

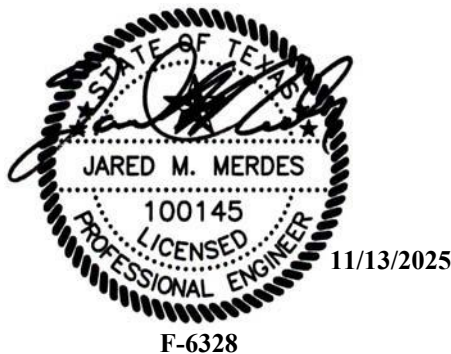


PROMOTING EXCELLENCE • CREATING THE FUTURE

**REQUEST FOR COMPETITIVE SEALED PROPOSALS
(RFCSP)
for
WOOD RIVER ELEMENTARY HVAC EQUIPMENT
REPLACEMENTS AND UPGRADES – 2026 (PHASE 1)**

**CALALLEN INDEPENDENT SCHOOL DISTRICT
15118 DRY CREEK DR.
CORPUS CHRISTI, TEXAS 78410**

Issue Date: November 13, 2025



**Sealed Proposal Submission to:
Calallen ISD
Attention: Emily Lorenz
Superintendent of Schools
Calallen ISD Administrant Building
4205 Wildcat Dr.
Corpus Christi, TX 78410**

**Deadline for Submission:
2:00 o'clock p.m., Thursday, December 4, 2025**

Pre-Proposal Meeting will be held at the CISD Administrative Office with onsite visit at 4205 Wildcat Drive, Corpus Christi, Texas 78410 on Wednesday November 19, 2025 at 8:30 am. Attendance is strongly encouraged.

Sealed Proposal Opening: Approximate 2:15 p.m. Thursday December 4, 2025 at Calallen ISD Administration Building Board Room located at 4205 Wildcat Dr. Corpus Christi, TX 78410. Attendance is not required.

The District is an Equal Opportunity employer/program. Historically Underutilized Businesses (HUB's) are encouraged to apply.

WOOD RIVER ELEMENTARY HVAC EQUIPMENT REPLACEMENTS AND UPGRADES – 2026 (PHASE 1)

CALALLEN INDEPENDENT SCHOOL DISTRICT CORPUS CHRISTI, TEXAS

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RFCSP - PUBLIC NOTICE

Competitive Sealed Proposals for “**Wood River Elementary HVAC Equipment Replacements and Upgrades – 2026 (Phase 1)**” for Calallen Independent School District, Corpus Christi, Texas, will be received by the Calallen Independent School District, Emily Lorenz – Superintendent of Schools, Calallen Administration Building, at 4205 Wildcat Drive, Corpus Christi, Texas 78410 on **Thursday at 2:00 o'clock p.m., December 4, 2025.**

Pre-Proposal Conference will be held at the Calallen Administration Building, at 4205 Wildcat Drive, Corpus Christi, Texas 78410 on **Wednesday at 8:30 o'clock a.m., November 19, 2025.**

Project consists of replacement of existing HVAC split DX and packaged units with new, installation of new HVAC equipment, general roofing repairs for HVAC, electrical and BAS support connections and general construction work indicated on drawings and specifications.

Electronic Proposal Documents are available from the Engineers' Office by request and the CISD website at <https://www.calallen.org/departments/business-office/purchasing-procurement>. All offerors shall register with the Engineer's office with request emailed to Patty Garcia, p.garcia@scaengineering.com to be notified of any addendums and clarifications as necessary. Offerors that do not register with the Engineers office will be responsible for checking download links regularly for any updates as applicable.

Office of the Engineer: Stridde, Callins, and Associated, Inc.; 342 S. Navigation Blvd., Corpus Christi, Texas 78405, Telephone 361-883-9199.

**REQUEST FOR COMPETITIVE SEALED PROPOSALS (RFCSP)
FOR
WOOD RIVER ELEMENTARY HVAC EQUIPMENT REPLACEMENTS AND UPGRADES – 2026
(PHASE 1)**

NOTICE AND INSTRUCTIONS TO RESPONDENTS:

Calallen Independent School District herein referred to as “the District” is a tax-exempt educational organization which is located in northwest Corpus Christi, Texas. The District has approximately 4,000 students and operates two elementary schools, two intermediate schools, a middle school, and a high school. The school’s board is composed of seven active members. The District receives funding from local, state, and federal sources, including taxpayer dollars, the Texas Education Agency (TEA), and the U.S. Department of Education (USDE).

Using the Request for Competitive Sealed Proposals (RFCSP) method of procurement under Texas Government Code Chapter 2269, Subchapter D, the District is soliciting proposals from qualified vendors to provide for rerouting of existing sanitary/waste plumbing piping system (underground within baseball field area) and general construction work indicated on drawings and specifications.

The RFCSP is to be received at the time and location designated and should include all the information requested hereafter. Failure to comply with the requirements contained in this RFCSP may result in a finding that the respondent and proposal is not qualified. The District reserves the right to exclude from consideration any responses that are incomplete or received after the deadline. All times included in this RFCSP are Central Standard Time (CST).

All solicitations are posted to the District's website, and upon request, will be made available to anyone who wishes to submit a response. However, it is the responsibility of the Respondent to provide the District with appropriate company name, authorized representatives, and contact information for the purposes of receiving notices, changes, addenda, or other critical information. Otherwise, potential respondents are responsible for watching for such notifications.

The District may choose to award to a single Respondent, or multiple Respondents. The District makes no guarantee that an award will be made as a result of this RFCSP or any subsequent RFCSP's and reserves the right to accept or reject any or all submittals, waive any formalities, irregularities, or minor technical inconsistencies, or delete any item/requirement from the RFCSP or contract when deemed to be in the District's best interest.

No contract or award shall be executed until it has been reviewed and approved by the School Board in a duly called and posted meeting of the Board. This RFCSP does not commit the District to pay for any costs incurred prior to the execution of the contract and issuance of the District Purchase Order.

The District reserves the right to accept or reject any and all Respondents, request additional information from Respondents, extend the deadline for submission, and cancel and reissue to RFCSP.

The vendor SHALL NOT contact in any manner, nor deliver gifts or other items, to any District employee (other than the point of contact listed herein for questions and submissions), School Board member, or District consultant during this proposal solicitation, evaluation, and award process without prior approval of the Director of Operations. This restriction extends to “thank you” letters, phone calls, emails and any contact that results in the direct or indirect discussion of the CSP and/or Proposal submitted by Respondents. Failure to comply will result in disqualification.

RFCSP ACTIVITIES:

Issue & Advertise RFCSP – Advertisement #1:

Thursday, November 13, 2025

This is the date of the first procurement advertisement in the Corpus Christi Caller Times newspaper, posted to the district website, and initial distribution of RFCSP packet to vendor list.

Advertisement #2:

Thursday, November 20, 2025

This is the date of the second procurement advertisement in the Corpus Christi Caller Times newspaper.

Pre-Proposal Walk-Throughs:

Wednesday, November 19, 2025 @ 8:30 am

Deadline for Technical

Assistance Questions:

Monday, December 1, 2025 at 12:00 Noon

This is time and date that any technical questions must be submitted by to the District and Engineer.

Deadline for Sealed Proposals:

Thursday, December 4, 2025 at 2:00 pm

This is the time and date that all proposals must be submitted and received by the District following the specifications in this document.

Proposals/Bid Opening:

Thursday, December 4, 2025 at approximately
2:15 pm

This is the time and date that the District's staff will receive, publicly open, and read aloud the names of the Respondents and all fees and prices stated in the Proposals at the District's administration address: 4205 Wildcat Drive Corpus Christi, TX 78410.

PRE-PROPOSAL WALK-THROUGH:

Pre-Proposal Conference will be held at the Calallen Administration Building, at 4205 Wildcat Drive, Corpus Christi, Texas 78410 on **Wednesday at 8:30 o'clock a.m., November 19, 2025**. Site Visit will be conducted after the meeting at Wood River Elementary School, 15118 Dry Creek Dr., Corpus Christi, Texas 78410 after the pre-proposal meeting. Attendance is strongly encouraged.

TECHNICAL ASSISTANCE AND REQUESTS FOR CLARIFICATION / INTERPRETATION:

Vendors must submit questions regarding this procurement in writing via the following point of contact: Engineer's office with request e-mailed to Patty Garcia p.garcia@scaengineering.com, (361) 883-9199. The deadline for submitting questions is **Monday, December 1, 2025 at 12:00 Noon**. The questions and answers will be made available to all vendors that will be provided in an email response from the District prior to the submittal deadline. Any clarifications or interpretations of this RFCSP that materially affects or changes its requirements will be issued by the District as an addendum. It is the responsibility of each Respondent to obtain this information in a timely manner. All such addenda issued by the District before the Proposals are due are part of the RFP, and Respondents shall acknowledge receipt of each addendum. The District will consider only those clarifications and interpretations that Respondents timely submit prior to the submittal deadline. Interpretations or clarifications in any other form, including oral statements, will not be binding on the District and should not be relied on in preparing Proposals.

PROPOSAL SUBMITTAL REQUIREMENTS:

Responses must be **delivered** to:

**Calallen ISD
Attention: Emily Lorenz
Superintendent of Schools
Calallen ISD Adminstrant Building
4205 Wildcat Dr.
Corpus Christi, TX 78410**

Proposal envelopes must be plainly marked on the outside with the Respondent's name and address and the following:

**SEALED PROPOSAL - DO NOT OPEN
CALALLEN ISD – Wood River HVAC Equipment Replacements and Upgrades – 2026
(Phase 1)**

The District will not accept responses by oral communication, telephone, electronic mail, telegraphic transmission, fax transmission, or other electronic means. Respondents who hand deliver or mail their proposals, and also provide an electronic copy to any District contact will be disqualified.

Following the deadline for receipt, the District's staff will receive, publicly open, and read aloud the names of the Respondents and all fees and prices stated in the Proposals at the District's administration address: 4205 Wildcat Drive Corpus Christi, TX 78410. Within forty-five (45) days following the date of the opening, District staff will evaluate and rank each Proposal submitted in relation to the selection criteria set forth herein.

Respondents are solely responsible for the timely delivery of their proposal response based on the instructions in this RFCSP. Responses received after the deadline will be rejected and shall be returned to the Respondent(s) unopened. No provisions or exceptions are made for late delivery due to actions or consequences of third-party carriers. The District is not responsible for notifying Respondents of receipt of proposals delivered by third-party carriers.

A complete response will consist of One (1) clearly marked original containing original signatures, Five (5) clearly marked exact copies using standard letter size paper (8.5" x 11") and one digital copy of USB flash media drive. Your proposal must be delivered in a **sealed envelope plainly marked with the RFCSP Title above**. The 'original' response shall prevail in the event of a discrepancy between the Respondent's submissions.

Each proposal shall include the following Three (3) items:

- A. Attachment "A": Procurement Proposal Response Packet (all 37 pages)**
- B. Attachment "A1" Contractors supporting documentation**
- C. Proposal/Bid Security "Bid Bond"**

All vendors must utilize the provided Procurement Proposal Response Packet (Attachment A) as means of response to be considered. All pages in the provided packet must be completed and all required signatures present to be considered. Proposals and responses shall be direct, concise, and complete; prepared in a manner that provides a straightforward description of the respondent's ability to meet the requirements set forth in the RFCSP. Emphasis should be on completeness, clarity of content, responsiveness to the requirements, and an understanding of the District's needs. When submitting a proposal, it is required that Respondent s have the necessary professional experience, prior training and applicable professional judgment to perform the activities proposed to supply the services requested by this RFCSP.

PROPOSAL/BID SECURITY "BID BOND":

A certified or cashier's check, or bid/proposal bond acceptable to Owner, in the amount of at least five percent (5%) of the largest amount proposed must accompany each Proposal submitted. Such proposal security is to protect Owner against the withdrawal by the Proposer 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 Performance and Payment Bonds within ten (10) days after notification of acceptance.

If any Offeror withdraws his proposal(s), after Owner's opening of proposals, he shall forfeit such bid 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/Agreement provided for by Owner or fails or refuses to furnish the required Contract and required Performance and Payment Bonds within ten (10) days after notification of such acceptance, he shall forfeit such security to Owner as liquidated damages for such default.

The proposal security of all Offerors, except the three lowest, shall be returned promptly after the tabulation of proposals. 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 thirty (30) days after the date scheduled for opening of proposal and an Offeror withdraws their proposal, their security shall also be returned.

SELECTION PROCESS:

In accordance with Education Code 44.031(b) and Government Code 2269.155, in evaluating qualified proposals for contract award, the District will use the Best Value Method to determine the awarded vendor(s). In determining Best Value, the District will consider the following evaluation criteria, which will be evaluated based on the following scale:

WEIGHT	CRITERIA
5%	Offeror's General Firm Information and Safety Record (Criteria 1.1 to 1.3)
25%	Offeror's Experience, Reputation and References (Criteria 2.1 to 2.3)
5%	Offeror's Project Personnel and Qualifications (Criteria 3.1 to 3.3)
5%	Offeror's Financial Stability (Criteria 4.1 to 4.2)
50%	Price Proposal (Criteria 5)
10%	Offeror's Proposed Construction Schedule (Criteria 6)

The district will select the Respondent that submits the proposal that offers the best value for the district based on the selection criteria and weighted values above, and its subsequent ranking evaluation.

Following the ranking of the Proposals based on the published selection criteria and board action to approve the ranking, the District will attempt to negotiate an agreement with the Respondent that offers the best value to the District. If the District is unable to negotiate an agreement with the selected Respondent, the District will, formally and in writing, end negotiations with that Respondent and begin the negotiation process with the next ranked Respondent in the order of selection ranking until a contract is reached or negotiations with all ranked Respondents end. Please note that the Board may choose to delegate authority to the District's Administration to negotiate and/or execute a contract depending on the specific Board action taken.

By submission of their Proposal, the Offeror also agrees to waive all rights to claims against the District "Calallen I.S.D.", or persons authorized by the district, including the Engineer, Stridde, Callins and Associates, Inc. for any damages whatsoever arising from the Owner's or said person's evaluation of the Offeror's proposal and/or qualifications to perform this specific project.

EXAMINATION OF THE CONTRACT DOCUMENTS AND SITE:

Each Offeror, before submitting their Proposal, shall fully examine and acquaint themselves with the Contract Documents and the sites of the proposed Project. Offeror shall make such investigations 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.

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

ADDENDA:

Changes in or official interpretations of the Contract Documents will be made only by written addenda. Addenda will be issued primarily by e-mail and will be updated to the main project download link. Offerors that do not have access to e-mail may make special arrangements with Engineer for alternate delivery methods or shall be required to check the download link regularly.

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 and failure of any Offeror to receive any addendum will not release them from any obligation under their Proposal. However, if any Offeror fails to receive any addendum, and their offer is otherwise determined by the Owner to provide the best value, the contract may be awarded to them and the changes in the work set out in the addendum 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.

TRENCH AND EXCAVATION:

If the project requires trench excavation which will exceed a depth of five feet, the Contractor will be required to comply with the provisions of the Trench Safety Requirements of the Contract Documents and to include a separate pay item for trench excavation safety protection based upon (i) the number of linear feet of trench excavated, and (ii) the square feet of any shoring used to satisfy any special shoring requirements. In the absence of enclosures of same in Proposal, Contractor will provide all elements necessary to comply with Trench Safety Requirements at the stipulated lump-sum proposal, without additional compensation.

Contractor shall contract "Call Before You Dig" to mark all known underground utilities before the start of **any work**.

EQUIVALENT PRODUCTS:

In order to establish the desired standard of quality or effect, the Specifications make reference to specific brands, trade-names and/or manufacturer of specified systems, methods, materials and/or services. Additionally, where appropriate, manufacturers of equivalent systems or products are listed. These do not require approval prior to opening of Proposals.

Where approval is required prior to receipt of Proposals others desiring to propose "as equals" shall obtain Engineers' written permission to do so not later than five (5) days prior to the date scheduled for opening of Proposals. The Engineer shall be provided with manufacturer's data, cut sheets, product samples, and other supportive information sufficient to allow the Engineer to render a decision. Also included shall be a letter referenced to this specific project stating that the proposed system, method, material or service meets or exceeds that specified. Approved equals shall be identified in writing. The decision of the Engineer is absolute and final.

GENERAL TERMS AND CONDITIONS:

Respondents are advised to review the Standard Form of Agreement Between Owner and Contractor where the Basis of Payment is a Stipulated Sum - AIA Documents A101-2017 and A201-2017 as modified by the Owner, (attached as **Appendix 1**). **Offeror is directed to pay special attention to the terms and conditions in this proposed form of agreement. The terms and conditions in these AIA documents will govern and to the extent there is any conflict between the terms and conditions below and the terms of the A101-2017 and A201-2017, both as modified by Owner, the AIA form of agreement will govern.**

1. Applicability:

- a) All items listed under the general terms and conditions apply unless otherwise stated in the specifications.
- b) These conditions are applicable and form a part of the contract documents in each commodity and/or service contract and a part of the terms of each purchase order for commodity and/or service included in the specifications and Proposal forms issued herewith.

2. Laws, Policies, and Procedures:

- a) This solicitation shall be governed by the following documents unless an exception is otherwise taken within this solicitation. Some documents are incorporated by reference only, and may not be attached as part of this solicitation, though they will be considered enforced as part of the solicitation.
 - Texas Education Code Section 44.031.
 - Texas Government Code Sections 2253, 2258, 2269
 - CISD Policies, including but not limited to CH(Legal), CH (Local), CV (Legal), CV (Local), CVB (Legal), CVB (Local).

3. Use of District Documents:

- a) Proposal responses must be submitted on forms provided by the District. No alteration to the District forms will be permitted, including substitutions, additions, deletions, or interlineations, without written consent of the District.
- b) Reproduction of District documents is permitted, so long as reproduced copies are exactly the same in size, format, and content as forms prepared by the District. Any response submitted in altered form may result in rejection of such response at the option of the District.

4. Development of Specifications:

- a) Brands of equal quality or type are acceptable. The District reserves the right to make final decisions as comparable items. Be very certain that items upon which you submit and deliver are equal to items listed. Materials that are determined to be not equal shall be returned to the Respondent transportation charges collect.
- b) Whenever an article or material is defined by describing a proprietary product or by using the name of a manufacturer or brand name, the term "or equal" if not inserted shall be implied. The specified article or material shall be understood as indicating the type, function, minimum standard of design, efficiency, and quality desired and shall not be construed as to exclude other manufactured products of comparable quality, design, and efficiency.
- c) The District reserves the right to purchase additional quantities above that stated at the same unit price unless otherwise specified by the Respondent.
- d) The District reserves the right to modify conditions and specifications by mutual agreement with the selected supplier, both at the time of acceptance of this Proposal offer as so modified and subsequent thereto.

5. Inspection of Documents:

- a) Before submitting a response, each Respondent shall thoroughly examine the Proposal documents and project sites (if applicable) to ensure that the equipment and/or services submitted meet the intent of these specifications.
- b) Each Respondent receiving forms prepared by the District is responsible for inspection of District documents for missing or illegible pages, or other indication of incomplete information provided to the Respondent. The failure or neglect of Respondent to receive or examine any contract document, form, instrument, addendum, or document shall in no way relieve Respondent from obligations with respect to his or her response. The submission of a response shall be taken as prima facie evidence of compliance with this section. Receipt of addenda to the Proposal documents by a Respondent must be acknowledged in the response.
- c) The District is not responsible for incomplete response packets.

6. Withdrawal or Modification or Correction of Submitted Proposal Responses:

- a) Any response, which has been submitted, may be withdrawn prior to the deadline. A request to withdraw a Proposal response must be in writing and be received by the District prior to the receiving deadline.
- b) No amendment, addendum, or modification shall be accepted after the deadline for submitting a Proposal response to the District. If a change to a response that has been submitted is desired, the

submitted response must be withdrawn and the replacement response submitted prior to the receiving deadline.

- c) No Respondent may have more than one Proposal response on file with the District.
- d) After the scheduled time for receiving Proposal responses, responses may not be withdrawn for a period of sixty (60) days.
- e) Any contract entered into can be modified or rescinded only by a written document signed by both of the parties or their duly authorized agents.
- f) Any erasures and/or corrections to Proposals, whether executed prior to or subsequent to the original Proposal submittal shall be authenticated by affixing in the margin immediately opposite the correction and the initials of the agent(s) signing the Proposal response.

7. Proposal Cost:

- a) The District shall not be liable for any cost incurred by a Respondent in the preparation or delivery of its response to this request for competitive sealed proposal or for any other cost incurred because of the request for proposal.

8. Proposal Disclosure:

- a) The District is a government body subject to the Texas Public Information Act. Responses submitted to the District as a result of this solicitation are subject to release as public information after contracts are executed or the procurement is terminated. In the event a Respondent desires to claim portions of submitted response are exempt from disclosure, it is incumbent upon the Respondent to identify those portions in a transmittal letter. The transmittal letter must identify the page, the particular exemption(s) from disclosure, and the contended justification for exemption upon which it is making its claim. The District will consider a Respondent's request(s) for exemption from disclosure; however, the District will not be bound by the assertion that a page contains exempt material. An assertion by a Respondent that an entire volume of its response is exempt from disclosure will not be honored.
- b) Until a contract resulting from this request for Proposal is executed, no employee, agent, or representative of any Respondent shall make available or discuss its response with the press, any elected or appointed official or officer of the District, or any employee, agent, or other representative of the District, unless specifically allowed to do so in writing by the District for the purposes of clarification, evaluation, and/or awarding the Proposal.
- c) Respondents shall not issue any news release(s) or make any statement to the news media pertaining to this request for Proposal or any Proposal and/or contract or work resulting therefrom without the prior written approval of the District and then only in cooperation with the District.
- d) By signing this Proposal response, a Respondent affirms he/she has not given, offered to give, nor intends to give at any time hereafter any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to a public servant in connection with the Proposal response submitted.
- e) Respondent shall note any and all relationships which might be a conflict of interest and include such information with their response.
- f) By signing this Proposal response, a Respondent affirms, to the best of his/her knowledge, the response has been arrived at independently, and is submitted without collusion with anyone to obtain information or gain any favoritism that would in any way limit competition or give them an unfair advantage over other Respondents in the award of this Proposal.
- g) If a Respondent's response is accepted by the District, the Respondent shall not advertise or publish, without the District's prior consent, the fact the District has entered into the contract, except to the extent necessary to comply with proper requests for information from an authorized representative of the federal, state, or local government.

9. Delivery and Materials:

- a) The Respondent shall store and protect materials and equipment in accordance with the manufacturer's recommendations.
- b) The Respondent, in the event of damage, shall immediately make all repairs and replacements necessary to the approval of Calallen ISD, with no additional cost to the District.
- c) All deliveries will be made to the address(es) specified on the purchase order during normal working hours of 8:00 a.m. to 4:00 p.m. Monday through Friday, unless authorized by the Purchasing Coordinator or designee.

- d) The District shall not be responsible for any “hidden damage” for a period dating from the date of delivery until statute of limitations as provided by the Uniform Commercial Code.
- e) If applicable, delivery shall provide, at no cost, at least one copy of any applicable Manufacturer’s Safety Data Sheets (SDS) with each shipment, and upon request. If OSHA, federal, or state laws provide for additional requirements, those requirements are in addition to the SDS requirement.
- f) The Respondent shall retain all portable and detachable parts or portions of installation until final completion of work. These parts shall be delivered to the District’s Representative or designated District site and acknowledged as itemized receipts to obtain request for final payment.

10. Licenses, Permits, and Taxes:

- a) The price or prices for the services shall include full compensation for all taxes, permits, and licenses that the Respondent is or may be required to pay.

11. Invoice, Payment, and Inspection:

- a) The Respondent shall provide an invoice showing labor hours performed by labor description and the actual invoices for all materials purchased before payment will be issued.
- b) The District will pay the Contractor’s actual cost plus the contracted mark up for materials. All items purchased (i.e., tools) and billed to the District will remain the property of the District.
- c) Federal excise taxes, state taxes, or sales taxes shall not be included in the invoiced amount. The District is not liable for these taxes. The District will furnish a tax exemption certificate upon request.
- d) All valid and complete invoices received by the District will be paid within thirty (30) days of the District’s receipt of the deliverables or of the invoice, whichever is later.
- e) Payment terms, including the rate of interest that shall accrue on any overdue payments, are subject to Chapter 2251 of the Texas Government Code.
- f) The Respondent shall demonstrate work completed meets the requirements of Galveston ISD.
- g) The District Representative shall give final approval to all work performed.
- h) The Respondent will email all or fax all inspection reports or other applicable documents to the District Representative for processing.

12. Award of Contract:

- a) The District reserves the right to accept or reject, in part or in whole, any and all Proposal responses and to waive any irregularities or informalities in any Proposal or in the Proposal process. The contract will be awarded to a responsible Respondent. Whose responses are most advantageous to the District, considering the relative importance of price and the other evaluation criteria which may be included in the proposal.
- b) Award of the contract shall be made to the bidder who provides goods or services at the best value for the District taking into consideration the relative importance of price and other factors set forth below. Best value evaluation criteria will be grouped into percentage factors.
- c) The District may, by written notice to contractor, cancel the contract if it is found by the District that gratuities, in the form of entertainment, gifts, or otherwise, were offered or given by contractor or any agent or representative of contractor, to any employee or members of the Board of Trustees with a view toward securing an order or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performing of such order.
- d) A Respondent may be disqualified before or after an award is made, upon evidence of collusion with the intent to defraud, or perform other illegal activities for the purpose of obtaining an unfair competitive advantage.
- e) It is expected that all contact by Respondent with any District personnel and/or members of the Board of Trustees begin with the issuer of this Proposal. Failure to follow this procedure is grounds for eliminating the Respondent from any further consideration of awarding the contract. The recommendation to award the Proposal will be made to the District Board of Trustees. No contract shall be executed until it has been reviewed and approved by the Board of Trustees in a duly called and posted meeting of the Board.
- f) In connection with the performance of work under the contract, the Respondent agrees to comply with the Fair Labor Standard Act, Equal Opportunity Employment Act, and all other applicable federal, state, and local laws, regulations, and executive orders to the extent that the same may be applicable.

13. Insurance:

- a) If requested the successful Respondent shall be required to provide the District with copies of certificates of insurance, named as additional insured. Certificates of Insurance, name and address

of Respondent, the limits of liability, the effective dates of each policy and policy number shall be delivered to the District prior to commencement of work. The insurance company shall be licensed in the State of Texas, certificate forms shall be approved by the Texas Department of Insurance and shall be acceptable to the District. All policies of insurance shall waive all rights of subrogation against the District, its officers, employees, and agents.

- b) The required insurance coverages and limits are listed in the draft of form agreement provided with this RFCSP.

14. Prevailing Wage Rate:

- a) Respondents are required to comply with Texas Government Code, Chapter 2258 Prevailing Wage Rates, with respect to payment of prevailing wage rates for the construction or improvements, paid for in whole or in part from public funds, without regard to whether the work is done under public supervision or direction. A worker is employed on a public work if the worker is employed by the Respondent or any subcontractor in the execution of the contract for the project.
- b) A worker employed on a public work by or on behalf of the District shall be paid no less than the general prevailing rate of per diem wages for the work of similar character in the locality in which the work is performed, and not less than the general prevailing rate of per diem wages for legal holiday and overtime work.
- c) The District has adopted the federal Davis-Bacon wage rates for the use in Texas pursuant to and in accordance with the Texas Government Code, Section 2258.022. The District's prevailing wage rate is provided in the vendor packet in **Exhibit A**.
- d) The Respondent or subcontractor who violates Texas Government Code Section 2258.023 shall forfeit as a penalty to the District, \$60.00 for each worker employed for each calendar day, or portion thereof, such worker is paid less than the stipulated rates for any work done under the contract by him, or by any subcontractor under him.
- e) Nothing herein contained, however, shall be construed to prohibit the payment of more than the prevailing rate of wages to any worker employed on the work.

15. Service-Related Contracts:

- a) The Respondent warrants it shall have available the necessary personnel, organization, equipment, and facilities to perform all the services and /or provide all the goods required under this solicitation.
- b) The Respondent shall employ orderly and competent employees trained in the required services to be provided under this solicitation.
- c) The Respondent, its employees, subcontractors, and subcontractor's employees may not use or possess any firearms, intoxicating beverages, tobacco, illegal drugs, or controlled substances while on the District's property, nor may such workers be intoxicated, or under the influence of alcohol or drugs.
- d) The District reserves the right to prevent, forbid, and/or temporarily or permanently bar any Respondent, its employees, subcontractors, and subcontractor's employees from any district facility for whatever reason it determines necessary to maintain safety and orderly operations.
- e) If applicable under this solicitation, Respondent, its employees, subcontractors, and subcontractor's employees shall have and maintain any and all required licenses and/or certifications for the duration of the contract. Additionally, the District reserves the right to require proof of any such requirement at any time during the contract term.
- f) The Respondent, its employees, subcontractors, and subcontractor's employees shall fully comply with all applicable federal, state, and local safety and health laws, ordinances, rules and regulations in the performance of the services, including but not limited to those imposed by the District and by the Occupational Safety and Health Administration (OSHA). In case of conflict, the most stringent safety requirements shall govern.

16. Warranties:

- a) Warranty conditions for all supplies and/or equipment shall be considered manufacturer's minimum standard warranty or a minimum of one (1) year guarantee, whichever is greater, unless otherwise agreed to in writing. Respondent shall be an authorized dealer, distributor, or manufacturer for the product. All equipment submitted shall be new unless clearly stated in writing.
- b) If a Respondent's response is accepted by the District, the price to be paid by the District shall be that contained in Respondent's response which Respondent warrants to be no higher than Respondent's current prices on orders by others for products of the kind and specification covered

by this agreement for similar quantities under similar or like conditions and methods of purchase. In the event Respondent breaches this warranty, the prices of the items shall be reduced to the Respondent's current prices on orders by others, or in the alternative, the District may cancel this contract without liability to Respondent for breach or Respondent actual expense.

- c) If a Respondent's response is accepted by the District, the Respondent warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for commission, percentage, brokerage, or contingent fee excepting bona fide employees of bona fide established commercial or selling agencies maintained by the Respondent for the purpose of securing business. For breach or violation of this warranty, the District shall have the right in addition to any other right or rights to cancel the contract without liability and to deduct from the contract price, or otherwise recover the full amount of such commission percentage, brokerage, or contingent fee.
- d) If a Respondent's response is accepted by the District, the Respondent shall not limit or exclude any implied warranties and attempt to do so shall render the contract voidable at the option of the District. Respondent warrants that the goods furnished will conform to the specifications, drawings, and descriptions listed in this request for Proposal, and to the sample(s) furnished by the Respondent, if any. In the event of a conflict between the specifications, drawings, and descriptions, the specification shall govern.
- e) If a Respondent's response is accepted by the District, the Respondent warrants the product sold to the District shall conform to the standards promulgated by the U.S. Department of Labor under Occupational Safety and Health Act (OSHA). In the event the product does not conform to OSHA standards, the District may return the product for correction or replacement at the Respondent's expense. In the event the Respondent fails to make the appropriate correction within a reasonable time (15 working days), correction made by the District will be at the Respondent's expense.

17. Indemnification:

- a) The Respondent will defend, indemnify, hold harmless, and exempt the District, its officers, agents, and employees from and against any and all suits, actions, legal proceedings, claims, demands, damages, costs, expenses, and attorneys' fees incident to any work done in the performance of this contract arising out of a willful or negligent act or omission of the Respondent, its officers, agents, or employees.

18. Force Majeure:

- a) Neither party shall be deemed to have breached any provision of this contract as a result of force majeure. The term force majeure as referenced herein, shall mean acts of God, strikes, lockouts, or other industrial disturbances, act of public enemy, orders of any kind of government of the United States or the State of Texas or any civil or military authority; insurrections; riots; pandemics; epidemics; landslides; land sinkage; lightning; earthquake; fires; hurricanes; storms; floods; washouts; droughts; arrests; restraint of government and people; civil disturbances; explosions; breakage or accidents to machinery, pipelines or canals, or other causes not reasonably within the control of the party claiming such inability.

19. Non-Appropriate Clause:

- a) Any/all contracts exceeding one (1) year will require a standard non-appropriation clause. Renewal of contracts will be in accordance with Local Government Code 271.903 concerning non-appropriation of funds for multi-year contracts. The Board of Trustees of District reserves the right to rescind the contract at the end of each fiscal year if it is determined that there are insufficient funds to extend the contract.

20. Uniform Commercial Code:

- a) All contracts and agreements between Respondent and the District shall strictly adhere to the statutes as set forth in the Uniform Commercial Code as last amended by the American Law Institute in the National Conference of Commissioners on Uniform State Laws. Reference: Uniform Commercial Code, Official Text.

21. Non-Performance:

- a) Immediate non-performance of the Respondent in terms of specifications shall be a basis for the termination of the contract.
- b) If, at any time, the Respondent fails to fulfill or abide by the terms, conditions, or specifications of the contract, the District reserves the right to: a) purchase on the open market and charge the

Respondent the difference between contract and actual price, or b) deduct charges from existing invoice totals due at the time.

- c) The District shall have the right to cancel for default all or any part of the undelivered portion of this order if Respondent breaches any of the terms hereof including warranties of Respondent or if the Respondent becomes insolvent or commits acts of bankruptcy. Such right of cancellation is in addition to and not in lieu of any other remedies which the District may have in law or equity.

22. Termination of Contract:

- a) The District shall have the right to terminate the contract, in whole or in part, for its own convenience and without cause any time upon thirty (30) days prior written Notice of Termination. Upon receipt of a Notice of Termination, the Respondent shall promptly cease all further work pursuant to the contract award, with such exceptions, if any, specified in the Notice of Termination.
- b) The District will pay the Respondent, to the extent of funds appropriated or otherwise legally available for such purposes, for all goods delivered and services performed, and obligations incurred prior to the date of termination in accordance with the terms hereof.

23. Venue:

- a) This Proposal shall be constructed and enforced in all respects in accordance with the laws of the State of Texas and the laws of the United States applicable to transactions in Texas. Exclusive venue with respect to any legal action relating to or arising under this Proposal shall lie in the District Court(s) of the State of Texas sitting in Galveston County, Texas, Respondent hereby expressly consenting to the jurisdiction of such courts.

SAFETY & SECURITY MEASURES:

Student, instructor and all staff safety and campus security are of the utmost importance to the District, and safety and security measures are required by state law or prescribed for in District policy and procedures. Adherence to the District safety & security measures while on District premises is required. Each campus presents security concerns in terms of site access, traffic, classroom and non-classroom related functions. The work performed at each campus is directive in nature and work rules for each project can vary depending on the scope of work. CISD has responsibilities to the students, staff, the State of Texas and others to ensure that safety measures are strictly applied on each project.

1. Requirements:

- a. The Contractor, Subcontractor, their agents, and all others who perform Work on any District campuses are required to observe and abide by the campus security.
- b. The Contractor, Subcontractors, and their agents shall perform employee 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.
- c. Criminal History Checks: Upon request from the District at any time, the Contractor shall provide a list of employees that is updated on a regular basis and provide the following minimum information for each person working on school property:
 - 1) Legal Name: First and Last.
 - 2) Date of Birth.
 - 3) Last 4 digits of their social security number.
 - 4) Driver's License State and Number.
- d. Contractor Supervisor and Designated Support Personal:
 - 1) Supervisor shall be present for all activities. If Owner finds out that the supervisor or their designated staff are not in responsible charge of the worksite, Owner may terminate work activities at the Contractors expense until such time the appropriate personnel are back in responsible charge.
 - 2) Supervisor is responsible for securing the project site each day after work and shall confirm that the site is safe and secure. Check all interior and exterior doors, floor hatches, roof hatches, roof access doors, gates, temporary barricades and the like.
 - 3) Supervisor is responsible for verifying that the project and site are clean after work each day. All trash is disposed of in approved containers. Floor surfaces are clean. Campus grounds are clear and all holes are covered up.

- e. RAPTOR Checks:
 - 1) All contractor personnel shall obtain a RAPTOR check upon their first day of work on the project. The Contractor is required to obtain a replacement badge if their badge gets damaged or becomes non-legible. All personnel will be issued a paper badge with their name, photo, and date of issue. This badge shall be affixed to a badge clip that shall be affixed to their uniform shirt in the upper torso area and shall be worn at all times.
 - 2) Contractor shall obtain a new Raptor badge every month around the 1st day of the month regardless of the initial badge issued date. Contractor shall contact the Maintenance Office and schedule the quantity of personnel requiring retesting in advance so as to not overload the maintenance office regular school activities.
- f. Owner reserves the right to question all Contractor personnel and to perform additional background checks and safety and security screening as applicable at their discretions for any persons working on school district property.
- g. Campus Check-in Procedures:
 - 1) The Supervisor or designated staff shall check in at the main office of each school campus each workday and shall be responsible for facility access and control direct sub-contractor supervision. Contractor personnel and sub-contractors are not required to check-in to a campus that has a Supervisor in responsible charge.
 - 2) All employees must check-in at the Maintenance for the 1st day at work and at the 1st of the month.

2. Code of Conduct:

- a. All Contractor, Subcontractors, and their agents shall be required to wear company uniforms with company name and logo clearly marked, RAPTOR tags that are currently up to date, and all appropriate and applicable safety gear such as hard hats at all times when on District premises. All attire shall be clean and presentable at the start of work each day.
- b. Interaction with students, faculty, and staff is discouraged. The District will not tolerate “cat-calling,” “whistling,” “profanity,” or derogatory remarks.
- c. No smoking or tobacco products, illegal drugs or weapons or firearms are allowed on District premises.

SPECIFICATIONS:

- **The Project Manual with plans/specifications/drawings is also provided as Exhibit C.**
- All Plans and Specification have been provided by Stridde, Callins and Associates, Inc. and incorporated as Exhibit C in this document.
- Where certain manufacturers or products are specified, it is not to limit competition but to set a standard of quality satisfactory to the Owner. All proposed substitutions must be submitted to the Owner prior to the receipt of Proposal and, if approved, must be listed in an addendum issued prior to the Proposal date.

ESTIMATED PROJECT BUDGET:

\$1,400,000.00

Owner’s Contingency:

The respondent shall provide for and include an owner’s contingency of \$45,000.00. Refer to the Attachment “A” and Specification Section 01 20 00 for further details.

Estimated Project Schedule:

The following indicates the anticipated schedule of the project.

Contract Negotiations Start	Estimated December 16, 2025
Notice to Proceed	Estimated January 6, 2026
Commence Project Physical Work Start	Monday, June 3, 2026
Substantial Completion of All Work	Sunday, August 2, 2026

END OF SECTION



VENDOR APPLICATION - REQUIRED FORM

Instructions:

1. The application form should be completed and signed by an authorized representative of the vendor.
2. The application must be submitted with all supporting documents and completed certifications.

Notice to Prospective Vendors:

1. Vendors are not placed on the district's approved vendor list until a purchase order is approved by the purchasing department.
2. Vendors must accept purchase orders for all purchases. The district will not be responsible for payment for goods or services that are provided to Calallen ISD staff without an approved purchase order issued.
3. All invoices must reflect the purchase order number and must be emailed or mailed to the Calallen ISD Accounts Payable Department (email address and mailing address are noted below).
4. All payments are net thirty (30) days after receipt of the goods and/or services.

VENDOR IDENTIFICATION:	
Vendor Full Legal Name	
Vendor DBA (if applicable)	
Texas Taxpayer ID #	
VENDOR CONTACT INFORMATION:	
Vendor Mailing Address:	
Vendor Remit Address: (if different from mailing)	
Vendor Phone Number:	
Vendor Fax Number:	
Vendor Website URL:	
Vendor Email Address: (for point of contact on procurement)	

I hereby certify that the above information is true and correct. I further certify that I am an authorized representative of this vendor.

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date



PROPOSAL RESPONSE CERTIFICATION - REQUIRED FORM

The undersigned authorized representative of the responding company indicated below hereby acknowledges:

1. That the respondent is authorized to enter into contractual relationship on behalf of the responding company indicated below.
2. That respondent has carefully examined this document in its entirety.
3. The respondent proposes to supply any products or services submitted under this solicitation in strict compliance with all terms, policies and procedures, unless any exceptions are noted.
4. That any and all exceptions have been noted in writing in the response and that no other exception will be claimed.
5. The accuracy of all certifications required which accompany this proposal.
6. The stated organization is an equal opportunity employer.
7. That any prices in this offer have been determined independently, without consultation, communication, or agreement for the purpose of restricting competition, as to any matter related to such prices, with any other Respondent or with any competitor.
8. That notice of award and/or any communication regarding an award will be submitted via CISD and not by any consultant, Respondent or other party involved in this solicitation.
9. That the organization has not been a party to any collusion among Respondent in restraint of freedom of competition by agreement to offer at a fixed price or to refrain from offering; or with any CISD employee, Board Trustee, or consultant as to quantity, quality, or price in the prospective contract, or in any terms of the prospective contract except in any authorized discussion(s) with CISD’s Purchasing personnel; or in any discussions or actions between Respondent and any CISD employee, Board Trustee, or consultant concerning exchange of money or other things of value for special consideration in the award of this contract.
10. That neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
11. By submitting a Proposal, Respondent agrees to waive any claim it has or may have against the District, its trustees, agents and employees, and any reference sources, arising out of or in connection with the administration, evaluation, or recommendation of any Proposal; waiver of any requirements under the Proposal documents; acceptance or rejection of any Proposal; and award of the Proposal. The District shall have no contractual obligation to any Respondent, nor will any Respondent have any property interest or other right in the Proposal or contract being proposed unless and until the contract is unconditionally executed and delivered by all parties, and all conditions to be fulfilled by the Respondent have been fulfilled by the Respondent.

By submitting this proposal, the Respondent warrants that the Respondent has had the opportunity to carefully examine the site of the proposed work and all of the requirements of the RFCSP. The Respondent further warrants that the Respondent is satisfied that there are no conflicts in the bidding documents and that the site proposed for the project is suitable for the work. By submission of a proposal in response to this RFCSP, the Respondent confirms Respondent’s understanding of the entire document and all of its contents. The Respondent also represents that its firm possesses the personnel, processes, and technology necessary to safely and efficiently perform the work outlined in this RFCSP.

Your signature below is the Proposal Response Certification acknowledgement.

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date



RESPONDENT’S MONETARY PROPOSAL - REQUIRED FORM

This Proposal is submitted by

(hereafter called "Offeror"), for the construction of "WOOD RIVER ELEMENTARY HVAC EQUIPMENT REPLACEMENTS AND UPGRADES – 2026 (PHASE 1)" Calallen I.S.D., Corpus Christi, Texas, (hereafter called "Project").

BASE PROPOSAL: Offeror 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 or Architect").

Contractor’s Base Proposal includes a \$45,000.00 Contingency Allowance as required by Specification Section 01 20 00.

BASE PROPOSAL COST BREAKDOWN:

HVAC Systems :	\$ _____
Electrical Work:	\$ _____
Control BAS:	\$ _____
Roofing:	\$ _____
Fire Alarm Systems:	\$ _____
General Construction:	\$ _____
General Conditions:	\$ _____
Contingency Allowance	\$ 45,000.00
Total Base Proposal Cost	\$ _____

RFCSP FOR WOOD RIVER ELEMENTARY HVAC EQUIPMENT REPLACEMENTS
AND UPGRADES – 2026 (PHASE 1)

PROCUREMENT PROPOSAL RESPONSE PACKET – *Construction Services ONLY*

Note: All pages must be completed by Proposers and Submitted with Final Proposal.



BASE PROPOSAL CONTRACTOR/SUB-CONTRACTOR LIST:

(Company Name)

HVAC: _____
Electrical: _____
Control BAS: _____
Roofing: _____
Fire Alarm: _____
General Construction: _____

ALTERNATE NO. 1A (Additive/Deductive): Offeror agrees that if this additive/deductive Alternate No. 1A is accepted by the Owner, then they will provide alternate HVAC (5-Ton) split DX AHU and ACCU equipment with manufacturer and model number(s) as listed below including all duct, base supports, electrical, controls, piping, and the like modifications as needed for complete and functional systems in accordance with Specification Sections 23 62 13 and 23 82 19 and contract documents. If this Alternate No. 1A item is not accepted by the Owner, then the Contractor shall provide HVAC split DX AHU and ACCU equipment as manufactured by approved Base proposal manufacturer Lennox as shown on Plans and as specified in Base Proposal. The amount to be **Added/Deducted** (Circle applicable proposal alteration) to the Base Proposal amount for Alternate No. 1A is

Dollars (\$_____).

Provide the proposed Make and Model of the alternate HVAC (5-Ton) split DX AHU and ACCU equipment for Alternate No. 1A:

ALTERNATE NO. 1B (Additive/Deductive): Offeror agrees that if this additive/deductive Alternate No. 1B is accepted by the Owner, then they will provide alternate HVAC (7.5 and 10-Ton) split DX AHU and ACCU equipment with manufacturer and model number(s) as listed below including all duct, base supports, electrical, controls, piping, and the like modifications as needed for complete and functional systems in accordance with Specification Sections 23 62 13 and 23 82 19 and contract documents. If this Alternate No. 1B item is not accepted by the Owner, then the Contractor shall provide HVAC (7.5 and 10-Ton) split DX AHU and ACCU equipment as manufactured by approved Base proposal manufacturer Trane as shown on Plans and as specified in Base Proposal. The amount to be **Added/Deducted** (Circle applicable proposal alteration) to the Base Proposal amount for Alternate No. 1B is



_____ Dollars (\$_____).

Provide the proposed Make and Model of the alternate HVAC (7.5 and 10-Ton) split DX AHU and ACCU equipment for Alternate No. 1B:

ALTERNATE NO. 2 (Additive/Deductive): Offeror agrees that if this additive/deductive Alternate No. 2 is accepted by the Owner, then they will provide alternate HVAC Packaged Rooftop equipment with manufacturer and model number(s) as listed below including all duct, curb, electrical, controls, piping, structural, roofing and the like modifications as needed for complete and functional systems in accordance with Specification Sections 23 74 10 and contract documents. If this Alternate No. 2 item is not accepted by the Owner, then the Contractor shall provide HVAC Packaged Rooftop equipment as manufactured by approved Base proposal manufacturer Lennox as shown on Plans and as specified in Base Proposal. The amount to be **Added/Deducted** (Circle applicable proposal alteration) to the Base Proposal amount for Alternate No. 2 is

_____ Dollars (\$_____).

Provide the proposed Make and Model of the alternate HVAC Packaged Rooftop equipment for Alternate No. 2:

ALTERNATE BAS-1 (Additive): Offeror agrees that if this additive Alternate BAS-1 is accepted by the Owner, then they will provide new split DX AHU/ACCU HVAC equipment BAS (supply air temperature sensors, return air temperature sensors, control transformers and fan current sensors to replace existing) as needed for complete and functional systems in accordance with Specification Sections 23 09 00 and contract documents. If this Alternate No. BAS-1 item is not accepted by the Owner, then the Contractor shall reinstall existing split DX AHU/ACCU BAS sensors and devices as shown on Plans and as specified in Base Proposal. The amount to be **Added** to the Base Proposal amount for Alternate BAS-1 is

_____ Dollars (\$_____).



ALTERNATE BAS-2 (Additive): Offeror agrees that if this additive Alternate BAS-2 is accepted by the Owner, then they will provide new split DX AHU/ACCU HVAC equipment BAS (space room sensors with combination temperature and humidity function) as needed for complete and functional systems in accordance with Specification Sections 23 09 00 and contract documents. If this Alternate No. BAS-2 item is not accepted by the Owner, then the Contractor shall reuse existing split DX AHU/ACCU BAS space sensors and devices as shown on Plans and as specified in Base Proposal. The amount to be **Added** to the Base Proposal amount for Alternate BAS-2 is

_____. Dollars (\$_____).

ALTERNATE WAR-1 (Additive): Offeror agrees that if this additive Alternate No. WAR-1 is accepted by the Owner, then they will provide HVAC split (5-Ton) AHU and ACCU's with 5-year extended equipment PARTS warranties for base proposal equipment manufacturer Lennox as detailed in equipment specification sections 23 62 13 and 23 82 19. If this Alternate No WAR-1 item is not accepted by the Owner, then the Contractor shall provide HVAC (5-Ton) split AHU and ACCU's with standard manufacturers parts warranties. The amount to be Added to the Base Proposal amount for Alternate WAR-1 is

_____. Dollars (\$_____).

ALTERNATE WAR-2 (Additive): Offeror agrees that if this additive Alternate No. WAR-2 is accepted by the Owner, then they will provide HVAC split (7.5 and 10-Ton) AHU and ACCU's with 5-year extended equipment PARTS warranties for base proposal equipment manufacturer Lennox as detailed in equipment specification sections 23 62 13 and 23 82 19. If this Alternate No WAR-2 item is not accepted by the Owner, then the Contractor shall provide HVAC (7.5 and 10-Ton) split AHU and ACCU's with standard manufacturers parts warranties. The amount to be Added to the Base Proposal amount for Alternate WAR-2 is

_____. Dollars (\$_____).



ALTERNATE WAR-3 (Additive): Offeror agrees that if this additive Alternate No. WAR-3 is accepted by the Owner, then they will provide HVAC Packaged Rooftop units with 5-year extended equipment PARTS warranties for base proposal equipment manufacturer Lennox as detailed in equipment specification section 23 74 10. If this Alternate No WAR-3 item is not accepted by the Owner, then the Contractor shall provide HVAC Packaged Rooftop units with standard manufacturers parts warranties. The amount to be Added to the Base Proposal amount for Alternate WAR-3 is

_____. Dollars (\$_____).

OVERHEAD AND PROFIT FOR CHANGES IN WORK: Refer to AIA-A105, section 4.3

Overhead and Profit shall include (but not limited to) the following: Supervision, Insurance, Bonds, Workman's Comp, Mark-up, Job-site and Office Overhead, Coordination, Submittals and any other related expenses.

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 they are 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/bid bond payable to the order of the Calallen 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 Agreement 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.

CALALLEN ISD

ATTACHMENT "A"

**RFCSP FOR WOOD RIVER ELEMENTARY HVAC EQUIPMENT REPLACEMENTS
AND UPGRADES – 2026 (PHASE 1)**

PROCUREMENT PROPOSAL RESPONSE PACKET – *Construction Services ONLY*

Note: All pages must be completed by Proposers and Submitted with Final Proposal.



Offeror agrees that if their Proposal is accepted by the Owner, Offeror will Substantially Complete with all work on or before August 2, 2026, and if the work is not completed by such time, Offeror 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.

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date

**RESPONDENT’S GENERAL QUESTIONNAIRE - REQUIRED FORM***(With Criteria, Weights, and Methodology)*

Instructions: Respondents are required to attach an ATTACHMENT “A1” to their PROCUREMENT PROPOSAL RESPONSE PACKET which addresses all of the following general questionnaire requests.

GENERAL FIRM INFORMATION (CRITERIA 1.1 THRU 1.3) – 5 POINTS TOTAL**General Firm Information: General (Criteria 1.1)**

1. Name of Firm, address of principal office, phone, and fax numbers, contact person (with telephone and email address)
2. Type of Business Organization (Corporation, Partnership, etc.)
 - a) If your organization is a corporation, state the date of incorporation, the state of incorporation, president’s name, vice president’s name, secretary’s name, and treasurer’s name.
 - b) If your organization is a partnership, state the date of organization, type of partnership, and names of general partners.
 - c) If your organization is individually owned, state the date of organization and the name of the owner.
 - d) If your organization is a form other than those listed above, please describe it and name your principals.
 - e) Year Founded; state how many years your organization has been in business in its current capacity; list any former names under which your organization has operated.
3. List jurisdictions and trade categories in which your organization is legally qualified to do business and indicate registration or license numbers, if applicable.
4. List jurisdictions in which your organization’s partnership or trade name is filed.

General Firm Information: Safety Record (Criteria 1.2 & 1.3)

1. Provide information related to your firm’s accident frequency rate for the last five years, including any OSHA citations and deaths that have occurred on your projects. (Submit Form 300)
2. Describe your organization’s safety program and provide your workers’ compensation experience modification factor. List any safety awards your company has received within the past five (5) years.

EXPERIENCE, REPUTATION AND REFERENCES (CRITERIA 2.1 THRU 2.3) – 25 POINTS TOTAL**Experience, Reputation and References: Comparable Experience (Criteria 2.1)**

1. List the categories of work that your organization normally performs with its forces.
2. Would you propose to do any work with your own forces or bid all work to subcontractors?



3. List all construction projects your organization has in progress, giving the name and location of the project, owner, architect, contract amount, percent complete and scheduled completion date.
4. List all construction projects your organization has performed in the last seven years. For each, include the name Owner, the name of the Project, a brief description of the Project, the budget for the Project, whether the Project completed on or before the date contracted for Substantial Completion, and whether the Project completed within the budget amount, and the reason for any additional amounts exceeding the original contract amount.
5. Please list all of your firm's previous experience with the District, including the name of project, and date of substantial completion; list all previous experience any of the proposed personnel have had with the District, including the name of the project and the date of substantial completion.

Experience, Reputation and References: Reputation and References (Criteria 2.2)

1. Within the last five years, has an officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details).
2. Describe your organization's concepts for working in a team relationship with the Owner and Architect during the design and construction of major projects.
3. Describe the most common problem or challenge that you have encountered in construction and your method for addressing the issue. (Maximum length: 2 pages.)
4. What makes your project team unique and most qualified to complete this project? Please answer in essay form.
5. Please describe your firm's ability to complete projects on schedule, including the number of projects that have not been completed on schedule, and the reasons for such delay.

Experience, Reputation and References: Claims/Disputes (Criteria 2.3)

1. Claims and suits: If the answer to any of the questions below is yes, please attach details:
 - a. Has your organization ever failed to complete any work awarded to it?
 - b. Are there any judgments, claims, arbitration proceedings or suits outstanding against your organization or its officers?
 - c. Has your organization filed any lawsuits or requested arbitration with regard to construction contracts within the last five years?

OFFERORS PROJECT PERSONNEL/QUALIFICATIONS (CRITERIA 3.1 THRU 3.3) – TOTAL 5 POINTS**Proposer's Project Personnel and Qualifications: Program Management (Criteria 3.1)**

1. Identify your firm's proposed Project Manager and Site Superintendent who will work on the project. Provide a resume and references for each individual.

**RFCSP FOR WOOD RIVER ELEMENTARY HVAC EQUIPMENT REPLACEMENTS
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PROCUREMENT PROPOSAL RESPONSE PACKET – *Construction Services ONLY*

Note: All pages must be completed by Proposers and Submitted with Final Proposal.



2. Identify the person who will be primarily responsible for accounting for the Project and describe their qualifications to perform that function.
3. Identify the person who will be primarily responsible for cost estimating for the Project and describe their qualifications.

Proposer's Project Personnel and Qualifications: Succession Planning (Criteria 3.2)

1. Identify your team's key personnel and process for replacement with equally qualified individuals if needed.

Proposer's Project Personnel and Qualifications: Project Approach (Criteria 3.3)

1. Describe the team's overall project approach for this project and a description of planned efforts to provide quality work, meet schedules, and work within an agreed budget.
2. Describe your procedures for providing an accurate punch list, completing the punch list in a timely manner, prepare and submit closeout documents in a timely manner and service and correct all warranty calls in a timely manner.

FINANCIAL STABILITY (CRITERIA 4.1-4.2) – TOTAL 5 POINTS

Financial Stability: Financial Information (Criteria 4.1)

1. Provide last 3 years of audited financial statements (licensed CPA firm required), including full balance sheet and income statements. Financials must include all subsidiaries and entities respective to the firm's overall interests.
2. Bank reference(s): Individual Name, Bank, Address, Phone and state how long. (1 point)
3. Dunn & Bradstreet rating, if available.

Financial Stability: Bonding Information (Criteria 4.2).

1. Bonding Company reference(s): Individual Name, Company, Address, Phone and state how long.
2. Provide your bonding capacity per project and in the aggregate.

PRICE PROPOSAL (CRITERIA 5) – TOTAL 50 POINTS

1. The Owner will consider the total contract cost listed in the **RESPONDENT'S MONETARY PROPOSAL FORM** as part of its evaluation. The Owner shall have the right to accept alternates in any order or combination unless otherwise specifically provided in the Proposal Documents. The Respondent submitting the lowest proposed amount shall receive the highest number of points in this category, and the Respondent submitting the highest proposed amount shall receive the lowest number of points awarded in this category. The Respondent shall not provide any additional price proposal information in this **RESPONDENT'S GENERAL QUESTIONNAIRE** section, only the price information provided in the **RESPONDENT'S MONETARY PROPOSAL FORM** will be used for its evaluation.



OFFERORS PROPOSED CONSTRUCTION SCHEDULE (CRITERIA 6) – TOTAL 10 POINTS

All work completed by August 2, 2026

1. Provide a detailed work schedule for all work up to Substantial Completion on August 2, 2026.

CONTRACT DOCUMENTS: In addition to your price proposal, provide any comments or requested changes to the form of Contract Documents and include an explanation for the change, otherwise Respondent will be deemed to have accepted the form of the Contract Documents.

The undersigned confirms ATTACHMENT "A1" is enclosed, contains all required information above, and that all information is correct to the best of his/her knowledge.

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date



STATEMENT OF COMPLIANCE/DEVIATION FORM - REQUIRED FORM

DEVIATIONS. This form is a signed statement that all information in the response packet complies with all specifications, terms and conditions, scope, and/or qualifications contained in the solicitation document. If the undersigned Respondent intends to deviate from the listed specifications, terms and conditions, scope, and/or qualifications contained in the solicitation document, all such deviations must be listed on this page, with complete and detailed conditions and information included or attached. The District will consider any deviations in its award decisions, and reserves the right to accept or reject any proposal based upon any deviations indicated below or in any attachments or inclusions. In the absence of any deviation entry on this form, the Respondent assures Calallen ISD of their full compliance with the General Terms and Conditions, Item Specifications, and all other information contained in this Proposal Invitation. **If you are requesting any deviations, please indicate those and attach them to this form.**

_____ No Deviations _____ Yes Deviations

FORM OF CONTRACT: Any contract resulting from this solicitation shall be the A105-2017 Standard Short Form of Agreement Between Owner and Contractor, as modified by the Owner. The Contract and exhibits thereto are all attached as **RFCSP APPENDIX 1**. Proposers are required to delineate any comments or requested changes and include an explanation for the requested change in its response, otherwise the Proposer will be deemed to have accepted the form of Agreement as written. The final contract is subject to review and approval of the District's legal counsel. **If you are requesting any modifications to the form of Agreement included with the RFCSP package, please indicate those and attach them to this form.**

_____ No Changes to Form of Contract _____ Yes Changes to Form of Contract

RFP ADDENDUMS: The Proposer acknowledges receipt of the Addenda to this RFCSP: specifically, Addenda No.(s) (please list all you received) :

_____ No RFP Addendums Received _____ Yes RFP Addendums Received, Specifically,
Addendum No.(s): _____

ATTACHMENTS. List any Attachments your company is submitting below (Attach additional sheet if necessary):

_____ No Attachments Included

Attachment Number: _____ Attachment Description: _____

Attachment Number: _____ Attachment Description: _____

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date



REFERENCES - REQUIRED FORM

Please complete the reference fields below. Vendor should list as references school districts and/or other governmental entities (other than Calallen ISD) for which vendor has provided products or services similar to what is requested on this proposal. Additional references for the can be provided as an attachment, but the minimum required for this proposal is 3 references.

Reference 1

Name of Entity:
Contact Name & Title:
Mailing Address:
Phone Number:
Email Address:
Date of Similar Products/Services Delivered:
Brief Description of Similar Products/Services Delivered:

Reference 2

Name of Entity:
Contact Name & Title:
Mailing Address:
Phone Number:
Email Address:
Date of Similar Products/Services Delivered:
Brief Description of Similar Products/Services Delivered:

Reference 3

Name of Entity:
Contact Name & Title:
Mailing Address:
Phone Number:
Email Address:
Date of Similar Products/Services Delivered:
Brief Description of Similar Products/Services Delivered:

The undersigned confirms the above information is correct to the best of his/her knowledge and understands the District may contact any of the above.

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date



SAFETY & SECURITY MEASURES - **REQUIRED FORM**

Student, instructor and all staff safety and campus security are of the upmost importance to the District, and safety and security measures are required by state law or prescribed for in District policy and procedures. Adherence to the District safety & security measures while on District premises is required. Each campus presents security concerns in terms of site access, traffic, classroom and non-classroom related functions. The work performed at each campus is directive in nature and work rules for each project can vary depending on the scope of work. CISD has responsibilities to the students, staff, the State of Texas and others to ensure that safety measures are strictly applied on each project.

1. Requirements:

- a) The Contractor, Subcontractor, their agents, and all others who perform Work on any District campuses are required to observe and abide by the campus security.
- b) The Contractor, Subcontractors, and their agents shall comply with the criminal history records checks requirements of Section 2 below.
- c) Contractor Supervisor and Designated Support Personal:
 - i. Supervisor shall be present for all activities. If Owner finds out that the supervisor or their designated staff are not in responsible charge of the worksite, Owner may terminate work activities at the Contractors expense until such time the appropriate personnel are back in responsible charge.
 - ii. Supervisor is responsible for securing the project site each day after work and shall confirm that the site is safe and secure. Check all interior and exterior doors, floor hatches, roof hatches, roof access doors, gates, temporary barricades and the like.
 - iii. Supervisor is responsible for verifying that the project and site are clean after work each day. All trash is disposed of in approved containers. Floor surfaces are clean. Campus grounds are clear and all holes are covered up.
- d) RAPTOR Checks:
 - i. All contractor personnel shall obtain a RAPTOR check upon their first day of work on the project. The Contractor is required to obtain a replacement badge if their badge gets damaged or becomes non-legible. All personnel will be issued a paper badge with their name, photo, and date of issue. This badge shall be affixed to a badge clip that shall be affixed to their uniform shirt in the upper torso area and shall be worn at all times.
 - ii. During Summer - School on Vacation: Contractor shall obtain a new Raptor badge every month around the 1st day of the month regardless of the initial badge issue date. Contractor shall contact the Maintenance Office and schedule the quantity of personnel requiring retesting in advance so as to not overload the maintenance office regular school activities.
 - iii. During School Hours After Summer: Contractor shall obtain a new Raptor badge every day. Contractor shall contact the Maintenance Office and schedule the quantity of personnel requiring retesting in advance so as to not overload the maintenance office regular school activities.



- e) Owner reserves the right to question all Contractor personnel and to perform additional background checks and safety and security screening as applicable at their discretions for any persons working on school district property.
 - f) Campus Check-in Procedures:
 - i. The Supervisor or designated staff shall check in at the main office of each school campus each workday and shall be responsible for facility access and control direct sub-contractor supervision. Contractor personnel and sub-contractors are not required to check-in to a campus that has a Supervisor in responsible charge.
 - ii. All employees must check-in at the Maintenance for the 1st day at work and at the 1st of the month.
- 2. Criminal History Records Checks:** Respondent should review the provisions of the form of agreement included with this procurement package regarding criminal history requirements. Please refer to the Criminal History Records Checks Section in the proposed AIA Contract Document provided in **RFCSP APPENDIX 1.**
- 3. Code of Conduct:**
- a) All Contractor, Subcontractors, and their agents shall be required to wear company uniforms with company name and logo clearly marked, RAPTOR tags that are currently up to date, and all appropriate and applicable safety gear such as hard hats at all times when on District premises. All attire shall be clean and presentable at the start of work each day.
 - b) Interaction with students, faculty, and staff is discouraged. The District will not tolerate “cat-calling,” “whistling,” “profanity,” or derogatory remarks.
 - c) No smoking or tobacco products, illegal drugs or weapons or firearms are allowed on District premises.

I, the undersigned agent for the firm named below, certify that the information concerning safety & security measures has been reviewed by me, the following information furnished is true to the best of my knowledge and I acknowledge compliance with this section.

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date



CERTIFICATE OF RESIDENCY - REQUIRED FORM

Pursuant to Government Code, Chapter 2252 a district may not award a governmental contract to a nonresident bidder unless the nonresident underbids the lowest bid submitted by a responsible resident bidder by an amount that is not less than the greater of the amount by which a resident bidder would be required to underbid the nonresident bidder to obtain a comparable contract in the state in which the nonresident's principal place of business is located, or the state in which a majority of the manufacturing relating to the contract will be performed. (Gov't Code 2252.002).

Definitions (Gov't Code 2252.001)

- "Governmental contract" means a contract awarded by a governmental entity, including a public school district, for general construction, an improvement, a service, or a public works project or for a purchase of supplies, materials, or equipment.
- "Resident bidder" refers to a person whose principal place of business is in this state, including a contractor whose ultimate parent company or majority owner has its principal place of business in this state (Texas).
- "Nonresident bidder" refers to a person who is not a resident.

Indicate the certification of residency that applies:

_____ My company is a "resident Respondent"

_____ My company is a "nonresident Respondent" of _____ (the state your principal place of business is located)

If applicable, does your "resident state" require Respondent whose principal place of business is in Texas to under Proposal, Respondents who resident state is the same as yours by a prescribes amount or percentage to receive a comparable contract?

_____ No

_____ Yes, the amount or percentage is _____

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date



CERTIFICATIONS REGARDING LOBBYING, DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS, AND DRUG-FREE WORKPLACE REQUIREMENTS – REQUIRED FORM

Lobbying: This certification is required by the Federal Regulations, implementing Section 1352 of the Program Fraud and Civil Remedies Act, Title 31 U.S. Code, for the Department of Education (34 CFR Part 82), Department of Health and Human Services (45 CFR Part 93).

The undersigned contractor certifies that:

- (1) No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan or cooperative agreement.
- (2) If any funds other than federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with this federal contract, grant, loan or cooperative agreement, the undersigned shall complete and submit Standard Form – LLL, "Disclosure Form to Report Lobbying", in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

Debarment, Suspension, and Other Responsibility Matters: This certification is required by the Federal Regulations, implementing, Executive Order 12549, Government-wide Debarment and Suspension, for the Department of Agriculture (7 CFR Part 3017), Department of Labor (29 CFR Part 98), Department of Education (34 CFR Parts 85, 668 and 682), Department of Health and Human Services (45 CFR Part 76).

The undersigned contractor certifies that neither it nor its principals:

- (1) Are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency.
- (2) Have not within a three-year period preceding this contract been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, State or Local) transaction or contract under a public transaction, violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property; Are not presently indicted for or otherwise criminally or civilly charged by a



- governmental entity with commission of any of the offenses enumerated in Paragraph (2) of this certification; and,
- (3) Have not within a three-year period preceding this contract had one or more public transactions terminated for cause or default.

Where the prospective recipient of federal assistance funds is unable to certify to any of the statements in this certification, such prospective recipient shall attach an explanation to this certification.

Drug-Free Workplace: This certification is required by the Federal Regulations, implementing Sections 5151-5160 of the Drug-Free Workplace Act, 41 U.S.C. 701; for the Department of Agriculture (7 CFR Part 3017), Department of Labor (29 CFR Part 98), Department of Education (34 CFR Parts 85, 668 and 682), and Department of Health and Human Services (45 CFR Part 76).

The undersigned contractor certifies that it shall provide a drug-free workplace by:

- (a) Publishing a policy statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the workplace and specifying the consequences of any such action by an employee;
- (b) Establishing an ongoing drug-free awareness program to inform employees of the dangers of drug abuse in the workplace, the Contractor's policy of maintaining a drug-free workplace, the availability of counseling, rehabilitation and employee assistance programs, and the penalties that may be imposed on employees for drug abuse violations in the workplace;
- (c) Providing each employee with a copy of the Contractor's policy statement;
- (d) Notifying the employees in the Contractor's policy statement that as a condition of employment under this contract, employees shall abide by the terms of the policy statement and notifying the Contractor in writing within five days after any conviction for a violation by the employee of a criminal drug statute in the workplace;
- (e) Notifying the District within ten days of Contractor's receipt of a notice of a conviction of an employee; and,
- (f) Taking appropriate personnel action against an employee convicted of violating a criminal drug statute or require such employee to participate in a drug abuse assistance or rehabilitation program.

These certifications are a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction.

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date



PROHIBITION ON DIVERSITY, EQUITY, AND INCLUSION DUTIES - REQUIRED FORM

In 2025, the Texas Legislature adopted Senate Bill 12, which added section 11.005 to SECTION 3. Subchapter A, Chapter 11, of the Education Code, among other changes. Effective September 1, 2025, the bill implements Diversity, Equity, and Inclusion (DEI) related provisions and requirements for school district contractors, including:

- Prohibition of DEI duties: School districts are not allowed to assign any DEI duties, as defined in the law, to contractors.
- Ban on DEI statements: School districts cannot request or evaluate DEI statements from contractors during the hiring or selection process.
- Training and programs: Contractors are prohibited from developing or implementing training or programs that reference protected characteristics such as race, ethnicity, or gender identity, except under specific, limited circumstances.

Applicable bill section text:

Sec. 11.005. PROHIBITION ON DIVERSITY, EQUITY, AND INCLUSION DUTIES.

- (a) In this section, "diversity, equity, and inclusion duties" means:
 - (1) influencing hiring or employment practices with respect to race, sex, color, or ethnicity except as necessary to comply with state or federal antidiscrimination laws;
 - (2) promoting differential treatment of or providing special benefits to individuals on the basis of race, color, or ethnicity;
 - (3) developing or implementing policies, procedures, trainings, activities, or programs that reference race, color, ethnicity, gender identity, or sexual orientation except:
 - (A) for the purpose of student recruitment efforts by colleges and universities designated as historically black colleges and universities in collaboration with school districts or open-enrollment charter schools;
 - or
 - (B) as necessary to comply with state or federal law; and
 - (4) compelling, requiring, inducing, or soliciting any person to provide a diversity, equity, and inclusion statement or giving preferential consideration to any person based on the provision of a diversity, equity, and inclusion statement.
- (b) Except as required by state or federal law, a school district:
 - (1) may not assign diversity, equity, and inclusion duties to any person; and
 - (2) shall prohibit a district employee, contractor, or volunteer from engaging in diversity, equity, and inclusion duties at, for, or on behalf of the district.
- (c) A school district shall adopt a policy and procedure for the appropriate discipline, including termination, of a district employee or contractor who intentionally or knowingly engages in or assigns to another person diversity, equity, and inclusion duties. The district shall provide a physical and electronic copy of the policy and procedure to each district employee or contractor.
- (d) The policy and procedure adopted by a school district under Subsection (c) must ensure that an employee or contractor receives adequate due process and an opportunity to appeal disciplinary actions, including termination, in the same manner provided for other disciplinary actions.
- (e) Nothing in this section may be construed to:
 - (1) limit or prohibit a school district from contracting with historically underutilized businesses or businesses owned by members of a minority group or by women in accordance with applicable state law;



- (2) limit or prohibit a school district from acknowledging or teaching the significance of state and federal holidays or commemorative months and how those holidays or months fit into the themes of history and the stories of this state and the United States of America in accordance with the essential knowledge and skills adopted under Subchapter A, Chapter 28;
- (3) affect a student's rights under the First Amendment to the United States Constitution or Section 8, Article I, Texas Constitution;
- (4) limit or prohibit a school district from analyzing school-based causes and taking steps to eliminate unlawful discriminatory practices as necessary to address achievement gaps and differentials described by Section 39.053; or
- (5) apply to:
 - (A) classroom instruction that is consistent with the essential knowledge and skills adopted by the State Board of Education;
 - (B) the collection, monitoring, or reporting of data;
 - (C) a policy, practice, procedure, program, or activity intended to enhance student academic achievement or postgraduate outcomes that is designed and implemented without regard to race, sex, color, or ethnicity; or
 - (D) a student club that is in compliance with the requirements of Section 33.0815.

Additionally, Senate Bill 12, added Subsection (h) SECTION 22. Section 28.0022, of the Education Code. Effective September 1, 2025, the District is required to provide a physical and electronic copy of the policy and procedure to each district or school employee or contractor. An electronic copy of the policy and procedure can be accessed here: <https://www.calallen.org/leadership-clone/school-board/board-policy-online> . Should the contractor require a physical copy of the policy and procedure, please contact the CISD Central Administration at 361-242-5600 and the District will mail a physical copy at no charge to the contractor.

Applicable bill section text:

- (h) A school district or open-enrollment charter school shall adopt a policy and procedure for the appropriate discipline, including termination, of a district or school employee or contractor who intentionally or knowingly engages in or assigns to another person an act prohibited by this section. The district or school shall provide a physical and electronic copy of the policy and procedure to each district or school employee or contractor.

For access to full bill text: <https://capitol.texas.gov/tlodocs/89R/billtext/html/SB00012F.htm>

The Vendor certifies that they have been informed of the SB2 language and requirements regarding DEI, and received a copy of the District’s policies and procedures in compliance with this bill. The vendor certifies that it does not and will not engage in DEI duties at, for, or on behalf of the District and if the vendor does so, the vendors contract/s (including purchase orders) are subject to termination.

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date



CRIMINAL HISTORY RECORDS CHECKS - REQUIRED FORM

All Respondents and its subcontractors of every tier must comply with the Section 13.3 Criminal History Records Checks of the AIA Document A105 – 2017 Standard Short Form of Agreement Between Owner and Contract found in Appendix 1 of this RFCSP.

In accordance with Section 13.3, all Respondents will provide written certification to the District that (select one):

- ☐ Contractor and its Subcontractors of every tier, do not have any Covered Employees, as defined;
- ☐ Contractor and its Subcontractors of every tier are otherwise exempted from compliance with the requirement contained herein; or
- ☐ Contractor and its Subcontractors of every tier have complied with the statutory requirements of this Agreement as of this date.

Respondent agrees that if it receives information that a Covered Employee is arrested or convicted for any of the Disqualifying Criminal History offenses, during the performance of the Work, Contractor will immediately remove the Covered Employee from Owner's property or other location where students are regularly present, and notify the District of said removal within three (3) days of doing so.

I, the undersigned agent for the firm named below, certify that the information concerning criminal background checks has been reviewed by me, the following information furnished is true to the best of my knowledge and I acknowledge compliance with this section.

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date



FELONY CONVICTION NOTICE - REQUIRED FORM

State of Texas Legislative Senate Bill No. 1, Section 44.034, Notification of Criminal History, Subsection (a), states “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 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.

Subsection (b) states “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.”

You must check A, B or C and sign below:

- _____ A. Our firm is a publicly held corporation, therefore, this reporting requirement is not applicable.
- _____ B. Our firm is not owned or operated by anyone who has been convicted of a felony.
- _____ C. Our firm is owned or operated by the following individual(s) who has/have been convicted of a felony.

Vendor Name: _____

Name of Individual(s): _____
(Attach additional sheets if necessary)

Details of Conviction(s): _____

(Attach additional sheets if necessary)

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

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date



STATE ASSESSMENT CERTIFICATION - REQUIRED FORM

The undersigned authorized representative of the corporation contracting herein certifies that the following indicated statement is true and correct and that the undersigned understands making a false statement is a material breach of contract and is grounds for contract cancellation.

The corporation certifies that:

_____ It is current in Unemployment Insurance taxes, Payday and Child Labor law monetary obligations, and Proprietary School fees and assessments payable to the State of Texas.

_____ It has no outstanding Unemployment Insurance overpayment balance payable to the State of Texas.

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date



REQUIRED STATE AND FEDERAL CERTIFICATIONS - **REQUIRED FORM**

Certification Regarding Terrorist Organizations. Pursuant to Sections 2252.151-.154 of the Texas Government Code, the Contractor hereby certifies that it is not a company identified on the Texas Comptroller's list of companies known to have contracts with, or provide supplies or services to, a foreign organization designated as a Foreign Terrorist Organization by the U.S. Secretary of State under federal law.

Certification Regarding Boycotting of Israel. Pursuant to Sections 2270.001-.002, 808.001-.006, .051-.057, .101-.102 of the Texas Government Code, the Contractor hereby certifies and verifies that neither the Contractor, nor any affiliate, subsidiary, or parent company of the Contractor, if any (the "Contractor Companies"), boycotts Israel, and the Contractor agrees that the Contractor and Contractor Companies will not boycott Israel during the term of this Agreement. For purposes of this Agreement, the term "boycott" shall mean and include terminating business activities or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory

The undersigned authorized representative of the corporation contracting herein certifies that the following indicated statement is true and correct and that the undersigned understands making a false statement is a material breach of contract and is grounds for contract cancellation.

The contractor certifies that:

- _____ It is not doing business with any organization indicated on the Foreign Terrorist Organization list as so designated by the U.S. Secretary of State under Federal Law.
 - _____ that neither the Contractor, nor any affiliate, subsidiary, or parent company of the Contractor, if any (the "Contractor Companies"), boycotts Israel.
-

Certification Regarding Boycotting Energy Companies. Pursuant to Texas Government Code Chapter 2274, the Contractor hereby certifies and verifies that it does not boycott energy companies; and will not boycott energy companies during the term of the Agreement. This verification is not required for an agreement where a governmental entity determines that these requirements are inconsistent with the governmental entity's constitutional or statutory duties related to the issuance, incurrence, or management of debt obligations or the deposit, custody, management, borrowing, or investment of funds.

Certification Regarding Discriminating Against Firearm Industry. Pursuant to Texas Government Code Chapter 2274, the Contractor hereby certifies and verifies that it does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and will not discriminate during the term of the contract against a firearm entity or firearm trade association. The verification is not required for contracts with a

**RFCSP FOR WOOD RIVER ELEMENTARY HVAC EQUIPMENT REPLACEMENTS
AND UPGRADES – 2026 (PHASE 1)**

PROCUREMENT PROPOSAL RESPONSE PACKET – *Construction Services ONLY*

Note: All pages must be completed by Proposers and Submitted with Final Proposal.



sole-source provider or if the governmental entity does not receive any bids from a company that is able to provide the required verification.

The undersigned authorized representative of the corporation contracting herein certifies that the following indicated statement is true and correct and that the undersigned understands making a false statement is a material breach of contract and is grounds for contract cancellation.

The contractor certifies that:

_____ By entering into this Agreement, the Contractor represents and warrants that: (1) it does not, and will not for the duration of the contract, boycott energy companies or (2) the verification required by Section 2274.002 of the Texas Government Code does not apply to the contract.

_____ By entering into this Agreement, the Contractor verifies that: (1) it does not, and will not for the duration of the contract, have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association or (2) the verification required by Section 2274.002 of the Texas Government Code does not apply to the contract

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date



CONFLICT OF INTEREST QUESTIONNAIRE – FORM CIQ - REQUIRED FORM

A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with the district and:

1. Has an employment or other business relationship with a local government officer of the district, or a family member of the officer, described by Local Government Code 176.003(a)(2)(A);
2. Has given a local government officer of the district, or a family member of the officer, one or more gifts with the aggregate value specified by Local Government Code 176.003(a)(2)(B), excluding any gift described by Local Government Code 176.003(a-1); or
3. Has a family relationship with a local government officer of the district

The Vendor certifies that:

_____ No conflict of interest exists

_____ A possible or potential conflict of interest exists. Form CIQ completed (or attached) on the following page.

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date

A copy of the form is attached hereto and must be submitted if applicable.

RFCSP FOR WOOD RIVER ELEMENTARY HVAC EQUIPMENT REPLACEMENTS
AND UPGRADES – 2026 (PHASE 1)PROCUREMENT PROPOSAL RESPONSE PACKET – *Construction Services ONLY*

Note: All pages must be completed by Proposers and Submitted with Final Proposal.



CONFLICT OF INTEREST QUESTIONNAIRE For vendor doing business with local governmental entity		FORM CIQ
This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session. This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor 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 vendor becomes aware of facts that require the statement to be filed. See Section 176.006(a-1), Local Government Code. A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.	OFFICE USE ONLY Date Received	
1 Name of vendor 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 on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)		
3 Name of local government officer about whom the information is being disclosed. Name of Officer		
4 Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary. A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor? ☐ Yes ☐ No B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity? ☐ Yes ☐ No		
5 Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.		
6 ☐ Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).		
7 Signature of vendor doing business with the governmental entity Date		



PROHIBITION ON CERTAIN ACTIVITY BY VENDOR - REQUIRED FORM

In 2025, the Texas Legislature adopted House Bill 210, which added section 11.067 to SECTION 1. Subchapter C, Chapter 11, of the Education Code. Effective September 1, 2025, the law severely limits the ability of Board Member-owned businesses to contract with their school districts. The Vendor commits a criminal offense if it receives a contract from the school and any Board Member or Board Member's family member (2nd degree of consanguinity) has a substantial interest in the business - more than 10% ownership or profits from that business. It also provides for Vendor criminal liability if the Vendor gave or promised a Board Member a gift valued at \$250 or more.

For a current list of Calallen ISD Board Members, please visit <https://www.calallen.org/leadership-clone/school-board>.

Full bill text:

Sec. 11.067. PROHIBITION ON CERTAIN ACTIVITY BY VENDOR.

- (a) In this section, "vendor" means a company, individual, contractor, subcontractor, or professional services provider with whom a school district or open-enrollment charter school enters into an agreement, contract, memorandum of understanding, interlocal agreement, fee schedule, retainer, or similar instrument for goods or services.
- (b) A vendor that bids on or receives a contract from a school district or an open-enrollment charter school commits an offense if any individual serving on the board of trustees or governing body of the district or school:
 - (1) has a substantial interest in the vendor or a subcontractor hired by a vendor;
 - (2) is related in the second degree by consanguinity or affinity, as determined under Chapter 573, Government Code, to an individual who has a substantial interest in the vendor; or
 - (3) has received or has been promised a gift or in-kind services with a value of more than \$250.
- (c) An individual has a substantial interest in a vendor if the individual:
 - (1) owns more than 10 percent of the voting interest in the vendor; or
 - (2) has a direct or indirect participating interest by shares, stock, or otherwise, regardless of whether voting rights are included, in more than 10 percent of the profits, proceeds, or capital gains of the vendor.
- (d) An offense under this section is a Class C misdemeanor, except that a second offense under this section is a Class B misdemeanor, a third offense under this section is a Class A misdemeanor, and a fourth or subsequent offense under this section is a state jail felony.
- (e) Notwithstanding Subsection (d), any offense under this section is a state jail felony if the vendor directly or indirectly through a third party compensated the individual serving on the board of trustees or governing body of a school district or open-enrollment charter school with money, gifts, or in-kind services as consideration for the district or school entering into a contract with the vendor.

The Vendor certifies that they have been informed of the HB210 language, requirements, and penalties.

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date



CERTIFICATE OF INTERESTED PARTIES - REQUIRED FORM

In 2015, the Texas Legislature adopted House Bill 1295, which added section 2252.908 of the Government Code. The law states that a governmental entity or state agency may not enter into certain contracts with a business entity unless the business entity submits a disclosure of interested parties to the governmental entity or state agency at the time the business entity submits the signed contract to the governmental entity or state agency. The disclosure requirement applies to a contract entered into on or after January 1, 2016.

The requirement above applies only to a contract of a district that:

1. Requires an action or vote by the board before the contract may be signed;
2. Has a value of at least \$1 million; or
3. Is for services that would require a person to register as a lobbyist under Government Code Chapter 305.

Gov't Code 2252.908

The disclosure requirement does not apply to a contract with:

1. A publicly traded business entity, including a wholly owned subsidiary of the entity;
2. An electric utility, as defined by Utilities Code 31.002; or
3. A gas utility, as defined by Utilities Code 121.001.

Gov't Code 2252.908(c)(4)–(6)

Filing Process: The commission has made available on its website a new filing application that must be used to file Form 1295. A business entity must use the application to enter the required information on Form 1295 and print a copy of the completed form, which will include a certification of filing that will contain a unique certification number. An authorized agent of the business entity must sign the printed copy of the form and have the form notarized. The completed Form 1295 with the certification of filing must be filed with Calallen ISD.

Form Availability: Certificate of Interested Parties Form is available from the Texas Ethics Commission website at the following address: https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm For questions regarding and assistance in filling out this form, please contact the Texas Ethics Commission at 512-463-5800. A sample is attached hereto but must be submitted only.

The contractor certifies that:

_____ Form 1295 filing is required and a certification of filing will be provided to Calallen ISD should we be awarded the contract

_____ Form 1295 filing is not required

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date

ATTACHMENT "A"

RFCSP FOR WOOD RIVER ELEMENTARY HVAC EQUIPMENT REPLACEMENTS AND UPGRADES – 2026 (PHASE 1)

PROCUREMENT PROPOSAL RESPONSE PACKET – *Construction Services ONLY*

Note: All pages must be completed by Proposers and Submitted with Final Proposal.



CERTIFICATE OF INTERESTED PARTIES		FORM 1295	
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.		OFFICE USE ONLY	
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. <input style="float: right;" type="checkbox"/>			
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			



**AFFIDAVIT OF NON-COLLUSION, NON-CONFLICT OF INTEREST, AND ANTI-LOBBYING -
REQUIRED FORM**

By submission of this proposal, the undersigned certifies that:

1. Neither the Respondent nor any of Respondent's officers, partners, owners, agents, representatives, employees, or parties in interest, has in any way colluded, conspired, or agreed, directly or indirectly with any person, firm, corporation or other Respondent or potential Respondent any money or other valuable consideration for assistance in procuring or attempting to procure a contract or fix the prices in the attached proposal or the proposal of any other Respondent, and further states that no such money or other reward will be hereinafter paid.
2. No attempt has been or will be made by this company's officers, employees, or agents to lobby, directly or indirectly, the Calallen ISD Board of Trustees between proposal submission date and award by the Calallen ISD Board of Trustees.
3. No officer or stockholder of the Respondent is a member of the staff or related to any employee or Board of Trustees member of the Calallen ISD except as noted on Form CIQ (Conflict of Interest Questionnaire - attached).
4. The undersigned certifies that he/she is fully informed regarding the accuracy of the statements contained in this certification, and that the penalties herein are applicable to the Respondent as well as to any person signing in his/her behalf.

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date



ORIENTATION TO COMPLAINT PROCEDURES FOR SERVICE PROVIDERS – REQUIRED FORM

The policy of Calallen ISD herein referred to as “the District” is to resolve complaints in a fair and prompt manner. The Districts administrative directive on GRIEVANCE PROCEDURE establishes the guidelines for the resolution of grievances/complaints and requires this orientation sheet be received and acknowledged by all individuals or organizations providing services to the District under contract or agreement.

Acts of restraint, interference, coercion, discrimination or reprisal towards complainants exercising their rights to a file a grievance under District policy are prohibited. A complainant is the individual or organization filing a grievance/complaint. A respondent is the individual or organization against whom a grievance/complaint is filed. Inquiries regarding the resolution of grievances should be addressed to:

**Calallen Independent School District
ATTN: Blair McDavid
4205 Wildcat Dr.
Corpus Christi, Texas 78410
Telephone: (361) 242-5600**

Every effort should be made to resolve your grievance at the optimum management level. The District’s EO Officer is available to assist, as necessary, in the grievance resolution process.

The time limit to file a complaint under the District’s grievance procedure is 30 calendar days from the date of the event that leads to the filing of the grievance. A copy of the District’s Policy and Procedure is available upon request.

EQUAL OPPORTUNITY IS THE LAW

The District is prohibited from discriminating on the ground of race, color, religion, sex, national origin, age, disability, political affiliation or belief, and for beneficiaries only. If you think that you have been subjected to discrimination, you may file a complaint within 180 days from the date of the alleged violation with the Equal Opportunity Officer at the:

**TEXAS WORKFORCE COMMISSION
WORKFORCE DEVELOPMENT DIVISION
EQUAL OPPORTUNITY OFFICE
101 E. 15th STREET
AUSTIN, TEXAS 78778
Telephones: (512) 936-0342; (TDD): 1-800-RELAY TX, Voice 1-800-RELAY VV.**

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date

RFCSP FOR WOOD RIVER ELEMENTARY HVAC EQUIPMENT REPLACEMENTS
AND UPGRADES – 2026 (PHASE 1)PROCUREMENT PROPOSAL RESPONSE PACKET – *Construction Services ONLY*

Note: All pages must be completed by Proposers and Submitted with Final Proposal.

**CERTIFICATE OF LIABILITY - REQUIRED (Provide Copy)**

Please provide a Copy of Your Certificate of Liability Insurance.

Provide actual Certificate of Liability Insurance as part of your proposal

CERTIFICATE OF LIABILITY INSURANCE					DATE
PRODUCER		THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.			
SAMPLE ONLY		COMPANIES AFFORDING COVERAGE			
		COMPANY A			
		COMPANY B			
		COMPANY C			
INSURED		COMPANY D			
SAMPLE ONLY		COMPANY A			
		COMPANY B			
		COMPANY C			
		COMPANY D			
COVERAGES					
THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN. THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.					
CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS
	GENERAL LIABILITY				GENERAL AGGREGATE \$1,000,000.00
	☒ COMMERCIAL GENERAL LIABILITY				PRODUCTS COMP/OP AGG \$1,000,000.00
	☐ CLAIMS MADE ☒ OCCUR				PERSONAL & ADV INJURY \$1,000,000.00
	☒ OWNERS PROTECTIVE LIABILITY				EACH OCCURRENCE \$1,000,000.00
	THE STATE OF TEXAS, ITS EMPLOYEES, NAME INSURED (SEE BELOW)				FIRE DAMAGE (Any one fire) \$ 50,000.00
					MED EXP (Any one person) \$ 5,000.00
	AUTOMOBILE LIABILITY				COMBINED SINGLE LIMIT \$1,000,000.00
	☐ ANY AUTO				BODILY INJURY \$
	☐ ALL OWNED AUTOS				(Per person)
	☒ SCHEDULED AUTOS				BODILY INJURY \$
	☒ HIRED AUTOS				(Per accident)
	☒ NON-OWNED AUTOS				PROPERTY DAMAGE \$
					\$
	GARAGE LIABILITY				AUTO ONLY-EA ACCIDENT \$
	☐ ANY AUTO				OTHER THAN AUTO ONLY:
					EACH ACCIDENT \$
					AGGREGATE \$
	EXCESS LIABILITY				EACH OCCURRENCE \$
	☐ UMBRELLA FORM				AGGREGATE \$
	☐ OTHER THAN UMBRELLA FORM				\$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY				☒ WC STATUTORY LIMITS ☐ OTH-ER
	THE PROPRIETOR/ PARTNERS/EXECUTIVE OFFICERS ARE: ☐ INCL ☐ EXCL				EL EACH ACCIDENT \$ 500,000.00
					EL DISEASE-Policy Limit \$ 500,000.00
					EL DISEASE-Ea. Employee \$ 500,000.00
☒	☒ OTHER: BUILDERS RISK				AMOUNT OF CONTRACT
☒	OWNERS PROTECTIVE LIABILITY				\$1,000,000.00
	NAMED INSURED, THE STATE OF TEXAS, ITS EMPLOYEES				
DESCRIPTION OF OPERATION/LOCATIONS/VEHICLES/SPECIAL ITEMS					
(PROJECT ADDRESS)					
SAMPLE ONLY					
CERTIFICATE HOLDER			CANCELLATION		
TEXAS WORKFORCE COMMISSION 101 East 15 th Street, Room 226T Austin, Texas 78778-0001			SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 10 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT. BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.		
			AUTHORIZED REPRESENTATIVE		

Provide a completed IRS Form W-9 as part of your proposal – available at <https://www.irs.gov/forms-pubs/about-form-w-9>.



PAYMENT AND PERFORMANCE BONDS - REQUIRED FORM

A district that makes a public work contract with a prime contractor shall require the contractor, before beginning the work, to execute to the district:

1. A performance bond if the contract is in excess of \$100,000; and
2. A payment bond if the contract is in excess of \$25,000.

A bond required by this provision must be executed by a corporate surety in accordance with Insurance Code Article 7.19-1 (now Insurance Code 3503.001–.005). A bond for a public work contract with a district must be payable to and its form must be approved by the awarding board. *Gov't Code 2253.021(a), (d)–(e).*

The performance bond is solely for the protection of the district awarding the public work contract, in the amount of the contract, and conditioned on the faithful performance of the work in accordance with the plans, specifications, and contract documents. *Gov't Code 2253.021(b).*

The payment bond is solely for the protection and use of payment bond beneficiaries who have a direct contractual relationship with the prime contractor or a subcontractor to supply public work labor or material, and in the amount of the contract. *Gov't Code 2253.021(c).*

The contractor certifies that:

_____ A performance bond is required and will be provided to Calallen ISD should we be awarded the contract

_____ A performance bond is not required

_____ A payment bond is required and will be provided to Calallen ISD should we be awarded the contract

_____ A payment bond is not required

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date



PREVAILING WAGE SCHEDULES - REQUIRED FORM

Respondents are required to comply with Texas Government Code, Chapter 2258 Prevailing Wage Rates, with respect to payment of prevailing wage rates for the construction or improvements, paid for in whole or in part from public funds, without regard to whether the work is done under public supervision or direction. A worker is employed on a public work if the worker is employed by the Respondent or any subcontractor in the execution of the contract for the project.

The District has adopted the federal Davis-Bacon wage rates for the use in Texas pursuant to and in accordance with the Texas Government Code, Section 2258.022. The District's prevailing wage rate is provided as Exhibit A to APPENDIX 1 the STANDARD SHORT FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR, AIA DOCUMENT A105-2017.

Please sign below confirming receipt of the District's current Prevailing Wage Rate Schedule. Contractor will be required to pay these wages as set out in the form of Agreement.

Authorized Representative (Print Name)

Title

Authorized Representative (Signature)

Date

ATTACHMENT “A1”
REQUIRED FORM
RESPONDENT’S GENERAL
QUESTIONNAIRE SUPPORTING
DOCUMENTATION

*To RFCSP FOR WOOD RIVER ELEMENTARY HVAC
EQUIPMENT REPLACEMENTS AND UPGRADES – 2026
(PHASE 1)
PROCUREMENT PROPOSAL RESPONSE PACKET*

*RESPONDENT’S GENERAL QUESTIONNAIRE
(With Criteria, Weights, and Methodology)*

*CONTRACTOR SHALL ATTACH AND INCLUDE ALL
REQUIRED SUPPORTING DOCUMENTATION FOR
CRITERIA, WEIGHTS AND METHODOLOGY AS
IDENTIFIED IN THE ATTACHMENT “A” PROCUREMENT
PROPOSAL RESPONSE PACKET PAGE 9 THROUGH 12*

APPENDIX 1

STANDARD SHORT FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR AIA DOCUMENT A105-2017, AS MODIFIED BY THE OWNER

See the documents provided as .pdf attached below. Agreement will not be submitted with the contractor response packet and will be completed after successful contractor selection and appropriate cost negotiations.

AIA® Document A105® – 2017

Standard Short Form of Agreement Between Owner and Contractor

AGREEMENT made as of the _____ day of _____ in the year Two Thousand Twenty-Five (2025)

(In words, indicate day, month and year.)

BETWEEN the Owner:

(Name, legal status, address and other information)

Calallen Independent School District, a public school district and political subdivision of the State of Texas

4205 Wildcat Drive

Corpus Christi, Texas 78410

Phone: (361) 242-5600

and the Contractor:

(Name, legal status, address and other information)

EXHIBIT FOR PROCUREMENT ONLY

Name: _____

Type of Entity: _____

Address: _____

Phone: _____

for the following Project:

(Name, location and detailed description)

Calallen Independent School District (2023 Bond Project): Wood River Elementary School HVAC Equipment Replacements and Upgrades – 2026 (Phase 1)

The Architect:

(Name, legal status, address and other information)

Stridde, Callins & Associates, Inc., a corporation of the State of Texas

342 S. Navigation Blvd.

Corpus Christi, Texas 78405-3615

Phone: (361) 883-9199

Fax: (361) 883-9177

**Architect herein shall mean Engineer.*

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.

Init.

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User Notes:

(3B9ADA17)

TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
- 3 CONTRACT SUM
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- 6 GENERAL PROVISIONS
- 7 OWNER
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- 9 ARCHITECT
- 10 CHANGES IN THE WORK
- 11 TIME
- 12 PAYMENTS AND COMPLETION
- 13 PROTECTION OF PERSONS AND PROPERTY
- 14 CORRECTION OF WORK
- 15 MISCELLANEOUS PROVISIONS
- 16 TERMINATION OF THE CONTRACT
- 17 OTHER TERMS AND CONDITIONS

NOTE: Any reference to an AIA™ Document or any AIA Documents included in the Contract Documents shall refer to such document “as modified for this Project”. In addition any reference to AIA Documents shall all be considered to have included the Trademark “™” after the AIA reference, whether or not included in the text. The AIA Documents are registered intellectual property of the American Institute of Architects and use and amendment of such forms is permitted under license granted to Walsh Gallegos Trevino Kyle & Robinson P.C. for this Project. No use may be made of this AIA document other than as Contract Documents for this Project.

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contractor shall complete the Work described in the Contract Documents for the Project. The Contract Documents consist of

- .1 this Agreement signed by the Owner and Contractor;
- .2 the drawings and specifications prepared by the Architect and attached as Exhibit C *OR*, dated _____, and enumerated as follows:

Drawings: Number	Title	Date

(Table Deleted)

Specifications:
Section

Title

Pages

(Table Deleted)

.3 addenda prepared by the Architect as follows:

Number

Date

Pages

(Table Deleted)

.4 written orders for changes in the Work, pursuant to Article 10, issued after execution of this Agreement; and

.5 other documents, if any, identified as follows:

Exhibit A, Owner's Prevailing Wage Rate Schedule

Exhibit B, Supplementary General Conditions for Project

ARTICLE 2 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 2.1 The Contract Time is the number of calendar days available to the Contractor to substantially complete the Work.

§ 2.2 Date of Commencement:

Unless otherwise set forth below, the date of commencement shall be the date of this Agreement.

(Insert the date of commencement if other than the date of this Agreement.)

Upon Owner's issuance of a Notice to Proceed, which shall be Early January 2026

§ 2.3 Substantial Completion:

Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion, as defined in Section 12.5, of the entire Work:

(Check the appropriate box and complete the necessary information.)

☐ Not later than () calendar days from the date of

☒ By the following date: August 2, 2026

ARTICLE 3 CONTRACT SUM

§ 3.1 The Contract Sum shall include all items and services necessary for the proper execution and completion of the Work. Subject to additions and deductions in accordance with Article 10, the Contract Sum is:

EXHIBIT FOR PROCUREMENT ONLY

_____ (\$ _____)

§ 3.2 For purposes of payment, the Contract Sum includes the following values related to portions of the Work:

(Itemize the Contract Sum among the major portions of the Work.)

Portion of the Work

Value

(Table Deleted)

§ 3.3 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and hereby accepted by the Owner:

(Identify the accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)

§ 3.4 Allowances, if any, included in the Contract Sum are as follows:

(Identify each allowance.)

Item

Price

(Table Deleted)

§ 3.5 Unit prices, if any, are as follows:

(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item

Units and Limitations

Price per Unit (\$0.00)

(Table Deleted)

ARTICLE 4 PAYMENTS

§ 4.1 Based on Contractor's Applications for Payment certified by the Architect, the Owner shall pay the Contractor, in accordance with Article 12.

(Paragraph Deleted)

§ 4.2 Undisputed payments remaining unpaid under the Contract on the 31st day after the date the Owner receives a properly documented Certificate of Payment from the Architect are considered overdue and in accordance with the Texas Prompt Payment Act, Texas Government Code Chapter 2251, shall bear interest from that date until the date that the Owner mails or electronically transmits payment, including accrued interest to that date.

§ 4.3 Changes in Work

1. For work performed by the Contractor's own forces, Contractor's mark-up for overhead and profit shall not exceed (15%) of the cost of the change in the work.
2. For the Contractor, for supervision of work performed by the Contractor's Subcontractors, the total Contractor mark-up for overhead and profit shall not exceed (5%) for the amount due to the Subcontractors.
3. For each Subcontractor or Sub-Subcontractor involved, in the Work performed by the Subcontractor's or Sub-Subcontractor's own forces, the total mark-up for overhead and profit shall not exceed Ten percent (10%) of the cost of the change in the work.

4. In no event shall the total mark-up for overhead, profit or fee in any work which involves a subcontractor or one or more sub-contractors, regardless of who performs the work, exceed(15%) of the total cost of the change in the Work.

ARTICLE 5 INSURANCE AND BONDS

§ 5.1 CONTRACTOR'S INSURANCE

§ 5.1.1 The Contractor and the Contractor's Subcontractors shall purchase and maintain in force, insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the table below, the Agreement, or elsewhere in the Contract Documents. No work will be commenced, and no equipment or materials may be shipped, until all requirements of Article 5 have been satisfied, satisfactory evidence of insurance has been provided, and all required insurance is in full force and effect. The Contractor shall purchase and maintain the insurance required by this Agreement from an insurance company or insurance companies lawfully authorized to issue insurance in the State of Texas. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents. Nothing contained herein shall limit or waive Contractor's legal or contractual responsibilities to Owner or others. Contractor shall permit Owner to examine the insurance policies, or at Owner's option, Contractor shall furnish Owner with copies, certified by the carrier(s), of insurance policies required under this Article 5. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in this Agreement, unless a different duration is stated below:

Workmen's Compensation: (Including Waiver of Subrogation Endorsement)	All liability arising out of Contractor's employment of workers and anyone for whom Contractor shall be liable for Worker's Compensation claims. Worker's Compensation is required and no "alternative" form of insurance shall be permitted.
Employer's Liability:	\$1,000,000.00
Commercial General Liability:	
Each Occurrence	\$1,000,000.00
General Aggregate	\$2,000,000.00 (A Designated Construction Project General Aggregate Limit shall be provided)
Personal & Advertising Injury	\$1,000,000.00 each person
Products and Completed Operations	\$1,000,000.00 (for one (1) year, commencing with issuance of final Certificate for Payment)
Property Damage:	\$2,000,000.00 aggregate
Independent Contractors	(Same limits as above)
Contractual Liability	(Same limits as above)
Automobile Liability:	
Bodily Injury/Property Damage	\$1,000,000.00 combined single limit
Property Damage	\$1,000,000.00 each occurrence
Umbrella/Excess	\$1,000,000.00

§ 5.1.2 The required insurance must be written by a company licensed to do business in Texas at the time the policy is issued. In addition, the company must be rated at least A-VIII by A.M. Best's Key Rating Guide. The Owner's

Representative will contact the State Board of Insurance to confirm that the issuing companies are admitted and authorized to issue such policies in the State of Texas.

§ 5.1.3 The General Liability and Automobile so issued in the name of Contractor shall also name the Owner and subcontractors as additional insureds, as their respective interests may appear. The coverage afforded to the additional insured under the policy or policies shall be primary insurance. It is the intent of the parties to this Agreement that the General Liability coverage required herein shall be primary to and shall seek no contribution from all insurance available to Owner, with Owner's insurance being excess, secondary and non-contributing. The Commercial General Liability coverage provided by Contractor shall be endorsed to provide such primary and non-contributing liability. If the additional insured has other insurance which is applicable to the loss, such other insurance shall be on an excess or contingent basis.

§ 5.1.4 If the insurance is written with stipulated amounts deductible under the terms of the policy, the Contractor shall pay the difference attributable to deductions in any payment made by the insurance carrier on claims paid by this insurance. If the Owner is damaged by the failure of the Contractor to maintain such insurance and to so notify the Owner then the Contractor shall bear all reasonable costs properly attributable thereto.

§ 5.1.5 The insurance required by Section 5.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents. Nothing contained herein shall limit or waive Contractor's legal or contractual responsibilities to Owner or others.

§ 5.1.6 Contractor shall have its insurance carrier(s) furnish to Owner with ISO ACORD Form 25 insurance certificates specifying the types and amounts of coverage in effect, the expiration dates of each policy, and a statement that no insurance will be canceled or materially changed while the Work is in progress without thirty (30) calendar day's prior written notice to Owner. Contractor shall permit Owner to examine the insurance policies, or at Owner's option, Contractor shall furnish Owner with copies, certified by the carrier(s), of insurance policies required in Section 5.1.1. If Contractor neglects or refuses to provide any insurance required herein, or if any insurance is canceled, Owner may, but shall not be obligated to, procure such insurance and the provisions of Section 5.1.8 hereof shall apply.

§ 5.1.7 Contractor and its contractors shall not commence the shipment of equipment or materials or commence the Work at the site until all of the insurance coverage required of Contractor and its contractors are in force and the necessary certificates and statements pursuant to Section 5 hereof have been received by Owner and the Architect has issued a written notice to proceed.

§ 5.1.8 As an alternative and at Owner's option and expense, Owner may elect to furnish or to arrange for any part or all of the insurance required by Section 5.1 hereof. If Owner so elects, it shall notify, in writing, Contractor and issue a Change Order therefor, but no adjustment to the scheduled completion date or the Contract Sum shall be allowed.

§ 5.1.9 Workers' Compensation Insurance Coverage.

.1 Definitions:

- .1.1 Certificate of coverage ("Certificate").** A copy of a certificate of insurance, a certificate of authority to self-insure issued by the division, or a coverage agreement (DWC Form-81, DWC Form-82, DWC Form-83, or DWC Form-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on the Project, for the duration of the Project.
- .1.2 Duration of the Project.** Includes the time from the beginning of the work on the Project until the Contractor's work on the Project has been completed and accepted by the Owner.
- .1.3 Persons providing services on the Project ("subcontractor" in Texas Labor Code §406.096).** 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 contracts 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 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 a Project, and provide to the Owner:
 - .5.1 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
 - .5.2 no later than seven (7) 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 (1) year thereafter.
- .7 The Contractor shall notify the Owner in writing by certified mail or personal delivery, within ten (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 each Project site a notice, in the text, form and manner prescribed by the Texas Department of Insurance, Division of Workers' Compensation, 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 a Project, to:
 - .9.1 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;
 - .9.2 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;
 - .9.3 provide the Contractor, prior to the end of the coverage period, 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;
- .9.4 obtain from each other person with whom it contracts, and provide to the Contractor:
 - (a) a certificate of coverage, prior to the other person beginning work on the Project; and
 - (b) 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;
- .9.5 retain all required certificates of coverage on file for the duration of the Project and for one (1) year thereafter;
- .9.6 notify the Owner in writing by certified mail or personal delivery, within ten (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
- .9.7 contractually require each person with whom it contracts, to perform as required by Subparagraphs .9.1 - .9.7 with the certificates of coverage to be provided to the person for whom they are providing services.

- .10 By signing this 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 a self-insured, with the Texas Department of Insurance, 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 (10) days after receipt of notice of breach from the Owner. [28 TAC §110.110(c)(7)]

§ 5.1.10 The Contractor shall provide an Installation Floater or Builder's Risk Insurance to cover the total value of the entire Project on a replacement cost basis, with the Owner named as an Additional Insured. Such insurance shall cover replacement cost of the Project (including additions and modifications) together with Contractor's equipment, materials and supplies relating to the Project which are on the job site, in transit to the job site or at a temporary storage location pending delivery to the job site. In addition, soft cost coverage for Architect's fees shall be included. Owner shall be named as an insured, loss payee on the policy.

§ 5.2 PERFORMANCE BOND AND PAYMENT BOND

§ 5.2.1 If the Contract Sum in Article 3 is in excess of \$100,000, the Contractor is required, as a condition precedent to the execution of the Contract, to execute a PERFORMANCE BOND in the form required by TEXAS STATUTES, in the amount equal to ONE HUNDRED PERCENT (100%) of the total combined accepted bid(s).

§ 5.2.2 If the Contract Sum in Article 3 is in excess of \$25,000, the Contractor is required, as a condition precedent to the execution of the Contract, to execute a PAYMENT BOND in the form required by TEXAS STATUTES, in the amount equal to ONE HUNDRED PERCENT (100%) of the total bid as security for payment of all persons performing labor and furnishing materials in connection with this Contract. (Bonding Company is to furnish such forms). All bonds shall name the Owner as additional obligee.

(Table Deleted)

§ 5.2.3 The Bond(s) shall meet requirements of Chapter 2253 of the Texas Governmental Code. All bonds shall be issued by a surety company licensed, listed and authorized to issue bonds in the State of Texas by the Texas Department of Insurance. The surety company may be required by the Owner to have a rating of not less than AB@ in the latest edition of Best's Insurance Reports, Property-Casualty. The surety company shall provide, if requested, information on bonding capacity, other projects under coverage and shall provide proof to establish adequate financial capacity for this project.

Should the bond amount be in excess of ten percent (10%) of the surety company's capital and surplus, the surety company issuing the bond shall certify that the surety company has acquired reinsurance, in a form and amount acceptable to the Owner, to reinsure the portion of the risk that exceeds ten percent (10%) of the surety company's capital and surplus with one or more reinsurers who are duly authorized and admitted to do business in Texas and that amount reinsured by an reinsurer does not exceed ten percent (10%) of the reinsurer's capital and surplus.

The Sureties shall promptly file a signed copy of the Contract, Performance, and Payment Bonds with the Owner in full compliance with Chapter 2253 of the Texas Governmental Code.

§ 5.2.4 All bonds will be reviewed by the Owner for compliance with the Contract Documents prior to execution of the contract. In the event that the Owner has any questions concerning the sufficiency of the bonds, the bonds will be referred to the Owner or the Owner's representative for review and decision.

§ 5.2.5 All bonds shall be originals. The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the Power-of-Attorney. The name, address, and telephone number of a contact person for the bonding company shall be provided.

§ 5.2.6 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.

§ 5.2.7 Bonds shall be signed by an agent resident in the State of Texas and the date of the bond shall be the date of execution of the contract. If at any time during the continuance of the contract, the surety of the Contractor's bonds becomes insufficient, Owner shall have the right to require additional and sufficient sureties which the Contractor shall furnish to the satisfaction of the Owner within ten (10) business days after notice to do so. In default thereof, the Contractor may be suspended, and all payment or money due to the Contractor withheld.

§ 5.2.8 By inclusion of this Subsection in the Contract Documents, the surety which issues the bonds is hereby notified that the Owner and its agents and employees do not represent and will not be responsible for the surety's interests during the course of the Work. To protect its interests, the surety shall have the right to attend pay estimate meetings, review Applications for Payment when requested in writing by them, comment upon and make recommendations regarding payments, and inspect the Work in the presence of the Contractor and the Owner. By providing the bonds for the Work, the surety shall and hereby waives any cause of action against the Owner, its agents and employees, for any loss suffered by the surety by reason of overpayment of any amounts to the Contractor, unless such is a direct result of a fraudulent or grossly negligent act committed by such party.

ARTICLE 6 GENERAL PROVISIONS

§ 6.1 The Contract

The Contract represents the entire and integrated agreement between the parties and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a written modification in accordance with Article 10.

§ 6.2 The Work

The term "Work" means the construction and services required by the Contract Documents, and includes all other labor, materials, equipment, and services provided, or to be provided, by the Contractor to fulfill the Contractor's obligations.

§ 6.3 Intent

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.

§ 6.4 Ownership and Use of Architect's Drawings, Specifications and Other Documents

Documents prepared by the Architect are instruments of the Architect's service for use solely with respect to this Project. The Architect shall retain all common law, statutory, and other reserved rights, including the copyright. The Contractor, subcontractors, sub-subcontractors, and suppliers are authorized to use and reproduce the instruments of service solely and exclusively for execution of the Work. The instruments of service may not be used for other Projects or for additions to this Project outside the scope of the Work without the specific written consent of the Architect.

§ 6.5 Electronic Notice

Written notice under this Agreement may be given by one party to the other by email as set forth below.

(Insert requirements for delivering written notice by email such as name, title, and email address of the recipient, and whether and how the system will be required to generate a read receipt for the transmission.)

Owner's representative:

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

Emily Lorenz, Superintendent of Schools

Calallen Independent School District

4205 Wildcat Drive, Corpus, Christi, Texas 78410-5198

Phone: (361) 242-5600

Email: elorenz@calallen.org

Contractor's representative:
(Name, address, email address, and other information)
EXHIBIT FOR PROCUREMENT ONLY

Representative's Name: _____
Representative's Title: _____
Company Full Legal Name: _____
Address: _____
Company Phone: _____
Cell Phone: _____
Email: _____

ARTICLE 7 OWNER

§ 7.0.1 The Owner is the Board of Trustees of the Calallen Independent School District and is referred to throughout the Contract Documents as if singular in number. The Owner may designate in writing one or more persons to represent the Owner; however, such representatives shall have the authority to bind the Owner only to the extent expressly authorized by the Owner and shall have no implied authority. Neither the Architect nor the Contractor may rely upon the direction of any employee of Owner who has not been so designated as Owner's representative. Owner shall not be financially responsible for actions taken by the Architect or Contractor in reliance upon direction from unauthorized persons.

§ 7.0.2 The Contractor acknowledges that no lien rights exist with respect to public property. 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 situated.

§ 7.1 Information and Services Required of the Owner

§ 7.1.1 If requested by the Contractor, the Owner shall furnish all necessary surveys and a legal description of the site.

§ 7.1.2 Except for permits and fees under Section 8.7.1 that are the responsibility of the Contractor, the Owner shall obtain and pay for other necessary approvals, easements, assessments, and charges.

§ 7.1.3 Prior to commencement of the Work, at the written request of the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence.

§ 7.2 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is defective or not in accordance with the Contract Documents, the Owner may direct the Contractor in writing to stop the Work until the correction is made.

§ 7.3 Owner's Right to Carry Out the Work

If the Contractor is in default on any of its material obligations hereunder, neglects to timely carry out the Work in accordance with the Contract Documents, or fails within a seven day period after receipt of written notice from the Owner to commence and continue correction of such default or non-conforming or defective Work with diligence and promptness, the Owner may, without prejudice to other remedies, correct such defaults or such non-conforming or defective Work. In such case, the Architect may withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the cost of correction, provided the actions of the Owner and amounts charged to the Contractor were approved by the Architect.

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

§ 7.4.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project.

§ 7.4.2 The Contractor shall coordinate and cooperate with the Owner's own forces and separate contractors employed by the Owner.

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ARTICLE 8 CONTRACTOR

§ 8.1 Review of Contract Documents and Field Conditions by Contractor

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

§ 8.1.2 The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the Owner. Before commencing activities, the Contractor shall (1) take field measurements and verify field conditions; (2) carefully compare this and other information known to the Contractor with the Contract Documents; and (3) promptly report errors, inconsistencies, or omissions discovered to the Architect. If the Contractor performs any construction activity knowing it involves a recognized error, inconsistency or omission in the Contract Documents without such notice to Architect, the Contractor shall assume appropriate responsibility for any such performance and shall bear an appropriate amount of the attributable costs for correction. 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, however any apparent design errors or omissions noted by the Contractor during this review shall be reported promptly to the Architect.

§ 8.2 Contractor's Construction Schedule

The Contractor's initial schedule shall be provided with the proposal in response to the Owner's procurement for this Project. As part of the response, Contractor shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The Contractor, promptly after being awarded the Contract, will also prepare and submit for the Owner's and Architect's information a Contractor's final coordinated construction schedule for the Work.

§ 8.3 Supervision and Construction Procedures

§ 8.3.1 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, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and except as stated below shall be fully and solely responsible for the jobsite safety of such means, methods, techniques sequences or procedures. If the Contractor determines that such means, methods, techniques, or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed by the Owner, in writing, to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by Contractor, the Owner shall be solely responsible for any loss or damage arising solely from the Owner-required means, methods, techniques, sequences or procedures.

§ 8.3.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner, through the Architect, the names of subcontractors or suppliers for each portion of the Work. The Contractor shall not contract with any subcontractor or supplier to whom the Owner or Architect have made a timely and reasonable objection.

§ 8.4 Labor and Materials

§ 8.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for qualified, careful, and efficient workers and labor, eligible to work in accordance with state and federal law. Contractor shall appropriately classify all workers in accordance with the Fair Labor Standards Act, its implementing regulations, and Texas Labor Code Section 214.008. In addition, unless otherwise provided in the Contract Documents, the Contractor shall make temporary connections for all utilities necessary during construction and shall remove them after completion of the Project.

Contractor shall provide and maintain sanitary facilities for workmen at the job in accordance with the laws of Texas and the code and ordinances of the City of Calallen. Contractor shall completely remove such facilities when the Project is completed.

All or a portion of the work necessary to complete the Project may be done on or near buildings which presently are in use as schools, or will be so used before the completion of such Project, and the Contractor must take all precautions necessary to protect students, employees and the public during the term of such Construction Contract.

In conjunction with, but not in lieu of other requirements, Contractor may provide temporary construction fencing generally 4' tall and orange in color as necessary to protect the public and work. The Contractor is responsible for taking necessary precautions to protect the public from hazards associated with Contractor's construction site and protect Contractor's work from damage by the public.

The Contractor shall maintain protection measures in a state of good repair at all times for the duration of the project. Any condition of the protection measures which the Architect or Owner deems hazardous will be corrected immediately. If such conditions are not corrected immediately upon verbal or written notice, the owner will correct the hazardous conditions and the cost of the corrective action will be deducted from the Contractor's payment.

Contractor shall provide and pay for, materials, equipment, tools, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work.

§ 8.4.2 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract Work. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them. The Contractor shall be responsible for the actions of Contractor's forces, Subcontractor's forces and all tiers of Sub-subcontractor's forces. The Contractor recognizes that the Project Site is a public school campus, and will prohibit the possession or use of alcohol, controlled substances, tobacco, and any prohibited weapons on the Project Site and shall require adequate dress of the Contractor's forces consistent with the nature of the Work being performed, including wearing shirts at all times. Sexual harassment of employees of the Contractor or employees or students of the Owner by employees of the Contractor is strictly forbidden. Any employee of the Contractor who is found to have engaged in such conduct shall be subject to appropriate disciplinary action by the Contractor, including removal from the job site.

§ 8.4.3 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 Architect for Architect's consideration and instructions before ordering material or 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 or damage. Upon receipt of notice from Architect 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.

§ 8.4.4 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. Chiller equipment stored off-site shall be stored at a bonded warehouse provided by Contractor. 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 material, from the date of the Contract until the date of acceptance, 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 Architect 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 Architect and, if so rejected, shall be removed at once from the premises by Contractor installing same.

§ 8.4.5 Substituted Materials, Products, Methods or Services. In certain instances, specific materials, products, methods and services have been specified by brand or trade-name partly for the purpose of establishing the effect or standard of quality desired. Upon the prior written approval of Architect, substitutions for such specifically named materials, products, methods or services may be made provided the materials, products, methods or services desired to be substituted have been proven to Architect to provide the effect or standard of quality desired. The decision of the Architect is absolute and final.

§ 8.4.6 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 are 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.

§ 8.4.7 Cooperation with Owner and City Building Officials. When required, Contractor shall notify the proper official of the City of Calallen in advance of all stopping and starting of construction. Contractor shall cooperate with 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 insure 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 Architect on a monthly basis along with Contractor's request for payment. The contractor shall submit copies of all City permits, interim inspections, and final inspections, including a Certificate of Occupancy where required, for the project showing compliance with code requirements of the entities with jurisdiction with the Record Documents for the Project.

§ 8.4.3 PREVAILING WAGES

The Project is subject to the Texas Government Code, Chapter 2258, Prevailing Wage Rates. This statute requires the Contractor and any Subcontractor to pay not less than the prevailing rates of per diem wages in the locality at the time of construction to all laborers, workmen, and mechanics employed by them in the execution of the contract.

§ 8.4.3.1 In accordance therewith, the Owner has established a scale of prevailing wages which is incorporated in the Contract as **Exhibit A**, attached hereto and incorporated herein, and not less than this established scale must be paid on the Project. Any workers not included in the schedule shall be properly classified and paid not less than the rate of wages prevailing in the locality of the Work at the time of construction.

§ 8.4.3.2 A Contractor or Subcontractor who violates the provisions of Section 8.4.3 shall pay to Owner the sum of Sixty Dollars and No/100 (\$60.00) for each worker employed for each calendar day or part of the day that the worker is paid less than the wage rate stipulated in the scale of prevailing wages applicable to this Project, as required by Texas Government Code Section 2258.023(b).

§ 8.4.3.3 Substitutions will not be accepted unless approved through the procedures set forth in the Contract Documents. The Owner shall be entitled to deduct from the Contract Sum, regardless of acceptance or rejection, amounts paid to the Architect to evaluate the Contractors proposed substitutions. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect to make agreed upon changes in the Drawings and Specifications made necessary by the Owner's acceptance of such substitutions.

§ 8.4.3.4 The Contractor shall only employ or use labor in connection with the Work capable of working harmoniously with all trades, crafts, and any other individuals associated with the Project.

§ 8.5 Warranty

The Contractor warrants to the Owner and Architect that: (1) materials and equipment furnished under the Contract will be new and of good quality unless otherwise required or permitted by the Contract Documents; (2) the Work will be free from defects not inherent in the quality required or permitted; and (3) the Work will conform to the requirements of the Contract Documents. Any material or equipment 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 12.5.

§ 8.5.1 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, including substitutions not properly approved and authorized, 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 under normal usage.

§ 8.5.2 The Contractor agrees to assign to the Owner at the time of final completion of the Work any and all manufacturer's warranties relating to materials and labor used in the Work and further agrees to perform the Work in such manner so as to preserve any and all such manufacturer's warranties. As a condition precedent to final payment, the Contractor shall submit to Owner a complete set of warranties from subcontractors, manufacturers, or suppliers as appropriate, and executed by Contractor as required, with a warranty commencement date as required by the Contract Documents.

§ 8.5.3 Contractor's express warranty herein shall be in addition to, and not in lieu of, any other remedies Owner may have under this Agreement, at law, or in equity for defective Work.

§ 8.5.4 The warranty provided in Section 8. shall be in addition to and not in limitation of any other warranty or remedy required by law or by the Contract Documents, and such warranty shall be interpreted to require Contractor to replace defective materials and equipment and re-execute defective Work which is disclosed to the Contractor by the Owner within a period of one (1) year after Substantial Completion of the entire Work or if latent defect, within one (1) year after discovery thereof by Owner.

§ 8.5.5 The Contractor shall issue in writing to the Owner as a condition precedent to final payment a "General Warranty" reflecting the terms and conditions of Sections 8.5.1 and 8.5.2 for all Work under the Contract Documents. This General Warranty shall be assignable. Submittal of all warranties and guarantees are required as a prerequisite to the final payment.

§ 8.5.6 Except when a longer warranty time is specifically called for in the Specification Sections, herein, or is otherwise provided by law, the General Warranty shall be for twelve (12) months and shall be in form and content otherwise satisfactory to the Owner. Contractor acknowledges that the Project may involve construction work on more than one (1) building for the Owner. Each building, or approved phase of each building, shall have its own, separate, and independent date of Substantial Completion or Final Completion. Contractor shall maintain a complete and accurate schedule of the dates of Substantial Completion, dates upon which the one (1) year warranty on each phase or building which is substantially complete will expire, and dates of Final Completion. Contractor agrees to provide notice of the warranty expiration date to Owner at least one (1) month prior to the expiration of the one (1) year warranty period on each building or each phase of the building which has been substantially completed. Prior to termination of the one (1) year warranty period, Contractor shall accompany the Owner on re-inspection of the building and be responsible for correcting any reasonable additional deficiencies not caused by the Owner or by the use of the building which are observed or reported during the re-inspection. For extended warranties required by various sections, i.e. roofing, compressors, mechanical equipment, Owner will notify the Contractor of deficiencies and Contractor shall start remedying these defects within three (3) days of initial notification from Owner. Contractor shall prosecute the work without interruption until accepted by the Owner, even though such prosecution should extend beyond the limit of the warranty period. If Contractor fails to provide notice of the expiration of the one (1) year warranty period at least one (1) month prior to the expiration date, Contractor's warranty obligations described in this Section shall continue until such inspection is conducted and any deficiencies found in the inspection corrected.

§ 8.5.7 Warranties shall become effective on a date established by the Owner in accordance with the Contract Documents. This date shall be the Date of Substantial Completion of the entire Work, unless otherwise provided in any Certificate of Partial Substantial Completion approved by the parties, except for work to be completed or corrected after the date of Substantial Completion and prior to final payment. Warranties for work to be completed or corrected after the date of Substantial Completion and prior to final payment shall become effective on the later of the date the work is completed or corrected and accepted by the Owner or the date of final payment.

§ 8.6 Taxes

The Contractor shall not include in the Contract Price or any Modification any amount for sales, use, or similar taxes for which (1) a Texas independent school district is exempt, and (2) the Owner has provided the Contractor with a tax exemption certificate or other documentation necessary to establish the Owner's exemption from such taxes.

CONTRACTOR HEREBY RELEASES, INDEMNIFIES, AND HOLDS HARMLESS OWNER FROM ANY AND ALL CLAIMS AND DEMANDS MADE AS A RESULT OF THE FAILURE OF CONTRACTOR OR ANY SUBCONTRACTOR TO COMPLY WITH THE PROVISIONS OF ANY OR ALL SUCH LAWS AND REGULATIONS. 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 Calallen Independent School District is 1-74-6000464-1.

§ 8.7 Permits, Fees and Notices

§ 8.7.1 The Contractor shall obtain and pay for the building permit and other permits and governmental fees, licenses, and inspections necessary for proper execution and completion of the Work.

§ 8.7.2 The Contractor shall comply with and give notices required by agencies having jurisdiction over the Work. 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 full responsibility for such Work and shall bear the attributable costs. The Contractor shall promptly notify the Architect in writing of any known inconsistencies in the Contract Documents with such governmental laws, rules, and regulations.

§ 8.8 Submittals

The Contractor shall promptly review, approve in writing, and submit to the Architect shop drawings, product data, samples, and similar submittals required by the Contract Documents. Shop drawings, product data, samples, and similar submittals are not Contract Documents.

§ 8.9 Use of Site

The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits, the Contract Documents, and the Owner.

§ 8.10 Cutting and Patching

The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly.

§ 8.11 Cleaning Up

The Contractor shall keep the premises and surrounding area free from accumulation of debris and trash related to the Work. At the completion of the Work, the Contractor shall remove its tools, construction equipment, machinery, and surplus material; and shall properly dispose of waste materials.

§ 8.12 Indemnification

§ 8.12.1 TO THE FULLEST EXTENT PERMITTED BY LAW, THE CONTRACTOR SHALL INDEMNIFY, DEFEND (EXCEPT AS LIMITED BELOW) AND HOLD HARMLESS THE OWNER, THE OWNER'S TRUSTEES, OFFICERS, AGENTS AND EMPLOYEES (HEREINAFTER IN THIS SECTION 8.12 "OWNER"), FROM AND AGAINST ALL CLAIMS, DAMAGES, LOSSES, AND EXPENSES, (INCLUDING BUT NOT LIMITED TO REASONABLE ATTORNEY'S FEES, AS PERMITTED BY STATUTE), 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), INCLUDING THE LOSS OF USE RESULTING THEREFROM, CAUSED IN WHOLE OR IN PART BY THE WILLFUL, INTENTIONAL OR NEGLIGENT ACTS OR OMISSIONS OF THE CONTRACTOR, A SUBCONTRACTOR, ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY THEM THE CONTRACTOR, 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 THE OWNER. IF THE OWNER'S NEGLIGENCE IS A CONCURRENT CAUSE OF THE INJURY, DEATH, OR DAMAGE, CONTRACTOR'S OBLIGATION TO INDEMNIFY IS LIMITED TO THE AMOUNT NECESSARY TO CAUSE THE RELATIVE LIABILITY OF OWNER AND CONTRACTOR TO REFLECT THE COMPARATIVE NEGLIGENCE FINDINGS OF THE TRIER OF FACT (JUDGE OR JURY) OR AS AGREED IN A SETTLEMENT AGREEMENT TO WHICH OWNER AND CONTRACTOR ARE BOTH PARTIES. 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 8.12.

§ 8.12.2 IN CLAIMS AGAINST ANY PERSON OR ENTITY INDEMNIFIED UNDER THIS SECTION 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 8.12.1 SHALL NOT BE LIMITED BY A LIMITATION ON AMOUNT OR TYPE OF DAMAGES, COMPENSATION OR BENEFITS PAYABLE BY OR FOR THE CONTRACTOR OR SUBCONTRACTOR UNDER INSURANCE POLICIES, WORKERS' COMPENSATION ACTS, DISABILITY BENEFIT ACTS OR OTHER EMPLOYEE BENEFIT ACTS.

§ 8.12.3 THE DUTY TO DEFEND SET OUT ABOVE SHALL NOT APPLY IN THE EVENT THAT THE CLAIM IS BASED, IN WHOLE OR IN PART, ON THE NEGLIGENCE OF, FAULT OF, OR BREACH OF CONTRACT BY THE OWNER. NOTWITHSTANDING THE FOREGOING, THE CONTRACTOR AGREES TO REIMBURSE THE OWNER'S REASONABLE ATTORNEY'S FEES IN PROPORTION TO THE CONTRACTOR'S LIABILITY.

§ 8.12.4 CONTRACTOR SHALL BE RESPONSIBLE FOR AND SHALL HOLD OWNER FREE AND HARMLESS FROM LIABILITY RESULTING FROM LOSS OF OR DAMAGE TO CONTRACTOR'S OR ITS SUBCONTRACTORS' CONSTRUCTION TOOLS AND EQUIPMENT AND RENTED ITEMS WHICH ARE USED OR INTENDED FOR USE IN PERFORMING THE WORK, REGARDLESS OF WHETHER SUCH LOSS OR DAMAGE IS CAUSED IN WHOLE OR IN PART BY THE WILLFUL, INTENTIONAL OR NEGLIGENT ACTS OR OMISSIONS OF THE CONTRACTOR, A SUBCONTRACTOR, ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY THE CONTRACTOR, 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 THE OWNER. IF THE OWNER'S NEGLIGENCE IS A CONCURRENT CAUSE OF THE INJURY, DEATH, OR DAMAGE, CONTRACTOR'S OBLIGATION TO INDEMNIFY IS LIMITED TO THE AMOUNT NECESSARY TO CAUSE THE RELATIVE LIABILITY OF OWNER AND CONTRACTOR TO REFLECT THE COMPARATIVE NEGLIGENCE FINDINGS OF THE TRIER OF FACT (JUDGE OR JURY) OR AS AGREED IN A SETTLEMENT AGREEMENT TO WHICH OWNER AND CONTRACTOR ARE BOTH PARTIES. THIS PROVISION SHALL APPLY, WITHOUT LIMITATION, TO LOSS OR DAMAGE OCCURRING AT THE WORK SITE OR WHILE SUCH ITEMS ARE IN TRANSIT TO OR FROM THE WORK SITE AND IS IN ADDITION TO CONTRACTOR'S OBLIGATIONS UNDER SECTION 8.12.1.

§ 8.12.4 Indemnification hereunder shall include, without limiting the generality of the foregoing, liability which could arise to the Owner, its agents, consultants, and representatives pursuant to State statutes for the safety of workmen and in addition, all Federal statutes and rules existing thereunder for protection, occupational safety and health to workmen. It being agreed that the primary obligation of the Contractor is to comply with said statutes in performance of the Work by Contractor and that the obligations of the Owner, its agents, consultants, and representatives under said statutes are secondary to that of the Contractor.

§ 8.13. Contractor, upon completion of the Project, shall furnish Architect with record drawings showing actual location in line and elevation of all new exterior utility lines within the limits of the site and of any relocation from that shown on the Drawings of concealed piping, wiring, cable or conduit within the lines of the building.

ARTICLE 9 ARCHITECT

§ 9.1 The Architect will provide administration of the Contract as described in the Contract Documents. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 9.2 The Architect will visit the site at intervals appropriate to the stage of construction to become generally familiar with the progress and quality of the Work.

§ 9.3 The Architect will not have control over or charge of, and will not be responsible for, construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work,

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since these are solely the Contractor's responsibility. The Architect will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.

§ 9.4 Based on the Architect's observations and evaluations of the Contractor's Applications for Payment, in accordance with the Contract Documents, the Architect will review and certify the amounts due the Contractor.

§ 9.5 The Architect or the Owner has authority to reject Work that does not conform to the Contract Documents.

§ 9.6 The Architect will promptly review and approve or take appropriate action upon Contractor's submittals, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 9.7 On written request from either the Owner or Contractor, the Architect will promptly interpret and decide matters concerning performance under, and requirements of, the Contract Documents.

§ 9.8 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.

§ 9.9 The Architect's duties, responsibilities, and limits of authority as described in the Contract Documents shall not be changed without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

ARTICLE 10 CHANGES IN THE WORK

§ 10.1 The Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract, consisting of additions, deletions or other revisions, and the Contract Sum and Contract Time shall be adjusted accordingly, in writing. If the Owner and Contractor cannot agree to a change in the Contract Sum, the Owner shall pay the Contractor its actual cost plus reasonable overhead and profit.

§ 10.2 The Architect may authorize or 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 authorization or order shall be in writing and shall be binding on the Owner and Contractor. The Contractor shall proceed with such minor changes promptly.

§ 10.3 If concealed or unknown physical conditions are encountered at the site that differ materially from those indicated in the Contract Documents or from those conditions ordinarily found to exist, the Contract Sum and Contract Time shall be subject to equitable adjustment.

ARTICLE 11 TIME

§ 11.1 Time limits stated in the Contract Documents are of the essence of the Contract.

§ 11.2 If the Contractor is delayed at any time in progress of the Work by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, or other causes beyond the Contractor's control, the Contract Time shall be subject to equitable adjustment.

§ 11.3 Costs caused by delays or by improperly timed activities or defective construction shall be borne by the responsible party.

ARTICLE 12 PAYMENTS AND COMPLETION

§ 12.1 Contract Sum

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

§ 12.2 Applications for Payment

§ 12.2.1 Where the Contract is based on a Stipulated Sum or the Cost of the Work with a Guaranteed Maximum Price as applicable, the Contractor shall submit to the Architect, before the first Application for Payment, or, in the

case of a Guaranteed Maximum Price, concurrent with the Guaranteed Maximum Price Proposal, a schedule of values, allocating the entire Contract Sum to the various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect or Owner, shall be used in reviewing the Contractor's Applications for Payment. The period covered by each Application for Payment shall be one (1) calendar month, ending on the last day of the month.

§ 12.2.2 With each Application for Payment where the Contract Sum is based upon the Cost of the Work, or the Cost of the Work with a Guaranteed Maximum Price, the Contractor shall submit payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, and any other evidence required by the Owner to demonstrate that cash disbursements already made by the Contractor on account of the Cost of the Work equal or exceed (1) progress payments already received by the Contractor, less (2) that portion of those payments attributable to the Contractor's Fee; plus (3) payrolls for the period covered by the present Application for Payment.

§ 12.2.3 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 stored, and protected from damage, off the site at a location agreed upon in writing.

§ 12.2.4 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 other encumbrances adverse to the Owner's interests. **CONTRACTOR SHALL INDEMNIFY AND HOLD OWNER HARMLESS FROM ANY LIENS, CLAIMS, SECURITY INTEREST OR ENCUMBRANCES FILED BY THE CONTRACTOR, SUBCONTRACTORS, OR ANYONE CLAIMING BY, THROUGH OR UNDER THE CONTRACTOR OR SUBCONTRACTOR FOR ITEMS COVERED BY PAYMENTS MADE BY THE OWNER TO CONTRACTOR.**

§ 12.3 Certificates for Payment

§ 12.3.1 In each Application for Payment, Contractor shall certify that there are no known mechanics' or materialmen's liens outstanding at the date of this requisition, that all due and payable bills with respect to the Work have been paid to date or are included in the amount requested in the current application and that except for such bills not paid but so included, there is no known basis for the filing of any mechanics' or materialmen's liens on the Work, and that releases from all subcontractors and materialmen have been obtained in such form as to constitute an effective release of lien under the laws of the State of Texas covering all Work theretofore performed and for which payment has been made by Owner to Contractor.

§ 12.3.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner that the Architect has observed the progress of the Work and determined that, in the Architect's professional opinion, based on the Architect's evaluations of the Work and the data comprising the Application for Payment, that the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. 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 in writing to the Owner. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. 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 material suppliers and other data unless 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. Examinations, audits, and verifications, if required by the Owner, will be performed by the Owner's accountants or other representatives of the Owner acting in the sole interest of the Owner.

§ 12.3.3 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 15.2.2 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 12. If the Contractor and the 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 herein, 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 for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a separate contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
- .7 repeated failure to carry out the Work in accordance with the Contract Documents;
- .8 **delay beyond the times set forth elsewhere in the Contract Documents including but not limited to the submission for approval of the schedule of values, cost breakdowns on proposal requests, progress schedule, list of subcontractors and insurance requirements;**
- .9 **failure to submit a written plan indicating action by the Contractor to regain the time schedule for completion of Work within the Contract Time;**
- .10 **evidence of financial inability to perform the Contract fully;**
- .11 **failure to submit record documents required by the Contract; or**
- .12 **failure of the Contractor to perform any other obligations of the Contract.**

§ 12.3.4 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld. The Owner shall not be deemed in default by reason of withholding payment as provided for in this Agreement.

§ 12.4 Progress Payments

§ 12.4.1 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 for undisputed amounts in the manner and within the time provided in the Contract Documents, on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents. Payment shall be made by the Owner not later than thirty (30) days after approval of the Contractor's Application for Payment by the Architect. Owner shall provide written notification to Contractor within twenty-one (21) days if Owner disputes the Contractor's Certificate for Payment pursuant to Texas Government Code section 2251.041 *et. seq.*, listing the specific reasons for non-payment. Payments to the Contractor shall not be construed as releasing the Contractor or his Surety from any obligations under the Contract Documents or Construction Documents. 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 Owner may require. This schedule shall be used as the basis for reviewing Contractor's Applications for Payment. Applications for Payment shall comply with all requirements of this Contract, including submission of the required certifications, and shall indicate the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 12.4.2 The period covered by each Application for Payment shall be one (1) calendar month ending on the last day of the month.

§ 12.4.3 Provided that an Application for Payment is received by the Architect not later than the last day of a month, the Owner shall make payment of the certified amount to the Contractor not later than the last day of the following month. If an Application for Payment is received by the Architect after the date fixed above, payment shall be made by the Owner not later than forty-five (45) days after the Architect receives the Application for Payment. Subject to the other provisions in the Contract Documents, the amount of each progress payment shall be computed as follows:

- .1 Take the portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of five percent (5%);
- .2 Add 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), less retainage of five percent (5%);
- .3 Subtract the aggregate of previous payments made by the Owner;
- .4 Subtract amounts, if any, for which the Owner has withheld or nullified a Certificate of Payment as provided for in this Contract; and
- .5 Upon Substantial Completion of the Work, add a sum sufficient to increase the total payments to ninety-five percent (95%) of the full amount of the Contract Sum, less such amounts as the Owner shall determine is necessary for incomplete work and unsettled claims.

§ 12.4.4 Retainage, if any, shall be withheld as set out in Section 12.4.3 above.

§ 12.4.5 Neither the Owner nor Architect shall have an obligation to pay or see to the payment of money to a Subcontractor except as may otherwise be required by law.

§ 12.4.6 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.

§ 12.4.7 The Contractor shall, as a condition precedent to any obligation of the Owner under this Agreement, provide to the Owner payment and performance bonds in the full penal amount of the Contract to the extent required by Texas Government Code Chapter 2253.

§ 12.5 Substantial Completion

§ 12.5.1 Substantial Completion is the stage in the progress of the 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 the correction or completion of minor finish work items the value of which shall in no event exceed one percent (1%) of the Contract Sum.

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.

§ 12.5.2 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.

§ 12.5.3 Upon receipt of the Contractor's list, the Architect, accompanied by the Owner or Owner's representative, at the Owner's option, will make an inspection to determine whether the Work or designated portion thereof is substantially complete. When the Architect determines that the Work is substantially complete in accordance with Section 12.5.1, Architect shall issue Certificate of Substantial Completion and shall deliver to the Contractor a "Punch List" of all items which must be completed or corrected before the Work is ready for final inspection and acceptance, which 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. If Contractor fails to fully and finally complete the Work within the time specified by the Architect for completion of the Punch List, then Contractor's name may be removed from the list of bidders acceptable to the Owner for the construction of future projects. 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. It is contemplated that Architect shall make no more than three (3) inspections after the Contractor notifies Architect that

Contractor considers the Work substantially complete. If upon completion of the third inspection, the Work has not progressed to the point that the Architect can certify that the Work is fully and finally complete in accordance with the Contract Documents, the cost of all additional inspections by the Architect shall be charged to and borne by the Contractor.

§ 12.5.4 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such 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.

§ 12.5.5 Liquidated Damages. The Contractor acknowledges that time is of the essence in completing the Work. The Contractor further recognizes that the Owner will sustain actual damages in the event the Work is not substantially complete within the Contract Time, but that the amount of such damages would be difficult or impracticable to ascertain with reasonable certainty. Therefore, the parties agree that the Contractor shall pay the Owner, as **liquidated damages and not as a penalty**, the amount of ONE THOUSAND DOLLARS AND NO CENTS (\$1,000.00) **per calendar day** for each day that Substantial Completion of the Work extends beyond the date required by the Contract. The Contractor agrees that the daily rate set forth above represents a reasonable estimate of the Owner's anticipated damages, including but not limited to administrative costs, loss of use, coordination with other trades, and disruption of district operations. The Owner may deduct any accrued liquidated damages from payments then or thereafter due to the Contractor. Assessment or withholding of liquidated damages shall not limit the Owner's right to terminate the Contract for default, nor waive or preclude recovery for costs, losses, or damages incurred by the Owner that are not addressed by this provision, including correction of defective work or costs to complete the Project after termination.

§ 12.6 Final Completion and Final Payment

§ 12.6.1 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 and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a Certificate of Completion and 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 terms and conditions of 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 stated in Section 12 as precedent to the Contractor's being entitled to final payment have been fulfilled.

The Architect 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.

§ 12.6.2 The Contractor shall not be entitled to final payment unless and until it submits to the Owner its affidavit that the payrolls, invoices for materials and equipment, and other liabilities connected with the Work for which the Owner, or the Owner's property, might be responsible have been fully paid or otherwise satisfied; releases and waivers of liens from all Subcontractors of the Contractor and of any and all other parties required by the Owner; such other provisions as Owner may request; and consent of Surety to final payment. If any third party fails or refuses to provide a release of claims or waiver of lien as required by Owner, the Contractor shall furnish a bond satisfactory to the Owner to discharge any such lien or indemnify the Owner from liability.

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

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in the Contract Documents, and to satisfy other requirements, if any, which extend beyond final payment;
- .2 Contractor's Final Application for Payment is properly submitted and accepted by Owner; and
- .3 a final Certificate for Payment has been issued by the Architect.

§ 12.6.4 The Owner shall make final payment of all sums due the Contractor not more than thirty-one (31) days after the issuance of Owner's final Certificate for Payment. Final Certificate for Payment and release of retainage will not be considered unless all testing required by the Contract Documents (including project manual), project specifications and drawings are provided in their final format showing that all findings of noncompliance have been corrected.

§ 12.6.5 Acceptance of final payment by the Contractor, a Subcontractor or material 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.

§ 12.7 AUDIT

Contractor agrees to maintain adequate books, payrolls and records satisfactory to the Owner in connection with any and all Work performed hereunder. Contractor agrees to retain all such books, payrolls and records (including data stored in computer) for a period of not less than three (3) years after completion of the Work. At all reasonable times, Owner and its duly authorized representatives shall have access to all personnel of Contractor and all such books, payrolls and records, and shall have the right to audit same.

ARTICLE 13 PROTECTION OF PERSONS AND PROPERTY

§ 13.1 SAFETY PRECAUTIONS AND PROGRAMS

§ 13.1.1 Contractor's employees, agents, and subcontractors shall not perform any service for Owner while under the influence of alcohol or any controlled substance. Contractor, its employees, agents, and subcontractors shall not use, possess, distribute, or sell illicit or unprescribed controlled drugs or drug paraphernalia, or misuse legitimate prescription drugs while performing the Work. Contractor, its employees, agents, and subcontractors shall not use, possess, distribute, or sell alcoholic beverages while performing the Work.

§ 13.1.2 Contractor has adopted or will adopt its own policy to assure a drug and alcohol free work place while performing the Work.

§ 13.1.3 Contractor will remove any of its employees from performing the Work any time there is suspicion of alcohol and/or drug use, possession, or impairment involving such employee, 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 employees from performing the Work any time cause exists to suspect alcohol or drug use. In such cases, Contractor's employees 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 employee was in compliance with this contract. Contractor will not use an employee to perform the Work who either refuses to take, or tests positive in, any alcohol or drug test.

§ 13.1.4 Contractor will comply with all applicable federal, state, and local drug and alcohol related laws and regulations (e.g., Department of Transportation regulations, Department of Defense Drug-free Work-free Workforce Policy, Drug-Free Workplace Act of 1988). Owner has also banned the presence of all weapons on the Project site, whether the owner thereof has a permit for a concealed weapon or not.

§ 13.2 HAZARDOUS MATERIALS

§ 13.2.1 The Contractor is responsible for compliance with the requirements of the Contract Documents regarding hazardous materials. 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 report the condition to the Owner and Architect in writing. If such notice is provided orally, written confirmation of such notice by Contractor shall be provided not later than one (1) business day following such notification. Upon receipt of the Contractor's written notice, the Owner may 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. Owner shall not be responsible for materials or substances brought to the site by the Contractor. 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 shall be extended appropriately and the Contract Sum shall be

increased in the amount of the Contractor's reasonable additional costs of shutdown, delay and start-up. Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles; or (2) where the Contractor fails to perform the obligations under this section, except to the extent the cost and expense are due to the Owner's fault or negligence.

§ 13.3 CRIMINAL HISTORY RECORDS CHECKS

§ 13.3.1

Prior to the commencement of work, Contractor shall take all necessary steps to comply with Texas Education Code, Section 22.0834 by obtaining, if a Qualified Contractor, as defined, or arranging with Owner to obtain, if not a Qualified Contractor, national criminal history record information ("CHRI") as to Contractor and Subcontractors and all persons associated with them including their employees, agents and representatives who a) have or will have continuing duties related to the contracted services; and b) have or will have direct contact with students (each a "Covered Employee").

§ 13.3.2 If the Contractor or any Subcontractor determines that § 13.3.1 does not apply to an employee, the Contractor or Subcontractor shall make a reasonable effort to ensure that the conditions or precautions that resulted in the determination that § 13.3.1 did not apply to the employee continue to exist throughout the time that the contracted services are provided.

§ 13.3.3 The requirements of § 13.3.1 do not apply if:

.1 the public work does not involve the construction, alteration, or repair of an Instructional Facility as defined by Section 46.001, Texas Education Code (real property, an improvement to real property, or a necessary fixture of an improvement to real property that is used predominantly for teaching the curriculum required by the Texas Education Code);

.2. for public work that involves construction of a new Instructional Facility, the person's duties related to the contracted services will be completed not later than the seventh (7th) day before the first day the facility will be used for instructional purposes; or

.3 for a public work that involves an existing Instructional Facility:

(a) the public work area contains sanitary facilities and is separated from all areas used by students by a secure barrier fence that is not less than six feet in height; and

(b) the Contractor adopts a policy prohibiting employees, including subcontractor entity employees, from interacting with students or entering areas used by students, informs employees of the policy, and enforces the policy at the public work area.

§ 13.3.4 If the Contractor is not a Qualified School Contractor, a person to whom § 13.3.1 applies must submit to a CHRI review by the Owner.

§ 13.3.5 Owner and Contractor agree to destroy any CHRI obtained or indexed by the Federal Bureau of Investigation ("FBI") or Texas Department of Public Safety ("DPS") under this § 13.3.1 after the information is used for its authorized purpose. CHRI may only be released to the individual who is the subject of the information, by court order, or as allowed by law.

§ 13.3.6 Any Covered Employee that has during the preceding thirty (30) years, (a) been convicted of or placed on deferred adjudication community supervision for an 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 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 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 described in this § 3.4.5, Contractor understands that it 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 judgment of the Owner as to whether the Covered Employee must be excluded from the Project.

§ 13.3.7 Prior to commencement of its work on the Project the Contractor will provide written certification to the Owner that either: (1) Contractor and its Subcontractors of every tier, do not have any Covered Employees, as defined; (2) Contractor and its Subcontractors of every tier are otherwise exempt from compliance with the requirements contained herein; or (3) Contractor and its Subcontractors of every tier have complied with the statutory and contractual requirements of this Agreement as of that date.

§ 13.3.8 Contractor agrees that if it receives information that a Covered Employee is arrested or convicted for any of the Disqualifying Criminal History offenses, during the performance of the Work, Contractor will immediately remove the Covered Employee from Owner's property or other location where students are regularly present, and notify the Owner of said removal within three (3) days of doing so. Contractor understands that any failure to comply with the requirements of this section may be grounds for termination of this Agreement by Owner, in accordance with Article 14, Termination.

ARTICLE 14 CORRECTION OF WORK

§ 14.1 The Contractor shall promptly correct Work rejected by the Architect as failing to conform to the requirements of the Contract Documents. The Contractor shall bear the cost of correcting such rejected Work, including the costs of uncovering, replacement, and additional testing.

§ 14.2 In addition to the Contractor's other obligations including warranties under the Contract, the Contractor shall, for a period of one year after Substantial Completion, correct work not conforming to the requirements of the Contract Documents.

§ 14.3 If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct it in accordance with Section 7.3.

ARTICLE 15 MISCELLANEOUS PROVISIONS

§ 15.1 Assignment of Contract

Neither party to the Contract shall assign the Contract as a whole without written consent of the other.

§ 15.2 Tests and Inspections

§ 15.2.1 At the appropriate times, the Contractor shall arrange and bear cost of tests, inspections, and approvals of portions of the Work required by the Contract Documents or by laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities.

§ 15.2.2 If the Architect requires additional testing, the Contractor shall perform those tests.

§ 15.2.3 The Owner shall bear cost of tests, inspections, or approvals that do not become requirements until after the Contract is executed. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 15.3 Governing Law

The Contract shall be governed by the laws of the State of Texas, without regard to the choice-of-law rules of any jurisdiction. The Contract is deemed performable entirely in the county in which the Project is located. Any litigation to enforce or interpret any terms of the Contract or any other litigation arising out of or as a result of the Contract shall be brought in the State courts of said county.

ARTICLE 16 TERMINATION OF THE CONTRACT

§ 16.1 Termination by the Contractor

If the Work is stopped for a period of 14 days through no fault of the Contractor, the Contractor may, upon seven additional days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed including reasonable overhead and profit, and costs incurred by reason of such termination.

§ 16.2 Termination by the Owner for Cause

§ 16.2.1 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 for materials or labor in accordance with the respective agreements between the Contractor and the subcontractors;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;
- .4 fails to proceed continuously and diligently with the construction and completion of the Work; except as permitted under the Contract Documents;
- .5 fails to furnish the Owner, upon written 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 or permits serious or repeated worker misconduct in violation of Article 13;
- .7 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
- .8 is otherwise guilty of substantial breach of a provision of the Contract Documents.

§ 16.2.2 When any of the above reasons exist, the Owner, after consultation with the Architect, 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

- .1 take possession of the site and of all materials thereon owned by the Contractor, and
- .2 finish the Work by whatever reasonable method the Owner may deem expedient.

§ 16.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 16.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished. Any further payment shall be limited to amounts actually earned to the date of termination.

§ 16.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the Owner. This obligation for payment shall survive termination of the Contract.

§ 16.3 Termination by the Owner for Convenience

The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause. The Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 17 OTHER TERMS AND CONDITIONS

(Insert any other terms or conditions below.)

§ 17.1 Pursuant to Texas Government Code Chapter 2271, as amended, if this contract is valued at \$100,000 or more and if the Contractor has at least ten (10) full time employees, then the Contractor, by its execution of this Agreement represents and warrants to the Owner that the Contractor does not boycott Israel and will not boycott Israel during the term of this Agreement. This section does not apply to a sole proprietorship.

§ 17.2 Pursuant to Texas Government Code Chapters 2274 and 809, if this contract is valued at \$100,000 or more and if Independent Consultant has at least ten (10) full-time employees, then Independent Consultant represents and warrants to the District that the Independent Consultant does not boycott energy companies and will not boycott energy companies during the term of this Agreement. This section does not apply to a sole proprietorship.

§ 17.3 Pursuant to Texas Government Code Chapter 2274, if this contract is valued at \$100,000 or more and if Independent Consultant has at least ten (10) full-time employees, then Independent Consultant represents and warrants to the District that the Independent Consultant does not discriminate against firearm entities or firearm trade associations and will not discriminate against firearm entities or firearm trade associations during the term of this Agreement. This section does not apply to a sole proprietorship.

§ 17.4 Contractor verifies and affirms that it is not a foreign terrorist organization as identified on the list prepared and maintained by the Texas Comptroller of Public Accounts. If Contractor has misrepresented its inclusion on the Comptroller's list such omission or misrepresentation will void this Contract.

§ 17.5 By signing this Agreement, the undersigned certifies as follows: Under Section 231.009 of the Texas Family Code, the Contractor certifies that the individual or business entity named in this Contract is not ineligible to receive the specified payments and acknowledges that this Contract may be terminated and payment withheld in this certification is inaccurate.

§ 17.6 The requirements of Subchapter J, Chapter 552, Government Code, may apply to this Contract and the Contractor agrees that the contract can be terminated if the Contractor knowingly or intentionally fails to comply with a requirement of that subchapter. Therefore, if the value of this Project is One Million Dollars (\$1,000,000.00) or more, the Contractor agrees to : (1) preserve all contracting information related to the contract as provided by the records retention requirements applicable to the Owner for the duration of the contract; (2) promptly provide to the governmental body any contracting information related to the contract that is in the custody or possession of the entity on request of the Owner; and (3) on completion of the contract, either: (a) provide at no cost to the Owner all contracting information related to the contract that is in the custody or possession of the entity; or (b) preserve the contracting information related to the contract as provided by the records retention requirements applicable to the Owner.

§ 17.7 Contractor verifies and affirms that it is not a foreign terrorist organization as identified on the list prepared and maintained by the Texas Comptroller of Public Accounts. If Contractor has misrepresented its inclusion on the Comptroller’s list such omission or misrepresentation will void this Agreement.

§ 17.8 Pursuant to Texas Government Code Chapter 2273, Contractor represents and warrants that it not a abortion provider or an affiliate of an abortion provider.

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

(Paragraph Deleted)

CALALLEN INDEPENDENT SCHOOL DISTRICT

COMPANY FULL LEGAL NAME:

EXHIBIT FOR PROCUREMENT ONLY

EXHIBIT FOR PROCUREMENT ONLY

OWNER (Signature)

CONTRACTOR (Signature)

Ms. Emily Lorenz, Superintendent of Schools
Email: elorenz@calallen.org

Name: _____
Title: _____
Email: _____

(Printed name and title)

(Printed name and title of authorized representative)

Additions and Deletions Report for AIA® Document A105® – 2017

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

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PAGE 1

AGREEMENT made as of the _____ day of _____ in the year Two Thousand Twenty-Five (2025)

...

Calallen Independent School District, a public school district and political subdivision of the State of Texas
4205 Wildcat Drive
Corpus Christi, Texas 78410
Phone: (361) 242-5600

...

EXHIBIT FOR PROCUREMENT ONLY

Name: _____
Type of Entity: _____
Address: _____
Phone: _____

...

Calallen Independent School District (2023 Bond Project): Wood River Elementary School HVAC Equipment
Replacements and Upgrades – 2026 (Phase 1)

...

Stridde, Callins & Associates, Inc., a corporation of the State of Texas
342 S. Navigation Blvd.
Corpus Christi, Texas 78405-3615
Phone: (361) 883-9199
Fax: (361) 883-9177

*Architect herein shall mean Engineer.

...

The Owner and Contractor agree as ~~follows~~follows:

5 INSURANCE AND BONDS

...

NOTE: Any reference to an AIA™ Document or any AIA Documents included in the Contract Documents shall refer to such document “as modified for this Project”. In addition any reference to AIA Documents shall all be considered to have included the Trademark “™” after the AIA reference, whether or not included in the text. The AIA Documents are registered intellectual property of the American Institute of Architects and use and amendment of such forms is permitted under license granted to Walsh Gallegos Trevino Kyle & Robinson P.C. for this Project. No use may be made of this AIA document other than as Contract Documents for this Project.

...

- .2 the drawings and specifications prepared by the Architect, ~~dated Architect and attached as Exhibit C~~ *OR*, dated _____, and enumerated as follows:

...

Number	Title	Date
<u>Number</u>	<u>Title</u>	<u>Date</u>

...

<u>Number</u>	<u>Title</u>	<u>Date</u>

Specifications:

...

Section	Title	Pages
<u>Section</u>	<u>Title</u>	<u>Pages</u>

...

<u>Section</u>	<u>Title</u>	<u>Pages</u>

...

Number	Date	Pages
<u>Number</u>	<u>Date</u>	<u>Pages</u>

...

Number

Date

Pages

...

Exhibit A, Owner's Prevailing Wage Rate Schedule

...

Exhibit B, Supplementary General Conditions for Project

...

ARTICLE 2 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

...

Upon Owner's issuance of a Notice to Proceed, which shall be Early January 2026

...

[] Not later than () calendar days from the date of ~~commencement~~.

...

[X] By the following date: August 2, 2026

...

EXHIBIT FOR PROCUREMENT ONLY

_____ (\$ _____) (\$—)

PAGE 4

<u>Portion of the Work</u>	<u>Value</u>

<u>Portion of the Work</u>	<u>Value</u>

...

<u>Portion of the Work</u>	<u>Value</u>

...

<u>Item</u>	<u>Price</u>

<u>Item</u>	<u>Price</u>

...

<u>Item</u>	<u>Price</u>	
...		
<u>Item</u>	<u>Units and Limitations</u>	<u>Price per Unit (\$0.00)</u>
<u>Item</u>	<u>Units and Limitations</u>	<u>Price per Unit (\$0.00)</u>
...		
<u>Item</u>	<u>Units and Limitations</u>	<u>Price per Unit (\$0.00)</u>

§ 4.1 Based on Contractor's Applications for Payment certified by the Architect, the Owner shall pay the Contractor, in accordance with Article 12, as follows: 12.

(Insert below timing for payments and provisions for withholding retainage, if any.)

§ 4.2 ~~Payments due and unpaid under the Contract Documents shall bear interest from the date payment is~~ Undisputed payments remaining unpaid under the Contract on the 31st day after the date the Owner receives a properly documented Certificate of Payment from the Architect are considered overdue and in accordance with the Texas Prompt Payment Act, Texas Government Code Chapter 2251, shall bear interest from that date until the date that the Owner mails or electronically transmits payment, including accrued interest to that date.

§ 4.3 Changes in Work

1. For work performed by the Contractors own forces, Contractor's mark-up for overhead and provide shall not exceed (15%) of the cost of the change in the work.

~~due at the rate below,~~ 2. For the Contractor, for supervision of work performed by the Contractor's Subcontractors, the total Contractor mark-up for overhead and profit shall not exceed (5%) for the amount due to the Subcontractors.

~~or in the absence thereof, at the legal rate prevailing at the place of the Project.~~ 3. For each Subcontractor or Sub-Subcontractor involved, in the Work performed by the Subcontractor's or Sub-Subcontractor's own forces, the total mark-up for overhead and profit shall not exceed Ten percent (10%) of the cost of the change in the work.

PAGE 5

~~(Insert rate of interest agreed upon, if any.)~~4. In no event shall the total mark-up for overhead, profit or fee in any work which involves a subcontractor or one or more sub-contractors, regardless of who performs the work, exceed(15%) of the total cost of the change in the Work.

...

9/-

...

ARTICLE 5 INSURANCE AND BONDS

...

§ 5.1 CONTRACTOR’S INSURANCE

...

The Contractor shall maintain the following types and limits of insurance § 5.1.1 The Contractor and the Contractor’s Subcontractors shall purchase and maintain in force, insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the table below, the Agreement, or elsewhere in the Contract Documents. No work will be commenced, and no equipment or materials may be shipped, until all requirements of Article 5 have been satisfied, satisfactory evidence of insurance has been provided, and all required insurance is in full force and effect. The Contractor shall purchase and maintain the insurance required by this Agreement from an insurance company or insurance companies lawfully authorized to issue insurance in the State of Texas. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor’s completed operations coverage, until the expiration of the period for correction of Work as set forth in Section 14.2, subject to the terms and conditions set forth in this Section 5.1; or for such other period for maintenance of completed operations coverage as specified in the Contract Documents. Nothing contained herein shall limit or waive Contractor’s legal or contractual responsibilities to Owner or others. Contractor shall permit Owner to examine the insurance policies, or at Owner’s option, Contractor shall furnish Owner with copies, certified by the carrier(s), of insurance policies required under this Article 5. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in this Agreement, unless a different duration is stated below:

...

Workmen’s Compensation:
(Including Waiver of Subrogation
Endorsement)

All liability arising out of Contractor’s employment of workers and anyone for whom Contractor shall be liable for Worker’s Compensation claims. Worker’s Compensation is required and no "alternative" form of insurance shall be permitted.

Employer’s Liability:

\$1,000,000.00

Commercial General Liability:

<u>Each Occurrence</u>	<u>\$1,000,000.00</u>
<u>General Aggregate</u>	<u>\$2,000,000.00 (A Designated Construction Project General Aggregate Limit shall be provided)</u>
<u>Personal & Advertising Injury</u>	<u>\$1,000,000.00 each person</u>
<u>Products and Completed Operations</u>	<u>\$1,000,000.00 (for one (1) year, commencing with issuance of final Certificate for Payment)</u>
<u>Property Damage:</u>	<u>\$2,000,000.00 aggregate</u>
<u> Independent Contractors</u>	<u>(Same limits as above)</u>
<u> Contractual Liability</u>	<u>(Same limits as above)</u>
<u>Automobile Liability:</u>	
<u> Bodily Injury/Property Damage</u>	<u>\$1,000,000.00 combined single limit</u>
<u> Property Damage</u>	<u>\$1,000,000.00 each occurrence</u>

Umbrella/Excess \$1,000,000.00

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§ 5.1.1 Commercial General Liability insurance for the Project, written on an occurrence form, with policy limits of not less than (\$) each occurrence, (\$) general aggregate, and (\$) aggregate for products completed operations hazard.
5.1.2 The required insurance must be written by a company licensed to do business in Texas at the time the policy is issued. In addition, the company must be rated at least A-VIII by A.M. Best's Key Rating Guide. The Owner's Representative will contact the State Board of Insurance to confirm that the issuing companies are admitted and authorized to issue such policies in the State of Texas.

...

§ 5.1.2 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor.
5.1.3 The General Liability and Automobile so issued in the name of Contractor shall also name the Owner and subcontractors as additional insureds, as their respective interests may appear. The coverage afforded to the additional insured under the policy or policies shall be primary insurance. It is the intent of the parties to this Agreement that the General Liability coverage required herein shall be primary to and shall seek no contribution from all insurance available to Owner, with Owner's insurance being excess, secondary and non-contributing. The Commercial General Liability coverage provided by Contractor shall be endorsed to provide such primary and non-contributing liability. If the additional insured has other insurance which is applicable to the loss, such other insurance shall be on an excess or contingent basis.

...

with policy limits of § 5.1.4 If the insurance is written with stipulated amounts deductible under the terms of the policy, the Contractor shall pay the difference attributable to deductions in any payment made by the insurance carrier on claims paid by this insurance. If the Owner is damaged by the failure of the Contractor to maintain such insurance and to so notify the Owner then the Contractor shall bear all reasonable costs properly attributable thereto.

...

not less than (\$) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance, and use of those motor vehicles along with any other statutorily required automobile coverage.
§ 5.1.5 The insurance required by Section 5.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an

occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents. Nothing contained herein shall limit or waive Contractor's legal or contractual responsibilities to Owner or others.

...

§ 5.1.3 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided that such primary and excess or umbrella insurance policies result in the same 5.1.6 Contractor shall have its insurance carrier(s) furnish to Owner with ISO ACORD Form 25 insurance certificates specifying the types and amounts of coverage in effect, the expiration dates of each policy, and a statement that no insurance will be canceled or materially changed while the Work is in progress without thirty (30) calendar day's prior written notice to Owner. Contractor shall permit Owner to examine the insurance policies, or at Owner's option, Contractor shall furnish Owner with copies, certified by the carrier(s), of insurance policies required in Section 5.1.1. If Contractor neglects or refuses to provide any insurance required herein, or if any insurance is canceled, Owner may, but shall not be obligated to, procure such insurance and the provisions of Section 5.1.8 hereof shall apply.

...

or greater coverage as those required under Section 5.1.1 § 5.1.7 Contractor and its contractors shall not commence the shipment of equipment or materials or commence the Work at the site until all of the insurance coverage required of Contractor and its contractors are in force and the necessary certificates and statements pursuant to Section 5 hereof have been received by Owner and the Architect has issued a written notice to proceed.

...

and 5.1.2, and in no event shall § 5.1.8 As an alternative and at Owner's option and expense, Owner may elect to furnish or to arrange for any part or all of the insurance required by Section 5.1 hereof. If Owner so elects, it shall notify, in writing, Contractor and issue a Change Order therefor, but no adjustment to the scheduled completion date or the Contract Sum shall be allowed.

...

§ 5.1.9 Workers' Compensation Insurance Coverage.

...

.1 Definitions:

...

.1.1 Certificate of coverage ("Certificate"). A copy of a certificate of insurance, a certificate of authority to self-insure issued by the division, or a coverage agreement (DWC Form-81, DWC Form-82, DWC Form-83, or DWC Form-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on the Project, for the duration of the Project.

...

.1.2 Duration of the Project. Includes the time from the beginning of the work on the Project until the Contractor's work on the Project has been completed and accepted by the Owner.

~~any excess or umbrella liability insurance.~~ **1.3 Persons providing services on the Project**
("subcontractor" in Texas Labor Code §406.096). 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 contracts 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 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.

...

~~provide narrower.~~ .5 The Contractor shall obtain from each person providing Services on a Project, and provide to the Owner:

...

.5.1 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

...

.5.2 no later than the ~~primary policy~~ seven (7) 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 (1) year thereafter.

...

~~The excess policy shall not require exhaustion of the underlying limits only through.~~7 The Contractor shall notify the Owner in writing by certified mail or personal delivery, within ten (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.

...

~~the actual payment by the underlying insurers.~~8 The Contractor shall post on each Project site a notice, in the text, form and manner prescribed by the Texas Department of Insurance, Division of Workers' Compensation, 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 a Project, to:

...

~~§ 5.1.4 Workers' Compensation at statutory limits.~~.9.1 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;

...

.9.2 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;

...

.9.3 provide the Contractor, prior to the end of the coverage period, 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;

...

~~§ 5.1.5 Employers' Liability with policy limits not less than (\$).~~.9.4 obtain from each other person with whom it contracts, and provide to the Contractor;

...

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

...

(b) 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;

...

.9.5 retain all required certificates of coverage on file for the duration of the Project and for one (1) year thereafter;

...

.9.6 notify the Owner in writing by certified mail or personal delivery, within ten (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

...

each accident, ~~(\$) each employee,~~ .9.7 contractually require each person with whom it contracts, to perform as required by Subparagraphs .9.1 - .9.7 with the certificates of coverage to be provided to the person for whom they are providing services.

PAGE 8

and ~~(\$) policy limit,~~ .10 By signing this 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 a self-insured, with the Texas Department of Insurance, 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 (10) days after receipt of notice of breach from the Owner. [28 TAC §110.110(c)(7)]

...

~~§ 5.1.6 The Contractor shall provide builder's risk insurance.~~ § 5.1.10 The Contractor shall provide an Installation Floater or Builder's Risk Insurance to cover the total value of the entire Project on a replacement cost basis, with the Owner named as an Additional Insured. Such insurance shall cover replacement cost of the Project (including additions and modifications) together with Contractor's equipment, materials and supplies relating to the Project which are on the job site, in transit to the job site or at a temporary storage location pending delivery to the job site. In addition, soft cost coverage for Architect's fees shall be included. Owner shall be named as an insured, loss payee on the policy.

...

§ 5.1.7 Other Insurance Provided 5.2 PERFORMANCE BOND AND PAYMENT BOND

...

§ 5.2.1 If the Contract Sum in Article 3 is in excess of \$100,000, the Contractor is required, as a condition precedent to the execution of the Contract, to execute a PERFORMANCE BOND in the form required by TEXAS STATUTES, in the amount equal to ONE HUNDRED PERCENT (100%) of the total combined accepted bid(s).

...

§ 5.2.2 If the Contract Sum in Article 3 is in excess of \$25,000, the Contractor

...

(List below any other insurance coverage to be provided by the Contractor and any applicable limits.) is required, as a condition precedent to the execution of the Contract, to execute a PAYMENT BOND in the form required by TEXAS STATUTES, in the amount equal to ONE HUNDRED PERCENT (100%) of the total bid as security for payment of all persons performing labor and furnishing materials in connection with this Contract. (Bonding Company is to furnish such forms). All bonds shall name the Owner as additional obligee.

...

Coverage

Limits

...

§ 5.2 The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance and shall provide property insurance.
5.2.3 The Bond(s) shall meet requirements of Chapter 2253 of the Texas Governmental Code. All bonds shall be issued by a surety company licensed, listed and authorized to issue bonds in the State of Texas by the Texas Department of Insurance. The surety company may be required by the Owner to have a rating of not less than AB@ in the latest edition of Best's Insurance Reports, Property-Casualty. The surety company shall provide, if requested, information on bonding capacity, other projects under coverage and shall provide proof to establish adequate financial capacity for this project.

...

to cover the value of the Owner's property. The Contractor is entitled to receive an increase. Should the bond amount be in excess of ten percent (10%) of the surety company's capital and surplus, the surety company issuing the bond shall certify that the surety company has acquired reinsurance, in a form and amount acceptable to the Owner, to reinsure the portion of the risk that exceeds ten percent (10%) of the surety company's capital and surplus with one or more reinsurers who are duly authorized and admitted to do business in Texas and that amount reinsured by an reinsurer does not exceed ten percent (10%) of the reinsurer's capital and surplus.

...

The Sureties shall promptly file a signed copy of the Contract, Performance, and Payment Bonds with the Owner in full compliance with Chapter 2253 of the Texas Governmental Code.

...

the Contract Sum equal to the insurance proceeds related to a loss for damage to the Work covered by the Owner's property insurance.
§ 5.2.4 All bonds will be reviewed by the Owner for compliance with the Contract Documents prior to execution of the contract. In the event that the Owner has any questions concerning the sufficiency of the bonds, the bonds will be referred to the Owner or the Owner's representative for review and decision.

...

§ 5.3 The Contractor shall obtain an endorsement to its Commercial General Liability insurance policy to provide coverage for the Contractor's obligations under Section 8.12.
5.2.5 All bonds shall be originals. The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the Power-of-Attorney. The name, address, and telephone number of a contact person for the bonding company shall be provided.

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~~§ 5.4 Prior to commencement of the Work, each party shall provide certificates of insurance showing their respective coverages.~~5.2.6 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.

...

~~§ 5.5 Unless specifically precluded by the Owner's property insurance policy, the Owner and Contractor waive all rights against (1) each other~~5.2.7 Bonds shall be signed by an agent resident in the State of Texas and the date of the bond shall be the date of execution of the contract. If at any time during the continuance of the contract, the surety of the Contractor's bonds becomes insufficient, Owner shall have the right to require additional and sufficient sureties which the Contractor shall furnish to the satisfaction of the Owner within ten (10) business days after notice to do so. In default thereof, the Contractor may be suspended, and all payment or money due to the Contractor withheld.

...

~~and any of their subcontractors, suppliers, agents, and employees, each of the other; and (2) the Architect, Architect's consultants, and any of their agents and employees, for damages caused by fire or other causes of loss to the extent those losses are covered by property insurance or other insurance applicable to the Project, except such rights as they have to the proceeds of such insurance.~~§ 5.2.8 By inclusion of this Subsection in the Contract Documents, the surety which issues the bonds is hereby notified that the Owner and its agents and employees do not represent and will not be responsible for the surety's interests during the course of the Work. To protect its interests, the surety shall have the right to attend pay estimate meetings, review Applications for Payment when requested in writing by them, comment upon and make recommendations regarding payments, and inspect the Work in the presence of the Contractor and the Owner. By providing the bonds for the Work, the surety shall and hereby waives any cause of action against the Owner, its agents and employees, for any loss suffered by the surety by reason of overpayment of any amounts to the Contractor, unless such is a direct result of a fraudulent or grossly negligent act committed by such party.

...

§ 6.5 Electronic Notice

...

Owner's representative:

...

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

...

Emily Lorenz, Superintendent of Schools
Calallen Independent School District
4205 Wildcat Drive, Corpus, Christi, Texas 78410-5198
Phone: (361) 242-5600
Email: elorenz@calallen.org

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Contractor's representative:

...

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

...

EXHIBIT FOR PROCUREMENT ONLY

Representative's Name: _____
Representative's Title: _____
Company Full Legal Name: _____
Address: _____
Company Phone: _____
Cell Phone: _____
Email: _____

...

§ 7.0.1 The Owner is the Board of Trustees of the Calallen Independent School District and is referred to throughout the Contract Documents as if singular in number. The Owner may designate in writing one or more persons to represent the Owner; however, such representatives shall have the authority to bind the Owner only to the extent expressly authorized by the Owner and shall have no implied authority. Neither the Architect nor the Contractor may rely upon the direction of any employee of Owner who has not been so designated as Owner's representative. Owner shall not be financially responsible for actions taken by the Architect or Contractor in reliance upon direction from unauthorized persons.

...

§ 7.0.2 The Contractor acknowledges that no lien rights exist with respect to public property. 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 situated.

...

If the Contractor fails to correct Work ~~which is~~ that is defective or not in accordance with the Contract Documents, the Owner may direct the Contractor in writing to stop the Work until the correction is made.

...

If the Contractor ~~defaults or neglects to~~ is in default on any of its material obligations hereunder, neglects to timely carry out the Work in accordance with the Contract Documents and Documents, or fails within a seven day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect non-conforming or defective Work with diligence and promptness, the Owner may, without prejudice to other remedies, correct such deficiencies, defaults or such non-conforming or defective Work. In such case, the Architect may withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the cost of correction, provided the actions of the Owner and amounts charged to the Contractor were approved by the Architect.

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§ 8.1.2 The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the Owner. Before commencing activities, the Contractor shall (1) take field measurements and verify field conditions; (2) carefully compare this and other information known to the Contractor with the Contract Documents; and (3) promptly report errors, inconsistencies, or omissions discovered to the Architect. If the Contractor performs any construction activity knowing it involves a recognized error, inconsistency or omission in the Contract Documents without such notice to Architect, the Contractor shall assume appropriate responsibility

for any such performance and shall bear an appropriate amount of the attributable costs for correction. 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, however any apparent design errors or omissions noted by the Contractor during this review shall be reported promptly to the Architect.

...

The Contractor's initial schedule shall be provided with the proposal in response to the Owner's procurement for this Project. As part of the response, Contractor shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The Contractor, promptly after being awarded the Contract, shall will also prepare and submit for the Owner's and Architect's information a Contractor's final coordinated construction schedule for the Work.

...

§ 8.3.1 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. Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and except as stated below shall be fully and solely responsible for the jobsite safety of such means, methods, techniques sequences or procedures. If the Contractor determines that such means, methods, techniques, or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed by the Owner, in writing, to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by Contractor, the Owner shall be solely responsible for any loss or damage arising solely from the Owner-required means, methods, techniques, sequences or procedures.

...

§ 8.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for qualified, careful, and efficient workers and labor, eligible to work in accordance with state and federal law. Contractor shall appropriately classify all workers in accordance with the Fair Labor Standards Act, its implementing regulations, and Texas Labor Code Section 214.008. In addition, unless otherwise provided in the Contract Documents, the

...

Contractor shall make temporary connections for all utilities necessary during construction and shall

...

remove them after completion of the Project.

...

Contractor shall provide and maintain sanitary facilities for workmen at the job in accordance with

...

the laws of Texas and the code and ordinances of the City of Calallen. Contractor shall completely remove

...

such facilities when the Project is completed.

All or a portion of the work necessary to complete the Project may be done on or near buildings which presently are in use as schools, or will be so used before the completion of such Project, and the Contractor must take all precautions necessary to protect students, employees and the public during the term of such Construction Contract.

...

In conjunction with, but not in lieu of other requirements, Contractor may provide temporary construction fencing generally 4' tall and orange in color as necessary to protect the public and work. The Contractor is responsible for taking necessary precautions to protect the public from hazards associated with Contractor's construction site and protect Contractor's work from damage by the public.

...

The Contractor shall maintain protection measures in a state of good repair at all times for the duration of the project. Any condition of the protection measures which the Architect or Owner deems hazardous will be corrected immediately. If such conditions are not corrected immediately upon verbal or written notice, the owner will correct the hazardous conditions and the cost of the corrective action will be deducted from the Contractor's payment. Contractor shall provide and pay for, materials, equipment, tools, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work.

...

§ 8.4.2 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract Work. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them. The Contractor shall be responsible for the actions of Contractor's forces, Subcontractor's forces and all tiers of Sub-subcontractor's forces. The Contractor recognizes that the Project Site is a public school campus, and will prohibit the possession or use of alcohol, controlled stances, tobacco, and any prohibited weapons on the Project Site and shall require adequate dress of the Contractor's forces consistent with the nature of the Work being performed, including wearing shirts at all times. Sexual harassment of employees of the Contractor or employees or students of the Owner by employees of the Contractor is strictly forbidden. Any employee of the Contractor who is found to have engaged in such conduct shall be subject to appropriate disciplinary action by the Contractor, including removal from the job site.

...

§ 8.4.3 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 Architect for Architect's consideration and instructions before ordering material or 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 or damage. Upon receipt of notice from Architect 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.

...

§ 8.4.4 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. Chiller equipment stored off-site shall be stored at a bonded warehouse provided by Contractor. 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 material, from the date of the Contract until the date of acceptance, 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 Architect 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 Architect and, if so rejected, shall be removed at once from the premises by Contractor installing same.

...

§ 8.4.5 Substituted Materials, Products, Methods or Services. In certain instances, specific materials, products, methods and services have been specified by brand or trade-name partly for the purpose of establishing the effect or standard of quality desired. Upon the prior written approval of Architect, substitutions for such specifically named materials, products, methods or services may be made provided the materials, products, methods or services desired to be substituted have been proven to Architect to provide the effect or standard of quality desired. The decision of the Architect is absolute and final.

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§ 8.4.6 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 are 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.

...

§ 8.4.7 Cooperation with Owner and City Building Officials. When required, Contractor shall notify the proper official of the City of Calallen in advance of all stopping and starting of construction. Contractor shall cooperate with 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 insure 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 Architect on a monthly basis along with Contractor's request for payment. The contractor shall submit copies of all City permits, interim inspections, and final inspections, including a Certificate of Occupancy where required, for the project showing compliance with code requirements of the entities with jurisdiction with the Record Documents for the Project.

...

§ 8.4.3 PREVAILING WAGES

...

The Project is subject to the Texas Government Code, Chapter 2258, Prevailing Wage Rates. This statute requires the Contractor and any Subcontractor to pay not less than the prevailing rates of per diem wages in the locality at the time of construction to all laborers, workmen, and mechanics employed by them in the execution of the contract.

...

§ 8.4.3.1 In accordance therewith, the Owner has established a scale of prevailing wages which is incorporated in the Contract as Exhibit A, attached hereto and incorporated herein, and not less than this established scale must be paid on the Project. Any workers not included in the schedule shall be properly classified and paid not less than the rate of wages prevailing in the locality of the Work at the time of construction.

...

§ 8.4.3.2 A Contractor or Subcontractor who violates the provisions of Section 8.4.3 shall pay to Owner the sum of Sixty Dollars and No/100 (\$60.00) for each worker employed for each calendar day or part of the day that the worker is paid less than the wage rate stipulated in the scale of prevailing wages applicable to this Project, as required by Texas Government Code Section 2258.023(b).

...

§ 8.4.3.3 Substitutions will not be accepted unless approved through the procedures set forth in the Contract Documents. The Owner shall be entitled to deduct from the Contract Sum, regardless of acceptance or rejection, amounts paid to the Architect to evaluate the Contractors proposed substitutions. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect to make agreed upon changes in the Drawings and Specifications made necessary by the Owner's acceptance of such substitutions.

...

§ 8.4.3.4 The Contractor shall only employ or use labor in connection with the Work capable of working harmoniously with all trades, crafts, and any other individuals associated with the Project.

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§ 8.5.1 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, including substitutions not properly approved and authorized, 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 under normal usage.

...

§ 8.5.2 The Contractor agrees to assign to the Owner at the time of final completion of the Work any and all manufacturer's warranties relating to materials and labor used in the Work and further agrees to perform the Work in such manner so as to preserve any and all such manufacturer's warranties. As a condition precedent to final payment, the Contractor shall submit to Owner a complete set of warranties from subcontractors, manufacturers, or suppliers as appropriate, and executed by Contractor as required, with a warranty commencement date as required by the Contract Documents.

...

§ 8.5.3 Contractor's express warranty herein shall be in addition to, and not in lieu of, any other remedies Owner may have under this Agreement, at law, or in equity for defective Work.

...

§ 8.5.4 The warranty provided in Section 8. shall be in addition to and not in limitation of any other warranty or remedy required by law or by the Contract Documents, and such warranty shall be interpreted to require Contractor to replace defective materials and equipment and re-execute defective Work which is disclosed to the Contractor by the Owner within a period of one (1) year after Substantial Completion of the entire Work or if latent defect, within one (1) year after discovery thereof by Owner.

...

§ 8.5.5 The Contractor shall issue in writing to the Owner as a condition precedent to final payment a "General Warranty" reflecting the terms and conditions of Sections 8.5.1 and 8.5.2 for all Work under the Contract Documents. This General Warranty shall be assignable. Submittal of all warranties and guarantees are required as a prerequisite to the final payment.

...

§ 8.5.6 Except when a longer warranty time is specifically called for in the Specification Sections, herein, or is otherwise provided by law, the General Warranty shall be for twelve (12) months and shall be in form and content otherwise satisfactory to the Owner. Contractor acknowledges that the Project may involve construction work on more than one (1) building for the Owner. Each building, or approved phase of each building, shall have its own, separate, and independent date of Substantial Completion or Final Completion. Contractor shall maintain a complete and accurate schedule of the dates of Substantial Completion, dates upon which the one (1) year warranty on each phase or building which is substantially complete will expire, and dates of Final Completion. Contractor agrees to provide notice of the warranty expiration date to Owner at least one (1) month prior to the expiration of the one (1) year warranty period on each building or each phase of the building which has been substantially completed. Prior to termination of the one (1) year warranty period, Contractor shall accompany the Owner on re-inspection of the building and be responsible for correcting any reasonable additional deficiencies not caused by the Owner or by the use of the building which are observed or reported during the re-inspection. For extended warranties required by various sections, i.e. roofing, compressors, mechanical equipment, Owner will notify the Contractor of deficiencies and Contractor shall start remedying these defects within three (3) days of initial notification from Owner. Contractor shall prosecute the work without interruption until accepted by the Owner, even though such prosecution should extend beyond the limit of the warranty period. If Contractor fails to provide notice of the expiration of the one (1) year warranty period at least one (1) month prior to the expiration date, Contractor's warranty obligations described in this Section shall continue until such inspection is conducted and any deficiencies found in the inspection corrected.

...

§ 8.5.7 Warranties shall become effective on a date established by the Owner in accordance with the Contract Documents. This date shall be the Date of Substantial Completion of the entire Work, unless otherwise provided in any Certificate of Partial Substantial Completion approved by the parties, except for work to be completed or corrected after the date of Substantial Completion and prior to final payment. Warranties for work to be completed or corrected after the date of Substantial Completion and prior to final payment shall become effective on the later of the date the work is completed or corrected and accepted by the Owner or the date of final payment.

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The Contractor shall pay sales, consumer, use, and similar taxes that are legally required when the Contract is executed, not include in the Contract Price or any Modification any amount for sales, use, or similar taxes for which (1) a Texas independent school district is exempt, and (2) the Owner has provided the Contractor with a tax exemption certificate or other documentation necessary to establish the Owner's exemption from such taxes. CONTRACTOR HEREBY RELEASES, INDEMNIFIES, AND HOLDS HARMLESS OWNER FROM ANY AND ALL CLAIMS AND DEMANDS MADE AS A RESULT OF THE FAILURE OF CONTRACTOR OR ANY SUBCONTRACTOR TO COMPLY WITH THE PROVISIONS OF ANY OR ALL SUCH LAWS AND REGULATIONS. 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 Calallen Independent School District is 1-74-6000464-1.

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TO § 8.12.1 TO THE FULLEST EXTENT PERMITTED BY LAW, THE CONTRACTOR SHALL INDEMNIFY, DEFEND (EXCEPT AS LIMITED BELOW) AND HOLD HARMLESS THE OWNER, THE OWNER'S TRUSTEES, OFFICERS, AGENTS AND EMPLOYEES (HEREINAFTER IN THIS SECTION 8.12 "OWNER"), FROM AND AGAINST ALL CLAIMS, DAMAGES, LOSSES, AND EXPENSES, (INCLUDING BUT NOT LIMITED TO REASONABLE ATTORNEY'S FEES, AS PERMITTED BY STATUTE), 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), INCLUDING THE LOSS OF USE RESULTING THEREFROM, CAUSED IN WHOLE OR IN PART BY THE WILLFUL, INTENTIONAL OR NEGLIGENT ACTS OR OMISSIONS OF THE CONTRACTOR, A SUBCONTRACTOR, ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY THEM, THE CONTRACTOR, 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 THE OWNER. IF THE OWNER'S NEGLIGENCE IS A CONCURRENT CAUSE OF THE INJURY, DEATH, OR DAMAGE, CONTRACTOR'S OBLIGATION TO INDEMNIFY IS LIMITED TO THE AMOUNT NECESSARY TO CAUSE THE RELATIVE LIABILITY OF OWNER AND CONTRACTOR TO REFLECT THE COMPARATIVE NEGLIGENCE FINDINGS OF THE TRIER OF FACT (JUDGE OR JURY) OR AS AGREED IN A SETTLEMENT AGREEMENT TO WHICH OWNER AND CONTRACTOR ARE BOTH PARTIES. 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 8.12.

...

§ 8.12.2 IN CLAIMS AGAINST ANY PERSON OR ENTITY INDEMNIFIED UNDER THIS SECTION 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 8.12.1 SHALL NOT BE LIMITED BY A LIMITATION ON AMOUNT OR TYPE OF DAMAGES, COMPENSATION OR BENEFITS PAYABLE BY OR FOR THE CONTRACTOR OR SUBCONTRACTOR UNDER INSURANCE POLICIES, WORKERS' COMPENSATION ACTS, DISABILITY BENEFIT ACTS OR OTHER EMPLOYEE BENEFIT ACTS.

...

§ 8.12.3 THE DUTY TO DEFEND SET OUT ABOVE SHALL NOT APPLY IN THE EVENT THAT THE CLAIM IS BASED, IN WHOLE OR IN PART, ON THE NEGLIGENCE OF, FAULT OF, OR BREACH OF CONTRACT BY THE OWNER. NOTWITHSTANDING THE FOREGOING, THE CONTRACTOR

AGREES TO REIMBURSE THE OWNER'S REASONABLE ATTORNEY'S FEES IN PROPORTION TO THE CONTRACTOR'S LIABILITY.

...

§ 8.12.4 CONTRACTOR SHALL BE RESPONSIBLE FOR AND SHALL HOLD OWNER FREE AND HARMLESS FROM LIABILITY RESULTING FROM LOSS OF OR DAMAGE TO CONTRACTOR'S OR ITS SUBCONTRACTORS' CONSTRUCTION TOOLS AND EQUIPMENT AND RENTED ITEMS WHICH ARE USED OR INTENDED FOR USE IN PERFORMING THE WORK, REGARDLESS OF WHETHER SUCH LOSS OR DAMAGE IS CAUSED IN WHOLE OR IN PART BY THE WILLFUL, INTENTIONAL OR NEGLIGENT ACTS OR OMISSIONS OF THE CONTRACTOR, A SUBCONTRACTOR, ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY THE CONTRACTOR, 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 THE OWNER. IF THE OWNER'S NEGLIGENCE IS A CONCURRENT CAUSE OF THE INJURY, DEATH, OR DAMAGE, CONTRACTOR'S OBLIGATION TO INDEMNIFY IS LIMITED TO THE AMOUNT NECESSARY TO CAUSE THE RELATIVE LIABILITY OF OWNER AND CONTRACTOR TO REFLECT THE COMPARATIVE NEGLIGENCE FINDINGS OF THE TRIER OF FACT (JUDGE OR JURY) OR AS AGREED IN A SETTLEMENT AGREEMENT TO WHICH OWNER AND CONTRACTOR ARE BOTH PARTIES. THIS PROVISION SHALL APPLY, WITHOUT LIMITATION, TO LOSS OR DAMAGE OCCURRING AT THE WORK SITE OR WHILE SUCH ITEMS ARE IN TRANSIT TO OR FROM THE WORK SITE AND IS IN ADDITION TO CONTRACTOR'S OBLIGATIONS UNDER SECTION 8.12.1.

...

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 actual location in line and elevation of all new exterior utility lines within the limits of the site and of any

...

of tangible property (other than the Work itself), but only to § 8.13. Contractor, upon completion of the Project, shall furnish Architect with record drawings showing

...

the extent caused by the negligent acts or omissions of actual location in line and elevation of all new exterior utility lines within the limits of the site and of any

...

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; relocation from that shown on the Drawings of concealed piping, wiring, cable or conduit within the lines of

...

the building.

PAGE 17

§ 9.4 Based on the Architect's observations and evaluations of the Contractor's Applications for Payment, in accordance with the Contract Documents, the Architect will review and certify the amounts due the Contractor.

...

§ 9.5 The Architect or the Owner has authority to reject Work that does not conform to the Contract Documents.

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~~§ 12.2.1 At least ten days before the date established for each progress payment, Where the Contract is based on a Stipulated Sum or the Cost of the Work with a Guaranteed Maximum Price as applicable, the Contractor shall submit to the Architect an itemized Application for Payment for Work completed in accordance with the values stated in this Agreement. The Application shall be supported by data substantiating the Contractor's right to payment as the Owner or Architect may reasonably require, such as Architect, before the first Application for Payment, or, in the case of a Guaranteed Maximum Price, concurrent with the Guaranteed Maximum Price Proposal, a schedule of values, allocating the entire Contract Sum to the various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect or Owner, shall be used in reviewing the Contractor's Applications for Payment. The period covered by each Application for Payment shall be one (1) calendar month, ending on the last day of the month.~~

...

~~evidence of payments made to, and waivers of liens from, subcontractors and suppliers. § 12.2.2 With each Application for Payment where the Contract Sum is based upon the Cost of the Work, or the Cost of the Work with a Guaranteed Maximum Price, the Contractor shall submit payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, and any other evidence required by the Owner to demonstrate that cash disbursements already made by the Contractor on account of the Cost of the Work equal or exceed (1) progress payments already received by the Contractor, less (2) that portion of those payments attributable to the Contractor's Fee; plus (3) payrolls for the period covered by the present Application for Payment.~~

...

§ 12.2.3 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 stored, and protected from damage, off the site at a location agreed upon in writing.

...

~~§ 12.2.2-12.2.4~~ 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,~~ 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, information~~ and belief, be free and clear of liens, claims, security interests, ~~interests~~ or other encumbrances adverse to the Owner's interests.
CONTRACTOR SHALL INDEMNIFY AND HOLD OWNER HARMLESS FROM ANY LIENS, CLAIMS, SECURITY INTEREST OR ENCUMBRANCES FILED BY THE CONTRACTOR, SUBCONTRACTORS, OR ANYONE CLAIMING BY, THROUGH OR UNDER THE CONTRACTOR OR SUBCONTRACTOR FOR ITEMS COVERED BY PAYMENTS MADE BY THE OWNER TO CONTRACTOR.

...

The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner § 12.3.1 In each Application for Payment, Contractor shall certify that there are no known mechanics' or materialmen's liens outstanding at the date of this requisition, that all due and payable bills with respect to the Work have been paid to date or are included in the amount requested in the current application and that except for such bills not paid but so included, there is no known basis for the filing of any mechanics' or materialmen's liens on the Work, and that releases from all subcontractors and materialmen have been obtained in such form as to constitute an effective release of lien under the laws of the State of Texas covering all Work theretofore performed and for which payment has been made by Owner to Contractor.

...

a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; (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 in writing of the Architect's reasons § 12.3.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner that the Architect has observed the progress of the Work and determined that, in the Architect's professional opinion, based on the Architect's evaluations of the Work and the data comprising the Application for Payment, that the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. 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 in writing to the Owner. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. 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 material suppliers and other data unless 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. Examinations, audits, and verifications, if required by the Owner, will be performed by the Owner's accountants or other representatives of the Owner acting in the sole interest of the Owner.

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for withholding certification in part; 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. If certification or notification is § 12.3.3 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 15.2.2 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 12. If the Contractor and the 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 herein, because of

...

~~not made within .1~~ defective Work not remedied;

...

~~such seven day period.~~ .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;

...

~~the Contractor may, upon seven additional days' written notice.~~ .3 failure of the Contractor to make payments properly to Subcontractors or 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;

...

~~and Architect, stop.~~ .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;

...

~~the Work until payment.~~ .7 repeated failure to carry out the Work in accordance with the Contract Documents;

...

.8 delay beyond the times set forth elsewhere in the Contract Documents including but not limited to the submission for approval of the schedule of values, cost breakdowns on proposal requests, progress schedule, list of subcontractors and insurance requirements;

...

~~of the amount owing has been received. The Contract Time and.~~ .9 failure to submit a written plan indicating action by the Contractor to regain the time schedule for completion of Work within the Contract Time;

...

~~the Contract Sum.~~ .10 evidence of financial inability to perform the Contract fully;

...

.11 failure to submit record documents required by the Contract; or

...

.12 failure of the Contractor to perform any other obligations of the Contract.

...

§ 12.3.4 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld. The Owner shall be equitably adjusted due to the delay not be deemed in default by reason of withholding payment as provided for in this Agreement.

...

§ 12.4.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner provided in the Contract Documents. 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 for undisputed amounts in the manner and within the time provided in the Contract Documents, on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents. Payment shall be made by the Owner not later than thirty (30) days after approval of the Contractor's Application for Payment by the Architect. Owner shall provide written notification to Contractor within twenty-one (21) days if Owner disputes the Contractor's Certificate for Payment pursuant to Texas Government Code section 2251.041 et. seq., listing the specific reasons for non-payment. Payments to the Contractor shall not be construed as releasing the Contractor or his Surety from any obligations under the Contract Documents or Construction Documents. 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 Owner may require. This schedule shall be used as the basis for reviewing Contractor's Applications for Payment. Applications for Payment shall comply with all requirements of this Contract, including submission of the required certifications, and shall indicate the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

...

§ 12.4.2 The period covered by each Application for Payment shall be one (1) calendar month ending on the last day of the month.

...

§ 12.4.3 Provided that an Application for Payment is received by the Architect not later than the last day of a month, the Owner shall make payment of the certified amount to the Contractor shall promptly pay not later than the last day of the following month. If an Application for Payment is received by the Architect after the date fixed above, payment shall be made by the Owner not later than forty-five (45) days after the Architect receives the Application for Payment. Subject to the other provisions in the Contract Documents, the amount of each progress payment shall be computed as follows:

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~~each subcontractor.~~1 Take the portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of five percent (5%);

...

~~and supplier, upon receipt.~~2 Add 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), less retainage of five percent (5%);

...

~~of payment from.~~3 Subtract the aggregate of previous payments made by the Owner;

...

~~the Owner, an amount determined in accordance with .4~~ Subtract amounts, if any, for which the Owner has withheld or nullified a Certificate of Payment as provided for in this Contract; and

...

~~the terms of the applicable subcontracts and purchase orders;.5~~ Upon Substantial Completion of the Work, add a sum sufficient to increase the total payments to ninety-five percent (95%) of the full amount of the Contract Sum, less such amounts as the Owner shall determine is necessary for incomplete work and unsettled claims.

...

§ 12.4.4 Retainage, if any, shall be withheld as set out in Section 12.4.3 above.

...

~~Neither the Owner nor the Architect shall have responsibility for payments to a subcontractor or supplier.~~ **§ 12.4.5** Neither the Owner nor Architect shall have an obligation to pay or see to the payment of money to a Subcontractor except as may otherwise be required by law.

...

~~§ 12.4.4~~ **§ 12.4.6** 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 ~~requirements~~ Contract Documents.

...

~~of the Contract Documents.~~ **§ 12.4.7** The Contractor shall, as a condition precedent to any obligation of the Owner under this Agreement, provide to the Owner payment and performance bonds in the full penal amount of the Contract to the extent required by Texas Government Code Chapter 2253.

...

§ 12.5.1 Substantial Completion is the stage in the progress of the Work when the ~~Work or designated portion thereof is sufficiently entire Project and all systems are fully complete and fully operable permitting Owner full and complete use of the entire Project, subject only to the correction or completion of minor finish work items the value of which shall in no event exceed one percent (1%) of the Contract Sum.~~

...

~~complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use.~~ 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.

...

§ 12.5.2 When the Contractor believes that the Work or designated portion thereof is substantially complete, it will notify the Architect and the Architect 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.

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§ 12.5.3 Upon receipt of the Contractor's list, the Architect, accompanied by the Owner or Owner's representative, at the Owner's option, will make an inspection to determine whether the Work or designated portion thereof is substantially complete. When the Architect determines that the Work is substantially complete, the Architect shall prepare a Certificate of Substantial Completion that complete in accordance with Section 12.5.1, Architect shall issue Certificate of Substantial Completion and shall deliver to the Contractor a "Punch List" of all items which must be completed or corrected before the Work is ready for final inspection and acceptance, which shall establish the date of Substantial Completion, establish the responsibilities of the Owner and Contractor, 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. If Contractor fails to fully and finally complete the Work within the time specified by the Architect for completion of the Punch List, then Contractor's name may be removed from the list of bidders acceptable to the Owner for the construction of future projects. 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. It is contemplated that Architect shall make no more than three (3) inspections after the Contractor notifies Architect that Contractor considers the Work substantially complete. If upon completion of the third inspection, the Work has not progressed to the point that the Architect can certify that the Work is fully and finally complete in accordance with the Contract Documents, the cost of all additional inspections by the Architect shall be charged to and borne by the Contractor.

...

§ 12.5.4 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such 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.

...

§ 12.5.5 Liquidated Damages. The Contractor acknowledges that time is of the essence in completing the Work. The Contractor further recognizes that the Owner will sustain actual damages in the event the Work is not substantially complete within the Contract Time, but that the amount of such damages would be difficult or impracticable to ascertain with reasonable certainty. Therefore, the parties agree that the Contractor shall pay the Owner, as liquidated damages and not as a penalty, the amount of ONE THOUSAND DOLLARS AND NO CENTS (\$1,000.00) per calendar day for each day that Substantial Completion of the Work extends beyond the date required by the Contract. The Contractor agrees that the daily rate set forth above represents a reasonable estimate of the Owner's anticipated damages, including but not limited to administrative costs, loss of use, coordination with other trades, and disruption of district operations. The Owner may deduct any accrued liquidated damages from payments then or thereafter due to the Contractor. Assessment or withholding of liquidated damages shall not limit the Owner's right to terminate the Contract for default, nor waive or preclude recovery for costs, losses, or damages incurred by the Owner that are not addressed by this provision, including correction of defective work or costs to complete the Project after termination.

...

§ 12.6.1 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 inspect the Work. When promptly make such inspection and, 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, a Certificate of Completion and 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 terms and conditions of 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 stated in Section 12 as precedent to the Contractor's being entitled to final payment have been fulfilled.

...

The Architect 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.

...

§ 12.6.2 Final payment shall not become due until the Contractor submits to the Architect releases and waivers of liens, and data establishing payment or satisfaction of obligations, such as receipts, claims, security interests, or encumbrances arising out of the Contract. The Contractor shall not be entitled to final payment unless and until it submits to the Owner its affidavit that the payrolls, invoices for materials and equipment, and other liabilities connected with the Work for which the Owner, or the Owner's property, might be responsible have been fully paid or otherwise satisfied; releases and waivers of liens from all Subcontractors of the Contractor and of any and all other parties required by the Owner; such other provisions as Owner may request; and consent of Surety to final payment. If any third party fails or refuses to provide a release of claims or waiver of lien as required by Owner, the Contractor shall furnish a bond satisfactory to the Owner to discharge any such lien or indemnify the Owner from liability.

...

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

...

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in the Contract Documents, and to satisfy other requirements, if any, which extend beyond final payment;

...

.2 Contractor's Final Application for Payment is properly submitted and accepted by Owner; and

...

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

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§ 12.6.4 The Owner shall make final payment of all sums due the Contractor not more than thirty-one (31) days after the issuance of Owner's final Certificate for Payment. Final Certificate for Payment and release of retainage will not be considered unless all testing required by the Contract Documents (including project manual), project specifications and drawings are provided in their final format showing that all findings of noncompliance have been corrected.

...

§ 12.6.5 Acceptance of final payment by the Contractor, a ~~subcontractor or~~ Subcontractor or material 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.

...

§ 12.7 AUDIT

...

Contractor agrees to maintain adequate books, payrolls and records satisfactory to the Owner in connection with any and all Work performed hereunder. Contractor agrees to retain all such books, payrolls and records (including data stored in computer) for a period of not less than three (3) years after completion of the Work. At all reasonable times, Owner and its duly authorized representatives shall have access to all personnel of Contractor and all such books, payrolls and records, and shall have the right to audit same.

...

The-§ 13.1 SAFETY PRECAUTIONS AND PROGRAMS

...

§ 13.1.1 Contractor's employees, agents, and subcontractors shall not perform any service for Owner while under the influence of alcohol or any controlled substance. Contractor, its employees, agents, and subcontractors shall not use, possess, distribute, or sell illicit or unprescribed controlled drugs or drug paraphernalia, or misuse legitimate prescription drugs while performing the Work. Contractor, its employees, agents, and subcontractors shall not use, possess, distribute, or sell alcoholic beverages while performing the Work.

...

§ 13.1.2 Contractor has adopted or will adopt its own policy to assure a drug and alcohol free work place while performing the Work.

...

Contractor shall be responsible for initiating, maintaining-§ 13.1.3 Contractor will remove any of its employees from performing the Work any time there is suspicion of alcohol and/or drug use, possession, or impairment involving such employee, 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 employees from performing the Work any time cause exists to suspect alcohol or drug use. In such cases, Contractor's employees 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 employee was in compliance with this contract. Contractor will not use an employee to perform the Work who either refuses to take, or tests positive in, any alcohol or drug test.

...

and supervising all safety precautions and programs, including all those required by law in connection
§ 13.1.4 Contractor will comply with all applicable federal, state, and local drug and alcohol related laws and regulations (e.g., Department of Transportation regulations, Department of Defense Drug-free Work-free Workforce

Policy, Drug-Free Workplace Act of 1988). Owner has also banned the presence of all weapons on the Project site, whether the owner thereof has a permit for a concealed weapon or not.

...

§ 13.2 HAZARDOUS MATERIALS

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with performance of the Contract. The Contractor shall take reasonable precautions to prevent damage, injury, or loss to employees on the Work and other persons who may be affected thereby, the Work and materials and equipment to be incorporated therein, and other property at the site or adjacent thereto. The Contractor shall promptly remedy damage and loss. § 13.2.1 The Contractor is responsible for compliance with the requirements of the Contract Documents regarding hazardous materials. 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 report the condition to the Owner and Architect in writing. If such notice is provided orally, written confirmation of such notice by Contractor shall be provided not later than one (1) business day following such notification. Upon receipt of the Contractor's written notice, the Owner may 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. Owner shall not be responsible for materials or substances brought to the site by the Contractor. 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 shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shutdown, delay and start-up. Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles; or (2) where the Contractor fails to perform the obligations under this section, except to the extent the cost and expense are due to the Owner's fault or negligence.

...

§ 13.3 CRIMINAL HISTORY RECORDS CHECKS

...

§ 13.3.1

...

Prior to the commencement of work, Contractor shall take all necessary steps to comply with Texas Education Code, Section 22.0834 by obtaining, if a Qualified Contractor, as defined, or arranging with Owner to obtain, if not a Qualified Contractor, national criminal history record information ("CHRI") as to Contractor and Subcontractors and all persons associated with them including their employees, agents and representatives who a) have or will have continuing duties related to the contracted services; and b) have or will have direct contact with students (each a "Covered Employee").

...

§ 13.3.2 If the Contractor or any Subcontractor determines that § 13.3.1 does not apply to an employee, the Contractor or Subcontractor shall make a reasonable effort to ensure that the conditions or precautions that resulted in the determination that § 13.3.1 did not apply to the employee continue to exist throughout the time that the contracted services are provided.

...

§ 13.3.3 The requirements of § 13.3.1 do not apply if:

...

.1 the public work does not involve the construction, alteration, or repair of an Instructional Facility as defined by Section 46.001, Texas Education Code (real property, an improvement to real property, or a necessary fixture of an improvement to real property that is used predominantly for teaching the curriculum required by the Texas Education Code);

...

.2. for public work that involves construction of a new Instructional Facility, the person's duties related to the contracted services will be completed not later than the seventh (7th) day before the first day the facility will be used for instructional purposes; or

...

.3 for a public work that involves an existing Instructional Facility:

...

(a) the public work area contains sanitary facilities and is separated from all areas used by students by a secure barrier fence that is not less than six feet in height; and

...

(b) the Contractor adopts a policy prohibiting employees, including subcontractor entity employees, from interacting with students or entering areas used by students, informs employees of the policy, and enforces the policy at the public work area.

...

§ 13.3.4 If the Contractor is not a Qualified School Contractor, a person to whom § 13.3.1 applies must submit to a CHRI review by the Owner.

...

§ 13.3.5 Owner and Contractor agree to destroy any CHRI obtained or indexed by the Federal Bureau of Investigation ("FBI") or Texas Department of Public Safety ("DPS") under this § 13.3.1 after the information is used for its authorized purpose. CHRI may only be released to the individual who is the subject of the information, by court order, or as allowed by law.

...

§ 13.3. 6 Any Covered Employee that has during the preceding thirty (30) years, (a) been convicted of or placed on deferred adjudication community supervision for an 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 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 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 described in this § 3.4.5, Contractor understands that it 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 judgment of the Owner as to whether the Covered Employee must be excluded from the Project.

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to property caused in whole or in part by the Contractor, § 13.3.7 Prior to commencement of its work on the Project the Contractor will provide written certification to the Owner that either: (1) Contractor and its Subcontractors of every tier, do not have any Covered Employees, as defined; (2) Contractor and its Subcontractors of every tier are otherwise exempt from compliance with the requirements contained herein; or (3) Contractor and its Subcontractors of every tier have complied with the statutory and contractual requirements of this Agreement as of that date.

...

or by anyone for whose acts the Contractor may be liable. § 13.3.8 Contractor agrees that if it receives information that a Covered Employee is arrested or convicted for any of the Disqualifying Criminal History offenses, during the performance of the Work, Contractor will immediately remove the Covered Employee from Owner’s property or other location where students are regularly present, and notify the Owner of said removal within three (3) days of doing so. Contractor understands that any failure to comply with the requirements of this section may be grounds for termination of this Agreement by Owner, in accordance with Article 14, Termination.

...

§ 14.3 If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct it in accordance with Section 7.3.

...

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction’s choice of law rules. laws of the State of Texas, without regard to the choice-of-law rules of any jurisdiction. The Contract is deemed performable entirely in the county in which the Project is located. Any litigation to enforce or interpret any terms of the Contract or any other litigation arising out of or as a result of the Contract shall be brought in the State courts of said county.

...

If the Work is stopped under Section 12.3 for a period of 14 days through no fault of the Contractor, the Contractor may, upon seven additional days’ written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed including reasonable overhead and profit, and costs incurred by reason of such termination.

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- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;

...

- .4 fails to proceed continuously and diligently with the construction and completion of the Work; except _____ as permitted under the Contract Documents;

...

.5 fails to furnish the Owner, upon written 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 or permits serious or repeated worker misconduct in violation of Article 13;

...

.4—.7 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

...

.8 is otherwise guilty of substantial breach of a provision of the Contract Documents.

...

§ 16.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 16.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished. Any further payment shall be limited to amounts actually earned to the date of termination.

...

§ 17.1 Pursuant to Texas Government Code Chapter 2271, as amended, if this contract is valued at \$100,000 or more and if the Contractor has at least ten (10) full time employees, then the Contractor, by its execution of this Agreement represents and warrants to the Owner that the Contractor does not boycott Israel and will not boycott Israel during the term of this Agreement. This section does not apply to a sole proprietorship.

...

§ 17.2 Pursuant to Texas Government Code Chapters 2274 and 809, if this contract is valued at \$100,000 or more and if Independent Consultant has at least ten (10) full-time employees, then Independent Consultant represents and warrants to the District that the Independent Consultant does not boycott energy companies and will not boycott energy companies during the term of this Agreement. This section does not apply to a sole proprietorship.

...

§ 17.3 Pursuant to Texas Government Code Chapter 2274, if this contract is valued at \$100,000 or more and if Independent Consultant has at least ten (10) full-time employees, then Independent Consultant represents and warrants to the District that the Independent Consultant does not discriminate against firearm entities or firearm trade associations and will not discriminate against firearm entities or firearm trade associations during the term of this Agreement. This section does not apply to a sole proprietorship.

§ 17.4 Contractor verifies and affirms that it is not a foreign terrorist organization as identified on the list prepared and maintained by the Texas Comptroller of Public Accounts. If Contractor has misrepresented its inclusion on the Comptroller's list such omission or misrepresentation will void this Contract.

§ 17.5 By signing this Agreement, the undersigned certifies as follows: Under Section 231.009 of the Texas Family Code, the Contractor certifies that the individual or business entity named in this Contract is not ineligible to receive

the specified payments and acknowledges that this Contract may be terminated and payment withheld in this certification is inaccurate.

PAGE 26

§ 17.6 The requirements of Subchapter J, Chapter 552, Government Code, may apply to this Contract and the Contractor agrees that the contract can be terminated if the Contractor knowingly or intentionally fails to comply with a requirement of that subchapter. Therefore, if the value of this Project is One Million Dollars (\$1,000,000.00) or more, the Contractor agrees to : (1) preserve all contracting information related to the contract as provided by the records retention requirements applicable to the Owner for the duration of the contract; (2) promptly provide to the governmental body any contracting information related to the contract that is in the custody or possession of the entity on request of the Owner; and (3) on completion of the contract, either: (a) provide at no cost to the Owner all contracting information related to the contract that is in the custody or possession of the entity; or (b) preserve the contracting information related to the contract as provided by the records retention requirements applicable to the Owner.

§ 17.7 Contractor verifies and affirms that it is not a foreign terrorist organization as identified on the list prepared and maintained by the Texas Comptroller of Public Accounts. If Contractor has misrepresented its inclusion on the Comptroller’s list such omission or misrepresentation will void this Agreement.

§ 17.8 Pursuant to Texas Government Code Chapter 2273, Contractor represents and warrants that it not a abortion provider or an affiliate of an abortion provider.

...

(If required by law, insert cancellation period, disclosures or other warning statements above the signatures.)

...

CALALLEN INDEPENDENT SCHOOL DISTRICT

COMPANY FULL LEGAL NAME:

EXHIBIT FOR PROCUREMENT ONLY

EXHIBIT FOR PROCUREMENT ONLY

OWNER (Signature)

CONTRACTOR (Signature)

Ms. Emily Lorenz, Superintendent of Schools
Email: elorenz@calallen.org

Name:
Title:
Email:

(Printed name and title)

(Printed name and title of authorized representative)

OWNER (Signature)

CONTRACTOR (Signature)

(Printed name and title)

(Printed name and title)
LICENSE NO.:
JURISDICTION:

Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 17:37:57 on 10/21/2025 under Order No. 20250116623 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A105™ - 2017, Standard Short Form of Agreement Between Owner and Contractor, other than those additions and deletions shown in the associated Additions and Deletions Report.

(Signed)

(Title)

(Dated)

EXHIBIT A

PREVAILING WAGE RATE SCHEDULE FOR PROJECT

*To AIA Document A105-2017, Standard Short Form of
Agreement Between Owner and Contractor, as Modified by
Owner*

*Project: Wood River Elementary HVAC Equipment
Replacement Upgrades - 2026 (Phase 1)*

Owner: Calallen Independent School District

Architect: Stridde, Callins & Associates, Inc.

Contractor: [TO BE INSERTED - EXHIBIT ONLY]



CALALLEN ISD PREVAILING WAGE RATE SCHEDULE (as of March 14, 2025)

Please note that fringes are only required to be paid on projects that involve federal funds. If you are unsure about whether the project will be using federal funds, please inquire and seek clarification.

General Decision Number: TX20250288 03/14/2025

Superseded General Decision Number: TX20240288

State: Texas

Construction Type: Building

Counties: Aransas, Nueces and San Patricio Counties in Texas.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022: 	Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$17.75 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours

	spent performing on the contract in 2025.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least \$13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2025.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number	Publication Date
0	01/03/2025
1	03/14/2025

* BOIL0074-003 01/01/2025

	Rates	Fringes
BOILERMAKER.....	\$ 33.17	24.92

ELEC0278-002 08/25/2024

	Rates	Fringes
ELECTRICIAN.....	\$ 30.80	8.97

ENG10178-005 06/01/2020

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
(1) Tower Crane.....	\$ 32.85	13.10
(2) Cranes with Pile Driving or Caisson Attachment and Hydraulic Crane 60 tons and above.....	\$ 28.75	10.60
(3) Hydraulic cranes 59 Tons and under.....	\$ 32.35	13.10

IRON0084-011 06/01/2024

	Rates	Fringes
IRONWORKER, ORNAMENTAL.....	\$ 28.26	8.13

* SUTX2014-068 07/21/2014

	Rates	Fringes
BRICKLAYER.	\$ 20.04	0.00
CARPENTER.	\$ 15.21 **	0.00
CEMENT MASON/CONCRETE FINISHER.	\$ 15.33 **	0.00
INSULATOR - MECHANICAL (Duct, Pipe & Mechanical System Insulation).....	\$ 19.77	7.13
IRONWORKER, REINFORCING.	\$ 12.27 **	0.00
IRONWORKER, STRUCTURAL.....	\$ 22.16	5.26
LABORER: Common or General.....	\$ 9.68 **	0.00
LABORER: Mason Tender - Brick.	\$ 11.36 **	0.00
LABORER: Mason Tender - Cement/Concrete.....	\$ 10.58 **	0.00
LABORER: Pipelayer....	\$ 12.49 **	2.13
LABORER: Roof Tearoff.....	\$ 11.28 **	0.00

OPERATOR:		
Backhoe/Excavator/Trackhoe...	\$ 14.25 **	0.00
OPERATOR: Bobcat/Skid		
Steer/Skid Loader.....	\$ 13.93 **	0.00
OPERATOR: Bulldozer.....	\$ 18.29	1.31
OPERATOR: Drill.....	\$ 16.22 **	0.34
OPERATOR: Forklift.....	\$ 14.83 **	0.00
OPERATOR: Grader/Blade.....	\$ 13.37 **	0.00
OPERATOR: Loader.....	\$ 13.55 **	0.94
OPERATOR: Mechanic.....	\$ 17.52 **	3.33
OPERATOR: Paver (Asphalt, Aggregate, and Concrete).....	\$ 16.03 **	0.00
OPERATOR: Roller.....	\$ 12.70 **	0.00
PAINTER (Brush, Roller, and Spray).....	\$ 14.45 **	0.00
PIPEFITTER.....	\$ 25.80	8.55
PLUMBER.....	\$ 25.64	8.16
ROOFER.....	\$ 13.75 **	0.00
SHEET METAL WORKER (HVAC Duct Installation Only)	\$ 22.73	7.52
SHEET METAL WORKER, Excludes HVAC Duct Installation.....	\$ 21.13	6.53
TILE FINISHER.....	\$ 11.22 **	0.00
TILE SETTER.....	\$ 14.74 **	0.00
TRUCK DRIVER: Dump Truck.....	\$ 12.39 **	1.18
TRUCK DRIVER: Flatbed Truck.....	\$ 19.65	8.57
TRUCK DRIVER: Semi-Trailer		

Truck.....	\$ 12.50 **	0.00
TRUCK DRIVER: Water Truck.....	\$ 12.00 **	4.11

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$17.75) or 13658 (\$13.30). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

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

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in

the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R. 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination.

The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

- a) a survey underlying a wage determination
- b) an existing published wage determination
- c) an initial WHD letter setting forth a position on a wage determination matter
- d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION"

EXHIBIT B

SUPPLEMENTARY GENERAL CONDITIONS FOR PROJECT

*To AIA Document A105-2017, Standard Short Form of
Agreement Between Owner and Contractor, as Modified by
Owner*

*Project: Wood River Elementary HVAC Equipment
Replacements and Upgrades - 2026 (Phase 1)*

Owner: Calallen Independent School District

Architect: Stridde, Callins & Associates, Inc.

Contractor: [TO BE INSERTED - EXHIBIT ONLY]

SUPPLEMENTARY GENERAL CONDITIONS

The Conditions of the AIA Document A105-2017, as modified by Owner, between Contractor and Owner (Calallen ISD) and these 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. LAYING OUT BUILDING:

Where applicable, Owner shall employ an experienced and competent licensed surveyor or civil Architect 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 2. 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 Architect on a monthly basis along with Contractor's request for payment.

ARTICLE 3. 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 Architect 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 Architect 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.

ARTICLE 4. 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 5. 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 Architect 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 Architect and, if so rejected, shall be removed at once from the premises by Contractor installing same.

ARTICLE 6. 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 "secondhand material". Salvaged materials may be incorporated into the Project only if allowed in the Contract Documents.

ARTICLE 7. 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 Seven Hundred Fifty Dollars and No Cents (\$750.00) per day for each calendar day (excluding Saturdays and Sundays) thereafter until the Project is completed.

ARTICLE 8. ASBESTOS:

The Architect 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 Architect prior to ordering. Asbestos containing materials may not be used in this contract.

ARTICLE 9. PROGRESS PAYMENTS – RETAINAGE:

AIA Document A105-2017, Section 12.4 PROGRESS PAYMENTS 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.

EXHIBIT C

LIST OF DRAWINGS AND TABLE OF CONTENTS FOR SPECIFICATIONS

*To AIA Document A105-2017, Standard Short Form of
Agreement Between Owner and Contractor, as Modified by
Owner*

*Project: Wood River Elementary HVAC Equipment
Replacement Upgrades - 2026 (Phase 1)*

Owner: Calallen Independent School District

Architect: Stridde, Callins & Associates, Inc.

Contractor: [TO BE INSERTED - EXHIBIT ONLY]

[To Be Inserted – See Bid Package for Full Plans and Specifications for Project]

Refer to this Project Manual pages 2 through 4.

**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 and Protection of Building Environment.
- D. Contractor use of site and premises.
- E. Owner occupancy.
- F. Smoking and Use of Tobacco Products.
- G. Project Management and Coordination.
- H. Permit Review.

1.2 WORK COVERED BY CONTRACT DOCUMENTS:

- A. Project Identification: Wood River Elementary HVAC Equipment Replacements and Upgrades – 2026 (Phase 1).
- B. Project Locations: Wood River Elementary School, 15118 Dry Creek Dr., Corpus Christi, TX, 78410.
- C. Owner: Calallen Independent School District, 4205 Wildcat Drive, Corpus Christi, TX 78410.
 - 1. Owner's Representative: Kelly Murphy, Director of Maintenance.
- D. Engineer: Stridde, Callins and Associates, Inc., 342 S. Navigation Blvd., Corpus Christi, Texas 78405.
 - 1. Engineer's Representative: Jared Merdes, PE, MBA, LEED AP.
- E. Project consists of replacement of existing HVAC split DX and packaged units with new, installation of new HVAC equipment, general roofing repairs for HVAC, electrical and BAS support connections and general construction work indicated on drawings and specifications.
- F. Work performed under this contract will be performed under a single prime contract.

1.3 CONSTRUCTION TIMING:

- A. Physical site work is anticipated to begin on June 3, 2026, after the award of the contract and the provision of bonds and insurance, and be substantially complete by August 2, 2026, except as extended by legitimate extensions of time due to unavoidable delays to the project.
- B. This Schedule of construction requires the Contractor to provide crews of personnel as required to complete the project on time. Contractor and Subcontractors shall provide sufficient skilled manpower to perform the work.
- C. Other Construction Project: This project location will also be under construction with another Contractor (Weaver and Jacob's Constructors) who will be performing ceiling

**SECTION 01 10 00
SUMMARY OF WORK**

replacements, lighting replacements and other work at the same time schedule as this project. Both Contractors shall schedule a pre-construction meeting before the start of work and coordinate work activities to avoid conflicts, double work and delays.

1.4 PROTECTION OF BUILDING ENVIRONMENT:

- A. Construction activity shall be scheduled in such a manner as to maintain building humidity levels at acceptable levels by allowing HVAC system to operate in a limited capacity.

1.5 CONTRACTOR USE OF SITE AND PREMISES AND OWNERS' OCCUPANCY:

- A. Summer 2026 – June 3 – August 2, 2026: The Owner shall not occupy this campus. Contractor will be allowed to work at the project location unobstructed 24-hours a day, 7-days a week.
- B. After August 2, 2026 and Fall 2026 for Minor Work Completion: Owner will occupy the entire facility
 - 1. School will be in occupied operations generally by Owner during the day from 7:00 a.m. to approximately 5:00 p.m., Monday through Friday.
 - 2. Contractor may work during normal hours or after hours as needed. After hours work at night, holidays, and weekends shall be approved by Owner.
 - 3. Schedule construction with Owner to minimize interference with Owner regular operations. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
 - 4. All active Plumbing, HVAC, and Electrical systems shall remain fully operational at all times during normal business hours unless authorized by Owner.
 - 5. Testing Dates: Contractor shall perform no construction work during testing days. Contractor shall coordinate all construction activities to avoid work on testing days. Contact Owner for testing days with the understanding that day may change from time to time as needed.
 - 6. School campus is occupied; the Contractor is responsible for the conduct of their employees and their sub-contractor. Personnel shall conduct themselves in an appropriate manner and within the guidelines and regulations set forth by the Owner.

1.6 SMOKING AND THE USE OF TOBACCO PRODUCTS:

- A. The smoking policy of Calallen I.S.D. is set by state law and applies to all persons involved in the execution of the Work, including deliverymen. This policy, in effect, prohibits smoking and the use of tobacco products anywhere on school property.

1.7 PROJECT MANAGEMENT AND COORDINATION:

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

1.8 PERMIT REVIEW:

- A. Contractor shall review with the Engineer, the Drawings and Specifications and all other documents relating to the Construction Permit issued by the authorities having jurisdiction and all notations, comments or exceptions recorded on any of these documents shall be resolved prior to the start of construction.

**SECTION 01 10 00
SUMMARY OF WORK**

PART 2 PRODUCTS

2.1 Not Applicable.

PART 3 EXECUTION

3.1 Not Applicable.

END OF SECTION

**SECTION 01 20 00
CONTINGENCY ALLOWANCE**

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.

1.3 ALLOWANCES:

- A. At Project closeout, credit unused amounts remaining in all specified allowances to Owner by Change Order.

PART 2 PRODUCTS

- 2.1** Not Applicable.

PART 3 EXECUTION

3.1 SCHEDULE OF ALLOWANCE:

- A. Contingency Allowance: Forty-Five Thousand dollars and no cents (\$45,000.00).

END OF SECTION

**SECTION 01 23 00
PROPOSAL ALTERNATES**

PART 1 GENERAL

1.1 RELATED REQUIREMENTS:

- A. Related Work of Other Sections:
 - 1. Divisions 23: Sections as affected by each Alternate.
 - 2. Structural Drawings and Specifications

1.2 PROCEDURES:

- A. Provide to the Owner alternate prices which shall state the amounts to be added to or deducted from the Base Proposal 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. 1A (Additive/Deductive): Offeror agrees that if this additive/deductive Alternate No. 1A is accepted by the Owner, then they will provide alternate HVAC (5-Ton) split DX AHU and ACCU equipment with manufacturer and model number(s) as listed below including all duct, base supports, electrical, controls, piping, and the like modifications as needed for complete and functional systems in accordance with Specification Sections 23 62 13 and 23 82 19 and Contract Documents.
- B. ALTERNATE NO. 1B (Additive/Deductive): Offeror agrees that if this additive/deductive Alternate No. 1B is accepted by the Owner, then they will provide alternate HVAC (7.5 and 10-Ton) split DX AHU and ACCU equipment with manufacturer and model number(s) as listed below including all duct, base supports, electrical, controls, piping, and the like modifications as needed for complete and functional systems in accordance with Specification Sections 23 62 13 and 23 82 19 and Contract Documents.
- C. ALTERNATE NO. 2 (Additive/Deductive): Offeror agrees that if this additive/deductive Alternate No. 2 is accepted by the Owner, then they will provide alternate HVAC Packaged Rooftop equipment with manufacturer and model number(s) as listed below including all duct, curb, electrical, controls, piping, structural, roofing and the like modifications as needed for complete and functional systems in accordance with Specification Sections 23 74 10 and Contract Documents.
- D. ALTERNATE BAS-1 (Additive): Offeror agrees that if this additive Alternate BAS-1 is accepted by the Owner, then they will provide new split DX AHU/ACCU HVAC equipment BAS (supply air temperature sensors, return air temperature sensors, control transformers and fan current sensors to replace existing) as needed for complete and

**SECTION 01 23 00
PROPOSAL ALTERNATES**

functional systems in accordance with Specification Sections 23 09 00 and Contract Documents.

- E. ALTERNATE BAS-2 (Additive): Offeror agrees that if this additive Alternate BAS-2 is accepted by the Owner, then they will provide new split DX AHU/ACCU HVAC equipment BAS (space room sensors with combination temperature and humidity function) as needed for complete and functional systems in accordance with Specification Sections 23 09 00 and Contract Documents.
- F. ALTERNATE WAR-1 (Additive): Offeror agrees that if this additive Alternate No. WAR-1 is accepted by the Owner, then they will provide HVAC split (5-Ton) AHU and ACCU's with 5-year extended equipment PARTS warranties for base proposal equipment manufacturer Lennox as detailed in equipment specification sections 23 62 13 and 23 82 19.
- G. ALTERNATE WAR-2 (Additive): Offeror agrees that if this additive Alternate No. WAR-2 is accepted by the Owner, then they will provide HVAC split (7.5 and 10-Ton) AHU and ACCU's with 5-year extended equipment PARTS warranties for base proposal equipment manufacturer Lennox as detailed in equipment specification sections 23 62 13 and 23 82 19.
- H. ALTERNATE WAR-3 (Additive): Offeror agrees that if this additive Alternate No. WAR-3 is accepted by the Owner, then they will provide HVAC Packaged Rooftop units with 5-year extended equipment PARTS warranties for base proposal equipment manufacturer Lennox as detailed in Equipment Specification Section 23 74 10.

PART 2 PRODUCTS

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

PART 3 EXECUTION

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

END OF SECTION

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.

**SECTION 01 26 00
CONTRACT MODIFICATION PROCEDURES**

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

**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.

**SECTION 01 29 00
PAYMENT PROCEDURES**

- 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.
- 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.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- 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 non-conditional waiver of Payment of Debts and Claims verifying that vendors have been paid based on previous application.
 - 3. Contractor shall provide updated construction schedule with each payment application. Any applications submitted without a construction schedule will not be reviewed and will be returned to the Contractor.
 - 4. Contractor shall provide an electronic version of the current Contractor's in progress as-built drawing(s) work set.
- D. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.

SECTION 01 29 00
PAYMENT PROCEDURES

- 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.
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. One copy shall include waivers of lien and similar attachments as required by Owner, General Conditions, and Supplemental General Conditions.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
 2. Electronic applications with supporting documentation will be allowed in lieu of paper documents if submitted in PDF format.
- 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.

**SECTION 01 29 00
PAYMENT PROCEDURES**

- 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. HVAC Test, Adjust and Balancing is completed.
 2. Commissioning of HVAC systems is completed.
 3. Evidence of completion of Project closeout requirements.
 4. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 5. Updated final statement, accounting for final changes to the Contract Sum.
 6. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims".
 7. AIA Document G706A, "Contractor's Affidavit of Release of Liens".
 8. AIA Document G707, "Consent of Surety to Final Payment".
 9. Evidence that claims have been settled.
 10. Final, liquidated damages settlement statement.
 11. Technical specification close-out requirements including contractor warranties.
 12. Final Passing City of Corpus Christi Inspection notification.

PART 2 PRODUCTS

- 2.1** Not Applicable.

PART 3 EXECUTION

- 3.1** Not Applicable.

END OF SECTION

SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

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 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.

SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

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. Number of Copies: Submit six opaque copies of each submittal. Engineer will return four copies.
 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. Post copies of list in Project meeting room and in temporary field office. Keep list current at all times.

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 locations at all times of construction activity. Sub-contractors may not be allowed to work without supervision by Contractor 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.

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PROJECT MANAGEMENT AND COORDINATION

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.
- 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.

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- 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.
 - 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.

SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

- 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.
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 to Owner and Engineer.
- E. Construction Progress Meetings:
1. Engineer will lead weekly or bi-weekly (every two weeks) construction progress meetings as necessary during the construction phase of the project in efforts to answer Contractor questions, to review construction progress, and to coordinate with the Owner.
 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 as applicable.

PART 2 PRODUCTS

2.1 Not Applicable.

PART 3 EXECUTION

3.1 Not Applicable.

END OF SECTION

SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

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 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 29 00 "Payment Procedures" for submitting the Schedule of Values.
 - 2. Division 1 Section 01 31 00 "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
 - 3. 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.

SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

- 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- 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.

SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

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. 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.
 - e. Deliveries.
 - f. Installation.

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CONSTRUCTION PROGRESS DOCUMENTATION

- 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

SECTION 01 33 00
SUBMITTAL 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 includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Construction Schedule, and other submittals.
- B. Related Sections include the following:
 - 1. Division 1 Section 01 29 00 "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
 - 2. Division 1 Section 01 31 00 "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
 - 3. Division 1 Section 01 32 00 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
 - 4. Division 1 Section 01 77 00 "Closeout Procedures" for submitting warranties.
 - 5. 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 01320 "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

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- 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.
 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., 22 05 00.01). Re-submittals shall include an alphabetic suffix after another decimal point (e.g., 22 05 00.01.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 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.

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SUBMITTAL PROCEDURES

- 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 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.

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- 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.
 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.

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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 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 Plants, Mechanical Rooms, 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. Application for Payment: Comply with requirements specified in Division 1 Section 01 29 00 "Payment Procedures".
- H. Schedule of Values: Comply with requirements specified in Division 1 Section 01 29 00 "Payment Procedures".
- I. 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.

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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 1 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 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 equipment, neatly bound in 3 ring binders and with electronic version on CD or DVD. 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.

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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.
 14. Final Test, Adjust and Balancing report.
 15. Final Commissioning Report.
- 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.
 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.

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SUBMITTAL PROCEDURES

- 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.
- 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

**SECTION 01 41 00
REGULATORY REQUIREMENTS**

PART 1 GENERAL

1.1 SUMMARY:

- A. The Conditions of the Contract and applicable requirements of Division 01 govern this section.
- B. Section Includes: General administrative requirements and procedures and related applicable codes.

1.2 APPROVAL AND RECOMMENDATION AGENCIES:

- A. The City of Corpus Christi, Texas has jurisdiction for the interpretation and enforcement of Code requirements for construction of projects.

1.3 CODES:

- A. All Contractors shall comply with all applicable codes, ordinances, and regulations in effect at the time of Competitive Sealed Proposal / Bid openings.
- B. Approved Building Codes.
 - 1. The following approved building codes and standards have been adopted by the City of Corpus Christi as the minimum requirements to be applied to all city buildings and physical facilities including but not limited to, new construction, additions, renovations, and maintenance construction projects:
 - a. The 2021 edition of the International Building Code (IBC), as amended with appendixes.
 - b. The 2021 edition of the International Mechanical Code (IMC), as amended with appendixes.
 - c. The 2015 edition of the International Energy Conservation Code (IECC), as amended with appendixes.
 - d. The 2020 edition of the National Electrical Code (NEC), as amended.
 - e. The 2021 edition of the International Plumbing Code (IPC) as amended with appendixes.
 - f. The 2021 edition of the International Residential Code, as amended with appendixes.
 - g. The 2021 edition of the International Fuel Gas Code, as amended with appendixes.
 - h. Texas Accessibility Standards (TAS)
 - i. Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG).
- C. In case of a conflict between references applicable codes, the one having the more stringent requirements shall govern. Where governing codes indicate that the drawings or specifications do not comply with the minimum requirements of the codes, the Contractor shall be responsible for providing an installation, which will comply with code requirements. Drawings and specifications shall be followed where they are superior to code requirements.

1.4 OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA):

- A. The Contractor shall have sole responsibility for compliance on the job site to all applicable portions of the Occupational Safety and Health Act. The Contractor is responsible for other regulatory requirements as they relate to occupational Health and Safety requirements. For example, NIOSH, ANSI, and MSA.

**SECTION 01 41 00
REGULATORY REQUIREMENTS**

- B. Protection of life, health, and public welfare as it relates to the execution of the construction contract is the responsibility of the Contractor. The Owner's Representative may, at their discretion, observe, inspect, or comment on plans, procedures, or actions employed at the project as they relate to safety of life, health, or public welfare. If conditions are imposed by the Owner which interfere with, or imply actions detrimental to safety, written notice shall be returned to the Owner for action prior to affecting any unsafe conditions.

1.5 PERMITS:

- A. The contractor must obtain and pay for all building permit prior to starting work.
- B. The contractor must post the permit(s) in a prominent location at the jobsite including all inspection reports. The contractor shall have an updated set of contract documents available at the jobsite for all inspections.

1.6 INSPECTIONS:

- A. The Contractor must schedule all required inspections not less than 72 hours [120 hours if includes a weekend] in advance by calling CISC Maintenance Office (361) 242-5975.
- B. The contractor is required to arrange for the following inspections:
 - 1. Required inspections: General. Reinforcing steel or structural framework of any part of any building or structure shall not be covered or concealed without first obtaining the approval of the building official.
 - 2. Final inspection: To be made after the building is completed and ready for occupancy.
 - 3. Special inspection: Special inspection may be required on special projects and special types of construction.
 - 4. Re-inspections: A re-inspection fee may be assessed for each inspection or re-inspection when such portion of work for which inspection is called is not complete or when corrections called for are not made.
- C. The Contractor will be responsible for all cost related to re-inspections as applicable.

PART 2 PRODUCTS

- 2.1** Not Applicable.

PART 3 EXECUTION

- 3.1** Not Applicable.

END OF SECTION

**SECTION 01 41 26
PERMITS**

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 CORPUS CHRISTI 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 Calallen 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

**SECTION 01 45 00
QUALITY CONTROL**

PART 1 GENERAL

1.1 SECTION INCLUDES:

- A. Quality Assurance: Requirements for material and product quality and control of installation.
- B. Tolerances.
- C. References and Standards.
- D. Mock-ups.
- E. Testing Laboratory Services.
- F. Inspection Services.
- G. Manufacturers' field services.

1.2 RELATED SECTIONS:

- A. Section 01 33 00 - Submittal Procedures.
- B. The Work of this Section shall be included as a part of all Sections of Work, whether referenced therein or not.

1.3 DESCRIPTION OF REQUIREMENTS:

- A. Unless specifically noted otherwise, perform all Work shown, mentioned, or reasonably inferred and comply with all work restrictions.
- B. Many of the requirements specified elsewhere are included herein for reference and convenience. Where a conflict occurs between the Contract Documents, either within themselves or each other, the more stringent requirement or the most expensive combination of materials and workmanship shall prevail.
- C. Contractor shall:
 - 1. Perform Work in accordance with the General Conditions, as specified herein, and with the quality control requirements of each Specification Section;
 - 2. Perform Work in the highest quality workmanship, unless specified otherwise;
 - 3. Join materials with a uniform and accurate fit so they meet with neat straight lines, free of smears, overlaps or irregularities, as applicable to the work;
 - 4. Install all exposed materials appropriately level, plumb, and at accurate angles as shown and flush with adjoining materials;
 - 5. Attach materials with sufficient strength, and with number and spacing of fasteners and attachments that will not fail until materials joined are broken or permanently deformed;
 - 6. Use concealed fasteners, unless shown or directed otherwise.

1.4 QUALITY ASSURANCE AND CONTROL OF INSTALLATION:

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.

**SECTION 01 45 00
QUALITY CONTROL**

- C. Should manufacturer's instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.5 TOLERANCES:

- A. Monitor fabrication and installation tolerance control of Products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Adjust Products to appropriate dimensions; position before securing Products in place.

1.6 REFERENCES AND STANDARDS:

- A. For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date of Owner-Contractor Agreement except where specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.
- D. When specified reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- E. Neither contractual relationships, duties, responsibilities of parties in Contract nor those of Architect/Engineer shall be altered from Contract Documents by mention or inference otherwise in reference documents.

1.7 MANUFACTURERS' FIELD SERVICES:

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as required, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect/Engineer within ten (10) days after receipt of Notice to Proceed, in advance of required observations. Observer subject to approval of Architect/Engineer and Owner.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

**SECTION 01 45 00
QUALITY CONTROL**

- D. Refer to Section 01 33 00, Submittal Procedures, for additional information concerning submittal procedures and requirements for Manufacturers Field Reports.

PART 2 PRODUCTS

- 2.1 Not Applicable.

PART 3 EXECUTION

3.1 EXAMINATION:

- A. Verify existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Verify utility services are available, of correct characteristics, and in correct locations.

3.2 PREPARATION:

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

END OF SECTION

SECTION 01 50 20
CAMPUS SECURITY MEASURES

PART 1 GENERAL

1.1 REQUIREMENTS:

- A. The Contractor, Subcontractor, their agents and all others who perform Work on any CISD campuses are required to observe and abide by the campus security.
- B. The Contractor, Subcontractors, and their agents shall comply with the criminal history records checks requirements of Section 13.3 Criminal History Records Checks of the AIA Document A105 – 2017 Standard Short Form of Agreement Between Owner and Contractor found in Appendix 1 of this RFCSP.
- C. Contractor Superintendent and Designated Support Personal:
 - 1. Shall obtain a permanent Badge issued by CISD and shall also be present at the job site at all times that construction activities are taking place. Superintendent shall be present for all activities. If Owner finds out that the superintendent or their designated staff are not in responsible charge of the construction site, Owner may terminate work activities at the Contractors expense until such time the appropriate personnel are back in responsible charge.
 - 2. Superintendent is responsible for securing the project site each day after work and shall confirm that the site is safe and secure. Check all interior and exterior doors, floor hatches, roof hatches, roof access doors, gates, temporary barricades and the like.
 - 3. Superintendent is responsible for verifying that the project and site are clean after work each day. All trash is disposed of in approved containers. Floor surfaces are clean. Campus grounds are clear and all holes are covered up.
- D. RAPTOR Checks:
 - 1. All contractor personnel shall obtain a RAPTOR check upon their first day of work on the project. The Contractor is required to obtain a replacement badge if their badge gets damaged or becomes non-legible. All personnel will be issued a paper badge with their name, photo, and date of issue. This badge shall be affixed to a badge clip that shall be affixed to their uniform shirt in the upper torso area and shall be worn at all times.
 - 2. During Summer – School on Vacation: Contractor shall obtain a new Raptor badge every month around the 1st day of the month regardless of the initial badge issue date. Contractor shall contact the Maintenance Office and schedule the quantity of personnel requiring retesting in advance so as to not overload the maintenance office regular school activities.
 - 3. During School Hours After Summer: Contractor shall obtain a new Raptor badge every day. Contractor shall contact the Maintenance Office and schedule the quantity of personnel requiring retesting in advance so as to not overload the maintenance office regular school activities.
- E. Owner reserves the right to question all Contractor personnel and to perform additional background checks and screening as applicable at their discretions for any persons working on school district property.
- F. All Contractor personnel shall be required to wear company uniforms with company name and logo clearly marked in addition to badges and hard hats with RAPTOR tags that are currently up to date. All attire shall be clean and presentable at the start of work each day.
- G. Campus Check-in Procedures:
 - 1. The project superintendent or designated assistant superintendent shall check in at the main office of each school campus each work day and shall be responsible

SECTION 01 50 20
CAMPUS SECURITY MEASURES

for facility access and control direct sub-contractor supervision. Contractor personnel and sub-contractors are not required to check-in to a campus that has a Supervisor in responsible charge.

2. All employees must check-in at the Maintenance for the 1st day at work and at the 1st of the month.

1.2 CODE OF CONDUCT:

- A. All Contractor, Subcontractors, and their agents shall be required to wear company uniforms with company name and logo clearly marked, RAPTOR tags that are currently up to date, and all appropriate and applicable safety gear such as hard hats at all times when on District premises. All attire shall be clean and presentable at the start of work each day.
- B. Interaction with students, faculty, and staff is discouraged. The District will not tolerate "cat-calling," "whistling," "profanity," or derogatory remarks.
- C. No smoking or tobacco products, illegal drugs or weapons or firearms are allowed on District premises.

1.3 SAFETY ISSUES:

- A. All construction related workers shall adhere to all CISD safety plans, programs, and procedures.
- B. All construction related workers shall adhere to all CISD campus parking regulations.
- C. All worksites must be secured.
- 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 CISD and shall wear identification badges as required at all times during construction. Safety and Security requirements shall be detailed at pre-construction meeting. CISD shall provide badges to Contractor as needed.
- G. Contractor shall observe social distancing and shall wear masks as required by CDC and applicable Texas State and Federal laws to prevent the spread and transmission of COVID-19 if requested as applicable.

1.4 POLICY STATEMENT:

- A. Student, instructor and all staff safety and campus security are a concern to CISD and required by state law. 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. CISD has responsibilities to the students, staff, the State of Texas and others to ensure that safety measures are strictly applied on each project.

1.5 RELATED REQUIREMENTS:

- A. Section 01 31 0 0 – Project Management Coordination.
- B. Section 01 52 00 – Construction Facilities.

**SECTION 01 50 20
CAMPUS SECURITY MEASURES**

PART 2 PRODUCTS

2.1 Not Applicable.

PART 3 EXECUTION

3.1 Not Applicable.

END OF SECTION

**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.

1.5 TEMPORARY SANITARY FACILITIES:

- A. Contractor shall provide portable restroom facilities at contractor's expense. Contractor shall coordinate facility locations with Owner's representative and provide safeguards as required to protect facilities. Facilities shall be regularly serviced and cleaned. Contractor shall remove facilities at project completion and shall restore areas to original conditions such as replace ground cover and level grade.

1.6 BARRIERS AND CONSTRUCTION FENCES:

- A. Provide appropriate barriers to prevent unauthorized entry to construction areas and temporary sanitary facilities.

**SECTION 01 52 00
CONSTRUCTION FACILITIES**

- B. Protect non-owned vehicular traffic, stored materials, site and structures from damage.
- C. Provide plastic coverings and barricades as noted on drawings.

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 designated areas 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.

PART 2 PRODUCTS

- 2.1** Not Applicable.

**SECTION 01 52 00
CONSTRUCTION FACILITIES**

PART 3 EXECUTION

3.1 Not Applicable.

END OF SECTION

SECTION 01 73 29
CUTTING AND PATCHING

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 includes administrative and procedural requirements for cutting and patching.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
 - 2. Requirements of this Section also apply to mechanical and electrical installations. Refer to Division 23 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.
 - k. Operating systems of special construction in Division 13 Sections.
- 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

SECTION 01 73 29
CUTTING AND PATCHING

visual evidence of 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.

**SECTION 01 73 29
CUTTING AND PATCHING**

2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
 3. Cut through concrete and masonry using a cutting machine, such as a Carborundum saw or a diamond-core drill.
 4. Comply with requirements of applicable Division 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. Existing roof construction is tar and gravel. New roofing shall be commercial modified bitumen (dual layer) base sheet and top sheet with white granular cover. Contractor shall survey existing roof construction before submitting final proposal.
- C. CISD 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

**SECTION 01 77 00
CLOSEOUT 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 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 29 00 "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
 - 2. Division 1 Section 01 33 00 "Submittal Procedures".
 - 3. Divisions 2 through 26 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION:

- A. 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.
 - 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.

**SECTION 01 77 00
CLOSEOUT PROCEDURES**

- B. 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 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. Reinspection: Request reinspection 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 Specification Section 20 00 10 and 2015 International Energy Conservation Code.

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 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. Reinspection: Request reinspection 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.

**SECTION 01 77 00
CLOSEOUT PROCEDURES**

d. Page number.

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.
 - 4. Each binder shall include a full electronic version on USB drive.
- 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.

**SECTION 01 77 00
CLOSEOUT PROCEDURES**

- 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.
 - 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

SECTION 01 78 39
RECORD DOCUMENTS, AS-BUILT DRAWINGS

1.1 AS-BUILT DRAWINGS:

- A. The Contractor shall provide as-built drawings which clearly show all differences between the contract work as drawn and as actually installed, as well as work added to the contract which is not indicated on the contract drawings.
- B. Special attention should be paid to precisely documenting changes to concealed work, meaning work installed underground or in areas which can not be readily inspected by use of access panels, inspection plates or other removable features.
- C. The Contractor shall maintain a set of record drawings at the job site. These drawings shall be kept legible and current and shall be available for inspection at all times by the Engineer.
- D. Upon substantial completion of the work, transfer the changes noted on the record drawings to the as-built drawings.
- E. As-built drawings shall be prepared on Xerox copies paid for by the Contractor. As-builts shall be provided for all sheets of the drawings. Provide a digital scanned copy in PDF format for the vinal version for review by Engineer.
- F. In showing changes in the work or added work, use the same legends as used on the contract drawings. The as-built drawings shall consist of a complete set of Xerox copies. If no changes are made on a particular as-built drawing, a notation reading "No Change" shall be made in the lower right hand corner of the drawing.
- G. As-built drawings shall contain the names, addresses and phone numbers of all the Subcontractors and shall be signed by the Contractor.
- H. Upon completion of the as-built drawings, submit one digital set of as-built drawings to the Engineer for approval. Any changes required by the Engineer must be made and upon receipt of approval of modified drawings, deliver the as-built Xerox copies to the owner.
- I. The Engineer shall be the sole judge of acceptability of the as-built drawings. Final payment on the project will not be made until the as-built drawings and copies as described above are delivered to and accepted by the Owner and Engineer.

END OF SECTION

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, PE, Stridde, Callins and Associates, Inc.
- B. Project Name: Wood River Elementary School HVAC Equipment Replacements and Upgrades – 2026 (Phase 1).
- C. City of Corpus Christi Application Number: _____
- D. Project Address: 15118 Dry Creek Dr., Corpus Christi, Texas 78410

1.2 SYSTEMS TO BE COMMISSIONED

- A. Mechanical HVAC Systems:
 - 1. Packaged and Split HVAC Units.
 - 2. Duct Systems.
 - 3. Piping Systems.
 - 4. Control Systems.
 - 5. Air Fans.

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.

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MECHANICAL SYSTEMS COMMISSIONING – COMMISSIONING PLAN

- 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.
 - 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.

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MECHANICAL SYSTEMS COMMISSIONING – COMMISSIONING PLAN

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:

- A. Location: 15118 Dry Creek Drive, Corpus Christi, Texas 78410.
- B. OW: Calallen Independent School District.
- C. CP: Stridde, Callins and Associates, Inc.; Jared Merdes, PE, MBA, LEED AP.
- D. Completion: August 2, 2026 (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.

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4. **SUBS:** Demonstrate correct system performance.
5. **EM:** Equipment manufacturers and vendors shall provide documentation to facilitate the CxP and perform contracted startup.

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: 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
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
CO ₂	50 PPM
Sound Level	5 Db

- 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
 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.

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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.

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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.
- 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 as 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.

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- 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.
 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

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MECHANICAL SYSTEMS COMMISSIONING – COMMISSIONING PLAN

Preliminary Commissioning Report. A copy of the Preliminary Commissioning Report shall be provided to AHJ upon request.

3.10 DOCUMENTATION REQUIREMENTS, CLOSEOUT: 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.

- A. Operation and Maintenance Manuals in accordance with Specification Section 01 33 00.
- B. Owner Training in accordance with Specification Section 23 05 10.
- C. Final TAB Reports in accordance with Specification Section 23 05 93.
- D. 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 commissioned systems findings in separate sections to allow independent review. The report shall include the following at a minimum:
 - 1. Results of FPT and CxP
 - 2. Disposition of deficiencies found during testing, including details of corrective measures used or proposed.
 - 3. Actual Final Pre-Functional and Functional PT used during the commissioning process including measureable criteria for test acceptance, providing herein for repeatability.
 - 4. Final Test, Adjust, and Balance Reports

END OF SECTION

SECTION 20 00 00
MECHANICAL AND ELECTRICAL SPECIFICATIONS (COMMON CONDITIONS)

1.1 GENERAL CONDITIONS:

- A. Sections of the Specifications covering general and supplemental conditions are a part of the contract and Contractors shall observe all of the requirements thereof, insofar as they pertain and are applicable to their respective work. Reference to Contractor or Contractors shall imply Mechanical (HVAC) and Electrical Contractors.
- B. Contractors shall examine all Drawings and Specifications, visit the site of the proposed construction, become fully informed as to the extent and character of the work required, and make provisions for same in his bid. It will be assumed that the Contractor in submitting his bid has visited the premises and his bid covers all work necessary to properly install his work.
- C. If any requirements of the Drawings and the Specifications appear to be difficult to perform, or if there is a question regarding performance, Contractor shall report same to the Engineer during the bidding period. The right to make any reasonable change in the location of equipment and apparatus up to the time of rough-in is reserved by the Engineer without involving any additional expense.
- D. If any discrepancies occur during construction between work being performed by the Contractor and work of other trades, it shall be the responsibility of the Contractor to notify the Engineer immediately. Under no circumstances shall the Contractor proceed with any work conflicting with other trades until such time as the discrepancies have been corrected. In cases where interference develops, Engineer shall decide which work is to be relocated regardless of which was first installed.
- E. Contractor shall proceed with his work so as to conform to the progress of the work of other trades and not delay the project. Contractor shall complete all installations as soon as the conditions of the project will permit.

1.2 SCOPE OF WORK:

- A. Work to be done under this contract shall include the furnishing of all labor, materials, apparatus, and connections to complete, in finished operating condition, the work for Wood River Elementary HVAC Replacements and Upgrades – 2026 (Phase 1), Corpus Christi, Texas.
- B. Contractor shall take into account that deviations from routing and layout of new work indicated on the Drawings may be required to avoid interference with existing structure. Contractor shall be responsible for rerouting of existing conduit, piping, etc., to avoid interference with new work if deviations in routing of new work cannot be made to avoid interference with existing conditions. Wiring, piping, ductwork, etc., which serves loads or areas to remain in use either temporarily or permanently will be rerouted as required and as directed to preserve continuity of service.
- C. All items of labor, material, or equipment not required in detail by the Specifications or Drawings, but incidental to, or necessary for the complete installation and proper operation of all phases of work described herein, or reasonably implied in connection therewith, shall be furnished as if called for in detail by the Specifications or Drawings.

1.3 WORKMANSHIP:

- A. All labor shall be performed in the best and most workmanlike manner by mechanics skilled in their particular trades. All installations shall be complete in both effectiveness and appearance whether finally enclosed or left exposed. Engineer reserves the right

SECTION 20 00 00
MECHANICAL AND ELECTRICAL SPECIFICATIONS (COMMON CONDITIONS)

to direct the removal or replacement of any item which in his opinion shall not present a reasonable neat or workmanlike appearance, providing that same can be properly installed in an orderly way by usual method for such work. All specialties and appurtenances shall be installed to conform to the manufacturer's recommendations unless otherwise specified.

1.4 CODES, PERMITS, AND FEES:

- A. Entire installation shall be done in strict accordance with all local, state, and federal ordinances, codes, and regulations.
- B. In the event there is a conflict between the Drawings and Specifications and the applicable codes, ordinances, and regulations, the codes, ordinances, and regulations requirements shall govern. However, if the contract requirements are in excess of these requirements and do not conflict with the requirements, the contract provisions shall govern. If any work indicated on the Drawings is in conflict with codes, ordinances and regulations, Contractor shall advise Engineer at least one (1) week prior to bid date so that discrepancies may be corrected by an addendum to the Drawings and Specifications. Failure by the Contractor to advise of any discrepancies shall leave the Contractor fully and completely responsible for compliance with all applicable codes and requirements.
- C. All work shall comply with Standards contained in applicable NFPA pamphlets, all as published by the NFPA (National Fire Protection Association).
- D. Contractor shall obtain all permits and pay all fees necessary in connection with his work.

1.5 SAFETY STANDARDS:

- A. It shall be Contractor's sole responsibility to initiate, maintain, and supervise all safety precautions required by local, state, and federal laws, including OSHA (Occupational Health and Safety Administration) and trench safety laws.

1.6 MATERIALS AND EQUIPMENT:

- A. All materials and equipment furnished under this contract shall be in strict accordance with these Specifications, and shall be new. Equipment shall be of the latest or current products available. When two (2) or more articles of the same materials or equipment are required, the articles of each kind shall be standard products of a single reputable manufacturer. Electrical materials and equipment shall bear the label of UL (Underwriters Laboratories, Inc.).
- B. All materials and equipment shall be clearly marked, stamped, or labeled for identification. Identification marks or labels shall be plainly visible for inspection and shall not be obscured or obliterated in any manner. Painting or covering shall not be done until so ordered by the Engineer.
- C. Contractor shall furnish to the Engineer, within a reasonable time after award of contract, and prior to commencing any work, complete brochures of all materials and equipment which the Contractor proposes to furnish on the project. Data shall include descriptive literature, performance data, diagrams, capacity information, etc., to substantiate that proposed equipment physical size and capacity will meet all of the requirements of the Drawings and Specifications.

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MECHANICAL AND ELECTRICAL SPECIFICATIONS (COMMON CONDITIONS)

- D. All data must be checked and any required changes indicated thereon by the Contractor, signed, and dated prior to furnishing same to the Engineer for approval. Contractor's attention is directed that it is mandatory that he thoroughly review data prior to furnishing same to assure that equipment is in accordance with Drawings and Specifications and to assure prompt return of the data.
- E. Each brochure shall be neatly organized into a single binder or electronic PDF file. In each brochure provide cover sheet identifying project name and location, Engineer, General Contractor, and Mechanical, Electrical, or Plumbing Contractor. Include Contractor's addresses and phone numbers. Provide adequate space for Engineer's stamps. Provide quantity of submittal copies required by other sections of the Specifications.
- F. If above information is not provided complete as specified above and within the allocated time, all equipment shall be furnished exactly as specified without any substitutions.
- G. In furnishing data of proposed equipment and materials, Contractor must, in writing, specifically call to the attention of the Engineer every deviation from the Contract Drawings and Specifications.
- H. Review of data, drawings, etc., shall not be construed as releasing the Contractor from further responsibility, but rather as a means to coordinate the work and to aid in the proper selection and installation of the equipment. All material and equipment shall be subject to final acceptance by the Engineer at the completion of the project.

1.7 WARRANTY:

- A. Any defects from defective or improper materials or faults arising from improper workmanship which may appear within a period of twelve (12) months from the date of final acceptance of the building shall be amended and made good by the Contractor at his own cost. Engineer shall furnish to the Contractor a letter indicating the date of final acceptance.
- B. Where such defective work results in damage to the work installed under other sections of the Specifications, all such work shall be restored to its original condition at the expense of the Contractor by parties skilled in the particular work required.

1.8 DRAWINGS:

- A. These Specifications are accompanied by Drawings indicating typical layouts, pipe, conduit sizes, and equipment locations, etc. Drawings and these Specifications are complementary each to the other and what is called for by one shall be as binding as if called for by both.
- B. Drawings as prepared are in general diagrammatic. Contractor shall carefully lay out his work at the site to conform to existing conditions, architectural, structural, mechanical, and electrical conditions, to avoid all obstructions and to conform to details of installation as indicated on the Drawings and supplied by the manufacturers of the equipment to be installed and thereby to provide an integrated, satisfactorily operating installation. All necessary offsets in piping, fittings, etc., required to avoid interferences between piping, equipment, architectural, and structural shall be furnished and installed by the Contractor without additional expense to the Owner or Engineer.

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MECHANICAL AND ELECTRICAL SPECIFICATIONS (COMMON CONDITIONS)

- C. Routing paths for all piping, power feeders, and branch circuits are not indicated on the Drawings. Routing paths which are indicated are schematic and are not accompanied by dimensional data or detailed for every required offset. Contractor shall coordinate proposed routing paths for piping power feeders, and branch circuits with the General Contractor / Engineer prior to installing any such piping or conduit raceways. All piping, conductors, conduit, boxes, fittings and supports required to install piping and raceways indicated within the Construction Drawings and Technical Specifications are hereby included in the project requirements and shall be included in the proposal submitted by the Contractor.
- D. These Specifications and Drawings accompanying same are intended to cover systems which will not interfere with existing building conditions, which will fit into the available spaces, and which will ensure complete and satisfactory systems. Contractor shall, therefore, carefully examine the Drawings and the building and shall be responsible for the proper fitting of his material and apparatus into the building.
- E. Contractor's attention is directed that all equipment he proposes to furnish must fit into the space allocated for same on the Drawings. It shall be the Contractor's responsibility to furnish data to evident that sufficient space can be provided for the installation of proposed equipment and that adequate access will exist for service and maintenance of equipment. Should changes become necessary during construction, the Contractor shall make such necessary changes at his (the Contractor's) own expense.

1.9 CHANGES:

- A. Any changes from the Drawings necessary to make the installation conform to building construction, to make this work fit the work of other trades, or to make this work conform to the rules of the city and municipal bodies having jurisdiction shall be made by the Contractor at his (the Contractor's) own expense.

1.10 PROTECTION:

- A. All work, equipment, and materials shall be protected at all times to prevent damage or breakage either in transit, storage, installation, or testing. All openings shall be closed with caps or plugs during installation. All material and equipment shall be covered and protected against dirt, water, chemicals, or mechanical injury. Failure on the part of the Contractor to provide adequate protection will be cause for rejection of the unprotected equipment and materials.

1.11 CUTTING AND PATCHING:

- A. Where existing surfaces are disturbed, cut, or damaged and these surfaces are exposed to view in finished areas, Contractor shall replace same with materials and finish matching existing surfaces. All patches, etc., shall thoroughly bond with the original surfaces and shall be level with same. Cutting and patching of existing surfaces shall be done by parties skilled in that particular work. All openings around conduits or piping through floors or walls shall be grouted and sealed.
- B. Work shall be carefully laid out in advance and the exact size and locations of openings required shall be furnished to the General Contractor. Contractor shall be responsible for the furnishing and setting for the proper and permanent location of all sleeves, hangers, supports, inserts, plates, etc. If any cutting of the construction is necessary because of erroneous locations or to patch openings not used, the work shall be done at the expense of the Contractor by parties skilled in that particular work. No cutting or core drilling shall be done without permission of the Engineer. All drilling and

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patching for expansion bolts, hangers, and other supports shall be done by the Contractor, subject to the approval of the Engineer.

- C. Contractor's attention is directed that existing roofs are bonded roofs and warranty of work cannot be disrupted. Cutting and patching of roofs, mopping new equipment and pipe supports into existing roof, cutting new duct penetrations through roof, and flashing/sealing roof curbs into existing roof shall be done in accordance with instructions, method, etc., of a roofing Contractor approved by the Owner.

1.12 EXTERIOR WALL PENETRATIONS:

- A. All piping and conduit passing through exterior walls shall have the space between the pipe or conduit and penetrated surface packed and caulked watertight and rodent proof.

1.13 CERTIFICATION OF INSTALLATION BY EQUIPMENT MANUFACTURER'S REPRESENTATIVE:

- A. In order to place responsibility for the furnishing of the proper equipment and to see that it is installed as intended by the manufacturer, the Contractor, during construction, shall request supervisory assistance from the equipment manufacturer's representatives so that the material installation will be properly installed. After installation, the Contractor shall again request the representatives to inspect and certify that the equipment is in proper working order.
- B. Before final payment is issued, the representatives shall submit to the Engineer, through the Contractor, a signed statement certifying to their inspection and that the equipment is properly installed and ready for operation.

1.14 VIBRATION AND NOISE:

- A. Vibration and noise made in any part of the building by the operation of the Contractor's equipment will be objectionable and the Contractor shall take all precautions against same by isolating the various elements from the building and by such other means as may be necessary to eliminate all vibration and objectionable noise.

1.15 ESCUTCHEONS:

- A. Where exposed pipes pass through floors, walls, or ceilings, they shall be fitted with chromium plated stainless steel escutcheons firmly secured to the pipes and held in place with set screws.

1.16 FIRE PROTECTION/SOUND ATTENUATION SEALANT:

- A. All pipe, conduit, etc., penetrations through fire separation walls, partitions, floors, etc., shall be sealed with firestop sealant or foam system. Firestop sealant or foam shall be UL classified for the application, shall have intumescent characteristics, and shall be listed (1 hour, 2 hour, 4 hour) to match the rating of surface penetrated.
- B. All pipe, conduit, etc., penetrations through walls, partitions, floors, etc., which are not fire rated but are intended to attenuate sound shall be sealed with expandable foam or other material to provide sound barrier.

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1.17 DEMOLITION AND WORK WITHIN EXISTING BUILDING:

- A. This project shall be accomplished as required to accommodate the Owner's need to utilize the existing building during the finishing stages of construction. During the finishing stages of construction, the facility will be occupied by the owner. Disruption of owner activities and/or discontinuities of service during owner occupied times will not be permitted.
- B. In the preparation of these documents, effort has been made to show the approximate locations of, and connections to the existing piping, duct, equipment and other apparatus related to this phase of the work. However, the Contractor shall be responsible for verifying existing conditions which are associated with new work. Contractor shall visit the site to inspect the facilities and related areas. Contractor shall inspect and verify all details and requirements of all the contract documents, prior to submittal of proposal. All discrepancies between the contract documents and existing conditions shall be reported to the Engineer during the bidding period.
- C. Conduit, power and control wiring, pipe, duct, equipment and controls serving mechanical, plumbing, electrical, Owner's equipment, etc., which is to remain but which is served by conduit, pipe, duct, equipment, and controls that are disturbed by the remodeling work, shall be reconnected in such a manner as to leave this equipment in proper operating condition.
- D. No portion of the existing fire protection or security alarm systems shall be turned off, modified, or changed in any way without the knowledge and written permission of the Owner's representative.

1.18 CONTINUITY OF SERVICE:

- A. During the finishing stages of the project, work by the contractor shall not interrupt the continuity of any of the required services to the building during regular scheduled usage by Owner. It shall be the responsibility of the Contractor to take the necessary precautions and to plan the sequence of his work so that this may be accomplished.
- B. Where service interruptions are required, the Contractor shall arrange a minimum of one week in advance by written notice to the Owner for the service interruption and shall submit for approval, a proposal indicating the extent of time of the interruption and the service or facilities that will be interrupted. Final time which will be scheduled will be that approved by the Owner.

1.19 REMOVED MATERIALS, FIXTURES, AND EQUIPMENT:

- A. Certain existing materials and equipment are to be removed. Equipment and devices which are selected by the Owner shall remain the property of the Owner. Such equipment and devices shall be delivered by the Contractor to a designated location at the site of construction. Contractor shall exercise extreme care in removing any equipment and devices to be retained by the Owner.
- B. Equipment which is not selected by the Owner shall become the property of the Contractor. Such equipment shall be removed from the premises by the Contractor.
- C. All removed materials shall become the property of the contractor. All removed materials shall be promptly removed from the site of construction by the contractor and properly disposed of.

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1.20 CLEANING:

- A. Contractor shall thoroughly clean all equipment, materials, and devices furnished and set by him. Contractor shall remove all of his debris that may have accumulated during the job. After the Engineer inspects the equipment, any discrepancies shall be amended as directed.

1.21 USE OF ENGINEERS ELECTRONIC DRAWINGS:

- A. The Contractor may request the use of electronic copies of the Engineers Drawings for preparation of Contractor shop drawings. Upon receipt by the Engineer of the executed Engineer's standard Waiver of Indemnification, the Engineer will forward requested Drawings (with Engineering seal removed) for use by the Contractor.

1.22 OWNER TRAINING:

- A. Owner training is required by other sections of these Specifications. The Contractor must include evidence of completed Owner training with (bound within) the Operation and Maintenance manuals. Such evidence of completed Owner training shall include the following:
 - 1. Owner training log to include:
 - a. Typewritten names with job titles and signatures for each person in attendance.
 - b. The time, date, and duration of each training session.
 - c. A comprehensive list of all training topics covered.
 - d. A comprehensive list of all demonstrations and/or hands-on training for items such as systems programming, maintenance techniques, etc.
 - 2. Copy of audio and/or video recordings of training sessions where such recordings are required by other sections of these Specifications.

END OF SECTION

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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 Offerors, Notice to Offerors, 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, 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.
ABMA:	American Boiler Manufacturer's Association.
ADC:	Air Diffuser Council.
AGA:	American Gas Association.
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.
CGA:	Compressed Gas Association.
CTI:	Cooling Tower Institute.
FM:	Factory Mutual Engineering Company.

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IRI:	Industrial Risk Insurers.
ISA:	Instrument Society of America.
MSS:	Manufacturers Standardization Society.
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.
PDI:	Plumbing and Drainage Institute.
PFI:	Pipe Fabrication Institute.
SMACNA:	Sheet Metal and Air Conditioning Contractors National Association.
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.

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- 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 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.

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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.
- 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

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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.
- 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,

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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 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:

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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.

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 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.

1.17 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

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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.

1.18 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 official date of Substantial Completion. The Contractor to the complete satisfaction of the Owner's 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.

1.19 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.

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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.
- 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.

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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.

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.

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- 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.

2.8 LIFE SAFETIES FIRE SMOKE DAMPERS:

- A. It is the Contractor's responsibility to coordinate with the architectural Drawings and verify the need for fire and or fire smoke dampers whether or not they are specifically indicated. Additionally, it is the Contractor's responsibility to include in bid proposal the cost to furnish and install fire and or fire/smoke dampers required by code, whether or not they are specifically indicated.
- B. It is the Contractor's responsibility to coordinate with other applicable trades to determine the proper voltage of the fire/smoke damper operator and the proper sequencing of the damper operation. Refer to paragraph "Electrical Motors" and other Sections of Division 23 and Division 26 for the requirements for the damper operator wiring.

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

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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. 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.

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- 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 construction. This is to include but is not limited to temperature control system devices, electrical switches, relays, fixtures, piping, conduit, etc.

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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.

**SECTION 23 05 00
MECHANICAL GENERAL CONDITIONS**

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. Leak test of all renovated and new draining systems.
 - 2. Pressure test of all renovated and new pressure piping systems.
 - 3. 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 incidency, 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 proposals are turned in, the Contractor is expected to complete the systems at no additional cost to the Owner.

END OF SECTION

**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 20 00 10 – Commissioning Plan.
- B. Section 23 09 00 – Building Automation System.
- C. Section 23 09 93 – Equipment Sequence of Operation.
- D. Section 23 05 93 – Testing, Adjusting, and Balancing.
- E. 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.
- H. Adjust electrical amp draw on motors to within 80% of rated amp draw.

SECTION 23 05 10
STARTING OF HVAC SYSTEMS

- 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

SECTION 23 05 10
STARTING OF HVAC SYSTEMS

damage occur due to start-up procedures, contractor shall be responsible for all costs associated with repair or replacement of damaged elements.

3.4 HVAC TESTING, ADJUSTING, AND BALANCING:

- A. The Owner (CISD) shall 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.
 - 1. Commissioning of the HVAC systems will be performed by the Engineer. This division shall assist the commissioning provider in the performance of their duties. Refer to Specification Section 20 00 10.

END OF SECTION

SECTION 23 05 29
HANGERS, SUPPORTS AND FOUNDATIONS

PART 1 GENERAL

1.1 SUMMARY:

- A. Section includes pipe and equipment supports, hangers, flashings, curbs, equipment bases, foundations, sleeves, and sealing of work to adjacent construction.

1.2 SUBMITTALS:

- A. Section 01 33 00 – Submittal Procedures.
- B. Shop Drawings: Indicate system layout with location and detail of trapeze hangers.
- C. Product Data: Submit manufacturers catalog data including load capacity.
- D. Design Data: Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers.
- E. Manufacturer's Installation Instructions: Submit special procedures and assembly of components.

1.3 QUALITY ASSURANCE:

- A. Perform work in accordance with code for piping support and in conformance with NFPA 13 and 14 for support of sprinkler piping and standpipes.
- B. Perform Work in accordance with AWS D1.1 for welding hanger and support attachments to building structure.

PART 2 PRODUCTS

2.1 PIPE HANGERS AND SUPPORTS:

- A. Manufacturers:
 - 1. Elcen.
 - 2. Midland-Ross.
 - 3. Michigan Hanger Co.
 - 4. Sioux Chief.
 - 5. ITT Grinnell.
 - 6. B-Line.
 - 7. Substitutions: Section 23 05 00 – Mechanical General Conditions.
- B. Refrigerant Piping:
 - 1. Conform to ASME B31.5 ASTM F708.
 - 2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch (13 to 38 mm): Malleable iron or carbon steel, adjustable swivel, split ring.
 - 3. Hangers for Pipe Sizes 2 inches (50 mm) and Over: Carbon steel, adjustable, clevis.
 - 4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - 5. Vertical Support: Steel riser clamp.
 - 6. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 - 7. Copper Pipe Support: Copper-plated carbon-steel ring.
 - 8. Copper Piping Concealed in Stud Walls: Copper plated stud brackets.

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HANGERS, SUPPORTS AND FOUNDATIONS

- C. Condensate Drain Piping:
 - 1. Conform to ASME B31.9 ASTM F708.
 - 2. Hangers for Pipe Sizes **1/2 to 1-1/2 inch (13 to 38 mm)**: Malleable iron or carbon steel, adjustable swivel, split ring.
 - 3. Copper Pipe Support: Copper-plated, carbon-steel adjustable, ring.
 - 4. Piping Concealed in Stud Walls: Galvanized steel or copper plated stud brackets.

2.2 ACCESSORIES:

- A. Hanger Rods:
 - 1. Indoors Conditioned Spaces: Hot dipped galvanized or zinc plated mild steel threaded both ends, threaded on one end, or continuous threaded.
 - 2. Outdoors Exposed to the Sun-UV: 316 Stainless Steel threaded on one end, or continuous threaded.
 - 3. Outdoors and Un-conditioned Spaces Fully Shaded with no UV exposure: 316 Stainless Steel or FRP threaded both ends, threaded on one end, or continuous threaded.

2.3 PROTECTION OF HANGERS:

- A. Steel hangers, hanger rod and appurtenances located in crawl spaces, ventilated mechanical rooms, unconditioned attics or exposed to outdoors shall be hot dipped galvanized.
 - 1. As an alternate method, components such as rollers, chairs, pipe stands, steel supports, etc., may be primed with PPG or equal Inhibitor Red Primer 6-208, and painted with two (2) coats of PPG or equal Enamel 54 Line.
 - 2. All surfaces to be painted shall be free of dust, rust, scale, grease, or other foreign material, and shall be dry at time of painting.
- B. All hangers, hanger rods, nuts, bolts, washers and appurtenances located in crawl spaces, ventilated mechanical rooms, unconditioned attics or exposed to outdoors shall have 100% 316 stainless steel construction for all system components.

2.4 FLASHING:

- A. Metal Flashing: **26 gage** thick galvanized steel.
- B. Metal Counterflashing: **22 gage** thick galvanized steel.
- C. Flexible Flashing: **47 mil** thick sheet butyl; compatible with roofing.
- D. Caps: Steel, **22-gage** minimum; **16 gage (1.5 mm)** at fire resistant elements.

2.5 EQUIPMENT CURBS:

- A. Manufacturers:
 - 1. RPS Corporation.
 - 2. Pate.
 - 3. Stiles.
 - 4. Thy Curb.
 - 5. Substitutions: Section 23 05 00 – Mechanical General Conditions.
- B. Fabrication: Welded **18 gage (1.2 mm)** galvanized steel shell and base, mitered **3 inch (75 mm)** cant, variable step to match roof insulation, **1-1/2 inch (38 mm)** thick insulation, factory installed wood nailer welded to the base with a steel nailer strap as

SECTION 23 05 29
HANGERS, SUPPORTS AND FOUNDATIONS

required to prevent uplift forces. Curbs shall be 18 inches minimum above roofing surface. Construct to match pitch of roof or shim in the field with a hard wood.

- C. Curbs to be constructed of materials that are dielectrically compatible with roof deck. Contractor to verify of curb and roof deck prior to submittal.
- D. Refer to other sections of these Specifications for additional requirements or special requirements suitable for that section's application, i.e. Packaged Rooftop Units or Exhaust Fans.
- E. Roof curbs shall be constructed to support and secure fans in accordance with local windstorm code requirements. Manufacturer shall provide details for securing curb to building roof structure and unit to curb in accordance with local windstorm code requirements.

2.6 SLEEVES:

- A. Manufacturers:
 - 1. Holdrite.
 - 2. Pro Set.
 - 3. Substitutions: Section 23 05 00 – Mechanical General Conditions.
- B. Sleeves for Pipes Through Non-Fire Rated Beams, Walls, Footings, and Potentially Wet Floors: minimum 20 gage thick stainless steel.
- C. Sleeves for Pipes Through Fire Rated and Fire Resistive Floors and Walls, and Fire Proofing: Prefabricated fire rated sleeves including seals, UL listed; Holdrite Hydroflame Pro Series Telescoping system.
- D. Sleeves for Round Ductwork: Galvanized steel.
- E. Sleeves for Rectangular Ductwork: Galvanized steel.
- F. Stuffing or Fire-stopping Insulation: Glass fiber type, non-combustible.
- G. Sealant: Acrylic in non-fire rated application.

2.7 FIRE STOP SYSTEMS:

- A. Manufacturers:
 - 1. 3m Model 2000.
 - 2. Spec Seal Model 100.
 - 3. Hilti.
 - 4. Substitutions: Section 23 05 00 – Mechanical General Conditions.
- B. General Purpose Fire Stopping Sealant: Water based non-slumping, premixed sealant with intumescent properties, rated for 3 hours in accordance with ASTM E814 and UL 1479.
- C. General Purpose Vibration Resistant Fire Stopping Sealant: Silicone based, non-slumping, premixed sealant with intumescent properties, vibration and moisture resistant, rated for 3 hours in accordance with ASTM E814 and UL 1479.
- D. Plastic Pipe Systems Fire Stopping Sealant: Silicone based, premixed sealant with intumescent properties, vibration and moisture resistant, rated for 3 hours in accordance with ASTM E814 and UL 1479 with metal collars.

SECTION 23 05 29
HANGERS, SUPPORTS AND FOUNDATIONS

PART 3 EXECUTION

3.1 INSTALLATION:

- A. Install in accordance with manufacturer's instructions.
- B. Install cast iron piping in accordance with CISPI Standards.

3.2 PIPE HANGERS AND SUPPORTS:

- A. Piping systems shall be installed so as to be freely floating. They shall be securely supported from structure but shall be able to expand and contract independently of structure without causing undue stress or damage to the piping system. Piping shall not support itself. Piping systems shall be rigidly attached to structure only where shown on plans, as required by Specifications and codes, or as required for proper installation of equipment or fixtures. Provide sleeves, rollers, expansion fittings, expansion loops, or special fittings as required to prevent transmission or vibration to the structure or for the proper operation of systems whether specifically shown on plans or not.
- B. Install in accordance with ASME B31.9, ASTM708.
- C. Support horizontal piping as scheduled.
- D. Install hangers with minimum 1/2-inch (13 mm) space between finished covering and adjacent work.
- E. Place hangers within 12 inches (300 mm) of each horizontal elbow.
- F. Use hangers with 1-1/2 inch (38 mm) minimum vertical adjustment.
- G. Support horizontal cast iron pipe adjacent to each hub, with 5 feet (1.5 m) maximum spacing between hangers.
- H. Where piping is installed in parallel and at same elevation, provide multiple pipe or trapeze hangers.
- I. Support riser piping independently of connected horizontal piping.
- J. Provide copper plated hangers and supports for copper piping.
- K. Design hangers for pipe movement without disengagement of supported pipe.
- L. Support base of risers in crawl spaces or above ceilings with braces, blocks, rodding or other suitable method, to prevent movement of pipe or separation of joints and fittings.
- M. Provide non-conducting dielectric connections wherever dissimilar metals come in contact such as between pipe and hangers or pipe and metal structure and wall studs.
- N. Paint pipe and equipment supports exposed to weather with galvanizing paint or other approved method.
- O. Where piping is suspended in excess of 18 inches, provide sway bracing to secure against horizontal movement.

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HANGERS, SUPPORTS AND FOUNDATIONS

- P. Install hangers adjacent to motor driven equipment with vibration isolation; refer to Section 23 05 48 – Vibration Isolation.

3.3 EQUIPMENT BASES, FOUNDATIONS, PIERS, SUPPORTS, AND ATTACHMENTS:

- A. Provide necessary foundations, supports, pads, equipment bases and piers, as required and shown on drawings or as required by manufacturer for equipment furnished by Mechanical Division. Materials, fixtures, and equipment shall be securely attached to the building structure. Attachments shall be strong, durable, and suitable for their intended application.
- B. Provide housekeeping pads or foundations for every item of floor mounted equipment specified herein or indicated on the Drawings.
- C. All concrete foundations required by equipment furnished by the Mechanical Division shall be constructed by the Mechanical Division (except where otherwise noted) in conformity with the recommendations of the manufacturer of the respective equipment and with the approval of the Owner's Representative.
- D. Provide housekeeping pads of 4,000 PSI concrete, minimum 4 inches thick and extending 6 inches beyond supported equipment. Provide #3 steel reinforcing bar with 12" on center square grid pattern. Steel members may be substituted for concrete pad where approved prior to installation, or as shown on drawings.
- E. All corners of the foundations shall be neatly chamfered at a 45 degree angle.
- F. After removal of the forms, the surface of the foundation shall be hand rubbed.
- G. All concrete work performed by the Contractor shall conform entirely to the requirements of the General Specifications which describe this class of work.
- H. Provide additional steel framing to raise equipment above housekeeping pad where necessary to properly construct p-traps and equipment drains.
- I. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.

3.4 FLASHING:

- A. Provide flexible flashing and metal counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Provide curbs for mechanical roof installations **18 inches** minimum high above roofing surface. Flash and counter-flash with sheet metal; seal watertight. Attach Counterflashing mechanical equipment and lap base flashing on roof curbs. Flatten and solder joints.
- C. Adjust storm collars tight to pipe with bolts; caulk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

3.5 SLEEVES:

- A. Set sleeves in position in forms. Provide reinforcing around sleeves.

SECTION 23 05 29
HANGERS, SUPPORTS AND FOUNDATIONS

- B. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- C. Extend sleeves through floors **2 inches** above finished floor level. Caulk sleeves.
- D. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with stuffing or fire stopping insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- E. Install chrome plated steel escutcheons at finished surfaces.

3.6 SCHEDULES:

PIPE SIZE	MAX. HANGER SPACING	DIAMETER
Inches (mm)	Feet (m)	Inches (mm)
1/2 to 1-1/4 (12 to 32)	6.5 (2)	3/8 (9)
1-1/2 to 2 (38 to 50)	10 (3)	3/8 (9)
PVC (All Sizes)	6 (1.8)	3/8 (9)
C.I. Bell and Spigot (or No-Hub) And at Joints	5 (1.5)	5/8"

(7/8" and larger hangers can be substituted for smaller hangers if support spacing is decreased accordingly. Contractor shall provide calculations to support proposed deviations as applicable.)

END OF SECTION

SECTION 23 05 48
MECHANICAL SOUND, VIBRATION, AND SEISMIC CONTROL

PART 1 GENERAL

1.1 SUMMARY:

- A. Section includes vibration isolation.

1.2 PERFORMANCE REQUIREMENTS:

- A. Provide vibration isolation on motor driven equipment 0.5 hp (0.35 kW) and over, plus connected piping and ductwork.
- B. Consider upper floor locations critical unless otherwise indicated.

1.3 SUBMITTALS:

- A. Section 01 33 00– Submittal Procedures.
- B. Product Data: Submit schedule of vibration isolator type with location and load on each. Submit catalog information indicating, materials, dimensional data, pressure losses, and acoustical performance for standard sound attenuation products.
- C. Manufacturer's Installation Instructions: Submit special procedures and setting dimensions.

1.4 CLOSEOUT SUBMITTALS:

- A. Project Record Documents: Record actual locations of ductwork lagging. Record actual locations of hangers including attachment points.

1.5 QUALITY ASSURANCE:

- A. Perform Work in accordance with AMCA 300, ANSI S1.13, ARI 575, ASA 16 (ANSI S1.36) standards and recommendations of ASHRAE 68.

PART 2 PRODUCTS

2.1 VIBRATION ISOLATORS:

- A. Manufacturers:
 - 1. The VMC Group.
 - 2. Mason Industries.
 - 3. Kinetics.
 - 4. Substitutions: Section 23 05 00 – Mechanical General Conditions.
- B. Neoprene Pad Isolators:
 - 1. Durulene or neoprene-waffle pads.
 - a. Hardness 30 Shore A Durometer.
 - b. Minimum 7/8 – 1 inch thick.
 - c. Maximum loading 40 psi.
 - d. Height of ribs: not to exceed 0.7 times width.
 - e. Size as required for application.
 - 2. Configuration: 7/8 - 1 inch thick waffle pads bonded each side of 1/4 inch thick steel plate.
 - a. Indoors: Galvanized steel plate.
 - b. Outdoors: 316 stainless steel plate.

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MECHANICAL SOUND, VIBRATION, AND SEISMIC CONTROL

- 3. Model:
 - a. Kinetics Model NGD Combination Shear Pad and Plate.
 - b. VMC Model Shear-Flex Combination Shear Pad and Plate.

PART 3 EXECUTION

3.1 INSTALLATION:

- A. Install in accordance with manufacturer's instructions.
- B. Install isolation for motor driven equipment.
 - 1. Bases:
 - a. Set steel bases for 1 inch (25 mm) clearance between housekeeping pad and base.
 - b. Adjust equipment level.
- C. Prior to making piping connections to equipment with operating weights substantially different from installed weights, block up equipment with temporary shims to final height. When full load is applied, adjust isolators to load to allow shim removal.
- D. Connect wiring to isolated equipment with flexible hanging loop.

3.2 MANUFACTURER'S FIELD SERVICES:

- A. Inspect isolated equipment after installation and submit report. Include static deflections.

3.3 SCHEDULES:

<u>EQUIPMENT ISOLATION SCHEDULE</u>	
ISOLATED EQUIPMENT	
Air Cooled Condensing Units	Neoprene Pad

END OF SECTION

**SECTION 23 05 53
MECHANICAL IDENTIFICATION**

PART 1 GENERAL

1.1 SUMMARY:

- A. Section includes nameplates, tags, stencils and pipe markers.

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.

2.2 TAGS:

- A. Metal Tags:
 - 1. Manufacturers:
 - a. Brady.
 - b. LEM.
 - c. Seton.
 - d. Brimar.
 - e. Substitutions: Section 23 05 00 - Mechanical General Conditions.

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2. Brass with stamped letters; tag size minimum 1-1/2 inches diameter with finished edges.
- B. Tag Chart: Typewritten letter size list of applied tags and location in anodized aluminum frame.

2.3 PIPE MARKERS:

- A. Color and Lettering: Conform to ASME A13.1.
- B. Plastic Pipe Markers:
 1. Manufacturers:
 - a. Brady.
 - b. LEM.
 - c. Seton.
 - d. Brimar.
 - e. Substitutions: Section 23 05 00 - Mechanical General Conditions.
 2. Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.

2.4 CEILING TACKS:

- A. Manufacturers:
 1. Brady.
 2. LEM.
 3. Seton.
 4. Brimar.
 5. Substitutions: Section 23 05 00 - Mechanical General Conditions.
- B. Description: Steel with 3/4-inch diameter color-coded head.
- C. Color code as follows:
 1. HVAC equipment: Yellow.
 2. Heating/cooling valves: Blue.

PART 3 EXECUTION

3.1 PREPARATION:

- A. Degrease and clean surfaces to receive adhesive for identification materials.

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. Install tags using corrosion resistant chain. Number tags consecutively by location.
- E. Identify chillers, cooling towers, air handling units, pumps, heat transfer equipment, tanks, domestic water heaters, boilers, condensing units, fans, air terminal units, water treatment devices, and other mechanical equipment with plastic nameplates.

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MECHANICAL IDENTIFICATION

Identify in-line pumps and other small devices with tags. Air devices do not require mechanical identification.

- F. Identify control panels and major control components outside panels with plastic nameplates.
- G. Identify valves in main and branch piping with tags.
- H. Tag automatic controls, instruments, and relays. Key to control schematic.
- I. Identify indoor piping, concealed or exposed, with plastic pipe markers. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet (6 m) on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.
- J. Identify outdoor piping and cooling towers with stencils and black enamel spray paint with minimum 4" letter height.
- K. Provide ceiling tacks to locate valves or dampers above T-bar type panel ceilings. Locate in corner of panel closest to equipment.
- L. Identify all equipment located above ceiling with nameplates affixed to lay-in ceiling grid frame adjacent to and right below each device.
- M. Outdoor DX Condensing Units: Identify units with plastic nameplates. Nameplate shall indicate both the unit tag and the space is services. Examples: "ACCU-1, Class Rm 121/122" , "ACCU-1 Library", "ACCU-1, Office 01/02/03/04".

END OF SECTION

**SECTION 23 05 58
ACCESS DOORS**

PART 1 GENERAL

1.1 WORK INCLUDES:

- A. Furnish and install access doors in inaccessible wall or ceiling locations as required or shown for access to valves, controls, regulating devices, water hammer arrestors, trap-primers, cleanouts, fire dampers, air distribution devices, and other equipment requiring maintenance, adjustment, or operation.

PART 2 PRODUCTS

2.1 NON-FIRE RATED ACCESS DOORS:

- A. Furnish Inryco/Milcor, Acudor, Elmdor, or equal with 16 gauge frames, 14-gauge panels, and 22-gauge casing head. Provide continuous concealed hinges and flush screwdriver cam lock. Use Style K access doors for plastered surfaces, Style M for masonry or gypboard surfaces. Use Style AP for acoustical plaster ceiling, with 18-gauge panel and all-galvanized construction.

2.2 FIRE RATED ACCESS DOORS:

- A. Furnish Inryco/Milcor, Acudor, Elmdor, Nystrum, or equal, UL listed, 1-1/2 hour Label "B", access doors with 16-gauge steel frames, and 20-gauge insulated sandwich-type door panel. Provide door with continuous concealed hinge and automatic closing and latching mechanism.

2.3 FINISHED AREAS:

- A. Provide stainless steel access doors were located in finished areas that are accessible to the general public such as but not limited to toilet rooms, offices, corridors, and classrooms.

PART 3 EXECUTION

3.1 EXECUTION:

- A. Access doors specified in Division 23 will be installed by other divisions. Not all required access doors are shown. Coordinate with the contractor to locate access doors for ease of operation and maintenance of concealed equipment.
- B. Installation shall be in accordance with the manufacturer's printed instructions.
- C. Access doors shall be of sufficient size to perform all necessary service and maintenance tasks.

END OF SECTION

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. Owner 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. Mechanical Contractor shall coordinate work with testing agency and shall not include the cost of testing within their proposal.
- 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.

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- 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.
- 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 or NEBB.
- 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 23. 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

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- 2. Winter: 55% relative humidity
70 degrees Fahrenheit dry bulb
- C. Outside Conditions:
 - 1. Summer: 100 degrees Fahrenheit dry bulb
81 degrees Fahrenheit wet bulb
 - 2. Winter: 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. Reynolds Engineering, LLC.
- H. Professional Engineer Balance Lab, Inc.
- I. Cleary Zimmerman Engineers, Inc.
- J. 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.
 - 11. Duct system leakage is minimized.
 - 12. Service and balance valves are open.
- B. Submit field reports. Report defects and deficiencies noted during performance of services that prevent system balance.

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- 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.
- 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.**

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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%
Exhaust fans	0% to -5%
Diffusers/supply grilles	-5% to +5%
Return grilles	0% to -5%
Exhaust 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.
- 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.

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- 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. For variable air volume system powered units set volume controller to air flow setting indicated. Confirm connections properly made and confirm proper operation for automatic variable air volume temperature control.

3.8 SCHEDULES:

- A. Equipment Requiring Testing, Adjusting, and Balancing:
 - 1. Air Cooled Condensing Units.
 - 2. Air Handling Units.
 - 3. Fans.
 - 4. Air Filters.
 - 5. Air Inlets and Outlets.
 - 6. Packaged Rooftop Units.

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.

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6. Calibration date.
- D. Electric Motors:
1. Manufacturer.
 2. Model/Frame.
 3. HP/BHP.
 4. Phase, voltage, amperage; nameplate, actual, no load.
 5. RPM.
 6. Service factor.
 7. Starter size, rating, heater elements.
 8. Sheave Make/Size/Bore.
- E. V-Belt Drive:
1. Identification/location.
 2. Required driven RPM.
 3. Driven sheave, diameter and RPM.
 4. Belt, size and quantity.
 5. Motor sheave diameter and RPM.
 6. Center to center distance, maximum, minimum, and actual.
- F. Air Cooled Condensing Unit:
1. Identification/number.
 2. Location.
 3. Manufacturer.
 4. Model number.
 5. Serial number.
 6. Entering DB air temperature, design and actual.
 7. Leaving DB air temperature, actual.
 8. Number of compressors.
 9. Refrigerant type.
 10. Operating refrigerant head and suction pressures.
- G. Direct Expansion Cooling Coil Data:
1. Identification/number.
 2. Location.
 3. Service.
 4. Manufacturer.
 5. Air flow rate, design and actual.
 6. Entering air dry bulb DB and wet bulb WB temperatures, design and actual.
 7. Leaving air dry bulb DB temperature, design and actual.
 8. Saturated suction temperature, design and actual.
 9. Air pressure drop, design and actual.
- H. Electric Resistance Heater:
1. Manufacturer.
 2. Identification/number.
 3. Location.
 4. Model number.
 5. Design capacity kW.
 6. Number of stages.
 7. Phase, voltage, amperage.
 8. Test voltage (each phase).
 9. Test amperage (each phase).
 10. Air flow, specified and actual.
 11. Entering and leaving air dry bulb DB temperatures, specified and actual.

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- I. Air Moving Equipment:
 - 1. Location.
 - 2. Manufacturer.
 - 3. Model number.
 - 4. Serial number.
 - 5. Arrangement/Class/Discharge.
 - 6. Supply air flow rate, specified and actual.
 - 7. Return air flow rate, specified and actual.
 - 8. Outside air flow rate, specified and actual.
 - 9. Total static pressure (total external), specified and actual.
 - 10. Inlet pressure.
 - 11. Discharge pressure.
 - 12. Sheave Make/Size/Bore.
 - 13. Number of Belts/Make/Size.
 - 14. Fan RPM.

- J. Exhaust Fan Data:
 - 1. Location.
 - 2. Manufacturer.
 - 3. Model number.
 - 4. Serial number.
 - 5. Air flow rate, specified and actual.
 - 6. Total static pressure (total external), specified and actual.
 - 7. Inlet and discharge pressures.
 - 8. Sheave Make/Size/Bore.
 - 9. Number of Belts/Make/Size.
 - 10. Fan RPM.
 - 11. Motor voltage and current draw, name plate and actual.

- K. 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.

- L. Air Inlets and Outlets:
 - 1. System designation.
 - 2. Inlet or outlet number and area served.
 - 3. Size and type.
 - 4. Design and final air volumes.

- M. 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.

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- 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.
 - 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

**SECTION 23 07 00
MECHANICAL INSULATION**

PART 1 GENERAL

1.1 SUMMARY:

- A. Section includes ductwork insulation, duct liner, insulation jackets, equipment insulation, covering, thermal insulation for piping systems including vapor retarders, jackets, and accessories.

1.2 SUBMITTALS:

- A. Section 01 33 00 – Submittal Procedures.
- B. Product Data: Submit product description, thermal characteristics, and list of materials and thickness for each service, and location.

1.3 QUALIFICATIONS:

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three (3) years documented experience.
- B. Applicator: Company specializing in performing work of this Section whose primary business is insulation with minimum three (3) years documented experience.

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.

1.5 DELIVERY, STORAGE, AND HANDLING:

- A. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- B. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.6 ENVIRONMENTAL REQUIREMENTS:

- A. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer.
- B. Maintain temperature during and after installation for minimum period of 24 hours.

1.7 REGULATORY COMPLIANCE:

- A. Comply with latest Department of Energy regulations and ASHRAE 90.1 Standards, applicable International Energy Conservation Code.

1.8 DEFINITIONS:

- A. Indoor/Outdoor Clarification: All duct and pipe insulation installed in un-conditioned spaces and outdoors shall be insulated the same way. The words un-conditioned and outdoors shall be considered the same type of space regardless of definitions elsewhere in other specification sections.

**SECTION 23 07 00
MECHANICAL INSULATION**

PART 2 PRODUCTS

2.1 GLASS FIBER, FLEXIBLE:

Insulation for exterior of sheet metal ducts and backside of diffusers.

- A. Manufacturers:
 - 1. Johns Manville Model Microlite.
 - 2. Knauf Model Ductwrap.
 - 3. Owens Corning.
- B. Insulation: ASTM C553 Glass Fiber Blanket Thermal Insulation for Commercial and Industrial Applications, Type II.
 - 1. K Value: ASTM 518, 0.29 at 75 degrees F.
 - 2. Maximum Service Temperature: ASTM C411, 250 degrees F.
 - 3. Maximum Moisture Absorption: ASTM C1104, 0.2 percent by volume.
 - 4. Moisture Vapor Transmission: ASTM E96, 0.02 perm.
 - 5. Density: 0.75 or 1.0 pounds per cubic foot.
 - 6. Minimum Installed R-Value: Refer to Part 3, Schedules.
- C. Vapor Retarder Jacket:
 - 1. Kraft paper with glass fiber yarn and bonded to aluminized film ASTM C1136, Type II.
 - 2. Moisture vapor transmission: ASTM E96; 0.02 perm.
 - 3. Secure with galvanized steel outward clinching staples and pressure sensitive tape.
- D. Vapor Retarder Tape:
 - 1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.
 - 2. All connections, longitudinal and circumferential seams and laps, shall be additionally sealed over tape with a brush applied coat of mastic. Foster Model FDS-181 "Air-Tight Duct Sealant" or equal.
- E. Installation: Maximum allowable compression is 25 percent.
- F. Indoor Vapor Barrier Finish:
 - 1. Childers CP-30:
 - a. ASTM E-96, 0.02 perms at 0.02" dry film thickness.
 - b. Indoor/Outdoor vinyl emulsion type acrylic, compatible with insulation, white color.
 - 2. Fosters 30-80:
 - a. ASTM E-96, 0.03 perms at 73 mils dry film thickness.
 - b. Indoor/Outdoor low odor, water based compatible with insulation, white color.

2.2 GLASS FIBER, RIGID:

Insulation for exterior of sheet metal ducts.

- A. Manufacturers:
 - 1. Johns Manville Model 800 Series Spin-Glas.
 - 2. Knauf Model Insulation Board.
 - 3. CertainTeed Model ToughGard.

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MECHANICAL INSULATION**

- B. Insulation: ASTM C612 Mineral Fiber Block and Board Insulation, Type IA.
 - 1. K Value: ASTM 518, 0.23 at 75 degrees F.
 - 2. Maximum Service Temperature: ASTM C411, 450 degrees F. unfaced side.
 - 3. Maximum Moisture Absorption: ASTM C1104, 5 percent by weight.
 - 4. Moisture Vapor Transmission: ASTM E96, 0.02 perm.
 - 5. Density: 3.0 pounds per cubic foot.
 - 6. Minimum Installed R-Value: Refer to Part 3, Schedules.
- C. Vapor Retarder Jacket:
 - 1. Kraft paper with glass fiber yarn and bonded to aluminized film ASTM C1136.
 - 2. Moisture vapor transmission: ASTM E96; 0.04 perm.
 - 3. Secure with speed washers. Seal all joints, breaks, punctures, or protuberances with galvanized steel outward clinching staples and pressure sensitive tape.
- D. Vapor Retarder Tape:
 - 1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.
 - 2. All connections, longitudinal and circumferential seams and laps, shall be additionally sealed over tape with a brush applied coat of mastic. Foster Model FDS-181 "Air-Tight Duct Sealant" or equal.
- E. Indoor Vapor Barrier Finish:
 - 1. Childers CP-30:
 - a. ASTM E-96, 0.02 perms at 0.02" dry film thickness.
 - b. Indoor/Outdoor vinyl emulsion type acrylic, compatible with insulation, white color.
 - 2. Fosters 30-80:
 - a. ASTM E-96, 0.03 perms at 73 mils dry film thickness.
 - b. Indoor/Outdoor low odor, water based compatible with insulation, white color.

2.3 ELASTOMERIC CELLULAR FOAM FOR PIPING OR EQUIPMENT:

- A. Manufacturers: Armstrong Model AP Armaflex.
- B. Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular form, Closed Cell: ASTM C534; Type I, Tubular form. CFC, HCFC, HFC free.
 - 1. K Value (Btu-in/(hr*ft²*F°)), ASTM C177 or C518:
 - a. 1" Thickness:
 - 1) Mean Temperature 75°F = 0.245.
 - 2) Mean Temperature 90°F = 0.254.
 - b. 1-1/2"-2" Thickness:
 - 1) Mean Temperature 75°F = 0.28.
 - 2) Mean Temperature 90°F = 0.286.
 - 2. Water Vapor Permeability, ASTM E96, Procedure A (Perm-in):
 - a. 1" Thickness: 0.05.
 - b. 1-1/2"-2": 0.08.
 - 3. Minimum Service Temperature, ASTM C534: -297 degrees F.
 - 4. Maximum Service Temperature, ASTM C534:
 - a. 1" Thickness: 220 degrees F.
 - b. 1-1/2"-2" Thickness: 300 degrees F.
 - 5. Maximum Moisture Absorption, ASTM C209: <0.2% by volume.
 - 6. Surface Burning Characteristics, ASTM E84:
 - a. Flame Spread: ≥25.
 - b. Smoke Development: ≥50.

**SECTION 23 07 00
MECHANICAL INSULATION**

- 7. Minimum R-value or Thickness: Refer to Part 3, Schedules.
- C. Elastomeric Foam Adhesive:
 - 1. Manufacturers: Armstrong Model 520.
 - 2. Air-dried, contact adhesive, compatible with insulation.
- D. Insulation Tape: Elastomeric foam tape of same material as insulation.
- E. Insert Material: Compression resistant elastomeric foam material.
- F. Finish Paint Coating (Indoor and Outdoor Applications):
 - 1. Armaflex WB Finish or equal.
 - 2. Water-based latex enamel paint with elastomeric and U.V. resistant properties, white finish color. Provide two coats minimum.

2.4 GLASS TEXTILE LONG FIBER DUCT LINER, FLEXIBLE INSULATION FOR INTERIOR OF SHEET METAL DUCTS:

- A. Manufacturers:
 - 1. CertainTeed Model ToughGard "R".
 - 2. Knauf Atmosphere.
 - 3. Johns Manville.
 - 4. Owens Corning.
- B. Insulation: ASTM C1071, C916, G21, G22, C423, C518, NFPA 90A, 90B, 259, Type I flexible, noncombustible blanket.
 - 1. Fabric Construction: Rotary or mesh textile long fiber design.
 - 2. K Value: ASTM C177, 0.26 at 75 degrees F.
 - 3. Maximum service temperature: 250 degrees F.
 - 4. Density: Minimum 1.50 lb/cu ft.
 - 5. Noise Reduction Criteria: 0.70 for 1 inch, 0.80 for 1 1/2 inch, 0.95 for 2 inch thickness.
 - 6. Maximum Velocity on Coated Air Side: 6,000 ft/min.
 - 7. Minimum R-Value: Refer to Part 3 Schedules.
- C. Adhesive:
 - 1. Manufacturers:
 - a. Foster Model 81-90.
 - b. Minnesota Mining Model EC104.
 - c. Substitutions: Section 23 05 00 - Mechanical General Conditions.
 - 2. Waterproof, ASTM E162 fire-retardant type.
- D. Biocide: Coat liner with EPA-registered anti-microbial agent that will not support the growth of fungus or bacteria. Product shall resistant to microbial growth using a "no growth criteria" when tested in accordance with ASTM C 1138, G 21 and G22.
- E. Liner Fasteners: Primary adhesion shall be through glue adhesive. Additionally secure with galvanized steel, weld pins. All fasteners shall be tack welded to duct surface. Adhesive pins are not allowed.

2.5 FIRE BARRIER PLENUM WRAP:

- A. Manufacturers: 3M 5A+.
- B. Insulation: ASTM 84, NFPA 262 (UL 910) and UL 1887.
 - 1. Density: 6 pounds per cubic foot (pcf).

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2. Provide foil type FSK jacket.
 3. Minimum Thickness: 1/2" (Thickness shall be per manufacturers U.L. listing).
- C. Wrap non-metallic piping and cables located in return air plenums with thickness as required by NFPA and other applicable codes. Product shall be designed and U.L. tested to wrap cables and PVC, CPVC, PB, PE, PP, PVDF, and ABS pipe systems when install in air plenums to reduce the installed flame and propagation and smoke degeneration of pipes and cables to below Flame Spread Index and Smoke Development Index to <25/<50.

2.6 JACKETS:

- A. (Outdoor) Aluminum Jacket – Refrigerant Pipe and Fittings Outdoors: ASTM B209.
1. Manufacturers: Johns Manville Insulation Systems, Model Aluminum Roll Jacketing (Cladding).
 2. Jacket:
 - a. Aluminum Alloy: 3003 or 3105.
 - b. Thickness: 0.016 inch sheet.
 - c. Finish: Smooth (Paint Mill).
 - d. Joining: Longitudinal slip joints and 2 inch laps.
 - e. Fittings: 0.24 inch thick die shaped fitting covers with factory attached protective liner.
 - f. Metal Jacket Bands: 1/2 inch wide; 0.020 inch thick aluminum or stainless steel.
 - g. Color: Anodized aluminum.

2.7 GENERAL SEALANT:

- A. Manufacturers / Product:
1. Foster Model FDS-181 "Air-Tight Duct Sealant", white or gray.
 2. Rector Seal / Air-Lock 181.
 3. Design Polymerics / DP 1020.
- B. Non-hardening, Non-flammable; water-based; fiber reinforced; mildew, water and U.V. resistant; compatible with mating materials; UL listed 181A or 181B; liquid used alone or with tape or heavy mastic.

PART 3 EXECUTION

3.1 EXAMINATION:

- A. Verify piping, equipment, and ductwork have been tested before applying insulation materials.
- B. Verify surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION:

- A. Install in accordance with NAIMA National Insulation Standards and Manufacturers instructions.
- B. It shall be the responsibility of the contractor to ensure that an effective insulation and vapor seal is achieved on all cold surfaces which will eliminate any sweating or condensation on any cold surfaces installed by the contractor.

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- C. Building Penetration Sleeves:
1. Contractor shall provide sleeves at all building penetrations "Wall, Floors and Roofs" with sufficient room for the installation of finished insulation products.
 2. All exterior penetrations shall be suitably weatherproofed air and water tight. All sealants shall be compatible with building system and shall be U.V. resistant.
- D. Exposed Piping: Locate insulation and cover seams in least visible locations.
- E. Insulated Pipes Conveying Fluids Below Ambient Temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, expansion joints, air separators, suction diffusers, expansion tanks and chemical feeders.
1. Furnish factory-applied or field-applied vapor retarder jackets. Secure jackets with pressure sensitive adhesive self-sealing longitudinal laps and butt strips, then with outward clinch expanding staples. Staples shall have stainless steel construction. Seal staple penetrations with vapor retarder mastic.
 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe or as specified in Part 3 - 3.3 Schedules. Finish with glass cloth and vapor retarder adhesive.
 3. Insulate piping components such as nipples, valve stems or other cold surfaces were condensation forms with elastomeric cellular foam insulation.
- F. Equipment Connections: Seal duct and piping at point of connection to equipment to maintain vapor barrier.
- G. Shields at Support Locations:
1. Shields, All Pipe Sizes:
 - a. Material:
 - 1) Indoors: Galvanized Steel.
 - 2) Outdoors: 316 Stainless Steel.
 - b. Length:
 - 1) 1-1/2"-6" = Minimum 8" Long.
 - 2) 8"-10" = Minimum 12" Long.
 - 3) 12" and Over = Minimum 18" Long.
 - c. Minimum 18-gage.
 - d. Provide between pipe hangers or pipe hanger rolls and inserts. Length shall be 4 inches shorter than insert to allow for vapor retarding butt joints.
- H. Elastomeric Cellular Foam Insulation – Piping:
1. Apply adhesive at butt ends of joints and fittings.
 2. Fittings shall be mitered or template-cut in accordance with manufacturer's instructions. Do not slide tubing over 90-degree elbows.
 3. Inserts: Provide rigid elastomeric insulation at pipe hangers for pipe sizes 1 1/2 inch and larger to prevent compression of insulation.
- I. Continue insulation through penetrations of building assemblies or portions of assemblies having fire resistance rating of one (1) hour or less. Provide intumescent firestopping when continuing insulation through assembly. Finish at supports, protrusions, and interruptions. Refer to architectural for penetrations of assemblies with fire resistance rating greater than one hour.
- J. Exterior Applications: Provide vapor retarder jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor retarder cement. Cover with aluminum jacket with

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seams located at 3 or 9 o'clock position on side of horizontal piping with overlap facing down to shed water or on bottom side of horizontal equipment.

1. Elastomeric Insulation – Apply two coats of ultraviolet resistant paint.
- K. Factory Insulated Equipment: Do not insulate, except when indicated on Drawings, or other sections of Specifications.
- L. Exposed Equipment: Locate insulation and cover seams in least visible locations.
- M. Apply insulation close to equipment by grooving, scoring, and beveling insulation. Fasten insulation to equipment with studs, pins, clips, adhesive, wires, or bands.
- N. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor retarder cement.
- O. Insulated Equipment Containing Fluids Below Ambient Temperature: Insulate entire system.
- P. Finish insulation at supports, protrusions, and interruptions.
- Q. Nameplates and ASME Stamps: Bevel and seal insulation around; do not insulate over.
- R. Test and Service Ports: Insulation shall not cover any test or system service ports. Contractor shall install extensions on ports as needed to extend port for easy access outside of the finished insulation thickness.
- S. Equipment Requiring Access for Maintenance, Repair, or Cleaning: Install insulation for easy removal and replacement without damage.
- T. Insulated Ductwork Conveying Air Below Ambient Temperature:
1. Provide insulation with vapor retarder jackets.
 2. Finish with tape and vapor retarder jacket.
 3. Seal over tape with sealant at all connections. All connections, longitudinal and circumferential seams and laps, shall be additionally sealed over tape with a brush applied coat of vapor retarding mastic.
 4. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
 5. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, expansion joints, diffuser plenums, and return plenums.
 6. Seal insulation airtight where duct hanger straps penetrate insulation vapor barrier.
- U. Duct and Plenum Liner Application:
1. Adhere insulation with adhesive for 100 percent coverage.
 2. Secure insulation with mechanical liner fasteners. SMACNA Standards for spacing.
 3. Seal and smooth joints. Seal and coat transverse joints.
 4. Seal liner surface penetrations with adhesive.
 5. Duct dimensions indicated are net inside dimensions required for airflow. Increase duct size to allow for insulation thickness.
- V. Install according to manufacturer's recommended stretch out chart and to manufacturer's installation instructions where more stringent than herein.

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MECHANICAL INSULATION**

3.3 SCHEDULES:

Provide minimum thickness or R-value as follows. Increase as necessary for compliance with local code. R-values are installed values.

- A. Cooling Systems:
 - 1. Condensate Drain Pipes (50 degrees F. and above)
 - a. Indoors and Within Building Envelopes:
 - 1) Elastomeric Cellular Foam Insulation:
 - a) Pipe Size Range: All sizes.
 - (1) Thickness: 3/4- inch.
 - b. Outdoors on the Roof and Ground Mounted: Insulate P-Traps only; trap and 8-12" beyond the trap in each direction.
 - 1) Elastomeric Cellular Foam Insulation:
 - a) Pipe Size Range: All sizes.
 - (1) Thickness: 1- inch.
 - 2. Refrigerant Suction:
 - a. Elastomeric Cellular Foam Insulation:
 - 1) Pipe Size Range: All Sizes
 - a) Thickness: 1-inch.
- B. Exhaust Ducts:
 - 1. Crawl Space Exhaust: Rectangular Sheet Metal Ductwork: Wrap all ductwork with Flexible Glass Fiber Ductwork Insulation, Exterior R=8.
- C. Packaged RTUs:
 - 1. Supply and Return Ducts:
 - a. Rectangular Ducts: 1.5" Flexible Glass Fiber Duct Liner, Interior.
 - b. Round Ducts: Flexible Glass Fiber Ductwork Insulation, Exterior, Minimum Installed R=6.0.
- D. AHUs:
 - 1. Supply and Return Ducts:
 - a. Rectangular Ducts: 1" Flexible Glass Fiber Duct Liner, Interior.
 - b. Round Ducts and Manual Balancing Dampers: Flexible Glass Fiber Ductwork Insulation, Exterior, Minimum Installed R=6.0.
 - 2. Return Air Plenums: 1" Flexible Glass Fiber Duct Liner or Rigid Board, Interior.
- E. Transfer Air Ducts:
 - 1. Rectangular Ducts: 1-inch-Thick Flexible Glass Fiber Duct Liner.
 - 2. Round Ducts: Flexible Glass Fiber Ductwork Insulation, Exterior, Minimum Installed R=6.0.
- F. Backside of Diffusers: Flexible Glass Fiber Ductwork Insulation, Minimum installed R=8.0.
- G. Fire Dampers: Externally insulate all fire dampers with insulation values equal to the adjoining duct systems; rigid or external wrap. Coordinate insulation requirements fire damper manufacturers U.L. installation instructions. Refer to Engineers details for specific instructions were applicable.

END OF SECTION

**SPECIFICATION SECTION 23 09 00
BUILDING AUTOMATION CONTROL SYSTEM**

PART 1 GENERAL

1.1 SUMMARY:

- A. Section includes Building Automation System (BAS) utilizing Web Based direct digital controls for the Calallen Independent School District, Wood River Elementary HVAC Equipment Replacements and Upgrades – 2026 (Phase 1), Corpus Christi, Texas.
- B. BAS system shall be subcontracted directly by the Prime Contractor. HVAC Contractor shall coordinate their work with BAS Contractor for a fully operational and functional system.

1.2 SCOPE OF WORK:

- A. Project scope is to provide new BAS for HVAC replacement equipment as described by the specifications, project drawings and equipment sequence of operations.
- B. New systems shall be provided complete and integrated back to existing respective school building BAS infrastructure. BAS shall reuse existing control system as applicable and provide new control devices as needed for complete and functional systems.
- C. **BASE PROPOSAL:** The project shall consist of the replacement of Sixteen (16) classroom split systems, Two (2) new packaged rooftop units and replacement of Five (5) existing Packaged Roof top u nits.
 - 1. Main Router Upgrades:
 - a. Replace the existing LGR250 with new latest model router Model Optiflex OFINT-E2. Take care with removal of the existing router and deliver to the Owner in good working condition.
 - b. The existing installed LGR25 router is not currently being used and shall remain in place as is.
 - 2. Split DX AHU/ACCU Systems:
 - a. General Demolition:
 - 1) AHU's:
 - a) Demolish all existing control wiring connecting to AHU's.
 - b) Carefully remove all control devices; XFMR's, fan CT, duct sensors and the like and reinstall on new systems.
 - c) Existing space sensors and controllers shall remain for reuse with new systems.
 - 2) ACCU's: Demolish all control wiring between AHU and ACCU.
 - b. General Renovation:
 - 1) Reinstall all existing control devices into/onto new AHU's.
 - 2) Connect new freeze thermostat and float switch alarm inputs wired in series. Devices shall be provided by the HVAC contractor.
 - 3) Provide new control wiring to ACCU's.
 - 4) Update system graphics and sequencing to reflect new two stage cooling operation.
 - c. AHU/ACCU-H1-1 and AHU/ACCU-G1-1: Remove existing control devices and demolish complete control wiring. Existing BAS panels shall remain for reuse with new RTU-W7. Refer to drawings for further details. Deliver existing control devices removed not scheduled to be reused for RTU-W7 to Owner for attic stock.

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BUILDING AUTOMATION CONTROL SYSTEM**

- d. AHU/ACCU-F1-1: Remove existing control devices and demolish complete control wiring. Existing BAS panel shall remain for reuse with new RTU-W6. Refer to drawings for further details. Deliver existing control devices removed not scheduled to be reused for RTU-W6 to Owner for attic stock.
- 3. Five (5) Replacement Packaged Rooftop Units:
 - a. General Demolition:
 - 1) Demolish all existing control wiring connecting to RTU's.
 - 2) Carefully remove all control devices; XFMR's, fan CT, duct supply and return temperature sensors and the like and deliver to owner in good working conditions for attic stock.
 - 3) Existing controllers shall remain for reuse with new systems.
 - 4) All new replacement RTUs have integral dehumidification. The existing space sensors are temperature only. Remove the existing space sensors and deliver to the Owner and provide new combination temperature and humidify sensors.
 - b. General Renovation:
 - 1) Install all new control devices; XFMR's, fan CT, duct supply and return temperature sensors.
 - 2) Provide new control wiring to RTU's.
 - 3) Update system graphics and sequencing to reflect new two stage cooling operation and dehumidification.
 - 4) The existing ZN551 controllers will need an additional binary output to control the RTU dehumidification. Provide an analog to binary convertor for the existing analog output to control the dehumidification function.
 - 5) Update system graphics and sequencing to reflect new sequences.
- 4. Two (2) New Packaged Rooftop Units:
 - a. RTU-W7: Teachers Work Room
 - 1) Install new fan CT and control XFMR in new RTU, duct mounted supply and return air temperature sensors and wire RTU to New BAS controller previously used control panel from AHU- G1-1 as needed for complete system.
 - 2) Replace the existing space sensor with new combination temperature and humidity type sensor.
 - 3) Update system graphics and sequencing to reflect new sequences and new ventilation mode.
 - b. RTU-W6: Administration
 - 1) Install new fan CT and control XFMR in new RTU, duct mounted supply and return air temperature sensors and wire RTU to New BAS controller previously used control panel from AHU- F1-1 as needed for complete system.
 - 2) Replace the existing space sensor with new combination temperature and humidity type sensor.
 - 3) Update system graphics and sequencing to reflect new sequences and new ventilation mode.
- D. BAS Contractor shall replace and update all existing system diagrams at each controller location with new based on final as-built conditions from this project.
- E. BAS Contractor shall update master as-built drawings for each campus to reflect project final installation.

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BUILDING AUTOMATION CONTROL SYSTEM**

- F. **ALTERNATE BAS-1 (Additive):** For all existing split DX AHU/ACCUs replacement equipment, demolish existing duct sensors (supply and return), supply fan CT and control transformer and replace with new.
- G. **ALTERNATE BAS-2 (Additive):** For all existing split DX AHU/ACCUs replacement equipment, demolish existing room sensors and replace with new combination temperature and humidity sensors.

1.3 PRE-APPROVED MANUFACTURER AND PROPOSAL STRUCTURE:

- A. The following are pre-approved control system suppliers, manufacturers, and product lines: Automated Logic of Texas (Jonathan Neskora, jonathan.neskora@carrier.com, 210-419-8007)
- B. 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 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 split system air conditioning units, packaged rooftop units 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 Unit Controllers shall be BACnet MS/TP 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 formatted for both PC terminal and mobile content.
- 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

**SPECIFICATION SECTION 23 09 00
BUILDING AUTOMATION CONTROL SYSTEM**

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.

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 20 00 10 – Commissioning Specification.
 - 3. Section 23 05 93 – Testing, Adjusting and Balancing.
 - 4. Section 23 09 23 – Direct Digital Control Coordination.

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- 5. Section 23 09 93 – Equipment Control Sequence of Operations.
 - 6. Section 26 00 00 – Electrical Specifications.
- C. Commissioning: Refer to Commissioning Specification 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. As 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 2021(IBC).
 - a. Section 717 Ducts and Air Transfer Openings.
 - b. Section 907 Fire Alarm and Detection System.
 - c. Chapter 28 Mechanical.
 - 3. International Mechanical Code 2021 (IMC).
 - 4. International Energy Conservation Code 2015 (IECC).
 - 5. ASHRAE/ANSI 135-2016: Data Communication Protocol for Building Automation and Control System (BACnet).
 - 6. UL 916 Underwriters Laboratories Standard for Energy Management Equipment.

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.

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10. Provide BACnet Protocol Implementation Conformance Statements (PICS) as per ANSI/ASHRAE Standard 135-2016.
11. A list of functions available and a sample of function block programming that shall be part of delivered system.
12. Proposed routing of all COM wiring.
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.

1.10 RECORD DOCUMENTATION:

- A. Operation and Maintenance Manuals - Two (2) paper copies of the Operation and Maintenance Manuals shall be provided to the Owner's Representative upon completion of the project. The entire Operation and Maintenance Manual shall be furnished on USB 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, actually installed 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 mill of material shall show the device symbol, description, manufacturer, and part number.

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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 cutsheets, 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.
 2. Provide an additional Four (4) year parts warranty for complete system for a total of Five (5) year parts warranty for all new control devices.
 3. If within twelve (12) months from the date of Substantial Completion, 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.
 4. Maintain an adequate supply of materials within 24-hours of project site.
 5. BAS Contractor shall provide system software updates free of charge to Owner for minimum of 5-years from the date of Final Completion for normal use and maintenance of system. Contractor shall not provide systems that require continuous or costly updates for normal operations of the system. System upgrades such as new controls, new graphics, or the like are not considered updates.
 6. BAS Contractor shall provide Owner phone technical support and web based technical support documents for the life of the system.

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

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be tested by BACnet Testing Laboratories (BTL) and shall be manufacturer's latest version.

- B. The BAS shall consist of the following:
 - 1. Standalone Network Building Controllers.
 - 2. Unit Controllers.
 - 3. Local Display Devices and Sensors.
 - 4. Network processing, data storage and communications equipment.
 - 5. 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 MS/TP.
- 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 laptop 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.
- 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.

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2.3 USER INTERFACE:

- A. User Interface Application Components:
1. Operator Interface:
 - a. The existing 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. 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.
 - d. Software shall have the ability to lock input and output values for predetermined time intervals.
 - e. 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.
 - 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.

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- 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 alphanumeric pager. This must be provided in addition to the pop up window described above. System 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.
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 SP135-2012 BACnet.
 - 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.

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- 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.
- 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.
 - 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 = All privileges, including Password Add/Modify.
 - 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 enabled or disabled by system administrator. BAS shall display on screen that user is logged out after automatic logout occurs.

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7. Dynamic Color Display Graphics:
- a. The system shall display all data associated with project as called out on drawings and/or object type list supplied. 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 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

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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 trend logs.

- 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: A maximum of 16 graphic applications shall be able to execute at any one time on a user interface or workstation with 4 visible to the user. 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 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.

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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.
 - 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

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- 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.
 - 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 ROM or 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 NETWORK LEVEL CONTROLLERS OR BUILDING CONTROLLERS:

- A. General:
- 1. Automated Logic Model OPTIFLEX OFINT-E2 or equal.
 - 2. Network Level Controllers shall manage and supervise a network of Application Specific Controllers.
 - 3. Network Level Controllers shall be provided with designated 120-volt power and uninterruptable power supply (UPS) at each controller location by BAS Contractor.
 - 4. Each building controller shall be provided with a minimum of 30% future expansion capability of adding additional devices per each final installed MS/TP communication line (COM). Minimum 30% future expansion capability shall be built into building controller system and shall not require additional control devices or COM wiring in future.
- B. Network Communications: Communications to the Data/Web Server, third party BACnet devices and other Network Level Controllers shall be via Information Technology standard Ethernet Category 5/6 cable and 100Mbps connection. Network LThe following networks shall be provided:
- 1. Main Network Port: BACnet/IP.
 - 2. Application Specific Controller and Modular I/O Subnetworks: The Network Level Controller shall have a minimum of Two (2) RS-485 ports running BACnet MS/TP 9,600 or 115,200 bps speeds.
- 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.

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- D. BACnet Support:
1. The Network Level Controllers shall communicate using the BACnet/IP protocol over an onboard 100Mbps Ethernet connection.
 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 one or more RS485 ports which shall run the MS/TP BACnet protocol to other BACnet devices.
- E. Construction shall be easily expandable.
- 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: 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. 8 GBs eMMC flash memory and 512 MBDDR3 DRAM.
- I. Microprocessor: Provide minimum 32-bit ARM Cortex-A8, 600 MHz, with multi-level cache memory.
- J. Application Specific Controllers: 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.
- K. Modular Input / Output Points: 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.
- L. 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.
 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.

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- 7. Operator/Test Mode: Inhibit scanning and calculation of input points and issue manual control of input point values from operator workstations.
- M. 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. Each Binary Output shall have a hand/off/auto switch. Each Analog Output shall have a hand/auto switch and a potentiometer for setting the hand override value.
- H. BACnet Compliance: Modular Input / Output System shall employ the BACnet MS/TP communications protocol at not less than 76.8 Kbps for communications with a Network Level Controller.

2.6 BACnet COMPLIANT APPLICATION SPECIFIC UNIT CONTROLLERS:

- A. General:
 - 1. Automated Logic Model SE563 or equal.
 - 2. Application Specific Unit Controllers (ASUCs) shall be from the same manufacturer as BAS, and shall be provided for all listed packaged rooftop units, Air Handling Units and similar equipment. Communication protocol between controllers shall be BACnet MS/TP.
 - 3. BAS manufacturer shall provide ASUC's 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 ASUCs 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.

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- C. Memory: The ASUCs 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. Real-Time Clock: Internal clock with battery backup to maintain accurate time during a power failure, maintenance, etc., must be included.
- F. 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.
 - e. Operate and run program in both Occupied and Unoccupied control modes based on time schedule as required to maintain set points.
 - 7. ASUC's 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.
- G. Programming Language: The software tool used to configure the ASUC shall employ a Wizard system to assist the designer in configuring I/O points, setpoints, and other items which define the "Personality" of the ASUCs. PID loops and 2 position control routines must be available.
- H. Inputs:
 - 1. At a minimum, the following input types must be supported:
 - a. 3K and 10 K thermistor.
 - b. 0 – 5 VDC.
 - c. Dry Contact Closure.
 - 2. Provide a minimum of five (5) universal inputs, analog or binary.
- I. Multifunction Room Sensor: Must allow occupant to modify occupancy status and adjust temperature setpoint.
- J. Outputs:
 - 1. At a minimum, the following output types must be supported:
 - a. Binary Output.

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- b. Pulse Width Modulation (0 – 25 seconds, .1 second resolution).
 - c. 0 – 10 VDC or 0-20 mA.
 - 2. Provide a minimum of Five (5) universal outputs, analog or binary.
- K. BACnet Compliance: ASUCs shall employ the BACnet MS/TP communications protocol at not less than 76.8 Kbps for communications with other network devices.

2.7 INPUT DEVICES:

- A. General Requirements:
- 1. Installation, testing, and calibration of all sensors, transmitters, and other input devices shall be provided to meet the system requirements.
 - 2. Provide combination temperature/humidity or temperature/CO2 sensors where possible.
- 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:
- | Point Type | Accuracy |
|-----------------------|-----------------|
| Space Temp | + 0.5 °F |
| All Other Air Temp | + 0.5 °F |
| All Relative Humidity | + 3% RH |
| Air Flow | + 5% or reading |
| Air Pressure (Ducts) | 0.075" w.g. |
| Air Pressure (Space) | 0.01" w.g. |
| Electrical Power | + 5% of reading |
| Carbon Dioxide (CO2) | + 50 PPM |
- 2. Room Temperature Sensors:
 - a. Automated Logic Model ZSPro.
 - b. Room sensors shall be constructed for either surface or wall box mounting. Each sensor shall provide combination temperature and % relative humidity function.
 - c. 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.
 - d. Mount new wall sensors no higher than 48 inches above finished floor for new sensor installations in accordance with ADA requirements.
 - 3. Duct Mount Sensors:
 - a. Duct mount sensors shall mount in an electrical box through a hole in the duct, and be positioned so as to be easily accessible for repair or replacement.
 - b. Duct sensors shall be insertion type and constructed as a complete assembly, including lock nut and mounting plate.

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- c. For outdoor air duct applications, a weatherproof mounting box with weatherproof cover and gasket shall be used.
- C. Averaging Sensors:
 - 1. For ductwork greater in any dimension than 48 inches and/or where air temperature stratification exists, an averaging sensor with multiple sensing points shall be used.
 - 2. For plenum applications, such as mixed air temperature measurements, a continuous averaging sensor or a string of sensors mounted across the plenum shall be used to account for stratification and/or air turbulence. The averaging string shall have a minimum of 4 sensing points per 12-foot long segment.
 - 3. Capillary supports at the sides of the duct shall be provided to support the sensing string.
- D. Humidity Sensors:
 - 1. Provide devices with a range of 5-90%. Operating temperature of 0 to 120 degrees F. combined accuracy of sensor and transducer of $\pm 3.0\%$ between 20% and 80% RH @ 77 °F. Maximum sensor non-linearity of $\pm 5.0\%$ RH with defined curve. Transducer to provide linearized 4-20 ma output or 0-10 VDC output.
 - 2. Provide replaceable sensor type.
 - 3. Provide duct or wall mounting assembly as required for each sensor application.
 - 4. Duct type sensing probes shall be constructed of 304 stainless steel, and shall be equipped with a neoprene grommet, bushings, and a mounting bracket.
- E. Smoke Detectors: Ionization type air duct detectors shall be furnished as specified elsewhere in Division 23 for installation under Division 23. All wiring for air duct detectors shall be provided under Division 26, Fire Alarm System.
- F. Status and Safety Switches:
 - 1. General Requirements: Switches shall be provided to monitor equipment status, safety conditions, and generate alarms at the BAS when a failure or abnormal condition occurs. Safety switches shall be provided with two sets of contacts.
 - 2. Current Sensing Switches:
 - a. The current sensing switch shall be self-powered with solid-state circuitry and a dry contact output. It shall consist of a current transformer, a solid state current sensing circuit, adjustable trip point, solid state switch, SPDT relay, and an LED indicating the on or off status. A conductor of the load shall be passed through the window of the device. It shall accept over-current up to twice its trip point range.
 - b. Current sensing switches shall be used for run status for fans and other miscellaneous motor loads.
 - c. Current sensing switches shall be calibrated to show a positive run status only when the motor is operating under load. A motor running with a broken belt or coupling shall indicate a negative run status.
 - d. Provide switches compatible for use with EC motors as applicable.

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2.8 OUTPUT DEVICES:

- A. Control Relays:
 - 1. Control Pilot Relays:
 - a. Control pilot relays shall be of a modular plug-in design with retaining springs or clips.
 - b. Mounting Bases shall be snap-mount.
 - c. DPDT, 3PDT, or 4PDT relays shall be provided, as appropriate for application.
 - d. Contacts shall be rated for 10 amps at 120-VAC.
 - e. Relays shall have an integral indicator light and check button. Check button shall have off and on-hold operation. Momentary check buttons are not allowed.

2.9 MISCELLANEOUS DEVICES:

- A. Local Control Panels:
 - 1. All control panels shall be factory constructed, incorporating the BAS manufacturer's standard designs and layouts. All control panels shall be UL inspected and listed as an assembly and carry a UL 508 label listing compliance. Control panels shall be fully enclosed, with perforated sub-panel, hinged door, and slotted flush latch with painted steel construction.
 - 2. In general, the control panels shall consist of the DDC controller(s), display module as specified and indicated on the plans, and I/O devices—such as relays, transducers, and so forth—that are not required to be located external to the control panel due to function. Where specified the display module shall be flush mounted in the panel face unless otherwise noted.
 - 3. All I/O connections on the DDC controller shall be provide via removable or fixed screw terminals.
 - 4. Low and line voltage wiring shall be segregated. All provided terminal strips and wiring shall be UL listed, 300-volt service and provide adequate clearance for field wiring.
 - 5. All wiring shall be neatly installed in plastic trays or tie-wrapped.
 - 6. Building Level: A convenience 120 VAC duplex receptacle shall be provided in each building controller enclosure, on/off power switch, and required low voltage transformers.
 - 7. Unit Level: BAS contractor shall install control transformer in all equipment and wire back to BAS controller as needed for 24-vac controller power.
- B. Power Supplies:
 - 1. AC power supplies shall be sized for the connected device load. Total rated load shall not exceed 75% of the rated capacity of the power supply.
 - 2. Input: 120 VAC +10%, 60Hz.
 - 3. Output: 24 VAC, 75-VA minimum.
 - 4. Line Regulation: +0.05% for 10% line change.
 - 5. Load Regulation: +0.05% for 50% load change.
 - 6. Ripple and Noise: 1 mV rms, 5 mV peak to peak.
 - 7. Provide all power supplies with integral circuit breaker type over current protection.
 - 8. A power disconnect switch shall be provided next to the power supply.

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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. 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.
 - 3. The sizing, type and provision of cable and cable trays shall be the design responsibility of the BAS Contractor. If complications arise, however, due to the incorrect selection of cable and/or cable trays 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.
 - e. Outdoor Applications: Refer to Division 26 for all wiring and conduit located outdoors requirements. Flexible metal conduit shall be used for vibration isolation and shall be limited to 3-feet in length when terminating to vibrating equipment. Flexible conduit outdoors shall be Seal-tight or approved equal of weather/liquid tight construction with approved fittings.
 - 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

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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: Contractor shall provide both primary and secondary spare COM wiring to each piece of equipment. All MS/TP COM cabling shall have Orange outer shield jacketing color for main COM and Orange with red stripe for spare COM.
 8. BAS Contractor shall provide Cat5 cabling from each building controller to Owner IT router located in IT equipment rooms. BAS Contractor shall coordinate location and number of LAN connections with Owner at start of project.
 9. 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.
 10. BAS Contractor shall provide all control wiring for all HVAC equipment such as connecting wiring between air handling units and roof mounted condensing units and the like for complete and functional systems.
 11. 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.
- B. BAS Line Voltage Power Source:
1. 120-volt electrical power circuits shall be provided by Electrical Contractor for dedicated BAS use at locations indicated on drawings. Refer to electrical drawings for circuit locations. BAS Contractor shall extend power from that location to end devices. All power wiring shall be installed in accordance with Division 26 Specification requirement and NEC latest addition. Circuits used for the BAS shall be dedicated to the BAS and shall not be used for any other purposes. Additional power circuits shall be provided by BAS Contractor, if required at BAS contractors cost beyond what is indicated on drawings.
 2. Control power, whether it be 24-volt, or 120-volt, should be delivered to each piece of mechanical equipment, dampers, and/or control panels whether or not it is specifically indicated on the Contract Drawings.
 3. It is the Contractor's responsibility to include in his or her proposal 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 his proposal or a failure on the Contractor's part to properly coordinate these important functions.
 4. Unit Controller Power: HVAC equipment AHU's, RTU's, OAU's and the like controllers shall derive 24-volt control power from secondary transformers provided by BAS Contractor and installed within each unit RTU control panel or AHU heater control panel. Coordinate final transformer locations with HVAC Contractor to not interfere with operation and maintenance of HVAC equipment.
 5. BAS Contractor shall provide designated 120-volt power sources with UPS for each building/network level controller. Provide a new UPS to replace the existing when replacing the existing network level controller.

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- C. BAS Raceway:
1. All line voltage wiring and all low voltage wiring concealed in walls or above inaccessible ceilings, shall be installed in conduit or raceway. Minimum control wiring conduit size 1/2".
 2. All conduits and raceways shall be installed level, plumb, at right angles to the building lines and shall follow the contours of the surface to which they are attached.
 3. Flexible Metal Conduit shall be used for vibration isolation and shall be limited to 3 feet in length when terminating to vibrating equipment. Flexible Metal Conduit may be used within partition walls. Flexible Metal Conduit shall be UL listed.
 4. Electrical Contractor shall provide junction boxes and conduits in walls with pull strings for use by BAS for wall mounted sensors and AHU controllers at locations indicated on drawings. BAS Contractor shall coordinate with Electrical Contractor and shall provide any additional raceways and junction boxes that may be needed not indicated on drawings.
- D. Penetrations:
1. Provide fire stopping for all penetrations through fire rate barriers used by dedicated BAS conduits and raceways.
 2. All openings in fire proofed or fire stopped components shall be closed by using approved fire resistive sealant.
 3. All wiring passing through penetrations, including walls shall be in conduit or enclosed raceway.
 4. Penetrations of floor slabs shall be by core drilling. All penetrations shall be plumb, true, and square.
 5. Roof penetrations shall be through roof penetration hoods provided by HVAC Contractor. Coordinate roof penetration requirements with HVAC Contractor prior to installation.
- E. 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.
- F. BAS Panel and Unit Controller Installation:
1. The BAS panels and cabinets shall be located as indicated at an elevation of not less than 30 inches from the bottom edge of the panel to the finished floor. Each cabinet shall be anchored per the manufacturer's recommendations.
 2. The BAS Contractor shall be responsible for coordinating panel locations with Engineer and Owner prior to installation.
 3. All BAS control components shall be installed in protective panel or cabinet enclosures. BAS panels and cabinets shall be NEMA 1 rated painted steel for indoor applications and NEMA 4X stainless steel or UV resistant plastic for outdoor applications.
 4. BAS Unit Controllers: Coordinate location of all controllers and panels with Owner prior to installation.

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- G. HVAC Input Devices – General:
1. All Input devices shall be installed per the manufacturer's recommendation.
 2. Locate components of the BAS in accessible local control panels wherever possible.
 3. Duct Temperature Sensors:
 - a. Duct mount sensors shall mount in an electrical box through a hole in the duct and be positioned so as to be easily accessible for repair or replacement.
 - b. The sensors shall be insertion type and constructed as a complete assembly including lock nut and mounting plate.
 - c. For ductwork greater in any dimension than 48 inches or where air temperature stratification exists such as a mixed air plenum, utilize an averaging sensor.
 - d. The sensor shall be mounted to suitable supports using factory approved element holders.
 - e. Sensor installation shall not damage duct insulation or insulation vapor barrier. Provide additional duct insulation and vapor sealer as required for each individual sensor installation.
 4. Space Sensors: Shall be mounted per ADA requirements.

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 project. Class will provide students the ability to identify and repair common issues that can be utilized via software modifications.

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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. Completed system must function and best tested to meet at least the minimum requirements of 2015 International Energy Conservation Code Prescriptive Compliance Path.
- B. Refer to Commissioning Specification for coordination and additional responsibilities.
- C. 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.
- D. 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 star and span 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.
- E. 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 provider. Commissioning provider 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.

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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.
- F. 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.

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- 2) System shall not be accepted until completed demonstration forms and checklists are submitted and approved.

PART 4 EQUIPMENT SEQUENCE OF OPERATIONS

Refer to Specification Section 23 09 93 Equipment Control Sequence of Operation.

END OF SECTION

**SPECIFICATION SECTION 23 09 23
DIRECT DIGITAL CONTROL COORDINATION**

PART 1 GENERAL

1.1 SCOPE OF WORK:

- A. Conduits and Raceways:
 - 1. Indoors: All indoor raceway work shall be performed by BAS Contractor.
 - 2. Outdoors ACCU's: Electrical Contractor shall provide rigid conduits, junction boxes, and flexible conduit connections to final equipment with pull string for use by BAS Contractor to route control wiring to ACCU's; ground and roof mounted. Mechanical Contractor shall coordinate conduit space requirements with refrigerant pipe routing to ensure that support is sufficiently sized for complete system.
 - 3. Packaged Rooftop Units:
 - a. Electrical Contractor shall provide raceways from packaged units down above ceiling with bushings for high voltage power, low voltage BAS, and low voltage fire alarm.
 - b. BAS Contractor shall provide control wiring as needed.
 - 4. Mechanical Contractor shall insure that all rooftop packaged unit curbs are provided with chase built into curb to allow electrical contractor, BAS Contractor, and Fire Alarm Contractor to route power and control wiring up through curb and through unit base to control panel located integral to each packed unit.
- B. Fire Alarm Contractor: Fire Alarm Contractor shall provide duct mounted smoke detectors for installation by Mechanical Contractor at locations indicated on drawings and shall wire shutdowns directly to fan motor starters. Fire Alarm system shutdown shall not be routed through BAS.

END OF SECTION

**SPECIFICATION SECTION 23 09 93
EQUIPMENT CONTROL SEQUENCE OF OPERATION**

PART 1 GENERAL

1.1 SECTION INCLUDES:

- A. HVAC BAS sequence of operations for the Calallen Independent School District – Wood River Elementary HVAC Equipment Replacements and Upgrades - 2026 (Phase 1), 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 the 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.
- D. Combined Modes: The HVAC system shall be capable of assigning occupied mode status to any portion of the facility while simultaneously assigning unoccupied mode status to other portions in order to accommodate special events. As an example, classrooms may be unoccupied in the evening while the cafeteria is occupied.

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. Refer to commissioning plan for specific requirements.

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. (adj.)
 - 2. After Hours and Unoccupied Periods:
 - a. Cooling: 81 degrees F. (adj.); 5 degree dead band.
 - b. Heating: 55 degrees F. (adj.); 5 degree dead band.
 - c. Humidity: 60% RH maximum. (adj.)

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- B. Heating and Cooling Lockouts:
1. BAS shall provide the following lockouts for both occupied and unoccupied modes of operation.
 - a. Cooling Lockout: BAS shall configure each system to have a cooling mode of operation lockout that shall be specific to each unit that will not allow unit to operate in cooling mode if ambient air temperature is below 50°F (adj.) for 12 Hours (adj.).
 - b. Heating Lockout: BAS shall configure each system to have a heating mode of operation lockout that shall be specific to each unit that will not allow unit to operate in heating mode if ambient air temperature is above 55°F (adj.).
 - c. Dehumidification: Dehumidification shall be allowed to operate as needed and shall not be locked out.
- C. Occupancy Schedules: 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. BAS shall also stagger equipment start to limit electrical power demand.
- D. Space Temperature Sensors: Provide wall mounted space temperature sensors where required with occupancy override capability for general occupancy spaces and digital display. 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 and heating 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 °F adjustment range from setpoint.
- E. Duct Smoke Detectors:
1. All fire alarm system components shall be provided by Fire Alarm Contractor and shall not be controlled by BAS. BAS Contractor shall not interfere or modify fire alarm system connections to HVAC equipment. BAS shall monitor panel trouble and alarm operations by dry contact closures provided by fire alarm system for use as system monitoring only.
 2. Coordinate with Fire Alarm Contractor and HVAC Contractor for fire alarm terminations at HVAC equipment. Terminations by Fire Alarm Contractor.
- F. Air Balance:
1. Test, Adjust, and Balance services shall be provided by Owner 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 update system setpoints as needed with TAB Contractor for system fine tuning.
 3. TAB Contractor shall include BAS coordination setpoints on final TAB reports.
 4. Refer to Specification 23 05 93 Testing, Adjusting and Balancing for coordination requirements.
- G. BAS Control:
1. All sensors and actuators described below shall be controlled/monitored by the BAS. Thermostats, dehumidistats, sensors, etc. wired directly to actuators will not be allowed.
 2. All Air Handling and Packaged Rooftop Units: Provide units with both supply and return temperature sensors wired back to BAS controller for diagnostics.

SPECIFICATION SECTION 23 09 93
EQUIPMENT CONTROL SEQUENCE OF OPERATION

2.4 TWO-STAGE STAGE PACKAGED ROOFTOP UNITS, RTU-s:

- A. The unit shall consist of a packaged unit with filter section, direct expansion cooling coil(s), hot gas reheat coil(s), single or two stage control compressor(s), electric reheating coil, motorized outside air damper when scheduled, multi-speed automatic operating supply fan, remote BAS sensors (space sensor Temp/Humidity, 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. General Control Intent:
 - 1. RTU-W1, 2, 3, and 4:
 - a. Reuse the existing ZN551 controllers and reconfigure them to operate new RTUs with integral dehumidification. The existing Analog output will need to be configured with an analog to binary relay to operate the dehumidification output.
 - b. Replace the existing space sensor with new current model ZSPro temperature and humidity with temperature display and occupancy override buttons.
 - 2. RTU-W5:
 - a. Reuse the existing ZN551 controllers and reconfigure them to operate new RTUs.
 - b. Configure the spare binary output for the new dehumidification output.
 - c. Configure the existing Analog output to control the new outside air damper.
 - d. Replace the existing space sensor with new current model ZSPro temperature and humidity with temperature display and occupancy override buttons.
 - 3. RTU-W6 and W7:
 - a. Provide new controllers with sufficient points to control new systems. Current ZN551s do not have sufficient capacity for 2-stage cool, 2-stage heat, dehumidification and ventilation damper.
 - b. Replace the existing space sensor with new current model ZSPro temperature and humidity with temperature display and occupancy override buttons.
 - 4. RTU manufacturer shall set each unit up at startup as needed to achieve the cooling and heating stages as scheduled. Some compressor configuration through the RTU controller is needed for systems with a combination of single stage compressor and 2-stage compressors.
 - 5. 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.
 - 6. Space and duct mounted sensors shall be directly connected to BAS controllers.
 - 7. Primary Control: BAS shall control unit heating, cooling and dehumidification through standard thermostat control connections. Installer shall set up RTU controller for "T-stat Control" mode.
- C. Occupied Mode:
 - 1. Supply Fan and Ventilation Damper:
 - a. RTU-W1, 2, 3, and 4: Fan shall start and cycle with load
 - b. RTU-W5, 6 and 7:
 - 1) Fan shall start and run continuously in recirculation mode.

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- 2) Outside air damper shall open to a single ventilation position to provide the scheduled maximum air volume rate.
 2. Cooling: Refer to Packaged Unit Schedule for supply fan airflows and cooling stage quantities.
 - a. Stage 1, Low Cool: Upon a call for cooling "Y1", the supply fan shall ramp up to Stage 1 airflow and Compressor(s) 1 shall start in low stage operation. Coordinate exact air flow requirements with final equipment provided on project. BAS shall cycle compressor at Stage 1 operation as needed to maintain space cooling temperature setpoint. If system is operating at Stage 1 cooling continuously and is not able to maintain setpoint, BAS shall enable stage 2 cooling operation.
 - b. Stage 2, High Cool: Upon call for cooling "Y2", supply fan shall ramp up to Stage 2 air flow at 100% schedule air flow, ALL Compressors shall operate at full capacity. Upon drop in space temperature to cooling setpoint, BAS shall disable Stage 2 operation and cycle down to Stage 1 operation as needed to maintain setpoint.
 3. Heating: Supply fan shall start and ramp up to Heat airflow, 100% of scheduled system air flow. BAS shall enable electric heating and stage heating capacity 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 58% RH (adj.), BAS shall close relay contact at RTU. BAS shall operate cooling same as regular cooling mode in dehumidification to allow the RTU internal controls to operate the reheat as required to maintain space temperature cooling setpoint. RTU internal control shall operate as follows:
 - b. Single 2-Stage Compressor Units:
 - 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.
 - c. Two Compressor Units, 1st Compressor 2-Stage Configures as Single Stage and 2nd Compressor 1-Stage (2-Stage Cooling):
 - 1) No demand for Y1 or Y2: Supply fan shall start at low speed, Compressor 1 shall start and operate at 2nd stage 100% capacity, and hot gas reheat valve shall energize.
 - 2) Y1 Demand: Supply fan shall start at Stage 2 High speed, all compressors shall start operate at full capacity, and hot gas reheat valve shall energize.
 - 3) Y2 Demand: Supply fan shall start at Stage 2 High speed, all compressors shall start operate at full capacity, and hot gas reheat valve shall de-energize.
- D. Unoccupied Mode:
1. 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 but with afterhours setback setpoints.

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2. Ventilation outside air damper shall close and remain closed.
- E. BAS shall provide graphics with the following minimum with read/write capability:
1. Unit Designation and Service Zone Area.
 2. Unit State of Operation:
 - a. Occupied/Unoccupied.
 - b. Cooling, Heating or Dehumidification
 3. Unit Configuration that Matches the Installed Conditions.
 4. Space Conditions:
 - a. Temperature and Humidity sensor readings, each sensor.
 - b. Effective control space temperature for systems with multiple sensors.
 - c. Temperature and Humidity control Setpoint.
 - d. Thermostat slide bar.
 5. Duct Mounted Sensors:
 - a. Supply Air Temperature after Reheating.
 - b. Return Air Temperature before Outside Air Mixing.
 6. Cooling Compressor:
 - a. Status: On/Off.
 - b. Capacity: Stage 1 or 2
 7. Fan:
 - a. Command On/Off.
 - b. Proof of Status through CT.
 8. Heating:
 - a. Status: On/Off.
 - b. Capacity: Stage 1 or 2.
 9. Dehumidification:
 - a. Status: On/Off.
 10. Alarm Status.
 11. Outside air temperature and humidity.
- F. Alarms and Safeties:
1. Report alarms upon any BAS errors or sensors reading 35% (adj.) outside of normal operating ranges.
 2. 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.
 3. Cooling Alarm: BAS shall monitor the supply air temperature. If the supply air temperature is not less than the return air temperature by at least 14° F (adj) after a minimum 5-minutes (adj) from start time, the BAS shall identify the unit and report a yellow/soft alarm.
 4. Heating Alarm: BAS shall monitor the supply air temperature. If the supply air temperature is not greater than the return air temperature by at least 5° F (adj) after a minimum 5-minutes (adj) from start time, the BAS shall identify the unit and report an alarm.

**SPECIFICATION SECTION 23 09 93
EQUIPMENT CONTROL SEQUENCE OF OPERATION**

2.5 TWO STAGE SPLIT HVAC UNITS; 5, 7.5 and 10-Ton:

- A. Project scope is basically a disconnect and reconnect with reusing existing sequences and graphics with upgrade to 2-stage cooling control. Existing BAS installation, sequences and graphics shall be modified to reflect the following changes.
 - 1. Two Stage Cooling; Y1 and Y2: Compressor at ACCU shall be two stage scroll type for the 5-Ton units or two compressors for the 7.5 and 10-Ton units.
 - 2. Binary Alarm:
 - a. Daisy chain evaporator freeze thermostat and drain pan overflow float switch and connect to the BAS control board as a single binary alarm input.
 - b. Upon alarm event, disable all cooling and allow the supply fan to operate in recirculation mode.

2.6 PLUMBING FOUNDATION TRENCH EXHAUST FAN, EF-F:

- A. System consists of a roof mounted constant air volume exhaust fan with backdraft damper and BAS control relay and status CT.
- B. Occupied Mode: BAS shall enable the fan and operate 24/7/365 continuously. BAS shall monitor the outdoor ambient air temperature from the building global temperature sensor. If the outdoor temperature drops below 55 F (adj.) for 30-minutes (adj.) the BAS shall disable the fans operation. Upon the ambient air temperature rise above 60 F (adj.) the BAS shall reenable the fan.
- C. Unoccupied Mode: The fan shall not have an unoccupied mode.
- D. Safeties: BAS shall monitor the fans operation through the current sensor. If the BAS records not activity within Five (5) minutes (adj) of run time with command enabled, the BAS shall disable the fan and report an alarm to the operator.

2.7 TRENDING:

- A. Provide the following minimum system trending. BAS Contractor shall coordinate additional trending with Owner upon system startup and Owner training.
- B. Outdoor temperature, %RH and dewpoint, 15-minute sample rate.
- C. Building space temperature, humidity; 1-minute sample rate.
- D. HVAC equipment supply and return air temperatures sensors, 5-minute sample rate.

PART 3 EXECUTION

NOT USED.

END OF SECTION

SECTION 23 21 14
REFRIGERANT AND EQUIPMENT DRAIN PIPING

PART 1 GENERAL

1.1 SUMMARY:

- A. Section includes systems, accessories, valves, pipe, and pipe-fittings for refrigerant and equipment drain piping.

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. Refrigerant Liquid Indicators: Use line size liquid indicators in main liquid line leaving condenser and entering the AHU.
- E. Refrigerant Valves:
 - 1. Use service valves on suction and discharge of compressors.
 - 2. Use gage taps at compressor inlet and outlet.
- F. Permanent Filter-Dryers: Install upstream on the liquid pipe entering the AHU before the TXV.

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. Product Data: Submit data on pipe materials, pipefittings, valves, and accessories. Submit manufacturers catalog information. Indicate valve data and ratings.
- D. Design Data: Indicate pipe size. Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers.

1.4 QUALITY ASSURANCE:

- A. Perform work in accordance with ASME B31.1, B31.9 code for installation of piping systems and ASME SEC IX for welding materials and procedures.

1.5 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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REFRIGERANT AND EQUIPMENT DRAIN PIPING

- C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system Protect.
- D. Dehydrate and charge refrigeration components including piping and receivers, seal prior to shipment. Maintain seal until connected into system.

1.6 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.
 - 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.).
- B. Plastic Drain Pans:
 - 1. If the unit drain pan is constructed of PVC or other plastic material, the condensate drain piping shall be constructed of schedule 40 PVC with solvent welds at the last 3-4 feet of the connection to the unit to prevent stress on the drain pan connection. This applies to all equipment installed indoors or outdoors.
 - a. PVC Pipe: ASTM D1785, Schedule 40 or ASTM D2241, SDR 21 or 26.
 - b. Fittings: ASTM D2466 or D2467, PVC.
 - c. Joints: ASTM D2855, solvent weld.

2.2 REFRIGERANT PIPING:

- A. Copper Tubing: ASTM B280, Type L ACR hard drawn.
 - 1. Fittings: ASME B16.22 wrought copper. All fittings shall be long radius type.
 - 2. Joints: Braze, AWS A5.8 BCuP silver/phosphorus/copper alloy with melting range 1190 to 1480 degrees F.; SIL-FOS 15 or equal.

2.3 UNIONS, FLANGES, AND COUPLINGS:

- A. Unions for Pipe 2 inches (50 mm) and Under:
 - 1. Copper Pipe: Wrought copper, soldered joints.
- B. Flanges for Pipe Over 2 inches (50 mm):
 - 1. Copper Piping: Bronze.
 - 2. Gaskets: 1/16-inch (1.6 mm) thick preformed neoprene.

2.4 PIPE HANGERS AND SUPPORTS:

- A. Refer to Section 23 05 29 – Hangers, Supports, and Foundations.

2.5 REFRIGERATION MOISTURE AND LIQUID INDICATORS:

- A. Manufacturers:
 - 1. Alco Controls Model AMI.
 - 2. Danfoss.
 - 3. Parker.

SECTION 23 21 14
REFRIGERANT AND EQUIPMENT DRAIN PIPING

4. Emerson.
 5. Mueller Brass Company Model Vuemaster.
 6. Substitutions: Section 23 05 00 – Mechanical General Conditions.
- B. Indicators:
1. Single port type, UL listed.
 2. Copper or brass body, flared or solder ends.
 3. Sight glass, color-coded paper moisture indicator with removable element cartridge and plastic cap.
 4. Maximum working pressure of 600 psig.
 5. Maximum temperature of 200 degrees F. (93 degrees C.).

2.6 REFRIGERATION FILTER-DRIERS:

- A. Manufacturers:
1. Alco Controls Model ADKS.
 2. Sporlan Valve Company Model Catch-All.
 3. Emerson.
 4. Substitutions: Section 23 05 00 – Mechanical General Conditions.
- B. Replaceable Cartridge Angle Type:
1. Shell: ARI 710, UL listed, brass or epoxy painted steel, removable cap with gauge service port, for maximum working pressure of 600 psig outside diameter size connections.
 2. Filter/Dryer Cartridge: Solid core desiccant media with activated alumina and filtration down to minimum 10 microns.
- C. Permanent Straight Through Type:
1. ARI 710, UL listed, steel shell with molded desiccant filter core, for maximum working pressure of 600 psig.
 2. Minimum Size: 163 (16 cubic inches)

2.7 FIRE STOP SYSTEMS:

- A. General Purpose Fire Stopping Sealant:
1. Manufacturers:
 - a. 3M Model 2000.
 - b. Spec Seal Model 100.
 - c. Hilti.
 2. Water based, nonslumping, premixed sealant with intumescent properties, rated for 3 hours per ASTM E814 and UL 1479.

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.

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REFRIGERANT AND EQUIPMENT DRAIN PIPING

3.2 INSTALLATION:

- A. Paint all steel piping with zinc chromate paint after installation of piping and prior to installation of insulation to cover scratches in factory coating that result from handling of piping in field.
- B. Install refrigerant piping in accordance with ASME B31.5 and equipment manufacturer's instructions. Confirm pipe sizing, routing, use of valves and accessories, and installation methods required by manufacturer prior to installation. Submit shop drawings of proposed layout for engineer's review.
- 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. Route piping parallel to building structure and maintain gradient.
- E. Install piping to conserve building space, and not interfere with use of space.
- F. Group piping whenever practical at common elevations.
- G. Sleeve pipe passing through partitions, walls and floors.
- H. Provide fire stop sealant around all piping penetrations through fire rated barriers.
- I. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 23 05 48 – Mechanical Sound, Vibration, and Seismic Control.
- J. Slope trenches for underground piping away from building.
- K. 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, Supports, and Foundations.
- L. Provide access where valves and fittings are not exposed.
- M. Arrange refrigeration piping to return oil to compressor. Provide traps and loops in piping, and provide double risers as required. Slope horizontal piping 0.40 percent in direction of flow.
- N. Flood refrigerant piping system with nitrogen when brazing at all times.
- O. Plug or cap refrigerant piping during construction when work is not being performed on piping. Evacuate air from piping or provide positive pressure nitrogen charge.
- P. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welds.
- Q. Prepare unfinished pipe, fittings, supports, and accessories, ready for finish painting.
- R. Insulate piping and equipment; refer to Section 23 07 00 – Mechanical Insulation.
- S. Follow ASHRAE 15 procedures for charging and purging of systems and for disposal of refrigerant.

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- T. Locate expansion valve sensing bulb immediately downstream of evaporator on suction line.
- U. Provide external equalizer piping on expansion valves with refrigerant distributor connected to evaporator. Locate downstream of expansion valve sensing bulb.
- V. Fully charge completed system with refrigerant after testing.

3.3 FIELD QUALITY CONTROL FOR REFRIGERANT PIPING SYSTEMS:

- A. Test refrigeration system in accordance with ASME B31.5.
- B. Pressure test system with dry nitrogen to 200 psig. Check all fittings and joints for leaks. Evacuate system down to 2,000 microns and brake system with nitrogen. Evacuate system down to below 350 microns and close off system valves. If system maintains vacuum below 500 microns for 1-minute minimum hold, system is ready for charging. If system fails evacuation procedures, perform remedial repairs and repeat evacuation process.
- C. Owner shall observe system evacuations for quality control purposes. Contractor shall coordinate work with Owner prior to start of evacuations and system charging.
- D. Follow manufacturer's installation instructions. Inform Engineer if manufacturer's procedures deviate from specification requirements. Contractor is required to perform evacuation procedures listed in this specification if requirements are more stringent than manufacturer's minimum requirements.
- E. Test to no leakage.

END OF SECTION

SECTION 23 31 13
DUCTS

PART 1 GENERAL

1.1 SUMMARY:

- A. Section includes metal ductwork, nonmetallic ductwork and casing and plenums.

1.2 PERFORMANCE REQUIREMENTS:

- A. No variation of duct configuration or sizes other than those of equivalent or lower loss coefficient is permitted except by written permission. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.
- B. Seal ductwork in accordance with ASHRAE 90.1 and International Energy Conservation Code - 2021 standards and as described herein.

1.3 SUBMITTALS:

- A. Section 01 33 00 – Submittal Procedures.
- B. Coordination Drawings: Indicate duct fittings, gages, sizes, welds, and configuration for all systems.
- C. Product Data: Submit data for duct materials duct liner and duct connectors.
- D. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA HVAC Air Duct Leakage Test Manual.

1.4 CLOSEOUT SUBMITTALS:

- A. Section 01 33 00 – Submittal Procedures.
- B. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.5 QUALITY ASSURANCE:

- A. Perform Work in accordance with SMACNA - HVAC Duct Construction Standards - Metal and flexible.
- B. Construct ductwork to NFPA 90A NFPA 90B and NFPA 96 standards.
- C. Materials: Flame spread / smoke developed rating of 25/50 in accordance with ASTM E84, NFPA 255, UL 723.

1.6 QUALIFICATIONS:

- A. Installer: Company specializing in performing Work of this Section with minimum three (3) years documented experience.

1.7 FIELD MEASUREMENTS:

- A. Verify field measurements prior to fabrication.

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DUCTS

PART 2 PRODUCTS

2.1 DUCT MATERIALS:

- A. Galvanized Steel Ducts: ASTM A525 and ASTM A527 galvanized steel sheet, lock-forming quality, having G90 zinc coating in conformance with ASTM A90.
- B. Stainless Steel Ducts: ASTM A167, Type 316.
- C. Fasteners: Rivets, bolts, or sheet metal screws of same construction as the duct system.
- D. Rectangular Duct Connection System:
 - 1. All duct connection shall be flanged type with full gasket and cleats per SMACNA requirements per application. The flanges shall be formed from the duct wall and shall have an integral mastic which allows the flange to seal itself to the duct. Corner pieces shall be used to add rigidity to the flange, hold the duct together and provide a sealing surface for the gasket. The gasket shall serve as a seal between the flanges. The cleat shall insure even compression of the gasket along the length of the flange. For weatherproof duct connection, install a full-length, one piece cleat to the top duct flange to prevent water from collecting on the gasket.
 - 2. Where space is limited for low pressure duct applications, low profile slip type drive may be allowed as approved by Engineer. Contractor shall coordinate slip drive applications with Engineer.
- E. Round Duct Systems: All round duct system shall have spiral lock-seam construction.
- F. Hanger Rod: ASTM A36; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.
- G. Sealant:
 - 1. Manufacturers / Product:
 - a. Rector Seal / Air-Lock 181.
 - b. Carlisle CCW1-181.
 - c. Design Polymerics DP 1020.
 - 2. Non-hardening, Non-flammable; water-based; fiber reinforced; mildew, water and U.V. resistant; compatible with mating materials; UL listed 181A or 181B; liquid used alone or with tape or heavy mastic.
- H. General Purpose Fire Stopping Sealant (Refer to Architectural Sections):
 - 1. Manufacturers:
 - a. 3M Model 2000.
 - b. Spec Seal Model 100.
 - c. Hilti.
 - 2. Water based, red color, non-slumping, premixed sealant with intumescent properties, rated for three (3) hours per ASTM E814 and UL 1479.

2.2 DUCTWORK FABRICATION:

- A. Fabricate and support in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated on Drawings. Furnish duct material, gages, reinforcing, and sealing for operating pressures indicated.

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DUCTS**

- B. Reinforcing: All rectangular duct systems shall be externally reinforced in accordance with SMACNA requirements based on system pressure class and duct construction chosen. Internal reinforcing is not allowed and may be considered on special occasions with prior approval from Engineer.
- C. Construct Tees, bends, and elbows with minimum radius 1-1/2 times centerline duct width. Where not possible and where rectangular elbows are used, provide airfoil turning vanes. Where acoustical lining is indicated, furnish turning vanes of perforated metal with glass fiber insulation for auditoriums, band halls, recording studios, TV stations and the like. Refer to the acoustical consultants design requirements as applicable.
- D. Round ductwork in secondary supply and constant volume supply, return, outside air and exhaust systems shall be constructed with spiral duct construction.
- E. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- F. Fabricate continuously welded round and oval duct fittings two gages heavier than duct gages indicated in SMACNA Standard. Minimum **4 inch** cemented slip joint, brazed or electric welded. Prime coat welded joints.
- G. On rectangular ductwork provide standard 45 degree lateral wye takeoffs. When space does not allow 45 degree lateral wye takeoff, use 90 degree conical tee connections.

2.3 INSULATED ROUND FLEXIBLE DUCTS:

- A. Manufacturers:
 - 1. Flexmaster USA, Inc. Model 1M.
 - 2. Thermaflex.
- B. Duct shall be constructed of a polyethylene fabric mechanically locked by helical wound galvanized steel. The fabric shall be mechanically locked to the steel helix without the use of adhesives or chemicals. Cover the insulation with a fire-retardant metalized vapor barrier jacket reinforced with crosshatched scrim having a permeance of not greater than 0.05 perms when tested in accordance with ASTM E96, Procedure A.
 - 1. Pressure Rating: 10.0 inches wg positive and 5.0 inches wg negative.
 - 2. Maximum Velocity: 4000 fpm.
 - 3. Temperature Range: -20 degrees F. to 250 degrees F.
 - 4. Vapor Barrier Permeance: Minimum 0.05 perm ASTM E96, Procedure A.
 - 5. R-value: Minimum of 6.
- C. The insertion loss (dB) of a 6 foot length of straight duct when tested in accordance with ASTM E477, at a velocity of 1000 feet per minute, shall be at least:

Octave Band	2	3	4	5	6	7
Hz.	125	250	500	1000	2000	4000
8" diameter	26	27	27	31	32	27
10" diameter	21	27	25	32	39	24
12" diameter	22	27	24	31	31	20

**SECTION 23 31 13
DUCTS**

2.4 SINGLE WALL ROUND DUCTS – SPIRAL:

- A. Manufacturers:
 - 1. Spiral Pipe of Texas.
 - 2. United McGill. Uni-Seal.
 - 3. Gowco.
 - 4. Semco.
 - 5. Duct Direct.
- B. Round spiral lock-seam duct with galvanized steel wall. Fittings to be spot welded and bonded, factory fabricated. Access doors to be pressure-relief style with insulated frame and door.
- C. 90 degree elbows shall consist of not less than five (5) gores and 45 degree elbows shall consist of not less than three gores. All elbows 8" diameter and less may be die-formed longitudinally welded type with centerline radius not less than 1 1/2 times the duct diameter. Tees shall be 90 degree "Lo Loss" tee taps. Register taps shall be boot taps welded to spiral lock-seam duct. Duct fittings shall be factory fabricated. Shop or field fabricated duct fittings will not be accepted.

PART 3 EXECUTION

3.1 EXAMINATION:

- A. Verify sizes of equipment connections before fabricating transitions.

3.2 INSTALLATION:

- A. Duct sizes shown on Plans are inside clear dimensions. For lined ducts, maintain sizes inside lining.
- B. Contractor Coordination Drawings – Provide contractor coordination drawings in accordance with Section 23 05 05 – Submittals.
- C. Install ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, Second Edition –1995 with Addendum No.1 November 1997.
- D. Duct systems shall be installed so as to be freely floating. Ducts shall be securely supported from structure but shall be able to expand and contract independently of structure without causing undue stress or damage to the duct system. Ductwork shall not support itself. Support duct systems in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, Second Edition –1995 with Addendum No.1 November 1997 or newer, Chapter 4. Attachments to structure shall not damage or alter the structural integrity of the structural systems. Contractor shall coordinate installations with Structure Engineer of record on project.
- E. Round Duct Internal Liner Insulation: If internal duct liner is specified for round duct applications, the duct must be constructed of double wall spiral construction. Engineer will not allow any round duct to be internally insulated with flexible or semi-flexible contractor installed duct liner without an inner metal core duct.
- F. Building Duct Penetrations and Sleeves:
 - 1. Contractor shall provide sleeves at all building penetrations "Wall, Floors and Roofs" with sufficient room for the installation of finished insulation products. Provide escutcheons at all duct wall/floor penetrations when exposed to

SECTION 23 31 13
DUCTS

- view. Coordinate with Architect for new construction and with existing wall/floor types for existing facilities.
2. Duct sleeves shall be installed with sealant and/or flashings as required to prevent air movement and sound transmission.
 3. All exterior penetrations shall be suitably weatherproofed air and water tight. All sealants shall be compatible with building system and shall be U.V. resistant.
- G. Field verify all measurements and dimensions prior to fabrication of any ductwork. Notify engineer where duct sizes require modifications. No additional compensation will be awarded for modifications to fit field conditions.
- H. Minor changes in duct routing and dimensions to avoid structural members and other obstructions will be allowed. Major departures from duct layout will require approval of the Owner's representative.
- I. Duct materials or prefabricated ductwork stored or installed at site shall be protected from weather, dust and moisture. Damaged duct shall be removed and replaced at the Contractor's expense.
- J. During construction, install temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- K. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
- L. Ductwork installed above inaccessible ceiling to have operable quadrants on balancing dampers.
- M. Use double nuts and lock washers on threaded rod supports.
- N. Connect flexible ducts inner liner to metal ducts with operable stainless steel screw clamping bands. Tape outer liner and insulation to metal duct or adjacent insulation.
- O. Flexible ducts shall be installed in a fully extended condition free of sags and kinks, using only the minimum length required to make the connection.
- P. Set plenum doors **6 to 12 inches** above floor. Arrange door swing so fan static pressure holds door in closed position.
- Q. Sleeve wall openings at all wall louvers installed by Mechanical Division.
- R. Seal openings in ducts where probes for TAB instruments are inserted.
- S. All joints in spiral pipe and fittings shall be made using a sleeve type coupling, duct sealer, and duct tape. This shall consist of application of duct sealer to the male fitting, mechanically locking with a minimum of three (3) pop rivets or sheet metal screws for round duct and a minimum of six (6) pop rivets or sheet metal screws for oval duct, application of duct sealer to the outside of the joint to 2" width, and a single wrap of duct tape over the wet sealer. A minimum period of 24 hours shall elapse after installation before attempting leakage test.
- T. Firestopping: Seal around all duct penetrations through fire barriers with fire stopping sealant. Provide fire dampers and smoke dampers as shown on Plans.

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DUCTS**

3.3 SEALING OF DUCTWORK:

- A. Seal ductwork, as a minimum, in accordance with ASHRAE 90.1 and IECC 2015 C403.12 requirements, and as required herein. All supply, return, and outside air duct shall be sealed as Class A and all exhaust duct shall be sealed as Class B, regardless of static pressure classification of system.
1. Supply, return, and outside air: Seal all transverse joints, longitudinal seams, duct connections, and duct wall penetrations.
 2. Exhaust air: Seal all transverse joints, longitudinal seams and duct connections.
 3. Pressure-sensitive tape shall not be used as the primary sealant.

3.4 VERIFICATION OF MINIMUM GAUGES:

- A. Contractor shall be required to cut samples of materials from installed ductwork at five (5) locations as designated by Engineer prior to installation of insulation. Samples will be provided to Engineer for verification that gauges are in compliance with SMACNA standards and with minimum gauges as specified herein. If any sample is found not to be in compliance with Contract Documents, ductwork shall be replaced and an additional set of five samples shall be provided until it is determined that all ductwork is in compliance. Contractor shall patch ductwork where samples are taken. All ductwork found to be non-compliant shall be removed and replaced by Contractor at no expense to the Owner or Design Professionals.

3.5 CLEANING:

- A. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air flow, clean one half of system completely before proceeding to other half. Protect equipment with potential to be harmed by excessive dirt with temporary filters, or bypass during cleaning.

3.6 SCHEDULES:

DUCTWORK MATERIAL SCHEDULE

AIR SYSTEM	MATERIAL
Supply, Return, General Exhaust, Outside Air – Round & Rectangular	Galvanized Steel
Crawl Space Exhaust EF-F	Stainless Steel

DUCTWORK PRESSURE CLASS SCHEDULE

AIR SYSTEM	PRESSURE CLASS
Supply, Return, General Exhaust, Outside Air	2 inch wg

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DUCTS**

MINIMUM SHEET METAL GAUGES

<u>Maximum Rectangular Duct Size Inches</u>	<u>U.S. Standard Gauges</u>
Up to 12	26
13 – 30	24
31 – 48	22
49 – 54	20
55 and above	18

<u>Maximum Round Duct Size Inches</u>	<u>U.S. Standard Gauges</u>
Up to 14	26
15 – 26	24
27 – 36	22
37 – 50	20
51 and above	18

Ductwork must be reinforced in accordance with pressure class and SMACNA standard requirements.

END OF SECTION

**SECTION 23 33 01
DUCT ACCESSORIES**

PART 1 GENERAL

1.1 SUMMARY:

- A. Section includes back-draft dampers, duct access doors, fire dampers, volume control dampers and flexible duct connections.

1.2 SUBMITTALS:

- A. Section 01 33 00 – Submittal Procedures.
- B. Shop Drawings: Indicate assembly, unit dimensions, weight loading, required clearances, construction details, field connection details, duct layout, and electrical characteristics and connection requirements.
- C. Product Data: Provide literature that indicates dimensions, weights, capacities, ratings, air performance, and finishes of materials, and connection requirements. Provide manufacturer's installation instructions.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.3 CLOSEOUT SUBMITTALS:

- A. Section 01 33 00 – Submittal Procedures.
- B. Project Record Documents: Record actual locations of access doors.
- C. Operation and Maintenance Data: Submit for Combination Smoke and Fire Dampers.

1.4 QUALIFICATIONS:

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three (3) years documented experience.

1.5 DELIVERY, STORAGE, AND HANDLING:

- A. Protect dampers from damage to operating linkages and blades.

1.6 FIELD MEASUREMENTS:

- A. Verify field measurements prior to fabrication.

1.7 WARRANTY:

- A. Furnish one (1) year manufacturer warranty for duct accessories.

1.8 EXTRA MATERIALS:

- A. Furnish two (2) of each size and type of fusible link.

**SECTION 23 33 01
DUCT ACCESSORIES**

PART 2 PRODUCTS

2.1 BACKDRAFT DAMPERS:

- A. Manufacturers: Ruskin Model S2SS (304 Stainless Steel)
- B. Gravity Back-draft Dampers. Furnished with Air Moving Equipment: Air moving equipment manufacturers standard construction.
- C. Multi-Blade, back-draft dampers (Square and Rectangular): Parallel-action, gravity-balanced, 304 stainless steel maximum 6 inch width. Frame shall have welded construction. Blades linked together in rattle-free manner with 90-degree stop. Provide corrosion resistant nylon bushings for smooth operation. Furnish dampers with adjustment device to permit setting for varying differential static pressure.

2.2 DUCT ACCESS DOORS:

- A. Manufacturers:
 - 1. Ruskin.
 - 2. Flexmaster.
 - 3. Greenheck.
 - 4. Philips.
 - 5. Safe-Air.
- B. General:
 - 1. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated on Drawings.
 - 2. Door material construction shall match the adjoining connecting duct systems; galvanized steel or stainless steel as applicable.
- C. 2 Inch w.g. and less: Rigid and close fitting of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ductwork, furnish double wall door with 1.5" insulation. Provide with stainless steel construction when used with stainless steel duct systems. Refer to duct construction schedules.
 - 1. Ruskin Model ADC/H Series or equal.
 - 2. Up to 18 Inches Square: Furnish with One (1) sash lock per side.
 - 3. Up to 24 x 24 Inches: Furnish with Two (2) sash locks per side.
 - 4. Access panels with sheet metal screw fasteners are not acceptable.

2.3 FIRE DAMPERS:

- A. Manufacturers:
 - 1. Ruskin Model DIBD series.
 - 2. Greenheck.
 - 3. Philips.
 - 4. Safe-Air.
- B. Fabricate in accordance with NFPA 90A and UL 555, and manufacturer's condition of listing. Dampers shall be dynamic type. Dampers shall be equipped for ceiling, wall, or floor mounting.
- C. Curtain Type Dampers:
 - 1. Galvanized steel with interlocking blades. Furnish stainless steel closure springs and latches for closure under airflow conditions. Configure with blades out of air stream except for 1.0-inch pressure class ducts up to 12 inches in height.

**SECTION 23 33 01
DUCT ACCESSORIES**

2. If multiple dampers are required for larger duct sizes, Contractor shall increase the duct size at each damper at least 15% to and from dampers with flanges in the air stream.
- D. Leakage Rating: Class 1.
- E. Fire Resistance Rating: 1 1/2 or 3 hour as indicated on Drawings.
- F. Fusible Links: UL 33, separate at **160 degrees F** with adjustable link straps for combination fire/balancing dampers.
- G. Sleeve: Mount damper in integral factory fabricated steel sleeve. Duct-to-sleeve connection to be breakaway type.
- H. Access: Provide each damper with duct access door at damper or removable duct section for full access to damper for service and maintenance. Access doors shall be provided with the largest size possible depending on the available duct space. Minimum access door size is 12"x12". If duct area is limited and 12"x12" door will not fit, damper must be installed with flanged type easily removable duct section at damper connection.

2.4 GENERAL VOLUME CONTROL DAMPERS:

- A. Manufacturers:
 1. Ruskin Model MD35, MDRS 25.
 2. Greenheck.
 3. Philips.
 4. Safe-Air.
- B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated on Drawings.
- C. Multi-Blade Damper: Opposed blade pattern. Frame to be 16 gauge galvanized steel hat channel. Blades shall be single skin of 16 gauge galvanized steel with three longitudinal grooves for reinforcement. Maximum blade width of 8 inches. Linkage concealed in frame. 1/2 inch hex axle.
- D. Round Damper: Fabricate of 20-gauge galvanized steel with 14-gauge butterfly damper blade, neoprene seal and stainless steel or nylon sleeve bearing.
- E. End Bearings: Furnish end bearings. On multiple blade dampers, furnish oil-impregnated nylon or sintered bronze bearings. Furnish closed end bearings on ducts having pressure classification over 2 inches wg.
- F. Quadrants:
 1. Furnish locking, indicating quadrant regulators on single and multi-blade dampers.
 2. On insulated ducts mount quadrant regulators on standoff mounting brackets, bases, or adapters.
 3. Where rod lengths exceed **30 inches (750 mm)** furnish regulator at both ends.
 4. On dampers concealed above inaccessible ceiling, provide concealed damper regulators as manufactured by Young Regulator, Model 315, 927, 1200. In finished areas where appearance of instrument port is unacceptable, provide remote cable control as manufactured by Young Regulator, Model Bowden Cable Control.

**SECTION 23 33 01
DUCT ACCESSORIES**

- G. Velocity and pressure rating of damper to match duct system characteristics at installed location.

2.5 FLEXIBLE DUCT CONNECTIONS:

- A. Manufacturers:
 - 1. Durodyne Model Excelon for indoor application.
 - 2. Vent Fab.
 - 3. Elgen.
- B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated on Drawings.
- C. Connector, Indoors: Fabric crimped into metal edging strip.
 - 1. Fabric: UL listed fire-retardant silicon rubber coated woven glass fiber fabric conforming to NFPA 90A, minimum density 22 oz per sq yd.
 - 2. Net Fabric Width: Approximately 3 inches wide.
 - 3. Metal: 3-inch wide, 24-gage. Provide G-90 galvanized steel construction when connecting to galvanized ductwork and 316 stainless steel construction when connecting to stainless steel ductwork.

2.6 LOW PRESSURE 45° BRANCH TAP TAKEOFF:

- A. Manufacturers:
 - 1. Flexmaster STOD-B03.
 - 2. Elgen HET.
- B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards as indicated on Drawings.
- C. Construction:
 - 1. Factory formed 1" flange with gasket.
 - 2. Air tight sealed seams.
 - 3. Metal Construction:
 - a. G-90 galvanized steel construction, ASTM A-653.
 - b. Minimum 24-ga collar and body construction.
 - 4. Blades:
 - a. 8" and Below: 22 ga.
 - b. Above 8": 20 ga.
 - 5. Minimum 3/8" operator shaft with 2" standoff with locking quadrant. Provide synthetic bushings with air tight construction to collar and shaft.

PART 3 EXECUTION

3.1 INSTALLATION:

- A. Install in accordance with NFPA 90A, and follow SMACNA HVAC Duct Construction Standards - Metal and Flexible. Refer to Section 23 31 13 - Ducts for duct construction and pressure class.
- B. Install back-draft dampers on exhaust fans or exhaust ducts nearest to outside and were indicated on Drawings.
- C. Install duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, combination fire and smoke dampers, and

**SECTION 23 33 01
DUCT ACCESSORIES**

as indicated on Drawings. Install at locations for cleaning kitchen exhaust ductwork in accordance with NFPA 96. Install minimum **12 x 12 inch** size for hand access, 24 x 24 inch size for shoulder access, and as indicated on Drawings. Review locations prior to fabrication.

- D. Install duct test holes were indicated on Drawings and required for testing and balancing purposes.
- E. Provide fire dampers, combination fire and smoke dampers and smoke dampers at locations as indicated on Drawings. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings, and hinges.
- F. Install smoke dampers and combination smoke and fire dampers in accordance with NFPA 92A.
- G. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment and supported by vibration isolators.
- H. Install balancing dampers a minimum of two (2) equivalent duct diameters from duct takeoff.
- I. Shop fabricated dampers of any kind are not acceptable.
- J. Provide access doors at all smoke, fire, motorized, manual volume dampers, and duct mounted electric heaters.

3.2 DEMONSTRATION AND TRAINING:

- A. Demonstrate re-setting of fire dampers to Owner's representative.

END OF SECTION

SECTION 23 34 23
FANS

PART 1 GENERAL

1.1 SCOPE:

- A. This Section provides for the furnishing and installation of fans with all supplemental equipment.

1.2 APPLICABLE PROVISIONS:

- A. Refer to Section 23 05 00 – Mechanical General Conditions.

1.3 PERFORMANCE:

- A. Provide fan type, arrangement, rotation, capacity, size, motor horsepower, and motor voltage as shown. Fan capacities and characteristics are scheduled on the Drawings.
- B. Rate fans according to appropriate Air Moving and Conditioning Association, Inc. (AMCA), approved test codes and procedures. Supply fans with sound ratings below the maximums permitted by AMCA standards. All fans provided must be licensed to bear the Certified Ratings Seal.
- C. Statically and dynamically balance all fans.

1.4 SUBMITTALS:

- A. Section 01 33 00 – Submittal Procedures.
- B. Submit product data on all fans, including cut sheets, fan curve, sound data, performance data, and accessories provided.
- C. On products required to have a paint finish, submit a detailed cut sheet of paint properties.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

- A. Centrifugal & Propeller Fans:
 - 1. Loren Cook (Basis of Design).
 - 2. Greenheck.
 - 3. Acme.
 - 4. ILG.

2.2 SUPPLEMENTAL EQUIPMENT:

- A. Motor Covers: Furnish weatherproof motor covers for installation outdoors in inclement weather. Apply the same finish as used on the fan.
- B. Safety Disconnect Switch: Furnish a factory-wired, safety disconnect switch on each unit.
- C. Relief Vents and Air Inlets: Furnish vents and inlets with aluminum frames, ½-inch mesh galvanized bird screens, and dampers.

SECTION 23 34 23
FANS

- D. Prefabricated Roof Curbs:
1. Furnish prefabricated roof curbs with built in cant strips and lined with R-8 glass fiber insulation. Curbs shall be made of minimum No. 18 U.S. Standard gage galvanized steel. The minimum height is 18 inches. Include on each roof curb a resilient pad for equipment mounting on the top flange. Curb base shall be flanged as needed to secure to roof structure. Base shall be flat or sloped as needed to match roof slope. Coordinate sloping requirements with General Contractor before ordering. Curb may be shim in the field as needed for level installation.
 2. Roof curbs shall be constructed to support and secure fans in accordance with local windstorm code requirements. Manufacturer shall provide details for securing curb to building roof structure and unit to curb in accordance with local windstorm code requirements sealed by Texas State License Structural Engineer.

2.3 ROOFTOP CENTRIFUGAL FANS: COOK ACE, DIRECT DRIVEN.

- A. Fan shall be a spun aluminum, roof mounted, direct driven, up-blast or down-blast centrifugal exhaust ventilator.
- B. Fan shall be manufactured at an ISO 9001 certified facility. Fan shall be listed by Underwriters Laboratories, Inc. (UL 705). Fan shall bear the AMCA certified ratings seal for sound and air performance.
- C. The fan shall be of bolted and welded construction utilizing corrosion resistant fasteners. The spun aluminum structural components shall be constructed of minimum 16-gauge marine alloy aluminum, bolted to a rigid aluminum support structure. The aluminum base shall have continuously welded curb cap corners for maximum leak protection. The discharge baffle shall have a rolled bead for added strength. Provide two piece top cap with stainless steel quick release latches to provide access into the motor compartment without the use of tools. An integral conduit chase shall be provided through the curb cap and into the motor compartment to facilitate wiring connections. The motor shall be enclosed in a weather-tight compartment, separated from the exhaust airstream with direct drive configuration. Unit shall bear an engraved aluminum nameplate that includes model no., serial no., design air flow in CFM, and design static pressure.
- D. Wheel shall be centrifugal backward inclined, constructed of 100% aluminum, including a precision-machined cast aluminum hub. Wheel inlet shall overlap an aerodynamic aluminum inlet cone to provide maximum performance and efficiency. Wheel shall be balanced in accordance with AMCA Standard 204-05, Balance Quality and Vibration Levels for Fans.
- E. Motor:
1. Model ACED: Motor shall be heavy duty type with permanently lubricated sealed ball bearings and furnished at the specified voltage, phase, and enclosure.
 2. Model ACED-EC: Motor shall be electronically commutated permanent magnet type rated for continuous duty and furnished with internally mounted speed controller. Unit shall be capable for remote control through 0-10 vdc signal or local manual adjustment. Motor shall be provided to operate at electrical power listed on equipment schedules.
- F. Windstorm Construction: Fan and curb assembly shall be listed and accepted by both Miami-Dade County, Florida and the Texas Department of Insurance TDI.
1. Florida NOA Number 08-0424.03/10-2-2013.

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FANS

- 2. TAS-201: Large Missile Impact Test.
 - 3. TAS-202: Uniform Static Air Pressure Test.
 - 4. TAS-203: Cyclic Wind Pressure Test.
- G. Provide single point power connection per NEC.
- H. Accessories: Provide the following accessories as indicated on the schedule
- 1. All Aluminum Construction.
 - 2. Stainless Steel Hardware.
 - 3. Stainless Steel Bird Screen.
 - 4. Integral electrical disconnect switch.
 - 5. Epoxy phenolic coating on the entire fan assembly or equal.
 - 6. 18" Roof Curb.
 - 7. Stainless Steel Backdraft Damper, Ruskin Model S2SS or equal.
 - 8. Motor speed controller.

PART 3 EXECUTION

3.1 EXECUTION:

- A. Install fans according to the manufacturer's instructions and in the locations shown on the Drawings.
- B. Provide flexible connection at inlet and outlet for fans.
- C. Roof mounted fans shall be installed on roof curbs provided by the fan manufacturer.
- D. Propeller wall fans shall be mounted in collars provided by the fan manufacturer. Carefully coordinate exact collar dimensions.
- E. Roof mounted fans shall be installed on roof curbs provided by the fan manufacturer in accordance with TDI windstorm code requirements.
- F. On roof mounted fans, electrical wiring and/or conduit shall not interfere with backdraft damper.

END OF SECTION

SECTION 23 37 13
AIR OUTLETS AND INLETS

PART 1 GENERAL

1.1 SECTION INCLUDES:

- A. Diffusers.
- B. Registers/Grilles.

1.2 RELATED SECTIONS:

- A. Section 23 31 130 – Ducts.
- B. Section 23 33 01 - Duct Accessories.
- C. Section 23 05 93 – Testing, Adjusting, and Balancing.
- D. All Divisions of Contract Documents.

1.3 REFERENCES:

- A. ADC 1062 - Certification, Rating and Test Manual.
- B. AMCA 500 - Test Method for Louvers, Dampers, and Shutters.
- C. ARI 650 - Air Outlets and Inlets.
- D. ASHRAE 70 - Method of Testing for Rating the Air Flow Performance of Outlets and Inlets.
- E. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.
- F. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

1.4 SUBMITTALS:

- A. Section 01 33 00 – Submittal Procedures.
- B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

1.5 PROJECT RECORD DOCUMENTS:

- A. Section 01 33 00 – Submittal Procedures.
- B. Record actual locations of air outlets and inlets.

1.6 QUALITY ASSURANCE:

- A. Test and rate air outlet and inlet performance in accordance with ADC Equipment Test Code 1062 and ASHRAE 70.
- B. Test and rate louver performance in accordance with AMCA 500.

SECTION 23 37 13
AIR OUTLETS AND INLETS

1.7 QUALIFICATIONS:

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.

1.8 MANUFACTURERS:

- A. Basis of Design: Titus and Price.
- B. Other acceptable manufacturers offering equivalent products:
 - 1. Metalaire.
 - 2. Krueger.

PART 2 PRODUCTS

2.1 RECTANGULAR CEILING DIFFUSERS:

- A. Manufacturers: Titus Model TDV or as shown on Plans.
- B. Type: Square and rectangular, removable core, multi-louvered diffuser face with integrated induction nozzles to discharge air in four-way pattern except as indicated on Plans.
- C. Frame: Surface mount, lay-in or as indicated on Plans.
- D. Fabrication: Aluminum with baked enamel off-white finish as indicated on Drawings.
- E. Damper: Integral, gang-operated opposed blade type with removable key operator, operable from face when notes as "OBVD" on Drawings.

2.2 CEILING RETURN GRILLES:

- A. Manufacturers: Titus Model 50F.
- B. Type: Eggcrate face, 1/2" x 1/2" x 1/2" grid with minimum 90% free area.
- C. Frame: 1 1/4" border width interlocked at four corners and staked to form a rigid frame. Surface mount, lay-in or as indicated on Plans.
- D. Fabrication: Heavy extruded aluminum border with aluminum grid. Provide countersunk screw holes for surface mount application.
- E. Damper: Integral, gang-operated opposed blade type with removable key operator, operable from face when notes as "OBVD" on Drawings.

2.3 RETURN REGISTERS/GRILLES:

- A. Manufacturers: Titus Model 3 FL or FS or as shown on Plans.
- B. Type: 45 degree blades, 1 1/8 inch (19 mm) minimum depth, 3/4 inch (19 mm) maximum spacing.
- C. Frame: 1-1/4 inch margin with concealed mounting. Surface mount, lay-in or as indicated on Plans.

SECTION 23 37 13
AIR OUTLETS AND INLETS

- D. Fabrication: Extruded aluminum frames and blades with factory off-white enamel finish or as shown on drawings.
- E. Damper: Integral, gang-operated opposed blade type with removable key operator, operable from face when notes as "OBVD" on Drawings.

PART 3 EXECUTION

3.1 PREPARATION:

- A. Coordinate work of this Section with other affected work.

3.2 INSTALLATION:

- A. Install in accordance with manufacturer's instructions.
- B. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.
- C. Install diffusers to ductwork with air tight connection.
- D. Provide balancing dampers on duct take-off to diffusers and grilles and registers, despite whether dampers are specified as part of the diffuser or grille and register assembly.
- E. Visibility:
 - 1. Paint ductwork visible behind air outlets and inlets matte black.
 - 2. Rotate all return and exhaust air devices so that the curve of the blades is facing the eye of the occupant to prohibit visibility through the air device wherever possible.

END OF SECTION

**SECTION 23 40 00
AIR CLEANING DEVICES**

PART 1 GENERAL

1.1 SECTION INCLUDES:

- A. Disposable, extended area panel filters.

1.2 REFERENCES:

- A. ARI 850 - Commercial and Industrial Air Filter Equipment.
- B. ASHRAE 52.2 - Method of Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter.
- C. UL 900 - Test Performance of Air Filter Units.

1.3 PERFORMANCE TOLERANCES:

- A. Conform to ASHRAE 52.2.

1.4 SUBMITTALS:

- A. Section 01 33 00 – Submittal Procedures.

1.5 OPERATION AND MAINTENANCE DATA:

- A. Section 01 33 00 – Submittal Procedures.
- B. Operation and Maintenance Data: Include instructions for operation, changing, and periodic cleaning.

1.6 EXTRA MATERIALS:

- A. Provide MERV-9A disposable panel filters during construction. Periodically inspect temporary construction filters and change out when dirty or as directed by manufacturer's recommendations whichever comes first. If, in the opinion of the Owner's representative, the temporary construction filters require changing, then the filters shall be changed out with clean filters at no additional cost to the Owner. Provide one (1) clean set of MERV-9A for air balance, and one (1) spare set of MERV-9A to Owner at project completion. Clean coils free of dirt and debris at the end of construction. Complete cleaning before commissioning of equipment.

PART 2 PRODUCTS

2.1 DISPOSABLE, EXTENDED AREA PANEL FILTERS – MERV-9:

- A. Manufacturers:
 - 1. Camfil-Farr Model 30/30 Dual 9.
 - 2. American Air Filter, Model MEGApleat M9.
 - 3. Precisionaire/Flanders.
- B. Media: UL 900 Class 2, pleated, minimum 14 pleats per lineal foot, lofted, non-woven, reinforced cotton and synthetic fabric; supported and bonded to welded wire grid or moisture resistant beverage carrier board.
 - 1. Frame: Moisture resistant beverage carrier board.
 - 2. Nominal thickness:
 - a. RTUs and AHUs 7.5-Tons and Over: 2 inches, Initial pressure loss (500 FPM): 0.22 inches W.G.

SECTION 23 40 00
AIR CLEANING DEVICES

- b. 5-Ton AHU's: 4 inches, Initial pressure loss (500 FPM): 0.17 inches W.G.
- C. Rating, ASHRAE 52.2: MERV 9A.

PART 3 EXECUTION

3.1 PREPARATION:

- A. Coordinate work of this Section with other affected work.

3.2 INSTALLATION:

- A. Install air-cleaning devices in accordance with manufacturer's instructions.
- B. Prevent passage of unfiltered air around filters with felt, rubber, or neoprene gaskets.
- C. Do not operate fan system until filters (temporary or permanent) are in place. Replace temporary filters used during construction and testing with clean set.
- D. Protect all return air ductwork during construction with temporary air filters installed over each return air inlet. The Contractor shall inspect air filters daily and replace as needed depending on particulate load.

END OF SECTION

SECTION 23 62 13
AIR COOLED CONDENSING UNITS – (10-TONS) AND UNDER

PART 1 GENERAL

1.1 SECTION INCLUDES:

- A. Condensing unit package.
- B. Charge of refrigerant and oil.
- C. Controls and control connections.
- D. Refrigerant piping connections.
- E. Motor starters.
- F. Electrical power connections.

1.2 REFERENCES:

- A. ARI 210/240 - Unitary Air-Conditioning and Air-Source Heat Pump Equipment.
- B. ARI 270 - Sound Rating of Outdoor Unitary Equipment.
- C. ARI 365 - Commercial and Industrial Unitary Air-Conditioning Condensing Units.
- D. ASHRAE 14 - Methods of Testing for Rating Positive Displacement Condensing Units.
- E. ASHRAE 15 - Safety Code for Mechanical Refrigeration.
- F. ASHRAE 90A - Energy Conservation in New Building Design.
- G. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- H. NEMA MG 1 - Motors and Generators.
- I. UL 207 - Refrigerant-Containing Components and Accessories, Non-Electrical.
- J. UL 303 - Refrigeration and Air-Conditioning Condensing, and Air-Source Heat Pump Equipment.

1.3 SUBMITTALS FOR REVIEW:

- A. Section 01 33 00 – Submittal Procedures.
- B. Shop Drawings: Indicate components, assembly, dimensions, weights and loadings, required clearances, and location and size of field connections. Include schematic layouts showing condensing units, cooling coils, refrigerant piping, and accessories required for complete system.
- C. Product Data: Provide rated capacities, weight specialties and accessories, electrical nameplate data, and wiring diagrams. Submit combined capacity with evaporator coils to ensure capacities are complementary.

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- D. Coordination Data: Provide electrical division with a drawing showing power and control knockout locations and equipment pad layout. Indicate orientation of equipment for coordination of electrical conduit routing.

1.4 SUBMITTALS FOR INFORMATION:

- A. Section 01 33 00 – Submittal Procedures.
- B. Design Data: Indicate pipe and equipment sizing.
- C. Submit manufacturer's installation instructions.

1.5 SUBMITTALS AT PROJECT CLOSEOUT:

- A. Section 01 33 00 – Submittal Procedures.
- B. Operation and Maintenance Data:
 - 1. Include start-up instructions, maintenance instructions, parts lists, controls, warranties and accessories.
 - 2. Manufacturer also shall provide full-service repair manuals for each model of equipment provided on project. Manuals shall provide thorough repair and diagnostics information for all system components such as digital controls, digital fans, electronic expansion valves, and the like. Provide a minimum of two (2) paper copies.

1.6 REGULATORY REQUIREMENTS:

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.7 DELIVERY, STORAGE, AND PROTECTION:

- A. Transport, handle, store, and protect products.
- B. Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.
- C. Protect units on site from physical damage. Protect coils.

1.8 WARRANTY:

- A. **Original Equipment Manufacturer "OEM" Part Requirements: All parts warranties "Base or Extended" shall be for OEM parts only. Aftermarket parts or accessories will not be allowed.**
- B. Base Proposal:
 - 1. Provide one (1) year parts and labor warranty on complete unit.
 - 2. Provide an additional four (4) year compressor parts warranty for a total of five (5) year compressor warranty.
- C. Alternate Proposal – Extended Parts Warranty
 - 1. **WAR-1, 5-Ton Units:** Provide an additional four (4) year ALL parts warranty for a total of five (5) year ALL parts warranty on the complete unit.

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2. **WAR-2, 7.5&10-Ton Units:** Provide an additional four (4) year ALL parts warranty for a total of five (5) year ALL parts warranty on the complete unit.

PART 2 PRODUCTS

2.1 MANUFACTURED UNITS:

- A. Manufacturers:
1. Basis of Design – Base Proposal:
 - a. 5-Ton Units: Lennox.
 - b. 7.5 and 10-Ton Units: Trane.
 2. Alternate No. 1A (5-Ton) Manufacturers:
 - a. Trane.
 - b. Carrier.
 - c. American Standard.
 - d. York.
 3. Alternate No. 1B (7.5 and 10-Ton) Manufacturers:
 - a. Lennox.
 - b. Carrier.
 - c. American Standard.
 - d. York.
- B. Units: Self-contained, packaged, factory assembled and pre-wired units suitable for outdoor use consisting of cabinet, compressors, condensing coil and fans, integral sub-cooling coil, starters, and controls.
- C. Refrigerant:
1. R-454B.
 2. Provide with all required semi-flammable refrigerant labels.
- D. Construction and Ratings: In accordance with ARI 210/240 ARI 365, UL 207 and UL 303. Testing shall be in accordance with ASHRAE 14.
- E. Performance Ratings: Energy Efficiency Rating (EER) not less than prescribed by ASHRAE 90.1 but equivalent to scheduled equipment.

2.2 CASING:

- A. House components in steel or molded plastic frame with steel panels with weather resistant, baked enamel finish.
- B. Mount starters and controls in weatherproof panel provided with full opening access doors.
- C. Provide removable access doors or panels with quick fasteners.

2.3 CONDENSER COILS:

- A. Coils: Aluminum fins mechanically bonded to seamless aluminum tubing or all aluminum micro-channel construction. Provide sub-cooling circuits. Air test under water to 600 psig and vacuum dehydrate. Seal with holding charge of nitrogen or refrigerant.
- B. Coil Guard: Provide PVC coated or painted steel hail guards.

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2.4 FANS AND MOTORS:

- A. Vertical discharge direct driven propeller type condenser fan with fan guard on discharge.
- B. Weatherproof motor suitable for outdoor use, single phase constant or variable speed motor with permanent lubricated ball bearings and built-in current and thermal overload protection.
- C. Provide acoustical fan discharge hood for low sound operation where available.

2.5 COMPRESSORS:

- A. Compressor: Hermetic scroll type.
- B. Mounting: Statically and dynamically balance rotating parts. Mount compressors on rubber-in-shear vibration isolators.
- C. Motor –Scroll Compressor:
 - 1. Constant speed 3500-rpm suction gas cooled with winding over-temperature and over current protection, designed for across-the-line starting. Furnish with starter. VFDs are not allowed.
 - 2. 5-Ton Units: Provide two stage mechanical solenoid control unloading scroll compressor as indicated on equipment schedules with all associated controls; 60%-100% capacity control.
- D. Sump Oil Heater: Evaporates refrigerant returning to sump during shut down. Energize heater thermostatically when compressor is not operating.
- E. Sound: Each compressor shall be provided with low sound enclosures.

2.6 REFRIGERANT CIRCUIT:

- A. Provide each unit with the number of independent refrigerant circuits as indicated on plans, factory supplied and piped.
- B. For each refrigerant circuit, provide:
 - 1. Filter dryer permanent core type.
 - 2. Liquid line sight glass and moisture indicator.
 - 3. Hard Shutoff thermal expansion valve for maximum operating pressure.
 - 4. Insulated suction piping.
 - 5. Suction and liquid line service valves and gage ports, reverse thread for semi-flammable refrigerant.
 - 6. Condenser pressure relief valve.

2.7 CONTROLS:

- A. Mount weatherproof control panel containing power and control wiring in unit, factory wired with single point power connection.
- B. For compressor, provide across-the-line starter, starter relay, and control power transformer or terminal for controls power. Provide automatic reset current overload protection. Provide hard start kit for single-phase compressors.

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- C. Provide safety controls arranged so any one will shut down machine:
 - 1. High discharge pressure and low suction pressure switch with automatic reset.
 - 2. Compressor over current protection.
 - 3. 3-Phase Units: Unit shall be provided with phase and brown out protection which shuts down unit if the electrical phases are more that 10% out of balance on voltage, the voltage is more that 10% under design voltage, or on phase reversal. Provide ICM Model ICM450A or equal with adjustable setpoints.
- D. Provide the following operating controls:
 - 1. Adjustable off timer prevents compressor from short cycling.
 - 2. Low ambient condenser fan cycling or variable speed temperature controls to permit cooling operation down to 30 degrees F ambient temperature.
 - 3. Provide line power monitors to three phase units where available to such equipment down upon loss of phase, phase imbalance or phase reversal.

2.8 WINDSTORM RESTRAINTS:

- A. Ground Mounted: Provide with manufacturer's Extreme Condition Mounting kits to secure ACCU to concrete pads in accordance with TDI windstorm design requirements for project location.
- B. Roof Mounted: Provide each ACCU with supports per Mechanical and Structural Drawings.

PART 3 EXECUTION

3.1 PREPARATION:

- A. Coordinate work of this Section with other affected work.

3.2 INSTALLATION:

- A. Install in accordance with manufacturer's installation instructions.
- B. Complete structural, mechanical, and electrical connections in accordance with manufacturer's installation instructions. Provide control wiring and conduit.
- C. Provide for connection to electrical service.
- D. Install units on vibration isolation.
- E. Install units on galvanized steel supports as indicated on drawings.
- F. Provide connection to refrigeration piping system and evaporators. Comply with ASHRAE 15.
- G. Refrigerant pipe sizes shall be selected according to equipment manufacturer's instructions. Sizes shown on plans are for bidding purposes only. Manufacturer's selection may deviate from Plans.
- H. Provide refrigerant liquid pipe filter/drier upstream of each TXV refrigerant meeting device.

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- I. Furnish charge of refrigerant and oil.

3.3 DEMONSTRATION AND INSTRUCTIONS:

- A. Section 23 05 10 – Starting of HVAC Systems: Demonstrating installed work.
- B. Supply initial charge of refrigerant and oil for each refrigeration system. Replace losses of oil or refrigerant prior to end of correction period.
- C. Test entire system for leaks before charging with refrigerant and installation of any piping insulation. Repair leaks if found, put system into operation, and test equipment performance.
- D. Charge system with refrigerant by method recommended by equipment manufacturer. Engineer recommends sub-cooling temperature method as follows:
 - 1. Record all cooling and heating performance at full load conditions.
 - 2. Wait minimum 15-minutes of operation before adjusting refrigerant charge as needed to achieve desired sub-cooling temperature.
 - 3. Adjust system charge in cooling when ambient temperature is above 60 °F.
 - 4. Adjust system charge when indoor AHU temperature is between 70-80 °F.
- E. Contractor shall provide proposed OEM or internal start-up sheets for review and consideration by Engineer prior to system startup in a submittal format. Contractor shall make any changes to the forms and the startup procedures as recommended by the Engineer.
- F. Provide cooling season startup and winter season shut-down for first year of operation.

END OF SECTION

SECTION 23 74 10
PACKAGED ROOFTOP AIR CONDITIONING UNITS

PART 1 GENERAL

1.1 SUMMARY:

- A. Section includes packaged rooftop air conditioning units for heating, cooling and dehumidification.

1.2 RELATED SECTIONS:

- A. Comply with Division 1 - General Requirements and referenced documents.
- B. Comply with all other Division 23 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 QUALITY ASSURANCE:

- A. All equipment and materials shall be new and of the best quality.
- B. All equipment and materials shall be installed in a workmanlike manner by experienced mechanics and as recommended by the manufacturer.
- C. All equipment shall be certified in accordance with UL Standard 1995/CSA C22.2 No. 236, Safety Standard for Heating and Cooling Equipment.
- D. Refrigeration system shall comply with ASHRAE Standard 15, Safety Standard for Mechanical Refrigeration.
- E. Safety Standards:
 - 1. Underwriters Laboratories (UL).
 - 2. National Electric Code (NEC).
 - 3. Canadian Electric Code (CEC).
- F. Air-Conditioning, Heating and Refrigeration Institute (AHRI):
 - 1. AHRI 340/360 Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment.
 - 2. AHRI 370 Sound Rating of Large Outdoor Refrigerating and Air Conditioning Equipment.
 - 3. AHRI 210/240 Performance Rating of Unitary Air Conditioning and Air-Source Heat Pump Equipment.
 - 4. AHRI 920/921 Performance Rating for Direct Expansion Dedicated Outdoor Air Systems.
- G. All models are ASHRAE 90.1 compliant
- H. ISO 9001, Manufacturing Quality Systems

1.5 SUBMITTALS:

- A. Section 23 05 05 – Submittal Procedures.

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- B. Product Data: Submit manufacturer's descriptive literature and installation instructions. Submit fan curves for all fans.
1. Indicate:
 - a. Equipment performance at scheduled and specified operating conditions.
 - b. Equipment, piping and connections, together with valves, strainers, control assemblies, thermostatic controls, auxiliaries and hardware and recommended ancillaries which are mounted, wired and piped ready for final connection to building system, its size and recommended bypass connections.
 - c. Piping, valves and fittings shipped loose showing final location in assembly.
 - d. Control equipment shipped loose, showing final location in assembly
 - e. Dimensions, internal and external construction details, recommended method of installation with proposed structural steel support, mounting curb details, sizes and location of mounting bolt holes; include mass distribution drawings showing point loads.
 - f. Detailed composite wiring diagrams for control systems showing factory installed wiring and equipment on packaged equipment or required for controlling devices or ancillaries, accessories and controllers
 - g. Details of vibration isolation.
 - h. Estimate of sound levels to be expected across individual octave bands in db.
 - i. Type of refrigerant used.
 - j. Plan view, front view end view, back view and curb detail with dimensions.
 2. Quality Assurance:
 - a. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties
 - b. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements
 - c. Manufacturer's Instructions: Manufacturer's installation instructions

1.6 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. Contractor shall furnish and install fully assembled, single piece, packaged rooftop air conditioning units as detailed and scheduled on the Plans. Unit shall consist of insulated weather-tight casing with pitch roof, compressor(s), evaporator and condenser air system, outside air intake, condensate drain pan, evaporator fan, motor and drive, heating section, filter, roof mounting curb, and controls. Refrigerant charge to be R-32, R-454B or approved alternate. Unit shall be factory run tested.
- B. Acceptable Manufacturers:
1. **BASE PROPOSAL:** Lennox.

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2. **ALTERNATE PROPOSAL No. 2:**
 - a. Carrier.
 - b. Trane.
 - c. York.
- C. Warranty: Base Proposal and Additive Alternates
 1. **Original Equipment Manufacturer "OEM" Part Requirements: All parts warranties "Base or Extended" shall be for OEM parts only. Aftermarket parts or accessories will not be allowed.**
 2. **Base Proposal:**
 - a. Provide one (1) year parts and labor warranty on complete unit.
 - b. Provide five (5) year non-prorated compressor parts warranty.
 3. **Alternate Proposal WAR-3:** Provide an additional four (4) year ALL parts warranty for a total of five (5) year ALL parts warranty on the complete unit.
- D. Unit Casing: (Single Wall Construction)
 1. Unit casing shall be single package type designed for outdoor application and shall provide complete protection for all components and controls. Construct of galvanized steel with baked enamel finish on all exterior surfaces. Unit cabinet surface shall be tested 1000 hours in salt spray test in compliance with ASTM B117. Cabinet roof top cover shall be one-piece construction or where seams exit, it shall be double-hemmed and gasket-sealed.
 2. All portions of casing in contact with return or conditioned air shall be insulated with a minimum of 1- inch thick foil faced fiberglass insulation liner or double wall foam insulated including unit base.
 3. Provide hinged access panels for access to all controls, compressors, filter section, supply fan motor, fan drives, heater, evaporator coil, and outside air damper sections. Provide gaskets for air tight construction and handles.
 4. Unit shall be designed for curb mounting with heavy duty full perimeter base rail and crane lifting lugs.
 5. Downflow units shall have raised base pane 1-1/8" high lip around supply and return openings for water integrity.
- E. Compressor:
 1. Compressor shall be of heavy-duty constant RPM single or multi-stage unloading scroll type mounted on rubber isolators with integral oil pump. Compressor shall have suction gas cooled motors with internal over temperature and over current protection. Compressors shall have crankcase heaters, internal pressure relief, and temperature and current sensitive overloads.
 2. Provide compressors with oil sight glass when available.
 3. Provide compressors with acoustical blanket enclosures when available.
 4. Provide with electric crank case heaters.
 5. Compressors shall be configured to provide the following minimum possible capacity control requirements. Refer to equipment schedules and sequence of operations for specific staging requirements for each unit.
 - a. 6-Tons and Under: 2-stage cooling capacity
 - b. 7.5-Tons and 17.5: 2-stage cooling capacity
 - c. Compressors with VFD control are prohibited.
- F. Condensing Section:
 1. Condensing fans shall be of the propeller type with all exposed fan and shaft surfaces suitably weatherproofed. Blades shall have aluminum construction riveted to corrosion resistant steel spiders. Fans shall be dynamically balanced direct drive fans with permanently lubricated ball bearings. Assembly shall have shaft down design to prevent water entrance into motor from shaft.

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2. Condenser fan motors shall be totally enclosed and thermally protected high efficiency variable speed ECM type or constant volume type.
 3. Condensing coil shall be 3/8" O.D. seamless copper tubing mechanically bounded to heavy duty aluminum fins or all aluminum micro-channel type. Condenser coil shall be factory pressure tested to at least 600 psig.
 4. Unit shall include a sub-cooling section.
 5. Unit shall have hail guards on the condenser to protect coil fins. Guard shall have painted galvanized steel construction.
 6. Anti-corrosion Coating – Condenser Coil: Provide factory applied flexible, epoxy polymer e-coating uniformly applied to coil through liquid emersion process. Humidity and water immersion resistance shall be up to a minimum 1,000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to no less than 6,000 hours salt spray per ASTM B117-90. Coated coils shall receive a spray-applied, UV-resistant polyurethane topcoat to prevent UV degradation of the e-coat. Coating shall be provided with minimum 5-yrs manufacturer's warranty against defects.
(Field or shop applied coatings are not allowed.)
- G. Evaporator Coil:
1. Evaporator coil shall be of non-ferrous construction with seamless copper tubes mechanically bonded to aluminum fins or all aluminum construction and factory pressure tested to at least 600 psig.
 2. The evaporator coil shall be of the direct expansion type with rows positioned vertically within the unit to allow horizontal air flow.
 3. Coil shall include factory installed thermal expansion valve and liquid line filter dryer for each refrigeration circuit. All TXV distribution tubing from the TXV to the evaporator connections shall be protected with poly or heat shrink tubing around each pipe to protect the pipe from rubbing and forming refrigerant leaks.
 4. Provide coil rows and fin spacing as indicated on equipment schedules.
 5. Provide interlaced, row split or single circuit coil configurations to allow for active full-face coils at all air flow conditions.
 6. Anti-corrosion Coating – Evaporator Coil: Provide factory applied flexible, epoxy polymer e-coating uniformly applied to coil through liquid emersion process. Humidity and water immersion resistance shall be up to a minimum 1,000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to no less than 6,000 hours salt spray per ASTM B117-90. Coated coils shall receive a spray-applied, UV-resistant polyurethane topcoat to prevent UV degradation of the e-coat. Coating shall be provided with minimum 5-yrs manufacturer's warranty against defects.
(Field or shop applied coatings are not allowed)
- H. Dehumidification – Hot Gas Reheat System:
1. Provide units with hot-gas reheat coil for dehumidification on lead refrigeration circuit. Hot-gas reheat coil shall be located on the leaving side of the evaporator coil pre-piped and circuited.
 2. Each system shall consist of a reheat coil, control solenoid valve(s) (on/off or modulating), a check valve (to prevent reverse flow of refrigerant during cooling operation) and associated copper piping.
 3. Reheat coil shall be constructed with enhanced aluminum fins mechanically bonded to copper tubes or all aluminum microchannel construction.
 4. Reheat coil shall be sized to provide 20-25 degrees Fahrenheit of reheat under design operation conditions.
- I. Supply Fan Section:
1. Provide multi-stage fan operation to match the cooling capacity stages for each unit.

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2. Belt Drive Units:
 - a. Belt-drive centrifugal forward-curved double-width wheels, statically and dynamically balanced. Fan wheel shall be mounted on shafts with rubber-isolated, cartridge- type ball bearings. Motor shall be high efficiency NEMA Premium, TEFC, sealed bearings, adjustable sheave, and mounted on adjustable base frame. Provide with automatic belt tensioners.
 - b. Provide shafts constructed of solid hot rolled steel, ground and polished, with key-way, and protectively coated with lubricating oil.
 - c. Provide with VFD for fan speed control and soft start integrated with the RTU controller to vary the fan speed as needed based on load demand and dehumidification.
 3. Direct Drive: Unit shall have forward curved double inlet centrifugal or backward inclined airfoil supply fan, direct drive, as indicated on Drawings, statically and dynamically balanced at factory.
 - a. Motor:
 - 1) ODP with VFD: Motor shall be open drip proof with re-greasable ball bearings with minimum L10-200,000 hour rating. Motor shall be open type best efficiency possible, minimum NEMA premium efficiency. Provide motor with internal shaft grounding ring to protect motor from use with VFD. Provide factory mounted and wired variable frequency drive for supply fan operation.
 - 2) ECM:
 - a) Provide ebmpapst or equal.
 - b) Motor shall be electronically commutated with remote DC variable voltage signal for fan speed and permanently lubricated ball type bearings.
 - c) All electronics shall be totally sealed and shall not be open to air streams.
 - b. Fan assembly shall be internally isolated with spring or rubber in shear type isolators as needed for vibration isolation. Provide flexible duct connection between fan inlet and unit connection to prevent air leakage.
- J. Drain Pan:
1. Units with Removable Drain Pans: Drain pan shall be of plastic HDPE or equal, ASHRAE 62 IAQ construction with threaded drain pipe connections. Slope drain pan so that standing water will not accumulate in pan.
 2. Units with Non-removable Drain Plans: Drain pan shall be of stainless steel, ASHRAE 62 IAQ construction with threaded drain pipe connections. Slope drain pan so that standing water will not accumulate in pan.
- K. Outside Air Intake: Provide when outside air is indicated on RTU schedules
1. Provide outside air intake section with motor operated opposed blade damper constructed of extruded aluminum, hollow core, air-foil blade or galvanized steel with neoprene edge and end seals. Provide 24-volt proportional spring return closed. Actuators shall be manufactured by Belimo or Johnson Controls. Actuator shall be controlled by EMS via BACnet for space CO2 control with primarily three position operation:
 - a. Position One: Close
 - b. Position Two: Minimum outside air
 - c. Position Three: Maximum scheduled outside air
 2. Provide expanded metal filter on intake.

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- L. Filter Section: Filter section shall cover the full extent of the mixed air path. Filters shall be 2" MERV 9A pleated throw away type. All filters shall be accessible through hinged access panel on a slide out track using standard size filters.
- M. Refrigerant Components: Each refrigerant circuit shall include:
1. Compressor.
 2. Condenser coil and fans.
 3. Evaporator coil and fan.
 4. Hot gas reheat coil with reheat valve(s) and associated controls on lead circuit only.
 5. Thermostatic expansion valves.
 6. Refrigerant filter dryer.
 7. High and low refrigerant pressure safety switches.
 8. Thermostat for evaporator coil freeze-up protection during loss of air flow with automatic reset.
 9. Low-ambient refrigerant head pressure variable fan speed control or fan cycling control.
 10. Brass gauge port service valves installed in discharge and liquid pipes.
 11. Full charge of refrigerant.
- N. Refrigeration Controls and Safeties:
1. Refrigeration operating and safety controls shall include high-pressure cutout and low-pressure cutout with automatic reset, over-temperature and over-current protection. Solid-state motor winding overload sensors shall be located directly in each compressor motor.
 2. Condenser fan motors shall be protected by inherent devices providing both thermal and current overload protection.
 3. Unit shall have anti-short cycling controls, compressor reverse rotation protection, and loss of charge protection.
 4. Unit shall have low ambient cooling control for operation to 30 degrees Fahrenheit.
 5. Evaporator coil shall have freeze protection with automatic reset.
 6. Provide compressor discharge pipe thermostat or thermistor safety control configured to disable compressors upon an over temperature event.
 7. 3-Phase Units: Unit shall be provided with phase and brown out protection which shuts down unit if the electrical phases are more that 10% out of balance on voltage, the voltage is more that 10% under design voltage, or on phase reversal. Provide ICM Model ICM450A or equal with adjustable setpoints.
 8. Flammable Refrigerant Leak Detection Systems:
 - a. Provide leak detection systems for all A2L class refrigerants (R-32, R-454B and the like) as required by ASHRAE Standard 34, U.L. 60335-2-40 and IMC.
 - b. Systems shall be permanently installed by the OEM to prevent the formation of refrigerant concentrations in excess of the code allowed concentrations.
 - c. Detectors shall enable the required mitigation devices such as circulation fans, shall have defined life design, shall default to alarm upon system failure and shall have integral self-test protocols.
 - d. All systems shall be tested and calibrated by the OEM at the factory and shall not require field testing, calibration or adjustments.
- O. Automatic Temperature Controls:
1. All equipment shall be provided with multi-stage cooling, heating, and dehumidification as needed to meet the minimum operation as follows:
 - a. Cooling: 2-stage cooling with multi-two-stage air flow.
 - b. Heating: 2-stage heating with single-stage air flow.

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- c. Dehumidification: 2-stage cooling with multi-two-stage air flow and single stage hot gas reheat.
 - 2. Control Intent - Primary Control: BAS shall provide remote controller and interface with unit for direct control of heating, cooling, ventilation and dehumidification through standard thermostat control connections.
 - 3. All controls necessary for operation shall be provided by the unit Manufacturer. Unit controls shall be complete with fuses, starters, relays, switches, and transformers.
 - 4. Controls shall be capable of remote monitoring and reset of space temperature and humidity settings by Building Control System.
 - 5. Controls shall accept input from temperature, dewpoint, humidity, or CO2 sensors.
 - 6. Unit controls shall be factory provided completely wired with fuses, starters, contactors, transformers, relays, switches, electronic controllers, sensors, safeties, remote control interface, and the like as required for full independent and autonomous control. Manufacturer shall provide controls as required to meet equipment sequence of operations detailed in Specification Section 23 09 93.
 - 7. Provide unit with both supply and return temperature sensors wired back to unit controller for diagnostics and use for control in stand-alone mode.
 - 8. Standard control power shall be 24-vac.
 - 9. Provide laminated color-coded wiring diagram to match factory installed wiring and shall be affixed to the interior of the control compartment's access door.
 - 10. Provide human interface with digital display and supply and return air temperature sensors built into unit from manufacturer where available. Bluetooth connectivity with application tool for mobile device is an acceptable alternative.
- P. Electrical Service:
- 1. Provide to operate at voltage and phase listed on equipment schedules.
 - 2. Electrical Disconnect: Single point power connection per NEC with external access with one of the following options.
 - a. 460-480 Volt: Circuit breaker type switch with minimum short circuit current rating (SCCR) withstand rating of 10KA amps per UL 508.
 - b. 208-230 Volt: Circuit breaker type switch with minimum short circuit current rating (SCCR) withstand rating of 5KA amps per UL 508.
 - 3. Unit shall have standard through-the-bottom power and control wiring connection capability.
- Q. Heating Section:
- 1. Electric Heating Section: Units shall be constructed with completely assembled, wired, electric heating systems integral within unit U.L. listed designed for outdoor applications and NEC compliant. Provide the following at a minimum:
 - a. Automatic high limit control.
 - b. Secondary high limit control with manual reset.
 - c. Proof of air flow switch.
 - d. Staging as noted on equipment schedules.
- R. Roof Curb:
- 1. Unit shall be furnished with an 18-inch high factory fabricated, acoustical style solid bottom roof curb constructed of 16 gauge fully welded galvanized steel capable of supporting entire weight of the unit with windstorm anchoring clips. Curb to be fully lined with 2" fiberglass insulation liner. Curb shall be fully gasketed between the curb top and unit bottom to form an air tight installation.

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2. Curb shall have slope as needed to match roof pitch. Contractor may shim curbs to create a level installation in the field for low sloped roofs but some of the roofs on this project have high sloped design that shall prevent field shimming.
 3. Curb shall be provided with insulated internal divider plate to separate supply and return air chambers.
 4. Curbs shall be provided with insulated chase built into curb to allow electrical contractor, BAS contractor, and fire alarm contractor to route power and control wiring up through curb and through unit base to control panel located integral to each packaged unit.
 5. Windstorm Design:
 - a. Manufacturer shall provide windstorm compliant designs for new roof curb, attachments of curb to roof steel structure and attachments of new RTU to roof curb sealed by a Texas License Structural Engineer for review during the submittal process. Contractor shall install and secure equipment accordingly based on the final approved submittals.
 - b. Contractor shall secure unit to roofing steel structure in accordance with structural drawings. Contractor shall secure the services of a State of Texas licensed engineer who is TDI certified to review construction and provide windstorm certification for complete project upon completion.
 - c. Provide full perimeter base flange to secure curb to steel roof structure.
 - d. Provide windstorm clip brackets welded to top of curb as needed to secure RTU base rail to curb. All securing screws shall be stainless steel type to secure RTU base rail to clips. Coordinate clip locations to prevent conflict with holes in base rail for trucking and lifting.
 - e. Manufacturer shall provide curb construction with windstorm bracket design for review by structural windstorm engineer on project for review and consideration. Manufacturer and Contractor shall make minor changes to design such as metal thickness and quantity of attachment as directed by windstorm Engineer at no additional charge.
 6. Submit proposed roof curb shop drawings with all dimensional and construction details identified prior to fabrication based on actual field measurements and final equipment provided on project to Windstorm Engineer for review and consideration.
- S. Roof Curb Adapter:
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 include integral windstorm clip brackets welded to the side of the curb with size and locations required by TDI for windstorm code compliance. Secure base rail to brackets with minimum #12 316 stainless steel screws. Coordinate clip locations to avoid forklift truck holes in unit base rail as applicable. 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 as needed to anchor base to existing curb with minimum #12 316 stainless steel crews with rubber back washer. Replace existing roof curb counter flashings with 316 stainless steel, minimum 24-g. Curb adapters shall have integral utility chase.
 2. Submit proposed curb adapter shop drawings with all dimensional and construction details identified prior to fabrication based on actual field measurements and final equipment provided on project to Windstorm Engineer

SECTION 23 74 10
PACKAGED ROOFTOP AIR CONDITIONING UNITS

during submittal review phase. Contractor shall make small modifications to brackets and screw sizes and quantities as required at no additional charge or change to construction contract

3. Contractor shall clean curb adapter after project completion with soap and water and paint curb as follows:
 - a. Provide primer coat of Uniflex 36-520 or equal.
 - b. Provide Two (2) minimum 25-wet mill finish coats of Uniflex 44-300 or equal.

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. Provide roof mounting curbs and 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.

END OF SECTION

SECTION 23 82 19
DX AIR HANDLING UNITS, LIGHT COMMERCIAL – (10-TONS) AND UNDER

PART 1 GENERAL

1.1 SUMMARY:

- A. Section includes air handling units and electric heaters.

1.2 REFERENCES:

- A. ARI 410 (Air-Conditioning and Refrigeration Institute) - Forced-Circulation Air-Cooling and Air-Heating Coils.
- B. UL 1096 (ANSI/Underwriters Laboratories, Inc.) - Electric Central Air Heating Equipment.

1.3 SUBMITTALS:

- A. Section 01 33 00 – Submittal Procedures.
- B. Product Data: Submit coil and frame configurations, dimensions, materials, rows, connections, and rough-in dimensions. Submit mechanical and electrical service locations, capacities, and requirements.
- C. Manufacturer's Installation Instructions: Submit assembly, support details, and connection requirements.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
- E. Operation and Maintenance Data:
 - 1. Include start-up instructions, maintenance instructions, parts lists, controls, warranties and accessories.
 - 2. Manufacturer also shall provide full-service repair manuals for each model of equipment provided on project. Manuals shall provide thorough repair and diagnostics information for all system components such as digital controls, digital fans, electronic expansion valves, and the like. Provide a minimum of two (2) paper copies.

1.4 QUALIFICATIONS:

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three (3) years documented experience.
- B. Installer: Company specializing in performing Work of this Section with minimum three (3) years documented experience.

1.5 DELIVERY, STORAGE, AND HANDLING:

- A. Accept units on site in factory packing. Inspect for damage. Store under roof.
- B. Protect coil fins from crushing and bending by leaving in shipping cases until installation, and by storing indoors. Protect coils from entry of dirt and debris with pipe caps or plugs.

1.6 FIELD MEASUREMENTS:

- A. Verify field measurements prior to fabrication.

SECTION 23 82 19
DX AIR HANDLING UNITS, LIGHT COMMERCIAL – (10-TONS) AND UNDER

1.7 WARRANTY:

- A. **Original Equipment Manufacturer “OEM” Part Requirements: All parts warranties “Base or Extended” shall be for OEM parts only. Aftermarket parts or accessories will not be allowed.**
- B. Base Proposal: Provide one (1) year parts and labor warranty on complete unit.
- C. Alternate Proposal – Extended Parts Warranty:
 - 1. **WAR-1, 5-Ton Units:** Provide an additional four (4) year ALL parts warranty for a total of five (5) year ALL parts warranty on the complete unit.
 - 2. **WAR-2, 7.5&10-Ton Units:** Provide an additional four (4) year ALL parts warranty for a total of five (5) year ALL parts warranty on the complete unit.

PART 2 PRODUCTS

2.1 AIR HANDLING UNITS:

- A. Manufacturers:
 - 1. Basis of Design – Base Proposal:
 - a. 5-Ton Units: Lennox.
 - b. 7.5 and 10 Ton Units: Trane.
 - 2. Alternate No. 1A (5-Ton) Manufacturers:
 - a. Trane.
 - b. Carrier.
 - c. American Standard.
 - d. York.
 - 3. Alternate No. 1B (7.5 and 10-Ton) Manufacturers:
 - a. Lennox.
 - b. Carrier.
 - c. American Standard.
 - d. York.
- B. Refrigerant:
 - 1. R-454B.
 - 2. Provide with all required semi-flammable refrigerant labels.
 - 3. Provide with on board factory wired and commissioned UL 60335-2-40 semi flammable refrigerate detector control system; Refrigerant Detection System (RDS) sensor and Refrigerant Detection System (RDS) blower control board.
 - 4. If the RDS detects refrigerant, the system will stop the compressor and/or heating operation and operate the supply fan to reduce the concentrations in the conditioned space. Once safe levels are reached the HVAC system will resume normal operation.
- C. Fan coil units shall be completely factory assembled including fan, motor, evaporator coil, expansion valve, condensate drain pan, insulated casing, electric heater, filter rack, filters, and controls. Units shall be suitable for vertical or horizontal configuration. Units shall be UL listed for intended application.
- D. Evaporator Coil:
 - 1. 5-Tons and Under: 100% all aluminum construction with Thermostatic Expansion Valve, removable plastic IAQ drain pan and slide out design.
 - 2. Over 5-Tons: Evenly spaced aluminum fins mechanically bonded to copper tubes or all aluminum construction with interlaced construction for multi-circuit units, factory pressure and leak tested per application. Furnish drain pan under cooling coil, easily removable for cleaning, with drain connection

SECTION 23 82 19
DX AIR HANDLING UNITS, LIGHT COMMERCIAL – (10-TONS) AND UNDER

constructed of plastic or stainless steel. Provide Hard Shutoff (non-bleed) Thermal Expansion Valve suitable for both cooling and heat pump operation.

- E. Cabinet:
 - 1. Heavy gauge galvanized steel construction with baked enamel finish. Cabinet shall be completely lined with minimum R-4.2 glass fiber insulation and adhered with adhesive and mechanical fasteners.
 - 2. Access Doors: Provide easily removable insulated service access doors with mechanical fasteners
- F. Finish: Factory applied baked enamel on visible surfaces of enclosure or cabinet.
- G. Fans:
 - 1. 5-Tons and Under: Provide direct driven fan with centrifugal forward-curved double-width wheels, statically and dynamically balanced. Provide high efficiency ECM motor with permanently lubricated ball bearings and rubber in shear vibration isolators. Provide with digital fan speed selector control suitable for multi-stage cooling and heating air volume. Provide on slide rail for easy removal and power disconnect plug.
 - 2. Over 5-Tons: Direct Drive or Belt Drive
 - a. Direct Drive:
 - 1) Provide direct driven fan with centrifugal forward-curved double-width wheels, statically and dynamically balanced. Provide high efficiency ECM motor with permanently lubricated ball bearings and rubber in shear vibration isolators. Provide with digital fan speed selector control suitable for multi-stage cooling and heating air volume. Provide on slide rail for easy removal and power disconnect plug.
 - b. Belt Drive:
 - 1) Provide belt driven fan with centrifugal forward-curved double-width wheels, statically and dynamically balanced, with replaceable shaft bearings.
 - 2) Provide high efficiency VFD rated motor with permanently lubricated ball bearings, rubber in shear vibration isolators, adjustable motor base, and adjustable sheave on motor shaft.
 - 3) Provide with on board VFD for fan speed control.
 - 4) Provide with automatic belter tensioner where available.
- H. Electrical Power and Control:
 - 1. Single Point Power Connection: Single point power wiring connection, factory-wired, located in cabinet. Provide control terminal block for connection of thermostat and fan controls including fan contactor, control transformer, relay, or heat controls. Power and control wiring to be provided in accordance with National Electric Code.
 - 2. Provide with either digital or electro-mechanical controls for connection to matched outdoor condensing unit. All control inputs shall be through standard binary control inputs from existing ALC BAS such as R, G, X, C, Y1, Y2, W1, W2 and the like.
 - 3. Evaporator Freeze Protection:
 - a. Each unit shall be provided with thermostatic evaporator freeze protection controls.
 - b. Recommended Setpoints: Cut Out @ 34° F and Cut In 45° F.
 - 4. 3-Phase Units: Unit shall be provided with phase and brown out protection which shuts down unit if the electrical phases are more that 10% out of

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DX AIR HANDLING UNITS, LIGHT COMMERCIAL – (10-TONS) AND UNDER

balance on voltage, the voltage is more than 10% under design voltage, or on phase reversal. Provide ICM Model ICM450A or equal with adjustable setpoints.

- I. Filter:
 - 1. 5-Tons and Under: Provide with external extended area 4" filter sub-base. Refer to equipment schedules.
 - 2. Over 5-Tons: Provide with integral factory air filter frame suitable for 2" air filters.
- J. Electric Resistance Heater:
 - 1. Assembly: ANSI/UL 1096 listed and labeled, with terminal control box and cover, splice box, heavy duty nickel chromium elements, casing, and controls.
 - 2. Controls: Automatic reset thermal cut-out, built-in magnetic contactors, control circuit transformer and fuse, manual reset thermal cut-out, air flow proving device, fusing per stage.
 - 3. Staging: Refer to HVAC equipment schedules.
 - 4. 5-Tons and Under: Heater shall be slip in type for installation within air handling unit cabinet.
 - 5. Over 5-tons: Heater shall be external type designed for field installation directly to supply fan discharge on top of AHU. Provide insulated heater assembly were available.
- K. Accessories - Water Safety Float Valve: Provide each unit with a secondary drain overflow float switch. Float shall be RECTORSEAL MODEL No. SS2 or approved equal. Wire switch to operate supply fan and disable compressor upon sensing water in series with the freeze protection thermostat.

PART 3 EXECUTION

3.1 INSTALLATION:

- A. Install in accordance with manufacturer's instructions.
- B. Units with Cooling Coils: Install drain piping to condensate drain. Construct p-trap in accordance with Drawings and manufacturer's instructions.
- C. Connect refrigerant piping to condensing unit in accordance with manufacturer's instructions.
- E. Coordinate connection of electrical power with Electrical Division.
- F. Install controls for operation of heating and cooling.
- G. Install piping connection to units to maintain service and maintenance clearance to coils, motors, and filters and to provide access to other mechanical and electrical equipment within mechanical rooms.
- H. Shim unit up as required for free air filter pull access.

END OF SECTION

SECTION 26 00 00
ELECTRICAL SPECIFICATIONS

1.1 GENERAL:

- A. Division 20 00 00 is a part of these Electrical Specifications for Wood River Elementary HVAC Replacements and Upgrades – 2026 (Phase 1), Corpus Christi, Texas.

1.2 SCOPE:

- A. Work to be accomplished under these Specifications includes the furnishing of all labor, materials, and equipment required for the complete installation as described herein and as indicated on the Drawings.
- B. Work is to be completed from point of service to each HVAC unit indicated for installation or replacement on Drawings and/or specified herein with all accessory construction as may be required to make the installation of each piece of equipment complete and ready for normal service. In general, this work consists of the following:
 - 1. A system of power and fire alarm connections and modifications to the heating and air conditioning equipment as indicated on the Drawings. Including new disconnect switches, transformers, conduit, conductors, junction boxes, terminations, and associated apparatus.
 - 2. Selective demolition and associated modifications of existing electrical circuits as indicated on the Drawings and as specified herein.
 - 3. Selective demolition and associated modifications of existing unit feeders and fire alarm devices as indicated on the Drawings and as specified herein.
 - 4. A partial system of conduits, junction boxes, conduit bodies, and a complete system of conductors, detectors, and related items for extensions from the existing fire alarm system.
 - 5. A partial system of conduits with Jetline pullcords, outlet boxes with plates, junction boxes, and related items for BAS system cabling and devices by the BAS system contractor.
- C. Installation of this work, including all materials and labor shall be first class in every respect and in exact accordance with these Specifications and accompanying Drawings. It is intended that Specifications and accompanying Drawings shall include everything requisite and necessary for proper installation of electric wiring, even though every item may not be particularly mentioned in detail.

1.3 ELECTRICAL SERVICE:

- A. The existing service utilization voltage for both services is solidly grounded, 277/480 volt, 3-phase, 4-wire nominal.
- B. Contractor shall furnish all new service equipment and materials as indicated on the Drawings and as required for electrical service extensions / modifications to new equipment.

1.4 GROUNDING:

- A. The main service entrance ground is existing. All electrical system modifications / extensions shall be grounded in accordance with Article 250 of the National Electrical Code, and as hereinafter specified.
- B. Grounding electrode and equipment conductors with a "green" colored insulated jacket shall be provided and installed in all new and modified raceways.
- C. All new and modified equipment shall have an effective equipment ground in accordance with the National Electrical Code.

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ELECTRICAL SPECIFICATIONS

1.5 CONDUIT AND TUBING:

- A. Conduit size shall be 1/2" unless otherwise indicated on the Drawings or otherwise specified.
- B. Conduit installed in damp or wet locations shall be Schedule 40 rigid hot-dip galvanized conduit as manufactured by Republic, Allied, Triangle, Wheatland, Western, or an approved equal, with screwed couplings and fittings. All fittings used shall be hot-dip galvanized.
- C. Conduit routed to/from roof penetration hoods above the roof shall be Schedule 40 rigid galvanized steel to the respective disconnect switch. The final 3' of all exposed conduit terminations (disconnect switches, and unit final terminations) shall be made with liquid tight flexible metal conduit. All other conduit in damp or wet locations shall be Schedule 40 rigid galvanized steel.
- D. All conduit in dry locations shall be galvanized thinwall (EMT) with die-cast watertight, insulated throat type compression fittings. Indentor type or set screw type connectors and fittings will not be accepted. All conduit installed in finished spaces shall be concealed unless otherwise specifically indicated on the Drawings.
- E. Fittings and connections involving dissimilar metals will not be allowed in damp or wet locations.
- F. MC type cable is not permissible for use.
- G. PVC conduit is not permissible for use.
- H. Flexible metal conduit shall not be used for any purpose except as hereinafter specified and as specifically indicated on the Drawings. All flexible metal conduit shall be installed in strict accordance with Articles 348 and 350 of the National Electrical Code. Non-metallic flexible conduit will not be acceptable for any purpose.
 - 1. Connections to mechanical equipment shall be made with flexible metal conduit. Length of flexible conduit for this application shall not exceed 6'-0".
 - 2. Where flexible conduit is used for connections to equipment in damp or wet locations, conduit shall be liquid-tight flexible metal conduit with approved fittings. Length of exposed flexible metal conduit shall not exceed 3'-0".

1.6 INSTALLATION AND ROUTING OF CONDUITS:

- A. All conduit shall be run in the straightest possible path.
- B. Conduit shall be run in straight lines, at right angles to, or parallel with units and unit curbs and shall be supported at maximum of 6'-0" by malleable conduit straps or suitable clamps to provide a rigid installation.
- C. In no case shall conduit be fastened to other pipe or equipment or so installed as to prevent the ready removal equipment service panels.
- D. All Schedule 40 steel conduit ends are to have a minimum of five full threads. No threadless connectors are to be used. All conduit shall be reamed after cutting and threading and before installation; runs shall be straight and true; elbows, offsets, and bends shall be uniform and symmetrical. All conduit after installation and prior to completion of project shall be capped to prevent entrance of moisture and foreign objects. Conduit shall be swabbed before installation of wire.

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ELECTRICAL SPECIFICATIONS**

1.7 CONDUIT AND FITTING SUBMITTAL:

- A. The Contractor shall complete the following table and submit for approval prior to acquisition of conduit and conduit fittings.
- B. A copy of the following table (submitted and approved) shall be retained on site in the possession of the on-site electrical foreman until the certificate of substantial completion is executed.

CONDUIT AND FITTING TABLE							
Location / Environment	Conduit Type and Schedule	Coupling Material and Type	Terminal Adapter Material/Type	Elbow Material / Type	Expansion Fitting Material	Condulet Material	Maximum Allowance Length
Interior/Dry Locations							NA
Exterior/Wet Locations							NA
Flexible Conduit Dry Locations		NA		NA	NA	NA	
Flexible Conduit Damp and Wet Locations		NA		NA	NA	NA	

SUBMITTED BY CONTRACTOR _____ DATE: _____

ENGINEER APPROVAL: _____ DATE: _____

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ELECTRICAL SPECIFICATIONS

1.8 HANGERS AND SUPPORTS:

- A. Contractor shall provide all hardware and supports for supporting all conduit, disconnect switches, and boxes. All hangers and supports shall be secure and of a type appropriate in material, application, and dimensions for the particular application.
- B. Hangers and supports for exterior applications and in wet locations shall be stainless-steel. Hangers and supports for interior applications shall be zinc-plated steel.
- C. Perforated hanger strap and wire will not be acceptable for any supporting purpose.

1.9 CONDUCTORS:

- A. All wiring and cables shall be insulated soft-drawn annealed 98% conductivity copper and shall be new. Voltage rating of wire and cable operating on voltages in excess of 50 volts shall be 600 volts A.C. For circuits operating on voltage less than 50 volts, the voltage rating shall be not less than 300 volts A.C.
- B. All wire shall be stranded.
- C. Power feeder and branch circuit wire and cables shall have insulation Type THWN. Conductors as manufactured by Cablec, Capitol, American Insulated, Houston Wire and Cable, Southwire, and Okonite will be acceptable.

1.10 WIRE PULLING LUBRICANTS:

- A. Contractor shall use Ideal "CableEase" or approved equal wire pulling lubricants for all wire installation. Soaps or other substitute material having electrical conduction properties are not acceptable.

1.11 COLOR-CODING AND TAGGING:

- A. All wiring furnished shall be color-coded. Conductors No. 10 AWG and smaller shall have insulation colored as follows. Conductors larger than No. 10 AWG may be black with tape manufactured for this application and colored as follows. All such conductors shall be color-code taped at all junctions and terminations.
 - 1. 120/240 volt, 1-phase: Red and Black.
 - 2. 480 volt, 3-phase:
 - a. Phase A – Brown.
 - b. Phase B – Purple.
 - c. Phase C – Yellow.
 - d. Neutral – Gray.
 - 3. Ground conductors: Green.

1.12 INSULATION OF SPLICES AND CABLE TERMINATION:

- A. All connections for conductors No. 8 and larger must be made by means of a compression type connector UL listed and specifically approved for the purpose for which it is used. Such connectors shall be Polaris or equal insulated NSI type lug blocks. Wire No. 10 and smaller may be connected with U.L. listed wire nuts in lieu of compression connections.

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1.13 JUNCTION BOXES:

- A. All interior boxes shall be galvanized and shall be set with covers plumb and square with the finished surface.
- B. All boxes shall be securely attached to the structural members.
- C. Junction boxes and pull boxes shall be furnished where indicated on the Drawings, or as required by the National Electrical Code. Boxes shall be of code gauge galvanized steel, and shall have removable screw cover. Flush boxes shall be used on all walls and ceilings where conduits are concealed. Where conduits are exposed, surface type boxes shall be used.
- D. Any boxes not installed in a workmanlike manner shall be removed by contractor, wall repaired, and box reset.
- E. Boxes and conduit fittings for outdoor work shall be cast aluminum, watertight, and have gasketed coverplates.

1.14 WIRING DEVICES:

- A. Wiring devices, or approved equal, as scheduled and/or indicated on the Drawings shall be furnished and installed. All receptacles shall be grounding type, and shall be polarized in accordance with the latest standards of the National Electrical Code.

1.15 DISCONNECT SWITCHES:

- A. All disconnect switches shall be Square D Type HD, or approved equal, for 480 volt use, quick-make quick-break type safety switches with cover interlocked door.
- B. All switches on exterior of building and in damp or wet locations shall be in NEMA 3R enclosures.
- C. All motors and fixed equipment connections shall have disconnects as required by the National Electrical Code.
- D. All disconnect switches shall have the load served by the switch identified by 1/8" thick white thermoplastic with black (3/4" stroke) sunken letter nameplate screwed or riveted to outside cover of the switch.
- E. Disconnect switches as manufactured by Eaton will be acceptable.

1.16 CIRCUIT BREAKERS:

- A. Provide new circuit breakers in existing Panelboards as indicated on drawings.
- B. Jobsite identify Panelboard Manufacturers and required circuit breaker types prior to acquisition of circuit breakers. All new circuit breakers must be manufactured by the manufacturer of each respective panelboard.

1.17 CONTROL EQUIPMENT, WIRING, AND CONNECTIONS:

- A. The HVAC Contractor shall furnish and install complete automatic temperature control system. Provide (via licensed Fire Alarm Contractor subcontract) all fire alarm system unit shut-down reconnections at each unit.

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ELECTRICAL SPECIFICATIONS

1.18 IDENTIFICATION AND LABELING OF DISTRIBUTION GEAR:

- A. Contractor shall furnish white thermoplastic (1/8" thick) with black sunken letters (3/4" stroke) for all disconnect switches. Labels shall be permanently attached to service side of all such gear.
- B. Identification and labeling of individual branch circuit devices shall be provided as hereinafter specified.

1.17 PANEL DIRECTORIES:

- A. Existing panels directories at panels where no loads are changed and no new loads are added may remain as-is.
- B. At existing panels where circuits/loads are modified or added, existing directory cards shall be replaced by new typewritten directory cards. Such new directory cards shall indicate all new and existing load conditions on a per circuit basis. New equipment designations indicated on the Drawings shall be used to identify all new load conditions. Existing load designations may be utilized to identify existing load conditions. Where the accuracy of existing load designations are questionable; provide circuit tracing as required to properly identify such existing loads.

1.18 CONNECTIONS TO EQUIPMENT SPECIFIED ELSEWHERE:

- A. Certain equipment will be furnished by other contractors on the job which will require electrical services and connections by the Electrical. Contractor shall refer to the "Disconnects", and "Control Equipment, Wiring, and Connections" Sections of these Specifications.
- B. HVAC equipment such as packaged rooftop units, air handling units, and condensing units shall be furnished and installed by the HVAC Contractor. Electrical services indicated on the Drawings are based on the requirements of specified HVAC equipment. Attention is directed that in the event the HVAC Contractor furnishes equipment other than specified, changes may be required to accommodate the electrical load and quantity of electrical connections for such furnished equipment. Electrical Contractor must coordinate changes resulting from differences between the specified and furnished HVAC equipment and advise the HVAC Contractor of any additional costs. HVAC Contractor shall be responsible for paying all costs involved as a result of the changes.

1.19 FIRE ALARM SYSTEM EXTENSIONS:

- A. Attention is directed that the definition of work, materials, and devices required to provide extensions from the existing fire alarm system shall be based upon jobsite observations by the contractor. The contractor shall visit the site and become completely informed of the scope of work required for system extensions prior to submittal of proposal. The contractor shall provide all materials, devices, labor, and accessory apparatus required for system extensions in the amount of the proposal. General fire alarm system extension/modification requirements are indicated on the Drawings. The existing fire alarm control panel is Notifier NFS-640 control panel. The Fire Alarm Contractor shall design and submit for approval, a complete designed system configuration and layout based upon jobsite observations, applicable codes, and requirements specified herein. The complete configuration shall include all devices, wiring, conduit, and device locations along with other required information as specified herein for the system proposed for installation. No additional compensation

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will be considered if the fire alarm contractor fails to perform the required jobsite observations.

- B. All system components and system programming required for compliance with applicable codes and the requirements of the authorities having jurisdiction are hereby included in the contract requirements.
- C. Provide connection to and extension from the existing Notifier NFS-640 control panel fire alarm control panel as required to serve new duct smoke detectors associated with the new HVAC equipment.
- D. Duct type smoke detectors shall match existing at facility. Jobsite verify type. Duct detectors shall be furnished with control modules, visual indicator sampling tubes, and enclosure. Refer to drawing notes for installation and connection requirements.
- E. Existing smoke duct detectors serving existing air handlers (4-ton and less) to be replaced shall be removed. Remove all conduit and fire alarm cabling to nearest SLC loop junction. Fire Alarm Contractor must maintain continuity of existing SLC loop as required by removal of detectors.
- F. All fire alarm system devices furnished shall be completely compatible with the existing system.
- G. All programming changes and system labeling required to accommodate the system extensions/modifications shall be provided by the contractor.
- H. Conduit shall be furnished and installed by the Electrical Contractor if and only if the fire alarm subcontractor is contracted to the Electrical Contractor. Refer to Specification Section 26 00 00 for conduit requirements.
- I. If the fire alarm portion of the project is subcontracted directly to the General Contractor the Fire Alarm Contractor shall be responsible for furnishing all required rough-in and conduit necessary for the fire alarm system. All rough-in and conduit shall be installed in accordance with Specification Section 26 00 00.
- J. All fire alarm cable shall be installed in conduit.
- K. Conduit fill shall not exceed 40% of interior cross sectional area where three or more cables are contained within a single conduit.
- L. Cable must be separated from any open conductors of power, or Class 1 circuits, and shall not be placed in any conduit, junction box, or raceway containing these conductors, per N.E.C. Article 760-29.
- M. All wiring shall be new. Provide plenum rated cable where cable is to be installed in plenum space.
- N. Wiring shall be in accordance with local, state, and national codes (e.g., N.E.C. Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than No. 18 AWG (1.02 mm) for Initiating Device Circuits and Signaling Line Circuits, and No. 14 AWG (1.63 mm) for Notification Appliance Circuits.
- O. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.

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- P. Wire and cable not installed in conduit shall have a fire resistance rating suitable for the installation as indicated in NFPA 70 (e.g., FPLR).
- Q. Wiring used for the multiplex communication circuit (SLC) shall be twisted and unshielded and support a minimum wiring distance of 12,500 feet. In certain applications, the system shall support up to SLCs with up to 1,000 feet of untwisted, unshielded wire. Design of the system shall permit use of IDC and NAC wiring in the same conduit with the SLC communication circuit.
- R. All field wiring shall be electrically supervised for open circuit and ground fault.
- S. Terminal Boxes, Junction Boxes and Cabinets: All boxes and cabinets shall be UL listed for their use and purpose.
- T. Submittals:
 - 1. Fire alarm devices indicated on the Drawings and specified herein are intended to illustrate the general extent and character of system requirements. Specific wiring between devices has not been indicated. Location and quantity of devices indicated are intended only to be used as general guide. The fire alarm contractor shall design and submit for approval, a complete designed system configuration and layout. The complete configuration shall include all devices, wiring, conduit, and locations along with other required information as specified herein for the system proposed for installation. No additional compensation will be considered if the fire alarm contractor submits the issued construction drawings by this firm for approval to the AHJ.
 - 2. Factory data sheets on each device to be used and so marked as to model and configuration.
 - 3. All submittal data shall be in bound form with Contractor's name, project name, and State Fire Alarm License Number of Installer.
 - 4. Provide as-built drawings indicating all new and modified device addresses on a per device basis. As-built drawings shall also include cable routing for all modified cable routes.

1.20 BAS ROUGH IN SYSTEM:

- A. Provide a partial BAS rough-in system with a Jetline pullcord in each conduit. Minimum conduit size shall be 3/4". Refer to HVAC drawings for general locations for outlet boxes for BAS system devices. Coordinate all BAS outlet box locations with the BAS system contractor.
- B. Conduit shall extend from each rough-in outlet box to point above accessible ceiling, or as indicated.
- C. Provide a blank cover plate for all rough-in outlet boxes.
- D. Provide plastic bushing at each conduit stub.

1.21 ACCESSORY CONSTRUCTION APPARATUS:

- A. It is the intention that these Specifications shall provide a complete installation, except as herein specifically excepted. All accessory construction and apparatus necessary or advantageous in the operation or testing of the work shall be included. Omission of specific references to any part of the work necessary for such complete installation shall not be interpreted as relieving the contractor from furnishing such work.

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1.22 TESTS/DEMONSTRATION:

- A. The entire system upon completion shall be "Meggered" for faults in accordance with methods approved by I.E.E.E. and National Electrical Code if so directed by the Engineer.
- B. A demonstration shall be performed in the presence of a representative of the Engineer. Equipment installed and/or connected by the contractor shall be put through their normal operating paces and all such equipment shall be required to operate to the satisfaction of the Architect on completion of the job.

1.23 WORKMANSHIP AND INSTALLATION:

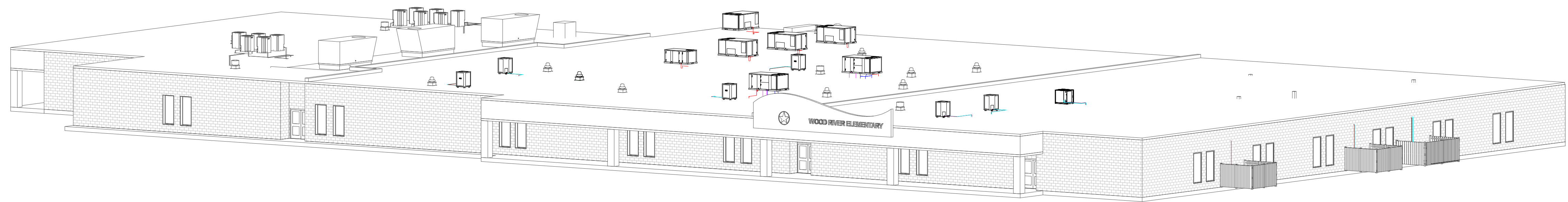
- A. Contractor shall make such progress in his work that he will not delay the work of other trades unduly.
- B. Contractor shall provide service to all using connections.
- C. Cutting or drilling of structural members and roof curbs, regardless of material, must be prior approved by the Engineer. Contractor shall pay for repairing damage to such members.
- D. All electrical conduit, boxes, and disconnect switches shall be properly supported to construction.

END OF SECTION

WOOD RIVER ELEMENTARY HVAC REPLACEMENTS AND UPGRADES - 2026 (PHASE 1)

Calallen Independent School District

Wood River Elementary School



CALALLEN I.S.D.
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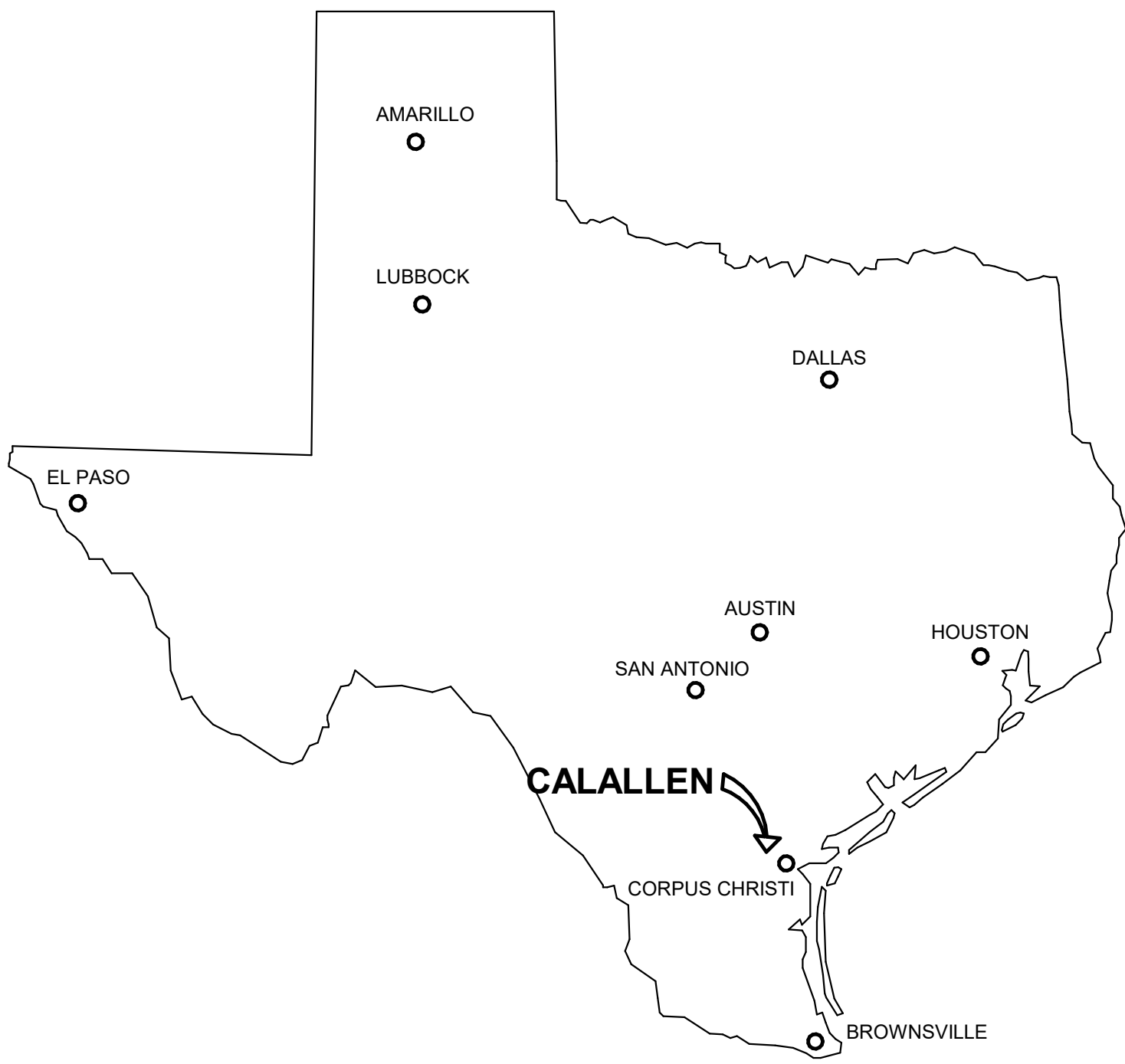
STRIDDE, CALLINS & ASSOCIATES, INC.
342 S. NAVIGATION BLVD.
CORPUS CHRISTI, TX 78405
PHONE: (361) 883-9199
FAX: (361) 883-9177
TEXAS ENGINEERING FIRM NO. F-006328

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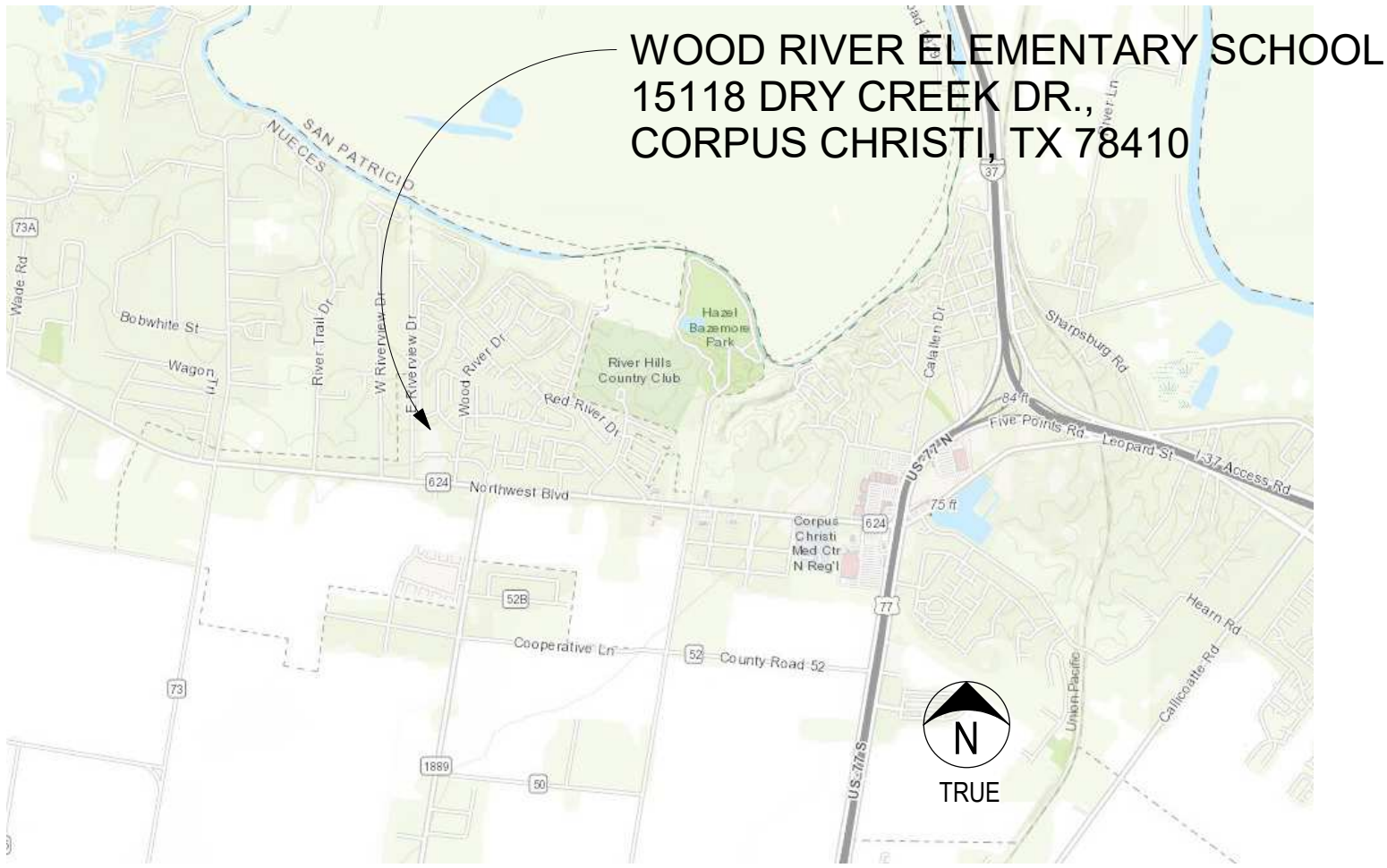
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3530 SOUTH ALAMEDA ST.
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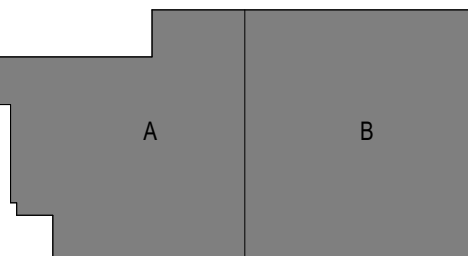
DRAWING SHEET INDEX

	SHEET NUMBER	SHEET TITLE
1	T100	TITLE SHEET
2	E100	ELECTRICAL FLOOR PLAN AREA "A"
3	E101	ELECTRICAL FLOOR PLAN AREA "B"
4	E102	ELECTRICAL ROOF PLAN AREA "A"
5	E103	ELECTRICAL ROOF PLAN AREA "B"
6	M100	MECHANICAL DEMOLITION PLAN AREA "A"
7	M101	MECHANICAL DEMOLITION PLAN AREA "B"
8	M102	MECHANICAL DEMOLITION ROOF PLAN AREA "A"
9	M103	MECHANICAL DEMOLITION ROOF PLAN AREA "B"
10	M104	MECHANICAL ENLARGED DEMOLITION PLANS AREA "A"
11	M105	MECHANICAL ENLARGED DEMOLITION PLANS AREA "B"
12	M200	MECHANICAL RENOVATION PLAN AREA "A"
13	M201	MECHANICAL RENOVATION PLAN AREA "B"
14	M202	MECHANICAL RENOVATION ROOF PLAN AREA "A"
15	M203	MECHANICAL RENOVATION ROOF PLAN AREA "B"
16	M204	MECHANICAL ENLARGED RENOVATION PLANS AREA "A"
17	M205	MECHANICAL ENLARGED RENOVATION PLANS AREA "B"
18	M300	MECHANICAL SCHEDULES AND GENERAL NOTES
19	M400	MECHANICAL DETAILS
20	M401	MECHANICAL DETAILS
21	M402	MECHANICAL DETAILS
22	M403	MECHANICAL DETAILS
23	M404	MECHANICAL DETAILS
24	S100	PARTIAL STRUCTURAL ROOF FRAMING PLAN - AREA "A"
25	S200	PARTIAL STRUCTURAL ROOF FRAMING PLAN - AREA "B"

NO	REVISION	DATE

WOOD RIVER ELEMENTARY HVAC REPLACEMENTS AND UPGRADES - 2026 (PHASE 1)
CALALLEN INDEPENDENT SCHOOL DISTRICT
15118 DRY CREEK DR, CORPUS CHRISTI, TX 78410
SERVICE ORDER NO. 4 - BOND 2023

TITLE SHEET



TRUE
PLAN

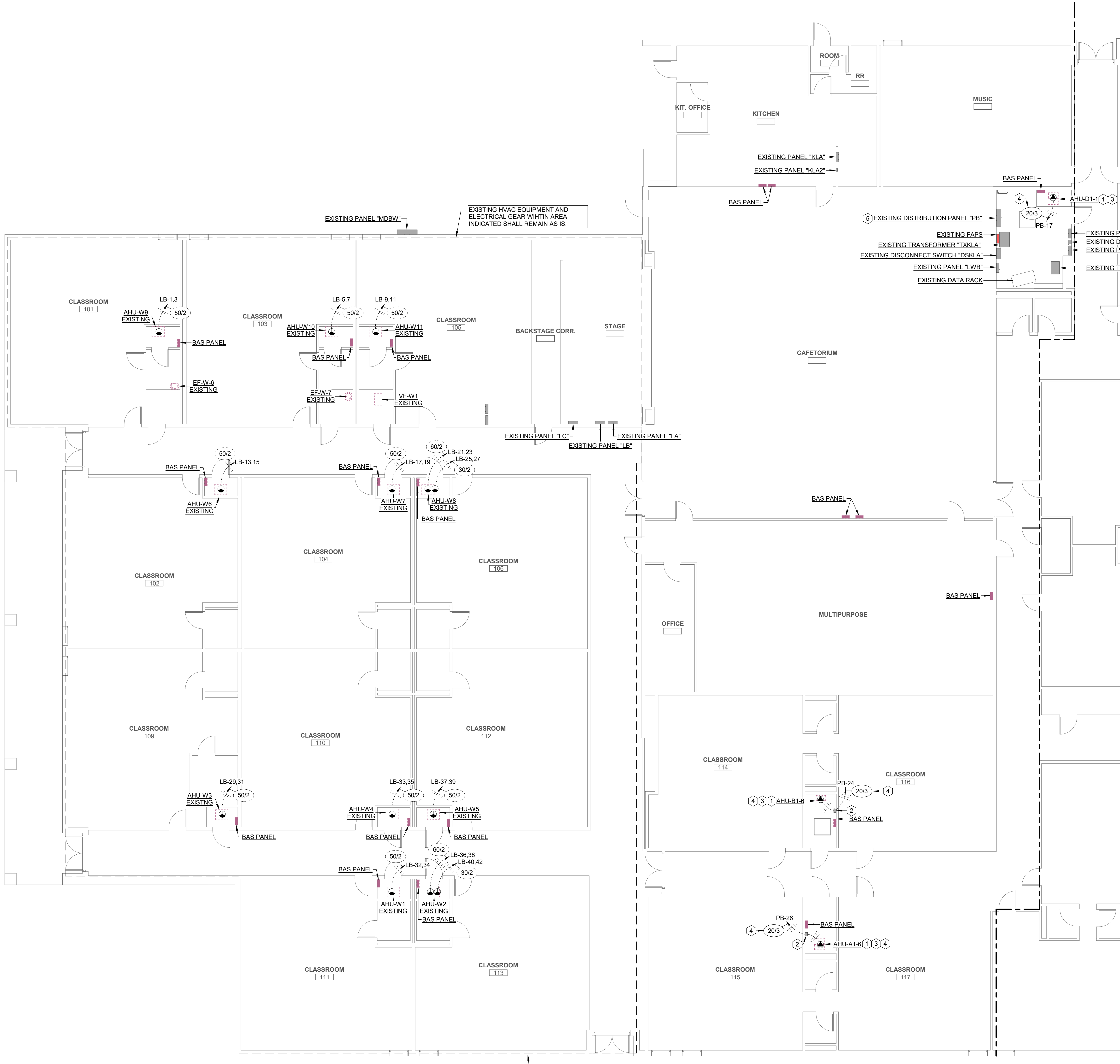
STRIDDE, CALLINS & ASSOCIATES INC.
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Corpus Christi, TX 78405-3618
Registration # F-006328



11/13/2025

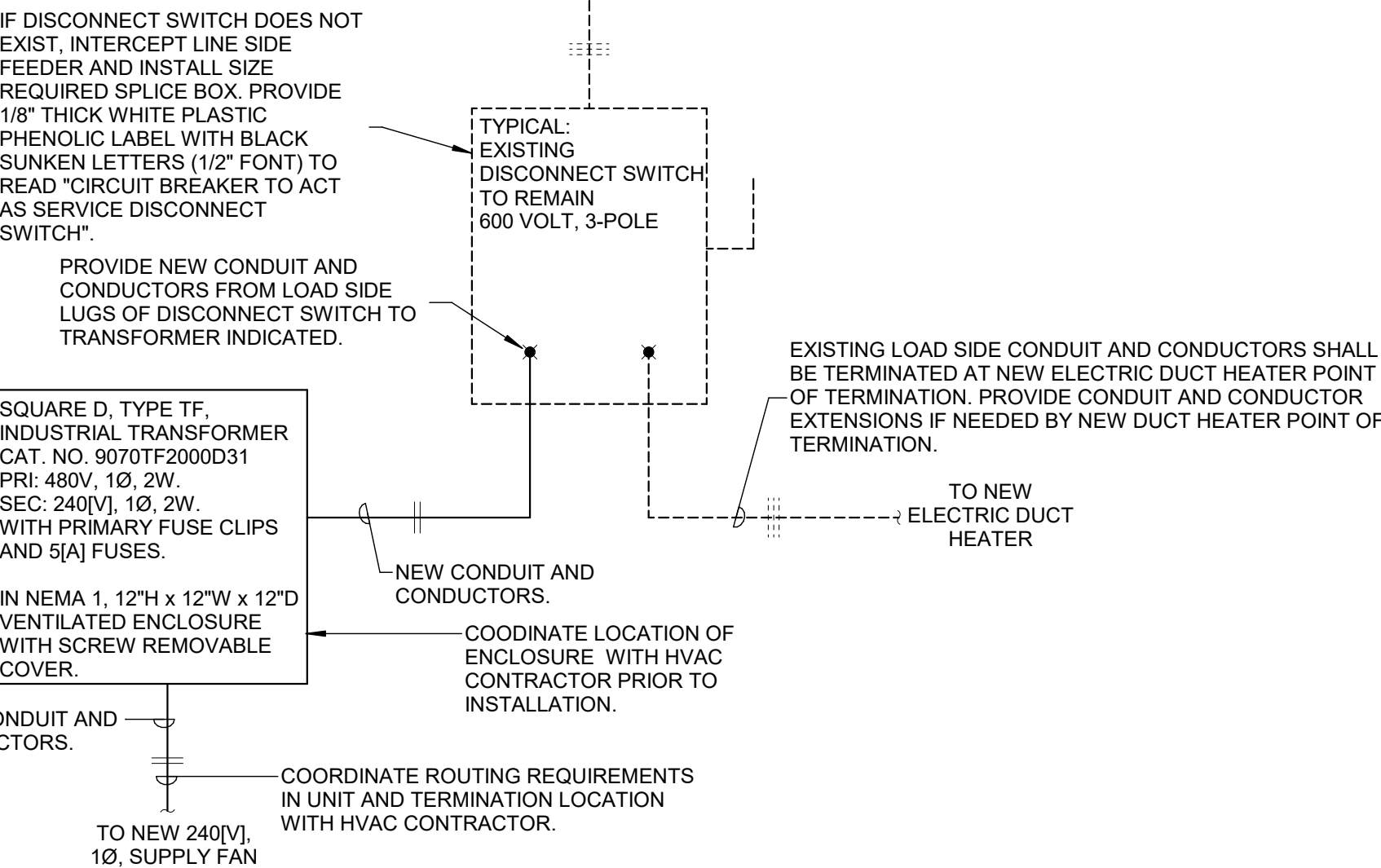
Project No.	2024100
Date Drawn	11/13/2025
Drawn By	AR
Check By	JM
Scale	1" = 1/2"
Sheet No.	1 of 25

T100



- GENERAL NOTES:**
- A. INFORMATION INCLUDED ON THIS DRAWING IS INTENDED TO INDICATE THE GENERAL CHARACTER AND EXTENT OF WORK REQUIRED. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
 - B. ELECTRICAL DESIGN IS BASED UPON 2020 NEC AND 2021 IECC.
 - C. FIRE ALARM DESIGN IS BASED UPON 2021 IFC AND 2020 NFPA 72.
 - D. ELECTRICAL ITEMS INDICATED ON THIS DRAWING AS "EXISTING" SHALL REMAIN AS IS UNLESS OTHERWISE INDICATED.
 - E. EXISTING DISTRIBUTION PANELS "PA" AND "PB" ARE I-T-E SWITCHBOARD TYPE CDP-6A. JOB SITE SURVEY NEW CIRCUIT BREAKER REQUIREMENTS.

- KEYED NOTES:**
- EXISTING HVAC EQUIPMENT SHALL BE REMOVED AND REPLACED BY NEW AT SAME APPROXIMATE LOCATION. DISCONNECT AND RECONNECT POWER CONNECTIONS TO EQUIPMENT AS REQUIRED. COORDINATE DISCONNECT / RECONNECT REQUIREMENTS WITH HVAC CONTRACTOR. ELECTRICAL FLOOR PLAN DRAWING INDICATES AHU HEATER CONNECTIONS ONLY. REFER TO AIR HANDLER CONNECTION DETAIL ON 2/E100 FOR RECONNECTION REQUIREMENTS FOR AHU HEATER AND SUPPLY FAN.
 - EXISTING 30A, 600V, 3P, NF, NEMA-1 DISCONNECT SWITCH TO REMAIN.
 - REMOVE EXISTING FIRE ALARM SMOKE DUCT DETECTORS FROM SUPPLY AND RETURN AIR DUCTS AS REQUIRED. REMOVE FIRE ALARM RELAY AND ASSOCIATED FIRE ALARM CABLE CONNECTION TO SLG LOOP. PROVIDE CONTINUITY OF THE SLG LOOP IF CONTINUITY IS LOST DUE TO DETECTOR REMOVAL. REPROGRAM FIRE ALARM CONTROL PANEL AS REQUIRED TO REMOVE DEVICES.
 - REPLACE EXISTING 3P - 15A CIRCUIT BREAKER WITH NEW CIRCUIT BREAKER INDICATED.
 - REPLACE EXISTING CIRCUIT BREAKERS WITH NEW CIRCUIT BREAKERS AT SAME RESPECTIVE LOCATIONS WITHIN PANELBOARD AS REQUIRED BY OTHER KEYED NOTES.



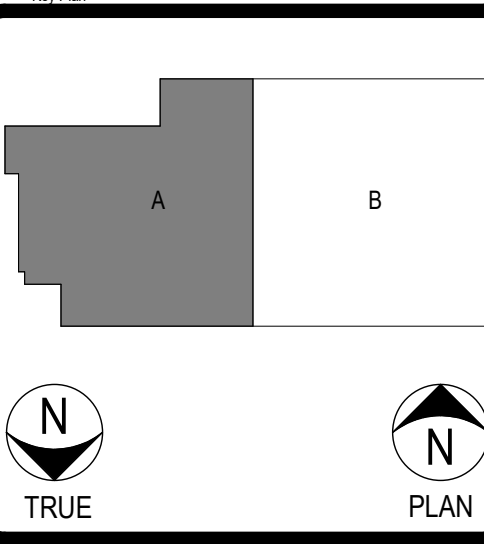
WIRING DEVICE LEGEND AND SCHEDULE							
SYMBOL	CHARACTERISTICS	RATING		DESCRIPTION	MANUFACTURER'S REFERENCE		
		VOLTS	AMPS		P. & S.	HUBBELL	LEVITON
WP	NEMA 5-20R	125	20	WEATHERPROOF GFI CONVENIENCE RECEPTACLE	2095	GFS362	7899

1 ELECTRICAL FLOOR PLAN AREA A
1/8" = 1'-0"

EXISTING HVAC EQUIPMENT AND ELECTRICAL GEAR WITHIN AREA INDICATED SHALL REMAIN AS IS.

NO	REVISION	DATE

WOOD RIVER ELEMENTARY HVAC REPLACEMENTS AND UPGRADES - 2026 (PHASE 1)
CALALLEN INDEPENDENT SCHOOL DISTRICT
15118 DRY CREEK DR, CORPUS CHRISTI, TX 78410
SERVICE ORDER NO. 4 - BOND 2023
ELECTRICAL FLOOR PLAN AREA A

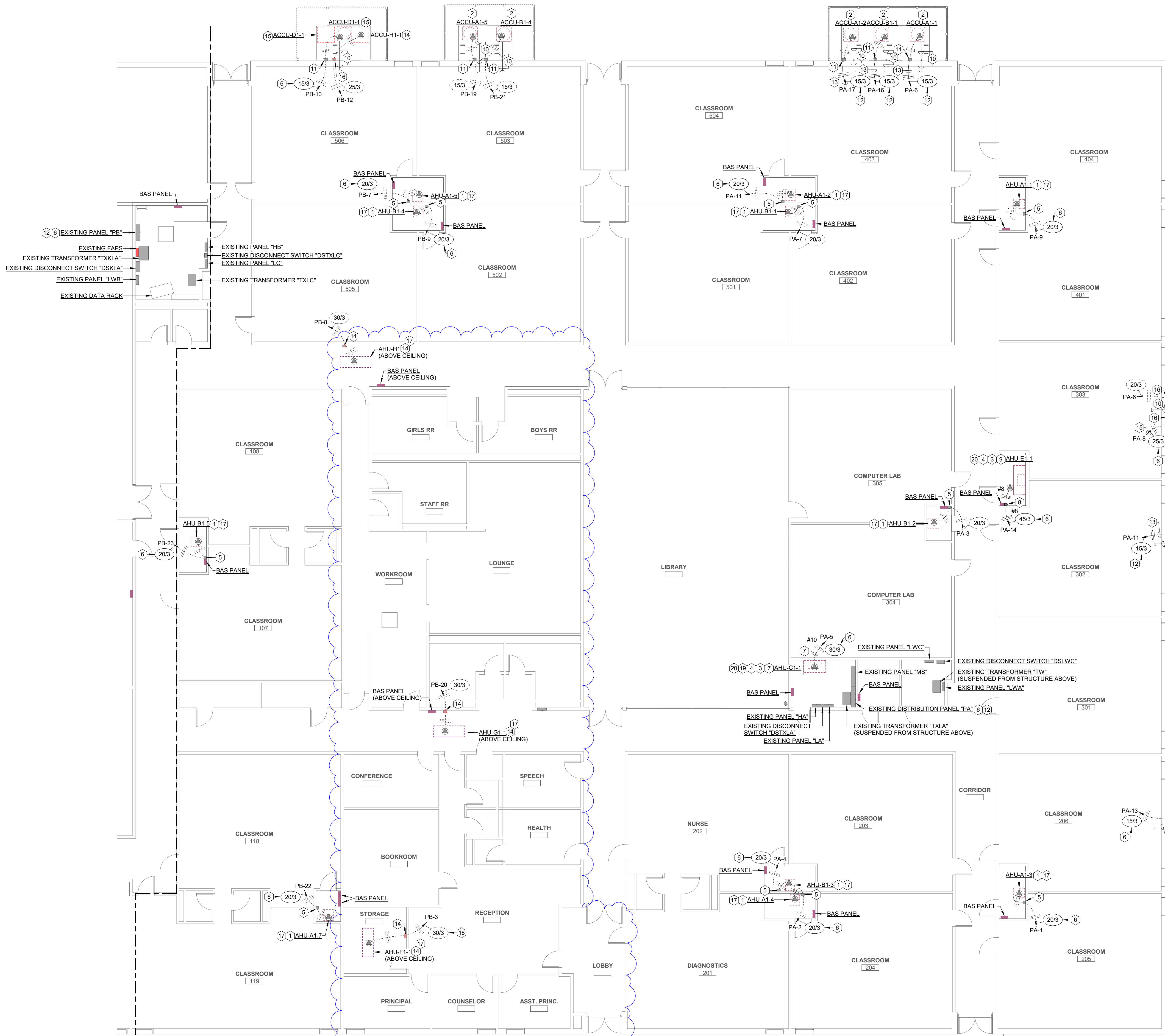


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Project No.	2024100
Date Drawn	11/13/2025
Drawn By	B.T.
Checked By	S.S.
Scale	As indicated
Sheet No.	2 of 25

E100



1 ELECTRICAL FLOOR PLAN AREA B
1/8" = 1'-0"

THE EXISTING CEILINGS IN THIS AREA WILL BE REMOVED AND REINSTALLED WITH NEW UNDER A SEPARATE PROJECT. THE DESIGN OF THE ASSOCIATED CEILINGS, LIGHT FIXTURES, FIRE ALARM, PA, AND THE LIKE WILL BE A PART OF THAT FUTURE PROJECT. THE CONTRACTOR ON THIS PROJECT SHALL NOT INCLUDE THE COST OF CEILING WORK IN THEIR PROPOSAL AND SHALL BE REQUIRED TO COORDINATE THEIR WORK WITH THE CONTRACTOR PROVIDED ON THIS FUTURE PROJECT FOR CONSTRUCTION IN SUMMER 2026. BOTH CONTRACTORS SHALL COORDINATE WORK ACTIVITIES TO AVOID CONFLICTS AND DELAYS IN CONSTRUCTION.

GENERAL NOTES:

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- ELECTRICAL DESIGN IS BASED UPON 2020 NEC AND 2021 IECC.
- FIRE ALARM DESIGN IS BASED UPON 2021 IFC AND 2020 NFPA 72.
- ELECTRICAL ITEMS INDICATED ON THIS DRAWING AS "EXISTING" SHALL REMAIN AS IS UNLESS OTHERWISE INDICATED.
- EXISTING DISTRIBUTION PANELS "PA" AND "PB" ARE I-T-E SWITCHBOARD TYPE CDP-6A. JOBSITE SURVEY NEW CIRCUIT BREAKER REQUIREMENTS.

KEYED NOTES:

- EXISTING HVAC EQUIPMENT SHALL BE REMOVED AND REPLACED BY NEW AT SAME APPROXIMATE LOCATION. DISCONNECT AND RECONNECT POWER CONNECTIONS TO EQUIPMENT AS REQUIRED. COORDINATE DISCONNECT / RECONNECT REQUIREMENTS WITH HVAC CONTRACTOR. ELECTRICAL FLOOR PLAN DRAWING INDICATES AHU HEATER CONNECTIONS ONLY. REFER TO AIR HANDLER CONNECTION DETAIL ON 2/E-100 FOR RECONNECTION REQUIREMENTS FOR AHU HEATER AND SUPPLY FAN.
- EXISTING HVAC EQUIPMENT SHALL BE REMOVED AND REPLACED BY NEW AT SAME APPROXIMATE LOCATION. DISCONNECT AND RECONNECT POWER CONNECTIONS TO EQUIPMENT AS REQUIRED. COORDINATE DISCONNECT / RECONNECT WITH HVAC CONTRACTOR.
- FIRE ALARM CONTRACTOR SHALL INSPECT EXISTING DUCT SMOKE DETECTOR(S) (SUPPLY AND RETURN AND THOROUGHLY CLEAN DETECTOR HEAD AND SAMPLING TUBE.
- EXISTING RETURN SMOKE DUCT DETECTOR SHALL BE RELOCATED FROM INSIDE OF PLENUM BOX TO EXTERIOR OF PLENUM BOX. COORDINATE LOCATION WITH HVAC CONTRACTOR AND HVAC DETAILS.
- EXISTING 30A, 600V, 3P, NF, NEMA-1 DISCONNECT SWITCH TO REMAIN.
- EXISTING CIRCUIT BREAKER TO BE REPLACED BY NEW CIRCUIT BREAKER INDICATED AT SAME CIRCUIT DESIGNATION. JOBSITE SURVEY CIRCUIT BREAKER REQUIREMENTS.
- EXISTING HVAC EQUIPMENT SHALL BE REMOVED AND REPLACED BY NEW AT SAME APPROXIMATE LOCATION. DISCONNECT AND REMOVE EXISTING CONDUCTORS AND REPLACE WITH NEW AS INDICATED IN NEW CONDUIT. TERMINATE NEW CONDUCTORS AT AHU POINT OF TERMINATION. COORDINATE DISCONNECT / RECONNECT REQUIREMENTS WITH HVAC CONTRACTOR.
- REMOVE EXISTING DISCONNECT SWITCH AND REPLACE WITH 60A, 600V, 3P, NF, NEMA-1 DISCONNECT SWITCH. MOUNT DISCONNECT SWITCH ABOVE BAS PANEL AT APPROXIMATE LOCATION INDICATED.
- EXISTING HVAC EQUIPMENT SHALL BE REMOVED AND REPLACED BY NEW AT SAME APPROXIMATE LOCATION. DISCONNECT AND REMOVE EXISTING CONDUIT AND CONDUCTORS AND REPLACE WITH NEW AS INDICATED IN NEW CONDUIT. TERMINATE NEW CONDUCTORS AT AHU POINT OF TERMINATION. COORDINATE DISCONNECT / RECONNECT REQUIREMENTS WITH HVAC CONTRACTOR.
- ROUTE ONE(1) - 3/4" CONDUIT WITH PULLCORD FROM ACCESSIBLE CEILING SPACE, THROUGH EXISTING WALL, DOWN EXPOSED WALL TO CONDENSING UNIT. CONDUIT SHALL BE ROUTED THRU WALL PENETRATION HOOD (BY HVAC CONTRACTOR). COORDINATE ROUTING / LOCATION WITH HVAC CONTRACTOR AND HVAC DETAILS.
- EXISTING DISCONNECT SWITCH SHALL BE REPLACED BY NEW 30A, 600V, 3P, NF, NEMA-3R DISCONNECT SWITCH AT SAME APPROXIMATE LOCATION. RECONNECT EXISTING LINE SIDE FEEDER TO NEW DISCONNECT SWITCH AS REQUIRED. EXISTING LOAD SIDE FEEDER MAY BE REUSED IF AS FEASIBLE. PROVIDE NEW LOAD SIDE CONDUIT AND CONDUCTORS (TO MATCH EXISTING) IF REQUIRED. MODIFY AND SUPPORT EXISTING AND NEW CONDUIT AND CONDUCTORS AS REQUIRED. N.E.C. REQUIRED CLEARANCES SHALL BE MAINTAINED.
- INSTALL NEW CIRCUIT BREAKER AT CIRCUIT DESIGNATION INDICATED. JOBSITE SURVEY CIRCUIT BREAKER REQUIREMENTS.
- JOBSITE LOCATE AND INTERCEPT EXISTING LINE SIDE CONDUIT AND CONDUCTORS AND ROUTE TO PANEL INDICATED. PROVIDE NEW CONDUIT AND CONDUCTORS FROM INTERCEPTION POINT TO PANEL INDICATED. JOBSITE LOCATE ROUTE. TERMINATE CONDUCTORS AT NEW CIRCUIT BREAKER INDICATED.
- EXISTING HVAC UNIT SHALL BE REMOVED. REMOVE ASSOCIATED ELECTRICAL GEAR, CONDUIT, AND CONDUCTORS TO SOURCE. REMOVE EXISTING CIRCUIT BREAKER UNLESS OTHERWISE INDICATED.
- EXISTING HVAC UNIT SHALL BE REMOVED AND REPLACED WITH NEW AT DIFFERENT LOCATION. EXISTING DISCONNECT SWITCH SHALL BE REPLACED BY NEW 30A, 600V, 3P, NF, NEMA-3R DISCONNECT SWITCH AT NEW APPROXIMATE LOCATION. RECONNECT EXISTING LINE SIDE FEEDER TO NEW DISCONNECT SWITCH AS REQUIRED. PROVIDE NEW LOAD SIDE CONDUIT AND CONDUCTORS (TO MATCH EXISTING). ROUTE NEW CONDUIT AND CONDUCTORS ON HVAC SUPPORTS TO NEW CONDENSING UNIT AS REQUIRED. N.E.C. REQUIRED CLEARANCES SHALL BE MAINTAINED. REFER TO HVAC DETAILS FOR ADDITIONAL REQUIREMENTS.
- EXISTING DISCONNECT SWITCH TO BE REMOVED. CUT EXISTING CONDUIT TO ABANDONED IN WALL TO BE FLUSH WITH EXTERIOR BRICK. SPRAY FOAM INSIDE OF CONDUIT TO BE AIR-TIGHT SEALED. APPLY MORTAR OVER EXISTING CONDUIT TO MATCH EXISTING BRICK CONDITIONS.
- REMOVE EXISTING FIRE ALARM SMOKE DETECTORS FROM SUPPLY AND RETURN AIR DUCTS AS REQUIRED. REMOVE FIRE ALARM RELAY AND ASSOCIATED FIRE ALARM CABLE CONNECTION TO SLC LOOP. PROVIDE CONTINUITY OF THE SLC LOOP IF CONTINUITY IS LOST DUE TO DETECTOR REMOVAL. REPROGRAM FIRE ALARM CONTROL PANEL AS REQUIRED TO REMOVE DEVICES.
- EXISTING CIRCUIT BREAKER SHALL REMAIN.
- PROVIDE 1/8" THICK WHITE PLASTIC PHENOLIC LABEL WITH BLACK SUNKEN LETTERS (1/2" FONT) TO READ "CIRCUIT BREAKER TO ACT AS SERVICE DISCONNECT SWITCH". PERMANENTLY AFFIX LABEL NEXT TO AHU-C-1 LABEL.
- RECONNECT EXISTING FIRE ALARM CABLE TO NEW EMERGENCY E-STOP TERMINATION POINT.

EXISTING METER
EXISTING 300KVA
UTILITY TRANSFORMER

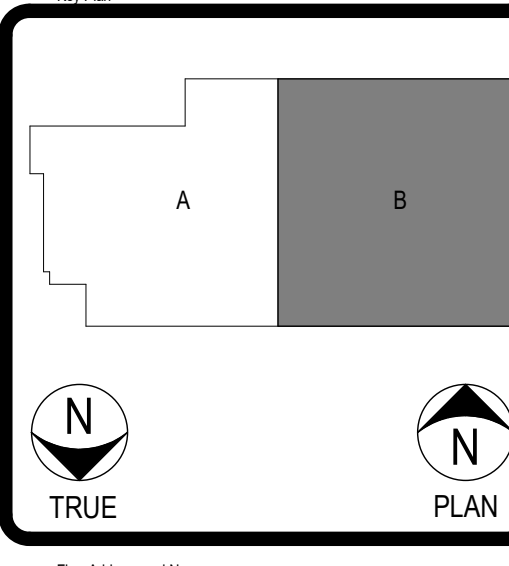
ELECTRICAL LEGEND

NOTE: THIS IS A STANDARD LEGEND. ALL SYMBOLS AND ABBREVIATIONS HEREIN MAY NOT BE APPLICABLE TO THIS PROJECT.

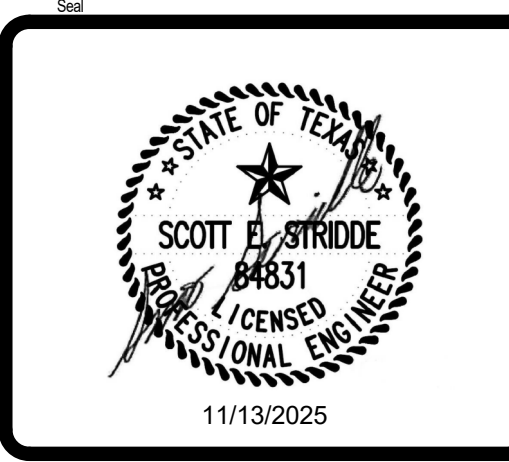
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
[RECEPTACLE]	RECEPTACLE - REFER TO WIRING DEVICE SCHEDULE	[RACEWAY WITH NUMBER OF CONDUCTORS INDICATED]	RACEWAY WITH NUMBER OF CONDUCTORS INDICATED
[MANUAL MOTOR STARTER, SURFACE MOUNTED]	MANUAL MOTOR STARTER, SURFACE MOUNTED	[RACEWAY IN CONCRETE FLOOR SLAB AND/OR WALLS WITH NUMBER OF CONDUCTORS INDICATED]	RACEWAY IN CONCRETE FLOOR SLAB AND/OR WALLS WITH NUMBER OF CONDUCTORS INDICATED
[MANUAL MOTOR STARTER, FLUSH MOUNTED]	MANUAL MOTOR STARTER, FLUSH MOUNTED	[UG - UNDERGROUND RACEWAY]	UNDERGROUND RACEWAY
[MAGNETIC MOTOR STARTER]	MAGNETIC MOTOR STARTER	[LA1/2]	PANEL AND CIRCUIT NUMBERS
[CONTRACTOR - C, RELAY - R]	CONTRACTOR - C, RELAY - R	[ARROW]	ARROWS INDICATE HOME RUN TO PANEL
[DISCONNECT SWITCH]	DISCONNECT SWITCH	[1"]	CONDUIT SIZE IF INDICATED
[COMBINATION MOTOR STARTER/DISCONNECT SWITCH - REFER TO DRAWING NOTES FOR REQUIREMENTS]	COMBINATION MOTOR STARTER/DISCONNECT SWITCH - REFER TO DRAWING NOTES FOR REQUIREMENTS	[302]	BRANCH CIRCUIT BREAKER SIZE IN PANEL INDICATED IF OTHER THAN 1P20A
[JUNCTION BOX]	JUNCTION BOX	[NEUTRAL CONDUCTOR]	NEUTRAL CONDUCTOR
[120 VOLT SINGLE PHASE CONNECTION TO EQUIPMENT NOTED]	120 VOLT SINGLE PHASE CONNECTION TO EQUIPMENT NOTED	[UNGROUNDING CONDUCTORS]	UNGROUNDING CONDUCTORS
[208 VOLT OR 240 VOLT SINGLE PHASE CONNECTION TO EQUIPMENT NOTED]	208 VOLT OR 240 VOLT SINGLE PHASE CONNECTION TO EQUIPMENT NOTED	[CONDUCTOR SIZE INDICATED IF OTHER THAN NO. 12 AWG]	CONDUCTOR SIZE INDICATED IF OTHER THAN NO. 12 AWG
[208 VOLT OR 240 VOLT THREE PHASE CONNECTION TO EQUIPMENT NOTED]	208 VOLT OR 240 VOLT THREE PHASE CONNECTION TO EQUIPMENT NOTED	[CONDUCTORS SHALL BE SIZE INDICATED FOR ENTIRE LENGTH OF CIRCUIT]	CONDUCTORS SHALL BE SIZE INDICATED FOR ENTIRE LENGTH OF CIRCUIT
[277 VOLT SINGLE PHASE CONNECTION TO EQUIPMENT NOTED]	277 VOLT SINGLE PHASE CONNECTION TO EQUIPMENT NOTED	[C]	CONTROL SYSTEM RACEWAY AND/OR CONDUCTORS - REFER TO SPECIFICATIONS FOR REQUIREMENTS
[480 VOLT THREE PHASE CONNECTION TO EQUIPMENT NOTED]	480 VOLT THREE PHASE CONNECTION TO EQUIPMENT NOTED	[CONDUIT CONTINUATION TO POINT NOTED]	CONDUIT CONTINUATION TO POINT NOTED
[CONTROL OUTLET AND CONNECTIONS AS REQUIRED]	CONTROL OUTLET AND CONNECTIONS AS REQUIRED	[ELECTRICAL BRANCH CIRCUIT PANEL AS NOTED]	ELECTRICAL BRANCH CIRCUIT PANEL AS NOTED
[FIRE ALARM SYSTEM HEAT DETECTOR]	FIRE ALARM SYSTEM HEAT DETECTOR	[DISTRIBUTION PANEL OR SWITCHBOARD AS NOTED]	DISTRIBUTION PANEL OR SWITCHBOARD AS NOTED
[FIRE ALARM SYSTEM MANUAL STATION]	FIRE ALARM SYSTEM MANUAL STATION	[VFD]	VARIABLE FREQUENCY DRIVE
[FAPS]	FIRE ALARM SYSTEM CONTROL PANEL	[FAN]	FAN POWERED BOX
[FAPS]	FIRE ALARM SYSTEM POWER SUPPLY	[AHU]	AIR HANDLING UNIT
[FAPS]	FIRE ALARM SYSTEM VOICE EVACUATION PANEL	[EDH]	ELECTRIC DUCT HEATER
[RA]	FIRE ALARM SYSTEM REMOTE ANNUNCIATOR	[WP]	WEATHERPROOF DEVICE OR ENCLOSURE
[SD]	FIRE ALARM SYSTEM SMOKE DETECTOR		
[S]	FIRE ALARM SYSTEM SPEAKER		
[F]	FIRE ALARM SYSTEM COMBINATION SPEAKER/STROBE		
[F]	FIRE ALARM SYSTEM EXTERIOR HORN		
[F]	FIRE ALARM SYSTEM COMBINATION HORN/STROBE (C-CEILING)		
[S]	FIRE ALARM SYSTEM DUCT SMOKE DETECTOR		
[S]	FIRE ALARM SYSTEM DOOR HOLDER		

NO REVISION DATE

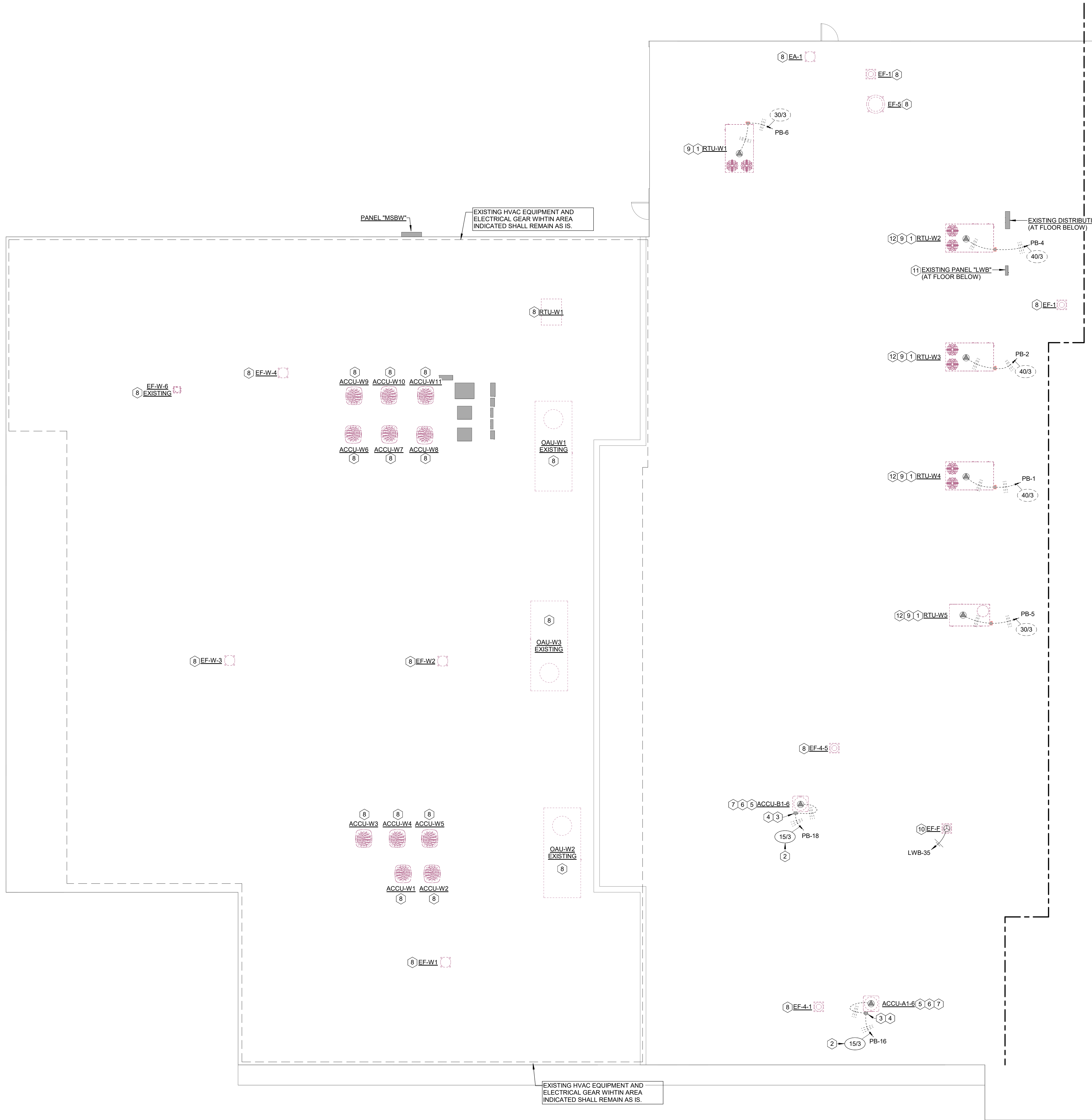
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ELECTRICAL FLOOR PLAN AREA B



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Project No. 2024100
Date Drawn: 11/13/2025
Drawn By: B.T.
Checked By: S.S.
Scale: As Indicated
Sheet No. 3 of 25
E101



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- ELECTRICAL ITEMS INDICATED ON THIS DRAWINGS AS "EXISTING" SHALL REMAIN AS IS UNLESS OTHERWISE INDICATED.

KEYED NOTES:

- EXISTING HVAC EQUIPMENT SHALL BE REMOVED AND REPLACED BY NEW AT SAME APPROXIMATE LOCATION. DISCONNECT AND REMOVE LOAD SIDE CONDUIT AND CONDUCTORS AND DISCONNECT SWITCH. INSTALL NEW JUNCTION BOX BELOW ROOF AND TERMINATE EXISTING LINE SIDE FEEDER AT BOX. PROVIDE AND ROUTE NEW LINE SIDE CONDUIT AND CONDUCTORS (TO MATCH EXISTING) FROM JUNCTION BOX TO UNIT AND TERMINATE AT NEW RTU POINT OF TERMINATION (INTEGRAL CIRCUIT BREAKER / DISCONNECT). MODIFY AND SUPPORT EXISTING AND NEW CONDUIT AND CONDUCTORS AS REQUIRED. REFER TO HVAC DETAILS FOR CONDUIT ROUTING.
- EXISTING CIRCUIT BREAKER TO BE REPLACED BY NEW CIRCUIT BREAKER INDICATED AT SAME CIRCUIT DESIGNATION. JOBSITE SURVEY CIRCUIT BREAKER REQUIREMENTS.
- EXISTING DISCONNECT SWITCH SHALL BE REPLACED BY NEW 30A, 600V, 3P, NF, NEMA-3R DISCONNECT SWITCH AT SAME APPROXIMATE LOCATION. RECONNECT EXISTING LINE SIDE FEEDER TO NEW DISCONNECT SWITCH AS REQUIRED. EXISTING ROOF PENETRATION LOCATION FOR LINE SIDE FEEDER IS TO REMAIN AS IS. MODIFY EXISTING LINE SIDE FEEDER IF REQUIRED TO ROUTE THRU NEW ROOF PENETRATION HOOD. EXISTING LOAD SIDE FEEDER MAY BE REUSED IF / AS FEASIBLE. PROVIDE NEW LOAD SIDE CONDUIT AND CONDUCTORS (TO MATCH EXISTING) IF REQUIRED. MODIFY AND SUPPORT EXISTING AND NEW CONDUIT AND CONDUCTORS AS REQUIRED. ROUTE NEW AND EXISTING CONDUIT ON HVAC SUPPORTS. N.E.C. REQUIRED CLEARANCES SHALL BE MAINTAINED. REFER TO HVAC DETAILS FOR DISCONNECT SWITCH LOCATION.
- FURNISH AND INSTALL 1 5/8" HOT DIPPED GALVANIZED STRUT SECURED TO UNISTRUT SUPPORT BY HVAC CONTRACTOR FOR REPLACED / NEW DISCONNECT SWITCH. PROVIDE TWO(2) - VERTICAL SUPPORTS, TWO (2) - LATERAL SUPPORTS AND TOE BRACES FOR EACH DISCONNECT SWITCH. COORDINATE REQUIREMENTS WITH HVAC CONTRACTOR. REFER TO HVAC DETAILS FOR DISCONNECT SWITCH LOCATION.
- EXISTING HVAC EQUIPMENT SHALL BE REMOVED AND REPLACED WITH NEW AT SAME APPROXIMATE LOCATION. DISCONNECT AND RECONNECT POWER CONNECTION TO EQUIPMENT AS REQUIRED. COORDINATE DISCONNECT / RECONNECT REQUIREMENTS WITH HVAC CONTRACTOR.
- ROUTE CONDUIT AND CONDUCTORS THROUGH NEW ROOF PENETRATION HOOD. COORDINATE ROOF PENETRATION HOOD LOCATION WITH HVAC CONTRACTOR.
- PROVIDE 3/4" CONDUIT (EMT BELOW ROOF AND RIGID GALVANIZED CONDUIT ABOVE ROOF) WITH PULLCORD FOR HVAC CONTROLS. STUB CONDUIT BELOW ROOF STRUCTURE AND ROUTE CONDUIT FROM ACCESSIBLE CEILING UP THROUGH ROOF PENETRATION HOOD TO NEW CONDENSING UNIT. COORDINATE ROUTE WITH HVAC CONTRACTOR AND HVAC DRAWINGS / DETAILS.
- EXISTING EQUIPMENT SHALL REMAIN AS IS.
- FIRE ALARM CONTRACTOR SHALL INSPECT EXISTING DUCT SMOKE DETECTOR(S) (SUPPLY AND RETURN) AND THOROUGHLY CLEAN DETECTOR HEAD AND SAMPLING TUBE.
- ROUTE CONDUIT AND CONDUCTORS THROUGH RELAY BY HVAC / BAS CONTRACTOR. COORDINATE ROUTING REQUIREMENTS WITH HVAC CONTRACTOR.
- EXISTING EATON PRL1A PANEL "LWB". INSTALL NEW 20A/1P CIRCUIT BREAKER AT NEXT AVAILABLE SPACE.
- PROVIDE ONE (1) - 1" CONDUIT WITH PULLCORD (BAS CONTROLS) AND ONE (1) - 3/4" LIQUID TIGHT METAL FLEX CONDUIT (WITH FIRE ALARM CABLE) THROUGH NEW HVAC UNIT UTILITY CHASE, TO ROOFTOP UNIT CONTROL CABINET. STUB CONDUIT AT ACCESSIBLE LOCATION ABOVE LOWEST CEILING.

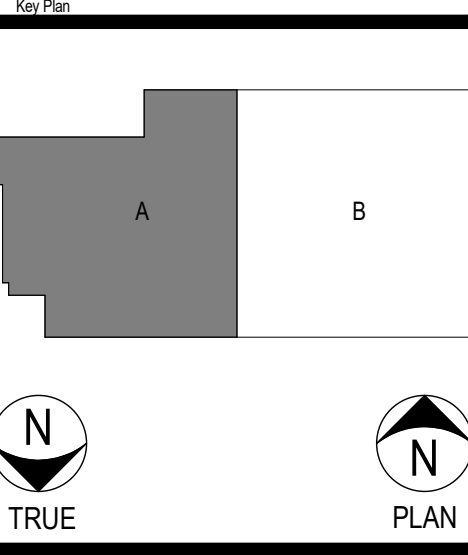
WOOD RIVER ELEMENTARY HVAC REPLACEMENTS AND UPGRADES - 2026 (PHASE 1)

CALALLEN INDEPENDENT SCHOOL DISTRICT

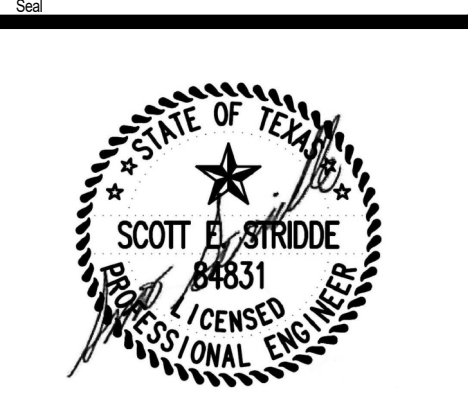
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SERVICE ORDER NO. 4 - BOND 2023

ELECTRICAL ROOF PLAN AREA A

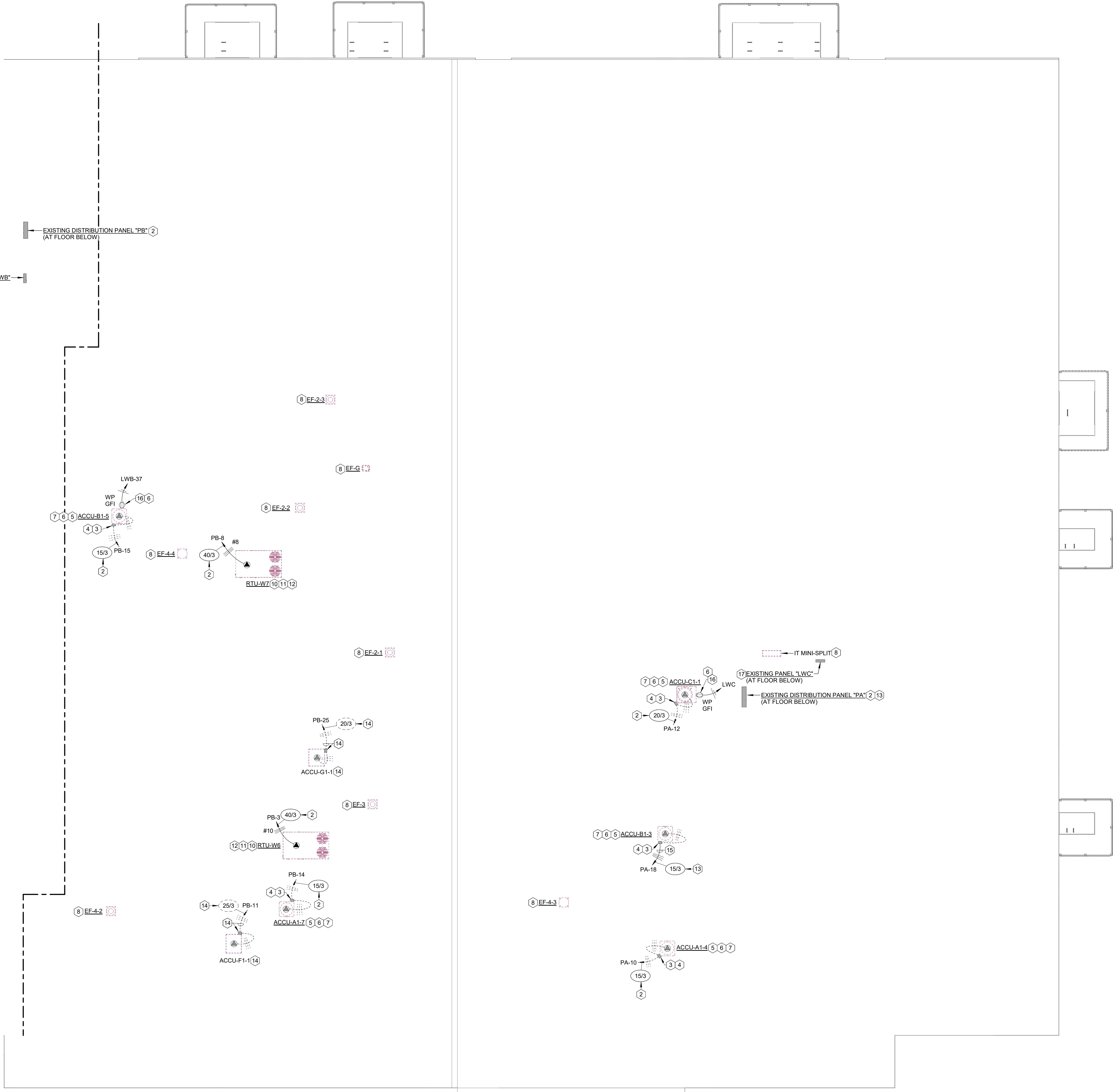


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Registration # F-006328



Project No.	2024100
Date Drawn	11/13/2025
Drawn By	B.T.
Checked By	S.S.
Scale	1/8" = 1'-0"
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E102



GENERAL NOTES:

- INFORMATION INCLUDED ON THIS DRAWING IS INTENDED TO INDICATE THE GENERAL CHARACTER AND EXTENT OF WORK REQUIRED. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- ELECTRICAL DESIGN IS BASED UPON 2020 NEC AND 2021 IECC.
- FIRE ALARM DESIGN IS BASED UPON 2021 IFC AND 2020 NFPA 72.
- EXISTING DISTRIBUTION PANELS "PA" AND "PB" ARE I-T-E SWITCHBOARD TYPE CDP-6A. JOBSITE SURVEY NEW CIRCUIT BREAKER REQUIREMENTS.
- ELECTRICAL ITEMS INDICATED ON THIS DRAWINGS AS "EXISTING" SHALL REMAIN AS IS UNLESS OTHERWISE INDICATED.

KEYED NOTES:

- NOT USED.
- EXISTING CIRCUIT BREAKER TO BE REPLACED BY NEW CIRCUIT BREAKER INDICATED AT SAME CIRCUIT DESIGNATION. JOBSITE SURVEY CIRCUIT BREAKER REQUIREMENTS.
- EXISTING DISCONNECT SWITCH SHALL BE REPLACED BY NEW 30A, 600V, 3P, NF, NEMA-3R DISCONNECT SWITCH AT SAME APPROXIMATE LOCATION. RECONNECT EXISTING LINE SIDE FEEDER TO NEW DISCONNECT SWITCH AS REQUIRED. EXISTING ROOF PENETRATION LOCATION FOR LINE SIDE FEEDER IS TO REMAIN AS IS. MODIFY EXISTING LINE SIDE FEEDER IF REQUIRED TO ROUTE THRU NEW ROOF PENETRATION HOOD. EXISTING LOAD SIDE FEEDER MAY BE REUSED IF / AS FEASIBLE. PROVIDE NEW LOAD SIDE CONDUIT AND CONDUCTORS (TO MATCH EXISTING) IF REQUIRED. MODIFY AND SUPPORT EXISTING AND NEW CONDUIT AND CONDUCTORS AS REQUIRED. ROUTE NEW AND EXISTING CONDUIT ON HVAC SUPPORTS, N.E.C. REQUIRED CLEARANCES SHALL BE MAINTAINED. REFER TO HVAC DETAILS FOR DISCONNECT SWITCH LOCATION.
- FURNISH AND INSTALL 1 5/8" HOT DIPPED GALVANIZED STRUT SECURED TO UNISTRUT SUPPORT BY HVAC CONTRACTOR FOR REPLACED / NEW DISCONNECT SWITCH. PROVIDE TWO(2) - VERTICAL SUPPORTS, TWO (2) - LATERAL SUPPORTS AND TOE BRACES FOR EACH DISCONNECT SWITCH. COORDINATE REQUIREMENTS WITH HVAC CONTRACTOR. REFER TO HVAC DETAILS FOR DISCONNECT SWITCH LOCATION.
- EXISTING HVAC EQUIPMENT SHALL BE REMOVED AND REPLACED WITH NEW AT SAME APPROXIMATE LOCATION. DISCONNECT AND RECONNECT POWER CONNECTION TO EQUIPMENT AS REQUIRED. COORDINATE DISCONNECT / RECONNECT REQUIREMENTS WITH HVAC CONTRACTOR.
- ROUTE CONDUIT AND CONDUCTORS THROUGH NEW ROOF PENETRATION HOOD. COORDINATE ROOF PENETRATION HOOD LOCATION WITH HVAC CONTRACTOR.
- PROVIDE 3/4" CONDUIT (EMT BELOW ROOF AND RIGID GALVANIZED CONDUIT ABOVE ROOF) WITH PULLCORD FOR HVAC CONTROLS. STUB CONDUIT BELOW ROOF STRUCTURE AND ROUTE CONDUIT FROM ACCESSIBLE CEILING UP THROUGH ROOF PENETRATION HOOD TO NEW CONDENSING UNIT. COORDINATE ROUTE WITH HVAC CONTRACTOR AND HVAC DRAWINGS / DETAILS.
- EXISTING EQUIPMENT SHALL REMAIN.
- EXISTING EATON PRL1A PANEL "LWB". INSTALL NEW 20A/1P CIRCUIT BREAKER AT NEXT AVAILABLE SPACE.
- ROUTE CONDUIT AND CONDUCTORS UP INSIDE ROOF CURB AND THROUGH ROOFTOP UNIT UTILITY CHASE AS REQUIRED AT DISCONNECT SWITCH INTEGRAL TO UNIT. COORDINATE ROUTING / INSTALLATION WITH HVAC CONTRACTOR.
- PROVIDE ONE (1) - 1" CONDUIT WITH PULLCORD (BAS CONTROLS) AND ONE (1) - 3/4" CONDUIT (WITH FIRE ALARM CABLE) THROUGH NEW HVAC UNIT UTILITY CHASE, TO ROOFTOP UNIT CONTROL CABINET. STUB CONDUIT AT ACCESSIBLE LOCATION ABOVE CEILING.
- FIRE ALARM CONTRACTOR SHALL PROVIDE SUPPLY AND RETURN SIDE SMOKE DUCT DETECTORS FOR UNIT INDICATED.
- INSTALL NEW CIRCUIT BREAKER AT CIRCUIT DESIGNATION INDICATED. JOBSITE SURVEY CIRCUIT BREAKER REQUIREMENTS.
- EXISTING HVAC UNIT SHALL BE REMOVED. REMOVE ASSOCIATED ELECTRICAL GEAR, CONDUIT, AND CONDUCTORS TO SOURCE. REMOVE EXISTING CIRCUIT BREAKER.
- JOBSITE LOCATE AND INTERCEPT EXISTING LINE SIDE CONDUIT AND CONDUCTORS BELOW ROOF AND ROUTE TO PANEL INDICATED. PROVIDE NEW CONDUIT AND CONDUCTORS FROM INTERCEPTION POINT TO PANEL INDICATED. JOBSITE LOCATE ROUTE. TERMINATE CONDUCTORS AT NEW CIRCUIT BREAKER INDICATED.
- MOUNT DEVICE ON NEW STRUT BY HVAC CONTRACTOR AT LOCATION SELECTED BY HVAC CONTRACTOR.
- EXISTING EATON PRL1A PANEL "LWC". INSTALL NEW 20A/1P CIRCUIT BREAKER AT NEXT AVAILABLE SPACE.

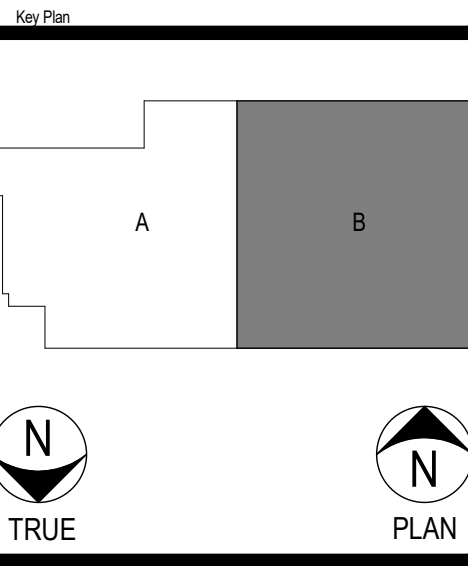
WOOD RIVER ELEMENTARY HVAC REPLACEMENTS AND UPGRADES - 2026 (PHASE 1)

CALALLEN INDEPENDENT SCHOOL DISTRICT

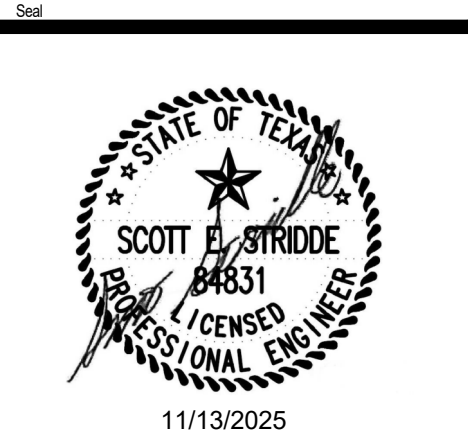
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SERVICE ORDER NO. 4 - BOND 2023

ELECTRICAL ROOF PLAN AREA B

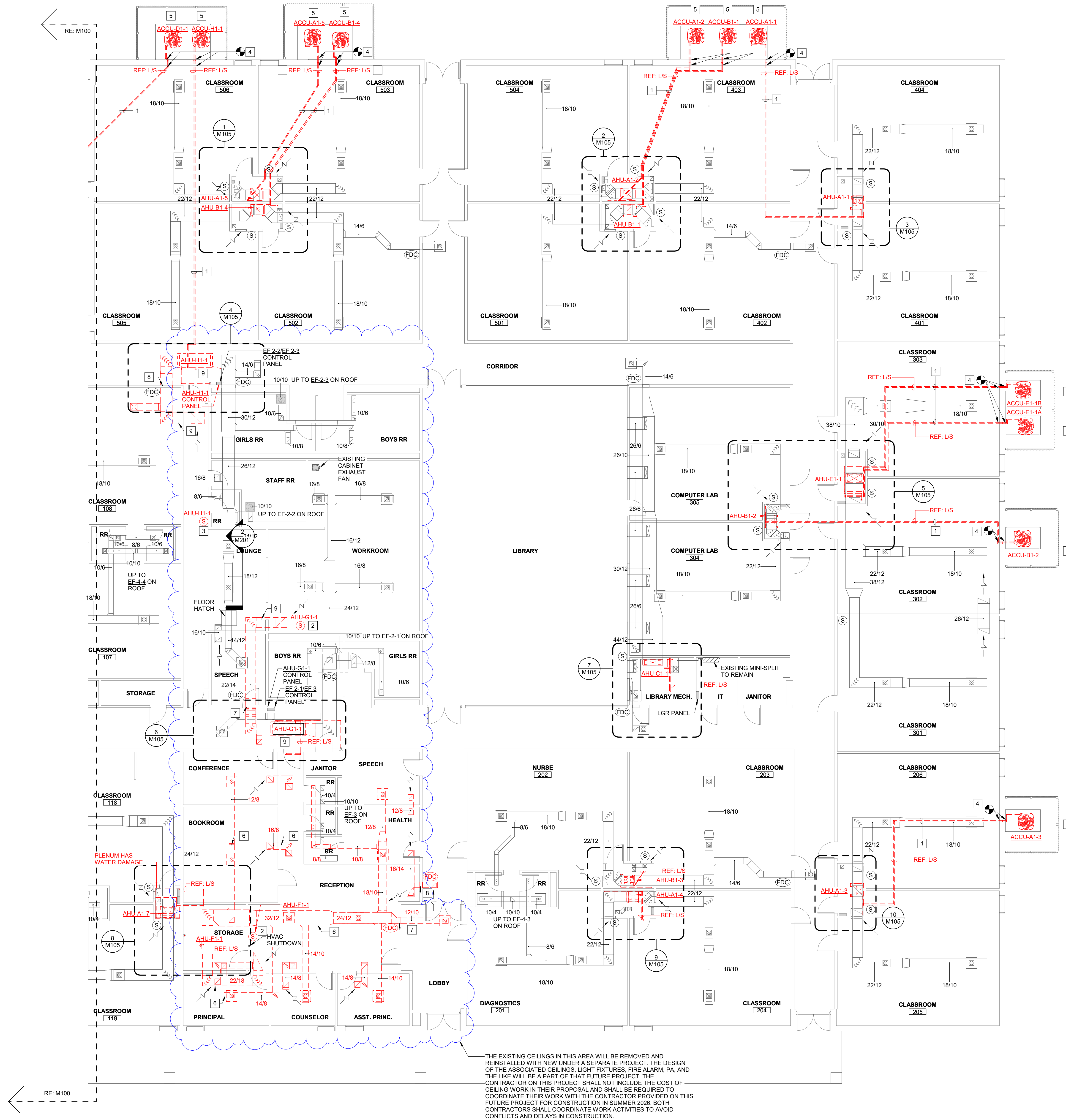


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1 MECHANICAL DEMOLITION PLAN AREA "B"
1/8" = 1'-0"

MECHANICAL DEMOLITION DRAWING SHEET LEGEND		
	PIPING AND/OR DUCTWORK TO BE DEMOLISHED	
	EQUIPMENT TO BE DEMOLISHED	
	PIPING AND/OR DUCTWORK EXISTING TO REMAIN	
	EQUIPMENT TO REMAIN	
	EXTENT OF DEMOLITION	

GENERAL NOTES: SHEET M101

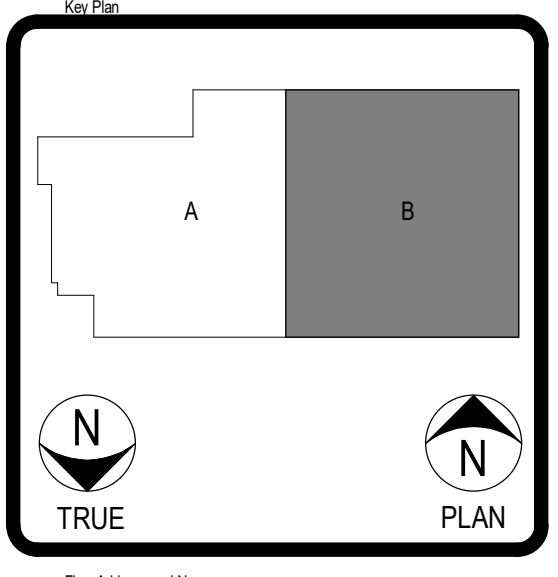
- CEILINGS:
 - CONTRACTOR SHALL SURVEY EXISTING FACILITIES AND LOCATE ALL CEILING TYPES AND INCLUDE THE COST OF CEILING REPAIRS AS NEEDED TO PERFORM THE PROJECT WORK.
 - GENERAL AREAS: CONTRACTOR SHALL CAREFULLY REMOVE EXISTING LAY-IN CEILING GRID AND DEMOLISH CEILING TILES AS NEEDED TO PERFORM WORK AND REINSTALL GRID AT PROJECT COMPLETION WITH NEW CEILING TILES. ANY DAMAGED SYSTEMS SHALL BE REPLACED WITH NEW TO MATCH EXISTING CONSTRUCTION AND FINISHED COLOR.
 - HEAVY WORK AREAS: CONTRACTOR SHALL REMOVE EXISTING LAY-IN CEILING "GRID AND TILES" IN HEAVY AREAS OF CONSTRUCTION ABOVE AND REPLACE WITH NEW AT PROJECT COMPLETION. EXISTING LIGHT FIXTURES, FIRE ALARM, HVAC AIR DEVICES AND THE LIKE SHALL BE STRUNG UP WITH TEMPORARY SUPPORTS DURING CONSTRUCTION FOR REINSTALLATION INTO NEW CEILINGS FOR ALL SYSTEMS TO REMAIN. REFER TO THE SPECIFICATIONS FOR NEW GRID AND TILES CONSTRUCTION AND INSTALLATION REQUIREMENTS.
 - STRUCTURAL SUB-CEILING: CONTRACTOR IS NOTIFIED THAT THE EXISTING ROOF STRUCTURE HAS A GYPSUM BOARD SUB-CEILING INSTALLED BELOW THE STEEL AS A MEANS OF FIRE PROTECTION. CONTRACTOR WILL BE REQUIRED TO REMOVE PORTIONS OF THE CEILING AND PATCH AT PROJECT COMPLETION AS NEEDED TO PERFORM THE WORK.
 - ADMIN. LOUNGE, WORK AND ASSOCIATED CORRIDOR AREAS: CEILINGS WILL BE DEMOLISHED AND REPLACED WITH NEW UNDER A SEPARATE CONSTRUCTION PROJECT. CONTRACTOR SHALL NOT INCLUDE THE COST OF CEILING WORK IN THESE AREAS IN THEIR PROPOSAL AND SHALL COORDINATE THEIR WORK WITH THE OTHER CONSTRUCTION PROJECT AS APPLICABLE.
- FLOORS: CONTRACTOR SHALL PROTECT ALL FLOORS WITH PANELING OR HEAVY CARDBOARD AS REQUIRED TO PREVENT DAMAGE TO EXISTING FLOORING.
- REFER TO ENLARGED PLANS FOR DETAILED WORK SCOPE NEAR EQUIPMENT AS CALLED OUT ON THE DRAWINGS.
- INTERIOR WALLS:
 - ALL INTERIOR WALLS GO ALL OF THE WAY UP TO THE BOTTOM OF THE GYPSUM BOARD ROOF SUB-CEILING. CONTRACTOR SHALL PROVIDE WALL SLEEVES AS NEEDED FOR PIPE AND DUCT PENETRATIONS.
 - ALL CORRIDOR WALLS GO ALL OF THE WAY UP TO THE BOTTOM OF THE GYPSUM BOARD ROOF SUB-CEILING. CONTRACTOR SHALL PROVIDE WALL SLEEVES FOR ALL PIPING PENETRATIONS AND SEAL FIRE TIGHT AND SHALL PROVIDE FIRE DAMPERS FOR ALL DUCT PENETRATIONS.

HVAC DEMOLITION KEYED NOTES: SHEET M101

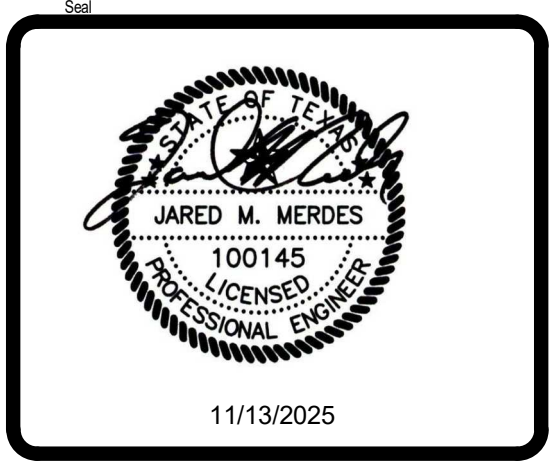
- DEMOLISH EXISTING REFRIGERANT PIPING AND CONTROL WIRING FROM AHU TO OUTDOOR ACCU. GROUND OR ROOF MOUNTED. REUSE EXISTING PIPE SUPPORT VERTICAL ROD SUPPORTS WHEREVER FEASIBLE. NEW PIPING WILL BE INSTALLED AT THE APPROXIMATE LOCATION AS EXISTING WITH NEW HANGER SUPPORTS. (TYPICAL).
- BAS CONTRACTOR SHALL REMOVE THE EXISTING SPACE SENSORS AND REPLACE WITH NEW. DELIVER SENSORS TO OWNER FOR ATTIC STOCK. REFER TO RENOVATION DRAWINGS.
- BAS CONTRACTOR SHALL DEMOLISH THE EXISTING SPACE SENSOR AND PROVIDE A STAINLESS-STEEL BLANK PLATE. DELIVER SENSORS TO OWNER FOR ATTIC STOCK.
- GROUND MOUNTED ACCUS: ABANDON EXISTING REFRIGERANT PIPING INSTALLED WITHIN CONCRETE BLOCK WALLS. DEMOLISH PIPING AND CONTROL CONDUIT AT BOTTOM OF EXTERIOR WALL MINIMUM 1.5" INTO WALL. FILL VOID SPACE IN WALL WITH MORTAR TO MATCH EXISTING GROUT FOR A PERMANENT FINISH.
- DEMOLISH EXISTING GROUND MOUNTED ACCU AND ANY ASSOCIATED ANCHORAGE. EXISTING CONCRETE PAD FOUNDATIONS SHALL REMAIN FOR REUSE WITH NEW EQUIPMENT.
- AHU-F-1 ADMIN: DEMOLISH ALL EXISTING SUPPLY AND RETURN AIR DUCTWORK AND REPLACE WITH NEW. REFER TO RENOVATION DRAWINGS. (TYPICAL).
- DEMOLISH EXISTING WALL FIRE DAMPER AND REPLACE WITH NEW. REFER TO RENOVATION DRAWINGS.
- DEMOLISH EXISTING WALL FIRE DAMPER AND PERMANENTLY PATCH WALL ABOVE CEILING FIRE TIGHT.
- AHU-H-1, AHU-G-1: DEMOLISH EXISTING AHU, DUCTWORK AND PIPING AS SHOWN. EXISTING SUPPLY DUCTWORK SHALL REMAIN FOR SERVICE FROM NEW RTU-W7. REFER TO RENOVATION DRAWINGS.

NO	REVISION	DATE

WOOD RIVER ELEMENTARY HVAC REPLACEMENTS AND UPGRADES - 2026 (PHASE 1)
CALALLEN INDEPENDENT SCHOOL DISTRICT
15118 DRY CREEK DR, CORPUS CHRISTI, TX 78410
SERVICE ORDER NO. 4 - BOND 2023
MECHANICAL DEMOLITION PLAN AREA "B"

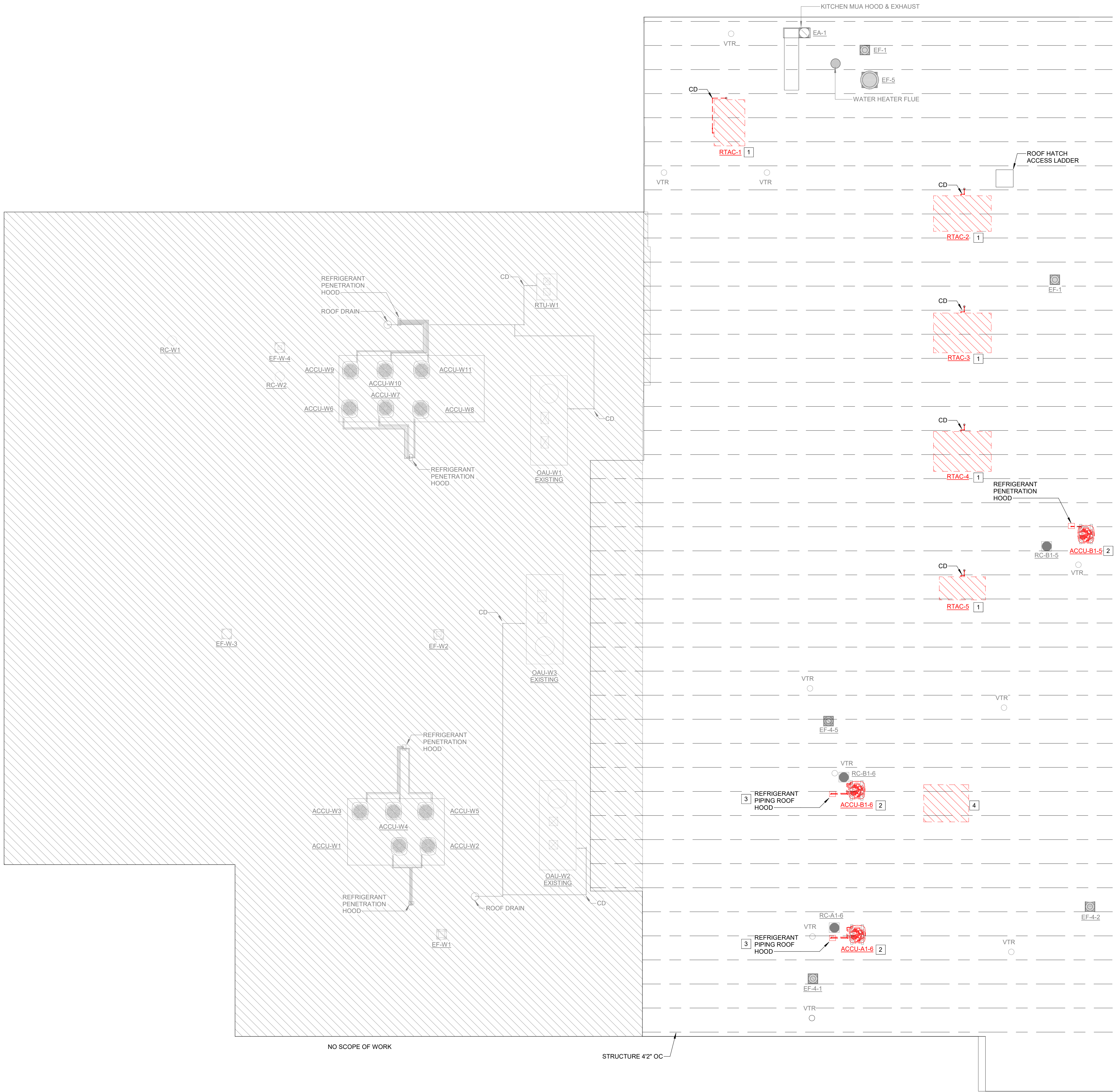


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Drawn By	AR
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MECHANICAL DEMOLITION DRAWING SHEET LEGEND		
	PIPING AND/OR DUCTWORK TO BE DEMOLISHED	
	EQUIPMENT TO BE DEMOLISHED	
	PIPING AND/OR DUCTWORK EXISTING TO REMAIN	
	EQUIPMENT TO REMAIN	
	EXTENT OF DEMOLITION	

HVAC GENERAL NOTES, SHEET M102

- ROOFING:
 - EXISTING ROOFING IS CONSTRUCTED OF TAR AND GRAVEL.
 - CONTRACTOR SHALL PROTECT EXISTING ROOFING FROM DAMAGE DURING CONSTRUCTION WITH PANELING OR PLYWOOD SHEETS AS NEEDED.
 - EXISTING PACKAGED UNIT DEMOLITION: CONTRACTOR SHALL SCHEDULE MEETING WITH MECHANICAL AND STRUCTURAL ENGINEERS AFTER THE REMOVAL OF THE EXISTING RTUS AND CURB ADAPTERS AS NEEDED TO INSPECT EXISTING BASE CURB STRUCTURAL SUPPORT AND ATTACHMENTS.
- HVAC DEMOLITION KEYED NOTES: SHEET M102
- DEMOLISH EXISTING PACKAGED ROOFTOP UNIT, CURB ADAPTER AND CONDENSATE DRAIN PIPING UP TO THE ROOF RECEPTOR. EXISTING BASE CURB SHALL REMAIN FOR REUSE WITH NEW UNITS. REFER TO RENOVATION DRAWINGS AND DETAILS 1 AND 2/SHEET M404.
 - DEMOLISH EXISTING ROOF MOUNTED CONDENSING UNIT AND ASSOCIATED REFRIGERANT PIPING AND CONTROL WIRING DOWN TO WITHIN BUILDING. EXISTING ROOF SUPPORT SHALL REMAIN UNDISTURBED. PROVIDE NEW STAINLESS STEEL TOP CLOSURE CAPS AS INDICATED ON RENOVATION DRAWINGS. (TYPICAL)
 - DEMOLISH EXISTING REFRIGERANT PIPE HOOD AND REPLACE WITH NEW AS INDICATED ON RENOVATION DRAWINGS.
 - DEMOLISH EXISTING ROOF SYSTEM AND METAL DECK AS NEEDED FOR INSTALLATION OF NEW EXHAUST FAN EF-F.

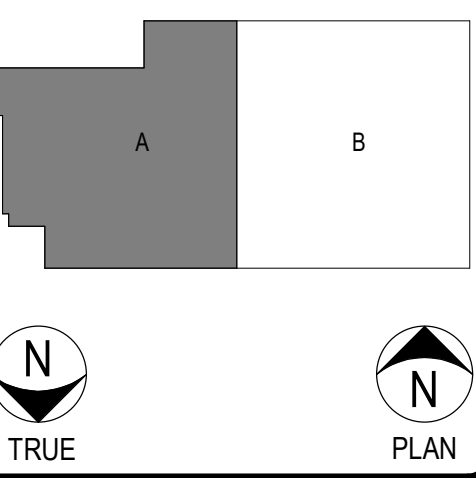
WOOD RIVER ELEMENTARY HVAC REPLACEMENTS AND UPGRADES - 2026 (PHASE 1)

CALALLEN INDEPENDENT SCHOOL DISTRICT

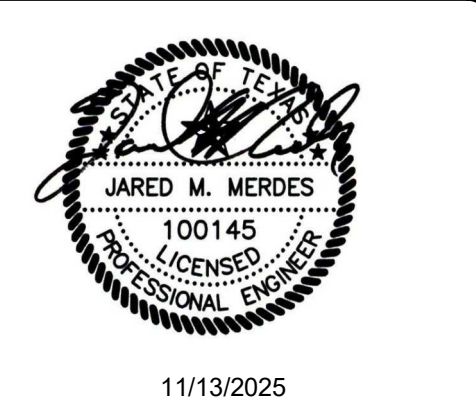
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SERVICE ORDER NO. 4 - BOND 2023

MECHANICAL DEMOLITION ROOF PLAN AREA "A"



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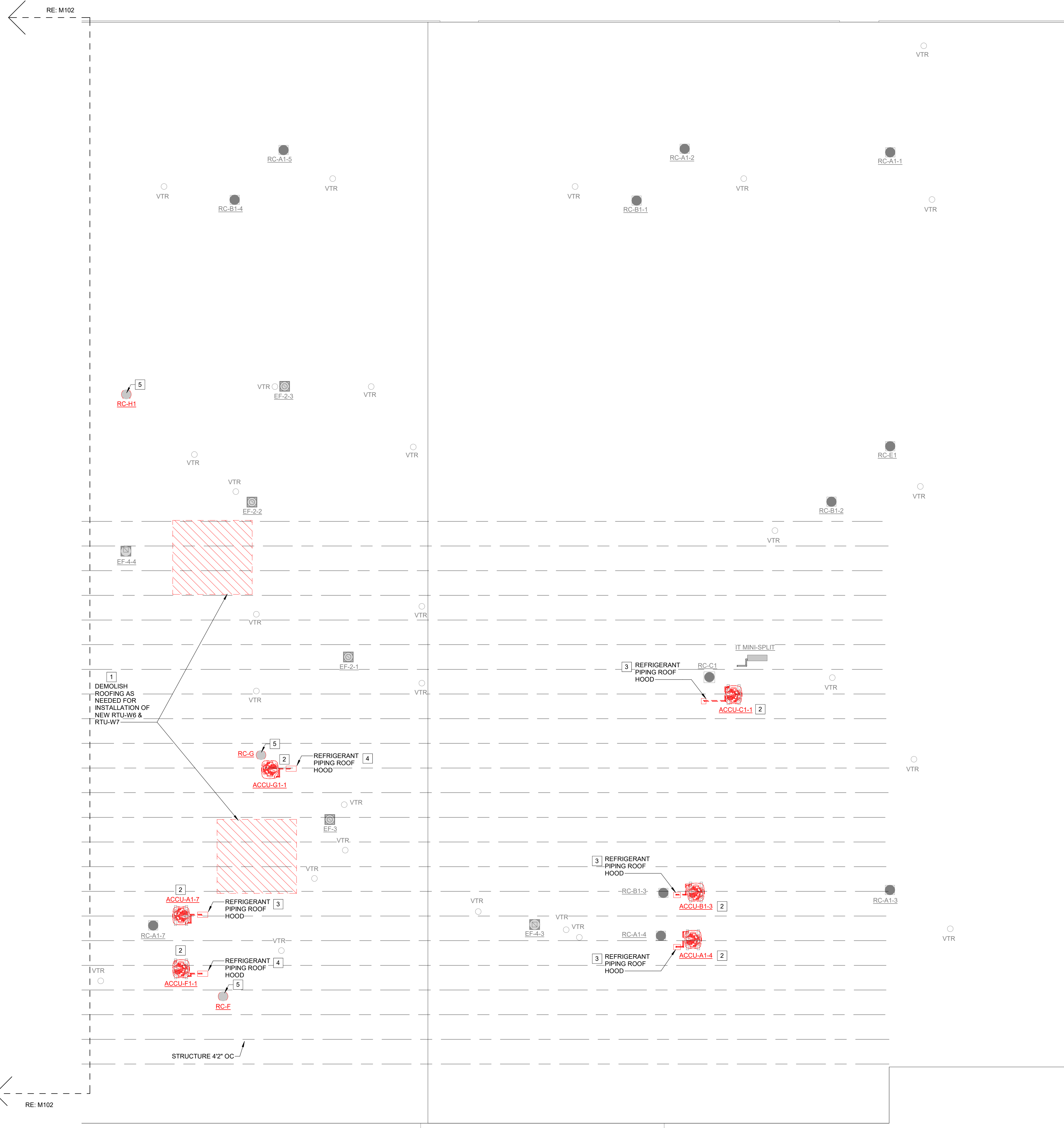


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Drawn By	JM
Checked By	JM
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M102

1 MECHANICAL DEMOLITION ROOF PLAN AREA "A"

1/8" = 1'-0"



MECHANICAL DEMOLITION DRAWING SHEET LEGEND	
	PIPING AND/OR DUCTWORK TO BE DEMOLISHED
	EQUIPMENT TO BE DEMOLISHED
	PIPING AND/OR DUCTWORK EXISTING TO REMAIN
	EQUIPMENT TO REMAIN
	EXTENT OF DEMOLITION

HVAC GENERAL NOTES: SHEET M103

- ROOFING:
 - EXISTING ROOFING IS CONSTRUCTED OF TAR AND GRAVEL.
 - CONTRACTOR SHALL PROTECT EXISTING ROOFING FROM DAMAGE DURING CONSTRUCTION WITH PANELING OR PLYWOOD SHEETS.

HVAC DEMOLITION KEYED NOTES: SHEET M103

- DEMOLISH EXISTING ROOFING SYSTEM AND METAL DECK AS NEEDED FOR NEW RTU. REFER TO RENOVATION DRAWINGS.
- DEMOLISH EXISTING ROOF MOUNTED CONDENSING UNIT AND ASSOCIATED REFRIGERANT PIPING AND CONTROL WIRING DOWN TO WITHIN BUILDING. EXISTING ROOF SUPPORT SHALL REMAIN UNDISTURBED. PROVIDE NEW STAINLESS STEEL TOP CLOSURE CAPS AS INDICATED ON RENOVATION DRAWINGS. (TYPICAL)
- DEMOLISH EXISTING REFRIGERANT PIPE HOOD AND REPLACE WITH NEW AS INDICATED ON RENOVATION DRAWINGS.
- DEMOLISH EXISTING REFRIGERANT PIPE HOOD AND PROVIDE DUCT CLOSURE AND PERMANENT CAP SIMILAR TO OUTSIDE AIR HOODS. REFER TO RENOVATION DRAWINGS AND DETAIL 3/SHEET M403.
- DEMOLISH EXISTING OUTSIDE AIR HOOD AND PROVIDE DUCT CLOSURE AND PERMANENT CAP. REFER TO RENOVATION DRAWINGS AND DETAIL 3/SHEET M403.

1 MECHANICAL DEMOLITION ROOF PLAN AREA "B"

1/8" = 1'-0"

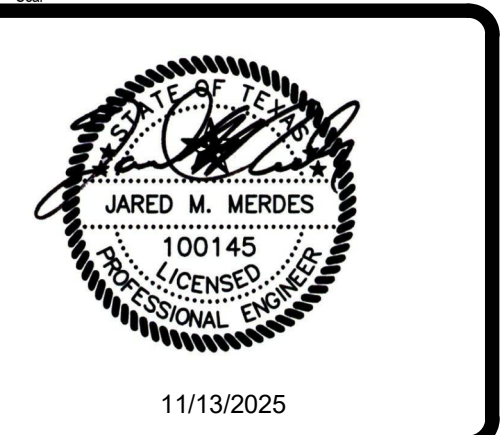
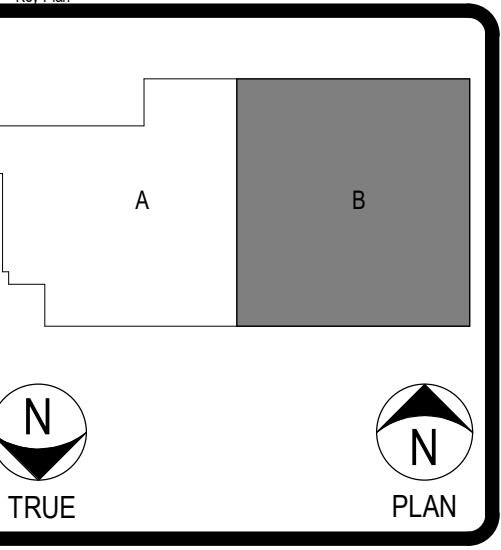
WOOD RIVER ELEMENTARY HVAC REPLACEMENTS AND UPGRADES - 2026 (PHASE 1)

CALLEN INDEPENDENT SCHOOL DISTRICT

15118 DRY CREEK DR, CORPUS CHRISTI, TX 78410

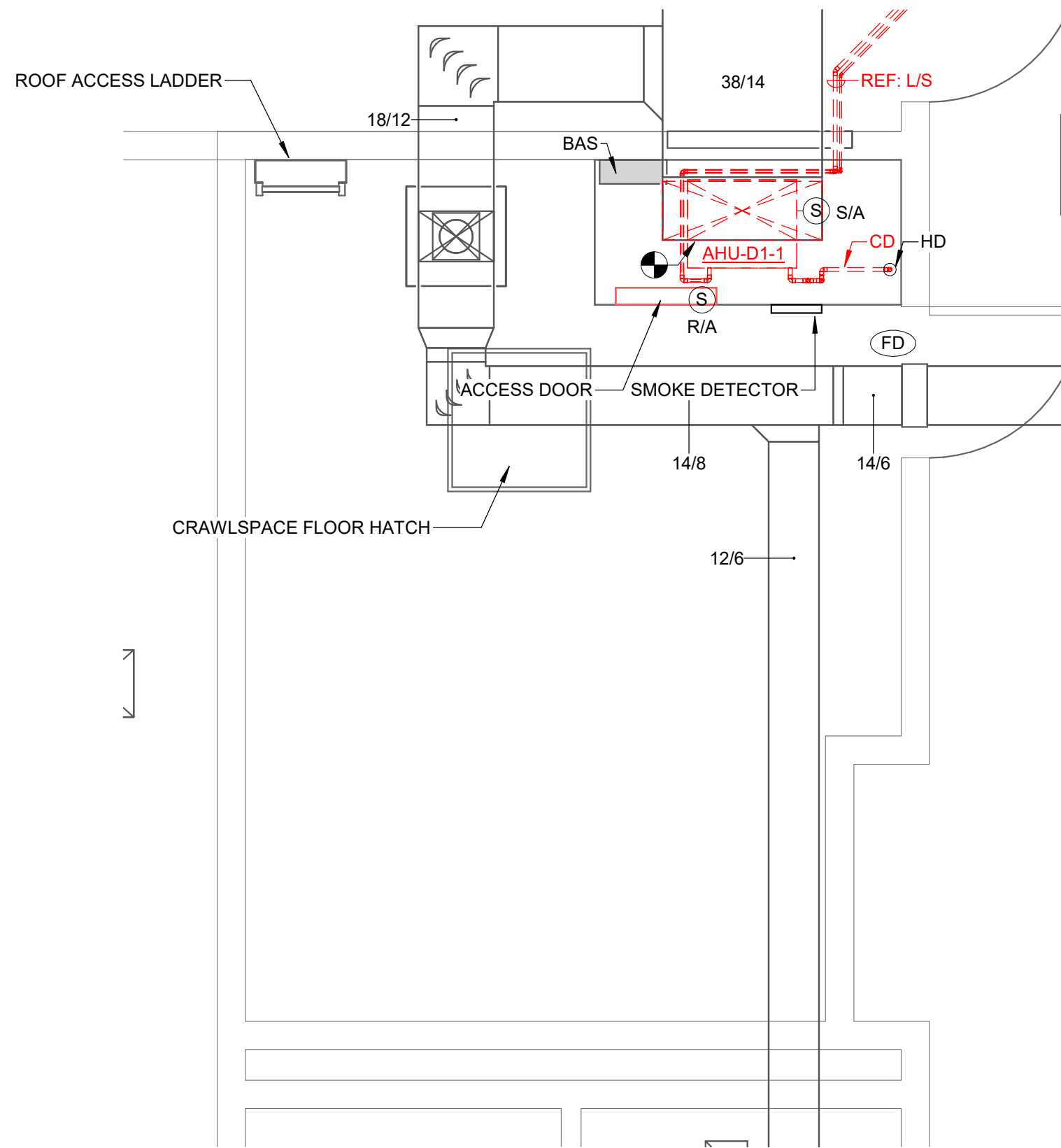
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MECHANICAL DEMOLITION ROOF PLAN AREA "B"

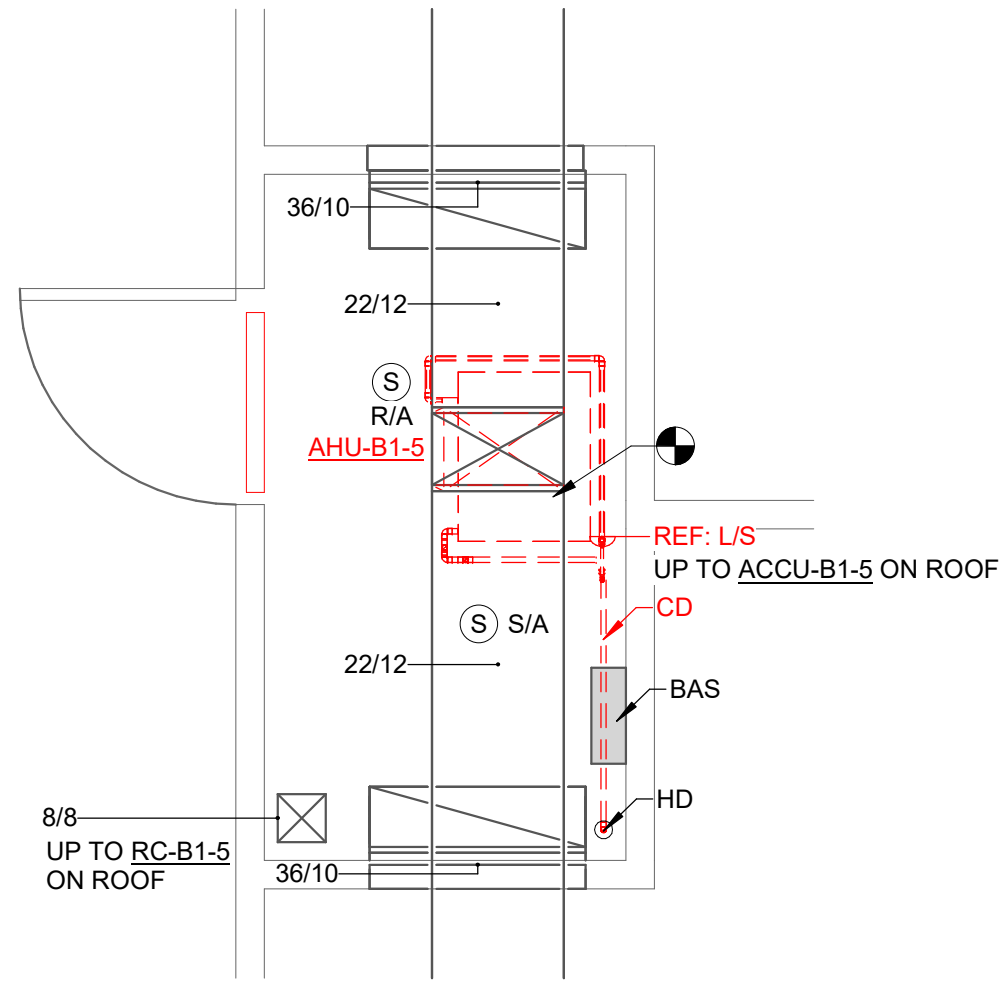


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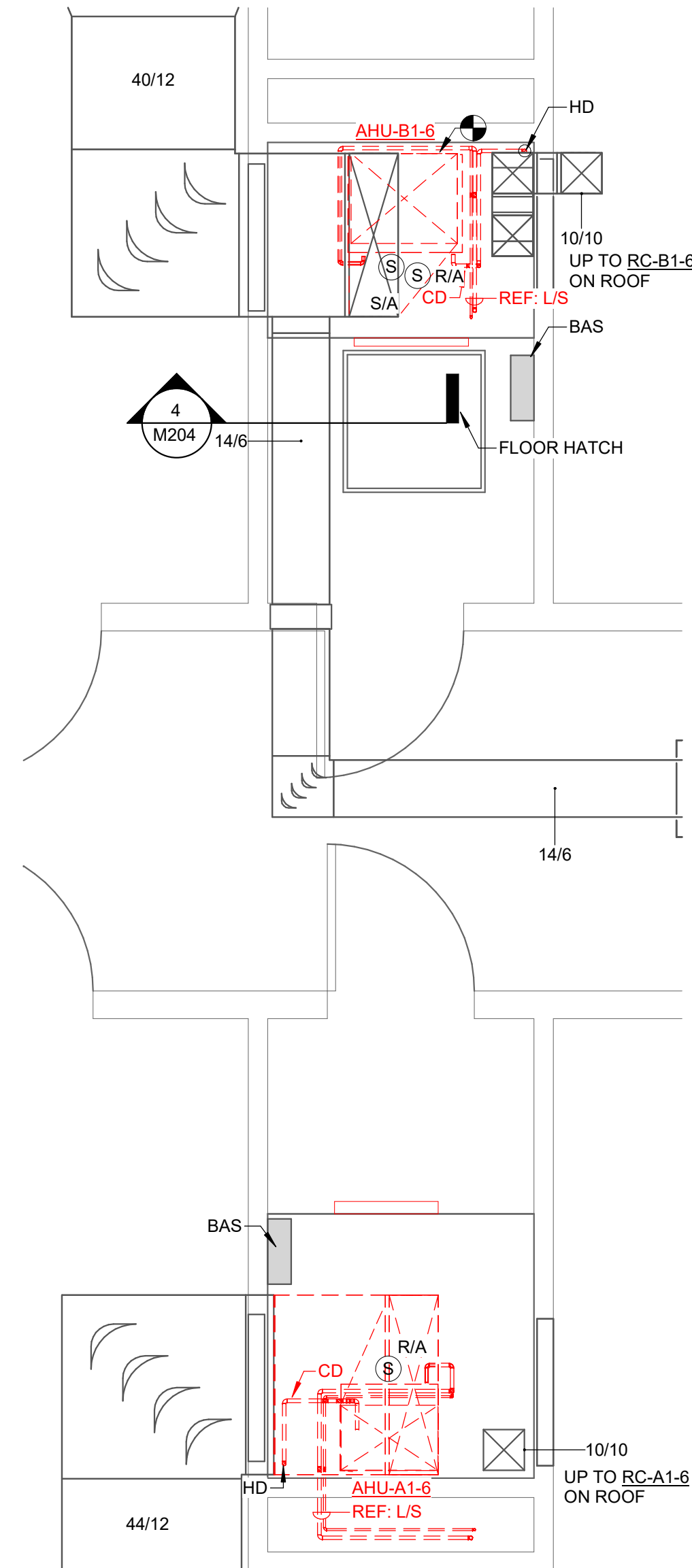
M103



1 ENLARGED DEMO. PLAN AREA "A" - MECH/ELEC. - AHU-D1-1
3/8" = 1'-0"



2 ENLARGED DEMO. PLAN AREA "A" - AHU-B1-5
3/8" = 1'-0"

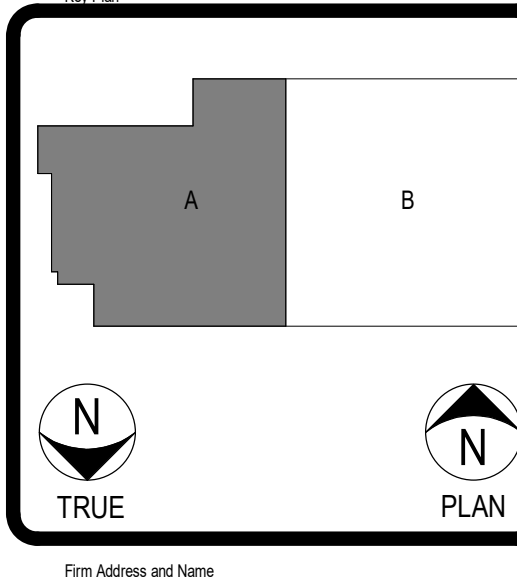


3 ENLARGED DEMO. PLAN AREA "A" - AHU-A1-6 AND AHU-B1-6
3/8" = 1'-0"

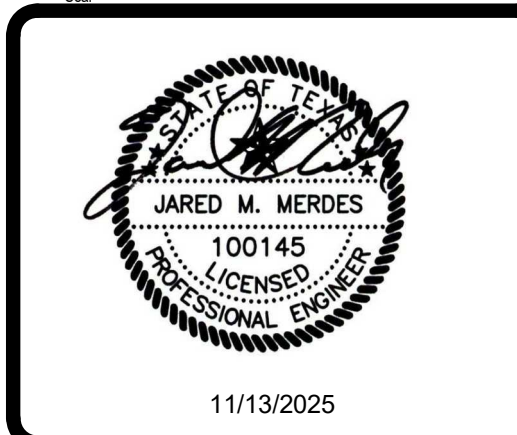
MECHANICAL DEMOLITION DRAWING SHEET LEGEND		
	PIPING AND/OR DUCTWORK TO BE DEMOLISHED	
	EQUIPMENT TO BE DEMOLISHED	
	PIPING AND/OR DUCTWORK EXISTING TO REMAIN	
	EQUIPMENT TO REMAIN	
	EXTENT OF DEMOLITION	

- HVAC GENERAL DEMOLITION NOTES: SHEET M104
1. ENLARGED PLANS HAVE BEEN PROVIDED TO INDICATE MORE DETAIL OF THE ACTUALLY INSTALLED CONDITIONS AT EACH EQUIPMENT LOCATION. REFER TO DETAIL 1/SHEET M403 FOR DETAILED DEMOLITION SCOPE OF WORK FOR ALL AHU'S INSTALLED ON PLENUM PLATFORMS. SUSPENDED AHU'S SHALL BE SIMILAR.
 2. CONTRACTOR SHALL DEMOLISH EXISTING SYSTEMS TO THE EXTENT NEEDED FOR INSTALLATION OF NEW EQUIPMENT ONLY. COORDINATE SCOPE WITH FINAL NEW EQUIPMENT FURNISHED ON THE PROJECT.
 3. CONTRACTOR WILL NEED TO REPLACE SOME OF THE EXISTING WOOD PLATFORM TOPS DUE TO EQUIPMENT WATER DAMAGE.

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MECHANICAL ENLARGED DEMOLITION PLANS AREA "A"

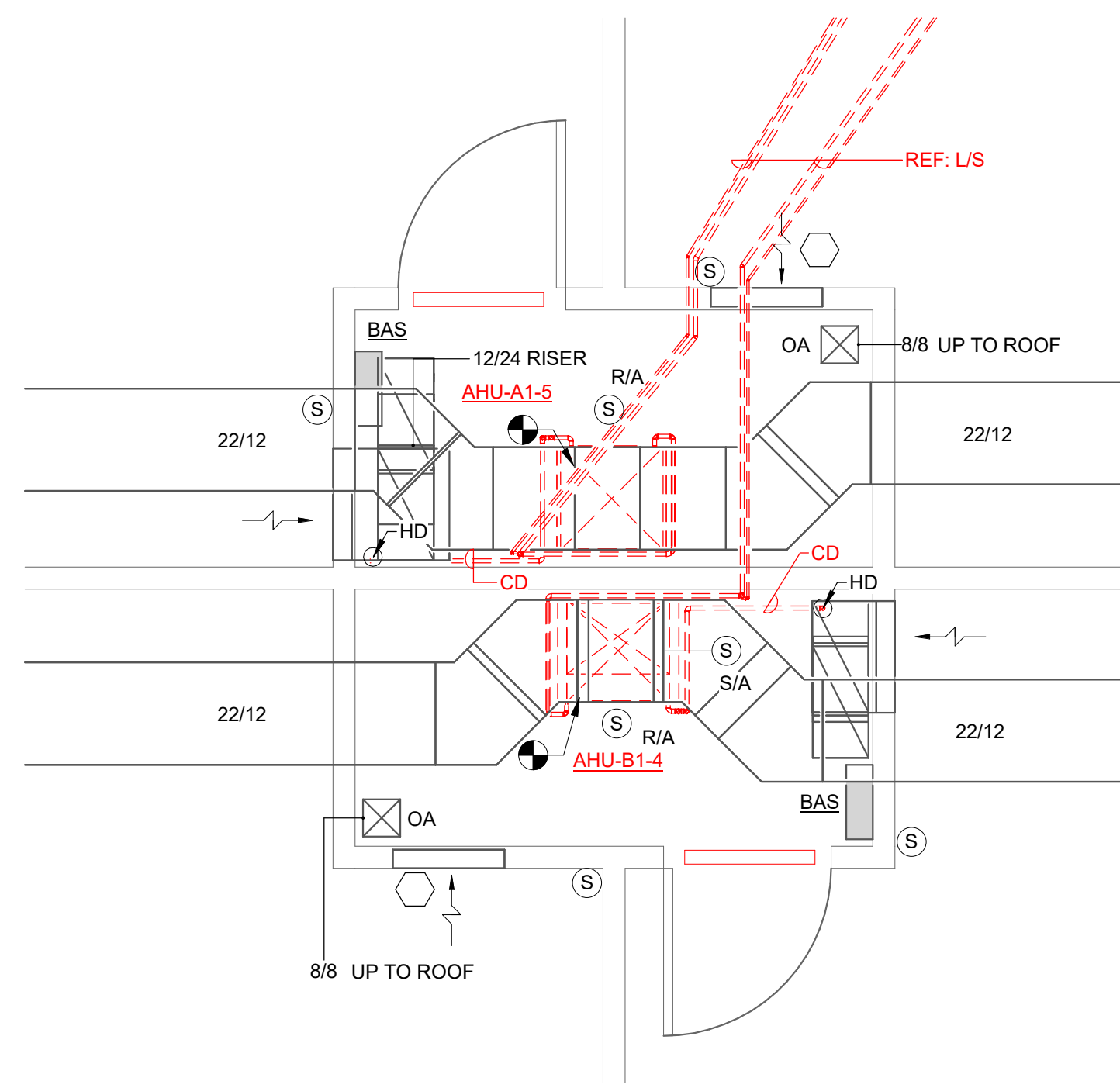


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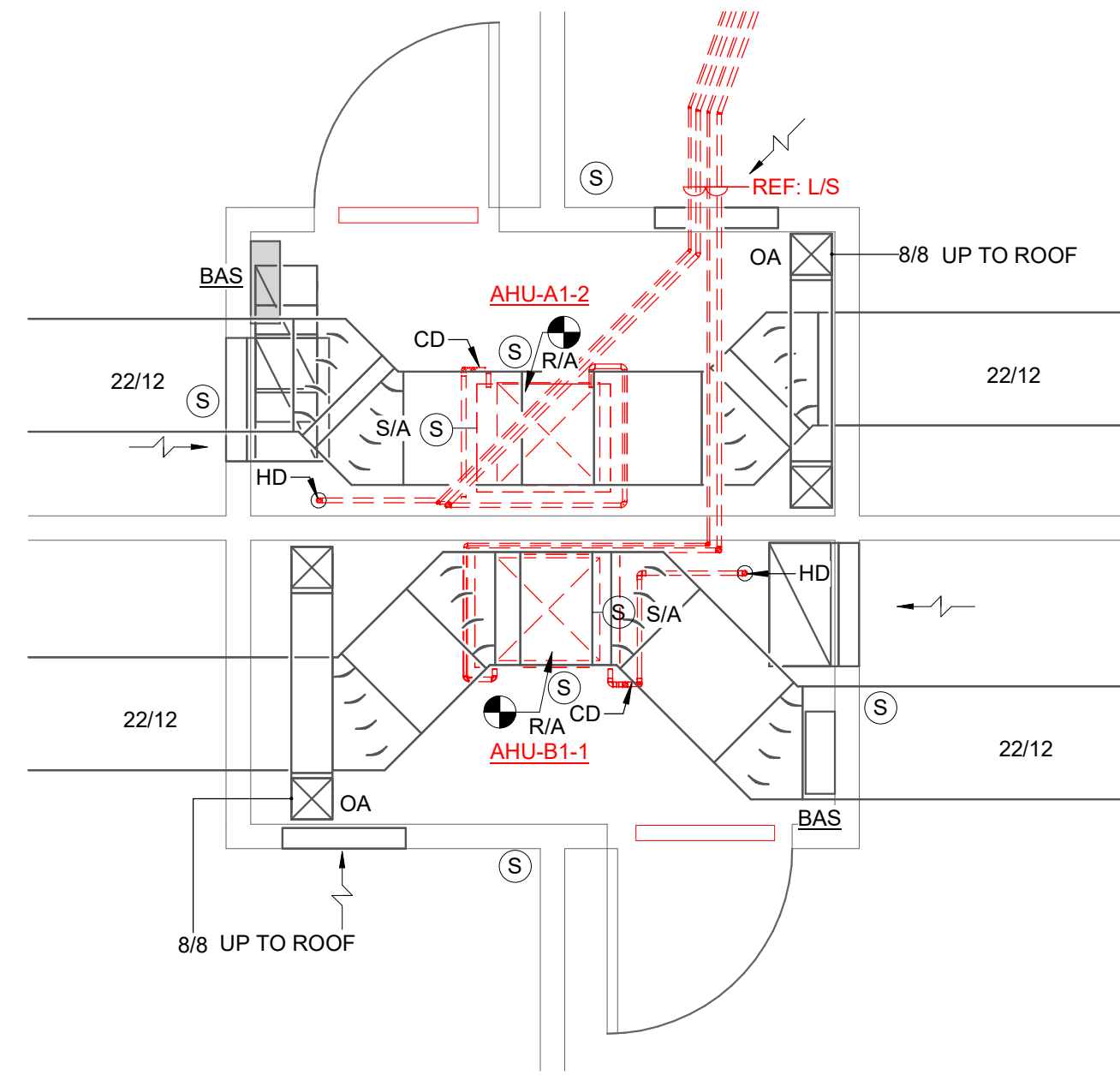


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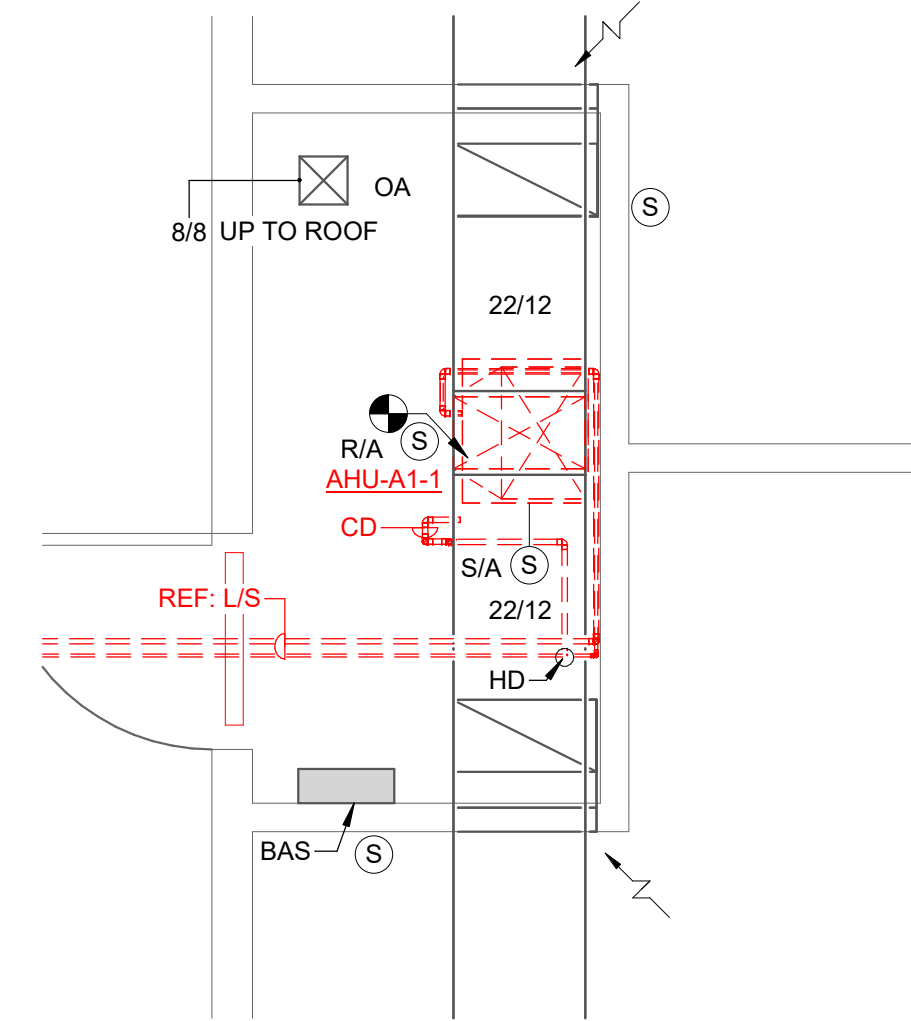
M104



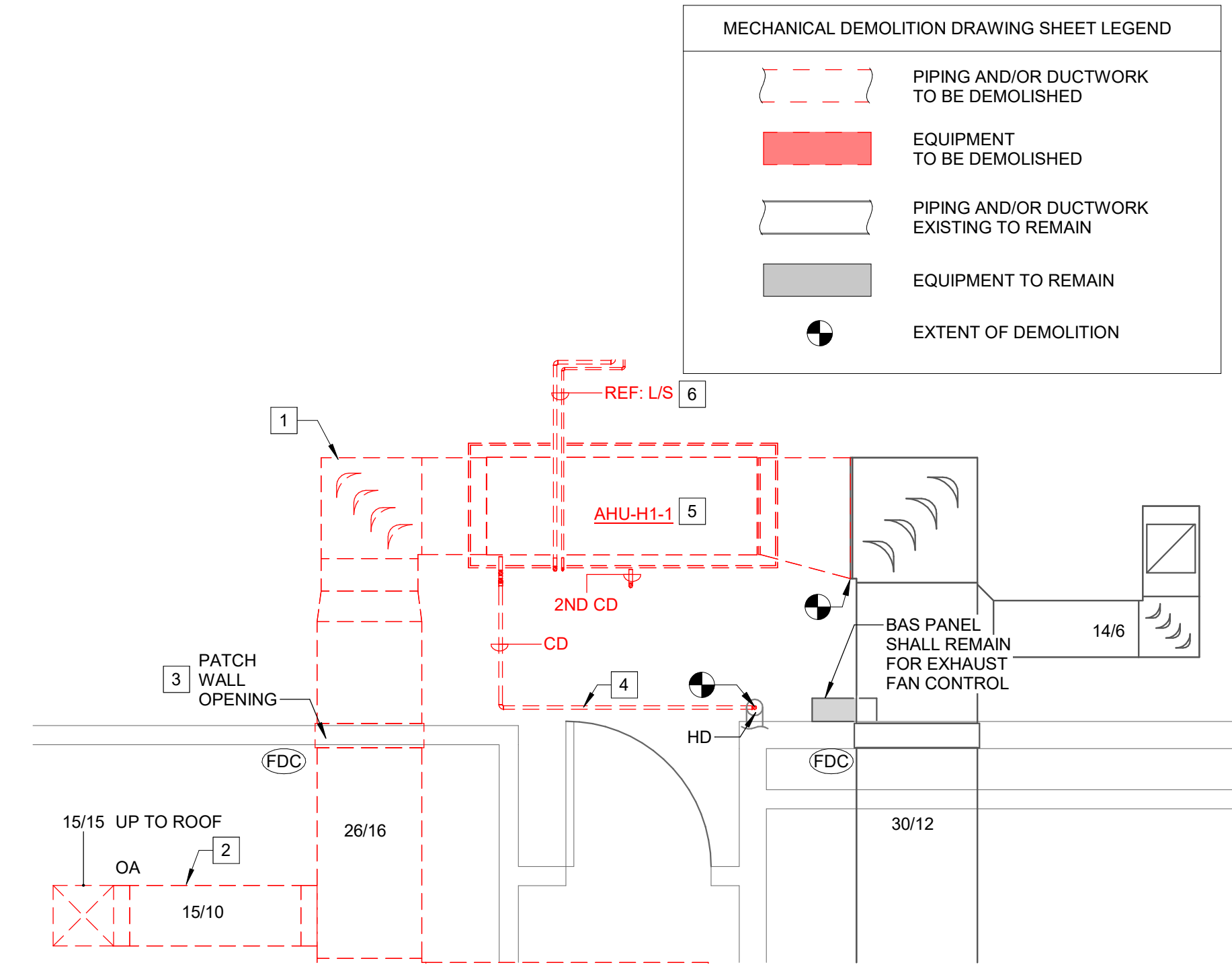
1 ENLARGED DEMO. PLAN AREA "B" - AHU-A1-5 AND AHU-B1-4
3/8" = 1'-0"



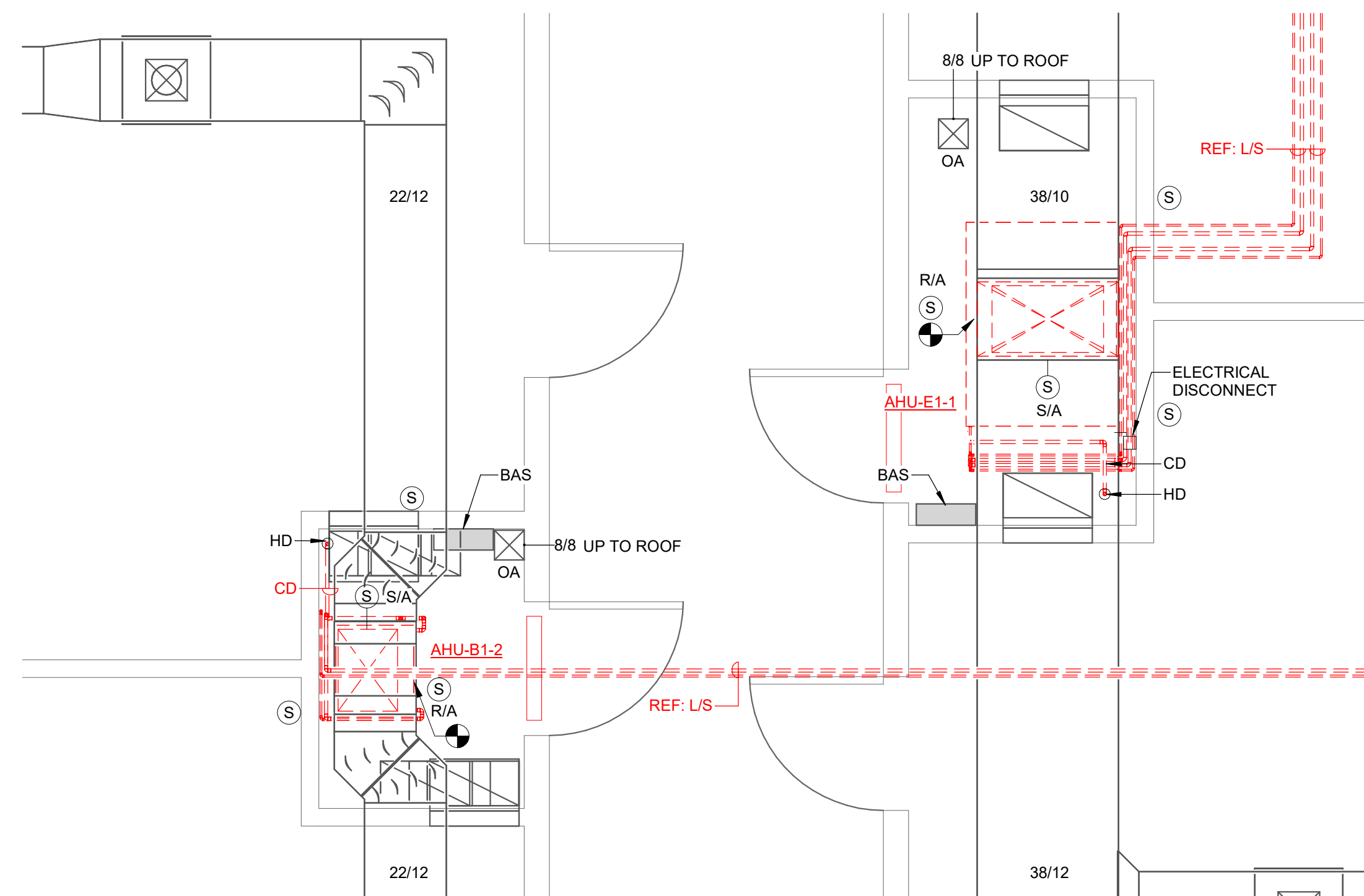
2 ENLARGED DEMO. PLAN AREA "B" - AHU-A1-2 AND AHU-B1-1
3/8" = 1'-0"



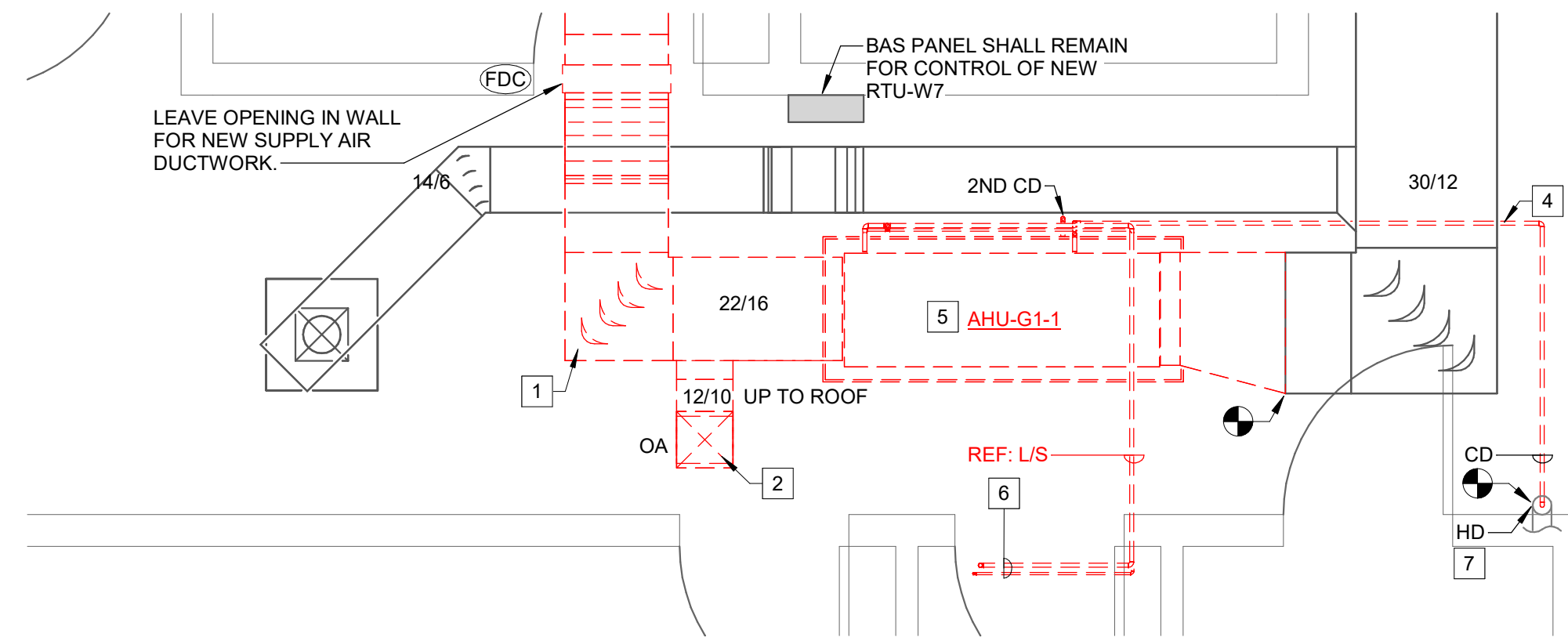
3 ENLARGED DEMO. PLAN AREA "B" - AHU-A1-1
3/8" = 1'-0"



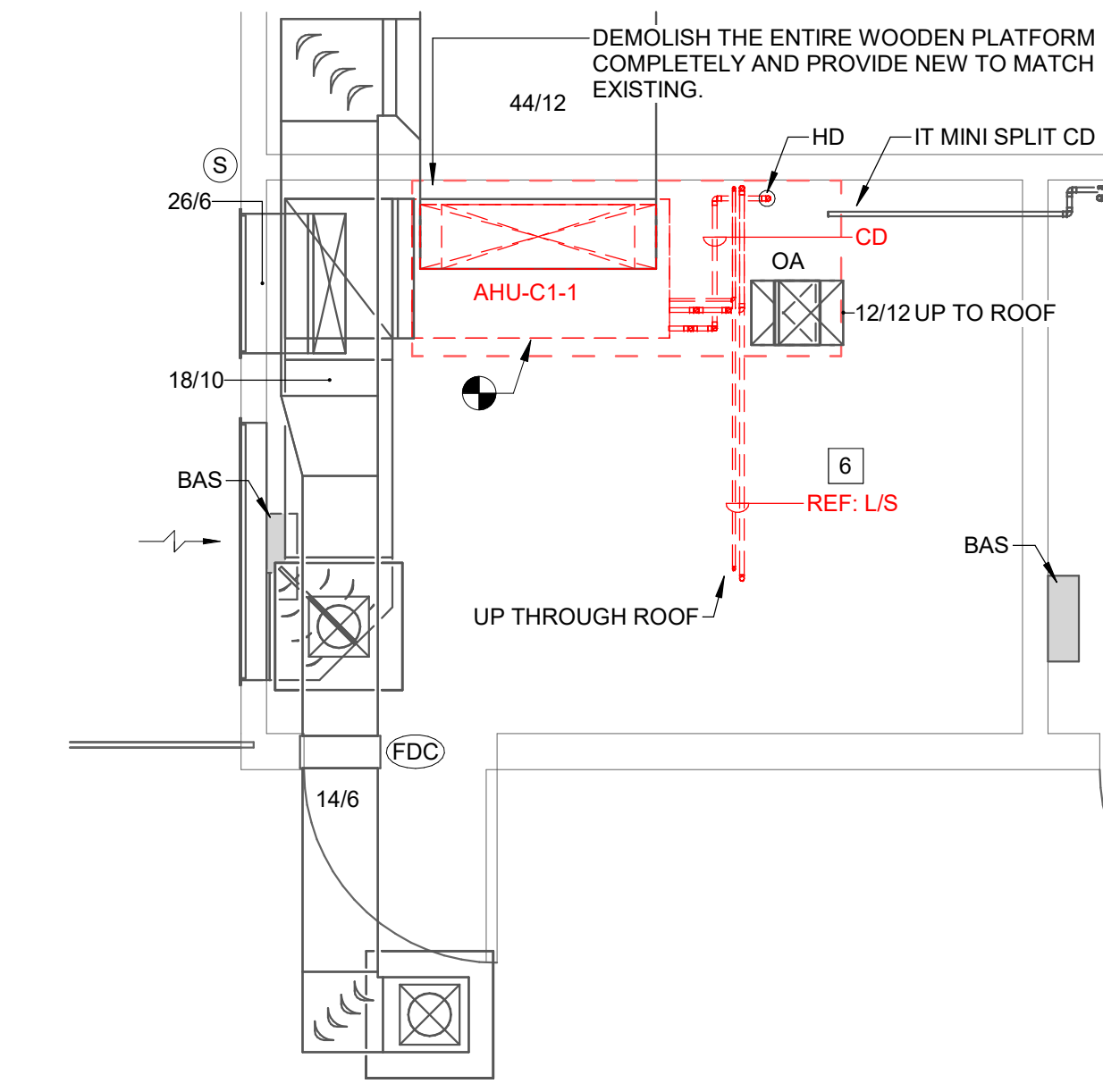
4 ENLARGED DEMO. PLAN AREA "B" - AHU-H1
3/8" = 1'-0"



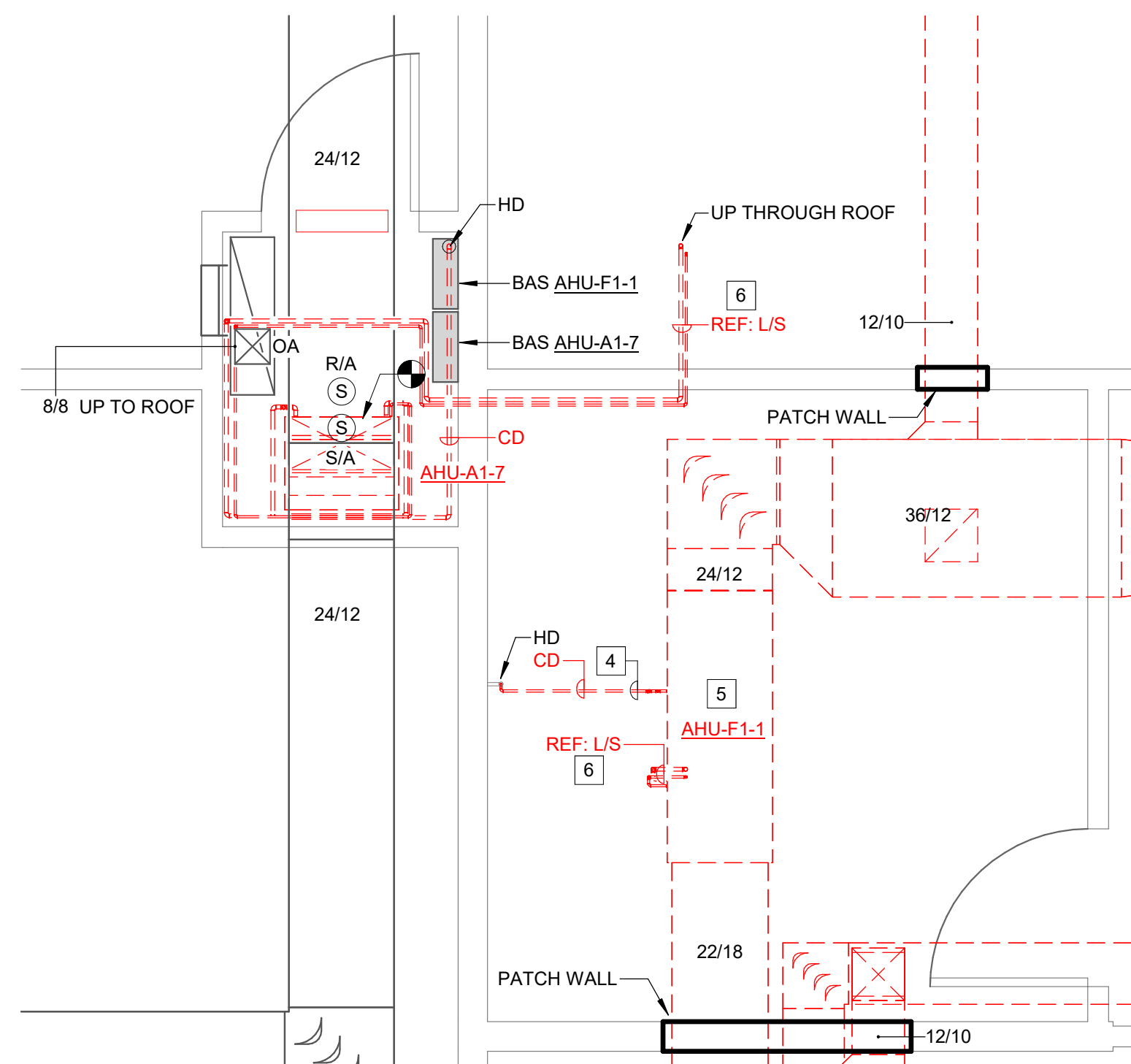
5 ENLARGED DEMO. PLAN AREA "B" - AHU-B1-2 AND AHU-E1-1
3/8" = 1'-0"



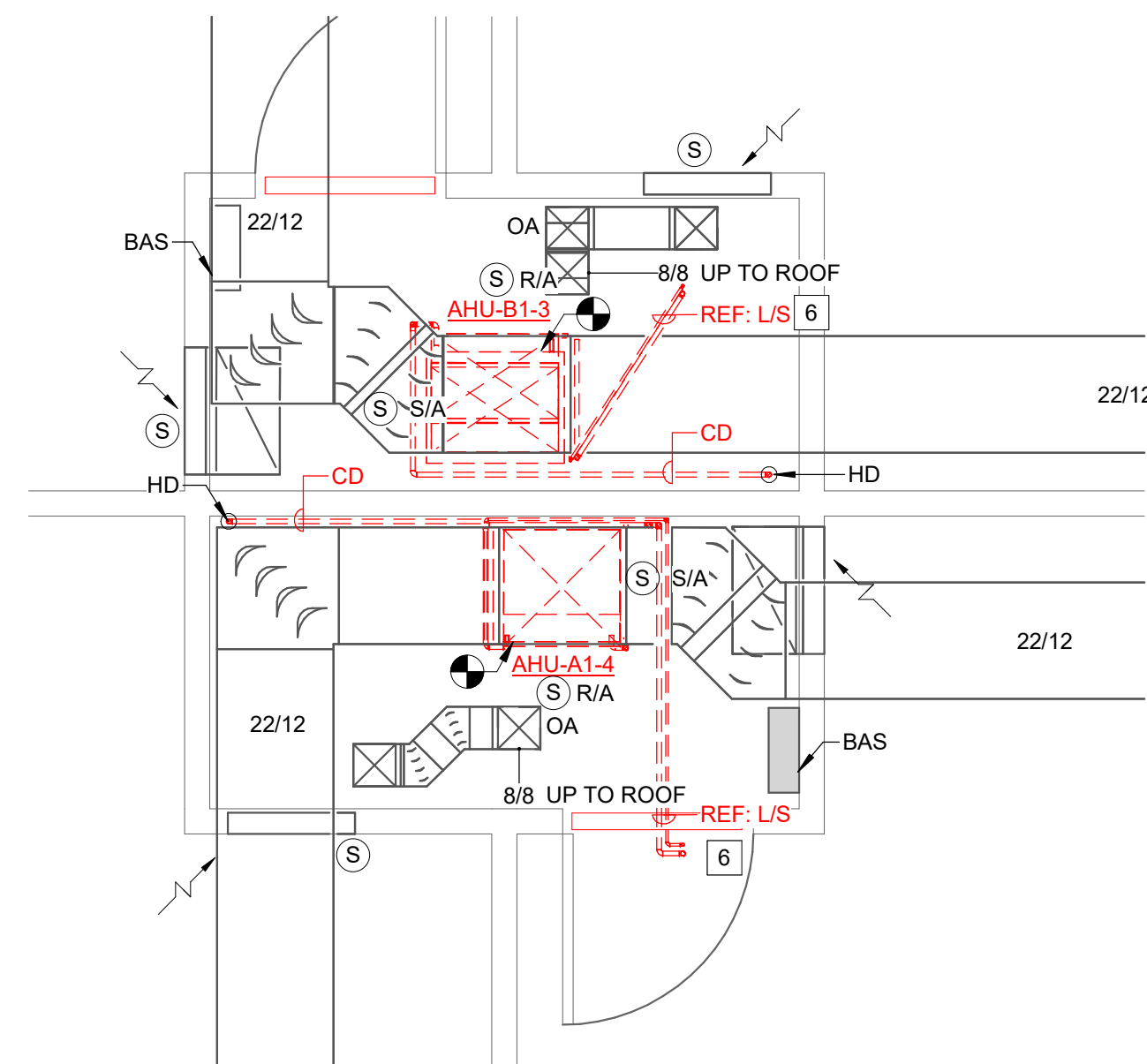
6 ENLARGED DEMO. PLAN AREA "B" - AHU-G1-1
3/8" = 1'-0"



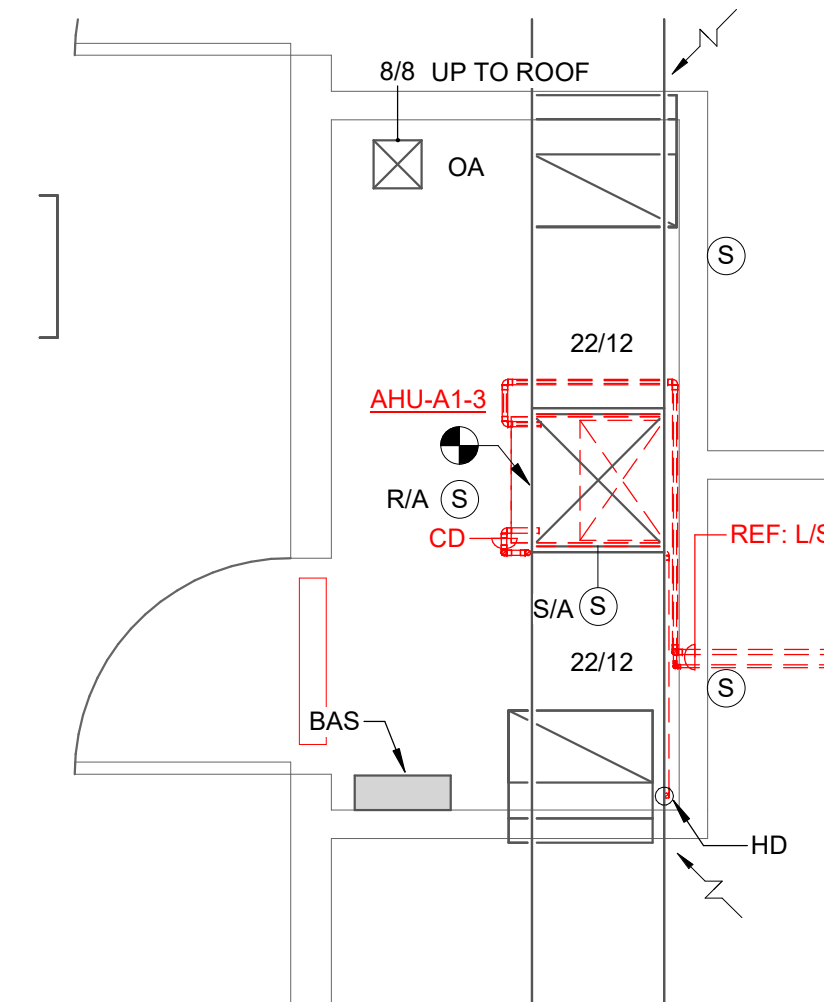
7 ENLARGED DEMO. PLAN AREA "B" - AHU-C1-1
3/8" = 1'-0"



8 ENLARGED DEMO. PLAN AREA "B" - AHU-A1-7 AND AHU-F1-1
3/8" = 1'-0"



9 ENLARGED DEMO. PLAN AREA "B" - AHU-A1-4 AND AHU-B1-3
3/8" = 1'-0"



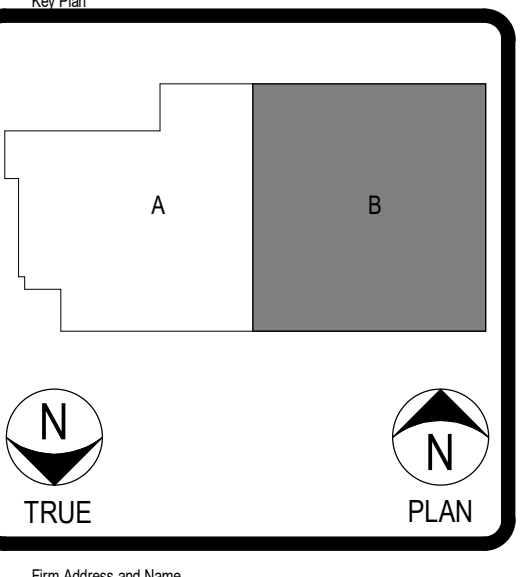
10 ENLARGED DEMO. PLAN AREA "B" - AHU-A1-3
3/8" = 1'-0"

- HVAC GENERAL DEMOLITION NOTES: SHEET M105
- ENLARGED PLANS HAVE BEEN PROVIDED TO INDICATE MORE DETAIL OF THE ACTUALLY INSTALLED CONDITIONS AT EACH EQUIPMENT LOCATION. REFER TO DETAIL 1/SHEET M403 FOR DETAILED DEMOLITION SCOPE OF WORK FOR ALL AHU'S INSTALLED ON PLENUM PLATFORMS. SUSPENDED AHU'S SHALL BE SIMILAR.
 - CONTRACTOR SHALL DEMOLISH EXISTING SYSTEMS TO THE EXTENT NEEDED FOR INSTALLATION OF NEW EQUIPMENT ONLY. COORDINATE SCOPE WITH FINAL NEW EQUIPMENT FURNISHED ON THE PROJECT.
 - CONTRACTOR WILL NEED TO REPLACE SOME OF THE EXISTING WOOD PLATFORM TOPS DUE TO EQUIPMENT WATER DAMAGE.
- HVAC DEMOLITION KEYED NOTES: SHEET M105
- DEMOLISH EXISTING RETURN AIR DUCTWORK IN ITS ENTIRETY.
 - DEMOLISH OA DUCTWORK UP TO ROOF HOOD.
 - DEMOLISH FIRE DAMPER IN WALL AND PERMANENTLY PATCH WALL FIRE TIGHT.
 - DEMOLISH EXISTING PRIMARY AND SECONDARY CONDENSATE DRAIN PIPING FROM AHU TO PLUMBING TERMINATION LOCATION.
 - DEMOLISH EXISTING SUSPENDED AHU AND ALL ASSOCIATED SUPPORT AND APPURTENANCES.
 - DEMOLISH EXISTING REFRIGERANT PIPING AND CONTROL WIRING FROM AHU TO OUTDOOR ACCU ON ROOF. RESUE EXISTING PIPE SUPPORT VERTICAL RODS WHEREVER FEASIBLE FOR NEW RENOVATION WORK AS APPLICABLE. NEW PIPING WILL BE INSTALLED AT THE APPROXIMATE LOCATION AS EXISTING WITH NEW HANGER SUPPORT SYSTEMS. (TYPICAL)
 - PROVIDE RUBBER EXPANSION DRAIN PLUG AT THE EXISTING HUB DRAIN INLET.

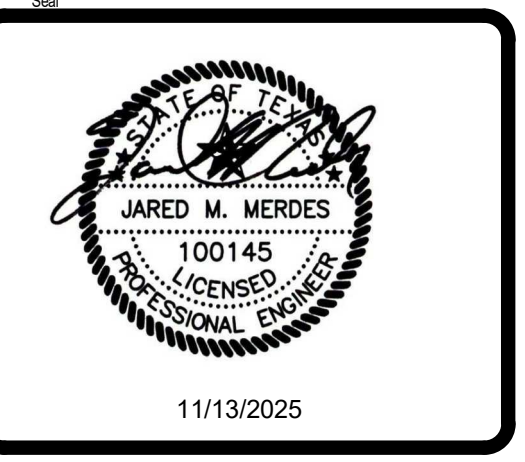
NO REVISION DATE

WOOD RIVER ELEMENTARY HVAC REPLACEMENTS AND UPGRADES - 2026 (PHASE 1)
CALALLEN INDEPENDENT SCHOOL DISTRICT
15118 DRY CREEK DR, CORPUS CHRISTI, TX 78410
SERVICE ORDER NO. 4 - BOND 2023

MECHANICAL ENLARGED DEMOLITION PLANS AREA "B"



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Registration # F-006328



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Checked By: JLM
Scale: As Indicated
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M105



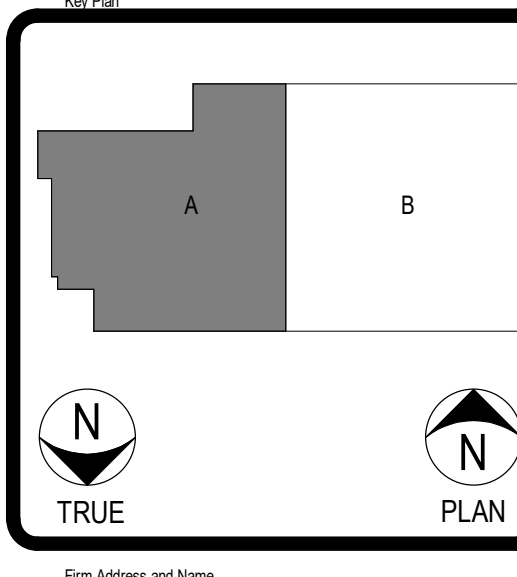
HVAC GENERAL NOTES: SHEET M200

- A. CONTRACTOR SHALL SURVEY EXISTING FACILITIES AND LOCATE ALL CEILING TIES AND INCLUDE THE COST OF CEILING REPAIRS AS NEEDED TO PERFORM THE PROJECT WORK.
- B. REMOVE AREAS: CONTRACTOR SHALL CAREFULLY REMOVE EXISTING LAIV CEILING GRID AND DEMOLISH CEILING TILES. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIRS TO THE PROJECT COMPLETION WITH NEW CEILING TILES. ANY DAMAGED SYSTEMS SHALL BE REPLACED WITH NEW TO MATCH EXISTING CONDITIONS. CONTRACTOR SHALL REMOVE EXISTING LAIV WORK AREAS; CONTRACTOR SHALL REMOVE EXISTING LAIV CEILING "GRID AND TILES" IN HEAVY AREAS OF THE STRUCTURE ABOVE THE CEILING WITH NEW AT PROJECT COMPLETION. EXISTING LIGHT FIXTURES, FIRE ALARM, HVAC AIR DEVICES AND THE LIKE SHALL BE STRUNG UP WITH TEMPORARY SUPPORTS TO BE REMOVED AT PROJECT REINSTALLATION INTO NEW CEILINGING FOR ALL SYSTEMS TO BE REFERRED TO THE PROJECT SPECIFICATIONS, GRID AND TILES CONSTRUCTION AND INSTALLATION REQUIREMENTS.
- D. STRUCTURAL SUB-CEILING: CONTRACTOR IS NOTIFIED THAT THE EXISTING ROOF STRUCTURE SHALL BE A GYPSUM BOARD SUB-CEILING INSTALLED BELOW THE STEEL AS A MEANS OF FIRE PROTECTION. CONTRACTOR WILL BE REQUIRED TO REMOVE EXISTING SUB-CEILING AND REINSTALL NEW GYPSUM BOARD SUB-CEILING AS NEEDED TO PERFORM THE WORK.
- F. FLOORS: CONTRACTOR SHALL PROTECT ALL FLOORS WITH PAPER OR HEAVY CLOTH AS REQUIRED TO PREVENT DAMAGE TO EXISTING FLOORING.
- G. REMOVE AND REPAIR DETAIL WORK SCOPE NEAR EQUIPMENT AS CALLED OUT ON THE DRAWINGS.
- H. INTERIOR WALLS:
 - A. ALL CORRIDOR WALLS GO ALL OF THE WAY UP TO THE BOTTOM OF THE GYPSUM BOARD ROOF SUB-CEILING. CONTRACTOR SHALL PROVIDE WALL SLEEVES AS NEEDED FOR PIPE AND PENETRATIONS.
 - B. ALL CORRIDOR WALLS GO ALL OF THE WAY UP TO THE BOTTOM OF THE GYPSUM BOARD ROOF SUB-CEILING.
 - C. CONTRACTOR SHALL PROVIDE FIRE RATED WALLS FOR ALL PIPING PENETRATIONS AND SEAL FIRE TIGHT AND SHALL PROVIDE FIRE DAMPERS FOR ALL DUCT PENETRATIONS.

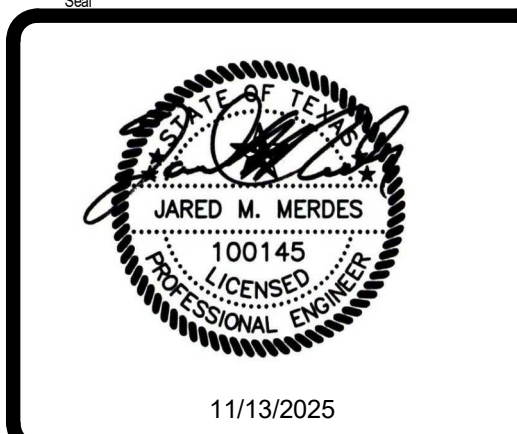
HVAC RENOVATION KEYED NOTES: SHEET M200

1. PROVIDE NEW REFRIGERANT PIPING AND COLD WIRING FROM AHU TO OUTDOOR ACQU; GROUND ROOF MOUNTED, NEW PIPING SHALL BE INSTALLED TO THE OUTDOOR ACQU IN ACCORDANCE WITH NEW HANGER SUPPORT SYSTEMS IN ACCORDANCE WITH DETAIL 11, SHEET M400, (TYPICAL).
2. BATH CONTRACTOR SHALL PROVIDE DETAIL 11, SHEET M400, TEMPERATURE AND HUMIDITY SENSORS AT THE SAME LOCATION.
3. PROVIDE NEW ROOF MOUNTED EXHAUST FAN AND DUCTWORK, REFER TO STRUCTURAL DRAWINGS AND DETAIL 4, SHEET M400. EXHAUST FAN IN GROUND FLOOR.

WOOD RIVER ELEMENTARY HVAC REPLACEMENTS AND UPGRADES - 2026 (PHASE 1)
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 MECHANICAL RENOVATION PLAN AREA "A"

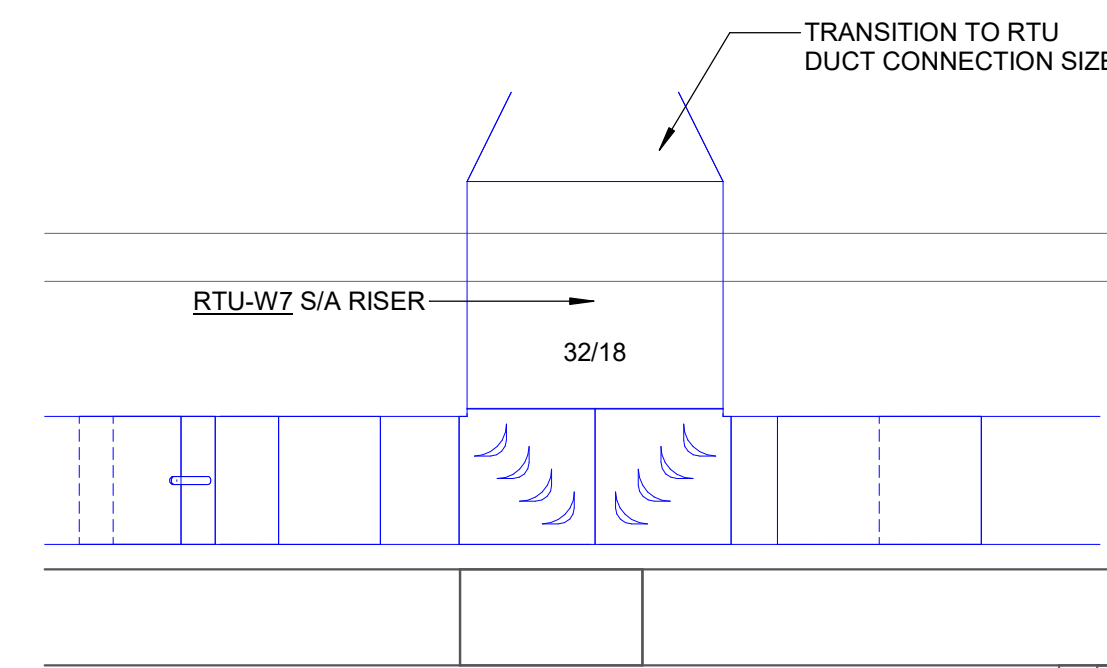
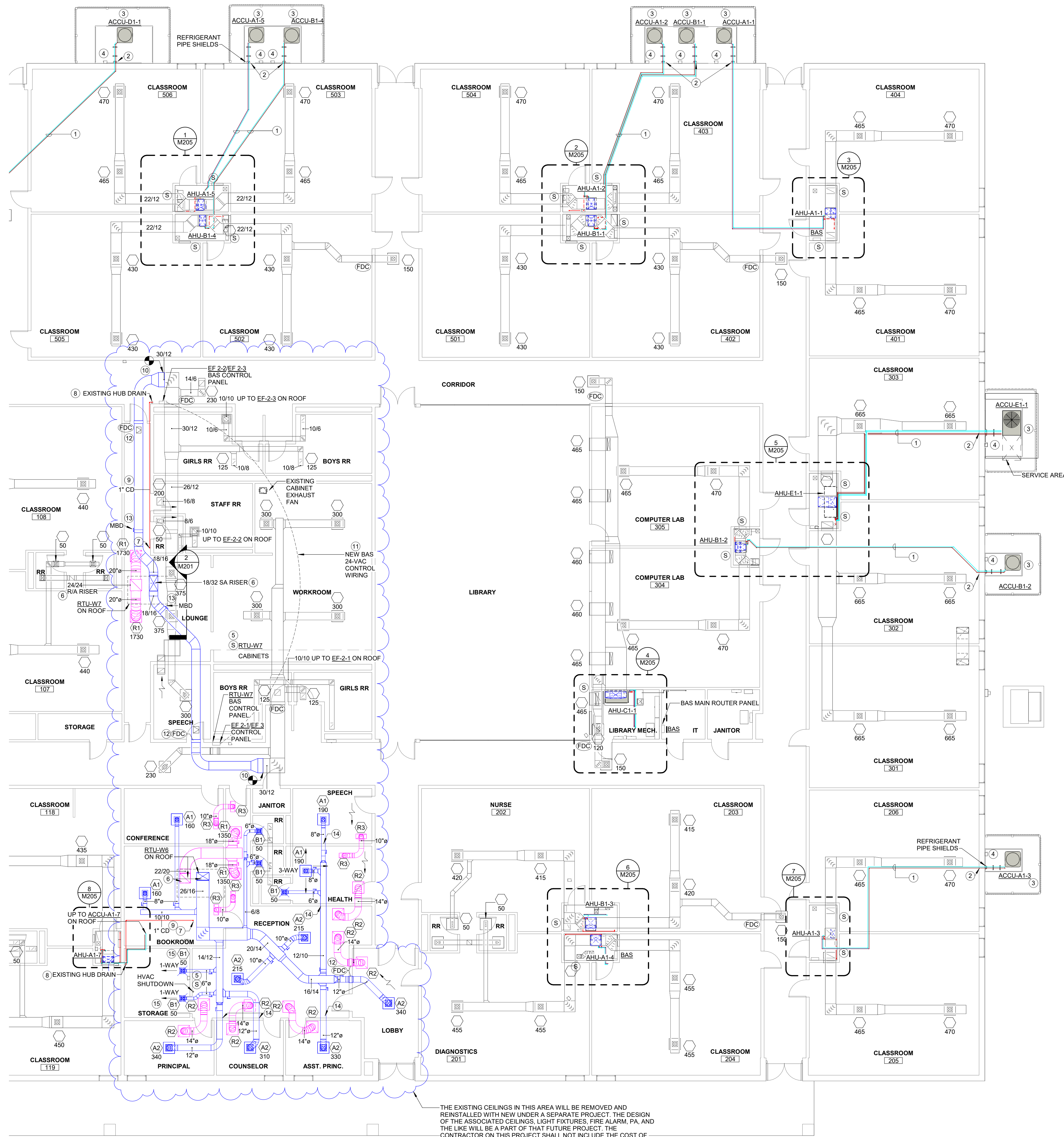


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Project No.:	2024160	M200 Sheet No: 12 of 25
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Drawn By:	AR	
Chkd By:	JM	
Scale:	1/8" = 1'-0"	

M200



2 HVAC ELEVATION VIEW - RTU-W7 S/A

HVAC GENERAL NOTES, SHEET M201

- CEILINGS:
 - CONTRACTOR SHALL SURVEY EXISTING FACILITIES AND LOCATE ALL CEILING TYPES AND INCLUDE THE COST OF CEILING REPAIRS AS NEEDED TO PERFORM THE PROJECT WORK.
 - GENERAL AREAS: CONTRACTOR SHALL CAREFULLY REMOVE EXISTING LAY-IN CEILING GRID AND DEMOLISH CEILING TILES AS NEEDED TO PERFORM WORK AND REINSTALL GRID AT PROJECT COMPLETION WITH NEW CEILING TILES. ANY DAMAGED SYSTEMS SHALL BE REPLACED WITH NEW TO MATCH EXISTING CONSTRUCTION AND FINISHED COLOR.
 - HEAVY WORK AREAS: CONTRACTOR SHALL REMOVE EXISTING LAY-IN CEILING "GRID AND TILES" IN HEAVY AREAS OF CONSTRUCTION ABOVE AND REPLACE WITH NEW AT PROJECT COMPLETION. EXISTING LIGHT FIXTURES, FIRE ALARM, HVAC AIR DEVICES AND THE LIKE SHALL BE STRUNG UP WITH TEMPORARY SUPPORTS DURING CONSTRUCTION FOR REINSTALLATION INTO NEW CEILINGS FOR ALL SYSTEMS TO REMAIN. REFER TO THE SPECIFICATIONS FOR NEW GRID AND TILES CONSTRUCTION AND INSTALLATION REQUIREMENTS.
 - STRUCTURAL SUB-CEILING: CONTRACTOR IS NOTIFIED THAT THE EXISTING ROOF STRUCTURE HAS A GYPSUM BOARD SUB-CEILING INSTALLED BELOW THE STEEL AS A MEANS OF FIRE PROTECTION. CONTRACTOR WILL BE REQUIRED TO REMOVE PORTIONS OF THE CEILING AND PATCH AT PROJECT COMPLETION AS NEEDED TO PERFORM THE WORK.
 - ADMIN. LOUNGE, WORK AND ASSOCIATED CORRIDOR AREAS: CEILINGS WILL BE DEMOLISHED AND REPLACED WITH NEW UNDER A SEPARATE CONSTRUCTION PROJECT. CONTRACTOR SHALL NOT INCLUDE THE COST OF CEILING WORK IN THESE AREAS IN THEIR PROPOSAL AND SHALL COORDINATE THEIR WORK WITH THE OTHER CONSTRUCTION PROJECT AS APPLICABLE.
- FLOORS: CONTRACTOR SHALL PROTECT ALL FLOORS WITH PANELING OR HEAVY CARDBOARD AS REQUIRED TO PREVENT DAMAGE TO EXISTING FLOORING.
- REFER TO ENLARGED PLANS FOR DETAILED WORK SCOPE NEAR EQUIPMENT AS CALLED OUT ON THE DRAWINGS.
- INTERIOR WALLS:
 - ALL INTERIOR WALLS GO ALL OF THE WAY UP TO THE BOTTOM OF THE GYPSUM BOARD ROOF SUB-CEILING. CONTRACTOR SHALL PROVIDE WALL SLEEVES AS NEEDED FOR PIPE AND DUCT PENETRATIONS.
 - ALL CORRIDOR WALLS GO ALL OF THE WAY UP TO THE BOTTOM OF THE GYPSUM BOARD ROOF SUB-CEILING. CONTRACTOR SHALL PROVIDE WALL SLEEVES FOR ALL PIPING PENETRATIONS AND SEAL FIRE TIGHT AND SHALL PROVIDE FIRE DAMPERS FOR ALL DUCT PENETRATIONS.

HVAC RENOVATION KEYED NOTES: SHEET M201

- PROVIDE NEW REFRIGERANT PIPING AND CONTROL WIRING FROM AHU TO OUTDOOR ACCU. GROUND OR ROOF MOUNTED. NEW PIPING SHALL BE INSTALLED AT THE APPROXIMATE LOCATION AS EXISTING WITH NEW HANGER SUPPORT SYSTEMS IN ACCORDANCE WITH DETAIL 11, SHEET M400. (TYPICAL)
- CORE DRILL EXTERIOR WALL AND INSTALL REFRIGERANT PIPING DOWN ON EXTERIOR WALL TO NEW GROUND MOUNTED ACCU IN ACCORDANCE WITH DETAILS 2 OR 3/SHEET M401. (TYPICAL)
- INSTALL GROUND MOUNTED ACCU IN ACCORDANCE WITH DETAILS 2 OR 3/SHEET M401. (TYPICAL)
- MECHANICAL CONTRACTOR SHALL INSTALL HVAC EQUIPMENT AND PIPING TO AVOID CONFLICTS WITH ELECTRICAL DISCONNECT SWITCH SERVICE AREAS, MINIMUM 36" IN FRONT OF THE SWITCH AND 36" SIDE-TO-SIDE.
- BAS CONTRACTOR SHALL PROVIDE NEW SPACE COMBINATION TEMPERATURE AND HUMIDITY SENSORS AT THE SAME LOCATION AS EXISTING.
- PROVIDE NEW SUPPLY AND RETURN AIR DUCT RISERS AND TRANSITION AS NEEDED TO CONNECT TO NEW RTU ON ROOF. TRANSITION WITHIN CURB AS NEEDED TO AVOID STRUCTURAL ROOF CONFLICTS.
- CONDENSATE DRAIN PIPING UP TO ROOF. REFER TO ROOFING PLAN FOR CONTINUATION.
- TURN CONDENSATE DRAIN PIPING DOWN OVER EXISTING HUB DRAIN. PROVIDE PIPE SUPPORT AT TURN DOWN.
- SUPPORT PIPING ABOVE CEILING SIMILAR TO DETAIL 11, SHEET M400 REFRIGERANT SUCTION PIPING.
- TRANSITION AS NEEDED WHEN CONNECTING TO EXISTING DUCT CONNECTIONS.
- BAS CONTRACTOR SHALL PROVIDE 24-VAC CONTROL WIRING FROM RTU-W7 CONTROL PANEL AS NEEDED TO PROVIDE CONTROL POWER TO THE EXISTING FAN CONTROL PANEL.
- PROVIDE NEW WALL FIRE DAMPERS IN ACCORDANCE WITH DETAIL 3, SHEET M402. (TYPICAL)
- PROVIDE MANUAL AIR BALANCING DAMPERS IN ACCORDANCE WITH DETAIL 4, SHEET M400. (TYPICAL)
- ENGINEER HAS DESIGNED NEW DUCT SYSTEMS TO MATCH AS BEST AS POSSIBLE TO EXISTING DUCT WALL PENETRATIONS TO LIMIT THE AMOUNT OF WALL PATCHING AND NEW WALL PENETRATIONS. (TYPICAL FOR THE ADMINISTRATION AREA)
- INSTALL NEW SURFACE MOUNT DIFFUSER AT THE SAME LOCATION AS EXISTING. DUCT DROPS DOWN THROUGH A CONCRETE CEILING OF THE OLD VAULT.

NO	REVISION	DATE

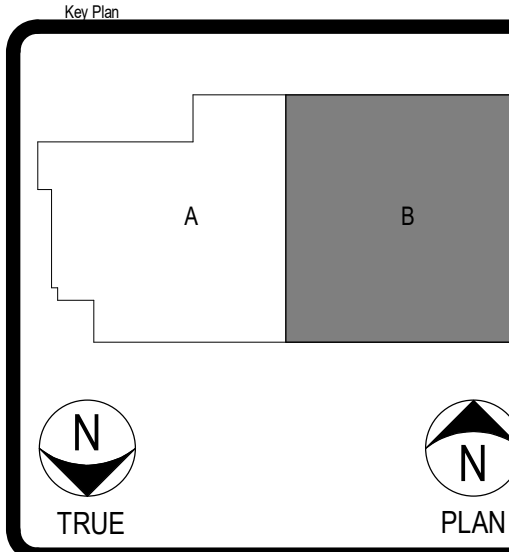
WOOD RIVER ELEMENTARY HVAC REPLACEMENTS AND UPGRADES - 2026 (PHASE 1)

CALALLEN INDEPENDENT SCHOOL DISTRICT

15118 DRY CREEK DR, CORPUS CHRISTI, TX 78410

SERVICE ORDER NO. 4 - BOND 2023

MECHANICAL RENOVATION PLAN AREA "B"



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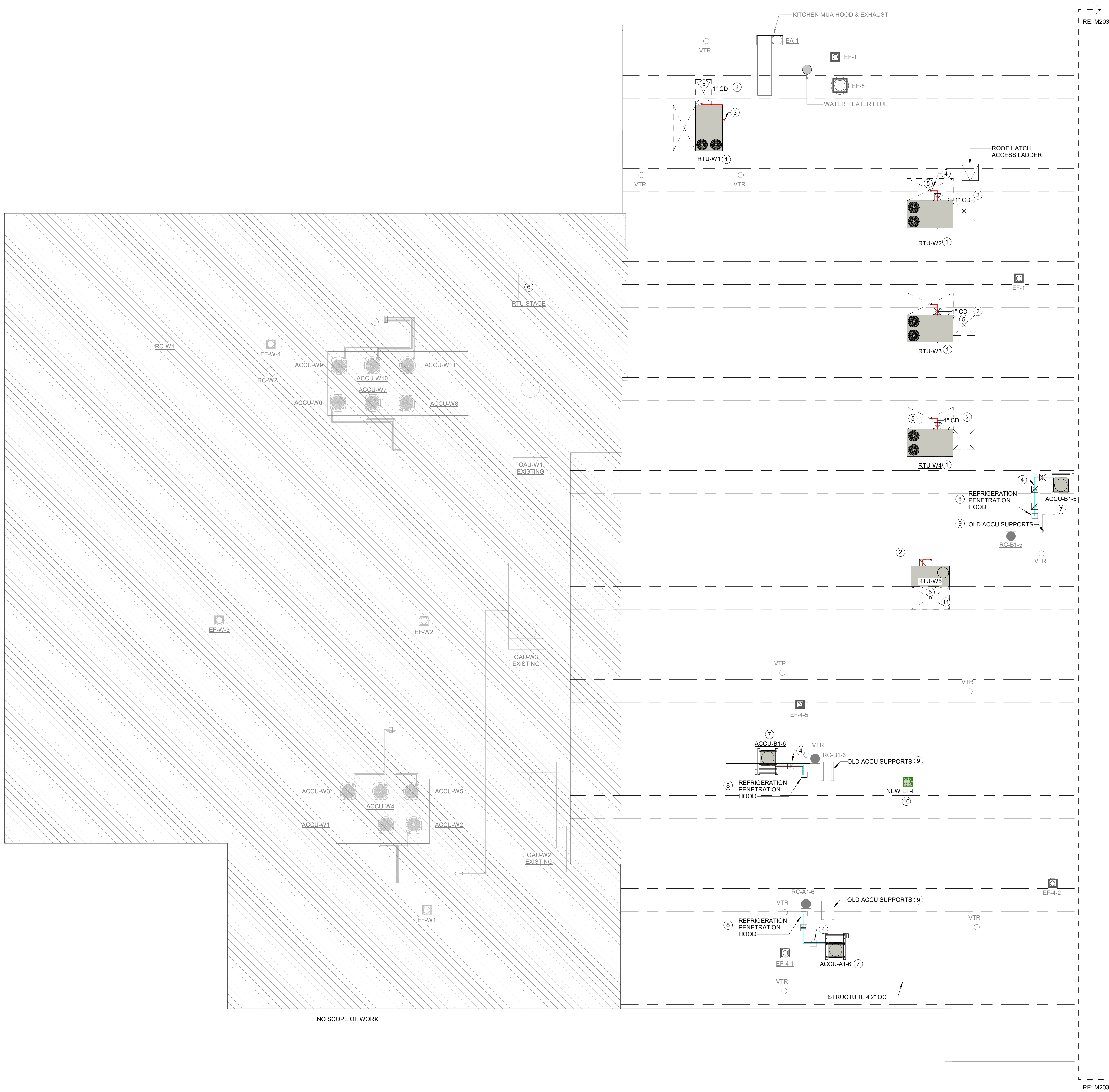
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11/13/2025

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Date Drawn	11/13/2025
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M201



1 MECHANICAL RENOVATION ROOF PLAN AREA "A"

1/8" = 1'-0"

HVAC GENERAL NOTES, SHEET M202

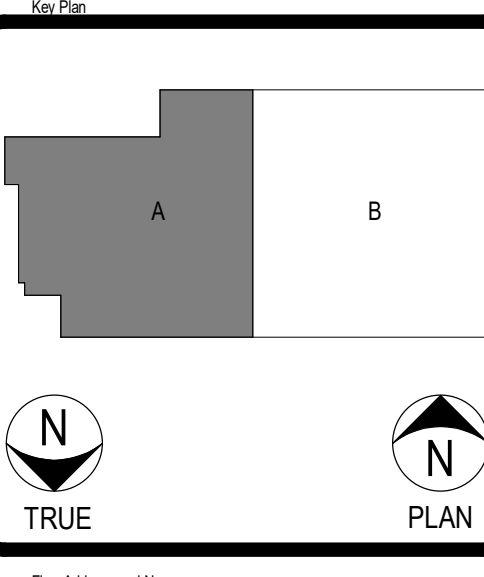
1. ROOFING:
 - A. EXISTING ROOFING IS CONSTRUCTED OF TAR AND GRAVEL.
 - B. CONTRACTOR SHALL PROTECT EXISTING ROOFING FROM DAMAGE DURING CONSTRUCTION WITH PANELING OR PLYWOOD SHEETS AS NEEDED.

HVAC RENOVATION KEYED NOTES, SHEET M202

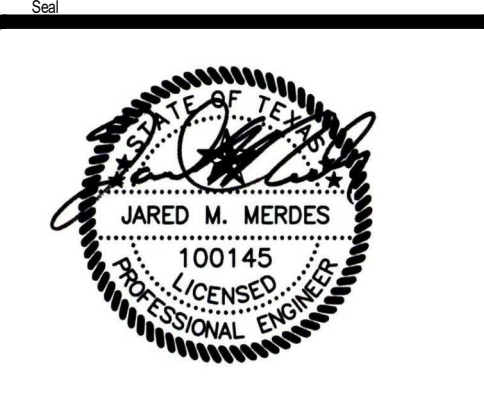
1. PROVIDE NEW RTU WITH NEW ROOF CURB ADAPTER AS NEEDED TO ADAPT TO EXISTING BASE CURB AND DUCT RISERS. INSTALL IN ACCORDANCE WITH DETAILS 1 AND 2/SHEET M404.
2. PROVIDE CONDENSATE DRAIN WITH TRAP AND AIR BRAKE IN ACCORDANCE WITH DETAIL 12, SHEET M400. ROUTE PIPING TO EXISTING ROOF DRAINS. TURN DOWN WITH 1" AIR GAP AND SUPPORT PIPING AT TURN DOWN.
3. SUPPORT NEW CONDENSATE DRAIN PIPING WITH STRUT SECURED TO THE RTU BASE RAIL. PROVIDE MINIMUM 1/8" FOOT DOWNWARD SLOPE.
4. PROVIDE NEW ADJUSTABLE ROOF PIPE/CONDUIT SUPPORTS IN ACCORDANCE WITH DETAILS 9 AND 10, SHEET M400 (TYPICAL).
5. EQUIPMENT SERVICE AREA. KEEP CLEAR OF OBSTRUCTIONS. (TYPICAL)
6. BAS CONTRACTOR SHALL RELABEL TO THE EXISTING STAGE UNIT RTU-STAGE.
7. PROVIDE NEW ACCU WITH NEW ROOF SUPPORT. STRUCTURAL ATTACHMENTS AND ROOFING PATCHES. REFER TO DETAIL 1, SHEET M402.
8. PROVIDE NEW PIPE HOOD ON EXISTING ROOF CURB. REFER TO DETAIL 13, SHEET M400 (TYPICAL).
9. PROVIDE NEW STAINLESS-STEEL CAPS ON EXISTING ACCU CURB. REFER TO DETAIL 2, SHEET M403 (TYPICAL).
10. PROVIDE CRAWLSPACE EXHAUST FAN WITH ROOF CURB AND ROOF PATCHES IN ACCORDANCE WITH DETAIL 4, SHEET M402.

NO	REVISION	DATE

WOOD RIVER ELEMENTARY HVAC REPLACEMENTS AND UPGRADES - 2026 (PHASE 1)
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MECHANICAL RENOVATION ROOF PLAN AREA "A"



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Project No.	2024100
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Scale	1/8" = 1'-0"
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M202



HVAC GENERAL NOTES: SHEET M203

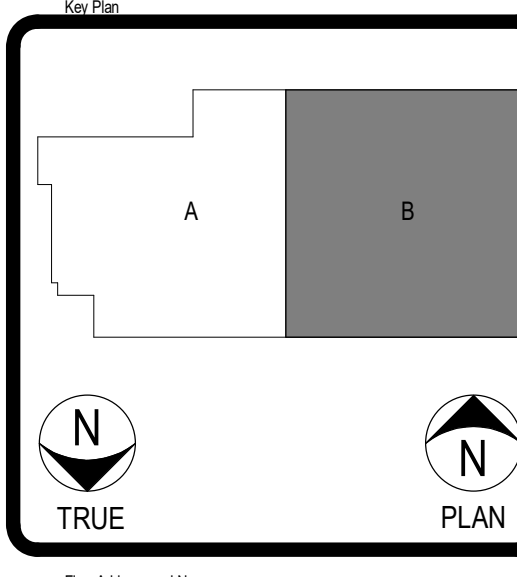
1. ROOFING:
 - A. EXISTING ROOFING IS CONSTRUCTED OF TAR AND GRAVEL.
 - B. CONTRACTOR SHALL PROTECT EXISTING ROOFING FROM DAMAGE DURING CONSTRUCTION WITH PANELING OR PLYWOOD SHEETS AS NEEDED.

HVAC RENOVATION KEYED NOTES: SHEET M203

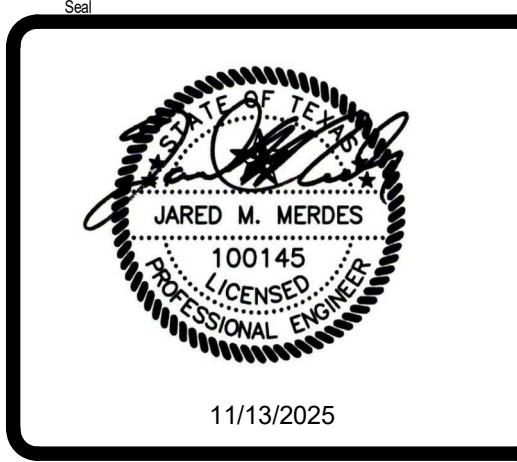
1. PROVIDE NEW RTU WITH NEW ROOF CURB, STRUCTURAL STEEL SUPPORTS AND RE-ROOFING. REFER TO STRUCTURAL DRAWINGS, DETAIL 1/SHEET M401.
2. PROVIDE CONDENSATE DRAIN PIPING WITH TRAP AND AIR BRAKE IN ACCORDANCE WITH DETAIL 12, SHEET M400.
3. PROVIDE NEW ADJUSTABLE ROOF PIPING/CONDUIT SUPPORTS IN ACCORDANCE WITH DETAILS 9 AND 10, SHEET M400 (TYPICAL).
4. EQUIPMENT SERVICE AREA. KEEP CLEAR OF OBSTRUCTIONS. (TYPICAL)
5. ROUTE NEW CONDENSATE DRAIN PIPING DOWN THROUGH ROOF AT APPROXIMATE LOCATION. PROVIDE 316 STAINLESS STEEL PITCH PAN SECURED TO ROOF AND FILL WITH SYNTHETIC PITCH, CHEMLINK OR EQUAL.
6. PROVIDE NEW PIPE HOOD ON EXISTING ROOF CURB. REFER TO DETAILS 1 AND 2, SHEET M402.
7. PROVIDE NEW PIPE HOOD ON EXISTING ROOF CURB. REFER TO DETAIL 13, SHEET M400 (TYPICAL).
8. PROVIDE CURB CAP WITH INSULATION AND NEW STAINLESS-STEEL CAP ON ABANDONED OUTSIDE AIR HOOD IN ACCORDANCE WITH DETAIL 3, SHEET M403.
9. PROVIDE PERMANENT STAINLESS-STEEL CAP ON ABANDONED REFRIGERANT PIPE CURB SIMILAR TO OA HOOD. REFER TO DETAIL 3, SHEET M403.

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MECHANICAL RENOVATION ROOF PLAN AREA "B"

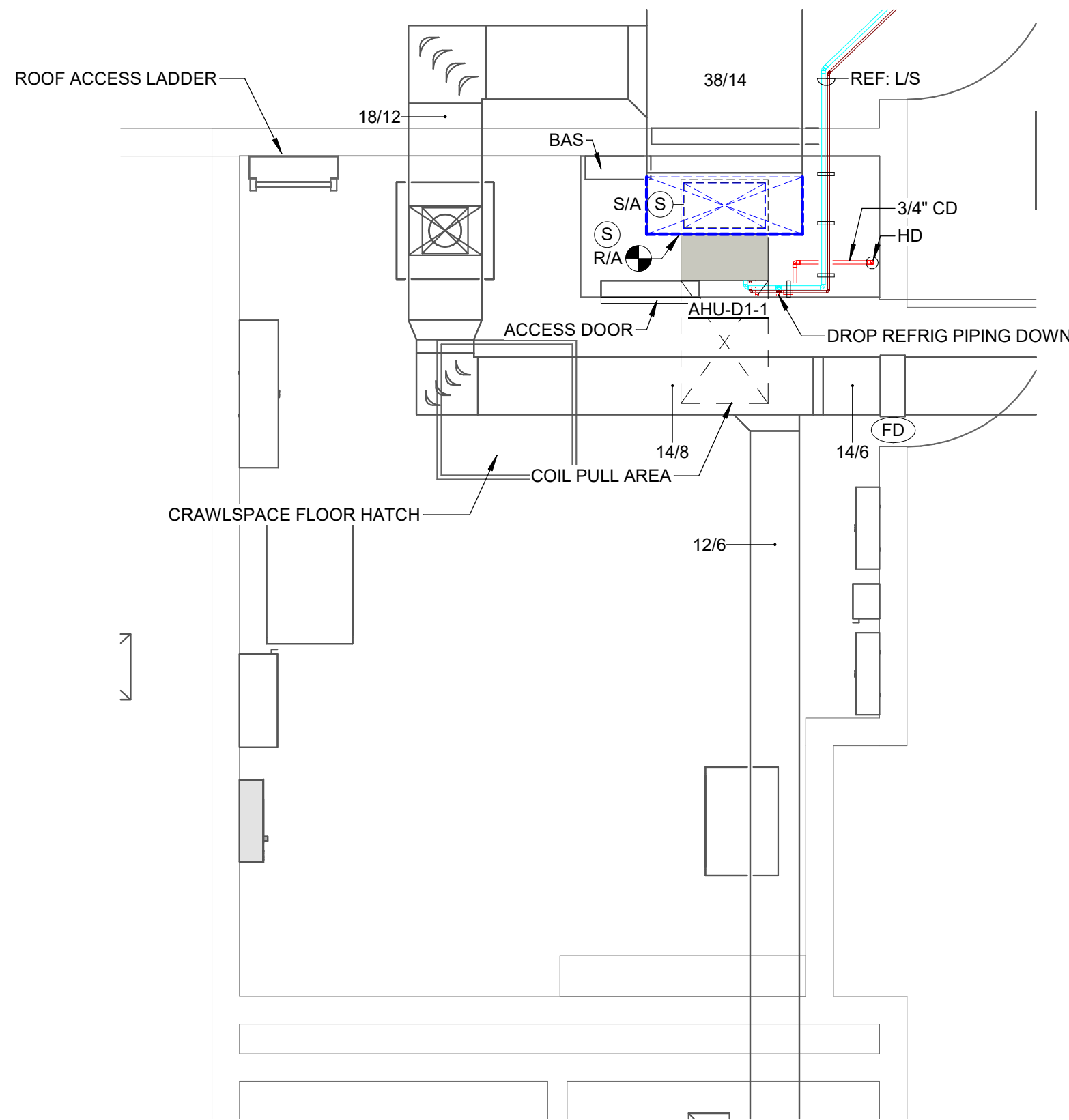


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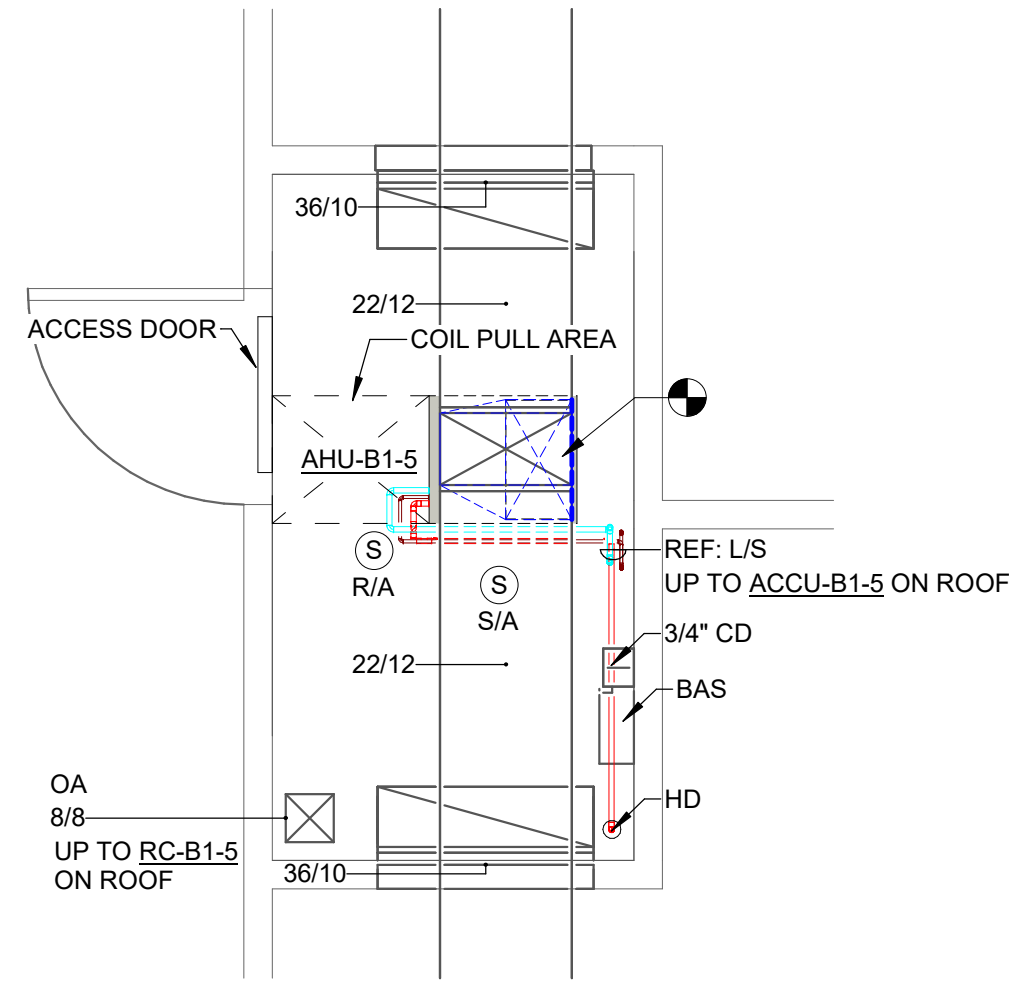


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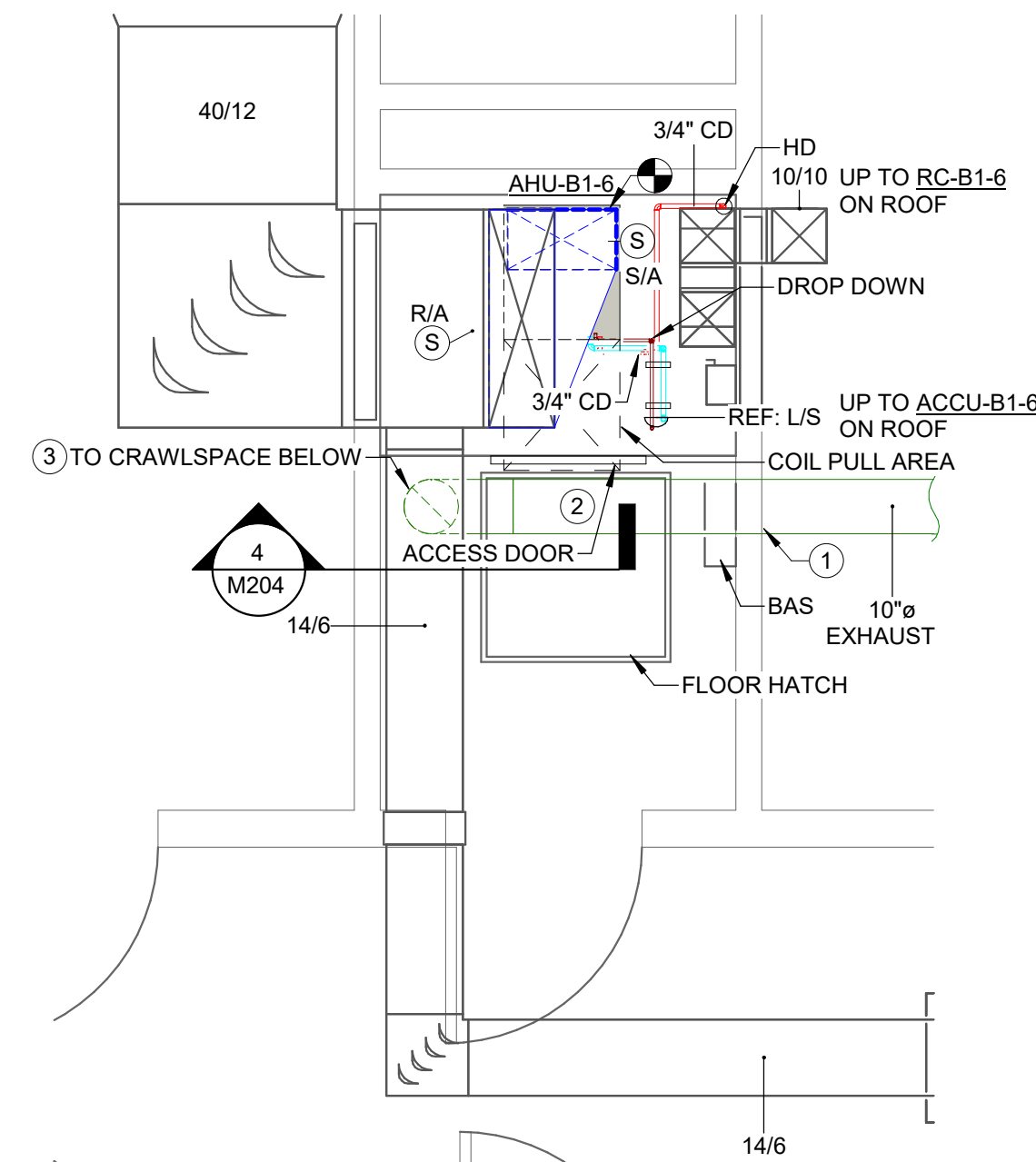
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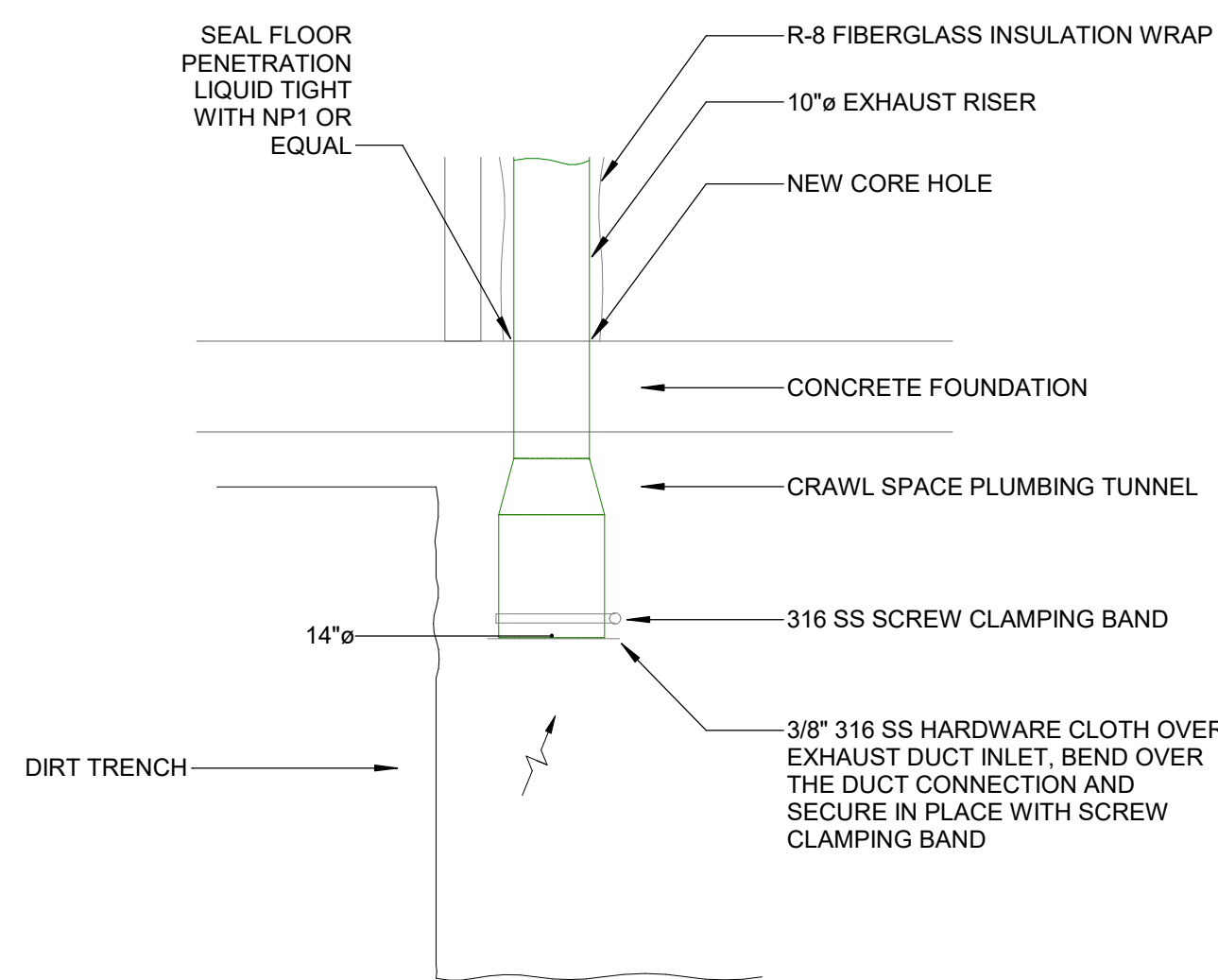
1 ENLARGED RENO. PLAN AREA "A" - MECH/ELEC. - AHU-D1-1
3/8" = 1'-0"



2 ENLARGED RENO PLAN AREA "A" - AHU-B1-5
3/8" = 1'-0"



3 ENLARGED RENO PLAN AREA "A" - AHU-A1-6 AND AHU-B1-6
3/8" = 1'-0"



4 CRAWLSPACE EXHAUST ELEVATION DETAIL
1/2" = 1'-0"

HVAC GENERAL RENOVATION NOTES: SHEET M204

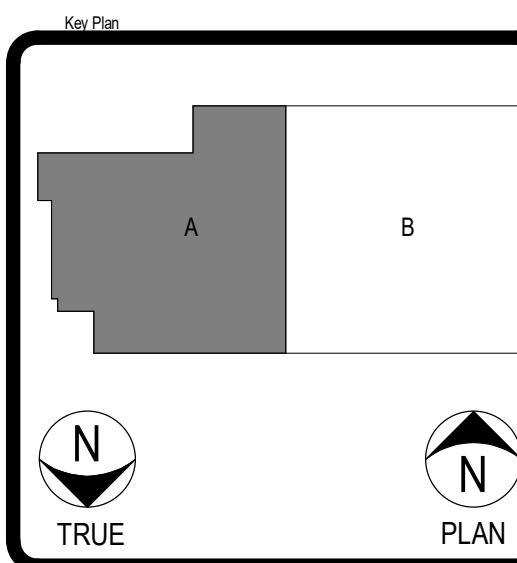
1. ENLARGED PLANS HAVE BEEN PROVIDED TO INDICATE MORE DETAIL OF THE ACTUALLY INSTALLED CONDITIONS AT EACH EQUIPMENT LOCATION. REFER TO DETAIL 2, SHEET M403 FOR DETAILED RENOVATION SCOPE OF WORK FOR ALL AHU'S INSTALLED ON PLENUM PLATFORMS.
2. CONTRACTOR WILL NEED TO REPLACE SOME OF THE EXISTING WOOD PLATFORM TOPS DUE TO EQUIPMENT WATER DAMAGE.

HVAC RENOVATION KEYED NOTES: SHEET M204

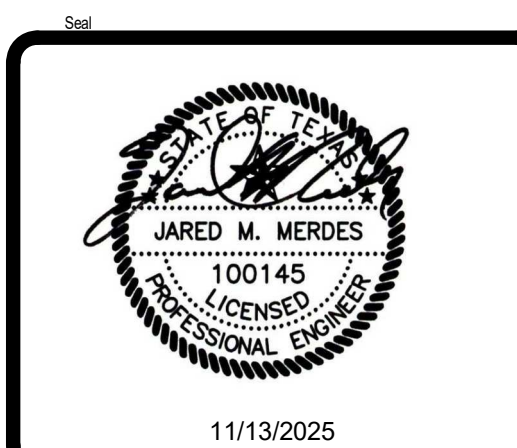
1. PROVIDE WALL SLEEVE FOR NEW EXHAUST DUCT PENETRATION.
2. DROP EXHAUST DUCT DOWN BELOW EXISTING SUPPLY DUCTWORK.
3. DROP PIPING DOWN AND PENETRATE THE FOUNDATION TO THE CRAWL SPACE BELOW. CORE DRILL THE FLOOR AND PROVIDE DUCT PENETRATION IN ACCORDANCE WITH DETAIL 4, SHEET M402.

NO	REVISION	DATE

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MECHANICAL ENLARGED RENOVATION PLANS AREA "A"

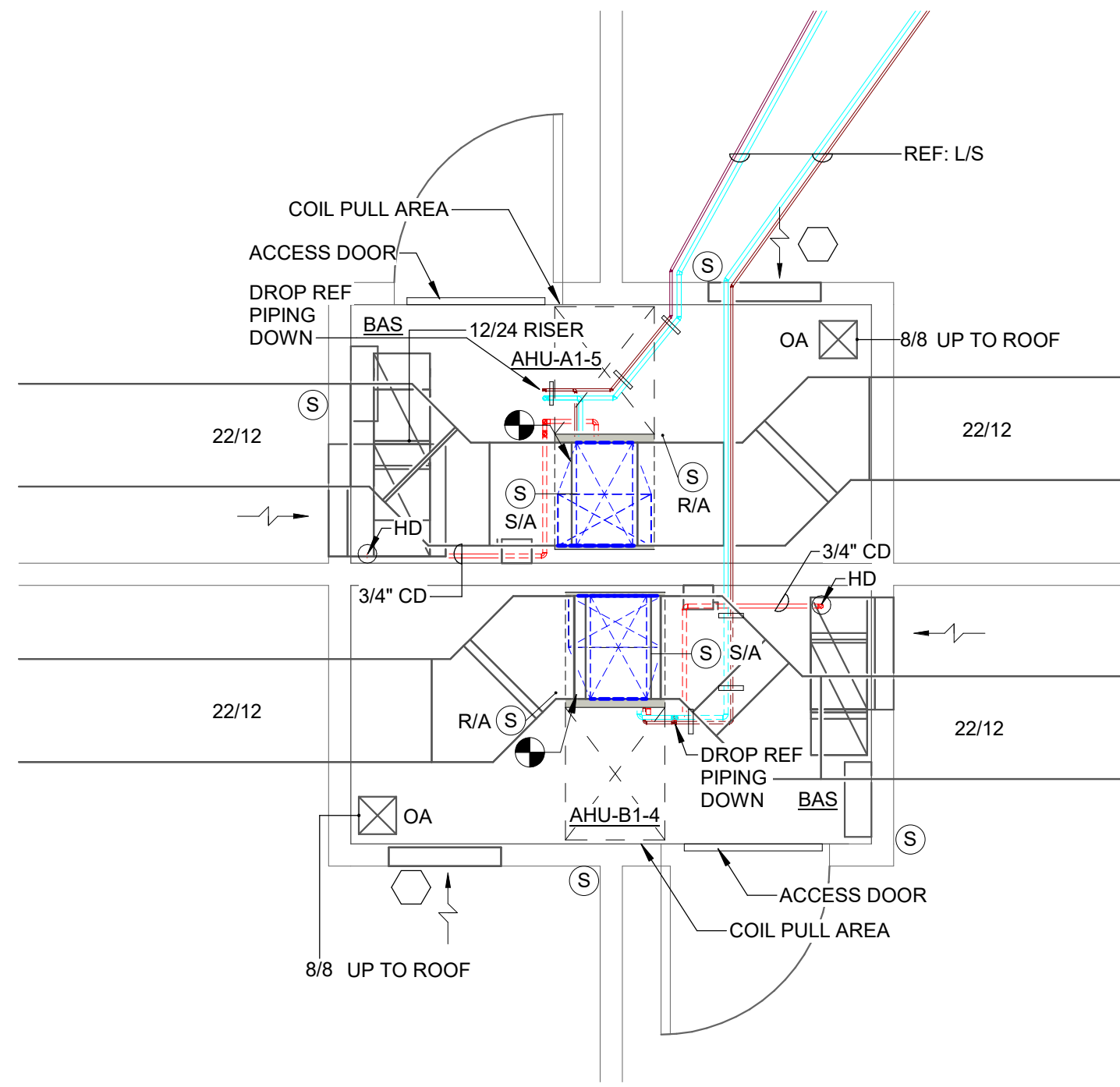


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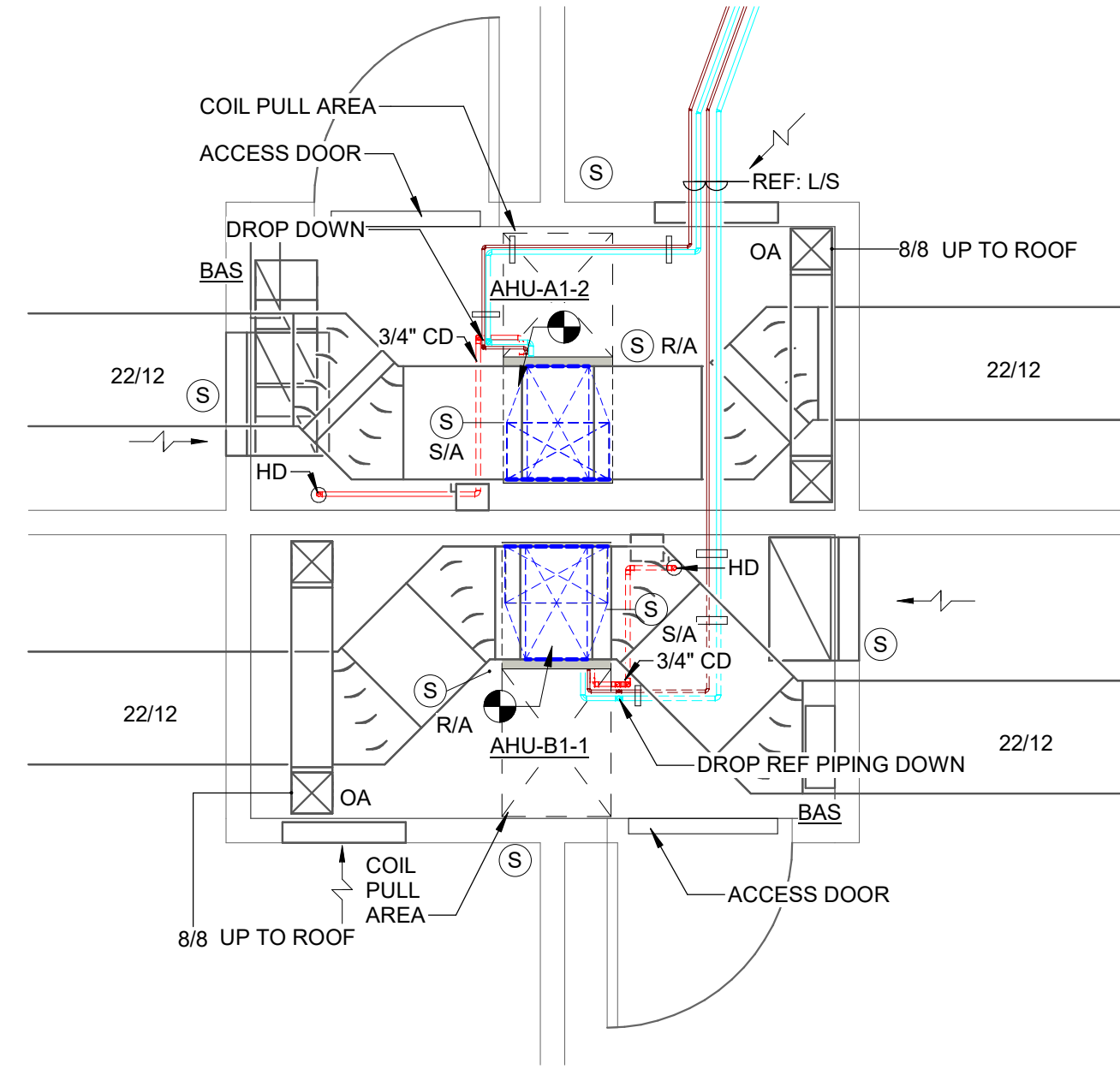


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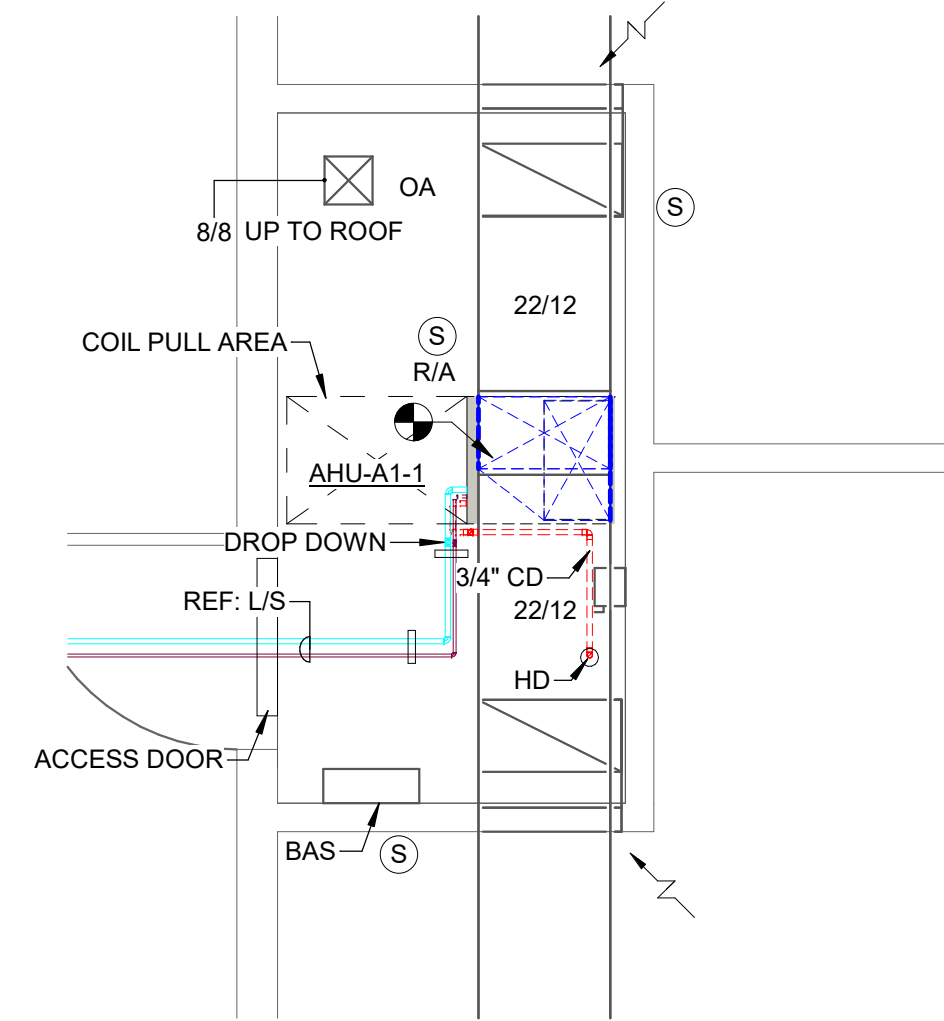
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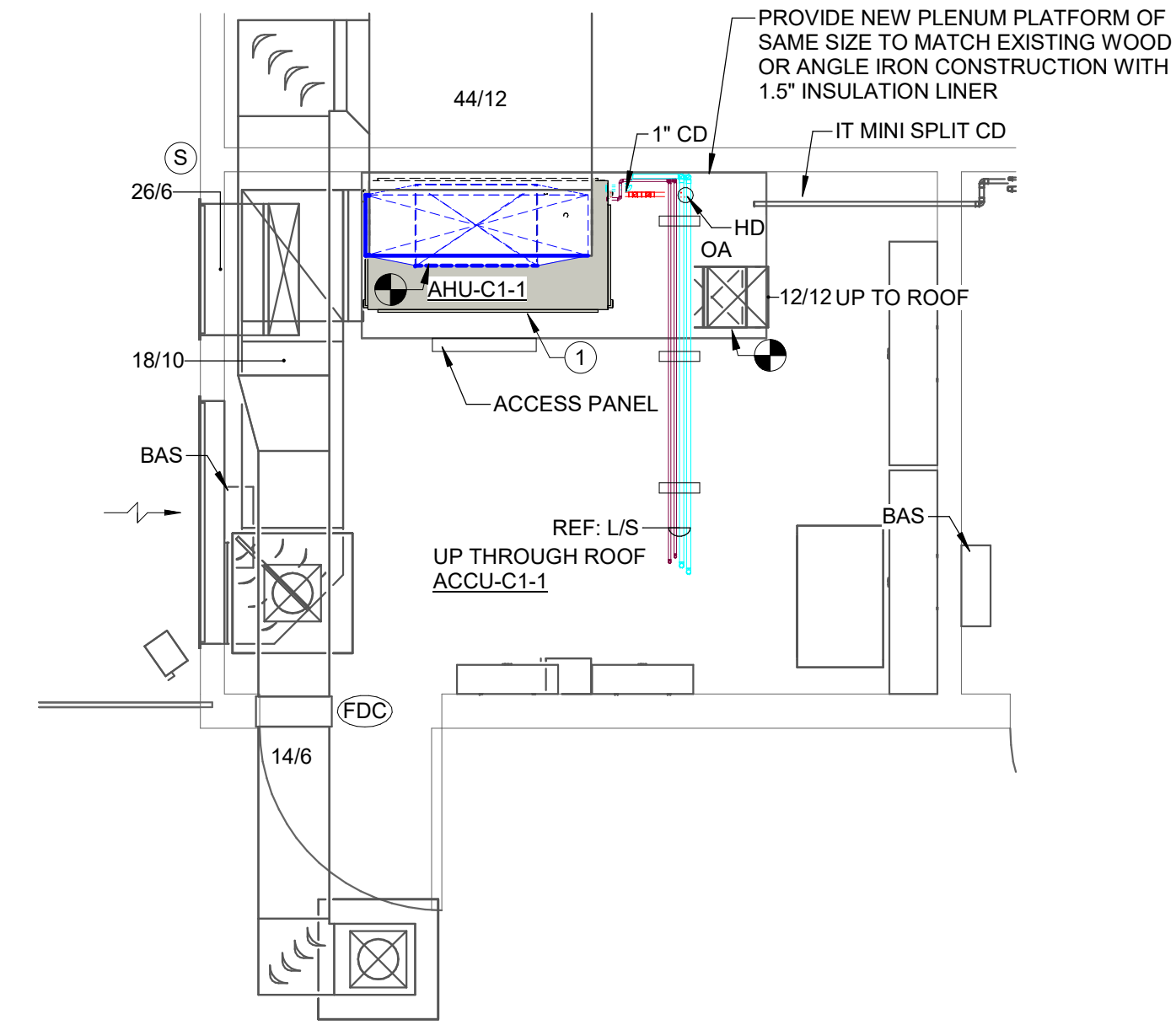
1 ENLARGED RENO. PLAN AREA "B" - AHU-A1-5 AND AHU-B1-4
3/8" = 1'-0"



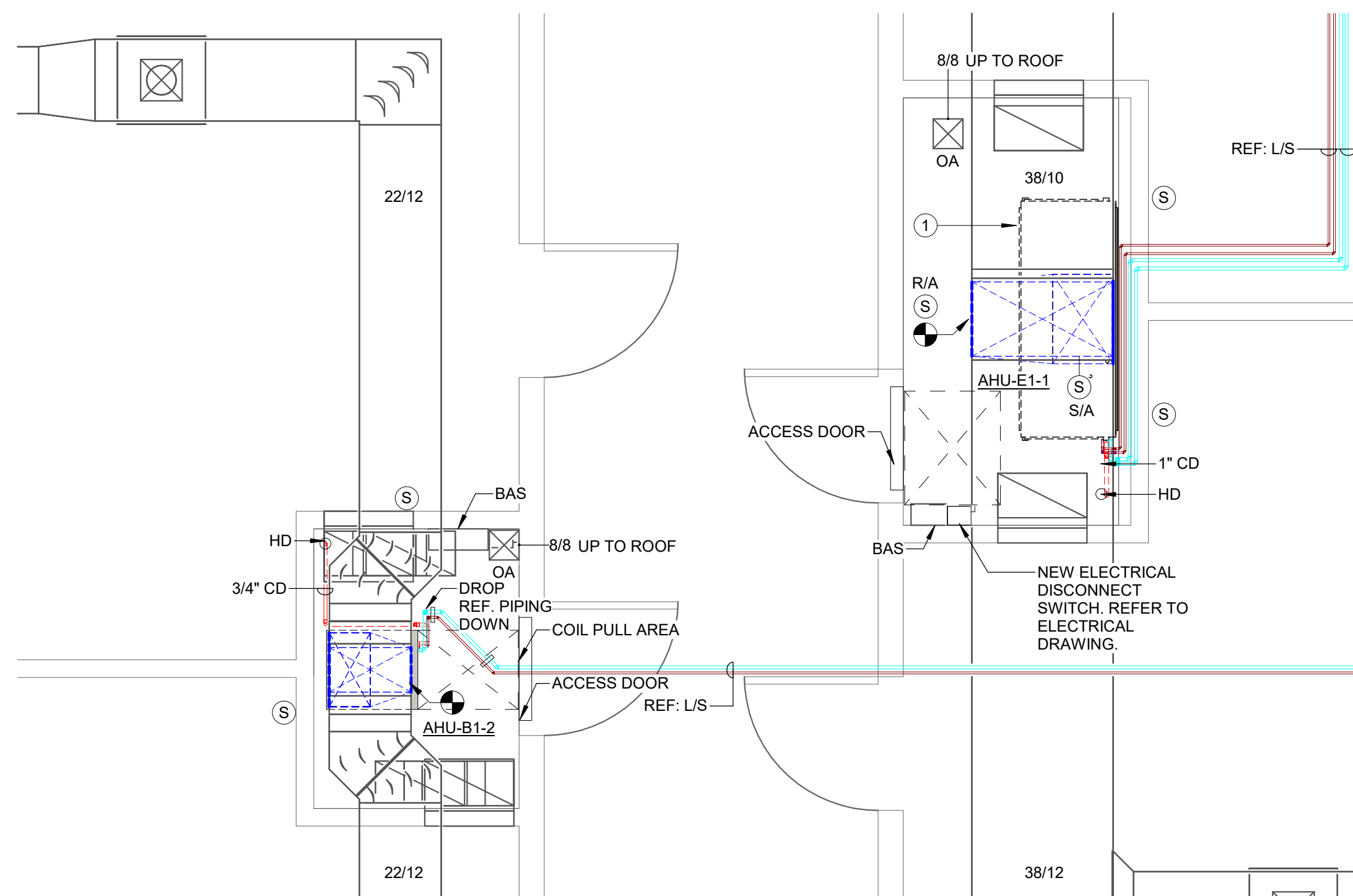
2 ENLARGED RENO. PLAN AREA "B" - AHU-A1-2 AND AHU-B1-1
3/8" = 1'-0"



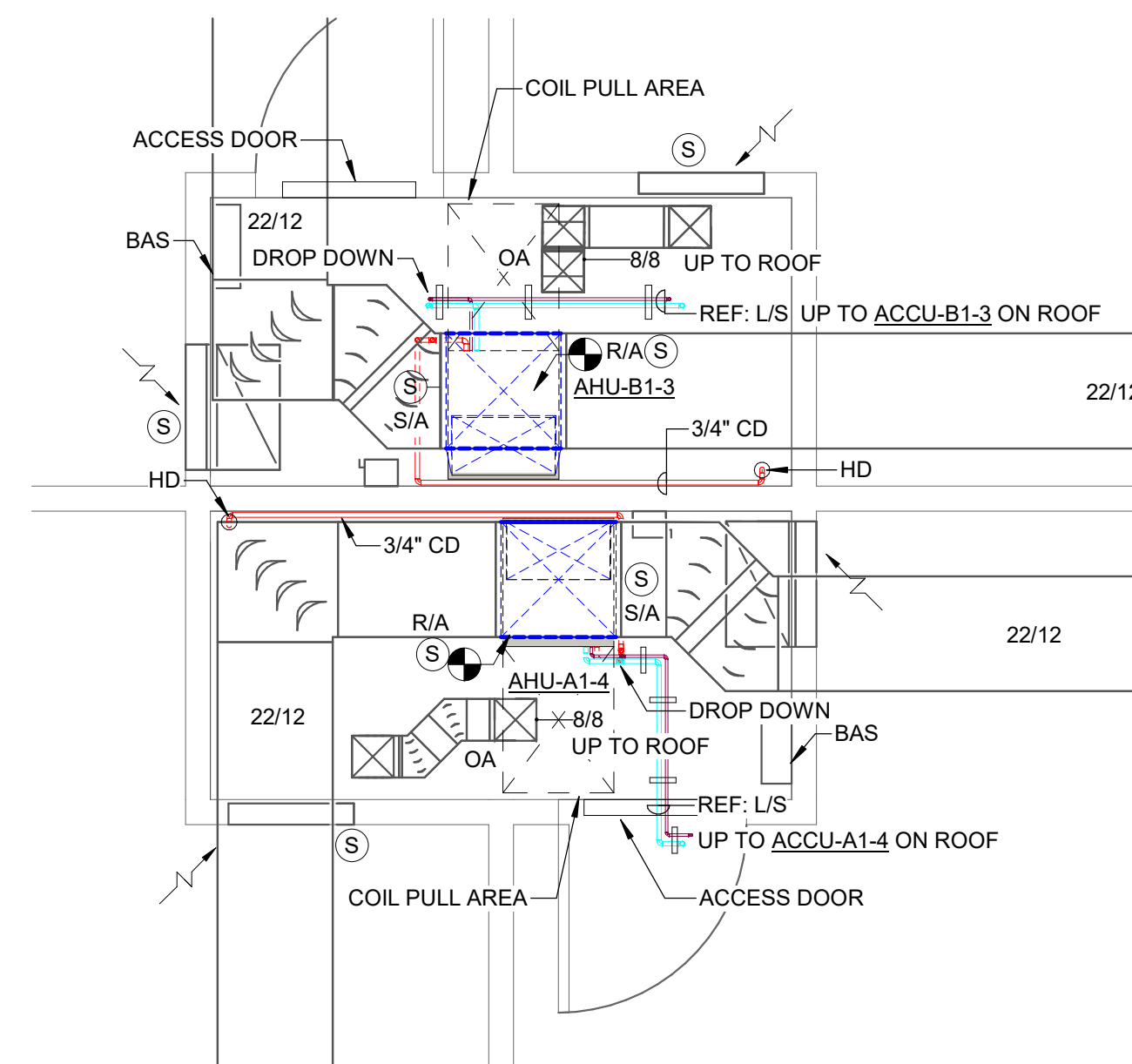
3 ENLARGED RENO. PLAN AREA "B" - AHU-A1-1
3/8" = 1'-0"



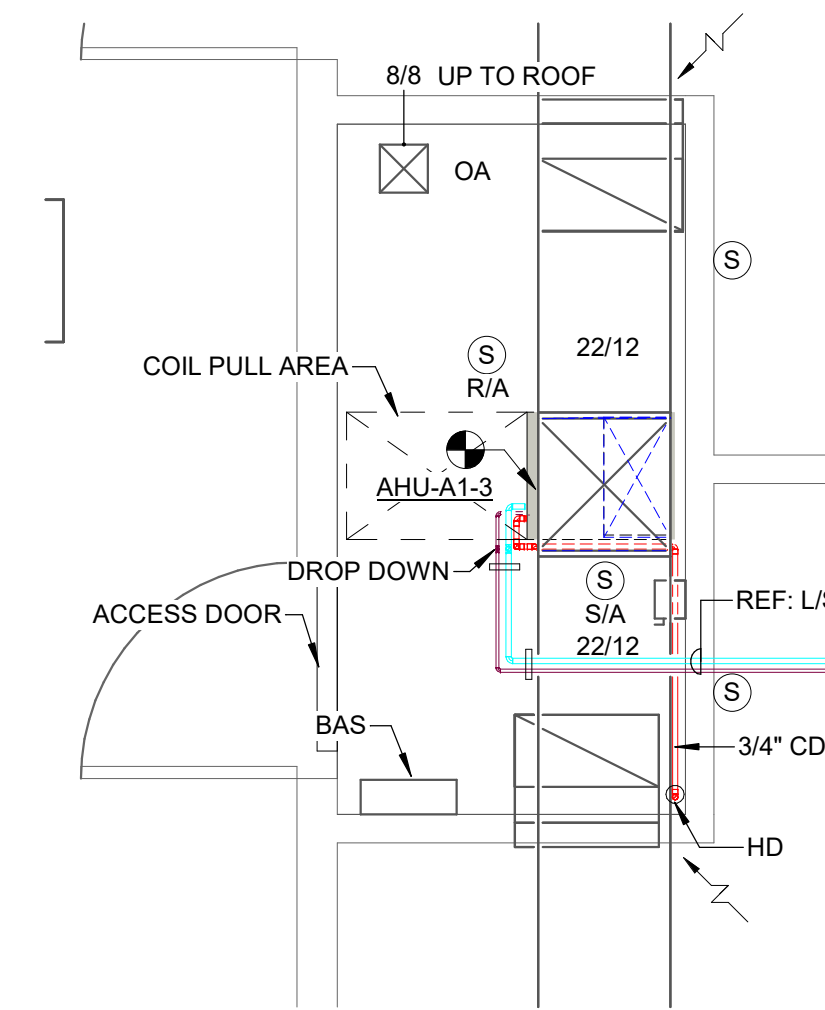
4 ENLARGED RENO. PLAN AREA "B" - AHU-C1-1
3/8" = 1'-0"



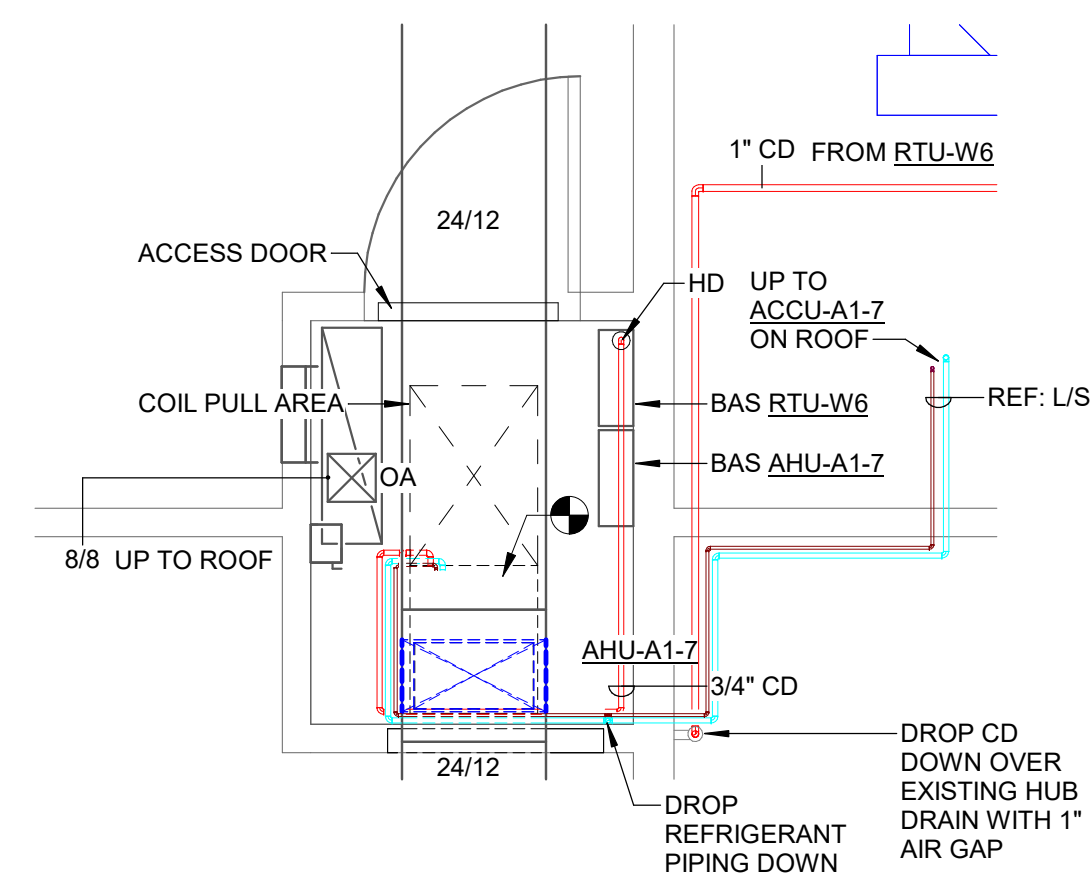
5 ENLARGED RENO. PLAN AREA "B" - AHU-B1-2 AND AHU-E1-1
3/8" = 1'-0"



6 ENLARGED RENO. PLAN AREA "B" - AHU-A1-4 AND AHU-B1-3
3/8" = 1'-0"



7 ENLARGED RENO. PLAN AREA "B" - AHU-A1-3
3/8" = 1'-0"



8 ENLARGED RENO. PLAN AREA "B" - AHU-A1-7
3/8" = 1'-0"

HVAC GENERAL NOTES; SHEET M205

1. ENLARGED PLANS HAVE BEEN PROVIDED TO INDICATE MORE DETAIL OF THE ACTUALLY INSTALLED CONDITIONS AT EACH EQUIPMENT LOCATION. REFER TO DETAIL 2, SHEET M403 FOR DETAILED RENOVATION SCOPE OF WORK FOR ALL AHU'S INSTALLED ON PLENUM PLATFORMS.
2. CONTRACTOR WILL NEED TO REPLACE SOME OF THE EXISTING WOOD PLATFORM TOPS DUE TO EQUIPMENT WATER DAMAGE.

HVAC RENOVATION KEYED NOTES; SHEET M205

1. TRANE 7.5 AND 10-TON AHU'S: MOUNT THE ELECTRIC REHEATER TO THE TOP OF THE UNIT FAN DISCHARGE AND WIRE THE SYSTEM FOR SINGLE POINT POWER CONNECTION. REVIEW THE INTERNAL AIR FILTER CONFIGURATIONS AND COORDINATE THE INSTALLATION TO ALLOW FOR THE REQUIRED AIR FILTER PULL AREA.

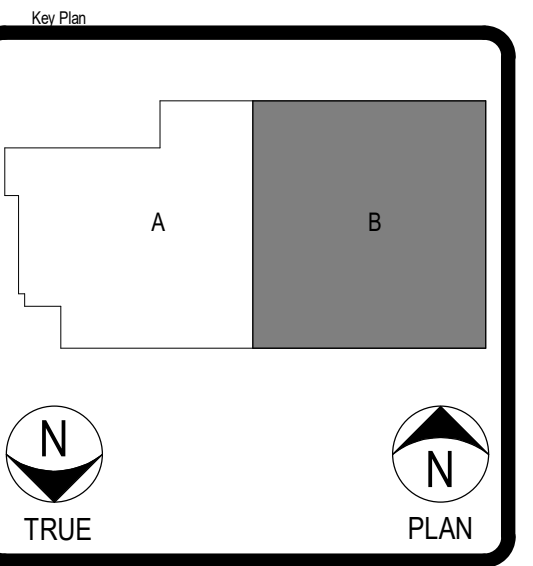
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WOOD RIVER ELEMENTARY HVAC REPLACEMENTS AND UPGRADES - 2026 (PHASE 1)

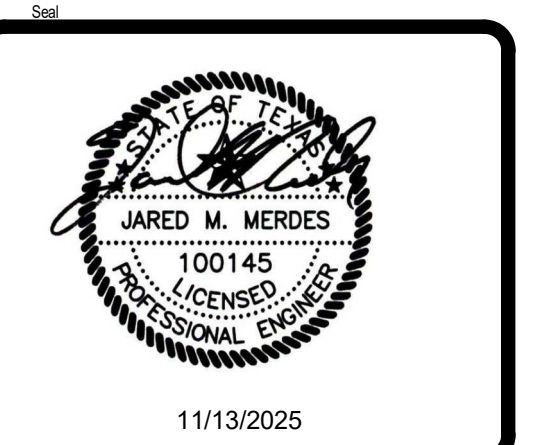
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SERVICE ORDER NO. 4 - BOND 2023

MECHANICAL ENLARGED RENOVATION PLANS AREA "B"

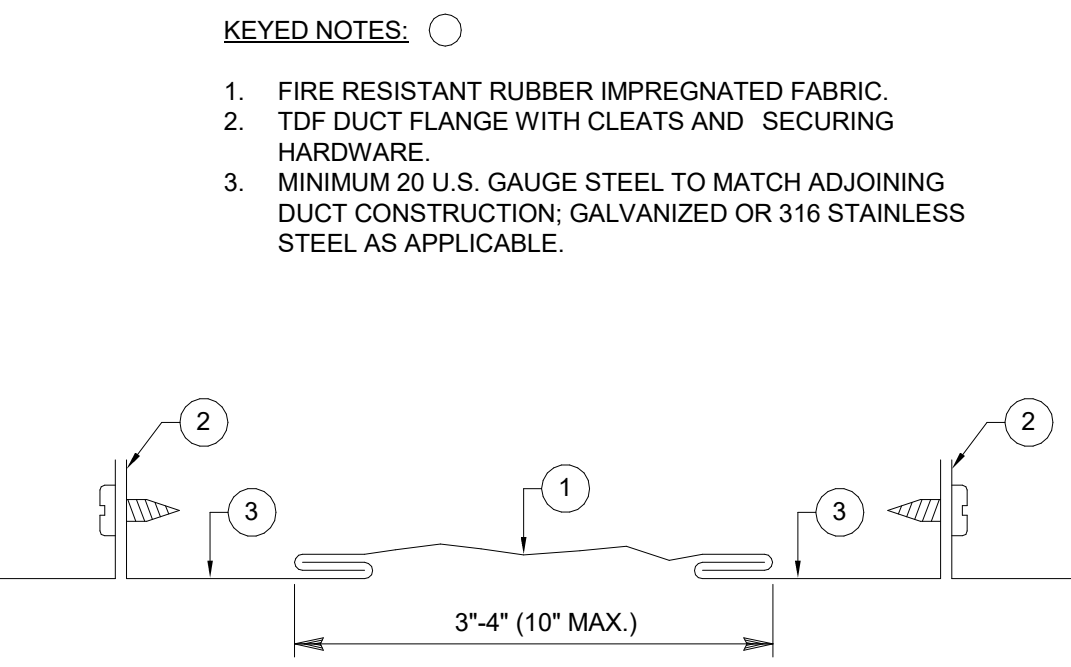


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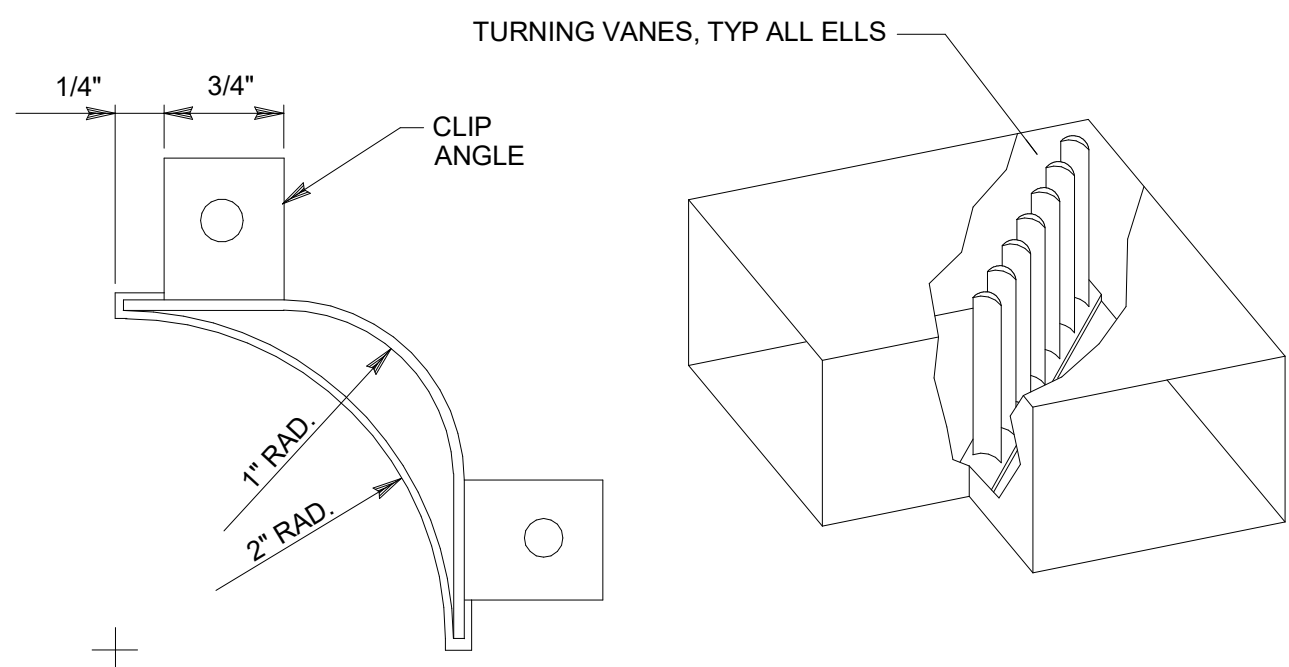


Project No.	2024100
Date Drawn	11/13/2025
Drawn By	AR
Checked By	JM
Scale	3/8" = 1'-0"
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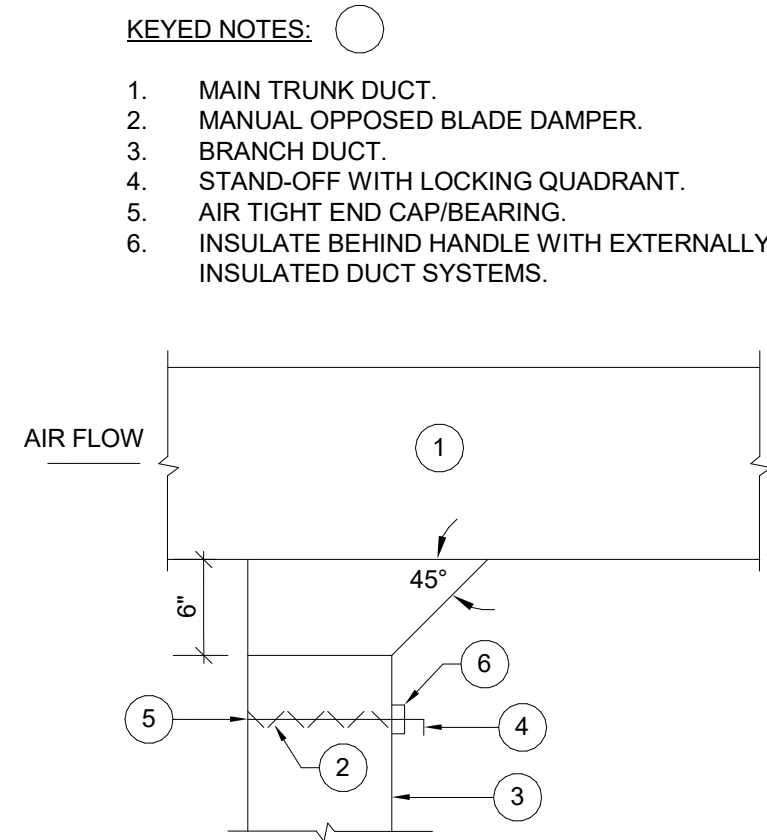
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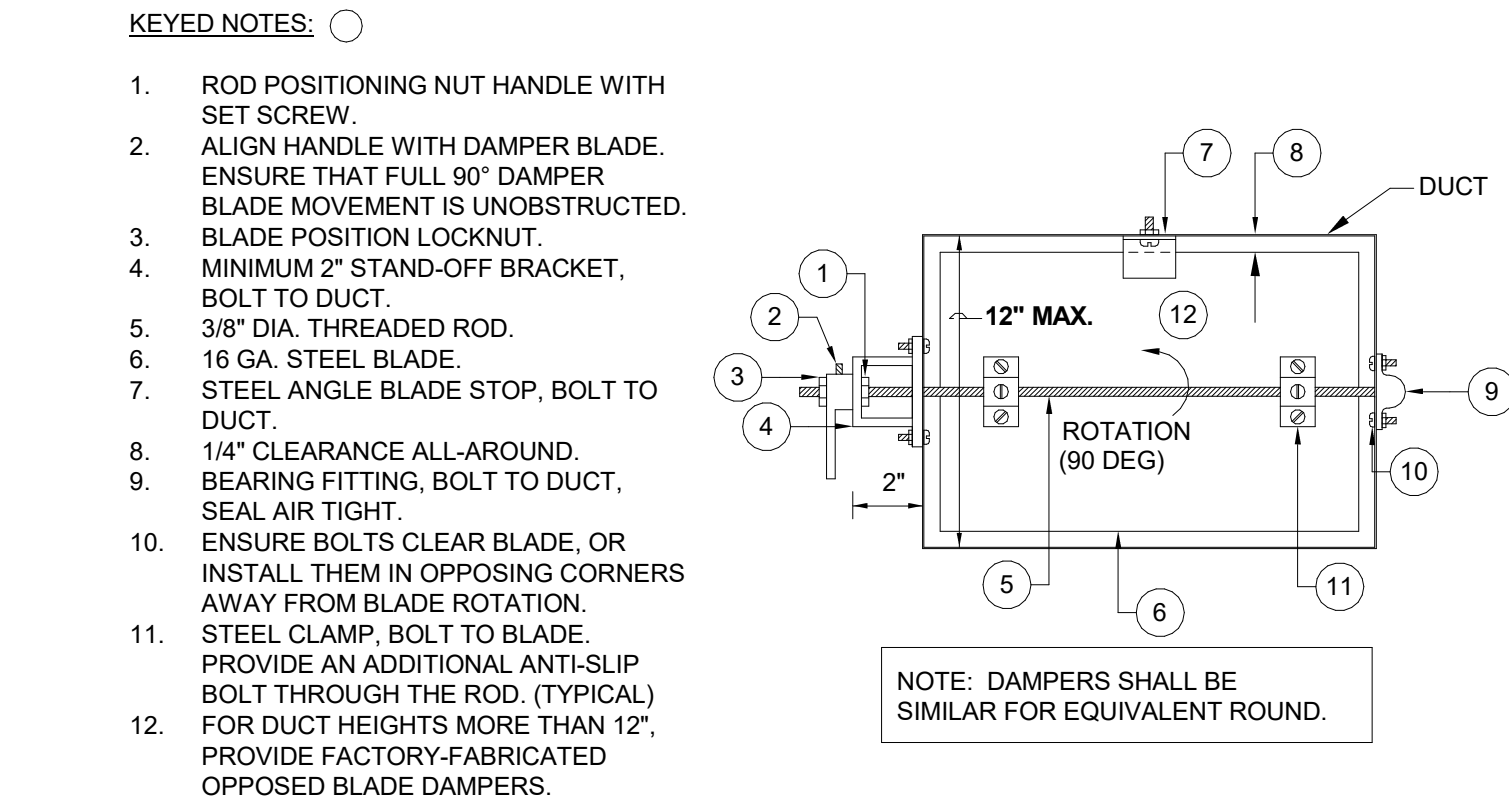
1 DETAIL - FLEXIBLE DUCT CONNECTION
SCALE: NOT TO SCALE



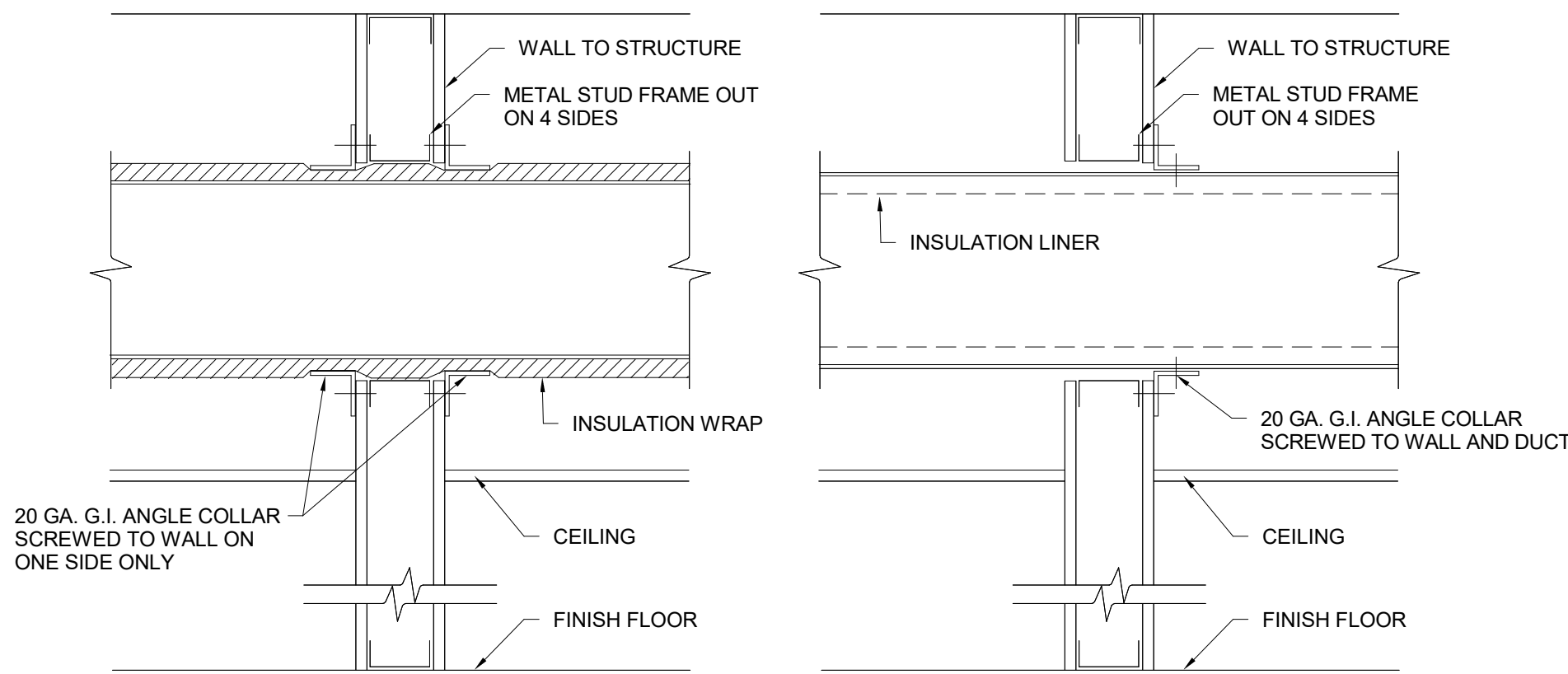
2 DETAIL - TURNING VANES, MITERED 90S
SCALE: NOT TO SCALE



3 DETAIL - BRANCH DUCT CONNECTION
SCALE: NOT TO SCALE



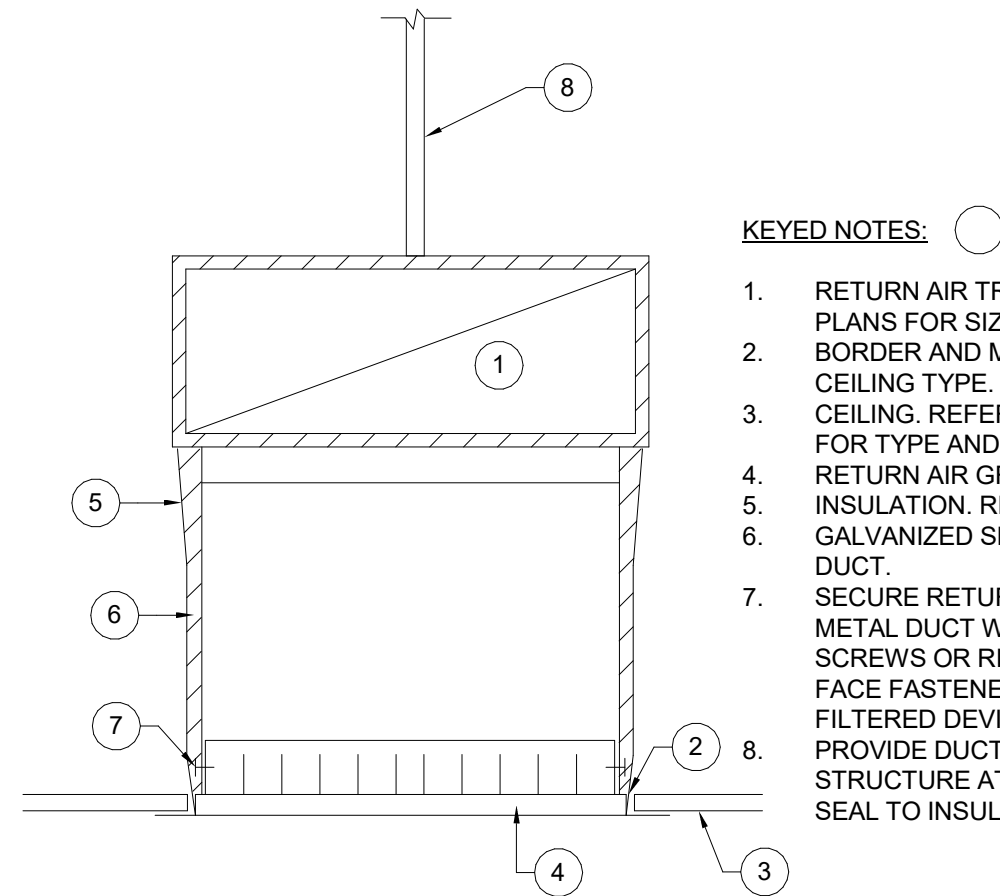
4 DETAIL - MANUAL BALANCING DAMPER (MBD)
SCALE: NOT TO SALE



5 DETAIL - DUCT WALL PENETRATION
SCALE: NOT TO SCALE

GENERAL NOTES:

1. ANGLE COLLARS ARE PRIMARILY USED FOR ACOUSTICAL PURPOSES TO PREVENT SOUND TRANSMISSION THROUGH THE WALLS AND TO ALSO PREVENT AIR FROM MOVING THROUGH WALLS.
2. WHEN THE DUCT IS INSTALLED ON A WALL THAT IS EXPOSED TO VIEW ADD THE ANGLE COLLARS ON THE VISIBLE SIDE. IF THE DUCT IS EXPOSED ON BOTH SIDES THAN PROVIDE ANGLES ON BOTH SIDES FOR VISUAL PURPOSES.
3. DETAIL IS BASED ON FRAME WALL CONSTRUCTION. IF WALL CONSTRUCTION IS CMU, CONTRACTOR SHALL PROVIDE SHEET METAL WALL SLEEVE FOR EXTERNAL DUCT WRAP APPLICATION. THE SLEEVE SHALL BE MINIMUM OF 1/2" LARGER THAN THE EXTERNAL WRAP STRETCH OUT LENGTH ON ALL FOUR SIDES.



6 DETAIL - DUCTED RETURN AIR DEVICE
SCALE: NOT TO SCALE

KEYED NOTES: ○

1. SEAL CONNECTION WITH DUCT JOINT SEALANT.
2. 45° TAKE-OFF AND DAMPER COMBINATION. FLEXMASTER TYPE STOD-B03 OR APPROVED EQUAL.
3. MANUAL BALANCING DAMPER WITH STAND OFF QUADRANT.
4. ROUND METAL DUCT. REFER TO PLANS FOR SIZES.
5. STAINLESS STEEL SCREW CLAMP. SECURE INNER FLEX DUCT LINER TO METAL DUCT COLLAR, (TYPICAL).
6. INSULATED FLEXIBLE DUCT, (MAX. LENGTH 4'-0") WITH RADIUS IN ACCORDANCE WITH MANUFACTURERS DIRECTIONS.
7. EXTERNALLY INSULATE DIFFUSER BACKPAN AND AIR PLENUM. SECURE TO DIFFUSER EDGE AND FLEX DUCT VAPOR TIGHT.
8. SUPPLY AIR DIFFUSER.
9. CEILING. REFER TO ARCHITECTURAL FOR TYPE AND HEIGHT.
10. BORDER PER CEILING TYPE. PROVIDE WITH PLASTER FRAME FOR GYPSUM BOARD CEILINGS.
11. SECURE PLENUM TO DIFFUSER NECK WITH SCREWS OR RIVETS. CLAMPS ARE NOT ALLOWED.
12. 2" WIDE FLEXIBLE STRAPS. SUPPORT FROM STRUCTURE ABOVE.
13. PROVIDE SQUARE TO ROUND DUCT TRANSITION AT CONNECTION TO DIFFUSER AS REQUIRED. MINIMUM 6" ABOVE REAR OF AIR DEVICE OR DAMPER.
14. EXTERNALLY INSULATE DUCT PER SPECIFICATIONS.
15. PROVIDE MANUAL OPPOSED BLADE VOLUME DAMPER AS SHOWN ON DRAWINGS OR SCHEDULED "OBVD".

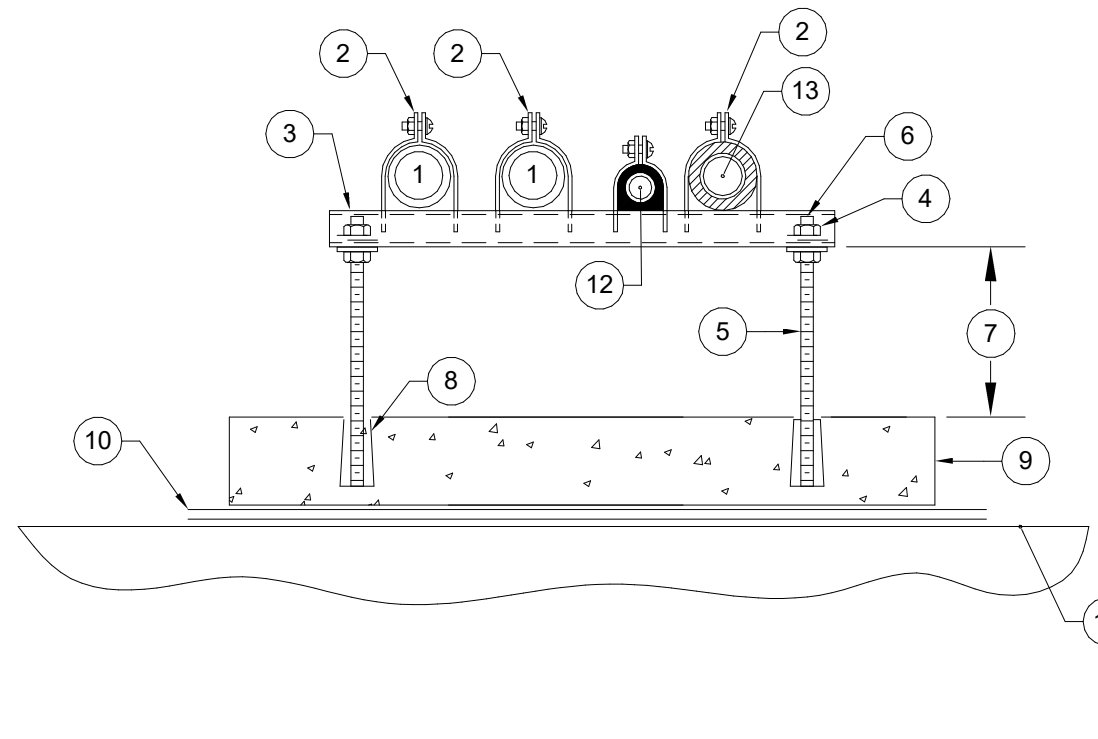
7 DETAIL - SUPPLY DIFFUSER RUNOUT
SCALE: NOT TO SCALE

GENERAL NOTES:

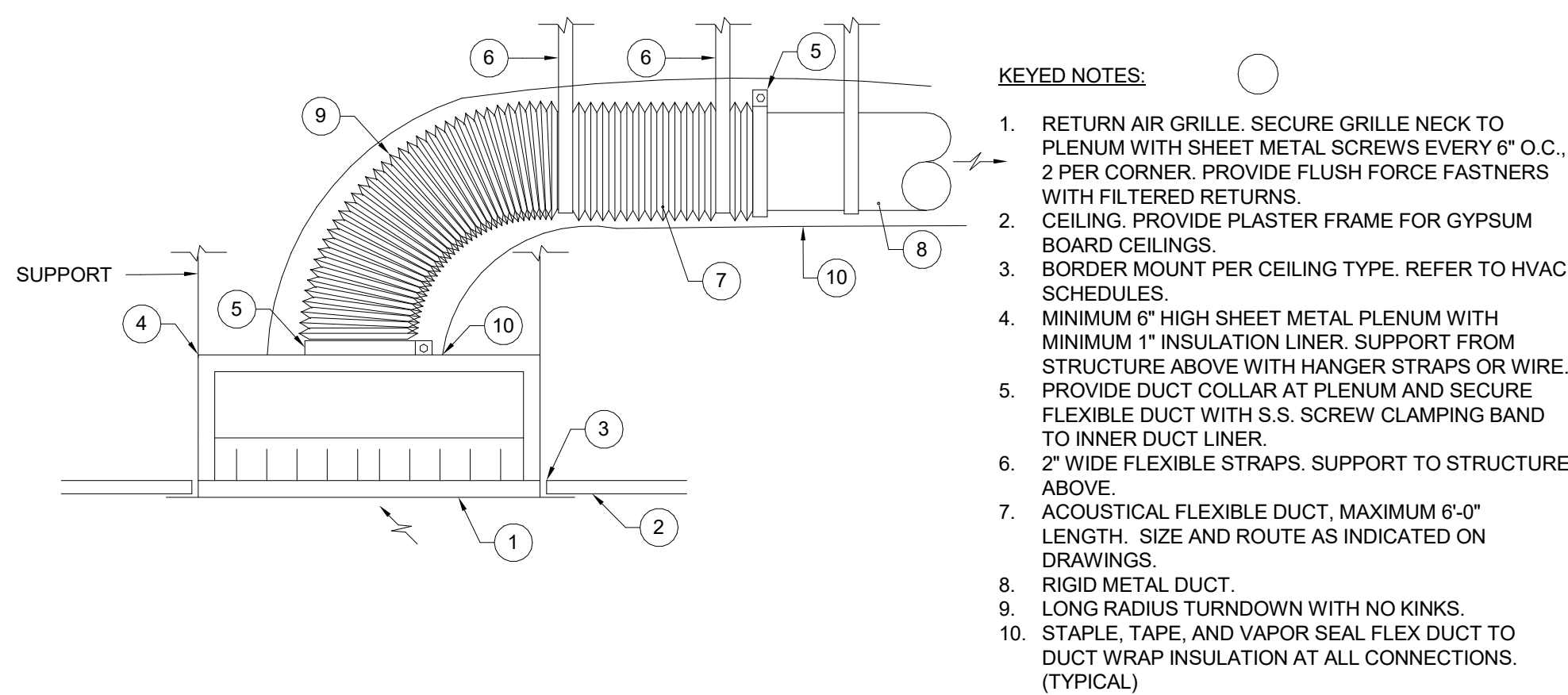
1. ALL STEEL COMPONENTS SHALL HAVE HOT DIPPED GALVANIZED FINISH.
2. SPRAY ALL CUT ENDS WITH COLD GALVANIZING COMPOUND.

KEYED NOTES: ○

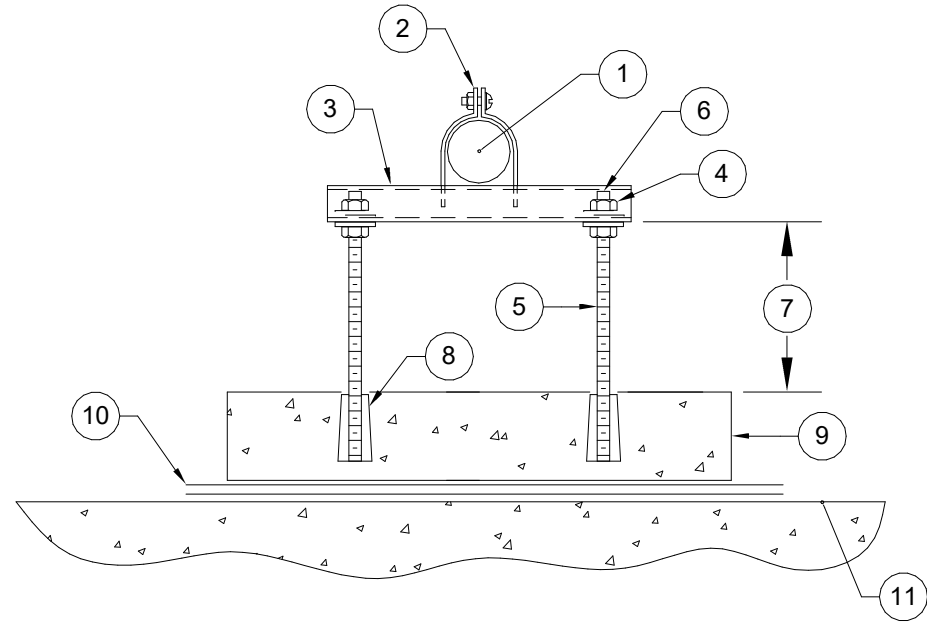
1. OUTDOOR PIPE OR CONDUIT. QUANTITY AND SIZE VARIES. (TYPICAL).
2. STEEL STRUT PIPE CLAMP, B-LINE SERIES 2000.
3. 1-5/8" STEEL STRUT CHANNEL. LENGTH AS NEEDED PER APPLICATION.
4. WASHER AND NUT, (TYPICAL).
5. 3/8" OR 1/2" DIA. THREADED ROD.
6. CUT EXCESS ROD AT PROJECT COMPLETION.
7. PROVIDE HEIGHT AS NEEDED.
8. DROP IN EXPANSION ANCHOR. IMBED MINIMUM 2" INTO CONCRETE PAD.
9. MINIMUM 14"x14"x4", 3000 PSI CONCRETE PAD.
10. REST CONCRETE PAD ON TWO LAYERS OF MODIFIED BITUMEN "WALK-PAD" ROOFING MATERIAL. MINIMUM 2" LARGER THAN CONCRETE PAD.
11. ROOF DECK.
12. REFRIGERANT LIQUID PIPING WITH B-LINE SERIES BVT VIBRACLAMP, (TYPICAL).
13. INSULATED REFRIGERANT SUCTION PIPING. PROVIDE ALUMINUM JACKET COVERINGS.



10 DETAIL - ROOF PIPE SUPPORT
SCALE: NOT TO SCALE



8 DETAIL - DUCTED RETURN WITH FLEX
SCALE: NOT TO SCALE



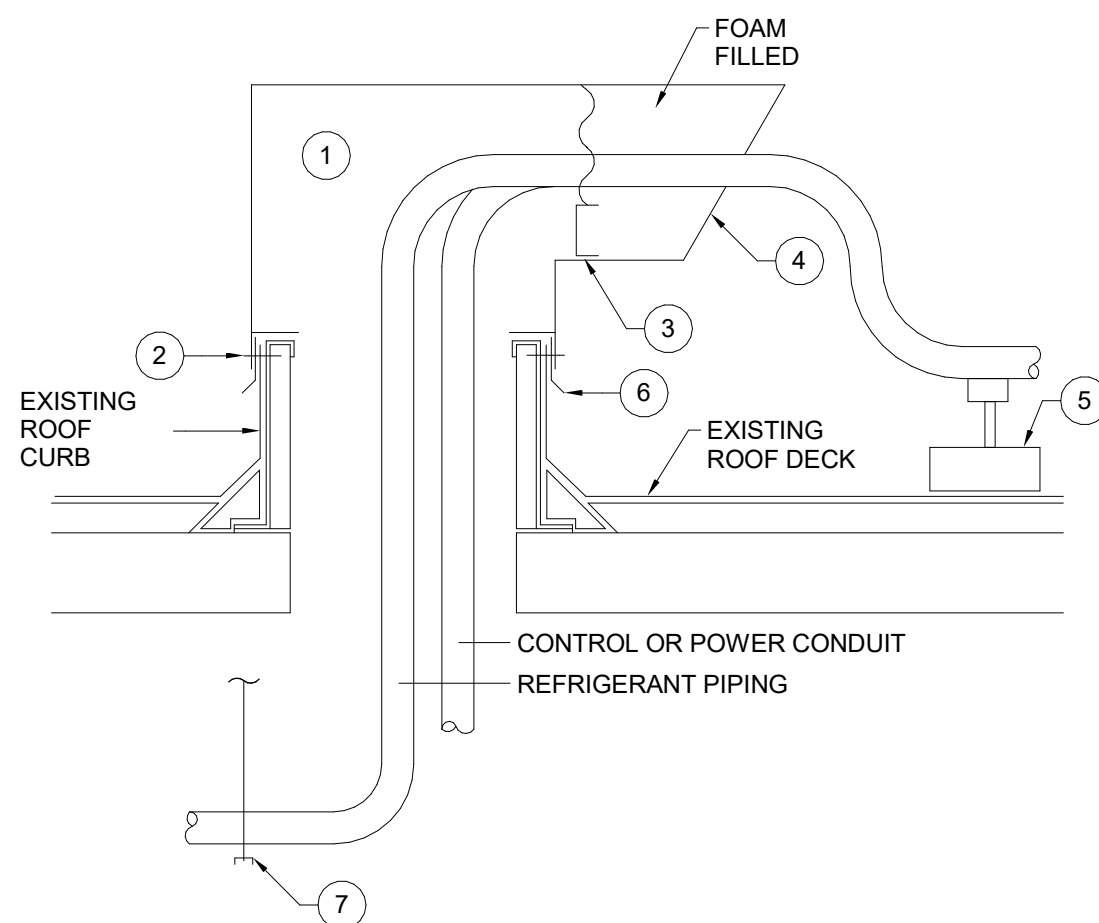
9 DETAIL - ROOF PIPE SUPPORT
SCALE: NOT TO SCALE

GENERAL NOTES:

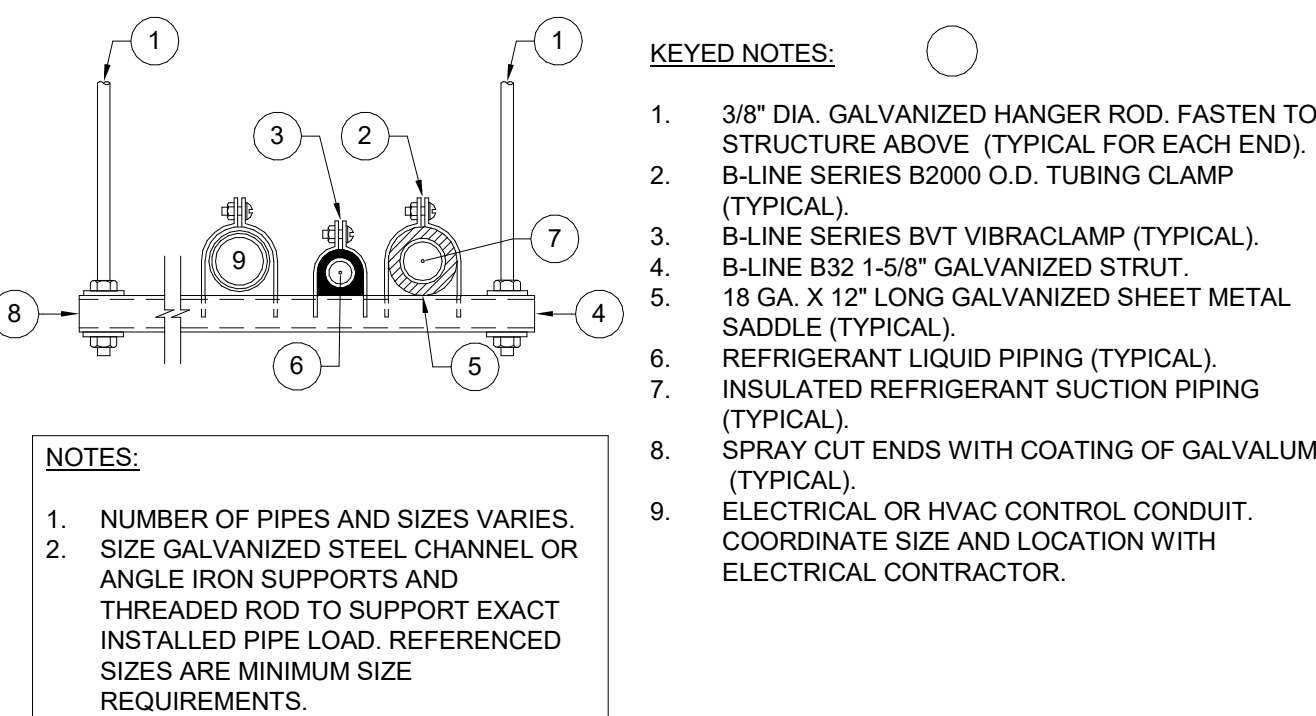
1. ALL STEEL COMPONENTS SHALL HAVE HOT DIPPED GALVANIZED FINISH.
2. SPRAY ALL CUT ENDS WITH COLD GALVANIZING COMPOUND.

KEYED NOTES: ○

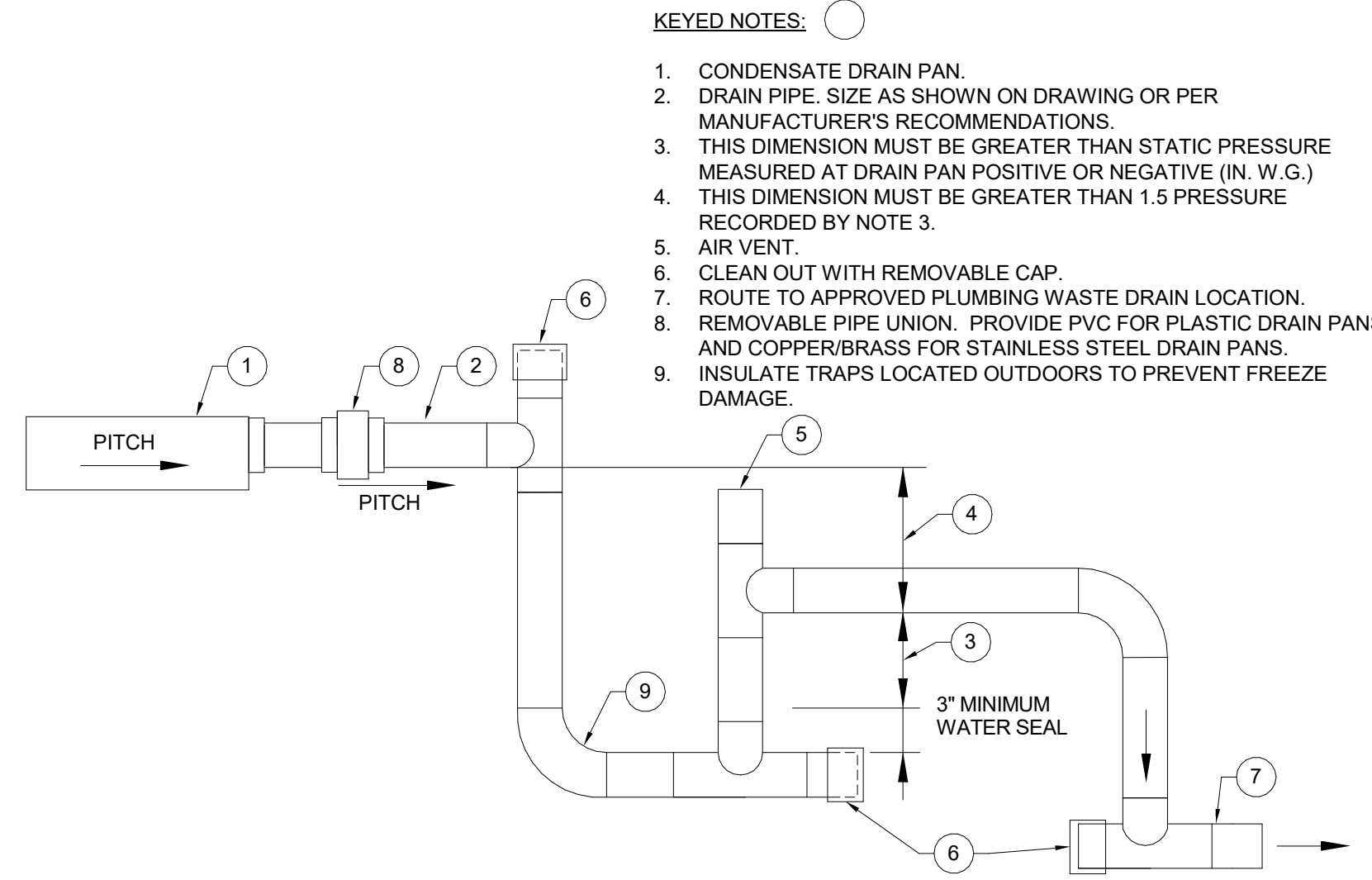
1. PIPE OR ELECTRICAL CONDUIT.
2. STEEL STRUT PIPE CLAMP, B-LINE SERIES 2000.
3. 1-5/8" STEEL STRUT CHANNEL. LENGTH AS NEEDED PER APPLICATION.
4. STEEL WASHER AND NUT, (TYPICAL).
5. MINIMUM STEEL 3/8" OR 1/2" DIA. THREADED ROD.
6. CUT EXCESS ROD AT PROJECT COMPLETION.
7. PROVIDE HEIGHT AS NEEDED FOR APPLICATION.
8. DROP IN EXPANSION ANCHOR. IMBED MINIMUM 2" INTO CONCRETE PAD.
9. MINIMUM 14"x14"x4", 3000 PSI CONCRETE PAD.
10. REST CONCRETE PAD ON TWO LAYERS OF MODIFIED BITUMEN "WALK-PAD" ROOFING MATERIAL. MINIMUM 2" LARGER THAN CONCRETE PAD.
11. EXISTING ROOF DECK.



12 DETAIL - REFRIGERANT PIPE AND CONDUIT HOOD
SCALE: NOT TO SCALE



11 DETAIL - TRAPEZE PIPE SUPPORT
SCALE: NOT TO SCALE



13 DETAIL - CONDENSATE DRAIN TRAP
SCALE: NOT TO SCALE

NO	REVISION	DATE

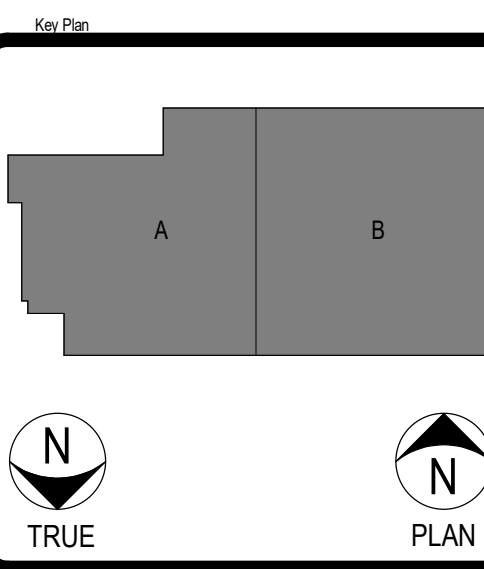
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CALALLEN INDEPENDENT SCHOOL DISTRICT

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SERVICE ORDER NO. 4 - BOND 2023

MECHANICAL DETAILS



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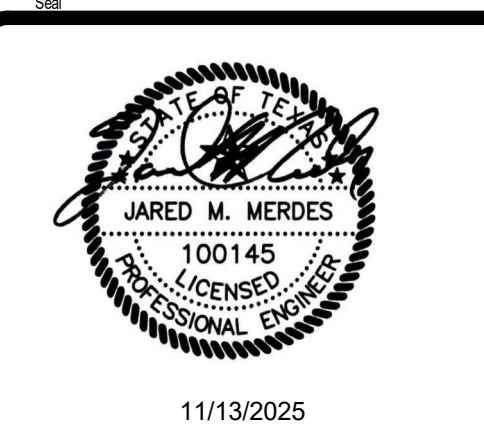
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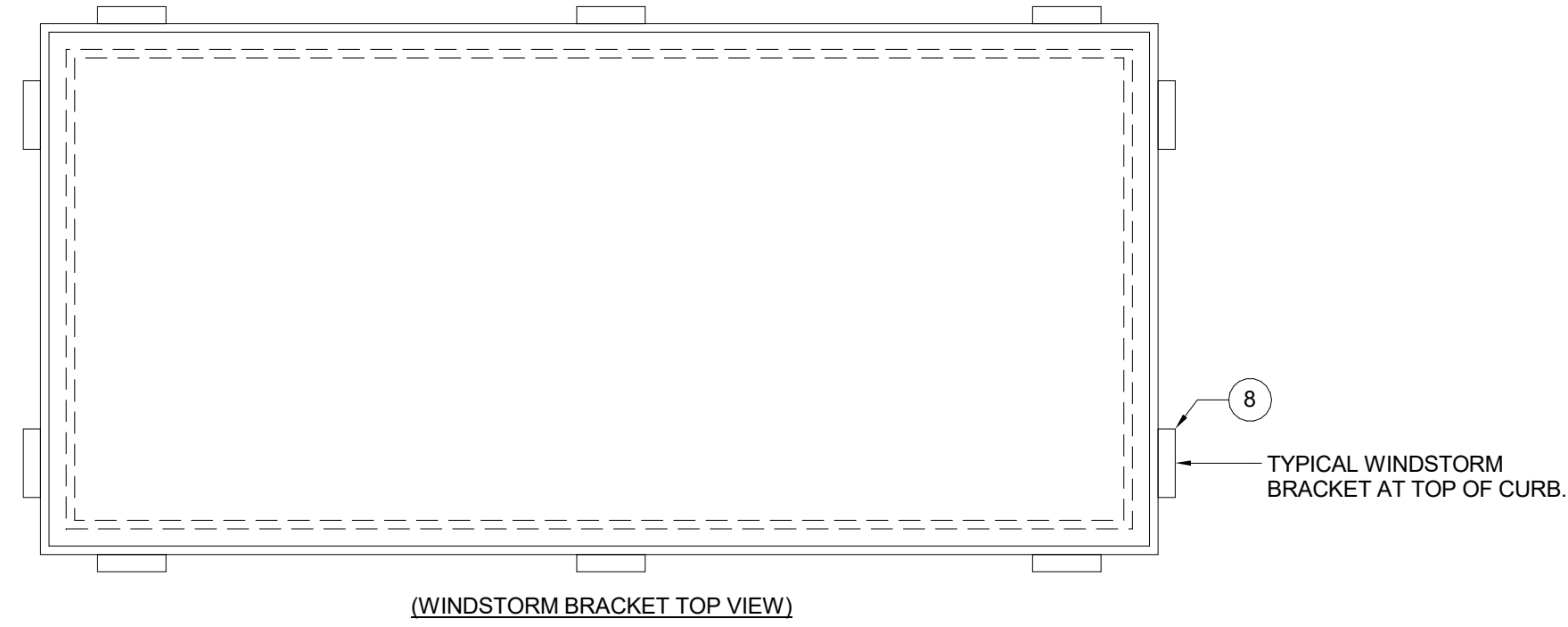
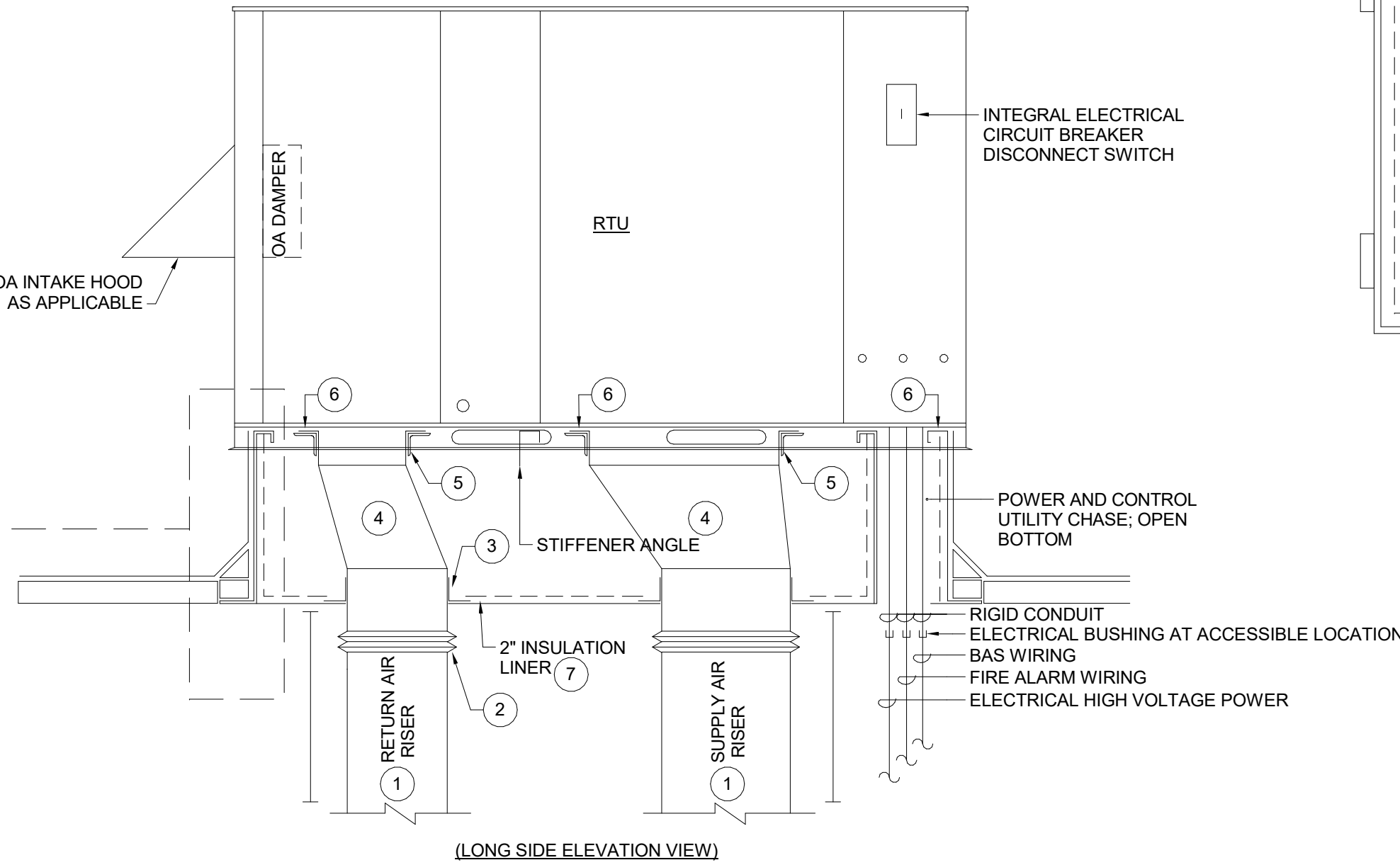
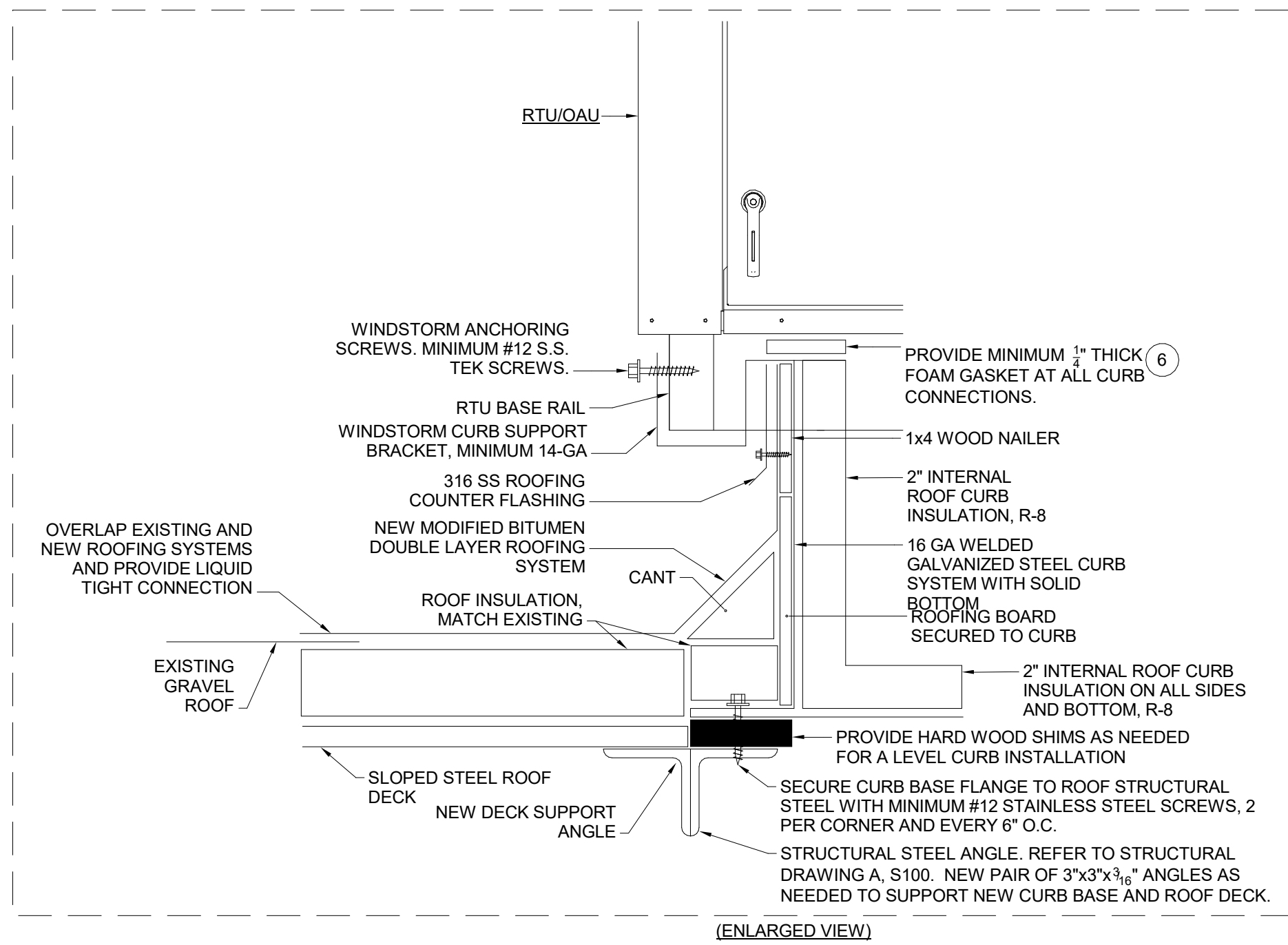
Corpus Christi, TX 78405-3618

Registration # F-0065238



Project No.	2024105
Date Drawn	11/13/2025
Drawn By	AR
Check By	JM
Scale	Sheet No. 19 of 25

M400



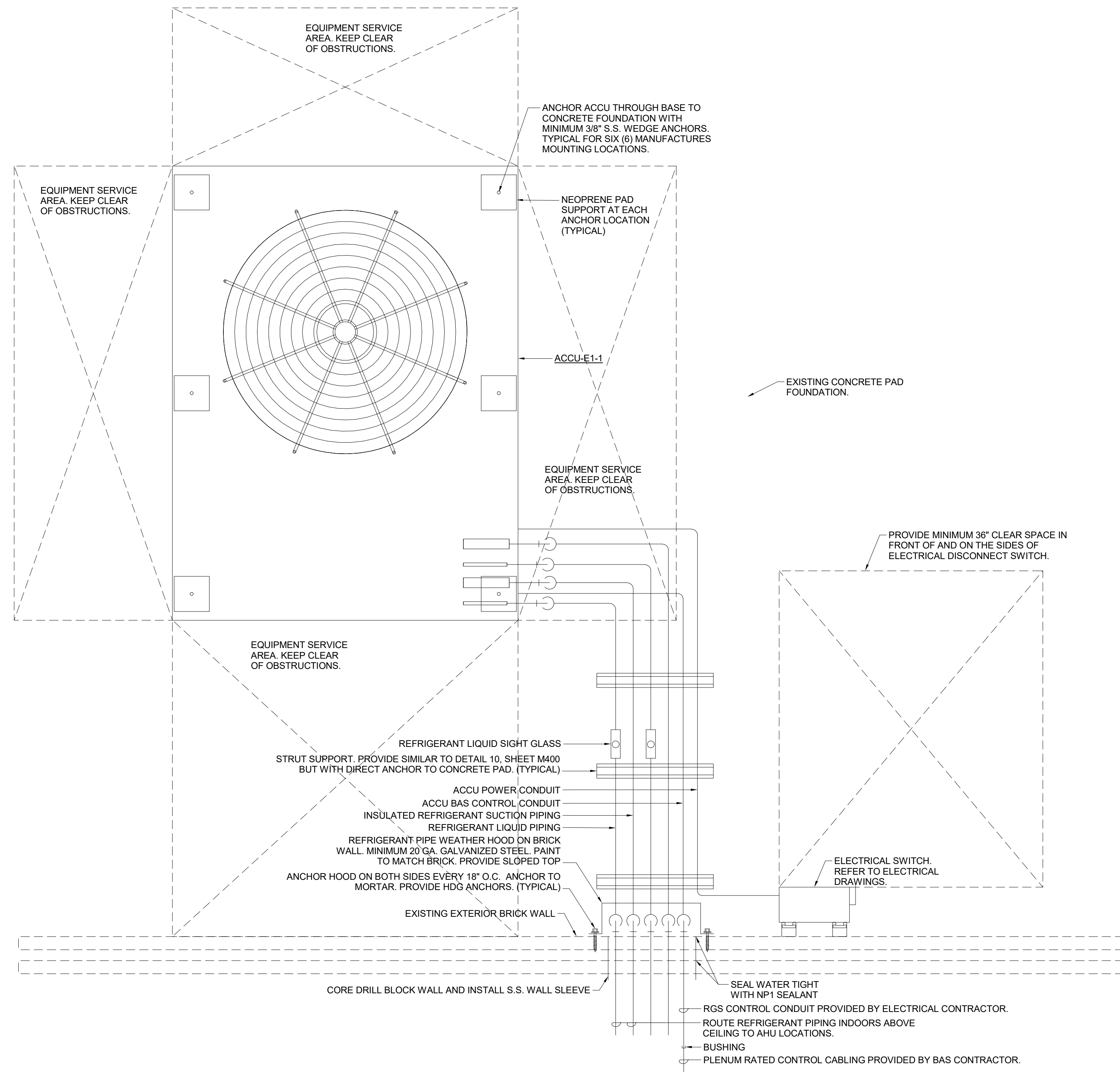
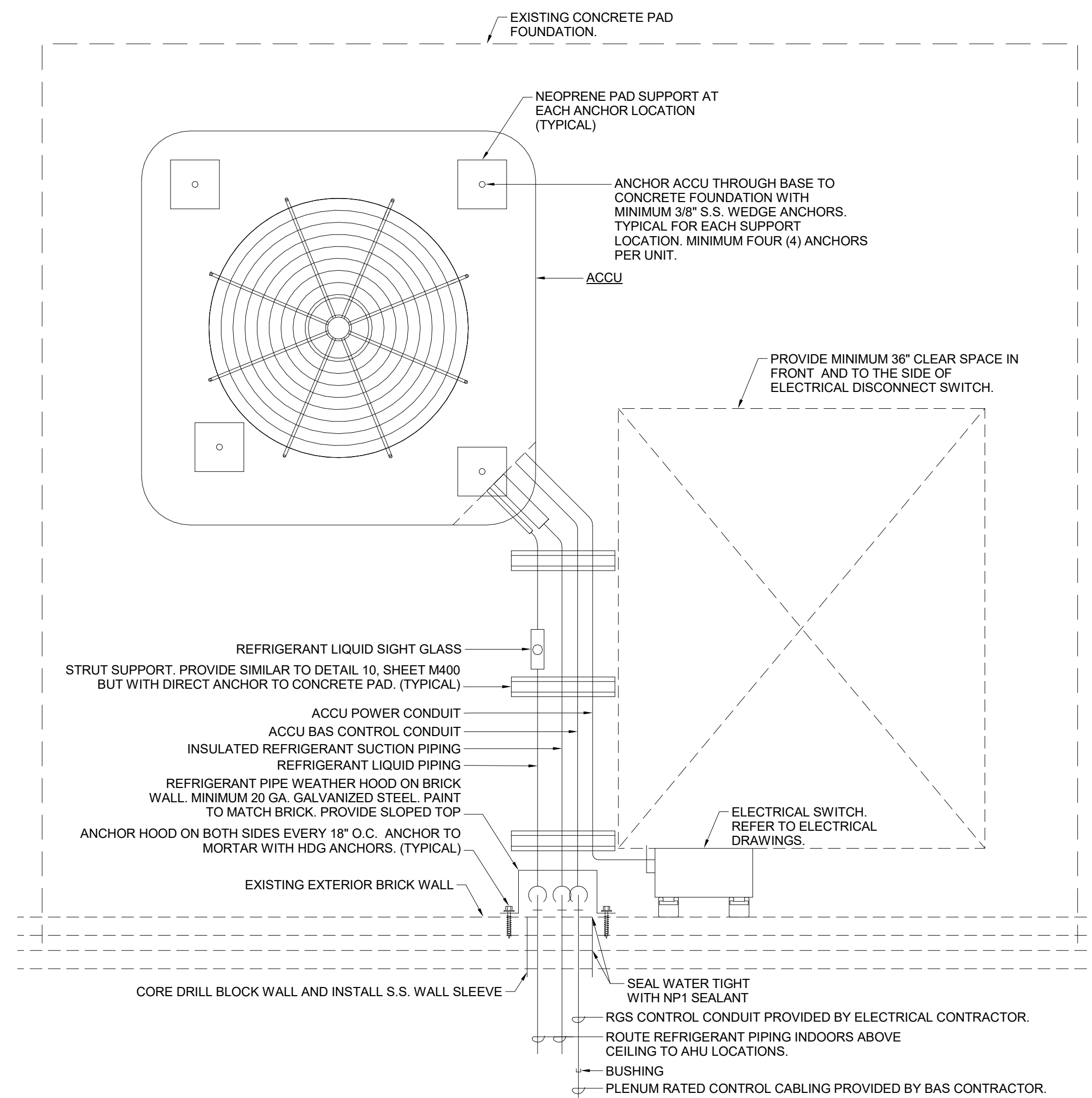
GENERAL NOTES: 1/M401

- COORDINATE EXACT WINDSTORM ATTACHMENTS OF CURB TO ROOF AND RTU TO CURB WITH STRUCTURAL ENGINEER BASED ON FINAL EQUIPMENT PROVIDED ON PROJECT. MAKE ALL NECESSARY CHANGES AS DIRECTED BY WINDSTORM ENGINEER. INFORMATION PROVIDED ON DETAIL IS FOR BIDDING PURPOSES ONLY.
- DETAIL IS BASED ON RTU UNIT USED AS BASIS OF DESIGN. CONTRACTOR SHALL COORDINATE INSTALLATION REQUIREMENTS WITH FINAL EQUIPMENT PROVIDED ON PROJECT.
- PROVIDE MINIMUM FOUR (4) #12 S.S. TEK SCREWS PER EACH WINDSTORM CLIP.

KEYED NOTES: 1/M401

- SUPPORT SUPPLY AND RETURN DUCTS IN RISER BEFORE FLEXIBLE DUCT CONNECTIONS. INSULATE AS REQUIRED IN SPECIFICATIONS.
- PROVIDE FLEXIBLE DUCT CONNECTION IN RISER BEFORE BOTTOM OF CURB. (TYPICAL)
- CUT OPENING IN BOTTOM OF CURB AS NEEDED FOR DUCT RISER. FLASH OPENING WITH SHEET METAL SECURED WITH SCREWS TO CURB AND DUCT AND SEAL AIR TIGHT WITH BUSH ON TYPE DUCT SEALANT. (TYPICAL)
- PROVIDE DUCT TRANSITION WITHIN CURB TO MATE DUCT RISER WITH RTU DUCT CONNECTION SIZE.
- PROVIDE ANGLE IRON OR HEAVY GAGE IRON CHANNELS AT DUCT ATTACHMENTS AT RTU TO SUPPORT THE WEIGHT OF THE DUCT. (TYPICAL)
- PROVIDE FOAM GASKET AT TOP OF CURB AT ENTIRE PERIMETER AND ALL INTERNAL DUCT CONNECTION FLANGES. (TYPICAL)
- INSULATE ENTIRE ROOF CURB WITH R-8 INSULATION LINER. SEAL ALL CONNECTIONS AND SEALS AIR TIGHT WITH DUCT SEALANT. (TYPICAL)
- WELD MINIMUM 1/4 GAGE X8" LONG H.D.G. WINDSTORM SUPPORT BRACKET TO CURB TOP AS NEEDED TO SECURE RTU TO CURB AT LOCATIONS SHOWN ON THE DETAIL. PROVIDE MINIMUM FOUR (4) #12 STAINLESS STEEL TEK SCREWS PER BRACKET THROUGH UNIT BASE RAIL AND BRACKET. COORDINATE EXACT CONSTRUCTION WITH WINDSTORM ENGINEER PROVIDED ON PROJECT BASED ON FINAL EQUIPMENT FURNISHED.

1 DETAIL - NEW PACKAGED ROOFTOP UNIT INSTALLATION
M401 SCALE: NOT TO SCALE



3 DETAIL - (ACCU-E1-1, 10-TON) GROUND MOUNTED ACCU INSTALLATION
M401 SCALE: NOT TO SCALE

2 DETAIL - (5-TON) GROUND MOUNTED ACCU INSTALLATION
M401 SCALE: NOT TO SCALE

NO	REVISION	DATE

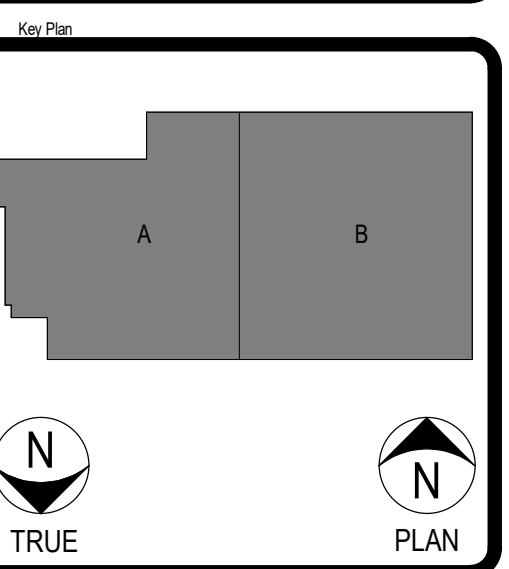
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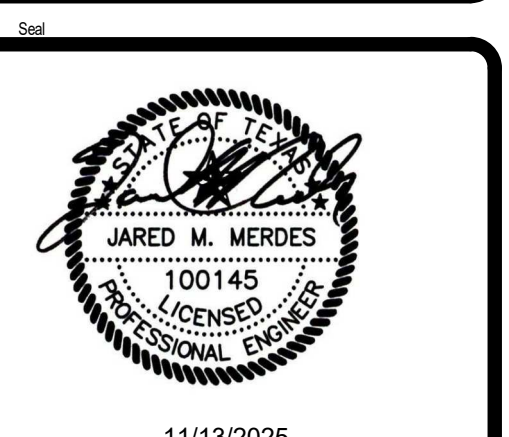
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MECHANICAL DETAILS



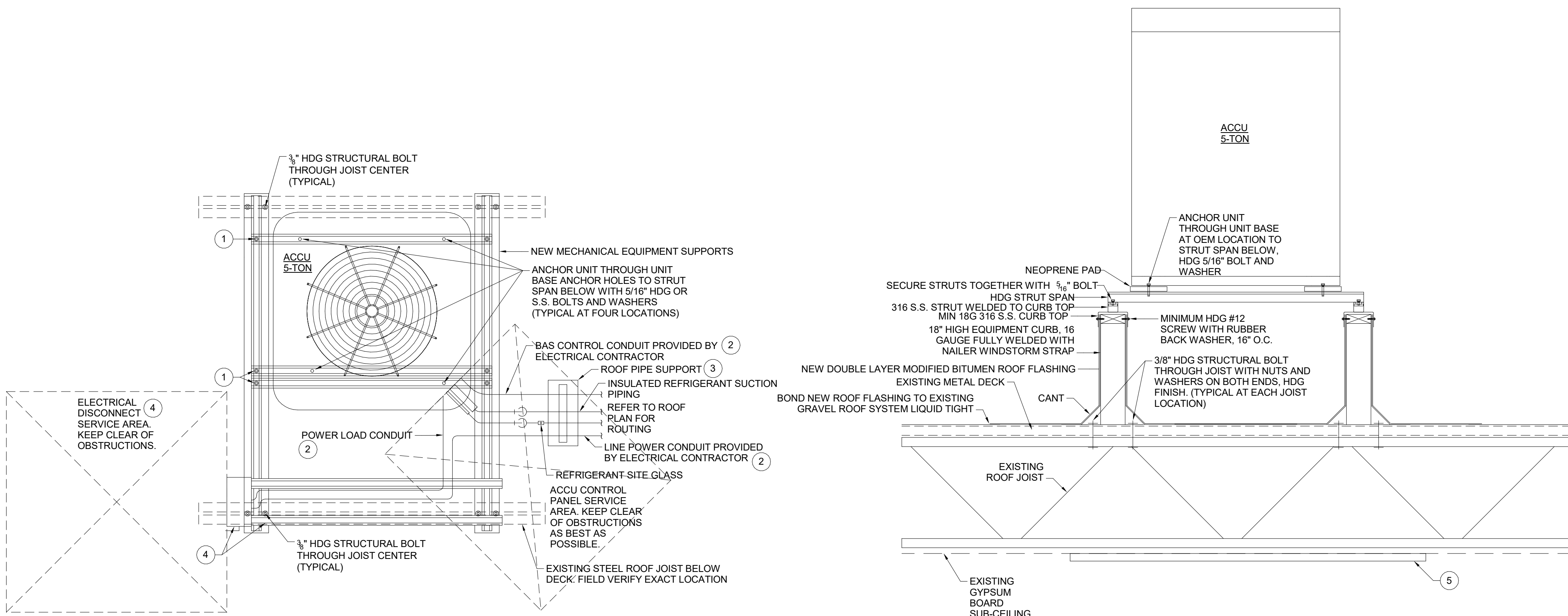
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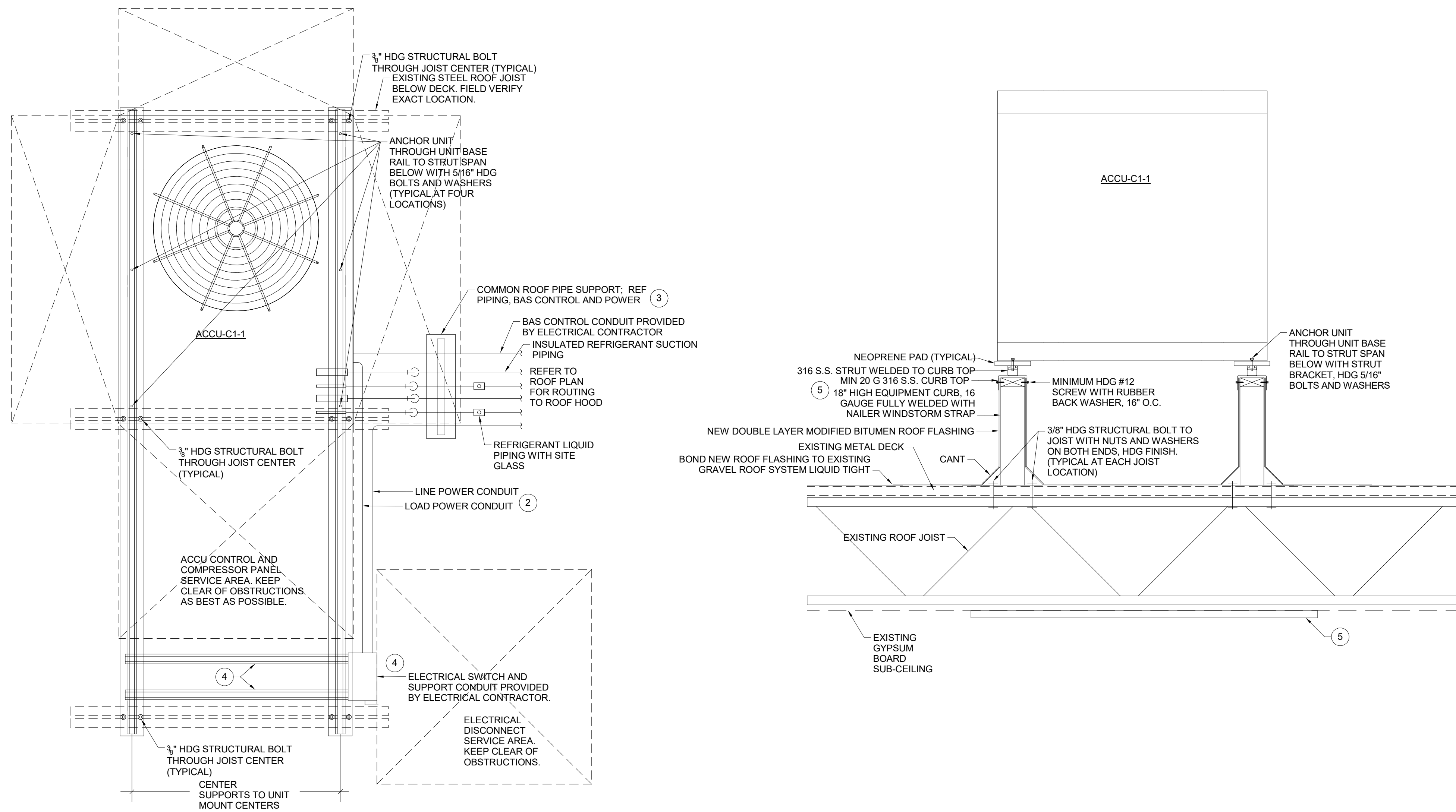
11/13/2025

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Date Drawn:	11/13/2025
Drawn By:	AK
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M401



1 DETAIL - (5-TON) ROOF MOUNTED ACCU INSTALLATION
M402 SCALE: NOT TO SCALE

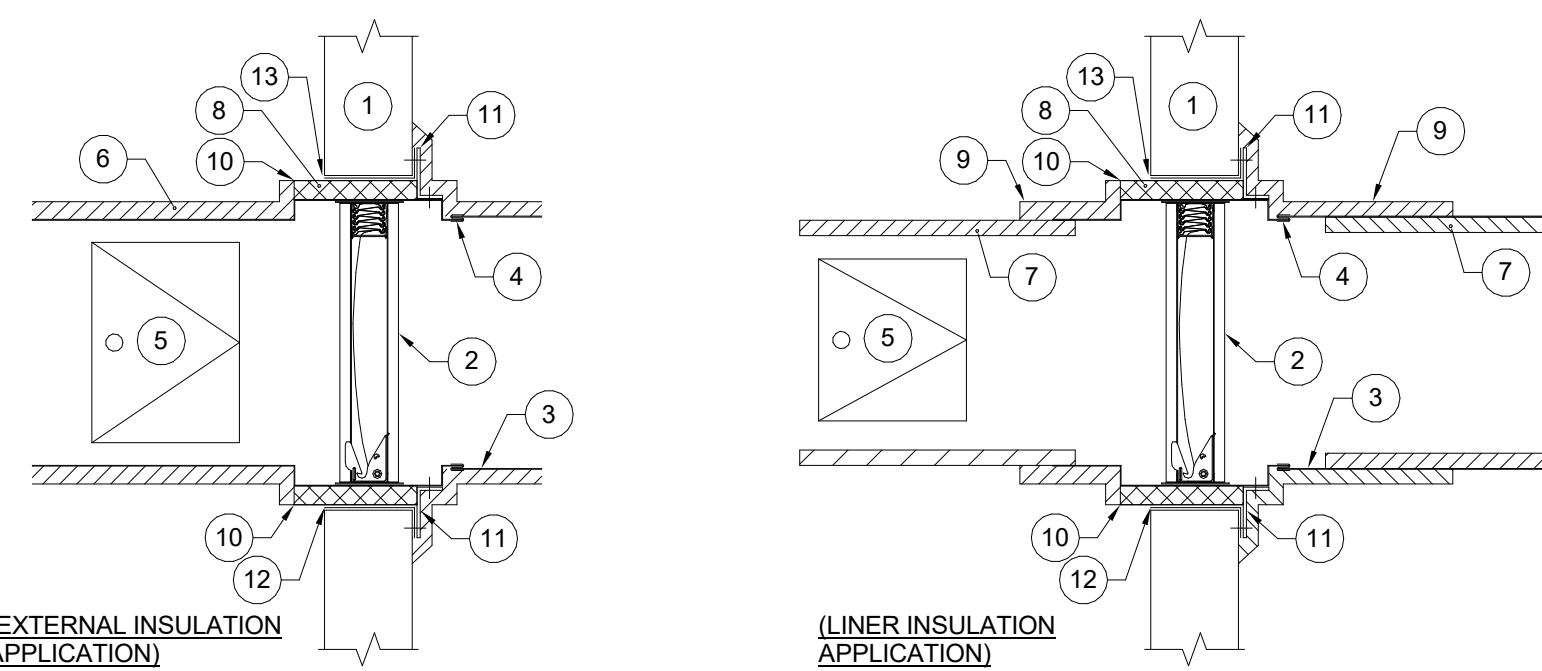


2 DETAIL - (7.5 TO 10-TON) ROOF MOUNTED ACCU INSTALLATION
M402 SCALE: NOT TO SCALE

- GENERAL NOTES: 1&2/M402
- CONTRACTOR SHALL REVIEW ALL EQUIPMENT SUPPORTS WITH WINDSTORM ENGINEER PROVIDED ON PROJECT AND MAKE ANY CHANGES AS NECESSARY TO MEET LOCAL WINDSTORM CODE REQUIREMENTS.
 - ALL STRUT, BOLTS, SCREWS, WASHERS, AND THE LIKE SHALL HAVE HDG STEEL CONSTRUCTION ABOVE THE MAIN STAINLESS STEEL SUPPORT STRUT AND BASE.
 - ALL ANCHOR BOLTS AND HARDWARE SHALL HAVE 3/8" SIZE WHEREVER POSSIBLE. PROVIDE MINIMUM 5/16" AS A LAST RESORT.
 - TOP EQUIPMENT CURB CAP AND MAIN STRUT RUNNER SHALL BOTH HAVE 316 STAINLESS STEEL CONSTRUCTION.
 - DETAIL IS BASED ON ONE (1) ACCU SECURED TO TWO STEEL ROOF JOIST. FOR TWO (2) ACCU LOCATIONS, PROVIDE DOUBLE LENGTH SUPPORTS AND SECURE TO THREE (3) STEEL JOINTS SIMILAR TO THIS DESIGN. REFER TO ROOFING PLANS FOR SINGLE OR DOUBLE APPLICATIONS.
 - PROJECT IS DESIGNED WITH MINIMUM 36" CLEARANCE BETWEEN ACCUS. CONTRACTOR SHALL COORDINATE MINIMUM CLEARANCE REQUIREMENTS WITH FINAL EQUIPMENT PROVIDED ON PROJECT AND INCREASE SPACING AS NEEDED. (TYPICAL)
 - HDG: HOT DIPPED GALVANIZED STEEL

- KEYED NOTES: 1&2/M402
- PROVIDE MINIMUM 1-5/8" HDG STRUT SUPPORT AS NEEDED BASED ON ACCU LAYOUTS ON DRAWINGS. STRUT SPACING SHALL BE COORDINATED WITH FINAL ACCU ANCHOR BRACKET CENTER LINE LOCATIONS. (TYPICAL FOR BOTH SIDES)
 - COORDINATE INSTALLATION OF ELECTRICAL DISCONNECT SWITCH AND ASSOCIATED CONDUITS WITH ELECTRICAL CONTRACTOR TO INSURE PROPER SERVICE CLEARANCES AND MAINTENANCE FOR BOTH HVAC AND ELECTRICAL EQUIPMENT. (TYPICAL)
 - ROOF SUPPORT PROVIDED BY HVAC CONTRACTOR FOR ALL SYSTEMS; REFRIGERANT PIPING, CONTROL CONDUIT AND POWER CONDUITS. REFER TO DETAIL 10, M400
 - ELECTRICAL CONTRACTOR SHALL PROVIDE STRUT AND DISCONNECT SWITCH. REFER TO ELECTRICAL DRAWINGS.
 - CONTRACTOR SHALL PROVIDE GYPSUM BOARD SUB-CEILING PATCH AS NEEDED BELOW THE ROOF STRUCTURE AFTER WORK COMPLETION.

- KEYED NOTES: 3/M402
- FIRE RATED WALL OR FLOOR. REFER TO ARCHITECTURAL FOR TYPE AND CONSTRUCTION.
 - FIRE DAMPER WITH INTEGRAL WALL SLEEVE, MINIMUM 16-GAGE. CURTAIN SHALL BE OUT OF THE AIR STREAM.
 - GALVANIZED SHEET METAL DUCTWORK.
 - BREAK-AWAY "S" CLIP FITTING ALL AROUND ON ANCHORED SIDE OF THE DAMPER.
 - INSULATED DOUBLE WALL ACCESS DOOR.
 - EXTERNAL DUCT INSULATION. REFER TO INSULATION SPECIFICATIONS.
 - INTERNAL DUCT LINER INSULATION. REFER TO INSULATION SPECIFICATIONS.
 - INSTALL MAXIMUM 1" RIGID BOARD INSULATION AROUND DAMPER AT THE WALL PENETRATION. INSTALL AROUND THE DAMPER BEFORE SETTING IN PLACE IN THE FIRE BARRIER. TAPE AND SEAL ALL CONNECTIONS.
 - OVERLAP CONNECTION BETWEEN INTERNAL AND EXTERNAL LINER WITH MINIMUM 6-8" OVERLAP TO PREVENT THERMAL BRIDGING. TAPE AND VAPOR SEAL EXTERNAL WRAP INSULATION TO RIGID INSULATION AT THE CONNECTION.
 - MINIMUM 1-1/2" X 3" X 1/8 GAGE GALVANIZED SHEET METAL ANGLE FRAMING AROUND PERIMETER OF SLEEVE. BOLT, TACK-WELD OR SCREW TO SLEEVE AT MAXIMUM SPACING OF 12" ON CENTERS AND WITH MINIMUM OF TWO CONNECTIONS ON EACH SIDE. FRAMING SHALL OVERLAP WALL OR FLOOR (TYPICAL) MINIMUM OF ONE INCH ON ALL FOUR SIDES.
 - WALL SLEEVE IF NEEDED FOR MASONRY CONSTRUCTION.
 - PROVIDE DUCT SEALANT TO BOND INSULATION TO FIRE BARRIER TO STOP AIR MOVEMENT.

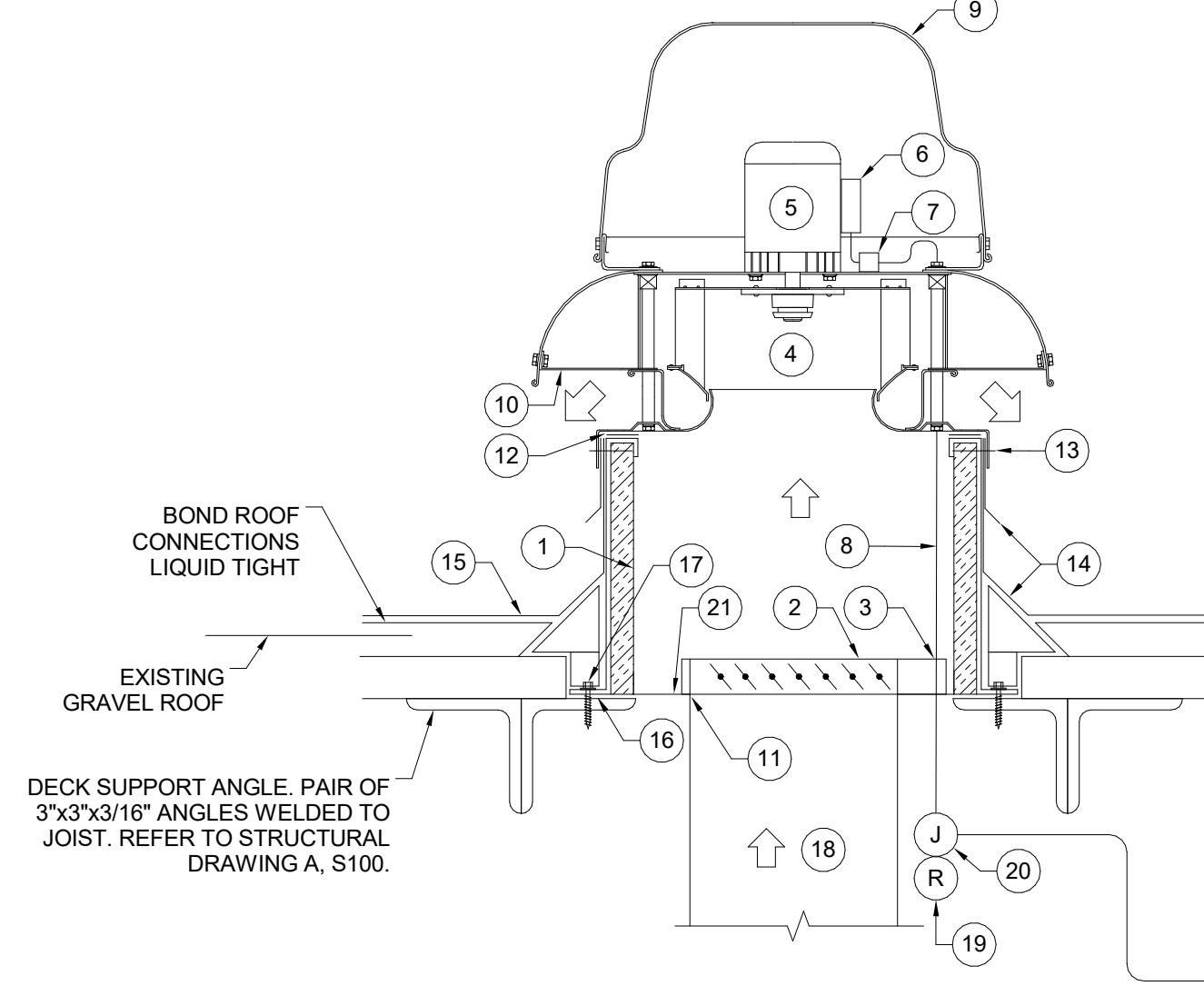


- GENERAL NOTE:
- INSTALL FIRE DAMPERS IN ACCORDANCE WITH MANUFACTURER'S U.L. APPROVED INSTALLATION INSTRUCTIONS PER EACH APPLICATION.
 - INSTALLATION FOR FLOOR IS SIMILAR TO WALLS.
 - DETAIL IS FOR SINGLE ANGLE INSTALLATIONS ONLY.

3 DETAIL - CURTAIN FIRE DAMPER
M402 SCALE: NOT TO SCALE

- GENERAL NOTES: 4/M402
- ROOFING FLASHING AND COUNTER FLASHING WORK SHALL BE PROVIDED BY ROOFING CONTRACTOR.
 - INSULATE DUCTWORK IN ACCORDANCE WITH SPECIFICATIONS.
 - SECURE FAN TO CURB AND CURB TO STEEL ROOF STRUCTURE IN ACCORDANCE WITH TDI WINDSTORM CODE REQUIREMENTS. DETAIL IS BASED ON WINDSTORM INSTALLATION REQUIREMENTS PROVIDED TO ENGINEER BY MANUFACTURER FOR MANUFACTURER BASIS OF DESIGN ONLY. CONTRACTOR SHALL REVIEW SECURING DETAILS WITH WINDSTORM ENGINEER PRIOR TO START OF WORK AND MAKE ALL CHANGES AS REQUIRED BY WINDSTORM ENGINEER IN ADDITION TO MINIMUM REQUIREMENTS LISTED BELOW.
 - CONTRACTOR MAY SHIM THE CURB BASE TO STEEL WITH HARD WOOD AS NEEDED FOR A LEVEL INSTALLATION.

- KEYED NOTES: 4/M402
- FACTORY FABRICATED INSULATED ROOF CURB WITH SLOPE AS REQUIRED TO MATCH ROOF PITCH, 18" HEIGHT UNLESS OTHERWISE NOTED. LEVELING CURB WITH HARD WOOD SHIMS IS ALLOWED.
 - 316 STAINLESS STEEL GRAVITY BACKDRAFT DAMPER.
 - SEAL CONDUIT PENETRATION THROUGH DAMPER TRAY AIR TIGHT.
 - CENTRIFUGAL FAN.
 - DIRECT DRIVE FAN MOTOR WITH VIBRATION ISOLATORS.
 - ADJUSTABLE FAN SPEED CONTROLLER.
 - ELECTRICAL DISCONNECT SWITCH WITHIN MOTOR HOUSING.
 - ELECTRICAL CONDUIT WITH CONDUCTORS PROVIDED BY ELECTRICAL CONTRACTOR. ANCHOR TO CURB WALL TO PREVENT OBSTRUCTING BACKDRAFT DAMPER.
 - REMOVABLE WEATHERPROOF HOUSING.
 - CONTINUOUS BIRD SCREEN.
 - PROVIDE TRANSITION AS NEEDED AND CONNECT TO CURB BOTTOM. SECURE DUCT TO CURB WITH SHEET METAL SCREWS AND SEAL AIR TIGHT.
 - AIR TIGHT FOAM GASKET.
 - SECURE FAN TO CURB WITH MINIMUM #12 STAINLESS STEEL SCREWS, TWO (2) PER CORNER AND EVERY 6" O.C.
 - 3/16 S.S. CANT STRIP, FLASHING AND COUNTER-FLASHING PROVIDED BY ROOFING CONTRACTOR.
 - PROVIDE NEW DOUBLE LAYER MODIFIED BITUMEN ROOFING SYSTEM.
 - SUPPORT FAN CURB ON ALL FOUR SIDES DIRECTLY FROM ROOF STEEL STRUCTURE. DO NOT SUPPORT TO ROOF DECK. REFER TO STRUCTURAL DRAWINGS.
 - SECURE FAN CURB TO STEEL STRUCTURE WITH MINIMUM #12 SCREWS, 1/2" BOLTS OR WELDS, TWO (2) PER CORNER AND EVERY 6" O.C.
 - EXHAUST DUCTWORK. REFER TO DRAWINGS FOR SIZE AND LOCATION. INSULATE AS SPECIFIED.
 - HVAC BAS RELAY WITH INTEGRAL CT PROVIDED BY BAS CONTRACTOR MOUNTED TO POWER JUNCTION BOX PROVIDED BY ELECTRICAL CONTRACTOR.
 - ELECTRICAL CONTRACTOR SHALL PROVIDE JUNCTION BOX NEAR CURB PENETRATION.
 - INSULATE BOTTOM OF CURB WITH R-8 INSULATION LINER.



4 DETAIL - ROOF CURB MOUNTED FAN
M402 SCALE: NOT TO SCALE

NO	REVISION	DATE

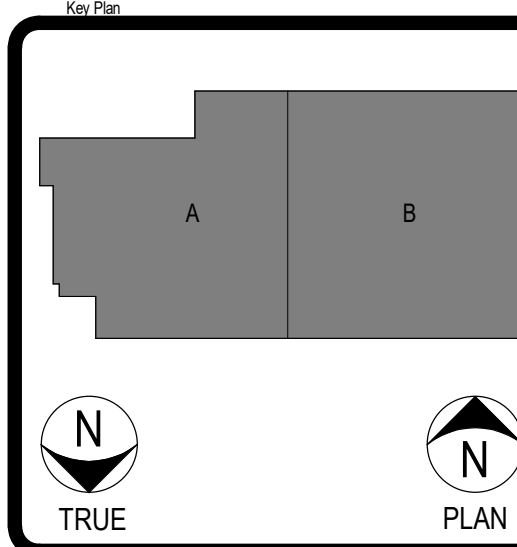
WOOD RIVER ELEMENTARY HVAC REPLACEMENTS AND UPGRADES - 2026 (PHASE 1)

CALALLEN INDEPENDENT SCHOOL DISTRICT

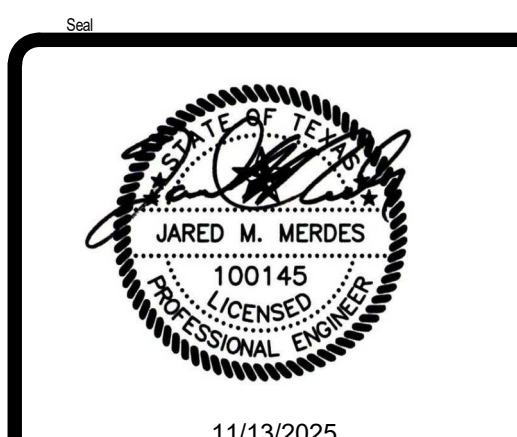
15118 DRY CREEK DR, CORPUS CHRISTI, TX 78410

SERVICE ORDER NO. 4 - BOND 2023

MECHANICAL DETAILS



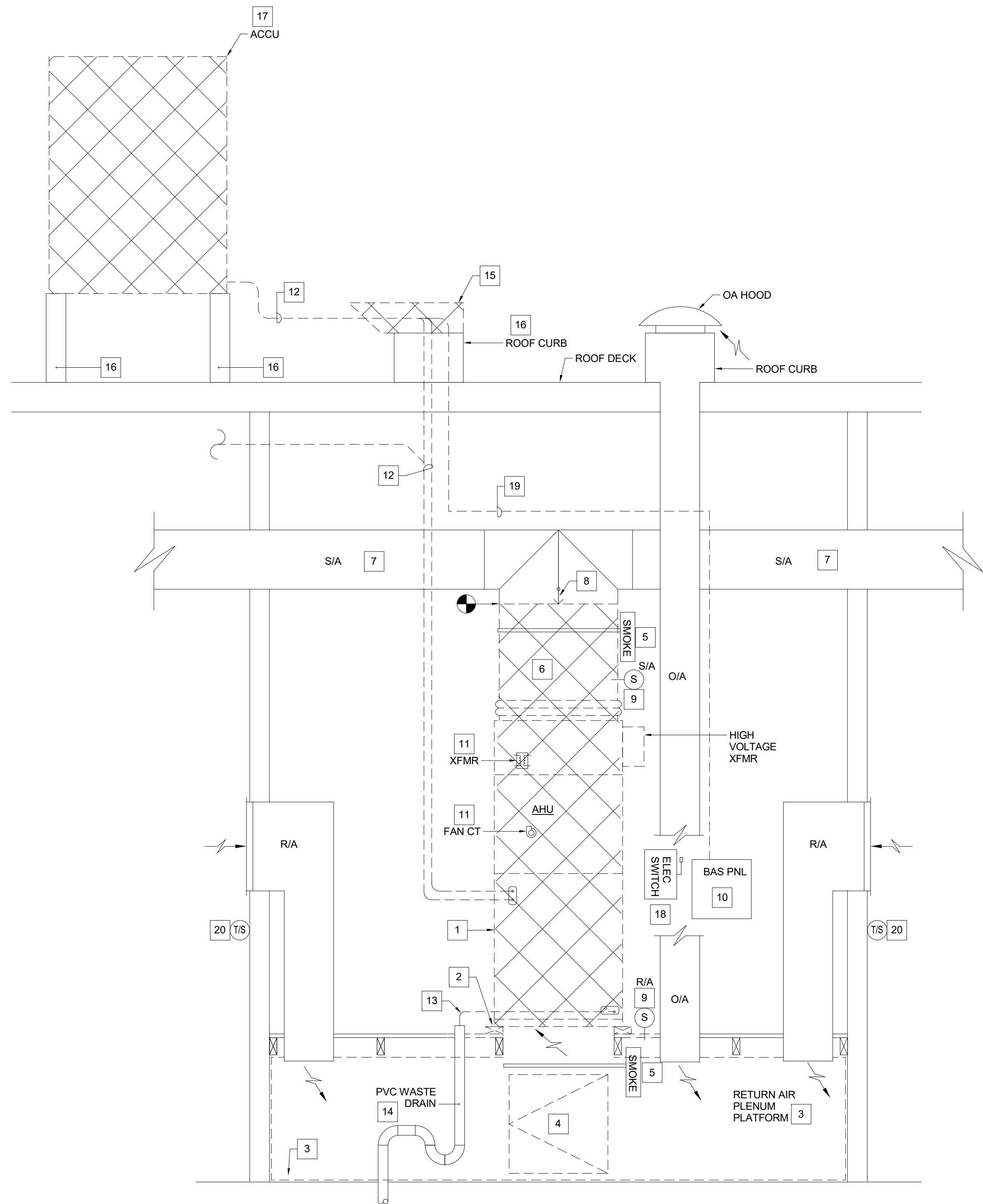
STRIDDE, CALLINS & ASSOCIATES INC.
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MECHANICAL ELECTRICAL
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342 S. Navigation Blvd.
Corpus Christi, TX 78405-3618
Registration # F-006528



11/13/2025

Project No.	2024100
Date Drawn	11/13/2025
Drawn By	AR
Checked By	JM
Scale	Sheet No. 21 of 25

M402

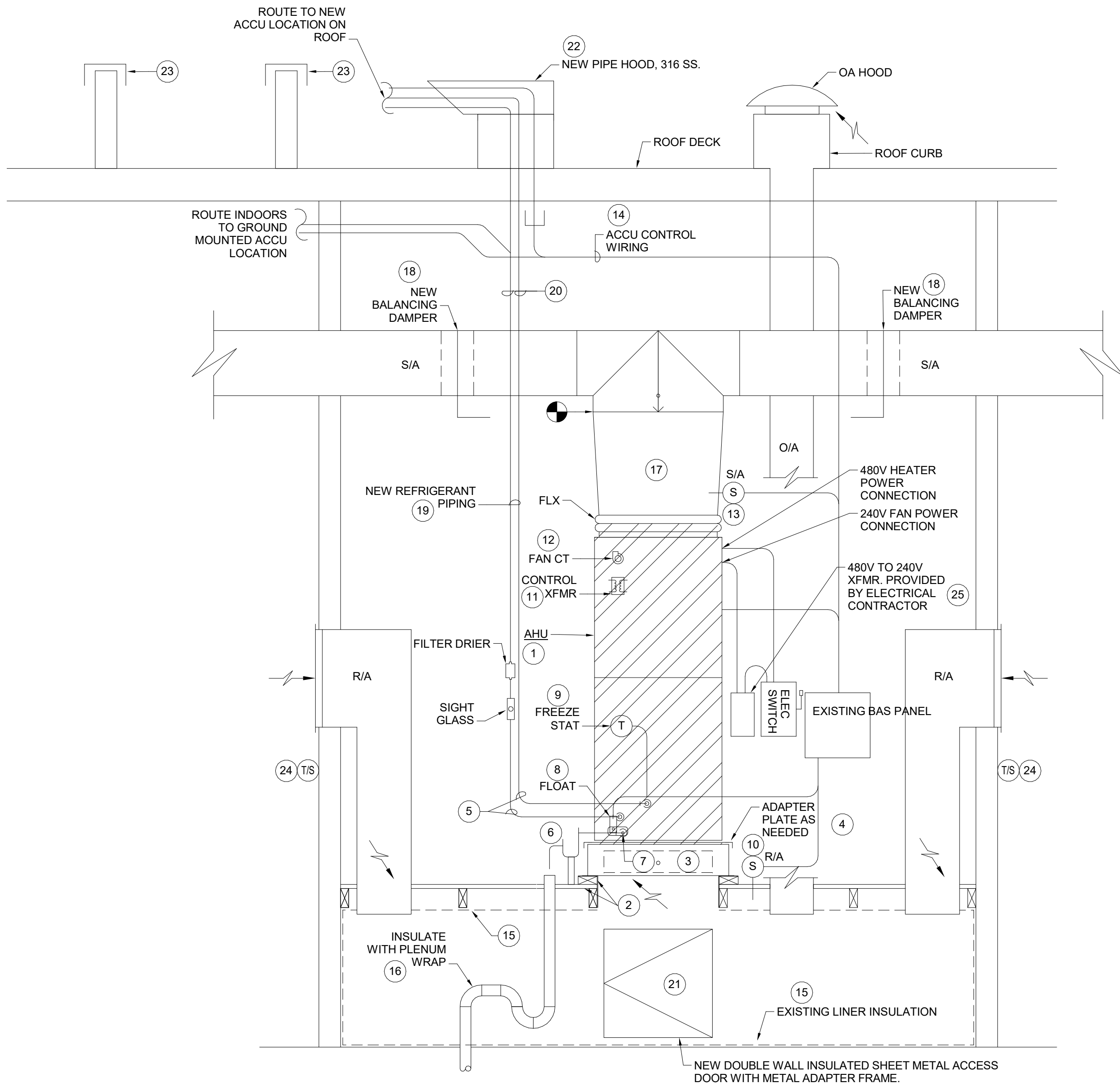


1 DETAIL - AHU TYPICAL DEMOLITION (5-TON UNITS)

M403 SCALE: NOT TO SCALE

DEMOLITION KEYED NOTES: 1, SHEET M403

- DEMOLISH EXISTING AIR HANDLING UNIT.
- DEMOLISH EXISTING 2x4 SUPPORT BASE AROUND PERIMETER OF AHU AND ANY PLYWOOD THAT IS WATER DAMAGED. WOOD PLATFORM TOP SHALL REMAIN.
- EXISTING WOOD RETURN AIR PLENUM PLATFORM SHALL REMAIN. CONTRACTOR SHALL CLEAN EXISTING INSULATION LINER WITH VACUUM.
- DEMOLISH EXISTING WOODEN PLENUM ACCESS DOOR AND REPLACE WITH NEW AS NOTED ON RENOVATION DETAILS.
- ELECTRICAL CONTRACTOR SHALL DEMOLISH EXISTING SMOKE DETECTORS. HVAC CONTRACTOR SHALL PERMANENTLY PATCH DUCTWORK OR PLATFORM WITH SHEET METAL, SCREWS, INSULATION AND SEALANT AIR TIGHT. HVAC CONTRACTOR SHALL PATCH THE WOOD PLATFORM AS NEEDED WITH WOOD PATCH AND INSULATION OR SHEET METAL AND INSULATION AS APPLICABLE.
- DEMOLISH EXISTING SUPPLY AIR DUCTWORK TO APPROXIMATE LOCATION INDICATED ON DRAWINGS WITHIN MECHANICAL CLOSET. CONTRACTOR SHALL COORDINATE EXACT EXTENTS WITH RENOVATION DRAWINGS AND NEW EQUIPMENT REQUIREMENTS.
- EXISTING SUPPLY AIR DUCTWORK SHALL REMAIN. FIELD VERIFY DUCT SIZING.
- LOCK EXISTING SPLITTER DAMPER IN THE FULLY OPEN POSITION. REMOVE ANY DAMPERS THAT ARE NOT OPERABLE.
- CAREFULLY REMOVE EXISTING BAS SUPPLY AND RETURN AIR TEMPERATURE SENSORS AND STORE AT SAFE LOCATION FOR REINSTALLATION WITH NEW SYSTEMS. DEMOLISH CONTROL WIRING BACK TO BAS PANEL.
- EXISTING BAS DDC CONTROL PANEL WITH CONTROLLERS SHALL REMAIN FOR REUSE WITH NEW SYSTEMS.
- CAREFULLY REMOVE EXISTING 24-VAC BAS CONTROL TRANSFORMER AND FAN CT FROM INSIDE EXISTING AHU AND STORE AT SAFE LOCATION. DEMOLISH CONTROL WIRING BACK TO BAS PANEL.
- DEMOLISH ALL REFRIGERANT PIPING AND PIPE SUPPORTS FROM INDOOR AHU TO OUTDOOR ACCU, GROUND OR ROOF MOUNTED.
- DEMOLISH EXISTING CONDENSATE DRAIN PIPING FROM AHU TO TERMINATION AT HUB DRAIN.
- EXISTING DRAIN PIPING TO REMAIN FOR REUSE WITH NEW SYSTEMS. BLOW OUT PIPING WITH COMPRESSED AIR.
- DEMOLISH EXISTING ROOF HOOD.
- ROOF CURB SHALL REMAIN. TAKE CARE TO PROTECT EXISTING ROOFING SYSTEMS.
- DEMOLISH ROOF OR GROUND MOUNTED OUTDOOR CONDENSING UNIT.
- EXISTING ELECTRICAL DISCONNECT SWITCH SHALL REMAIN FOR REUSE WITH NEW SYSTEMS. REFER TO ELECTRICAL DRAWINGS.
- DEMOLISH EXISTING LOW VOLTAGE CONTROL WIRING TO OUTDOOR ACCU.
- EXISTING BAS SPACE SENSOR/THERMOSTAT SHALL REMAIN FOR REUSE WITH NEW SYSTEMS UNLESS OTHERWISE NOTED ON DRAWINGS.



2 DETAIL - AHU TYPICAL RENOVATION (5-TON UNITS)

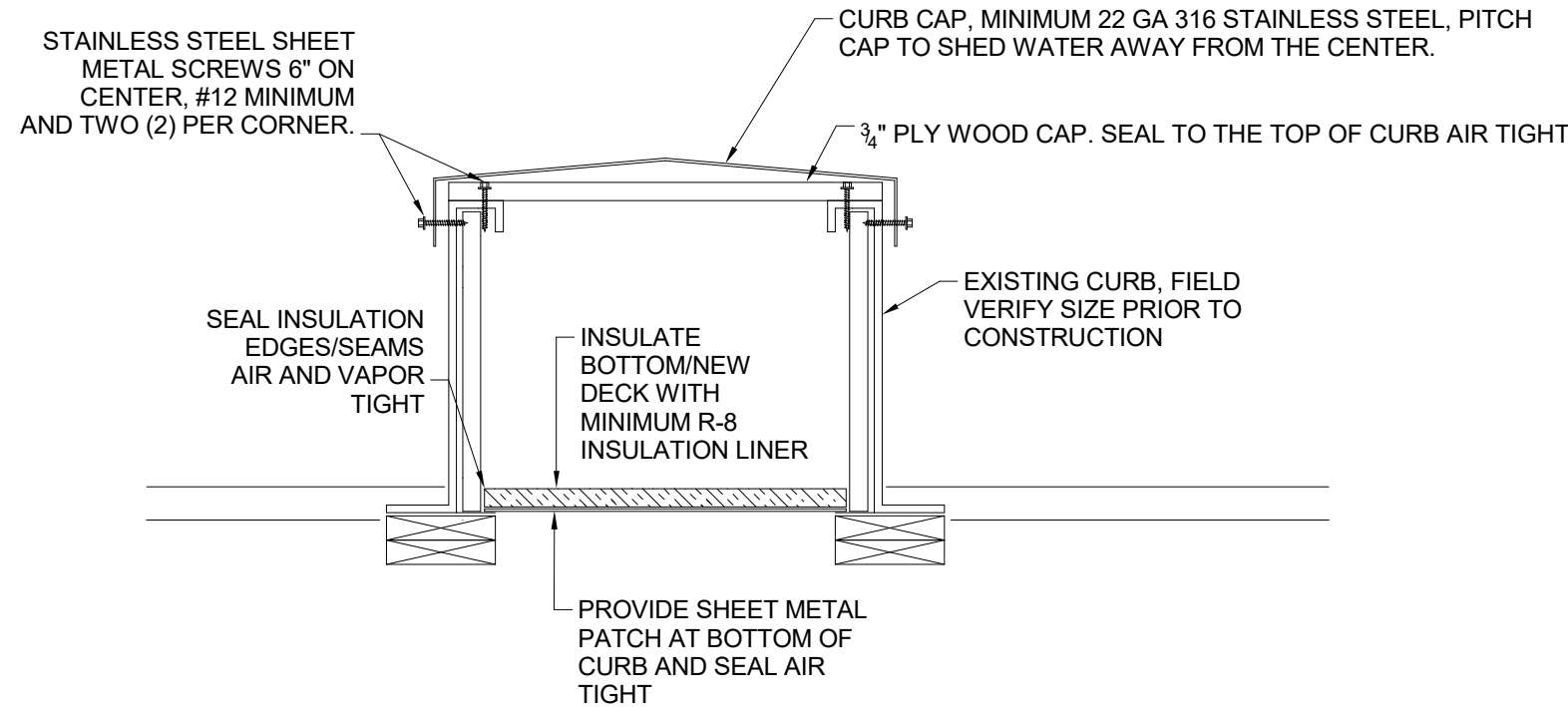
M403 SCALE: NOT TO SCALE

RENOVATION GENERAL NOTES: 2, SHEET M403

- BAS CONTRACTOR SHALL COORDINATE WORK WITH OWNER, HVAC, AND ELECTRICAL CONTRACTORS. PRE-INSTALLATION MEETINGS WILL BE NEEDED AT APPROPRIATE PHASES OF WORK.

RENOVATION KEYED NOTES: 2, SHEET M403

- INSTALL NEW VERTICAL AIR HANDLING UNIT ON EXISTING RETURN AIR PLENUM PLATFORM.
- PROVIDE NEW PLYWOOD TOP TO REPAIR EXISTING WATER DAMAGE AS NEEDED AND PROVIDE NEW 2x4 OR 4x4 WOOD BASE SUPPORT AROUND PERIMETER OF EXISTING RETURN AIR OPENING AS REQUIRED TO ADAPT TO NEW AIR HANDLING UNIT. STACK ADDITIONAL FRAMING IF NEEDED TO INCREASE ELEVATION AS NEEDED FOR CONDENSATE DRAIN SLOPE. PROVIDE SHEET METAL FLASHING OVER EXPOSED WOOD FRAMING IN RETURN AIR PATH.
- EXTERNAL AIR FILTER BASE. REFER TO AIR HANDLING UNIT SCHEDULES FOR AIR FILTER REQUIREMENTS. SECURE BASE TO WOOD FRAME AND UNIT WITH APPROPRIATE SCREWS. PROVIDE FOAM GASKETS AT ALL CONNECTION FOR AIR TIGHT INSTALLATION. USE INTERNAL FILTERS FOR UNITS OVER 5-TON.
- PROVIDE HEAVY GAGE 18-16 ADAPTER PLATE AT TOP OF FILTER BASE AS NEEDED TO SUPPORT AHU OF A SMALLER SIZE AS APPLICABLE. ADAPTER SHALL HAVE PERIMETER FLANGE DOWN OVER FILTER BASE ON THE SIDES AND REAR TO STRENGTHEN THE SYSTEM.
- INSTALL ALL PIPING, CONDUITS, AND THE LIKE A MINIMUM OF 3" CLEAR SPACE IN FRONT OF UNIT. PROVIDE ADDITIONAL SPACE FOR INSULATED PIPING. CLEAR SPACE IS FOR REMOVAL OF EQUIPMENT ACCESS PANELS. (TYPICAL)
- PVC CONDENSATE DRAIN PIPE WITH TRAP AND AIR BREAK. REFER TO DETAIL 12, M600 FOR TRAP CONSTRUCTION REQUIREMENTS. SUPPORT PIPING TO PLATFORM WITH STRUT AND CLAMPS. TURN DOWN OVER HUB DRAIN WITH AIR GAP. (TYPICAL)
- CONTRACTOR IS DIRECTED TO NOT GLUE NEW PVC DRAIN PIPING TO EQUIPMENT PIPE CONNECTION. PIPING SHALL REMAIN LOOSE IN FITTING FOR EASY REMOVAL FOR SERVICE AND MAINTENANCE.
- SECONDARY DRAIN PIPE OVERFLOW FLOAT SWITCH. STAND SWITCH MINIMUM OF 3" CLEAR FROM SERVICE ACCESS PANEL. WIRE SWITCH BACK TO CONTROL SYSTEM IN SERIES WITH EVAPORATOR FREEZE THERMOSTAT. PROVIDED BY HVAC CONTRACTOR.
- EVAPORATOR FREEZE THERMOSTAT. INSTALL WITH SENSING PROBE WOVEN INTO EVAPORATOR. WIRE IN SERIES WITH FLOAT SWITCH TO BAS PANEL ALARM. PROVIDED BY HVAC CONTRACTOR.
- BAS CONTRACTOR SHALL REINSTALL EXISTING RETURN AIR TEMPERATURE SENSOR IN TOP OF PLATFORM ADJACENT TO AHU. LOCATION SHALL NOT INTERFERE WITH EQUIPMENT SERVICE.
- BAS CONTRACTOR SHALL REINSTALL EXISTING 240/24VAC BAS CONTROL TRANSFORMER IN NEW AHU CONTROL PANEL. CONNECT 240V POWER TO MAIN POWER AFTER STEPDOWN TRANSFORMER AND WIRE 24-VAC BACK TO EXISTING BAS CONTROL BOARD POWER INPUT CONNECTIONS.
- BAS CONTRACTOR SHALL REINSTALL EXISTING BAS SUPPLY FAN CURRENT TRANSFORMER ON NEW FAN WIRING AND WIRE CT CONTROL BACK TO EXISTING BAS CONTROL BOARD.
- BAS CONTRACTOR SHALL REINSTALL EXISTING SUPPLY AIR TEMPERATURE SENSOR ON NEW DUCT AS REQUIRED AND WIRE BACK TO BAS PANEL.
- BAS CONTRACTOR SHALL PROVIDE NEW MINIMUM 4-CONDUCTOR CONTROL WIRING TO EACH ACCU. ALL OUTDOOR CONDUIT SHALL BE FURNISHED BY ELECTRICAL CONTRACTOR.
- PATCH EXISTING INSULATION LINER AS NEEDED. NO WOOD SHALL BE EXPOSED. SEAL ALL INSULATION JOINTS AIR TIGHT.
- WRAP EXISTING PVC DRAIN PIPING LOCATED WITHIN RETURN AIR STREAMS WITH PLENUM WRAP INSULATION.
- PROVIDE NEW SUPPLY AIR DUCT TRANSITION AS NEEDED TO CONNECT TO NEW AHU, AND EXISTING DUCTWORK TRANSITION AS REQUIRED TO CONNECT TO AHU DUCT CONNECTION SIZE. PROVIDE FLEXIBLE DUCT ATTACHMENT AT UNIT. FIELD VERIFY EACH DUCT SIZE AND LOCATION PRIOR TO DUCT FABRICATION AND INSTALLATION. (TYPICAL)
- PROVIDE NEW SUPPLY AIR DUCT MANUAL BALANCING DAMPERS IN EACH SUPPLY AIR DUCT BRANCH. EXTERNALLY INSULATE AROUND DAMPERS WITH DUCT WRAP.
- PROVIDE NEW REFRIGERANT LIQUID AND VAPOR PIPING FROM NEW INDOOR AHU TO NEW OUTDOOR ACCU AT SAME LOCATION AS EXISTING PIPING. (TYPICAL)
- PROVIDE PIPE SUPPORT AT TURN DOWN TO UNIT CONNECTIONS AND TURN UP TO ROOF PENETRATIONS. (TYPICAL)
- PROVIDE DUCT NEW SHEET METAL ACCESS DOOR SAME SIZE AS EXISTING PLENUM ACCESS DOOR. PROVIDE SHEET METAL REAR ADAPTER PLATE AS NEEDED TO SECURE DOOR TO WOODEN PLATFORM WALL.
- PROVIDE NEW 316 STAINLESS STEEL PIPE AND CONDUIT HOOD ON EXISTING CURB. REFER TO DETAIL 13, SHEET M400.
- PROVIDE MINIMUM 22-GA 316 STAINLESS STEEL CURB CAPS WITH MINIMUM 2" PERIMETER FLANGE, FULLY WELDED. SECURE FLANGE TO CURB WITH #10 STAINLESS STEEL SCREWS EVERY 16" O.C.
- EXISTING BAS SPACE SENSOR.
- HVAC AND ELECTRICAL CONTRACTORS SHALL MEET AND COORDINATE THE BEST LOCATION TO MOUNT THE HIGH VOLTAGE TRANSFORMER TO PREVENT OBSTRUCTING NEW OR EXISTING EQUIPMENT ACCESS OR SERVICE AREAS.



3 DETAIL - EXISTING ROOF CURB CAP CLOSURE

M403 SCALE: NOT TO SCALE

NO	REVISION	DATE

WOOD RIVER ELEMENTARY HVAC REPLACEMENTS AND UPGRADES - 2026 (PHASE 1)

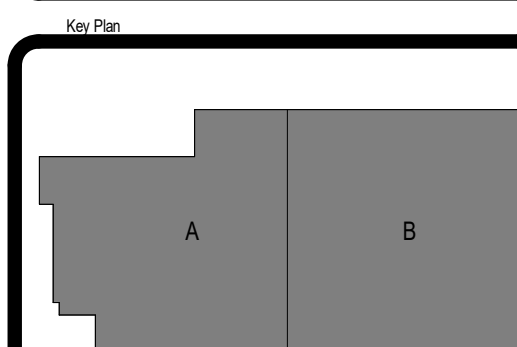
CALALLEN INDEPENDENT SCHOOL DISTRICT

15118 DRY CREEK DR, CORPUS CHRISTI, TX 78410

SERVICE ORDER NO. 4 - BOND 2023

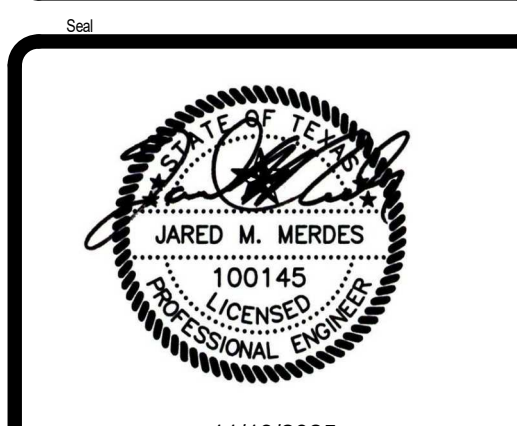
MECHANICAL DETAILS

Project Name and Address



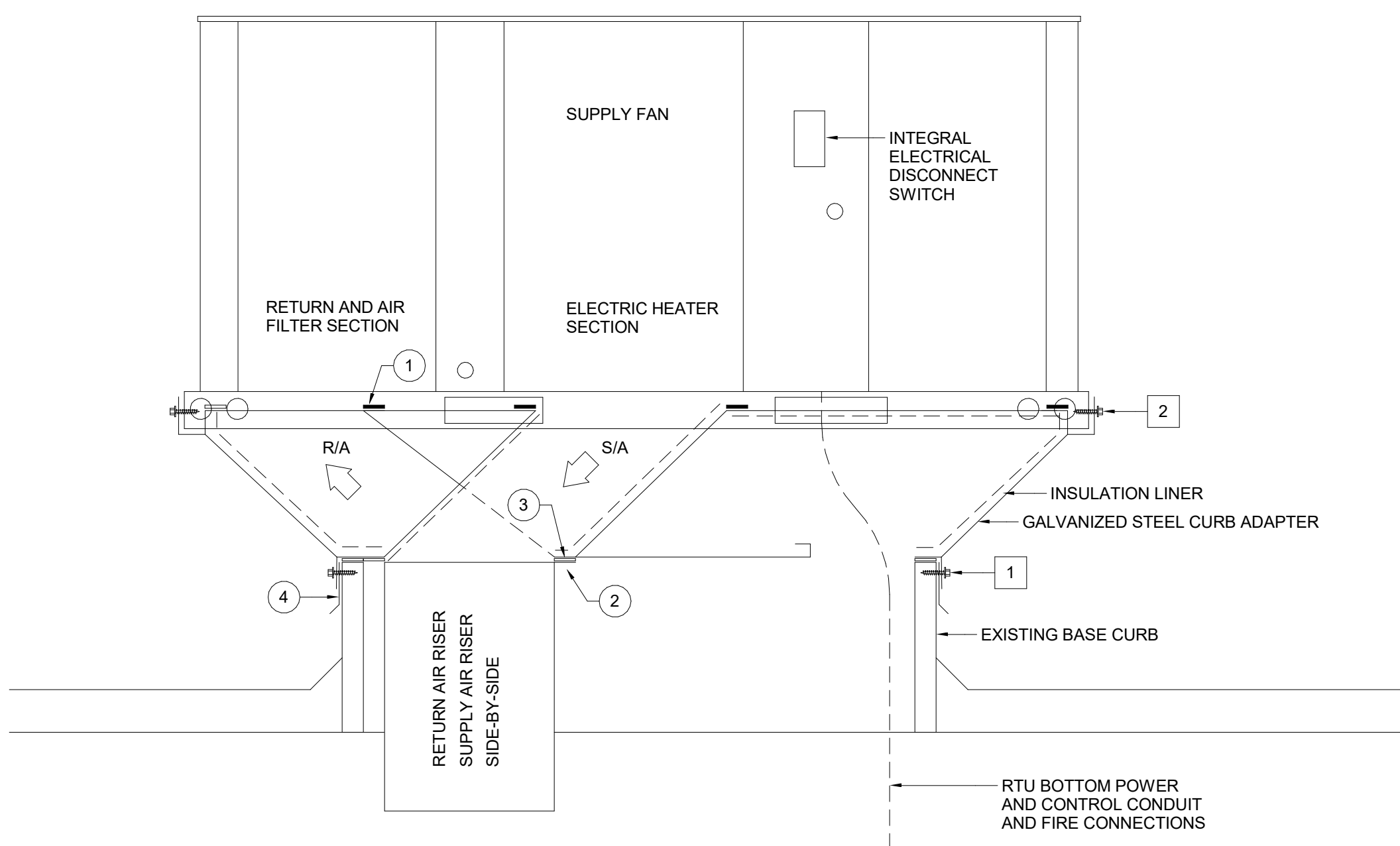
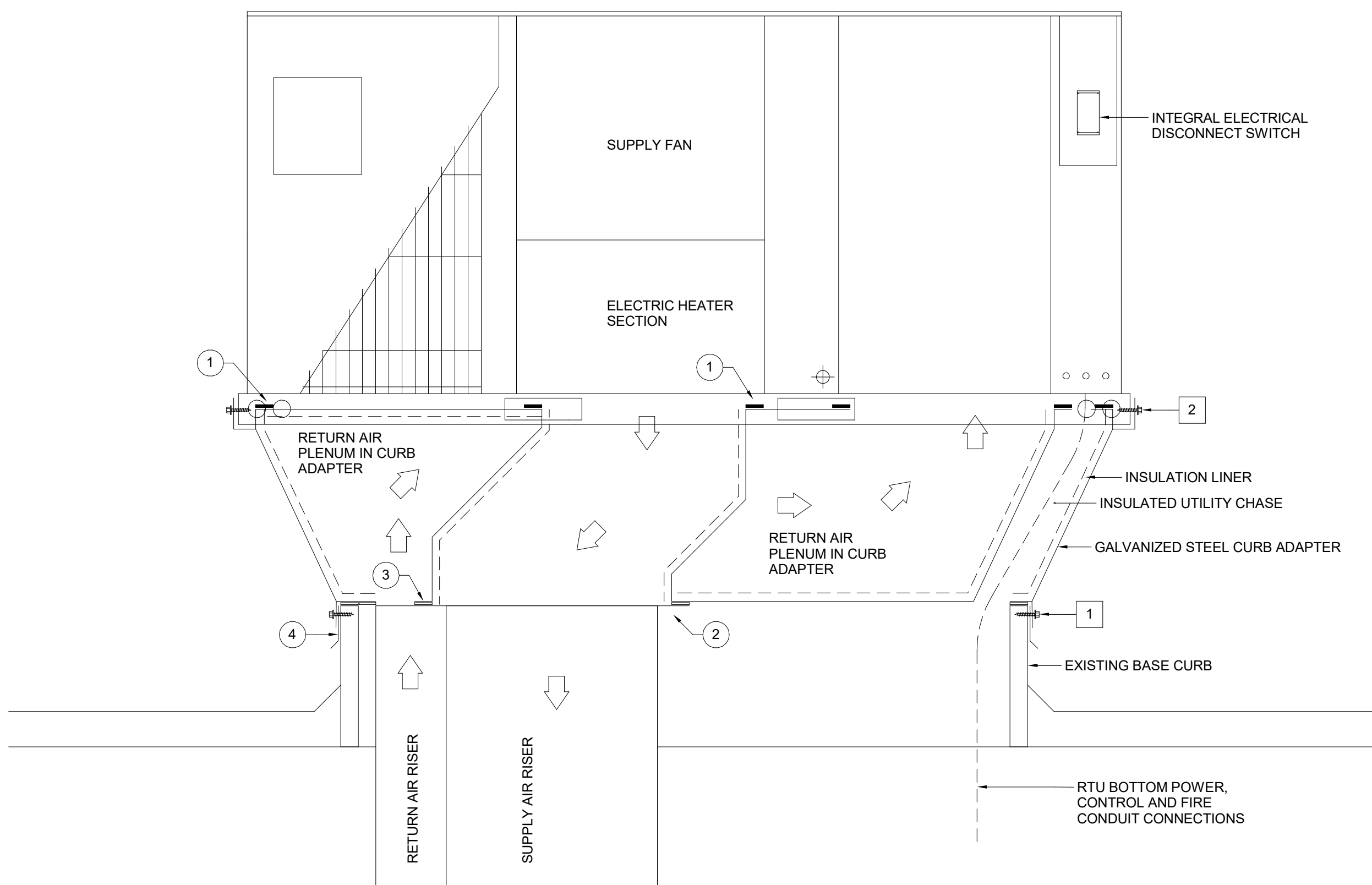
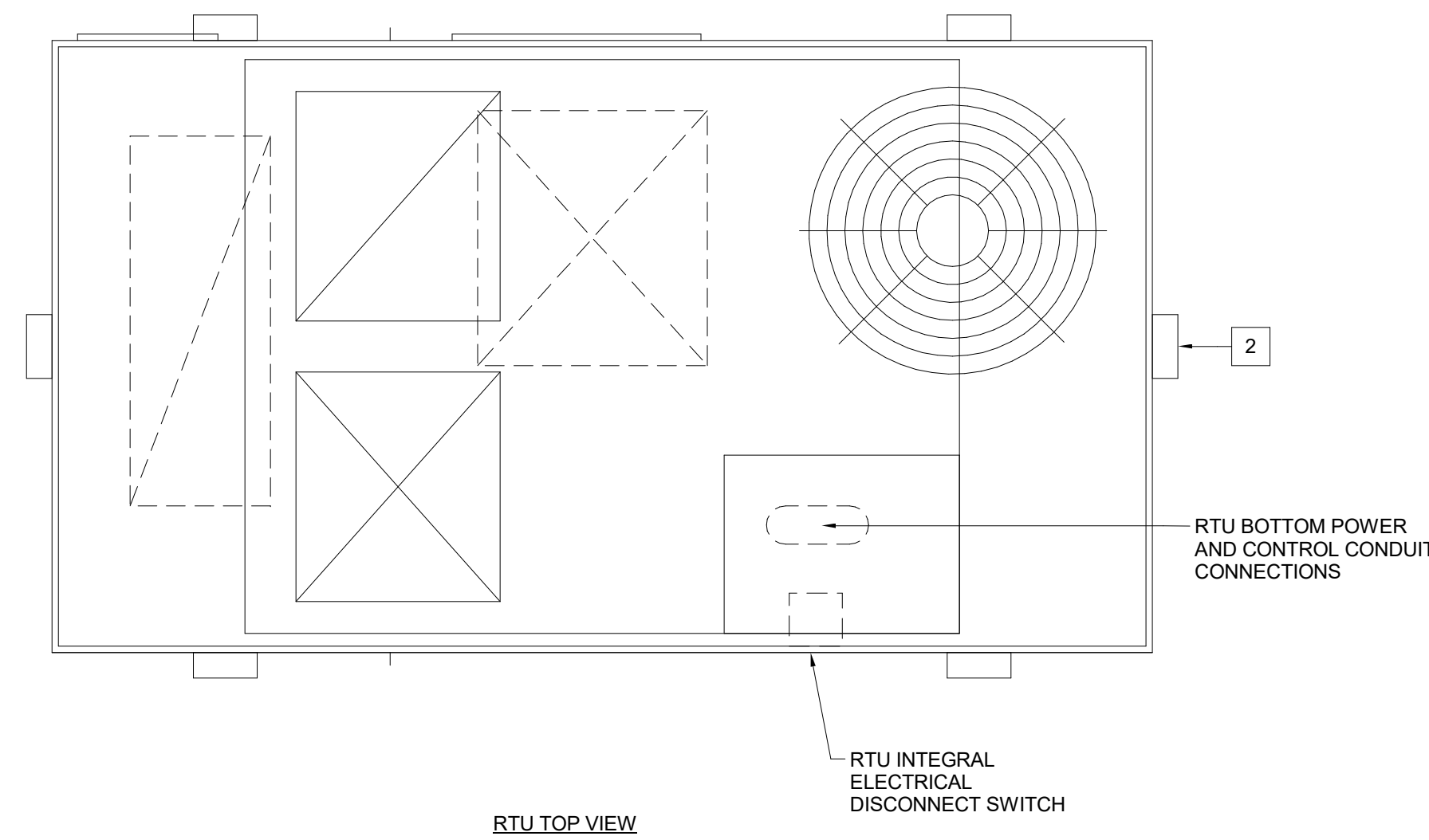
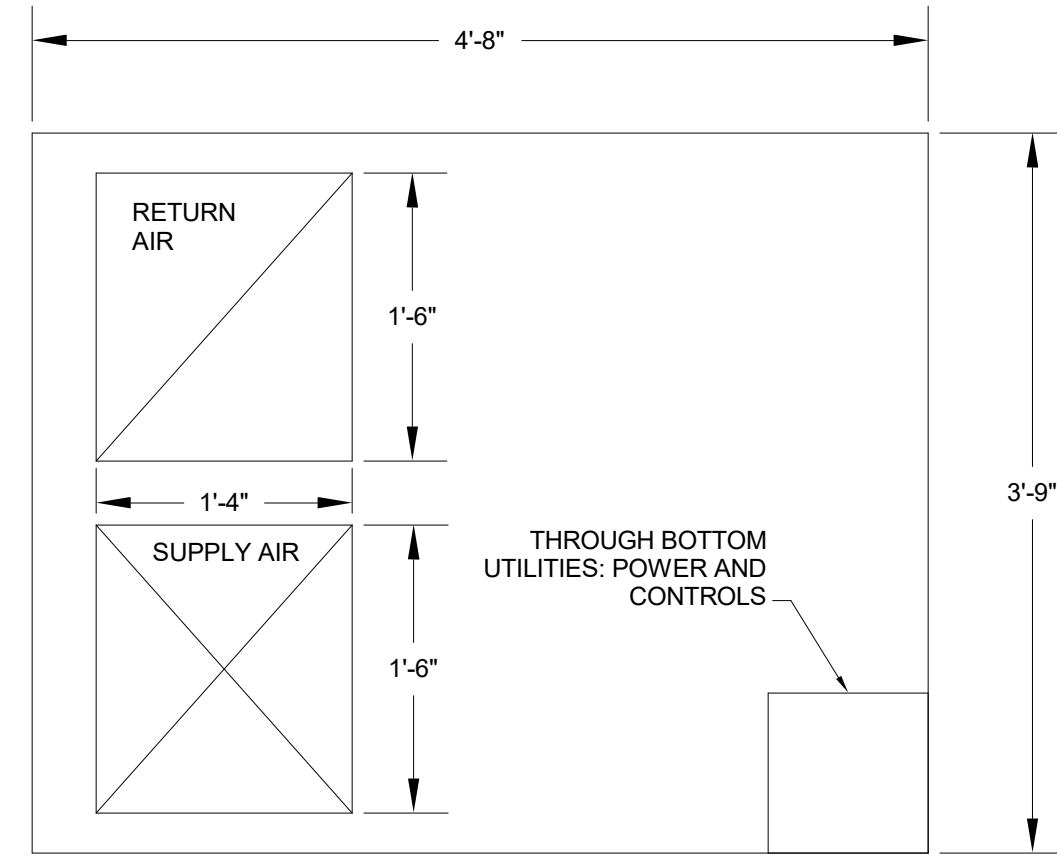
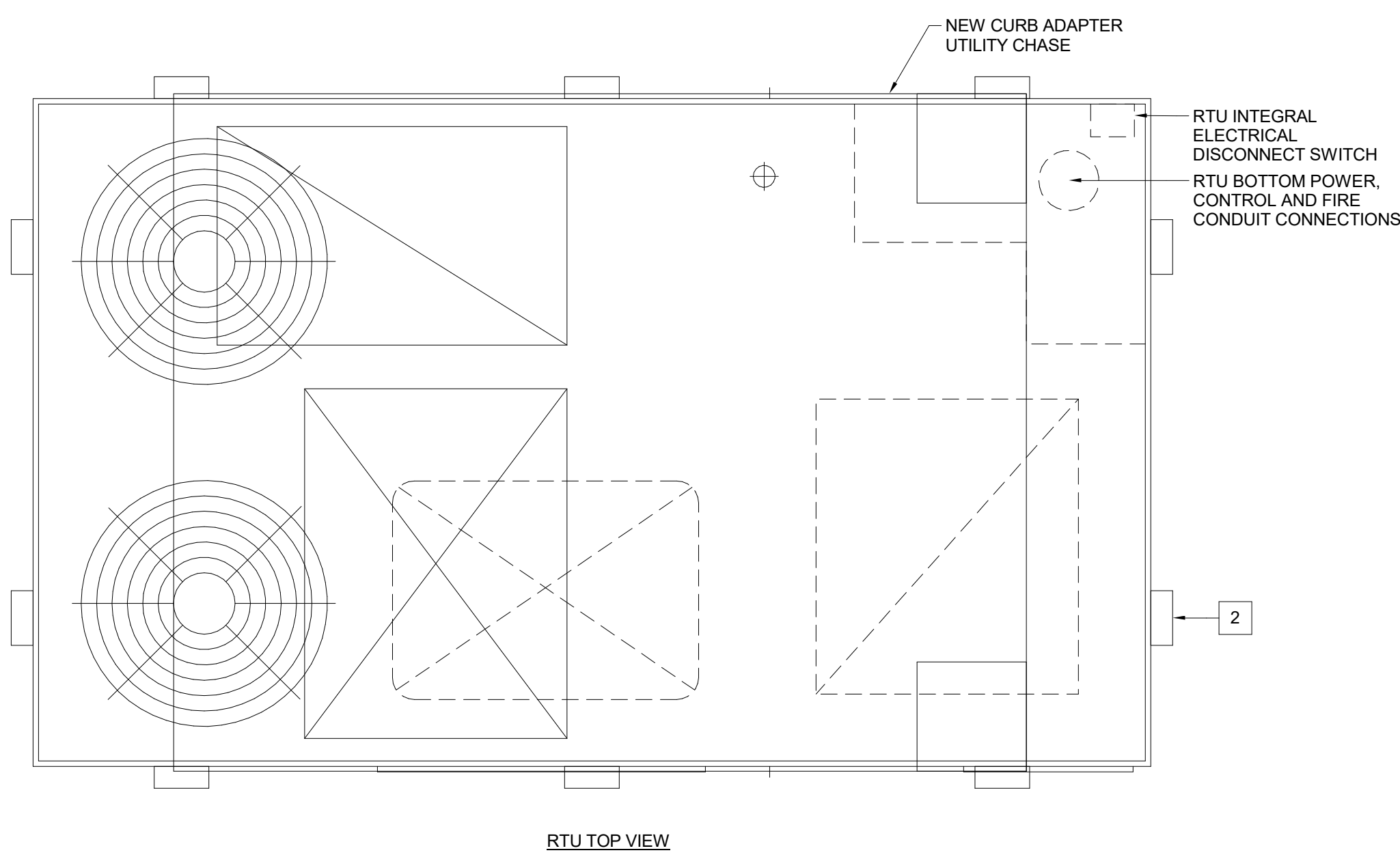
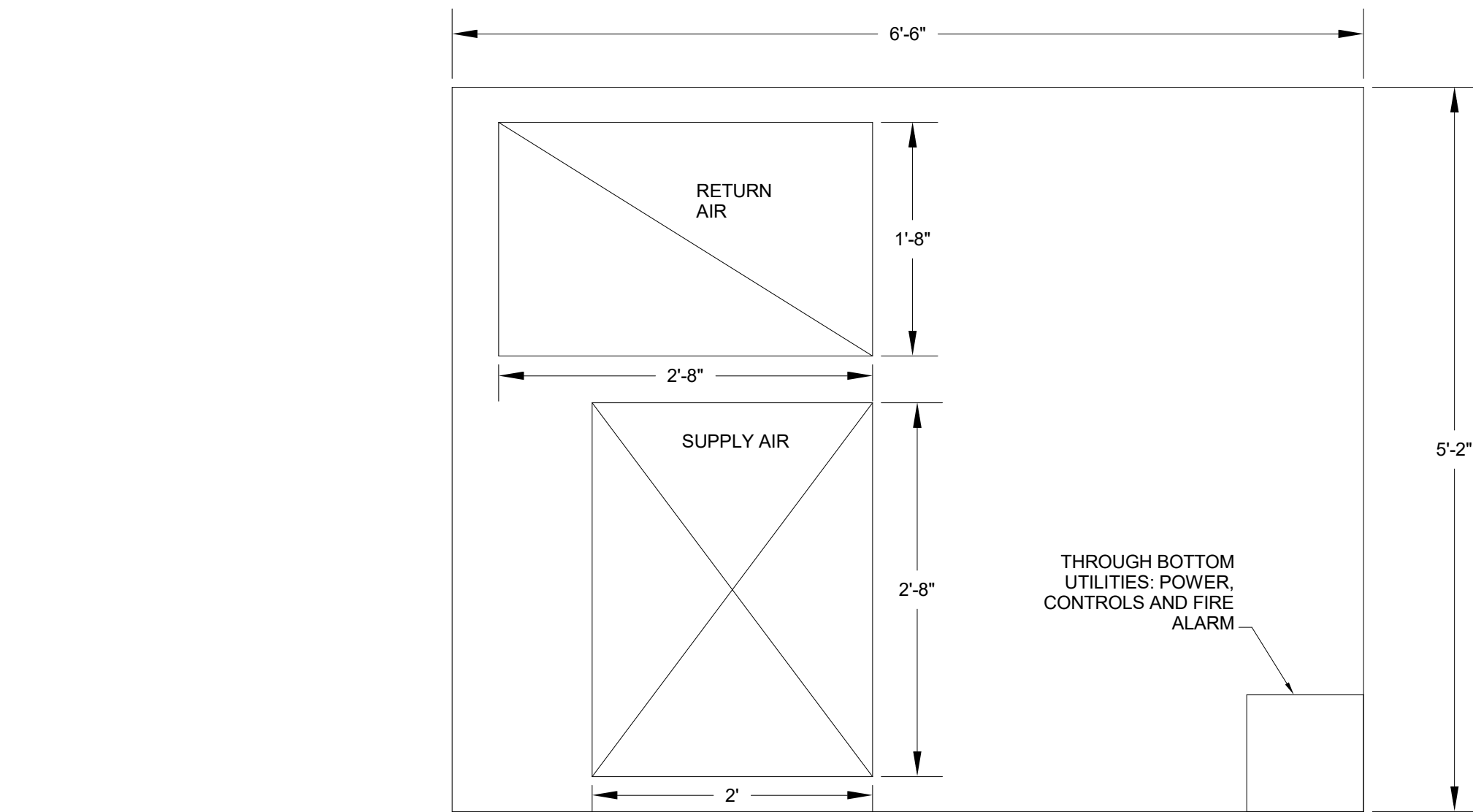
Site Address and Range

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Project No.	2024190
Date Drawn	11/13/2025
Drawn By	AR
Checked By	JM
Scale	Sheet No. 22 of 25

M403



1 DETAIL - "B" BOX RTUs WITH CURB ADAPTER
M404 SCALE: APPROXIMATE 1" = 1'-0"

2 DETAIL - "A" BOX RTUs WITH CURB ADAPTER (6-TON AND UNDER)
M404 SCALE: APPROXIMATE 1" = 1'-0"

GENERAL NOTES: 1 AND 2, SHEET M404

- CONTRACTOR SHALL FIELD VERIFY EXISTING BASE CURB DIMENSIONS AND SUPPLY AND RETURN AIR DUCT CONFIGURATIONS AND USE THIS INFORMATION AS THE BASIS FOR NEW CURB ADAPTER SHOP DRAWINGS. SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO FABRICATION AFTER EXISTING CONDITIONS VERIFICATION.
- NEW CURB ADAPTERS SHALL BE CUSTOM BUILT TO ADAPT EXISTING CURBS AND DUCTWORK TO NEW RTUs WITH THE BEST FIT AND LOWEST HEIGHT INCREASE POSSIBLE.
- CURB ADAPTERS SHALL HAVE FULLY WELDED LIQUID TIGHT GALVANIZED STEEL CONSTRUCTION AND SHALL BE INTERNALLY INSULATED WITH MINIMUM R-6 FIBERGLASS INSULATION. REFER TO SPECIFICATIONS.
- ENGINEER SUSPECTS THAT THE ORIGINAL RTUs ON THESE CURBS WERE MANUFACTURED BY COMMAND-AIRE.
- ALL EXTERIOR SCREWS AND HARDWARE SHALL HAVE 316 STAINLESS STEEL CONSTRUCTION.
- PROVIDE MINIMUM 1/4" THICK FOAM RUBBER TYPE INSULATION GASKETING AT CURB ADAPTER ATTACHMENTS TO EXISTING CURB AND NEW EQUIPMENT BASE AS NEEDED FOR AIR TIGHT CONNECTION AT ALL LOCATIONS.
- ENGINEER IS NOT SURE IF AND HOW THE EXISTING ROOF BASE CURBS ARE SECURED TO ROOF STEEL STRUCTURE. AS SUCH, THE CONTRACTOR SHALL REMOVE TWO (2) EXISTING ROOFTOP UNITS AND EXISTING CURB ADAPTERS AND SCHEDULE A FIELD INSPECTION BY THE STRUCTURAL ENGINEER. IF THE EXISTING CURBS REQUIRE REMEDIAL STRUCTURAL WORK, SUCH WORK SHALL BE PERFORMED AS ADDITIONAL SERVICES THROUGH THE CONTINGENCY FUND.

STRUCTURAL WINDSTORM KEYED NOTES: 1 AND 2, SHEET M404

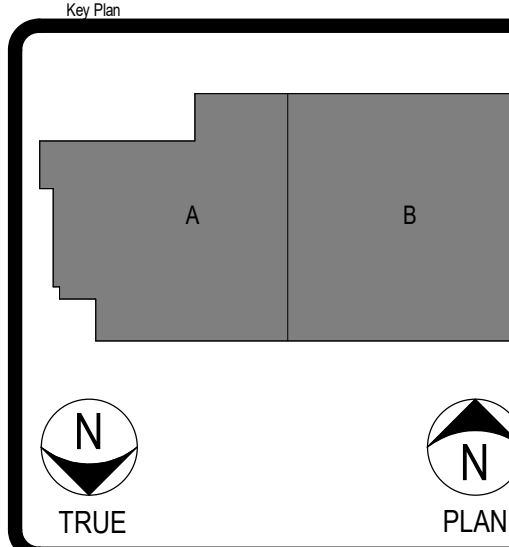
- ANCHOR NEW CURB ADAPTERS TO EXISTING ROOF BASE CURBS WITH MINIMUM #12 STAINLESS STEEL TEK SCREWS WITH GASKET TWO PER CORNER AND EVERY 12" O.C. ON ALL FOUR SIDE OF CURBS. (TYPICAL)
- WELD MINIMUM 1/4 GAGE 4" LONG L D G. WINDSTORM CLIP TO CURB ADAPTER TOP AS NEEDED TO SECURE NEW EQUIPMENT TO CURB ADAPTER AT LOCATIONS INDICATED ON DRAWINGS. PROVIDE FOUR (4) #12 STAINLESS STEEL TEK SCREWS PER CLIP THROUGH UNIT BASE RAIL AND CLIP PER CLIP LOCATION. PROVIDE BLANK PLATE ON BASE RAIL SCREWED IN PLACE AS NEEDED TO COVER ANY HOLES AS APPLICABLE. (TYPICAL)

MECHANICAL KEYED NOTES: 1 AND 2, SHEET M404

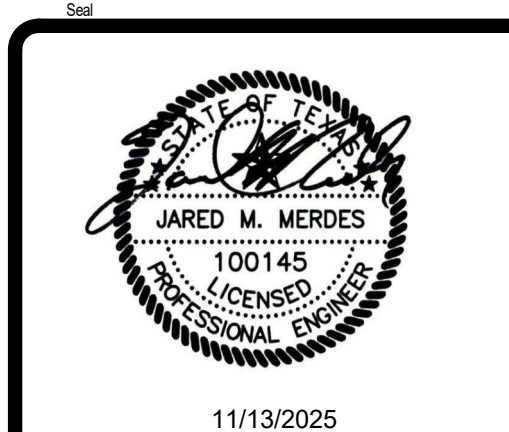
- PROVIDE MINIMUM 1/4 FOAM GASKET AROUND THE ENTIRE BASE CURB PERIMETER AND AT THE TOP OF THE CURB ADAPTER AT RTU CONNECTIONS. (TYPICAL)
- SUPPORT EXISTING DUCT RISERS AFTER DEMOLITION OF EXISTING UNITS WITH ANGLE IRON OR HEAVY GAGE SHEET METAL ANGLES IF EXISTING RISERS ARE NOT SUPPORTED. SEAL CONNECTIONS WITH DUCT SEALANT AIR TIGHT. (TYPICAL)
- SECURE CURB ADAPTER TO DUCT FLANGES IF THE ADAPTER SEAL IS NOT TIGHT TO PREVENT AIR LEAKAGE. (TYPICAL)
- PROVIDE NEW 24-GAGE ROOF CURB COUNTER FLASHINGS. (TYPICAL)

NO	REVISION	DATE

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SERVICE ORDER NO. 4 - BOND 2023
MECHANICAL DETAILS

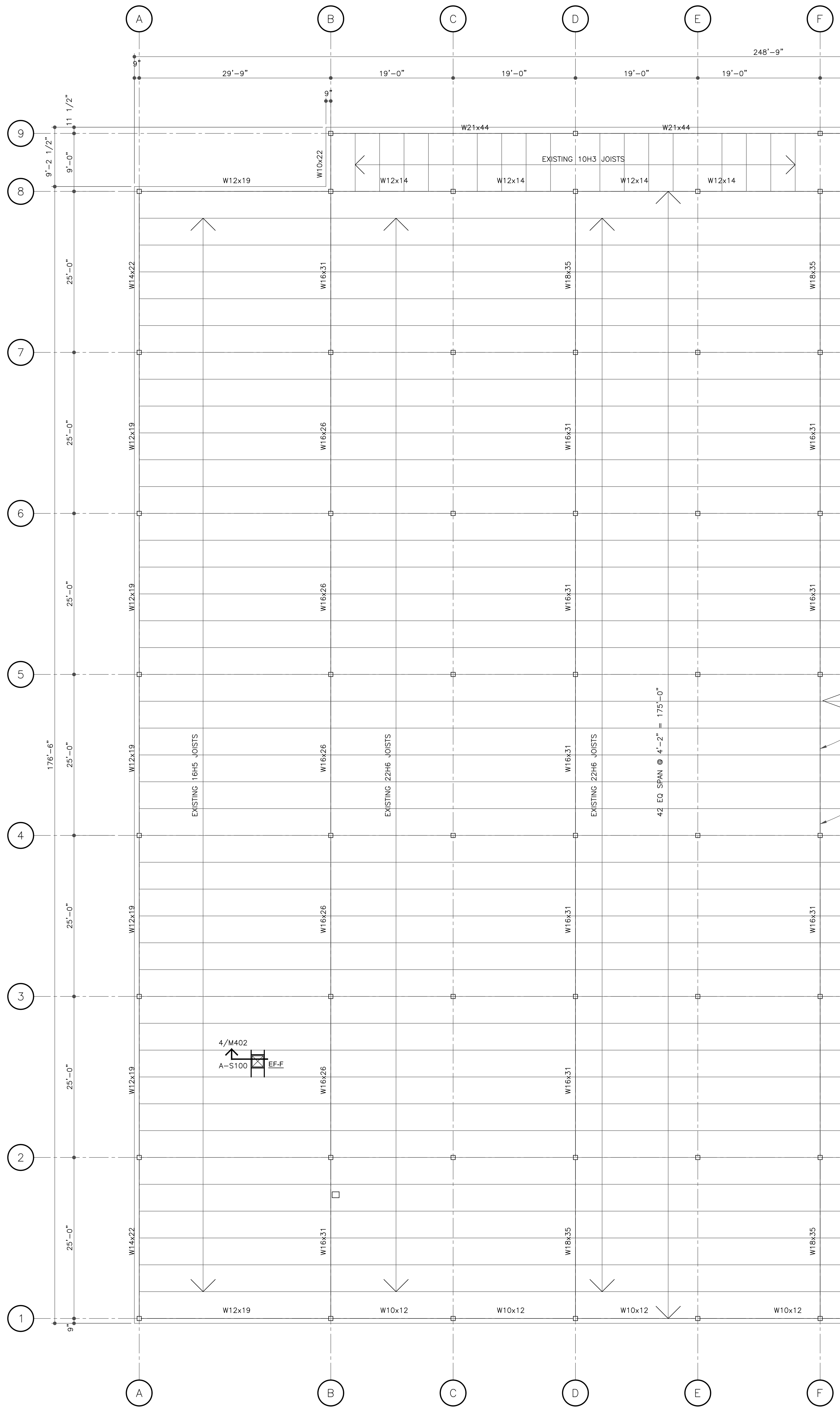


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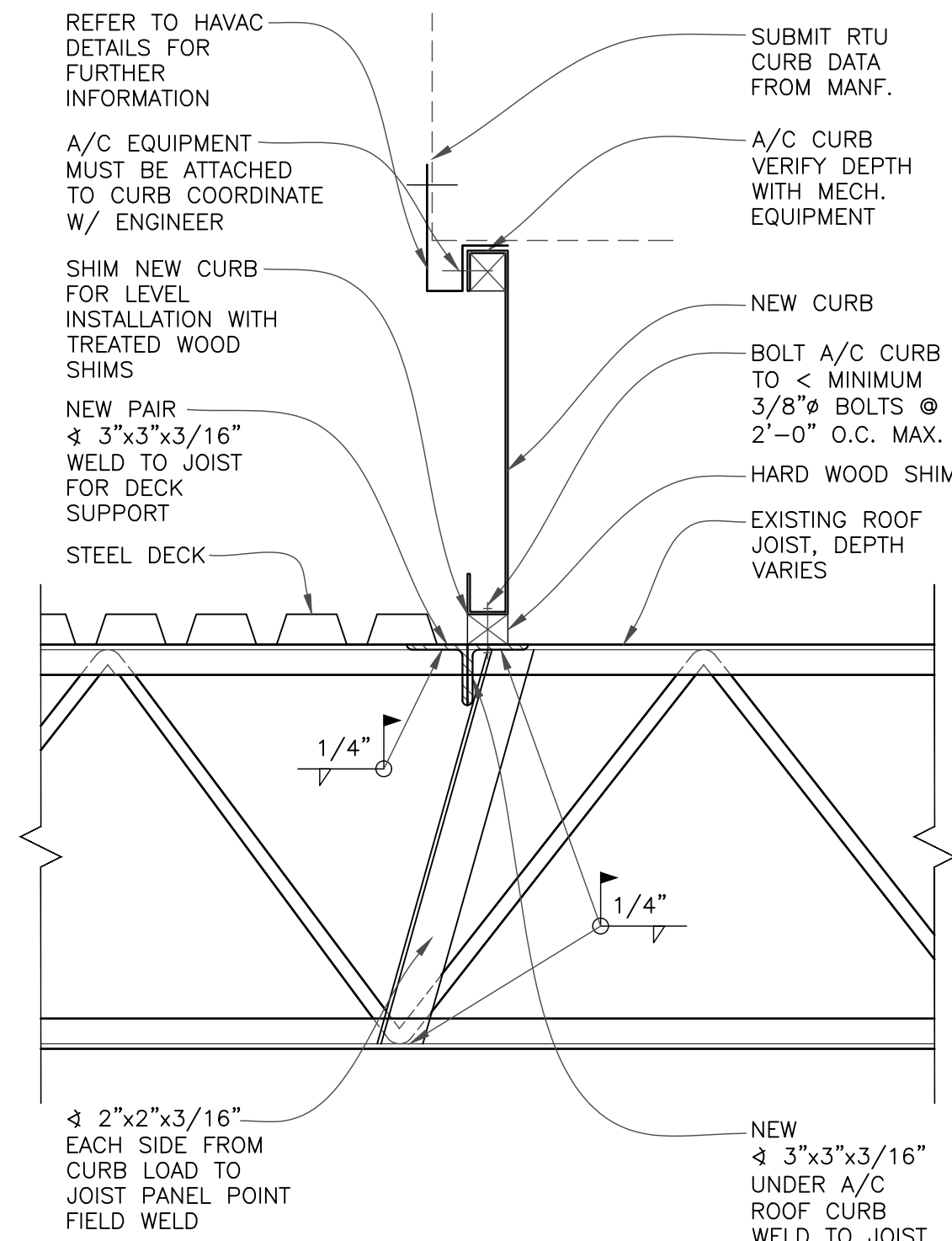


Project No.	2024100
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Drawn By	AR
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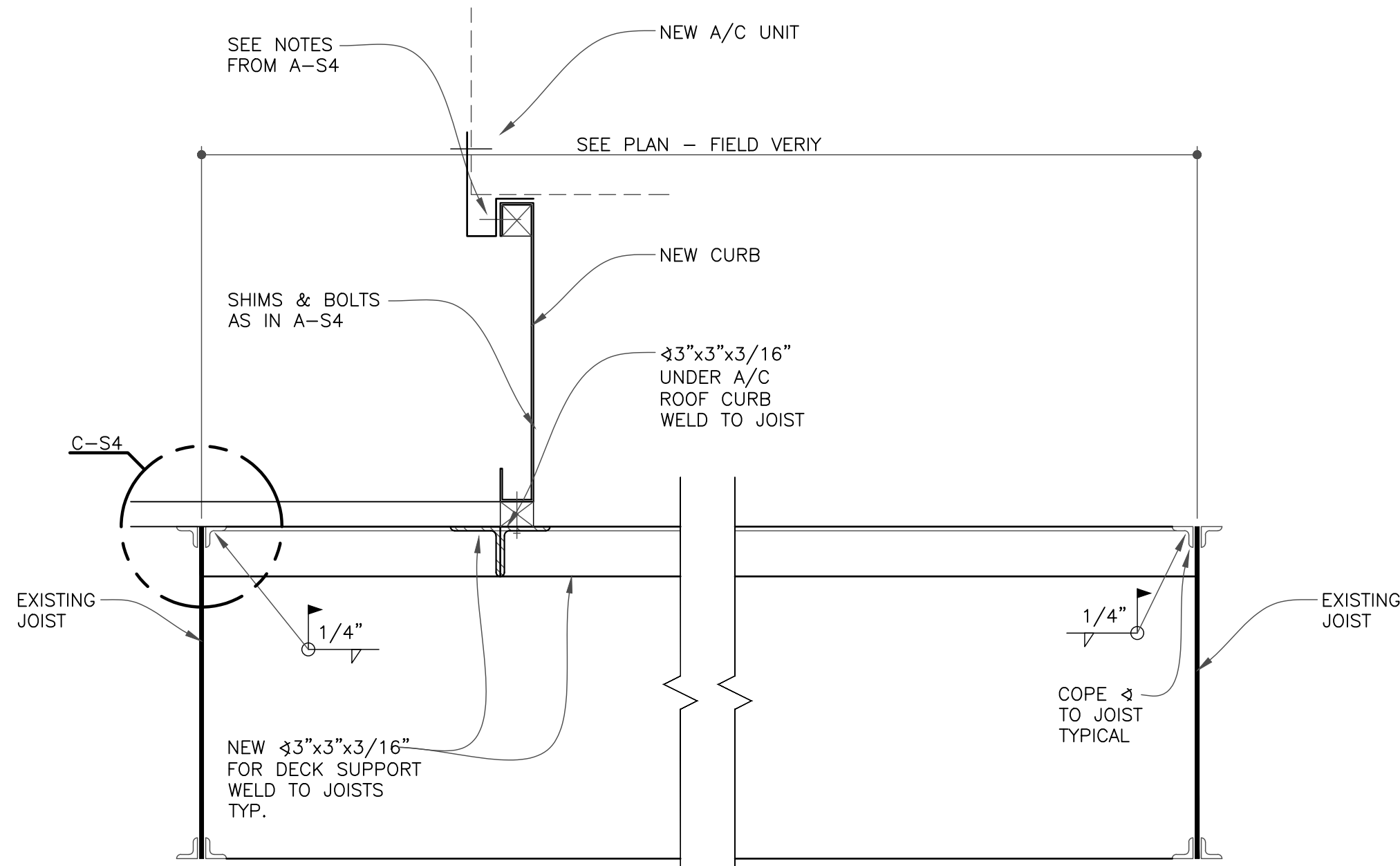
M404



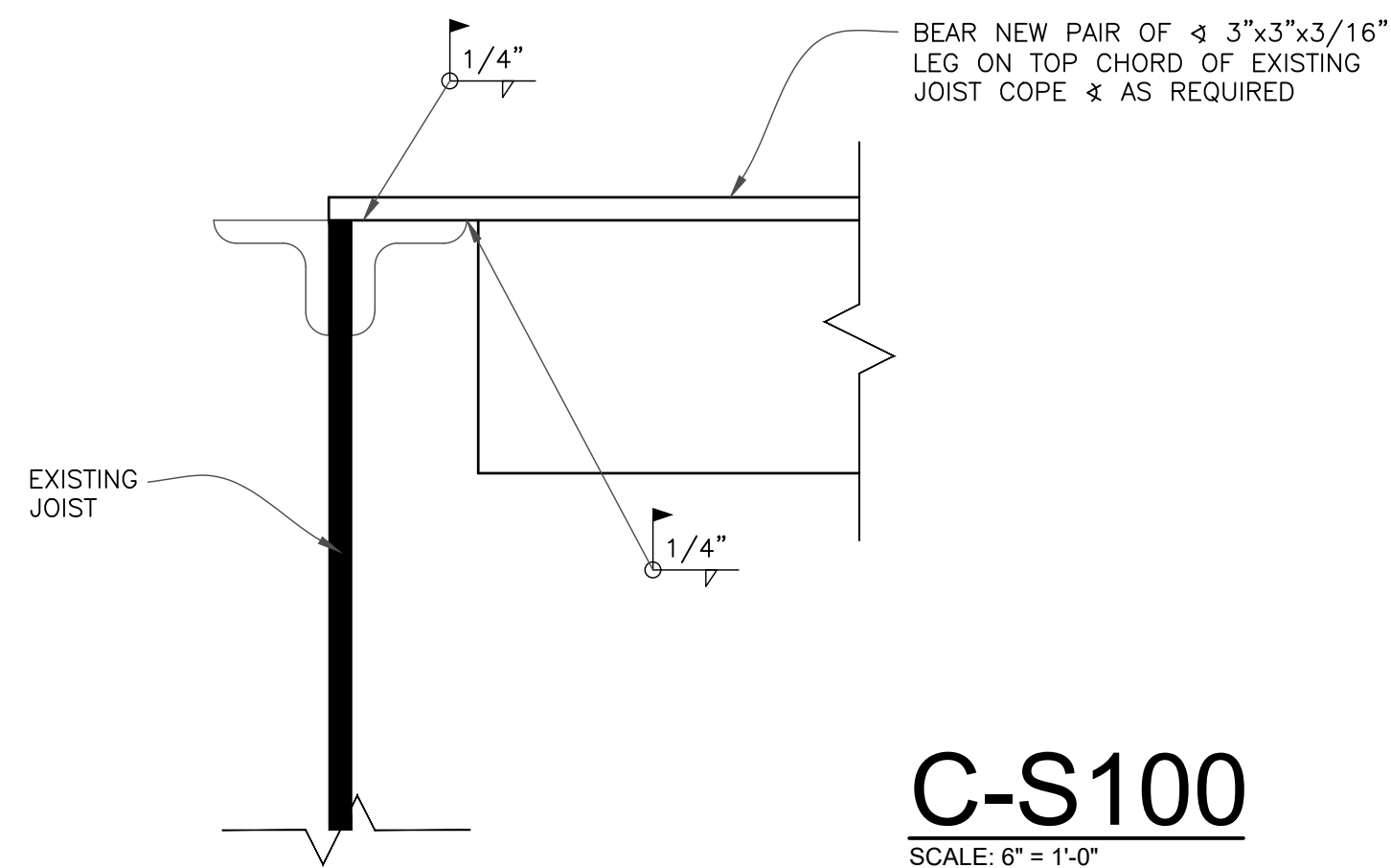
- NOTES:
- GENERAL CONDITIONS:
 - PRIOR TO CONSTRUCTION, VERIFY STRUCTURAL ELEVATIONS AND DIMENSIONS WITH OTHER PROJECT DRAWINGS AND COORDINATE LOCATIONS OF OPENINGS AND SLEEVES THROUGHOUT THE STRUCTURE, INSERTS AND OTHER RELATED ITEMS.
 - VERIFY ALL DIMENSIONS IN THE FIELD BEFORE STARTING THE WORK.
 - BEFORE BEGINNING CONSTRUCTION, NOTIFY THE ENGINEER OF DISCREPANCIES OR CONFLICTS FOUND IN THE DRAWINGS AND/OR FIELD DIMENSIONS.
 - EXISTING STRUCTURES ARE SHOWN ON THE DRAWINGS FOR CLARITY ONLY. VERIFY ALL DIMENSIONS, ELEVATIONS AND TYPE OF CONSTRUCTION OF THOSE STRUCTURES AND NOTIFY THE ENGINEER BEFORE BEGINNING OF CONSTRUCTION OF ANY INTERFERENCES AND/OR DISCREPANCIES THAT MIGHT EXIST.
 - STRUCTURAL STEEL:
 - ASTM A36 IN ACCORDANCE WITH AISC.
 - HOLES FOR OTHER WORK: PROVIDE HOLES REQUIRED FOR SECURING OTHER WORK STRUCTURAL STEEL FRAMING AND FOR PASSAGE OF OTHER WORK THROUGH STEEL FRAMING MEMBERS, AS SHOWN ON AIR CONDITIONING UNIT DRAWINGS.
 - CONTRACTOR SHALL FIELD MEASURE ANY EXISTING AND COORDINATE LOCATIONS OF EXISTING RTU ON EXISTING STEEL STRUCTURE/CURBS.
 - DEMOLISH EXISTING RTU FRAMING AS NEEDED AFTER REMOVAL OF EXISTING RTU CURB FOR NEW RTU INSTALLATION.
 - EXTRA MATERIALS: FURNISH THE FOLLOWING CUT ON THE JOB AND ERECT OR PLACE AS DIRECTED BY ENGINEER DURING CONSTRUCTION. PROVIDE CREDIT TO:
 - 3 PIECES OF $\angle 3 \times 3 \times 1/4"$ x 20'-0"
 - 5 LINEAR FEET OF $1/4"$ FILLET WELD
 - BOLTS:
 - ASTM A325 OR STRONGER.
 - WELDING:
 - IN ACCORDANCE WITH AWS.
 - SEE MECHANICAL FOR ALL RE-ROOFING DETAILS.
 - CONTRACTOR SHALL INCLUDE IN PROPOSAL COST OF WINDSTORM CERTIFICATE FOR ROOFING AND A/C ATTACHMENT BY APPROVED WINDSTORM ENGINEER, KEITH A. SANDERS, P.E.
 - FIRE PROTECTION:
 - COMPLIANCE WITH CHAPTER 3 AND 6 OR NFPA 518; STANDARD FOR FIRE PREVENTION DURING WELDING, CUTTING AND OTHER HOT WORK, 2003 EDITION INCLUDING THE REQUIREMENT FOR A TRAINED OBSERVER DURING AND FOLLOWING WELDING AND OTHER HOT WORK.
 - COMPLIANCE WITH ASHA STANDARD FOR FIRE PREVENTION, 1926.325, ALLIED PROCESSES.
 - COMPLIANCE WITH CHAPTER 3 AND 6 OR NFPA 518; STANDARD FOR FIRE COPIES OF EACH OF THE ABOVE PUBLICATIONS SHALL BE ON THE PROJECT SITE THROUGHOUT THE TIME PERIOD DURING WHICH WELDING AND OTHER HOT WORK WILL BE PERFORMED.WELDERS AND OTHERS PERFORMING HOT WORK SHALL BE FAMILIAR WITH THESE REQUIREMENTS.
 - SUBMITTALS SHALL BE PROVIDED FOR ALL STRUCTURAL COMPONENTS/MATERIALS FOR ENGINEER APPROVAL.
 - USE TREATED WOOD FOR SHIMS TO LEVEL CURBS.
 - INFILL AREAS WITH STEEL DECK TO MATCH EXISTING DECK. FIELD VERIFY. DECK SHALL BE 2 SPAN CONDITION. ATTACH STEEL DECK W/ 36/7 ATTACHMENT W/ 9 SIDELAP FASTENERS PER SPAN. USE 1.5B 22 GAGE, G60 BY VULCRAFT OR EQUAL. THE STEEL DECK SHALL SPAN FROM ϕ TO JOIST TYPICAL.
 - PAIN ALL NEW STRUCTURAL FRAMING AFTER INSTALLATION WITH RED PRIMER RUST INHIBITOR PAINT.



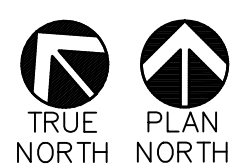
A-S100
SCALE: 1 1/2" = 1'-0"



B-S100
SCALE: 1 1/2" = 1'-0"



C-S100
SCALE: 6" = 1'-0"



PARTIAL ROOF FRAMING PLAN - AREA 'A'
SCALE: 1/8" = 1'-0"



Project Name and Address:
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CALALLEN INDEPENDENT SCHOOL DISTRICT
15118 DRY CREEK DR, CORPUS CHRISTI, TX 78410
SERVICE ORDER NO. 4 - BOND 2023

Drawn By:
KEITH A. SANDERS
11-13-2025

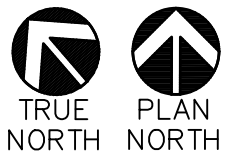
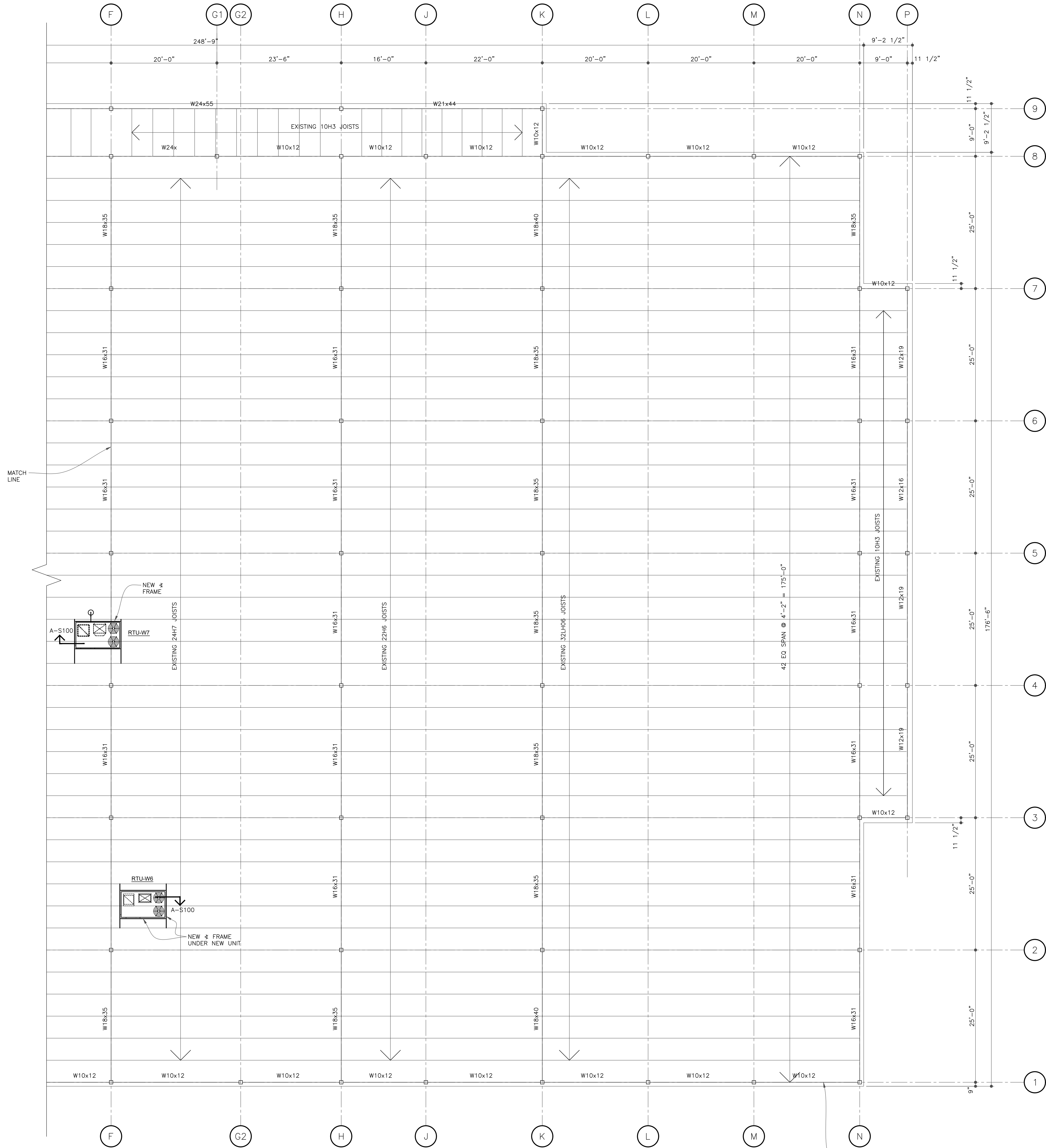
Project No.: 2024180
Date Drawn: 11/13/2025
Drawn By: JO
Checked By: KAS
Scale: Sheet No: 24 of 25

S100

Firm Address and Name:
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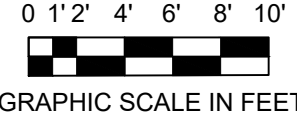
Seal:
KEITH A. SANDERS
88234
Professional Engineer
11-13-2025

W+S
WILKERSON & SANDERS, INC.
STRUCTURAL ENGINEERING
3530 S. ALAMEDA ST.
CORPUS CHRISTI, TEXAS 78411
361-774-1873 OFFICE
361-774-1873 CELL
FIRM REG. #F-4769



PARTIAL ROOF FRAMING PLAN - AREA 'B'

SCALE: 1/8" = 1'-0"



W+S

WILKERSON & SANDERS, INC.
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361-853-2071 OFFICE
361-774-1873 CELL
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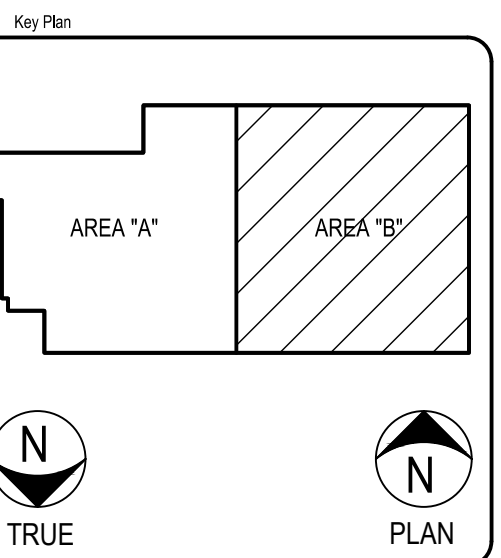
WOOD RIVER ELEMENTARY HVAC REPLACEMENTS AND UPGRADES - 2026 (PHASE 1)

CALLEN INDEPENDENT SCHOOL DISTRICT

15118 DRY CREEK DR, CORPUS CHRISTI, TX 78410

SERVICE ORDER NO. 4 - BOND 2023

PARTIAL STRUCTURAL ROOF FRAMING PLAN - AREA "B"



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