

SPECIAL SPECIFICATION

SECTION 15185S

CHEMICAL WATER TREATMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Water treatment for HVAC piping systems; including:

1. Cleaning of piping systems.
2. Chemical feeder equipment.
3. Treatment for closed systems.
4. Treatment for open systems.
5. Treatment for steam systems.

B. Scope of Work

- 1. The contractor shall be responsible for installing all piping, electrical and controls associated with the chemical water treatment. SNL will furnish all listed chemical equipment except the chemical pot feeders and items listed in 2.02 (contractor should furnish and install these). SNL will provide all chemicals including pretreatment and system chemicals such as scalant inhibitor, corrosion inhibitor and biocides. The contractor shall flush the piping systems, hydrotest, flush and clean, and fill.**

1.02 RELATED SECTIONS

A. Section **15051S – Piping Systems**.

1.03 PRODUCTS SUPPLIED BUT NOT INSTALLED UNDER THIS SECTION

- A. Pumps.
- B. Hydronic Piping.
- C. Cooling Tower.

1.04 SUBMITTALS

- A. Include product data for all chemical treatment materials, chemicals and equipment.
- B. Include manufacturer's installation instructions.
- C. Include shop drawings indicating all system schematics, equipment locations and controls schematics.
- D. Provide operation and maintenance manual.

1.05 QUALITY ASSURANCE

- A. **Manufacturer Qualifications:** Company specializing in manufacturing the products specified in this section with minimum ten year's documented experience with local representatives with water analysis laboratories and full-time service personnel within a 50 mile radius of the site.
- B. Conform to applicable EPA code for addition of toxic, legally prohibited chemicals to building mechanical systems and for delivery to public sewage systems.

1.06 MAINTENANCE SERVICE

- A. Include two eight hour training courses for operating personnel, instructing them on installation, care, maintenance, testing and operation of water treatment systems. Arrange course at start-up of systems.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Contractor shall contract with SNL's current provider, **LMI**, for the listed chemical treatment **equipment to be provided by SNL and installed by the Contractor.**

2.02 MATERIALS

- A. **Materials shall be provided by SNL, except as noted in Scope of Work, 1.01, B., and Contractor installed.**
- B. **PCW System:**
 - 1. **UV system (redundant) for the MicroFab PCW system.**
- C. Condenser Water System Treatment (Cooling Towers):

1. -CUB 1 will require

- a. (2) sets of chemical feed tanks, 130-gal each (total: 4 tanks) contractor furnished and installed.
- b. (4) LMI pumps
- c. (2-5) Aquatrac SmartAS tower controllers (if there are only 2 blowdown lines, only 2 controllers are needed)
- d. (2) Makeup Water meters (2.5"-3" line size?), with signal splitters (2)
- e. Blowdown Water meters (1-1.5" line size?), with signal splitters
- f. (1-2) panel mounts, depending on size/location of manifold

2. -CUB 2 will require

- a. (1) set of chemical feed tanks (26"x39"x52" tall), 130-gal each (total 2 tanks) contractor furnished and installed.
- b. (4) LMI pumps
- c. (2) Aquatrac SmartAS tower controllers, or (1) Aquatrac SmartFlex
- d. (2) Makeup Water meters (2.5"-3" line size?), with signal splitters
- e. (2) Blowdown Water meters (1-1.5" line size?), with signal splitters
- f. (1-2) panel mounts, depending on size/location of manifold

2.03 EQUIPMENT

- A. Bypass (Pot) Filter/Feeder: Neptune FTF-5.

2.04 TEST EQUIPMENT

- A. Provide test cabinet with local and fluorescent light, capable of accommodating 4 to 10 ml zeroing titrating burettes and associated reagents.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Provide systems which are operational, filled, started, and vented prior to cleaning. Use water meter to record capacity in each system.
- B. Place terminal control valves in open position during cleaning.

3.02 CLEANING SEQUENCE

- A. Add cleaner to closed systems at concentration as recommended by manufacturer. For steam systems, fill boilers only with cleaner and water.
- B. Add muriatic acid to the systems in the concentration recommended by the manufacturer, to remove mil scale. Flush system completely with water and test to see that traces of muriatic acid have been removed.
- C. Hot Water Heating Systems: Apply heat while circulating, slowly raising temperature to 180 degrees F and maintain for 12 hours minimum. Remove heat and circulate to 100 degrees F or less; drain systems as quickly as possible and refill with clean water. Circulate for six hours at design temperatures, then drain. Refill with clean water and repeat until system cleaner is removed.
- D. Chilled Water Systems: Circulate for 48 hours, then drain systems as quickly as possible. Refill with clean water, circulate for 24 hours, then drain. Refill with clean water and repeat until system cleaner is removed.
- E. Use neutralizer agents on recommendation of system cleaner supplier and approval of A/E.
- F. Flush open systems with clean water for one hour minimum. Drain completely and refill.
- G. Remove, clean, and replace strainer screens.
- H. Inspect, remove sludge, and flush low points with clean water after cleaning process is completed. Include disassembly of components as required.

3.03 CLOSED SYSTEM TREATMENT

- A. **Provide** one bypass feeder on each system. Install isolating and drain valves and necessary piping. Install around globe valve downstream of circulating pumps unless indicated otherwise.

- B. Introduce closed system treatment through bypass feeder when required or indicated by test.
- C. Provide 3/4-inch water coupon rack around circulating pumps with space for four test specimens.

3.04 CONDENSER WATER SYSTEMS (COOLING TOWERS)

- A. **Install** automatic condenser water control systems for inhibitor feed, blowdown and biocide feeds. Meter activate the inhibitor application and conductivity activate the blowdown. Meter feed the biocide with blowdown locked out to ensure biocide retention time.
- B. Provide water meter on system make-up, wired to control system.
- C. Provide solution pumps to feed sequestering agent and corrosion inhibitor from solution tank into condenser water system. Provide agitator as required.
- D. Provide conductivity controller to sample condenser water and operate 3/4-inch solenoid bleed valve and piping to blowdown controller sampler wired to open when condensing water pump is operating.
- E. Introduce algicide to tower by continuous feed with solution pump.
- F. Provide liquid level switch in each solution tank to de-activate solution pump and agitator and signal mechanical alarm system.
- G. Provide 3/4-inch water coupon rack around circulating pumps with space for four test specimens.
- H. Submit reports indicating analysis of system water after cleaning and after treatment.

END OF SECTION