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SECTION 238216 - AIR COILS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following types of air coils:
 - 1. Hot-water.
 - 2. Chilled-water.
 - 3. Steam.
 - 4. Vertical integral face and bypass.
 - 5. Refrigerant.
- B. Related Sections:
 - 1. Division 23 Section "Air Terminal Units" for hydronic coil requirements for these devices.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each air coil. Include rated capacity and pressure drop for each air coil.
- B. Field quality-control test reports.
- C. Operation and Maintenance Data: For air coils to include in operation and maintenance manuals.

1.4 QUALITY ASSURANCE

- A. ASHRAE Compliance:
 - 1. Comply with ASHRAE 15 for refrigeration system safety.

2. Comply with ASHRAE 33 for methods of testing cooling and heating coils.

LEED-NC Prerequisite EQ 1 requires compliance with requirements in ASHRAE 62.1, including requirements for controls, surfaces in contact with the airstream, humidification and dehumidification, drain pan construction and connection, finned-tube coil selection and cleaning, and equipment access. Verify, with manufacturers, availability of units with components and features that comply with these requirements.

3. Comply with applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."

PART 2 - PRODUCTS

2.1 WATER COILS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Aerofin Corporation.
 2. Carrier Corporation.
 3. Heatcraft Refrigeration Products LLC; Heat Transfer Division.
 4. Trane.
 5. Daikin – McQuay
 6. Marlo
 7. York
- B. Performance Ratings: Tested and rated according to ARI 410 and ASHRAE 33.
- C. Minimum Working-Pressure/Temperature Ratings: 200 psig (1380 kPa), 325 deg F (163 deg C).
- D. Source Quality Control: Factory tested to 300 psig (2070 kPa).
- E. Tubes: ASTM B 743 copper, minimum 0.035 inch (0.889 mm) thick.
- F. Fins: Aluminum, minimum 0.010 inch (0.254 mm) thick.

Omit removable headers for coils with glycol.

- G. Headers: Removable, cast iron, and drain and air vent tappings.
- H. Frames: Galvanized-steel channel frame, minimum 0.064 inch (1.6 mm) thick for flanged mounting.
- I. Hot-Water Characteristics:
 - a. Minimum Fin Spacing: 0.125 inch (3.18 mm).
 - b. Tube Diameter: 0.625 inch (15.9 mm).
 - c. Mounting: Flanged.
 - d. Coating: Include corrosion resistant coatings where applicable.

J. Chilled-Water Coil Characteristics:

- a. Minimum Fin Spacing: 0.125 inch (3.18 mm).
- b. Tube Diameter: 0.625 inch (15.9 mm).
- c. Mounting: Flanged.
- d. Coating: Include corrosion resistant coatings where applicable.
- e. Finned Area Face Velocity: Max. 500 fpm.

2.2 STEAM COILS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Aerofin Corporation.
2. Carrier Corporation.
3. Heatcraft Refrigeration Products LLC; Heat Transfer Division.
4. Trane.
5. Daikin-McQuay
6. York

B. Minimum Working-Pressure/Temperature Ratings: 100 psig (690 kPa), 400 deg F (204 deg C).

C. Source Quality Control: Factory tested to 300 psig (2070 kPa).

D. Tubes: ASTM B 743 copper, minimum 0.035 inch (0.889 mm) thick.

E. Fins: Aluminum, minimum 0.010 inch (0.254 mm) thick.

F. Headers: Cast iron with drain and air vent tappings.

G. Tube Type: Distributing.

H. Frames: Galvanized-steel channel frame, minimum 0.064 inch (1.6 mm) thick for flanged mounting.

I. Characteristics:

1. Minimum Fin Spacing: 0.125 inch (3.18 mm).
2. Tube Diameter: 0.625 inch (15.9 mm).
3. Mounting: Flanged.
4. Connections on both ends for coils over 6 feet in length.

2.3 VERTICAL INTEGRAL FACE AND BYPASS STEAM HEATING COILS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Aerofin Corporation.
2. Control Air.

3. Marlo.
 - B. Performance Ratings: Tested and rated according to ARI 410.
 - C. Minimum Working-Pressure/Temperature Ratings: 100 psig, 400 deg F.
 - D. Source Quality Control: Factory tested to 200 psig.
 - E. Frames: Minimum 14 gauge galvanized steel.
 - F. Tubes: Seamless copper, minimum .035 inch thick, 5/8 inch OD distributing tubes and 1.0 inch OD condensing tubes.
 - G. Fins: Aluminum.
 - H. Dampers: Minimum 16 gauge steel with baked enamel finish. Link all dampers together with a common actuator in multiple coil installations.
 - I. Accessories:
 1. Flexible connectors.
 2. Anti-stratification baffles.
 3. Insulated headers.

2.4 REFRIGERANT COILS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Aerofin Corporation.
 2. Carrier Corporation.
 3. Heatcraft Refrigeration Products LLC; Heat Transfer Division.
 4. Daikin-McQuay.
 5. Trane.
- B. Description: Direct expansion of refrigerant inside the tubes with multi-outlet venturi type distributors.
- C. Performance Ratings: Tested and rated according to ARI 410 and ASHRAE 33.
- D. Minimum Working-Pressure Rating: 300 psig (2070 kPa).
- E. Source Quality Control: Factory tested to 450 psig (3105 kPa).
- F. Tubes: ASTM B 743 copper, minimum 0.035 inch (0.889 mm) thick.
- G. Fins: Aluminum, minimum 0.010 inch (0.254 mm) thick.
- H. Suction and Distributor Piping: ASTM B 88, Type L (ASTM B 88M, Type B) copper tube with brazed joints.

- I. Frames: Galvanized-steel channel frame, minimum 0.064 inch (1.6 mm) thick for flanged mounting.
- J. Characteristics:
 - 1. Minimum Fin Spacing: 0.125 inch (3.18 mm).
 - 2. Tube Diameter: 0.625 inch (15.9 mm).
 - 3. Mounting: Flanged.
 - 4. Coating: Include corrosion resistant coatings where applicable.
 - 5. Finned Area Face Velocity: Max. 500 fpm.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine ducts, plenums, and casings to receive air coils for compliance with requirements for installation tolerances and other conditions affecting coil performance.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before coil installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install as recommended by the manufacturer to permit complete drainage.
- B. Install coils in metal ducts and casings constructed according to SMACNA's "HVAC Duct Construction Standards, Metal and Flexible."
- C. Straighten bent fins on air coils.
- D. Clean coils using materials and methods recommended in writing by manufacturers, and clean inside of casings and enclosures to remove dust and debris.
- E. Steam Heating Coils:
 - 1. Properly size condensate traps to ensure proper drainage.
 - 2. Install vacuum breakers in the top of the steam supply headers, after the automatic control valves.
- F. Cooling Coils:
 - 1. Install stainless-steel drain pan under each cooling coil.
 - a. Construct drain pans with connection for drain; double-wall, insulated and complying with ASHRAE 62.1.

- b. Construct drain pans to extend beyond coil length and width and to connect to condensate trap and drainage.
 - c. Extend drain pan upstream and downstream from coil face.
 - d. Extend drain pan under coil headers and exposed supply piping.
 - e. Install a deep seal trap on the drain pipe from the drain pan, low enough to provide sufficient head pressure to allow draining. Extend piping to the nearest floor drain. Avoid elbow and tee in drain lines.
2. Units with stacked coils shall have an intermediate drain pan to collect condensate from top coil.

3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to coils to allow service and maintenance.

Retain two paragraphs below for water coils.

- C. Connect water piping with unions and shutoff valves to allow coils to be disconnected without draining piping. Control valves are specified in Division 23 Section "Instrumentation and Control for HVAC," and other piping specialties are specified in Division 23 Section "Hydronic Piping."

Retain two paragraphs below for steam coils.

- D. Connect steam piping with gate valve and union and steam condensate piping with union, strainer, trap, and gate valve to allow coils to be disconnected without draining piping. Control valves are specified in Division 23 Section "Instrumentation and Control for HVAC," and other piping specialties are specified in Division 23 Section "Steam and Condensate Heating Piping."

Retain paragraph below for refrigerant coils.

- E. Connect refrigerant piping according to Division 23 Section "Refrigerant Piping."
- F. Refrigeration system shall be equipped with a servicing aperture or similar device to facilitate the recapture of refrigerants during service and repair. Provide adequate shutoff valves for service with a minimum change of refrigerant loss.

3.4 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
 1. Test and adjust controls for the VIFB coils. Replace damaged and malfunctioning controls and equipment.
 2. Upon completion of installation, operate system for not less than 8 hours under full load, and then conduct performance tests in presence of the Architect/Engineer or Construction Representative. Correct equipment defects or performance deficiencies, and repeat performance tests.

END OF SECTION 238216