15100  VALVES

PART 1:  GENERAL

1.01  RELATED SECTIONS

A.  Section 15050 – Basic Material and Methods

B.  Section 15545 – Chilled Water System

C.  Section 15550 – Heat Generation

D.  Section 15790 – Coils

E.  Section 15955 – Building Automation and Control System Guidelines

1.02  GENERAL

A.  Unless otherwise noted, all valves for shut-off and bypass service shall be ball valves, 2" and below, and butterfly valves 2-1/2" and above.  Ball valves are acceptable in 2-1/2" and 3" copper only.

B.  Valves for balancing operations shall not be ball or butterfly.

C.  End connections for NPS 2” and below shall be the same as is used for fittings. Use flanged valves for NPS two and one half inches (2-1/2") and above.  Solder joints are also acceptable in 2-1/2" and 3" copper piping systems.

D.  All valves shall be labeled with 1-1/2" (one and one half inch) brass tags bearing a letter to indicate the service and a number to indicate the valve.  A permanent valve chart and system schematic diagram shall show the location of all valves.

E.  A manufacturer's valve tag shall be on all valves identifying the valve type and major component materials.

F.  Install valves after welding adjacent to valve is completed to protect seat and disk.

G.  Insulated valves shall have extended handle stems.

H.  All valves shall be fully bi-directional and suitable for dead end service.

I.  Valve packing compression is to be independent of the stem, ball or handle systems.  All valve stems are to be blowout proof.  Packing shall be accessible without disturbing the insulation.
J. Plug or gate valves shall not be used on any services without approval by Facilities Engineering.

K. All valves used for vent or drain service on water systems shall have a brass hose connection with cap and chain.

L. Non-electric radiator control valves with valve mounted heads are not acceptable, except on cast iron radiators, where they shall be side mounted. Where used, thermostatic radiator valves shall be remote bulb and remote control head design. The control head shall be mounted on the radiation enclosure, if possible.

PART 2: PRODUCTS

2.01 BALL VALVES

A. For all water services, low pressure steam, low pressure condensate and all other normal non-corrosive services, ball valves shall be:

1. Body: Bronze
2. Body Style: Standard Port
3. Trim: 316 Stainless Steel Ball and Stem, with stem extension to raise handle out of insulation
4. Seat: Reinforced Teflon (RTFE), 15% glass filled double seal
5. Seat Working P/T Rating: 300 psig @ 250°F Minimum
6. Body Working P/T Rating: 300 psig @ 300°F Minimum
7. WOG Rating: 300 psig Minimum
8. Saturated Steam Rating: 150 psig Minimum

B. For high pressure steam service ball valves shall be:

1. Body: ASTM A216 WCB Carbon or 316 Stainless Steel
2. Body Style: Standard Port
   Butt or socket weld connection
3. Trim: 316 Stainless Steel Ball and Stem
   With stem extension, if required, to raise handle out of insulation

4. Seat: High Temperature RTFE, double seal

5. Seat Working P/T Rating: 100 psig @ 450°F Minimum

6. Body Working P/T Rating: 750 psig @ 100°F Minimum

7. WOG Rating: 400 psig Minimum

8. Steam Rating: 100 psig @ 450°F Minimum

C. For special applications, obtain approval from Facilities Engineering.

2.02 BUTTERFLY VALVES

A. GENERAL

1. For special applications, obtain approval from Facilities Engineering.

2. All lugged butterfly valves shall be fully bi-directional and bi-directionally dead-endable to the full pressure rating of the seat. This is defined to mean that the seat rating is not reduced when pressure is applied in either direction and the valve is capable of serving as a blank flange, when bolted to the end of a line from either side of the valve body and no mating flange is attached. The means of attaching the body to the pipe flange, and of attaching the seat ring to the body shall meet the ANSI class rating of the valve without mechanical failure. This requirement normally results in partially lugged butterfly valves not being acceptable.

3. Packing shall be able to be tightened without removing the insulation.

4. External disc position indicators shall be provided.

5. Valves must be fully factory assembled, set and tested.

6. Gear operators on steam valves shall be spaced 4” (four inches) above packing assembly.

7. Install all steam valves with the stem at least 30” off vertical to protect the bottom bearing from debris.
8. On all butterfly valve actuators located greater than 5' (five feet) above the floor, install chainwheels to 5' (five feet) above the floor when the design engineer determines valve service is critical.

B. Standard Butterfly Valves: For all water services and all other normal non-corrosive services, butterfly valves shall have the following requirements:

1. Body: Ductile Iron or Cast Iron
2. Body Style: Fully lugged
3. Trim: 316 or 17-4 pH Stainless Steel
4. Disc: Stainless Steel
5. Seat: Resilient Seat, fully bi-directional, dead-endable, EPDM
6. Seat Working P/T Rating: 150 psig @ 250F Minimum
8. Actuator: Under 4" – Locking Lever Handle
   4" and Above – Handwheel Gear Operator

C. High Performance Butterfly Valves: For low and high pressure steam, condensate, chilled water building entrance, butterfly valves shall have the following requirements:

1. Body: Carbon Steel
2. Body Style: Tapped Lug (full flange)
3. Trim: 316 Stainless Steel Double Offset Stem
4. Disc: 316 Stainless Steel
5. Seat: High temperature RTFE, fully bi-directional, dead-endable
6. Seat Working P/T Rating: 100 psig @ 450°F Minimum
8. Actuator: Handwheel Gear Operator
2.03 GAUGE VALVES

A. Provide ball valves for shut-off on all pressure gauges at the gauge and separate 1/2" (one half inch) ball valves for the various taps to the gauge on a manifold gauge.

2.04 CHECK VALVES

A. Two inches (2") and under: 45° swing check, screwed end.

B. Two and one half inches (2 1/2") and over: Non-slam type globe style lift check, non-slam type tilting disc or wafer body non-slam type lift check. Double disc or bi-folding disc type valves are not acceptable.

2.05 AIR VENT VALVES

A. On chilled water and glycol service use manual vents only. Do not use automatic vents.