

# Shelby County Schools Chemical Treatment Program Scope

## **1.0 CONTRACTOR Qualifications and Service Representative Requirements**

- 1.1 CONTRACTOR shall identify and provide a biography of their primary service representative. This primary service representative shall have a minimum of five years water treatment experience and shall have had extensive knowledge of the water treatment programs being offered. The representative shall have successfully treated system of equal or greater complexity than those at Shelby County Schools within the last year.
- 1.2 CONTRACTOR'S primary service representative shall hold a current license to apply biocides in the state of TN and proof of this qualification shall be available for inspection at any time during the contract period.
- 1.3 CONTRACTOR'S secondary service representative should also be identified to provide cover for the primary representative in the case of emergency or vacation. This secondary representative should have knowledge of the systems at Shelby County Schools and should have access to all the service reports and records generated by the primary service representative.
- 1.4 CONTRACTOR'S secondary service representative shall hold a current license to apply biocides in the state of TN and proof of this qualification shall be available for inspection at any time during the contract period.
- 1.5 CONTRACTOR shall appoint a managerial representative to oversee the team supporting Shelby County Schools. This manager shall have direct responsibility for the primary and secondary service representatives and will be available for regular program reviews and in case of emergency.
- 1.6 CONTRACTOR shall have been in the business of providing water treatment for at least 10 (ten) years.
- 1.7 CONTRACTOR shall provide three references of current customers of similar size and complexity to Shelby County Schools where services of a similar scope to this contract are currently being performed. These customer details will be held in confidence by Shelby County Schools and the references will not be contacted for any reason other than to confirm satisfactory performance of water treatment services.
- 1.8 CONTRACTOR will maintain an in-house analytical laboratory capable of analyzing water samples, solid deposit samples and undertaking particle size analyses. Analyses undertaken to verify performance or to diagnose issues will be undertaken by the contractor's in-house laboratory at no additional charge to Shelby County School System.
- 1.9 CONTRACTOR shall have a manufacturing facility within 500 miles of Shelby County, TN from where the products in use are inventoried and shipped.

# Shelby County Schools Chemical Treatment Program Scope

## 2.0 Evaporative Cooling Systems

2.1 Evaporative cooling systems will be treated with a suitable scale and corrosion inhibitor designed to maximize cycles of concentration in the system given the chemistry of the incoming makeup water.

2.3 CONTRACTOR shall undertake regular monthly testing of all open loop evaporative cooling systems during the Shelby County Schools cooling season (Typically April 1st to October 31st). Systems will be drained by Shelby County Schools during non-cooling months and appropriate measures should be recommended to Shelby County Schools if systems are to be left filled but not in use.

2.4 A laboratory analysis of the makeup water to the evaporative cooling towers will be undertaken by the CONTRACTOR at no cost to Shelby County Schools during the contract period.

2.5 If the makeup water chemistry is expected to change (example: well water supply vs. city water supply depending on demand) the treatment program will be designed to either cope with the difference in makeup water quality or will be supplemented with additional dispersants or treatment products to ensure that the systems are protected against scaling and corrosion at all times. Details of the treatment program and models of how the treatment philosophy will perform with changes in makeup water chemistry will be provided with the proposal.

2.6 It is the desire of Shelby County Schools to implement or continue a program of evaporative cooling water treatment designed to eliminate liquid chemical handling and reduce the impact to the environment by shipping large quantities of liquid chemistry over the road. To this end, the successful contractor shall eliminate liquid chemistry at every opportunity.

2.7 In the absence of suitable chemical feed equipment for a non-liquid chemical treatment program, CONTRACTOR shall furnish and install the following equipment at each location with evaporative cooling systems:

i. 3 (three) solid chemical feed containers – one for the scale and corrosion inhibitor product, a second for a non-oxidizing biocide and a third for an oxidizing biocide (see 2.9 below). The container for the feed of the oxidizing biocide shall have a suitable pressure relief valve and a solenoid or mechanically actuated valve to control flow to this unit.

## Shelby County Schools Chemical Treatment Program Scope

1. ii. To replace controllers that are not functional, functionally equivalent cooling tower controller with dual biocide timers, conductivity control and capability of addition of 4-20mA inputs for additional control probes in the future.

2. Contractor shall Install all new dry feeders (No Liquid feeders allowed), and possible piping and 3/4" taps as needed for continuous treatment feed on each cooling system. Note: The existing dry feeder equipment on site is currently owned by current supplier. At CONTRACTOR expiration date, all controllers and Pot Feeders including new install dry feeders become property of SCS.

2.8 The treatment program will be designed to achieve a maximum of 2.0mpy (mild steel) and 0.5mpy (copper) corrosion rates, as measured by corrosion coupons tested a minimum of twice a year per ASTM G4-95. Coupons will be installed upstream of chemical treatment injection points in clear PVC corrosion coupon racks with a flow regulator to ensure 5GPM flow through the rack at all times. Corrosion coupon racks, where they are not installed, will be purchased by Shelby County Schools. Where no coupon rack is available, no corrosion coupon studies need be performed.

2.9 Evaporative cooling systems will be treated with two alternating biocides – an oxidizing biocide dosed three times per week during cooling season at a minimum and a non-oxidizing biocide dosed once per week. The non-oxidizing biocide shall be based on 2,2-dibromo-3-nitrilopropionamide (DBNPA).

2.10 The biocide program shall be designed to maintain bacterial counts at a level of less than 10,000 cfu/mL at all times.

2.11 Costs to repair and maintain installed chemical dosing and control equipment controllers, solid chemistry feeders, probes, bleed valves is part of the scope of this bid.

2.12 CONTRACTOR shall furnish complete specifications for each product proposed for use in each water treatment system.

2.13 CONTRACTOR shall be responsible for providing all water treatment chemical products for evaporative cooling systems.

## Shelby County Schools Chemical Treatment Program Scope

### 3.0 Closed Loop Heating and Chilled Water Systems

3.1 CONTRACTOR shall treat each closed loop heating and cooling systems with a suitable treatment program to minimize corrosion and bacterial activity in the systems.

3.2 CONTRACTOR shall be responsible for providing all water treatment chemical products for closed loop cooling and heating systems.

3.2 CONTRACTOR shall dose each closed chilled and hot water loop ONCE at the commencement of the contract, or if such treatment is not necessary, ONE TIME following a water loss or system drain. Any additional treatment for closed chilled or hot water loops must be approved by Shelby County Schools.

3.3 The treatment program will be designed to achieve a maximum of 2.0mpy (mild steel) and 0.5mpy (copper) corrosion rates, as measured by corrosion coupons tested a minimum of twice a year per ASTM G4-95. Coupons will be installed upstream of chemical treatment injection points in clear PVC corrosion coupon racks (chilled water) or black iron corrosion coupon racks (hot water) with a flow regulator to ensure 5GPM flow through the rack at all times.

3.4 Hot water systems not containing aluminum components will be treated with a nitrite/borate treatment product dosed to maintain a nitrite residual of 800-1200ppm as sodium nitrite. The product shall be a liquid or solid (powder or granular) shipped in a suitable container to facilitate dosing using the existing chemical bypass feeders. The product can contain a dye to provide a visual indication of the presence of treatment product and to assist with leak identification, but this is not necessary.

3.5 Hot water systems containing aluminum components will be treated with a molybdate/silicate blended treatment product and the pH of the recirculating hot water will not be higher than 8.5. If the pH of the hot water does rise above 8.5, immediate pH adjustment is required and the times of the pH deviation documented on the service reports. The treatment product for these systems will not contain nitrite.

3.6 Chilled water systems will be treated with either a nitrite/borate treatment product or a molybdate/silicate blended treatment product. The CONTRACTOR will propose their preferred treatment approach. Large chilled water systems (over 50,000 gallons) can be treated with a silica based treatment program to maintain a lower overall treatment cost while keeping corrosion rates within specified targets.

3.7 CONTRACTOR shall provide all treatment dosages in ppm and pounds per 1,000 gallons system volume. Costs for treatment of each closed loop system annually will be given in cost / 1,000 gallons.

3.8 CONTRACTOR shall test closed chilled and hot water loops at each location identified in the site listing QUARTERLY.

3.8 Where not currently installed, CONTRACTOR shall furnish a suitable chemical bypass feeder or filter feeder for chilled and hot water loops. These shall be Neptune DBF-2HP or DBF-

## Shelby County Schools Chemical Treatment Program Scope

5HP or equal.  $\frac{3}{4}$ " taps, if required, shall be installed by a mechanical contractor approved by Shelby County Schools.

## Shelby County Schools Chemical Treatment Program Scope

3.9 Biocide treatment of the closed loops will occur once per year, or if routine bacterial testing indicates a  $>10^3$  cfu/mL bacterial count in the system. Biocide treatments will be an alternating non-oxidizing biocide treatment each year (example - isothiazolinone and glutaraldehyde).

3.10 If routine nitrite testing in the closed loops indicates a loss of nitrite residual without a pro-rated drop in the system conductivity, then testing for anaerobic bacterial populations should be undertaken and appropriate biocide treatment should be implemented.

# Shelby County Schools Chemical Treatment Program Scope

## 4.0 Steam Boiler Systems

4.1 Steam boilers rated greater than 300 HP should be treated with a three or four-product treatment program designed to minimize problems of scaling in the boiler and to reduce corrosion, pitting and condensate problems in the steam distribution system.

4.2 The boiler shall be treated with an internal all-polymer treatment program to facilitate the removal of solids with boiler bottom blowdown and to reduce the risk of corrosion in the boiler internals. Should additional alkalinity be required, this adjunct to the program should be included or blended with the internal treatment.

4.3 A catalyzed sodium sulfite/bisulfite product should be included in the treatment program to remove residual oxygen present in the feedwater. This product should be dosed so as to maintain a minimum of 20ppm sulfite in the boiler water. Feedwater temperature should be logged at each service call to ensure that mechanical removal of dissolved oxygen is maximized to reduce the amount of sulfite required.

4.4 A blend of morpholine, cyclohexylamine and DEAE shall be used as a steam line treatment to protect the steam and condensate return system from corrosion. This product shall be dosed to maintain a pH of 8.0-9.0 in the steam distribution and condensate return system. The product will be dosed directly into the steam header or into the feedwater line but should not be dosed into the boiler feedwater tank or deaerator. The successful bidder will work with Shelby County Schools to relocate chemical injection points if necessary.

4.5 All steam boiler water treatment products shall be liquid and shall be dosed with chemical metering pumps into the feedwater/DA tank, feedwater line or steam header as necessary. Chemical feed pumps will feed either on a relay which activates with the feedwater pumps, or shall be dosed based on softened water makeup volume.

## Shelby County Schools Chemical Treatment Program Scope

4.6 Steam boilers with a rated capacity of under 300 HP can be treated with a single, blended boiler water treatment product containing all of the above components.

4.7 Boiler blowdown shall be automated based on conductivity wherever possible. Should such automated controllers and valves not be present at the time of bidding, the bidder shall propose the supply of a suitable controller and valve package. All blowdown valve packages shall incorporate a 1" orifice union to reduce steam flashing across the conductivity sensor.

4.8 CONTRACTOR shall be responsible for providing all water treatment chemical products for steam boiler systems.



## Shelby County Schools Chemical Treatment Program Scope

### **5.0 Delivery, Chemical Handling and Safety**

5.1 CONTRACTOR shall make all routine (non-expedited) liquid chemical deliveries to Shelby County Schools under the supervision of a representative of the company in a delivery vehicle marked with the company name and shall include transfer of all chemical products to the point of use. All drivers shall be fully HAZMAT certified and will carry appropriate spill containment and personal protective equipment in the delivery vehicle. All empty containers will be removed following the delivery.

5.2 Expedited liquid chemical deliveries (under 3 days lead time) and non-liquid chemical deliveries can be made by common carrier (LTL) or courier service (UPS / FedEx etc). CONTRACTOR service representative will manage inventory and deliveries, working in conjunction with Shelby County Schools to ensure delivery is made during appropriate business hours.

5.3 CONTRACTOR shall, once per year, review all chemical labels and placards shall and replace if necessary.

5.4 CONTRACTOR shall ensure that all Safety Data Sheets (SDS) and all labels use the Global Harmonization System (GHS) of Classification and Labeling.

5.5 CONTRACTOR shall ensure that Safety Data Sheets (SDS) shall be made available electronically and in hard copy in the office of the Director of Facilities (or other designated repository).

5.6 CONTRACTOR shall ensure that all service representatives have undertaken the required company-sponsored safety training program and training records shall be made available for inspection on request. The service representative shall have available, at all times, appropriate personal protective equipment (PPE) to carry out their tasks safely. The representative shall sign in upon arrival with the Facilities Department and then sign out upon completion of the service call.

5.7 CONTRACTOR will be working on educational properties and as such will be expected to work safely, without direct supervision and without disruption to the educational environment of the school being serviced. Contractor will be expected to adhere to each school's sign in procedures and wear clearly visible identification or a visitor's badge at all times while on school properties.

5.8 CONTRACTOR shall have a written COVID-19 response plan and the primary and secondary service representative shall have available sufficient PPE, disinfectant and sanitizer to carry out their functions safely and without increasing risk to employees, pupils or staff at Shelby County Schools. Steps should be taken to utilize video conferencing and phone conferencing for review meetings where feasible to reduce social contact (see 6.7 below).

## Shelby County Schools Chemical Treatment Program Scope

### 6.0 Service Requirement and Reporting

6.1 CONTRACTOR shall generate, after each visit to Shelby County Schools, a service or visit report. These reports shall be reviewed regularly with the Facilities Department personnel.

6.2 CONTRACTOR shall complete all reports electronically and email or post the same within 24 hours of completion of the service call. The electronic reports shall outline systems or parameters that are out of the specification recommended by the vendor.

6.3 If remedial action is required that endangers personnel safety or will seriously jeopardize the lifespan or performance of capital equipment (example, blocked bleed valve causing excessive cooling tower cycling risking serious scaling), the CONTRACTOR representative will not leave the site until these issues have been brought to the attention of Shelby County Schools personnel by telephone, SMS or email.

6.4 A proposed service schedule for each location within the scope of this bid should be provided giving details of expected service frequency and outlining the expected frequency of site personnel testing to maintain a successful water treatment program.

6.5 CONTRACTOR shall provide on-site training a minimum of once per year for the purpose of training operators to oversee the water treatment program between routine CONTRACTOR service calls. Example training schedules and course titles should be provided with the bid response. Training records for attendees will be maintained by the CONTRACTOR.

6.6 CONTRACTOR shall maintain an online water treatment portal that shall serve as a repository for all service reports, safety data sheets and laboratory reports generated as part of this performance contract. This site shall be password protected, with each Shelby County Schools user being assigned a unique username and profile. The water treatment portal shall allow for the following:

- i i. Field Service Report archive
- ii ii. Safety Data Sheets
- iii iii. Operator logs including trends and graphing capability
- iv iv. Generation of work orders for operators or the water treatment vendor
- v v. Integration with an operator log sheet mobile app
- vi vi. Ability to pull data from water treatment equipment vendor online monitoring site (example – Advantage Controls “WebAdvantage”)

6.7 A minimum of once per year, CONTRACTOR shall host a review meeting with Shelby County Schools to outline performance goals, targets and identify future areas of improvement and potential projects that could provide a return on investment (ROI) for Shelby County Schools. These review meetings shall be documented and a summary shall be posted to the company's water treatment portal for review by Shelby County Schools at any time.

## Shelby County Schools Chemical Treatment Program Scope

### **7.0 New Construction / New Systems**

7.1 CONTRACTOR shall work with Shelby County Schools and its chosen mechanical or general contractor to ensure that all new build school facilities HVAC systems and associated pipework are appropriately cleaned and passivated prior to being placed into service.

7.2 CONTRACTOR shall clean and passivate all new SYSTEMS in existing buildings prior to turn over to Shelby County Schools. This shall be coordinated through Shelby County Schools chosen mechanical contractor for the project.

# Shelby County Schools Chemical Treatment Program Scope

## **8.0 Performance and Warranty**

8.1 CONTRACTOR shall provide a performance warranty for all services.

8.2 CONTRACTOR agrees that should any scaling occur due to a deficiency in the water treatment chemistry performance, then they shall clean the affected equipment at no additional cost to Shelby County Schools to the satisfaction of Shelby County Schools.