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SECTION 220523.12 - BALL VALVES FOR PLUMBING PIPING

TIPS:

To view non-printing **Editor's Notes** that provide guidance for editing, click on Masterworks/Single-File Formatting/Toggle/Editor's Notes.

To read **detailed research, technical information about products and materials, and coordination checklists**, click on Masterworks/Supporting Information.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Brass ball valves.
 - 2. Bronze ball valves.
 - 3. Carbon steel ball valves.
 - 4. Stainless steel ball valves
 - 5. Iron ball valves.

1.3 DEFINITIONS

- A. ANSI: American National Standards Institute.

- B. Buna-N: Nitrile copolymer of butadiene and acrylonitrile.
- C. CSA: Canadian Standards Association.
- D. CWP: Cold working pressure.
- E. DZR: Dezincification Resistant.
- F. EPDM: Ethylene propylene-diene monomer rubber.
- G. FM: Factory Mutual.
- H. LF: Lead Free (Brass).
- I. MSS: Manufacturer's Standardization Society.
- J. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
- K. NSF: National Sanitation Foundation.
- L. Pb: Lead.
- M. PTFE: Polytetrafluoroethylene.
- N. RPTFE: Reinforced Polytetrafluoroethylene.
- O. TFM: Modified Polytetrafluoroethylene (Hostaflon).
- P. T.E.A.: Ternary Ecological Alloy.
- Q. UL: Underwriters Laboratory.
- R. WOG: Water, Oil, and Gas.
- S. WSP: Working steam pressure.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of valve.
 - 1. Certification that brass or bronze ball valves comply with NSF 372 or NSF 61, Annex G.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 - 1. Protect internal parts against rust and corrosion.
 - 2. Protect threads, flange faces, and soldered ends.
 - 3. Set ball valves open to minimize exposure of functional surfaces.

- B. Use the following precautions during storage:
 - 1. Maintain valve end protection.
 - 2. Store valves indoors and maintain at higher-than-ambient-dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use operating handles or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
- B. ASME Compliance:
 - 1. ASME B1.20.1 for threads for threaded end valves.
 - 2. ASME B16.1 for flanges on iron valves.
 - 3. ASME B16.5 for flanges on steel valves.
 - 4. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 - 5. ASME B16.18 for solder-joint connections.
 - 6. ASME B31.9 for building services piping valves.
- C. NSF Compliance: NSF 372 or NSF 61 Annex G for valve materials for potable-water service.
- D. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- E. Valve Sizes: Same as upstream piping unless otherwise indicated.
- F. Valve Actuator Types:
 - 1. Gear Actuator: For quarter-turn valves **NPS 10 (DN 250)** and larger.
 - 2. Handlever: For quarter-turn valves smaller than **NPS 10 (DN 250)**.
- G. Valves in Insulated Piping:
 - 1. Include **2-inch (50-mm)** stem extensions.
 - 2. Extended operating handles of nonthermal-conductive material and protective sleeves that allow operation of valves without breaking vapor seals or disturbing insulation.
 - 3. Memory stops that are fully adjustable after insulation is applied.

2.2 BRASS BALL VALVES

- A. One-Piece, Brass Ball Valves:

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]:**
 2. Basis-of-Design Product: Subject to compliance with requirements, provide **[product indicated on Drawings] <Insert manufacturer's name; product name or designation>** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.
 3. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: **400 psig (2760 kPa)**.
 - c. Body Design: One piece.
 - d. Body Material: Forged brass or bronze.
 - e. Ends: Threaded or Solder.
 - f. Seats: PTFE.
 - g. Stem: Brass or stainless steel.
 - h. Ball: Chrome-plated brass or stainless steel.
 - i. Port: Reduced.
- B. Two-Piece, Brass Ball Valves with Full Port and Brass Trim:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Jomar Valve; **[T-100CG] [S-100CG]** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: MSS SP-110.
 - b. WOG Rating:
 - 1) **600 psig (4140 kPa), NPS 1/4-3/4 (DN 8-20)**.
 - 2) **500 psig (3447 kPa), NPS 1-2 (DN 25-50)**.
 - c. Body Design: Two piece.
 - d. Body Material: Heat Treated Lead Free Forged brass.
 - e. Ends: Threaded or Solder.
 - f. Seats: TFM, PTFE or G300.
 - g. Stem: Brass.
 - h. Ball: T.E.A. coated or chrome-plated brass.
 - i. Port: Full.
- C. Two-Piece, Brass Ball Valves with Full Port and Stainless-Steel Trim:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Jomar Valve; **[T-100CSSG] [S-100CSSG]** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.

2. Description:

- a. Standard: MSS SP-110.
- b. WOG Rating:
 - 1) 600 psig (4140 kPa), NPS 1/4-3/4 (DN 8-20).
 - 2) 500 psig (3447 kPa), NPS 1-2 (DN 25-50).
- c. Body Design: Two piece.
- d. Body Material: Heat Treated Lead Free Forged brass.
- e. Ends: Threaded or Solder.
- f. Seats: TFM, PTFE or G300.
- g. Stem: Stainless steel.
- h. Ball: Stainless steel.
- i. Port: Full.

D. Two-Piece, Brass Ball Valves with Regular Port and Brass Trim:

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]:**
2. Basis-of-Design Product: Subject to compliance with requirements, provide **[product indicated on Drawings]** <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
 - a. <Insert manufacturer's name>.

3. Description:

- a. Standard: MSS SP-110.
- b. WOG Rating:
 - 1) 600 psig (4140 kPa), NPS 1/4-3/4 (DN 8-20).
 - 2) 500 psig (3447 kPa), NPS 1-2 (DN 25-50).
- c. Body Design: Two piece.
- d. Body Material: Heat Treated Lead Free Forged brass.
- e. Ends: Threaded or Solder.
- f. Seats: TFM, PTFE or G300.
- g. Stem: Brass.
- h. Ball: T.E.A. coated or chrome-plated brass.
- i. Port: Regular.

E. Two-Piece, Brass Ball Valves with Regular Port and Stainless-Steel Trim:

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]:**

2. Basis-of-Design Product: Subject to compliance with requirements, provide [**product indicated on Drawings**] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
 - a. <Insert manufacturer's name>.
3. Description:
 - a. Standard: MSS SP-110.
 - b. WOG Rating:
 - 1) 600 psig (4140 kPa), NPS 1/4-3/4 (DN 8-20).
 - 2) 500 psig (3447 kPa), NPS 1-2 (DN 25-50).
 - c. Body Design: Two piece.
 - d. Body Material: Lead Free brass.
 - e. Ends: Threaded or Solder.
 - f. Seats: TFM, PTFE or G300.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel.
 - i. Port: Regular.

F. Three-Piece, Brass Ball Valves with Full Port and Brass Trim:

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**]:
2. Basis-of-Design Product: Subject to compliance with requirements, provide [**product indicated on Drawings**] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
 - a. <Insert manufacturer's name>.
3. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig (4140 kPa).
 - c. Body Design: Three piece.
 - d. Body Material: Forged brass.
 - e. Ends: Threaded or Solder.
 - f. Seats: TFM, PTFE or G300.
 - g. Stem: Brass.
 - h. Ball: Chrome-plated brass.
 - i. Port: Full.

G. Three-Piece, Brass Ball Valves with Full Port and Stainless-Steel Trim:

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]:

2. Basis-of-Design Product: Subject to compliance with requirements, provide [**product indicated on Drawings**] **<Insert manufacturer's name; product name or designation>** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.
3. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: **600 psig (4140 kPa)**.
 - c. Body Design: Three piece.
 - d. Body Material: Forged brass.
 - e. Ends: Threaded or Solder.
 - f. Seats: TFM, PTFE or G300.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.

2.3 BRONZE BALL VALVES

A. One-Piece, Bronze Ball Valves with Bronze Trim:

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**]:
2. Basis-of-Design Product: Subject to compliance with requirements, provide [**product indicated on Drawings**] **<Insert manufacturer's name; product name or designation>** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.
3. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: **400 psig (2760 kPa)**.
 - c. Body Design: One piece.
 - d. Body Material: Bronze.
 - e. Ends: Threaded.
 - f. Seats: TFM, PTFE or G300.
 - g. Stem: Bronze.
 - h. Ball: Chrome-plated brass.
 - i. Port: Reduced.

B. One-Piece, Bronze Ball Valves with Stainless-Steel Trim:

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]:

2. Basis-of-Design Product: Subject to compliance with requirements, provide [**product indicated on Drawings**] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
 - a. <Insert manufacturer's name>.
3. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig (4140 kPa).
 - c. Body Design: One piece.
 - d. Body Material: Bronze.
 - e. Ends: Threaded.
 - f. Seats: TFM, PTFE or G300.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Reduced.

C. Two-Piece, Bronze Ball Valves with Full Port, and Bronze or Brass Trim:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Jomar Valve [**T-200CSSG**] [**S-200CSSG**], or Jomar Valve; [**T-100CG**] [**S-100CG**] with Heat Treated CW511L brass alloy body and end connection, or comparable product by one of the following:
 - a. <Insert manufacturer's name>.
2. Description:
 - a. Standard: MSS SP-110.
 - b. WOG Rating:
 - 1) 600 psig (4140 kPa), NPS 1/4-3/4 (DN 8-20).
 - 2) 500 psig (3447 kPa), NPS 1-2 (DN 25-50).
 - c. Body Design: Two piece.
 - d. Body Material: Bronze or *Heat Treated Dezincification Resistant (CW511L) Brass (CW511L).
 - e. Ends: Threaded or Solder.
 - f. Seats: TFM, PTFE or G300
 - g. Stem: Bronze or brass.
 - h. Ball: T.E.A. coated or chrome-plated brass.
 - i. Port: Full.

D. Two-Piece, Bronze Ball Valves with Full Port and Stainless-Steel Trim:

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]:

1. Basis-of-Design Product: Subject to compliance with requirements, provide [**product indicated on Drawings**] Jomar Valve; [**T-200CSSG**] [**S-200CSSG**] or Jomar Valve; [**T-100CSSG**] [**S-100CSSG**] with Heat Treated CW511L brass alloy body and end connection, or comparable product by one of the following:

- a. <Insert manufacturer's name>.

2. Description:

- a. Standard: MSS SP-110.

- b. WOG Rating:

- 1) 600 psig (4140 kPa), NPS 1/4-3/4 (DN 8-20).

- 2) 500 psig (3447 kPa), NPS 1-2 (DN 25-50).

- c. Body Design: Two piece.

- d. Body Material: Bronze or * Heat Treated Dezincification Resistant (CW511L) Brass.

- e. Ends: Threaded or Solder.

- f. Seats: PTFE, TFE or G300

- g. Stem: Stainless steel.

- h. Ball: Stainless steel.

- i. Port: Full.

E. Two-Piece, Bronze Ball Valves with Regular Port and Bronze or Brass Trim:

1. Basis-of-Design Product: Subject to compliance with requirements, provide [**product indicated on Drawings**] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:

- 2.

- a. <Insert manufacturer's name>.

3. Description:

- a. Standard: MSS SP-110.

- b. WOG Rating:

- 1) 600 psig (4140 kPa), NPS 1/4-3/4 (DN 8-20).

- 2) 500 psig (3447 kPa), NPS 1-2 (DN 25-50).

- c. Body Design: Two piece.

- d. Body Material: Bronze or Dezincification Resistant Brass (CW511L).

- e. Ends: Threaded.

- f. Seats: TFM, PTFE or G300.

- g. Stem: Bronze or brass.

- h. Ball: T.E.A. coated or chrome-plated brass.

i. Port: Regular.

F. Two-Piece, Bronze Ball Valves with Regular Port and Stainless-Steel Trim:

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]:**
2. Basis-of-Design Product: Subject to compliance with requirements, provide **[product indicated on Drawings]** <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
 - a. <Insert manufacturer's name>.
3. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig (4140 kPa).
 - c. Body Design: Two piece.
 - d. Body Material: Bronze.
 - e. Ends: Threaded or Solder.
 - f. Seats: PTFE, TFE or G300.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel.
 - i. Port: Regular.

G. Three-Piece, Bronze Ball Valves with Full Port and Bronze or Brass Trim:

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]:**
2. Basis-of-Design Product: Subject to compliance with requirements, provide **[product indicated on Drawings]** <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
 - a. <Insert manufacturer's name>.
3. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: 600 psig (4140 kPa).
 - c. Body Design: Three piece.
 - d. Body Material: Bronze.
 - e. Ends: Threaded.
 - f. Seats: PTFE.
 - g. Stem: Bronze or brass.
 - h. Ball: Chrome-plated brass.
 - i. Port: Full.

H. Three-Piece, Bronze Ball Valves with Full Port and Stainless-Steel Trim:

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]:**
 2. Basis-of-Design Product: Subject to compliance with requirements, provide **[product indicated on Drawings] <Insert manufacturer's name; product name or designation>** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.
 3. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: **600 psig (4140 kPa)**.
 - c. Body Design: Three piece.
 - d. Body Material: Bronze.
 - e. Ends: Threaded.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.
- I. Three-Piece, Bronze Ball Valves with Regular Port and Bronze Trim:
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]:**
 2. Basis-of-Design Product: Subject to compliance with requirements, provide **[product indicated on Drawings] <Insert manufacturer's name; product name or designation>** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.
 3. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: **600 psig (4140 kPa)**.
 - c. Body Design: Three piece
 - d. Body Material: Bronze
 - e. Ends: Threaded or soldered.
 - f. Seats: PTFE.
 - g. Stem: Bronze.
 - h. Ball: Chrome-plated brass.
 - i. Port: Regular.
- J. Three-Piece, Bronze Ball Valves with Regular Port and Stainless-Steel Trim:
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]:

2. Basis-of-Design Product: Subject to compliance with requirements, provide [**product indicated on Drawings**] **<Insert manufacturer's name; product name or designation>** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.
3. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: **600 psig (4140 kPa)**.
 - c. Body Design: Three piece.
 - d. Body Material: Bronze.
 - e. Ends: Threaded or soldered.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Regular.

K. Two-Piece, Safety-Exhaust, Bronze Ball Valves:

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**]:
2. Basis-of-Design Product: Subject to compliance with requirements, provide [**product indicated on Drawings**] **<Insert manufacturer's name; product name or designation>** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.
3. Description:
 - a. Standard: MSS SP-110.
 - b. CWP Rating: **600 psig (4140 kPa)**.
 - c. Body Design: Two piece.
 - d. Body Material: Bronze, ASTM B 584, Alloy C844.
 - e. Ends: Threaded.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Chrome-plated brass, with exhaust vent opening for pneumatic applications.
 - i. Port: Full.

2.4 CARBON STEEL BALL VALVES

A. Flanged, Class 150, Carbon Steel Ball Valves with Full Port:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Jomar Valve; [**FL-CS-100-150**] or comparable product by one of the following:

- a. <Insert manufacturer's name>.
2. Description:
 - a. Standard: MSS SP-72.
 - b. WOG Rating: 285 psig (1964 kPa).
 - c. Body Design: Split body.
 - d. Body Material: Carbon steel, ASTM A 216, Type WCB.
 - e. Ends: Flanged.
 - f. Seats: PTFE or RPTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.
- B. Flanged, Class 300, Carbon Steel Ball Valves with Full Port:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Jomar Valve; **[FL-CS-100-300]** or comparable product by one of the following:
 - a. <Insert manufacturer's name>.
 2. Description:
 - a. Standard: MSS SP-72.
 - b. WOG Rating: 720 psig (4960 kPa).
 - c. Body Design: Split body.
 - d. Body Material: Carbon steel, ASTM A 216, Type WCB.
 - e. Ends: Flanged.
 - f. Seats: PTFE or RPTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.
- C. Flanged Class 150, Carbon Steel Ball Valves with Regular Port:
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]:**
 2. Basis-of-Design Product: Subject to compliance with requirements, provide **[product indicated on Drawings] <Insert manufacturer's name; product name or designation>** or comparable product by one of the following:
 - a. <Insert manufacturer's name>.
 3. Description:
 - a. Standard: MSS SP-72.
 - b. CWP Rating: 285 psig (1964 kPa).
 - c. Body Design: Uni-body.

- d. Body Material: Carbon steel, ASTM A 216, Type WCB.
- e. Ends: Flanged or threaded.
- f. Seats: PTFE.
- g. Stem: Stainless steel.
- h. Ball: Stainless steel, vented.
- i. Port: Regular.

D. Two Piece, Carbon Steel Ball Valves with Full Port:

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide Jomar Valve; **[T-CS-1001N-SS]** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.
- 2. Description:
 - a. Standard: MSS SP-110.
 - b. WOG Rating: **1000 psig (6895 kPa)**.
 - c. Body Design: Two pieces.
 - d. Body Material: Carbon steel, ASTM A 216, Type WCB.
 - e. Ends: Threaded.
 - f. Seats: TFM or PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel.
 - i. Port: Full.

E. Three Piece, Carbon Steel Ball Valves with Full Port:

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide Jomar Valve; **[T-CS-1000N-SS-4B][S-CS-1000N-SS-4B]** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.
- 2. Description:
 - a. Standard: MSS SP-110.
 - b. WOG Rating: **1000 psig (6895 kPa)**.
 - c. Body Design: Three pieces.
 - d. Body Material: Carbon steel, ASTM A 216, Type WCB.
 - e. Ends: Threaded or socket weld.
 - f. Seats: TFM or PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel.
 - i. Port: Full.

2.5 STAINLESS STEEL BALL VALVES

A. Flanged, Class 150, Stainless Steel Ball Valves with Full Port:

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1. Basis-of-Design Product: Subject to compliance with requirements, provide Jomar Valve; **[FL-SS-100-150]** **[A2020D]** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: MSS SP-72.
 - b. WOG Rating: **285 psig (1964 kPa)**.
 - c. Body Design: Split body.
 - d. Body Material: Stainless steel, ASTM A 351, Type CF8M.
 - e. Ends: Flanged.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.
- B. Flanged, Class 300, Stainless Steel Ball Valves with Full Port:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Jomar Valve; **[FL-SS-100-300]** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: MSS SP-72.
 - b. WOG Rating: **720 psig (4960 kPa)**.
 - c. Body Design: Split body.
 - d. Body Material: Stainless steel, ASTM A 351, Type CF8M.
 - e. Ends: Flanged.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.
- C. Flanged, Class 150, Stainless Steel Ball Valves with Regular Port:
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]:**
 2. Basis-of-Design Product: Subject to compliance with requirements, provide **[product indicated on Drawings]** **<Insert manufacturer's name; product name or designation>** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.
 3. Description:
 - a. Standard: MSS SP-72.

- b. WOG Rating: 285 psig (1964 kPa).
 - c. Body Design: Uni-body.
 - d. Body Material: Carbon Stainless steel, ASTM A 351, Type CF8M.
 - e. Ends: Flanged or threaded.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Regular.
- D. Two Piece, Stainless Steel Ball Valves with Full Port:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Jomar Valve; **[T-SS-1001N]** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: MSS SP-110.
 - b. WOG Rating: 1000 psig (6895 kPa).
 - c. Body Design: Two piece.
 - d. Body Material: Stainless steel, ASTM A 351, Type CF8M.
 - e. Ends: Threaded.
 - f. Seats: TFM or PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel.
 - i. Port: Full.
- E. Three Piece, Stainless Steel Ball Valves with Full Port:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Jomar Valve; **[T-SS-1000N-4B]** **[S-SS-1000N-4B]** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: MSS SP-110.
 - b. WOG Rating: 1000 psig (6895 kPa).
 - c. Body Design: Three piece.
 - d. Body Material: Stainless steel, ASTM A 351, Type CF8M.
 - e. Ends: Threaded or socket weld.
 - f. Seats: TFM or PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel.
 - i. Port: Full.

2.6 IRON BALL VALVES

- A. Class 125, Iron Ball Valves:

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**]:
2. Basis-of-Design Product: Subject to compliance with requirements, provide [**product indicated on Drawings**] **<Insert manufacturer's name; product name or designation>** or comparable product by one of the following:
 - a. **<Insert manufacturer's name>**.
3. Description:
 - a. Standard: MSS SP-72.
 - b. CWP Rating: **200 psig (1380 kPa)**.
 - c. Body Design: Split body.
 - d. Body Material: ASTM A 126, gray iron.
 - e. Ends: Flanged or threaded.
 - f. Seats: PTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel.
 - i. Port: Full.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION

- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Locate valves for easy access and provide separate support where necessary.

- C. Install valves in horizontal piping with stem at or above center of pipe.
- D. Install valves in position to allow full stem movement.
- E. Install valve tags. Comply with requirements in Section 220553 "Identification for Plumbing Piping and Equipment" for valve tags and schedules.

3.3 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

- A. If valves with specified WOG ratings are unavailable, the same types of valves with higher WOG ratings may be substituted.
- B. Select valves with the following end connections:
 - 1. For Copper Tubing, **NPS 2 (DN 50)** and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
 - 2. For Copper Tubing, **NPS 2-1/2 to NPS 4 (DN 65 to DN 100)**: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
 - 3. For Copper Tubing, **NPS 5 (DN 125)** and Larger: Flanged ends.
 - 4. For Steel Piping, **NPS 2 (DN 50)** and Smaller: Threaded ends, except where solder-joint valve-end option is indicated in valve schedules below..
 - 5. For Steel Piping, **NPS 2-1/2 to NPS 4 (DN 65 to DN 100)**: Flanged ends except where threaded or solder valve-end option is indicated in valve schedules below.
 - 6. For Steel Piping, **NPS 5 (DN 125)** and Larger: Flanged ends.

3.4 LOW-PRESSURE, COMPRESSED-AIR VALVE SCHEDULE (**150 PSIG ((1035 kPa))** OR LESS)

- A. Pipe **NPS 2 (DN 50)** and Smaller:
 - 1. Bronze and Brass Valves: May be provided with solder-joint ends instead of threaded ends.
 - 2. One piece, brass ball valve.
 - 3. One piece, bronze ball valve with **[bronze] [stainless-steel]** trim.
 - 4. Two-piece, brass ball valves with **[full] [regular]** port and **[brass] [stainless-steel]** trim.
 - 5. Two-piece, bronze ball valves with **[full] [regular]** port and **[bronze or brass] [stainless-steel]** trim.
 - 6. Three-piece, brass ball valves with full port and **[brass] [stainless-steel]** trim.
 - 7. Three-piece, bronze ball valves with full port and **[bronze or brass] [stainless-steel]** trim.
 - 8. Two-piece, bronze ball valves with regular port and **[bronze] [stainless-steel]** trim.
- B. Pipe **NPS 2-1/2 (DN 65)** and Larger:
 - 1. Steel and Iron Valves, **NPS 2-1/2 to NPS 4 (DN 65 to DN 100)**: May be provided with threaded ends instead of flanged ends.
 - 2. Class 150, steel ball valves with **[full] [regular]** port.
 - 3. Class 150, iron ball valves.

3.5 HIGH-PRESSURE, COMPRESSED-AIR VALVE SCHEDULE (150 TO 200 PSIG ((1035 TO 1380 kPa)))

A. Pipe NPS 2 (DN 50) and Smaller:

1. Bronze and Brass Valves: May be provided with solder-joint ends instead of threaded ends.
2. One piece, brass ball valve.
3. One piece, bronze ball valve with [bronze] [stainless-steel] trim.
4. Two-piece, brass ball valves with [full] [regular] port and [brass] [stainless-steel] trim.
5. Two-piece, bronze ball valves with [full] [regular] port and [bronze or brass] [stainless-steel] trim.
6. Three-piece, brass ball valves with full port and [brass] [stainless-steel] trim.
7. Three-piece, bronze ball valves with full port and [bronze or brass] [stainless-steel] trim.
8. Two-piece, bronze ball valves with regular port and [bronze] [stainless-steel] trim.

B. Pipe NPS 2-1/2 (DN 65) and Larger:

1. Steel and Iron Valves, NPS 2-1/2 to NPS 4 (DN 65 to DN 100): May be provided with threaded ends instead of flanged ends.
2. Class 150, steel ball valves with [full] [regular] port.
3. Class 150, iron ball valves.

3.6 DOMESTIC HOT- AND COLD-WATER VALVE SCHEDULE

A. Pipe NPS 2 (DN 50) and Smaller:

1. Bronze and Brass Valves: May be provided with solder-joint ends instead of threaded ends.
2. One piece, brass ball valve.
3. One piece, bronze ball valve with [bronze] [stainless-steel] trim.
4. Two-piece, brass ball valves with [full] [regular] port and [brass] [stainless-steel] trim.
5. Two-piece, bronze ball valves with [full] [regular] port and [bronze or brass] [stainless-steel] trim.
6. Three-piece, brass ball valves with full port and [brass] [stainless-steel] trim.
7. Three-piece, bronze ball valves with full port and [bronze or brass] [stainless-steel] trim.
8. Two-piece, bronze ball valves with regular port and [bronze] [stainless-steel] trim.

B. Pipe NPS 2-1/2 (DN 65) and Larger:

1. Steel and Iron Valves, NPS 2-1/2 to NPS 4 (DN 65 to DN 100): May be provided with threaded ends instead of flanged ends.
2. Class 150, steel ball valves with [full] [regular] port.
3. Class 150, iron ball valves.

END OF SECTION 220523.12