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**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 23 05 00 – Common work results for HVAC.
- .2        Section 23 05 49.01 – Seismic protection systems.

**1.2                REFERENCES**

- .1        ASTM International
  - .1        ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
  - .2        ASTM C916, Standard Specification for Adhesives for Duct Thermal Insulation.
  - .3        ASTM C1071, Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material).
- .2        National Fire Protection Association (NFPA)
  - .1        NFPA 90A, Standard for the Installation of Air Conditioning and Ventilating Systems.
  - .2        NFPA 90B, Standard for the Installation of Warm Air Heating and Air Conditioning Systems (ANSI).
- .3        Underwriters' Laboratories (UL) Inc.
  - .1        UL 2021, Fixed and Location-Dedicated Electric Room Heaters.

**1.3                ACTION AND INFORMATIONAL SUBMITTALS**

- .1        Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2        Product Data:
  - .1        Submit manufacturer's instructions, printed product literature and data sheets for unit heaters and include product characteristics, performance criteria, physical size, finish and limitations.
- .3        Manufacturer's Instructions: provide to indicate special handling criteria, installation sequence and cleaning procedures.
- .4        Shop Drawings:
  - .1        Submit drawings stamped and signed by professional engineer registered or licensed in Canada, member of OIQ.
  - .2        Indicate on drawings:
    - .1        Equipment, capacity and piping connections.
    - .2        Dimensions, internal and external construction details, recommended method of installation with proposed support, sizes and location of mounting bolt holes.

#### **1.4 CLOSEOUT SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for unit heaters for incorporation into manual.

#### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect unit heaters from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

#### **1.6 MATERIAL/PRODUCT REPLACEMENT**

- .1 Where materials or products are specified by their trademark, consult the Instructions to Bidders document for the procedures to follow regarding the request for approval for materials or product replacement.
- .2 Material/Product Replacement
  - .1 Providing material/equipment maintenance required in accordance with Section 01 78 00 – Closeout Submittals.
  - .2 Provide a list of spare parts recommended by each manufacturer, a list of suppliers where one can obtain spare parts, and a list of special tools necessary to adjust, repair and replacement of these parts, and add them in the maintenance manual.
  - .3 Provide following: one complete set of renewable evaporator media.

### **Part 2 Products**

#### **2.1 GAS UNIT HEATERS – DOWNFLOW DISCHARGE**

- .1 General
  - .1 Certified by CSA.
- .2 Cabinet
  - .1 Powder-coat paint finish on G30 galvanized steel. Constructed so that screws are not visible from the bottom, front or sides.
  - .2 Service access panel with lifting handle to access all internal components.
  - .3 Aerodynamic louvers conceived such as to reduce noise level.
  - .4 Low static pressure axial fan. Fan and drive guard.

- .3 Heat exchanger
  - .1 Tubes made of titanium stabilized alumized steel. Fabricated with no welding, only tool pressed mechanical joints.
  - .2 Multi-cell 4 pass serpentine style heat exchanger with 83% thermal efficiency.
  - .3 10-year warranty.
- .4 Burner
  - .1 Cell type burner, auto-aligning, for air-gas premix and with multiple combustion surfaces.
  - .2 Venturi tube and orifice calibrated for all heat exchangers.
  - .3 Combustion collector with radial blade fan to exhaust combustion gases, with integral flow switch.
  - .4 Controls and fuel train for natural gas and incorporated into service cabinet of unit.
  - .5 Forced-flow burner.
  - .6 10-year warranty.
- .5 Controls :
  - .1 Single-stage gas valve and safety limit switch.
  - .2 120/24 volts stepdown transformer.
  - .3 Direct spark ignition automatically controlled via a printed circuit control board with two diagnostic lights. The first light is for safety faults and the second light is for the state and quality of the flame.
  - .4 All controls are prewired and ready for connection of 24 volts thermostat to externally mounted terminal connector.
- .6 Accessories : vent cap
- .7 Capacity : see tables in drawings.
- .8 Acceptable products : Reznor UDAP or a replacement product approved via addenda in accordance with Bidder instructions.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for unit heaters installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

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### **3.2           INSTALLATION**

- .1     Install in accordance with manufacturer's instructions.
- .2     Check final location with Departmental Representative if different from that indicated prior to installation.
  - .1       Should deviations beyond allowable clearances arise, request and follow Departmental Representative's directive.
- .3     Gas unit heaters: for each unit, install isolation gate valves on piping.
- .4     Clean finned tubes and comb straight.
- .5     Provide supplementary suspension steel as required.
- .6     Install thermostats in locations indicated.
- .7     Before acceptance, set discharge patterns and fan speeds to suit requirements.

### **3.3           CLEANING**

- .1     Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1       Leave Work area clean at end of each day.
- .2     Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3     Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1       Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### **3.4           PROTECTION**

- .1     Protect installed products and components from damage during construction.
- .2     Repair damage to adjacent materials caused by unit heaters installation.

**END OF SECTION**