1. General Information

1.1 Summary

.1 Section Contents

.1 Pipes, valves and fittings for steel pipes of building hydronic systems, manufacturing materials and related installation methods.

.2 Related sections

.1 Section 21 05 01 - Mechanical - General requirements for work results.

.2 Section 23 05 01 - Piping installation.

.3 Section 23 05 93 - HVAC network testing, adjustment and balancing

1.2 References

.1 American Society of Mechanical Engineers (ASME).

.1 ASME B16.1-98, Cast Iron Pipe Flanges and Flanged Fittings.

.2 ASME B16.3-98, Malleable Iron Threaded Fittings.

.3 ASME B16.5-03, Pipe Flanges and Flanged Fittings.

.4 ASME B16.9-01, Factory-Made Wrought Buttwelding Fittings.

.5 ASME B18.2.1-03, Square and Hex Bolts and Screws (Inch Series).

.6 ASME B18.2.2-87(R1999), Square and Hex Nuts (Inch Series).

.2 American Society for Testing and Materials International, (ASTM).

.1 ASTM A 47/A 47M-99, Standard Specification for Ferritic Malleable Iron Castings.

.2 ASTM A 53/A 53M-02, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless.

.3 ASTM A 536-84 e1, Standard Specification for Ductile Iron Castings.

.4 ASTM B 61-02, Standard Specification for Steam or Valve Bronze Castings.

.5 ASTM B 62-02, Standard Specification for Composition Bronze or Ounce Metal Castings.

.6 ASTM E 202-00, Standard Test Method for Analysis of Ethylene Glycols and Propylene Glycols.

.3 American Water Works Association (AWWA).

.1 AWWA C111-00, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

.4 Canadian Standards Association (CSA)/CSA International

.1 CSA B242-M, Groove and Shoulder Type Mechanical Pipe Couplings.

.2 CAN/CSA W48-01, Filler Metals and Allied Materials for Metal Arc Welding (Developed in cooperation with the Canadian Welding Bureau).

.5 Manufacturer's Standardization of the Valve and Fittings Industry (MSS).

.1 MSS-SP-67-025, Butterfly Valves.

.2 MSS-SP-70-98, Cast Iron Gate Valves, Flanged and Threaded Ends.

.3 MSS-SP-71-97, Cast Iron Swing Check Valves Flanged and Threaded Ends.

.4 MSS-SP-80-03, Bronze Gate, Globe, Angle and Check Valves.

.5 MSS-SP-85-02, Cast Iron Globe and Angle Valves, Flanged and Threaded Ends.

2. Products

2.1 Piping

.1 Steel pipes: In accordance with ASTM A 53/A 53M, grade B and the following requirements.

.1 Up to DN 6

.2 SA 40

2.2 Joints

.1 Pipes with a nominal diameter of DN 2 or less: Screw connections with PTFE tape or lead-free solder paste.

.2 Pipes with a nominal diameter equal to or greater than DN 2 1/2: Fittings and flanges to be welded, according to the standard [CAN / CSA W48].

.3 Flanges: Regular or with raised face.

.4 Flange fittings: according to the AWWA C111 standard.

.5 Threading: Conical.

.6 Bolts and nuts: According to the ASME B18.2.1 and ASME B18.2.2 standards.

.7 Fittings for pipe couplings with grooved ends by rolling: Type EPDM.

.1 Fittings

.8 Threaded fittings: Malleable iron according to ASME B16.3, class 150.

.9 Buttwelding fittings: Steel, according to the ASME B16.9 standard.

.10 Flanges for pipes and flanged fittings

.1 Cast iron: According to the ASME B16.1 standard, class 125.

.2 Steel: According to the ASME B16.5 standard.

.11 Fittings-unions: Malleable cast iron according to the ASTM A 47/A 47M and ASME B16.3 standards.

2.3 Valves and fittings

.1 Connections

.1 Valves with a nominal diameter of DN 2 or less: screwed ends.

.2 Globe valves: Meets MSS-SP-80 85, used for throttling, flow control and emergency bypass.

.1 Globe valves of nominal diameter equal to or lesser than DN 2

.1 For installation in mechanical installation rooms: PTFE shutter as specified in Section - Valves and fittings - Bronze.

.2 For installation other than in mechanical installation rooms: Composite shutter as specified in Section - Valves and fittings -

.3 Balancing valves (used for TAB operations)

.1 Valves of all diameters: Calibrated as specified in this section.

.2 Valves of nominal diameter equal to or lesser than DN 2

.1 For installation in mechanical installation rooms: Conical shutter as specified in Section - Valves and fittings - Bronze.

.2 For installation other than in mechanical installation rooms: Conical shutter as specified in Section - Valves and fittings - Bronze.

.4 Outlet/drain valves: Gate valves, class 125, fixed rod, one-piece wedge seal, as specified in Section - Valves and fittings - Bronze.

.1 Ball valves, nominal diameter equal to or less than DN 2

.1 Body and cap: Made of high strength cast bronze according to the ASTM B 62 standard.

.2 Nominal operating pressure: Class 125 2760 kPa (CWP) 4140 kPa (CWP) and 860 kPa (steam).

.3 End caps: To screw, according to ANSI B1.20.1 (hexagonal threaded sleeves) to be welded, according to the ANSI standard.

.4 Rod: Tamper-proof control rod.

.5 Stuffing box nut (rod): external.

.6 Shutter and bases: Solid spherical ball in hard chrome stainless steel, replaceable, and Teflon bases.

.7 Trimming of stuffing box (rod): in TFE with external nut.

.8 Actuator: lever handle, removable.

3. Execution

3.1 Piping installation

.1 Install piping in accordance with Section 23 05 01 - Piping Installation.

3.2 Balancing valve installation

.1 Remove the wheel from valve devices after installing them and once the TAB operations are complete.

.2 Apply tape on each of the joints of the prefabricated insulation placed on the taps of the cold water pipelines.

3.3 Cleaning and commissioning of the network

.1 Proceed with the cleaning and commissioning of the network in accordance with Section 23 08 02 - Cleaning and commissioning of mechanical systems piping networks.

3.4 Testing

.1 Perform the network testing in accordance with Section 21 05 01 - Mechanical - General requirements for work results.

.2 In the case of a glycol water system, repeat the test, after proceeding with cleaning, with an inhibited ethylene glycol propylene glycol solution suitable for building systems according to the ASTM E 202 standard. If required, correct all leaks in joints, fittings or valves.

3.5 Balancing

.1 Balance the hydronic system so that the actual flow is within 5% of the design flow.

.2 Use the appropriate TAB methods described in Section 23 05 93 - HVAC network testing, adjustment and balancing.

3.6 Loading the glycol water circuit

.1 Provide a mixing tank and a volumetric pump for the glycol water circuit load.

.2 After cleaning the system, recheck the concentration of the glycol water solution according to the ASTM E 202 standard.

END OF SECTION