iii. Comprehensive O&M of 06 RO systems and 26 Chiller plants (9 New & 17 Old) for 5 years are to be borne by Contractor for which he shall be paid as per the quoted rates and tender terms & conditions. 1 year warranty period will be applicable for the items newly installed i.e 06 RO and 09 Chillers during which only manpower for operation shall be paid to the contractor and the cost of the spare parts and consumables shall be borne by the contractor. The cost of operation maintenance spare parts, consumable material, chemicals, filters, membrane, refrigerating gas etc. everything complete i/c manpower for operations is inclusive in estimated cost for 6 years for all 6 RO's and 26 chillers and shall be borne by the contractor nothing extra shall be payble.

iv. The treated water shall be provided by O & M contractor after installation of plant and for the agreed period of 6 year.

(a) Running, operation and maintenance of complete system for period of five years after completion of warranty/ maintenance period (i.e. 12 months after successful commissioning of water treatment plant) with spares, consumables and required man power during warranty as well as O & M period etc. all complete.

(b) Tender document contains brief preliminary, details/ data/ parameters necessary to workout cost of work, details of functional requirement and complete detailed specifications thereof of tendering. Any clarification or doubt can be raised by the intending tenderer by personal meeting with EXECUTIVE ENGINEER- AZADPUR between 11:00 AM to 1:30 PM of 12/09/2018 .

(c) The work shall be required to execute as per detailed design, drawing to be prepared by the successful contractor confirming to the BIS Standards.

(d) Parameters & functional/ design requirements as mentioned in tender document are to be submitted to the Department within specified time/ 10 days after award of work. The contractor shall accordingly get the design/ drawing approved by the Department before taking up execution of the work or any change required for functional requirement shall be made by contractor and no extra cost shall be payable as, such requirement deemed to have been included in the quoted rates of the contactor(being lump sum contract).

(e) Tenderer, which propose any alteration other than above specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other condition of any sort including conditional rebates, will be summarily rejected.

(f) The tenderer shall have to give self-declaration and a certificate that the firm has not been blacklisted or abandoned any work in the past in/ by any of the Government Organization /Public Sector/Hospital/Reputed Private Organization. The declaration/ certificate shall be submitted along with the tender in the event if it is found that the tenderer has submitted wrong information in this regard his tender shall be summarily rejected and department can also initiate action against the firm for furnishing wrong information as deemed fit under the rules in force.

(g) In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof or in the event of the absence of any partner, it must be signed on his behalf by a person holding a valid registered power of attorney authorizing him to do so. Such power of attorney should be produced with the tender and it must be disclosed that the firm is duly registered under the Indian Partnership Act, 1952.

(h) **All Taxes, duties including GST etc. as applicable shall be paid by the contractor himself. The quoted rate of the contractor shall be deemed to include all the taxes whatsoever and nothing on this account shall be payable to contractor over and above his quoted price.**

(i) The tenderer may also go through General Condition of Contract with upto date correction slips of CPWD. However the word CPWD in the document may be read as APMC, AZADPUR and the word President of India may be read as SECRETARY, APMC, AZADPUR. Moreover may also be read/interpreted in conjunction with this document.

(j) **The agency shall ensure to provide parameters of treated water quality within the DJB permissible parameters in order to achieve this, he is required to use inputs which are deemed to be included in their quoted price.**

(k) No proposal / design/ modification to Technical Bid shall be allowed except if Deptt. feels the modification necessary for effective water treatment plant(functional requirement).

(l) **The contractor shall ensure quality of supplied/processed treated water as per IS : 10500, 1991. However as a 3rd party, any laboratory can be engaged by Dept. on this work who shall also monitor the quality & quantity assurance. The cost of the same shall be borned by the contractor.**

I.(a) The contractor shall got checked the characteristics of parameter of water from Govt./ NABL approved lab or DJB every third month and the water quality shall be in accordance to IS : 10500, 1991 and portable water.

(m) This being D/S/I/T/C of RO plant at various locations of APMC, Azadpur mandi. Tenderer must inspect the site and existing quality of raw water. He shall be at liberty to analyze the raw water characteristics from any Lab to his satisfaction and to examine and satisfying himself with the process and detail provided in tender document in obtaining treated water quality as specified in tender document no claim on whatsoever account regarding raw water characteristics and treated water parameters thereon shall be entertained.

(n) Contractor shall submit with the Tender, General Arrangement, layout and hydraulic drawing of plant giving all major dimensions, design parameters, sizes of units and equipment and pipes, H.P. of motors and all other required information for satisfactory functioning of the system to the satisfaction of department. A brief writes up, describing the process adopted shall also be enclosed.

(o) Contractor shall submit with the Tender all the detailed specifications of proposed Electro-mechanical part of work described herein.

(p) The contractor shall arrange all T&P, Manpower, and chemicals/ consumables like RO antiscalant chemical, pH correction agent, chlorine, CEB & CIP chemicals, micro cartridge filters, media filter, activated carbon, cleaning chemical, membrane, reducing agents, POL, labour and staff etc. specified in the tender document for commissioning and running/ maintaining the plant under warrantee period of 12 months and O&M period of 60 month. The cost on account of all arrangement during warranty and operation & maintenance as specified shall deemed to be included under quoted rates in schedule of item of execution part and O&M part respectively. Nothing extra shall be payable on this account except quoted rates.

(q) The L-1 shall be evaluated adding tendered amount of execution and O&M part, however it may be noted that cost for O&M part should not be less than to execution part. In the event, if L-1 quotes for O&M part less, than the execution part than to make it equal to execution part, the amount quoted from electro-mechanical execution part shall be reduced proportionately to make component of O&M part min. equal to execution part and the order for work shall be issued accordingly. The Contractor shall have no claim/ objection on this account.

(r) The proof checking of drawing shall be carried out by the department (if required) and the contractor shall be bound to agree to the contentions of

department for any modifications/ revising the design, if/ any suggested for functional requirement. He shall have no claim on this account.

(s) The raw water characteristics has been indicated from the sample which got tested however the values can be different, the tenderer shall deemed to have considered this in his quoted rates, considering the treated water quality result which ultimately department required on satisfactory installation of plant complete with the prescribed technology and treatment process.

(t) Ultra Filtration & RO Membrane shall be guaranteed for minimum 4 years to produce quality of water as specified in tender document. In case if the RO plant failed to produce the rated capacity and quality of water before 4 years in that case the agency shall replace the UF and RO Membrane free of cost.

No plea of the contractor to justify replacement (at cost) before 4 years considering variation in quality of underground water or any other sort shall be entertained.

u) **Payment terms**

i) The payment for installation of RO systems along with chilling units under item 1 & 2 of schedule of quantities shall be one time on successful Design, Supply, Installation, Testing, Commissioning.

b) The payment for operation and maintenance part shall be quarterly i.e every 3rd month for 1+5 years.

Executive Engineer
APMC, Azadpur

3. NOTICE INVITING TENDER

1. Lump-sum rate tender is invited through Delhi Govt. e-procurement website **https://delhi.govtprocurement.com/** on behalf of the Secretary, APMC, AZADPUR, By Executive Engineer, APMC, AZADPUR, New Delhi for under mentioned work from specialized agencies/ firms dealing with reverse osmosis based Water Treatment Plant.

Name of Work:- Supply, Installation, Testing, and Commissioning of 06 nos. R.O. System of Capacity 500 LPH each with 09 nos. Chilling units of capacity 3 TR to Produce portable treated water for drinking purpose in existing Piaos structures including operation & maintenance of newly/existing R.O. system & chiller units installed in all 26 piaos for 5 years beyond one year warranty period at APMC (MNI), Azadpur.

2. The estimated cost of this work is **Rs. 1,94,37,624**/- (i) Civil, Electro-mechanical component part etc. **Rs. 40,95,000**/- (ii) O&M component part **Rs. 1,53,42,624/-** . The Estimated cost is merely a guide.

3. Criteria for eligibility.

a. No joint venture shall be permitted.

b. Only those agencies shall be eligible to tender who Submit definite proof of following:-

(i) Should be registered manufacturer/ assembler having a minimum capacity to manufacturer/assemble average 10 nos. R.O. Plant of capacity 500 or more LPH per month (manufacturer/assembler should be registered with NSIC or SISI or any industry deptt of state govt. Certificate/factory license in this regard shall be required to be attached.

(ii) The agency should have successfully completed, operated and maintained the works mentioned as below during last 7 years:

a) At least one similar work costing not less than the amount equal to 80% of estimated cost Rs. 1,94,37,624/- i.e Rs. 155 lacs (including installation and O&M both).

b) At least two similar work costing not less than the amount equal to 60% each of estimated cost Rs. 1,94,37,624/- i.e Rs. 117 lacs (including installation and O&M both).

c) At least three similar work costing not less than the amount equal to 40% each of estimated cost Rs. 1,94,37,624/- i.e Rs. 78 lacs (including installation and O&M both).

Similar work means executed for Govt. Deptt/public sector undertaking/ large MNC's /recognized group based treatment plant of minimum capacity 500 LPH or more with its **successful completion,** operation & maintenance during last 7 years. In case the work experience in private sector the completion certificate shall be submitted along with corresponding TDS certificate. Value of work will be considered equivalent to the amount of TDS certificate.

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum calculated from the date of completion to last date of receipt of tender.

iii) The specialize agency/firm should have experience during last 7 years of D/S/I/T/C, operation and maintaining such system of equal to or greater capacity than 500 LPH.

"Similar work means" "Having D/S/I/T/C of 500 LPH or more R.O. Plant with water and with or without cabin/room "*.

***The details of experience certificate shall be require to be uploaded/ produced in original duly signed by competent authority of client along with contact detail and location enabling the staff of APMC, AZADPUR for visit and satisfaction in respect of installed plant, its technology, and performance.**

***The inspection of installed plant shall be carried out by the staff of APMC, AZADPUR before finalization of technical evaluation of bids.**

(iii) Average annual financial turn over should not be less than 50% of the estimated cost during the immediate last 3 consecutive financial year.

(iv) Solvency of the amount not less than 40% of the estimated cost i.e solvency of Rs. 78 lacs or more.

(v) PAN card.

(vi) GST Registration Number and all other required registration for all type of taxes etc.

(vii) Earnest Money Deposit through RTGS/NEFT Challan in favour of APMC, Azadpur, A/c No.50276843057 of (Allahabad Bank Azadpur). IFSC Code:ALLA0210711, MICR Code 110010004.

4. **Technical & Financial bid shall be uploaded simultaneously. But documents required for Technical Bid shall only be uploaded under Technical Bid Part and Financial Bid shall only be uploaded under Financial Bid Part.**

Technical Bid shall be uploaded through E-tendering with scanned copies of:-

(i) RTGS towards EMD amounting to Rs. 3.90 lacs in favour of APMC, Azadpur and copies of all above required documents pertaining to eligibility criteria.

(ii) An affidavit duly notarised that upto date returns have been filed and agency has no dues towards GST with acknowledgment of latest copy return filed.

(iii) Affidavit duly notarised regarding non execution of similar work on back to back basis as elaborated under.

(iv) Audited balance sheet for Average Annual Turnover of last 3 consecutive financial years.

(v) Detail of General Arrangement (GA) layout and hydraulic drawing of plant giving all major dimensions, design parameters/ calculations, sizes of units, detailed specifications of proposed electro-mechanical equipments, detail specification and H.P. of motors and all other required information for assessment of the tender.

(vi) Brief writes up, describing the process adopted shall also be enclosed, which should be to the possible extent in line with the treatment process described in tender document and general arrangement layout. Any modification may be submitted with proper justification and should be without extra cost.

(vii) Any other documents not specified in the tender document and considered essential to establish his claim/ bid.

Note :- **(1) Agency shall enclose/upload all requisite papers/ under taking (on non judicial stamp paper of Rs. 50/- each). In the event of failure to enclose/ upload above, bid of the participating firm shall not be considered for Technical Evaluation.**

(2) No Financial Bid/ Rate be given under Technical Bid. In case if any agency upload financial Bid/ rate with above Technical Bid documents, his bid shall not be considered for Technical Evaluation and his tender shall be invalid.

- **The tenderer shall be required to produce definite proof from the appropriate authority, in line with the above eligibility criteria and it should be to the satisfaction of competent authority of having satisfactorily completed similar work as specified above. Work executed with private sector, be supported by Tax deposit certificates/ details to justify the execution of work. (Experience certificate of which has been attached in support of this tender.)**

- **Only scanned and uploaded documents through E-tender process shall be considered for eligibility. No other document later on submitted manually shall be considered. The tenderer shall have no claim on this account afterwards.**

5. **"**I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another agency/ manufacturer on back to back basis. Further that, If such a violation comes to the notice of Department, then I/we shall be debarred for tendering in APMC, AZADPUR in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee."

6. **The scope of work in this tender are for Design, Supply, Construction of cabin /Room, Installation Testing, Commissioning of R.O. System of Capacity 500 LPH to Produce ideal quality treated water for drinking purpose including chilling plant, Water vending/ATM machine and operation maintenance for 6 years. On acceptance of work, agreement for execution part and Operation & Maintenance part of work shall be drawn separately as agreement for Construction of cabin /Room including Execution, Testing & Commissioning part and agreement for O & M part.**

L-1 shall be evaluated adding tendered amount of both part of work i.e. execution and Operation/Maintenance part.

7. Contractor should be registered with the Provident Fund Commissioner, if so applicable otherwise an affidavit of less than 20 employees are employed and its non applicability on him / them to submit.

8. Agreement shall be drawn with the successful tenderer on prescribed Form No. **APMC, AZADPUR** which is available with APMC, AZADPUR office. Tenderer shall quote his rates as per various terms and conditions of the said form, which will form part of the agreement.

9. Time of completion of this work shall be:-

i. **3 month** from the date of start as defined in schedule "F" or from the 1st date of handing over the site whichever is later for execution part including successful commissioning of R.O. system. Thereafter the plant shall be under warranty period of 1 year. During this period the contractor shall run and maintain the plant however operation charges and consumable shall be payable after the successful commissioning of plant for one year and no spare etc. shall be paid.

ii. Other part of this work shall be for operation and maintenance of R.O. SYSTEM for a period of 5 years, which shall start from the date of completion of 1 year warranty period.

10. The site for the work is available.

11. Tender documents consisting of plans, specifications, the schedule of quantities, contact clauses of work, set of terms and conditions of contract to be complied with by the contractor from whose tender may be accepted and other necessary documents can be seen in the office of the **Office of the Executive Engineer APMC, Azadpur Sarai pipal thalla, Delhi-33** between **11.00 hours** & **15.00 hours** upto 12/09/2018 every day except on Sundays and Public Holidays. Tender documents is *available on web site http://delhi.govtprocurement.com*

12. Tenders shall be accompanied with Earnest money of Rs. 3,90,000/- as per RTGS detail mentioned herein.

The tenderer shall have to scan zerox copy of the UTR of Earnest Money Deposit through RTGS and other relevant documents as required above and then upload the same scanned copies, duly signed by him owning responsibility for their correctness / authenticity in support of their eligibility, along with the tender at web site **https://delhi.govtprocurement.com**

Copy of enlistment order and certificate of work experience and other document as specified in the tender notice shall be scanned and uploaded to the e tendering website **https://delhi.govtprocurement.com** with in the period of tender submission and certified copy of each shall be deposited in a separate envelope marked as "other document".

13. Failure to submit the tender as specified above **will entail rejection of tender.**

1. Submission of tender through e-procurement will be stopped on 12/09/2018 **at 13.00** hours and only technical bid will be opened on the same day at **15.00** hours *and result of technically qualified tendered will be displayed on web site* ***http://delhi.govtprocurement.com*** *which can be seen by all the tenderers who participated in the process. The financial bids of only eligible tenderers who have deposited EMD of Rs. 3.90 lacs through RTGS and has submitted other documents to the satisfaction of competent authority of* ***APMC, AZADPUR*** *and who have technically qualified shall only be opened. Intimation of which shall be displayed on website* ***http://delhi.govtprocurement.com***

2. The Contractor, whose tender is accepted, will be required to furnish performance guarantee @ 5% of tendered amount for his proper

performance of contract for execution part amount plus six years of Operation and maintenance part i/c one year of warranty period for operation and maintenance part.

iii) This guarantee shall be in the form of Deposit at call receipt of any scheduled bank/Banker's cheque of any scheduled bank/Demand Draft of any scheduled bank/Pay order of any scheduled bank or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form.

These performance guarantee shall required to submit within the period specified under schedule "F". In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'F'. including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor as per terms and conditions of tender.

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iv) The description of the work is as follows

The work involves (i) Providing of Construction of cabin/room, Design, Supply, Erection/ Installation Testing, Commissioning of auto operated reverse osmosis, based water treatment plant of capacity 500 LPH including providing chilling plant and Running & Maintenance of complete system for a period of Five Years which shall be reckoned after completion of one year warranty period on successful commissioning of work and recording of completion Certificate.

v) The entire R.O. SYSTEM work has to be executed on Lump sum basis. The contractor is required to complete the entire work necessary and required for fully operational system in ready to use condition. The contractor shall provide required arrangement for R.O. SYSTEM like piping work, control panels, flow transmitter magnetic roto meter, rejection rate flow transmitter, UF units, Storage tank, suction and delivery headers, PLC involves, pressure pumps etc. and other equipments required for smooth functioning of R.O. System. The agency must check the Design Parameters required and Treated Water Parameters for all work required for setting up of R.O. SYSTEM etc. and shall take full responsibility for achieving the parameters given in this documents and its effective working.

14. Copies of other drawings and documents pertaining to the works will be open for inspection by the tenderers at the office of the Executive Engineer, Azadpur.

Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders as to the nature of the ground and sub-soil

(So far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender. A tenderer shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charges consequent on any misunderstanding or otherwise shall be allowed. The tenderer shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a tender by a tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

15. Canvassing whether directly or indirectly, in connection with tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection.

16. The VC, DAMB reserves to himself the right of accepting the whole or any part of the tender and the tenderer shall be bound to perform the same at the rate quoted.

17. In case of any difference / ambiguity between English & Hindi versions, English version shall prevail.

18. The 5% security deposit as defined under in the contract documents shall be deducted from total value of work done under execution part.

In addition to this 5% of the gross amount shall be with held from execution part work of Electro-mechanical and Operation and Maintenance of the R.O. SYSTEM for the Period of 5 years, which shall start after 1 year of warranty period, from the date of successful commissioning/ completion certificate as recorded by the Engineer-in-charge.

The 5% SD deducted and 5% with held amount for O&M i.e. total 10% shall be released in 5 equal installments after successful completion of O&M of 1st year, 2nd year, 3rd year, 4th year, 5th year, which shall start from the date of completion of 1 year warranty period. The mode of security deposit and with held amount release, have been specified under payment schedule chapter.

19. The contractor shall not be permitted to tender for works in the APMC, AZADPUR, Circle (DAMB) (responsible for award and execution of contracts) in which his near

relative is posted as Divisional Accountant or as an officer in any capacity between the grades of Project Director (Superintending Engineer) and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any Gazetted officer in DAMB/APMC. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this department.

The contractor shall give a list of both Gazetted and non-gazetted APMC, AZADPUR employees related to him.

20. No Engineer of gazetted rank or other gazetted officer employed in Engineering or Administrative duties in an Engineering Department of the APMC, AZADPUR is allowed to work as a contractor for a period of one year after his retirement from Government service, without the previous permission of the SECRETARY,, APMC, AZADPUR in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of the SECRETARY, APMC, AZADPUR as aforesaid before uploading of the tender or engagement in the contractor's service.

21. The tender for the works shall remain open for acceptance for a period of **one twenty (120) days** from the date of opening of technical bid. If any tenderer withdraws his tender before the said period or from issuance of a letter of acceptance, whichever is earlier, makes any modifications in the terms and conditions of the tender to the department, then the department shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money.

Further, the tenderer shall not be allowed to participate in the re-tendering process of this work.

22. This Notice inviting tender shall form a part of the contract document. The successful tenderer / contractor, on acceptance of his tender by the Accepting Authority, shall, within **15** days from the stipulated date of start of the work, sign the contract consisting of: -

22.1 The Notice Inviting Tender, all the documents including additional conditions, specifications and drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.

22.2 Form 12 i.e. General Conditions of Contract for APMC, AZADPUR works as modified and corrected upto the last date of uploading of tender.

23 The contractor shall quote his rates keeping in mind the specifications; terms & conditions, particular specifications and special conditions etc. and nothing shall be payable extra whatsoever unless otherwise specified. If the tenderer does not quote the rate for any item, leaving the space blank, whatsoever, it will be presumed that the tenderer has loaded the cost of this/ these item(s) on other item(s), and he will execute this /these items at zero cost, and the tender will be evaluated accordingly.

24 The department shall deduct Income Tax on the value of work done from each bill of the contractor as per prevailing Government orders. In lieu, the department shall issue a certificate of deduction of the tax at source to the contractor, in relevant form.

25 Engineer-in-Charge shall deduct TDS towards GST as per prevailing Government instructions/orders from the total payment made to contractor in pursuance of this contract. TDS shall also be deducted on advance payment to be adjusted in future bills. The TDS certificate shall be issued by the Engineer-in-Charge to the contractor in view of GST- deducted from payments made.

26 The department shall deduct Labour CESS @1% on the value of work done from each bill of the contractor as per prevailing Government instructions/orders.

27 In the tender document, the word "CPWD" shall be read as "APMC, AZADPUR" wherever exists.

28 The tenderer shall ensure to submit his offer only through E- tendering process.

29 The rates are inclusive all taxes like GST etc. and nothing on this account shall be payable apart from quoted rates.

Executive Engineer, Azadpur

For & on behalf of SECRETARY,
APMC, AZADPUR

Agricultural Produce Marketing Committee, Azadpur, Delhi-33

STATE : -DELHI

DIVISION : Azadpur

LUMP-SUM RATE TENDER & CONTRACT FOR WORK

Tender for the work of

N/W: - Supply, Installation, Testing, and Commissioning of 06 nos. R.O. System of Capacity 500 LPH each with 09 nos. Chilling units of capacity 3 TR to Produce portable treated water for drinking purpose in existing Piaos structures including comprehensive operation & maintenance of newly/existing R.O. system & chiller units installed in all 26 piaos for 5 years beyond one year warranty period at APMC (MNI), Azadpur.

(i) To be submitted *through e-procurement solution* by 13.00 hours on 12/09/2018 to **Executive Engineer, APMC Azadpur, New Delhi-33,** ***at web site*** *http://delhi.govtprocurement.com*

(ii) To be opened in presence of tenderers who may be present *either at the place of opening of tenders (electronically)on 12/09/2018 at 15.00.*

Released to website http://delhi.govtprocurement.com

Designation : **Executive Engineer**

TENDER

I/We have read and examined the notice inviting tender, schedule, A,B,C,D,E & F. Specifications applicable , Drawings & Designs, General Rules and Directions, Conditions of Contract, clauses of contract, Special conditions, Schedule of Rate & other documents and Rules referred to in the condition of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for the SECRETARY,, APMC, AZADPUR within the time specified in Schedule "F", viz., schedule of quantities and in accordance in all respects with the specifications, design, drawings and instructions in writing referred to in Rule-I of General Rules and Directions and in Clause-11 of the Conditions of contract and with such materials as are provided for, by, and in respects in accordance with, such condition so far as applicable.

I/We agree to keep the tender open for **one twenty (120)** days from the date of its opening technical bid and not to make any modification in its terms and conditions.

A sum of **Rs. 3,90,000/-** as Earnest Money Deposit through RTGS/NEFT Challan in favour of APMC, Azadpur A/c No.50276843057 of (Allahabad Bank Azadpur). IFSC Code:ALLA0210711, MICR Code 110010004 has been. If I/ We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said SECRETARY,, APMC, AZADPUR or his successors in office shall, without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I/We fail to commence work as specified, I/We agree that SECRETARY, , APMC, AZADPUR or his successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money and the performance guarantee absolutely, otherwise the said earnest money shall be retained by him towards security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in clause 12.2 and 12.3 of the tender form.

Further, I/we agree that in case of forfeiture of Earnest Money or both Earnest Money and Performance Guarantee or failure to deposit of EMD/performance gurranty, in original to APMC, AZADPUR as aforesaid, I/we may be debarred for participation in the re-tendering process of the work.

I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on back to back basis. Further that, If such a violation comes

to the notice of Department, then I/we shall be debarred for tendering in APMC, AZADPUR in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

I/We hereby declare that I/We shall treat the tender documents drawings and other records connected with the work as secret / confidential documents and shall not communicate information / derived there from to any person other than a person to whom I/We am / are authorised to communicate the same or use the information in any manner prejudicial to the safety of the APMC, AZADPUR.

Dated .....……*

*

Signature of Contractor

Postal Address

*

Witness:

Address: *

Occupation:

Telephone No:

Telephone No.

Fax

Email

* ***To be filled in by the contractor***

5. ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on behalf of the SECRETARY,, APMC, AZADPUR for a sum of Rs.…..……** Rupees…..…… …… .. … … ……**).

The letter referred to below shall form part of this contract agreement:-

i)

ii) .....**

iii)

For & on behalf of the SECRETARY,, APMC, AZADPUR

Date: …..……..**

Signature…...…….....**
Designation:**Executive Engineer, APMC Azadpur, New Delhi-33**

** ***To be filled in by the Executive Engineer***

6. SCHEDULE "A" to "F"

SCHEDULE 'A'

Schedule of Quantities: -

SCHEDULE 'B'

Schedule of materials to be issued to the contractor:

Sl. No.	**Description of Item**	**Quantity**	**Rates in figures & words at which the material will be charged to the contractor**	**Place of Issue**
1	2	3	4	5
----------All materials to be arranged by the contractor him self----------				

SCHEDULE 'C'

Tools and Plants to be hired to the contractor

.No	*Description*	**Hire charges per day**	**Place of issue**
1	**2**	3	4
----------NIL----------			

SCHEDULE 'D'

Extra schedule for specific requirements / documents for the work, if any: **NIL**

SCHEDULE 'F'

Reference to General conditions of contract :- { General conditions of contract up dated up to date 2014

N/ W: - **Supply, Installation, Testing, and Commissioning of 06 nos. R.O. System of Capacity 500 LPH each with 09 nos. Chilling units of capacity 3 TR to Produce portable treated water for drinking purpose in existing Piaos structures including comprehensive operation & maintenance of newly/existing R.O. system & chiller units installed in all 26 piaos for 5 years beyond one year warranty period at APMC (MNI), Azadpur.**

Estimate cost of Work : **Rs. 1,94,37,624/-**

Earnest Money : **Rs. 3,90,000/-**

Performance Guarantee : ***5% of tendered value of work.***

Security Deposit : ***5% of tendered value of work***

SCHEDULE-F (Form 12)

GENERAL RULES

AND DIRECTIONS

Divisional officer means : **Executive Engineer**
APMC, AZADPUR,

Definitions: (Clause – 1)

1. Divisional Officer/Engineer-in-charge : **Executive Engineer**
APMC Azadpur

2. Tender Accepting Authority : Vice-Chairman, DAMB

3. Percentage on cost of materials and labour to cover all overheads and profits. : **15%**

4. Standard Schedule of Rates : Market rates

5. Department/CPWD means /PWD : **APMC, AZADPUR**

6. Standard CPWD contract Form 12 means **: APMC, AZADPUR form 12 , as modified and corrected with upto the last date of uploading of tender.**

7. President of India means : V.C, DAMB

8. Additional Chief Engineer /Chief Engineer means :Superintending Engineer, DAMB

Clause -2

Performance Guarantee* : *5% of tendered value of work.

Security Deposit : ***5% of tendered value of work***

Clause 7 & 8

(i) Specifications to be followed for execution of work along with conditions of the contract	**:**	**CPWD specifications 2009 Vol. I & II with correction slips issued upto the last date of Uploading of tender & Specifications of Manufacturers.**
(ii) Rates of work executed due to alteration in design & specification.	:	Applicable

Clause 10A
List of testing equipment to be provided by the contractor at site lab
Clause 10B NA
Clause 10C Applicable
Clause 10CA NA

Clause-16

(i) Time allowed for submission of Performance guarantee from the date of issue of letter of acceptance : **15 days**

(ii) Maximum allowable extension beyond the period provided in (i) above : **7days**

(iii) Authority competent to fix compensation on a/c in delay of completion of work : **Vice Chairman, DAMB**

(iv) Number of days from the date of issue of letter of acceptance for reckoning date of start : **15 days**

Mile Stone (s) : **As per table given below**

Table of Mile Stone(s)

S. No.	Description of milestone (physical)	Time allowed in days (from date of start)	Amount to be with-held in case of non achievement of milestone
1a)	Submission of Bar chart of progress and schedule for completion of job	15 days	In the event of non achieving the necessary progress, 1% of the tender value of work will be withheld for failure of each milestone
1b)	Submission of drawing GA and P & I Drawings with Complete details/ specifications of equipments, pumps and size, MOC of pipeline, valves etc.		
1c)	Submission of plant layout and foundation drawings, electro mechanical equipment with detailed specifications.		
2	Providing of Construction of cabin/rooms at site including completion of all civil work required for installation of R.O. Plant, chilling plant Storage tank, Water vending machine, Reject Water storage tank and pumping arrangement of rejection water.	45 days	
3	Completion and supply of all electromechanical equipment, piping, valves, pumps and fittings with instruments and accessories.	15 days	

4a) 4b)	Installation of complete system. Testing, commissioning and handing of system	15 days	

Note:- Consumables during commissioning shall be provided by the contractor.
Note: Any inputs missing shall deem to have been included of successful functioning of the R.O.system.

Time allowed for execution of work : **Three Months(Execution part)**
6 years: for operation & maint. Part i/c
1 year for pre-warranty period.

Clause 21

(i)Gross work to be done together with net payment/ adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment. : **Rs. 5 (Five) Lacs**

(ii)List of testing equipment to be provided by the contractor at site lab **:** All equipment required for testing of materials to be used on work

Clause-29 - Arbitration **:** Applicable

Additional clauses under this contract/agreement

(A) Requirement of Technical representative (s) required at site

S. No.	Minimum Qualification of Technical Representative	Designation (Principal Technical/ Technical representative)	Minimum Experience	Number	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 36(i)	
					Figures (Per Person)	Words (Per Person)
1.	Expert of water treatment chemistry having required experience of designing of	Technical Representative	10 Years	1 No.	60,000/- pm.	Sixty Thousand

	water system with ultra filtration and desalination process					
2.	Project Manager with degree/ Diploma in corresponding discipline of Engineering	Principal Technical Representative	5 Years for degree/ 10 years for Diploma	1 No.	25,000/- pm.	Twenty Five Thousand

Assistant Engineer retired from Government service that are holding Diploma will be treated at PAR with Graduate Engineers. Even, if contractor or partner himself is an Engineer / Overseer, it is necessary on part of contractor to employ Engineer as per stipulation.

(B)

i) Schedule/statement for determining : theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates 2014 printed by CPWD

ii) Variations permissible on theoretical quantities:-

(a) Cement : Applicable

(b) Steel reinforcement and structure steel sections for each diameter, section and category : NA

(c) All other materials : **NA**

RECOVERY RATES FOR QUANTITIES BEYOND PERMISSIBLE VARIATION

S.No.	Description of Item	Rates in figures and words at which recovery shall be made from the contractor.	
		Excess use beyond Permissible Variation	**Less use up to the permissible variation of design Mix**
1	2	3	4
Applicable for cement as per CPWD norms			

Executive Engineer
APMC, Azadpur

1. <u>Scope of Work</u>

a. Preparation and submission of process and instrumentation drawings

b. Preparation and submission general arrangement drawings

c. Preparation and submission of equipment/ system layout drawings

d. Preparation and submission of detailed engineering drawings.

e. Preparation and submission of working drawings

2. Structure work for installation of pumps hallo-fiber ultra filtration membrane, UF feed pumps, dosing pumps interconnecting pipe line, fine filtration unit, high pressure pumps, control instruments, flow meter & reject pressure gauges, level switches, flange couplings, PLC panels for PLC controls etc. The structure work shall be made out of tubes of adequate gauges is to sustain the different installation of treatment plant.

3. Making out/ linking proper drainage so that any leaked water from joints, couplings etc. may not flow on floor of the service block.

4. Providing complete layout duly mounted on frame and laminated with glass pane showing complete system flow and discharge also necessary guideline for the operator for day-to-day running of plant and regarding periodical service of plant.

5. Supplying, installation and commissioning of all electro-mechanical equipments as per the specifications.

6. Providing and fixing of all interconnecting pipe works starting from inlet chamber to final delivery outlet pipe (including connecting existing source of supply to R.O. Plant).

7. Testing and commissioning of plant to produce output of specified parameters as well as specified water quality.

8. To carry out testing of water quality regularly within the Lab provided at site and on three month basis from Shree Ram Test House or from the Lab prescribed by Engineer-in-charge.

9. It is proposed to utilize the entire treated water for domestic use, drinking purpose,

10. Operation and maintenance of plant for five years after completion of Warranty/ Maintenance period with required manpower, spares and consumables etc. all complete.

11. The capacity of raw water tank is 3000 ltrs. and have already been installed at existing pioas.

12. The RO and chiller unit shall be installed at existing structure.

13. Two operators per shift round the clock i.e Total 06 nos. per day shall be required for operation and maintenance.

14. Water wending machine/ATM machines are not required.

15. The RO units are be customized by the agency and accordingly shall provide the design of membrane, vessel size etc. as per site requirement suitable for 500 LPH RO and in accordance to be specifications conforming to IS.

The bidders will be responsible for:-

1) For providing, installation and commissioning of complete RO Plant, chilling plant along with raw water, treated water and reject water storage tanks of required capacity including pumping of reject water and submitting test report of output water from laboratory after every 3 months thereafter its operation and maintenance for 6 (six)Years
2) Making Power connection at RO plant and all electrical fittings up to the power meter of APMC, Azadpur distribution

a) Making connection for raw water from the source provided by department and construction of waste water disposal system using appropriate method & technology and waste water should not impose any environmental hazard. One 15mm tap should be provided on waste water disposal pipe for use of waste water.

b) Delivering potable water site that meets BIS norms at all times

c) The bidder will need to supply a suitable technology (A combination of Ultra Filtrati on with Reverse Osmosis) to treat ground water at each location and provide potable water of BIS standards. The pre-treatment of underground raw water before feeding to RO plant shall be by Ultra Filtration followed by micron cartridge filter)

3. The main components in the scope of supplier shall be as under:

RO System Components, Instrumentation & Controls

RO System	To design the R.O. plant with minimum recovery of 70% for all time from commissioning of plant upto end of O&M period of 6 years.
Components	Instrumentation & Controls
Inlet Pump	Pressure Gauges
Anti Scalent Dosing System	Flow indicators
Fully Automatic Ultra filtration Unit	Liquid level controllers in storage
High Pressure Pump	Ball valves at inlet and outlet piping
Pressure Vessel	Timer for auto flash
Membrane	High pressure switch and low pressure switch
pH correction system	Auto flushing system with solenoid valve
Ultra Violet System	Electric control panel with " A" meter, Voltmeter indicators, on off switch
Cleaning in place system	Pressure Control Valve
Micron cartridge filter	Digital conductivity or TDS Meter
Raw Water tank	5,000 ltrs
Treated Water Tank	2000 ltrs
Piping from raw water tank to RO System	
Piping from RO System to product	
water tank and up to supply	
Waste water disposal system	
Departmental glow sign board as specified with logo	Size_____
Suitable enclosure for accommodating RO System and material storage	
General layout will be as per the block diagram given in Section III (Technical Section) of this document	
Water chilling unit/ plant	As per design for water vending machine however, each water vending machine should have minimum capacity of 500 ltrs to store cold water
Piping work for chilling unit and for water vending machines	Should be with S.S. 304 grade pipe of required size and length

Specifications

COMPONENTS	SPECIFICATIONS
Machine Skid	Stainless Steel S.S.304 depth 800mm max.
Raw Water Pump	1 HP- 1 phase
HP Pump (Vertical Multistage)	1.5HP- 1 Phase
Multi Grade Filter	FRP vessel, Size-L-48" ,Dia-12"
Activated carbon filter	FRP vessel, Size-L-48" ,Dia-12"
Automatic multi port valve (AMPV)	20NB (For MGF & ACF Backwash)
Micron cartridge filters	10 & 5 micron, Size-L-20", Dia-2.5"
Antiscalant dosing	Must for RO system protection

Reverse Osmosis Membrane	Brackish water membrane -4040, 2Nos
pH correction dosing system	Must for Healthy Water
UV sterilization	Flow rate-1000LPH
Flow sensors	In Line for system performance monitoring
Conductivity Sensor	0-200 us/cm
Temperature Meter	0-24 C
Water level sensor	As required
Online Monitoring Features	1. 2 line LCD - to show all plant information on the site.
	2. GSM based – Real time data transfer to Web
	3. RO plant can be controlled for all its functions.
	4. Shows dispensed water Qty from starting to till date.
	5. AC Low and High Voltage protection to prevent pumps damage.
	6. Controls Auto Flushing / Flush Cycle setting.
	7. Controls Level Switch for Raw Water Tank & Treated Water Ta nk.
	8. Low Pressure & High Pressure protection.
	9. Measures TDS & Conductivity.
	10.It can controls Auto Multi Port Valves.
	11.User friendly – Average plant setting time is less than 10 minutes.
	12.LED Indications to show the Power ON, Raw water tank, Auto Flush, HPP, TWT, HPS, LPS & RWP.
	13.Password protection to prevent un-authorized changes at plant level.
	14.If any electronic PCB's failed in the control panel, still RO Plant runs in Manual mode.
	15.Product design followed as per international safety standards of IEC 60950.
Water Dispensing By Solenoid valve	Push Button
Chiller specifications	
Cooling Tons	3 Ton
Compressor	
Chiller Tank Material	SS 304
PUF density	40 Kg/m3
Insulation Thickness	40mm
Auto-cut feature	Yes

* **REMOTE MONITORING:** Real time data transfer shall be provided through GSM base online monitoring system. All monitoring related expenditure like Sim card along with SMS Package shall be provided by the agency at each RO Unit and nothing extra shall be paid for this job till the operation and maintenance period i.e. 1+5 years.

Note:- The R.O Plant should have control instrument i.e. flow meter for permeate and reject, pressure gage so that the deptt may able to visualize the rejection percentage of water.

3.1 RO plant requirements

3.1.1 The capacity of the plant shall be the output water capacity of RO in liters per hour (LPH).

3.1.2. The technical specifications of each component of RO system for its output capacity of 500 LPH are given in .

3.1.3. The raw water quality characteristics are given in ,are based upon the water testing result carried out by the department. However, the bidder is advised to analyze the water samples on their own before quoting their rates. No extra claim will be entertained after the allotment of the work on this account.

3.1.4. The output water quality characteristics are given in relevant table. However, output water obtained from RO plant shall have chemical parameters as brought out in the relevant BIS code of practices.

3.1.5. The contractor shall design the R.O keeping in view recovery of treated water minimum 70% and shall provide the required digitized gauge so as to ascertain the percentage of treated and reject water. In any case the reject water should not be more than 30%. In the event if it is noticed that during running and operating of R.O. Plant the treated water recovery and quality is not in terms of NIT in such case the deptt shall forfeit the performance guarantee and can also claim damages on a/c of breach.

3.1.6. The bidder has to design supply, install, commission, operate and maintain the RO system for six years including the housing structure. He will also maintain the area around the RO site & landscape the same with plantation.

3.1.7. This offer should include all the possible expenses towards spares, replacement of membranes, consumables and repairing/ reconditioning if any required during the specified period of the six years (in terms with contract clauses during execution and maintenance paid.

3.1.8. The bidder should have their own testing facilities to handle water testing. The bidder would analyze the water sample for parameters as per BIS norms at least once in a month, may be from lab located at Head Quarters or some reputed lab & maintain proper record. In addition to this the bidder shall make available at plant site, all the times, a digital TDS meter for on the spot testing of product water. However, the product water quality shall also be tested in the Laboratories of the Department or Department approved laboratories located at various places of the State & the report of chemical examination from these laboratories shall be treated as final.

3.1.9. The water quality must conform as per BIS standards. Water quality will be periodically evaluated maximum with an interval of three months and the system should perform consistently.

3.1.10. The operation of tube well/ water source will be the responsibility of the department including payment of electricity bills and repairs if any. However maintenance of pipeline etc from point of connection onwards for RO plant etc would be responsibility of bidder during the entire contract period of execution and maintenance.

3.1.11. **The payment of electricity bill on a/c of treatment process, running of water vending machine and electricity consumed for running of lighting fixtures, chilling plant etc shall be borne by the deptt.**

3.1.12. The system should be able to adopt the variable feed water characteristic such as varying amount of fine particulate / silt etc. in the raw water and varying TDS levels throughout the design

3.1.13. The use of cleaning chemicals in the system should be minimal.

3.1.14. The system should ensure prevention of fouling of the downstream RO membranes caused by the presence of organic and microbiological coolants in the raw water.

3.1.15. The system should ensure prevention of a majority of physical foulants from entering into RO membranes so as to ensure clean RO membranes delivering consistent performance.

3.1.16. The system should generate minimal amount of effluents thus giving an environment-friendly solution.

3.1.17. The dependence on operator from day to day functioning should be minimal. The Bidders should provide semi-automated system along with specifications mentioned in.

3.2 Making connection for raw water:-
The bidder shall be responsible for executing works for making connection for raw water from the source provided by the department including cost of all material and labour etc.

3.3 Disposal of Reject Water:-

The bidder shall be responsible for proper disposal of reject water from the RO Plant site by construction of waste water disposal system using appropriate method & technology and waste water should not impose any environmental hazard. The consent of state pollution control board shall be taken by bidder, if required.
Various works which are to be executed at every individual site are also listed in.

4. GENERAL REQUIREMENTS:

4.1 The bidder shall install the required equipment and maintain the same for a period of six years from the date of commissioning of plants, as per the conditions prescribed in this document, and in the time frame prescribed at his own cost.

4.2 The successful bidder will indicate methodology for collection of funds and distribution of product water for its maximum utilization by complex visitors/traders. The bidder will carry out extensive IEC activities so as to generate the market for potable water.

4.3 After completion of six years the RO plant becomes property of the department. The bidder shall hand over all the assets to the department in good working conditions to the satisfaction of the department.

4.4 The bidder shall perform all routine maintenance to ensure proper operation.

4.5 The bidder will provide training to the system operator. The bidder shall ensure routine inspection of the equipment by the equipment supplier.

4.6 The bidder will be responsible for maintaining the service levels regarding the response-time to access the log sheet information and provisions of water selling throughout the period of the contract.

4.7 The bidder shall provide trained manpower to maintain the equipment, change filters,and refill chemical storage tanks. Maintaining the required uptime of all the systems to ensure the provisions of quality services to APMC are the main ingredients of the work.

4.8 The bidder will be responsible for the supply of consumables and chemicals, and any other material required essentially to provide effective services as per terms and condition of the contract.

4.9 The bidder will install the equipment at the above maintained facility.

4.10 The bidder shall organize wide publicity for the R.O. plant & benefits of potable water through different media, at his own expense.

4.11 The bidder shall provide and maintain the electrical and plumbing fittings of all types to ensure that R.O. plant is in good working

4.12 The bidder shall provide display boards giving general information and facilities available. These boards shall be of standard type(on the contract conditions & drawings).

5. OTHER REQUIREMENTS:

5.1 The record of treated water supplied to the complex shall be maintained by the bidder. The record should always be updated, legible and be produced for inspection as and when asked for.

5.2 All the successful bidders will have to ensure collection of the samples from the respective site and meeting of the design criteria

5.3 The minimum generated period of membrane should not be less than 4 years and in case if the water quality is deteriorating and membrane is require to change before 4 years, it shall be replaced by the bidders at his own cost.

5.4 Any deviation from the proposed design needs to be approved by the Department.

6. TESTING AND INSPECTION

6.1 Pre dispatch inspection

All equipment covered under R.O. Plants may require pre dispatch inspection, if so required by the department during the course of execution. The pre- dispatch inspection may be carried out by Department or its accredited agencies/third party as approved by the department. The charges for third party inspection, if any, would be borne by the contractor

6.2 Wherever pre dispatch inspection is required, the bidder should produce all the documentary evidences having procured and used new and quality components which go into the total system. These documents including guarantee/ warrantee / test certificate of the component manufacturer will be verified and authenticated by the inspection agencies. Such authenticated document should form a part of the total document required for clearing the bill for payment as per the schedule of payment.

6.3 The contractor shall provide facility for pre dispatch inspection including too and fro arrangement by road/ by air, for the official inspecting pre dispatch.

6.4 Tests for R.O. Plant system on commissioning
All equipment covered under R.O. Plant shall be subjected to inspection testing byDepartment on completion & commissioning.

6.5 Site tests
After successful installation and commissioning of R.O. plant at site, all components, equipment as described shall be tested to prove satisfactory performance and /or fulfillment of functional requirements without showing any sign of defect as individual equipment and as well as a system. All rotating components of the system as applicable shall run at the rated speed for a period of 7 (Seven) Days. During this period, all the components shall function smoothly without any undue deflection; unbalance vibration, flutter, slipping or sticky motion, excessive play & overheating at bearing parts, sparking etc.

7. PACKING, FORWARDING AND TRANSPORTATION

All accessories which are likely to get damaged during transit if transported mounted on the equipment shall be removed adequately packed and shipped separately. All inlet and outlet flanges shall be blanked with thick bolted wooden planks. Packing shall be sturdy and adequate to protect all assemblies' components and accessories from injury by corrosion, dampness, heavy rains breakage and vibration encountered during transportation, handling and storage at the plant site.

8. ERECTION AND COMMISSIONING (E & C)

The Supplier shall be responsible for satisfying himself and the Department as to the correctness of the electrical and mechanical connections between all equipment in his supply. For all above work, the supplier shall furnish the required services of erection superintendent and other skilled and unskilled labour, erection tools, tackles and other required equipment. The supplier shall take these materials back after the erection is complete.

6. TREATMENT PROCESS

SCHEME OF TREATMENT

Sand Bed Filter

Outlet of Iron removal filter shall be passed through Sand Bed for removal of suspended solids to produce clear filtrate.

Activated Carbon Filter

Filtered water after removal of iron and suspended solids, shall be passed through Activated carbon filter to remove color, odor and residual oxidizing agent.
Activated carbon filter outlet shall be collected in Buffer tank to feed Ultra Filtration unit.

Operation of all the filtration units (viz. iron removal, sand bed and activated carbon filter) shall be on automatic mode for service and regeneration. Raw water pumps will operate automatically as per the requirement of water level in tanks.

b. pH Correction unit with online check by transmitter

Perfect pH of Membrane feed water not only ensures better performance of membranes also reduce the dose of costly anti-scalant chemical. Suitable chemical shall be dosed to maintain the appropriate LSI. pH shall be constantly checked and monitored by online transmitter having 4-20 mA signal and digital indicator.

c. Anti-scalant Dosing unit

To prevent scale formation and fouling of membranes, specified measured quantity of suitable sequestrate chemical shall be dosed in membrane feed water.

The dosing pump shall be electronic metering type having proper arrangement of level controller and alarm for accurate and consistent dosing.

d. Fine Filtration unit

After dosing of required chemicals, water is passed through micron cartridges filtration unit of rating 5 microns to avoid the possibility any residual carry over in membranes.

Desalination by reverse osmosis unit with post ph correction

Ultra Filtered and properly conditioned water shall be pumped to membranes at high pressure over osmotic level to separate the concentrate and dilute water stream. The membranes selected shall be energy efficient, high rejection type and will be designed on safe flux rate 13 GFD to

produce purified water having TDS below 300 mg/L and pH neutral (7.0 – 7.5) after correction. The vendor shall guarantee that the RO system produces rated output on 70 % recovery and specified parameters (TDS, Total hardness, Total alkalinity, chlorides etc) shall not exceed the limit as specified in treated water table. Besides, it will conform to IS – 10500:1991 protocol of drinking water specified by Bureau of Indian Standards

Cleaning In Place (CIP) Unit

Independent CIP units having chemical solution tank, pumps, micron filter, piping and instrument of suitable capacity as per specifications shall be provided for UF and RO unit to effectively clean / flush the membranes as per requirement.

Treated water for Domestic, drinking and cooling

RO permeate water after pH correction shall be ideal/ suitable for domestic, drinking and cooling and major quantity of this water shall be utilized for such applications of following parameters

Quantity	**12000 ltr/day**
pH	**7.0 – 7.5**
Total Dissolved Solids	**Less than 250 mg/L (Maximum - 300 mg/l after minimum 3 Years working of membranes)**
Total hardness	**40-60 mg/L as CaCO3 (Maximum - 80 mg/l after minimum 3 Years working of membranes)**
Total Alkalinity/ Bicarbonates	**40-80 mg/L as CaCO3 (Maximum - 150 mg/l after minimum 3 Years working of membranes)**
Chlorides	**Less than 50 mg/L as Cl (Maximum - 100 mg/l after minimum 3 Years working of membranes)**

Other parameters and E.Coli, coliforms shall confirm to the standard IS : 10,500

06. Storage and pumping of water for domestic, drinking and cooling

Purified water of above specifications shall be collected in storage tank in pump house area. Vendor shall provide the pump to feed the water to the tanks placed in the complex.

07. Chillng plant

The treated water shall be made cold refrigerated to the required temperature for human consumption during the summer **period i.e from April to September or for the period as directed by Engineer-in-charge. The agency shall provide the chilling plant of minimum**

3 TR capacity so that minimum 500 ltrs of refrigerated cold water could be store in SS 304 grade tank. The engineer-in-charge shall be at liberty **to direct for providing treated refrigerated cold water to all the taps/ bibcocks provided under one piao or** so that the treated water may be made available to the user as per his/her consumption requirement.

08. Civil part

a. Shall consist of construction of cabin/room to accommodate R.O. System complete in terms of the specification mentioned in this bid document.

b. Shall require to prepare raised platform of adequate height with suitable provision of foundation detailing for installation of motors, pumps, filters etc.-etc.

c. Shall require to make the provision of proper drainage so that in the event of any leakage the water may not spill on the floor.

d. Buffing of all SS units on complete installation and before handing over so as to maintain shine of Stainless steel installation.

e. Installation of electric panels and PLC board in such a way so that the operator/ maintenance personal may barrier free moment within the plant area.

f. The malba shall be disposed off outside the boundary of Azadpur Complex, as directed by Engineer-in-charge. The cost on account of disposal i/c leveling and dressing shall deemed to be included in quoted price.

g. The contractor shall provide all required and mandatory internal signages of R.O. SYSTEM including its general arrangement layout. These signages should be digital printing on sign board/ acrylic sheet. Wherever required he will provide the glowing nature signages also. Cost on this account shall deemed to be included in his quoted price.

7. GENERAL DESIGN INSTRUCTIONS AND REQUIREMENTS

1. The contractor will execute the entire work on a turnkey basis including designing of all elements, construction of cabin/room of required specification and size, supply & installation of all electro-mechanical components, design & execution of all civil/fabrication works, commissioning, start-up and obtaining satisfactory results from approved testing agencies, as per norms & standards of DJB, based on accepted shop drawings & detailed calculations. The contractor shall be completely responsible for the design of all components, structural details & supervision of any related civil/ electro-mechanical works at no extra cost.

2. The contractor shall bear responsibility for the characteristics of the final treated water and shall make any addition/alterations to the equipment or plant, if the same fails to meet the required standard, without any extra cost.

3. Work under this contract shall consist of furnishing all labour, materials, equipment and appliances necessary and required together with shop drawings and required details to construct, erect and commission, a water treatment plant in accordance with the specifications and drawings enclosed with this tender generally comprising but not limited to the items mentioned in the following sections.

i. Detailed engineering and preparation of all working drawings as per design data given in the document and actual site conditions to be determined by the contractor.

ii. Construction of foundation platform for installation of electro-mechanical instruments and pipe work.

iii. Interconnecting piping between all units, flow transmitters, valves, gates, membranes, pressure gauges, air compressor and all other appurtenances and devices as required.

iv. All mechanical equipments duly protected against corrosion.

v. All electric drives, motor control centers, power and control cables (except main incoming feeder and yard lighting).

vi. All instrumentation, control cabling, panels complete in all respects

vii. All units are shown on the contract drawings. These drawings are enclosed for guidance of the contractor. The contractor shall work out detailed layout and flow scheme with levels. The contractor may suggest

minor changes in the proposed flow scheme, ensuring that the basic design data conforms to this contract documents.

viii. Start-up and obtaining satisfactory results from approved testing agencies, as per norms of the Delhi Jal Board.

ix. **The raw water quality is already available with the Dept. in case tenderer wish to ascertain it again he can get it investigate at his own end. Any flaw/ discrepancy in design of R.O. SYSTEM, if any in r/o ultimate treated water quality shall not absolve contractor from his liability of soundness and successful execution and commissioning of R.O. SYSTEM. Nothing extra on this account shall be payable to contractor.**

4. **Contractor shall verify/check raw water quality of deferent bore-wells of the complex from which the intake of raw water can be obtained. No extra payment shall be admissible for any variation of raw water quality and thus if any extra arrangements are required to provide in plant during entire warrantee/ running maintenance period.**

5. The treatment scheme/sizing of equipment as given in the tender is minimum requirement.

6. **The agency, if deems fit, can add additional units/ equipment to meet the requirement of guaranteed treated water characteristic as mentioned herein. However the rates quoted by him shall be for the compact and packaged R.O. plant and nothing extra over and above to it shall be payable.**

7. The contractor shall stand guarantee for the efficient performance of the plant and for the treated water conforming to the standard laid down herein and standards of DJB.

8. **The plant shall be deemed to have been commissioned when analysis & test result of composite samples on seven consecutive days shall be found to be within prescribed limit.** Composite sample for the purpose of this article shall mean the sample prepared by mixing the samples of treated water collected at regular interval during the day. **Testing of the sample shall be carried out in the reputed lab as approved by the Department**. Testing charges shall be paid by the contractor. Nothing extra shall be paid on this account.

9. **Tenderer shall incorporate all the necessary provisions in their design to ensure the plant to handle an excess flow of 20% satisfactorily without any problem and compromise with the quality of the treated water.**

10. All piping system shall be designed with good quality of required steel and as per relevant I.S. code and shall be leak proof.

11. The contractor shall submit the detailed shop drawing duly vetted to the Department for the approval of the competent authority (The charges on account of getting vet the structural drawings shall be borne by the Contractor / agency. Any improvement or change suggested by the Department shall be incorporated in the drawings and the same shall be strictly adhered to during execution at site. Nothing extra shall be paid on this account. Further Deptt. shall be at liberty to engage any water chemistry expert/ consultant for final vetting of design & drawings. For this, Deptt. shall make arrangement for payment to such Consultant.

12. **The completion certificate shall be issued after successful commissioning. The contractor shall apply for Completion Certificate along with 3 sets of "As built drawings" indicating levels along with soft copy of the same. The contractor shall also furnish 3 copies of operations & maintenance manual along with the soft copy of the same.**

13. The contractor shall furnish spare parts details for each component of the equipment. The details shall include complete list of parts, as recommended by the manufacturers their specifications and authorized dealers.

14. The Electrical & Mechanical equipment shall be got approved from the Executive Engineer (Electrical), APMC.

15. The contractor shall arrange at his own cost the approval of the regulatory authorities/ DJB, Local bodies, before the plant is deemed to have been commissioned. **It shall be exclusive and foremost important liability of contractor to arrange and provide all statutory certificates for running of R.O. plant**.

16. Tender document contains brief preliminary, architectural and structure details/ data/ parameters necessary to workout cost of work, details of functional requirement and complete detailed specifications thereof of tendering.

17. The work shall be required to execute as per detailed design and architectural/ drawing to be prepared by the successful contractor confirming to the given parameters & functional/ design requirements as mentioned in tender document and submitted to the Department within specified time after award of work. The contractor shall accordingly get the design/ drawing approved by the Department before taking up execution of the work.

DESIGN DATA FOR R.O. Plant

A. GENERAL

1.Site Location: The site is located at Azadpur, New Delhi.

2. Ground Water

Inspect and verify site before tendering.

3. Soil Characteristics

Inspect and verify site before tendering.

4. Accessibility of Site

The site is well connected by all-weather roads from all directions. Even then may be inspected before tendering.

5. Construction Material Available

As the site is connected by roads construction material can be at site.

6. Influent Characteristics

a. **Type of Feed Water:** This shall be from the ground having approx characteristics as under:

The water characteristics of the available water source are as per the enclosed water Test Report

Water Characteristics:

S.No.	PARAMETERS	UNITS	S1
1	Colour	Hazen	Clear
2	Odour	--	No Objection
3	Turbidity	N.T.U	1.6
4	p^h value	--	7.5
	Electrical Conductivity	µmhos/cm	1031
	CHEMICAL EXAMINIATION		
5	Phenolphthalein Alkalinity	(mg/l)	Nil
6	Total Alkalinity	(mg/l)	290
7	Total Hardness	(mg/l)	300
8	Calcium Hardness	(mg/l)	118
9	Magnesium Hardness	(mg/l)	182
10	Calcium as ca	(mg/l)	47.2
11	Magnesium as mg	(mg/l)	43.68
12	Ammonia(free & saline)	(mg/l)	Nil
13	Nitrite-Nitrogen (N)	(mg/l)	0.03
14	Nitrate NO_3	(mg/l)	9.2
15	Dissolved Iron(Fe)	(mg/l)	0.18
16	Chlorides(Cl)	(mg/l)	120
17	Fluorides(F)	(mg/l)	1.1
18	Sulphate (SO_4)	(mg/l)	60.0
19	Cyanides(CN)	(mg/l)	Abst.
20	Residual Chlorine	(mg/l)	Nil
21	Coliform per 100 ml at 37°	MPN/100ml	3.6

Note: - The raw water characteristics has been indicated from the sample which got tested however the values can slightly be different however the tenderer shall consider his quote considering the treated water quality result which ultimately department required on satisfactory installation of plant complete with the prescribed technology and treatment process.

(i) **Treated Water Characteristics, however the treated water quality shall required to meet all laid down criteria of DJB.**

Parameters	Unit	Result
pH		7 - 7.5
TURBIDITY	NTU	< 1
TOTAL DISSOLVED SOLIDS	mg/l	**< 300***
CHLORIDES as CI	mg/l	< 100
SULPHATES as SO4	mg/l	< 10
NITRATES as no3	mg/l	< 5
TOTAL HARDNESS as CaCO3	mg/l	40 – 60
M. ALKALINITY as CaCO3	mg/l	80 – 250
TOTAL IRON (as Fe) E-Coil & Coliform	mg/l	ND As per IS-10500 standards

* Total Dissolved Solid should not exceeds to 300 mg/l till the replacement of membrane

7. It may clearly be understood that the client wants to use the treated water for domestic use, drinking purpose, Hence, it is imperative that the agency shall ensures that the treated water is usable for above purposes.

8. <u>Space Availability & Proposed Height</u>

The plant shall require to be adjusted within cabin or rooms of 8 sq mtr area. He shall require to plan and coordinate within the space only for which he shall require to get approve the exact space, location and area from the Dept.

8. SPECIFICATIONS OF CABIN/ROOM, R.O PLANT AND ELECTRO-MECHANICAL EQUIPMENTS

5.0	Multigrade Sand Bed filter	Providing, installing, testing and commissioning vertical down flow type Multigrade Sand bed unit for removal of suspended impurities. The filter shall comprise of FRP pressure vessel sampling arrangement, pressure guage, first charge of filter media. etc. The unit shall be suitably treated extremely	
		Filteration unit as described above having following parameters	
	Design Flow	Dia, Shell Thickness shall be as per requirement	
	Make	Pentaire/Aventura	
	Quantity	1	
	Size	350 Dia	
	Height	Minimum 1625	
	Media	Multigrade Sand	
	Operation	Automatic with PLC control	1 No.
6.0	Activated carbon as filter	Providing, installing, testing and commissioning vertical down flow type Activated Carbon bed unit for removal of residual oxidizing agent and impurities. The filter shall comprise of FRP pressure vessel, shell internally rubber lined Complete with mounting pedestals, FRP frontal piping with, Pneumatic Actuator, Solenoid Valves, sampling arrangement, pressure guage, first charge of carbon media make NORIT / Equivalent etc.	
		Filteration unit as described above having following parameters	
	Design Flow	As per requirement	
	Dia	350 mm	
	Height on Straight	1625 mm minimum	
	Media	Activated Carbon bed of NORIT or Equivalent	
	Operation	Automatic with PLC control	1 No.
7.0	Anti scalant Dosing System	Function- to inhibit scaling of hardness salt and silica on RO Membranes	1 No.
	Pump	1 Set	

	Make	ASIA LMI/ Sonder /Prominent / E-dose/ OCEAN	
	Quantity	1 No.	
	Type	Electronic Diaphragm Type	
	Capacity	0-5 LPH	
	Quantity of tank	1 No.	
	Capacity of Tank	100 ltr.	
	MOC of tank	PE/FRP	
	Make of Tank	Syntax/Frontier	
8.0	High Pressure Pump	Function- to develop required pressure for Reverse Osmosis on RO Membranes	1 No.
	Type	Vertical Centrifugal Multistage	
	Number	One No.	
	Make	Grundfos / CRI /Kriloskar	
	Capacity	As per plant requirement	
	Pressure and power	As per plant requirement	
9.0	Pressure Vessel	Function- to house RO Membranes under pressure	3 No.
	Item	RO Module consisting of membrane housing with RO membrane mounted on skid	
	MOC	FRP	
	Diameter	As per plant requirement	
	Length	As per plant requirement	
	Make	Code line/ WATERLIFE /Ecoline/Structural	
10.0	Membrane	Function- to remove dissolved salt from water by Reverse Osmosis, produce permeate water having less dissolved salt and reject water having highly concentrated salt.	6 No.
	Type	TFC, Polyamide	
	Size	As per plant requirement	
	Average Flux	<18 GFD	
	Make	DOW Filmtec-USA, / Hydranautics/Tora Japan/GE / Oltremare	
	Operating water Temperature	Ambient Temperature	
11.0	PH Correction System	Function- to enhance PH of RO permeate from 5.5-6 to 7-7.5 as per WHO guideline	1 No.
	Pump	1 Set	
	Make	ASIA LMI/E-Dose/OCEAN	
	Quantity	1 No.	
	Type	Electronic Diaphragm Type	
	Capacity	0-5 LPH	
	Quantity	1 No	
	Capacity of tank	100 ltrs.	
	MOC tank	PE/FRP	
12.0	Ultra Violate System	Function- to disinfect water, will kill bacteria and micro-organisms	1 No.
	Capacity	As per plant requirement	
	Make	Alfa/ Phillips /ACE Hygiene/Sukrut	
13.0	Cleaning in Place (CIP) System	Function- use for chemical cleaning of RO Membranes over a period of time	1 No.
	Quantity of tank	1 No.	
	Capacity of tank	As per plant requirement	

	MOC to tank	FRP/ MSRL/PE	
	Make of tank	Indian	
	Micron Cartridge Filter		
	Flow rate	As per plant requirement	
	MOC	FRP/ Engineering Grade Plastic	
	No. of Cartridge housing	As per plant requirement	
	Micron Rating	5 Micron	
	Flow velocity	2.5 Mtr /Sec	
	MOC of cartridge	PP	
14.0	RO Water Storage Tank	Function – For storage of Product Water from R. O. Plant (The height of storage tank should be kept in such a way that there is no dead storage)	1 No.
	Type/ MOC	Three Layered PE tanks white in color made from virgin material of Food Grade (SS, 304 grade) Quality, suitable for the purpose of providing / storage of drinking/potable water.	
	Make	Sintex or Equivalent	
	Control	Provision of Low Level and High Level Switch	
	Capacity	Minimum 6000 Litres	
Instrumentation & Controls			
15.0	Remote access and Monitoring system	Real time remote access and Monitoring system based on GSM network with central database software capable of receiving data from plant site (via SMS at regular predefined intervals) and generating compiled reports for automatically E-Mailing (daily /weekly /monthly) of production data and distribution data as well as sending SMS on 3 mobile numbers giving alerts on tripping of plant/ conductivity or flow rate beyond range/ non functional due to treated water tank empty or low voltage. This shall include reporting of plant operations with name of village/ location,permeate conductivity, permeate and reject flow rate, permeate quantity, working hours, net volume of pure water produced in last 24 hours, total volume produced and alerts on plant tripped and reason for tripping, conductivity or flow rate beyond range, inactive site (no sms received for more than 24/48 hours)	
16.0	Pressure Gauges	Function- to measure pressure	
	Quantity	4 No	
	Location	Pump outlet, Filter outlet, High Pressure pump Discharge and RO Reject	
	Range	0-7 Kg/cm2	
	Location	Feed pump outlet / Filter outlet	
	Quantity	6 No	
	Location	High pressure pump discharge and RO reject	
	Range	0-20 Kg/ cm2	
	Make	Forbes Marshal/ OCEAN/H-Guru	
	MOC	SS	
17.0	Flow Indicator	Function- to measure flow rate at location	

	Quantity	3 No.	
	Location	RO Feed, RO Product, Reject	
	Type	Float type, panel mounted	
	Max, operating temperature	40 degree centigrade	
	Measuring points	RO Feed, RO Product, Reject	
	Make	Flow Max/Blue & White/FIP/H-GURU	
18.0	High pressure switch and low pressure switch	Function – for system safety. Stop the system for low suction pressure at High pressure pump and if required high pressure for RO Membranes	
	Quantity	2 No	
	Location	Before and after High pressure pump	
	Make	Orion / Indfos / Forbes Marshall/DENFOS	
19.0	Auto flushing system with solenoid valve	Function – to flush RO system with clean water at the time of stop to enhance life of RO Membranes	
	Quantity	1 No.	
20.0	Electrical Control Panel with Volt Meter, Indicators, ON/OFF Switch		
	Function to control and operate system properly		
	Make	Local	
	Location	Skid** Mounted **MS box pipe frame with primer and 3 coats of epoxy coating	
	Type	Non draw out type	
	Material of Panel	as per requirement	
	Voltage	415V +/- 10% Frequency 50 Hz +/- 5%, 3 phase, 4 wire system with solidity grounded neutral or 220V, 50 Hz as per requirements	
21.0	Digital Conductivity Meter / TDS Meter	Function – to measure quality of RO product water	
	Quantity	1 nos	
	Location	RO permeate line	
	Indication	4 digit, 1 line LED	
	Range	0 – 200 µs /cm	
	Max. Temperature	40 degree centigrade	
	Make	F Marshal / Hanna / HM	
23.0	Chilling Plant		
	Capacity	3 TR	
	Refrigerant	8-22	
	Power Consumption	6 KW/ 415 +/- 6% volts, 3 phase , 4 wire, 50 cycles AC supply.	
	Compressor	Sealed type of Copeland or Emersion	
	Chiller	Copper cooling coil dipped in tank	
	Condenser	Air cooled	
	Chilled water pump	½ HP mono block of Crompton or Grundfos	

	Control	Thermal static extention wall, digital temperature controller indicator of VEI or equivalent , LP/HP gages WIKA, LP/HP cutout denfoss	
	Interconnecting Refrigeration pipe	Cooper in suction & chilled water piping should be dully insulated	
	Water Storage Tank	SS of 304 grade of capacity to store minimum 500 ltrs of refrigerated water so as to supply to all the 3 water vending /ATM machiness.	
	Electric panels box	Should be equipped with overload relays, timer, MCB, SPP, Volt meter/ampere meter, HRC fuels, push button and indicator with complete wiring work within the chiller and upto WATER VENDING / ATM MACHINE's	
24.0	Data Services	APMC, Azadpur may able to monitor the requisite data reports either manually or through electronically by providing online access. The report should contain the volume of filtered water, vol of water dispensed through all WATER VENDING / ATM MACHINE's, no. of hours the plant was in operation.	

Note:

1) All the Equipment/ Instruments shall conform to BIS/ American/ British/ EU standards.
2) Plant should be mounted on SS Steel frame of 304 grade.

Specifications for the RO Plant Enclosure (room) and Development of Site

1. General requirements and specifications for RO plant enclosure (room) – space requirement for accommodating RO system.

- **Minimum covered area of RO Plant enclosure to be provided for fixing the R.O. Plant along with the required nos of raw/ treated water tanks shall be as follows:**

Sr.No.	Capacity of Plant	Min. Covered area required
1	500 LPH	8 Sq M

- Indicative drawings for plant are annexed, however the final drawing design submitted by bidders shall be approved by the Executive Engineer, Azadpur.

Note: It is mandatory for every bidder to submit layout plan showing the above minimum area requirement along with their bids. Bids of the bidders not complying with this are liable to be rejected.

- A service bay should be provided with sufficient space so that the larger equipment can also be conveniently taken inside the enclosure for fitting and repairs.
- Minimum 3 meter head room shall be provided.
- Raw water and treated water Storage Tank shall be placed in the RO Housing cabin/room.
- Adequate space shall be provided for storing materials/ consumable required during O & M of the RO system.

2. **Enclosure of RO System:**

- Necessary foundation for RO system and required platforms for specified category of RO system shall be provided with plinth height of 0.45 to 0.60 meter above average Road level.
- Required number of windows and doors of adequate size with locking arrangement and chajjas (0.75)shall be provided. Minimum area shall be about 40% of the covered area.
- in all weather conditions and it should withstand the extreme climatic variations of Delhi region.
- A canopy 2.0 meter wide supported with suitable structure should be provided over the area where the water vending / water ATM are to be installed with a minimum length of 4.0 meter. The material of canopy should be PP reinforced UV stabilized Poly Vinyl/FRP covering.
- The total floor area, canopy area and internal wall height upto 1.2 mtr of the cabin/room should be covered with Good quality vitrified/anti-skid tiles as approved by Engineering In charge.

- Necessary electricity and illumination arrangement for day & night shall required to provide.
- The height of the room shall be kept minimum 3.0 mtr or as per the requirement of raw water/treated water storage tank or as per the height of R.O plant
- A 60 cm wide plinth protection with 60mm thick interlocking pavers (M-35) shall be provided all around the entire housing structure.
- The outer wall should be painted with best quality exterior paint and the gate should be painted with the best quality enamel paint.
- A shutter of adequate size and height shall be provided including the gate so that there may not be any hindrance while handling the P.E tanks and R.O plants inside the porta cabin.
- The R. O. Plant cabin should be provided with a Display glow sign board of minimum 3.0 mtr x 1.0 mtr and display boards minimum 6 nos of size 1.5 x 0.6 mtr depicting the name of the Department and the agency including highlighting the facility of availability of treated water. This should be provided as per the design approved by Engineering-in-charge at various location of APMC.

PRODUCT WATER QUALITY AS PER BIS 10500

S.No.	Characteristics	Acceptable
1	Turbidity (NTU)	
2	Color (Units on platinum cobalt scale hazen unit)	
3	Taste and odour	Un objectionable
4	Ph	7.0 to 8.5
5	Total dissolved solids (mg/lt)	500
6	Total hardness as CaCO3 (mg/lt)	200
7	Chlorides (as Cl)(mg/lt)	
8	Sulphates (as SO4)(mg/lt)	200
9	Fluorides (as F)(mg/lt)	1.0
10	Nitrates (as NO3)(mg/lt)	
11	Calcium (as Ca)(mg/lt)	75
12	Magnesium (as Mg)(mg/lt)	<3 *If there are 250 mg/l of sulphates mg content can be increased to a maximum of 125 mg with the reduction of sulphates @ 1 unit per every 2.5 units of sulphates
13	Iron (as Fe)(mg/lt)	0.1
14	Alkalinity (mg/lt)	200
15	Manganese as Mn mg/lt	0.05
16	Copper as Cu mg/I	0.05
17	Zinc as Zn mg/l	5.0
18	Residual free chlorine (mg.lt)	0.2
19	Bacteria (MPN/100 ml)	0-As per BIS Standards
20	Uranium	<60 µg/l

Note:- The total dissolved solids (TDS) of output water obtained from RO plant shall range between 100 to 250 mg per liter in any case.

9. SPECIFICATIONS

1. GENERAL

a. Contractor shall provide, install and commission instrumentation system/ equipments wherever found desirable for the proper and efficient functioning of the R.O. Plant.

b. Contractor shall be fully responsible for design, sizing and selection of the proper instruments for their system and the porta cabin for adjustment of R.O. Plant, Raw & treated water tank.

c. All equipments supplied shall be of field-proven-quality both with respect to design and materials. No prototype instrument or instrument of an experimental nature shall be offered or supplied.

d. No instrument requiring special maintenance or operating facilities shall be offered or supplied as far as possible.

e. Contractor shall prepare and submit a P & I Diagram for the system within the scope of his supply, showing all the instruments and interlock/,trip operations. Each instrument shall be given individual tag numbers from blocks of numbers allotted by the purchaser.

f. All instrument design shall be essentially safe wherever applicable.

g. All instruments and equipment shall be suitable for use in a hot, humid and tropical industrial climate (in which corrosive gases and/or chemicals may be' present.)

h. All the panel-mounted instruments i.e. indicators, recorders, controllers etc shall be microprocessor based.

i. All the controllers shall be single loop dedicated controllers. All the recorders shall be 3-pin type.

j. The contractor shall submit to the Project Manager/Consultant the Technical Specifications for all instruments supplied giving manufacturers name, model number etc. Instrument specification must include process data, minimum / normal / maximum values or variable and all information required to define instrument specification and application.

k. Electronic instruments shall generally operate on 440 V, 50 Hz and shall have transmission and output signal generally of 4 to 20 mA DC. Transmitters shall be two wire and shall be capable of delivering rated current into external load of at least 600 ohms when powered with 24v DC.

l. All receivers shall be suitable for voltage input of 1 to 5 v or 0.25 to 1.25 v

DC.

m. All electronic instruments shall be immune to Radio frequently interference.

2. PIPING WORK

a. Work under this section consists of furnishing detailed designing, labour, materials and necessary equipment required to provide all piping, valves and other appurtenances for the treatment plant.

b. Without restricting to the generality of the foregoing the piping work shall consists of:-

   i. All gravity pipes required between various units.

   ii. Pressure pipes required from pumps to aeration tank, treated effluent disposal etc.

   iii. All other pipes, valves and control gates necessary and required.

c. All piping shall be of suitable material/ make, to be as per the approval of the Engineer-In-Charge.

d. All pipes under pressure / gravity shall be of approved grade of approved make for Water line to the satisfaction of Engineer-in-charge.

e. Pipes shall be laid true to level and gradient and properly supported on stainless steel mounted frame.

3. VALVES

Valves for water outlet shall be of required size and approved make as per requirement of R.O. plant.

Laying of all piping work as per detailed designs and generally for:

i. All above mentioned civil structure and tanks.

ii. For the interconnection of the various equipments, filter pumps, pump house and control room.

iii. All interconnecting piping between various units, bypass etc.

iv. Piping required for providing water supply for the Testing Laboratory.

4. ELECTRO- MECHANICAL EQUIPMENT

Design, supply, erection, commissioning and testing of all mechanical equipments, as mentioned in the proceeding sections, generally comprising of:

a. Raw water lift pumps & treated water pump.

b. All Pipe-line and valves.

c. Supply line and boosting pumps from R.O. plant room area.

d. Any other equipment required for functioning of R.O. plant or as per Clients' requirements.

e. Mechanical Ventilation as per requirement.

(i) **TREATED WATER SUPPLY PUMPS**

f. (Each type of pumps shall be min. two nos. (1 working + 1 standby)

g. Raw water lift pumps shall be compact, mono-block and has specified under tender document.

5. SCOPE OF WORK (ELECTRICAL WORK)

GENERAL

(i) Work under this section shall consist of providing detailed designing, labour, materials and equipment necessary and required to provide all electrical equipment for the treatment plant and providing of porta cabin of required size. Without restricting to the generality of the foregoing the electrical installation work shall consist of :-

i. Electric motors for all equipment.
ii. Cabling to all electrical motors.
iii. Wiring for pumping station and control room.
iv. Motor control center
v. Instrumentation
vi. Internal electrification of all pumps/control rotors.

b. All motors shall be rated 5% above the required H.P.

c. Each motor shall be provided with weatherproof terminal box and motors in exposed conditions shall be provided with suitable removable PVC covers.

d. Connections to all motors shall be made with flexible connections with suitable bushes and terminal lugs.

e. All electrical equipment supplied shall conform to relevant Indian or British standards wherever applicable and of reputed makes. All items shall be tested at manufacturer's works and certified copies of such tests shall be supplied to the owners.

f. All electrical equipment e.g. motors, switchgears, cables etc. shall be of reputed make only approved makes Siemens, NGHP, Crompton, Kirloskar, Indian Cable Company, Cutler and Hammer or Larsen & Turbo.

g. CABLING

(i) Contractor shall supply install and commission all cables from the M.C.C. panel to each motor. Underground cables shall be laid to a minimum depth

of 3100 or as specified by the Consultant and shall be protected with sand and bricks on top. Cables running on surfaces shall be neatly clipped to aluminum saddles at suitable intervals.

h. PAINTING

(i) All metal surfaces shall be thoroughly cleaned and degreased to remove all scales, rust, grease and dirt. Fabricated structures shall be pickled and treated to remove any trace of acid. The under surface shall be prepared by applying a coat of phosphate paint and a coat of yellow zinc chromate primer. The under surface shall be freed from all imperfections before undertaking the final coat. After preparation of the under surface, the panel shall be powder coated /epoxy paint with two coats of paint of approved shade. The finished panel shall be dried in staving ovens in dust free atmosphere. Panel finish shall be free from imperfections like pin holes, orange peels, run-off paint etc. All unpainted steel parts shall be cadmium plated or suitably treated to prevent rust, corrosion etc.

6. COMMISSIONING OF THE SYSTEMS

a. Contractor shall operate and maintain the entire R.O. plant for a period of 1 year under a warrantee period after successful testing and commissioning of R.O. plant and further for a period of 5 year under operation & maintenance part of contract

b. The contractor shall submit the Operation and Maintenance Manual considering the condition mentioned here in for the plant with complete set of drawings and normal operations instructions at the time of commissioning of the plant.

c. Contractor shall submit all required test reports, approvals etc. as per the above sections, as part of the commissioning process.

7. EQUIPMENT GUARANTEE

a. All equipment supplied and installed by the contractor under this contract (whether manufactured by him or not) shall be guaranteed for a defect liability period of twelve months from the date of commissioning of the plant against defective workmanship, installation and materials and further for a period of 5 (Five) years during the O & M period.

b. The guarantee shall cover replacement of defective parts with new ones. Replaced parts shall also be covered by a similar guarantee.

c. The replaced parts shall be of genuine make and approved by the Project Manager.

1. **PERFORMANCE GUARANTEE**

a. The contractor shall submit an irrevocable PERFORMANCE GUARANTEE of 5% (Five percent of the tendered amount) in addition to other deposits mentioned elsewhere in the contract for his proper performance of the contract agreement, the Contractor whose tender is accepted, will be required to furnish performance guarantee for execution part amount and for the period ending one and half year of completion of work other for Operation and maintenance part amount and for the period ending six and half years of completion of work. These performance guarantee shall required to submit within the period specified under schedule "F" (notwithstanding and/ or without prejudice to any other provisions in the contract) within 15 days of issue of letter of acceptance. This period can be further extended by the Engineer-in-Charge upto a maximum period of 7 days on written request of the contractor stating the reason for delays in procuring the Bank Guarantee to the satisfaction of the Engineer-in- Charge. This guarantee shall be in the form of Fixed deposits or Guarantee Bonds of any scheduled Bank or the State Bank of India in accordance with the form annexed hereto. In case a fixed deposit receipt of any Scheduled Bank is furnished by the contractor the Govt. as part of the performance guarantee and the Bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forth with on demand furnish additional security to the Govt. to make good the deficit.

b. A letter of acceptance shall be issued informing the successful tenderer of the decision of the competent authority to accept his tender and to submit the performance Guarantee within 15 days in any of the prescribed form and site of work shall be handed over thereafter. In case of failure by the contractor to furnish the performance guarantee within the specified period, APMC, AZADPUR shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the earnest money absolutely.

c. The performance Guarantee shall be initially valid upto the period stipulated above. In case the time for completion of work gets extended, the contractor shall get the validity of Performance Guarantee extended to cover such enlarged time for completion of work. The performance guarantee shall be returned to the contractor, without any interest after the above defined period.

d. The Engineer-in-charge shall not make a claim under the performance guarantee except for amounts to which APMC, AZADPUR is entitled under the contract (not withstanding and/ or without prejudice to any other provisions in the contract agreement) in the event of:-

ii. Failure by the contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer-in-Charge may claim the full amount of the Performance Guarantee.

iii. Failure by the contractor to pay APMC, AZADPUR any amount due, either as agreed by the contractor or determined under any of the clauses/ conditions of the agreement, within 30 days of the service of notice to this effect by Engineer-in-Charge.

iv. In the event of the contract being determined or rescinded under provision of any of the clause/ condition of the agreement shall stand forfeited in full and shall be absolutely at the disposal of the SECRETARY, APMC, AZADPUR.

LIST OF APPROVED MAKES / MANUFACTURES OF MATERIALS

Engineer-in-charge can direct for use of any brand out of the below mentioned material & brands:-

S. No.	Material/ plant	Brand name/ Manufacturer
(A)	**R.O. Membranes**	**a. Hydraunautics** **b. DOW Flintec** **c. GE**
1.	**Membrane Pressure Tubes**	**a. Ecoline** b. **Codeline** **c.** Structural
2.	**Rotameters**	**a. Flowstar** b. **Fowmax**
3.	**Pressure switches**	**a. Indfos** b. **DENFOS**
4.	**Pressure Gauges**	**a. H. Guru** **b. Forbes Marshal** c. **OCEAN**
5.	**FRP Pressure Tank**	**a. Pentair** b. **Aventura**
(B)	**Pipes and Fittings**	
1.	S. S. Pipes	a. Jindal b. Prakash Steelage c. Ravi Stainless
2.	S. S. Fittings (Investment Casting)	a. Rolex b. Sunlight metal
3.	PVC Pipes and Fittings	a. Astral b. AKG c. Supreme
4.	MS Pipes	a. Jindal b. Tata
5.	Valves	
6.	Butterfly Valves	**a.** Audco **b.** Kirloskar/KSB **c.** CRI
7.	Brass/Bronze Ball Valves	a. Sant b. Shenco c. Loader, Spain d. CIM, Italy, Zoloto
8.	Gunmetal Gate Valves, Non-return Valves	a. Leader b. Sant
9.	Solenoid Valves	a. Rotex b. Aira - Airmax
10	Water Level Controller	a. SBEM b. Cirrus

	(Magnetic Float Type)	c. Elegant Control d. Swlitzer
11.	Diaphragm Valves	a. Saunders b. Expert
12.	PVC Ball Valve	a. Astral b. NKI c. Hitech
	Electric Switch Gear and Starters	
C)	Electric Switch Gear	a. Siemens b. L & T c. ABB d. Merlin Gerin Schinder
1.	PVC Insulated Armoured Power and Control Cables	a. Cable Corporation of India b. Polycab c. Havell`s
2.	MCCB	a. L & T b. Merlin Gerin c. ABB d. Schinder
3.	MCB	a. L & T - Hager b. Merlin Gerin c. Legrand- Lexic Series d. GE - Power
4.	Starters, Relayes etc.	a. L & T b. ABB c. Control & Switch Gear d. Schinder
5.	Push button and indication lights	a. L & T b. Siemens c. Telemenaque d. Vaishno e. BCH
6.	Digital Voltmeter & Ammeter	a. AE b. Cadel c. Enercon
7.	Selector Switches	a. L & T b. Keycell c. Salzar
8.	HRC Control Fuses	**a.** L & T **b.** GE **c.** Siemens
	PLC	**a. Allen Bradley** **b. Siemens** **c. Salzer** d. **Schinder**
D)	Miscellaneous	
1.	HDPE Tanks	a. Sintex b. Jindal
2.	Anti-vibration Pads/Footings	a. Resistoflex b. Kanwal

3.	Vibrations Eliminators	a. Resistoflex b. Flexcons c. Arrowflex d. Kanwal
4.	Pressure Switches	a. System Sensor, U.S.A b. Danfoss c. Indfoss d. Swlitzer
5.	Water Flow Meter Turbine Type	a. Kranti b. Kent
6.	MCC Panel Box	As per Standard design
7.	Main Switch, TPN	a. Havells b. L & T c. Siemens

Note:-

All Equipment and materials proposed makes & specifications shall be submitted by the R.O. SYSTEM Contractor at the time of detailed designing of the system, and approval sought from all concerned as per requirements.

10. GENERAL AND SALIENT POINTS FOR EXECUTION WORK

1. The security deposit shall be recovered from the running bills of the contractor at the rates specified in schedule of quantities and earnest money deposited in the form of Securities or fixed deposit receipt shall only be treated a part of the security deposit. The part earnest money in the form of the Guarantee bonds, if deposited at the time of tender, shall not be considered towards this part of security deposit.
2. The contractor(s) shall submit a detailed programme of execution of work showing activities distinctly along with Bar-Chart and CPM Chart on MS project within fifteen days of the letter of acceptance of work in direct relation to the time stated in the contract document for completions of items of the works.
3. The contractor shall make his own arrangements for electricity and water required for the execution of the work and nothing extra shall be paid for the same. However, for electrical connection, Engineer-In-Charge shall recommend the application to concerned authority for Electrical connection if required. Necessary payment shall be made by the contractor directly to the department concerned. In case the concerned authority fails to sanction the electric connection or delays the sanction of electric connection, the contractor shall make his own arrangements at his own cost.
4. All the materials will be arranged by the contractor himself and nothing extra shall be paid for cartage of material at site of work.
5. The contractor shall quote the rates separately in figures and words accurately so that there is no discrepancy in figures and words and total amount. In case of discrepancy, procedure specified in the contract document of APMC, AZADPUR shall be followed.
6. Final date of completion shall be recorded by the Engineer-in-charge. The authority for levying compensation under clause 16 and granting fair & reasonable extension of time for completion under clause 29 shall be Secy., APMC, AZADPUR, Delhi or his successor.
7. If the contract is determined for any reasons whatsoever by the Engineer-in-Charge/Competent Authority the entire contract shall be treated determined automatically. The Engineer-in-Charge for determination of contract under clause-3 shall be Executive Engineer for work.
8. The authority for appointment of arbitrator shall be Vice Chairman, DAMB.
9. The proposed PI – layout plan and hydraulic flow diagram attached here shall form part of the tender document.
10. The plant shall be adhered to:

a. Plant to be designed using Indian know-how and skill.
b. Plant to be designed in keeping in view economy of material and available land Space.

c. All Indian material to be used.

d. Installation team and future operation & maintenance team to be Indian.

e. Plant will be designed and installed in such a way keeping in view ease of all future operations and maintenance.

11. No Alternate proposal/scheme will be considered.

12. Designs of various units of the plants shall be submitted by the tenderer along with their bid.

13. The process design of the units shall be got checked/ approved by water chemistry expert before submitting the same to the accepting authority for approval.

14. Correctness of the design, drawings, civil structural drawings, electrical, mechanical shop drawings and the execution of the works according to the drawings shall be the responsibility of the contractor. **Approval of the design and drawing by the Engineer-in-Charge does not absolve the contractor from any of his responsibilities to the soundness & satisfactory performance of the structure & plant.**

15. The plant shall be complete with all civil/Electrical & Mechanical components including necessary pumps, motors drives, controls, instruments, electrical connections, piping and valves etc.

16. The compensation penalty, if any, imposed & levied on the Department, under any regulation related to pollution Control by the pollution Control board or any other regulatory authority for failing the general standards as laid down and modified under environment (Protection) Act 1986 for treated water, shall be recovered from the agency.

17. The officers/officials of the Department as well as the officials of pollution control board/ Delhi Jal Board/ Central Pollution Control Board shall have free access to the plant for the purpose of inspection and monitoring the working of the plant. They will have the authority to collect the treated water as & when they so desire.

18. **The contractor shall rectify the defects & replace the defective parts and complete equipment, if the situation so demands, during the guarantee/ maintenance period on the terms defined under O & M agreement part.**

19. Any defect or damage to any part of the plant & machinery resulting in either unsatisfactory performance of the plant or inefficient treatment of water not conforming to laid down standard shall be got rectified and repaired by the agency at his risk & cost during commissioning as well as guarantee/ maintenance period.

20. Defective parts of mechanical & electrical equipments such as pumps, motors, pressure gauges, pipelines, valves, starters & other equipments, shall be replaced with spare parts of approved make conforming to relevant I.S. code during guarantee period.

21. The agency shall be fully responsible for watch & ward, upkeep safety of the plants, equipments etc from pilferage, theft and misuse in any manner till the handing over the same to the department after completion of O & M period.
22. The contractor shall be fully responsible for any act of trespass and consequential damage to the plant.
23. For different materials brought at site for the execution of various items as per schedule attached, the secured advance shall be payable as per provision exist in CPWD Work Mannual-2007, if desired by the contractor. However secured advance shall be paid only after indemnifying Government through an insurance cover as per direction of the Engineer-in-Charge.
24. The contractor shall submit the detailed programme in the form of CPM/PERT/BAR CHART to the Engineer-in-Charge within 7 days of the award of the work and shall get it approved from the Engineer-in-Charge.
25. Net work CPM/PERT/BAR Chart shall show various events/ activities to be carried out including program for procurement of materials, mobilization of machinery/ equipment etc.
26. The program will have to be updated on fortnightly basis in consultation with Engineer-in-Charge.
27. Equipment shall be provided with suitable bracings / stiffeners to avoid any damage during transportation and erection.
28. The contractor shall arrange all T&P, Manpower, and chemicals/ consumables specified in the tender document for commissioning and running/ maintaining the plant under warrantee period of 12 months and O&M period of 60 month. The cost on account of all arrangement specified shall deemed to include under schedule of item of execution part and O&M part respectively. Nothing extra shall be payable on this account.
29. Connection of gasket flanges shall be done with stud bolts and nuts.
30. Threads of Bolts and nuts shall be coated before installation with lubricant to prevent galling of threads.
31. All equipments shall be open to inspection of Engineer-in-Charge during various stages of manufacturing starting from identification of raw material to completion and all the observations of the Engineer-in-charge shall be complied with during manufacturing.
32. All equipment shall be got tested hydrostatically as per the requirements of specification/ codes in presence of the Engineer-in-charge.

11. QUALITY ASSURANCE

1. The contractor shall ensure quality control measures on different aspects of construction including materials, workmanship and correct construction methodologies to be adopted for providing porta cabin/room. He shall have to submit **quality assurance programme within fifteen days of the letter of acceptance of the work.** The quality assurance programme should include method statement for various items of work to be executed along with check lists to enforce quality control.

2. The contractor shall intimate the source of various machines, pumps, motors, filters, membranes, SS Pipes etc. to be used on the work to get, approved from the Engineer-In-Charge. The contractor shall stick to the approved source unless it is absolutely unavoidable. Any change shall be done with the prior approval of the Engineer-In-Charge.

3. The contractor shall submit brand / make of various materials to be used for the approval of the Engineer-In-Charge out of the preferred list appended in the tender document within 30 days of the letter of acceptance and once approved, he shall stick to it.

4. The contractor shall submit shop drawings of staging and shuttering arrangement to Engineer-In-Charge. The contractor shall be fully responsible for the safety of workers.

5. **APMC, AZADPUR may deploy M/s Shri Ram Institute for quality audit and assurance as a 3rd party or any other agency / institute , who shall have free access to take sample during execution of work and audit the progress to ascertain time over run etc. The test outcome of the samples so collected and findings/ observations/ advice shall be binding on the contractor and he shall be duty bound under the contract to rectify/ dismantle the defective work if any pointed out by M/s Shri Ram Institute.**

   Payment due to contractor for any stage, under which the 3rd party has made any observations etc. shall only be released on satisfactorily rectification of defect and removal of rejected material from site.

6. All material shall only be brought at site as per programme finalized with the Engineer-in-charge. Any pre-delivery of the material, not required for immediate consumption shall not be accepted and thus not paid for.

7. The contractor shall submit his detailed quality assurance plan and quality assurance manual and get it approved from the Engineer-in-charge within fifteen days of issue of letter of acceptance of work.

8. Samples of materials required for testing shall be provided free of charge by the contractor. The cost of tests shall be borne by the contractor.

i. All expenditure required to be incurred for taking samples, conveyance, packing etc. shall be borne by the contractor himself.

ii. The Contractor shall deposit the required fees with laboratory (directed by Engineer-in-charge). In case, if contractor delays in submission of samples in testing Laboratory the Deptt. shall be at liberty to send the sample for testing at his own in the testing Laboratory **in such case the Deptt. shall make recovery twice the cost of testing charges deposited from his due payment**.

9. In case there is any discrepancy in frequency of testing as given in list of mandatory tests and that in individual sub-heads of work as per CPWD Specifications, higher of the two frequencies of testing shall be followed and nothing extra shall be payable on this account. However nos. of test conducted by appointed 3rd party by the Deptt. shall be accounted towards total nos. of mandatory test.

10. Detail of routine tests which shall be required to carry out on day to day basis as per IS:10500/ DJB/ as per requirement of

a. COLOUR
b. TURBIDITY
c. pH
d. TOTAL DISSOLVED SOLIDS
e. IRON
f. CHLORIDES
g. CARBONATES
h. BICARBONATES
i. TOTAL HARDNESS
j. CALCIUM HARDNESS
k. RESIDUAL CHLORINE
l. e-COLI
m. COLIFORM

11. Balance tests as per IS:10500 shall be carried out from the outside NABL accredited Lab as approved by Engineer-in-charge.

12. The work shall be executed and measured as per metric dimensions given in the schedule of quantities, drawings etc. (FPS units wherever indicated are for guidelines only)

13. Any legal or financial implications resulting out of disposal of malba/ dismantled material shall be sole responsibility of the contractor. Nothing extra shall be paid on this account.

14. All the hidden items such as drainage pipes, conduits etc. are to be properly tested before covering. **Failing to test the lines shall attract recovery of 5% of amount that particular item head**.

15. The contractor shall bear all incidental charges for cartage, storage and safe custody of materials brought to site.

16. The contractor shall conduct his work, so as not to interfere with or hinder the progress or completion of the work being performed by other contractor(s) or by the Engineer-In-Charge and shall as far as possible arrange his work and shall place and dispose off the materials being used or removed so as not to interfere with the operations of other contractor or he shall arrange his work with that of the others in an acceptable and coordinated manner and shall perform it in proper sequence to the complete satisfaction of others.

17. The Architectural drawings other than those indicated in nomenclature of items are only indicative of the nature of the work and materials/fixings involved unless and otherwise specifically mentioned. However, the work shall be executed in accordance with the drawings duly approved by the Engineer-in-charge.

18. Contractor shall provide permanent bench marks, flags tops and other reference points for the proper execution of work and these shall be preserved till the end of work. All such reference points shall be in relation to the levels and locations, given in the Architectural and plumbing drawings.

19. On completion of work, the contractor shall submit at his own cost four prints of "as built" drawings to the Engineer-in-Charge. These drawings shall have the following information.

i. Run off all piping and their diameter.

ii. Ground and invert level of all inlet/ outlet pipes together with locations.

20. Run off all supply lines with diameters location of control valves, access panels, etc. In case the contractor fails to submit the aforesaid drawings to the Engineer-in-Charge, the security deposit shall not be released.

21. Water tanks, taps, sanitary, water supply and drainage pipes, civil fittings and accessories should conform to byelaws and municipal body/ corporation where CPWD specifications are not available. The contractor should engage licensed plumbers for the work and get the materials (fixtures/fittings) tested by the Municipal Body/ Corporation authorities wherever required at his own cost.

22. The contractor shall give performance test of the entire installation (s) as per the standing specifications before the work is finally accepted and completion certificate is

recorded by the Engineer-in-Charge. Nothing extra whatsoever shall be payable to the contractor for the test.

23. The Contractor shall ensure compliance monitoring conditions as imposed by MOEF/ DPCC/ DJB.

24. Responsibility to conduct field / Lab test and Testing Record of the test conducted at site shall be done & / maintained by contractor's staff. Regular checks of such field / Lab test / Recordings of results etc. shall be made by the subordinate staff of Engineer-in-charge. All record of field test in Register's / Reports shall be maintained by the Quality Control staff deployed by the contractor at site and this record of test shall require to submit along with the bill payment.

25. The Quantities if shall vary more than the specified under schedule F, the contractor shall immediately inform but not later than 3 days to Engineer-in-charge in writing of such deviations. No claim whatsoever if intimation of such deviation are given later on shall be entertained.

26. The Contractor shall submit a detailed program in the form of CPM/PERT chart resource schedule to Engineer-in- charge within 15 days of award of work failing which compensation shall be levied at the rate of Rs. 500/- for each day of delay, till the actual date at submission of detailed program for not following the submitted program chart, the fine @ Rs. 500/- per day for delaying activity, and shall be got approved by him. The program chart should include the following:-

i. Network CPM/PERT diagram prepared as per existing practice.
ii. Descriptive note explaining sequence of various activities.
iii. Program for procurement of material by the contractors.

27. All tools, plant and machinery provided by the contractor, shall, when brought to the site, be deemed to be exclusively intended for construction and completion of this work and the contractor shall not remove the same or any part thereof without the consent of the Engineer-in-charge.

12. OPERATION AND MAINTENANCE INCLUDING FOR WARRANTY PERIOD

The Running Operation & Maintenance of plant shall include the following during the free warranty period of one year and paid O & M period of Five years after completion of warranty period. The warranty period shall start from successful Testing and commissioning of plant and recording of completion certificate by Engineer-in-charge:-

1) **O & M shall include Running, Operation, and maintenance of Cabin/room from inside and outside both, R.O.Plant, Chiller Plant, Water vending /ATM machines and various tanks on Day-to-Day basis.**
2) **Cost of consumables and operating staff during commissioning period of minimum 90 days shall deemed to be included in the cost of execution part of contract.**
3) **The cost of only consumable and operating staff shall be paid during warranty period of 1 year from the date of commissioning and cost of spares shall be borne by the contractor and subsequently during 5 yrs of O & M the cost of consumable, labour and spares shall be paid to the contractor against his quoted rate for this item.**

   In addition to plant brought out in para(1) following should also be produced free of cost during 1st year of O & M:-

i. Maintenance of cabin/room from inside & outside so as to upkeep the cabin/room proper.

ii. Maintenance water vending machine including its calibration.

iii. Maintenance of chilling plant so as to provide the required temperature of cold water during summer.

iv. Cleaning & maintenance of raw water storage, treated water storage and reject water storage tanks including the pumps & motors

v. POL for running and maintenance of pumps/ motors / Electric panels etc. etc.

vi. All spare parts/ fuses/ replacement/ oil seals etc. require for motors / pumps/ Electric panels.

vii. Requisite approvals of statuary authorities during warranty and O & M period.

viii. Civil maintenance of plant room, Yearly white washing/ painting, all precautions from avoiding corrosion of Electric motors and panels including oiling, greasing and maintenance of requisite signages of R.O. SYSTEM room.

ix. All man power required for O & M and carrying out testing of Water samples including providing of general instrument for checking the TDS and physical parameters of treated water.

x. Supply/ boosting of Treated Water to the required location from treated water tank including running and maintenance of all pumps, PLC's and motors of this subject matter.

xi. All consumables like Sand filters, anti-scalant, pH correction agent, chlorine, redign agent, CEB & CIB chemicals, micro filters etc. etc.

xii. Testing of treated water on three month basis from Shri Ram Test House or any other Lab as directed by the client.

xiii. Maintaining of residual chlorine in treated water.

xiv. All electrical fittings and fixtures like tube light, fans, switches etc. for up keepment of R.O. plant room.

xv. Avoiding any pungent smell in the R.O. plant room for this the agency shall provide exhaust fans and any comical etc. at his own cost.

xvi. Safety and security of plant room, electric motors and pumps.

xvii. Maintaining of record of labour deployed on day-to-day basis, servicing record of motors and pumps, Test record of Samples of the quality of water, inventory of consumables and POL brought at site and its use along with the proof of its purchase.

xviii. No payment of O&M period shall be released without endorsing the above record along with the raised bill and it shall be released to contractor on satisfactory performance of R.O. plant. Payment shall be released only on 6 monthly basis. The payment by department for operation and maintenance part shall be quarterly.

xix. Any/all major part/parts replaced as a result of defective equipment/equipments/ workmanship in the final year of operation and maintenance period shall be guaranteed for another twelve months from the date of such replacement for this a performance bond to cover up defect during the liability period of the replaced equipments shall required to be provided separately. The amount of performance bond shall be the cost of equipments so replaced.

xx. The replacement of part during O&M shall be of the same make and standard which has been provided originally during set up of R.O. SYSTEM system.

xxi. The Contractor shall exercise quarterly service/Inspection and at the time of such inspection perform the normal maintenance service comprising of, but not limited to, the items listed below:

a. Check all automatic changeover equipment
b. Check operation control for all motors and pumps.
c. Check dryers, separators, and condition of all filters. Replace as necessary.
d. Check all pressure gauges and switches for correct pressure readings and settings.
e. Check all pressure regulating devices for proper operation.
f. Test all panels, warning lights and alarms.
g. Check the operation of all safety devices and clean, adjust and lubricate as necessary.
h. Lubricate motors pumps and check oil level.
i. Check the tension of all Vee belts, and adjust as necessary.
j. Check all bolts and nuts for tightness, and tighten as necessary.
k. All other maintenance in accordance with equipment manufacturer's recommendations and as stated in the Operation and Maintenance Manual.

xxii. Performance security of O&M part shall be released on satisfactory discharge of operation maintained and running of R.O. system satisfactorily at the end of year.

xxiii. The contractor shall maintain a log book to record the date, time and detail of maintenance/replacement/consumables.

xxiv. The compensation penalty, if any, imposed & levied on the Department, under any regulation related to pollution Control by the pollution Control board or any other regulatory authority for failing the general standards as laid down and modified under environment (Protection) Act 1986 for treated water shall be recovered from the agency.

xxv. The officers/officials of the Department as well as the officials of pollution control board/ Delhi Jal Board/ Central Pollution Control Board shall have free access to the plant for the purpose of inspection and monitoring the working of the plant. They will have the authority to collect the sample of treated water as & when they so desire.

xxvi. Staff required for operations and maintenance like chemist, operators, helpers, plumbers and electricians etc. shall be engaged by the contractor at his own cost.

xxvii. Operators & helpers for the operation & maintenance shall be engaged round the clock by the contractor himself.

i. The staff engaged for maintenance shall have the minimum qualification. The employees of the contractor shall be provided with the identity card/badges and they will display it during their working hours.

xxviii. After successful commissioning of the plant, the Engineer-in-Charge at his discretion shall close the main contract and shall operate O&M agreement already drawn with the agency for operation & maintenance of the plant at his quoted rate. However for operating successful O&M agreement the reference from main agreement can also be drawn and the clauses of O&M can be read in conjunction to even closed agreement of execution part.

xxix. The plant shall be taken over by the Department after successful running and maintenance for 6 years from the date of completion of work (fully functional to the satisfaction of engineer-in-charge).

xxx. The periodicity of test of the treated water during maintenance shall be as per standard practice or as decided by the Engineer-in-Charge.

xxxi. The whole R.O. plant shall be guaranteed for 6 years to be reckoned from the date of Commissioning of R.O.plant through Guarantee bond on non-judicial stamp paper of Rs. 100 as per Annexure – I. This shall require to submit within 15 days of successful commissioning of R.O. plant.

xxxii. Contractor shall perform daily testing of the required parameters of the treated water for its TDS, hardness etc.-etc.

xxxiii. Contractor shall get the final test reports at least once in a month from an approved External Testing agency for the raw water and treated water quality at his own cost, suitable to ensure proof that the entire Plant is running satisfactorily. The frequency of water test is monthly and testing charges shall be borne by the contractor.

xxxiv. It shall be a duty of contractor to run and operate the R.O. plant including running and maintaining the pumping arrangement of treated water for domestic use. In the event the contractor fail to fail to provide treated water in that case the actual expenditure incurred on account of arranging treated water for use in the complex on that day/days shall be recovered from the contractor on triple the cost of actual basis.

DETAIL FOR O & M FOR OPERATION & MAINTENANCE PART WORK:-

Operating & Maintaining the 500 LPH capacity auto operated Reverse Osmosis, based water treatment plant complete in all respects, including all technical/non-technical manpower, consumables and disposal of treated water through Water vending /ATM machines as per requirements/ details given in the Tender Document. (The tender shall be evaluated adding tendered amount of execution and O&M part, it may be noted that cost for O&M part should not be less than to execution part. In the event, if tenderer quotes for O&M part less, than to make it equal to execution part, the amount quoted from civil and electro-mechanical i.e execution part shall be reduced proportionately to make component of O&M part min. equal to execution part)

The Operation & Maintenance shall include running and maintaining of plant including all consumables required to achieve the desired quality of treated water. The consumables shall be like reducing agent. antiscalant chemicals, CEB & CIP chemicals & Micron cartridge filters, POL, labour & staff for the purpose i/c all spare parts required for running & maintaining of pumps & motors during the maintenance period of 5 years comprehensive warranty (service, spare parts and consumables) for whole system after the expiry of free service warranty of 1 year.

The contractor shall also require to set up mini laboratory i/c all chemicals etc. for conducting requisite tests to asserting the quality of water at random. This cost shall also include the charges on account of cleaning and over hauling of treatment plant.

Abstract per year on Operation & Maintenance of Porta Cabin R.O Plant, Chiller and Water vending /ATM machines under 1 Job:-

S.No.	Period	Manpower Cost per Annum	Spare parts cost per Annum	Consumable Cost per Annum	Total Cost per annum
		Annexure-I	**Annexure-III**	**Annexure-IV**	
1	1st Year				
2	2nd Year				
3	3rd Year				
4	4th Year				
5	5th Year				
6	6th Year				
	Total				

Note:-

1. All machines, equipments, Motors, Pumps, MCC, PLC panels, valves etc. shall remain under warranty period of one year from the date of completion of work. Any replacement during the warranty period shall be free of cost.
2. For subsequent years of O&M period wear & tear and annual maintenance of the system shall be considered to workout O&M cost however the cost of this work shall deemed to be included in the quoted rate of the contractor and any maintenance/ replacement shall be done by the contractor free of cost.

3. Consumables and operating during testing and commissioning of period of 90 days shall be supplied free of cost by the agency.
4. All POL for running of pumps and motors shall be provided by the contractor upto to the completion of O&M period.
5. All defective parts/ system/ pumps/ motors during the O&M period shall be provided by the contractor himself nothing extra on this account shall be payable beyond quoted rates.
6. The payment of O&M part shall be made after minimum period of 3 months. No interim payment shall be made to the contractor.
7. Minimum one operator shall required to be deploy in each shift.
8. The plant shall work for 24 hrs x 7 and no extra manpower shall be paid, except as agreed in terms of NIT.

Manpower Cost per annum for O & M of Water Vending / ATM Machine for a period of 6 years.

S.No.	Details of cost for every year	Amount(Rs.)
	Original estimate of Man power(A)	
	Assuming increase in rate of labour @ ____per year:-	
1	1st year Estimated cost of man power for Operation of Plant & Consumables (cost of spares not included)	
2	On 2nd year @ ____ of cost of man power	
3	On 3rd year @ ____ of cost of man power	
4	On 4th year @ ____ of cost of man power	
5	On 5th year @ _____ of cost of man power	
6	On 6th Year @ _____ of cost of man power	
	Total	

Man power Cost per annum for O & M of Water ATM

S.No.	Description	Qty	Unit
	Details of cost for 1 Month		
1	1 Operator cum helper from **__ AM to __ PM**		

Consumable Item Cost per annum for O & M of Water ATM

S.No.	Chemicals/Filter	Unit	Consumption/Month
1	Micro Cartage Filter	Each	
2	Antiscalant Chemical	Litres	
3	Sand media filter	Kg	

Spare parts Cost per annum for O & M of Water ATM for 5 year.

S.No.	Details of cost for every year	Amount(Rs.)
	Original estimated cost of Civil, Electro-mechanical equipment's (A)	
	Assuming cost of spare parts per year:-	
1	On 1st year under warranty	
2	On 2nd year @ ___ of cost of (A)	
3	On 3rd year @___ of cost of (A)	
4	On 4th year @ ___ of cost of (A)	
5	On 5th year @ ___ of cost of (A)	
6	On 6th year @ ___ of cost of (A)	
	Total	

13. GENERAL CONDITIONS

1. Unless otherwise specified, CPWD Specification latest with correction slips issued upto the last date of Uploading of tender shall be followed in general. Any additional item of work, if taken up subsequently, shall also conform to the relevant CPWD specifications mentioned above. Should there be any difference or discrepancy between the description of items as given in the schedule of quantities, particular specifications for individual items of work (including special conditions) and I.S. Codes etc., the following order of preference shall be observed:

(i) Description of items as given in Schedule read along with design and general requirements.

(ii) Contract conditions including Manufacturer's specification and specifications submitted by contractor and accepted by Deptt.

(iii) Special conditions and particular specifications.

(iv) General Conditions of Contract for APMC, AZADPUR works and CPWD Specifications 2009 , Vol.-I and II and general specifications of CPWD for electrical and mechanical part of work.

(v) I.S. Codes.

(vi) Decision of Engineer-in-Charge.

2. INSPECTION OF SITE

The Contractors are advised to inspect and examine the site and its surroundings and satisfy themselves with the nature of site, the means of access to the site, the constraints of space for stacking material machinery, labour etc. constraints put by local regulations, if any, weather conditions at site, general ground / subsoil conditions etc. or any other circumstances which may affect or influence their tenders.

(a) The Contractor shall, if required by him, before submission of the tender, inspect the drawings in the Office of the Engineer-in-Charge. The Department shall not bear any responsibility for the lack of knowledge and also the consequences, thereof to the Contractor. The information and data shown in the drawings and mentioned in the tender documents have been furnished, in good faith, for general information and guidance only. The Engineer-in- Charge, in no case, shall be held responsible for the accuracy thereof and or interpretations or conclusions drawn there from by the Contractor and all consequences shall be borne by the Contractor. No claim, whatsoever, shall be entertained from the Contractor, if the data or information furnished in tender document is different or in-correct otherwise or actual working

drawings are at variance with the drawings available for inspection or attached to the tender documents. It is presumed that the Contractor shall satisfy himself for all possible contingencies, incidental charges, wastages, bottlenecks etc. likely during execution of work and acts of coordination, which may be required between different agencies. Nothing extra shall be payable on this account.

(b) Results of sub-surface investigations conducted at site are indicated in extracts of the report if any available in the office of Executive Engineer, APMC, AZADPUR. This information about the soil and sub-soil water conditions is being made available to the Contractor, in good faith, for guidance only and the Contractor is advised to obtain details directly as may be considered necessary by him before quoting rates in the tender. No claim whatsoever on account of any discrepancy between the sub-surface strata conditions that may be actually encountered at the time of execution of the work and those given in these tender documents, in-accuracy or interpretation thereof shall not be entertained from the Contractor under any circumstances.

(c) The nomenclature of the item given in the schedule of quantities gives in general the work content but is not exhaustive i.e. does not mention all the incidental works required to be carried out for complete execution of the item of work. The work shall be carried out, all in accordance with true intent and meaning of the specifications and the drawings taken together, regardless of whether the same mayor may not be particularly shown on the drawings and / or described in the specifications, provided that the same can be reasonably inferred there from. There may be several incidental works, which are not mentioned in the nomenclature of each item but will be necessary to complete the item in all respect. All these incidental works / costs which are not mentioned in item nomenclature but are necessary to complete the item shall be deemed to have been included in the rates quoted by the contractor for various items in the schedule of quantities. No adjustment of rates shall be made for any variation in quantum of incidental works due to variation / change in actual working drawings. Also, no adjustment of rates shall be made due to any change in incidental works or any other deviation in such element of work (which is incidental to the items of work and are necessary to complete such items in all respects) on account of the directions of Engineer-in-Charge. Nothing extra shall be payable on this account.

(d) If there are varying or conflicting or contradictory provision made in General Condition of contract APMC, AZADPUR – 12 and Conditions mentioned in Tender Document decision of Superintending Engineer shall be final & binding & such decision shall be outside the preview of arbitration

(e) All ancillary and incidental facilities required for execution of work like labour camp, stores, fabrication yard, offices for Contractor, watch and ward, temporary ramp required to be made for working at the basement level, temporary structure for plants and machineries, water storage tanks, installation and consumption charges of temporary electricity, telephone, water etc. required for execution of the work, liaison and pursuing for obtaining various No Objection Certificates, completion certificates from local bodies etc., protection works, barricading, testing facilities laboratory at site of work, facilities for all field tests and for taking samples etc. during execution or any other activity which is necessary (for execution of work and as directed by Engineer-in-Charge), shall be deemed to be included in rates quoted by the Contractor, for various items in the schedule of quantities. Nothing extra shall be payable on these accounts. **Before start of the work, the Contractor shall submit to the Engineer-in-Charge, the layout plan for construction of cabin/room specifying the made and specification of walls, floors, roofs and the base including positioning of machinery, material and other storage, water tank, etc .**

3. SIGN BOARDS

The Contractor shall provide and erect a display board of size and shape as required and paint over it, in a legible and workman like manner, the details about the salient features of the project, as required by the Engineer-in- Charge. The Contractor shall fabricate and put up a sign board in an approved location and to an approved design indicating name of the project, client / owner, architects, structural consultants, Department etc. besides providing space for names of other Contractors, Sub-Contractors and specialized agencies. Nothing extra shall be payable on this account.

1. **DISPLAY PERMISSIONS**

The Contractor shall display all permissions, licenses, registration certificates, bar charts, other statements etc under various labour laws and other regulations applicable to the works, at his site office.

2. **REMOVAL OF 'MALBA' ETC. FROM SITE**

The Contractor shall not stack building material/ malba / muck on the land or road of the local development authority or on the land owned by the others, as the case may be. So the muck, rubbish etc. shall be removed periodically as directed by the Engineer-in-Charge, from the site of work to the approved dumping grounds as per the local byelaws

and regulations of the concerned authorities and all necessary permissions in this regard from the local bodies shall be obtained by the Contractor. Nothing extra shall be payable on this account. In case, the Contractor is found stacking the building material / malba as stated above, the Contractor shall be liable to pay the stacking charges / penalty as may be levied by the local body or any other authority and also to face penal action as per the rules, regulations and bye-laws of such body or authority. The Engineer -in-Charge shall be at liberty to recover, such sums due but not paid to the concerned authorities on the above counts, from any sums due to the Contractor including amount of the Security Deposit and performance guarantee in respect of this contract agreement.

3. **TOOLS AND PLANTS**

No tools and plants including any special T&P etc. shall be supplied by the Department and the Contractor shall have to make his own arrangements at his own cost. No claim of hindrance (or any other claim) shall be entertained on this account.

(a) The site of work shall be always kept clean due to constraints of space and to avoid any nuisance to the users of buildings in the adjacent plots. The Contractor shall take all care to prevent any water- logging at site. The wastewater, slush etc. shall not be allowed to be collected at site. It may be directly pumped into the creek with prior approval of the concerned authorities. For discharge into public drainage system, necessary permission shall be obtained from relevant authorities after paying the necessary charges, if any, directly to the authorities. The work shall be carried out in such a way that the area is kept clean and tidy. All the fees/charges in this regard shall be borne by the Contractor. Nothing extra shall be payable on this account.

(b) The Contractor shall maintain all the work in good condition till the completion of entire work. The Contractor shall be responsible for and shall make good, all damages and repairs, rendered necessary due to fire, rain, traffic, floods or any other causes. The Engineer-in-Charge shall not be responsible for any claims for injuries to person/workmen or for structural damage to property happening from any neglect, default, want of proper care or misconduct on the part of the Contractor or of any other of his representatives, in his employment during the execution of the work. The compensation, if any, shall be paid directly to the Department / authority / persons concerned, by the Contractor at his own cost.

(c) For completing the work in given time frame, the Contractor might be required to work in two or more shifts (including night shifts).

(d) In case of flooding of site on account of rain or any other cause and any consequent damage, whatsoever, no claim financially or otherwise shall be entertained not withstanding any other provisions elsewhere in the contract agreement. Also, the Contractor shall make good, at his own cost, the damages caused, if any.

(e) The Contractor shall render all help and assistance in documenting the total sequences of this project by way of photography, slides, audio / video recording etc. Nothing extra shall be payable to Contractor on this account. However, cost of photographs, slides, audio / video-graphy etc shall be borne by the Department. The original films shall be the property of the Department. No copy shall be prepared without the prior approval of the Engineer- in Charge.

(f) The Contractor shall make all necessary arrangements for protecting from rains, the work already executed and for carrying out the further work, during monsoon including providing and fixing temporary shelters, protections etc. Nothing extra shall be payable on this account. Also, no claims for hindrance shall be entertained on this account.

7. INCIDENTAL CHARGES

For all items of work, all the incidental charges of any kind including cartage, storage, wastage and safe custody of material etc. shall be borne by the Contractor and no claim of any kind, whatsoever, shall be entertained on this account.

8. **STORAGE OF MATERIAL AT SITE**

No inflammable materials including P.O.L shall be allowed to be stored in huge quantity at site. Only limited quantity of P.O.L may be allowed to be stored at site subject to the compliance of all rules / instructions issued by the relevant authorities in this regard. Also all precautions and safety measures shall be taken by the Contractor for safe handling of the P.O.L products stored at site. All consequences on account of unsafe handling of P.O.L shall be borne by the Contractor.

9. NO WAIVING OF LEGAL RIGHTS AND POWERS

The Engineer-in-Charge shall not be precluded or stopped from taking any measurements, and framing of estimates or detaining any certificates made either before or after the completion and acceptance of the work and payment, from showing the true amount and character of the works performed and materials furnished by the Contractor and from showing that any such measurements, estimates or certificates untrue or incorrectly made and that Engineer-in-Charge shall not be precluded or stopped from recovering from the Contractor such damages as it may be sustained by reasons of his failure to comply with the terms and conditions of the contract.

10. FINAL TESTING OF THE INSTALLATION

The Contractor shall demonstrate trouble free functioning of all the services. The Engineer-in-Charge or his authorized representatives shall carry out final inspection of the various works. Any defect(s) noticed during demonstration shall be rectified by the Contractor at his own cost to the entire satisfaction of the Engineer-in-Charge. Nothing extra shall be payable on this account.

11. ARRANGEMENT FOR ISSUE OF WATER VENDING MACHINE CARDS.

It shall be responsible of the contractor to provide cards for water vending machine on the rates as prescribed and fixed by the deptt in writing. Nothing extra shall be charged from the customers except as decided and circulated by APMC,Azadpur. The staff so deployed on the porta cabin shall be available for all the time. It shall be responsibility of the contractor to deploy the person on the porta cabin and the charges of such person on this a/c shall be deemed to included in the yearly maintenance charges payable to the agency.

The agency shall keep the complete a/c of card issued and amount so collected and the same shall be deposited with APMC, Azadpur preferably on every Monday. Further the agency shall furnish the detail of water sold on monthly basis to the deptt so that the deptt may tally the water sold and the amount so collected any difference on this a/c shall have to borne by the agency.

The agency shall also ensure that water is only sold for drinking purpose and at a time maximum of 2 ltrs is dispensed and will restrict filling of water jars/cannons.

14 SPECIAL CONDITIONS

1. The contractor shall be responsible for the watch and ward / guard of the buildings, safety of all fittings and fixtures including sanitary and water supply fittings and fixtures provided by him against pilferage and breakage during the period of installations and thereafter till the building is physically handed over to the department along with completion drawings. No extra payment shall be made on this account.

2. All materials and fittings brought by the contractor to the site for use shall conform to the samples approved by the Engineer-in-charge which shall be preserved till the completion of the work. If a particular brand of material is specified in the item of work in Schedule of Quantity, the same shall be used after getting the same approved from Engineer-In-Charge. Wherever brand / quality of material is not specified in the item of work, the contractor shall submit the samples as per list of preferred makes given in the tender document / particular specifications for approval of Engineer-In-Charge. For all other items, materials and fittings of ISI Marked shall be used with the approval of Engineer-In-Charge. Wherever ISI Marked material fittings are not available, the contractor shall submit samples of materials/fittings manufactured by firms of repute conforming to relevant specifications or is codes and use the same only after getting the approval of Engineer-In-Charge. To avoid delay, contractor should submit samples as stated above well in advance so as to give timely orders for procurement. If any material, even though approved by Engineer-In-Charge is found defective or not conforming to specifications shall be replaced/removed by the contractor at his own risk & cost

3. The contractor shall ensure quality construction in a planned and time bound manner. Any sub-standard material/ work beyond set-out tolerance limit shall be summarily rejected by the Engineer-in-charge & contractor shall be bound to replace / remove such sub-standard / defective work immediately.

4. BIS marked materials except otherwise specified shall be subjected to quality test besides testing of other materials as per the specifications described for the item/material. Wherever BIS marked materials are brought to the site of work, the contractor shall, furnish manufacturer's test certificate or test certificate from approved testing laboratory to establish that the material procured by the contractor for incorporation in the work satisfies the provisions of specifications relevant to the material and / or the work done.

For certain items, if frequency of tests is not mentioned in the CPWD Specifications & BIS, then tests shall be carried out as per decision of Engineer-in-charge

5. The contractor shall remove the malba/ dismantled material from the site and shall dispose off at place directed by Engineer-in-charge. Nothing' extra shall be payable to the contractor for stacking the malba.

6. The contractor shall take adequate measures for the safety and security of visitors/ on day to day basis. He shall take all precautions for displaying signage's, barriers and caution signage's etc. for restricting the movement of in the working area. In the event of any mishap on this account shall be the entire and sole responsibility of the contractor. All damages/ treatment cost in case of any accident shall be borne by the contractor. In the event of failure to pay the amount so payable shall be deducted and paid to the agreed person(s) directly by the deptt. for the sum(s) payable to contractor engaged the said work.

i. **Regarding release of with held amount for operation and maintenance.**

a) The 5% security deposit as defined under GCC-2014 shall be deducted from total value of work done under execution part.

b) In addition to this 5% of the gross amount shall be with held from execution part work of Electro-mechanical for Operation and Maintenance of the R.O for the Period of 5 years, which shall start after 1 year of warranty period, from the date of successful commissioning/ completion certificate as recorded by the Engineer-in-charge.

c) The 5% with held amount for O&M & 5% SD deducted i.e. total 10% shall be released in 5 equal installments after successful completion of O&M of 1st year, 2nd year, 3rd year, 4th year, which shall start from the date of completion of 1 year warranty period and for 5th year (after 12 month of successful completion of 5th Year of O&M and recording of completion certificate of O&M) in five installments as per detail given below:-

1. 20% of the with held amount (5% of with held amount of gross amount and 5% security deposit i.e. total 10%) shall be released only after successfully completion of O & M of 1st Year which shall be started from the completion of one year warranty period.

2. 20% of the with held amount (5% of with held amount of gross amount and 5% security deposit i.e. total 10%) shall be released only after successfully completion of O & M of 2nd Year which shall be started from the date of completion of one year warranty period.

3. 20% of the with held amount (5% of with held amount of gross amount and 5% security deposit i.e. total 10%) shall be released only after successfully completion of O & M of 3rd Year which shall be started from the date of completion of one year warranty period.

4. 20% of the with held amount (5% of with held amount of gross amount and 5% security deposit i.e. total 10%) shall be released only after successfully completion of O & M of 4th Year which shall be started from the date of completion of one year warranty period.

5. 20% of the with held amount (5% of with held amount of gross amount and 5% security deposit i.e. total 10%) shall be released after 12 month of successful completion of 5th Year of O&M and recording of completion certificate (the 5th year of O&M shall be started from the date of completion of one year warranty period).

ANNEXURE-I

FORM OF BANK GUARANTEE BOND

In consideration of the SECRETARY,, APMC, AZADPUR (hereinafter called "APMC, AZADPUR") having agreed to exempt ..... (Hereinafter called the said contractor(s) from the demand under the terms and conditions of Tender No. ..... invited for the work of ... . (Hereinafter called "The said tender") part earnest money for compliance of his obligations in accordance with the terms and conditions of the said tender, on production of a irrevocable Bank Guarantee for Rs. .... (Rupees .... only), we .... (indicate the name of the bank) (hereinafter referred to as "the Bank) hereby undertake to pay to APMC, AZADPUR an amount not exceeding Rs. ..... (Rupees .....only) on demand by APMC, AZADPUR.

1. We ..... (indicate the name of the bank) do hereby undertake to pay the amounts due and payable under this Guarantee without any demure. merely on a demand from APMC, AZADPUR stating that the amount claimed is required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the bank under this Guarantee. However. our liability under this guarantee shall be restricted to an amount not exceeding Rs. .... (Rupees. .... only).

2. We ..... (indicate the name of the bank) the said bank further undertake to pay to APMC, AZADPUR any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal.
   The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the contractor(s) shall have no claim against us for making such payment.

3. We ..... (indicate the name of the Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the said tender and that it shall continue to be enforceable till all the dues of APMC, AZADPUR under or by virtue of the said tender have been fully paid and its claims satisfied or discharged or till Engineer-in-charge on behalf of APMC, AZADPUR certified that the terms and conditions of the said tender have been fully and properly carried out by the said contractor (s) and accordingly discharges this guarantee.

4. We .... (indicate name of the bank)· further agree with APMC, AZADPUR that APMC, AZADPUR shall have the fullest liberty without our consent and without effecting in any manner our obligations hereunder to vary any of the terms and conditions of the said tender or to extend time of tender by the said contractor(s) form time to time or to poR.O. SYSTEMone for any time or from time to time any of the powers exercisable by APMC, AZADPUR against the said contractor(s) and to for bear or enforce any of the terms and conditions relating to the said tender and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said contractor(s) or for any for-bearance, act of omission on the part of APMC, AZADPUR or any indulgence by APMC, AZADPUR to the said contractor(s) or by any such matter of thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

5. This guarantee will not be discharged due to the change in the constitution of the Bank or the contractor(s).

6. We .... (indicate the name of the Bank) lastly undertake not to revoke this guarantee except with the previous consent of APMC, AZADPUR in writing.

7. This guarantee shall be valid upto ..... unless extended on demand by APMC, AZADPUR. Not withstanding anything mentioned above, our liability against this guarantee is restricted to Rs. ..... (Rupees .... only) and unless a claim in writing is lodged with us within six months of the date of expiry or the extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharged.

Date the ..... day of ..... for ....
(indicate the name of Bank).

AFFIDAVIT

I/We have submitted a Bank Guarantee for the work.... ....

ANNEXURE-II

GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION

The agreement made this ..... day of ..... (Two Thousand only) ..... between ..... S/o

..... (hereinafter called the GUARANTOR of the one part} and the SECRETARY,, APMC, AZADPUR (hereinafter called APMC, AZADPUR of the other part)

WHEREAS THIS agreement is supplementary to a contract (Hereinafter called the Contract) dated ..... and made between the GUARANTOR OF THE ONE PART AND APMC, AZADPUR of the other part, whereby the contractor interalia, undertook to render the work in the said contract recited structurally stable, with sound material, workmanship and proper design including installation so as to provide the requisite quality of treated water.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the affect that the said work will remain structurally stable and workable and guaranteed against faulty material and workmanship and design so as to produce requisite quality of treated water. For perfect soundness of finishing and operational for two years from the date of completion of work.

NOW THE GUARANTOR hereby guarantee that work executed by him will be free from any hindrance leakage, seepage, deformity in pipes and guaranteed against faulty material, workmanship and design for two years to be reckoned from the date after the expiry of maintenance period prescribed in the contract.

The decision of the Engineer-In-Charge with regard to nature and cause of defect shall be final.

During this period of guarantee, the guarantor shall make good all defects and in case of any defect to satisfaction of Engineer-in-charge at his cost and shall commence the work for such rectification within seven days from the date of issue of the notice from the Engineer-in-charge calling upon him to rectify the defects failing which the work shall be got done by the Department by some other contractor at the guarantor's cost and risk. The decision of the Engineer-in-Charge as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to make good all defects or commits breach there under, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and or cost incurred by APMC, AZADPUR, the decision of the Engineer-in-charge will be final and binding on both the parties.

IN WITNESS WHEREOF these presents have been executed by the obligator ..... and …….....
by

..... for and on behalf of the SECRETARY,, APMC, AZADPUR on the day, month and year first above written.

SIGNED, sealed and delivered by OBLIGATOR in the presence of:-

1. ..... 2. .....

SIGNED FOR AND BEHALF OF THE SECRETARY,, APMC, AZADPUR BY.....in the

Presence of:-

1. ..... 2. .....

Confirmation:

I / We conform that the NIT, General and salient points to the General condition, Additional General Condition, Special condition, Particular Specification and other details appended in the documents have been fully examined and fully cognizance taken therein for arriving at the item unit prices and total amount and tendered sums contained therein my / our tender.

Contractor

Financial bid

FOR

N/W: - **Supply, Installation, Testing, and Commissioning of 06 nos. R.O. System of Capacity 500 LPH each with 09 nos. Chilling units of capacity 3 TR to Produce portable treated water for drinking purpose in existing Piaos structures including comprehensive operation & maintenance of newly/existing R.O. system & chiller units installed in all 26 piaos for 5 years beyond one year warranty period at APMC (MNI), Azadpur.**

AGRICULTURAL PRODUCE MARKETING COMMITTEE

(Market Of National Importance)
New Office Complex, NFM- Ph.-II, Sarai Pipal Thalla, Azadpur, Delhi-33.

ENGINEERING DIVISION
APMC, AZADPUR

Estimated Cost: Rs. 1,94,376/-
Time Allowed: 3 Months + 6 years (O&M Part)

SECHDULE OF QUANTITY

N.O.W:-Supply, Installation, Testing, and Commissioning of 06 nos. R.O. System of Capacity 500 LPH each with 09 nos. Chilling units of capacity 3 TR to Produce portable treated water for drinking purpose in existing Piaos structures including comprehensive operation & maintenance of newly/existing R.O. system & chiller units installed in all 26 piaos for 5 years beyond one year warranty period at APMC (MNI), Azadpur.

S. .NO	Description of Item	Qty	Unit	Rate	Amount
	Part-A				
1.	Design, Supply, Installation, Testing, Commissioning, of fully SS 304 grade housing structure R.O.Plant of capacity 500 LPH with eight stage filtration consisting of multi grade filter, activated carbon filter, 10 micron PP filter, 5 micron PP filter, anti scalent dosing, pH correction dosing, R.O. & UV System so as to produce water quality as per IS-10500 with minimum recovery of 70% potable water with the provision of online monitoring of water quality complete as per satisfaction/direction of Engineer in charge.	**6**	**Each**		
2.	Supply, Installation, Testing, Commissioning, of water Chilling unit of 3 TR capacity along with a provision of SS 304 grade steel sheet dully insulated water storage tank with a capacity of 500 ltr. Including water connections with accessories & faucets as per requirement/direction/satisfaction of E-I-C	**9**	**Each**		
	Part-B				

3.	Operation & Maintenance Part consisting of O&M of 06 nos. 500 LPH capacity R.O. Plants, 26 nos. chilling unit of capacity 3 TR & storage tanks etc all complete round the clock. The maintenance shall be comprehensive including maintenance of plant to achieve the desired quality of treated & potable water as per IS 10500. The O & M shall include running and maintaining of plant including all Consumable like cartage filter, anticalent chemical, cleaning chemical, PH correction agent, activated carbon, media filter of required concentration, POL, labour and staff etc. for the purpose inclusive cost of all spare part required for running and maintaining complete system for a period of 5 year comprehensive warranty (service spare parts, consumable and maintenance) for whole system after the expiry of free service warranty of 1 year which is only for newly installed 6 RO and 9 chillers. Details of warranty period cost and after warranty period cost as under:				
A	1st Year : (In Warranty period items i.e 6 nos. R.O. plants & 9 nos. Chilling unit of capacity 3 TR consumable spare parts shall be provided by the agency) and includes comprehensive operation and maintenance of 17 old chillers of 3 TR.	**1**	**Year**		
B	2nd Year (Comprehensive Operation & Maintenance of 6 R.O and 26 chillers of capacity 3 TR).	**1**	**Year**		
C	3rd Year (Comprehensive Operation & Maintenance of 6 R.O and 26 chillers of capacity 3 TR).				

		1	**Year**		
D	4th Year (Comprehensive Operation & Maintenance of 6 R.O and 26 chillers of capacity 3 TR).	**1**	**Year**		
E	5th Year (Comprehensive Operation & Maintenance of 6 R.O and 26 chillers of capacity 3 TR).	**1**	**Year**		
F	6th Year (Comprehensive Operation & Maintenance of 6 R.O and 26 chillers of capacity 3 TR).	**1**	**Year**		

Total Amount Rs.

Note:-

1. Cost of consumables and operating staff during commissioning period shall deemed to be included in the cost of execution part of contract.
2. RO Membrane shall be guaranteed for a minimum 4 years to produce quantity and quality of water as specified in tender document. In case if the RO plant fails to produce the rated capacity and quality of water before 4 years from the date of commissioning of the plant, in that case the agency shall replace the RO Membrane free of cost and nothing extra on this account shall be payable. Decision of Superintending Engineer on replacement of RO membrane shall be final and binding.

Executive Engineer
APMC, Azadpur

Signature of the contractor