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Addendum 1

Project Name: Durham Arts Council Freight Elevator Modernization Project
Date: April 16, 2020

Re: Durham Arts Council Freight Elevator
Project Manual dated March 31, 2020

To: All Bidders'

1. As noted in the City's Project Manual dated March 31, 2020, Section 01000 Scope of Work a link for the Durham Arts Council specifications cannot be shared on the City's Purchasing website. A Dropbox link to receive Durham Arts Council specifications provided to access the documents. See below for link to the files:

Durham Arts Council – Revised Scope of Work, Bidding Question & As-Builts folder:
<https://www.dropbox.com/sh/z9zcxhlualojby3/AABHXyE84JgH7WR89DRfVsdQa?dl=0>

Please contact Lisa R. Smith at lisa.smith@durhamnc.gov if you cannot access the Dropbox. The referenced documents cannot be shared at this time on the City's Purchasing website.

2. A Dropbox link to receive The Durham Arts Council elevator room, electrical panel, freight elevator cab and exterior photos is located in the link below:

Durham Arts Council – Revised Scope of Work, Bidding Question & As-Builts folder:
<https://www.dropbox.com/sh/z9zcxhlualojby3/AABHXyE84JgH7WR89DRfVsdQa?dl=0>

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3. As referenced in the Project Manual, Section 238127 Mini-Split System Heat Pumps was inadvertently omitted from the specifications section. The aforementioned specifications are attached.
4. We are revising the location for the power for the HVAC system and condensate path for air handler. It will now be pulled from Panel LPS1-1 located in the Durham Arts Council lower level near the elevator machine room. See revised scope of work with changes detailed in red color. Condensate will be terminated & pumped outside near location of outdoor unit by freight elevator.
5. Provided clarification on location for panel service for elevator machine equipment. This is breaker 14 in the main service panel tagged "MS".

SECTION 23 81 27 – MINI-SPLIT-SYSTEM HEAT PUMPS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes ductless split-system heat pump units consisting of separate evaporator-fan and compressor-condenser components.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include dimensioned drawings with required clearances.

1.3 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ASHRAE Compliance:
 - 1. Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Standard for Refrigeration Systems."
 - 2. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment," Section 6 - "Procedures."
- C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.
- D. All wiring shall be in accordance with the National Electrical Code (N.E.C.).
- E. The units shall be rated in accordance with Air-Conditioning, Heating, and Refrigeration Institute's (AHRI) Standard 210 and bear the AHRI Certification label.
- F. The units shall be manufactured in a facility registered to ISO 9001 and ISO14001 which are a set of standards applying to environmental protection set by the International Standard Organization (ISO).
- G. A pressure charge of R410A refrigerant sufficient for 70 feet of refrigerant tubing shall be provided in the condensing unit.

- H. A dry air holding charge shall be provided in the indoor section.
- I. System efficiency shall meet or exceed that shown on the Equipment Schedule.

1.6 WARRANTY

- A. The units shall have a manufacturer's parts and defects warranty for a period one (1) year from the date of the original installation. The compressor shall have a warranty of seven (7) years from date of installation. If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- 1. Mitsubishi.
- 2. EMI
- 3. Panasonic.
- 4. LG.
- 5. Sanyo.
- 6. Toshiba.

- B. HIGH EFFICIENCY INVERTER HEAT PUMP OUTDOOR UNIT

- 1. General

- a. The outdoor units shall be specifically designed to work with the indoor units. The outdoor units must have a thermally fused powder coated finish. The outdoor unit shall be completely factory assembled, piped and wired. Each unit shall be run tested at the factory.

- 2. Unit Cabinet:

- a. The casing shall be fabricated of galvanized steel plate, finished with an electrostatically applied, thermally fused acrylic or polyester powder coating.
- b. Mounting feet shall be welded to the base of the cabinet.
- c. Easy access shall be provided to all serviceable parts by means of removable panel sections.

- 3. Fan:

- a. The unit shall be furnished with a direct drive propeller type fan.
- b. The outdoor unit fan motor shall be a direct current (DC) motor and have permanently lubricated bearings.
- c. The fan motor shall be mounted for quiet operation.
- d. The fan shall be provided with a raised guard to prevent contact with moving parts.

- e. The outdoor unit shall have horizontal discharge airflow with the fan mounted in front of the coil.
4. Coil:
- a. The outdoor unit coil shall be copper tubing with flat aluminum fins. The coil shall be protected with an integral metal guard.
 - b. Refrigerant flow from the outdoor unit shall be regulated by means of an electronically controlled, precision, linear expansion valve (LEV). The LEV shall be controlled by a microprocessor-controlled step motor.
 - c. Outdoor unit shall be pre-charged with sufficient R-410A refrigerant for up to seventy (70) feet of refrigerant piping.
5. Compressor:
- a. The compressor shall be of a high performance, hermetic; inverter driven, variable speed, rotary type. The compressor speed shall vary to match the space loads.
 - b. The compressor motor shall be direct current (DC) type.
 - c. The outdoor unit shall be equipped with an accumulator and high pressure safety switch.
 - d. The compressor will be equipped with internal thermal overload protection.
 - e. There shall be no need for line size changes, traps shall not be used, and no additional refrigerant oil shall be required.
 - f. The compressor shall be mounted so as to avoid the transmission of vibration.
6. Electrical:
- a. The outdoor unit electrical power supply shall be as indicated on the Equipment Schedule.
 - b. The outdoor unit shall be controlled by microprocessors located in the indoor unit.
 - c. Power for the indoor unit shall be supplied from the outdoor unit.
- C. INDOOR UNIT – WALL MOUNTED
1. General:
- a. The heat pump air conditioning system shall be a high efficiency, ductless split system series. The system shall consist of a slim silhouette, compact wall mounted indoor fan coil section with wired, wall-mounted controller and a slim silhouette horizontal discharge outdoor unit which shall be of an inverter driven, high efficiency, heat pump design.
 - b. Systems shall be designed to use R-410A refrigerant
 - c. The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, control circuit board, fan and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, and an auto restart function. Indoor unit shall be charged with dry air before shipment from factory.
2. Unit Cabinet:
- a. The casing shall be formed from high strength molded plastic with smooth white finish.
 - b. Multi directional drain connection and refrigerant piping.
 - c. There shall be a separate, metal back-plate that secures the indoor unit firmly to the wall. The back plate shall be securely attached to the wall.

3. Fan:
 - a. The indoor unit fan shall be an assembly with a double inlet, forward curve, direct drive fan with a single motor.
 - b. The fan shall be statically and dynamically balanced and be powered by a motor with permanently lubricated bearings.
 - c. A manual adjustable guide vane shall be provided with the ability to change the airflow from side to side (left to right).
 - d. An integral, motorized, multi-position, horizontal air sweep flow louver shall provide for uniform air distribution, up and down.
 - e. The indoor fan shall operate at of three (3) selectable speeds: High, Medium and Low and an Auto speed setting that will adjust the fan speed based on the difference between controller set-point and space temperature.
4. Filter: Return air shall be filtered by means of easily removable, washable filter.
5. Coil:
 - a. The indoor unit coil shall be of nonferrous construction with smooth plate fins on copper tubing.
 - b. All tube joints shall be brazed with PhosCopper or silver alloy.
 - c. The coils shall be pressure tested at the factory.
 - d. A corrosion resistant condensate pan with drain shall be provided under the coil.
6. Electrical:
 - a. The indoor unit electrical power shall be as indicated on the Equipment Schedule.
 - b. The system shall be equipped with a system directing that the indoor unit be powered directly from the outdoor unit.
 - c. The indoor unit shall not have any supplemental electrical heat elements.
7. Control:
 - a. The unit shall have a wall-mounted, wired controller to perform input functions necessary to operate the system.
 - b. The wall-mounted, wired controller shall have a Power On/Off switch, Mode Selector – Cool, Dry, Heat, Auto Modes - Temperature Setting, Timer Control, Fan Speed Select and Auto Vane selector.
 - c. The indoor unit shall perform a Self-diagnostic Function and Check Mode switching.
 - d. Temperature changes shall be by 1°F increments with a range of 63 - 83°F.
 - e. The microprocessor located in the indoor unit shall have the capability of sensing return air temperature and indoor coil temperature, receiving and processing commands from the wired controller, providing emergency operation and controlling the outdoor unit.
 - f. The system shall be capable of automatically restarting and operating at the previously selected conditions when the power is restored after power interruption.
 - g. Control system shall control the continued operation of the air sweep louvers, as well as provide On/Off, System/Mode function.
 - h. The indoor unit shall have a field installed, multi-function, hard-wired, wall mounted remote controller. Interface will be mounted at the indoor unit.

D. INDOOR UNITS – DUCTED

1. Cabinet:

- a. The indoor unit cabinet shall be space saving, low profile, horizontal, ducted type. Formed cabinet shall be constructed of G-60 galvanized steel with factory applied foam surface insulation. The cabinet shall be provided with four mounting brackets to accommodate suspension from threaded rod or structural support located on the side panels in all four corners. The indoor unit cabinet shall be equipped with a ducted air outlet and ducted rear return air connection.
2. Fan:
 - a. The indoor unit fan unit shall be an assembly with two (2) Sirocco fans direct driven by a single motor. Fan shall develop airflow to deliver up to 0.60 inches wg of external static pressure. The indoor fans shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings. The indoor fans shall operate on any of three (3) speeds, High, Mid, and Low and Auto. The fan shall have a selectable Auto fan setting that will adjust the fan speed based on the difference between controller set-point and space temperature.
3. Coil:
 - a. The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with Copper or silver alloy. The coils shall be pressure tested at the factory. A condensate pan and with two (2) drains shall be provided under the coil. In addition to the two (2) gravity drains, the indoor unit shall be provided with an integral condensate lift mechanism able to raise drain water above the condensate pan. Lift mechanism shall incorporate a safety sensor system to shut down the indoor fan and the compressor in the outdoor unit in the event of high level of condensate in the drain pan.
4. Controls:
 - a. The control system shall consist of a minimum of two (2) microprocessors, one on each indoor and outdoor unit, interconnected by a single non-polar two-wire cable. The microprocessor located in the indoor unit shall have the capability of receiving and processing commands from a wall-mounted, wired controller, providing emergency operation and controlling the outdoor unit.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install units' level and plumb.
- B. Install evaporator-fan components using manufacturer's standard mounting devices and suspended from anchors in deck above. Coordinate penetrations of pre-tensioned cable slabs with structural drawings.
- C. Install and connect precharged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.
- D. Condensate drain tubing shall use wrought copper DWV fittings and be full size of drain connection. Pumped condensate tubing shall be 1/2-in. copper Type K or L.

3.2 CONNECTIONS

- A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Where piping is installed adjacent to unit, allow space for service and maintenance of unit.
- C. Make communication wiring connection between indoor unit and outdoor unit using 14-gauge double-shielded cable with shielding terminated to outdoor unit.

3.3 FIELD QUALITY CONTROL

- A. Perform inspections.
 - 1. Manufacturer's Field Service: Inspect components, assemblies, and equipment installations, including connections.
- B. Tests and Inspections:
 - 1. Leak Test: After installation, verify system charge and test for leaks per manufacturer's recommendation. Repair leaks and retest until no leaks exist.
 - 2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 - 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- C. Remove and replace malfunctioning units and retest as specified above.
- D. Prepare test and inspection reports.

3.4 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION 23 81 26