

**SECTION 22 31 11
WATER SOFTENERS**

PART 1 – GENERAL

1.1 DESCRIPTION:

Relocate existing water softening equipment complete with piping services, electrical services, controls, accessories and auxiliary equipment.

1.2 RELATED WORK:

- A. Preparation and finish painting: Section 09 91 00, PAINTING.
- B. Section 13 05 41, SEISMIC RESTRAINT REQUIREMENTS FOR NON-STRUCTURAL COMPONENTS.
- C. Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING.
- D. SECTION 22 08 00, COMMISSIONING OF PLUMBING SYSTEMS. Requirements for commissioning, systems readiness checklist, and training.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Material or equipment containing a weighted average of greater than 0.25 percent lead shall not be used in any potable water system intended for human consumption, and shall be certified in accordance with NSF/ANSI 61 or NSF 372.

2.3 EXTERNAL SOFTENER PIPING:

- A. Pipe: ASTM A53, galvanized, Schedule 40.
- B. Fittings: Malleable iron, ASME B16.3, or coated cast iron, ASME B16.1, class 125.
- C. Flanges: ASME B16.1, Class 125.
- D. Threaded Joints: Shall be made with ends reamed out. Apply bituminous base lubricant or fluorocarbon resin tape to male threads only.

2.4 BRINE PIPING:

Polyvinyl chloride (PVC), ASTM D2665, Schedule 80 with solvent welded joints.

2.5 VALVES

Ball: Carbon steel body, stainless steel trim, reinforced Teflon seat and seal, full port, threaded ends.

2.6 WATER TESTING EQUIPMENT:

- A. Furnish water testing equipment in a portable cabinet specially made for the installed equipment.
- B. Equipment shall permit the conducting of Boutron & Boudet standard soap test, or test as recommended by manufacturer of equipment.
- C. Include in the testing equipment kit the following:
 - 1. One test bottle suitable for taking and shaking water samples, graduated to indicate proper quantity of sample.
 - 2. One quart bottle with a screwed cap containing a solution of stock soap with the lather factor shown thereon.
 - 3. One dropping bottle of 50 mL capacity with a screw cap and with dropping pipette as one integral part of the cap.
 - 4. Two Baume hydrometers, calibrated for range necessary to test brine solution.
 - 5. Two heat resisting glass cylinders suitable for holding brine solution for testing with hydrometer.

PART 3 – EXECUTION

3.1 REQUIRED TECHNICAL SERVICES:

Provide services of a qualified manufacturer's representative to check complete installation for conformance to manufacturer's recommendation, put system into service, make all adjustments required for full conformance to design and specified requirements, and perform all demonstrations and tests.

3.2 FLUSHING AND DISINFECTING:

- A. Flush and disinfect new water lines and softener interiors in accordance with AWWA C651.
- B. Material:
 - 1. Liquid chlorine: AWWA B301.
 - 2. Hypochlorite: AWWA B300.

3.3 STARTUP AND TESTING:

- A. Operating: Tests shall be run in presence of Contracting Officers Representative (COR). It will not be permitted, for testing purposes, to add to or subtract from exchange material used in apparatus, neither will any regenerating agent, other than the solution specified, be permitted.

B. Procedure:

1. Regenerate system to demonstrate operation of multiport valve.
2. Operate each softener at constant maximum required capacity for ten minutes after soft water is produced. When necessary, waste softened water to sewer to maintain above flow rate. Soft water production shall begin when a sample of 40 cc does not require more than five drops of Boutron & Boudet soap solution to produce a permanent lather.
3. In order that color and turbidity of softened water may be under continuous observation during test, soft water sampling cock shall remain open and the stream of softened water run through a rubber hose discharging at the bottom of a wide mouth 4 L (1 gallon) clear glass container, set against a white background.
4. Demonstrate all features of the control system including diagnostics and flow and cycle indications.

- C. The Commissioning Agent will observe startup and contractor testing of selected equipment. Coordinate the startup and contractor testing schedules with the Resident Engineer and Commissioning Agent. Provide a minimum of 7 days prior to notice.

3.4 COMMISSIONING

- A. Provide commissioning documentation accordance with the requirements of Section 22 08 00, COMMISSIONING OF PLUMBING SYSTEMS for all inspection, startup, and contractor testing required above and required by the System Readiness Checklist provided by the Commissioning Agent.
- B. Components provided under this section of the specification will be tested as part of a larger system. Refer to Section 22 08 00, COMMISSIONING OF PLUMBING SYSTEMS and related sections for contractor responsibilities for system commissioning.

3.5 DEMONSTRATION AND TRAINING

- A. Provide services of manufacturer's technical representative for four hours to instruct VA Personnel in operation and maintenance of units.
- B. Submit training plans and instructor qualifications in accordance with the requirements of Section 22 08 00, COMMISSIONING OF PLUMBING SYSTEMS.

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