UCB Standards Section 15548

Water Treatment

Part 1 – GENERAL

1.01 SYSTEM DESCRIPTION

A. Design Requirements:

1. Spill containment is required for chemicals and shall meet OSHA requirements. Consult with UCB Facilities Management for possible additional requirements.
2. All materials and equipment shall be compatible with the chemicals in contact and the temperature and pressure of the systems.
3. All feed pumps will be sized appropriately for the systems and provide enough head pressure to overcome the maximum system pressure at the point of injection.

B. Pre-Cleaning

1. All systems must be cleaned before being put into service. Follow system manufacturer's recommendation of procedure and compatibility for chemical cleaning, current industry standards, and cleaning chemicals' instructions. Flush systems with water until clear and TDS is +/- 50 micromhos of city water.

C. Chemical Feed Equipment

1. Cooling Towers

   Provide a proportional make-up chemical feed system where chemical feed is fed in proportion to the quantity of make-up water fed to the cooling tower. Automatic biocide is required. Water conductivity will be monitored and automatically bleed when above a preset limit. A flow sensor will be installed to alarm and shut down the system when loss of flow is sensed.

2. Steam Boilers

   Provide a TDS sensor that samples boiler water and a blow down valve that will be opened anytime a preset TDS limit is exceeded. Oxygen scavengers must be installed with consideration of deaerators in conjunction.

   Scale inhibitors will be fed into the suction side of the feed water pumps. The inhibitor pump must run simultaneously with the feed pumps or make up water, operators must have the option of either control.

   A water softener must be provided for all steam boilers. It shall be capable of producing a consistent supply of make-up water containing less than 0.5 ppm total hardness. If a salt-based system is used, then automatic regeneration will be provided. For continuously operated boilers a redundant and automatically switch over softening system will be provided in case of regeneration or failure.

3. Closed Systems

   All hot-water or chilled water closed-loop systems under 1,000 gallons shall have a 2-gallon bypass pot filter feeder installed. Systems over 1,000 gallons shall have a 5-gallon bypass filter feeder installed.

4. Corrosion Coupon Racks

   Corrosion coupon racks shall be provided on all process-cooling, heating water, chilled-water, and water systems served by open cooling towers (condensers and indirect evaporative cooling coils). Coupon racks will be capable of accepting at least

two corrosion test specimens. Flow control must be provided for the rack with a flow meter installed near the rack and after the control valve. The flowmeter and control valve shall be easily replaceable/serviceable Specify preference for union/flanges/threaded?. When installing a rack in a condenser water system, the warmest water in the system will supply the rack (usually the water exiting the condenser).

1.02 QUALITY ASSURANCE

A. The water treatment, chemical and service company shall be a recognized specialist, active in the field of industrial water treatment for at least ten years, whose major business is the field of water treatment, and shall have regional water analysis laboratories, development facilities, and service department, plus full-time personnel within the locale of the job site.

1.03 MAINTENANCE

A. Provide the services of a fully qualified Field Engineer, laboratory, and technical assistance from a fully qualified laboratory staff for one year warranty period. Services and assistance shall include the following:
    1. A training course for the University's operating personnel. Instructing them clearly and fully on the installation care, maintenance, testing, and operation of the water treatment systems. Length of training shall be given as needed per system size and complexity.
    2. Periodic technical service visits to the job site to perform field inspections and water analysis to evaluate the condition of the treated systems.
    3. The Field Engineer shall report findings to the University's operating personnel in writing on proper practices, chemical treating requirements, and any corrective actions needed to protect the water systems from scale, corrosion, and fouling.

Part 2 – EXECUTION

2.01 INSTALLATION/APPLICATION

A. Emergency eye wash/shower will be located at or within 10' to the chemical treatment station with no obstruction or tripping hazards in between. Chemical containers, filter feeders, chemical pumps, and controllers are considered part of the chemical treatment station.

B. Chemical treatment stations shall be located at or near a sanitary sewer floor drain or be constrained in a basin piped to a sanitary drain.

C. All chemical pumps shall be mounted no higher than 5 feet above floor elevation, with 4 feet being the optimal height.
D. Wye strainers must be installed upstream of all controller sensors. Systems over 1,500 gallons shall have individual wye strainers upstream of the coupon rack, controller sensors, and bleed valve.
E. Controllers must be mounted on fixed walls or stands that are free of vibration and insulated from extreme cold and heat if installed on an exterior wall. All controllers shall be mounted between 5’ and 5’6” above the elevation of the floor and have 36” of clearance in front.
F. All chemical pumps must be secured and supported to prevent any movement due to pump action or normal contact.

Part 3 – WATER TREATMENT

3.01 ULTRASONIC WATER TREATMENT SPECIFICATIONS

A. Provide complete chemical treatment program including corrosion inhibitor and non-chemical system for microbiological control.
B. The biocide equipment for the tower water treatment shall be a complete packaged, pre-piped, pre-wired, automatic system with installation provided by others.
C. The biocide unit shall have a fail-safe backup control and warning alarm in the event of failure. The alarm will be connected to the building management system.
D. The biocide equipment will be run independently of the bulk water inhibitor and not be connected to the conductivity control equipment.
E. All maintenance of the unit shall be the responsibility of the vendor. All replacement parts to keep the unit operational will remain the responsibility of the vendor for the life of the contract.
F. 24-hour emergency response to be provided to keep unit operational.
G. The contractor is to submit shop drawings as well as signed documents and agreements regarding terms of use.