Reverse Osmosis Deionized Systems

1 GENERAL

1.1 Related Documents

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

1.2 SUMMARY

A. Section includes deionized-water equipment. Equipment and associated control and accessories shall be capable of producing Type 2 reagent grade water.
   1. Multimedia filter.
   2. Carbon Filter
   3. Deionized (DI) media.
   4. RO Systems.
   5. Recirculating pump.
   6. Purified-water storage tank.

1.3 DEFINITIONS

A. DI: Deionized.

B. RO: Reverse Osmosis.

C. Type 2 Reagent Grade Water: Type II grade of reagent water shall be prepared by distillation using a still designed to produce a distillate having a conductivity of less than 1.0 µS/cm at 298 K (25 C). Ion exchange, distillation, or reverse osmosis and organic adsorption may be required prior to distillation if the purity cannot be attained by single distillation.

1.4 ACTION SUBMITTALS

A. Product Data for each type of product, including the following.
   1. Pump curves.
   2. Equipment dimensions and weight data.
   3. Electrical wiring data.
   4. Recirculating pump.
   5. Purified-water storage tank.

B. Shop Drawings:
   1. Provide a flow schematic of the proposed systems, showing:
      a. Equipment and accessories.
      b. Piping and directional flows and sizes
      c. Flow rates.
      d. Connection to domestic water.
      e. Components.
      f. Interconnection piping.

1.5 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1. Provide water quality report after startup showing all type 2 requirements and sample data

B. Operation and Maintenance Data: For all equipment in this section.
1. Include maintenance and product regeneration recommendations.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer shall have the qualifications for supplying and servicing process water equipment, including engineering services.

B. The process water quality shall be in accordance with ASTM D1193.

C. Include installation and equipment setting technical assistance, loading media, startup and training.

2 PRODUCTS

2.1 REVERSE OSMOSIS, DEIONIZATION SYSTEM

A. System shall be provided complete with all the components from a single vendor in a package system to be installed by contractor in accordance with the vendors installation instructions.

B. See drawings for performance specifications.

2.2 PERFORMANCE REQUIREMENTS

A. Design equipment based on the site water supply quality.

B. RO/DI water shall be in accordance with ASTM D1193 Type 2 Water.

1. Electrical Conductivity (maximum): 1.0 µS/cm at 298 K (25oC)
2. Electrical Resistivity (minimum): 1.0 Mcm at 298 K (25oC)
3. Total Organic Carbon (TOC) (maximum): 50 µg/L
4. Sodium (maximum): 5 µg/L
5. Chlorides (maximum): 5 µg/L
6. Total Silica (maximum): 3 µg/L

2.3 PIPING

A. Specification G:
1. Pipe: PVC Pipe: ASTM D 1785, Schedule 80, High Purity, Low Extractable
2. Fittings: PVC Plastic Pipe Fittings, ASTM D 2467 for Schedule 80.
   a. PVC solvent cement used within buildings shall have a VOC content of 510 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
   b. Adhesive primer shall have a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
   c. Solvent cement and adhesive primer used within buildings shall comply with testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions form Various Sources Using Small-Scale Environmenta

3 EXECUTION

3.1 INSTALLATION

A. General locations and Arrangements: Drawings and details indicate general location and arrangement of water piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install equipment in accordance with all codes, standards, and manufacturers recommendations.

C. Provide documentation that the equipment has been installed in accordance with manufacturers requirements.

D. Provide a startup of the equipment and a per-check of all associated piping, valves, control devices and control panels.

E. After completion of the installation, provide up to eight hours of instructional time with the Owners personnel.

F. Connect, calibrate, balance, and adjust equipment, devices, and instrumentation to perform functions as specified.

G. Reverse Osmosis/ Deionized Water: Pipe specification G

3.2 PIPING CONNECTIONS

A. Drawings indicate general arrangement of equipment, piping, fittings, and specialties.

B. Where installing equipment, allow space for service and maintenance.

C. Connect deionized-water piping to equipment and service outlets with unions or flanges.

3.3 IDENTIFICATION

A. Comply with requirements for identification specified in Section 23050 “Common Work Results for Mechanical systems”.

3.4 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. After installation, installer shall test equipment for performance, defects and water quality.
2. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the system’s working pressure. Test pressure shall not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength or 1.7 times the “SE” value in Appendix A ASME B31.9 “Building Service Piping.”
3. The installer shall notify the commissioning agent, with at least 24 hours advance notice.
4. Submit separate reports for each test.

END OF SECTION 226719