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The Description of the Project
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SPECIFICATION DIVISION 23

NUMBER SECTION DESCRIPTION

DIVISION 23 HEATING, VENTILATING AND AIR CONDITIONING (HVAC)
SECTION 238216 - COILS AND DRAIN PANS

END OF CONTENTS TABLE

DIVISION 23 HEATING, VENTILATING AND AIR CONDITIONING (HVAC)
SECTION 238216 - COILS AND DRAIN PANS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, Standard General and Supplementary General Conditions, Division 1 Specification Sections, and other applicable Specification Sections including the Related Sections listed below, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Coils and drain pans for all purposes, unless specified in other specification sections as part of a manufactured unit or assembly.

1.3 SUBMITTALS

A. Submit the following product data for approval, for each unit.:

1. Certified coil-performance ratings with all system operating conditions indicated.
2. Coil performance data substantiated by computer generated output data.
3. Coil materials of construction including headers, frames, and coil tracks, number of rows, fin spacing, fin types, and any heat transfer enhancements.
4. Details of coil supports for stacked coils.
5. Details and materials of cooling coil condensate collection drain pans and drain piping.
6. Coil anti-corrosion coating material data sheets.

1.4 QUALITY ASSURANCE

A. Manufacturers and Products: The products and manufacturers specified in this Section establish the standard of quality for the Work. Subject to compliance with all requirements, provide specified products from the manufacturers named in Part 2.

B. Reference Standards: Products in this section shall be built, tested, and installed in compliance with the following quality assurance standards; latest editions, unless noted otherwise.

1. AHRI Standard 410 Forced-Circulation Air Cooling and Air Heating Coils.
2. ANSI/ASHRAE Standard 62.1 Ventilation for Acceptable Indoor Air Quality.

1.5 WARRANTY

A. Provide a complete parts and labor warranty for a minimum of one year from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. Trane, a business of Ingersoll Rand
2. York by Johnson Controls
3. Daikin Applied
4. Aerofin
5. Marlo DRS Technologies, Inc.
6. Modine - Heatcraft Coils
7. Precision Coil
8. USA Coil & Air
9. Nortek
10. Coil Masters
11. Great American Coils
12. RAE Coils
13. Super Radiator Coils

2.2 GENERAL COIL INFORMATION

A. Coil Tubes: Copper, minimum 5/8 in. diameter, minimum 0.020 in. tube wall thickness.

B. Coil Fins: Aluminum, plate type, minimum 0.0095 in. thickness.

C. Coil Header and Connection Materials: Seamless copper with extruded tube holes to permit expansion and contraction without creating undue stress or strain. Copper connections.

D. Coil Configuration: A maximum of 6 rows (8 rows for hospital projects) and a maximum of 10 fins per in.

E. Brazed joints.

F. Fins shall consist of corrugated aluminum plates with full fin collars for accurate spacing and maximum fin/tube contact. Fins shall have no openings punched on them to accumulate lint or dirt. Tubes mechanically expanded into fins to provide a continuous primary to secondary compression bond over the entire finned length for maximum heat transfer rates. Tubes that have been expanded through use of hydraulic methods are not acceptable.

G. Casing and Tube Supports: Construct with bolt holes for mounting at approximately 8-in. centers. Minimum 16 gauge, reinforced flange type, constructed to support the coil properly without sagging, racking, or stressing coil tubes. Provide heavier gauge casings and additional reinforcement where required to properly support stacked coils.

H. Coil manufacturer shall select the coil based on the most efficient coil circuiting. All coil circuits shall be of equal pressure drop. All coils shall be counter-flow configuration. Coils shall achieve uniform leaving air temperature across entire coil face. Use of internal restrictive devices to obtain turbulent flow is not acceptable. Coil performance shall be substantiated by computer generated output data.

I. Circuit coils to facilitate air venting and draining when installed level and plumb, and for service without removing individual plugs from each tube. Provide coils with same end connections, unless indicated otherwise. Provide vent and drain connections on the coil header.

J. Provide a foam strip seal located between casing channels and fins along top and bottom to prevent air bypass and water carryover.

K. Factory label inlet, outlet, vent, and drain connections.

L. Coil inlet, outlet, vent, and drain connections shall not penetrate drain pans. Configure coil and mounting arrangement accordingly.

M. Provide anti-corrosion coating for coils mounted in corrosive air streams, such as those mounted in lab exhaust heat recovery systems. Provide a coating type that will protect against the specific corrosives in the air stream. Coil coating subject to Owner and Engineer review, approval, or modification.

2.3 WATER COILS

A. Hot Water Coil Casings: Galvanized steel.

B. Chilled Water Coil Casings: Stainless steel.

C. Face velocities across chilled water coils shall not exceed 500 FPM.

D. Connection Type:

1. Sizes up to and including 2 in.: Soldered, screwed, or flanged type. Give consideration to equipment installation conditions when selecting connection type.
2. Sizes greater than 2 in.: Flanged connections.

E. Water Coil working pressure and temperature: 200 psig/220 deg. F.

2.4 DIRECT EXPANSION COILS

A. Face velocities across DX coils shall not exceed 500 FPM.

B. Dehydrate and seal with a dry nitrogen charge before shipment.

C. Evaporator coil connections: Male sweat type.

D. Liquid piping connections: Brass.

E. Suction piping connections: Copper.

F. Use interlaced tube configuration in VAV applications.

G. Direct expansion coil working pressure: 300 psig.

2.5 STEAM COILS

A. One row, steam distributing tube-in-tube type, with 1-in. diameter outside tubes and 5/8-in. diameter inside tubes; same or opposite end connections as required. Uniform leaving-air distribution temperature with maximum 4 deg. F temperature difference between leaving air from any lengthwise quadrant of coil area (based on nine or more equal area temperature readings in any given quadrant) and average leaving air temperature over entire coil face area. Dieform distributor tubes. Orifices shall discharge steam in the direction of condensate flow. Tubes shall be located concentrically within condensing tubes with corrosion resistant support clips. Provide steam deflectors opposite the supply connection, to prevent impingement of steam into tubes in connection area.

1. 100 percent outside air steam coils with finned length greater than 48 inches: Provide vertical tubes; 1-in. diameter outside tubes and 5/8-in. diameter inside tubes.

B. Steam coil working pressure and temperature: 100 psig/400 deg. F.

2.6 DRAIN PANS

A. Provide a drain pan under each cooling coil, and where indicated. Provide intermediate drain pans at each level of stacked coils. Drain pans shall capture all condensate from coil assembly; including pipe header, pipe return bends, upstream run-off, and downstream carryover.

B. Drain Pan Construction: 304 stainless steel, self-supporting, sloped in two directions minimum, leak-tight with welded seams. Design, fabricate and install to prevent standing water.

C. For coils mounted in 100 percent outside air units, insulate the bottom of intermediate drains pans with 3/8-in.-thick flexible closed cell elastomeric insulation, with the upstream edge protected by a stainless steel angle.

D. Provide rigidly supported, leak tight copper downcomer drains from each intermediate pan to pan below.

E. Above Floor Bottom Pan: Minimum 16 gauge construction. Insulate between pan and floor with 1/2 in. thick flexible closed cell elastomeric insulation. Provide threaded outlet at pan low point. Bottom drain pan shall extend to end of coil section. Minimum of 18" is required.

F. Flexible Closed Cell Elastomeric Drain Pan Insulation: Armacell-Armaflex or equivalent. Composite flame spread / smoke density not to exceed 25/50. Fully adhere to the pan bottom with insulation manufacturer's recommended adhesive.

2.7 SOURCE QUALITY CONTROL

A. Factory test all coils.

B. Proof test all water and steam coils to 300-psig minimum, and leak test to 200 psig, minimum.

C. Proof test all direct expansion coils to 450 psig minimum, and leak test to 300 psig, minimum.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install coil assemblies in accordance with details, other specifications sections, approved submittals, and the coil manufacturer's installation requirements and recommendations.

B. Install coils level and plumb.

C. Use fin combs to restore bent fins to upright condition.

D. Block (safe) gaps around coil casings to prevent air flow bypass. Use sheet metal matching the coil casing material, secured with sheet metal screws. Close minor gaps with gasketing and sealants. All safing to match adjacent construction.

E. Clean coils using materials and methods recommended by manufacturers, to remove dust and debris

3.2 COMMISSIONING

A. Perform the commissioning activities as outlined in the Division 01 Section Commissioning and other requirements of the Contract Documents.

END OF SECTION 238216