

NO.DMRC/O&M/E&M/UG/M-3/ECS/CAMC-2015



DELHI METRO RAIL CORPORATION LTD.

(A Joint Venture of Govt. of India & Govt. of NCT, Delhi)

**Tender Document
For**

Comprehensive Annual Maintenance Contract for ECS equipments (other than chillers, Air compressors, Water treatment Plant) at L-2(UDB-GNPK) 06 Under Ground stations of Delhi Metro Rail Corporation (DMRC).

DELHI METRO RAIL CORPORATION LTD.

METRO BHAWAN, Fire Brigade Lane, Barakhamba Road

New Delhi-110001

SECTION 1

NOTICE INVITING TENDER

1.1 GENERAL

Delhi Metro Rail Corporation (DMRC) Ltd. invites **e-open tenders in TWO STAGE SYSTEM (Technical Bid and Financial Bid)** from the eligible tenderes as per tender clause 1.2. Of NIT for “ **Comprehensive Annual Maintenance Contract for ECS equipments (Other than chillers, Air compressors, Water treatment Plant) at L-2 (UDB-GNPK) 06 Under Ground stations of Delhi Metro Rail Corporation. ”**

1.1.1 Delhi Metro Rail Corporation (DMRC) Ltd. invites e-open tenders from eligible tenderers for the above-mentioned work as per following details:

Estimated cost of work	Rs.12132218 /-(inclusive of all taxes)
Tender Security amount	Rs.121323 /- (in form of draft or bankers cheque in the favor of DMRC Ltd.)
Cost of Tender form (Non Refundable)	Rs. 5250/- (Rs.5000 plus 5% VAT)
Contract period of the Work	03.09.2015 to 02.09.2016
Underground stations at which works to be executed	Udyog Bhawan, Race Course, Jor Bagh, INA, AIIMS, Green park underground metro stations.
Tender documents on sale	From 28/04/2015 to 20/05/2015 (upto1400 hrs) through e-tendering website www.tenderwizard.com/DMRC Tender document can only be obtained after registration of tenderer on the website www.tenderwizard.com/DMRC. For further information on this regard bidders are advised to contact 011-49424307, 011-49424365 or 011-23417910
Last date of Seeking Clarification	14/05/15 (up to 1500 hrs)
Last date of issuing addendum	18/05/2015
Date & time of Submission of Tender	20/05/2015 up to 1500 hrs

Date & time of opening of Technical Bid	20/05/2015 at 15.30 hrs
Date & time of opening of Financial Bid	Same will be intimated on www.tenderwizard.com/DMRC after technical evaluation
Authority for purchase of tender documents, seeking clarifications and submission of completed tender documents	DGM/E&M/UG-II Delhi Metro Rail Corporation, 6th floor, C-Wing, Metro Bhawan, Fire Brigade Lane, Barakhamba Road, New Delhi –110 001
<p>The tender cost and tender security will be in the form of a Demand draft/ Banker's cheque drawn on a scheduled Commercial Bank based in India and should be in favour of "Delhi Metro Rail Corporation Ltd." payable at New Delhi.</p> <p>The same should be submitted in original before opening of technical bid in the office of DGM/E&M/UG-II at the above mentioned address.</p> <p>NOTE: The bidders who fail to submit the tender cost & tender security (in original), etc. within stipulated scheduled time deemed to be rejected.</p>	

- 1.1.2 This is two bid open tender. Tenderer has to submit their e-offer in two different bids. One bid will be for technical bid and another will be for financial bid as per clause 8.3.1 of ITT.

1.2 ELIGIBILITY CRITERIA (Mandatory documents)

1.2.1 Work Experiences:

The tenderers should have the experience in the similar nature of work not less than three years. The tenderers will be qualified only if they have completed work(s) in last seven years mentioned below:-

- a. Three similar works costing not less than the amount equal to 40% of the estimated cost.

Or

- b. Two similar works costing not less than the amount equal to 50% value of estimated cost

Or

- c. One similar work costing not less than the amount equal to 80% value of estimated cost

Similar nature of work:

Below mentioned work would be considered as similar nature of work for the purpose of evaluation of work experience mentioned in above clause i.e. clause 1.2.1(a), (b) & (c).

Supply, Installation, Testing & Commissioning of Environment Control System (with or without chiller) along with/without CAMC.

Or

CAMC of Environment Control System (with or without chiller).

Note: Work involving only operation of Environment Control System will not be considered as similar nature of work.

1.2.2 N/A

1.2.3 The tenderers shall submit details of works executed by them in the Performa prescribed in **FORM A of FOT of ITT** for the works to be considered for qualification of work experience criteria. **Documentary proof such as completion certificates from client clearly indicating the nature/scope of work, actual completion cost and actual date of completion for such work should be submitted. Tender offers submitted without this documentary proof may be liable to be rejected.** In case the work is executed for private client, copy of work order, bill of quantities, bill wise details of payment received certified by C.A., T.D.S certificates for all payments received and copy of final/last bill paid by client shall be submitted.

1.2.4 Value of successfully completed portion of any ongoing work will also be considered for qualification of work experience criteria.

1.2.5 A tenderer may be from any country and all areas either a single entity or any combination of entities in the form of a joint venture or association (JVA) under an existing agreement. In the case of a JVA: all partners shall be jointly and severally liable for the execution of the Contract in accordance with the contract terms: and the JVA shall nominate a representative who shall have the authority to conduct all business for and on behalf of any and all the partners of the JVA during the tendering process and, in the event the JVA is awarded the contract, during contract execution. A tenderer and all partners constituting the tenderer can be from any country and any areas.

The tenders for this contract will be considered only from those tenderers (proprietorship firms, partnerships firms, companies, corporations, consortia or joint ventures) who meet requisite eligibility criteria prescribed in the sub-clauses of Clause 1.2.1 of NIT. In the case of a JV or Consortium, all members of the Group shall be jointly and severally liable for the performance of whole contract..

A tenderer shall submit only one tender, either individually as a tenderer or as a partner of a JV/Consortium. A tenderer who submits or participates in more than one tender will cause all of the proposals in which the tenderer has participated either as sole tenderer or member of JV/consortium will be disqualified. No tenderer can be included as subcontractor while submitting a bid individually or as a partner of a JV/consortium in the same bidding process subsequently or at the tender stage. A tenderer, if acting in the capacity of subcontractor in any bid may however participate in more than one bid, but only in the capacity as subcontractor.

1.2.6 Tenderers shall not have a conflict of interest. Tenderers found to have a conflict of

interest shall be disqualified. Tenderers shall be considered to have a conflict of interest with one or more parties in this bidding process, if:

- (a) a tenderer has been engaged by the Employer to provide consulting services for the preparation related to procurement for implementation of the project;
- (b) a tenderer's associate(s)/affiliate(s) (inclusive of parent firms) mentioned in subparagraph (a) above; or
- (c) a tenderer lends, or temporarily seconds its personnel to firms or organizations which are engaged in consulting services for the preparation related to procurement for implementation of the project, if the personnel would be involved in any capacity on the same project.

1.2.7 A firm, who has purchased the tender document in their name, can submit the tender either as individual firm or as partner of a joint venture/consortium. However, the lead partner in case of JV shall be one who has experience of similar works.

1.3.0 NON SUBSTANTIAL PARTNERS IN CASE OF JV/CONSORTIUM

- a. Lead partner must have a minimum of 40% participation in the JV/Consortium.
- b. Partners having less than 25% participation will be termed as non-substantial partner and will not be considered for evaluation which means that their financial soundness and work experience shall not be considered for evaluation of JV/Consortium.
- c. In case of JV/Consortium, change in constitution or percentage participation shall not be permitted at any stage after their submission of application otherwise the applicant shall be treated as non-responsive.

1.3.1 **Financial Standings :**

- a. Applicant should have average Annual Turnover of last three audited financial years not less than **80% of X**.

Where, X= estimated cost of work as per NIT

- b. Self attested copy of VAT/Service tax registration certificate, PAN no.
- c. Applicant must not have been black listed or deregistered by any Govt or Public sector undertaking during last 5 years the contractor has to submit an undertaking on Rs. 10 stamp paper duly attested by Notary
- d. Tenderers shall submit last three years (yr 2012-2013, 2013-2014, 2014-2015) audited financial statement duly attested by certified CA to work out net worth. The net worth must be positive.

Documentary proof of satisfying eligibility conditions and chartered accountant certificate for turnover to be furnished along with the application on printed

letter heads. Testimonials of satisfactory completion should be obtained from an officer not below the rank of executive engineer

Notes :

- Financial data for latest last three audited financial years has to be submitted by the tenderer in **FORM T-V** along with audited balance sheets. The financial data in the prescribed format shall be certified by Chartered Accountant with his stamp and signature in original. In case audited balance sheet of the last financial year is not made available by the bidder, he has to submit an affidavit certifying that 'the balance sheet has actually not been audited so far'. In such a case the financial data of previous '2' audited financial years will be taken into consideration for evaluation. If audited balance sheet of any year other than the last year is not submitted, the tender may be considered as non-responsive.
- Where a work is undertaken by a group, only that portion of the contract which is undertaken by the concerned applicant/member should be indicated and the remaining done by the other members of the group be excluded. This is to be substantiated with documentary evidence.

The tenderers will be qualified only if they have minimum financial capabilities as below:

- (i) **T1 – Liquidity:** It is necessary that the firm can withstand cash flow that the contract will require until payments received from the Employer. Liquidity therefore becomes an important consideration.

This shall be seen from the balance sheets and/or from the banking reference. Net current assets and/or documents including banking reference, should show that the applicant has access to or has available liquid assets, lines of credit and other financial means to meet cash flow of **INR 9 Lacs** for this contract, net of applicant's commitments for other Contracts. Banking reference should contain in clear terms the amount that bank will be in a position to lend for this work to the applicant/member of the Joint Venture/Consortium. In case the Net Current Assets (as seen from the Balance Sheets) are negative, only the Banking references will be considered. Otherwise the aggregate of the Net Current Assets and submitted Banking references will be considered for working out the Liquidity.

The banking reference should be from a Scheduled Bank in India or (in case of foreign parties) from an international bank of repute acceptable to DMRC **as per Performa provided in Annexure - 4 of ITT** and it should not be more than 3 months old as on date of submission of bids.

In Case of JV- Requirement of liquidity is to be distributed between members as per their percentage participation and every member should satisfy the minimum requirement.

Example: Let member-1 has percentage participation=M and member-2 has percentage participation=N. If minimum liquidity required is 'W' then liquidity of member-1 $\geq \frac{WM}{100}$

And liquidity of member-2 $\geq \frac{WN}{100}$

- (ii) **T2 - Profitability:** Profit before Tax should be **Positive in at least 3 (three) years**, out of the last three audited financial years.

In Case of JV: The profitability of only lead member shall be evaluated.

- (iii) **T3 - Net Worth:** Net Worth of tenderer during last audited financial year should be \geq **Positive**

In Case of JV- Net worth will be based on the percentage participation of each Member.

Example: Let Member-1 has percentage participation = M and Member-2 has =N. Let the Net worth of Member-1 is A and that of Member-2 is B, then the Net worth of JV will be

$$= \frac{AM+BN}{100}$$

- (iv) **T4 - Annual Turnover:** The average annual turnover from works of last three financial years should be \geq **0.8X**

The average annual turnover of JV will be based on percentage participation of each member.

Example: Let Member-1 has percentage participation = M and Member - 2 has =N. Let the average annual turnover of Member-1 is 'A' and that of Member-2 is 'B', then the average annual turnover of JV will be

$$= \frac{AM+BN}{100}$$

Notes :

- Financial data for latest last three audited financial years has to be submitted by the tenderer in **Appendix-14 of FOT** along with audited balance sheets. The financial data in the prescribed format shall be certified by Chartered Accountant with his stamp and signature in original. In case audited balance sheet of the last financial year is not made available by the bidder, he has to submit an affidavit certifying that 'the balance sheet has actually not been audited so far'. In such a case the financial data of previous '2' audited financial years will be taken into consideration for evaluation. If audited balance sheet of any year other than the last year is not submitted, the tender may be considered as non-responsive.
- Where a work is undertaken by a group, only that portion of the contract which is undertaken by the concerned applicant/member should be indicated and the remaining done by the other members of the group be excluded. This is to be substantiated with documentary evidence.

C. Bid Capacity Criteria:

Bid Capacity: The tenderers will be qualified only if their available bid capacity is more than the approximate cost of work as per NIT. Available bid capacity will be calculated based on the following formula:

$$\text{Available Bid Capacity} = 2 * A * N - B$$

Where,

A = Maximum of the value of works executed in any one year during the last three financial years (updated to **28.02.2015** price level assuming 5% inflation for Indian Rupees every year and 2% for foreign currency portions per year).

N = No. of years prescribed for completion of the work.

B = Value of existing commitments (**as on 28.02.2015**) for on-going works during period of **09 months w.e.f.01.03.2015**.

Notes:

- Financial data for latest last three financial years has to be submitted by the tenderer in **Appendix-11 of FOT** along with audited financial statements. The financial data in the prescribed format shall be certified by the Chartered Accountant with his stamp and signature in original.
- Value of existing commitments for on-going works during period of **09 months w.e.f .01.03.2015** has to be submitted by the tenderer in **Appendix-12 of FOT**. These data shall be certified by the Chartered Accountant with his stamp and signature in original.
- In the case of a group, the above formula will be applied to each member to the extent of his proposed participation in the execution of the work. If the proposed % participation is not mentioned then equal participation will be assumed.

Example for calculation of bid capacity in case of JV / Group

Suppose there are 'P' and 'Q' members of the JV / group with their participation in the JV / group as 70% and 30% respectively and available bid capacity of these members as per above formula individually works out 'X' and 'Y' respectively, then Bid Capacity of JV / group shall be as under:

$$\text{Bid Capacity of the JV / group} = 0.7X + 0.3Y$$

1.3.2 The tender submission of tenderers, who do not qualify the minimum eligibility criteria & bid capacity criteria stipulated in the clauses 1.1.3.2 A, B, C above, shall not be considered for further evaluation and therefore rejected. The mere fact that the tenderer is qualified as mentioned in sub clause 1.1.3.2 shall not imply that his bid shall automatically be accepted. The same should contain all technical data as required for consideration of tender prescribed in the ITT.

1.3.3 The descriptive and detailed scope is defined in Scope of Works (Volume 2)

- 1.3.4 The tender submission of bidders, who do not qualify the minimum eligibility criteria stipulated in the clauses 1.2 above, shall not be considered for further evaluation. The mere fact that the bidder is qualified as mentioned in sub clause shall not imply that his bid shall automatically be accepted. The same shall be subject to the data as required for consideration of tender prescribed in the ITT
- The mere fact that the tenderer is technically qualified as shall not imply that his bid shall automatically be accepted. The same should contain all Financial & other details as required for the consideration of tender.
- 1.3.5 Tender document consists of the following:
- a. Notice Inviting Tender - consisting of
 - i. Notice Inviting Tender
 - ii. Scope of Work
 - iii. Tender prices
 - b. Instructions to Tenderers
 - c. General Conditions of Contract
 - d. Special Conditions of Contract
 - e. Bill of Quantities.
- 1.3.6 The tenderers may obtain further information in respect of these tender documents from the office of Deputy General Manager/E&M/UG-II office, 6th Floor, Metro Bhawan Fire Brigade lane, Barakhamba Road New Delhi-110001
- 1.3.7 The intending bidders must be registered on e-tendering portal www.tenderwizard.com/DMRC. Those who are not registered on the e-tendering portal shall be required to get registered beforehand. If needed they can be imparted training on 'online tendering process'. After registration the tenderer will get user id and password. On login tenderer can participate in tendering process and can witness various activities of the process.
- 1.3.8 The authorized signatory of intending bidder, as per Power of Attorney (POA), must have valid class-III digital signature. The tender document can only be downloaded or uploaded using Class-III digital signature of the authorized signatory.
- 1.3.9 Tender submissions will be made online after uploading the mandatory scanned documents towards cost of tender documents such as Demand Draft or Pay Order or Banker's Cheque from a Scheduled commercial bank based in India and towards Tender Security such as Bank Guarantee or Demand Draft or Pay Order or Banker's Cheque from a Scheduled commercial bank based in India and other documents as stated in the tender document.
- 1.4.0 Tenderer is cautioned that the tender containing any material deviation from the tender document which consists of NIT, Instructions to tenderes, General conditions of contract, Special conditions of contract, Bill of quantities is liable to be summarily rejected as non-responsive.
- 1.4.1 Tenders shall be valid for a period of 180 days from the date of submission of Tenders and shall be accompanied with a tender security of the requisite amount as per clause 4.0 of ITT.
- 1.4.2 DMRC reserves the right to accept or reject any or all proposals without assigning any reasons. No bidder shall have any cause of action or claim against the DMRC for rejection of his proposal.
- 1.4.3 Bidders shall note that the maximum file size that can be uploaded is 5 MB. All the uploaded files in tender submission should be named properly and arrange systematically.

1.4.2 The bidders are advised to keep in touch with e-tendering portal www.tenderwizard.com/DMRC for updates. Any corrigendum, addendum etc issued shall be part of this tender document and shall be made available on DMRC website www.tenderwizard.com/DMRC

(Vivek Shrivastava)
DGM/E&M/UG-II
Delhi Metro Rail Corporation Ltd
6th floor, Metro Bhawan,
Fire Brigade lane,
Barakhambha Road
New Delhi-110001

SECTION 2

SCOPE OF WORK

The contractor will execute the work i.e. **“Comprehensive Annual Maintenance Contract for ECS equipments (Other than chillers, Air compressors, Water treatment Plant) at L-2 06 Under Ground stations of Delhi Metro Rail Corporation.”**

The works shall be carried out by the contractor at the following 06 underground stations of DMRC:

1. Udyog Bhawan
2. Race Course
3. Jor Bagh
4. INA
5. AIIMS
6. Green Park

Schedule of Maintenance:-

A. Preventive Maintenance:- Contractor shall strictly follow the Preventive Maintenance Schedule along with Checklists as per Manufacturers **recommendation**. However if contractor feels that any other activity is required to be additionally done for proper maintenance of the system as per the OEM recommendation, they shall carryout the same with approval from DMRC representative.

Contractor shall also submit the schedule of maintenance before maintenance and Performance Reports after Maintenance.

B. Corrective/Breakdown Maintenance: The Corrective/Breakdown Maintenance is to be carried out any time during **24 hrs x 365 days** inclusive of all Sundays & Holidays

Minor Maintenance: - The Minor failures / defects which include repairing/replacement (if required) of defective items with spare parts/Components.

- | | | |
|---------------------------|---|-----------------|
| i. Response Time (Max.) | - | 03 hours |
| ii. Attending Time (Max.) | - | 08 hours |

Major Maintenance: - The Major failures / defects cover the attention of all type of major Failures/Breakdown, which includes Repair/Replacement of Assemblies, Sub-Assemblies, and Components etc

- i. **Response Time (Max.)** - **03 hours**
- ii. **Attending Time (Max.)** - **48 hours**

The decision regarding minor/major maintenance shall be of DMRC, which will be binding on the contractor.

- C. **Providing all man power, labor, tools and tackles and replacement of defective spare parts including consumables.**
 - D. **To maintain proper inventory of spares & consumables at site**
 - E. **To maintain record of defects attended with the consumption of spares & consumables**
 - F. **Proving the chemicals required for operation and maintenance of the ECS system**
 - G. **Other activities to be carried out to upkeep the system in healthy condition**
 - Repairing insulation removed for inspection & maintenance procedure.
 - Clean the equipment and surrounding area upon completion of work.
 - Report deficiencies and repairs required.
 - Contractor shall provide localized support for immediate problem resolution.
 - Completely filled the service inspection report after each visit with findings documented on equipment condition and performance, and recommendations on equipment enhancement to extend usable life.
 - Other activities required to be carried out as per manufacturer recommendation and to keep the system in healthy condition.
 - If anything not included / missed and required for system proper operation if then it should be done by contractor free of cost.
-
- For every site visit, for Servicing / repair of water cooled chillers, Engineer in-charge will prepare a service report, signed by Contractor's Service Engineer and DMRC engineer. First copy of it will be handed over to the DMRC engineer and second would be retained by Contractor's Service Engineer
 - If during the period if any equipment is required to be changed as a whole then the replacement will be done on mutually agreed terms.
 - DMRC is an ISO-14001 & OHSAS 18001 certified Organization for Environment, Health & safety. The work is to be carried out as per International Norms/Standards and in such a manner that all premises always look Neat & Clean. Similarly, the

waste disposal is also carried out in totally sealed manner without affecting the Environment.

Check List:

S no.	Timeline	AHU
1	Weekly	Check for damage specially to coil and filters.
2	Weekly	Cleaning of AHU pre-filters
3	weekly	Check for air and water leakage
4	Weekly	Check condensate drain for any blockage, clean if required.
5	Weekly	Check drain pan for any blockage.
1	Monthly	Follow Weekly Checks
2	Monthly	Check for UVC lights for termination and cleanliness.
3	Monthly	Check fan belt for correct tension and sign of wear and alignment of fan and motor.
4	Monthly	Inspect coils and clean if required
5	Monthly	Check functioning of lights and limit switch interlocking & proper illumination
6	Monthly	Check for bearing of motor and blower
7	Monthly	Check for tightness of V-belts and pulleys.
8	Monthly	check & maintain CFM as per design
9	Monthly	Check looseness of any bolt in fan casing motor base etc
10	Monthly	check for vibration in blower and motors
11	Monthly	Check access doors and hinges for easy operation.
12	Monthly	Check cleanliness of the filters and clean if required.
13	Monthly	Check the looseness of any bolt in the fan or casing etc.,
14	Monthly	Check the associated damper flap movement and apply grease for the bearing

		housing if required.
15	Monthly	Check running current of the motor.
1	Quarterly	Follow Monthly Checks
2	Quarterly	Check/Add grease or lubricate to the Fan shaft bearing, motor bearing blower bearing. If required
3	Quarterly	Clean the belt by using good grade of belt cleaner.
4	Quarterly	Check the alignment of Fan and Motor. If necessary, correct the same. .
5	Quarterly	Inspect the condensate drain pane and ensure that it is clean and water is freely flow.
6	Quarterly	Inspect the coils for cleanliness. If necessary, Hose the coil down with a low pressure water hose or low pressure air.
7	Quarterly	Observe the operation of all dampers and make any necessary adjustment in linkages and blade orientation for proper operation.
8	Quarterly	Check operation and status of NRD.
9	Quarterly	Check access doors hinges for easy operation, if required.
10	Quarterly	Check air flow (CFM) of AHU & submit report, if not found as per design, do the corrective connections
11	Quarterly	Check tightness of electrical connections
12	Quarterly	Check flexible connections spool piece for leakage.
13	Quarterly	Check for condition of inlet strainers and clean, replace if required
1	Half Yearly	Follow Quarterly Checks
2	Half Yearly	Check the condition of inlet strainers and clean if required.
3	Half Yearly	Check in motors full load current, fan motor running current and tightness of terminals
4	Half Yearly	Check blower shaft, scroll, impeller and bearing.
5	Half Yearly	Check EPB.

1	Yearly	Follow Half yearly checks
2	Yearly	Check/clean cooling coils & fins.
3	Yearly	Clean interiors and check for corrosion, check tightness of all sections
4	Yearly	Check anti-vibration mounting & duct work, flexible connections
5	Yearly	Check operation & condition of all electrical connections.
6	Yearly	Check alignment & security of drive pulleys, adjust the same if required
7	Yearly	Combing of fins to be done after coil cleaning
8	Yearly	Check all bellows, replace if any crack/water leakage observed
9	Yearly	Check& record insulation resistance (megger) of motor.
10	Yearly	Record Compare Performance parameters before &after Maintenance
11	Yearly	Replace defective filters
S no.	Timeline	FCU
1	Weekly	Check the water leakage.
2	Weekly	Clean air filters.
3	Weekly	Check drain pan for any blockage.
1	Monthly	Follow the Weekly check
2	Monthly	Clean the filter & Y-strainer, if required.
3	Monthly	Check the fan belt tension, abnormal noise and rectify if required.
4	Monthly	Check any water leakage from unit.
5	Monthly	Inspect the condensate drain pan and ensure that it is clean and water is freely flowing.
6	Monthly	Check the condition of access door hinges for proper fixing
7	Monthly	Check the unit is secured.
8	Monthly	Check the operation of 3-speed switch of the fan.
9	Monthly	Check the operation of inlet/outlet isolation valve, rectify if any problem.

10	Monthly	Check looseness of any bolts in fan casing motor base etc
11	Monthly	Check associated damper movement and applies grease for bearings.
1	Quarterly	Follow the Monthly check
2	Quarterly	Inspect cooling coil and clean if required.
3	Quarterly	Clean strainers for FCU.
4	Quarterly	Check& Record air flow (CFM) of FCU & submit report, if not found as per design, do the corrective connections
1	Half Yearly	Follow Quarterly Checks
2	Half Yearly	Check blower, motor unit etc. Clean lubricate.
3	Half Yearly	Check and receive the vibration value and compare with recommended values.
4	Half Yearly	Check tightness of electrical connections.
5	Half Yearly	Add water and flush condensate drain pan, trap and drain line.
6	Half Yearly	Check the condition of inlet strainers and clean if required.
7	Half Yearly	Check the proper functioning of the 3 way and 2way valve.
8	Half Yearly	Check the interconnection, copper piping, canvas and cooling coils.
9	Half Yearly	Check grease, clean and lubricate bearing of motor.
10	Half Yearly	Check Record full load current of motor.
11	Half Yearly	Check the tightness of terminals of motor.
12	Half Yearly	Check Record motor running current.

1	Yearly	Follow Half yearly checks
2	Yearly	Check blower, motor unit etc clean & lubricate.
3	Yearly	Check electrical control & connection.
4	Yearly	Check and clean cooling coil with water, if necessary.
5	Yearly	Check 2/3-way valve for proper operation.
6	Yearly	Check insulation resistance (megger) of motor.
7	Yearly	Check/clean cooling coils and fins.
8	Yearly	Record Compare Performance parameters before & after Maintenance
S no.	Timeline	Cooling Towers
1	Weekly	Check the operating oil level and oil leakage in gear box.
2	Weekly	Check the Proper operation of cooling tower and uniform distribution of water
3	Weekly	Inspect basin for clogging.
1	Monthly	Check for unusual noise/vibration in fan and fan guard, motor drive shaft and guards, gear reducer.
2	Monthly	Inspect for clogging in eliminator, fills and water basin
3	Monthly	Check operating and static oil level in gear reducer.
4	Monthly	Check oil seals of gear reducer.
5	Monthly	Check oil for water and sludge in gear reducer.
6	Monthly	Check water level in water basin.
7	Monthly	Check and adjust float valve if required.
8	Monthly	Check AMP of motor
9	Monthly	Check for any leakage in gear reducer, water basin and float valve.
10	Monthly	Check gear-reducer oil for water and sludge.
11	Monthly	Inspect eliminator and fills for clogging
12	Monthly	Check motor winding for over heating

13	Monthly	General cleaning for inside and outside.
14	Monthly	Drain cooling tower twice in a month along with condenser pipe line water.
15	Monthly	Check access door work properly
16	Monthly	Check the staircase ladder & interior walkway of wooden decay or shell corrosion
17	Monthly	Check the distribution basin for corrosion, leaks and sediments
18	Monthly	Check the drift eliminator louvers for scale build up
19	Monthly	Adjust belts and pulleys for proper tension and alignment
20	Monthly	check the fan blades for dirt/scale deposits and condition of fan cylinder
21	Monthly	check the mechanical parts of motor supports (cracks)
22	Monthly	Check the distribution spray nozzles to ensure even distribution of water over the fill
23	Monthly	Check sludge in gear box
24	Monthly	Check motor winding for overheating.
25	Monthly	Clean cooling tower from inside and outside.
26	Monthly	Check proper functioning of auto bleed off valve and controller of Cooling Towers
1	Quarterly	Follow Monthly Checks
2	Quarterly	Check and top up oil in gear box
3	Quarterly	Cleaning of sump and check for any leakage
4	Quarterly	Clean Fan & Fan Guard, motor shaft, gear reducer, eliminator, fills, water basin, float valve, control valves etc.
5	Quarterly	Rebalance of fan & fan guard, driveshaft & guards.
6	Quarterly	Repaint fan & fan guard, motor, shaft, gear-reducer and if any.
7	Quarterly	Check and record insulation resistance.
8	Quarterly	Clean all nozzle & clean if required.
9	Quarterly	Check the water distribution system including the nozzles

10	Quarterly	Complete cleaning and disinfection of CT
11	Quarterly	Section screen cleaning.
14	Quarterly	Check operation of MBV.
15	Quarterly	Check connection of CT motor and MBV.
16	Quarterly	Check proper operation of auto bleed of valve and its electrical connections.
1	Half Yearly	Follow Quarterly Checks
2	Half Yearly	Inspect Keys, keyways and set screws of fan and fan guard, motor, gear reducer, drive shaft and guards.
3	Half Yearly	Check vents are open of gear reducer.
4	Half Yearly	Check and change oil of gear reducer.
5	Half Yearly	Check fan blade tip clearance.
6	Half Yearly	Inspect the general condition of fan & fan guard, motor, shaft, gear reducer, fills, control valves, structural members, fan cylinder, stairs ladders etc.
7	Half Yearly	Tighten loose bolts of fan, fan guard, motor, shaft, gear reducer if any.,
8	Half Yearly	Check the working of control valve.
9	Half Yearly	check & apply lubricant (grease) in control valves and motor and apply if required.
10	Half Yearly	Check completely open and close operation of float valve. Repair as reqd.,
11	Half Yearly	Clean all nozzles & replace if damaged.
12	Half Yearly	Complete cleaning the whole parts of CT (Louvers drift eliminators & fill surface)
13	Half Yearly	Check EPB.

14	Half Yearly	Check FRP and structure bolted connections.
1	Yearly	Follow Half yearly checks
2	Yearly	Check rotating element for wear.
3	Yearly	Check grease, clean and relubricate bearings of motor and MBVs.
4	Yearly	Tighten loose bolts of FRP, gear box, structure bolt connection and motor.
5	Yearly	Replace defective nozzles, fills, eliminators, branches etc..
6	Yearly	Check & Record insulation resistance (megger) of motor.
7	Yearly	Record Compare Performance parameters before & after Maintenance
S no.	Timeline	Pumps related to Chillers
1	Weekly	Check for vibrations and abnormal noise during running and rectify if observed
2	Weekly	Check for any leakage in valve, strainers and flexible connections.
1	Monthly	Check for any leak in motor and pump connections
2	Monthly	Check bearings temperature with thermometer or hand test that bearing is not running excessively hot are not running excessively hot.
3	Monthly	Check for any abnormal noise and vibrations during running (If observed then rectify).
4	Monthly	Check for leaks in isolation of valves, strainers, and flexible connections.
5	Monthly	Check proper working of VFD and ensure its auto operation
6	Monthly	Clean pump exterior & associated pipes
1	Quarterly	Follow Monthly Checks
2	Quarterly	Check pumps lubrication as necessary.
3	Quarterly	Check & clean pump, strainers & motor casings
4	Quarterly	Check shaft or shaft sleeve for scoring
5	Quarterly	Tight & clean all electrical terminals, electrical connections, conduits, insulation, flexible connection.

6	Quarterly	Check for EPB.
7	Quarterly	Check & record motor running current.
1	Half Yearly	Follow Quarterly Checks
2	Half Yearly	Check & clean all contact surfaces of Circuit breaker, enclosures switches & push buttons.
1	Yearly	Follow Half yearly checks
2	Yearly	Check condition of seals & bearing (Adjust or replace if required).
3	Yearly	Check& Record insulation resistance (megger) of motor.
4	Yearly	Record Compare Performance parameters before &after Maintenance
5	Yearly	Painting of pump exterior, if required with paint of make Narolac, Asian, Berger
S no.	Timeline	SF,SPF,EF,SEF,FAF
1	Monthly	Check cleanliness of the fan and impeller blades and clean filters.
2	Monthly	Check for looseness of any bolts in the fan, casings etc.,
3	Monthly	Check the associated damper flap movement and apply grease for the bearing housing.
4	Monthly	Lubrication of motor bearing with recommended lubricant (sealed for life bearings should not be serviced)
5	Monthly	Check for alignment of belts/ pulleys if any.
1	Quarterly	Follow Monthly Checks
2	Quarterly	Check the operation of non-return damper. (Where Fitted)
3	Quarterly	Add grease to the fan shaft bearing & blower bearing.(If required).
4	Quarterly	Clean the belt by using good grade belt cleaner (If required).
5	Quarterly	Check the alignment of fan and motor. If necessary correct the same. Adjust the belt tension.(If required)
6	Quarterly	Remove used bearing lubricant from bearing housing. Check the bearing condition. Replace (If required).

7	Quarterly	Fill new lubricant in the bearing housing of recommended specification.
8	Quarterly	Check the operation of all dampers and make any necessary adjustment in linkage and blade orientation for proper operation.
9	Quarterly	Check the overlap and radial clearance between impeller shroud and inlet cone. If found disturbed adjust the same.
1	Half Yearly	Follow Quarterly Checks
2	Half Yearly	Check and record the vibration level and compare with recommended values.
3	Half Yearly	Check the condition of vibration isolators and mounting. Replace if reqd.,
4	Half Yearly	Check integrity of insulation resistance
5	Half Yearly	Check cleanliness of filters and clean.
1	Yearly	Follow Half yearly Checks
1	Yearly	Replace defective filters
S no.	Timeline	Duct System
1	Weekly	Check for air leakage.
2	Quarterly	Check the MOD, MFD status in BMS through limit switch.
3	Half Yearly	Check condition of termination to damper motor/controls.
4	Half Yearly	Clean and lubricate for loose suspended support etc.
5	Yearly	Cleaning of all diffusers, dampers and grills.
S no.	Timeline	Piping Sys
1	Weekly	Check drain points for blockage.
2	Monthly	Check for any damage to water handling components.
3	Monthly	Check pressure gauges, thermometers for correct functions.

4	Quarterly	Check and clean Y-strainers.
5	Half Yearly	General checking for loose brackets, supports etc.
6	Yearly	Conduct manual test for 3-way valve for full operation.
7	Yearly	Check isolating valves through full travel for operation.
8	Yearly	Lubricate valve spindles for smooth operation.
9	Yearly	Check the condition of insulation, repair if required.
S no.	Timeline	General
1	Monthly	Visual check for any leaks & damage.
2	Monthly	Check for any visual damage.
3	Monthly	Check the cleanliness of the system and clean if required
4	Monthly	Check drain points for blockage.
5	Monthly	Check for any damage to water handling components.
6	Monthly	Check all gauges, meters for correct functions.
7	Monthly	Check and clean Y-strainers.
8	Monthly	General checking for loose brackets, supports etc.
10	Monthly	Check isolating valves through full travel for operation.
11	Monthly	Lubricate valve spindles for smooth operation.
12	Monthly	Check the condition of insulation, repair if required.
13	Monthly	Check proper functioning of meters, gauges replace/repair if damage
14	Monthly	Check condition of termination to damper motor/controls.
15	Monthly	Clean and lubricate for loose suspended support etc.
16	Monthly	Cleaning of all diffusers, dampers and grills.
17	yearly	Drain the chilled water line and charge with nitrogen.
18	yearly	Replace all faulty gauges, meters, sensors and valves.

SECTION 3
TENDER PRICES AND
SCHEDULE OF PAYMENT

3.1 Tender Prices

- 3.1.1 a. Unless explicitly stated otherwise in the Tender Documents, the contractor shall be responsible for the whole works, based on the Bill of Quantities and payment shall be as per accepted rates based on the activities carried out as in the Schedule of work.
- b. The rate quoted by the tenderer shall be inclusive of all duties, taxes, fees, octroi and other levies, materials, labor etc. service tax shall be shown separately in BOQ by the contractor.

3.1.2 Schedule of Payment

Payment shall be made by running bills as per accepted rates on the quarterly basis after submission of bill along with the service reports duly verified from the DMRC in charge.

Payment shall be subjected to deduction of all T.D.S as per applicable law.

