

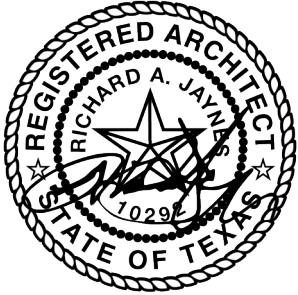


ADDENDUM No. 4
Request for Competitive Sealed Proposals (CSP)
19CSP060 Renovations at Reilly Elementary School

November 29, 2018

Item 1: Clarifications and revisions to this 19CSP060 are attached.

ADDENDUM NO. 4
TO THE
DRAWINGS AND PROJECT MANUAL
FOR
**RENOVATIONS TO REILLY ELEMENTARY SCHOOL
AUSTIN ISD
AUSTIN, TEXAS**



11/29/2018

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Austin, Texas 78746
512.807.3145 voice
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4.1 GENERAL

- A. This addendum modifies the drawings and project manual, dated October 25, 2018, as noted within and shall become part of the Contract Documents.
- B. Proposers shall acknowledge receipt of this addendum in the space provided on the proposal form. Failure to do so may subject proposer to disqualification.
- C. Each holder of proposal documents registered with the Owner will receive a copy of the addendum. Each prime proposer is responsible for distribution of information conveyed by this addendum to its sub-proposers and suppliers.

4.2 SECTION 28 31 01 - FIRE ALARM SYSTEM

- A. Question: Please verify that per the specifications these are to be Silent Knight 4-wire SD505-DuctR detectors which replaces the Specified SD-505ADHR.
1. Answer: Yes, provide Silent Knight 4-wire SD505-DuctR detectors.
- B. Question: Please verify that these detectors should be powered by existing or new UL listed Fire Alarm Power Supplies with required battery backup.
1. Yes, duct detectors are to be powered by existing UL listed Fire Alarm Power Supplies.
- C. Question: Please verify if Remote Test Switches Type SD505-RTS should be provided for each duct detector.
1. Answer: Yes, provide remote test switches type SD505-RTS at ceiling below unit.

4.3 SECTION 23 81 33 - ROOFTOP HEATING AND COOLING UNITS (ELECTRIC COOLING-GAS HEATING)

- A. Delete this section in its entirety and insert attached revised section. Section has been revised to include BACnet controls.

4.4 SECTION 23 81 36 - ROOFTOP HEATING AND COOLING UNITS ELECTRIC COOLING-ELECTRIC HEATING

- A. Delete this section in its entirety and insert attached revised section. Section has been revised to include BACnet controls.

4.5 SHEET A4.01 – ROOF PLAN

- A. Reference attached revised sheet and attached Structural Narrative - RTU-11 and RTU-KIT, Supplemental Structural Work.

4.6 SHEET M5.01 – MECHANICAL SCHEDULES

- A. Question: Please verify that per M6.02 & MS.01 (4) new duct detectors should be provided at RTUs 11, 12, Kit, & Lib.
1. Answer: Yes, (4) New smoke duct detectors shall be provided for all (4) new RTU's (RTU's 11, 12, Kit., & Lib.)
- B. Question: Are the new Heat pump units and AH for the MDF to be stand-alone from the DDC controls?
1. Answer: Yes, the new heat pumps and air handler serving MDF room shall be stand-alone from the DDC controls.
- C. Additional changes include: New rooftop units are to be provided with BACnet capability instead of LON as previously specified.

4.7 SHEET M6.02 – MECHANICAL CONTROL DIAGRAMS & SEQUENCES

- A. Reference attached revised sheet.
- B. Question: Please verify that per M6.02 & MS.01 (4) new duct detectors should be provided at RTUs 11, 12, Kit, & Lib.
1. Answer: Yes, (4) New smoke duct detectors shall be provided for all (4) new RTU's (RTU's 11, 12, Kit., & Lib.)
- C. Question: Are the new Heat pump units and AH for the MDF to be stand-alone from the DDC controls?
1. Answer: Yes, the new heat pumps and air handler serving MDF room shall be stand-alone from the DDC controls.
- D. Additional changes include: New rooftop units are to be provided with BACnet capability instead of LON as previously specified.

4.8 REVISED DRAWINGS

- A. Sheets No. A4.01 and M6.02, dated November 29, 2018 and attached hereto, are revised drawings and are hereby made a part of this addendum.

END OF ADDENDUM NO. 4

SECTION 23 81 33
ROOFTOP HEATING AND COOLING UNITS (ELECTRIC COOLING -GAS HEATING)

PART 1 -GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.
- B. Section 23 02 00 – Basic Materials and Methods is included as a part of this Section as though written in full in this document.

1.02 SCOPE

Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for Owner's use.

1.03 OPERATIONS PERSONNEL TRAINING

- A. Provide a training session for the owner's operations personnel. Training session shall be performed by a qualified person who is knowledgeable in the subject system/equipment. Submit a training agenda two (2) weeks prior to the proposed training session for review and approval. Training session shall include at the minimum:
 - 1. Purpose of equipment.
 - 2. Principle of how the equipment works.
 - 3. Important parts and assemblies.
 - 4. How the equipment achieves its purpose and necessary operating conditions.
 - 5. Most likely failure modes, causes and corrections.
 - 6. On site demonstration.

1.04 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Division One.
- B. Shop drawings shall indicate assembly, unit dimensions, weight loading, required clearances, construction details, and field connection details.
- C. Product data shall indicate dimensions, weights, capacities, ratings, fan performance, motor electrical characteristics, and gauges and finishes of materials.
- D. Provide fan curves with specified operating point clearly plotted.
- E. Submit product data of filter media, filter performance data, filter assembly, and filter frames.
- F. Submit electrical requirements for power supply wiring including wiring diagrams for interlock and control wiring, clearly indicating factory installed and field installed wiring.
- G. Submit manufacturer's installation instructions under provisions of Division One.
- H. Submit operation and maintenance data under provisions of Section 23 02 00.

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- I. Include instructions for lubrication, filter replacement, motor and drive replacement, spare parts lists, and wiring diagrams.
- J. Complete controls data shall be provided with the unit submittal including sequences, points list and any integration requirement to the existing controls system on campus.

PART 2 –PRODUCTS

2.01 PRODUCTS

- A. Rooftop unit shall be packaged and include electric cooling and gas-fired heat, with variable frequency drive; capacity and steps of cooling and heating as shown on the Drawings.
- B. Unit shall be factory-charged and tested, shall be UL-labeled and ARI-certified by Standard 210 and 270, and shall be AGA-certified.
- C. Unit casing shall be heavy-gauge galvanized steel or heavy-gauge aluminum with protective coat of baked enamel. Weatherproof access panels shall be provided for access to all parts requiring service.
- D. Compressor(s) shall be sealed or serviceable hermetic type and shall be resiliently mounted to avoid vibration and noise. Compressor shall be provided with antislugging protection, crankcase heater, and time delay on recycling of the compressor. Two internal compressor motor thermal cutouts and a hot gas cutout shall protect the compressor in addition to high-pressure and low-pressure safeties. Standard controls shall permit operation down to 35 deg. F (2 deg. C), and compressor shall be locked out below this temperature.
- E. Condenser fan(s) shall be direct-driven and shall be designed for operation exposed to the weather.
- F. Condenser coils shall have a subcooling section.
- G. Refrigerant circuit shall include filter dryer, moisture indicator, sight glass, and gauge ports.
- H. Filter rack shall be provided for filters 2 in. thick and shall filter both outdoor air and return air. See Section 23 41 00 for type of filters, and the number of filter changes to be furnished with the equipment.
- I. Evaporator fan shall be quiet-type centrifugal blower, directly connected to variable frequency drive.
- J. Heat exchanger shall be aluminized steel, designed for long life and quiet operation. Burner shall provide dependable and quiet ignition in the stages as called for.
- K. Gas burner controls shall provide automatic safety pilot, dual automatic gas valves, manual gas cock, and pressure regulator. Ignition shall be electric for the intermittent pilot with 100% shutoff when the unit is off.
- L. Induced draft blower shall provide prepurge and shall be provided with a proving switch

to prevent burner operation if venter is not in operation.

- M. Provide fan switch and limit control to delay the fan until heat is available and to continue fan operation until heat is dispersed. Limit switch shall shut the burner down in case of failure of operating controls.
- N. Provide unit with BACnet Communication cards.
- O. Manufacturer shall provide a fully operational controls for the entire unit and shall be programmed from the factory to the manufacturer's standard sequence and shall be ready for integration via BACnet network.

2.02 WARRANTY

- A. Rooftop manufacturer shall provide a 5-year for the entire unit. The warranty shall include controls as well.
- B. Provide a line item cost for a 10-yr warranties on HVAC equipment and labor for the school district to evaluate and consider.

2.03 ACCESSORY EQUIPMENT

- A. Basis of design is Trane e-flex rooftop units. Refer to equipment schedule on the drawings and the control drawings and specifications for all controls requirements and components for a functional and operations unit.

2.04 ACCEPTABLE MANUFACTURERS

- A. Basis of design for the roof top unit shall be Lennox.
- B. Carrier, Trane, JCI, or Daikin-McQuay are acceptable alternate manufacturers and need to request an approval prior to bid date.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install the curb as required by the job conditions and as recommended by the manufacturer, and install proper flashing and counterflashing. See details on the Drawings.
- B. Set the unit in place, taking care to protect the adjacent roofing, and connect the supply and return ductwork.
- C. Make electrical and gas line connections, taking care that these do not block access to any part of the equipment requiring service.
- D. Have the factory service person check out the unit and make a written report. Place the unit in service.
- E. Engage a factory personnel for at least one day to start-up the unit and meet with the controls technician on site to provide assistance in commissioning the unit and to confirm unit controls are functioning and responding to all operational modes.

- F. Connect full size condensate drain pipe to roof top unit and extend to nearest drain. Pipe shall be schedule 40 galvanized with malleable iron screwed fittings.

3.02 BALANCING AND TEST

- A. Operate the roof top unit and check for proper supply air quantity, noise, and proper operation.
- B. Report the airflow, static pressure, voltage and current draw of each item, refrigerant pressure readings, etc., as required by Section 23 05 93 – Testing, Adjusting, and Balancing. This system is not complete until these readings have been made, submitted to the engineer, and accepted.

END OF SECTION

SECTION 23 81 36
ROOFTOP HEATING AND COOLING UNITS (ELECTRIC COOLING - ELECTRIC HEATING)

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.
- B. The Basic Materials and Methods, Section 230200, are included as a part of this Section as though written in full in this document.

1.2 SCOPE

- A. Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.

1.3 RELATED SECTIONS

- A. Section 23 02 00 – Basic Materials and Methods
- B. Section 23 05 13 – Common Motor Requirements for HVAC Equipment
- C. Section 23 05 48 - Vibration and Seismic Controls for HVAC Piping and Equipment
- D. Section 23 05 93 – Testing, Adjusting, and Balancing
- E. Section 23 33 00 - Ductwork Accessories
- F. Section 23 41 00 – Air Filters

1.4 QUALITY ASSURANCE

- A. NFPA 90 A & B - Installation of Air Conditioning and Ventilation Systems and Installation of Warm Air Heating and Air Conditioning Systems.
- B. ANSI/ASHRAE 15 - Safety Code for Mechanical Refrigeration.
- C. AHRI 360 - Commercial and Industrial Unitary Air Conditioning Equipment testing and rating standard.
- D. ANSI/ASHRAE/IES 90 A - Energy Conservation in New Building Design Standard provides performance requirements to improve the utilization of energy in new buildings.
- E. AHRI 410 - Forced Circulation Air-Cooling and Air- Heating Coils Standard for establishing requirements for testing, rating and certification of ratings.
- F. ANSI/UL 465 - Central Cooling Air Conditioners Standard for safety requirements.
- G. AMCA 300 - Reverberant room method for sound testing of fans.
- H. ANS S1.32 - Precision methods for the determination of sound power levels of discrete frequency and narrow band noise sources in reverberation rooms.

1.5 SUBMITTALS

- A. Submit Shop drawings and product data under provisions of Division One.
- B. Shop drawings shall indicate components, dimensions, weights, required service clearances, and location and sizes of field connections. Indicate equipment, piping and connections and valves required for complete system.
- C. Product data shall include rated capacities, weights, specialties and accessories, electrical requirements and wiring diagrams.
- D. Provide fan curves with specified operating point clearly identified.
- E. Submit manufacturer's installation instructions.

1.6 OPERATION AND MAINTENANCE DATA

- A. Submit operation data.
- B. Include start-up instructions, maintenance data, controls, and accessories. Include trouble-shooting guide.
- C. Submit maintenance data.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect and handle products to site. Comply with manufacturer's installation instructions for rigging, unloading and transporting units.
- B. Accept products on site and inspect for damage.
- C. Protect units from physical damage. Factory shipping covers and skids shall be kept in place until installation. Store in a clean dry place and protect from weather and construction traffic.

1.8 WARRANTY

- A. Rooftop manufacturer shall provide a 5-year warranty for the entire unit. The warranty shall include controls.
- B. Provide a line item cost for a 10-year warranties on HVAC equipment and labor for the school district to evaluate and consider.

1.9 OPERATIONS PERSONNEL TRAINING

- A. Provide a training session for the owner's operations personnel. Training session shall be performed by a qualified person who is knowledgeable in the subject system/equipment. Submit a training agenda two (2) weeks prior to the proposed training session for review and approval. Training session shall include at the minimum:
 - 1. Purpose of equipment.
 - 2. Principle of how the equipment works.
 - 3. Important parts and assemblies.
 - 4. How the equipment achieves its purpose and necessary operating conditions.
 - 5. Most likely failure modes, causes and corrections.
 - 6. On site demonstration.

PART 2 - PRODUCTS

2.1 ROOFTOP UNIT

- A. Rooftop unit shall be packaged and include electric cooling and electric heat with capacity and modulating cooling and heating as shown on the drawings.
- B. Unit shall be factory-charged and tested, shall be UL-labeled and ARI-certified by Standard 210 and 270, and shall be AGA-certified.
- C. Unit casing shall be heavy-gauge galvanized steel or heavy-gauge aluminum with protective coat of baked enamel. Weatherproof access panels shall be provided for access to all parts requiring service.
- D. Compressor(s) shall be hermetic scroll type and shall be resiliently mounted to avoid vibration and noise. Compressor shall be provided with anti-slugging protection, crankcase heater, and time delay on recycling of the compressor. Two internal compressor motor thermal cutouts and a hot gas cutout shall protect the compressor in addition to high-pressure and low-pressure safeties. Standard controls shall permit operation down to 35 deg. F (2 deg. C) and compressor shall be locked out below this temperature.
- E. Condenser fan(s) shall be direct-driven on the shaft of the slow-speed motor, which shall be designed to operate exposed to the weather.
- F. Condenser coils shall have a sub-cooling section.
- G. Refrigerant circuit shall include filter dryer, moisture indicator, sight glass, and gauge ports.
- H. Filter rack shall be provided for filters 2 in. thick and shall filter both outdoor air and return air. See Section 234100 of these Specifications for type of filters and the number of filter changes to be furnished with the equipment.
- I. Evaporator fan shall be quiet-type centrifugal blower, directly connected to an adjustable-speed motor or belt driven with an adjustable-pitch pulley on the motor.
- J. Electric heat section shall be installed in the unit and served by the same power source as the rest of the unit. Only one power feed shall be required for the unit.
- K. Provide unit with BACnet communication card.
- L. Manufacturer shall provide a fully operational controls for the entire unit and shall be programmed from the factory to the manufacturer's standard sequence and shall be ready for integration via BACnet network.

2.2 ACCESSORY EQUIPMENT

- A. Unit shall be provided with hot gas reheat option for dehumidification. Hot gas reheat coil shall be located on the leaving air side of the evaporator coil and fully piped and circuited at the factory.
- B. Condenser coil hail guards shall be provided.

Renovations to Reilly Elementary School
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- C. A prefabricated heavy gauge galvanized steel, mounting curb shall be provided for field assembly on the roof decking prior to unit shipment. The roof curb shall be a full perimeter type with complete perimeter support of the air handling section and condensing section. The curb shall be a minimum of 18" high and include a nominal 2" x 4" wood nailing strip. Gasket shall be provided for field mounting between the unit base and roof curb.
- D. Provide "power saver" dampers and controls to provide "free cooling" from 0 to 100% outdoor air (OA) when the outside air humidity and temperature are acceptable. Provide OA, return air, and relief air dampers in a factory-provided enclosure. All air shall be filtered and bird screen shall be installed.
- E. A solid state enthalpy changeover control shall determine the capability of the outside air to provide free cooling. The control package shall include a differential enthalpy sensor in the return air duct to compare the enthalpy of the outside air and return air and use the air with the lowest enthalpy for free cooling or assisting the mechanical cooling. The cooling control sequence is as follows:
 - 1. The changeover control determines if the outdoor air is suitable for free cooling.
 - 2. The space thermostat determines if cooling is needed in the building. If so:
 - 3. The actuator modulates the outdoor air and return air dampers to maintain the desired mixed air temperature.
 - 4. The second cooling stage of the space thermostat energizes the compressor to assist the economizer if required.
 - 5. If the outdoor air is not suitable for free cooling, the outdoor air damper remains in the minimum ventilation position and the compressor is energized when space cooling is required.
- F. Provide a warm-up thermostat to prevent the OA dampers from opening if the return air temperature is below the set point (65 deg. F) (18 deg. C).
- G. Provide necessary controls for operation of the compressor below the normal temperature of the compressor cutout. Operation shall be permitted down to temperature specified on drawings.
- H. Provide factory-trained service person to check out the system, calibrate the controls, and see that the RTU is operating properly. The service person making the settings shall make a written report to the engineer and the owner with all set points listed for future reference.
- I. Rooftop units mounted on slabs or other fixed locations shall be provided with adapters for end discharge and return to the unit.
- J. Provide programmable combination thermostat/humidistat and other controls required to produce the control functions called for.
- K. Manufacturer shall provide BACnet interface card for communication with EMCS.

2.3 ACCEPTABLE MANUFACTURERS

- A. Roof top unit shall be the make and model number shown on the schedule on the drawings, or acceptable equivalents are Carrier, Lennox, Trane, York or Daikin.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install the curb as required by the job conditions and as recommended by the manufacturer, and install proper flashing and counterflashing. See details on the drawings.
- B. Set the unit in place, taking care to protect the adjacent roofing, and connect the supply and return ductwork.
- C. Make electrical connections, taking care that these do not block access to any part of the equipment requiring service.
- D. Have the factory service person check out the unit and make a written report. Place the unit in service.
- E. Connect full size condensate drain pipe to roof top unit and extend to nearest drain, pipe shall be schedule 40 galvanized with malleable iron fittings.

3.2 BALANCING AND TEST

- A. Operate the roof top unit and check for proper supply air quantity, noise, and proper operation.
- B. Report the airflow, static pressure, voltage and current draw of each item, refrigerant pressure readings, etc., as required by Section 23 05 93 of these Specifications. This system is not complete until these readings have been made, submitted to the engineer, and accepted.

END OF SECTION

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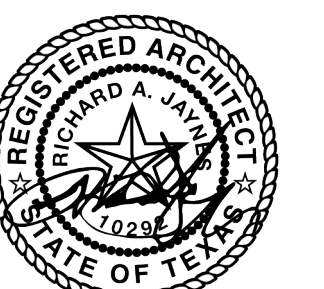
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AISD PROJECT #
 19-0029-REILLY

CONSTRUCTION
 DOCUMENTS
 SUBMITTAL



ISSUE DATE: OCTOBER 25, 2018

REVISIONS

Revision No.	Description	Date
1	ADDENDUM #4	11-29-2018

Director: RJ
 Designer: VLK
 Proj. Coord.: WW

Drawn By: WW
 Quality Control: VLK

PROJECT NO.

1831.00

SHEET TITLE

ROOF PLAN

SHEET NO.

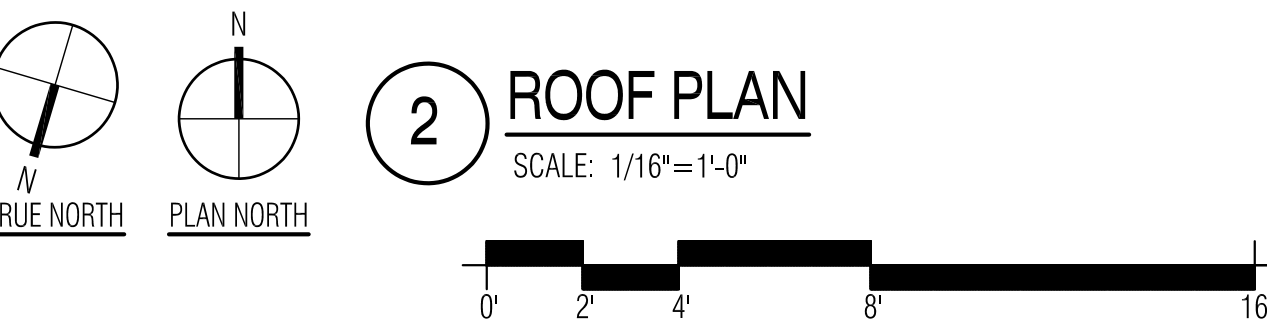
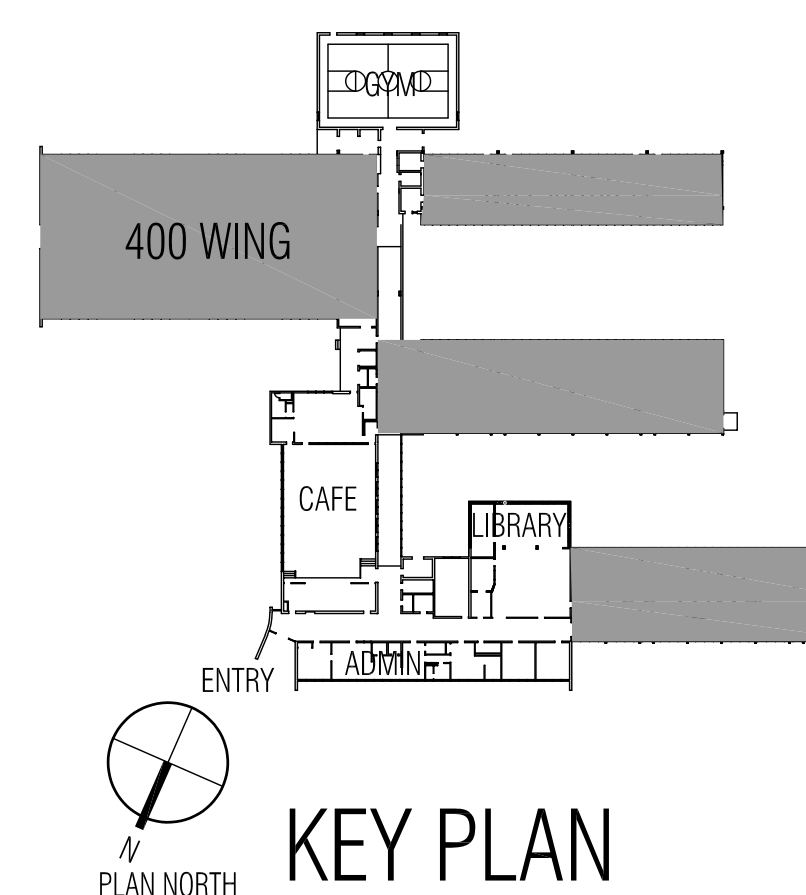
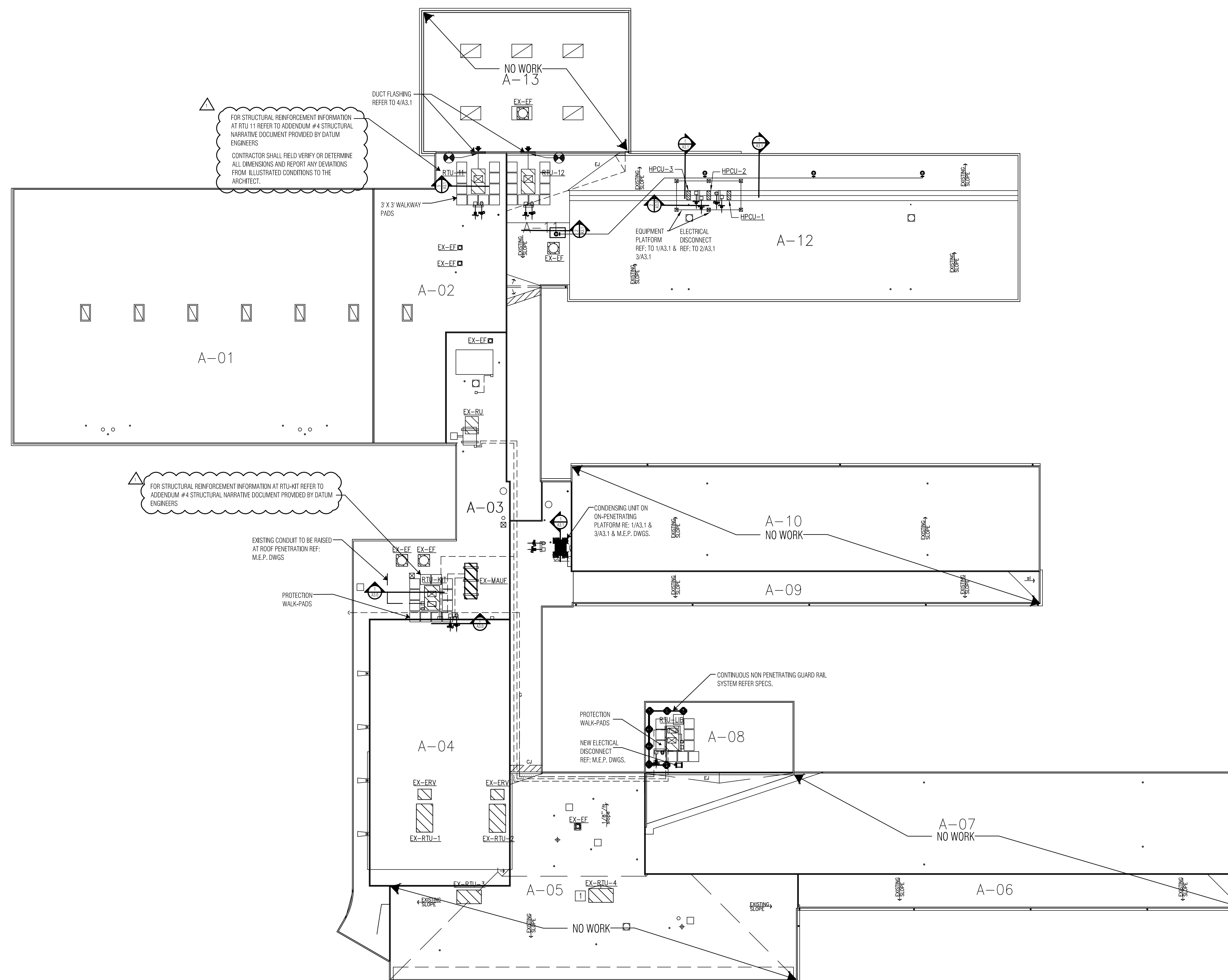
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ROOF PLAN LEGEND

RD	ROOF DRAIN
OD	OVERFLOW DRAIN
DS	5" DOWNSPOUT
SP	SPLASH PAN
MC	MANUFACTURED COPING
RL	ROOF LADDER
RTU	ROOF TOP UNIT, REF. MECH
CU	CONDENSING UNIT, REF. MEP
GP	GAS PIPE PENETRATION
RV	RELIEF VENT, REF. MEP
EF	EXHAUST FAN, REF. MEP

- GENERAL ROOF NOTES**
- REFER TO A3.0 AND A3.1 SHEETS FOR BUILDING ENVELOPE DETAILS.
 - REFER TO MECHANICAL DRAWINGS FOR NEW UNITS BEING INSTALLED ON ROOF.
 - NON PENETRATING FALL PROTECTION GUARDRAIL AT LIBRARY ROOF.

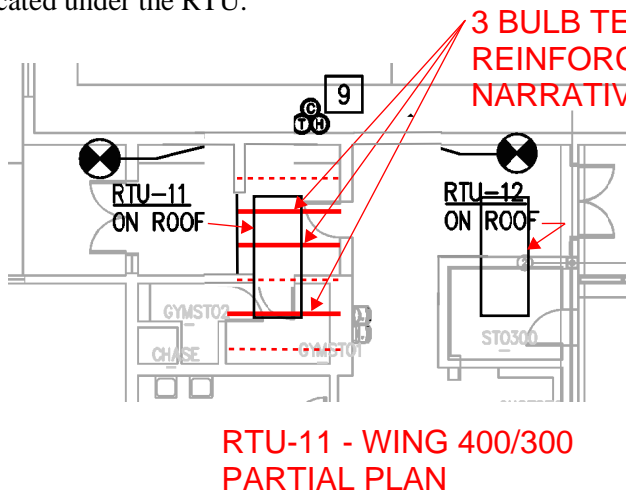


2 ROOF PLAN
 SCALE: 1/16" = 1'-0"

Renovations to Reilly Elementary School

Addendum #4 (Structural) to Reilly Elementary School for Support of Replacement Rooftop Mechanical Units
 November 29, 2018

RTU-11 weighs 1311 pounds, and is located adjacent to and northeast of the Gymnasium, on the 1963 addition to the school, referred to as the 400 wing (see attached RTU-11 Partial Plan, below). The existing roof structure in this area consists of a steel frame with steel bulb tee purlins on 33" centers supporting Tectum panels. Provide an HSS2x1x3/16x8'-2" (long dimension vertical), connected to the bulb tee bottom flange with 3/16" x 1" flare bevel groove welds on each side, spaced 12" on center (provide 2" of weld each side at first weld location on each end of tube). These HSS2x1's shall be installed at all bulb tees located under the RTU.

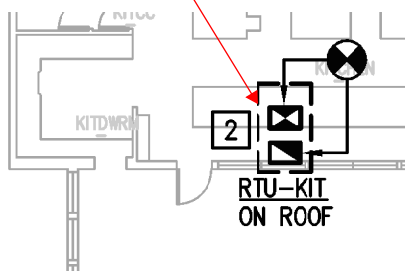


3 BULB TEES TO BE REINFORCED PER NARRATIVE

CONTRACTOR SHALL FIELD VERIFY OR DETERMINE ALL DIMENSIONS AND REPORT ANY DEVIATIONS FROM ILLUSTRATED CONDITIONS TO THE ARCHITECT.

RTU-KIT weighs 966 pounds (35 psf over the footprint of the unit) and is located in the 1956 Cafetorium addition on the east side of the main connecting corridor of the school (see attached RTU-KIT Partial Plan, below). The existing roof structure in this area consists of a steel frame with SJ125 joists on 4'-0" centers, spanning about 22'-0". These joists have been determined to have adequate capacity to support the proposed RTU, but the RTU curb shall be supported by angles and tubes as detailed in the attached RTU-KIT Support Detail @ Kitchen. If the new or relocated curb support angles connect to the existing joist top chords at locations farther than 6" from the joist panel points, then the joist top chords shall be braced as indicated in the attached detail.

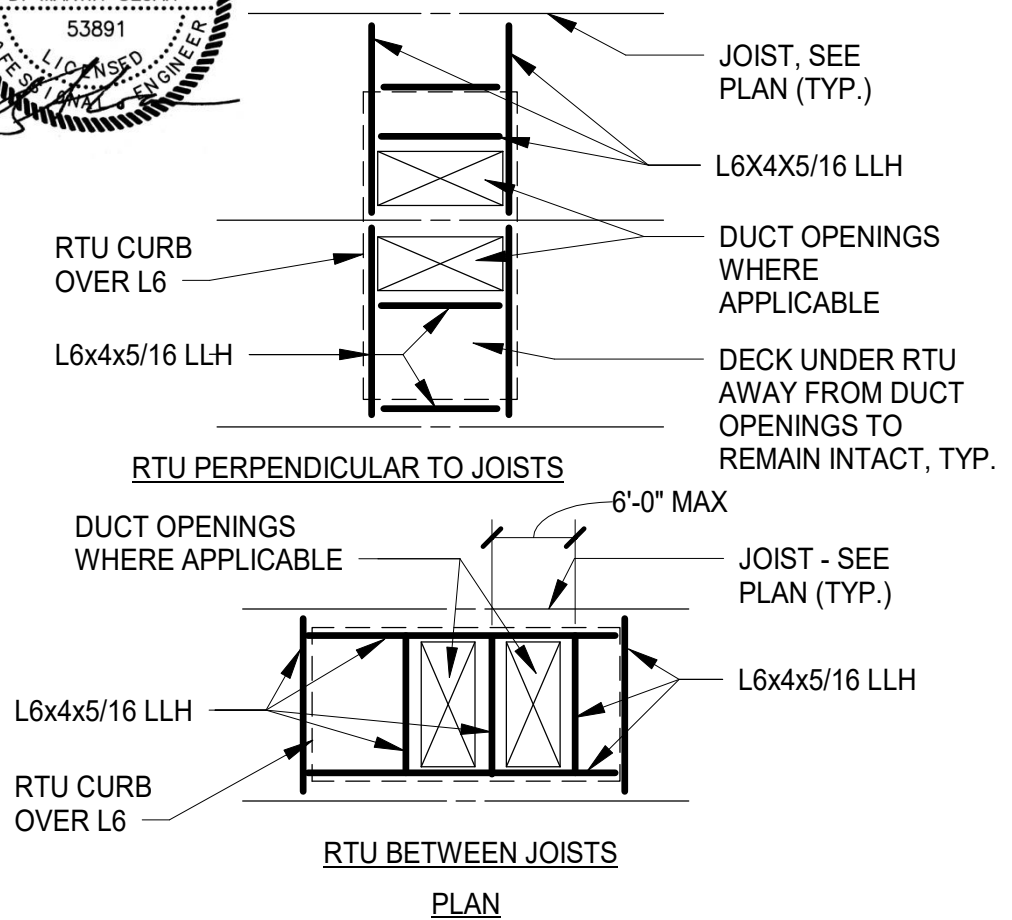
RTU-KIT SUPPORT DETAIL



RTU-KIT - CAFETORIUM PARTIAL PLAN

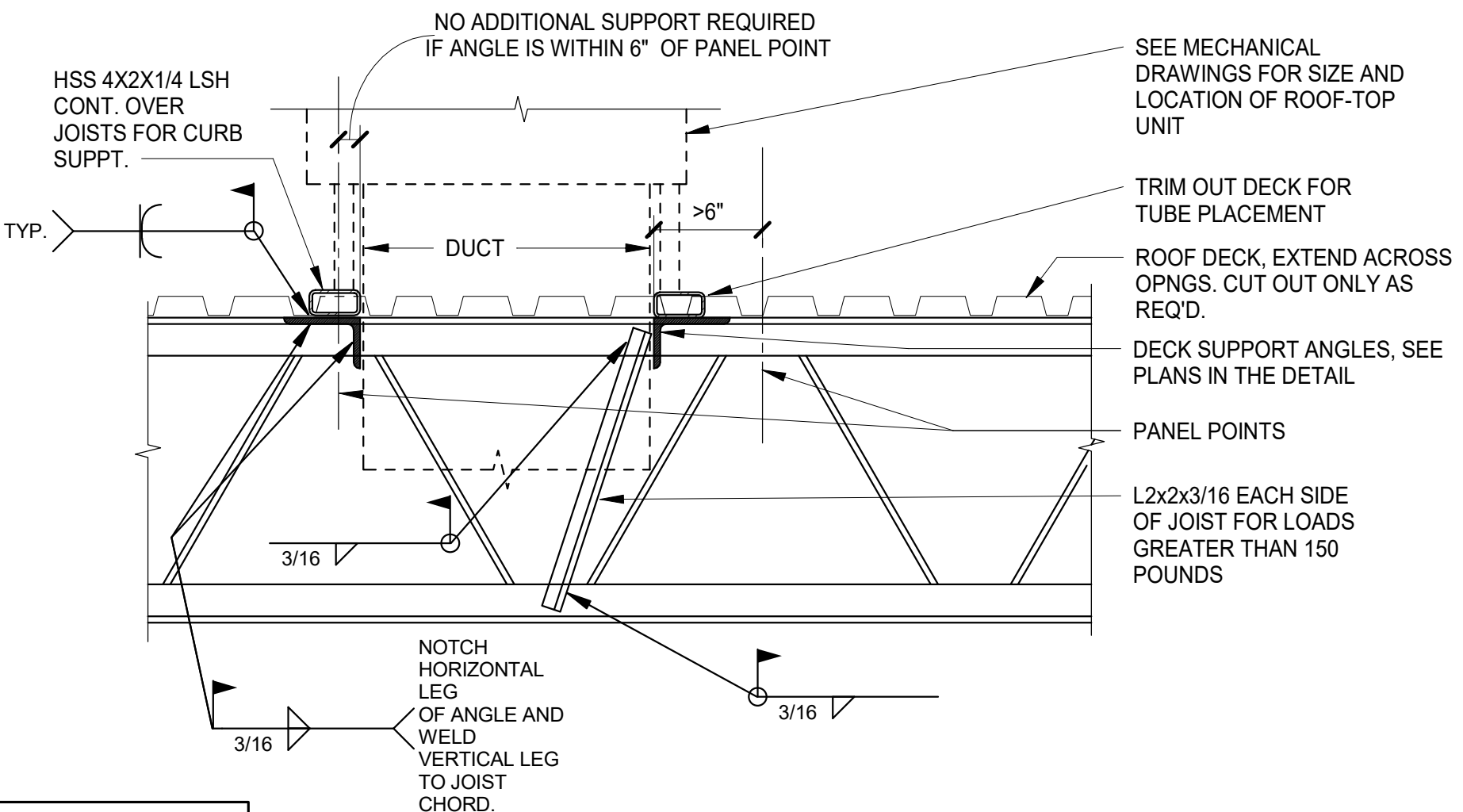


11/29/2018



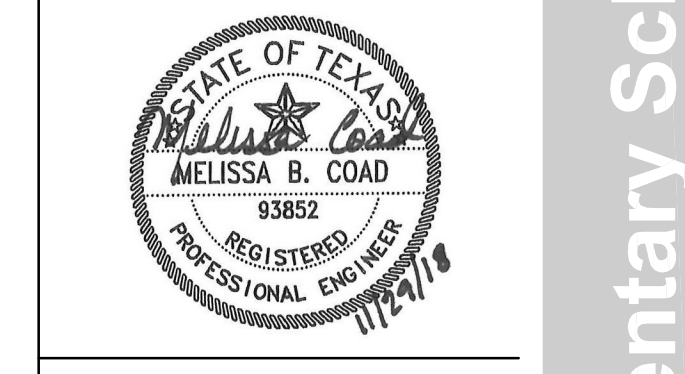
SCHMATIC ARRANGEMENT OF RTU
MISC. METAL SUPPORT ANGLES

NOTE:
CONTRACTOR TO PROVIDE MISC. METALS COORDINATED WITH THE EQUIPMENT FURNISHED. ARRANGEMENT SHOWN IS SCHEMATIC ONLY AND A FINAL ARRANGEMENT IS TO BE DESIGNED BY THE CONTRACTOR. STRENGTHEN JOIST AS REQ'D. TO COMPLY WITH THIS TYPICAL DETAIL.



MECHANICAL UNIT CURB BEARING ON JOISTS

TYPICAL DETAIL



REVISIONS	
Revision No.	
ADDENDUM #4	

Director Drawn By
 RJ
 Designer Quality Control

Proj. Coord.
 WW

PROJECT NO.
1831.00

SHEET TITLE
 MECHANICAL CONTROL
 DIAGRAMS & SEQUENCES

SHEET NO.

M6.02

AUSTIN ISD
 AUSTIN, TEXAS
 Renovations to Reilly Elementary School

PACKAGED DIRECT EXPANSION

Guideline Sequence

System enabled by one or more of the following:

- A. Occupancy schedule
- B. Unoccupied setback/setup
- C. Local override at zone thermostat
- D. Remote override at WANHMI
- E. Fan Control
 - 1. Fan shall run continuously during occupied hours.
 - 2. For units with variable speed fan, fan speed will vary as required to maintain space temperature and relative humidity.
- F. Temperature Control
 - 1. Unit controls shall be programmed with adjustable discrete occupied and unoccupied heating and cooling setpoints with appropriate dead-bands.
 - 2. System shall cycle compressor(s) as required to meet space temperature.
 - 3. For units with variable speed compressors, these will modulate as required to maintain space temperature and relative humidity.
 - 4. Upon a drop in space temperature below the heating setpoint, unit shall modulate gas heat (or enable heat pump reversing valve) to maintain space temperature setpoint.
- G. Ventilation Control
 - 1. Decoupled OA damper shall modulate to maintain CO2 levels within limits established by the Engineer.
 - 2. Outside air damper shall remain closed during unoccupied hours.
- H. Controls shall allow outside air damper to be commanded from the HMI.
- I. Dehumidification Control
 - 1. System shall enable hot gas reheat as required to maintain relative humidity below 60% during occupied hours.
 - 2. Disable hot gas reheat when unit is in net cooling or heating mode.
- J. Economizer
 - 1. Provide on-board economizer controls

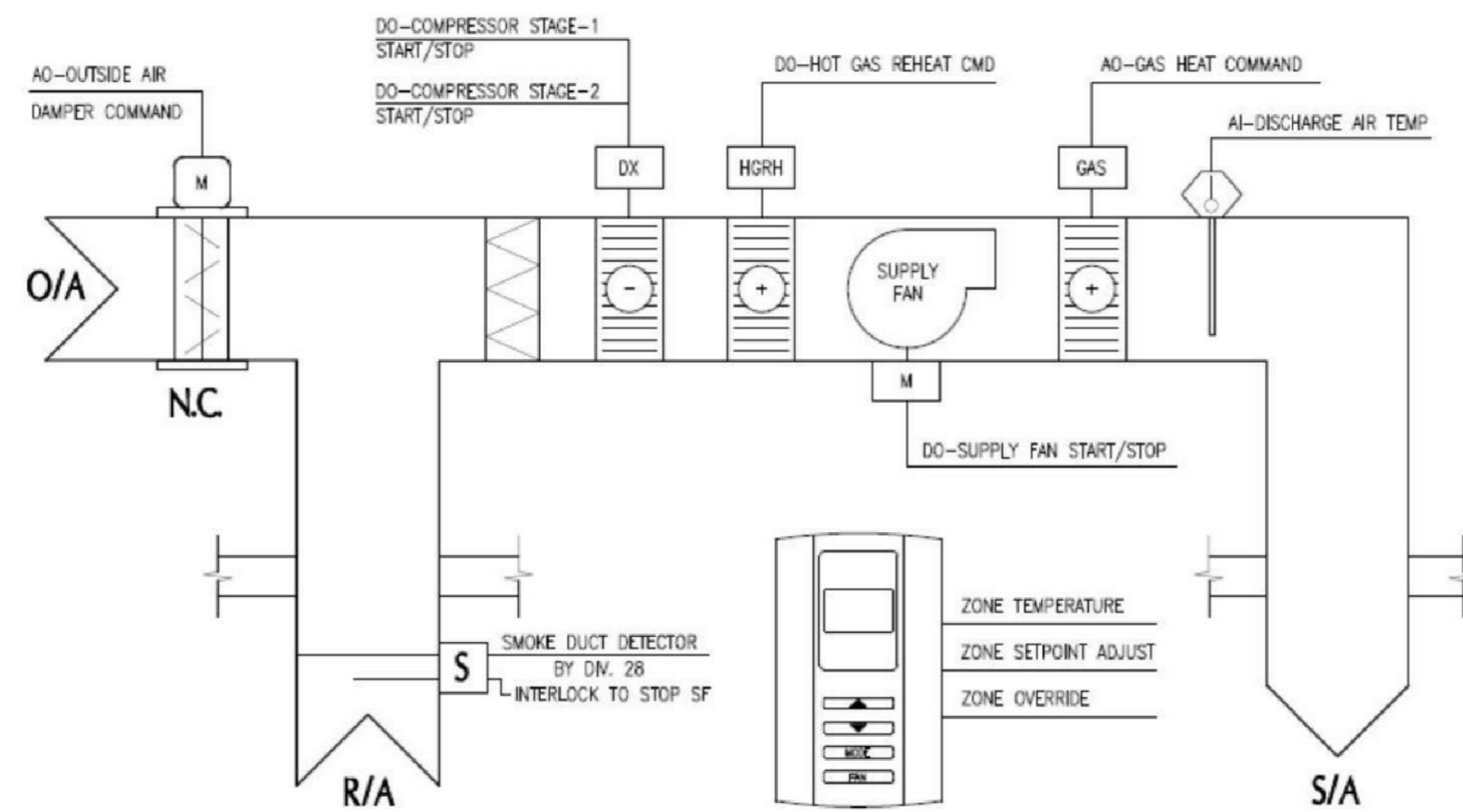
Control Points

All control points provided by manufacturer. Points indicated with (HMI) shall be accessible to the Owner via BACNET communications protocol for monitoring and control.

- A. Unit start/stop (HMI)
- B. Unit schedule override (at sensor)
- C. Outside air damper command (HMI)
- D. Compressor stage 1 (or modulation)
- E. Compressor stage 2
- F. Hot gas reheat
- G. Modulating gas heat/heat pump reversing valve/electric heat
- H. Space temperature (HMI)
- I. Space temperature setpoint adjust (HMI)
- J. Space relative humidity (HMI)
- K. Space CO2 (HMI)

NOTE TO CONTROLS CONTRACTOR:

CONTRACTOR SHALL FIELD VERIFY AND LOCATE EXISTING JACE WITHIN BUILDING FOR UTILIZING WITH NEW EQUIPMENT INSTALLED. PROVIDE A NEW BACNET COMMUNICATION CARD AS REQUIRED FOR NEW EQUIPMENT BEING CONNECTED TO THE EXISTING JACE. CONTRACTOR SHALL PROVIDE ADDITIONAL LICENSES REQUIRED TO ACCOMMODATE THE ADDITIONAL DEVICE POINTS AND NODES BEING ADDED TO THE EXISTING JACE.



1 CONTROL DIAGRAM FOR RTU-11, 12, KIT, LIB
 M6.02 NTS

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MC | AW/AH | HH | JL | --