

**OPERATION AND MAINTENANCE WATER COOLED
AIR-CONDITIONING PLANT INSTALLED AT
NBP MAIN BRANCH LAHORE**

SUMMARY

1. Engineering estimate for O/M of HVAC Plant		Rs. _____
Above Engineering Estimate	(+)	Rs. _____
Below Engineering Estimate	(-)	Rs. _____
Net Amount:-		Rs. _____

(RUPEES _____)

Note:- All items rates should be inclusive of all types of taxes, including income tax, PRA and any other govt. applicable taxes

ISSUED to _____

ADDRESS _____

ISSUED ON _____

DUE ON _____

CDR # _____ **Dated** _____

Rs. _____

FOR NATIONAL BANK OF PAKISTAN

CONTRACTOR

**OPERATION AND MAINTENANCE WATER COOLED AIR-CONDITIONING
PLANT INSTALLED AT NBP MAIN BRANCH LAHORE**
BILL OF QUANTITIES

Sr#	Description	Qty.	Rate In word & figure	Unit	Amount
1	<p>Operations and maintenance of vapor compression water cooled and air cooled air-conditioning plants of nominal capacity of 200 tons on monthly containing following units</p> <p>1. water cooled package units Capacity 40 HP 01 No. Capacity 30HP 04 Nos. Capacity 15HP 02 Nos. Capacity 7.5 HP 02 Nos. Air cooled Capacity 7.5 HP 01 No.</p> <p>These A.C plants comprises electrical controls, electrical panels, cabling, piping and ducting net work along with all accessories and components of air-conditioning system which require successful , smooth and trouble free operation for maintaining comfortable inside temperature of the Building upto 74 °F.</p> <p>The salient features, technical specifications and general terms and conditions for operation of air conditioning system are detailed in Annexure A.</p>	24 Months	158000	P. Job	3,792,000.00
				Total	3,792,000.00

Engr. PERVAIZ IQBAL
AVP-HEAD OF HVAC & MECH.

ANNEXURE –A

**SPECIFICATION OF AIR COOLED AND WATER COOLED AIR-
CONDITIONING PLANT INSTALLED AT
NBP MAIN BRANCH LAHORE**

1.	COMPONENTS OF WATER COOLED SPLIT A.C UNITS OF CAPACITY 30 HP AND CONTAINING. Reciprocating compressors, expansion valve, drier, fan and fan motor, water cooled condenser, contactor breaker overload relay, timer switch, heaters, evaporating unit copper piping, blower, bearings etc.	04 Nos.
02	COMPONENTS OF WATER COOLED SPLIT A.C UNITS OF CAPACITY 15 HP AND CONTAINING The following. Reciprocating compressors, expansion valve, drier, fan and fan motor, water cooled condenser, contactor breaker overload relay, timer switch, heaters, evaporating unit copper piping, blower, bearings etc.	02 Nos.
03	COMPONENTS OF WATER COOLED SPLIT A.C UNITS OF CAPACITY 7.5 HP AND CONTAINING The following. Reciprocating compressors, expansion valve, drier, fan and fan motor, water cooled condenser, contactor breaker overload relay, timer switch, heaters, evaporating unit copper piping, blower, bearings etc.	03 Nos.
03	AIR COOLED SPLIT A.C UNIT 7.5 HP Reciprocating compressors, expansion valve, drier, fan and fan motor, air cooled condenser, contactor breaker overload relay, timer switch, heaters, evaporating unit copper piping, blower, bearings etc.	01 No.
04.	<u>COOLING TOWERS.</u> Type. Induced Draft, FRP structure bottle shape Cooling Towers, 300 tons . <u>COMPONENTS.</u> Pulley, , hub, fan, fan blades, shafts, seals, bearing, breakats wood fills, water tray, stainer, suction, gate and globe valves, sump, 2 HP motor, three phase Thermostat control, float valve, lines, fresh water lines , control etc. alongwith all other components and accessories.	01 No.
05	Maintenance of electro-mechanical equipments require for smooth and trouble free operation of A.C. system which include maintenance- of M.S piping and G.I piping network and relevant fittings, G.I ducting network.	Lot
06	CENTRIFUGAL CONDENSER WATER PUMPS . Grun foss centrifugal pumps with bronze impeller mechanical seal and stainless steel shaft etc. Components of condenser water pumps, Siemens three phase electric motor , casing, shafts, bearing, seals, impeller, locking, gas kit, coupling, gate globe valves, strainers, check valves, expansion joint, foundation with water pumps, alongwith allied components and accessories	03 Nos.
	Electrical control panels Electrical control, panels of all electro-mechanical equipments, like, pumps, cooling towers, water cooled package unit, air-compressor, pneumatic system, water pumps etc	

**OPERATION AND MAINTENANCE OF AIR COOLED AND WATER COOLED
AIR-CONDITIONING PLANT INSTALLED AT MAIN BRANCH LAHORE**

GENERAL TERMS AND CONDITIONS

1. The contractor will be responsible for carrying out the works in true workmanship.
2. The work of Operations / Maintenance contract will be completed in specified time period.
3. No escalation in rates shall be paid by the Bank at any case.
4. All tools and welding plant, electricity etc. require for Operations / Maintenance works will be arranged by the contractor.
5. The contractor will be responsible to carry out Operations / Maintenance works during working hours and beyond working hours
6. The security measures will be managed by the contractor while execution of work, during working hours or beyond working hours.
7. The rates for Operations / Maintenance should be inclusive all kind of taxes like sale tax, import duties / insurance etc.
8. Rates should be quoted on item rate basis as detail given in the BOQ.
9. In case of any dispute arising during the execution of this contract the decision of the Chief Engineer / Divisional Head will be final and binding upon the Contract without appeal.
10. Poor quality work should not be accepted under any circumstances.
11. During execution of work contractor is responsible for the building fixture, fittings, furniture and any damage to them is the responsibility of Contractor to be indemnified to Bank at actual cost.
12. The supplier may visit the site for examining scope of work and location before, quoting rates.
13. Any change in govt. taxes/duties and currency devaluation will be on suppliers account. Bank shall not entertain any claim what so ever.
14. No previous quotation reference will be considered and accepted.
15. The Operations / Maintenance contractor will provide complete technical details, literature, original brochures along with tender.
16. No escalation in tender amount on any account what so ever shall be claimed by the Operations / Maintenance vendor.
17. The tender must be accompanied by a pay order or call deposit receipt (CDR) issued by NBP for an amount of **Rs.114,000/-** of total tender price in favour of Incharge Engineering Wing (Central), NBP, Main branch, Lahore.
18. A formal agreement shall be executed between the Operations / Maintenance contractor and the Bank on approved performance.
19. Bank reserves the right to reject any tender or part thereof without assigning any reason.
20. The details of terms & conditions related to subject works, as given in tender documents should be strictly followed.
21. The contract shall be awarded for a period of two years. The contract may be terminated by a written notice of the intention not to renew the agreement by either party with one month notice during the agreement period.
22. The employer will facilitate the working of the contractor by providing adequate facility particularly a suitable office for the contractor's Engineer within or close to the central plant room with a telephone extension from the existing intercom system during working hours for easy communication by the contractor's Engineer with the concerned officials of National Bank of Pakistan.

Contd/...2

23. The contractor will operate the plant providing effective air-conditioning in the Building as follows:
- | | |
|-------------------------------|-----------------------------|
| Monday to Friday | From 8:00 A.M. to 5:00 P.M. |
| Saturday | from 8:00 A.M to 2:30 P.M |
| Temperature to be maintained. | 74 °F |
24. The plant will not normally be operated on Sunday and listed public Holidays. However the extra operation charges will be Rs.125 /- P. Hour after working hours and on public holidays.
- The contractor will operate the plant on year round basis. The cooling, ventilation, heating would depend upon the weather conditions & decision in this regards will be at the discretion of the employer.
 - Normally the cooling cycle shall not be operated during December to January 15 every years and the contractor must complete the work of annual overhauling, maintenance, repair and servicing during this period so that the plant is in full working order by February 15.
25. (a)The contractor will submit a complete, list of materials required for the operation and servicing of the plant and for the annual maintenance and overhauling, giving three months time to the employer for their procurement for local material.
- (b) In case the Employer instructs the contractor to supply such items, the contractor will charge 10% as handling charges plus 6% with holding tax to cover the procurement expenses. The bill of the contractor will be supported by the cash memos or bills of the suppliers for the purchased items.
26. The contractor will be required to physically check the engineering stores of the employer to determine the availability of imported and indigenous spare parts. If any additional spare parts are required, the contractor will submit a list of the same to the employer giving one year's time for procurement of imported spare parts and four months times for indigenous spare parts.
27. (a).The contractor will Engage experienced and qualified staff for the operation servicing and maintenance of the plant who will work exclusively in the Building and shall not be diverted to the contractor's other installations. The staff must remain at the site of work during the operation & maintenance of A.C. Plant.
- (b). The contractor shall depute additional staff as required from his central workshop for carrying out the work of servicing and maintenance, particularly annual servicing, maintenance and overhauling without any extra cost.
- (c).The contractor shall arrange periodic site visits of his senior Engineer from his Head Office to check the operation of the plant and the servicing, maintenance and overhauling work carried out by his staff. The contractor will submit the inspection report to the Employer in first week of every quarter for the preceding quarter specifically pointing out any deficiency / shortcomings.
28. The contractor will ensure that the spare parts etc. are replaced only when it is considered essential, Maximum care would be exercised for economy and all efforts should be made to repair the old part for its reuse. New part should only be substituted when the old part can not be satisfactorily repaired.
29. The observations for equipment operation and temperature record for occupied area of the building shall be noted at regular intervals in approved printed or cyclostyled log sheets. One set of log sheets should be submitted to the Employer' representative the same day.

30. The contractor may carry out the servicing of the A.C plant on Sunday. The contractor's supervisor Engineer shall inform the Employer's Representative on a Friday regarding the servicing work to be carried out on Sunday so that the Employer's representative can arrange necessary security and access for the contractor's staff.
31. The contractor must ensure the proper functioning of the plant. In case of unsatisfactory functioning or failure of the plant on account of negligence of contractor of which the Employer shall be the sole judge, the employer shall have the right to terminate the Agreement by giving a written notice of one month.
32. In case any equipment or parts of the plant are damaged or destroyed as a result of negligence on the parts of the contractor, his agent or employees, the contractor shall be liable to pay for rectification and making good of all such damages or losses.
33. The employer reserves the right to make deduction for the period of interrupted operation of the plant on pro- rata basis where the cause of interruption is attributable to the negligence of the contractor, of which the employer shall be the sole judge.
34. For the execution of this contract, the Employer shall be represented by the Sr. Resident Engineer of the Employer (herein nominated by the Employer for this purpose and notified in writing to the contractor for operation & maintenance of A.C. Plant).
35. The contractor must ensure good behaviour by his staff and the contractor's supervisor Engineer should liaison with and follow the instructions of the Employer's Representative, particularly regarding the entry of the contractor's staff to the Building occupied areas for operation & maintenance of A.C. Plant.
36. (a). The employer's representative may instruct the contractor's supervisor Engineer to operate the plant (i) beyond normal hour on a working day or (ii) on a Sunday or public Holiday by giving notice two day before the holiday. Contractor's supervisor Engineer will take certificate in writing from the Employer's Representative regarding the date and the period of the additional operation.
(b). The contractor shall be paid charges for the additional operation of the plant as provided in the contract.
37. The Contractor should submit his bill to the Employer's representative during Ist week of every month for the work carried out during the preceding month, payments shall normally be made within 21 days of the submission of the Bill.

**SPECIFICATIONS OF AIR COOLED AND WATER COOLED AIR-
CONDITIONING PLANT INSTALLED AT NBP MAIN BRANCH, LAHORE**

SCHEDULE NO.1
SCOPE OF WORK

1. The contractor shall be responsible for the operation of the complete air-conditioning plant, complete servicing and maintenance of all equipment, controls, components and accessories including minor repairs, annual overhauling and servicing. Major repairs, when required are not included in the scope of works.
2. The Employer shall be responsible for the followings
 - a. Electricity, and water supply.
 - b. Spares and materials required for operation, maintenance, servicing, minor repairs and overhauling excluding miscellaneous items listed in para 3 c.
 - c. Water treatment chemicals.
refrigerants, and any special lubricants or oils.
 - d. Suitable office for contractor's supervisor Engineer within or close to the central plant room with a telephone extension from the existing Building Intercom system for easy communication with the concerned officials of NBP.
3. The contractor shall be responsible for providing following staff & services.
 - a. Supervisor Engineer, mechanic, electrician/ helper, tools and instruments required for operation, regular and annual servicing, overhauling and maintenance and minor repairs.
 - b. To keep the plant rooms, adjoining passages terrace clean and neat, cleaning to be done every day.
 - c. Supply of miscellaneous items required for work such as cotton waste, normal lubricants, grease and floor polish.
4. The contractor shall ensure that the air-conditioning plant is operated, maintained and serviced efficiently to avoid breakdown during normal operation. The contractor shall also ensure economical consumption of the materials and spare parts supplied by the Employer.
- 5 (a). The temperature on each floor at different locations shall be recorded at least twice daily.
 - b. The equipment operational observations shall be recorded at suitable intervals.
 - c. All readings shall be recorded in approved printed or cyclostyled log sheets prepared in duplicate. One set would be supplied to the employer's representative every day.
- 6 (a). The supervisor Engineer of the contractor shall regularly submit a monthly report in triplicate to the Employer's representative by 5th of each month regarding overall performance of the complete plant during the preceding month and pinpoint any actions to be taken by the Employer.
 - b. The contractor will carried out general overhauling air conditioning plant once in a month and as and when require for smooth operation of plants.
 - c. The contractor shall arrange periodic site visits (atleast once every quarter) from his Head office to check the operation of the complete plant and the servicing, maintenance and overhauling work carried out by the contractor's staff. The contractor will submit the inspection report to the Employer in the first week of every quarter for the preceding quarter.

7. The contractor shall submit an estimate to the Employer for approval before carrying out any major repairs which become necessary in due course but not due to any negligence or default of the contractor his agents of which the Employer shall be the sole judge. The estimate shall be submitted expeditiously so as not to disrupt the plant operation. The contractor shall under take the work on approval of the estimate by Employer.
8. The contractor shall be responsible for
 - a. Regular and effective chemical treatment of water for condensing, chilled water system by taking samples and testing and recording the results daily.
 - b. Cleaning, removals and refixing of all air-devices, painting of all devices is excluded which will be considered a major repair work.
 - c. Removal and refixing of false ceiling tiles as required by the contractor for carrying out his work. The contractor shall be responsible for any damage to the false ceiling framing and tiles.
9. The work of routine servicing and maintenance as required must be completed by the contractor's staff every day.
10. The O & M work is briefly detailed in para 11, 12 and 13 for referenced only without any limitation.
11. PLANT operation
 - a. Checking the working of all electrical and mechanical components of the equipment.
 - b. Dosing of chemicals for treatment of condensing and condenser water and testing of water samples.
 - c. Maintenance of daily operation log sheets.
 - d. Any servicing or running repair required during the operation of the plant.
12. **Weekly/ Biweekly / Monthly servicing, and Maintenance of plant.**
 - a. Washing and cleaning of air-filters.
 - b. Flushing and cleaning of strainers of water systems.
 - c. Servicing of automatic and safety controls of equipment and air-conditioning systems.
 - d. Checking of all and other lubricant levels and cleaning the same when required for all equipment components.
 - e. Checking of belt driven equipment and adjustment of belt tension and alignment.
 - f. Checking of water levels and level control valves.
 - g. Change of parts due to normal wear and tear when necessary.
 - h. Adjustment and lubrication / greasing of bearings and other components of equipment.
 - i. Checking and adjustment of all pressure and safety devices.
13. **Annual Maintenance and overhauling.**
 - 13.1 The work to be carried out between December 1 to January 15 under the supervision of senior Engineer. Parts to be changed where necessary instructions given in the manufacturer's manuals to be followed. Record of various checks and test to be maintained for future reference.
of automatic and safety controls.

13.3a. Servicing of all water pumps.

- b. Adjustment of glands and bearings.

13.4 General Overhauling

- a. Flushing and cleaning of condenser tubes.
- b. Checking and adjustment of dampers.
- c. Checking and adjustment of fan bearings and belts.

13.5 Fans

- a. Cleaning of fans.
- b. Checking and adjustment of bearings.

13.6 Air Filters.

- a. Cleaning and repair of air filters.

13.7 Cooling towers

- a. Servicing, cooling tower motor, overhauling of gears and greasing of bearing.
- b. Cleaning of PVC fill with light chemical by taking it out side the cooling tower.
- c. Repairing of leakage of cooling tower with fiber, cloth, cobalt and chemical etc.
- d. Cleaning of pipes, sprinkler head etc.

13.8 Automatic controls.

- a. Checking of setting and calibration of the automatic temperature, humidity and level controls.

13.9 Temperature recording.

- a. Checking of calibration of temperature sensing devices.

13.10 Electric motors and starters.

- a. Cleaning and checking of all components.
- b. Tightening of wire connections.
- c. Cleaning and adjustment of contacts.
- d. Checking of earthing.
- e. Checking of motor winding insulation with a meggar.

13.11 Electric control Boards and electric systems.

- a. Checking and servicing of all MCCBs. disconnect switches fuse, contacts, relays, overload cutouts and other safety devices.
- b. Tightening of wiring connections.
- c. Checking of wiring insulation.
- d. Checking of earthing.

13.12 Air distribution systems.

- a. Cleaning of air devices, painting is excluded.
- b. Repair of exposed ducts, duct insulation, jacketing and covering.

13.13 Piping systems.

- a. Cleaning and flushing of all piping systems including chemical cleaning when required.
- b. Servicing of all valves, , specialties strainer, seats.
- c. Repair of insulation, and covering of all insulation.

13.14 Painting

- a. Painting of all equipment, exposed ducting and piping. If the original paint has been scratched or has deteriorated.
- b. Painting of air devices is excluded.

14. General

- a. List of Equipment, briefly details the main items of the plant without limitation. It is to be noted that it is a year round air-conditioning plant complete in all respects and the tenderer should visit the site and familiarizes himself with the installation before submitting his tender.

SCHEDULE NO.2 **(STAFF STRENGTH)**

A- SITE SUPERVISOR **One**

Associates Engineer having 3 years diploma in mechanical or air-conditioning with 5 years relevant HVAC Experience in reputed firm.

B- Operator / Mechanic **one**

Matric with 5 years experience of operation of HVAC equipments in reputed firms.

C- Electrician **One**

Matric with 5 years experience of maintenance of electric panel of HVAC equipments in reputed firm.

D- Pipe Fitter **One**

3 years experience of piping / plumbing in reputed firm.

E- Skill Helper **One**

Having 3 years HVAC experience.

F- An experienced Engineer from company H.O shall inspect the plant after every 60 days. The Engineer shall have sufficient experience in handling rotary / reciprocating based vapor compression system of water cooled package A.C. Units. He shall report his findings to Bank after each visit.

G- In case of any major breakdown, the contractor shall depute his senior Engineer from H.O for rectification purpose.

H- No TA / DA shall be paid by the Bank on account of obligations mentioned at E & F above.

FOR NATIONAL BANK OF PAKISTAN

CONTRACTOR