

SECTION 232500 - WATER TREATMENT SYSTEMS: CHILLED WATER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE

- A. Scope: Provide complete water treatment systems for chilled water system. Provide water treatment systems as indicated on the drawings and specified herein and provide all plant, materials, equipment and labor required to flush and clean the new piping systems prior to operation.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division-23 and to all other applicable portions of the Drawings and Specifications.
- B. The chillers shall not be operated until all work of this Section is complete and the initial treatment begun. Coordinate the installation of all piping system mounted equipment control with all trades involved to insure a timely and workmanlike installation.

1.4 SHOP DRAWINGS

- A. Include specific data on: all chemicals; controls, feeders, pumps; blow down valves and like items; as well as complete power, control and interlock wiring diagrams. Include complete operating and maintenance instructions.
- B. Shop drawings for each complete chilled water treatment system and its chemicals shall include catalog descriptions of all components, written functional descriptions of all operation phases, shop drawings showing arrangement of all components and their enclosing cabinetry, schematic flow diagrams of all treatment system related piping to and from where such piping components connect into and are located in the other piping systems, and all other information necessary to assure that the treatment system(s) are satisfactory and completely as specified.

1.5 PRESSURE AND TEMPERATURE RATINGS

- A. Unless otherwise specified in this section, components of this equipment or system (specified by this section) which are connected to the fluid system (chilled water, potable water, etc.) to which this equipment or system serves shall be recommended and rated for same (or greater) maximum working pressure and temperature conditions which are applicable to the fluid system at the location(s) at which the equipment and systems of this section are installed. Refer to specification section(s) describing the related fluid systems(s) for pressure and temperature ratings applicable to the components of this section.

1.6 MANUFACTURER QUALIFICATIONS

- A. Chemicals, service and equipment shall be supplied by a single water treatment company for undivided responsibility.
- B. The water treatment chemical and service supplier shall be a recognized specialist, active in the field of industrial water treatment for at least ten years, whose major business is in the field of water treatment, and shall have regional water analysis laboratories, development facilities and service department, plus full-time personnel located within the trading area of the job site.

1.7 MANUFACTURERS

- A. Products listed in this Section or on the plans are based on a specific manufacturer to establish the desired style, quality and type. Equivalent products, complying with the requirements of this Section and the installation requirements of the plans, by the following manufacturers are acceptable:
 - 1. Mogul
 - 2. Mitco
 - 3. Betz

PART 2 - PRODUCTS

2.1 CHEMICAL TREATMENT SYSTEM - CHILLED WATER

- A. For the chilled water system, provide a shot feeder with funnel, and air release valve, minimum five gallon capacity and designed to meet pressure requirements of the system.

2.2 WATER TREATMENT CHEMICALS - CHILLED WATER SYSTEM

- A. Furnish one year's supply of recommended formula for scale and corrosion preventative protection of closed recirculating system. Formulation shall not contain any ingredients which are harmful to system materials.

2.3 TESTING EQUIPMENT

- A. Furnish basic water test equipment including spare reagents for maintaining control of program standards in the chilled water systems.
- B. Provide one test cabinet suitable for wall mounting for storage of testing glassware and reagents. The cabinet will have one shelf, keylock door and fluorescent light. Cabinet shall be constructed of 18 gauge, cold-rolled steel, primed and painted with white, polyurethane enamel paint for corrosion protection.
- C. Corrosion Testing Assembly: Provide a coupon by-pass assembly to monitor effectiveness of the corrosion prevention program. This prefabricated assembly shall include:
 - 1. 1" inlet and outlet shut-off valves.
 - 2. 1" line strainer with 20 mesh stainless steel screen.
 - 3. Corrosion probe connection fitting.

4. Two (2) corrosion coupons with holders.
 5. Two (2) corrosion coupon tees.
 6. Flow control valve.
- D. Corrosion coupons will be analyzed by standard laboratory test methods and test reports provided at six month intervals.
- E. Basis of Design: Mogul Packaged Microchem 4000.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install chemical feeding systems as indicated, in accordance with manufacturer's installation instructions, and with recognized industry practices, to insure equipment complies with requirements and serves intended purposes.

3.2 SHOT FEEDERS

- A. Install shot feeders as indicated with adequate pressure differential restrictive devices to permit flow through the chemical feeder body. Connect feed piping to inlet and outlet connections with shutoff valves. Pipe drain valve discharge to floor drain.

3.3 CLEANING AND FLUSHING

- A. All chilled water lines and related equipment shall be thoroughly flushed out with precleaning chemicals designed to remove deposition such as pipe dope, oils, loose rust and mill scale and other extraneous materials. Add recommended dosages of precleaner chemical products and circulate throughout the water system. The chemical supplier shall instruct as to the proper feed rates, shall check that the cleaning solution is actually in each system, shall instruct the Contractor as to when to flush the system and shall check each system following flushing to insure all cleaning chemicals have been removed from each system. Mechanical trades shall open all modulating valves, zone valves and all other system restrictions. Drain, fill and flush water system until no foreign matter is observed and total alkalinity of the rinse water is equal to that of the make-up water.
1. Chemical used for cleaning of systems shall comply with the recommendations of the manufacturers of the major components in the system.
 2. A certificate of cleaning shall be provided by the cleaning chemical supplier to the Owner.
 3. Following system flushing, upon initial fill, the approved chemicals which provide a protective coating are to be added to prevent oxidation of the piping system.

3.4 MANUFACTURER'S SUPERVISION

- A. Provide the services of a representative of the water treatment control manufacturer and the water treatment supplier to provide supervision of the system installation and operation check out and startup service for the complete water treatment system.

3.5 EQUIPMENT PLACEMENT AND MOUNTING

- A. The equipment and devices shall be located essentially as shown on the drawings; however, actual placement shall be verified using field measurements, installation diagrams and data relating to the equipment actually approved for installation on this project. The equipment, including accessory devices, shall be mounted in strict accordance with the manufacturer's instruction in such a manner as not to compromise service or operational access to any part of the system or to existing equipment.

3.6 PIPING

- A. Installation of chemical piping shall be made in strict compliance with the tube and fitting manufacturer's recommendations.

3.7 OPERATING INSTRUCTIONS

- A. Provide the services of an authorized representative of the automatic water treatment control manufacturer and the water treatment supplier to provide on site operating and service instruction of the Owner's designated operating personnel for a period not less than one day (8 hours). Instructions in routing maintenance, testing and control shall be given to Owner's authorized personnel in person by the chemical treatment specialist. This shall be done at the site. Typewritten instructions shall also be provided. Copy of instructions shall be signed by Owner's authorized personnel and sent to engineer by the contractor. Test kits shall be provided to Owner and receipt thereof acknowledged on copy of written instructions which are sent to Engineer.

3.8 OTHER REQUIREMENTS

- A. Provide all necessary pipe, valves, fittings, unions and other items necessary for proper installation.
- B. Locate shot type feeder in valved bypass from pump discharge to pump suction. Provide gate valve in bypass on each side of feeder.
- C. All components (including pumps, meter, piping, hose, valves, etc.) and their capacities shall be properly sized for proper chilled water treatment.

END OF SECTION 232500