

SECTION 22 70 00

DI WATER PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. The Conditions of the Contract and applicable requirements of Division 1, "General Requirements", and Section 23 01 00, "Mechanical General Provisions", govern this Section.

1.2 SCOPE OF WORK:

- A. Work Included: Provide all labor, materials, equipment, tools and services, and perform all operations required in connection with or properly incidental to the construction of a complete **[and fully recirculated]** deionized water distribution system with outlets as indicated on the Drawings, as required for a complete and functional system and capable of delivering **[]** Megohm deionized treated water to locations shown on the drawings. **[All treated water piping shall be circulated to the point of the wall stub-out to serve treated water faucets and equipment.]**

1.3 QUALITY ASSURANCE:

[EDIT TO SUIT PROJECT]

- A. Acceptable Manufacturers: Provide products complying with these specifications and produced by one of the following. All piping system products shall be provided by one manufacturer.

- 1. Polyvinyl Chloride (PVC) and Fittings:

- a. Corr Tech, Incorporated.
- b. Plastic Piping Systems (PPS).

- 2. Polypropylene (PP) Pipe and Fittings:

- a. Corr Tech, Incorporated.
- b. GSR Sloan.
- c. Plastic Piping Systems (PPS).

- 3. Polyvinylidene Fluoride (PVDF) Pipe and Fittings:

- a. Corr Tech, Incorporated.
- b. Plastic Piping Systems (PPS).

- 4. Treated Water Faucets:

- a. Corr Tech, Incorporated.
- b. Plastic Piping Systems (PPS).

1.4 SUBMITTALS:

- A. Shop Drawing submittals shall include, but not be limited to, the following:
 - 1. Cut sheets of treated water pipe, valves, faucets, fittings and other required accessories clearly indicating all features, options, materials and dimensions.
 - 2. Additional information as required in Section 23 01 00.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Deliver treated water piping system components in factory-fabricated water-resistant wrapping.
- B. Handle treated water piping system components carefully to avoid damage to material component, enclosure and finish.
- C. Store treated water piping system components in a clean, dry space and protect from the weather.

PART 2 - PRODUCTS

2.1 TREATED WATER PIPE, FITTINGS AND VALVES:

- A. Pipe and Fittings: Pipe and fittings shall be **[Schedule 80 Polyvinyl Chloride (PVC) conforming to ASTM D-1785, Type 1 (normal impact), Grade 1 (high chemical resistance) with solvent welded ASTM D-2467 fittings.] [Schedule 80 natural polypropylene pipe conforming to ASTM D-2146 for Type II copolymer, cell class 2690B with Fuseal fittings.] [SYGEF or approved equal 100% pure virgin natural PVDF polymer piping and heat fusion welded fittings.]** Connections at valves and other serviceable devices shall be threaded. All pipe and fittings shall be rated for a minimum of **[150] [232]** psi at 73°F.
- B. Valves: Valves shall be ball type and manufactured of the same material as fittings to assure compatibility. All ball valves shall have Viton seals and PTFE seats. Ball valves shall have a pressure rating of **[150] [225]** psi at 68°F and shall be a true union design.
- C. Flow Control Valves: Provide a 3/8" flow control valve in each and every **[Type TW-1]** treated water outlet that limits the flow to 1/2 GPM and shall furnish and install a 4 GPM flow control valve in each treated water connection to washers. Flow control valves shall maintain a constant flow regardless of inlet pressure changes between 15 and 100 psig. No metal shall be in contact with the liquid. Flow control valves shall be as manufactured by Continental Water Conditioning Corporation or an approved equal and shall be constructed of the same material as the piping system in which they are installed.
- D. Pressure Regulating Valves: Provide, where shown on the Drawings, pressure regulator valves, utilizing the no lube design as manufactured by R-K Industries, of Ontario, CA. Valves shall be constructed of the same material as the piping system in which they are installed. Regulators shall be Model "NLF", no lube fluid pressure with adjustable screw and locknut. Units shall have a teflon diaphragm and shall have no metallic contact with the fluid regulated and shall be of the entry design for inline maintenance.
- E. Pressure Gages: Treated water system pressure gages shall be 4" diameter with 316 stainless steel bourdon tubes and provide a readout of 6 to **[100] [250]** psi. Gages installed in pipe shall be supplied with standard polypropylene body, Teflon diaphragm, liquid filled gage guards. Treated water system pressure gage guards shall be manufactured by PLAST-O-MATIC or an approved equal.

2.2 HANGERS AND SUPPORTS:

- A. Horizontal Piping: All horizontal piping shall be supported on clevis type hangers as specified in Sections 23 03 00 and 22 00 00. Piping supports shall include "U" shaped galvanized sheetmetal trays/shields spanning between hangers and supports to continuously support piping and prevent sagging. Non-metallic piping system hangers and supports shall be provided on maximum 5 foot centers.
- B. Vertical/Riser Piping: All vertical/riser piping shall be supported using riser clamps as specified in Sections 23 03 00 and 22 00 00.
- C. Wall Chase Piping: All wall chase piping shall be supported using the wall/chase support system specified in Section 22 00 00.

2.3 DEIONIZED WATER SOURCE:

- A. **[General: Refer to Section 22 13 13 for water treatment equipment.]**

[OR]

- B. **[General: The deionized water system shall be located in the [], where shown on the drawings, and the entire system, including connections to piping stub-outs provided under this contract and system balancing shall be provided under a separate contract.]**

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. General: All piping, fittings, hangers, connections and accessories shall be installed in strict accordance with the manufacturer's written installation instructions and applicable codes. Air chambers and shokstops shall not be used on treated water systems.
- B. Damaged Piping: Any damaged piping shall be removed and replaced at the Contractors expense.

[SELECT ONE OF THE FOLLOWING]

- C. **[Fusion Joints: Piping joints and connections shall be made using socket type fittings and the manufacturer's interference fit fusion joint system. Pipe shall be cut and chanfered using the manufacturer's recommended tools, methods and requirements and pipe ends and fitting sockets shall be thoroughly cleaned using isopropyl alcohol or acetone and clean absorbent paper or cloth, prior to joining joints shall be fused using the manufacturer's recommended fusion tools, heater bushings and Tempil sticks and strictly following the manufacturer's recommended fusion procedure.]**

[OR]

- D. **[Solvent Welded Joints: Piping joints shall be made using socket welded fusion joints made per the manufacturer's written joining instructions.]**
- E. Expansion Provisions: All piping systems shall be installed with adequate provisions taken where the installation temperature is outside the range of 65°F to 85°F. Vertical expansion joint assemblies, offsets and restrain as recommended by the piping system manufacturer shall be provided wherever the installation temperature is more than 10°F different from the normal water temperature.
- F. Hangers and Supports: The entire piping system and related hangers and supports shall be installed such that the piping system is properly aligned and free of stress.
1. Vertical stacks shall be supported at each floor using riser clamps. The lowest riser support shall be located below the lowest coupling/hub on the stack and shall restrict sideways as well as downward motion.
 2. Horizontal piping shall be supported using Clevis type hangers with maximum 5'0" hanger spacing.
 3. Piping supports shall include "U" shaped galvanized sheetmetal trays/shields spanning between hangers and supports to continuously support piping and prevent sagging. Non-metallic piping system hangers and supports shall be provided on maximum 5 foot centers.
 4. **[Hangers shall also be located at each offset, bend or fitting.]**
- G. **[Training: The Contractor shall instruct the Owner's maintenance staff the proper procedure for fusing pipe joints and shall provide the Owner with all special tools and fusing equipment required to properly fuse pipe joints.]**

3.2 TESTING AND BALANCING:

- A. Test treated water piping as specified in Sections 23 05 93 and 22 00 00 for domestic water piping.
- B. After installation the Contractor shall **[sterilize the entire piping system using low pressure steam (PVDF systems only)]** and shall flush the entire system with treated water to obtain delivered water quality acceptable to the Owner.

- C. Balance the flow in each leg of the treated water system to assure equal recirculation volumes in each leg of the treated water distribution system.

3.3 IDENTIFICATION:

- A. Refer to Section 23 03 00 for applicable painting, nameplate and labeling requirements.

END OF SECTION 22 70 00