

North Florida College
NFC-04-2024 Building 8 HVAC Replacement
NBP #24045

ADDENDUM NO.1

This Addendum forms part of the Contract Documents and modifies the original bidding documents dated October 25, 2024. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do may subject the bidder to disqualification. The contract documents are herein amended under the date of November 11, 2024 as follows :

AMENDMENTS TO THE SPECIFICATIONS

1. General:
 - A. Clarification of Required Background Check:

FDLE background Level 2 is acceptable. Perform the check no more than 45 days before personnel are to be on-site. Submit a clearance letter for each person that will be on-site. Do not submit the report details, just the clearance letter.

2. Replace SECTION 23 8219 - Variable Refrigerant Flow HVAC Systems with attached revised section.

AMENDMENTS TO THE DRAWINGS

1. SHEET M001:
 - A. Grille "B" Neck Volume Damper changed from No to Yes.

2. SHEET M201:
 - A. Added location of control panels in mechanical room.
 - B. Added note to exterior refrigerant piping.
 - C. Revised note 2.
 - D. Revised supply air grilles from DOAS.
 - E. Removed extra thermostat in Corridor 005.
 - F. Added thermostat and temperature sensor to IT 016.

2. SHEET E401:
 - A. In Detail 2, change the size of the new transformer XVRF from 45KVA to 75KVA.

END OF ADDENDUM

SECTION 23 8129
VARIABLE REFRIGERANT FLOW HVAC SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Variable refrigerant volume HVAC system includes:
 - 1. Outdoor/condensing unit(s).
 - 2. Indoor/evaporator units.
 - 3. Refrigerant piping.
 - 4. Control panels.
 - 5. Control wiring.

1.2 RELATED REQUIREMENTS

- A. Section 23 2300 - REFRIGERANT PIPING: Additional requirements for refrigerant piping system.

1.3 REFERENCE STANDARDS

- A. NFPA 70 - National Electrical Code; 2020 Edition.

1.4 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturer's standard data sheets showing the following for each item of equipment, marked to correlate to equipment item markings shown in the contract documents:
 - 1. Outdoor/Central Units:
 - a. Refrigerant Type and Size of Charge.
 - b. Cooling Capacity: Btu/h.
 - c. Heating Capacity: Btu/h.
 - d. Cooling Input Power: Btu/h.
 - e. Heating Input Power: Btu/h.
 - f. Operating Temperature Range, Cooling and Heating.
 - g. Air Flow: Cubic feet per minute.
 - h. Fan Curves.

- i. External Static Pressure (ESP): Inches WG.
 - j. Sound Pressure Level: dB(A).
 - k. Electrical Data:
 - 1) Maximum Circuit Amps (MCA).
 - 2) Maximum Fuse Amps (MFA).
 - 3) Maximum Starting Current (MSC).
 - 4) Full Load Amps (FLA).
 - 5) Total Over Current Amps (TOCA).
 - 6) Fan Motor: HP.
 - l. Weight and Dimensions.
 - m. Maximum number of indoor units that can be served.
 - n. Maximum refrigerant piping run from outdoor/condenser unit to indoor/evaporator unit.
 - o. Maximum height difference between outdoor/condenser unit to indoor/evaporator unit, both above and below.
 - p. Control Options.
2. Indoor/Evaporator Units:
- a. Cooling Capacity: Btu/h.
 - b. Heating Capacity: Btu/h.
 - c. Cooling Input Power: Btu/h.
 - d. Heating Input Power: Btu/h.
 - e. Air Flow: Cubic feet per minute.
 - f. Fan Curves.
 - g. External Static Pressure (ESP): Inches WG.
 - h. Sound Pressure level: dB(A).
 - i. Electrical Data:
 - 1) Maximum Circuit Amps (MCA).
 - 2) Maximum Fuse Amps (MFA).
 - 3) Maximum Starting Current (MSC).

- 4) Full Load Amps (FLA).
- 5) Total Over Current Amps (TOCA).
- 6) Fan Motor: HP.
- j. Maximum Lift of Built-in Condensate Pump.
- k. Weight and Dimensions.
- l. Control Options.
3. Control Panels: Complete description of options, control points, zones/groups.
- C. Shop Drawings: Installation drawings custom-made for this project; include as-designed HVAC layouts, locations of equipment items, refrigerant piping sizes and locations, condensate piping sizes and locations, remote sensing devices, control components, electrical connections, control wiring connections. Include:
 1. Detailed piping diagrams, with branch balancing devices.
 2. Condensate piping routing, size, and pump connections.
 3. Detailed power wiring diagrams.
 4. Detailed control wiring diagrams.
 5. Locations of required access through fixed construction.
 6. Drawings required by manufacturer.
- D. Operating and Maintenance Data:
 1. Manufacturer's complete standard instructions for each unit of equipment and control panel.
 2. Custom-prepared system operation, troubleshooting, and maintenance instructions and recommendations.
 3. Identification of replaceable parts and local source of supply.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 1. Company that has been manufacturing variable refrigerant volume heat pump equipment for at least 5 years.
 2. Company that provides system design software to installers.
- B. Installer Qualifications: Trained and approved by manufacturer of equipment.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle equipment and refrigerant piping according to manufacturer's recommendations.

1.7 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Compressors: Provide manufacturer's warranty for six (6) years from date of installation. During the stated period, should any part fail due to defects in material and workmanship, it shall be repaired or replaced at the discretion of Daikin AC (Americas), Inc. according to Daikin's terms and conditions. All warranty service work shall be performed by a Daikin factory trained service professional.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Toshiba/Carrier.
- B. Other Manufacturers: Daikin, Hitachi, Trane.

2.2 HVAC SYSTEM DESIGN

- A. System Operation: Heating or cooling, selected at system level.
 - 1. Provide a complete functional system that achieves the specified performance based on the specified design conditions and that is designed and constructed according to the equipment manufacturer's requirements.
 - 2. Conditioned spaces are shown on drawings.
 - 3. Required equipment unit capacities are shown on the drawings.
 - 4. Refrigerant piping sizes are not shown on drawings.
 - 5. Connect equipment to condensate piping provided by others; condensate piping is shown on drawings.
- B. Energy Design Wind Speed: 25 mph.
- C. Operating Temperature Ranges:
 - 1. Cooling Mode Operating Range: 23 degrees F to 110 degrees F dry bulb.
- D. Refrigerant Piping Lengths: Provide equipment capable of serving system with following piping lengths without any oil traps:
 - 1. Minimum Piping Length from Outdoor/Central Unit(s) to Furthest Terminal Unit: 540 feet, actual; 620 feet, equivalent.
 - 2. Total Combined Liquid Line Length: 3280 feet, minimum.

3. Minimum Piping Length Between Indoor Units: 49 feet.

E. Control Wiring Lengths:

1. Between Outdoor/Condenser Unit and Indoor/Evaporator Unit: 6,665 feet, minimum.
2. Between Outdoor/Condenser Unit and Central Controller: 3,330 feet, minimum.
3. Between Indoor/Evaporator Unit and Remote Controller: 1,665 feet.

F. Controls: Provide the following control interfaces:

1. **For Each Indoor/Evaporator Unit: One wall-mounted wired "local" controller, with temperature sensor; locate where indicated.**
2. **One central remote control panel for entire system; locate where indicated.**
3. **BACNet gateways sufficient to connect all units to building automation system by others; include wiring to gateways.**

G. **Local Controllers: Wall-mounted, wired, containing temperature sensor.**

2.3 EQUIPMENT

A. All Units: Factory assembled, wired, and piped and factory tested for function and safety.

1. Refrigerant: R-410A.
2. Performance Certification: AHRI Certified; www.ahrinet.org.
3. Safety Certification: Tested to UL 1995 by UL or Intertek-ETL, listed in ITS (DIR), and bearing the certification label.
4. Provide outdoor/condensing units capable of serving indoor unit capacity up to 200 percent of the capacity of the outdoor/condensing unit.
5. Provide units capable of serving the zones indicated.
6. Thermal Performance: Provide heating and cooling capacity as indicated, based on the following nominal operating conditions:
7. Energy Efficiency: Report EER and COP based on tests conducted at "full load" in accordance with AHRI 210/240 or alternate test method approved by U.S. Department of Energy.

B. Electrical Characteristics:

1. Power - Indoor Units: 208 to 230 Volts, single phase, 60 Hz.
2. 208-230 Voltage Range: 187 to 253 volts.

C. Refrigerant Piping:

1. Insulate each refrigerant line individually between the condensing and indoor units.

- D. **Remote Centralized Control Panel:** Provide centralized control panel to support system configuration, daily/weekly scheduling, monitoring of operation status, night setback settings, free contact interlock configuration and malfunction monitoring.
- E. **BACnet Interface:** Provide BACnet interface capable of supporting integration with Building Management System. The BACnet interface shall provide the BMS access to Operation and Monitoring Points to include, but are not limited to: ON/OFF, operation mode, fan speed, prohibit remote controller, filter sign reset, alarm state, error code, and error address.

2.4 OUTDOOR/CONDENSING UNITS

- A. Outdoor/Condensing Units: Air-cooled DX refrigeration units, designed specifically for use with indoor/evaporator units; factory assembled and wired with all necessary electronic and refrigerant controls; modular design for ganging multiple units.
 - 1. Refrigeration Circuit: Scroll compressors, motors, fans, condenser coil, electronic expansion valves, solenoid valves, 4-way valve, distribution headers, capillaries, filters, shut off valves, oil separators, service ports and refrigerant regulator.
 - 2. Refrigerant: Factory charged.
 - 3. Variable Volume Control: Modulate compressor capacity automatically to maintain constant suction and condensing pressures while varying refrigerant volume to suit heating/cooling loads.
 - 4. Capable of being installed with wiring and piping to the left, right, rear or bottom.
 - 5. Capable of heating operation at low end of operating range as specified, without additional low ambient controls or auxiliary heat source; during heating operation, reverse cycle (cooling mode) oil return or defrost is not permitted, due to potential reduction in space temperature.
 - 6. Sound Pressure Level: As specified, measured at 3 feet from front of unit; provide night setback sound control as a standard feature; three selectable sound level steps of 55 dB, 50 dB, and 45 dB, maximum.
 - 7. Power Failure Mode: Automatically restart operation after power failure without loss of programmed settings.
 - 8. Safety Devices: High pressure sensor and switch, low pressure sensor/switch, control circuit fuses, crankcase heaters, fusible plug, overload relay, inverter overload protector, thermal protectors for compressor and fan motors, over current protection for the inverter and anti-recycling timers.
 - 9. Provide refrigerant sub-cooling to ensure the liquid refrigerant does not flash when supplying to us indoor units.
 - 10. Oil Recovery Cycle: Automatic, occurring 2 hours after start of operation and then every 8 hours of operation; maintain continuous heating during oil return operation.
 - 11. Controls: Provide contacts for electrical demand shedding.

- B. Unit Cabinet: Weatherproof and corrosion resistant; rust-proofed mild steel panels coated with baked enamel finish.
 - 1. Designed to allow side-by-side installation with minimum spacing.
- C. Fans: One or more direct-drive propeller type, vertical discharge, with multiple speed operation via DC (digitally commutating) inverter.
 - 1. Provide minimum of 2 fans for each condensing unit.
 - 2. External Static Pressure: Factory set at 0.12 in WG, minimum.
 - 3. Indoor Mounted Air-Cooled Units: External static pressure field set at 0.32 in WG, minimum; provide for mounting of field-installed ducts.
 - 4. Fan Airflow: As indicated for specific equipment.
 - 5. Fan Motors: Factory installed; permanently lubricated bearings; inherent protection; fan guard; output as indicated for specific equipment.
- D. Condenser Coils: Copper tubes expanded into aluminum fins to form mechanical bond; waffle louver fin and rifled bore tube design to ensure high efficiency performance.
- E. Compressors: Scroll type, hermetically sealed, variable speed inverter-driven and fixed speed in combination to suit total capacity; minimum of one variable speed, inverter driven compressor per condenser unit; minimum of two compressors per condenser unit; capable of controlling capacity within range of 6 percent to 100 percent of total capacity.
 - 1. Multiple Condenser Modules: Balance total operation hours of compressors by means of duty cycling function, providing for sequential starting of each module at each start/stop cycle, completion of oil return, and completion of defrost, or every 8 hours.
 - 2. Failure Mode: In the event of compressor failure, operate remaining compressor(s) at proportionally reduced capacity; provide microprocessor and associated controls specifically designed to address this condition.
 - 3. Provide each compressor with crankcase heater, high pressure safety switch, and internal thermal overload protector.
 - 4. Provide oil separators and intelligent oil management system.
 - 5. Provide spring mounted vibration isolators.

2.5 INDOOR/EVAPORATOR UNITS

- A. All Indoor/Evaporator Units: Factory assembled and tested DX fan-coil units, with electronic proportional expansion valve, control circuit board, factory wiring and piping, self-diagnostics, auto-restart function, 3-minute fused time delay, and test run switch.
 - 1. Refrigerant: Refrigerant circuits factory-charged with dehydrated air, for field charging.
 - 2. Temperature Control Mechanism: Return air thermistor and computerized Proportional-Integral-Derivative (PID) control of superheat.

3. Coils: Direct expansion type constructed from copper tubes expanded into aluminum fins to form a mechanical bond; waffle louver fin and high heat exchange, rifled bore tube design; factory tested.
 - a. Provide thermistor on liquid and gas lines.
4. Fans: Direct-drive, with statically and dynamically balanced impellers; high and low speeds unless otherwise indicated; motor thermally protected.
5. Return Air Filter: Washable long-life net filter with mildew proof resin, unless otherwise indicated.
6. Condensate Drainage: Built-in condensate drain pan with PVC drain connection.
7. Cabinet Insulation: Sound absorbing foamed polystyrene and polyethylene insulation.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install refrigerant piping in accordance with equipment manufacturer's instructions.
- C. Perform wiring in accordance with NFPA 70, National Electric Code (NEC).
- D. Coordinate with installers of systems and equipment connecting to this system.

3.2 SYSTEM STARTUP

- A. Provide manufacturer's field representative to perform system startup.
- B. Prepare and start equipment and system in accordance with manufacturer's instructions and recommendations.
- C. Adjust equipment for proper operation within manufacturer's published tolerances.
- D. Provide start-up certificate in accordance with the General Conditions.

END OF SECTION