

PROPOSAL CONTENTS

4.0 Scope of Work

OVERVIEW:

Provide all labor, equipment, materials, and insurance for water treatment service to Nine (9) locations on the Texas State Technical College Waco (TSTC) campus. This shall include, but not be limited to, a minimum of bi-weekly service per month to cooling towers; monthly service to the chilled and hot water loops; Clean Chiller Plant towers once within six months intervals. Power or pressure washing is acceptable as long as washing/cleaning is performed in an appropriate way as to not damage the "fill", etc.; Provide all chemicals necessary to maintain desired levels of boiler and chiller manufacturer; and, provide and install 5-micron sock filters per visit on all closed-loop systems. Service techs shall notify HVAC supervisor or foreman upon arrival at campus and receive service entry key from them. **Service tech. shall leave key with copy of their report at front desk at Physical Plant bldg. upon every visit.**

The goals of the water treatment process are the prevention of scale formation and microbiological growth; and, minimize the amount of contaminants in order to minimize corrosion and fouling of heat transfer surfaces. Water treatment services may be defined as a business conducted under contract that requires the interpretation of analysis of water samples, including the ability to determine how to treat influent or effluent water, alter or purify water, or add or remove a mineral, chemical, or bacteriological content or substance.

SERVICE LOCATIONS:

1. New Chiller Plant (Bldg 01-08) -- 205 Bolling Drive – (Two (2) each 610 ton chiller, condenser, and chilled water loop)
2. Provence Building (Bldg 24-14) – 200 1st Street – (200 ton tower and loop)
3. ITC Building (Bldg 01-05) – 101 Campus Drive – (chilled and hot water loops)
4. Electronics Building (Bldg 22-06) – 304 Airline Drive – (chilled and hot water loops)
5. Aerospace Bldg. (Bldg 06-01) – 605 Operations Road – (hot water loops)
6. Student Services Center (Bldg 31-01) – 301)Campus Drive—(chilled and hot water loops)
7. Fentress Center (Bldg 25-27)—200 Bolling Street--(chilled and hot water loops)
8. Culinary Arts (Bldg 33-06)--- 104 8th Street --- (chilled and hot water loops)
9. A.C.T. Building (Bldg. 33-04) 102 8th Street

4.1 Plans and Specifications

Specifications:

1. Contractor is responsible for all damages due to improper water treatment maintenance of equipment.
2. The contract term will be for a period beginning on September 01, 2015 and ending on August 31, 2016.
3. Option to renew and extend contract -- The Owner shall have the exclusive option to renew this contract for two subsequent one-year periods for the treatment of chilled and hot water systems for the contract period, this depending upon appropriation of funds. The Contractor must be agreeable to renewal under the conditions of this document.
4. Contractor will establish a "Preventive Maintenance Program" that will include a list of scale and corrosion inhibitor chemicals; amount and frequency of dosing for chillers, loop systems, and boilers; and testing procedures. Contractor will submit a copy of the proposed Preventive Maintenance Program to the appropriate Owner's Representative for approval prior to beginning the service agreement work.

PRODUCTS STORAGE & HANDLING:

1. To reduce the risk associated with drum handling, all products will be delivered to the point of feed. Mild steel drums of any size are not acceptable. In order to minimize our liability, we require adherence to the following.
2. Chemical Storage Requirements: All bulk containers should be stainless steel or dual wall polypropylene tanks, where appropriate.
3. Secondary containment volume: Containment requirements shall be as per applicable Industry Standards or Best Practices.
4. In cases where flood suction increases potential leaks for hazardous chemical spills, mount pump on top of the tank.
5. Storage tanks must have bottom drain capabilities to insure positive, flooded suction for chemical pumping and injection and to allow complete emptying of the vessel.
6. The supplier must retain ownership of tanks.
7. Tanks must be vented and fitted with fume suppression equipment during delivery

8. Carboys and other non-dual walled containers are acceptable

CHEMICAL DELIVERY REQUIREMENTS:

1. Chemical transport equipment must comply with DOT requirements for transporting hazardous material.
2. No empty or full chemical transport equipment is to be stored on-site.
3. Deliveries must be made by chemical handlers who are certified in HAZMAT compliance
4. Chemicals must be transportable up steps if needed.
5. Handlers must be equipped with PPE on-site for delivery and transfer of chemicals.
6. Handlers must be equipped with items required to handle spills and any unexpected incidents.
7. Successful Respondent shall be responsible for:
 - a. Monitoring the inventory of the various chemicals required.
 - b. Assuring that adequate quantities of each chemical are available on-site for field use
8. All liquid chemicals must be available in reusable and/or returnable containers, and improve or match same method of storage and feed as existing at each site.
9. All containers provided by the successful Respondent for hazardous chemicals and hazardous materials must include spill containment as recommended by the manufacturer or in accordance with best practices. The successful Respondent must collect and dispose of chemical containers at no cost to the College. Type and size of the container actually used will be determined to serve the best interests of the College. (If applicable)
10. The successful Respondent is responsible for delivery of products to the point of use and all transfer of chemicals.

ON-SITE SERVICE:

1. Routine Service: Scheduled service by a qualified representative must be conducted at bi-weekly intervals for Boilers and Towers, and monthly intervals for chilled and hot water loops.
2. The purpose of these service visits will be to ensure the adequacy of the water treatment program and to prevent potential problems from arising that will reduce equipment

efficiency and/or result in equipment damage. All scheduled visits must be scheduled by successful Respondent in advance.

3. All routine visits shall be during normal working hours (8:00 AM- 5:00 PM CST) and must be coordinated with the HVAC supervisor or foreman.
4. Emergency Service: Response time for the service person for emergency problems shall not exceed four (2) hours after notification on the same day.
5. Required Tests - The following are the required tests that must be performed at each bi-weekly routine service and at each site. A written report with the test results shall be provided to Plant Personnel within 10 working days of the routine service. A copy of this report will be maintained on file at the Main Chiller Plant.

a. Tower Water:

1. Conductivity
2. M-Alkalinity
3. Calcium hardness
4. Inhibitor tracer
5. Phosphonate
6. Azole
7. Free Halogen (Should be tested post bromine feed)
8. Biological count (by strip method)

b. Chilled Water:

1. pH
2. Conductivity
3. Silica (no molybdenum)
4. Copper (twice per year)
5. Iron (twice per year)
6. Azole
7. Turbidity
8. Biological count (by strip method)

c. Steam Boiler:

1. Conductivity
2. P and M-alkalinity
3. pH
4. Phosphate/Tracer
5. Sulfite

d. Feed water / Condensate:

1. Ph

2. Conductivity
 3. Copper
 4. Iron
 5. Hardness
6. The successful Respondent shall also accomplish the following routine services:
- a. Check and calibrate, as necessary, the inhibitor controllers.
 - b. Provide dissolved oxygen testing onsite.
 - c. When units are opened for annual inspection, perform boiler/chiller internal inspection a minimum of once per year on each boiler and each chiller. Provide deposit analysis and inspection report for each unit.
 - d. Clean Chiller Plant Towers at six months intervals in accordance with MFG's recommendations.

OPERATOR TRAINING AND UPDATING:

1. A formal training program shall be conducted once a year. This training program shall include the equipment testing instructions, analytical procedures, and handling/feeding methods of chemicals.
2. One month in advance, the successful Respondent must schedule the training sessions with the Plant HVAC Supervisor so that he can have all operators he wishes to be present.

RESEARCH, LABORATORY BACK-UP AND PROBLEM SOLVING:

1. Successful Respondent shall have an in-house laboratory, or access to a laboratory, capable of assisting in solutions of problems that may cause loss of efficiency or damage to equipment. When samples are taken for resolution of problem issues and submitted for analysis, results must be reported to the end user within three weeks.
2. Provide laboratory facilities capable of performing a wide array of analytical work to facilitate monitoring, control, and troubleshooting, including corrosion coupon analysis, water analysis, deposit analysis, microbiological analysis, and ion exchange resin analysis.

TECHNICAL REQUIREMENTS AND/OR PERFORMANCE STANDARDS:

1. Use of the successful Respondent's products in strict accordance with instructions must result in clean heat transfer surfaces and low corrosion rates in condensate lines, boiler,

and chiller systems. These criteria will be monitored by the successful Respondent using:

2. For Evaporative Cooling Towers, acceptable performance shall be corrosion rates of 1.0 mils/yr. or less for mild steel and 0.1 mils/yr. or less for copper; and, Tower counts of 10,000 of total aerobic bacterial colonies per ml or less, and, clean heat transfer surfaces with no pitting as determined by TSTC Physical Plant Personnel.
3. For Closed Systems, acceptable performance shall be corrosion rates of 0.5 mils/yr. or less for mild steel and 0.1 mils/yr. or less for copper; counts of 1,000 of total aerobic bacterial colonies per ml or less; counts of 50 of anaerobic bacteria colonies per ml or less; and clean heat transfer surfaces with no pitting as determined by TSTC Physical Plant Personnel.
4. Inspection:
 - a. Prior to the cooling season, successful Respondent shall submit a report on cooling towers, heat exchangers and piping, demonstrated by visual inspection.
5. The successful Respondent shall be responsible for all-cleanup costs and repairs due to any failure of successful Respondent treatment program, products, or service. Such clean up and repairs will be limited to restoring condition of boiler, condensate or chiller system to condition as found by successful Respondent as described by the initial inspection report.
6. Return of Unused Chemicals: If any Contract resulting from this Solicitation is terminated at any time, the Successful Respondent shall be responsible to collect and take back all surplus chemicals, testing hardware, and all surplus chemical testing reagents that had been provided by the Successful Respondent and purchased by individual agencies.
7. Termination of any Contract resulting from this Solicitation may occur at any point of the program if the College cannot maintain control of the boiler, condensate, or chiller tower system. The water conditions of the heating systems and cooling System must remain under control and within the target values of the successful Respondent per the contract program.
8. Any relocation of chemical feed point, and or purchase of test kits and reagents, pumps, piping and any other changes required to meet Respondent's proposed treatment program needs, shall be provided and installed by the successful Respondent at no cost to the College. Cost shall be included in the bid. No installation of any such equipment to be made without express written approval by the College.

PRODUCTS TYPES:

1. All chemicals must comply with applicable FDA standards. **Chemicals not in liquid form will require approval from TSTC HVAC supervisor.**

2. Oxygen Scavenger: Liquid Catalyzed Sodium Sulfite - Provide treatment levels for oxygen scavenger, application point, and method of application
3. Low-pressure lay-up requires 100 PPM of sulfite as a minimum.
4. Scale inhibitor Phosphate/Polymer program is required. Provide treatment levels for all components. Include application point and method of application. List exact product blow-down concentration in parts per million used to calculate costs, and exact control parameter concentration in parts per million developed at the calculated quantity.
5. Anti foam: If needed, shall be compatible with other boiler compounds.

BOILER INTERNAL CHEMICALS:

1. Scale inhibitor Phosphate/Polymer program is required. Provide treatment levels for all components. Include application point and method of application. List exact product blow-down concentration in parts per million used to calculate costs, and exact control parameter concentration in parts per million developed at the calculated quantity.
2. We require a minimum of 50 PPM of polymer be maintained in the Boiler.
3. Anti foam: If needed shall be compatible with other boiler compounds.

AUTOMATED DOSAGE CONTROLLER:

1. The successful Respondent is responsible for providing verification that the controllers are operating correctly and are properly calibrated on a monthly basis, or as requested

COOLING SYSTEM PRODUCT SPECIFICATIONS:

PRODUCT TYPES:

The treatment program must be comprehensive and shall include the integrated use of scale control agents, dispersants, and corrosion inhibitors, pH control agents (only if necessary), and biocides/micro biocides. All chemicals shall be in liquid form.

TOWER WATER:

1. Use of any heavy metals (such as zinc, copper, chromate, etc.) is not acceptable for cooling towers. Molybdate and nitrate based chemistry is acceptable for "tracer".
2. Scale control, dispersion, and pH control shall be achieved with use of non-toxic organic compounds and/or polymers and with the supplementary use of acid feed. The program will consist of a Phosphonate (PBTC)/Polymer/Azole-based chemistry.
3. Corrosion inhibitor(s) shall be non-toxic organic compounds. Corrosion protection is provided for all metal surfaces encountered in this tower loop system. Successful Respondent shall guarantee to achieve (less than) <1.0 MPY (mils per year) metal loss for ferrous, (less than) <0.1 MPY non-ferrous metal and surfaces.
4. Micro biocide: Microbiological growth control shall limit formation of algae, slime forming bacteria, legionnaire's disease bacteria (*Legionella pneumophilla*), molds, fungi, and any biological fouling organisms within the entire treated open loop cooling water system.
5. Biocide 1 (liquid bromine) should be fed continuously to achieve a free halogen residual within the range of 0.2-0.3 PPM. The tower controllers have the ability to feed product

via ORP. 90 PPM per day of liquid bromide is not required for calculation purposes. Acceptable levels to be determined.

6. Biocide 2 (non-oxidizer) should be proposed to achieve the biological goals listed below. The use of isothiazoline or glutaraldehyde are permitted. Program to include an Oxidizer and non-oxidizer process as determined by the successful respondent and approval of the TSTC H/VAC supervisor. Proposed product must be approved by the College.
7. Maintain microbiological activity below ten thousand (10,000 cfu/ml) per milliliter of treated cooling water. Provide dip slides to monitor effectiveness of biocide treatment in (open systems) at each site on a weekly basis. Anaerobic biological counts should be maintained at 50 organisms per milliliter or less for Iron Related and Sulfate Reducing Bacteria.