

## **SCOPE OF WORK AND SPECIFICATIONS**

Comprehensive Contract of Maintenance of two chillar plants and AHUs at MMTC House, Bandra – Kurla Complex, Mumbai.

Water chilling AC plants (Reciprocating compressors) – 2x75 Tr

Air handling units – 17 Nos.

Chilled water pump sets 12.5 HP each (1 standby) – 3 Nos.

Condenser water pump sets 12.5 HP each (1 standby) – 3 Nos.

FRP induced draft-cooling tower – 2 Nos.

Centrifugal fans/blowers for basement exhaust – 4 nos.

FRP induced draft-cooling tower – 7.5 HP each – 2 Nos.

Electrical panel & cabling at plant room and all control cabling.

Operation & Maintenance of BMS with skilled technician as per O & M manual.

Operation & Maintenance of exhaust and ventilation system.

Regular checks and servicing of various equipment shall be carried out as per checklist attached and schedule giving scope of the work.

Quarterly checking and servicing of the plant.

Half-yearly de-scaling/cleaning of condensers, cooling coils, cleaning of chillers if found necessary as required.

Checking the air-conditioning system, comprising of the refrigeration plant, air distribution network, condensers/chillers water pumps, cooling tower and their respective motors and starters.

Lubricating all bearings as required.

Inspection of the safety operating controls for proper operation.

Checking/rectifying of alignment of coupling in direct driven components.

Testing & rectifying leakage in the refrigeration system with replacing refrigerant in case gas is leaking.

Checking the plant performance.

Repairs and replacement of faulty spare parts of all electrical panels/motor control panel, pump panels, winding of motors and relay etc. and taking out defective spares against repaired or new spares.

Checking of cooling tower fan motors, bearing etc. replacement of faulty spare parts, as & when required, for all electrical and mechanical items for cooling tower.

Checking of belt tension and alignment of motor.

Routine maintenance such as oiling, greasing, checking of tension of belt, cleaning of filters, changing of bearings & routine maintenance of AHU to be carried.

Checking/cleaning/replacement of coil as required.

Annual oil/gas charging of compressor.

## **SCOPE OF WORK FOR EXHAUST & VENTILATION SYSTEM INCLUDES :-**

- Cleaning of filters all material required will be provided by the contractor.
- Checking of motors, blowers for smooth operation.
- Periodically greasing of the bearings of the blowers.
- Tightening of 'V' belts and its adjustments as and when required.
- Attending to emergency complaints/break-down by employing additional workmen as required within the quoted rates.
- The contractor shall maintain Logbooks indicating daily.
- Starting/stopping of various plants, inlet outlet temperatures etc, as required.
  
- The Contractor shall also undertake operation of suction/delivery valves, control valves/starter/switches and checking of air flow as per laid down procedure/manufacturers recommendations.
  
- Checking to be done to notice abnormal operational noise in the running of plant/condenser/chilled water pump and corrective action to be taken as required.
  
- The contractor should check over-heating of compressors/Condenser/chilled water pumps, and corrective action be taken as required.
  
- The responsibility for the maintenance, servicing and requisite inspection of pumps, compressors etc. shall totally lie with the contractor. Periodical inspection for pump sets be undertaken within quoted rates for ensuring serviceability of the plant to ensure smooth working of the system.
  
- All pumps & compressors shall be serviced by experienced mechanic/electrician as per manufacturers recommendation.
  
- Any leakage due to gland packing of pumps/refrigerant or otherwise is to be checked and corrective action should be taken immediately.
  
- The contractor is required to carry out periodical greasing, replacement of gland packing, inspection and cleaning of pumps, repair/replacement of control valves etc within quoted rates.
  
- Pump and motor shaft and coupling should be periodically checked for alignment and tightness of nuts and bolts. motor terminal shall be checked periodically and corrective action to be taken as required. Dismantling, de-coupling and re-fixing of motor/compressor to be done as required within the quoted rates. Contractor shall ensure proper ground earthing of plant, motors and requisite corrective action is to be taken.
  
- The contractor should attend to the breakdown of plant on priority basis. Records of the break down should be maintained by him as directed by MMTC. Efforts should be made to restore working of plant within 8 hours of break so that regular air conditioned supply to users is maintained. If need be, the extra workmen shall be arranged by the contractor within quoted rates. Rewinding pump motor sets are included in the scope of this section. IN case of failure to rectify and complete the work as explained in the scope of work within the time limit as mentioned below, the work shall be got carried out through other agency at the risk and cost of contractor without further notice to them.

Minor complaints	- 04 hours.
Major complaints	- 24 hours.
Compressor Motor winding	- 08 days
Compressor overhauling	- 08 days

- The complaints which cannot be attended to within above specified time limit on technical grounds, be brought to knowledge of Engineer in- charge for taking suitable remedial action. (The contractor shall immediately intimate, MMTC about the breakdown of plant if any, and likely time which shall be taken by contractor to restore the plant, failing which he will be liable to the penalty of RS. 500/-. If A/C operator/operators fail to attend duty during a shift a penalty of Rs. 200/- shall be imposed and if a helper fails to attend duty during a shift of RS. 150/- shall be imposed.)
- Failing to attend minor complaints such equipment, cable system, performance, electrical replacement of glands in wearer valves etc will attract a penalty of Rs. 500/- per day.
- In case of major complaints such as down of system more than 08 hours whenever the standby equipment is not available for service a penalty of Rs. 500/- for each shift shall be imposed subject to maximum of Rs. 15,000/- depending upon the continuity of the shutdown. And the operating charges will be deducted proportionally for the period. All penalties will be null and void under Force Major circumstances.
- The scope of work includes preventive maintenance of air conditioning plant, etc. The same should be carried out on Saturdays and Sundays and on holidays with prior intimation to MMTC and Contractors shall work out time schedule for carrying out preventive maintenance in consultation with Engineer in-charge.
- The Contractor shall abide by and strictly follow all the requirements of security to prevent the accident or damage to the property of MMTC. The contractor shall be entirely responsible for all safety precautions required.
- The contractor shall be liable for all penalties, claims, compensations, damages on account of electrical/fire accidents, if any caused due to negligence of his workmen/non compliance of safety requirement. The contractor shall indemnify MMTC from all such penalties, claims, compensations and damages etc. on this contract.
- Gas filling shall be free of cost, as and when required.

A separate agreement shall be entered with the successful bidder later.

## CHECK LIST

S.No.	Description	Hourly	Daily	Weekly	Monthly
1.0	<u>Compressors</u>				
1.1	Oil Pressure				
1.2	Temperature				
1.3	Chamber oil level				
1.4	Float chamber oil level				
1.5	Checking lubrication				
1.6	Checking operating pressure				
1.7	Observe compressor & motor bearing temperature				
1.8	Check for unusual noise and vibration				
1.9	Chillers check entering & leaving water temperature				
1.10	Check entering & leaving water pressure.				
1.11	condensers : refrigerant pressure				
1.12	Check entering & leaving water temperature				
1.13	Check entering & leaving water pressure.				
1.14	Check water level in sump and float valve operation				
1.15	Checking motor gear boxes fan checking of oil level and topping up if necessary.				
1.16	Checking for unusual vibration				
1.17	Check oil leakages through gear box seal chambers.				
1.18	Cleaning of cooling towers and its basin				
1.19	Check oil leakages through gear box seal chambers.				
1.20	Check bearing temperature.				
1.21	Check noise and vibration				
1.22	Check all motors, starters for level heating.				
1.23	Replacing gland packing for pumps and valves if necessary				
1.24	Check motor, blower & bearing for level of heating				
1.25	Check for leakages through joint and valves if necessary.				
1.26	Air handling units : check motor,blower & bearing for level of heating				
1.27	Lubricating the pump motors/ compressors/motors of airhandling unit, motor bearing etc. If necessary check belt tension & alignment.				
1.28	Clean AHU filters.				
1.29	Motors : Check for heating				
1.30	Alignment				
1.31	Current				
1.32	Vibration				