MUNICIPAL CORPORATION OF VIJAYAWADA

Name of the Work: Manning, Operation, Maintenance and repairs to VMCs 29 MGD Capacity Water Supply Scheme in Vijayawada from collection wells, treatment plants, pumping stations at Dr. K.L.Rao Head Water Works to clear water pumping mains up to reservoir filling including providing chemicals, consumables, workmen and all repairs along with necessary spares.

BID DOCUMENT FOR OPERATION AND MAINTENANCE
Dr. K.L. RAO HEAD WATER WORKS
(TECHNICAL BID – COVER A)

OFFICE OF THE SUPERINTENDING ENGINEER,
MUNICIPAL CORPORATION,
VIJAYAWADA.

BIDDER

SUPERINTENDING ENGINEER
VIJAYAWADA MUNICIPAL COPORATION

VIJAYAWADA MUNICIPAL CORPORATION

...

O/ o. Superintending Engineer,
Municipal Corporation,Vijayawada-1,

FORWARDING SLIP TO BID SCHEDULE

1	Name of the Work	Manning, Operation, Maintenance and repairs to VMCs 29 MGD Capacity Water Supply Scheme in Vijayawada from collection wells, treatment plants, pumping stations at Dr. K.L.Rao Head Water Works to clear water pumping mains up to reservoir filling including, providing chemicals, consumables, workmen and all repairs along with necessary spares.
2	Earnest money deposit Along with submission of completed Bid schedule.	**Rs 4,50,000.00**.[Rupees Four lakhs fifty thousand only] in the form of Crossed Demand Draft / Bank Guarantee drawn from any nationalized Bank valid for a period of **45** days beyond the validity period of the bid.
3.	Performance guarantee at the time of entering into agreement	**5% of contract value** including the **EMD** in the form of Crossed Demand Draft / Bank Guarantee drawn from any nationalized Bank within **20 days** of awarding of the contract.
4.	Name and address of contractor to whom schedule is issued	

Schedule cost Rs. 5000/- paid vide _____ _____ _____

5.	Last date of submission of application for bid documents	**15.06.2006**
6.	Date of issue of schedule	**From 25.05.2006 to 26.06.2006**.
7.	Date of prebid meeting	**26.06.2006 at 11.00 Hours in Chamber of S.E /VMC**
8.	Last date for receipt of Bid and time.	**26.07.2006 up to 15.00 Hours**
9.	Date of opening of Technical Bid and time	**26.07.2006 at 15.30 Hours.**
10.	The validity of Bid from the date of opening of technical Bid	**3 months**
11.	Place of receipt of Bid	O/ o. Superintending Engineer, Municipal Corporation,Vijayawada-1, Phone No. 0866-2427483, Fax No.0866-2424338.

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O/ o. Superintending Engineer,
Municipal Corporation,Vijayawada-1.

Bid Notice No. SE/11318/O&M/HWW/2005 Dt: 15-05-2006

Sealed Bids will be received from the Reputed Firms /Registered Contractors on LS contract system on the basis of schedule of percentage Bid by the Superintending Engineer, VMC on the date of closing of Bids i.e**. 26.07.2006**. The Bids will be opened on the same date at 15.30 hours by the Superintending Engineer, VMC or his nominee for the following work.

Sl. No.	Name of the Work	Approximate value of work	E.M.D.	Status of Contractor	Cost of Bid Schedule	Time limit for completion work
1	Manning, Operation, Maintenance and repairs to VMC's 29 MGD Capacity Water Supply Scheme in Vijayawada from intake wells, treatment plants, pumping stations at Dr. K.L.Rao Head Water Works to clear water pumping up to reservoir filling including providing chemicals, consumables,		**Rs. 4,50,000/- at the time of submission of completed Bid Schedule and 5% of bid value as performance security at the time of agreement including E.M.D**	L.S	Rs.5000/- + S.T for Rs. 625/-	3 years

2 The last date of receipt of applications for the Bid documents is **15-06-2006**

3 The Contractor shall be required to pay the E.M.D. along with completed Bid Schedule in the form of Crossed Demand Draft / Bañk guarantee drawn from any nationalized bank in favour of Commissioner, VMC valid for 45 days beyond the validity period of the bid.

4. The Bid Schedules will be supplied between **25-05-2006 to 26-06-2006**. The supply of Bid schedules by post will be at the risk and responsibility of the Contractor. If any bidder requires the bid documents by post, they have to pay an additional amount of **Rs. 500/-.** The Bid documents are non transferable.

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5. The cost of Bid Schedules(non refundable) will not be refundable under any circumstances. The E.M.D. shall be refunded to the unsuccessful Bidder soon after deciding the Bids.
6. The Bids received late or without E.M.D. will summarily be rejected
7. The Bidder must keep his Bid valid for a period of **3 months**. If any Bidder withdraws his offer within the validity period, the E.M.D. will be forfeited.
8. The Bidder shall not, without the written consent of the VMC authorities assign the contract or sublet any portion of the same to any other person.
9. The payment towards cost of Bid schedules should be in the form of separate crossed demand drafts. The D.D towards cost of schedule has to be drawn in favour of **Commissioner, VMC** and D.D towards Sales Tax has to be drawn in favour of **C.T.O, Sivalayam street, Vijayawada**. The cost of Bid schedules and E.M.D. in currency notes or interest bearing securities bank guarantee or insufficient deposits will not be accepted.
10. A Bill of quantities (Schedule-A) occupies the Bid Schedule. The Bidder will be to state clearly their willingness to execute the work. The rates shall be inclusive of EPF, Insurance, Uniform & Shoes to their employees and other statutory benefits & taxes etc., as in-force for the time being for the various items in schedule-A, excluding service tax which will be paid separately on production of proof. Bidder should quote their offer both in words as well as in figures, the offer quoted in words shall prevail.
11. The contractor shall be solely responsible for the payment of E.P.F. Insurance, Uniforms & Shoes and other statutory benefits to his employees & taxes etc., as enforce for the time being and the rates for the various items in Schedule-A are taken into account all sorts excluding service tax. The rate(s) shall remain unaffected by any change that may be made from time to time.
12. The Bidder can submit the Bid either personally or through his agent of by post. In case of submission of Bid by post, the risk and responsibility for either loss or delays in transit of the same is to be borne by the Bidder and the Bid opening authority will not consider any Bid received by him after expiry of date and time fixed for receipt of Bid.
13. If any of the dates notified above happens to be a holiday, then the next working day will hold good in lieu of the date/dates mentioned.

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14. The work to be carried out under this contract includes.

    i) Routine operation of the pumps through hourly, daily (round the clock) operation of various components of pumping installations such as switch gears, valves, pumping plant machinery equipment etc., by entrusting such operations to qualified experienced and trained personnel, so that the objective of pumping 29 MGD from HWW is achieved. The work also included routine maintenance of preventive maintenance to upkeep the mechanical and electrical components of the plant through normal repairs and so that these components are able to function to their designed capacity and prevent these components from malfunctioning.

    ii) The work includes attending to emergencies and unplanned shutdown by repairs and replacements and worn out parts whenever required for which the required men, materials, spares and equipment are to be maintained in a reserve by the contractor.

15. The total period of contract will be **3 years** from the date of hand over of the site to the contractor upon signing of the contract agreement and furnishing the requisite performance security.

16. Issuance of document does not imply that the Bid is qualified automatically.

17. The Bidder shall preferably be registered under Section 7(1) of the Contract Labour (Regulation & Abolition) Act, 1970 and obtained valid License under Section 12(1) of the above said Act from competent authority and enclosed a copy of registration certificate under the Labour Contract Act.

18. Along with the application for purchase of Bid Schedules, the Bids are requested to furnish the following information.

    1) **A copy of order enlisting as contractor.**
    2) **List of works executed in the last (2) years duly certified by the concerned authorities.**
    3) **List of works on hand certified by the concerned authorities.**
    4) **A declaration that he has not been blacklisted or demoted by Govt./Undertakings.**

19. Any wrong declaration in this regard comes to notice at a later date will disqualify him for Biding.

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The Commissioner, VMC reserves the right to reject any or all the Bids without assigning any reasons therefor any Bidder shall have no cause of action or claim against the Vijayawada Municipal Corporation or its Officers, employees, successors or assignee for rejection of his Bid.

20. The tender document is available in the website ***'www.ourvmc.org'*** and can be downloaded for reference. However, filing of tender shall be with the original tender document issued by the department.

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BID CONDITION

1. Bids from Reputed firms/ Registered contractors (Registered as per G.O. Ms. No. 521, Dt: 10-12-1984 and terms as per G.O. Ms. No. 94, dt. 01-7-2003 of I & CAD (PW-COD) Dept.) of Class-I, Electrical having Electrical Contractors License Grade-A issued by competent Authority GOAP and having experience in similar nature of work on L.S contract system. Bids will be received by the Commissioner Vijayawada Municipal Corporation, Vijayawada upto 15.00 hours on 26-07-2006 for the work "Manning, Operation, Maintenance and repairs to VMCs 29 MGD Capacity Water Supply Scheme in Vijayawada from collection wells, treatment plants, pumping stations at Dr. K.L.Rao Head Water Works to clear water pumping up to reservoir filling including providing chemicals, consumables, workmen and all repairs along with necessary spares." For a period of three years.

2. Submission of Proposals:-

a) Proposals should be submitted in one original document. Proposals must be prepared in indelible ink and be signed by the authorized representative of the Contractors/firms.

b) Bids must be submitted in Two cover system containing Technical and Financial Proposals in two separate sealed covers.

The Technical proposals shall contain all the prequalifying criteria specified in this Bid document such as Bidder`s experience, staff proposed to be employed , Methodology and work plan.

All technical proposals shall be placed in one envelope clearly marked "**Technical Proposal**," and the financial proposals in another envelope marked "**Financial Proposals**." These two envelopes, in turn, shall be sealed in an outer envelope bearing the Following Information superscribed on the envelope.

Outsourcing of 'O & M' in Dr. K.L. Rao Head Water Works, Vijayawada.

The name of the bidder shall be noted on the all the sealed covers. The tender should be filed at O/o Superintending Engineer, Jawahar Lal Nehru Buildings, Municipal Corporation, Vijayawada **in the tender box assigned for the purpose**.

c) In case, if the proposals are submitted by post , the Outer envelope duly sealed and bearing the Following Information superscribed on the envelope

Outsourcing of 'O & M' in Dr. K.L. Rao Head Water Works, Vijayawada.

Shall not be opened except in the presence of Superintending Engineer, VMC, and not before 15.30 Hours on 26.07.2006

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and addressed to:

The Commissioner,
Jawahar Lal Nehru Buildings,
MUNICIPALCORPORATION,
Vijayawada – 520 001.

The completed technical and financial proposals must be delivered to this address on or before 15**.00 hours on 26.07.2006**. The department is not responsible for any postal delay in submission of bid.

d) Technical and financial proposals shall be written in English including reports. The Client reserves the right to modify and extend the deadline for the submission of proposals.

e) Contact Telephone Nos.

Superintending Engineer / VMC	**Phone**	**: 0866-2427483**
	Fax	**0866—242338**
	Mobile	**: 9866514160**
Executive Engineer1, VMC,	**Phone**	**: 0866-2514944**
	(Mobile)	**9866514161**

4. The Bidders or their agents are expected to be present at the time of opening of Bids. If any of the Bidders or their agents find inconvenient to be present at the time of opening the Bid, the Bid receiving officer will on opening the Bid of the absentee Bidder, make initial on the unattested corrections. The Bidder shall then accept these corrections without any question whatsoever.

5. If the Bid is made by an individual, it should be signed with his full signature and his address shall be given. If it is made by a firm, it shall also be signed with the Co-Partnership name by a member of the firm who shall sign, furnish his own name, and address of each member of the firm shall be given. If the Bid is made by a corporation, it shall be signed by a duly authorised officer, who should produce authorisation along with his Bid.

6. Date of opening of Financial bids will be intimated after due evaluation of Technical Bids. The Financial bids of Technically Qualifying bidders only will be opened , and will be intimated in advance .

7. **EMD**: Each Bid while submitting completed Bid schedules must pay as Earnest Money (Not to bear any interest) for **Rs. 4,50,000/-** (Rupees: Four lakhs fifty thousand only) by way of crossed Demand Draft / in the form of bank guarantee) drawn on any branch of a Nationalised Bank with in jurisdiction of Vijayawada Municipal Corporation to the credit of the Commissioner, Vijayawada Municipal Corporation.

8. If the contractor fails to quote his rates in figures or words, the Bid will be treated as incomplete and will be rejected.

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9. Bids not submitted in proper form or in due time will be rejected. Rates or lump-sum amounts for items not called for shall not be included in the Bid. No alteration shall be made by the Bidder in the contract form, the conditions of contract, the drawings specifications or quantities accompanying the same. If any such alterations are made, the Bid will be void.

10. The Bidder must keep his ***Bid valid for Three months*** from the date of submission of Bid. During the above period, no plea by the Bidder for any modification of the Bid based upon or arising out of any alleged misunderstanding or misconception or mistake or for any reasons will be entertained. The Bids received will be decided within a period of three months after the expiry of the last date prescribed for the receipt of the Bids and the decision regarding the disposal of the Bid will be indicated any time within the said period.

11. The earnest money will be retained in the case of successful Bidder, and will not carry any interest, it will be dealt with as provided in the Bid

12. When a Bid is accepted, the Bidder shall attend Superintending Engineer's office at the Vijayawada Municipal Corporation within 20 days from the date of issue of letter of acceptance of bid/on the date fixed and intimated to him. He shall forth with upon intimation being given to him by the Superintending Engineer, Vijayawada Municipal Corporation acceptance of his Bid shall sign an agreement in the proper form of Agreement prescribed by VMC and within 20 days after issue of letter of acceptence, shall submit the performance security for total amount equal to **5 %** of contract value including the EMD given along with the bid in the form of Crossed demand Draft /Bank guarantee drawn from any nationalised bank valid for **30days** beyond the date of completion of contract. Failure to attend the Superintending Engineer, Vijayawada Municipal Corporation office on the date fixed in the written intimation and enter into required agreement shall entail forfeiture of the earnest money paid for the Bidder. The written agreement to be entered into between the contractor and Commissioner shall be the foundation of the rights and the obligation of both the parties and the contract shall not be deemed to be complete until the agreement has first been signed by the contractor and then by the proper officer authorised to enter into contract on behalf of the Commissioner. In case the Commissioner finds it necessary to take additional security the contractor shall remit the additional security in addition to the EMD before entering into the agreement.

13. The contractor shall not, without the written consent of the Commissioner, Vijayawada Municipal Corporation assign the contract or sublet any portion of the same to any other person/ Agency.

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14. Bidder shall not be eligible to Bid for works in a division where any of his near relatives employed in the rank of Asst. Commissioner and above Vijayawada Municipal Corporation, Asst. Engineer and above on the Engineering side and Accountant and above on Administrative, Accounts & Finance side. The contractor shall intimate the name of persons who are working with him in any capacity or subsequently employed. He shall also furnish a list of Non-Gazetted Corporation employees related to him. Failure to furnish such information shall render him liable to be removed from the list of approved contractors and his contract liable for cancellation.

NOTE: Near Relatives are:

1. Sons, Step-sons, Daughters and Step-daughters.
2. Son-in-laws and Daughter-in-laws.
3. Brother-in-laws and Sister-in-laws.
4. Brothers and sisters.
5. Father and Mother.
6. Wife and Husband.
7. Father-in-law and Mother-in-law.
8. Nephews, Nieces, Uncles and Aunties.
9. Cousins and
10. Any person residing with the contractor.

15. A list of members employed shall be furnished before entering into agreement with the VMC.

16. Each member of Technical staff shall also furnish a Declaration form in the matter.

17. The contractor shall inform to the VMC in case there is any change in their staff mentioned above for any reason.

18. The contractor shall at all times indemnify the VMC against all claims which may be made under the workmen compensation Act or any statutory modification, thereof for the rules of compensation, payable in consequence of any accident or any injury sustained by any workman engaged in the performance of the business relating to this contract.

19. In all cases of personal injury to workmen employed by a contractor on this work, the contractor is liable to pay compensation under the workmen's compensation Act. He shall pay the prescribed medical fee to the Medical Officer for issue of C and D forms as prescribed, failing which the said fee will be paid to the Medical Officer by the VMC and recovery will be effected from the contractor's bills.

20. The contractor shall be solely responsible for the payment of the E.P.F, Insurance, Uniform & Shoes and other statutory benefits to his workers, employees & taxes etc as in force for the time being and the rates for the various items are taken into account all sorts. The rates shall remain unaffected by any change that may be made from time to time.

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21. The operation and maintenance contract covered by this agreement shall be in force for continuous **Thirty six months (36)** from the date of taking over the premises /equipment /plant.

22. The operation and maintenance contract is extendable for further period as per site requirement with mutual consent of both parties.

23. **FSD** will be recovered from the contractor's bills at the rate of **5%** of the running bill value and shall be returned to the contractor within **30 days** of hand over of facilities to VMC on completion of contract period.

24. The Manning operation and maintenance of the water supply scheme is vital for augmenting drinking water supply to Vijayawada city which is a part of essential public utility services, the Commissioner or the authority competent to accept the Bid, reserve the right to put an end to the contract without issuing notice or assigning any reasons in case of emergency or / by giving **30 days** notice duly forfeiting the **EMD & FSD** in addition to the penalties, fines imposed (if any) on the matter as the case may be or for failure on the part of the contractor to maintain the performance of plant, or employ maintenance service personnel as required, inaction, negligence and non-compliance of contractual obligation by the contracting agency. The contracting agency would be responsible for all the consequences on termination of contract and the VMC will not consider any sort of claim/compensation therefor.

25. Laws covering the contract:- The contract shall be governed by the laws of the Indian Republic for the time being.

26. Bidders are expected to furnish information documentary evidence in support of information / particulars furnished in respect of their experience, details of works(s) carried out/on hand also record of arbitration and litigation (if any).

27. Bidders are expected to inspect the site before submission of Bid.

28. Commissioner, VMC reserves the right to reject any of the Bid or all the Bids without assigning any reasons therefor. Any Bidder shall have no cause of action or claim against the VMC, its officer, employees, successors or assignee for rejection of his Bid.

29. **Eligibility criteria Technical Proposals**

a) **Physical**: 1) The contractor should have constructed successfully Water Treatment Plant of capacity **not less than 2.50 MGD or having experience of atleast 12 months of the operation and maintenance of WTP of capacity not less than 2.50 MGD in the last 5 years.**

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2) The Bidder shall have experience for **minimum period of 12 months for operation, maintenance and repairs to H.T. pumping machinery of atleast capacity of 300 HP And above or of individual pump or having experience of supply installation, testing and commissioning of H.T pumping machinery of atleast 300 HP or above**.

b) Financial: The contractor should satisfactorily completed **similar work of valve not less than Rs. 50.00 lakhs in any one year of last five years.**

c) The subsidiary companies are eligible to submit their bids based on qualification of their parent company dully enclosing a letter of commitment for technical support to that effect.

d) JOINT VENTURE will be considered.

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B I D

To

The Superintending Engineer,
Jawahar Lal Nehru Building,
Municipal Corporation,
VIJAYAWADA.

I/We,_____ do hereby under take to execute the following viz., "Manning, Operation, Maintenance and repairs to VMC's 29 MGD Capacity Water Supply Scheme in Vijayawada from collection wells, treatment plants, pumping stations at Dr. K.L.Rao Head Water Works to clear water pumping up to reservoir filling, including providing chemicals, consumables, workmen and all repairs along with necessary spares" as described in the specifications of CPHEEO Manuals with such variations by way of alterations or additions to and omission from the said work and method of payment as provided for in the conditions of contract for the sum of Rs._____(Rupees_____) such other sum as may be arrived at under the clause of the standard preliminary specification relating to payment by final measurement at unit prices/ Schedule of percentage Bid.

I/We have also completed the priced list of items in Schedule-A annexed (in words and figures) for which I/We agree to execute the work when the lump-sum payment under the terms of the agreement is varied by payment on measured quantities/Actual on day book.

I/We agree to keep the offer in this Bid valid for a period of (3) months and not to modify the whole or any part of it for any reasons within the above period. If the Bid is withdrawn by me/us for any reason whatsoever, the earnest money deposited by me/us will be forfeited to VMC.

I/We hereby distinctly and expressly declare and acknowledge that before the submission of my/our Bid I/We have carefully followed the terms and conditions in the Bid notice and have read the Andhra Pradesh Detailed Standard Specification and the preliminary specifications therein and that I/We have made such examination of the contract documents, plans, specification, quantities and location alignment where the said work is to be done and such investigation of the work required to be done and in regard to the materials required to be furnished as to be entered in words and figures enabling me/us to understand thoroughly the intention of the same and the requirement, agreements, stipulations and restrictions contained in the contract and in the said plans and specifications and distinctly agree that I/We will not here after make any claim or demand upon the VMC based upon arising out of any alleged misunderstanding / misconception / mistake on my/our part of the said requirements, covenants, agreements, stipulations, restrictions and conditions.

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I/We enclosed Demand Draft/Pay Orders/Banker's Cheque/ Bank guarantee along with the completed Bid schedule for the payment of sum of Rs._____ (Rupees_____)through DD/PO/BC/BG No_____Dt._____ as E.M.D not to bear interest. If my/our Bid is not accepted, the earnest money deposit shall be returned to me/us or my/our application when intimation is sent to me/us of rejection or at the expiration of three months after the last date prescribed for the receipt of Bids. If my/our Bid is accepted, the earnest money shall be retained by VMC as security for the due fulfillment of the contract. If upon written intimation to me/us by the office of the Superintending Engineer fail to attend the said office on the date there in fixed or if upon intimation being given to me/us by the Superintending Engineer of acceptance of my/our Bid I/We fail to make the additional security deposit and to enter into the required agreement as defined in clause 16 of the Bid notice then I/We agree to the forfeiture of the earnest money.

Any notice required to be served on me/us here under shall be sufficiently served on me/us if delivered to me/us personally or forwarded to me/us by post to (registered or ordinary) or left any my/our address given herein. Such notice shall if sent by post be deemed to have been served on me/us at the time when in due course of post it would be delivered at the address to which it is sent.

I/We fully understand that the written agreement to be entered into between me/us and the VMC shall be the foundation of the rights of both the parties and the contract shall not be deemed to be complete until the agreement has first been signed by me/us and then by the proper officer authorised to enter into contracts on behalf of VMC.

Name:
H.No.:

Locality:

Town/City/Postal Pin code

Contact telephone No.

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5.0 EVALUTION OF BIDS

5.1 RECEIPTOF TENDERS:

The tender schedules shall be issued from **25-05-2006 to 26-06-2006**. The tenders will be received at the place and time as specified in the tender notice.

Tenders will be received in two parts in 2 different sealed covers. Cover-A and Cover-B. The cover 'A' shall contains the Technical bid and qualification data Viz., Annual turnover and value of works under execution etc., The cover 'B' will contain the financial bid for the work in question. The Cover 'A' and Cover 'B' will be sealed and kept in another sealed envelop (Cover 'C') supplied by the department while issuing Tender Schedules.

The Superintending Engineer's delegated with the power to invite the tenders will open and evaluate the tenders as per the qualification criteria. While opening the tenders care should be taken to first open cover 'C' in the presence of the tenders or their authorised representatives and other officials concerned on the specified date and time and also verify Whether the Cover 'A' and Cover 'B' are properly sealed and in case the Covers A&B or any one of them are found unsealed, such tenders will not be opened and summarily rejected.

FIRST COVER (COVER-A) with superscription as "TECHNICAL BID' which shall contain the qualification data as described will be opened first and evaluated

SECOND COVER (COVER-B) with the superscription of "PRICE BID" shall contain the Schedule-A i.e., the statement of description of work quantity and amount. Price bid (Cover-B) of those tenderers who are determined as qualified as per eligibility criteria will be opened on the date specified and shall be intimated. The Cover-B of un-qualified tenderers shall not be opened and kept in the safe custody till the tenders are finalised and there after shall be returned to them along with E.M.D.

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Before recommending/accepting the tender, the tender accepting authority will verify the correctness of certificates submitted to meet the eligibility criteria and specifically for experience, the authenticated agreements of previous works executed by the lowest tenderer shall be called for.

The EMD shall be returned to the qualified but unsuccessful tenderer either after finalisation of tenders or on expiry of validity of tenders which ever is earlier.

5.2 FINALISATION OF TENDERS:

Tenders shall be finalised by the Commissioner, VMC

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6. CONDITIONS OF THE CONTRACT

6.1. GENERAL:

Vijayawada Municipal Corporation have 5MGD, 8MGD & 16MGD Water treatment plants having total capacity of 29 MGD for providing drinking water to Vijayawada Municipal areas. All the three plants are conventional treatment plants with clarifloculators and Rapid gravity filters.

All the three plants are located on Krishna River Bank on upstream of Prakasam Barrage. The Raw water is being drawn from the River through Raw Water intake wells cum pump houses constructed in the bed of the River. Raw water is being pumped through Raw water pumping mains to the existing Filteration plants. After filtration process, water is collected in clear water sumps and this clear water is being pumped to the Reservoirs located at different places and also to direct distribution system to some of the areas which are not commanded by reservoirs.

All the three water treatment plants having civil, Electrical, Mechanical and Chemical units for supply of safe drinking water at designed capacity and as per standards stipulated in CPHEEO manual. The clear water is being pumped with sufficient No. of pumpsets and pumping mains safely from HWW to reservoirs / distribution system. Sufficient capacity of power transformers are installed in HWW.Supply of drinking water being the essential service, this is to be processed 24 hours of the day even on Sundays and public holidays . These water treatment plants should run throughout the year without interruption. Proper care has to be taken .

6.2. SCOPE OF WORK:

Scope of work included providing skilled/semi - skilled/unskilled men tools and equipment, required chemicals, consumables and skilled expertise to operate maintain, carryout repairs for components and filling to the reservoir located in different parts of the town and also to direct distribution to the area which are not covered by reservoirs during entire

period of operation and maintenance of VMCs own 29 MG/Day water supply scheme at Dr. K.L.Rao HWW, through the MS/PSC/CI/AC pumping mains for a continuous period of 36 (thirty six) months. Contract shall include operation, , regular ,periodical and preventive maintenance and checking up routine checks, rectification of Civil, mechanical and electrical repairs of all components of system at HWW.

6.3. CONDITIONS OF THE CONTRACT:

1. The contract includes attending operation and maintenance of drawing raw water purifying process, / including cost of coagulants and disinfection agents, regular maintenance of pumpsets for pumping , checking and routine rectification of all pump sets, valves with in Head water works premises (excluding power charges). The details are given under head. "Brief description of operations involved"

2. The contractor shall also maintain following Water treatment installations

   i) Clarifflocculators and all other components including scrapers, sludge removal and sludge disposal systems, settling tanks and filterbeds, equipment including pumps, motors, compressors, blowers, valve operating systems, including gauges, motor starters, switch gear units, capacitors and transformers.

   ii) Mechanical and all other appliances including chlorinators, valves, pipe lines distributors, accessories and fittings for chlorine handling and dosing.

   iii) Mechanical and all other appliances for handling and lifting of solid alum, weighing, proportioning, dissolving, preparing solution, diluting and distributing, including dosing units, strainers, stirrers, mixers, disperses, motors, for applying alum solutions;

   iv) Mechanical and other equipment for handling, storing and lifting of plant items Alum & Chlorine.

v) Wash water Tank Pumps including suction and delivery pipes

3. Electrical Systems: Transformers, Switch gears, Raw Water pumpsets, Clear water pumpsets ,distribution boards, motor control equipments, cubicles/panels, capacitors, lighting systems, cable trays, earthing and lightening protection, control systems, safety devices, cabling AC System equipment.

4. Equipment and materials for internal and external lighting for buildings, structures, basements, galleries chambers, service ways, yard lighting including distribution boards, cabling and wiring, and all fittings and lighting fixtures, Fans, inlet units, exhaust fans, equipment, ductwork, filters, screen.

5. Service Water installations: Pumps, motors, valves etc., for service water systems for area supply, water for chemical dosing, and water supply to buildings and structures; to / through tankers for water supply to unserved areas.

6. The sludge, from plain sedimentation tanks and clariflocculators will be collected in sludge wells / receiving tanks by gravity and disposed into a storm water drain. The overflow from various units is connected to the storm water drain Maintenance of this drainage system is included in this contract.

7. The list of equipment to be operated and maintained in this contract is given under the head "Brief description of components and equipments".

6.3.1 INSTRUCTION FOR OPERATION AND MAINTENANCE:

The O & M contract will commence from the date of handing over of the plant to the contractor. Operations involved in running of the scheme are described in "Brief description of operations involved"

The overall watch and ward of the premises is the responsibility of the Contractor. The contractor is also responsible for the safety of the VMCs equipment provided to HWW including materials tools and plants and consumables .

6.3.2 OPERATION AND MAINTENANCE PERIOD

The Contract for Operation and Maintenance period is for continuous thirty six months (36) from the date of handing over the treatment plants. This period can be extended by mutual agreement on such terms and conditions as will be agreed to.

6.3.2 OBLIGATIONS OF THE VIJAYAWADA MUNICIPAL CORPORATION.

a. Provision of office space at HWW

b. Telephones in the premises of HWW &Reservoirs will be provided by VMC for communication. However telephone bills at HWW are to be paid by the contractor.

c. VMC will check the O & M performance and also attendance of the operating staff.

d. VMC will pay bills bimonthly for the operation and maintenance of the plant to the contractor.

e. VMC will provide electrical power to the contractor at free of cost.

f. Major pipe line break downs will be attended by the VMC .

6.3.4 CONTRACTOR'S OBLIGATIONS DURING OPERATION AND MAINTENANCE PERIOD.

The Contractor shall comply with the of following provisions during Operation and Maintenance period and carry out routine Maintenance and repairs for the renovation of wear and tear due to operation of the works. The contractor has to provide the required chemicals such as Alum, chlorine, Bleaching powder, lime(if required), oils and lubricants, spare parts, lighting consumables etc., which are required for the operation of the plant.

i. The supply of treated water should be ensured at 29 MG / Day through out the year.

ii. To ensure supply of the potable water from HWW, the contractor is required to operate & maintain the following equipment / units.

a) Filtration plants with necessary coagulation such as alum.
b) Chlorination plants with necessary chlorine.
c) Lighting system of the yard & units.

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The above units/equipment should be manned with the required/ minimum strength for satisfactory operation & maintenance as specified in CPHEEO manual.

Filteration Plant

The contractor should endeavor & ensure supply of drinking water through out the contract period during which period the WTP shall not be stopped for the reasons other than mentioned below:

a. Power shutdown by APSPDCL & VMC
b. Any Electrical breakdown.
c. Pipeline breakdown.
d. Due to any other reasons specified by VMC
e. Pumping plant breakdown

Even in the cases mentioned above, the restoration of the WTP should be done with least interruption.

f. due to any force majeure like cyclones, earthquakes etc.

iii) The rates offered by the contractors should include all the minor / regular repairs which are to be attended for regular maintenance.

iv) Major pipe line break downs which will be attended by the VMC on an urgent basis.

v) The contractor should maintain sufficient spares required for taking up all repairs at time of breakdowns.

vi) Tools and tackles required for operation and maintenance shall be arranged by the contractor.

vii) Watch and ward for entire HWW the premises shall be arranged by the contractor if any T &P provided by VMC the same will be returned to VMC in good working condition.

viii) The contractor shall maintain the laboratory with their staff only. The dosage of alum and chlorine shall be used as per standard specifications only.

ix) The contractor shall maintain records and printing of stationery at his own cost. The records should be maintained as per the approved formats & as per directions of Engineer-in-charge. These records shall

be produced to the VMCs inspecting authorities regularly and whenever required.

x) The job of operation and maintenance shall include the following in each shift.

a. All manual operations required for starting, running, up-keeping in use and stopping of installations and equipment and connected services of the equipment mentioned in description of materials by employing trained & qualified personnel so that minimum 29 MGD clear water shall be produced from the WTP.

b. Receiving/handling/accounting of all consumable stores purchased by contractor . The procurement, conveyance loading and unloading of chlorine cylinders and alum shall also be done by the contractor.

c. Use of any tools or plants for operation and maintenance of the installation and up-keeping all such tools and plants, equipment, stores and other items of inventory shall be kept / in safe custody and be readily accessible in times of necessity.

d. Issue necessary operating instructions to operators of different installations.

e. Tightening of foundation bolts, checking of oil, lubricating, greasing, preventing of leakage, cleaning the equipment every day and whenever required.

f. The installations shall be manned and operated on all the 365 days and 7 days of the week irrespective of public holidays and Sundays and 24-hours a day. The WTP should not be stopped except for the reasons mentioned below.

1. Power shutdown by APSPDCLVMC and any electrical break down.
2. Shutdown on pumping main or pumping plant.
3. Any other reasons to be specified by VMC.

All stoppages due to electrical breakdown shall be repaired expeditiously. Even in the above case the water treatment plant shall be re- commissioned as soon as possible. Daily duty charts of the personnel are to be displayed in the premises. The Engineer-in charge can inspect the attendance on the basis daily duty charts.

g. The contractor shall employ reserve operators in performance of contract consequent to labour regulations on working of personnel on Notional Holidays etc., and also on any day when operators is/are absent from duty.

h. If any operator not performing duty as prescribed in the duty chart for what ever reason a penal recovery will be effected from the payments due to the contractor by the Engineer-in-charge.

i. All payments for manning operations of the WSS shall be made on the basis of out put of water but limited to actual performance as entered in log sheets plus a fixed cost as stated elsewhere in the tender.

j. The cost of repairs/modifications necessary due to negligence of operator shall be recovered from the contractor as per assessment of Engineer –in charge. If the contractor fails to repair with in the period given to him the same will be got repaired through other agency at contractor's risk and cost. with penalty if necessary.

k. The operating personnel shall be well qualified and experienced in the trade for which he is employed. The contractor shall employ skilled workmen holding proper license under IE Act/Rules. This provision shall be complied with even if the contractor is a registered electrical contractor. The contractor shall be responsible for complying with the applicable provisions of IE Act rules.

l. The contractor shall produce certificates of qualifications and experience of engaged personnel on the work to the satisfaction of the Engineer-in-charge.

m. The operating personnel shall have thorough knowledge of safety precautions during emergency cases and also be conversant with the APSPDCL rules/regulations, IE Act/Rules and Indian Factory Act/Rules.

n. The contractor shall exhibit a notice board with precautions to be taken by operating and maintenance staff.

6.3.5 GENERAL REQUIREMENTS:

i. The contractor shall wash each filter bed at a maximum interval of 24-hours or earlier as required based on turbidity levels of Raw Water.

ii. The contractor shall de-sludge each pre-settling tank and clariflocculators at maximum interval of 24 hours or continuous desludging as the situation demands for purpose of uninterrupted supply of safe, potable drinking water.

iii. The contractor shall make necessary arrangement for preparation of alum solution as required.

iv. The contractor shall arrange for adjustment of chlorine dosage both for pre-Chlorination (if required) and post-Chlorination as the situation demands for purpose of uninterrupted supply of drinking water quantity & quality.

v. The operators employed by the contractor must have thorough knowledge on functions of various equipments and their components/parts. They should also be familiar with all operations like starting, running and stopping of all equipments and their sequence of operation. A part from operational adjustments of various control valves etc., They should also know the maintenance/testing procedures. The contractor has to ensure that the whole premises is kept clean and tidy.

vi. The contractor shall arrange required tools and Safety Equipment tackles available to the operators for safe and satisfactory performance of their duties in addition to tools handed over by VMC.

vii. The contractor has to issue necessary operation instructions for operations of different types of installations and ensure their compliance.

viii. Maintenance includes overhauling, Lubricating , greasing, checking of oils, oil seals, glands, cleaning and up-keeping of the plant.

ix. The contractor has to carry out routine mechanical and electrical maintenance at his own cost for purpose of uninterrupted supply of drinking water.

xi. The contractor is responsible for safe and good condition of materials and equipment under this contract till handing over the plant to the VMC/ on termination of contract.

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xii. The contractor shall maintain the tools handed over by the VMC for the proper maintenance of the machinery and equipment.

xiii. Minor repairs normally encountered in the pumping installations are mentioned below and shall be carried out by the contractor with out any extra cost.

Replacement of HG fuses.

Replacement of lightning arrestors.

Replacement of Jumpers.

Replacement of insulators on every phase

Replacement of NO volt coils and relays of switch gear.

Replacement of Jumper with socket panel board.

Replacement of cable lugs and terminations.

Replacement of burnout HRC fuses.

Replacement of main or fixed cables or contractors.

Replacement of isolators.

Replacement of coupling bolts and nuts and rubber bushes

Replacement of worn out impeller nuts.

Replacement of spindle nuts in the sluice valve.

Replacement of terminal plate in the motors.

Regular maintenance of earth pits

Rectification of any loose connections in electrical equipment

Provide gland packing for pumps, sluice valves etc.,

Greasing of bearings shafts and lubricating all moving parts.

Tighten all loose coupling, bolts and all other fasteners

Greasing & oiling of Air blowers motors, & cleaning of air filters, Repair of V- Belt.

Lubricating and test operation of penstock valves.

General cleaning of all equipment and buildings.

Observe mandatory regulations prescribed by electrical inspectorate and Factory inspector.

The contractor has to submit an operating plan and instructions for maintenance of the plant and get it approved by the VMC

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6.3.6 DOCUMENTS TO BE MAINTAINED AT SITE:

i. Log book for each installation.

ii. Record of periodical maintenance as recommended by the manufacturer/CPHEEO manuals, including lubricating, oiling etc.,

iii. Chlorine dosage register.

iv. Lab reports.

v. Reservoir filling Register

vi. Alum dosage Register

vii. Register of repairs, pump set wise

The contractor has to submit two sets of above particulars monthly to VMCs office for taking necessary action in addition to uploading the daily data in the VMC`s net.

6.3.7 MAINTENANCE AND DEFECTS

i. In these conditions the expression "period of maintenance" shall mean the period of operation and maintenance of continuous thirty six months which shall commence from the date of handing over the site.

ii. The contractor shall be responsible for making good with all possible speed any defect arising from improper use in the works or any portion there of during the period of maintenance.

iii. If any defects be not rectified with in a reasonable time, the Engineer may proceed to do the work at the contractor's risk and expense, but without prejudice to any other rights which the VMC may have against the contractor in respect of the failure of the contractor to rectify such defects. The list of spare parts available with VMC is provided in description of materials. The contractor may use the spare parts whenever required. The cost of spare parts will be recovered from the subsequent bills payable to the contractor.(Procurement costs enclosed)

iv. The available stock of chemicals as on the date of handing over of the plant to the contractor, will be issued to the contractor and the cost will be recovered in subsequent bills at the procurement cost which is enclosed elsewhere in the tender

.

v. However, the available Empty chlorine tonners (100 kg) shall be provided to the bidder on hand over of the site free of cost but the filling cost shall be to its account during the pendency of the contract. It shall be the bidders responsibility to maintain the tonners in good condition during the period of contract and shall return them to VMC on completion of the contract period in good working condition. However 1 tonne capacity chlorine tonner shall be arranged by the bidder at his risk and cost.

6.3.8 LIST OF INSTRUMENTS

The contractor shall maintain the instruments provided for Water Treatment Plant as stated in "Brief description of material" and the contractor shall handover the same in good working condition at the end of the contract/on termination of the contract.

6.3.9 PERFORMANCE TESTS:

The contractor shall carry out all the necessary laboratory tests and maintain the dosage of alum/chlorine with a view to ensure that when operated at or below the design capacity the treatment plant shall produce water as per standards stipulated in CPHEEO manual.

6.3.9 BREAKDOWN OR SHUTDOWN

If any interruption in the Operation of water treatment plant (WTP) due to any reason (not attributable to power failure and any force majeure as stated else where in the tender). In such an event the bidder shall rectify forthwith the defects leading to such interruptions in Operation of WTP. The time taken for rectification of defects shall no case exceeds **12 hours**, with such an interruption occurring not more than once in three (3) months. The liquidated damages for failure to supply minimum quantity of water shall be invoked in case such interruption is not rectified with in **12 hours** in each interruption and if such interruptions are more than once in three **(3) months**.

6.3.10.1 The bidder shall provide a list of the operating personnel proposed to be employed by him on this contract along with the qualifications and the experience of the personnel.

6.3.10.2 During the period of O & M the contractor shall maintain all equipments in good working condition to the satisfaction of VMC Authorities The technical specifications provide sample check lists to assess the performance of O & M. The contractor shall attend all repairs works as directed by the engineer -in -charge and shall execute all such work of repair, replacements, reconstruction, rectification and making good defect, imperfections, shrinkage's, other faults as may be required by the contractor in writing by engineer – in - charge during the agreement period of operation and maintenance. The corporation reserves the right to cancel/take over repairs on unsatisfactory O&M of any component in part or in full depending on the exigency of the situation at the contractors risks.

6.3.10 HANDING OVER

At the end of the contract period of 36 months or upon termination of agreement the contractor, shall hand over the entire HWW in good working condition to VMC including all the facilities provided during contract period ,all improvements, structures, buildings, materials as required

6.3.12 OPERATION & MAINTENANCE – CHECK LISTS

VMC's staff will check the performance of operation & maintenance of WSS daily to ensure compliance with the conditions of contract. The sample check lists are provided for guidance.

Sl. No.	Unit	Attribute
1.	**TREATMENT PLANT** – Chemical Feeding Unit	1) Cleaning of alum tanks
		2) Cleaning of V notch weirs and floats
		3) Spares for mixing unit
		4) Rapid mixer - cleaning
		5) Functioning of chemical feed pumps
		6) Check for alum dose
		7) Check for cleaning of alum feeding HDPE pipe lines
2	**RAPID GRAVITY FILTERS**	1) Check for water quality at various stages
		2) Check for washing of beds
		a) Quantity of Raw Water
		b) Quantity wash water
		c) Quantity of filtered water produced
		d) Quantity of water used for back washing of filters
		e) Observation for filter media washed out
		f) Adequate depth of water over filter media
		4) Status of operation of valves

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		5) Performance of blower
		6) Uniform washing of filter bed by air and water (search for dead pockets)
		7) Check sand depth & air binding
		8) Observe length of filter run and loss of head and compare
		9) Observe rate of filtration
		10) Performance of filter
		a) Out put
		b) Quality
		11) Check the surface of filter media for:
		a) Cracks
		b) Incrustation of media
		c) Mud balls
		d) Slime growths
		12) Check for media depth
		13)Status of functioning of:
		a) Instrumentation
		b) valves
		c) Blowers
		d) All other equipments
3	**CHLORINATORS**	1) Maintain the Register for
		a) Dosage of Chlorine
		b) Residual chlorine – 2 PPM
		c) Pressure readings of chlorine
		2) Observe leakage of chlorine gas
		3) Uninterrupted supply of water for Chlorinator
		6) status of gas filters
		7) Check for leakages
		8) Check for signs of corrosion
		9) Check for spare cylinders
		10) Functioning of Chlorinator panel
		11) Availability of replacement spares
		12) Availability of adequate chlorine gas cylinders stock
		13) Check the incoming water lines
		14) Check the solution feeder lines
		15) Check the ventilation of chlorine room.
		16) Check leak detection equipment and other safety equipment
		17) Check for functioning of E.O.T crane
4	**ELECTRICAL MACHINERY MOTORS**	1) Cleaning
		2) Anti moisture precautions
		3) Oiling and greasing to avoid friction
		4) Check for vibration
		5) Check for tightness of contacts
		6) Operation at rated voltage
		7) Check tripping circuits to protect motors
		8) Inspect contact points for any deposition

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		9) Check whether manufacturers recommendations are followed regarding:
		a) Quality of oil and grease
		b) Correct periodically of lubrication (avoid over-lubrication)
		10) Check for performance of capacitors
		For Panel, Circuit breaker, Starter
		a) Check the phase indicating lamps
		b)Note readings of voltage, current frequency
		c) Note energy meter readings.
		d) Examine contacts of relay and circuit breaker
		b) Check setting of over-current relay, no-volt coil and tripping mechanism and oil in the dash-pot relay
5	**PUMPS**	1 Timing of pump running
		2. Observe for leakage through stuffing box
		3. Bearing temperature
		4. Any undue noise or vibration
		5. Readings of pressure, suction/delivery
		6. Free movement of the gland of stuffing box
		7. Cleaning and oiling of gland bolts
		8. Inspection of the gland packing
		9. Alignment of pump and drive
		10. cleaning of oil lubricated bearings or grease lubricated and replacing oil and grease
		11. Clean and examine all bearings for flaws
		12. Examine shaft sleeves for wear
		13. Check clearance at wearing ring
		14. Check impeller hubs and vane tips for pitting or erosion
		15. Calibration of all instruments and flow meters
		16. Check for availability of lubricants and other consumables such as gland packing belts and lubricant
		17. Check for repair facilities such as pullers, clamps, machinery, welding set, grinder, blower, drilling machine etc.,
6.	**PUMPING MAINS**	Observe the leakages through out length of pipelines along roads and in HWW while pumping.

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6.3.13 Contractor should adopt a preventive maintenance schedule for avoiding breakdowns. Following are the preventive maintenance schedule.

DAILY:

a) Checking of vibrations in the pump-sets.

b) Tightening of foundation bolts.

c) Bearing

d) Rise in temperature of bearing in motors.

e) Rate of filtration of filter beds.

f) Compressed pressure and operation of compressors.

g) Chlorine dosing equipment

h) Alum dosing equipment

i) Checking of bridge functioning and Flocculator paddles etc.

j) Checking of pipeline leakage.

k) Tightening of all electrical connections

l) Tightening of all cable connections

m) Temperature difference due to loose connections.

n) Operation of all sluice and butterfly valves, scour and pr. Relief valves, gates and air valves.

o) Measurement of current and voltages in all electrical equipment**.**

WEEKLY:

a) Changing of gland packing

b) Checking indicators for wearing of parts

c) Functioning of chlorine equipment

d) Adoption of energy conservation methods.

e) Checking of electrical contacts.

f) Checking of motors.

g) Meggering of electrical equipments.

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MONTHLY:

a) Relay, testing and calibration of instruments.

b) Calibration of motor speed.

c) Level gauges and flow meters.

YEARLY:

a) Checking for over hauling of equipments wherever required.

b) Improvements if required for operation of motors

c) Testing of all electrical equipments and instruments.

6.3.15 Check for availability of required tools:

During the operation and maintenance period the contractor shall provide required persons, materials for all routine maintenance. All consumables such as grease, gland packing, coupling bushes, pins, transformer oil, cable jointing kits, insulators, fuses, jumpers, connectors, fasteners, bus bars, spindles, bulbs and lighting materials etc., shall be provided by the contractor in sufficient quantity well in advance.

The contractor's offer shall cover the following:-

i. for any work of maintenance, repair and adjustment or testing which are of routine nature.

ii. Emergency breakdowns.

6.4. ADDITIONAL GENERAL CONDITIONS

6.4.1 ACQUAINTANCE WITH SITE & WORK CONDITIONS ETC:

a) The Bidder at his own expenses and prior to submitting the Bid shall visit the sites and installations and determine the extent characteristics quantity and quality of the work required to be performed. The specifications, descriptions and drawing attached to the Bid are indicative and for guidance only. All items, matters and things omitted but are required during operation and maintenance are deemed to be included in scope of contract for operation, maintenance and routine rectifications. In case of doubt about any item or data included in the Bid or otherwise shall be go clarified by applying in

writing to the Executive Engineer-1, VMC and conformed in the field. The Bidder shall also examine and conform the local conditions and problems, facilities in the locality, prevailing wages and other factors affecting cost and performance of work.

b) At his own expenses and prior to submitting Bid, Each Bidder shall

(a) examine the contract documents,

(b) visit the site and determine the local conditions which in any way affect the performance of the work including the prevailing wages and other pertinent cost factors,

(c) familiarize himself with all Central, state and local laws, ordinance, rules, regulations and other codes affecting the performance of the work including the cost of permits and licenses required for the work.

(d) make such investigations including investigations of sub-surface of latest physical conditions at the site where the work is to be performed as he may deem necessary for performance of the contract documents,

(e) determine the character, quality and quantities of the work to be performed and the materials and equipments to be provided and correlate his observations, investigations and determinations with the requirements of the contract documents.

c) The contractor document show and describe the existing conditions as they are believed to exist, and investigations, and other data works, Engineer-in-charge shall not be liable for any loss sustained by the contractor resulting from any variation between the conditions and data given in contract documents and the actual conditions revealed during progress of the work. The submission of the Bid shall be incontrovertible evidence that the Bidder has complied with all the requirements of this clause.

d) Prices, wordings and notations must be in ink or typewriter, No erasures will be permitted. Mistakes may be crossed out and corrections typed or written in ink adjacent there to and must to be initialed in ink by the person or persons signing the Bid. All extensions of prices and arithmetic shall be checked before submission of the Bid.

6.4.2 GOVERNING OF LABOUR LAWS:

The contractor shall be fully responsible for making arrangements entirely at contractor's cost for housing all labour employed by him and make necessary satisfactory arrangements for the same as may be required under the rules and laws of the central Government, State Government or local body. All the rules regarding workmen's compensation etc., shall be binding on the contractor without any claim on V.M.C. So also food grains for the labour shall be arranged by the contractor where it is not available in the open market.

6.4.3. ACCIDENTS ON THE WORKS:

The contractors shall be fully responsible for any accident that may occur to the labour on his work on duty and report the same to the Engineer-in-charge and concerned Government labour department authority and shall pay all necessary compensation as per rules, failing which it may be paid by VMC from the amount payable to him. Contractor shall also be fully responsible for any loss to any individual or public property occurred due to him or his workers under the scope of this contract.

6.4.4. MODE OF PAYMENT:

The payment towards operation & maintenance shall be made on bimonthly basis i.e., as per the rates entered in schedule and subject to the recoveries and checking & inspection before release of payments. The agency shall submit his bill bimonthly before fifth of that month . However it is the responsibility of the contractor to make timely payment to his staff, irrespective of payment received from VMC to the contractor.

The payment will be made as per actual quantity of drinking water supplied subject to its acceptance by the Engineer-in-charge and Executive authority as per the rates entered in the schedule.

The payment module shall have two components one as fixed component which shall not draw any incentives or penalties and shall remain fixed irrespective of the water produced. Whereas the other or the second component shall be a variable component depending on the quantity of water produced and shall be liable for incentives or penalties as stated elsewhere in the contract document.

No interest shall be payable by the department on the amounts due to Contractors pending final settlement of the claims.

6.4.5 COMPLIANCE:

The Contractor shall be bound by all ordinance acts, codes, rules, regulations, orders and decrees of which in any way affects conduct of works, or workmen engaged for the works. The Contractor shall protect and indemnify compensation the V.M.C. against any claim or liability arising from violation of above.

6.4.6 HANDLING OF CHEMICALS:

Safety facilities to the staff for handling of chemicals and equipment is an important consideration. Handling of chemicals needs Special attention. Following instructions are for guidance of the Contractor and observing them strictly at his cost.

COAGULANT AID:

For use of a coagulant aid, contractor has to follow the instructions displayed on its drum by the manufacturer.

6.4.6(1) ALUM:

Alum is block form / powder form or in liquid form shall be used. Alum cause irritation of skin. Rubber apron, gloves, boots, safety goggles and /oxygen masks are must. These shall be provided by the contractor to his staff at his cost.

6.4.6(2) CHLORINE:

Chlorine vapour is extremely hazardous. Avoid prolonged breathing. Suitable gas mask may be used. Anti chloro solution shall be ready for quick relief.

Special precaution for keeping store room should be well ventilated before entering, smoke test be carried out.

As chlorine is a dangerous gas and above certain levels inhalation of this gas is fatal. Therefore, it is essential that all operators working with chlorine are considered to be familiar with dangers of the gas. It is imperative to have protection equipments oxygen masks are always readily available at site at the Contractor's cost.

Contractor has to follow the instructions displayed in Chemical house for handling the chlorine.

6.4.7 CONTRACTOR'S STAFF & CONDUCT ETC. :

(A) ADDRESS:

The Contractor is responsible to furnish temporary and permanent addresses of all the employees.. Convicted or penalized person should not be employed.

(B) SALARY TO EMPLOYEES;

Contractor should strictly follow labour laws and should also ensure regular monthly salary payment to his staff. The V.M.C. will not take any liability of any of his employees appointed for operation and maintenance under this contract. Contractor should submit monthly certificate for full payment to his staff on or before 10^{th} of every month. V.M.C reserves the right to confirm the contents of the certificate from Contractor's employees for their last pay. The VMC will not be responsible for any delayed payment / compensation / overtime or any other claims by employees of Contractor during the contract period and even after the contract period. The contractor should pay not less than the minimum wages to the labour employed as specified by Govt. of A.P. from time to time.

(C) HOLIDAYS AND LEAVES:

Holidays and leaves should be given to staff as per relevant labour rules. During holidays / casual leaves / earned leaves etc., the contractor shall arrange for the substitute. The VMC shall not make any separate payment or overtime for these

substitutes provided by the contractor during above periods.

(D) CONDUCT:

All employees of the contractor should follow the instructions of Engineer- in-charge. If any employee misbehaves with Engineer-in-charge and also with co- employee he/ she should be immediately removed from duty and substitute for that should be employed by the Contractor.

E) SAFETY

The contractor shall arrange training programmes to all the employees engaged by him on safety measures with suitable institutions at his own cost.

6.4.8 VISITORS:

HWW is a protected area. Hence no persons should be allowed with out prior permission of Departmental authorities. The plant is one of it's own kind. Visitors of inland and institutions are visiting and shall be allowed on the permission of Engineer -in-charge. It is expected that all staff and Engineers be present and follow the directives of Engineer-in-charge, without reservation.

6.4.9 PLANT MONITORING:

Standards to be achieved by the contractor in Water Treatment Plant. In case of failure agency will be fully responsible in this matter.

Turbidity of (I) Clarified Water should be less than 8 NTU.

Turbidity of (II) Filtered Water should be less than 5 NTU.

Following tests shall be carried out for raw water and clarified water and treated water.

No.	Parameter / Test	Raw Water	Clarifical Water	Filtered Water	Pure Water
1.	P^H	2 Hourly	2 Hourly	2 Hourly	2 Hourly
2.	Temperature	2 Hourly	2 Hourly	2 Hourly	2 Hourly
3.	Turbidity	2 Hourly	2 Hourly	2 Hourly	2 Hourly
4.	Residual Chlorine	---	---	---	2 Hourly

5.	Colour	2 Hourly	2 Hourly	2 Hourly	2 Hourly
6.	Odour	2 Hourly	2 Hourly	2 Hourly	2 Hourly
7.	Alkalinity	Once daily	Once daily	Once daily	Once daily
8.	Chloride	Once daily	Once daily	Once daily	Once daily
9.	Hardness	Once daily	Once daily	Once daily	Once daily
10.	D.O.	Once daily	Once daily	Once daily	Once daily
11.	T.D.S.	Once daily	Once daily	Once daily	Once daily
12.	T.S.S.	Once daily	Once daily	Once daily	Once daily
13.	Conductivity	Once daily	Once daily	Once daily	Once daily
14.	C.O.D.	Once daily	Once daily	Once daily	Once daily
15.	Jar Test	Once daily And when turbidity varies Once	---	---	---
16.	Bacteriological Test	daily	Once daily	Once daily	Once daily

Additional tests, if any, are to be conducted as per instruction of Engineer-in-charge. The equipment available with VMC lab will be provided to the contractor. Additional equipment required for conducting above tests are to be procured by the contractor at contractor's cost. After completion of agreement period or on termination of the contract, they shall hand over the same including equipment acquired by contractor to the VMC at the free of cost in good working condition. All the consumables required for the lab should be borne by the contractor.

6.5. SPECIAL CONDITIONS

1. All the rates quoted in schedule 'A' shall be in Rupees and paise for complete work. The quoted rates in Schedule 'A' will be hold good, till the completion of the job. All the items of the above schedule must be quoted for without making for any alteration to description of item or laying down any conditions.

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2. Commissioner has reserves the right to cancel any part/ whole work at any time without assigning any reasons thereof.

3. A) The contractor shall arrange for the required skilled and un-skilled labour from local and imported to the extent necessary to complete the work with in the specified time as may be required by the Executive Engineer, VMC in writing.

   B) The contractor should give identity cards for the staff engaged for this work along with uniform.

4 The Contractor will abide by the rules of workman compensation Act of A.P.

5 The contractor shall at all time indemnify the Municipal Corporation Vijayawada against all the claim which may be made under the workman's compensation Act or any statutory modifications therefore or rules of compensation payable in consequence of any accident or any injury sustained by any workman engaged in the performance of the business relating to contract.

6 The contractor should not remove the materials from the work site which have been supplied to him by the Corporation for the use on the work.

7 Lighting and appointment of watchman shall be done by the contractor at his own cost and he is responsible for any accidents or claims preferred by the Public.

8 The contractor should note that in the event of emergency, he shall pay wages to the laborers every day. And if he fails, Corporation make requisite payment to the labour and it will be recovered from the contractors bills.

9 The contractor should not employ the labour below the age of 14 years.

10 In respect of labour employed directly and indirectly in the work for the purpose of contractors part of agreement the contractor shall comply with the rules and regulations on the maintenance of suitable records prescribed for this purpose from time to time by the Government he shall maintain his accounts and vouchers on the payment of wages to the laborers to the satisfaction of the Commissioner, Vijayawada Municipal Corporation

11 The Corporation shall have the right to call such records as required to satisfy himself on the payment of fair wages to labour and shall have the right to deduct from the contractor amount suitable for making good the loss suffered

by the workers for reason of fair wages clause to the workers.

12 The contractor shall be primarily liable for all payments to be made and for observance of the regulations formed by the Government from time to time without prejudice to his right to claim or indemnify from his sub- contractor.

13 Any violation of conditions above shall be deemed to be a breach office contract.

14 The contract will at all times duly observed the provisions of payment of Children Act 2 of 1938 and the reenactment of modification of the same and will not apply or permit any reason to do any work for the purpose under this provisions of this agreement in contraction of the provisions of the said Act. The contractor hereby advise to indemnify from the equal land claims. penalties which may be referred by the Municipal Engineering Department of any person employed by the reason of any defaultation on the part of the contract in observance of the provisions of employment of Children of 1988 any reenactment or modification of the same.

15 WATER AND SANITARY ARRANGEMENTS : The Contractor's specific attention is invited to the clause 37,38,39 and 51 preliminary specification and he shall be requested to provide at his own expenses the following amenities.

A) FIRST AID: At the work site there shall be maintained in a readily accessible places, first aid appliance and including an adequate supply of sterilised, dressing and sterilised cotton wool the appliance shall be kept in good order. They shall be placed under the charge of a responsible person who shall be readily available during working hours.

B) DRINKING WATER: Water of a good quality fit for drinking purpose shall be provided for the works on the scale of not less than 3 Gallons per head per day.

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1) LATRINES AND URINALS: They shall be provided at the premises of every work site. If women are employed, separate Latrine and urinal shall be provided on the same scale. Proper screening shall be provided for Men and women and kept in strict sanitary condition.

16 CONTRACTOR'S OFFICE:

The Contractor shall have an office near the work site, where notice or directions and instructions from the Engineer- in-charge may be served the contractor shall have a clerk or some authorized person always prescribed in his office. Who shall receive such notices or directions and instructions on behalf of the contractor. The name of such authorized person or persons shall be intimated in writing to the Engineer- in-charge.

17. As a owner of the plant, insurance of plant and equipments for various risk on account of natural calamity / force majeure conditions shall be in the scope of VMC. However insurance towards the labour, chemicals etc., shall be the in the scope of the bidder.

18. Capital replacements such as equipment replacement, MCC panels, transformers, filter bed media replacement, Civil construction or any other modification of plant is in the scope of Employer. However if any equipment damaged due to mishandling, the cost of such replacement shall be in the scope of the bidder.

19. The contractor shall not be responsible for the performance of the contract on account of Force Majeure conditions.

20. The contractor shall not be responsible for any loss or damages to the plant and equipment, civil structure due to any force majeure condition or any other event beyond the control of contractor during O & M period.

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17. OTHER CONDITIONS

17.1 Notices

Any notice, request or consent made pursuant to this Contract shall be in writing and shall be deemed to have been made when delivered in person to an authorized representative of the Party to whom the communication is addressed, or when sent by registered mail, telex, telegram or facsimile to such Party at the address specified in the document

17.2 Taxes and Duties

The Contractors and their Personnel shall pay such taxes, duties fees and other impositions as may be levied under the Applicable Law, the amount of which is deemed to have been included in the Contract Price excluding service tax which will be paid separately on submission of proof of payment or alternatively deducted at source.

17.3 COMMENCEMENTS, COMPLETION, MODIFICATION AND TERMINATION OF CONTRACT

17.3.1 Effectiveness of Contract

The Contract shall come into effect on the date of handing over of the plant after signing of agreement by both Parties or such other later date as may be stated in the Contract.

17.3.2 Commencement of Services

The Contractors shall begin carrying out the Services from the date of handing over of the site/plant.

17.3.3 Expiration of Contract

Unless terminated earlier pursuant to Clause 17.5, this Contract shall terminate at the end of such time, period after the Effective Date as is specified in the tender.i.e.3years

17.3.3 Modification

Modification of the terms and conditions of this Contract, including any modification or the scope of the Services or of the Contract Price, can only be made by written agreement between the Parties.

17.4 Force Majeure

17.4.1 Definition

For the purposes of this Contract, "Force Majeure" means an event which is beyond the reasonable control of a party, and which makes a Party's performance of its obligations under the Contract impossible or so impractical as to be considered impossible under the circumstances.

17.4.2 No Breach of Contract

The failure of a Party to fulfill any of its obligations under the contract shall not be considered to be a breach of, or default under this Contract insofar as such inability arises from an event of Force Majeure, provided that the Party affected by such as event (a) has taken all reasonable precautions, due care and reasonable alternative measures in order to carry out the terms and conditions of this Contract, and (b) has informed the other Party as soon as possible about the occurrences of such an event.

17.4.3 Extension of Time

The contract can be extended on mutual agreement

17.4.4 Payments

During the period of their inability to perform the Services as a result of an event of Force Majeure, the Contractor shall be entitled to continue to be paid fixed costs under the terms of this Contract.

17.5 Termination

17.5.1 By the Employer

The employer may terminate this Contract, by not less than thirty (30) days' written notice of termination to the Contractors, to be given after the occurrence of any of the events specified in paragraphs (a) through (b) of this Clause 17.5.1

a. if the Contractors do not remedy a **failure in the performance of their obligations under the Contract,** within reasonable time of receipt after being notified

b. if the Contractors become insolvent or bankrupt;

c. if, as the result of Force Majeure, the Contractors are unable to perform a material portion of the Services

d. if the bidder, in the judgment of the Employer has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

For the purpose of this clause:

"Corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the selection process or in contract execution.

"fraudulent practice" means a misrepresentation of facts in order to influence a selection process or the execution of a contract to the detriment of the client and includes collusive practice among contractors (prior to or after submission of proposals) designed to establish prices at artificial non-competitive levels and to deprive the client of the benefits of free and open competition.

17.5.2 Payment upon Termination

Upon termination of this Contract pursuant to Clauses 17.5.1, the Employer shall make the following payments to the Contractors:

a. remuneration pursuant for Services satisfactorily performed prior to the effective date of termination;

b. except in the case of termination pursuant to paragraphs (a) and (b) of Clause 17.5.1, reimbursement of any reasonable cost incident to the prompt and orderly termination of the Contract,

17.6 OBLIGATIONS OF THE CONTRACTORS

17.6.1 General

The contractor shall perform the Services and carry out their obligations hereunder with all due diligence, efficiency and economy, in accordance with generally accepted professional techniques and practices, and shall observe sound management practices, and employ appropriate advanced technology and safe methods. The Contractors shall always act, in respect of any mater relating to this Contract or to the Services, as faithful advisers to the Employer, and shall at all times support and safeguard the Employer's legitimate interest in any dealings.

17.6.2 Conflict of Interests

17.6.2.1 Contractors Not to Benefit from commissions, discounts etc.

The remuneration of the contractors pursuant to Clause 6 shall constitute the Contractors' sole remuneration in connection with this Contract or the Services, and the Contractors shall not accept for their own benefit any trade commission, discount or similar payment in connection with activities pursuant to this Contract or to the Services or in the discharge of their obligations under

the Contract, and the Contractors shall use their best efforts to ensure that the Personnel and agents of either of them, similarly shall not receive any such additional remuneration.

17.6.2.2 Contractors and Affiliates Not to be otherwise Interested in Project

The Contractors agree that, during the term of this Contract and after its termination, the Contractors and their affiliates, shall be disqualified from providing goods, works or services (other than the Services and any continuation thereof) for any project resulting from or closely related to the Services.

17.6.3 Prohibition of Conflicting Activities

Neither the Contractors nor their Personnel shall engage, either directly or indirectly, in any of the following activities:

a. during the term of the Contract, any business or professional activities in the Government's country which would conflict with the activities assigned to them under this Contracts; or

b. after the termination of this Contract, such other activities as may be specified in the contract.

17.7 Insurance to be taken out by the Contractors

The Contractors (a) shall take out and maintain, and shall cause to take out and maintain, at their own cost but on terms and conditions approved by the Employer, insurance against all the risks, and for the coverage, as shall be specified in the Tender; and (b) at the Employer's request, shall provide evidence to the Employer showing that such insurance has been taken out and maintained and that the current premium have been paid.

17.8 Contractors' Actions Requiring Employer's Prior Approval

The Contractors shall obtain the Employer's prior approval in writing before taking any of the following actions:

a. entering into a subcontract for the performance of any part of the Services,

b. appointing members of the Personnel whose name was not listed and

c. any other action that may be specified in the contract.

17.9 Reporting Obligations

The Contractors shall submit to the Employer the reports and documents in specified forms, in duplicate in addition to uploading the data in VMC's net.

18 CONTRACTOR'S PERSONNEL

18.1 Description of Personnel

The titles, agreed job descriptions, minimum qualifications and periods of engagement in the carrying out of the Services of the Contractors' Key Personnel and supporting staff shall be submitted by the contractor . The Key Personnel listed by title as well as by name are to be approved by the Employer.

18.2 Removal and / or Replacement of Personnel

a) Except as the Employer may otherwise agree, no changes shall be made in the Key Personnel. If, for any reason beyond the reasonable control of the Contractors, it becomes necessary to replace any of the Key Personnel, the Contractors shall forthwith provide as a replacement a person with better qualifications with the approval of VMC authorities.

b)If the Employer finds that any of the Personnel have

(i) committed serious misconduct or has been charged with having committed a criminal action, or

(ii) have reasonable cause to be dissatisfied with the performance of any of the Personnel, then the Contractors shall, at the Employer's written request specifying the grounds therefore, forthwith provide as a replacement a person with qualifications and experience acceptable to the Employer.

18.3 OBLIGATIONS OF THE EMPLOYER

18.3.1 Assistance and Exemptions

The Employer shall use its best efforts to ensure that the corporation shall provide the Contractors such assistance and exemptions as specified in the contract

18.3.2 Change in the Applicable Law

If, after the date of this Contract, there is any change in the Applicable Law with respect to taxes and duties which increases or decreases the cost of services rendered by the Contractors, then the remuneration and reimbursable expenses otherwise payable to the Contractors under this Contract shall be increased or decreased accordingly by agreement between the Parties.

18.3.3 Services and Facilities

The employer shall make available to the Contractors the Services and Facilities listed under Appendix F.

19. PAYMENTS TO THE CONTRACTORS

19.1 Contract Price

The price payable in local currency is set forth in the Contract.

19.2 Payment for Additional Services

For the purpose of determining the remuneration due for additional services as may be agreed

20. SETTLEMENT OF DISPUTES

20.1 Amicable Settlement

The Parties shall use their best efforts to settle amicably all disputes arising out of or in connection with this Contract or its interpretation.

20.2 Dispute Settlement

Any dispute between the Parties as to maters arising pursuant to this Contract that cannot be settled amicably within thirty (30) days after receipt by one Party of the other Party's request for such amicable settlement may be submitted by either Party for settlement in accordance with the provisions specified(at the time of agreement.as decided)

20.3 settlement of disputes

Any dispute arising out of this contract, which amicably not settled between the parties, shall be referred for adjudication / arbitration in accordance with the Indian arbitration and conciliation Act 1996.

20.4 Confidentiality

The Contractors and the Personnel of either of them shall not, either during the term or within two (2) years after the expiration of this Contract, disclose any proprietary or confidential information relating to the Project, the Services, this Contract, or the Employer's business or operations without the prior written consent of the Employer.

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PERFORMANCE PARAMETERS IN WATER SUPPLY:

7.1. QUALITY OF WATER:

The contractor should produce the drinking water as per the standards specified by CPHEEO manual. If the test results of drinking water are beyond the permissible limits, payment will not be made for such quantity for any parameter. However, in no case E-coli should present in clear water.

7.2 UP KEEP OF PLANTS:

Up keep of water treatment plants, machinery, motors, pipe lines and exposed iron parts are to be kept clean within the premises of head water works..They should be painted at regular interval by the contractor at contractor's cost. If any equipment is found rusting and maintenance is not satisfactory, as decided by the engineer- in-charge, necessary fine will be imposed at discretion of engineer- in-charge. Necessary work will be executed by the department at contractor's risk.

7.3. REPAIRS TO MOTORS:

All the pumpsets at Head Water Works are having 100% stand bye. If any repairs occurs to the motors, they should be rectified by the contractor within 48 hours at contractor's cost without interruption to drinking water supply.

The contractor should maintain sufficient stock of movable parts of the pumpsets and motors for easy maintenance.

7.4. RELIABILITY OF WATER SUPPLY AND LIQUIDET DAMAGES:

The existing water treatment plants are designed for a capacity of 29 MGD. If **the contractor fails to produce less than this quantity, he will be penalized at the rate of 2 times the variable cost of production for this short fall**. The contractor should monitor the quantity of water produced from each plant and pumped into the clear water pumping mains. The contractor should install digital flow meters for monitoring the quantity of water pumped from each plant. And payment will be made to the contractor based on the quantity of water pumped from these plants. Sufficient pressure should be maintained at the tail ends of the pumping main to fill the reservoir and also wherever there is direct distribution,

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The contractor is responsible for operation of valves for direct supply of water for supply of sufficient quantity of water for direct distribution from the pumping main to distribution to the people for the specified hours.

7.5. RESPONSE TIME FOR RECTIFICATION COMPLIANCE:

All the complaints with in the Head Water works are to be attended immediately, If any complaint is not rectified within 24 hours necessary fine will be imposed. The cost of such repairs are to be at the contractor's cost. No additional payment will be made.

7.6. LEAKAGES IN PUMPING MAIN:

The leakages in pumping main shall be attended by VMC in 12 hours.

7.7 INTERRUPTIONS:

The Water supply should be uninterrupted. It should run 24 hours and 365 days. The following interruptions will be permitted.

a. Power shutdown by APSPDCL & VMC
b. Any Electrical breakdown.
c. Pipeline breakdown.
d. Due to any other reasons specified by VMC
e. Pumping plant breakdown
f. Due to any force majeure like cyclones, earthquakes

If the interruption other than the above, necessary fine will be imposed as mentioned above.

7.8. CAPITAL INSTALLATIONS ON THE EXISTING SYSTEM FOR MECHANISATION AND MODERNISATION:

An initial three (3) months period during the contract period shall be given to the bidder/contractor to study the system and submit a feasibility report stating in the various capital investment required for mechanization and modernization and the return period for the same. The department shall make the necessary investment and the payment to the vendors shall be made directly by VMC, but the works shall be guided & supervised under the guidance of O&M contractor. The benefit arrived due to implementation / Modernization of the existing system with VMC funds will be shared by VMC and the contractor at 90 : 10 ratio basis.

7.9. INCENTIVES TO THE CONTRACTOR:

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If the contractor improves the performance of the existing units by producing more quantity of water than the designed capacity he will be encouraged by following means.

1. If the quantity of water produced **is more than 29 MGD payment for such additional quality will be paid at normal rate of production + 10% more than the variable component rate**.

2. Power charges: If the contractor **reduces the power consumption with out reducing the out put, and with out making any capital investment, he will be encouraged by giving 20 %of cost of energy saved.** First three months period will be considered as observation period. After observation period, energy saving will be considered. Power consumption shall be benchmarked as unit output of water produced in MGD during the initial study period.

7.10. ESCALATION CLAUSE:

There will not be any escalation of price during the contract period up to 18 months. From the date of handing over of the plant / date of signing of the agreement whichever is earlier. However Any variations due to change of law, taxes and duties by Central Government, State Government , Local Bodies during the period of the contract will be affected to the contractor

Price escalation will be considered after 18 months ie., from 19th month to 36th months.

7.10.1 Price Adjustment

The amounts payable to the Contractor shall be adjusted in respect of the rise or fall in the cost of wages, chemicals, and other inputs to the Contract Value for Part I of Schedule 'A' only, by applying to such amounts the formula prescribed in the sub-clause 7.10.2.

8.10.2 Adjustment Formulae.

The adjustment to the Interim Payment Certificates in respect of changes in cost shall be determined from the following formula for each of the types of Operations and Maintenance categories to be performed.

$$P_f = A + W_f \quad \frac{W_n}{W_o} + C_f \quad \frac{C_n}{C_o} + O_f \quad \frac{O_n}{O_o}$$

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Where:

P_f - is a price adjustment factor to be applied to the amount for the payment of services carried out in the subject month,

A - factor for non adjustable portion of the contract which is 0.1 for maintenance contract

W_f - Wages factor = 0.4

W_o - is the cost index number for Consumer Price Index Number for Industrial Workers pertaining to Hyderabad for the Base Period determined as per the sub-clause 7.10.3.

C_f – Chemical factor = 0.2

C_o - is the index number for whole sale prices in India (H) Chemicals and Chemical Products for the Base Period determined as per the sub-clause 7.10.3.

O_f - Other inputs factor = 0.3

O_o - is the index number for whole sale prices in India for All Commodities for the Base Period determined as per the sub-clause 7.10.3; and

W_n, C_n, O_n, are the current cost indices or reference prices of the cost elements for month "**n,**" applicable to each cost element determined as per the sub-clause 7.10.3.

7.10.3 Base, Current, and Provisional Indices

The base cost indices shall be those prevailing on the day 28 days prior to the latest date for submission of bids. Current indices or prices shall be those prevailing on the day 28 days prior to the last day of the period to which a particular Interim Payment Certificate is related. If at any time the current indices are not available, provisional indices as determined by the Engineer-in-Charge will be used, subject to subsequent correction of the amounts paid to the Contractor, when the current indices become available.

7.10.4 Sources of Indices and Weightings

The sources of indices shall as computed by the Office of the Economic Adviser, Ministry of Commerce & Industry, Government of India as published by Reserve Bank of India vide the RBI Website http://www.rbi.org.in/scripts/BS_ViewBulletin.aspx.

7.10.5 Change in Legislation

If, after the date 28 days prior to the latest date for submission of bids for the Contract, there occur changes to any National or State Statute, Ordinance, Decree, or other Law or any regulation or by-law of any local or other duly constituted authority, or the introduction of any such State Statute, Ordinance, Decree, Law, regulation, or by-law

that causes additional or reduced cost to the Contractor, other than under the preceding sub-clauses of this clause, in the execution of the Contract, such additional or reduced cost shall, after due consultation with the Employer and the Contractor, be determined by the Engineer-in-Charge and shall be added to or deducted from the Contract Price and the Engineer-in-Charge shall notify the Contractor accordingly, with a copy to the Employer. Notwithstanding the foregoing, such additional or reduced cost shall not be separately paid or credited if the same shall already have taken into account in the indexing of any inputs to the Price Adjustment Formula in accordance with the provisions of Sub-Clauses 7.10.1 to 7.10.4.

7.10.6 Local Taxation

The prices bid by the Contractor shall include all customs duties, import duties, business taxes, and income and other taxes that may be levied in accordance with the laws and regulations in being on the date 28 days prior to the latest date for submission of bids in the State of Andhra Pradesh, India on the Contractor's Equipment, Plant, materials, and supplies (permanent, temporary, and consumable) acquired for the purpose of the Contract and on the services performed under the Contract. Nothing in the Contract shall relieve the Contractor from his responsibility to pay any tax that may be levied in the State of Andhra Pradesh, India on profits made by him in respect of the Contract.

7.11 LIABILITY FOR DAMAGES TO ASSETS:

The contractor is responsible for any damages occur to assets of VMC and adjoining public assets during the operation and maintenance in the agreement period. They should rectify the damages immediately with contractor's own cost. If any such rectification was not attended by the contractor, the same will be rectified, and cost of such rectification will be recovered from the contractor.

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8. BRIEF DISCRIPTION OF OPERATIONS INVOLVED

SCOPE OF WORK: Manning, Operation, Maintenance of 29 MGD Capacity Water Supply Scheme at Dr. K.L.Rao Head Water Works in Vijayawada from collection wells, to reservoir filling including providing chemicals, consumables, workmen and up keep of all components along with necessary spares**.**

Vijayawada Municipal Corporation having 29MG/Day capacity water supply scheme in the form of three plants 5MGD, 8MGD, 16MGD for providing drinking water to Vijayawada Citizens. The main operations of the scheme are as follows:-

8. Description of operations involved in water treatment:-

8.1 Raw water intake well

Raw water intake wells and its pumping stations located on Krishna River Bank. Raw water intake well having vertical Turbine pumps. The raw water is being pumped through C.I & RCC pipe lines from intake well to filtration plants.

8.2 Water Treatment plant.

It is conventional water treatment plant with clariflocculator and filtration attaining to remove the suspended and colloidal impurities from Raw Water. This being essential service, water is to be processed daily even on Sunday, Holiday, Public Holidays supply shall be uninterrupted.

The Contract include operation, periodical preventive of maintenance and checkup rotten certification of Civil, mechanical and electrical Jobs of the following units with all components of equipments at Water Treatment plant and clear water.

8.3 Inlet works: The Raw water is received to the stilling Chamber. Here purification is done with Chlorine gas / Bleaching powder is to be feed with proper dosage calculated (if necessary) . Provision for lime slurry dose for PH correction is also made (if necessary) . Alum dosage is also to be adjusted from Alum stock Tank before Flash mixer after ascertaining optimum dose.

8.3.1: OPERATION

Ascertain the Alum dosage required and adjust flow of Alum before Raw Water enter to Flash Mixer. In place of Alum if any other substitute is used the same to be adjusted and dosing to be carried out by calculating actual requirement.

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8.4 FLASH MIXER

1. The Flash mixer and Bypass to filter is also provided (to be operated once in a while as and when such need arises)
2. Fixed blade coupled to Electrical Motor through reduction Gear Box is provided in flash mixer Chamber. Suitable starter is provided.

8.4.1 OPERATION

1. Run the flash mixer continuously.
2. Ensure optimum Alum dosage before Water reaching Flash Mixer by Carrying out Jar Test at required intervel in rainy season and at least once in fair reason.

8.5 CLARIFLOCCULATOR:-

1. Object to make distinct settable floc during flocculation and their removal of turbidity 8 NTU clarified water overflows at clarifier weirs for outlet.

8.5.1 FREQUENCY OF DESLUDGING

2 to 3 times in a day in rainy season & Once in a day in fair season or constant sludge bleed arrangement shall be provided.

8.5.2 OPERATON:-

1. Start the floculator paddles as soon as the water level reaches the paddles.
2. Keep the constant bleed arrangement of Sludge line open for the constant bleeding of sludge.
3. If the sludge constancy increase beyond 1.5 to 2% range. The sludge blow down i.e. to be carried out.
4. Optimize Frequency of sludge drawl.

8.6 FILTERS:-

The Filter under operation which removes residual suspended solids from the clarified water.

Back washing is to be done with Air (5 Min..) and them water wash 10 for minutes.

This schedule is merely indicative. The changes in operation schedule may be as directed by Engineering-in-charge.

Wash water Tank required capacity provided for storing filter water to meet the wash water requirement of plant.

NOTE:-

Percentage of water used not be more than 1.5% of Filtered water quantity.

8.6.1 OPERATIONS:-

1. Ensure that all valves i.e. inlet, outlet, wash water inlet and waste drain are closed.
2. Open the filter inlet valve to allow the clarified water to enter into the filter beds.
3. Allow the water level in the filter beds to reach the top water level.
4. Open the outlet valve slightly and close the outlet control valve, when this happen the outlet is to be opened fully.
5. Open the outlet valves completely.

8.6.2 BACK WASHING:

(a) Close the filter inlet valve of the filter bed to be washed and allow the water to drop down to about 10 cm. above the media. It is to be done by lifting the filter float close the main outlet valve.

(b) Start the air blower:

Open the air delivery valve and air inlet valve and introduce the air to the filter bed to be washed for 5 minutes.

(c) Start the wash water pump and open waste water drain valve.

(d) Open the wash water inlet, and waste water drain valves slowly, While washing ensure that sand is not escaping out of bed. Continue air water wash for further 5 minutes. Stop the air blower and continue water wash for further 6-8 minutes or till streaks of filter bed becomes apparently visible. Close the wash water inlet valve.

When wash water is fully drained close the drain valve and adopt the procedure for operating filter.

NOTES

1. While keeping any filter bed idle, it is to be washed and kept ready for future use.
2. Ensure that mud balls, or cracking of beds, air binding dose not occur.
3. Up keep of all filter bed clean manually, continuously, removing agglomerations and ugly settling substances. All channel through which filter water flows be kept clean and free from algal growth.

8.7 Chemical House:-

Chemical house comprises of storage, preparation of solution for alum, lime and coagulant including mixing, measuring/metering devices and its conveyance to inlet works and chlorine contact tank.

One separate room for storing chlorine containers and feeding arrangement of liquid chlorine to the chlorinators. Alum stock tank and saturation tank are provided.

Required number of elevated stock tank are located at first floor. Alum mixing is ensured by motors and mixers

Feeding at inlet is by P.V.C. pipes.

8.7.1 OPERATIONS:-

1. Ensure that the drain and outlet valves of each tanks are closed.
2. Place the calculated quantity of Alum of proper strength in the tank and open the feed water inlet valve for solutions preparation.
3. In order to homogenized the solution, re-circulate the solution by Alum agitator continuously.
4. The rate of alum dosing essential to be done as per laboratory jar test.
5. Once the solution is ready in stock tank, adjust the dose as required at inlet channel.
6. Ensure plastic P.V.C. feeding line and chlorine dosing lines for cleanliness and tidiness.

8.8 Chlorinators:-

0 to 10 Kg/hr capacity gravity feed equipment manufactured Aqua chlorinators Baroda controlled for control valve

1. Fixing of chlorine Cylinder with the help of Copper tube connected to Chlorination.
2. For loading unloading of chlorine cylinder
3. Open the water inlet valve and gas inlet valve.
4. Then open the cylinder valve to enter into the chlorination plant.

8.9 Raw Water Quality:-

Average raw water quality during fair monsoon seasons are as follows however, the raw water analysis particulars for a period of one year is enclosed for reference.

Parameter	Fair Season	Rainy Season
Turbidity	3-4 NTU	50 - 200 NTU
		(Peak 400 NTU)
Suspended solids	10 mg/1	60 MG/L(PEAK 250
		MG/L
Ammonical Nitrogen	1 to 002 mg/1	1 to 002mg/1
Albuminoid Nitrogen	0.06mg/litre	0.06mg/litre
Colour	10	60
Crome (Total)	0.3 mg/1	0.5 mg/1
Iron(Dissolved)	0.2 mg/1	0.3 mg/1
Maganese (Total)	LT0.5 mg/1	LT0.5 mg/1
Alkalinity	44 mg/1 ($CaCO_3$)	60 mg/1 ($CaCO_3$)

P^H	7.35 to 8.35	6.95 to 8.20
Total Coliform	2400/100 ml	2400/100 ml

Filter water expected qualities:

Turbidity	Clarified Water	8 NTU
	Filtered Water	5.0 NTU

The treated water should satisfy the standards specified in CPHEEO manual.

Raw water analysis particulars in a period of one year on particular dates submitted by Regional P.H Laboratory , Medical College, Guntur

Sl. No	Tests	Date on 04.04.05	Date on 21.03.05	Date on 22.05.04	Date on 12.02.04	Date on 22.12.03
1	Colour	Colour less	Colour less	Suspended matter, slightly greenish	Colour less	Colour less
2	Turbidity	14.0	2.5	29	4	0.4
3	Odour	Odour less	Odour less	Odour less	Odour less	Odour less
4	P^H value	8.1	8.4	8.1	8.4	8.6
5	Electrical conductivity at 25^0 C – Micro Mhos / Cm	720	700	670	600	580
6	Biological Examination	--	--	--	--	--
7	Alkalinity as Ca. Co_3 Phenolphthalein	Nil	8	Nil	8	8
	Total alkalinity	160	160	140	140	140
8	Total hardness	200	160	120	168	160
9	Calcium hardness	80	60	60	60	80
10	Magnesium hardness	120	100	60	108	80

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11	Nitrite as N	Nil	Nil	0.1	Nil	0.05
12	Nitrate as N	Nil	Nil	Nil	Nil	Nil
13	Ammonical Nitrogen	Nil	Nil	Nil	Nil	Nil
14	Sulphate as SO_4	Traces	Traces	Traces	Traces	Traces
15	Chloride as Cl	68	40	60	60	60
16	Fluoride as F	0.5	0.5	0.5	0.5	0.5
17	Iron as Fe	--	Nil	Nil	Nil	Nil
18	Oxygen consumed from $KmnO_4$					
	In 3 hours at 37^0 C	--	--	--	--	--
	In 3 minutes at 37^0 C	--	--	--	--	--
19	Any other special tests	--	--	--	--	--

8.9.1 Frequency of Tests:-

All chemical tests are per CPHEEO Manual should be carried once a month for raw water and filtered water. Standard method of examination of water and CPHEEO Manual be adopted a systematic records should be kept as a ready reckoner. Close co-ordination between staff of laboratory and operational wing is utmost necessary.

The laboratory with latest equipments to carry all relevant tests is provided at VMC However it is responsibility of agency to maintain the equipment & glassware in good condition during the period of contract.

The various costly instruments like Spectrophotometer, Analog & digital Turbidity meters(HACH make). Jar testing apparatus, Digital PH meter, are kept in laboratory. The Contractors responsible staff shall get themselves well conservent with all these instruments and use them in proper fashion and also follow the instruction manuals etc.,

Also some furniture is available at site, of which some will be utilised by V.M.C. Engineers. As such the furniture is sufficient for day to day activity. However it is responsibility of agency to procure the excess furniture required from its point of view.

8.10 Material & Reagents:-

Material required such as Alum, Lime, Co-ogulant and gaseous chlorine etc., will have to be procured by the contractor at his cost as per relevant I.S. as directed by Engineer-in-charge. The test certificate from reputed Govt. Institute shall have to be produced on the quality of such materials. The glass wares if found broken due to

bad handling shall have to be replaced by the agency immediately or same will be recovered at an actual cost / procurement cost.

Alum	;	Godowns provided in premises.
Chlorine	;	Chlorine storage room.

The labour required to transport these daily or as and when required will be the responsibility of the contractor including carting from stores to Alum solution tank and its loading/unloading etc., replacement and ensuring proper connection. The cost of the same is included in the contract & no separate payment will be made.

Dose of Alum Coagulant, Lime and Chlorine and its application shall be confirmed everyday before starting. Less or excessive dosing of chemicals so as to deteriorate the quality of water is not desired. Control of valves, cleanliness of piping to get proper dose, will be the sole responsibility of the Contractor.

Contractor should ensure that sufficient stock is available of all the materials at least 15 days in advance by timely indenting of materials from the supplier. In any case the water quality shall have to be maintained as per specification mentioned in CPHEEO manual and as per the standard.

8.11 Waste Water Channel:-

Open Channels are available to dispose of the washed water from filter beds to river Krishna Contractor should maintain these channels for cleanliness.

8.12 Electrical Work:-

The Contractor shall include operation routine checkup and maintenance of entire Electrical system and listed in brief description of equipment.

8.13 Clear water pumping main:

The contractor shall include routine checkup and operation of entire pumping mains system. The details of pumping mains are given in "Description of materials". They should operate necessary valve on the pumping mains to fill the all GLSR/ELSRS/Direct distribution for specified periods.

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BRIEF DESCRIPTION OF COMPONENTS & EQUIPMENTS OF PLANTS

9.1 5 MGD PLANT

9.1.1 Intake well:-

Intake well of diameter 18' and depth of 45' from the flatform. The raw water is coming through 15" C.I Pipes of 4 Nos. in different levels provided strainers.

Pump house above sump well is 15' above the working flat form.

9.1.1.1 Raw water pumping machinery:-

V.T. Pumps make	-	1) Jyothi Baroda (60HP 2 Nos.)
	-	2) Garden reach (100HP 1 No.)
Quantity	-	3 Nos. (100 % standby)
Discharge		2.50 Lakh gallons / Hour
Head		50'
Speed		1440 RPM
Frequency		50 HZ
No.of stages		1
Efficiency		80 %
Impeller		Bronze metal
Line shafts		M.S

Sluice valves:-

Size	-	14"
Quantity	-	3 Nos.

Reflex valves:-

Size	-	14"
Quantity	-	3 Nos.

Pipe work:-

Material	-	C.I
Delivery pipe	-	600mm

Lifting arrangements:-

1) 1 No. 3 M.T. capacity chain block is arranged for lifting of pumpsets. The chain block is fixed of the bottom of roof slab by the help of 'I' girder.

440 Volts LT panel:-

Make	**-**	**Local**
MCCB	-	2 Nos. for 60HP motor with busbar
Busbar	-	600A capacity
Starters	-	LTLK make 2 Nos. ML 2 for 60 HP and 1 No ML-4 FOR 100 HP and providing sufficient capacitors fixed to the panel board.

Cables:-

1) From 5 MGD clear water pump house to Raw water power room – 185 Sq mm 3 ½ core 2 runs.
2) From panel to (MCCB) to starter 119/10 copper wire and starter to motor (19/16 copper wire) for 100 HP OCB to starter and starter to motor 120 Sq mm 3 core cable.

9.1.2 Water Treatment Plant:

a) **Raw Water channel:**

1) Size of channel	2.50m x 0.90m
2) Length of channel	6.00m

b) **Flash Mixer:**

1) Size	2.00m dia x 5.00m depth
2) Electric motor capacity	2.00 HP

c) **Clariflocculator:**

1) Type of construction & dia	RCC & 30.00m dia
2) Inlet pipe size	RCC pipe, 600mm dia
3) Sludge valves sizes	200mm dia - 1 No 150mm dia - 2 Nos.
4) Bridge motor capacity	2.00 HP - 1 No
5) Paddles motor capacity	2.00 HP - 2 Nos.
6) Motors for alum tanks	2 HP - 3 Nos.

d) **Filter Beds:**

1) No. of units & sizes	3 Nos 9.75 x 6.70 mts.
2) Output of each filter	16.67 LG per day
3) Wash water tank capacity	0.45 LG

4) No. of valves each bed & sizes

Use of valve	**Each bed**	**Total**
inlet valve	300mmØ –1	3 Nos
outlet valve	300mmØ –1	3 Nos
Wash water inlet valve	300mmØ –2	6 Nos
Rate of flow valve	300mmØ –1	3 Nos
Air inlet valve	75mmØ – 2	6 Nos

5) No. of Alum tanks & sizes — 3 Nos, 2.50m x 2.30m x 2.00m

9.1.3 **Chlorination Plant:** — 0 - 10 Kg/hour capacity gravity feed Chlorinators - 1 No

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9.1.4 PURE WATER PUMPING STATION:-

Size of pump house - 10.00mts x 4.00mts

a) V.T. Pumps

make	-	Jyothi
Type	-	400 T_2
Quantity	-	3 Nos. (2 Nos working + 1 standby)
Discharge	-	2000 GPM
Head	-	45 Mts
Speed	-	1440 RPM
Frequency	-	50 HZ
No.of stages	-	3
Column pipe	-	300mm dia
Impeller	-	Bronze metal
Lines shafts	-	M.S

b) **Sluice valves 350 mm dia**

Size	-	350mm
Quantity	-	3 Nos.

C) **Reflex valves:-**

Size	-	350mm
Quantity	-	3 Nos.

d) **Chain fully block:-**

Make	-	Indeef
Capacity	-	3 M.T
Main girder	-	200mm-2 Nos.

e) 440 Volts LT panel

Make	-	Local
OCB's	-	4 Nos.
Busbar	-	1000 Amps TPN
Starters	-	Killburn (AT 15 Type) 3 Nos.
Main switches	-	3 Nos. (100A – 1 No 63A – 2 Nos.)

f) Cables:-

1) From 500 KVA Transforms to main OCB 300 Sq mm 3 ½ core 2 runs universal make.
2) From panel OCB to starter and starter to motor 19/16 VIR PVC copper wire.

g) Lighting:-

Raw water pump house	-	40 W tubes	-	5 Nos.
Clear water pump house	-	40 W tubes	-	4 Nos.
Filter house	-	40 W tubes	-	15 Nos.
		M.V.Lamps		2 Nos

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2 16 MGD PLANT:

INTAKE WELL:

9.2.1 Intake well diameter 30' and depth 45' from the flat form. The Raw water is coming with CI pipes 3 indifferent levels.
Pump house above sump well is 20' above the working flat form.

Raw water pumping machinery:

V.T. Pumps:

Make	: 1. Fair Bank Morse (150 HP VT Pump NGEF)			
	2. Garden Reach (150 HP VT pump 1 No.)			
	3. Garden Reach (100 HP - 1 No)			
	4. Calama Polder pump (80 HP – 1 No another 80 HP stand by – 2 No)			
Quantity	: 5 Nos (100 % stand by)			
Discharge	: 150 HP discharge	3.60 lakhs	-	2 Nos
	80 HP discharge	1.85 lakhs	-	1 No.
	100 HP discharge	2.40 lakhs	-	1 No.
	150 HP discharge	3.70 lakhs	-	1 No.
Head	: 50'			
Speed	: NGEF	150 HP	-	990 RPM
		80 HP	-	1440 RPM
		100 HP	-	1440 RPM
		150 HP	-	1440 RPM
Frequency	: 50Hz			
No. of stage	: 1			
Efficiency	: 85 %			
Impeller	: 100 HP	-	Bronze Impeller	
	80 HP	-	Bronze impeller	
	150 HP	-	CI impeller	
	150 New	-	Bronze impeller	
Line Shaft	: 100 HP VT pump	-	S.S	
	150 HP garden reach	-	S.S	
	150 HP NGEF	-	M.S	

Sluice Valves:

Size	: 150 HP Fair bank morse	-	500mm
	: 100 HP & 80 HP	-	300mm

Reflex Valve:

Size	: 150 HP Fair bank morse	-	500mm
	: 100 HP & 80 HP	-	300mm
	: 150 New (Garden reach)	-	600mm

Pipe work: : 150 HP (Fair Bank Morse)
Material - C.I
Delivery pipe - 600mm
80 HP + 100 HP + 150 HP New – 600mm M.S pipe

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Lifting arrangements:

1 No 3 MT capacity chain block is arranged for lifting of pump sets. The chain block is fixed at the Bottom of roof slab by the Help of 'I' girder and also rotating arrangements in the intake well.

440 Volts L.T Panel:

Make		**Local**		
OCB's	**:**	Capacity		
OCB's	**:**	300A"	-	2
		1000A"	-	1 No
Busbar	**:**	1000A capacity, M.S fabricated		
Starter	**:**	2 Nos of AT 15 type 'KIL BURN' Auto transformer starters. 1 No LTLK fully star delta starter for 100 HP.		

440 Volts L.T Panel (2)

Busber	**:**	**M.S fabricated 1000A**		
OCB's	:	600A capacity	-	1 No.
OCB's	:	200A capacity	-	2 Nos
		(one is 80HP and another one is 150HP)		
	:	200A MCB and LTLK fully automatic star delta starter for 80HP polder pump. Proving sufficient fixed capacitors to the panel board.		

Cables:

1. From power room to 16 MGD raw water pump house busbar. 300sq. mm 3 ½ core aluminum 2 runs.
2. From 630 KVA transformer to (300 HP) 16 MGD raw water pump house, 80 HP busbar 185 sq. mm. 3 ½ core aluminum 2 runs.

   From 80 HP busbar OCB outgoing 185 sq. mm. 3 core one run. From starter to polder pump 80 HP 35 sq .mm. submersible cable run.

   From 150 VT pump busbar 300 Amps OCB's to 150 HP motor to run 185 sq. mm. 3 core aluminum one run only.

   80 HP busbar 200 Amps OCB's to run 185 sq. mm. 3 core aluminum cable 150 HP starter and 150 HP motor from starter.

   From 150HP busbar 200 A OCB's to run 19/16 copper wire for 100HP fully Automatic star Delta LTLK make starter. From starter to 100HP motor 120 sq. mm. 3 core aluminum cable one run.

Lighting: 32 A lighting box to inside 40 WT 6 Nos out side 4 Nos of 250 MV lamps.

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9.2.2 WATER TREATMENT PLANT

a) **Stilling Chamber**

1) Size of chamber	4.00m dia x 7.00m depth

b) **Raw Water channel:**

2) Size of channel	2.90m x 0.80m
3) Length of channel	24.00m

c) **Flash Mixer:**

1) Size	4.00m dia x 7.00m depth
2) Electric motor capacity	2.00 HP

d) **Clariflocculator:**

1) Type of construction & dia	RCC, 2 Nos, 36.50mts & 39.63mts
2) Inlet pipe size	RCC pipe, 600mm dia
3) Sludge valves sizes	200mm dia - 2 Nos
4) Bridge motor capacity	2.00 HP - 2 Nos.
5) Paddles motor capacity	2.00 HP - 4 Nos.

e) **Filter Beds:**

1) No. of units & sizes	8 Nos 11.00m x 7.00m (4 Nos) 11.65m x 6.95m (4 Nos)
2) Output of each filter	20.00 LG per day
3) Wash water tank capacity	1.00 LG

4) No. of valves each bed & sizes

Use of valve	Each bed	Total
inlet valve	450mmØ –1	8 Nos
outlet valve	350mmØ –1	8 Nos
Wash water inlet valve	300mmØ –2	16 Nos
Rate of flow valve	300mmØ –1	8 Nos
Air inlet valve	150mmØ – 2	16 Nos

5) No. of Alum tanks & sizes	3 Nos, 3.15m x 3.15m x 2.15m
6) Motor capacity	3 Nos.- 150 HP

9.2.4Chlorination Plant: 0 - 10 Kg/hour capacity gravity feed Chlorinators

9.2.5 PURE WATER PUMPING STATION:

Size of pump house : 17.80mts x 10.95mts

A) Horizontal pumpsets:

Make	:	1. Kirloskar	-	2 Nos
		2. Mather & platt	-	2 Nos

Type	:	Horizontal split casing pumps
Motors	:	Slipring Industrial Motors
Quantity	:	4 Nos (2 Nos working + 2 Nos stand bye)
Discharge	:	3.40 lakh gallon / hours
Head	:	45 mts.
Speed	:	1440
Frequency	:	50 Hz
No. of stages	:	1 No
Impeller	:	Bronze

B) Sluice Valves:

Sizes	-	450mm	-	6Nos
Quantity	-	500mm	-	4Nos

C) Reflux Valves:

Sizes	-	500mm	-	2Nos
Quantity	-	450mm	-	2Nos

3 HP oil engine is also provided for lifting of seepage water in clear water pump house in case of power failure.

Capacitors: 3 Nos 25 KVAR power capacities are provided to improve P.F

Lighting:	1.	T.L – 40 W	-	15 Nos.
	2.	S.V Lamp 250 W	-	1 No
	3.	Air Circulated fans	-	1 No.

9.3 8 MGD PLANT:

9.3.1 INTAKE WELL:-

Intake well dia meter 18' and depth 45' from the platform. The Raw water is coming with 600mm M.S pipes 4 in different levels. Pump house above sum well is 12' above the working flat form.

Raw water pumping Machinery

V.T pumps

Make	:Garden reach – 150 HP V.T.pumps,	
Quantity	:	2 Nos
Discharge	:	3.70 Lakhs
Head	:	15 M
Speed	:	1440 RPM
Frequency	:	50 Hz
No. stages	:	1 stage
Efficiency	:	85 %
Impeller	:	Bronze
Line shaft	:	S.S
Reflex valves	:	600mm 2 Nos.
Pipe work	:	600mm M.S

Lifting Arrangements:

1 No of 5 MT. Capacity chain block is arranged for lifting of pumpsets. The chain block is fixed at the bottom of roof slab by the help of rotating 'I' girder arrangement in the intake well.

440 V L.T. Panel:

Make	:	1000 AMS fabricated.
Main OCB	:	600A KEI
Sub OCB's	:	300A KEI
Busbar	:	1000A capacity
Starter	:	200A KEI A.T star delta trans.
MCB's	:	63A - 2 Nos
		100A - 1 No

Cables:

Raw water main busbar 300 A out going 185 Sq,mm.3 core 1 Run to 150 HP starter from starter to 150 HP motor 185 sq. mm 3 core 1 run.

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Lighting:

Lighting MCB to 3/20 VIR copper wire run to board.

1. 4 Nos 150 W MV lamps out side wall.
2. 4 Nos 40 W tube lights inside pump house.

9.3.2 WATER TREATMENT PLANT:

a) **Stilling Chamber**

1) Size of chamber	2.75m dia x 6.10m depth

b) **Raw Water channel:**

1) Size of channel	0.90m x 0.65m
2) Length of channel	5.00m

c) **Flash Mixer:**

1) Size	2.00m dia x 5.75m depth
2) Electric motor capacity	1.50 HP

d) **Clariflocculator:**

1) Type of construction & dia	RCC, 43.85mts
2) Inlet pipe size	RCC pipe, 600mm dia
3) Sludge valves sizes	200mm dia - 1 No
4) Bridge motor capacity	1.50 HP - 1 No.
5) Paddles motor capacity	1.00 HP - 2 Nos.

e) **Filter Beds:**

1) No. of units & sizes — 4 Nos 15.74m x 5.60m
2) Output of each filter — 20.00 LG per day
3) Wash water tank capacity — 1.00 LG

4) No. of valves each bed & sizes

Use of valve	Each bed	Total
outlet valve	300mmØ –2	8 Nos
Wash water inlet valve	300mmØ –1	4 Nos
Rate of flow valve	300mmØ –1	4 Nos
Air inlet valve	100mmØ – 2	8 Nos

inlet valve - 700 x 700mm penstock gate – 4Nos

5) No. of Alum tanks & sizes — **4 Nos, 3.00m x 3.00m x 1.25m**

9.3.3Chlorination Plant: 0 - 10 Kg/hour capacity gravity feed Chlorinators - 1 Nos.

9.3.4 PURE WATER PUMPING STATION

Size of pump house : 10.95mts x 10.30mts

A. Horizontal Pumpsets

Make	:	VOLTAS 2 Nos
Type	:	Horizontal split casing pumps
Motors	:	Slipring Induction Motors.
Quantity	:	2 Nos (one work, one stand by)
Discharge	:	3.60 lakhs gallon / hour
Head	:	45 mt.
Speed	:	1440 RPM
Frequency	:	50 Hz
No. of stages	:	1 No.
Impeller	:	Bronze

B. Sluice Valve

Sizes	:	450mm
Quantity	:	4 Nos

C. Reflex valve

Sizes	:	450mm
Quantity	:	2 Nos

D. Chain Pulley Block

Make	**:**	**Indef**
Capacity	:	3 ton
Main girder	:	200mm horizontal movement

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E. 440 volts L.T penal for 340 HP

Make	:	Local
Busbar	:	1000A
Starter	:	600A resister type starter and OCB

Penal board consisting of Incoming 1250 A OCB 1 No and 800A out going OCB's 2 Nos.

F. 5 HP coupled vacuum pumpset at pure water pump house removing of vacuum from 340 HP pumps

G. 1 HP monoblock Texmo pumpset is provided for lifting of seepage water.

Capacitors: 25 KVAR of 3 Nos power capacitors are provided to improve P.F

Lighting:

1.	T.L. 40w	:	15 Nos
2.	M.V. Lamps	:	4 Nos
3.	Air Circulated fans	:	4 Nos
4.	Exhaust fans	:	2 Nos

9.3.5 MGD SUB STATION

No. of Transformers	:	1 No.
Capacity	:	630 KVA
Volts	:	11000 / 440 volts
Make	:	Kirlosker.

1. Electrical supply (11 KV) is coming from the existing 11 KV sub station at Head water works.
2. Electrical supply 630 KVA transformer to Raw water pump house with 185 Sq. mm 3 ½ core aluminum cable 2 runs to main OCB of Raw water penal.
3. Electrical supply from 630 KVA transformer to C.W pump house with 400 Sq. mm 3 ½ core aluminum cable 2 runs to main OCB of C.W penal.

9.4 Head Water Works Sub Station

No. of Transformers	:	4 Nos.		
Capacity	:	500 KVA	-	1 No.
		630 KVA	-	3 Nos.
Volts	:	1100 / 440 V		
Make	:	500 KVA	-	Kirloskar
		630 KVA	-	ETE

Electrical Supply from:

1. 500KVA transformer to 5 MGD plant with 300 sq. mm. 3 ½ core aluminum cables 2 runs.
2. Electrical supply from 630 KVA Transformer to Power room with 300 sq. mm. 3 ½ core aluminum cables 2 runs.
3. Electrical supply from 630 KVA transformer to 400 HP (16 MGD) clear water panel with 300 sq. mm. 3 ½ core aluminum cable 3 runs.
4. Electrical supply from 630 KVA transformer to 300 HP motors clear water panel (16 MGD) with 300 sq. mm. aluminum 3 ½ core cable 2 runs and another cables 185 sq. mm. aluminum 3 ½ core cable to 16 MGD intake well (80 HP panel) 2 runs.

9.5. LIST OF GLASS WARE AVAILABLE WITH VMC. LABORATORY

Sl.No.	Particulars	Size	Qt. In Nos.
1	**VOLUMETRIC PLASKS**	100 ml	3
		250ml	4
		500ml	2
		1000ml	2
2	PIPETTE'S	1ml	2
		2ml	2
		5ml	4
		10ml	4
3	BULB PIPETTE'S	10ml	1
		50ml	2
4	BURETTE'S	10ml	2
		50ml	2
5	BEAKERS	100ml	6
		1000ml	2
6	BEAKER'S PLASTIC	100ml	10
7	FUNNELS		6
8	REAGENTS BOTTLES WITH COVER	500ml	2
		250ml	5
		125ml	2
9	CONICAL FLASKS	100ml	4
		250ml	6
10	MEASURING CYLINDERS	100ml	2
		250ml	2
		1000ml	8
		2000ml	4
11	PLASTIC MEASURING JAR'S	50ml	2
		100ml	2
		1000ml	2
12	TEST TUBES	10ml	12
13	TEST TUBE STAND'S 6 holes Aluminium		2
14	GLASS ROD		3
15	WATCH GLASS LID		5
16	**PLASTIC BOTTLE'S**	500ml	4
17	PLASTIC DOPPER	60ml	1
18	BURETTE STAND		1
19	SAMPLES BOTTLES	500ml	60

If additional glassware required, they may be procured by the Contractor and they should hand over the above materials after completion of the contract period or on termination before the contract period at free of cost.

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9.6 LIST OF EQUIPMENT IN LABORATORY

Sl. No.	Description	Make	Qty.
1	DIGITAL TURBIDDITM METER'S		2
2	DIGITAL P^H METER		1
3	$P^{H\ TESTER}$		1
4	DIGITAL CONDUCTIVITY METER		1
5	CHLOROSCOPEWITH (O.T.)		1
6	ANALYTICAL CHEMICAL BALANCE(KEROY) WITH WEIGHTS mg to 100 gms		1
7	JAR TEST FOR CONDUCTING ALUM DOSE (4 BEAKER'S CAPACITY)		1
8	INCUBATOR FOR (BACTERIOLOGICAL ANALYSIS)		1
9	WATER DISTILLATION APPARATS		1
10	TULAMAN WEIGH MACHINE CAPACITY 0 to 200 Kgs		1
11	VENUS WEIGH MACHINE CAPACITY 0 to 200 Kgs		1
12	R.I.A. INSTRUMENT ITS (LAMINAR TYPE) (WEIGHING MACHINE)		1

The contractor has to procure additional equipment required for conducting the required tests at contractor cost. The above equipment has to be maintained properly by the contractor during the agreement period and they shall be handed over to the VMC in good working condition after completion of the contract period or on termination before the agreement period including the additional equipment procured by him during the contract period at free of cost.

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9.7 TOOLS

AVAILABLE IN H.W.W.

Sl. No.	Tools	Quantity	Rate /Each	Amount
1.	8" Cutting Plier	4 Nos.	150	600
2.	10" Screw Drivers	5 Nos.	60	300
3.	Flat files	7Nos.	60	420
4.	Ring Wrenches 6 to 40 (various sizes)	39Nos.	--	3200
5.	Flat wrenches(6 to 32 Nos) (various sizes)	22Nos.	--	3100
6.	Hammers 2 pounds	1No.	120	120
7.	Hand Climping Machine with various size bits(from 50 to 400)	1No.	11000	11000
8.	Bearing puller	1No.	350	350
9.	Iron Chisels	2Nos.	60	120
10.	Hock Saw frames	3Nos.	50	350
11.	Hand drilling Machines(portable)	1No.	2200	2200
12.	Stand Drilling Machine	1No.	4000	4000
13.	Pipe wrench 24"	1No.	800	800
14.	Pipe wrench 36"	1No.	2000	2000
15.	Chain wrenches 36"	2Nos.	1000	2000
16.	Grease guns	2Nos.	450	900
17.	Blow lamp	1No.	130	130
18.	Air Blower	1 No.	5000	5000
19.	L wrenches	1 Set.	175	175
20.	Tools (Bit Box) Taparia	1 No.	3500	3500
21.	Couplings(shaft) 250 HP-3 Nos, 150HP old-2 Nos, 125 HP –2	16 Nos.		23000

If any additional tools required for the regular maintenance for the plants they can be procured by the contractor at contractor's cost. The above materials are to be handed over to VMC after completion of the agreement period or termination of the contract before agreement period

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9.8. MATERIALS (SPARES)

Available with VMC in HWW

Sl. No	Item	Quantity	Rate / Each	Amount
1.	300HP PUMP Carbon Brushes	27 Nos.	300	8100
2.	400 HP H. Type pump carbon Brushes	16 Nos.	400	6400
3.	Clamp Meter – Digital-1, Analog-1 (clip on Meter) (0-1000A)	2 Nos.	--	3000
4.	300 & 400 HP moving contacts	9 Nos.	450	4050
5.	300 HP fixed contacts	72 Nos.	30	2160
6.	60 HP Moving contacts	25Nos.	20	500
7.	Hand Glowses (Ele)	5 Sets..	60	300
8.	120 Sq mm Copper legs	10Nos.	502	500
9.	70Sq.mm Copper legs	12Nos.	35	420
10.	70 Sq . mm Aluminum legs	9Nos.	18	162
11.	120 Sq. mm Aluminum legs	15Nos.	20	300
12.	185Sq.mm Aluminum legs	32Nos.	--	--
13.	300 Sq. mm Aluminum legs	90Nos.	--	--
14.	400 Sq. mm Aluminum legs	19Nos.	--	--
15.	400 HP fixed contacts	21Nos.	52	1092
16.	125 HP Moving arc contacts	12Nos.	250	3000
17.	Flexible Hose pipe (PVC)	(¾" 60Mts.)	1000	2000
18.	100 mm dia Hose suction pipes	6 Mts..	180	1080
19.	80 mm dia Hose suction pipes	10 Mts.	170	1700
20.	300 mm Sluice valve Rods & Nuts (S.S. & G.M.)	3 Nos.	4500	13500
21.	250 mm Sluice valve	1No.	--	--
22.	80 mm Reflex Valve (C.I)(N.V.R)	2Nos.	2500	5000
23.	80 mm Sluice Valve	1No.	3000	3000
24.	150 mm N.R.V.	2Nos.	3000	6000

150 H.P. FAIRBANKS MORSE PUMPSET MATERIALS

1	S.S. PUMP SHAFT	1 No.	--	--
2	M.S. LINE SHAFT(10 Feat length)	2 Nos.	4700	9400
3	M.S. Head Shaft – 7 feat length	1 No.	3200	3200

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4	M.S. Casing pipes-80 mm	4 Nos.	2700	10800
5	M.S. Casing pipe out side threading	1 No.	2700	2700
6	Discharge casting brush (G.M)	1 No.	3500	3500
7	Line shaft bearings bit(Branze)	4 Nos.	3100	12400
8	Head shaft bearing brush (G.M)	1 No.	3400	3400
9	Pump Boul Brushes (G.M)	5 Nos.	3060	15000
10	C.I. T.T. Plate	1 No.	1600	1600
11	Glaned nut	1 No.	1150	1150

125 H.P. Jyohi Turbine Pump spares

Sl. No	Item	Quantity	Rate / Each	Amount
1	Pump neck rings	6 Nos	2500	15000
2	Long bushes (G.M)	4 Nos	2200	8800
3	Short bushes	5 Nos	1200	6000
4	250 HP garden reach pumpsets & Both motor pump spares, pumps, bares, pipes, shafts	2 Sets	--	--
5	150 HP garden reach pumpsets pipes, bares, pumps		--	--
	Motors – 150 HP	1 No		

Sluice Valves:

1	Upadaya 700mm	2 Nos	--	--
2	PNIG 450mm	1 No	--	--
3	Upadaya 600mm	5 Nos.	--	--

Bearings

1	NBC 6311 for 300 HP	10 Nos	1460	14600
2	NBC 6314 for 400HP pump	2 Nos	2000	4000

60 HP Jyothi

1	300mm column pipes (MS)	4 Nos	--	--
2	300mm 'T' (MS)	1 No	--	--
3	Base CI	1 No	--	--
4	60 HP motor	1 No	--	--
5	300mm N.R.V (12")	1 No	9000	9000
6	350mm Bend (14"	1 No	--	--

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Chlorination plants

1	Spares- moisture glass tubes	14 Nos.	300	4200
2	Spares- moisture glass tubes nuts	10 Nos.	200	2000
3	NRV bends	2 Nos	1100	2200
4	Primary filter	1 No	3000	3000
5	Secondary filter	2 Nos.	3600	7200
6	Solutioniser	4 Nos.	1050	4200
7	Alum	3200/- per M.T		
8	Bleaching powder Gr-I	19000/- per M.T.		
9	Liquid Chlorine	9000/- per M.T. for 1 M.T tonner 24000/- per M.T. for 100 kg tonner		

The above materials are in HWW of VMC . The above materials can be used in repairs required and the amounts of materials used can be deducted as per market and purchased rate which ever is higher from the payment of bills.

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VIJAYAWADA MUNICIPAL CORPORATION

10. BRIEF DESCRIPTION OF PUMPING MAINS FROM HWW

10.1 5 MGD

I From 5 MGD plant to high level reservoir & low level reservoir

a) Size and length of pipe : 450mm dia CI pipe, 70m

b) Sluice valve : 350mm dia sluice valve 1 No. at HWW compound

: 300mm dia sluice valve 2 Nos at Reservoir.

II From Head water works to Brahmin street Junction in Canal road. a)

Size and length of pipe : 680mm dia CI pipe, 900m

b) Sluice valve : 680mm dia sluice valve 1 No. at Darga inside

III Brahman street Junction (Canal road) to Kaleswara Rao Market Junction.

a) Size and length of pipe : 600mm dia CI pipe, 600m

IV Kaleswararao Market Junction Low Bridge.

a) Size and length of pipe : 500mm dia CI pipe, 100m

b) Sluice valve : 150mm dia sluice valve 1 No. at Market junction

V Kaleswara Rao Market East Junction to ORRS Reservoir (1.00 GL)

a) Size and length of pipe : 300mm dia CI pipe, 950m

b) Sluice valve : 300mm dia sluice valve 1 No. at BSNL Exchange

VI Kaleswara Rao Market West junction to Gandhiji Mpl. School Reservoir (2.50 GL)

a) Size and length of pipe : 300mm dia CI pipe, 400m

b) Sluice valve : 300mm dia sluice valve 3 Nos. at Market junction and at Reservoir compound.

VII From Nehru road Rajakumari Theatre Junction to Nizam Gate Dr. Ambedkar Booster

a) Size and length of pipe : 150mm dia AC pipe, 1200m

b) Sluice valve : 150mm dia sluice valve 1 No. at Raja Kumari Theatre.

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VIII Nizam gate junction to Kamsalipeta & Raja Rajeswari Pet Direct Distribution

a) Size and length of pipe : 150mm dia AC pipe, 1500m

b) Sluice valve : 150mm dia sluice valve 2 Nos. at Nizam gate junction and at Railway track.

: 100mm dia sluice valve 2 Nos. at Railway track near Kamsalipeta for distribution.

IX From Raja Kumar Theater Junction to Scavengers colony on line Booster filling 12000 gallon reservoir and direct distribution.

a) Size and length of pipe : 150mm dia CI pipe, 600m

: 100mm dia AC pipe, 400m

b) Sluice valve : 150mm dia sluice valve 2 Nos. at Raja Kumari Theater.

X From Canal road Brahman street junction to Chittinagar Junction. a)

Size and length of pipe : 300mm dia CI pipe, 2200m

b) Sluice valves : 300mm sluice valves 3 Nos. at entrance and Pithani street K.T road junction and at Upparavagu junction.

c) Scouver Valve : 200mm dia scouver valve 1 No. at K.T road at Ganapathirao road street junction.

XI K.T road Komala Vilas Junction to Gandhi Bhavi Booster

a) Size and length of pipe : 150mm dia CI pipe, 10m

b) Sluice valves : 150mm sluice valves 3 Nos. at interconnection

10.2. 16 MGD

Pumping lines from 16 MGD plant.

I From Head water works to Bhavanipuram Mosque road.

a) Size and length of pipe : 300mm AC pipe, 1650m

b) Sluice valves : 300mm dia sluice valve at HWW compound

c) Air valves : 80mm dia air valve – 1 No.

II From Bhavanipuram Mosque road Junction to H.B.Colony ELSR

a) Size and length of pipe : 250mm AC pipe, 1700m

b) Sluice valves : 250mm dia sluice valves 3 Nos.

1. at Mosque road junction
2. at Phase-I reservoir
3. at Phase-II reservoir

c) Air valves : 80mm dia air valves – 1 No at Karakatta area

III From Head water works to Hanumanpet Bridge

a) Size and length of pipe : 900mm dia PSC pipe 2250m

b) Zero velocity valves : 900mm zero velocity valves – 2 Nos

1. at Head water work.
2. At Darga street

c) Sluice valve : 900mm sluice valve – 2 Nos.

1. at Head water work
2. at side of Head water work

d) Butterfly value : 900mm sluice valves butterfly valve 1 No. at back side of GGH.

e) Air valve : 250mm dia air valves – 3 Nos.

1. at Head water work
2. at Opp. LLR (river side)
3. at Low bridge rain water pump house.

f) Scour valves : 600mm dia scour valves 2 Nos.

1. at 5 MGD plant gate
2. at Low bridge rain water pumping station.

IV From Hanumanpet Bridge to Gandhi Nagar ELSR (3.25 + 3.25 LG)

a) Size and length of pipes : 500mm dia PSC pipe line, 450m

b) Sluice valve : 600mmdia 1 No.

V From Hanumanpet Bridge to Rehaman Park ELSR

a) Size and length of pipes : 600mm dia PSC pipe line, 1100m

b) Sluice valve :

VI Rehaman Park Junction to Machavaram S.R.R. College Booster

a) Size and length of pipes : 400mm dia CI pipe line, 2435m

b) Sluice valve :

VII Inter connections branch on 400m dia CI pipe line in Eluru road for filling to Gulmohiddin Nagar ELSR

a) Size and length of pipes : 400mm dia

b) Sluice valve :

VIII From 900mm PSC pipe line at GGH to Match Factory ELSR (S.N. Puram)

a) Size and length of pipe : 400mm dia AC pipe line 1100m

b) Sluice valve : 300mm dia 3 Nos.

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IX From 400mm dia AC pipe line at Match Factory to Sri Nagar Colony ELSR

a) Size and length of pipe : 350mm dia AC pipe line 1600m

b) Sluice valve : 450mm dia 3 Nos.

X From 900mm PSC pumping line at GGH to IGM Stadium ELSR

a) Size and length of pipe : 450mm dia CI pipe line 2500m

b) Sluice valve :

XI From 900mm dia PSC pumping line at Arjun street junction in Canal road to Mallikharjunapet ELSR

a) Size and length of pipe : 350mm dia CI pipe line 550m

b) Sluice valve : 350mm dia sluice valve 1 No at Arjun street

XII From 900mm dia PSC pumping line at Canal road Brahmin street junction to Chittinagar Booster pump house.

a) Size and length of pipe : 300mm dia AC pipe line 2200m

b) Sluice valve : 300mm dia sluice valves 4 Nos at

1. at Canal road junction – 2 Nos.
2. at Pithani street junction – 1 No.
3. at Wynchipet Booster – 1 No.

c) Air valves : 80mm dia air valves 1 No. at canal road junction

XIII Inter connections branches on 300mm dia AC pipe line in Brahmin street and K.T. Road.

a) Branch for Gandhi Bhavi Booster pump House in Brahmin street. : 150mm dia CI pipe line, 10m

b) Branch for Gollapalem Gattu Booster Pump House in Brahmin street : 200mm dia AC pipe line, 200m

c) Branch for Brahmamgari Booster pump House : 200mm dis AC pipe line, 180m

10.3. 8 MGD

I. From Head water works to Ramarajya nagar junction.

a) Size and length of pipe : 900mm PSC pipe, 800m

b) Sluice valves : 600mm dia sluice valve 1 No. at HWW compound

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: 900mm dia sluice valve 1 No at R.R.Nagar junction.

c) Air valves : 200mm dia air valves – 2 Nos.

d) Scour valves : 600mm dia scour valve 1 No near Appalaswamy quarry

II From Rama Rajya Nagar Junction to Frizerpet balancing GLSR (3.25 GL)

a) Size and length of pipe : 800mm PSC pipe, 1200m

b) Air valves : 200mm air valves – 3 Nos

c) Zero velocity : 800mm dia at zero velocity valve 2 Nos.

1) at Tunnel

2) at Reservoir entrance

d) Scour valves : 600mm dia scour valve – 1 at Chittinagar junction

III From 900 PSC pipe in Four pillar Center to Booster:

a) Size and length of pipe : 300mm dia AC pipe, 100m

b) Sluice valves : 300mm dia sluice valve – 2 Nos at inter connection in Ambedkar road at Booster pump house.

IV From 900mm dia PSC pumping line at R.R. Nagar Junction to R.R. Nagar hill area Reservoir.

a) Size and length of pipe : 300mm dia AC pipe, 120m

b) Sluice valves : 300mm dia sluice valve – 1 No at inter connection.

V From 900mm PSC pumping line in Ambedkar road at R.R. Nagar Junction to H.B.Colony along Bye-pass road.

a) Size and length of pipe : 300mm dia AC pipe, 2150m

b) Sluice valves : 300mm dia sluice valve – 2 Nos

1. at R.R. Nagar Junction
2. at Bye-pass road Joji nagar Church road.

c) Air valves : 80mm dia air valves 3 Nos.

1. at Bye-pass road Labour Colony
2. at Bye-pass road Steel Yard
3. at R.T.C – II Depo.

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VI Inter connections on 300mm dia AC pumping lines in Bye-pass road for direct distribution.

a) For distribution to Urmila nagar area : 200mm dia branch at Jojinagar church direct distribution.

b) For Steel Yard area direct distribution : 200mm dia branch at Steel yard.

VII From 300mm dia AC pumping line in Bye-pass road to Priyadharshini Colony Reservoir (3.25 GL)

a) Size and length of pipe : 300mm dia AC pipe, 600m

b) Sluice valves : 300mm dia sluice valve – 2 Nos
1. at Bye-pass road junction
2. at Reservoir.

VIII Gravity pipe line from balancing GLSR at Frizerpet to Singh Nagar.

a) Size and length of pipe : 300mm dia PSC pipe, 5300m
b) Sluice valves :
c) Expansion Joint : 800mm dia - 1 joint

IX Gravity pipe line from Singh Nagar to Rajeev Nagar ELSR (2.00 GL)

a) Size and length of pipe : 600mm dia PSC pipe, 2100m
b) Sluice valves :

X Inter connection on 800mm dia PSC gravity pipe line for filling ELSR's

a) Inter connection to branch pipe for filling : 350mm dia CI pipe line Kedharswarapeta ELSR (2.00 GL)
b) Inter connection to branch pipe for filling : 300mm dia AC pipe line 250m Singhnagar ELSR (2.00 GL)

XI Inter connection on 600mm dia PSC pipe line for filling ELSR at Santhi Nagar

a) Inter connection to branch pipe for filling : 300mm dia AC pipe line 200m Santhi Nagar ELSR (2.00 GL)

XII Booster pump house inter connection at Annapurna Devi School in K.T.Road

Size and length of pipe : 200mm CI pipe, 20m

XIII Inter connection for direct distribution on 300mm CI pumping lines from Canal road to Chittinagar.

a) Brahmin street cross roads : 100mm dia branches 6 Nos.
: 150mm dia branch 1 No
: 200mm dia branch 1 No
b) Kothapet cross roads : 100mm dia branches 5 Nos.
: 200mm dia branches 2 Nos.

XIV Inter connection for direct distribution on 300mm CI pumping line in Nehru road at Tarapet.

a) Tarapet cross roads : 200mm dia branch 1 No.

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10.4. ABSTRACT OF PUMPING MAIN LENGTHS FROM H.W.W TO RESERVOIRS AND BOOSTERS

Description of Pipe	Pipe Size in mm	Length of mains in meter			Total	Remarks
		of 5 MGD Plant	of 8 MGD Plant	of 16 MGD Plant		
PSC	900		800	2250	3050	
	800		6500		6500	
	600		2100	450	2550	
	500					
C.I	680	900			900	
	600	600		1100	1700	
	500	100			100	
	450	70		2500	2570	
	400			2710	2710	
	350			900	900	
	300	3550			3550	
	200	610	20		630	
	150					
A.C. PIPE	400			1100	1100	
	350			1600	1600	
	300		3420	3850	7270	
	250			1700	1700	
	200			380	380	
	150	2700			2700	
	100	400			400	
Total length in m		**8930**	**12840**	**18540**	**40310**	
Total length of pumping mains starts from K.L.Rao Head water works						**40.310 KM**

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10.5 SIZE OF PUMPING MAIN GRAVITY MAINS IN H.W.W COMPOUND

Sl. No.	Plant	Raw water	Length in Mt.	Clear Water	Length in Mt.	Other lines	Length in Mt.	
1	5 MGD	600mm C.I	45.00	450mm C.I	4.00	300mm C.I 200mm C.I 100mm C.I 300mm A.C	52.00 50.00 15.00 36.00	For low level Reservoir For High level Reservoir For Wash water tank Inter connection from 16 MGD to 5 MGD Raw water
2	16 MGD	600mm RCC 600mm RCC	105.00 109.00	900mm M.S (gravity main) 900mm RCC (gravity main) 900mm C.I (pumping main)	28.00 54.00 32.00	300mm A.C 150mm M.S 300mm A.C	157.00 75.00 36.00	For H.B.Colony For wash water tank For direct pumping
3	8 MGD	600mm M.S	52.00	600mm RCC (gravity main) 600mm D.I (pumping main)	28.00 105.00	450mm RCC 900mm PSC	110.00 45.00	For inter connection 8 MGD and 16 MGD clear water sump. Inter connection 8 MGD & 16 MGD pumping main.

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10.6 ABSTRACT OF PUMP SETS DETAILS IN H.W.W

S. No	Name of the Plant	HP of Pump set	Pump Make	Pump Model	Discharge in LG, PH	Head in Mts.	No. of Pump sets	Remarks
1	**5 M.G.D.**							
	a) Raw Water	100	Garden Reach	Turbine	2.4	15	1	100% stand by (100, 2 No.of 60 HP)
	Raw Water	60	Jyothi	Turbine	1.5	14	2	
	b) Clear Water	125	Jyothi	Turbine	1.2	48	3	50% standby
2	**16 M.G.D.**							
	a) Raw Water	150	Fair banks morse	Turbine	3.6	15	2	100% standby (100+80 discharge = 150 HP discharge)
	Raw Water	150	Garden Reach	Turbine	3.5	15	1	
	Raw Water	100	Garden Reach	Turbine	2.4	15	1	
	Raw Water	80	Kalama	Submersible	1.8	15	1	
	b) Clear Water	400	Kirloskar	Centrifugal	3.4	45	2	100% standby
	Clear Water	300	Mather Platt	Centrifugal	3.75	35	2	
3	**8 M.G.D.**							
	a) Raw Water	150	Garden Reach	Turbine	3.7	15	2	100% standby
	Raw Water	50	Kirloskar	Centrifugal	1.2	11	1	
	b) Clear Water	340	Voltas	Centrifugal	3.52	45	2	100% standby
4	**Direct Pumping**	15		Submersible	0.12		2	Opp. Head water works area
5	**Drainage Pump House**	12.5		Open well submersible			2	

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10.7 SUPPLIES TO RESERVOIRS FROM HEAD WATERWORKS

5 MGD:-

1.	Low Level	:	2.00 lakh gallons
2.	High Level	:	0.45 lakh gallons
3.	Gandhi Bhavi (1 & 2)	:	1.30 lakh gallons
4.	ORRs	:	1.00 lakh gallon
5.	Gandhi Municipal High School	:	2.50 lakh gallons
6.	Srinivasa Mahal	:	1.00 lakh gallon

			8.25 x 2 = 16.50 lakh gallons

Direct Pumping (Through Boosters & Direct) = 50 – 16.50 = 33.50 lakh gallons

16 MGD:-

1. Mallikarjuna pet	:	3.25 lakh gallons
2. Brahmam gari Mattam (1 & 2)	:	1.50 lakh gallon
3. Gollapalem Gattu	:	1.00 lakh gallon
4. Labbipet Stadium	:	3.25 lakh gallons
5. Raheman Park	:	2.50 lakh gallons
6. Gulammohiddin Nagar	:	1.50 lakh gallons
7. Machavaram (1 & 2)	:	2.25 lakh gallons
8. Match Factory, (SN Puram)	:	3.25 lakh gallons
9. Gandhinagar (1 & 2)	:	6.50 lakh gallons
10. Housing Board (1 & 2)	:	2.00 lakh gallons
11. Lorry Stand	:	3.25 lakh gallons

		30.25 x 2 = 60.50 lakh gallons

Direct pumping	=	160 – 60.50 = 99.50 lakh gallons

8MGD:-

1. Four Pillar Center (Through online Booster)	:	3.25 lakh gallons
2. R.R. Nagar	:	3.25 lakh gallons
3. Tennarpet	:	1.00 lakh gallon
4. Frizerpet	:	3.25 lakh gallons
5. Kedareswaripet	:	3.25 lakh gallons
6. Ajitsingh Nagar	:	2.00 lakh gallons
7. Rajeev Nagar	:	2.00 lakh gallons
8. Santhi Nagar	:	2.00 lakh gallons
9. Priyadarsini Colony	:	3.25 lakh gallons

		23.25 x 2 = 46.50 lakh gallons

Direct pumping	=	80 – 46.50 = 33.50 lakh gallons

Sl. No.	Areas	No. of Reservoirs	Capacity
1	Circle – 1	16 + 3 = 19	33.25 lakh gallons
2	Circle – 2	6 + 1 = 7	19.00 lakh gallons
3	Circle – 3	4 + 1 = 5	9.50 lakh gallons
	Total	**26 + 5 = 31**	**61.75 lakh gallons**

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10.8 DETAILS OF SERVICE RESERVOIRS TOBE FILLED FROM HWW

Sl. No.	Location of Reservoir	Capacity in lakhs gallons	Water Height in Feet's	LWL in Feet's	MWL in Feet's
1	**Low Level Reservoir**	2.00	10	+ 100	+ 110
2	**High Level Reservoir**	0.45	10	+ 130	+ 140
3	**Gandhi Bhavi**	1.30	14	+ 140	+ 154
4	**Gandhiji High School**	1.00	17	+ 93	+ 110
5	**ORS (Gandhi Hill)**	2.50	10	+ 110	+ 120
6	**Srinivasa Mahal**	1.00	14		
7	**Mallikharjuna pet**	3.25	14	+ 140	+ 154
8	**Brahmamgari Mattam I & II**	1.00	14	+ 158	+ 172
		0.50			
9	**Gollapalem Gattu**	1.00	20	+ 150	+ 170
10	**Stadium**	3.25	16	+ 109	+ 125
11	**Rehaman Park**	2.50	14	+ 110	+ 124
12	**Gandhinagar I & II**	3.25	14	+ 90	+ 104
		3.25	14	+ 113	+ 127
13	**Match Factory**	3.25	16	+ 110	+ 126
14	**Machavaram I & II**	2.25	10	+ 135	+ 145
			10	+ 140	+ 150
15	**Gulammohiddin Nagar**	1.00	16	+ 112	+ 128
16	**Housing Board Colony I & II**	1.00	10	+ 130	+ 140
		1.00	10	+ 130	+ 140
17	**Lorry Stand**	3.25	12	+ 118	+ 130
18	**Four pillar Center**	3.25	16		
19	**Rama Rajyanagar**	3.25	20	+ 130	+ 150
20	**Priyadarsini Colony**	3.25	16	+ 113	+ 125
21	**Tannerpet**	1.00	18	+ 150	+ 168
22	**Frizerpet**	3.25	10	+ 130	+ 140
23	**Kedareswari Pet**	3.25	16		
24	**Singh Nagar**	2.00	16	+ 102	+ 118
25	**Rajeev Nagar**	2.00	16	+ 102	+ 118
26	**Santhi Nagar**	2.00	16	+ 102	+ 118

Note:- If any additional reservoirs are constructed by VMC, they shall also be filled with clear water.

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10.9 DETAILS OF BOOSTERS

Sl. No.	Boosters in Location	HP	AMPS	RPM	MAKE	Head in Mts	Discharge in GPM	Size in MM	S.C.No.
1	HB Colony I	12.5 (2Nos)	18	2900	Texmo (TARO)	42	250	75	210250
2	HB Colony II	12.5 (2Nos)	18	2900	Texmo (TARO)	42	250	75	229560
3	Four Pillar Center	60	75	1470	Kirloskar	55	586	125x100	252124
4	Rama Rajya	20	28	2900	Kirloskar	64	200	65x50	233620
5	Tannerpet	30	37	2900	Texmo	62	250	100x75	45367
6	Nagamma Bhavi Satram	12.5	18	2900	Texmo	49	200	75x65	256286
7	Wynchipet	40	55	1460	Kirloskar	35	350	125x100	14158
8	Frizerpet	20	28	2900	Texmo	67	200	75x65	233595
9	Brahmamgari Mattam	20	28	2900	Texmo	67	200	75x65	42632A
10	Gollapalem Gattu	15	22	2900	Texmo	40	280	100x75	26367
11	Srinivasa Mahal (New)	60	75	1440	Kirloskar	80	396	125x100	200332
11A	Srinivasa Mahal (Old)	20	28	2900	Texmo	67	200	75x65	200332
12	Gandhi Bhavi	30	38	1440	Hindustan Kirloskar/ JYOTI	35	400	125x100	4330
12A	Gandhi Bhavi	5	8	2900	Texmo	24	180	75x65	203601
13	Uppara vagu	12.5	18	2900	Texmo	49	200	75x65	043370
14	Mallikharjunapet	20	28	2900	Texmo	30	340	125x100	238384
15	Arjun street	15	22	1440	GEC	30	350	150x125	011766
16	Scavengers	12.5	18	2900	Texmo	49	200	75x65	42632B
17	Ambedkar Statue	12.5	18	2900	Texmo	49	200	75x65	43758
18	Machavaram	40	55	1460	Kirloskar	35	898	150x100	-

Note:- Maintenance of boosters in not included in the scope of the work. However, the contractor shall supply sufficient quantity of water to these boosters for filling up ELSR's located on hill tops.

BIDDER

SUPERINTENDING ENGINEER
VIJAYAWADA MUNICIPAL COPORATION

ANNEXURE-I

DECLARAION OF BIDDER REGADING SITE INSPECTION

I/We hereby declare that I / We have inspected the site of work and that I/We have myself/ourselves thoroughly satisfied about the quality, availability and transport facilities for all materials and labour required for the work on which I/We have based received by me/us before submitted the Bid.

I/We am/are prepared to furnish detailed data in support of all my/our rates quoted, if and when called upon to do so without any reservations with in (3) days from the date of receipt of communication.

BIDDER

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VIJAYAWADA MUNICIPAL COPORATION

ANNEXURE – II

A) EVIDENCE OF EXPERIENCE – DETAILS OF WORKS ON HAND

Name of works on hand	Estimated cost	Amount of Contract	Date of Agmt.	Agreed date Of completion	Agreed progress upto end of previous month	Actual progress upto end of previous month	Name of the Department in which the work is situated.

B) DETAILS OF WORK CARRIED OUT BY THE BIDDER

Name of works completed	Estimate cost	Amount of contract or to be received	Actual amount final bill received		Agreed period of completion		Actual period of completion	
			From	To	From	To		

Note:- The Bidders may attach a separate sheet if the space left is insufficient.

BIDDER

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ANNEXURE-III

RECORD OF ARBITRATION & LITIGATION

The Bidder shall record chronolo9gically any disputes he had with any of his previous clients during the last 10 years, indicate whether Arbitration or Litigation, the nature, approximate duration and amount of claim involved in respective cases.

Sl. No.	Project identification And location	Name and Address of the Client	Description	Nature of Dispute			
				Period of Arbitration/ Litigation From	To	Amount Claimed (Rs. In Lakhs)	Award in favour of Client/ Contract Or (Rs. In Lakhs)

Name :

Signature :

Date :

Seal of the Company :

Designation :

Note: Separate forms shall be submitted to cover details in above format for the individual members of joint venture.

BIDDER

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VIJAYAWADA MUNICIPAL COPORATION