

EXHIBIT-A**Statement of Work
HVAC Water Systems****I. GENERAL INFORMATION:**

The United States Embassy, London requires professional services and contractor cost proposals to perform preventive maintenance services of the facility's HVAC Water Systems.

II. PROJECT DESCRIPTION:

The HVAC systems includes the following closed loops:

1. Primary and Secondary Chilled Water Loop – 61003 liters (16096 gallons).
2. Condenser Water Loop– 30536 liters (8057 gallons).
3. Primary and Secondary Heating Hot Water– 59126 liters (15600 gallons).
4. Ground Water Loop, 15% PROPLYENE GLYCOL - 40000 liters (10554 gallons),
5. Modular Water Heat Pump (Source Water loop)- 1571 liters (414 gallons).
6. Underfloor Heating Loops as follows:
 - a) RF-1 MAIN ENTRY LOBBY (Total Water Volume 88 liter)
 - b) RF-2 E GALLERY (Total Water Volume 156 liter)
 - c) RF-3 W GALLERY (Total Water Volume 85 liter)
 - d) RF-4 CONSULAR ENTRY LOBBY (Total Water Volume 134 liter)
 - e) RF-5 SERVICE CAC (Total Water Volume 45 liter)
 - f) RF-6 CONSULAR CAC WEST (Total Water Volume 21 liter)
 - g) RF-7 CONSULAR CAC EAST (Total Water Volume 121 liter)
 - h) RF-8 MAIN CAC (Total Water Volume 46 liter)

III. GENERAL REQUIREMENTS:

The Contractor SOW shall provide all labor, tools, and materials required to carry out all preventive maintenance as outlined in this SOW. US Embassy staff may have service manuals for all equipment included in this SOW. If they do not, the Contractor shall assist Embassy Staff in obtaining the manuals.

IV. SCOPE OF WORK - PREVENTIVE MAINTENANCE

1. The Contractor shall provide all materials, supervision, labor, tools, and equipment to perform preventive maintenance. All personnel working in the vicinity shall wear and /or use safety protection while all work is performed. Any questions or injuries **shall** be brought to the attention of the Post Occupation Safety and Health Officer (POSHO) and the COR. Material Safety Data Sheets (MSDS) shall be provided by the Contractor for all HAZMAT materials. Copies will be provided to the COR for approval.
2. If any discrepancies are found with the treatment system that are not covered under this scope of work, then the contractor must provide the following:
 - a) Detailed report noting the discrepancy found.

- b) Bill of Materials (BOM) to include component name, quantity, part #, and price for any repair material required and material lead time.
 - c) Price quote for repair works (labor and materials).
3. At a minimum, the following HVAC Water Treatment Preventive Maintenance work shall be accomplished:
- **Safety & Special Instructions:**
 - a) Chemicals must comply with the Environmental Protection Agency (EPA) regulations and handled in accordance with occupational safety requirements. Employ personal protection against corrosive or hazardous treatment chemicals as appropriate.
 - b) Be familiar with the Material Safety Data Sheets of any chemicals used in the water treatment program.
 - c) Water treatment specialists must be properly trained and certified.
 - d) Water treatment must be based on proven standard engineering practices.
 - e) Follow treatment as directed by manufacturer and in accordance with requirements specified under Section 10.
 - f) Maintenance includes chemicals, chemical feeding, maintaining proper water conditions, controlling bleed off, protecting idle equipment, and record keeping.
 - g) Ensure chemicals are properly stored; test equipment clean, and that chemicals have not passed expiration date.
 - h) Maintain records and test results.
 - i) All tests shall conform to the manufacturer test procedures and standard values.
 - **Maintenance Description:**
 - a) Inspect system and complete water analysis.
 - b) Monitor and test corrosion coupons (every 90 days for iron and copper coupons).
 - **Maintenance Procedures:**
 - a) Sample water from the closed loop system per manufacturer's recommendations.
 - b) Test for the proper levels of chemicals in the closed loop system and adjust chemical feeds as necessary to maintain optimal conditions in the system.
 - c) Record test results in a logbook.
 - d) Use the conductivity meter to test for total solids and plot in a logbook. Record and analyze abnormal changes.
 - e) Check the total conductivity of the system with a conductivity meter. Record results in a logbook.
 - f) Check pH with the pH test strips and/or pH meter.
 - g) Clean sample bottles and wipe down all chemical treatment equipment.
 - h) Change corrosion coupons. Send used coupons to the laboratory for analysis. Contractor to supply written coupon corrosion test report to the Facilities Manager within fourteen (14) calendar days after analysis.
 - **Process Instrumentation Engineer Checks and Adjustments.**
 - a) Testing of the chemical parameters:
 - PH
 - Total dissolved solids
 - Conductivity
 - Aerobic Plate Count

Corrosion Inhibitor Level
 Biocide dosage of both the Biocides
 Test supply water for base conditions (iron, manganese, alkalinity, total hardness, chloride)

- b) Make sure that the chemical is dosed only as per the specification.
- c) Submit service report with detailed description of errors and causes(if any) and corrective action taken.
- d) The water treatment Contractor shall determine the dosage levels of chemicals and stay within the specified operating parameters:

Parameters	Maintenance Levels	
	Open System	Closed System
Corrosion on mild steel	Less than 2.0 mpy	Less than 1.0 mpy
Pitting attack on mild steel	None	None
Corrosion on copper alloys	Less than 0.2 mpy	Less than 0.1 mpy
Scaling and deposition	None	None
Microbiological fouling	1. No visible deposits 2. No health hazards. 3. Total aerobic count less than 10,000/ml	1. No visible deposits 2. No health hazards. 3. Total aerobic count less than 10,000/ml

4. The Contactor’s service proposal shall include, **at a minimum**, the following service visits:

a) Monthly (twelve times per year):

Cooling Towers:

- i. Service visits to check, report and carry out remedial actions of the water in the basin of the evaporative cooling towers.
- ii. Check the biocide and the inhibitors dosing levels. Adjust the dosing level as needed.
- iii. Check the TVC of the basin water.
- iv. Supply and up-keep of all site logbooks.
- v. Provide report with recommendations.

b) Quarterly (four times per year):

- i. Corrosion coupons :
 Quarterly service visits to collect 15no coupons (3 coupons x 5 racks) and deliver to laboratory. New coupons shall be installed to replace the collected coupons. Provide report with interpretations and any recommendations on completion (Steel and Copper coupons).
- ii. Closed System Sampling:
 Samples shall be collected from the following HVAC loops to check the chemical and microbiological levels:
 - a) Primary and Secondary Chilled Water Loop
 - b) Condenser Water Loop

- c) Primary and Secondary Heating Hot Water
 - d) Ground Water Loop (15% PROPLYENE GLYCOL).
 - e) Modular Water Heat Pump (Source Water loop)
- iii. Legionella testing of the water in the cooling towers basins (Two cooling towers. Each cooling tower includes two basins).

c) Semi-Annual (two times per year):

Samples shall be collected from the following Under Floor Heating loops to check the chemical and microbiological levels:

- RF-1 MAIN ENTRY LOBBY
- RF-2 E GALLERY
- RF-3 W GALLERY
- RF-4 CONSULAR ENTRY LOBBY
- RF-5 SERVICE CAC
- RF-6 CONSULAR CAC WEST
- RF-7 CONSULAR CAC EAST
- RF-8 MAIN CAC

d) Annual (one time per year):

- i. Legionella Awareness Training Course for Cooling Towers: The course shall accommodate up to 15 candidates. The course shall include:
 - Introduction.
 - What is Legionella?
 - Susceptibility
 - Symptoms /effects of the disease.
 - Outbreaks.
 - Legislation.
 - Controlling the bacteria.
 - Completing logbooks and record keeping.
 - Written Assessment - Marked.
 - Questions and Discussion
- ii. Supply the following Chemicals/Materials:

Material	Quantity
Dip slides for microbiological monitoring	100 each
Molybdate Inhibitor for the HVAC water	100 liters
Biocide for the HVAC water	100 liters
Mild Steel coupons	20 each
Copper coupons.	20 each