SECTION 232216 - STEAM AND CONDENSATE HEATING PIPING SPECIALTIES

Revise this Section by deleting and inserting text to meet Project-specific requirements.

1. GENERAL
   * + 1. RELATED DOCUMENTS
          1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
       2. SUMMARY
          1. Section Includes:

Strainers.

Flash tanks.

Stop-check valves.

Steam safety valves.

Pressure-reducing valves.

Steam traps.

Thermostatic air vents and vacuum breakers.

Flexible connectors.

Steam meters.

Condensate meters.

* + - 1. ACTION SUBMITTALS
         1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
         4. Product Data: For each type of product

Strainer.

Flash tank.

Valve.

Steam trap.

Air vent and vacuum breaker.

Connector.

Meter.

* + - 1. CLOSEOUT SUBMITTALS
         1. Operation and Maintenance Data: For valves, safety valves, pressure-reducing valves, steam traps, air vents, vacuum breakers, and meters to include in emergency, operation, and maintenance manuals.
      2. QUALITY ASSURANCE
         1. Pipe Welding: Qualify procedures and operators according to the following:

ASME Compliance: Safety valves and pressure vessels shall bear the appropriate ASME label. Fabricate and stamp flash tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

1. PRODUCTS

Manufacturers and products listed in SpecAgent and MasterWorks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications.

* + - 1. PERFORMANCE REQUIREMENTS

Performance requirements in this article are for the piping system. Individual components may have higher pressure or temperature ratings.

* + - * 1. Components and installation shall be capable of withstanding the following minimum working pressures and temperatures unless otherwise indicated:

Insert minimum working pressure for systems in "HP Steam Piping" and "LP Steam Piping" subparagraphs below.

HP Steam Piping: <**Insert psig**>.

LP Steam Piping: <**Insert psig**>.

Insert or retain minimum working pressure and temperature for systems in "Condensate Piping" and "Makeup-Water Piping" subparagraphs below.

Condensate Piping: <**Insert psig> at [250 deg F] <Insert temperature**>.

Makeup-Water Piping: [**80 psig] [150 psig] <Insert value**> at [**73 deg F] [150 deg F**] <Insert temperature>.

Blowdown-Drain Piping: Equal to pressure of the piping system to which it is attached.

Air-Vent and Vacuum-Breaker Piping: Equal to pressure of the piping system to which it is attached.

Safety-Valve-Inlet and -Outlet Piping: Equal to pressure of the piping system to which it is attached.

* + - 1. STRAINERS
         1. Y-Pattern Strainers, Cast Iron:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Keckley Company.

Mueller Steam Specialty; A WATTS Brand.

Titan Flow Control, Inc.

Approved equivalent.

Body: ASTM A126, Class B cast iron, with bolted cover and bottom drain connection.

End Connections: Threaded ends for strainers NPS 2 and smaller; flanged ends for strainers NPS 2-1/2 and larger.

In "Strainer Screen" subparagraph below, the larger mesh numbers have larger passages, thus allowing larger objects to pass.

Strainer Screen: Stainless steel, [**20] [40] [60] <Insert number**>-mesh strainer or perforated stainless-steel basket.

Tapped blowoff plug.

Rating: 250-psig working steam pressure.

* + - * 1. Y-Pattern Strainers, Stainless Steel:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Keckley Company.

Mueller Steam Specialty; A WATTS Brand.

Titan Flow Control, Inc.

Approved equivalent.

Manufacturers offer varying stainless steel types. Insert stainless steel type in "Body" subparagraph below based on manufacturers.

Body: ASTM A351 <**Insert type**> stainless steel, with bolted cover and bottom drain connection.

End Connections: [**Socket weld**] [**Threaded**] for strainers NPS 2 and smaller; flanged ends for strainers NPS 2-1/2 and larger.

Manufacturers offer varying strainer material types. Insert strainer material type in "Strainer Screen" subparagraph below based on manufacturers.

Strainer Screen: [**1/32 inch] [1/16 inch] <Insert dimension**> perforations in <Insert type> stainless steel strainer screen.

Tapped blowoff plug.

Rating: [**Class 600] <Insert class**> for [socket weld] [threaded]; [Class 150] [Class 300] for flanged.

* + - * 1. Basket Strainers:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Keckley Company.

Mueller Steam Specialty; A WATTS Brand.

Titan Flow Control, Inc.

Approved equivalent.

Body: ASTM A126, Class B cast iron, with bolted cover and bottom drain connection.

End Connections: Threaded ends for strainers NPS 2 and smaller; flanged ends for strainers NPS 2-1/2 and larger.

Strainer Screen: Stainless steel, [**20] <Insert number**>-mesh strainer and perforated stainless steel basket with 50 percent free area.

Rating: 250-psig working steam pressure.

* + - 1. FLASH TANKS
         1. Shop or factory fabricated of welded steel according to ASME Boiler and Pressure Vessel Code for 150-psig rating, and bearing ASME label. Fabricate with tappings for low-pressure steam and condensate outlets, high-pressure condensate inlet, air vent, safety valve, and legs.
      2. STOP-CHECK VALVES
         1. Stop-Check Valves:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Crane; a Crane brand.

Jenkins Valves.

Lunkenheimer Valves.

Approved equivalent.

Body and Bonnet: Malleable iron.

End Connections: Flanged.

Disc: Cylindrical with removable liner and machined seat.

Stem: Brass alloy.

Operator: Outside screw and yoke with cast-iron handwheel.

Packing: PTFE-impregnated packing with two-piece packing gland assembly.

Pressure Class: 250.

* + - 1. STEAM SAFETY VALVES

Valves in first paragraph below are available in NPS 1/2 through NPS 2-1/2 (DN 15 through DN 65).

* + - * 1. [**Bronze] [or] [Brass**] Steam Safety Valves: ASME labeled.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Armstrong International, Inc.

Kunkle Valve.

Spirax Sarco Limited.

Approved equivalent.

Disc Material: Forged copper alloy.

End Connections: Threaded inlet and outlet.

Spring: Fully enclosed steel spring with adjustable pressure range and positive shutoff; factory set and sealed.

Pressure Class: 250.

Drip-Pan Elbow: Cast iron and having threaded inlet and outlet, with threads complying with ASME B1.20.1.

Size and Capacity: As required for equipment according to ASME Boiler and Pressure Vessel Code.

Valves in "Cast-Iron Safety Valves" paragraph below are available in NPS 1-1/2 through NPS 6 (DN 40 through DN 150).

* + - * 1. Cast-Iron Steam Safety Valves: ASME labeled.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Armstrong International, Inc.

Kunkle Valve.

Spirax Sarco Limited.

Approved equivalent.

Disc Material: Forged copper alloy with bronze nozzle.

End Connections: Raised-face flanged inlet and threaded or flanged outlet connections.

Spring: Fully enclosed cadmium-plated steel spring with adjustable pressure range and positive shutoff, factory set and sealed.

Pressure Class: 250.

Drip-Pan Elbow: Cast iron and having threaded inlet, outlet, and drain, with threads complying with ASME B1.20.1.

Exhaust Head: Cast iron and having threaded inlet and drain, with threads complying with ASME B1.20.1.

Size and Capacity: As required for equipment according to ASME Boiler and Pressure Vessel Code.

* + - 1. PRESSURE-REDUCING VALVES
         1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Armstrong International, Inc.

Hoffman Specialty.

Spence Engineering Company, Inc.

Approved equivalent.

If Project has more than one type or size of pressure-reducing valve, delete "Capacities and Characteristics" paragraph below and schedule pressure-reducing valve performance on Drawings.

* + - * 1. Capacities and Characteristics:

Steam Flow Rate: <**Insert lb/h**>.

Inlet Pressure: <**Insert psig**>.

Outlet Set Pressure: <**Insert psig**>.

Pressure Loss (Wide Open): <**Insert psig**>.

* + - * 1. ASME labeled.

Schedule pressure-reducing valves and include size, capacity, minimum length of straight pipe on both sides of valve, and inlet and outlet pressures. Retain pressure-reducing valves to develop no more than 85 dBA at an elevation of 3 feet above adjacent floor and at 3 feet in any direction. Use Schedule 80 minimum for piping inlet and outlet connections to pressure-reducing valves, to achieve the required sound level, or use sound attenuators.

* + - * 1. Size, Capacity, and Pressure Rating: Factory set for inlet and outlet pressures indicated.
        2. Description: Pilot-actuated diaphragm type, with adjustable pressure range and positive shutoff.
        3. Body: Cast iron.
        4. End Connections: Threaded connections for valves NPS 2 and smaller and flanged connections for valves NPS 2-1/2 and larger.
        5. Trim: Hardened stainless steel.
        6. Head and Seat: Replaceable, main head stem guide fitted with flushing and pressure-arresting device cover over pilot diaphragm.
        7. Gaskets: Non-asbestos materials.
      1. STEAM TRAPS
         1. Thermostatic Steam Traps, Bronze:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Armstrong International, Inc.

Hoffman Specialty.

Spirax Sarco Limited.

Approved equivalent.

Body: Bronze angle-pattern body with integral union tailpiece and screw-in cap.

Trap Type: Balanced pressure.

Bellows: Stainless steel or monel.

Head and Seat: Replaceable, hardened stainless steel.

Pressure Class: 125.

* + - * 1. Thermostatic Steam Traps, Stainless Steel:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Armstrong International, Inc.

Nicholson Steam Trap; a Division of Circor International, Inc.

Spirax Sarco Limited.

Approved equivalent.

Body: Type 316L or Type 316 stainless steel.

Trap Type: Balanced pressure.

Bellows: Type 316L or Type 316 stainless steel.

Maximum Operating Pressure: At least **[100 psig] <Insert pressure**> at saturated steam temperature.

* + - * 1. Thermodynamic Steam Traps, Stainless Steel:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Armstrong International, Inc.

Hoffman Specialty.

Spirax Sarco Limited.

Approved equivalent.

In "Body" subparagraph below, each manufacturer offers different stainless steel types. If one particular type is required, coordinate with manufacturers and insert specific type.

Body: <**Insert type**> stainless steel with screw-in cap.

End Connections: [**Threaded] <Insert connection type**>.

In "Disc and Seat" subparagraph below, each manufacturer offers different stainless steel types. If one particular type is required, coordinate with manufacturers and insert specific type.

Disc and Seat: <**Insert type**> stainless steel.

Maximum Operating Pressure: [**600 psig] <Insert pressure**>.

* + - * 1. Float and Thermostatic Steam Traps, Cast Iron:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Armstrong International, Inc.

Hoffman Specialty.

Spirax Sarco Limited.

Approved equivalent.

Body and Bolted Cap: ASTM A126 cast iron.

End Connections: Threaded.

Float Mechanism: Replaceable, stainless steel.

Seat: Hardened stainless steel.

Trap Type: Balanced pressure.

Thermostatic Bellows: Stainless steel or monel.

Thermostatic air vent capable of withstanding 45 deg F of superheat and resisting water hammer without sustaining damage.

Retain "Vacuum Breaker" subparagraph below for optional vacuum breaker.

Vacuum Breaker: Thermostatic with phosphor bronze bellows, and stainless steel cage, valve, and seat.

Maximum Operating Pressure: 125 psig.

* + - * 1. Float and Thermostatic Steam Traps, Stainless Steel:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Armstrong International, Inc.

Spirax Sarco Limited.

Approved equivalent.

In "Body and Bolted Cover," "Float Mechanism," and "Seat" subparagraphs below, each manufacturer offers a different stainless steel type. If a specific type is required, coordinate with manufacturer and insert specific type.

Body and Bolted Cover: <**Insert type**> stainless steel.

End Connections: [**Threaded] <Insert end connection type**>.

Float Mechanism: <**Insert type**> stainless steel.

Seat: <**Insert type**> stainless steel.

Strainer: Integral, stainless steel[, **with blowdown valve**].

Trap Type: Balanced pressure.

Thermostatic air vent.

In "Maximum Operation Pressure" subparagraph below, available pressures vary greatly depending on manufacturer. Insert pressure rating based on manufacturers.

Maximum Operating Pressure: <**Insert pressure**>.

* + - * 1. Inverted Bucket Steam Traps, Cast Iron:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Armstrong International, Inc.

Hoffman Specialty.

Spirax Sarco Limited.

Approved equivalent.

Body and Cap: Cast iron.

End Connections: Threaded.

Head and Seat: Stainless steel.

Valve Retainer, Lever, and Guide Pin Assembly: Stainless steel.

Bucket: Brass or stainless steel.

"Strainer" and "Air Vent" subparagraphs below are optional features for inverted bucket traps.

Strainer: Integral stainless steel inlet strainer within the trap body.

Air Vent: Stainless steel thermostatic vent.

Pressure Rating: 250 psig.

* + - * 1. Inverted Bucket Steam Traps, Stainless Steel:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Armstrong International, Inc.

Nicholson Steam Trap; a Division of Circor International, Inc.

Spirax Sarco Limited.

Approved equivalent.

Body and Cap: <**Insert type**> stainless steel.

End Connections: [**Threaded] <Insert connection type**>.

Head and Seat: Stainless steel.

Valve Retainer, Lever, and Guide Pin Assembly: Stainless steel.

Bucket: Stainless steel.

Strainer: Integral stainless steel inlet strainer within the trap body.

Air Vent: Stainless steel thermostatic vent.

In "Pressure Rating" subparagraph below, first option is minimum temperature capable by products of listed manufacturers. If specific pressure is required, coordinate with manufacturer and insert.

Pressure Rating: Minimum [**200 psig at 450 deg F**] <**Insert pressure at temperature**>.

* + - 1. THERMOSTATIC AIR VENTS AND VACUUM BREAKERS
         1. Thermostatic Air Vents:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Armstrong International, Inc.

Hoffman Specialty.

Spirax Sarco Limited.

Approved equivalent.

Body: Cast iron, bronze, or stainless steel.

End Connections: Threaded.

Float, Valve, and Seat: Stainless steel.

Thermostatic Element: Phosphor bronze bellows in a stainless steel cage.

Pressure Rating: [125 psig] [**300 psig] <Insert value**>.

Maximum Temperature Rating: [**350 deg F] <Insert temperature**>.

* + - * 1. Vacuum Breakers:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Armstrong International, Inc.

Hoffman Specialty.

Spirax Sarco Limited.

Approved equivalent.

Body: Cast iron, bronze, or stainless steel.

End Connections: Threaded.

Sealing Ball, Retainer, Spring, and Screen: Stainless steel.

O-Ring Seal: Ethylene propylene rubber.

Pressure Rating: [**125 psig] [300 psig] <Insert value**>.

Maximum Temperature Rating: [**350 deg F**] <**Insert temperature**>.

* + - 1. FLEXIBLE CONNECTORS
         1. Stainless Steel Bellows, Flexible Connectors:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Hyspan Precision Products, Inc.

Mason Industries, Inc.

Metraflex Company (The).

Approved equivalent.

Body: Stainless steel bellows with woven, flexible, bronze, wire-reinforced, protective jacket.

End Connections: Threaded or flanged to match equipment connected.

Performance: Capable of 3/4-inch misalignment.

CWP Rating: 150 psig.

Maximum Operating Temperature: 250 deg F.

* + - 1. STEAM METERS
         1. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

EMCO Flow Systems.

ISTEC Corporation.

Spirax Sarco Limited.

Approved equivalent.

* + - * 1. Meters shall have a microprocessor to display totalizer flow, flow rate, temperature, pressure, time, and date; alarms for high and low flow rate and temperature.

Computer shall have 4- to 20-mA or 2- to 10-V output for temperature, pressure, and contact closure for flow increments.

Independent timers to store four peak flow rates and total flow.

Interface compatible with central workstation described in Section 230923 "Direct Digital Control (DDC) System for HVAC."

Microprocessor Enclosure: NEMA 250, Type 4.

* + - * 1. Sensor:

Retain one of three subparagraphs below.

Venturi, of [**stainless steel] [carbon steel**] construction, for insertion in pipeline between flanges. At least 10:1 turndown with plus or minus 1 percent accuracy over full-flow range.

Vortex type with stainless steel wetted parts and [**wafer] [flange**] connections; and with a piezoelectric sensor removable and serviceable without shutting down the process. At least 10:1 turndown with plus or minus 1 percent accuracy over full-flow range.

Spring-loaded, variable-area flowmeter type; density compensated with stainless steel wetted parts and [**wafer] [flange**] connections. At least 10:1 turndown with plus or minus 2 percent accuracy over full-flow range.

* + - 1. CONDENSATE METERS
         1. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

Central Station Steam Co.

Lincoln Meter Company.

Spirax Sarco Limited.

Approved equivalent.

* + - * 1. Body: Cast iron, bronze, or brass.
        2. Turbine: Copper, brass, or stainless steel.
        3. Connections: Threaded for NPS 2 and smaller and flanged for NPS 2-1/2.
        4. Totalizer: Meters shall have a microprocessor to display flow, flow rate, time, and date; alarms for high and low flow rate, pressure, and temperature.

Computer shall have 4- to 20-mA or 2- to 10-V output for temperature, pressure, and contact closure for flow increments.

Independent timers to store four peak flow rates and total flow.

Interface compatible with central workstation specified in Section 230923 "Direct Digital Control (DDC) System for HVAC."

Microprocessor Enclosure: NEMA 250, Type 4.

* + - * 1. Pressure Rating: [**Atmospheric] <Insert pressure**>.
        2. Maximum Temperature Rating: [**250 deg F] <Insert temperature**>.

1. EXECUTION
   * + 1. VALVE APPLICATIONS
          1. Install shutoff duty valves at branch connections to steam supply mains, at steam supply connections to equipment, and at the outlet of steam traps.
          2. Install safety valves on pressure-reducing stations and elsewhere as required by ASME Boiler and Pressure Vessel Code. Install safety-valve discharge piping, without valves, to nearest floor drain or as indicated on Drawings. Comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1, for installation requirements.
       2. INSTALLATION OF PIPING
          1. Install piping to permit valve servicing.
          2. Install drains, consisting of a tee fitting, NPS 3/4 full-port ball valve, and short NPS 3/4 threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.
          3. Install valves according to Section 230523.11 "Globe Valves for HVAC Piping," Section 230523.12 "Ball Valves for HVAC Piping," Section 230523.13 "Butterfly Valves for HVAC Piping," Section 230523.14 "Check Valves for HVAC Piping," and Section 230523.15 "Gate Valves for HVAC Piping."
          4. Install unions in piping, [**NPS 2] <Insert pipe size**> and smaller, adjacent to valves, at final connections of equipment and elsewhere as indicated.
          5. Install flanges in piping, [**NPS 2-1/2] <Insert pipe** size> and larger, at final connections of equipment and elsewhere as indicated.
          6. Install shutoff valve immediately upstream of each dielectric fitting.
          7. Install strainers on supply side of control valves, pressure-reducing valves, traps, and elsewhere as indicated. Install NPS 3/4 nipple and full-port ball valve in blowdown connection of strainers NPS 2 and larger. Match size of strainer blowoff connection for strainers smaller than NPS 2.

Retain "Flash Tank" paragraph below if flash tanks are required.

* + - * 1. Flash Tank:

Pitch condensate piping down toward flash tank.

If more than one condensate pipe discharges into flash tank, install a check valve in each line.

Install thermostatic air vent at tank top.

Install safety valve at tank top.

Install full-port ball valve, and swing check valve on condensate outlet.

Install inverted bucket or float and thermostatic trap at low-pressure condensate outlet, sized for 3 times the calculated heat load.

Retain subparagraph below if flash tanks are required to recover low-pressure steam.

Install pressure gage on low-pressure steam outlet according to Section 230519 "Meters and Gages for HVAC Piping."

* + - 1. INSTALLATION OF STEAM TRAPS
         1. Install steam traps in accessible locations as close as possible to connected equipment.
         2. Install full-port ball valve, strainer, and union upstream from trap; install union, check valve, and full-port ball valve downstream from trap unless otherwise indicated.
      2. INSTALLATION OF PRESSURE-REDUCING VALVES

Consult manufacturers for proper installation of piping to and from pressure-reducing valves.

* + - * 1. Install pressure-reducing valves in accessible location for maintenance and inspection.
        2. Install bypass piping around pressure-reducing valves, with globe valve equal in size to area of pressure-reducing valve seat ring, unless otherwise indicated.
        3. Install gate valves on both sides of pressure-reducing valves.
        4. Install unions or flanges on both sides of pressure-reducing valves having threaded- or flanged-end connections, respectively.
        5. Install pressure gages on low-pressure side of pressure-reducing valves after the bypass connection according to Section 230519 "Meters and Gages for HVAC Piping."
        6. Install strainers upstream for pressure-reducing valve.
        7. Install safety valve downstream from pressure-reducing valve station.
      1. INSTALLATION OF STEAM OR CONDENSATE METERS
         1. Install meters with lengths of straight pipe upstream and downstream according to steam meter manufacturer's written instructions.
         2. Provide data acquisition wiring. See Section 230923 "Direct Digital Control (DDC) System for HVAC."
      2. INSTALLATION OF SAFETY VALVES

Retain first option in first paragraph below for HP systems; retain second option for LP systems; retain third option for combination HP and LP systems.

* + - * 1. Install safety valves according to [**ASME B31.1, "Power Piping."] [ASME B31.9, "Building Services Piping."] [ASME B31.1, "Power Piping," and ASME B31.9, "Building Services Piping."**]
        2. Pipe safety-valve discharge without valves to atmosphere outside the building.
        3. Install drip-pan elbow fitting adjacent to safety valve and pipe drain connection to nearest floor drain.
        4. Install exhaust head with drain to waste, on vents equal to or larger than NPS 2-1/2.
      1. TERMINAL EQUIPMENT CONNECTIONS

Specify access doors and panels for walls and ceilings in Section 083113 "Access Doors and Frames." Show locations of access doors and panels on Drawings, and coordinate with architectural reflected ceiling and wall elevation Drawings.

* + - * 1. Install traps and control valves in accessible locations close to connected equipment.
        2. Install bypass piping with globe valve around control valve. If parallel control valves are installed, only one bypass is required.
        3. Install vacuum breakers downstream from control valve, close to coil inlet connection.

END OF SECTION 232216