

**Project Title : PREVENTIVE MAINTENANCE OF COOLING TOWERS**

**Approved Budget : Php950,000.00**  
**for the Contract**

---

## **I. PURPOSE:**

The purpose of the Preventive Maintenance (PM) of the Cooling Towers is to have a periodic maintenance for the six (6) cooling towers and all its parts and components to ensure continuous operation of the Cooling Towers. This includes water treatment for the condenser water in the centralized air conditioning system of the GSIS

## **II. SCOPE OF WORK:**

### **Monthly Preventive Maintenance**

- 1.1 The supply of supervision, labor, equipment, tools, materials, parts and expertise for the Preventive Maintenance of six (6) Cooling Towers located at the GSIS Headquarters Building, Financial Center, Pasay City shall consist but not limited to the following activities to be done MONTHLY for a period of twenty four (24) months:
  - 1.1 Check the condition and tension of the cooling tower belts and readjust tension when necessary;
  - 1.2 Check and adjust the alignment of motor and fan pulley;
  - 1.3 Check and adjust alignment for pitch of fan assembly;
  - 1.4 Check alignment of fan motor, fan shaft and pillow block bearing;
  - 1.5 Lubricate pillow block bearing and motor bearing;
  - 1.6 Lubricate motor base adjusting screw;
  - 1.7 Clean fan blade and outside of fan motor;
  - 1.8 Take actual Ampere, Voltage and megger readings;
  - 1.9 Clean motor starters and tightening of terminals;
  - 1.10 Clean cooling towers and its vicinity; and,
  - 1.11 Submit PM reports indicating recommendations, defects found and other findings to the BMD every tenth (10<sup>th</sup>) working day of the following month.

### **Water Treatment**

- 1.2 Supply, delivery and dosing of chemicals (scale and corrosion inhibitor, bactericide and algaecide and biodispersant) necessary for the water treatment of the cooling towers.
- 1.3 Siphoning of cooling tower basin at least twice per month.
- 1.4 Supply of dosing equipment.
- 1.5 Supply, delivery and application of appropriate amounts of the chemicals for the water treatment of the Cooling Towers.
  - 1.5.1 Scale and Corrosion Inhibitor
    - 90 L/ month or 1,080 L/ 12 months for 2yrs.
    - Applied to inhibit corrosion and prevent scale deposition in recirculating open cooling system.
  - 1.5.2 Bactericide and Algaecide
    - 12 L/ month or 144 L/ 12 months for 2yrs.

- Applied every 2 weeks, alternate with biodispersant.
- Applied to contain legionella and biofilm.

#### 1.5.3 Biodispersant

- 6 L/ month or 72 L/ 12 months for 2yrs.
- Applied every 2 weeks, alternate with bactericide and algaecide.
- Applied to contain a wide range of algae in the cooling system.

### 1.6 Water Treatment Program and Monitoring System

1.6.1 The Water Treatment Program must be done once a week on-site to establish if the condensing water is within the allowable parameters, and if not do remedial work and measures on the same day. This includes the application of appropriate and necessary chemicals with the proper dosage for a period of twenty four (24) months. The water treatment program also includes the following:

- Selection of appropriate chemicals for treatment and submission of the Material Safety Data Sheet per chemical to be submitted to the BMD five (5) working days after receipt of Contract/ Purchase Order (PO);
- Siphoning of cooling tower basin every two (2) weeks;
- Determination of the source and remedial actions if the results do not conform to standards;
- Proper chemical application techniques; and,
- Water analysis results must be submitted to the BMD the following week.

1.6.2 A monthly water analysis monitoring report consisting of the results of the water analysis for the four weeks of the said month must be submitted to the BMD on the tenth (10<sup>th</sup>) working day of the following month.

- 1.7 Cleaning of cooling tower fillers including removal of algae every six (6) months under the supervision of the GSIS.
- 1.8 Swabbing of chiller condenser tubes as recommended by BMD or the Service Provider for the Preventive Maintenance of Chillers (maximum of one time swabbing per chiller per 12 months).
- 1.9 Provide training of FOMD personnel regarding the preventive maintenance and water treatment program.
- 1.10 Perform other essential maintenance associated with the cooling towers.
- 1.11 Provide minor repairs and service as necessary.
- 1.12 Repair leaks, if any.
- 1.13 In case of cooling tower/s breakdown during the project implementation, it will be the Service Provider's responsibility to restore the cooling tower/s to normal operation and for the expense of the Service Provider if the damage is related to the components indicated in the monthly PM.
- 1.14 The cooling tower/s must be restored to normal operation a maximum of five (5) working days after breakdown.

## III. SUPPORT SERVICE REQUIREMENTS

It is essential that the Service Provider maintains local parts and services facility. The Service Provider must inspect, check and repair the cooling towers within two (2) working days from receipt of call from the GSIS. Further, the Service

Provider shall have trained service representatives and supervisors to furnish all preventive maintenance, installations, tests and start-ups for final approval and acceptance on all components as required.

#### **IV. WARRANTY AND AFTER-SALES SERVICE REQUIREMENTS**

The Preventive Maintenance Work shall be guaranteed against workmanship under the terms of the standard warranty until the next scheduled Preventive Maintenance and shall cover full labor.

#### **V. SCHEDULE AND PLACE OF DELIVERY:**

The project duration is twenty four (24) months from September 2020 to August 2022 and must be completed for the periodic Preventive Maintenance as stated above from the effectivity date specified in the Purchase Order / Notice to Proceed.

#### **VI. TERMS OF PAYMENT**

1. Payment for the preventive maintenance, water treatment and supply and delivery of chemicals shall be made after the delivery of chemicals for every six months (6) usage and submission of the following:
  - 1.1 Letter request for payment;
  - 1.2 Preventive maintenance and water treatment reports; and,
  - 1.3 Delivery receipts showing the quantity in Liters of each chemical signed and received by an authorized BMD representative.
2. When the Service Provider fails to satisfactorily deliver goods within the specified delivery schedule, inclusive of duly granted time extensions, if any, the Service Provider shall be liable for damages for the delay and shall pay the procuring entity liquidated damages, an amount equal to one-tenth (1/10) of one percent (1%) of the cost of the delayed goods scheduled for delivery, for every day of delay until such goods are finally delivered and accepted by the procuring entity concerned.

#### **VII. RESPONSIBILITIES OF THE BMD DURING PROJECT IMPLEMENTATION**

1. The BMD authorized representative shall supervise the PM of the Cooling Towers.
2. In the implementation of work, the GSIS or its representative shall not be responsible for any accident such; as death injuries and diseases received by the Service Provider or any of his employee or laborers. Likewise, the GSIS shall not be responsible for any loss or damage of materials, tools, equipment delivered on the job site. Damages on the GSIS properties and equipment caused by the Service Provider shall be replaced / repaired at his own expense to the satisfaction of the GSIS. In the event of failure of repair and or replacement of the same, the GSIS shall deduct the cost of such

repairs from the payment due to the Service Provider.

3. The execution of all works shall be subject to the inspection and acceptance by the GSIS authorized representatives.

## **VIII. OTHER CONDITIONS**

1. The Service Provider represents and warrants that it has the capacity to perform its obligations and undertakings according to the terms and conditions of this project, and hereby agrees and warrants that it shall faithfully observe and comply therewith.
2. The Service Provider should submit a Certificate of Site Inspection issued by the Officer IV, BMD during submission of bid.
3. The Service Provider shall not disclose any confidential, proprietary and private information belonging to the GSIS they may become aware without the expressed permission of the GSIS.
4. The Service Provider should submit a list of similar PM contracts for Cooling Towers for the past three (3) years with the contact person and contact numbers during submission of bid.
5. The Service Provider shall assign trained and skilled personnel in its employ who are qualified to perform PM on the Cooling Towers and shall submit the curriculum vitae / bio-data of the supervisor/s and operators assigned to the GSIS for approval prior to being assigned to the GSIS. The GSIS has the right to request for replacement of the Service Provider's personnel for whatever reason.
6. All the components and consumables to be supplied by the Service Provider have to be approved by the GSIS prior to use / installation.
7. All water analyses shall be performed by the Service Provider and shall furnish materials and equipment required for the analyses. The Service Provider at no cost to GSIS shall correct deficiencies disclosed by the water analyses.
8. All works shall be completed within twenty four (24) months after the notarization of the Contract or receipt of the PO issued by the GSIS.
9. The Service Provider shall provide a breakdown of the project cost showing the cost of the individual chemicals to be used and the cost of the Preventive Maintenance for the project.
10. The Service Provider shall give priority in its service and repair to restore the Cooling Towers to normal service.
11. All work and services provided for in this project are to be performed during normal working hours on regular working days. The GSIS may request the Service Provider in writing, for work outside such times at no

extra cost if it affects the operation at the GSIS Headquarters Building. All works and services are not required to be carried out on public holidays except when the GSIS finds it necessary in its operation.

12. In case of breakdown of Cooling Towers during the conduct of preventive maintenance, it will be the Service Provider's responsibility to restore the Cooling Towers to normal operation under the supervision of BMD personnel at the expense of the Service Provider. The Cooling Towers must be restored to normal operation a maximum of five (5) working days after breakdown if the parts are available.
13. The Service Provider shall respond, to ensure the continuous and satisfactory operation of the chillers within two (2) working days upon receipt of phone, email or written notice from the GSIS.
14. The Service Provider's liability for any loss, damage or delay arising from any act, default or omission, negligence or otherwise, in or about the performance and completion of this project shall be restricted to liability for physical damage or injury to any person and damage to property, which in any such case is the natural, immediate and foreseeable result of such act, default or omission caused by the Service Provider, its employees or agents and for which it is solely responsible.
15. The Service Provider shall at all times be directly responsible for the acts or conduct of the personnel under its employ, for their salaries, wages or compensation or for other benefits provided for under existing and applicable labor laws.
16. The Service Provider shall clean the vicinity of the cooling towers including the water ways leading to the drains and prevent debris going to the drains that may cause clogging.



**GSIS** Government Service Insurance System  
Financial Center, Pasay City, Metro Manila 1308

## **APPROVAL PAGE**

# **PREVENTIVE MAINTENANCE OF COOLING TOWERS**

2020-GSIS-AMP-013

---

## **TERMS OF REFERENCE**

Building and Maintenance Department  
Facilities Operation and Maintenance Division

*Prepared by:*

**Engr. RONALD P. VALLEDOR**  
Staff Officer I

*Recommending Approval:*

**Engr. LOUIS DEXTER V. CRUZ**  
Acting Officer II

*Approved by:*

**Engr. DIVINA D.C. APOLINAR**  
Officer-In-Charge, BMD