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OUTDATED PLEASE REFERENCE DISTRICT BID ADDENDUM NO. 01

September 23, 2022

TO : All Bidders
FROM : Lisa Cox
PROJECT : Tovashal Elementary School HVAC Replacement
Project 1726200.41
SUBJECT : Addendum 1
DSA : 04-119843 / File 33-32

The following changes, omissions, and/or additions to the Project Manual and/or Drawings shall apply to proposals made for and to the execution of the various parts of the work affected thereby, and all other conditions shall remain the same.

Careful note of the Addendum shall be taken by all parties of interest so that the proper allowances may be made in strict accordance with the Addendum, and that all trades shall be fully advised in the performance of the work which will be required of them.

Bidder shall acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject Bidder to disqualification.

In case of conflict between Drawings, Project Manual, and this Addendum, this Addendum shall govern.

1. PROJECT MANUAL

1.1 TABLE OF CONTENTS (Attached)

- A. Table of Contents updated to include new Specification Section 23 09 23.

1.2 SECTION 23 09 23 - DIRECT DIGITAL CONTROL SYSTEM FOR HVAC (Attached)

- A. Add the attached Section 23 09 23 - Direct Digital Control System for HVAC in its entirety.

DRAWINGS

Mechanical

1.3 DRAWING M-1.1 - MECHANICAL SCHEDULES (Attached)

- A. Updated Notes 9 and 10 regarding field installation of HVAC unit controllers and replacement of wiring between unit thermostats and room thermostats.

Addendum 1
Tovashal Elementary School HVAC Replacement
Project 1726200.41
DSA 04-119843 / File 33-32
September 23, 2022
Page 2

1.4 DRAWING M-5.1 - MECHANICAL DETAILS (Attached)

A. Provided campus carrier communication wiring diagram for re-wiring.

END OF ADDENDUM 1

Submitted by,



LISA COX
Architect, AIA
Principal



LC:WA:hb/P41726200x1-add

Attachments: Table of Contents, Section 23 09 23 - Direct Digital Control System for HVAC, M-1.1,
M-5.1

**TABLE OF CONTENTS
SPECIFICATIONS GROUP**

TOVASHAL ELEMENTARY SCHOOL HVAC REPLACEMENT

**SPECIFICATIONS GROUP
GENERAL REQUIREMENTS SUBGROUP**

DIVISION 01	GENERAL REQUIREMENTS	PAGES
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01 20 00	Price and Payment Procedures	10
01 25 13	Product Substitution Procedures	4
01 31 00	Project Management and Coordination	7
01 32 17	Construction Schedule - Bar Chart	8
01 33 00	Submittal Procedures	12
01 35 16	Alteration Project Procedures	4
01 42 19	Reference Standards	3
01 43 00	Quality Assurance	3
01 45 29	Testing Laboratory Services	4
01 50 00	Temporary Facilities and Controls	6
01 61 00	Product Requirements	3
01 73 00	Execution Requirements	3
01 73 29	Cutting and Patching	3
01 74 19	Construction Waste Management and Disposal	12
01 77 00	Closeout Procedures	6

**SPECIFICATION GROUP
FACILITY CONSTRUCTION SUBGROUP**

DIVISION 02 **EXISTING CONDITIONS**

NOT USED

DIVISION 03 **CONCRETE**

NOT USED

DIVISION 04 **MASONRY**

NOT USED

DIVISION 05 **METALS**

NOT USED

DIVISION 06 **WOOD, PLASTICS, AND COMPOSITES**

NOT USED

DIVISION 07 **THERMAL AND MOISTURE PROTECTION**

NOT USED

DIVISION 08 **OPENINGS**

NOT USED

DIVISION 09 FINISHES

NOT USED

DIVISION 10 SPECIALTIES

NOT USED

DIVISION 11 EQUIPMENT

NOT USED

DIVISION 12 FURNISHINGS

NOT USED

DIVISION 13 SPECIAL CONSTRUCTION

NOT USED

DIVISION 14 CONVEYING EQUIPMENT

NOT USED

DIVISION 15 TO 19 RESERVED

NOT USED

SPECIFICATIONS GROUP
FACILITY SERVICES SUBGROUP

DIVISION 20 RESERVED

NOT USED

DIVISION 21 FIRE SUPPRESSION

NOT USED

DIVISION 22 PLUMBING

NOT USED

DIVISION 23 HEATING, VENTILATING, AND AIR CONDITIONING

23 05 00	Basic Materials and Methods	13
23 05 29	Hangers and Supports for HVAC	3
23 05 48	Vibration and Seismic Controls for HVAC	4
23 05 53	Identification for HVAC	2
23 05 93	Testing, Adjusting, and Balancing for HVAC	11
23 07 13	Duct Insulation	6
23 09 23	Direct Digital Control System for HVAC	6
23 11 23	Facility Natural-Gas Piping	6
23 31 13	Metal Duct	10
23 33 00	Duct Accessories	7
23 41 00	Air Filters	2
23 81 19	Rooftop Air Conditioners	9

DIVISION 24 RESERVED

NOT USED

DIVISION 25 INTEGRATED AUTOMATION

NOT USED

DIVISION 26 ELECTRICAL

26 01 00	Electrical General Provisions	13
26 05 19	Power Conductors	2
26 05 26	Grounding	2
26 05 33	Conduit and Fittings	6
26 05 34	Outlet and Junction Boxes	2
26 27 26	Switches and Receptacles	2
26 28 16	Disconnects	2
26 90 90	Electrical Closeout	1

DIVISION 27 COMMUNICATIONS

NOT USED

DIVISION 28 ELECTRONIC SAFETY AND SECURITY

28 01 00	Electronic Safety and Security General Provisions	1
28 30 00	Fire Alarm System	8

DIVISION 29 RESERVED

NOT USED

SPECIFICATIONS GROUP
SITE AND INFRASTRUCTURE SUBGROUP

DIVISION 30 RESERVED

NOT USED

DIVISION 31 EARTHWORK

NOT USED

DIVISION 32 EXTERIOR IMPROVEMENTS

NOT USED

DIVISION 33 UTILITIES

NOT USED

DIVISION 34 TRANSPORTATION

NOT USED

DIVISION 35 WATERWAY AND MARINE CONSTRUCTION

NOT USED

DIVISION 36 TO 39 RESERVED

NOT USED

SPECIFICATIONS GROUP
PROCESS EQUIPMENT SUBGROUP

DIVISION 40 PROCESS INTEGRATION

NOT USED

DIVISION 41 MATERIAL PROCESSING AND HANDLING EQUIPMENT

NOT USED

DIVISION 42 PROCESS HEATING, COOLING, AND DRYING EQUIPMENT

NOT USED

DIVISION 43 PROCESS GAS AND LIQUID HANDLING, PURIFICATION, AND STORAGE

NOT USED

DIVISION 44 POLLUTION CONTROL AND WASTE EQUIPMENT

NOT USED

DIVISION 45 INDUSTRY-SPECIFIC MANUFACTURING EQUIPMENT

NOT USED

DIVISION 46 INDUSTRY-SPECIFIC MANUFACTURING EQUIPMENT

NOT USED

DIVISION 47 INDUSTRY-SPECIFIC MANUFACTURING EQUIPMENT

NOT USED

DIVISION 48 ELECTRICAL POWER GENERATION

NOT USED

DIVISION 49 RESERVED

NOT USED

SECTION 23 09 23
DIRECT-DIGITAL CONTROL SYSTEM FOR HVAC

PART 1 - GENERAL

1.01 SUMMARY

- A. The Direct-Digital Control (DDC) System specified herein shall include materials, operator workstation, building controllers, sensors, control valves, wiring, installation, start-up, testing, documentation and training for a complete operable system as required for this project.
- B. Controls Engineering shall be provided by the local controls manufacturer representative.
- C. Work specified under this section shall be performed by, or under the direct supervision of the local controls manufacturer representative, or by a contractor that is certified by the controls manufacturer to perform all work.

1.02 SUBMITTALS

- A. Submit engineered shop drawings, sequences of operation, third party equipment and controls integration points and product data sheets covering all items of equipment for the proposed system prior to installation for approval. Any deviation from the contract documents shall be noted and the drawings signed and dated by the Contractor. Additionally, submit a UL508A Standard for Industrial Control Panels statement of compliance for any locally manufactured control panels.
- B. After completion of the installation, a full set of as-built documentation shall be turned over to the Owner. The as-built shall include operation and maintenance manuals, sequence of operation, shop drawings and digital copies of the following.
 - 1. Complete DDC System database backup
 - 2. Source files for all custom written controller applications
 - 3. Source files for graphics if required for this project

1.03 WARRANTY

- A. Components, system software, and parts shall be guaranteed against defects in materials, fabrication, and execution for (1) year from date of system acceptance. Provide labor and materials to repair, reprogram, or replace components at no charge to the Owner during the warranty period.
- B. Provide a list of applicable warranties for components, this list shall include warranty information, names, addresses, telephone numbers, and procedures for filing a claim and obtaining warranty services.
- C. Respond to the Owner's request for warranty service within (24) hours during normal business hours. Submit records of the nature of the call, the work performed, and the parts replaced or service rendered.

- D. Contractor shall request VPN access from owner and provide remote maintenance, software updates and repair service for the duration of the warranty period.

1.04 PREPAID WARRANTY SERVICE AGREEMENT

- A. A prepaid Warranty Service Agreement shall be turned over to the Owner at the time of the acceptance test as a prerequisite of system acceptance. The contract shall include the terms and conditions stated herein.
- B. Service work shall be performed by service personnel in the direct employ of the control contractors. The service technicians shall be factory trained and certified by the manufacturer to be competent in all aspects of the installed system. The technician shall have a working knowledge of calibration techniques, preventive maintenance, troubleshooting, software diagnostics and microprocessor repair.
- C. Provide preventive maintenance at one (1) month intervals such that one twelfth of the system is tested and recommissioned if necessary at each monthly inspection. An Owner's representative shall certify that the monthly test has been conducted and the control system is functioning properly. A log of tasks performed at each test shall be maintained by the controls contractor and signed by the Owner as evidence of satisfactory completion of the Warranty Service Agreement. The log shall be retained on site and available for review by authorized personnel.
- D. System modifications shall be incorporated into the as-built documentation and/or operators and maintenance manuals when operating parameters, control point settings or control strategies are changed. System modifications made by the user of the controls contractor shall have both parties' approvals in order to maintain the Warranty Service Agreement. All database changes shall be saved on disk for backup to the system.
- E. Software upgrade program shall be implemented on the anniversary or anniversaries of the warranty period. The upgrade shall provide all enhancements offered by the manufacturer for programs in the accepted systems.

1.05 TRAINING

- A. Provide a competent instructor who is factory trained and has comprehensive knowledge of system components and operations to provide full instructions to designated personnel in the system operation, maintenance, and programming. Training shall be specifically oriented to installed equipment and systems.
- B. Provide (8) hours of onsite owner familiarization and training for the installed system. Training shall include system overview, time schedules, emergency operation, and programming and report generation.
- C. Owner employees attending this training session shall be provided with the following documentation:
 - 1. System layout point to point connection diagram.
 - 2. System components cut sheets.
 - 3. Operations and maintenance data.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Do not store or install electronic hardware on the project until non-condensing environmental conditions have been established.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. DDC Equipment: Carrier OPEN BACnet Controls. No substitutions will be accepted.

2.02 SYSTEM LISTING COMPLIANCE

- A. Locally manufactured control panels shall meet all requirements as outlined by UL 508A standard and shall be both approved and listed by Underwriters Laboratories, Inc.

2.03 COMMUNICATION

- A. Controller and operator interface communication shall conform to ANSI/ASHRAE Standard 135, BACnet.
- B. 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.
- C. Project requires this contractor to replace complete existing backbone network systems.

2.04 OPERATOR INTERFACE

- A. Description. The control system shall be as shown and consist of a high-speed, peer-to-peer network of DDC controllers and a stand-alone web server operator interface. Depict each mechanical system and building floor plan by a point-and-click graphic. A web server shall gather data from this system and generate web pages accessible through a conventional web browser on each PC connected to the network. Operators with sufficient access level shall have an ability to make changes to all system and equipment graphics in the web server in addition to having full DDC system access to make configuration changes to the control system. Any tools required for making graphic changes shall be provided with web server.
- B. Operator Interface. Existing.
- C. Operator Functions. Operator interface shall allow each authorized operator to execute the following functions as a minimum:
 - 1. Log In and Log Out
 - 2. Point-and-click Navigation
 - 3. View and Adjust Equipment Properties
 - 4. View and Adjust Operating Schedules
 - 5. View and Respond to Alarms
 - 6. View and Configure Trends
 - 7. Manage Control System Hardware
 - 8. Manage Operator Access

- D. System Graphics. Operator interface shall be graphical and shall include at least one graphic per piece of equipment and graphics that summarize conditions on each floor of each building included in this contract. Indicate thermal comfort on floor plan summary graphics using dynamic colors to represent zone temperature relative to zone setpoint.
- E. Trend Configuration. Operator shall be able to configure trend sample or change of value (COV) interval, start time, and stop time for each system data object and shall be able to retrieve data for use in spreadsheets and standard database programs.
- F. Reports and Logs. Operator shall be able to select, to modify, to create, and to print reports and logs. Furnish the following standard system reports.
 - 1. Alarm Reports
 - 2. Schedule Reports
 - 3. Security Reports
 - 4. Commissioning Reports
 - 5. Equipment Reports
- G. Energy Conservation
 - 1. Outside Air Lockout. Lock out heating or cooling modes based on configurable outside air temperature limits.
 - 2. Demand Limiting
 - a. System shall monitor building power consumption from building power meter pulse generator signals or from building feeder line watt transducer or current transformer.
 - b. The system shall include all required hardware and software necessary to receive an Automated Demand Response (ADR) signal from the utilities Demand Response Automation Server (DRAS).
 - c. When power consumption exceeds adjustable levels, or the system receives an ADR signal from the utility, the system shall automatically adjust set points, and take other programmatic actions to reduce demand.
 - 3. Optimal Start. The system shall bring the conditioned space to within occupied set points prior to the occupied time period to ensure occupant comfort.
 - 4. Demand Controlled Ventilation (DCV). Each controlled space shall have a Carbon Dioxide (CO₂) sensor and shall maintain a ventilation setpoint through a DCV algorithm to fulfill the requirements of ASHRAE standard, 62-1989 "Ventilation for Acceptable Indoor Air Quality" (including Addendum 62a-1990).

2.05 CONTROLLERS

- A. General. The control system shall be available as a complete package with the required input sensors and devices readily available. Provide BACnet Building Controllers (BC), Advanced Application Controllers (AAC), Application Specific Controllers (ASC), and Sensors (SEN) as required.
- B. Stand-Alone Operation. Each piece of equipment shall be controlled by a single controller to provide stand-alone control in the event of communication failure.

- C. Serviceability. Controllers shall have diagnostic LEDs for power, communication, and processor.
- D. Rooftop Unit Controller (RTC). Defined as Application Specific Controllers (ASC), shall be factory installed by the HVAC manufacturer and shall control all associated HVAC rooftop equipment functions in a single zone application or as part of a zoning system application.
 - 1. Capacity control shall be based by the RTC internal time clock and setpoints (cooling and heating) coupled with a communicating room sensor. The controls shall provide separate occupied and unoccupied cooling and heating setpoints.
 - 2. RTC shall utilize up to 2 speed of fan control, up to 3 stages of cooling, and up to 4 stages of heating.
 - 3. RTC shall provide economizer control that has been certified for Fault Detection and Diagnostics (FDD) by California Energy Commission (CEC). The FDD system shall detect the following faults:
 - a. Air temperature sensor failure/fault
 - b. Not economizing when it should
 - c. Economizing when it should not
 - d. Damper not modulating
 - e. Excess outdoor air
- E. General Purpose Controller. Defined as Advanced Application Controller (AAC) shall be a solid state micro-controller with pre-tested and factory configured software designed for controlling building equipment using DDC algorithms and facility management routines. The controller shall be capable of operating in either a stand-alone mode or as part of a network.

2.06 FIELD INSTALLED SENSORS (See plans for model numbers)

- A. Space Temperature Sensors shall communicate to the controller over a 4-wire communication network and have setpoint adjustment, after hours override, occupancy sensor, LCD display and a communication service port.
- B. Carbon dioxide sensor (CO2) shall be integrated into the Space Temperature Sensors and have integral programming to perform automatic baseline calibration without user interface. The recommended manual recalibration period shall not be less than five years.
- C. Status indication for fans or pumps shall be provided by current sensing switch. The sensor shall be installed at the motor starter or motor to provide load indication. The unit shall consist of a current transformer, a solid state current sensing circuit (with adjustable set point) and a solid state switch. A light emitting diode (LED) shall indicate the on off status of the unit.

PART 3 - EXECUTION

3.01 ELECTRICAL WIRING

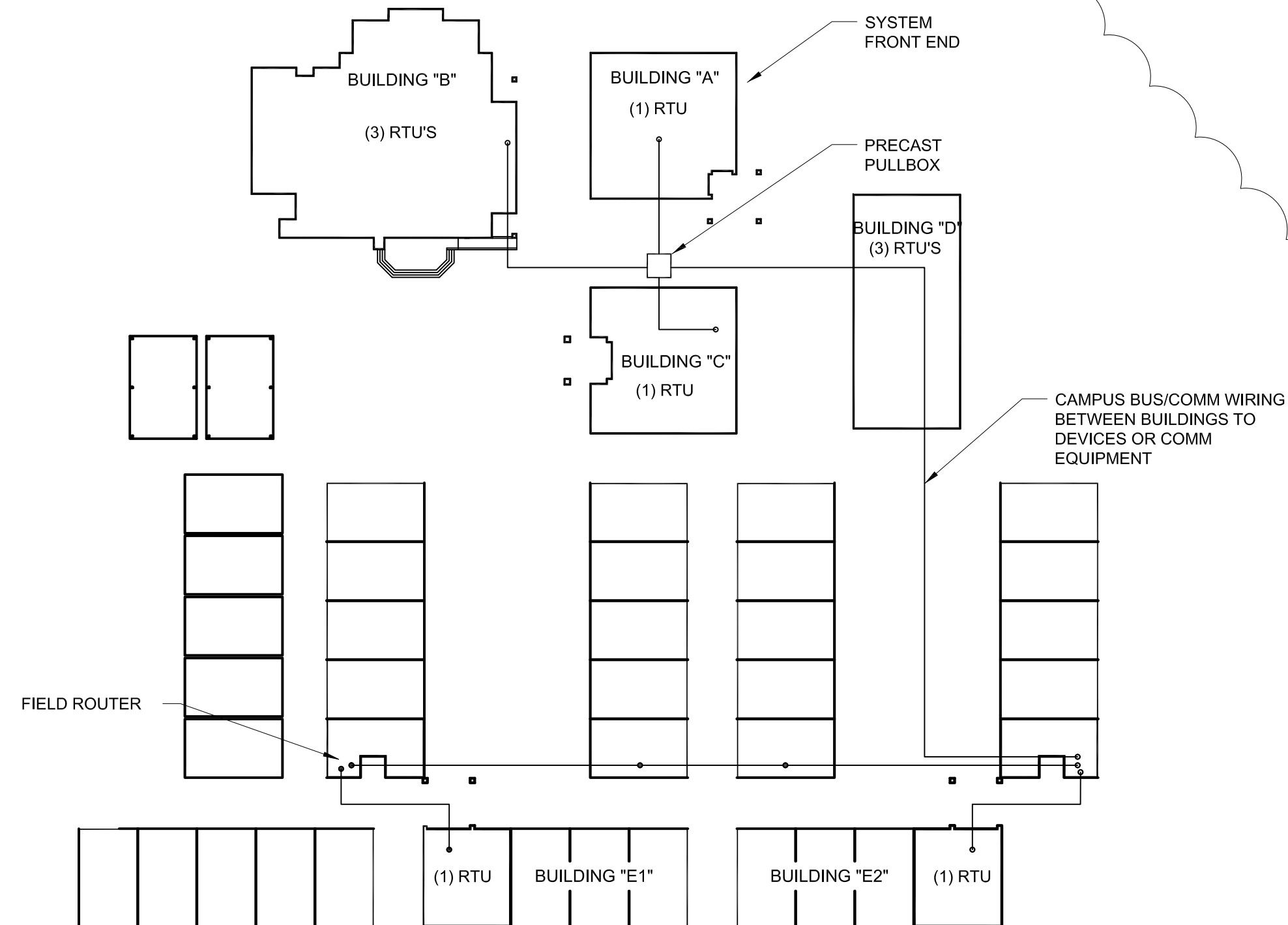
- A. This contractor is responsible for all low voltage electrical installation and wiring for a fully operational DDC System as shown on the drawings and shall perform electrical installation in accordance with local and national electrical codes and in accordance with Division 26.

- B. Install all HVAC control wiring, 24vdc or less, in electrical metallic tubing (EMT). Rigid metal conduit (RMC) will be used when conduit will be installed on roofs.
- C. Electrical Contractor is responsible for providing power from local electrical panels to the DDC System control panels.
- D. When transitioning between buildings above or below ground level, provide a pull box with necessary surge suppression hardware to transition exterior rated wiring to interior applications.

3.02 ACCEPTANCE PROCEDURE

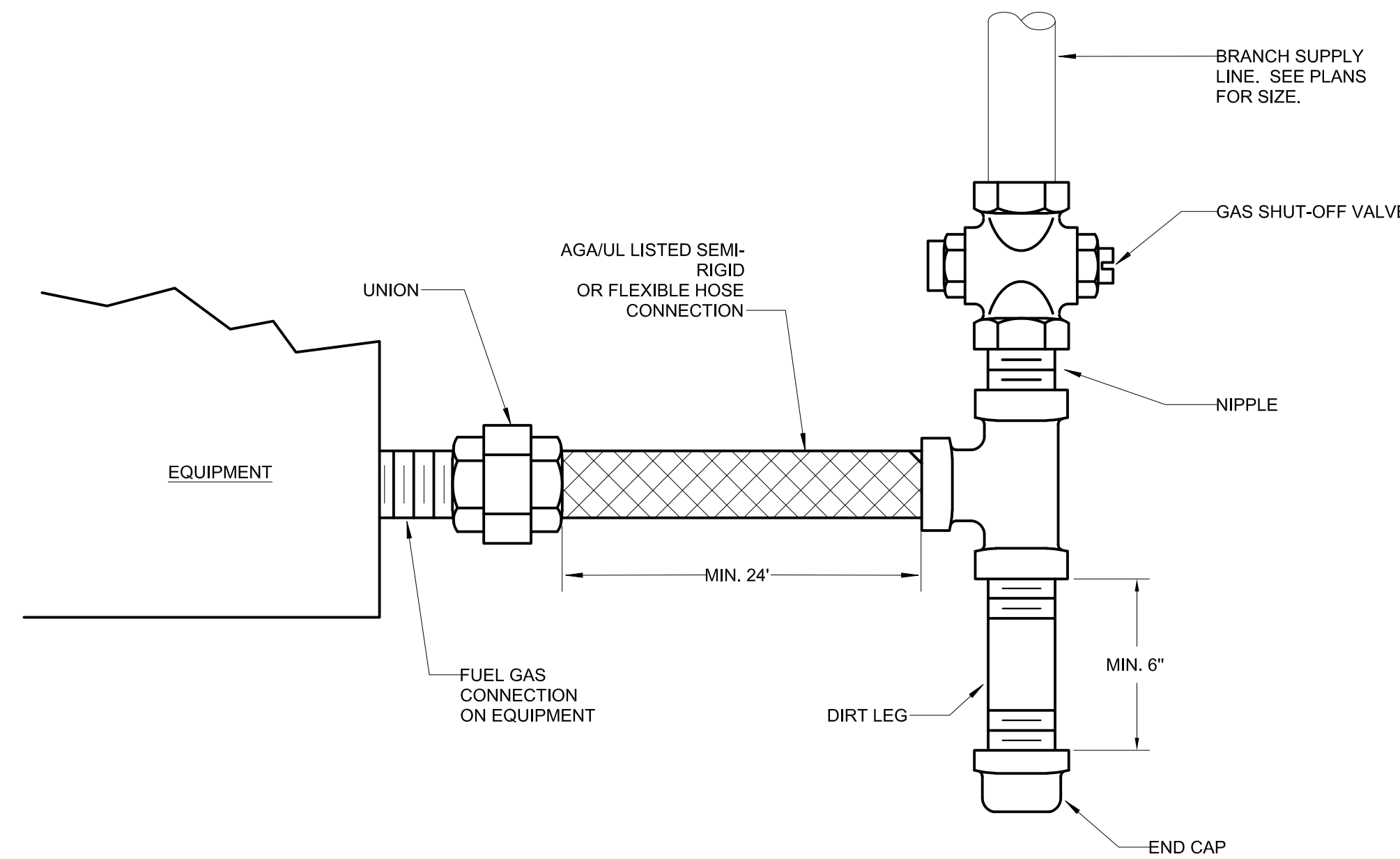
- A. Upon completion of the installation, the contractor shall start-up the system and perform all necessary calibration and testing to ensure the proper operation of the DDC System.
- B. After all calibration and testing have been completed, the contractor shall schedule a hardware demonstration and system acceptance test to be performed in the presence of the designated owner's representatives.

END OF SECTION

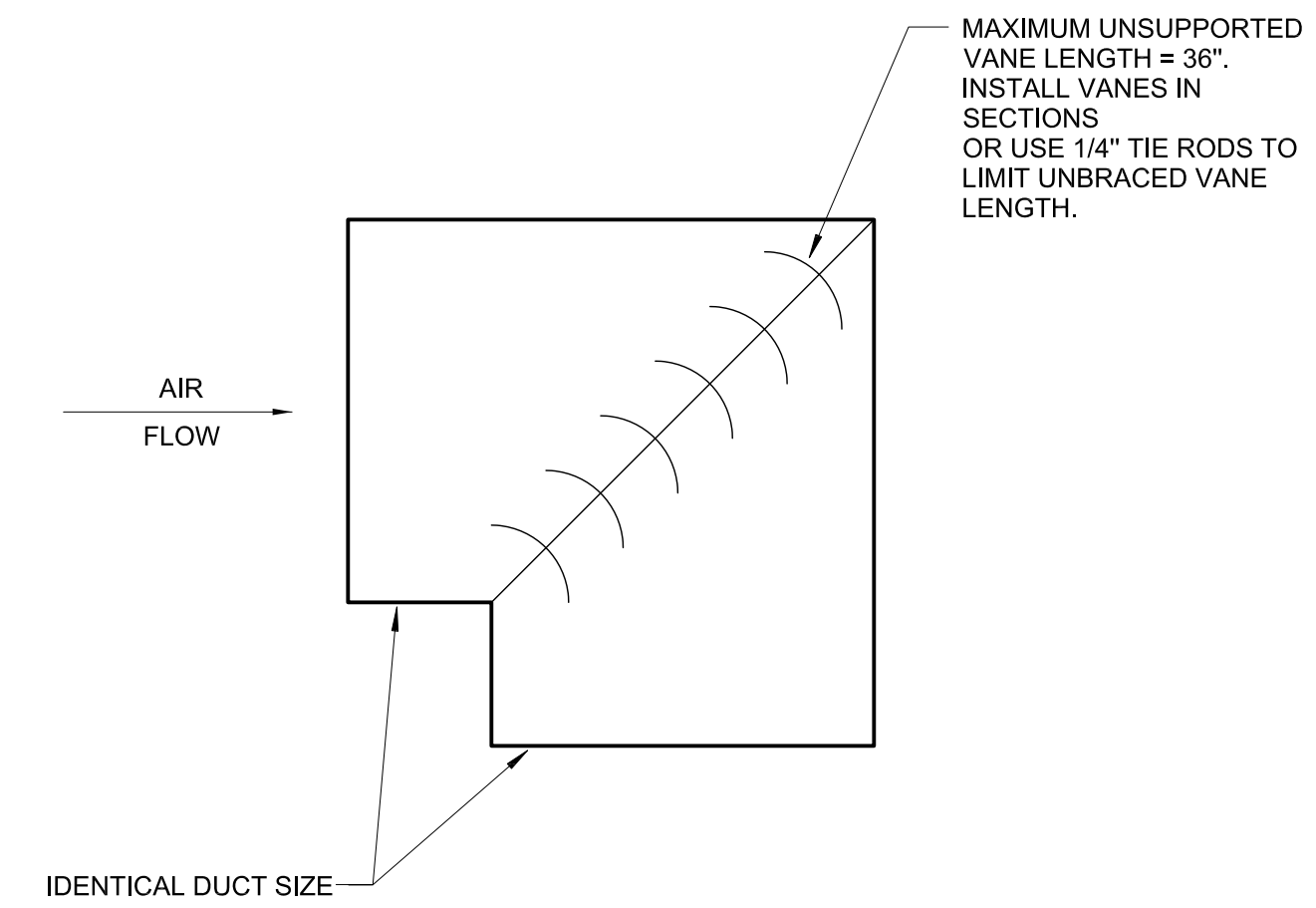


NOTES:
 1. ALL EXISTING COMMUNICATION BUS WIRING FOR CARRIER I-VU SYSTEM TO BE REPLACED. DIAGRAM ABOVE PROVIDES GENERAL CAMPUS CONFIGURATION. CONTRACTOR SHALL BE REQUIRED TO FIELD VERIFY PATHWAYS AND TERMINATION REQUIREMENTS TO EXISTING EQUIPMENT.
 2. ALL ROOFTOP CONTROLLERS IN ALL (10) REPLACED ROOFTOPS WILL HAVE STAND ALONE OPEN PROTOCOL BACKUP CONTROLLERS. THE CARRIER CONTRACTOR SHALL SUPPLEMENT AND INSTALL OPEN PROTOCOL APPCONTROLLER AND INTERCONNECT TO NEW WIRING SYSTEM.
 3. IT IS ASSUMED ALL CABLING PATHWAYS EXIST, AND NO NEW CONDUIT, PULL BOXES, SURGE SUPPRESSION, ETC. WILL BE REQUIRED.
 4. THIS CONTRACTOR SHALL REPLACE ALL EXISTING SPACE THERMOSTATS WITH CARRIER Z52P-HCM-CAR ZONE/STAT SENSORS CAPABLE OF MOTION/CO2 AND HUMIDITY MONITORING.
 5. WIRING BETWEEN NEW RTU AND STAT SHALL BE ALL NEW. ALL WIRING BETWEEN UNITS, BUILDINGS AND COMMUNICATION EQUIPMENT SHALL BE NEW.
 6. ALL EXISTING COMMUNICATION EQUIPMENT IS ASSUMED TO BE RE-USED.

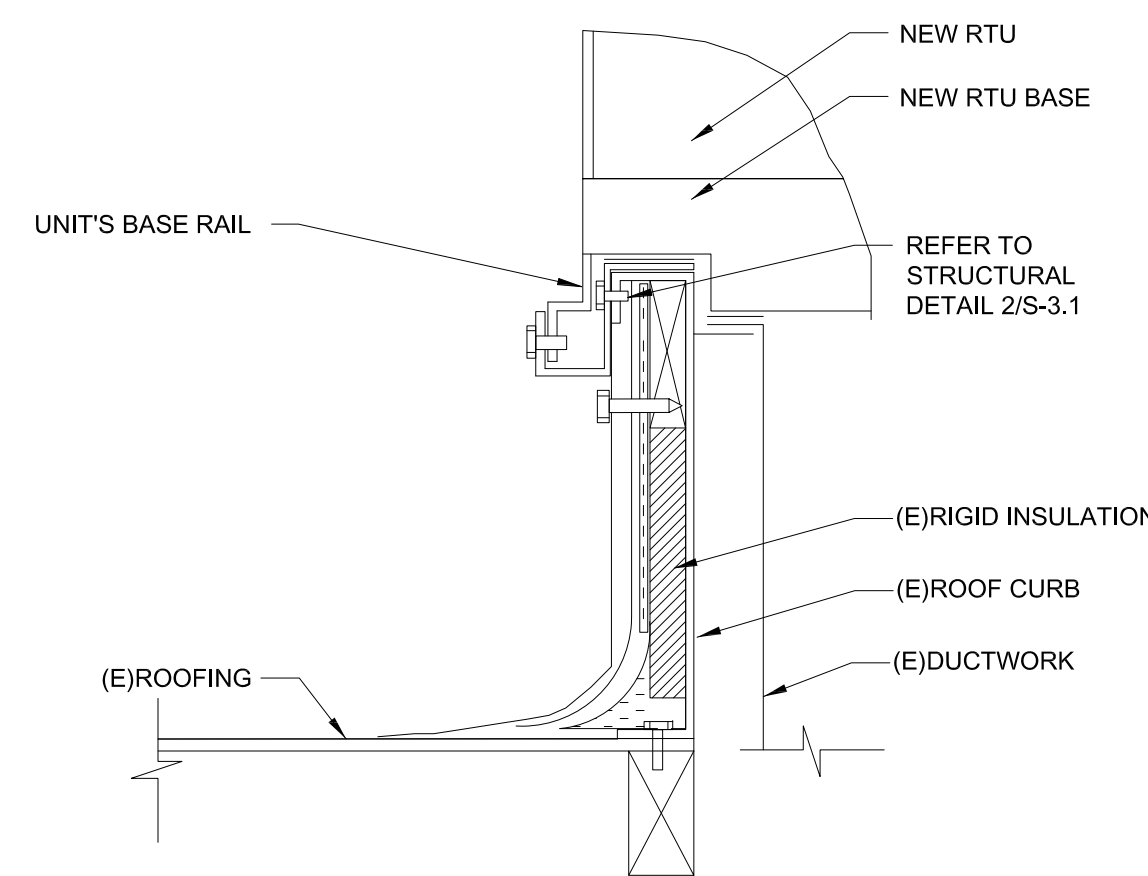
8 CAMPUS CARRIER COMM WIRING DIAGRAM FOR RE-WIRING
 NONE



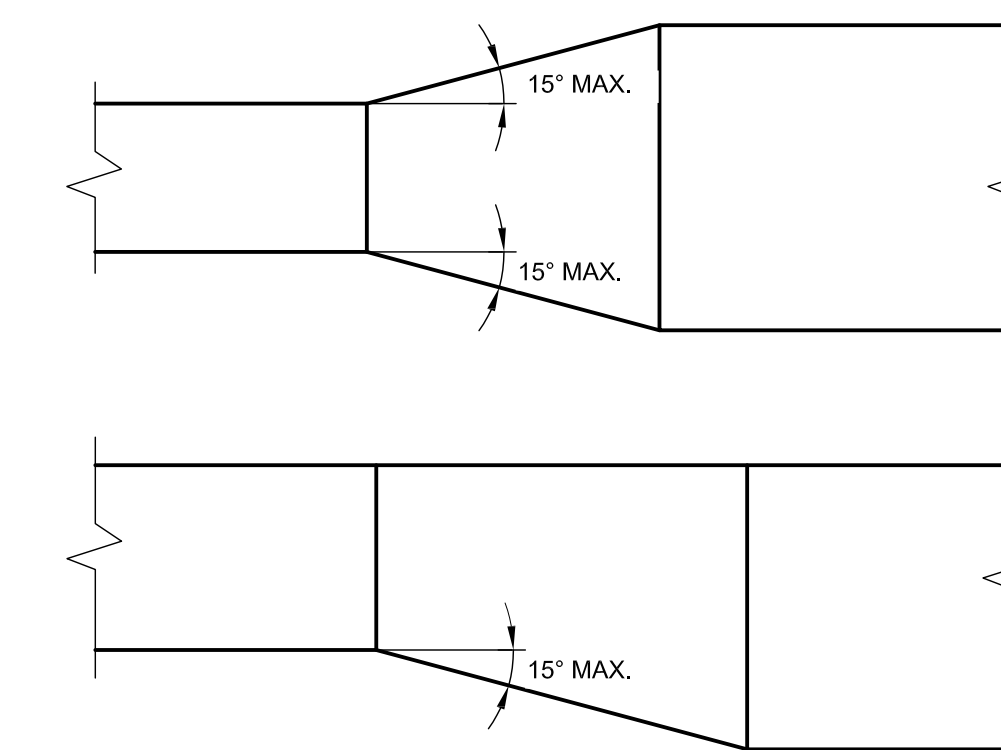
5 EQUIPMENT FUEL GAS CONNECTION DETAIL
 NONE



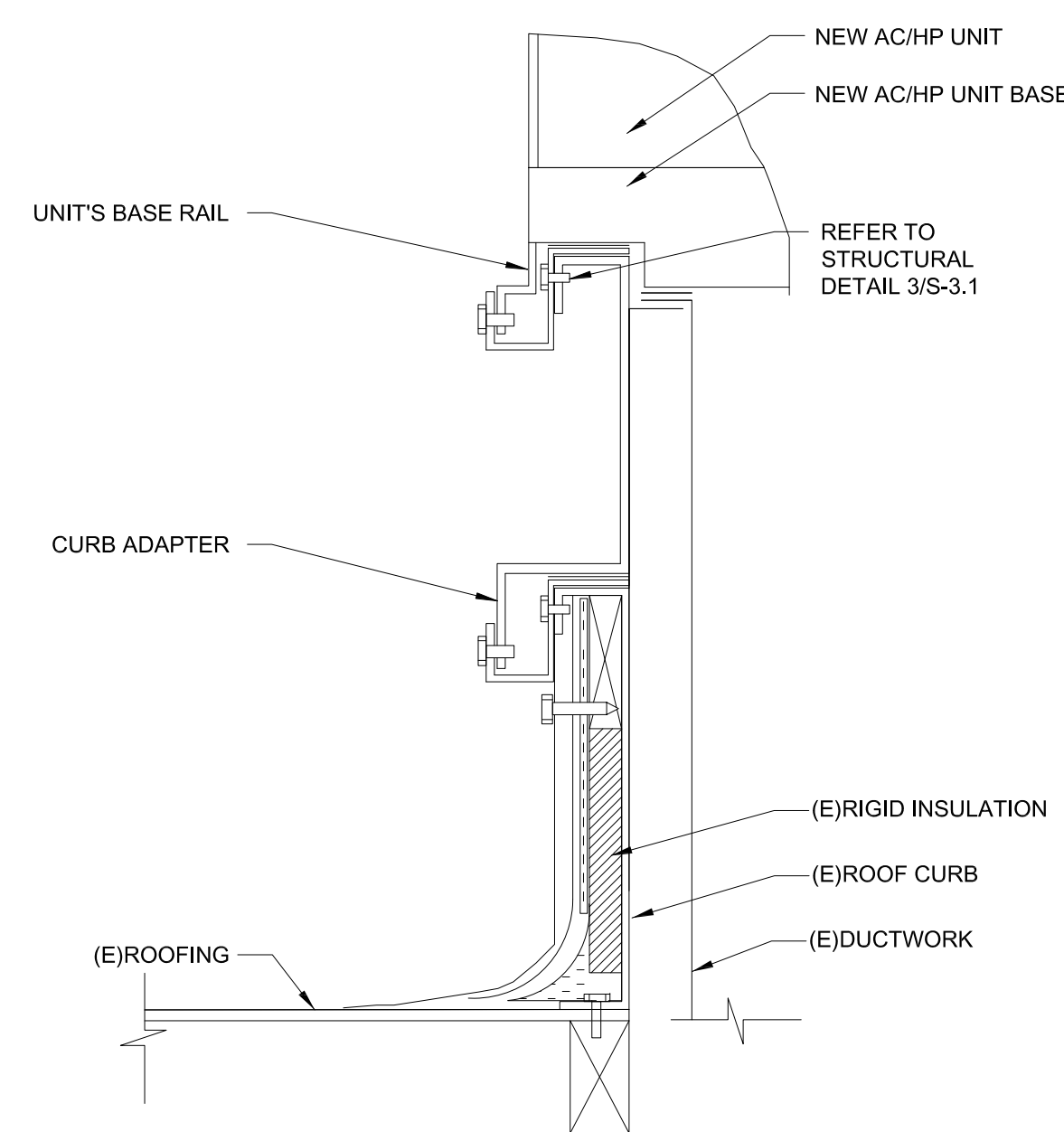
1 MILTERED ELBOW WITH TURNING VANES DETAIL
 NONE



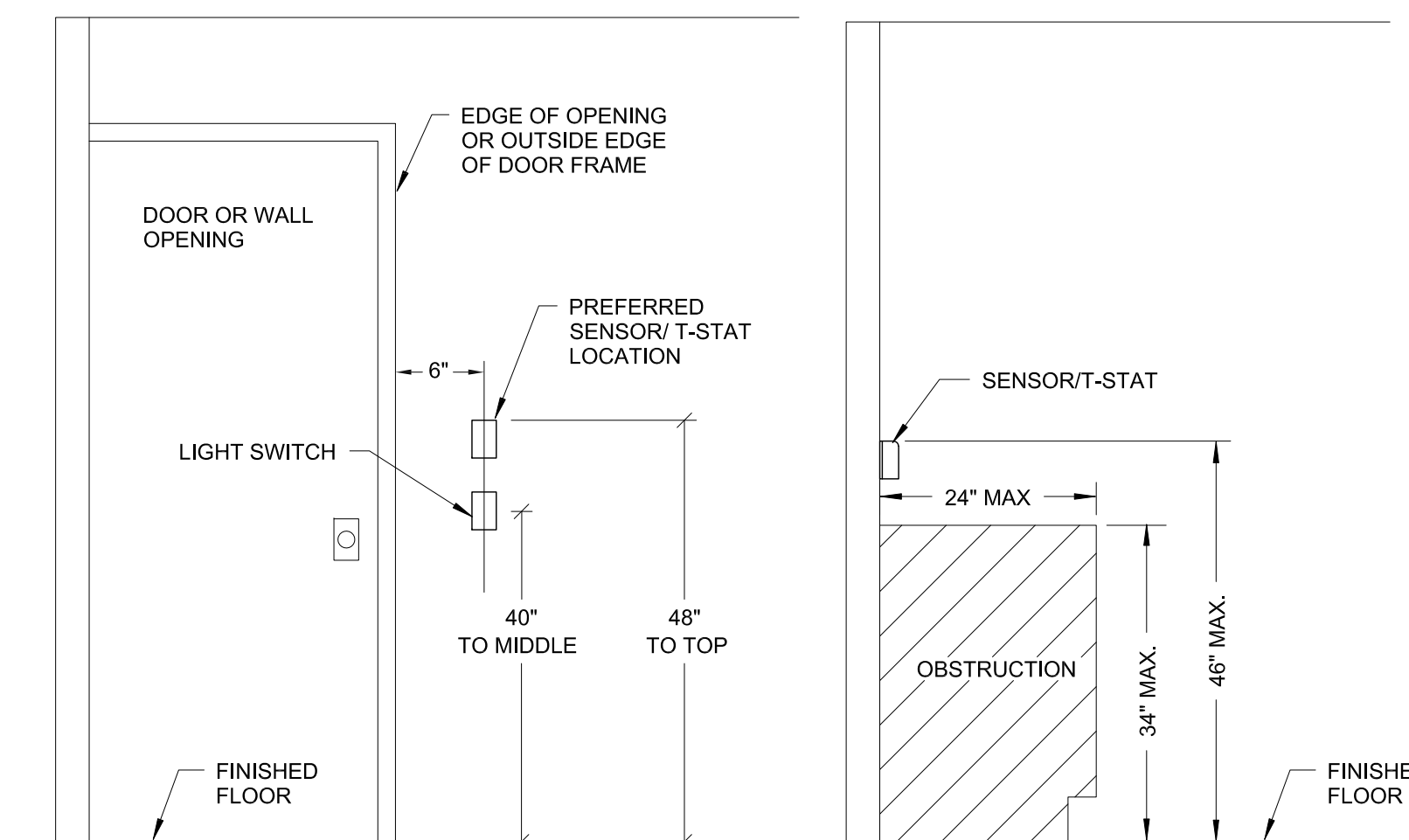
6 RTU AND EXISTING ROOF CURB DETAIL
 NONE



2 DUCT TRANSITION DETAIL
 NONE

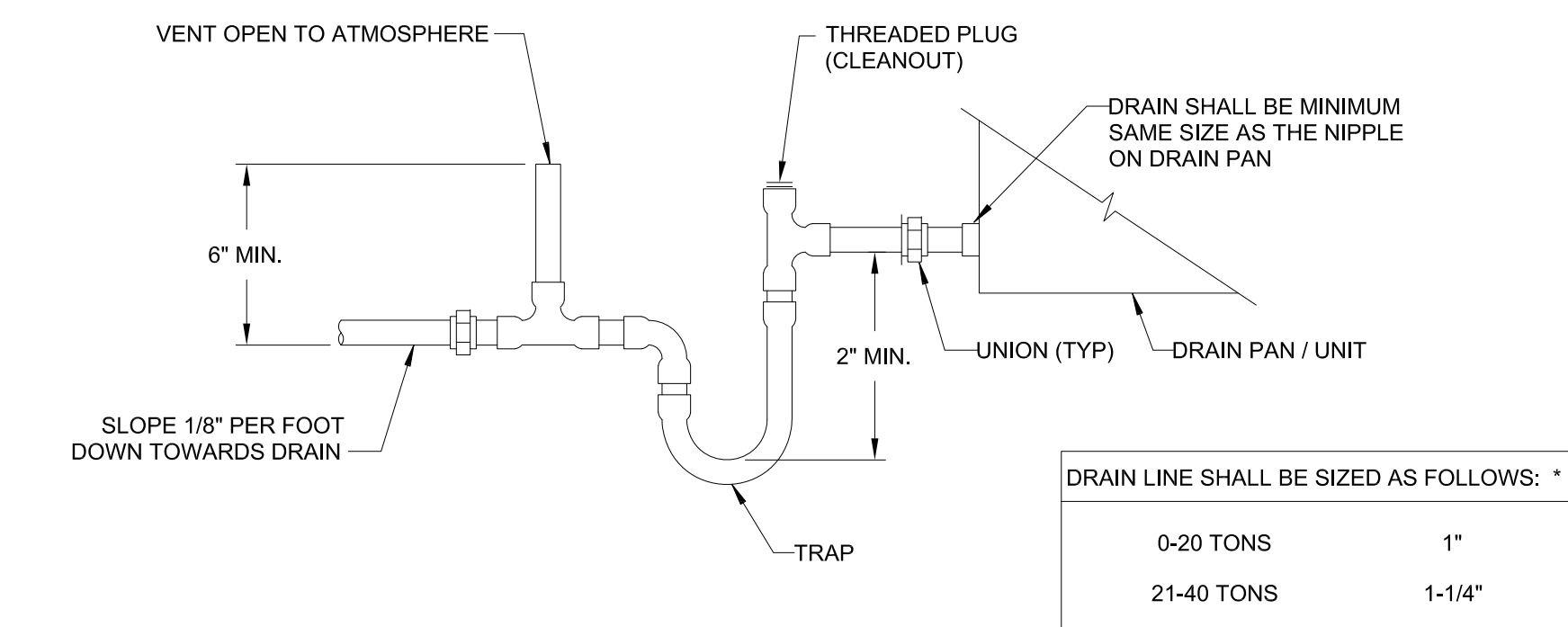


7 RTU, CURB ADAPTER, AND EXISTING ROOF CURB DETAIL
 NONE



NOTES:
 1. DO NOT INSTALL T-STATS ON EXTERIOR WALLS.
 2. DO NOT INSTALL CO2 SENSORS ON ACOUSTICAL PANELS.
 3. SEE ARCHITECTURAL DETAILS FOR FURTHER COORDINATION AND SENSOR CLUSTERS DETAILS.

3 THERMOSTAT MOUNTING DETAIL
 NONE



DRAIN LINE SHALL BE SIZED AS FOLLOWS: *	
0-20 TONS	1"
21-40 TONS	1-1/4"

* BUT NOT LESS THAN FULL SIZE EQUIP. CONN.

4 CONDENSATE DRAIN DETAIL
 NONE

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NO	DATE	BY	DESCRIPTION
REVISIONS			

DRAWN: RV	CHECKED: JD
DATE: 09/22/2022	SCALE:
PROJECT NUMBER: 1726200	

**MECHANICAL
 DETAILS**

DRAWING NUMBER: **M-5.1**