PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following general-duty valves:

1. Bronze ball valves.
2. Bronze check valves.
3. Iron swing check valves.
4. Spring-loaded, lift-disc check valves.
5. Bronze gate valves.
6. Cast-iron gate valves.

B. See Division 21 fire-suppression piping and fire pump Sections for fire-protection valves.

C. See Division 23 piping Sections for specialty valves applicable to those Sections only.

1.2 SUBMITTALS

A. For each type of valve indicated. Include body, seating, and trim materials; valve design; pressure and temperature classifications; end connections; arrangement; dimensions; and required clearances. Include list indicating valve and its application. Include rated capacities; furnished specialties; and accessories.

1.3 QUALITY ASSURANCE

A. ASME Compliance: ASME B31.9 Building Services Piping.

B. Potable Water: NSF 61 or NSF 72 certification for valve materials by a third party is required for potable-water service.

C. Source Limitations for Valves: Obtain each type of valve from single manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 VALVES, GENERAL

A. Refer to Part 3 "Valve Applications" Article for applications of valves.
B. Valves: NPS 2 and Smaller: Threaded or soldered ends, unless otherwise indicated.

C. Valves: NPS 2-1/2 and Larger: Flanged ends, unless otherwise indicated.

D. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system test pressures and temperatures.

E. Valve Sizes: Same as upstream pipe, unless otherwise indicated.

F. Valve Actuators:
   1. Handwheel: Non-heating style of cast, malleable iron or aluminum for gear-operated, quarter-turn valves and all valves other than quarter-turn types, located not more than 8 feet above walkway.
   2. Chainwheel Actuators: For gear-operated, quarter-turn valves and all valves other than quarter-turn types, located more than 8 feet above walkways. Adjust chain length to maintain 7 feet clearance above walkway.
   3. Lever Handle: For quarter-turn valves NPS 6 and smaller. Provide infinite-position handle with open-position memory stop in balancing applications, and where indicated on Drawings.

G. Valves in Insulated Piping: With 2-inch stem extensions and the following features:
   1. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.

H. Solder Joint: With sockets according to ASME B16.18.
   a. Caution: Use solder with melting point below 840 deg F for angle, check, and gate valves; below 421 deg F for ball valves.

I. Threaded: With threads according to ASME B1.20.1.


2.3 BRONZE BALL VALVES

A. Manufacturers:
   1. Two-Piece, Bronze Ball Valves:
      a. Honeywell Braukmann.
      b. Milwaukee Valve Company.
   2. Safety-Exhaust, Bronze Ball Valves:
      a. Milwaukee Valve Company.
B. Bronze Ball Valves, General: MSS SP-110.

C. Two-Piece, Bronze Ball Valves: Bronze body with full-port, stainless steel ball; PTFE seats; and 600-psig minimum CWP rating, 0°F to 400°F range, and blowout-proof stem.

D. Safety-Exhaust, Bronze Ball Valves: Two-piece bronze body with exhaust vent opening, chrome-plated ball with vent, blowout-proof stem, locking handle, and working pressure rating of 400-psig CWP.

2.4 BRONZE SWING CHECK VALVES

A. Manufacturers:

1. Bronze, Swing Check Valves with Nonmetallic Disc:
   a. Milwaukee Valve Company.

2. Description: MSS SP-80, Type 4.
   a. Standard: MSS SP-80, Type 4.
   b. SWP Rating: 150 psig.
   c. Design: Horizontal flow.
   e. Ends: Threaded.
   f. Disc: PTFE.

2.5 IRON SWING CHECK VALVES

A. Manufacturers:

1. Iron Swing Check Valves with Metal Seats:
   a. Grinnell Corporation.
   b. Milwaukee Valve Company.
   c. Mueller Co.

2. Description:
   a. Standard: MSS SP-71, Type I.
   b. SWP Rating: 125 psig.
   c. Body Design: Clear or full waterway.
   d. Body Material: ASTM A 126, iron with bolted bonnet.
   e. Design: Horizontal flow.
   f. Trim: Bronze.
   g. Gasket: Asbestos free.
2.6 SPRING-LOADED, LIFT-DISC CHECK VALVES

A. Manufacturers:

1. Lift-Disc Check Valves:
   a. Milwaukee Valve Company.
   b. Mueller Steam Specialty.

2. Description:
   b. SWP Rating: 125 psig.
   c. Body Material: Bronze.
   d. Disc Holder: Bronze.
   e. Disc ring: PTFE.
   f. Spring: Bronze

2.7 BRONZE GATE VALVES

A. Manufacturers:

1. Bronze, Rising-Stem, Solid-Wedge Gate Valves:
   a. Milwaukee Valve Company.

2. Description:
   a. Standard: MSS SP-80, Type 1.
   b. SWP Rating: 150 psig.
   d. Stem: Bronze.
   e. Disc: Solid wedge; bronze.
   f. Packing: Asbestos free.
   g. Handwheel: Malleable iron or bronze.

2.8 CAST-IRON GATE VALVES

A. Manufacturers:

1. Cast-Iron, Nonrising-Stem Gate Valves:
   a. Grinnell Corporation.
   b. Milwaukee Valve Company.

2. Description:
   a. Standard: MSS SP-70, Type I.
   b. SWP Rating: 150 psig.
   c. Body Material: ASTM A 126, gray iron with bolted bonnet.
d. Trim: Bronze.
e. Disc: Solid wedge.
f. Packing and Gasket: Asbestos free.

PART 3 - EXECUTION

3.1 VALVE APPLICATIONS

A. Refer to piping Sections for specific valve applications. If valve applications are not indicated, use the following:
   1. Shutoff Service: Ball or butterfly valves.
   2. Throttling Service: Ball valves.

B. If valves with specified CWP ratings are not available, the same types of valves with higher CWP ratings may be substituted.

C. Low-Pressure, Compressed-Air Piping:
   1. Ball Valves, NPS 2 and Smaller: Two-piece, 400-psig CWP rating, bronze.
   2. Equipment-Isolation Ball Valves, NPS 2 and Smaller: Safety-exhaust, bronze.
   3. Ball Valves, NPS 2-1/2 and Larger: Class 150, ferrous alloy.
   4. Swing Check Valves, NPS 2 and Smaller: Class 150, bronze.
   5. Swing Check Valves, NPS 2-1/2 and Larger: Class 250, gray iron.
   7. Spring-Loaded, Lift-Disc Check Valves, NPS 2-1/2 and Larger: Class 250, cast iron.

D. Domestic Water Piping: Use the following types of valves:
   1. Ball Valves, NPS 2 and Smaller: Two-piece, 400-psig CWP rating, bronze.
   2. Ball Valves, NPS 2-1/2: Class 150, ferrous alloy.
   3. Swing Check Valves, NPS 2 and Smaller: Class 125, bronze. (Horizontal only)
   4. Swing Check Valves, NPS 2-1/2 and Larger: Class 125, iron. (Horizontal only)
   5. Spring-Loaded, Lift-Disc Check Valves, NPS 2 and Smaller: Class 125 minimum.
   6. Spring-Loaded, Lift-Disc Check Valves, NPS 2-1/2 and Larger: Class 125, cast iron.
   7. Gate Valves, NPS 8 and Larger: Class 125, OS&Y, bronze-mounted cast iron.

E. Pumped Piping: Use the following types of valves:
   1. Ball Valves, NPS 2 and Smaller: Two-piece, 400-psig CWP rating, copper alloy.
   2. Ball Valves, NPS 2-1/2: Class 150, ferrous alloy.
   3. Swing Check Valves, NPS 2 and Smaller: Class 125, bronze. (Horizontal only)
   4. Swing Check Valves, NPS 2-1/2 and Larger: Class 125, gray iron. (Horizontal only)
   5. Gate Valves, NPS 6 and Larger: Class 125, OS&Y, bronze-mounted cast iron.
   6. Lift check valves: vertical position
3.2 VALVE INSTALLATION

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

C. Locate valves for safe access by personnel with both hands simultaneously and provide separate support where necessary. Access shall include repair and replacement of the valve, as well as actuation.

D. Install valves in horizontal piping with stem at or above center of pipe.

E. Install quarter-turn valves so handle in open position is downstream of valve.

F. Install valves in position to allow full stem movement.

G. Install check valves for proper direction of flow and as follows:
   1. Swing Check Valves: In horizontal position with hinge pin level.
   2. Lift Check Valves: With stem upright and plumb, vertical positions.

H. Install branch line isolation valves close to the branch connection.

3.3 JOINT CONSTRUCTION

A. Refer to Division 22 Section "Common Work Results for Plumbing" for basic piping joint construction.

END OF SECTION