

## PART 1 – GENERAL

### 1.1 RELATED DOCUMENTS

- A. Drawings and Divisions 00 and 01, apply to this Section.
- B. Related Sections:
  - 1. Division 23.

### 1.2 SUMMARY

- A. This Section includes the following types of air coils that are not an integral part of air-handling units:
  - 1. Hot-water.
  - 2. Chilled-water.
  - 3. Steam.
  - 4. Refrigerant.
  - 5. Electric.

### 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. Shop Drawings: Diagram power, signal, and control wiring.
- C. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which coil location and ceiling-mounted access panels are shown and coordinated with each other.
- D. Field quality-control test reports.
- E. Operation and Maintenance Data: For air coils to include in operation and maintenance manuals.

### 1.4 CODES AND STANDARDS

- A. Codes and Standards shall be the current version adopted by the Authority Having Jurisdiction.

### 1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

### 1.6 PROJECT CONDITIONS

- A. Altitude above Mean Sea Level: <Insert feet.>

## PART 2 – PRODUCTS

### 2.1 WATER COILS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- C. Basis-of-Design Product: Subject to compliance with requirements, provide [the product indicated on Drawings] <Insert manufacturer's name; product name or designation> or a comparable product by one of the following:
  - 1. Aerofin Corporation.
  - 2. Carrier Corporation.
  - 3. Coil Company, LLC.
  - 4. Dunham-Bush, Inc.
  - 5. Heatcraft Refrigeration Products LLC; Heat Transfer Division.
  - 6. Super Radiator Coils.
  - 7. Trane.
  - 8. USA Coil & Air.
  - 9. <Insert manufacturer's name.>
  - 10. Or Approved Equal.
- D. Performance Ratings: Tested and rated according to ARI 410 and ASHRAE 33.
- E. Minimum Working-Pressure/Temperature Ratings: 200 psig, 325 deg F.
- F. Source Quality Control: Factory tested to 300 psig.
- G. Tubes: ASTM B 743 copper, minimum [0.020 inch] [0.035 inch] [0.049 inch] <Insert size> thick.
- H. Fins: [Aluminum] [Copper], minimum [0.006 inch] [0.010 inch] <Insert size> thick.
- I. Headers: [Cast iron with drain and air vent tappings] [Cast iron with cleaning plugs, and drain and air vent tappings] [Seamless copper tube with brazed joints, prime coated] [Steel with brazed joints, prime coated].
- J. Frames: Galvanized-steel channel frame, minimum [0.052 inch] [0.064 inch] [0.079 inch] [0.0625 inch] thick for [slip-in] [flanged] mounting.
- K. Frames: ASTM A 666, Type [304] [316] stainless steel, minimum 0.0625 inch thick for [slip-in] [flanged] mounting.
- L. Hot-Water Coil and Steam Coil, Face-and-Bypass Dampers: Alternating arrangement of coil segments and dampers.
  - 1. Coil Configuration: [Horizontal] [Vertical] tubes.
  - 2. Dampers: [Extruded-aluminum] [Galvanized-steel] blades with edge and end seals; full-length drive rod and mount for actuator [in] [outside] the airstream.
- M. Hot-Water Coil Capacities and Characteristics:

1. Coil Face Dimensions:
    - a. Finned Length: <Insert inches.>
    - b. Finned Width: <Insert inches.>
  2. Minimum Fin Spacing: [0.125 inch] [0.091 inch] [0.071 inch] [0.067 inch] [0.056 inch] [0.0075 inch] <Insert spacing>.
  3. Tube Diameter: [0.625 inch] [0.50 inch] [0.375 inch] [0.75 inch] [1.0 inch] <Insert diameter>.
  4. Number of Rows: <Insert number.>
  5. Serpentine: [Single] [Half] [Full].
  6. Mounting: [Slip in] [Flanged].
  7. Coating: [Baked phenolic] [Cathodic epoxy e-coat].
  8. Air Side:
    - a. Flow Rate: <Insert cfm.>
    - b. Finned Area Face Velocity: <Insert fpm.>
    - c. Static Pressure Drop: <Insert inches wg.>
    - d. Total Capacity: <Insert Btu/h.>
    - e. Entering Temperature: <Insert deg F.>
    - f. Leaving Temperature: <Insert deg F.>
  9. Water Side:
    - a. Flow Rate: <Insert gpm.>
    - b. Tube Velocity: <Insert fpm.>
    - c. Glycol Type: [Ethylene] [Propylene].
    - d. Aqueous Glycol Solution Concentration: <Insert percentage.>
    - e. Pressure Drop: <Insert feet.>
    - f. Entering Temperature: <Insert deg F.>
    - g. Leaving Temperature: <Insert deg F.>
- N. Chilled-Water Coil Capacities and Characteristics:
1. Coil Face Dimensions:
    - a. Finned Length: <Insert inches.>
    - b. Finned Width: <Insert inches.>
  2. Minimum Fin Spacing: [0.125 inch] [0.091 inch] [0.071 inch] [0.067 inch] [0.056 inch] [0.0075 inch] <Insert spacing>.
  3. Tube Diameter: [0.625 inch] [0.50 inch] [0.375 inch] [0.75 inch] [1.0 inch] <Insert diameter>.
  4. Number of Rows: <Insert number.>
  5. Serpentine: [Half] [Single] [Double].
  6. Mounting: [Slip in] [Flanged].
  7. Coating: [Baked phenolic] [Cathodic epoxy e-coat].
  8. Air Side:
    - a. Flow Rate: <Insert cfm.>
    - b. Finned Area Face Velocity: <Insert fpm.>
    - c. Static Pressure Drop: <Insert inches wg.>
    - d. Total Capacity: <Insert Btu/h.>
    - e. Sensible Capacity: <Insert Btu/h.>

- f. Entering Dry-Bulb Temperature: <Insert deg F.>
- g. Entering Wet-Bulb Temperature: <Insert deg F.>
- h. Leaving Dry-Bulb Temperature: <Insert deg F.>
- i. Leaving Wet-Bulb Temperature: <Insert deg F.>

9. Water Side:

- a. Flow Rate: <Insert gpm.>
- b. Tube Velocity: <Insert fpm.>
- c. Glycol Type: [Ethylene] [Propylene].
- d. Aqueous Glycol Solution Concentration: <Insert percentage.>
- e. Pressure Drop: <Insert feet.>
- f. Entering Temperature: <Insert deg F.>
- g. Leaving Temperature: <Insert deg F.>

2.2 STEAM COILS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- C. Basis-of-Design Product: Subject to compliance with requirements, provide [the product indicated on Drawings] <Insert manufacturer's name; product name or designation> or a comparable product by one of the following:
  - 1. Aerofin Corporation.
  - 2. Carrier Corporation.
  - 3. Coil Company, LLC.
  - 4. Dunham-Bush, Inc.
  - 5. Heatcraft Refrigeration Products LLC; Heat Transfer Division.
  - 6. Super Radiator Coils.
  - 7. Trane.
  - 8. USA Coil & Air.
  - 9. <Insert manufacturer's name.>
  - 10. Or Approved Equal.
- D. Performance Ratings: Tested and rated according to ARI 410 and ASHRAE 33.
- E. Minimum Working-Pressure/Temperature Ratings: 100 psig, 400 deg F.
- F. Source Quality Control: Factory tested to 300 psig.
- G. Tubes: ASTM B 743 copper, minimum [0.025 inch] [0.035 inch] [0.049 inch] <Insert size> thick.
- H. Fins: [Aluminum] [Copper], minimum [0.006 inch] [0.010 inch] <Insert size> thick.
- I. Headers: [Cast iron with drain and air vent tappings] [Cast iron with cleaning plugs, and drain and air vent tappings] [Seamless copper tube with brazed joints, prime coated] [Steel with brazed joints, prime coated].
- J. Tube Type: Single or distributing as indicated.

- K. Frames: Galvanized-steel channel frame, minimum [0.052 inch] [0.064 inch] [0.079 inch] [0.0625 inch] thick for [slip-in] [flanged] mounting.
- L. Frames: ASTM A 666, Type [304] [316] stainless steel, minimum 0.0625 inch thick for [slip-in] [flanged] mounting.
- M. Face-and-Bypass Dampers: Alternating arrangement of coil segments and dampers.
  - 1. Coil Configuration: [Horizontal] [Vertical] tubes.
  - 2. Dampers: [Extruded-aluminum] [Galvanized-steel] blades with edge and end seals; full-length drive rod and mount for actuator [in] [outside] the airstream.
- N. Capacities and Characteristics:
  - 1. Coil Face Dimensions:
    - a. Finned Length: <Insert inches.>
    - b. Finned Width: <Insert inches.>
  - 2. Minimum Fin Spacing: [0.125 inch] [0.091 inch] [0.071 inch] [0.067 inch] [0.056 inch] [0.0075 inch] <Insert spacing>.
  - 3. Tube Diameter: [0.625 inch] [0.50 inch] [0.375 inch] [0.75 inch] [1.0 inch] <Insert diameter>.
  - 4. Number of Rows: <Insert number.>
  - 5. Mounting: [Slip in] [Flanged].
  - 6. Air Side:
    - a. Flow Rate: <Insert cfm.>
    - b. Finned Area Face Velocity: <Insert fpm.>
    - c. Static Pressure Drop: <Insert inches wg.>
    - d. Total Capacity: <Insert Btu/h.>
    - e. Entering Temperature: <Insert deg F.>
    - f. Leaving Temperature: <Insert deg F.>
  - 7. Steam Side:
    - a. Inlet Pressure: <Insert psig.>
    - b. Tube Type: [Single] [Distributing].
    - c. Condensing Capacity: <Insert lb./h.>

## 2.3 REFRIGERANT COILS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- C. Basis-of-Design Product: Subject to compliance with requirements, provide [the product indicated on Drawings] <Insert manufacturer's name; product name or designation> or a comparable product by one of the following:
  - 1. Aerofin Corporation.
  - 2. Carrier Corporation.

3. Coil Company, LLC.
  4. Dunham-Bush, Inc.
  5. Heatcraft Refrigeration Products LLC; Heat Transfer Division.
  6. Lennox Industries Inc.
  7. Super Radiator Coils.
  8. Trane.
  9. USA Coil & Air.
  10. <Insert manufacturer's name.>
  11. Or Approved Equal.
- D. Performance Ratings: Tested and rated according to ARI 410 and ASHRAE 33.
- E. Minimum Working-Pressure Rating: 300 psig.
- F. Source Quality Control: Factory tested to 450 psig.
- G. Tubes: ASTM B 743 copper, minimum [0.020 inch] [0.035 inch] [0.049 inch] <Insert size> thick.
- H. Fins: [Aluminum] [Copper], minimum [0.006 inch] [0.010 inch] <Insert size> thick.
- I. Suction and Distributor Piping: ASTM B 88, Type L copper tube with brazed joints.
- J. Frames: Galvanized-steel channel frame, minimum [0.052 inch] [0.064 inch] [0.079 inch] [0.0625 inch] thick for [slip-in] [flanged] mounting.
- K. Frames: ASTM A 666, Type [304] [316] stainless steel, minimum 0.0625 inch thick for [slip-in] [flanged] mounting.
- L. Capacities and Characteristics:
1. Coil Face Dimensions:
    - a. Finned Length: <Insert inches.>
    - b. Finned Width: <Insert inches.>
  2. Minimum Fin Spacing: [0.125 inch] [0.091 inch] [0.071 inch] [0.067 inch] [0.056 inch] [0.0075 inch] <Insert spacing>.
  3. Tube Diameter: [0.625 inch] [0.50 inch] [0.375 inch] [0.75 inch] [1.0 inch] <Insert diameter>.
  4. Number of Rows: <Insert number.>
  5. Coil Split: [Row] [Face] [Interlaced].
  6. Mounting: [Slip in] [Flanged].
  7. Coating: [Baked phenolic] [Cathodic epoxy e-coat].
  8. Air Side:
    - a. Flow Rate: <Insert cfm.>
    - b. Finned Area Face Velocity: <Insert fpm.>
    - c. Static Pressure Drop: <Insert inches wg.>
    - d. Total Capacity: <Insert Btu/h.>
    - e. Sensible Capacity: <Insert Btu/h.>
    - f. Entering Dry-Bulb Temperature: <Insert deg F.>
    - g. Entering Wet-Bulb Temperature: <Insert deg F.>
    - h. Leaving Dry-Bulb Temperature: <Insert deg F.>

- i. Leaving Wet-Bulb Temperature: <Insert deg F.>
- 9. Refrigerant Side:
  - a. Refrigerant Type: <Insert type.>
  - b. Saturated Suction Temperature: <Insert deg F.>

## 2.4 ELECTRIC COILS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- C. Basis-of-Design Product: Subject to compliance with requirements, provide [the product indicated on Drawings] <Insert manufacturer's name; product name or designation> or a comparable product by one of the following:
  - 1. Brasch Manufacturing Co., Inc.
  - 2. Chromalox, Inc., Wiegand Industrial Division; Emerson Electric Company.
  - 3. Dunham-Bush, Inc.
  - 4. INDEECO.
  - 5. Trane.
  - 6. <Insert manufacturer's name.>
  - 7. Or Approved Equal.
- D. Coil Assembly: Comply with UL 1995.
- E. Heating Elements: Coiled resistance wire of 80 percent nickel and 20 percent chromium; surrounded by compacted magnesium-oxide powder in tubular-steel sheath; with spiral-wound, copper-plated, steel fins continuously brazed to sheath.
- F. Heating Elements: Open-coil resistance wire of 80 percent nickel and 20 percent chromium, supported and insulated by floating ceramic bushings recessed into casing openings, and fastened to supporting brackets.
- G. High-Temperature Coil Protection: Disk-type, automatically reset, thermal-cutout, safety device; serviceable through terminal box without removing heater from duct or casing.
  - 1. Secondary Protection: Load-carrying, manually reset or manually replaceable, thermal cutouts; factory wired in series with each heater stage.
- H. Frames: Galvanized-steel channel frame, minimum [0.052 inch] [0.064 inch] [0.079 inch] [0.0625 inch] thick for [slip-in] [flanged] mounting.
- I. Control Panel: [Unit] [Remote] mounted with disconnecting means and overcurrent protection. Include the following controls:
  - 1. Magnetic contactor.
  - 2. Mercury contactor.
  - 3. Toggle switches; one per step.
  - 4. Step controller.
  - 5. Time-delay relay.

6. Pilot lights; one per step.
7. Airflow proving switch.
- J. Refer to Division 23 Section "Instrumentation and Control for HVAC" for thermostat.
- K. Thermostats: Wall-mounted thermostats, with temperature range from 50 to 90 deg F, and 2.5 deg F throttling range.
- L. Capacities and Characteristics:
  1. Coil Face Dimensions:
    - a. Length: <Insert inches.>
    - b. Height: <Insert inches.>
  2. Mounting: [Slip in] [Flanged].
  3. Air Side:
    - a. Flow Rate: <Insert cfm.>
    - b. Face Velocity: <Insert fpm.>
    - c. Static Pressure Drop: <Insert inches wg.>
    - d. Total Capacity: <Insert Btu/h.>
    - e. Entering Temperature: <Insert deg F.>
  4. Leaving Temperature: <Insert deg F.>
    - a. Electrical Characteristics:
    - b. Capacity: <Insert kW.>
    - c. Number of Steps: <Insert number.>
    - d. Volts: <Insert value.>
    - e. Phase: <Insert value.>
    - f. Hertz: <Insert value.>
    - g. Full-Load Amperes: <Insert value.>
    - h. Minimum Circuit Ampacity: <Insert value.>
    - i. Maximum Overcurrent Protection: <Insert amperage.>

## 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 coils level and plumb.
- B. Install coils in metal ducts and casings constructed according to SMACNA's "HVAC Duct Construction Standards, Metal and Flexible."



- C. Install [galvanized] [stainless]-steel drain pan under each cooling coil.
  - 1. Construct drain pans according to ASHRAE 62.
  - 2. Construct drain pans to extend beyond coil length and width and to connect to condensate trap and drainage.
  - 3. Extend drain pan upstream and downstream from coil face.
  - 4. Extend drain pan under coil headers and exposed supply piping.
- D. Install moisture eliminators for cooling coils. Extend drain pan under moisture eliminator.
- E. Straighten bent fins on air coils.
- F. Clean coils using materials and methods recommended in writing by manufacturers, and clean inside of casings and enclosures to remove dust and debris.

### 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.
- 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."
- 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."
- E. Connect refrigerant piping according to Division 23 Section "Refrigerant Piping."
- F. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- G. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

### 3.4 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
  - 1. Operational Test: After electrical circuitry has been energized, operate electric coils to confirm proper unit operation.
  - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

**END OF SECTION**