# SECTION 22 05 12
# PLUMBING PIPE AND FITTINGS
Design Standard

## PART 1 GENERAL

### 1.1 PURPOSE:

The plumbing piping materials are an essential element of the plumbing systems. This design standard has the purpose of creating a consistent application of plumbing piping material requirements throughout the San Mateo County Community College District, therefore achieving a standard of quality for maintenance, reliability, and energy efficiency throughout all renovation and new building projects.

## PART 2 PRODUCT

### 2.1 DESIGN AND SPECIFY WORK TO INCLUDE MATERIALS, INSTALLATION AND TESTING OF PIPE, TUBING AND FITTINGS FOR COMPLETE AND OPERABLE SYSTEMS.

A. General Electrical Equipment Clearances: Do not route piping through electrical rooms, transformer vaults, elevator equipment rooms, and other electrical or electronic equipment spaces and enclosures. Within mechanical or plumbing equipment rooms, provide minimum 3 feet lateral clearance from sides of electric switchgear panels, MCC's, etc. Do not route piping above any electric power or lighting panel, switchgear, or similar electric device. Coordinate with electrical and coordinate exact pipe routing to provide proper clearance with such items.

B. Welding Qualification: Qualify welding procedures, welders and operators in accordance with ANSI B31.9 for shop and project site welding of piping work.

C. All piping shall meet the piping material requirements set forth:

1. Equipment: Provide pipe, tube and fittings of the type, fitting requirements, grade, class, size and weight indicated or required for each service, as indicated in other Division 22 Specifications.

2. Piping: Piping shall conform to ASTM or ANSI Standards and be approved by the governing Code for the application intended.

3. Excavation: Perform necessary excavation and backfill required for the installation of the plumbing work.

4. Tests: Test piping according to the requirements of Plumbing Code and submit "Certificate of Accessibility" to Owner. Test water piping at 150 PSIG for a period of 2 hours with no loss in pressure.

5. Steel Pipe:

   a. ASTM A-53-84a, Electric Resistance Welded or Seamless, Grade B: Black, unless otherwise indicated, Schedule as specified.

   b. ASTM A-135-84, Grade B: Black, unless otherwise indicated, Schedule as specified.

6. Copper Tube:

   a. Temper: Provide hard drawn temper.

b. Water Service: ASTM B-88, type as indicated for each service.

c. Drain, Waste, and Vent (DWV): ASTM B-306.

7. Cast Iron Pipe:

a. ASTM A74, Hub-and-Spigot, service weight.

b. CISPI 301-75 Hubless (No-Hub), including coupling assembly.

8. Plastic Pipe:

a. Manufactured in accordance with ASTM D2239.

b. Fittings shall be socket or butt-fusion type.

9. SMCCCD's strong preference is to avoid the use of dielectric unions or dielectric pipe nipples on heating hot water, domestic and chilled water piping applications, exterior and interior. The inevitable corrosion issues present unacceptable maintenance headaches. SMCCCD prefers high-grade brass nipples and brass unions at transition points. If the use of dielectric unions is unavoidable, the design professional shall specify Elster Perfection Clearflow© Dielectric Waterway Fittings (or equivalent), which separate dissimilar metals in the electrolyte (waterway) - reducing the local galvanic cell.

10. Welding Materials: Comply with Section 2-C of ASME Boiler Code, as applicable.

11. Tin-Antimony Soldering Materials: ASTM B13.

12. Copper-Brazed: Make brazed joints for copper tubing and fittings with code approved brazing filler alloys meeting ASTM and AWS standards and listings. Filler alloys of BCuP2 classification (e.g., "Phos-O" or "Fos-Copper") may not be used to make joints between copper tubing and cast brass or bronze fittings. Installations conform to accepted published procedures, i.e., CPC Installation Standard 3-75 and CDA Publications. Use of steel wool for cleaning tube and fittings is prohibited.

13. Unions: Provide unions at all threaded connections to equipment, regulators, and controls that may have to be removed or replaced and at all points where necessary for the disassembly of piping for maintenance. Detail piping and unions to allow removal of equipment without springing pipe.

a. Steel Pipe Union: 150 PSI malleable iron, brass to iron seat, ground joint, black or galvanized to match pipe.

b. Copper Pipe Union: 200 PSI working pressure. Bronze body, solder or grooved ends. Pipes 2 inches and under use ground joint, pipes 2-1/2 inches and larger use flanged face or grooved ends.

c. Insulating Unions: 250 PSI working pressure. Pipe ends and material to match piping. Electric current below 1 percent of galvanic current. Gasket material as recommended by manufacturer. Epco or approved equal.

14. Escutcheons:

a. Brass material, chrome plated finish. Size sufficient to cover pipe openings through wall, floor or ceiling. Set screw or spring to secure to pipe. Coordinate opening sizes.

15. Sleeves: Provide sleeves on pipes passing through concrete or masonry construction. Extend sleeve 1 inch above finished floor. Caulk pipes passing through floor with non-shrinking grout or approved caulking compound. Provide "Link-Seal" sleeve sealing system for slab on grade or exterior wall penetrations. Caulk/seal piping and ductwork passing through fire rated building assembly with UL rated assemblies. Provide fire-rated assemblies per local AHJ requirements.

16. Corrosion Control: Underground Steel Piping Corrosion Protection: Factory wrap un-insulated underground steel piping systems with protective coating composed of a coal-tar saturated wrapping tape over a 20 mil thick coal-tar epoxy coating, equivalent to "Republic X-Tru-Coat." Wrap joints spirally with a minimum overlap of 1/2 tape width. Extend wrap not less than 3 inches above grade. Extensions of existing piping systems will match the type of piping installed, to ensure the integrity of the corrosion protection and eliminate the need for ancillary corrosion protection systems such as cathodic devices which require long-term maintenance programs.

17. Pipe Tests:

    a. Make test before pipes are concealed.

    b. Fill system and remove air from system at least 24 hours before test begins.

    c. Correct leaks in screwed fittings by remaking the joint. Cut out leaks in welded joints and reweld; caulking is not permitted.

    d. Apply test pressure of 125 PSI and maintain for 1 hour with no visible leaks and no appreciable drop after the test pump has been disconnected.

2.2 APPROVED MANUFACTURERS:

Not Applicable

PART 3 EXECUTION

3.1 SUBSTITUTES ALLOWED?

Not Applicable

3.2 ASSOCIATED DESIGN STANDARDS AND CONSTRUCTION SPECIFICATIONS:

22 05 29 - Hangers And Supports For Plumbing Piping and Equipment Design Standard

22 05 53 - Identification for Plumbing Piping and Equipment Design Standard

22 11 13 – General Plumbing Piping Systems Design Standard

END OF SECTION