238216  COILS

PART 1:  GENERAL

1.01  RELATED SECTIONS

A.  Section 230000 – Basic HVAC Requirements
B.  Section 230500 – HVAC Basic Materials and Methods
C.  Section 230523 – Valves
D.  Section 230510 – Chilled Water System
E.  Section 230520 – Heat Generation
F.  Section 232300 – Refrigeration
G.  Section 237300 – Air Handling
H.  Section 230900 – Building Automation and Control System Guidelines

1.02  RELATED STANDARD DETAILS

A.  Detail 3.1.5, Air Handling Unit Chilled Water Coil Piping Detail
B.  Detail 3.2.4, Steam Coil Piping Detail
C.  Detail 3.3.3, Direct Expansion Refrigeration Coil Piping Detail
D.  Detail 3.4.1, Fan Coil Unit and Reheat Coil Piping Detail
E.  Detail 3.4.7, Air Handling Unit Heating Coil Piping Detail
F.  Detail 3.4.8, Air Handling Unit Glycol Coil Piping Detail

1.03  GENERAL

A.  Coils for all air-handling units shall be selected to maximize temperature rise and subsequent capacity while minimizing the waterside and airside pressure losses.

B.  Maximum coil face air velocities shall be as follows:

1.  Chilled water and Direct Expansion cooling coils – 475 fpm
2. Hot water or steam – 700 fpm

C. Typically, heating coils shall be 40% propylene glycol (for preheat) or hot water (for heating and reheat). Steam coils shall not be used. Temperature control shall be by a modulating control valve, not face and bypass dampers.

D. All coils shall incorporate an air-water counter flow piping arrangement.

E. All coils shall employ ½-inch minimum connections for ball valve air vents and drains at the top and bottom of each header.

F. Cast iron headers are not acceptable on any coils.

G. All coils shall have copper tubes and return bends with a minimum thickness of 0.035-inches. Standard tubing wall thickness of 0.020-inches is acceptable for the following:
   1. Standard fan coil units in the 200-1200 cfm capacity range
   2. Standard manufacturer provided reheat coils associated with Variable Air Volume boxes

H. Fin spacing should not exceed 12 FPI. Fin spacing of 10 FPI or less is preferred.

I. All coils shall be certified by the manufacturer to comply with all requirements of ARI Standard 410.

1.04 DESIGN GUIDELINES

A. Drawings: All coil schedules shall, as a minimum, include the following information:

   1. Entering/leaving air conditions (DB/WB)
   2. Entering/leaving water conditions (˚F)
   3. Air pressure drop (in wc)
   4. Water pressure drop (ft wc)
   5. Air volume (CFM)
   6. Water flow (GPM)
   7. Fin Spacing (FPI/FPF)
   8. Rows

PART 2: PRODUCTS

2.01 PREFERRED MANUFACTURERS

A. Aerofin
B. Carrier
C. McQuay
D. Temtrol
E. Trane
F. Heatcraft

2.02 AIR HANDLING UNIT COILS

A. General

1. Fins: Construct of continuous aluminum or copper configured plate-fin type with full fin collars for accurate spacing and maximum fin-tube contact. Fin spacing shall be 12 fins per inch maximum.

2. Casings: Construct of 16-ga. 304 stainless steel for coil heights 33-inches and smaller; 14-ga. stainless steel for coil heights over 33-inches. Provide formed end supports and top and bottom channels. Provide 16-ga. stainless steel center tube support for coil lengths 42 to 96 inches, two or more supports for coil lengths over 96".

3. Tubes: Construct of seamless copper tubing, expanded into fin collars for permanent fin-tube bond and expanded into header for permanent leak-tight joint. Tubes shall be arranged in staggered pattern with respect to airflow.

4. Connections: Grooved connections (i.e., Victaulic) are not acceptable on hot water and steam coils.

5. Testing: All water, steam and DX coils shall meet or exceed ASME Requirements for burst and maximum operating pressures.

6. U-Bends: Construct of copper tubes, machine die-formed on each end to provide an accurate fit for silver brazed joints.

7. Air Bypass Barrier: Provide foam seals around the coil to prevent air bypass between casing and coil.

B. Hot Water Heating Coils:


C. Steam Heating Coils:
   1. Headers: Provide Schedule 40 steel or non-ferrous construction.

D. Chilled Water Cooling Coils:
   1. Chilled water coils are to be selected with an entering water temperature of 47˚F.
   2. Chilled water coils in central station air handlers shall be sized for a water temperature rise as great as practical, typically a minimum of 15 °F; and a 20 °F rise should be investigated for each load. Coils shall have a minimum of six (6) rows. The designer should investigate larger coil face areas in addition to additional rows to improve temperature rise and reduce coil air pressure drops.
   3. Tubes: Construct of minimum 5/8-inch thick copper tubing. Coils shall be drainable with non-trapping circuits. All coils shall have non-ferrous tubing.
   5. Frames and blank-off spacers between coil and frame housing shall be stainless steel. Use stainless steel hardware to fasten blank-offs and frames.
   6. Cooling coils stacked one above another shall incorporate drip troughs on the downstream side of each of the upper coils to eliminate drip into the air stream of the bottom coil. Drip troughs shall be sloped to allow for proper drainage.

2.03 FAN COIL UNIT COILS

A. Chilled water coils in terminal fan coil units should be selected for a water temperature rise as great as practical, typically a minimum of 10 °F. Low flow coils should be specified, with a minimum of four (4) rows. Fan coils over 1,000 CFM shall have a minimum of six (6) rows.