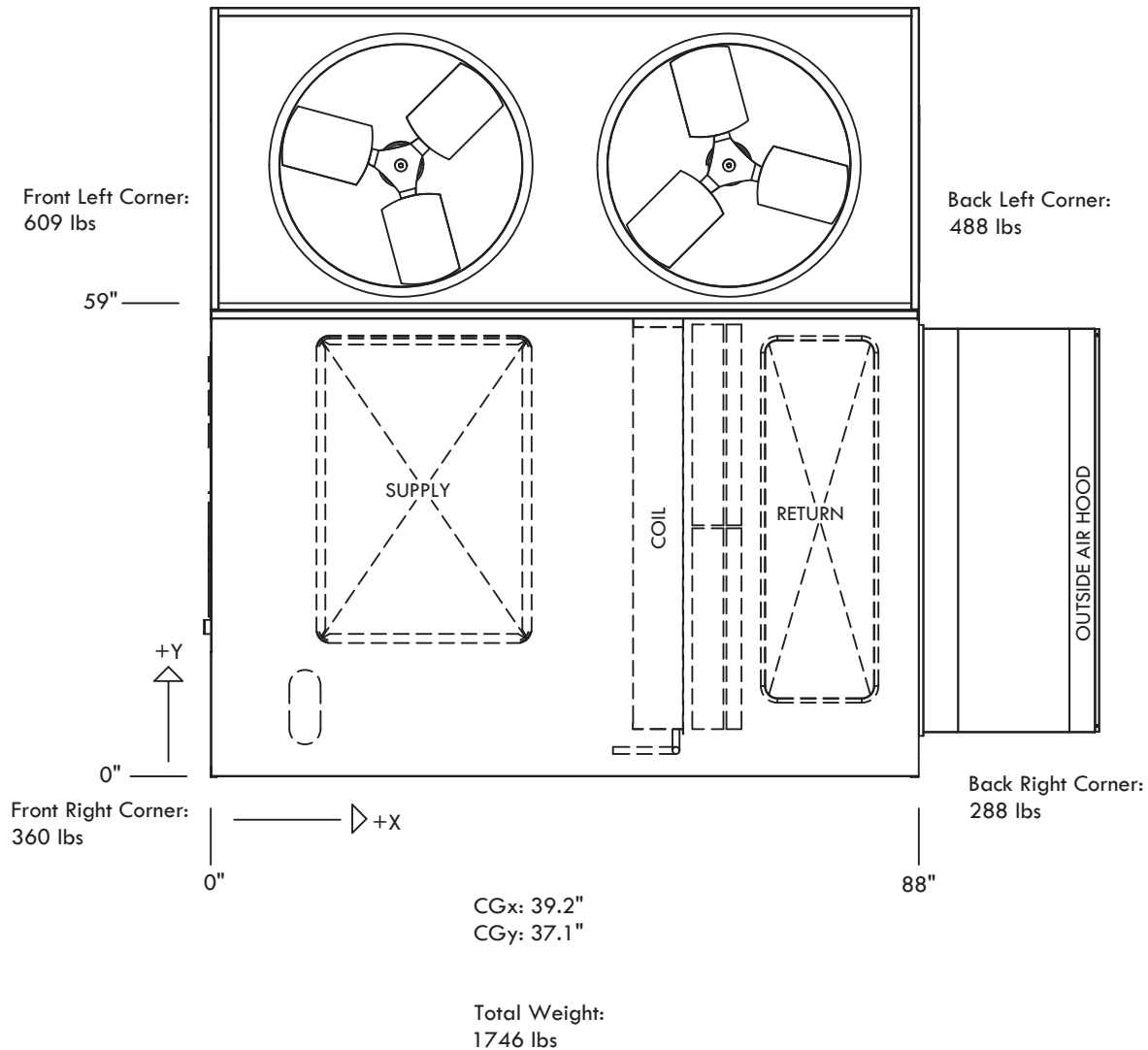
DETAIL C



RNB CABINET AIR COOLED CONDENSING UNIT



RN-009-3-A-HB89-1 22:A000-200-DRP-00A-OTMLHB2-00-00E0000VB



Disclaimer:
This weight estimate does not account for any SPAs.



Unit Rating

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Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-009-3-A-HB89-122:A000-200-DRP-00A-0TMLHB2-00-00E0000VB

Tag: RTU-14
Dehumidification

Job Information

Job Name: *Flour Bluff ISD ECD*
Job Number: *Job #18*
Site Altitude: *0 ft*
Refrigerant: *R-410A*

Static Pressure

External: *0.65 in. w.g.*
Evaporator: *0.13 in. w.g.*
Filters Clean: *0.07 in. w.g.*
Dirt Allowance: *0.35 in. w.g.*
Reheat Coil: *0.02 in. w.g.*

Cooling Section

	Gross	Net
Total Capacity:	<i>112.3 MBH</i>	<i>107.9 MBH</i>
Sensible Capacity:	<i>72.4 MBH</i>	<i>67.9 MBH</i>
Latent Capacity:	<i>40.0 MBH</i>	
Mixed Air Temp (DB/WB):	<i>78.9 °F</i>	<i>67.4 °F</i>
Entering Air Temp (DB/WB):	<i>78.9 °F</i>	<i>67.4 °F</i>
Lv Air Temp (Coil) (DB/WB):	<i>52.9 °F</i>	<i>52.9 °F</i>
Lv Air Temp (Unit) (DB/WB):	<i>54.4 °F</i>	<i>53.5 °F</i>

Supply Air Fan: *1 x 220 @ 1.54 BHP Ea.*
SA Fan RPM / Width: *1060 RPM / 4.930 in*
SA Fan FEI: *0.98*

Evaporator Coil: *14.6 ft² / 6 Rows / 12 FPI*
Evaporator Face Velocity: *178.3 fpm*

Rating Information

Listing Model *RN-009-2,3,4,8-*HB**-***:*

Cooling Capacity: *102.0 MBH*
Cooling EER: *14.8 BTU/h-W*
Cooling IEER: *19.1 BTU/h-W*

**Rated in accordance with AHRI Standard 340/360 (I-P)*

Application EER @ Op. Conditions: *15.0 BTU/h-W*

Electrical Data

Circuit 1

Rating: *460V/3Ø/60Hz*
Unit FLA: *28*
SCCR: *5 KAIC*

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	<i>1</i>		<i>460</i>	<i>3</i>			<i>7.8</i>
Compressor 2:	<i>1</i>		<i>460</i>	<i>3</i>			<i>6.4</i>
Condenser Fan:	<i>2</i>	<i>0.33</i>	<i>460</i>	<i>1</i>	<i>1100</i>	<i>1.6</i>	
Supply Fan:	<i>1</i>	<i>2.00</i>	<i>460</i>	<i>3</i>	<i>1170</i>	<i>3.4</i>	

Unit Information

Approx. Op./Ship Weights: *1746 lbs / 1746 lbs (±5%)*
Ambient Temperature (DB/WB): *85.0 °F / 80.0 °F*
Coil Filter FV / Qty: *187.2 fpm / 4*
Supply Airflow/ESP: *2600 SCFM / 0.65 in. w.g.*
Outside Airflow: *485 SCFM*
Return Temperature (DB/WB): *74.0 °F / 64.5 °F*

Economizer: *0.20 in. w.g.*
Heating: *0.02 in. w.g.*
Cabinet: *0.08 in. w.g.*
Total: *1.53 in. w.g.*

Heating Section

Preheat Type: *Std (No Preheat)*

Auxiliary Heating Type: *Electric Heat*
Heating Airflow: *2600 SCFM*
Total Capacity: *68.2 MBH*
Entering Air Temp (DB/WB): *60.9 °F / 57.2 °F*
Leaving Air Temp (DB/WB): *84.8 °F / 65.7 °F*
Electric Heat FLA: *24*

Re-heat Coil:

Capacity: *61.4 MBH*
LA (DB/WB): *75.0 °F / 61.4 °F*
RH: *46.0%*



Unit Rating

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918) 583-2266
Ecat Version: 345.0

Cabinet Sound Power Levels*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW (dB):	79	83	80	72	67	65	61	55
Return LW (dB):	70	74	69	58	57	53	46	35

**Sound power levels are given for informational purposes only. The sound levels are not guaranteed.*



22" STAR Plenum

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918) 583-2266
Ecat Version: 345.0

JOB INFORMATION:

Job Name: *Flour Bluff ISD ECD*
Job Tag: *RTU-14 Dehumidification*
Date: *2/5/2024 12:00:00 AM*

WHEEL SPECIFICATION:

Max RPM: *2200*
Diameter x Qty: *22 in. x 1*
CFM: *2600*
Inertia: *5WR²*

OPERATING CONDITIONS

Air Flow: *2600*
Fan Energy Index (FEI): *0.98*
Static Pressure: *1.53 in. Wg*
Relief Dampers DP: *0 in. Wg*
TSP: *1.53 in. Wg*
Site Altitude: *0 ft*
TSP @ Sea Level: *1.53 in. Wg*

MOTOR SELECTION

Rated HP / Bypass: *2 x 1 / No*
Frame Size: *184T*
Nominal RPM: *1170*
VAC/PH/HZ: *460V/3Ø/60Hz*
Enclosure Type: *ODP*
Max Inertial Load: *0 WR²*

FAN PERFORMANCE:

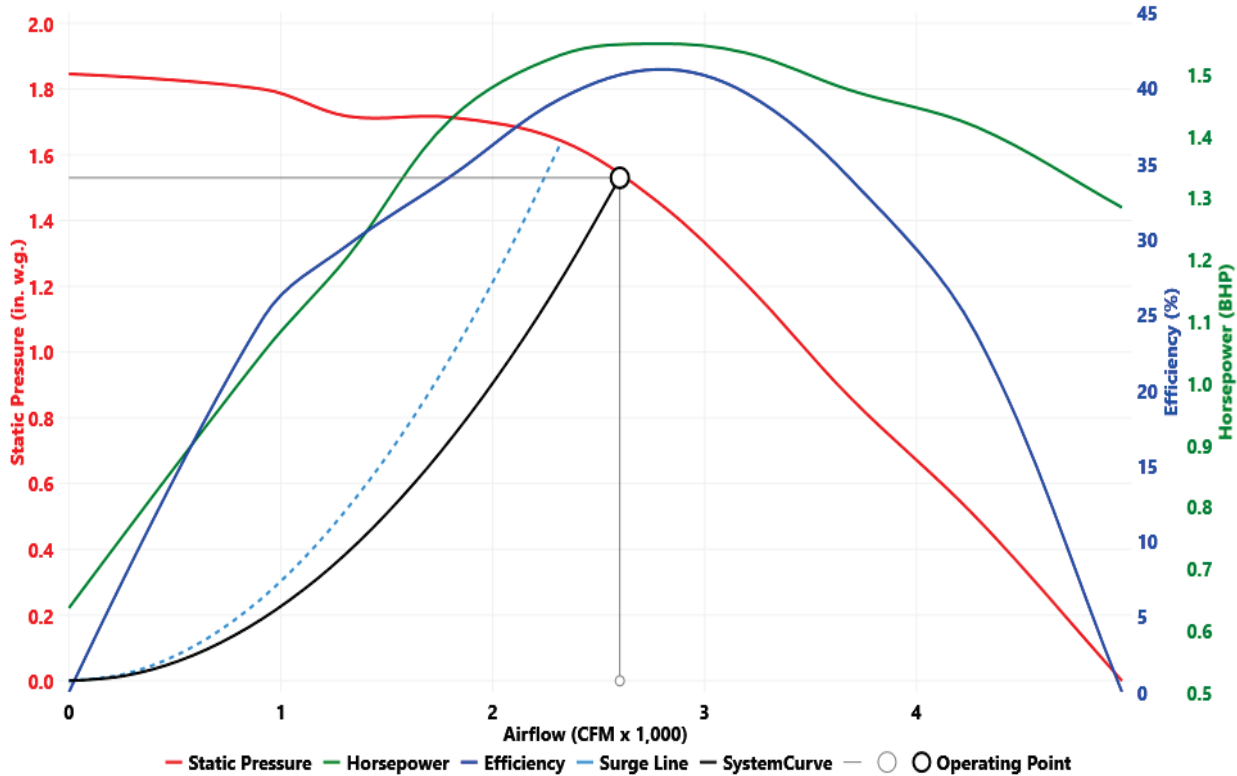
RPM: *1060*
BHP: *1.54*
Efficiency: *40.72%*
Max Duct SP with Blocked Airway: *0 in. Wg @ 1060 RPM*

FAN SOUND POWER (Inlet/Outlet)

Octave Band:	1	2	3	4	5	6	7	8
(Re 10 ⁻¹² watts)	79	83	80	73	70	68	64	58
SOUND POWER A-Weighted: 58 dB	79	83	80	73	70	68	64	58

Max Duct SP with Blocked Airway:

Supply Fan Model: 220 @ 1060 RPM and 79% Width Design Conditions: 2600 CFM @ 1.53 in. w.g. SP





Unit Submittal

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918) 583-2266
Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-009-3-A-HB89-122:A000-200-DRP-00A-0TMLHB2-00-00E0000VB

Tag: RTU-14

Dehumidification

Job Name: Flour Bluff ISD ECD

Unit Worksheet For:

Job Number: Job #18

Unit Worksheet Date: 2/5/2024

	Base Option	Description
RN	Generation	Rooftop - Ninth Generation
009	Unit Size	Nine
3	Voltage	460V/3φ/60Hz
A	Interior Protection	Interior Corrosion Protection
H	Refrigerant Style	R-410A Variable Capacity Scroll Compressor + Two-Step Compressor - High Efficiency
B	Unit Configuration	Air-Cooled Cond. + 6 Row Evap. Coil
8	Coil Coating	Polymer E-Coated Condenser Coil
9	Cooling/Heat Pump Staging	Modulating - 1 VCC + 1 Staged Comp.
1	Heating Type	Electric Heat
2	Heating Designation	Heat 2 - 20 kW
2	Heating Staging	2 Stage

	Feature Option	Description
A	F1A.	RA/OA Section Economizer
0	F1B.	RA/EA Blower Configuration Standard - None
0	F1C.	RA/EA Blower Standard - None
0	F1D.	RA/EA Blower Motor Standard - None
2	F2.	OA Control FDD Fully Modulating Actuator - Enthalpy Limit + CO2 Override
0	F3.	Heat Options Standard
0	F4.	Maintenance Options Standard
D	F5A.	SA Blower Configuration 1 Blower + Premium Efficiency Motor + 1 VFD
R	F5B.	SA Blower 22" Direct Drive Backward Curved Plenum
P	F5C.	SA Motor 2.0 hp - 1170 rpm
0	F6A.	Pre Filter Type Standard - None
0	F6B.	Unit Filter Type 2" Pleated - 30% Eff
A	F6C.	Filter Options Clogged Filter Switch
0	F7.	Refrigeration Control Standard - Adj Comp. Cooling Lock Out Through Unit Controls
T	F8.	Refrigeration Options Parallel Modulating Hot Gas Reheat Microchannel Coil [MHGR-MC] - Lag Circuit
M	F9.	Refrigeration Accessories ECM Condenser Fan - Head Pressure Control + Sight Glass + Compressor Isolation Valves
L	F10.	Power Options Circuit Breaker - 35 Amps
H	F11.	Safety Options Remote Safety Shutdown Terminals
B	F12.	Controls Phase & Brownout Protection
2	F13.	Special Controls VAV Single Zone Unit Controller - VAV Cool + CAV Heat
0	F14A.	Outside Air Configuration Standard - None
0	F14B.	Preheat Sizing Standard - None
0	F15.	Glycol Percent Water or No WSHp
0	F16.	Interior Cabinet Options Standard - Double Wall + R-13 Foam Insulation + Stainless Steel Drain Pan
E	F17.	Exterior Cabinet Options Base Insulation + Cond. Coil Guards
0	F18.	Electrical Rating Standard - 5 KAIC
0	F19.	Code Options Standard - ETL U.S.A. Listing
0	F20.	Crating Standard
0	F21.	Water-Cooled Cond. Standard - None
V	F22.	Control Vendors VCC-X Controls + Integrated BACnet IP
B	F23.	Type Standard - Includes AAON Gray Paint



Controller Components

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Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-009-3-A-HB89-122:A000-200-DRP-00A-0TMLHB2-00-00E0000VB

Tag: RTU-14 Dehumidification

Job Name: Flour Bluff ISD ECD
Job Number: Job #18

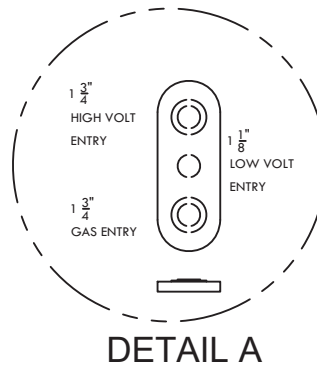
VCCX For:
VCCX Date: February 5, 2024

Part#	Included Parts	Assigned Channel	BACnet Point
ASM07424	VCCX-IP CONTROLLER		
ASM01692	OSA Temp/Hum Sensor	EBUS2 communicating sensor	AI:16, AI:17, AI:18, AI:19
ASM01820	Space Digital Temp/Hum Sensor	EBUS3 communicating sensor	AI:12, AI:13
R82890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI:9
ASM01831	Duct Mount C02	EBUS4 communicating sensor	AI:29
ASM01840	Return Air Temp/Hum	EBUS6 communicating sensor	AI:14, AI:15
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AI:22
	Economizer	VCCX control point AO 2	AI:30
R62330	Proof of Air Flow	VCCX control point BI 1	BI:6, BI:24
R64580	Dirty Filter Sensor	VCCX control point BI 2	BI:25
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay Point	BI:47
	Heat 1	Configured Relay Point	BI:48
	Heat 2	Configured Relay Point	BI:49
ASM01691	EM1 EXPANSION MODULE		
	Economizer Position Feedback (title 24)	EM1 expansion point AI4	AI:31
ASM02869	DIGITAL REFRIGERATION MODULE		
V38391	Suction Pressure Sensor A	RSMD2R SP-1	AI:48
V38410	Discharge Pressure Sensor A	RSMD2R HP-1	AI:50
V38391	Suction Pressure Sensor B	RSMD2R SP-2	AI:73
V38410	Discharge Pressure Sensor B	RSMD2R HP-2	AI:75
	Comp Discharge Temp A	RSMD2R TEMP1	AI:66
	Modulated Condenser Signal A	RSMD2R AOUT1	AI:46
	Modulated Condenser Signal B	RSMD2R AOUT2	AI:47
	Comp Status Input A	RSMD2R BIN1	BI:77
	Comp Status Input B	RSMD2R BIN2	BI:78
	Emergency Shutdown	RSMD2R BIN4	BI:83
	Comp Unload Signal A	RSMD2R COMP1	AI:44
	Comp Load Signal B2	RSMD2R COMP2	AI:45
	Comp Enable A	RSMD2R RLY1	BI:84
	Comp Enable B	RSMD2R RLY2	BI:85
ASM01670	MODULATING HOT GAS REHEAT MODULE		
	Reheat HGR Valve	MHGRV-X	AI:42

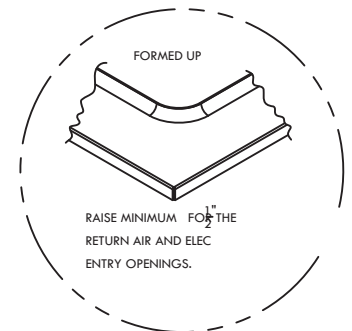
RN SERIES

B - CABINET WITH ECONOMIZER ~ 9-15 TON

CLEARANCES	
LOCATION	• UNIT SIZE • 9 - 15 TON
OUTSIDE AIR (BACK)	48
CONTROLS SIDE (FRONT)	48
LEFT SIDE	6
RIGHT SIDE	48
TOP	UNOBSTRUCTED



DETAIL A

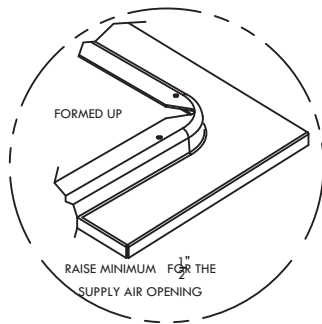


DETAIL B

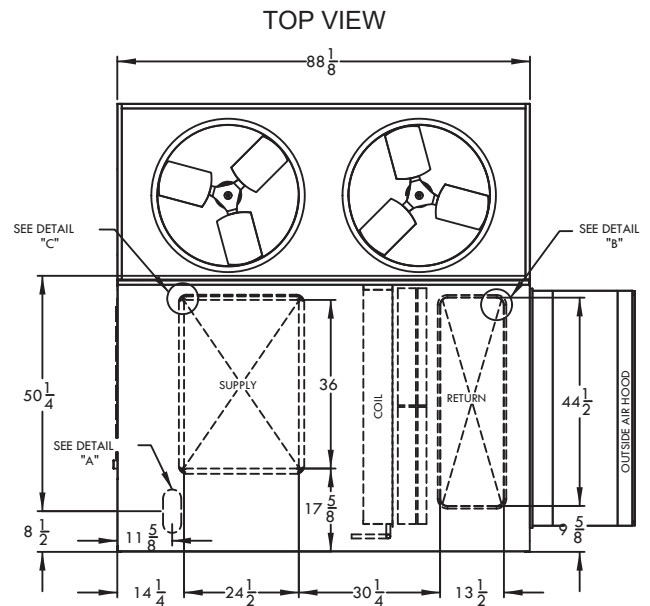
NUMBER OF CONDENSER FANS

9 & 11 TON - 1 FAN

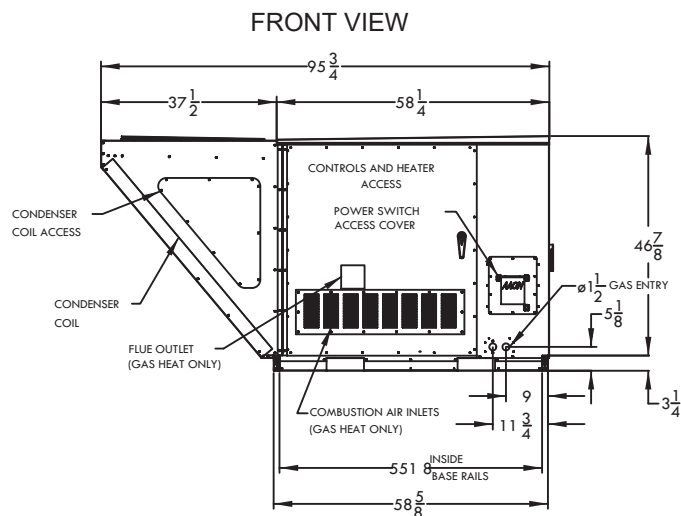
13 & 15 TON - 2 FANS



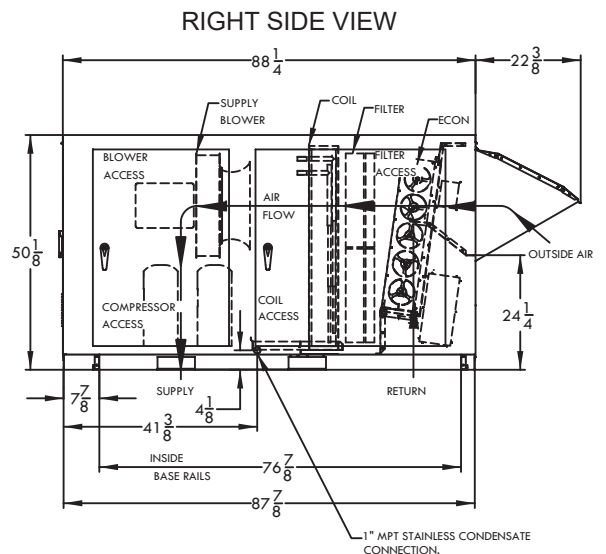
DETAIL C



TOP VIEW



FRONT VIEW

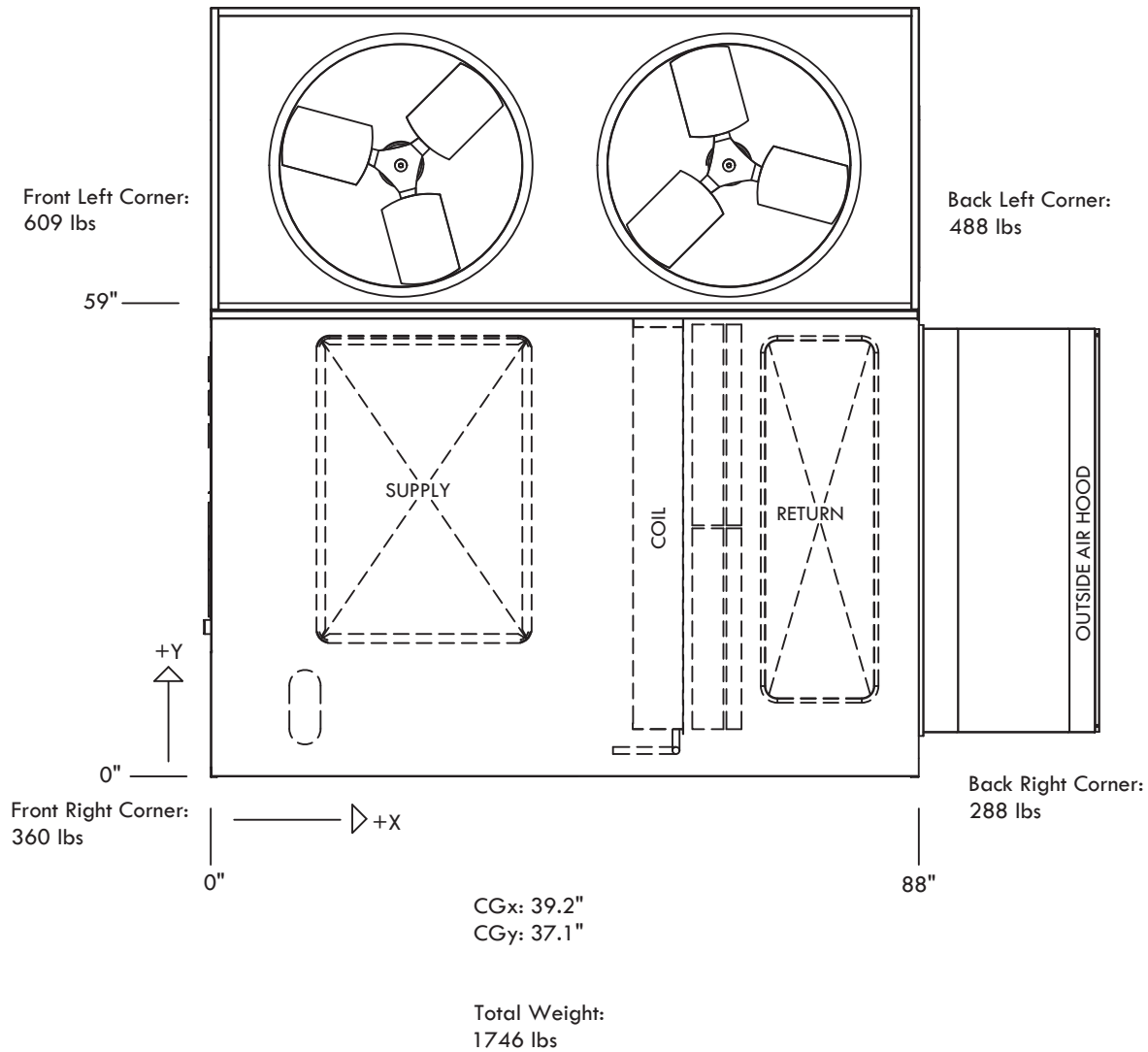


RIGHT SIDE VIEW

RNB CABINET AIR COOLED CONDENSING UNIT



RN-009-3-A-HB89-1 22:A000-200-DRP-00A-OTMLHB2-00-00E0000VB



Disclaimer:
This weight estimate does not account for any SPAs.



Unit Rating

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918) 583-2266
Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-011-3-A-HB89-142:A000-200-DCE-00A-01MRHB2-00-00E0000VB

Tag: RTU-15 Design Day

Job Information

Job Name: *Flour Bluff ISD ECD*
Job Number: *Job #18*
Site Altitude: *0 ft*
Refrigerant: *R-410A*

Static Pressure

External: *0.65 in. w.g.*
Evaporator: *0.24 in. w.g.*
Filters Clean: *0.10 in. w.g.*
Dirt Allowance: *0.35 in. w.g.*
Reheat Coil: *0.04 in. w.g.*

Cooling Section

	Gross	Net
Total Capacity:	<i>128.7 MBH</i>	<i>122.6 MBH</i>
Sensible Capacity:	<i>90.6 MBH</i>	<i>84.5 MBH</i>
Latent Capacity:	<i>38.1 MBH</i>	
Mixed Air Temp (DB/WB):	<i>75.3 °F</i>	<i>65.0 °F</i>
Entering Air Temp (DB/WB):	<i>75.3 °F</i>	<i>65.0 °F</i>
Lv Air Temp (Coil) (DB/WB):	<i>53.8 °F</i>	<i>53.7 °F</i>
Lv Air Temp (Unit) (DB/WB):	<i>55.2 °F</i>	<i>54.3 °F</i>

Supply Air Fan: *1 x RN185 @ 2.15 BHP Ea.*
SA Fan RPM / Width: *1858 RPM / 4.140 in*
SA Fan FEI: *1.16*

Evaporator Coil: *14.6 ft² / 6 Rows / 12 FPI*
Evaporator Face Velocity: *267.4 fpm*

Rating Information

Listing Model *RN-011-2,3,4,8-*-HB**-***:*

Cooling Capacity: *126.0 MBH*
Cooling EER: *14.3 BTU/h-W*
Cooling IEER: *19.1 BTU/h-W*

**Rated in accordance with AHRI Standard 340/360 (I-P)*

Application EER @ Op. Conditions: *11.4 BTU/h-W*

Electrical Data

Circuit 1

Rating: *460V/3Ø/60Hz*
Unit FLA: *53*
SCCR: *5 KAIC*

Minimum Circuit Amp: *66*
Maximum Overcurrent: *70*

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	<i>1</i>		<i>460</i>	<i>3</i>			<i>8.1</i>
Compressor 2:	<i>1</i>		<i>460</i>	<i>3</i>			<i>7.2</i>
Condenser Fan:	<i>2</i>	<i>0.33</i>	<i>460</i>	<i>1</i>	<i>1100</i>	<i>1.6</i>	
Supply Fan:	<i>1</i>	<i>3.00</i>	<i>460</i>	<i>3</i>	<i>1760</i>	<i>4.8</i>	

Cabinet Sound Power Levels*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW (dB):	<i>87</i>	<i>85</i>	<i>89</i>	<i>85</i>	<i>78</i>	<i>74</i>	<i>72</i>	<i>66</i>
Return LW (dB):	<i>78</i>	<i>74</i>	<i>76</i>	<i>70</i>	<i>65</i>	<i>61</i>	<i>56</i>	<i>45</i>

**Sound power levels are given for informational purposes only. The sound levels are not guaranteed.*



18.5" STAR Plenum

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918) 583-2266
Ecat Version: 345.0

JOB INFORMATION:

Job Name: *Flour Bluff ISD ECD*
Job Tag: *RTU-15 Design Day*
Date: *2/5/2024 12:00:00 AM*

WHEEL SPECIFICATION:

Max RPM: *3000*
Diameter x Qty: *18.5 in. x 1*
CFM: *3900*
Inertia: *3WR²*

OPERATING CONDITIONS

Air Flow: *3900*
Fan Energy Index (FEI): *1.16*
Static Pressure: *1.87 in. Wg*
Relief Dampers DP: *0 in. Wg*
TSP: *1.87 in. Wg*
Site Altitude: *0 ft*
TSP @ Sea Level: *1.87 in. Wg*

MOTOR SELECTION

Rated HP / Bypass: *3 x 1 / No*
Frame Size: *182T*
Nominal RPM: *1760*
VAC/PH/Hz: *460V/3Ø/60Hz*
Enclosure Type: *ODP*
Max Inertial Load: *0 WR²*

FAN PERFORMANCE:

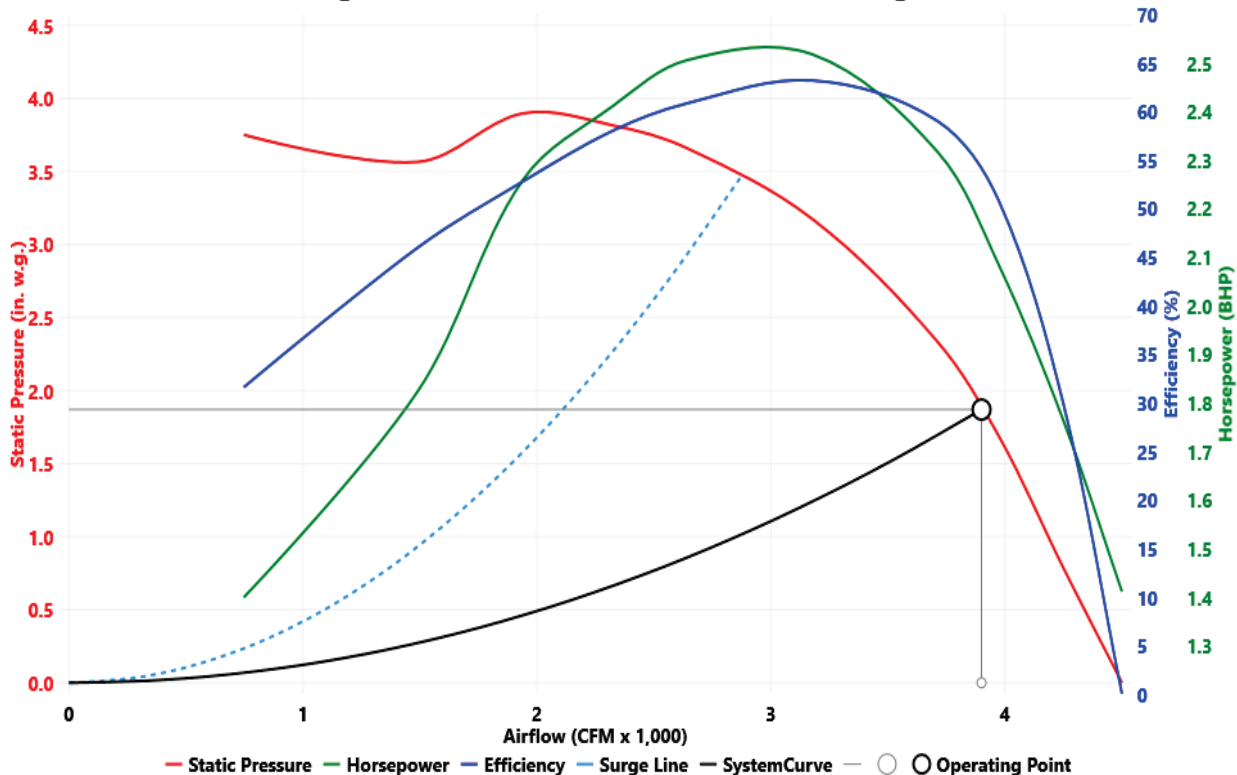
RPM: *1858*
BHP: *2.15*
Efficiency: *53.47%*
Max Duct SP with Blocked Airway: *0 in. Wg @ 1858 RPM*

FAN SOUND POWER (Inlet/Outlet)

Octave Band:		(Re 10 ⁻¹² watts)					
1	2	3	4	5	6	7	8
87	85	89	87	81	78	76	70
87	85	89	87	81	78	76	70

SOUND POWER A-Weighted: 70 dB

Supply Fan Model: RN185 @ 1858 RPM and 100% Width Design Conditions: 3900 CFM @ 1.87 in. w.g. SP





Unit Submittal

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918) 583-2266
Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-011-3-A-HB89-142:A000-200-DCE-00A-01MRHB2-00-00E0000VB

Tag: RTU-15 Design Day

Job Name: Flour Bluff ISD ECD

Job Number: Job #18

Unit Worksheet For:

Unit Worksheet Date: 2/5/2024

	Base Option	Description
RN	Generation	Rooftop - Ninth Generation
011	Unit Size	Eleven
3	Voltage	460V/3φ/60Hz
A	Interior Protection	Interior Corrosion Protection
H	Refrigerant Style	R-410A Variable Capacity Scroll Compressor + Two-Step Compressor - High Efficiency
B	Unit Configuration	Air-Cooled Cond. + 6 Row Evap. Coil
8	Coil Coating	Polymer E-Coated Condenser Coil
9	Cooling/Heat Pump Staging	Modulating - 1 VCC + 1 Staged Comp.
1	Heating Type	Electric Heat
4	Heating Designation	Heat 4 - 40 kW
2	Heating Staging	2 Stage

	Feature Option	Description
A	F1A.	RA/OA Section Economizer
0	F1B.	RA/EA Blower Configuration Standard - None
0	F1C.	RA/EA Blower Standard - None
0	F1D.	RA/EA Blower Motor Standard - None
2	F2.	OA Control FDD Fully Modulating Actuator - Enthalpy Limit + CO2 Override
0	F3.	Heat Options Standard
0	F4.	Maintenance Options Standard
D	F5A.	SA Blower Configuration 1 Blower + Premium Efficiency Motor + 1 VFD
C	F5B.	SA Blower 18.5" Direct Drive Backward Curved Plenum
E	F5C.	SA Motor 3.0 hp - 1760 rpm
0	F6A.	Pre Filter Type Standard - None
0	F6B.	Unit Filter Type 2" Pleated - 30% Eff
A	F6C.	Filter Options Clogged Filter Switch
0	F7.	Refrigeration Control Standard - Adj Comp. Cooling Lock Out Through Unit Controls
1	F8.	Refrigeration Options All Circuit Parallel Modulating Hot Gas Reheat Microchannel Coil [MHGR-MC]
M	F9.	Refrigeration Accessories ECM Condenser Fan - Head Pressure Control + Sight Glass + Compressor Isolation Valves
R	F10.	Power Options Circuit Breaker - 70 Amps
H	F11.	Safety Options Remote Safety Shutdown Terminals
B	F12.	Controls Phase & Brownout Protection
2	F13.	Special Controls VAV Single Zone Unit Controller - VAV Cool + CAV Heat
0	F14A.	Outside Air Configuration Standard - None
0	F14B.	Preheat Sizing Standard - None
0	F15.	Glycol Percent Water or No WSHP
0	F16.	Interior Cabinet Options Standard - Double Wall + R-13 Foam Insulation + Stainless Steel Drain Pan
E	F17.	Exterior Cabinet Options Base Insulation + Cond. Coil Guards
0	F18.	Electrical Rating Standard - 5 KAIC
0	F19.	Code Options Standard - ETL U.S.A. Listing
0	F20.	Crating Standard
0	F21.	Water-Cooled Cond. Standard - None
V	F22.	Control Vendors VCC-X Controls + Integrated BACnet IP
B	F23.	Type Standard - Includes AAON Gray Paint



Controller Components

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Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-011-3-A-HB89-142:A000-200-DCE-00A-01MRHB2-00-00E0000VB

Tag: RTU-15 Design Day

Job Name: Flour Bluff ISD ECD
Job Number: Job #18

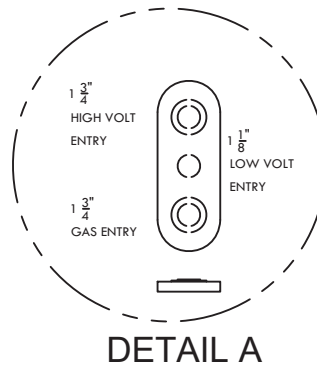
VCCX For:
VCCX Date: February 5, 2024

Part#	Included Parts	Assigned Channel	BACnet Point
ASM07424	VCCX-IP CONTROLLER		
ASM01692	OSA Temp/Hum Sensor	EBUS2 communicating sensor	AI:16, AI:17, AI:18, AI:19
ASM01820	Space Digital Temp/Hum Sensor	EBUS3 communicating sensor	AI:12, AI:13
R82890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI:9
ASM01831	Duct Mount C02	EBUS4 communicating sensor	AI:29
ASM01840	Return Air Temp/Hum	EBUS6 communicating sensor	AI:14, AI:15
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AI:22
	Economizer	VCCX control point AO 2	AI:30
R62330	Proof of Air Flow	VCCX control point BI 1	BI:6, BI:24
R64580	Dirty Filter Sensor	VCCX control point BI 2	BI:25
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay Point	BI:47
	Heat 1	Configured Relay Point	BI:48
	Heat 2	Configured Relay Point	BI:49
ASM01691	EM1 EXPANSION MODULE		
	Economizer Position Feedback (title 24)	EM1 expansion point AI4	AI:31
ASM02201	DIGITAL REFRIGERATION MODULE		
R57800	Comp Discharge Temp A	RSMD point TEMP1	AI:66
V38391	Suction Pressure Sensor A	RSMD point SP-1	AI:48
V38410	Discharge Pressure Sensor A	RSMD point HP-1	AI:50
V38391	Suction Pressure Sensor B	RSMD point SP-2	AI:73
V38410	Discharge Pressure Sensor B	RSMD point HP-2	AI:75
R63950	Modulated Condenser Signal A	RSMD point AO1	AI:46
R63950	Modulated Condenser Signal B	RSMD point AO2	AI:47
	Comp Status Input A	RSMD point BIN1	BI:77
	Comp Status Input B	RSMD point BIN2	BI:78
	Emergency Shutdown	RSMD point BIN4	BI:83
	Comp Part Load Signal B	RSMD point T2	AI:45
	Comp Enable A	RSMD Fixed Relay point	BI:84
	Comp Unload Signal A	RSMD point T1	AI:44
	Comp Enable B	RSMD Fixed Relay point	BI:85
ASM01670	MODULATING HOT GAS REHEAT MODULE		
	Reheat HGR Valve	MHGRV-X	AI:42

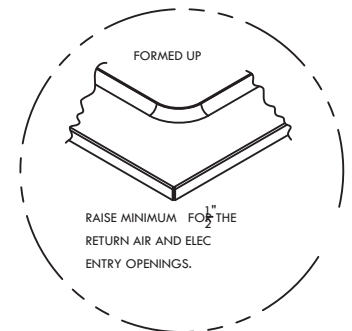
RN SERIES

B - CABINET WITH ECONOMIZER ~ 9-15 TON

CLEARANCES	
LOCATION	• UNIT SIZE • 9 - 15 TON
OUTSIDE AIR (BACK)	48
CONTROLS SIDE (FRONT)	48
LEFT SIDE	6
RIGHT SIDE	48
TOP	UNOBSTRUCTED



DETAIL A

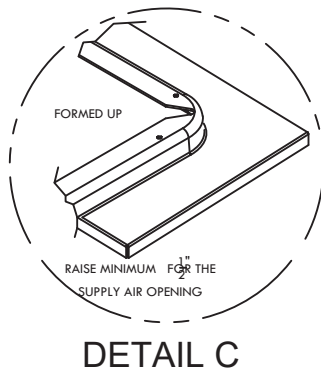


DETAIL B

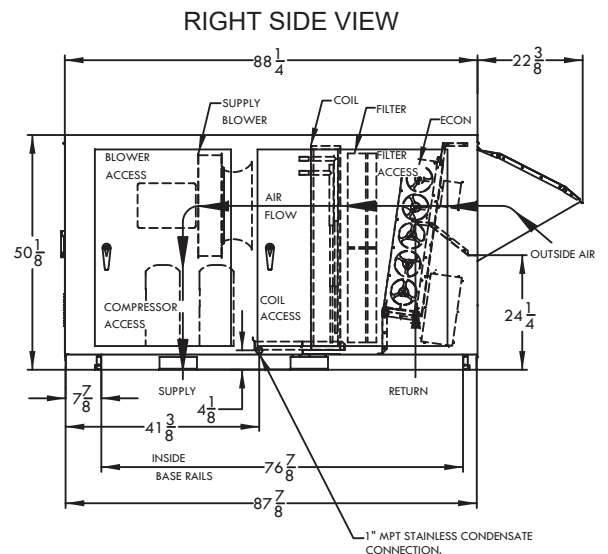
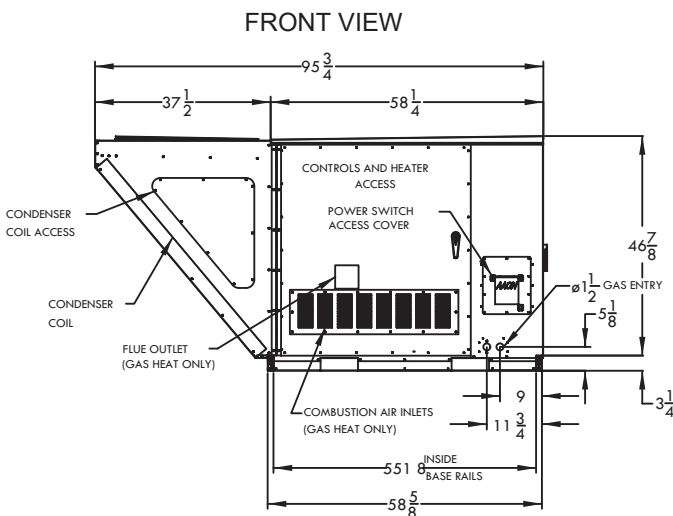
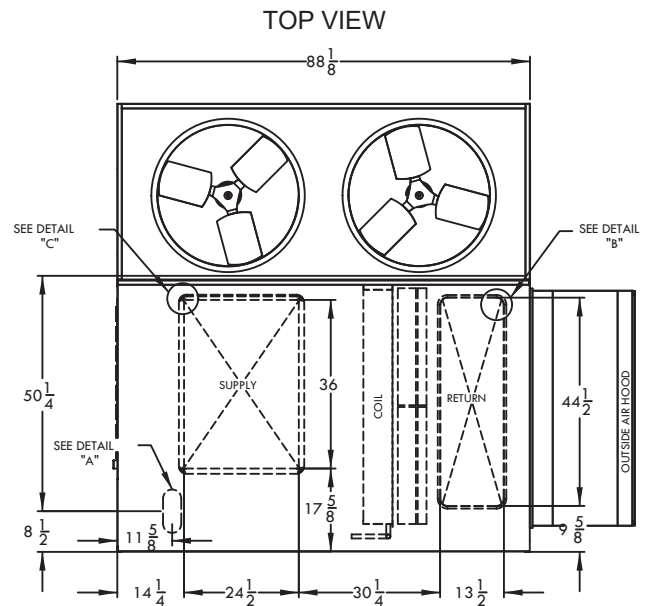
NUMBER OF CONDENSER FANS

9 & 11 TON - 1 FAN

13 & 15 TON - 2 FANS



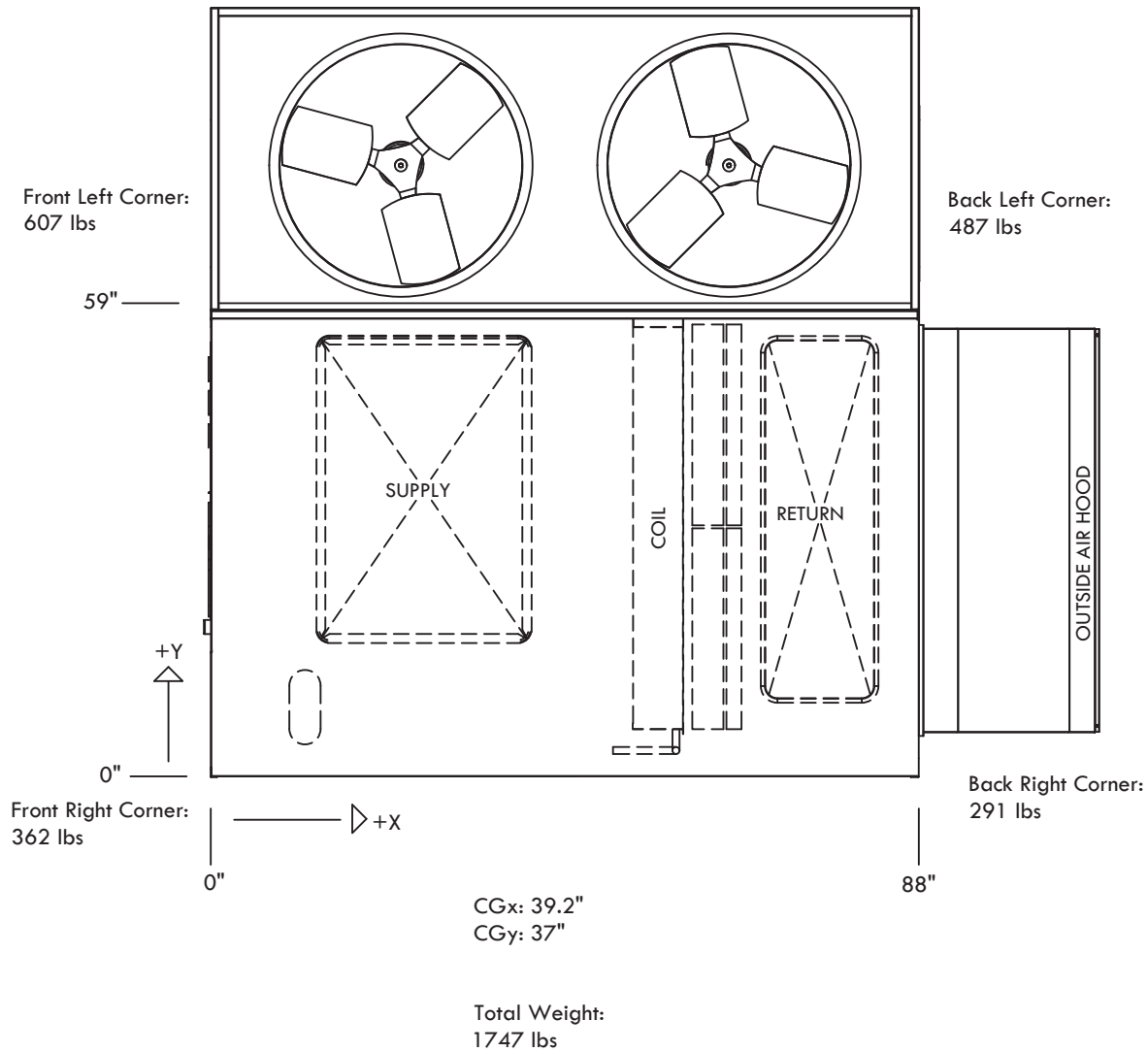
DETAIL C



RNB CABINET AIR COOLED CONDENSING UNIT



RN-011-3-A-HB89-142:A000-200-DCE-00A-01MRHB2-00-00E0000VB



Disclaimer:
This weight estimate does not account for any SPAs.



Unit Rating

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Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-011-3-A-HB89-142:A000-200-DCE-00A-01MRHB2-00-00E0000VB

Tag: RTU-15
Dehumidification

Job Information

Job Name: *Flour Bluff ISD ECD*
Job Number: *Job #18*
Site Altitude: *0 ft*
Refrigerant: *R-410A*

Static Pressure

External: *0.65 in. w.g.*
Evaporator: *0.26 in. w.g.*
Filters Clean: *0.10 in. w.g.*
Dirt Allowance: *0.35 in. w.g.*
Reheat Coil: *0.04 in. w.g.*

Cooling Section

	Gross	Net
Total Capacity:	<i>139.6 MBH</i>	<i>133.5 MBH</i>
Sensible Capacity:	<i>89.5 MBH</i>	<i>83.4 MBH</i>
Latent Capacity:	<i>50.1 MBH</i>	
Mixed Air Temp (DB/WB):	<i>74.6 °F</i>	<i>65.4 °F</i>
Entering Air Temp (DB/WB):	<i>74.6 °F</i>	<i>65.4 °F</i>
Lv Air Temp (Coil) (DB/WB):	<i>53.3 °F</i>	<i>53.2 °F</i>
Lv Air Temp (Unit) (DB/WB):	<i>54.7 °F</i>	<i>53.8 °F</i>

Supply Air Fan: *1 x RN185 @ 2.16 BHP Ea.*
SA Fan RPM / Width: *1859 RPM / 4.140 in*
SA Fan FEI: *1.16*

Evaporator Coil: *14.6 ft² / 6 Rows / 12 FPI*
Evaporator Face Velocity: *267.4 fpm*

Rating Information

Listing Model *RN-011-2,3,4,8-*HB**-***:*

Cooling Capacity: *126.0 MBH*
Cooling EER: *14.3 BTU/h-W*
Cooling IEER: *19.1 BTU/h-W*

**Rated in accordance with AHRI Standard 340/360 (I-P)*

Application EER @ Op. Conditions: *14.2 BTU/h-W*

Electrical Data

Circuit 1

Rating: *460V/3Ø/60Hz*
Unit FLA: *53*
SCCR: *5 KAIC*

	Qty	HP	VAC	Phase	RPM	FLA	RLA
Compressor 1:	<i>1</i>		<i>460</i>	<i>3</i>			<i>8.1</i>
Compressor 2:	<i>1</i>		<i>460</i>	<i>3</i>			<i>7.2</i>
Condenser Fan:	<i>2</i>	<i>0.33</i>	<i>460</i>	<i>1</i>	<i>1100</i>	<i>1.6</i>	
Supply Fan:	<i>1</i>	<i>3.00</i>	<i>460</i>	<i>3</i>	<i>1760</i>	<i>4.8</i>	

Unit Information

Approx. Op./Ship Weights: *1747 lbs / 1747 lbs (±5%)*
Ambient Temperature (DB/WB): *85.0 °F / 80.0 °F*
Coil Filter FV / Qty: *280.8 fpm / 4*
Supply Airflow/ESP: *3900 SCFM / 0.65 in. w.g.*
Outside Airflow: *200 SCFM*
Return Temperature (DB/WB): *74.0 °F / 64.5 °F*

Economizer: *0.27 in. w.g.*
Heating: *0.02 in. w.g.*
Cabinet: *0.20 in. w.g.*
Total: *1.88 in. w.g.*

Heating Section

Preheat Type: *Std (No Preheat)*

Auxiliary Heating Type: *Electric Heat*
Heating Airflow: *3900 SCFM*
Total Capacity: *136.5 MBH*
Entering Air Temp (DB/WB): *66.1 °F / 60.7 °F*
Leaving Air Temp (DB/WB): *97.9 °F / 71.0 °F*
Electric Heat FLA: *48*

Re-heat Coil:

Capacity: *91.1 MBH*
LA (DB/WB): *75.0 °F / 61.6 °F*
RH: *46.5%*



Unit Rating

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918) 583-2266
Ecat Version: 345.0

Cabinet Sound Power Levels*

Octave Bands:	63	125	250	500	1000	2000	4000	8000
Discharge LW (dB):	87	85	89	85	78	75	72	66
Return LW (dB):	78	74	76	70	65	61	56	45

**Sound power levels are given for informational purposes only. The sound levels are not guaranteed.*



18.5" STAR Plenum

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918) 583-2266
Ecat Version: 345.0

JOB INFORMATION:

Job Name: *Flour Bluff ISD ECD*
Job Tag: *RTU-15 Dehumidification*
Date: *2/5/2024 12:00:00 AM*

WHEEL SPECIFICATION:

Max RPM: *3000*
Diameter x Qty: *18.5 in. x 1*
CFM: *3900*
Inertia: *3WR²*

OPERATING CONDITIONS

Air Flow: *3900*
Fan Energy Index (FEI): *1.16*
Static Pressure: *1.88 in. Wg*
Relief Dampers DP: *0 in. Wg*
TSP: *1.88 in. Wg*
Site Altitude: *0 ft*
TSP @ Sea Level: *1.88 in. Wg*

MOTOR SELECTION

Rated HP / Bypass: *3 x 1 / No*
Frame Size: *182T*
Nominal RPM: *1760*
VAC/PH/HZ: *460V/3Ø/60Hz*
Enclosure Type: *ODP*
Max Inertial Load: *0 WR²*

FAN PERFORMANCE:

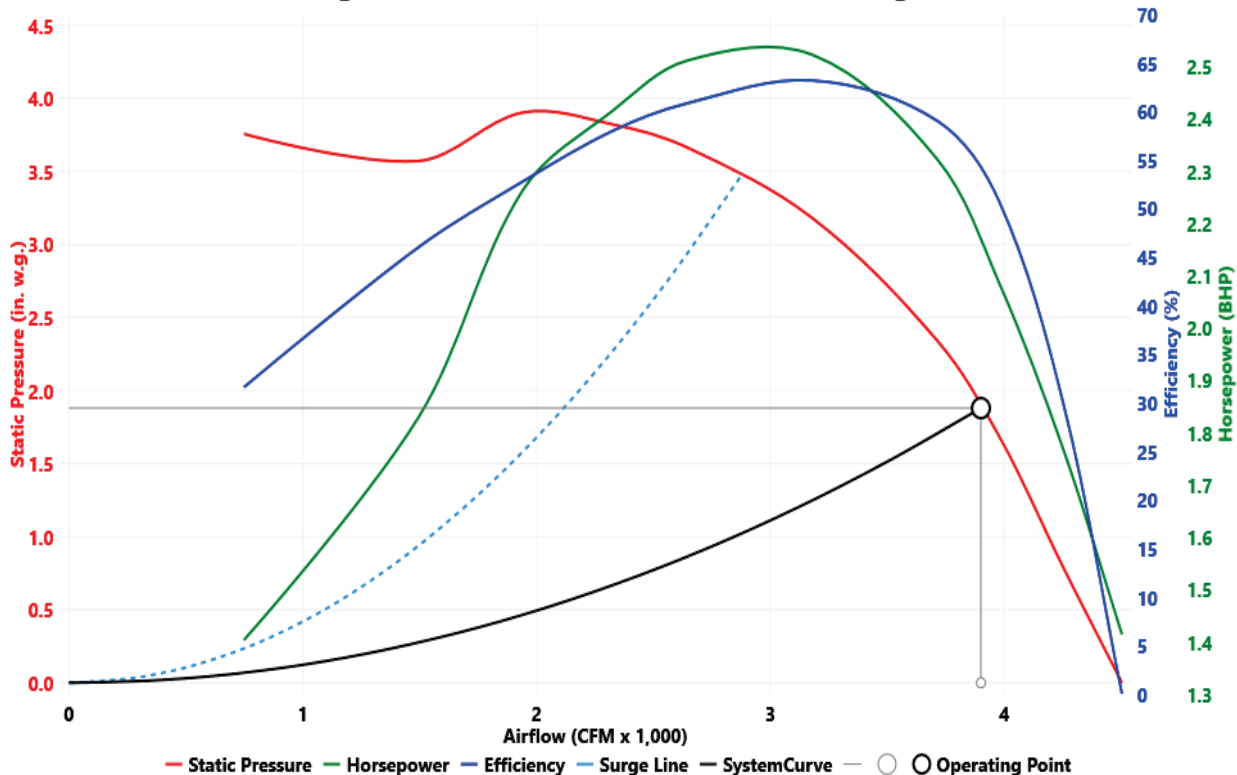
RPM: *1859*
BHP: *2.16*
Efficiency: *53.51%*
Max Duct SP with Blocked Airway: *0 in. Wg @1859 RPM*

FAN SOUND POWER (Inlet/Outlet)

Octave Band:		(Re 10 ⁻¹² watts)					
1	2	3	4	5	6	7	8
87	85	89	87	81	78	76	70
87	85	89	87	81	78	76	70

SOUND POWER A-Weighted: 70 dB

Supply Fan Model: RN185 @ 1859 RPM and 100% Width Design Conditions: 3900 CFM @ 1.88 in. w.g. SP





Unit Submittal

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918) 583-2266
Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-011-3-A-HB89-142:A000-200-DCE-00A-01MRHB2-00-00E0000VB

Tag: RTU-15

Dehumidification

Job Name: Flour Bluff ISD ECD

Unit Worksheet For:

Job Number: Job #18

Unit Worksheet Date: 2/5/2024

	Base Option	Description
RN	Generation	Rooftop - Ninth Generation
011	Unit Size	Eleven
3	Voltage	460V/3φ/60Hz
A	Interior Protection	Interior Corrosion Protection
H	Refrigerant Style	R-410A Variable Capacity Scroll Compressor + Two-Step Compressor - High Efficiency
B	Unit Configuration	Air-Cooled Cond. + 6 Row Evap. Coil
8	Coil Coating	Polymer E-Coated Condenser Coil
9	Cooling/Heat Pump Staging	Modulating - 1 VCC + 1 Staged Comp.
1	Heating Type	Electric Heat
4	Heating Designation	Heat 4 - 40 kW
2	Heating Staging	2 Stage

	Feature Option	Description
A	F1A.	RA/OA Section Economizer
0	F1B.	RA/EA Blower Configuration Standard - None
0	F1C.	RA/EA Blower Standard - None
0	F1D.	RA/EA Blower Motor Standard - None
2	F2.	OA Control FDD Fully Modulating Actuator - Enthalpy Limit + CO2 Override
0	F3.	Heat Options Standard
0	F4.	Maintenance Options Standard
D	F5A.	SA Blower Configuration 1 Blower + Premium Efficiency Motor + 1 VFD
C	F5B.	SA Blower 18.5" Direct Drive Backward Curved Plenum
E	F5C.	SA Motor 3.0 hp - 1760 rpm
0	F6A.	Pre Filter Type Standard - None
0	F6B.	Unit Filter Type 2" Pleated - 30% Eff
A	F6C.	Filter Options Clogged Filter Switch
0	F7.	Refrigeration Control Standard - Adj Comp. Cooling Lock Out Through Unit Controls
1	F8.	Refrigeration Options All Circuit Parallel Modulating Hot Gas Reheat Microchannel Coil [MHGR-MC]
M	F9.	Refrigeration Accessories ECM Condenser Fan - Head Pressure Control + Sight Glass + Compressor Isolation Valves
R	F10.	Power Options Circuit Breaker - 70 Amps
H	F11.	Safety Options Remote Safety Shutdown Terminals
B	F12.	Controls Phase & Brownout Protection
2	F13.	Special Controls VAV Single Zone Unit Controller - VAV Cool + CAV Heat
0	F14A.	Outside Air Configuration Standard - None
0	F14B.	Preheat Sizing Standard - None
0	F15.	Glycol Percent Water or No WSHp
0	F16.	Interior Cabinet Options Standard - Double Wall + R-13 Foam Insulation + Stainless Steel Drain Pan
E	F17.	Exterior Cabinet Options Base Insulation + Cond. Coil Guards
0	F18.	Electrical Rating Standard - 5 KAIC
0	F19.	Code Options Standard - ETL U.S.A. Listing
0	F20.	Crating Standard
0	F21.	Water-Cooled Cond. Standard - None
V	F22.	Control Vendors VCC-X Controls + Integrated BACnet IP
B	F23.	Type Standard - Includes AAON Gray Paint



Controller Components

2425 South Yukon Ave • Tulsa, OK 74107 • Ph: (918) 583-2266
Ecat Version: 345.0

1A 1B 1C 1D 2 3 4 5A 5B 5C 6A 6B 6C 7 8 9 10 11 12 13 14A 14B 15 16 17 18 19 20 21 22 23

RN-011-3-A-HB89-142:A000-200-DCE-00A-01MRHB2-00-00E0000VB

Tag: RTU-15 Dehumidification

Job Name: Flour Bluff ISD ECD

VCCX For:

Job Number: Job #18

VCCX Date:

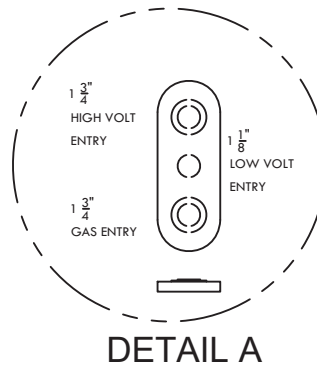
February 5, 2024

Part#	Included Parts	Assigned Channel	BACnet Point
ASM07424	VCCX-IP CONTROLLER		
ASM01692	OSA Temp/Hum Sensor	EBUS2 communicating sensor	AI:16, AI:17, AI:18, AI:19
ASM01820	Space Digital Temp/Hum Sensor	EBUS3 communicating sensor	AI:12, AI:13
R82890	Supply Temp Sensor - Field Installed	VCCX control point AI 3	AI:9
ASM01831	Duct Mount C02	EBUS4 communicating sensor	AI:29
ASM01840	Return Air Temp/Hum	EBUS6 communicating sensor	AI:14, AI:15
	Supply Fan Control Signal 0-10VDC	VCCX control point AO 1	AI:22
	Economizer	VCCX control point AO 2	AI:30
R62330	Proof of Air Flow	VCCX control point BI 1	BI:6, BI:24
R64580	Dirty Filter Sensor	VCCX control point BI 2	BI:25
	Safety Shut Down	VCCX control point BI 8	BI:26
	Supply Fan	Configured Relay Point	BI:47
	Heat 1	Configured Relay Point	BI:48
	Heat 2	Configured Relay Point	BI:49
ASM01691	EM1 EXPANSION MODULE		
	Economizer Position Feedback (title 24)	EM1 expansion point AI4	AI:31
ASM02201	DIGITAL REFRIGERATION MODULE		
R57800	Comp Discharge Temp A	RSMD point TEMP1	AI:66
V38391	Suction Pressure Sensor A	RSMD point SP-1	AI:48
V38410	Discharge Pressure Sensor A	RSMD point HP-1	AI:50
V38391	Suction Pressure Sensor B	RSMD point SP-2	AI:73
V38410	Discharge Pressure Sensor B	RSMD point HP-2	AI:75
R63950	Modulated Condenser Signal A	RSMD point AO1	AI:46
R63950	Modulated Condenser Signal B	RSMD point AO2	AI:47
	Comp Status Input A	RSMD point BIN1	BI:77
	Comp Status Input B	RSMD point BIN2	BI:78
	Emergency Shutdown	RSMD point BIN4	BI:83
	Comp Part Load Signal B	RSMD point T2	AI:45
	Comp Enable A	RSMD Fixed Relay point	BI:84
	Comp Unload Signal A	RSMD point T1	AI:44
	Comp Enable B	RSMD Fixed Relay point	BI:85
ASM01670	MODULATING HOT GAS REHEAT MODULE		
	Reheat HGR Valve	MHGRV-X	AI:42

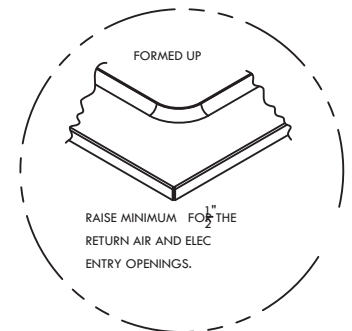
RN SERIES

B - CABINET WITH ECONOMIZER ~ 9-15 TON

CLEARANCES	
LOCATION	• UNIT SIZE • 9 - 15 TON
OUTSIDE AIR (BACK)	48
CONTROLS SIDE (FRONT)	48
LEFT SIDE	6
RIGHT SIDE	48
TOP	UNOBSTRUCTED



DETAIL A

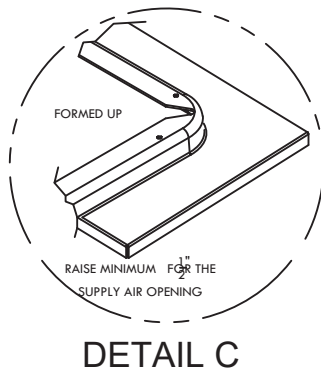


DETAIL B

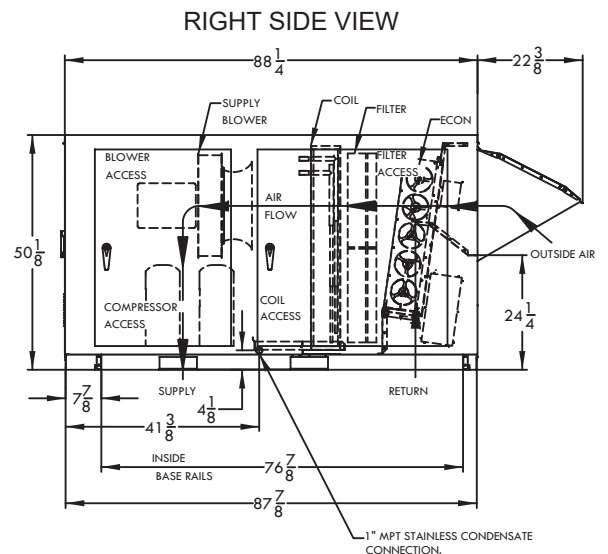
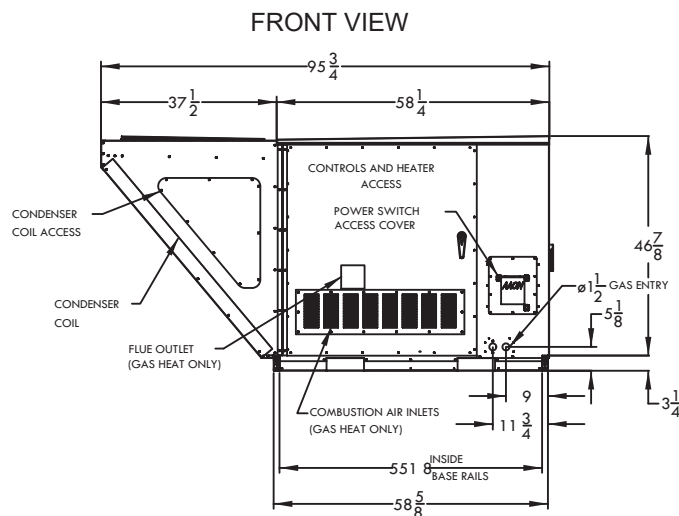
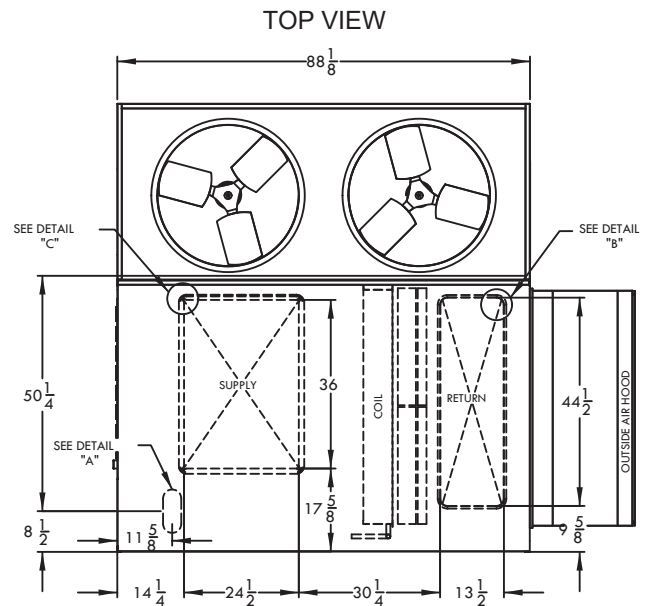
NUMBER OF CONDENSER FANS

9 & 11 TON - 1 FAN

13 & 15 TON - 2 FANS



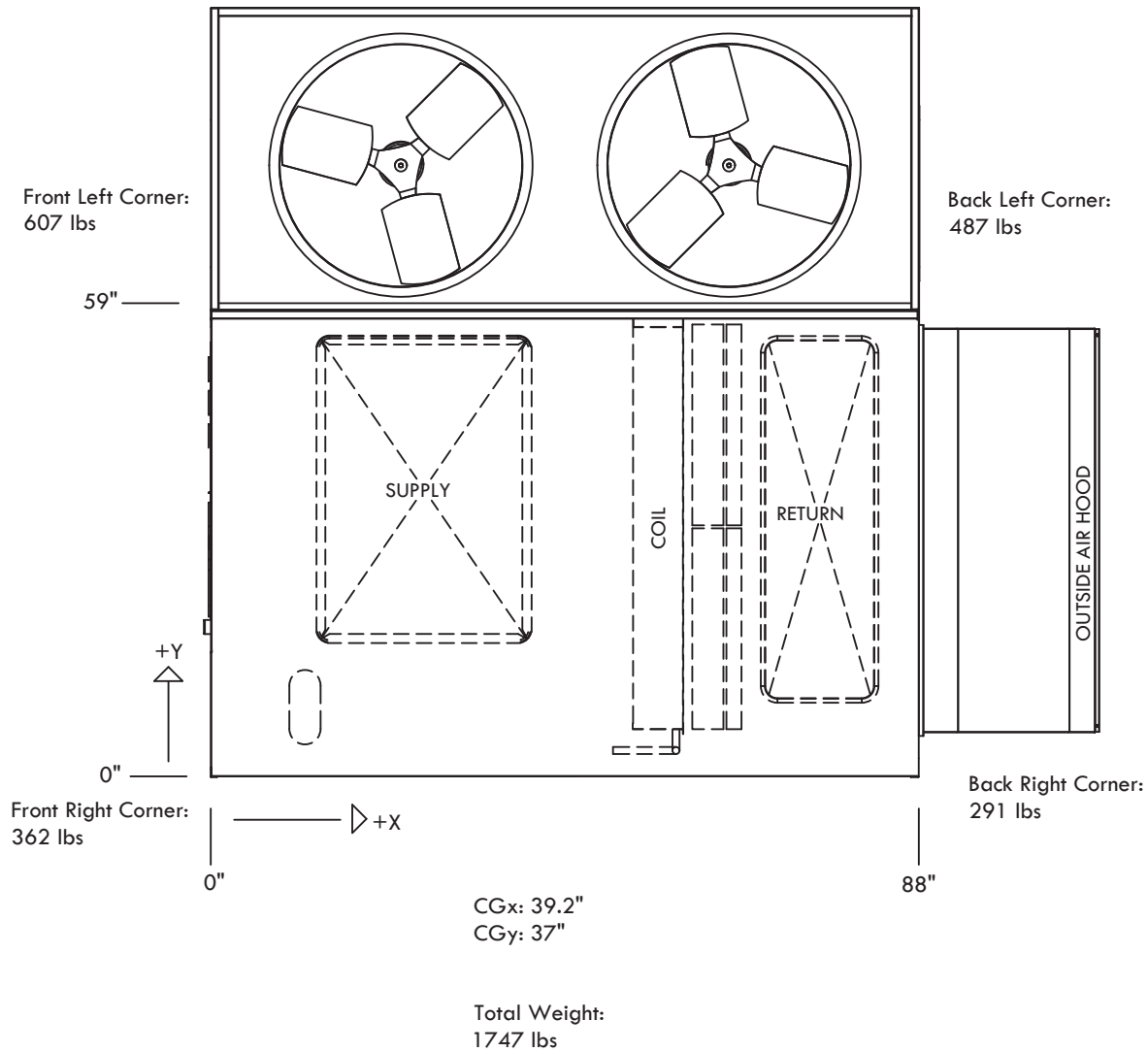
DETAIL C



RNB CABINET AIR COOLED CONDENSING UNIT



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Disclaimer:
This weight estimate does not account for any SPAs.