SECTION 238216 - AIR COILS

1.1 SUMMARY

A. Coils installed in ducts and field-fabricated air-handling casings.

B. Acceptable Manufacturers: Heat Craft, Aero-Fin, Trane, Ventrol, Coilmaster

C. All coils shall be certified by the manufacturer to comply with ARI standard 410.

1.2 COMPONENTS

A. Hot-Water/Glycol Coils:

1. Tubes: Copper .035” thickness minimum, 5/8” diameter, end bends - .040” thickness forged, .045” bent.
2. Fins: Aluminum .0095” thickness minimum. Coil fin spacing shall be equal to or less than 11 fpi.
3. Headers: Copper or non-ferrous metal.
4. Frames: Galvanized or stainless steel.
5. Casing: 16 gauge minimum galvanized or stainless steel.
6. Face-and-Bypass Damper Arrangement: Horizontal or Vertical tubes.
7. Drain and vents: ½” diameter female pipe thread (FPT) connections. Drain and vent connections to be extended outside AHU frame. Drain and vent connections shall be piped with full ported ball valve and hose bibs for drain. All piping shall be copper or non-ferrous metal. Drain to be at lowest level for full drainage of tubes and distribution header.
8. Support rack: stainless, galvanized steel or aluminum. Coils installed in an AHU shall be individually supported by a rack system. This rack shall allow any one coil to be removed through the unit casing normal to the direction of airflow without disturbing any other coil. Coils stacked one on top of another will not be accepted. If coils can not be removed normal to the direction of airflow, other solutions need to be discussed which allow any one coil to be removed without disturbing another coil.
9. Note: size coil capacity for the sliding temperature range of the University District Heating system as applicable provided by EOG. Coils shall be individually circuited to provide the required performance. The use of internal restrictive devices or turbulators to obtain turbulent flow will not be acceptable. Each coil is to have individual ball shutoff valves to isolate coil on supply and return. These valves are separate from the balance valves on each coil.
10. Coils shall be pressure tested to 250 psig under water and shall be guaranteed for 200 psig working pressure.

B. Chilled-Water Coils:

1. Tubes: Copper .035” thickness minimum, 5/8” diameter, end bends - .040” thickness forged, .045” bent.
2. Fins: Aluminum .0095” thickness minimum. Coil fin spacing shall be equal to or less than 11 fpi. Coils shall be maximum of (8) rows deep. Coils over (8) rows deep shall be separated into multiple banks.
3. Recommended for mixed air AHUs and required for 100% outside air AHUs – Coil will have a flexible epoxy polymer ElectroFin coating applied to all coil surface areas. Coils subjected to ultraviolet (UV) exposure will receive a spray applied UV-resistant urethane mastic topcoat to prevent UV degradation of epoxy e-coat film.
5. Coil to be selected based on the minimum sizes scheduled; maximum head pressure loss of 25 ft water.
6. Headers: Copper or non-ferrous metal.
8. Support rack: stainless steel. Coils installed in an AHU shall be individually supported by a rack system. This rack shall allow any one coil to be removed through the unit casing normal to the direction of airflow without disturbing any other coil. Coils stacked one on top of another will not be accepted. If coils can not be removed normal to the direction of airflow, other solutions need to be discussed which allow any one coil to be removed without disturbing another coil.
9. Drain and vents: ½” diameter FPT connections. Drain and vent connections to be extended outside AHU frame. Drain and vent connections shall be piped with full ported ball valve and hose bibs for drain. All piping shall be non-ferrous metals. Drain to be at lowest level for full drainage of tubes and distribution header.
10. Coils shall be individually circuited to provide the required performance. The use of internal restrictive devices or turbulators to obtain turbulent flow will not be acceptable. Recommended flow through the coil should be between 1 to 6 fps to maintain turbulent flow.
11. Each coil to have individual ball shutoff valves to isolate coil on supply and return. These valves are separate from the balance valves on each coil.
12. Coils shall be pressure tested to 250 psig under water and shall be guaranteed for 200 psig working pressure.
13. Each coil shall include a sloped, positive-draining stainless steel condensate pan. Coils shall be set slightly above pan for ease of removal. Intermediate condensate pan shall be minimum 1 ½” deep and extend at least 6” downstream of coil face. Each drain pan shall be individually piped down to a sloped sump section in the unit base; extending at least 3” upstream and at least 18” downstream of the coil face. Drain pan to be provided with 1-1/2”flush drain connection to remove condensate. Unit manufacturer shall assure no moisture carryover from coils at design conditions.
14. Maximum coil face velocity shall be 500 fpm. Preferred face velocity is 400 fpm or lower.
15. Coils designed for 44 degree Fahrenheit entering water temperature (EWT) and a minimum leaving water temperature (LWT) of 60 degrees, a 16 degree delta T.
16. Re-heater coils shall have stainless steel Frame/casing – These coil systems are located after cooling coils of “blow through”, higher pressure fan systems, where fans are upstream of cooling coils and not downstream of coils. The “re-heater coil” systems raise discharge air temperature above dew point avoiding condensing in air stream of ductwork and/or post filter banks.

C. Steam Coils:

1. Tubes: Copper .035” thickness minimum, 5/8” diameter, end bends - .040” thickness forged, .045” bent.
2. Fins: Aluminum .0095” thickness minimum. Coil fin spacing shall be equal to or less than 11 fpi.
3. Headers: Copper or non-ferrous metal.
4. Tube Type:
   a. Standard single tube for temperatures above 40 deg F.
   b. “Non-freeze” tube within a tube for air temperatures below 40 deg F.
5. Frames: Galvanized or stainless steel.
6. Face-and-Bypass Damper Arrangement: Horizontal or Vertical tubes
7. Pre-Heating coil system – the “clam shell” type pre-heating coil system not acceptable.
8. Acceptable preheating systems are:
   a. Steam heating coils with sequenced control valves (1/3 – 2/3, ½ - ½, or multiple coils and respective control valve arrangement).
   b. Steam heating coils with face and bypass air flow arrangement.
9. Coils shall be pressure tested to 250 psig under water and shall be guaranteed for 200 psig working pressure.
D. Refrigerant Coils:

1. Tubes: Copper.
2. Fins: Aluminum.
3. Suction and Distributor Piping: Copper tube.
4. Frames: galvanized or stainless steel.
5. Shall have distributing header for each coil and a suction header so that every tube in coil circuit is supplied with an equal amount of refrigerant.
6. Coils shall be designed for 250 psig working pressure and factory tested at 300 psi under water.