# general

## SECTION INCLUDES

### Cleaning of piping systems.

### Chemical feeder equipment

### Chemical treatment

## DESCRIPTION OF WORK

## PERFORMANCE REQUIREMENTS

### The mechanical contractor shall clean and flush the heating water and chilled water systems. After cleaning and flushing the system, the contractor shall have UNL representative inspect the installation and witness the flushing process. The contractor shall be responsible for cleaning the flushing system until the system is accepted by UNL.

## REFERENCE SECTION 23 05 00 FOR THE FOLLOWING:

### References.

### Submittals.

### Project documents.

### Project record documents.

### Operation and maintenance data.

#### Provide material safety data sheets on all chemicals provided.

### Qualifications.

#### HVAC Water-Treatment Service Provider Qualifications: An experienced HVAC water-treatment service provider capable of analyzing water qualities, installing water-treatment equipment, and applying water treatment as specified in this Section.

### Regulatory requirements.

#### Conform to applicable code for addition of non‑potable chemicals to building mechanical systems, and for to public sewage systems.

### Maintenance service.

#### Furnish service and maintenance of treatment systems for one year from Date of Substantial Completion.

#### Provide technical service visits to perform field inspections and make water analysis on site.

#### Detail findings in writing on proper practices, chemical treating requirements, and corrective actions needed. Submit two copies of field service report after each visit. At a minimum, all closed loop piping systems shall be tested at the start-up of the equipment, after the first month or equipment operation and at the end of the one year warranty period.

#### Provide laboratory and technical assistance services during this maintenance period.

#### Provide onsite inspections of equipment during scheduled shutdown to properly evaluate success of water treatment program, and make recommendations in writing based upon these inspections.

### Maintenance materials.

#### Provide sufficient chemicals for treatment and testing during warranty period.

# PRODUCTS

## MATERIALS

### System Cleaner

#### Liquid alkaline compound with emulsifying agents and detergents to remove grease and petroleum products.

#### Biocide.

### Closed System Treatment (Water):

#### Sequestering agent to reduce deposits and adjust pH.

#### Corrosion inhibitors.

#### Conductivity enhancers.

## BYPASS (POT) FEEDER

### 7.5 gallon capacity, welded steel construction complete with fill funnel, inlet, replaceable 5 micron filter, outlet connections and quick opening cap for working pressure of 300 psig. Provide extra filter sock with bypass feeder.

# EXECUTION

## PREPARATION

### Systems shall be operational, filled, started, and vented prior to cleaning. Use water meter to record capacity in each system.

### Place terminal control valves in open position during cleaning.

## CLEANING SEQUENCE

### Concentration:

#### As recommended by manufacturer.

#### One pound per 100 gallons (1 kg per 1000 L) of water contained in the system.

#### One pound per 100 gallons (1 kg per 1000 L) of water for hot systems and one pound per 50 gallons (1 kg per 500 L) of water for cold systems.

### Hot Water Heating Systems:

#### Apply heat while circulating, slowly raising temperature to 160 degrees F (71 degrees C) and maintain for 12 hours minimum.

#### Remove heat and circulate to 100 degrees F (37.8 degrees C) or less; drain systems as quickly as possible and refill with clean water.

#### Circulate for 6 hours at design temperatures, then drain.

#### Refill with clean water and repeat until system cleaner is removed.

### 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.

### Use neutralizer agents on recommendation of system cleaner supplier and approval of UNL BSM Representative.

### Remove, clean, and replace strainer screens.

### Inspect, remove sludge, and flush low points with clean water after cleaning process is completed. Include disassembly of components as required.

## INSTALLATION

### Install in accordance with manufacturer's instructions.

## CLOSED SYSTEM TREATMENT

### Provide one bypass feeder on each system or as shown on the Drawings. Install isolating and drain valves and necessary piping.

### Introduce closed system treatment through bypass feeder when required or indicated by test.

### END OF SECTION 23 2500