SECTION 23 8216
AIR COILS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Water heating coils.

B. Glycol coils.

C. Steam coils.

D. Water cooling coils.

E. Refrigerant coils.

1.02 RELATED REQUIREMENTS

A. Section 22 0719 - Plumbing Piping Insulation.

B. Section 23 0719 - HVAC Piping Insulation.

C. Section 23 2114 - Hydronic Specialties.

D. Section 23 2214 - Steam and Condensate Heating Specialties.

E. Section 23 2300 - Refrigerant Piping.

F. Section 23 3100 - HVAC Ducts and Casings: Installation of duct coils.

1.03 REFERENCE STANDARDS

A. AHRI 410 - Standard for Forced-Circulation Air-Cooling and Air-Heating Coils; 2001 (R2011).

B. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide coil and frame configurations, dimensions, materials, rows, connections, and rough-in dimensions.

C. Shop Drawings: Indicate coil and frame configurations, dimensions, materials, rows, connections, and rough-in dimensions.

D. Certificates: Certify that coil capacities, pressure drops, and selection procedures meet or exceed specified requirements.

E. Warranty: Submit manufacturer's warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect coil fins from crushing and bending by leaving in shipping cases until installation, and by storing indoors.

B. Protect coils from entry of dirt and debris with pipe caps or plugs.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturer warranty for _____.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Aerofin Corporation; _____: www.aerofin.com.

B. Luvata UK Ltd; _____: www.luvata.com.

C. Trane, a brand of Ingersoll Rand; _____: www.trane.com.

2.02 WATER HEATING COILS

A. Manufacturers:
   1. Aerofin Corporation; _____: www.aerofin.com.
   2. Luvata UK Ltd; _____: www.luvata.com.
   3. Trane, a brand of Ingersoll Rand; _____: www.trane.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Tubes: 5/8 inch OD seamless copper or brass arranged in parallel or staggered pattern, expanded into fins, silver brazed joints.

C. Fins: Aluminum or copper continuous plate type with full fin collars.

D. Casing: Die formed channel frame of 16 gage, 0.0598 inch galvanized steel with mounting holes on 3 inch centers. Provide tube supports for coils longer than 36 inches.

E. Headers: Seamless copper tube with silver brazed joints.

F. Testing: Air test under water to 200 psi for working pressure of 200 psi and 220 degrees F.

G. Configuration: Drainable, with threaded plugs for drain and vent.

H. Fin Spacing: 8 fins per inch.

2.03 GLYCOL HEATING COILS

A. Manufacturers:
   1. Aerofin Corporation; _____: www.aerofin.com.
   2. Luvata UK Ltd; _____: www.luvata.com.
   3. Trane, a brand of Ingersoll Rand; _____: www.trane.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Tubes: 5/8 inch OD seamless copper or brass arranged in parallel or staggered pattern, expanded into fins, silver brazed joints.

C. Fins: Aluminum or copper continuous plate type with full fin collars.

D. Casing: Die formed channel frame of 16 gage, 0.0598 inch galvanized steel with 3/8 inch mounting holes on 3 inch centers. Provide tube supports for coils longer than 36 inches.

E. Headers: Seamless copper tube with silver brazed joints.

F. Testing: Air test under water to 200 psi for working pressure of 200 psi and 220 degrees F.

G. Configuration: Drainable, with threaded plugs in headers for drain and vent; threaded plugs in return bends and in headers opposite each tube.

H. Fin Spacing: 8 fins per inch.

2.04 STEAM HEATING COILS

A. Manufacturers:
   1. Aerofin Corporation; _____: www.aerofin.com.
   2. Luvata UK Ltd; _____: www.luvata.com.
   3. Trane, a brand of Ingersoll Rand; _____: www.trane.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Tubes: 5/8 inch OD seamless copper or brass arranged in parallel or staggered pattern, expanded into fins, silver brazed joints.

C. Fins: Aluminum or copper continuous plate type with full fin collars.

D. Casing: Die formed channel frame of 16 gage, 0.0598 inch galvanized steel with 3/8 inch mounting holes on 3 inch centers. Provide tube supports for coils longer than 36 inches.

E. Headers: Cast iron with tubes expanded into header.

F. Testing: Air test under water to 200 psi for working pressure of 200 psi and 220 degrees F.

G. Configuration: Drainable, with threaded plugs in headers for drain and vent, threaded plugs in return bends and in headers opposite each tube, sloped within frame to condensate connection.

H. Fin Spacing: 8 fins per inch.

2.05 WATER COOLING COILS

A. Manufacturers:
   1. Aerofin Corporation; _____: www.aerofin.com.
   2. Luvata UK Ltd; _____: www.luvata.com.
   3. Trane, a brand of Ingersoll Rand; _____: www.trane.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Tubes: 5/8 inch OD seamless copper or brass arranged in parallel or staggered pattern, expanded into fins, silver brazed joints.

C. Fins: Aluminum or copper continuous plate type with full fin collars. Solder coat copper fin coils.

D. Casing: Die formed channel frame of 16 gage, 0.0598 inch galvanized steel with 3/8 inch mounting holes on 3 inch centers. Provide tube supports for coils longer than 36 inches.

E. Headers: Seamless copper tube with silver brazed joints.

F. Testing: Air test under water to 200 psi for working pressure of 200 psi and 220 degrees F.

G. Configuration: Drainable, with threaded plugs in headers for drain and vent; threaded plugs in return bends and in headers opposite each tube.

H. Fin Spacing: 14 fins per inch.

2.06 REFRIGERANT COILS

A. Manufacturers:
   1. Aerofin Corporation; _____: www.aerofin.com.
   2. Luvata UK Ltd; _____: www.luvata.com.
   3. Trane, a brand of Ingersoll Rand; _____: www.trane.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Tubes: 5/8 inch OD seamless copper or brass arranged in parallel or staggered pattern, expanded into fins, silver brazed joints.

C. Fins: Aluminum or copper continuous plate type with full fin collars. Solder coat copper fin coils.

D. Casing: Die formed channel frame of 16 gage, 0.0598 inch galvanized steel with 3/8 inch mounting holes on 3 inch centers. Provide tube supports for coils longer than 36 inches.

E. Headers: Seamless copper _____ tubes with silver brazed joints.

F. Liquid Distributors: Brass or copper venturi type distributor with seamless copper distributor tubes, 5/16 inch outside diameter; maximum 12 circuits per distributor.

G. Testing: Air test under water at 300 psi for working pressure of 250 psi; clean, dehydrate, and seal with dry nitrogen charge.

H. Configuration: Down feed with bottom suction to prevent trapping of oil.

I. Fin Spacing: 14 fins per inch.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in ducts and casings in accordance with SMACNA (DCS).
   1. Support coil sections independent of piping on steel channel or double angle frames and secure to casings.
   2. Provide frames for maximum three coil sections.
   3. Arrange supports to avoid piercing drain pans.
   4. Provide airtight seal between coil and duct or casing.

5. Refer to Section 23 3100.

B. Protect coils to prevent damage to fins and flanges. Comb out bent fins.

C. Install coils level. Install cleanable tube coils with 1:50 pitch.

D. Make connections to coils with unions and flanges.

E. Hydronic Coils:
   1. Hydronic Coils: Connect water supply to leaving air side of coil (counterflow arrangement).
   2. Provide shut-off valve on supply line and lockshield balancing valve with memory stop on return line.
   3. Locate water supply at bottom of supply header and return water connection at top.
   4. Provide manual air vents at high points complete with stop valve.
   5. Ensure water coils are drainable and provide drain connection at low points.
   6. Refer to Section 23 2114.

F. Cooling Coils:
   1. Provide three break moisture eliminators of 24 gage, 0.0239 inch galvanized steel, where air velocity exceeds 500 ft/min.
   2. Provide drain pan and drain connection; fabricate from 20 gage, 0.0359 inch galvanized steel, extend 3 inches from face of entering air side, 6 inches from face of leaving air side, and 4 inches from face of eliminators. Pipe drain pans individually to floor drain with water seal trap.

G. Steam Coils:
   1. Install vacuum breaker in steam line at or in header.
   2. Install steam traps with outlet minimum 12 inches below coil return connection.
   3. Refer to Section 23 2214.

H. Refrigerant Coils: Provide sight glass in liquid line within 12 inches of coil. Refer to Section 23 2300.

I. Insulate headers located outside air flow as specified for piping. Refer to Section 23 0719.

3.02 SCHEDULES

A. Heating Coils:
   1. Drawing Code:
   2. Location:
   3. Service:
   4. Manufacturer:
   5. No. Required:
   6. Construction:
      a. Type:
      b. Width:
      c. Height:
      d. Face Area:
      e. Rows:
      f. Circuits:
   7. Air:
      a. Flow Rate:
      b. Velocity:
      c. Static Pressure Drop:
      d. Heat Transfer Rate:
      e. Entering Temp:
      f. Leaving Temp:
   8. Water:
      a. Flow Ratev
      b. Velocity:
      c. Head Loss:

d. Entering Temp:
e. Leaving Temp:

9. Remarks:

B. Cooling Coils:
1. Drawing Code:
2. Location:
3. Service:
4. Manufacturer:
5. No. Required:
6. Construction:
a. Type:
b. Width:
c. Height:
d. Face Area:
e. Rows:
f. Circuits:
7. Air:
a. Flow Rate:
b. Velocity:
c. Static Pressure Drop:
d. Heat Transfer Rate:
e. Entering DB Temperature:
f. Entering WB Temperature:
g. Leaving DB Temperature:
h. Leaving WB Temperature:
8. Water:
a. Flow Rate:
b. Velocity:
c. Head Loss:
d. Entering Temperature:
e. Leaving Temperature:

END OF SECTION 23 8216