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 Institute of Boiler and Radiator Manufacturers (IBR)

.2 US Department of Commerce

.1 CS 140-47, Commercial Standard.

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 heating boiler and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Canada, IOQ member.

.2 Indicate on drawings:

.1 Equipment, capacity, piping, and connections.

.2 Dimensions, internal and external construction details, recommended method of installation with proposed structural steel support, sizes and location of mounting bolt holes.

.3 Special enclosures.

.4 Samples:

.1 Submit 1200 mm length sample enclosure showing method of securing to structure and connecting to adjacent length of enclosure.

.5 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

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 finned tube radiation heaters for incorporation into manual.

1.5 REPLACEMENT MATERIALS

.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.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements 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 finned tube radiation heaters from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 DAMPERS

.1 Install a factory built damper within the air outlet of each convection type heating unit not thermostatically controlled. Refer to nomenclature on drawings.

2.2 CAPACITY

.1 As indicated, based on average water temperature of 46.1 degrees C, temperature drop of 5.56 degrees C and entering air temperature of 18.3 degrees C.

2.3 HEATING BASEBOARDS – TYPE A

.1 Heating elements: NPS 15 (½") copper tubing mechanically expanded within aluminum fins. Fins are formed with an integral collar for uniform spacing.

.2 Architectural cabinet provided by Architecture, see architectural drawing A-751. Manufacturer must consider architectural cabinet when sizing.

.3 Provide upper grid of cabinet. Grid must be of same length as heating elements.

.4 Heating element supports: galvanized steel of at least 1 mm thick, used to hold the elements and the casing and installed according to manufacturer’s recommendations. Supports must not be visible once the cabinet is in place.

.5 Capacity, flow rate and length of baseboards are shown in drawings.

.6 Acceptable products: Rosemex RW10, Jaga Type 16, Zehnder Rittling, Runtal or substitute approved by addendum in accordance with the Instructions to tenderers .

2.4 FORCED AIR HEATING BASEBOARDS – TYPE B

.1 Heating elements: NPS 15 (½") copper tubing mechanically expanded within aluminum fins. Fins are formed with an integral collar for uniform spacing.

.2 Cabinet: prefinished steel of at least 0.9 mm (20 gauge) in thickness, surface mounted. Unless otherwise indicated, baseboards are independent from one another. A plate of at least 0.9 mm (20 gauge) in thickness must allow the back of the cabinet to be fixed over its entire length.

.3 Heating element supports: galvanized steel of at least 1 mm thick, used to hold the elements and the casing and installed according to manufacturer's recommendations. Supports must not be visible once the cabinet is in place.

.4 Fan: two tangential fans or a group of axial fans, statically and dynamically balanced for vibration free operation.

.5 Motor: two-speed motor with thermal overload protection for 115/1/60. Permanently lubricated for operation of 20 000 hours of operation.

.6 Warranty of 30 (thirty) years against leaks and manufacturing defects.

.7 Certified for operating pressures up to 1000 kPa.

.8 Orientation of intake and discharge grilles according to a floor type cabinet installation (on horizontal surface).

.9 Capacity, flow rate and length of baseboards are shown in drawings.

.10 Acceptable products : Rosemex Low-Flow LF-500, Jaga Freestanding/DBE, Zehnder Rittling, Runtal or substitute approved by addendum in accordance with the Instructions to tenderers

2.5 FORCED AIR HEATING BASEBOARDS – TYPE C

.1 Heating elements: NPS 15 (½") copper tubing mechanically expanded within aluminum fins. Fins are formed with an integral collar for uniform spacing. Connectors must terminate in the factory assembled and tested brass header. Connections for supply and return on the same side.

.2 Cabinet: prefinished steel of at least 0.9 mm (20 gauge) in thickness, surface mounted. Unless otherwise indicated, heating elements are independent from one another but cabinets are continuous and as shown in drawings.

.3 Heating element supports: galvanized steel of at least 0.9 mm (20 gauge) thick, used to hold the elements and the casing and installed according to manufacturer's recommendations. Supports must not be visible once the cabinet is in place.

.4 Fan : axial fans, statically and dynamically balanced for vibration free operation.

.5 Motor : 120VAC three speed programmable motor for 50,000 hours of operation. Speed variation according to temperature of water inlet and room temperature or according to a temporary manual override (15 min).

.6 DBE system includes a microprocessor and two temperature sensors. The micropressor must be equipped with a USB communication port.

.7 Maximum sound level of 31 dB(A).

.8 Warranty of 30 (thirty) years against leaks and manufacturing defects.

.9 Certified for operating pressures up to 1000 kPa.

.10 Orientation of intake and discharge grilles according to a wall type cabinet installation.

.11 Capacity, flow rate and length of baseboards are shown in drawings.

.12 Acceptable products : Jaga Tempo Wall TEMW070/DBE type 16 or substitute approved by addendum in accordance with the Instructions to tenderers

2.6 FORCED AIR HEATING BASEBOARDS – TYPE D

.1 Cabinet : type as indicated, made of 1.6 mm (16 gauge) thick steel, with apparent and rounded edges and angles, fitted with removable panels and integral air intake and outlet grilles coated with a rust-resistant primer. Installation for curtain type wall, cabinets continous in between columns.

.2 Coils: hot or cold water supply depending on season, made of copper tubes with aluminum fins mechanically bonded to tubes. A drip pan connected to drainage is required under the coil. Capacity as indicated.

.3 Fans: equipped with double-width centrifugal wheels, direct drive, statically and dynamically balanced and mounted on flexible supports with sleeve bearings.

.4 Motor: Two-speed, tapped windings, auxiliary phase type with permanent capacitor, fitted with sleeve bearings and thermal overload protection and mounted on soft rubber isolation pads.

.5 The integral control system must include a high-efficiency thermal overload protection switch and integrated line-voltage thermostats for hot water supply.

.6 Control system: 2 speed switch located within cabinet.

.7 Acceptable products : Rosemex Lo-Sil LS-37-A, Zehnder Rittling FLF-510 or substitute approved by addendum in accordance with the Instructions to tenderers

2.7 FORCED AIR HEATING BASEBOARDS – TYPE E

.1 Heating elements: NPS 15 (½") copper tubing mechanically expanded within aluminum fins. Fins are formed with an integral collar for uniform spacing.

.2 Cabinet: prefinished steel of at least 0.9 mm (20 gauge) in thickness, recessed-floor type installation with supports for elements. Unless otherwise indicated, baseboards are independent from one another.

.3 Fan : statically and dynamically balanced for vibration free operation.

.4 Motor : Two-speed motor with thermal overload protection for 115/1/60. Permanently lubricated for 20 000 hours of operation.

.5 Heating elements supports: galvanized steel 1.2 mm (18 gauge) in thickness, used to hold both the front panel and cradle, spaced 900 mm (36 ") on center.

.6 Warranty of 30 (thirty) years against leaks and manufacturing defects.

.7 Certified for operating pressures up to 1000 kPa.

.8 Orientation of intake and discharge grilles according to a recessed-floor type cabinet installation (on horizontal surface).

.9 Capacity, flow rate and length of baseboards are shown in drawings.

.10 Acceptable products : Rosemex RX, Jaga Mini-Canal/DBE, Runtal or substitute approved by addendum in accordance with the Instructions to tenderers.

2.8 HEATING BASEBOARD S – TYPE F

.1 Heating elements: NPS 15 (½") copper tubing mechanically expanded within aluminum fins. Fins are formed with an integral collar for uniform spacing.

.2 Cabinet: prefinished steel of at least 0.9 mm (20 gauge) in thickness, surface mounted. Unless otherwise indicated, baseboards are independent from one another. A plate of at least 0.9 mm (20 gauge) in thickness must allow the back of the cabinet to be fixed over its entire length.

.3 Heating element supports: galvanized steel of at least 1 mm thick, used to hold the elements and the casing and installed according to manufacturer's recommendations. Supports must not be visible once the cabinet is in place.

.4 Warranty of 30 (thirty) years against leaks and manufacturing defects.

.5 Certified for operating pressures up to 1000 kPa.

.6 Capacity, flow rate and length of baseboards are shown in drawings.

.7 Acceptable products : RVTG-H12-RW10, Jaga Tempo Wall, Zehnder Rittling, Runtal or substitute approved by addendum in accordance with the Instructions to tenderers.

2.9 FORCED AIR HEATING BASEBOARDS – TYPE G

.1 Cabinet : type as indicated, made of 1.6 mm (16 gauge) thick steel, with apparent and rounded edges and angles, fitted with removable panels and integral air intake and outlet grilles coated with a rust-resistant primer. Installation for curtain type wall, cabinets continous in between columns.

.2 Coils: hot or cold water supply depending on season, made of copper tubes with aluminum fins mechanically bonded to tubes. A drip pan connected to drainage is required under the coil. Capacity as indicated.

.3 Fans: equipped with double-width centrifugal wheels, direct drive, statically and dynamically balanced and mounted on flexible supports with sleeve bearings.

.4 Motor: Two-speed, tapped windings, auxiliary phase type with permanent capacitor, fitted with sleeve bearings and thermal overload protection and mounted on soft rubber isolation pads.

.5 The integral control system must include a high-efficiency thermal overload protection switch and integrated line-voltage thermostats for hot water supply.

.6 Control system: 2 speed switch located within cabinet.

.7 Acceptable products : Rosemex Lo-Sil LS-36-A, Zehnder Rittling, Runtal or substitute approved by addendum in accordance with the Instructions to tenderers

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 finned tube radiation convector heater 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.

3.2 INSTALLATION

.1 Install in accordance with manufacturer's instructions.

.2 Install in accordance with piping layout and approved shop drawings.

.3 Provide for pipe movement during normal operation.

.4 Maintain sufficient clearance to permit performance of service maintenance.

.5 Check final location with Departmental Representative if different from that indicated prior to installation. Should deviations beyond allowable clearances arise, request and follow Departmental Representative's directive.

.6 Valves:

.1 Install valves with stems upright or horizontal unless approved otherwise.

.2 Install isolating gate valves on inlet and lockshield balancing valves on outlet of each unit.

.7 Venting:

.1 Install screwdriver vent on cabinet convector, terminating flush with surface of cabinet.

.2 Install automatic air vent on continuous finned tube radiation.

.8 Clean finned tubes and comb straight.

.9 Install flexible expansion compensators as indicated.

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 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.

END OF SECTION