CONTRACT NO.

GUJARAT WATER SUPPLY & SEWERAGE BOARD GANDHINAGAR

(GOVERNMENT OF GUJARAT UNDERTAKING)

"Name of Project :- Comprehensive operation and maintenance of water supply project including all required materials, labours and all type of machinery etc. complete for water system for pumping treated water (WTP-2.6 MLD) from RCC U/G Sumps at Main HW to sumps and different SHW and from RCC U/G Sumps at SHW to ESR at various Sub Head works and distribution system up to Village level sumps covered under mangrol Dalki Regional Supply Scheme Ta: Jalalpor Di: Navsari based on Kakrapar left bank canal for Five years excluding cost of enegry charges & Raw water charges.

Estimated Cost: 2,06,98,591.00

VOLUME- V

Conditions of Contract for O & M

Superintending engineer

Gujarat Water Supply & Sewerage Board

Surat Zone.

GENERAL CONDITIONS OF CONTRACT

FOR OPERATION AND MAINTENANCE

I - ADMINISTRATIVE PROVISIONS

The following additional clauses shall apply only during the Operation and Maintenance period.

1. DEFINITIONS AND INTERPRETATION:

1.1. Definitions:

In these Conditions of Contract ("Conditions") the following words and expressions shall have the meanings hereby assigned to them, except where the context otherwise requires.

1. "Applicable Law" means all national (or State) legislation, statutes, ordinances and other Laws and regulations and by laws of any legally constituted public authority.

2. "Contract" means the contract agreement, these conditions, the employer's requirements, the Tender and the further documents (if any) which are listed in the contract agreement.

3. "Contractor's Equipment" shall mean all equipment, instruments, tools, machinery and other appliances and things of the Contractor at the Site required for the fulfilment of the obligations of the Contractor under these Conditions.

4. "Contractor's Personnel" means the contractor's representative and all personal that the contractor utilizes on site, which may include the staff, labour, & other employees of the contractor and of each sub–contractor & any other personnel assisting the contractor in the execution of the work.

5. "Dispute" shall have the meaning given to it in Clause 15 of these Conditions.

6. "Employer's Risk" shall include the risks mentioned as employer's risks in the General Conditions and shall include any negligence or misconduct on the part of the Employer and also any event of Force Majeure as provided in Clause 12 of these Conditions.

7. "Employer's Personnel" means the Employer's Representative, the assistants and all other staff, labour and other employees of the employer and of the Employer's representative, and any other personnel notified to the contractor, by the employer or the employer's representative, as employer's personnel.

8. "Employer's Requirements" means the document entitled employer's requirements, as included in the contract, and any additions and modifications to such document in accordance with the contract. Such document specifies the purpose, scope, and / or design and / or other technical criteria, for the works.

9. "Facility" shall mean the entire system to be designed and constructed including the buildings, structures, ramps, pits, pipes, fencing, lighting, testing and analysis

Equipment, tools, computers, software programs, safety equipment, plant machinery, supplies, instruments and inventory incorporated therein, as well as all open areas within the Site, and including any additions, modifications, alterations, replacement and repairs as may be made thereto from time to time.

10. "Force Majeure" shall mean those events mentioned in Clause 12 of these Conditions.

"General Conditions" shall mean the conditions of tender issued by GWSSB for O&M works of projects.

b) "Good Operating Practices" means the standards, practices, methods and procedures as practiced internationally and in India conforming to all Applicable Law and that degree of skill, diligence, prudence and foresight which would reasonably be expected from a skilled and experienced contractor engaged in India in the same type of undertaking under the same or similar circumstances as the Contractor pursuant to these Conditions.

11. "O & M Contract" shall mean the contract or part of any other contract having scope of operation and maintenance of facilities, entered in between the Employer and the Contractor pursuant to these Conditions.

12. "O & M Completion Certificate" shall mean the certificate to be issued by the Employer on the completion of all the obligations of the Contractor under these Conditions.

a) "O & M Services" shall mean those services specified in Schedule [1] which the Contractor is obligated to perform under these Conditions.

13. "O & M Standard" shall mean the standards:

a) As set forth in the O & M Manual as accepted by the Employer,

b) As required pursuant to Applicable Law;

c) Set out in the Performance Guarantee; and

d) For the functioning of the Facility as required in accordance with the Contract including such requirements as may be mentioned in the Employer's Requirements.

e) For the functioning of the Facilities set forth in these Conditions.

14. "O & M Manual" shall have the meaning for manual of Operation and Maintenance.

15. "O & M Period" shall have the meaning set out in Clause.

16. "O & M Price" shall mean the amount stated in Price Schedule.

17. "Party" shall mean each of the Contractor and the Employer and Parties shall mean both of them together.

18. "Performance Guarantees shall mean the guarantee that the Facility shall be operated satisfying the minimum performance parameters set out in Schedule.

22. "Successor Contractor" shall have the meaning given to it in Clause.

23. "Site" shall means that specific area specified in the bid documents & shall include any other places as may be specifically designed by the employer from the time to time as forming part of the site.

24. "Taking over Date" shall mean the date of issue of the taking over certificate at the end of Operation and Maintenance period.

25. "Taking over Certificate" means the certificate to be issued by employer to the contractor at the successful completion of the Operation and Maintenance period.

26. "Termination" shall have the meaning given to it in Clause [13] of these Conditions.

1.2. Interpretation:

In these Conditions, except where the context requires otherwise.

a) words indicating one gender include all genders,

b) words indicating the singular also include the plural and words indicating the plural also include the singular,

c) Provisions including the word ″agree″, ″agreed″ or ″agreement″ require the agreement to be recorded in writing;

d) ″written″ or ″in writing″ means hand-written, type-written, printed or electronically made, and resulting in a permanent record;

e) The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions;

f) The words "include", "includes" and "including "is not limiting;

g) As used in these Conditions, all defined terms include the plural as well as the singular;

h) Any agreement, document or drawing defined or referred to in these Conditions shall include amendment, modification and supplement thereto and waiver thereof as maybe come effective from time to time, except where otherwise indicated;

i) Any reference to any Clause or Sub – Clause shall unless specified otherwise mean Clause or Sub-Clause of these Conditions; and

j) Any rights of the Employer to make any inspections or to review any document shall not create any obligation on the Employer to conduct such inspections or reviews to detect any errors, inaccuracies, ambiguities or other potential problems. No inspection or approval by or on behalf of the Employer shall operate as a waiver of any provision of these Conditions, any obligation of Contractor under these Conditions, or any of the rights of the Employer hereunder, except as expressly agreed in writing by the Employer.

1.3 Commencement and Duration of O & M Contract:

1.3.1. "The O & M Period" shall commence from the date of issue of Work order **The Employer may propose an extension to the O & M Period by giving 90 days prior notice to the Contractor**.

1.3.2. The O & M period may then be extended subject to mutual consent and on terms and conditions agreed to by both the Parties.

1.4. Applicable Law:

1.4.1. The Contractor shall comply with all Applicable Law relevant to the Contractor's Personnel, including Applicable Law relating to their employment, health, safety, welfare, immigration and emigration, and shall allow them all their legal rights.

1.4.2. The Contractor shall require his employees to obey all Applicable Laws, including those concerning safety at work.

1.4.3. In the event Employer becomes liable to any Employers Personnel, any governmental authority (including but not limited to any fines or penalties levied by or payable to such authority) or any other third party under the provisions of any Applicable Law resulting from Contractor's failure to comply with such Applicable Law, Contractor shall reimburse Employer for all payments required to be made by Employer to such Employers Personnel, governmental authority or any other third party, plus the actual expenses that Employer may incur in investigating, settling or defending any litigation or threatened litigation.

1.5. Assignment:

The Contractor will not be entitled to sub-contract any part of his obligation under these Conditions to any third party without prior approval of the Employer. Neither party may assign their rights and obligations under these Conditions without the consent of the other Party. However the Employer may assign any rights under these Conditions to any financial institution from whom any financial assistance/credit facilities have been availed by the Employer.

1.6. Safety:

1.6.1. Emergencies:

In the event of an emergency endangering life or property, the Contractor shall immediately take action as may be necessary to prevent, avoid or mitigate injury, damage or loss and shall, as soon as possible, report any such incidents, including his response thereto to the Employer.

1.6.2. Contractor Action:

The Contractor shall utilize his personnel to take such action as may be necessary in accordance with Good Operating Practices in the event of an emergency. Notwithstanding anything to the contrary herein, the Contractor may incur any expenditure or take any other operating actions as the Contractor deems to be necessary (in accordance with Good operating practices) in the case of emergencies affecting the Facilities or the operation of the Facilities to counteract the effects where the Contractor considers immediate action is required to safeguard lives or property. In case such emergency was caused due to an Employer's Risk then the Employer shall reimburse such reasonable expenses that might have been incurred by the Contractor in relation thereto acting in accordance with Good Industry Practices.

1.7. Notification:

1.7.1. In the event of an emergency the Contractor shall forthwith notify the Employer of the emergency, the expenditures made and the operating actions taken.

1.7.2. If the Employer considers that an emergency has arisen in relation to the Facilities, the Employer may give written notice to the Contractor specifying the nature of the emergency which it has identified and the manner in which it requests such emergency to be rectified. The Contractor shall rectify such defect with all due diligence. If such emergency is on account of an Employer's Risk then the Contractor shall be reimbursed all costs and expenses reasonably incurred by the Contractor for any actions taken by it pursuant to such direction or notice. If the Contractor fails to comply with such direction or notice promptly, the Employer shall be entitled to procure that it or any third party takes such actions as may be necessary to remedy such breach by the Contractor. Any costs that may be incurred by the Employer in this regard shall be reimbursed to him in full by the Contractor and shall be a debt due to him from the Contractor.

1.8 Inspections:

Notwithstanding any provisions of these Conditions and without prejudice to any of the other rights vested by the Contractor under these Conditions, The Employer shall have the right at all times to inspect the Facilities and the Contractor shall co-operate in every manner with the representatives of the Employer inspecting the Facilities and allow them access to every part of the Facilities and produce any records requested.

2. OPERATION OF THE FACILITIES:

2.1. Operation of the Facilities:

2.1.1. The Employer appoints the Contractor to perform and undertake the O & M Services and all other obligations set out and in accordance with these Conditions during the O&M Period. The Contractor accepts the appointment and acknowledges a duty to perform such obligations.

2.1.2. The Contractor shall be in complete charge of and have custody and control over and responsibility for the Facilities, and the Contractor shall perform or cause to be performed on behalf of the Employer all O & M Services for the Facilities and shall supply or cause to be supplied all materials required therefore in accordance with the O & M Standard.

2.1.3. The Contractor shall also acknowledge that the Employer and the Employer's Personnel and other contractors may be carrying out work at the Facilities and shall Endeavour to fully co-operate and work in a manner so as not to cause any obstruction or hindrance to them.

2.1.4. The Contractor shall remain an independent Contractor and not an agent, employee and nothing in these conditions or the O & M part of contract shall be deemed to create a joint venture between the Employer and the Contractor.

2.2. Responsibility of the Contractor:

The Contractor shall be solely and exclusively responsible for:

2.2.1. Obtaining all necessary permits and consents required by Applicable Law or any governmental authority for the Contractor to carry out the O & M Services;

2.2.2. The procurement of all goods and services necessary to ensure compliance with its obligations under these Conditions,

2.2.3. Making available suitably qualified and trained personnel to perform the O & M Services;

2.2.4. Perform the O & M Services in accordance with the O & M Manuals and maintain the Facilities in good repair and condition and ensure that the Facilities are well and suitably maintained at all times in accordance with Good Operating Practices and in accordance with these Conditions;

2.2.5. Procuring and administering all chemicals and other consumables, tools, equipment, spare parts and other materials (which shall be of good quality and unused) necessary for the operation and maintenance of the Facilities;

2.2.6. Maintaining a system of records to identify all inventories related to the Facilities and preparing and providing to the Employer a complete accounting of such inventory for every fiscal quarter;

2.2.7. Arranging for the testing and recalibration of all scales, meters, gauges and other measuring devices at the Facilities on an annual basis and maintain the calibration certificate as records unless otherwise stated in the O & M Contract; and

2.2.8. for providing any and all relevant information required by the Employer.

3. DUTY OF CARE BY THE OPERATOR AND PERFORMANCE STANDARDS:

3.1. Duty of Care:

3.1.1. The Contractor shall manage, operate and maintain the Facilities in accordance with Good Operating Practices and in accordance with the O & M Standard so that the Facilities are capable of meeting the outputs and specifications set out in the Contract.

3.1.2. The Contractor shall take full responsibility for the care of the Facility from the date of start of o & M period, till the end of the O & M Period.

3.1.3. If any loss or damage happens to the facility, during the O & M Period due to any breach by the Contractor of any of his obligations under these Conditions including any wilful misconduct, negligence and non-conformity with Good Operating Practices then the Contractor shall, at his own cost, rectify such loss or damage so that the facility conforms in every respect with the provisions of these Conditions.

3.1.4. The Employer shall be liable only in case of any damage caused due to any Employer's Risk.

4. OBLIGATIONS AND RESPONSIBILITIES OF THE EMPLOYER:

The Employer shall employ the Contractor to provide the O & M Services and shall:

4.1. Follow the issue of certificate of successful commissioning, hand-over the custody of the facilities to the Contractor for its use during the O & M Period; and

4.2. Pay the Contractor all sums required to be paid in accordance with the terms of these Conditions. Notwithstanding anything else herein contained the Employer may set off any

sums owed by the Contractor under the Contract for monies owed to the Contractor by the Employer under these Conditions or as a debt due from the Contractor.

5. REPRESENTATIONS AND WARRANTIES OF THE CONTRACTOR:

The Contractor hereby represents for the benefit of the Employer as follows:

5.1. Performance of O & M Services:

5.1.1. That the Contractor has the required skills and capability to perform, and shall diligently perform, the O & M Services in a high-quality, timely and professional manner utilizing sound engineering principles and project management procedures in accordance with Good Industry Practices;

5.1.2. That the Contractor shall perform his obligations hereunder in accordance with the requirements of these Conditions and shall meet the Performance Guarantee; and

5.1.3. That it shall not use any spare parts or material that are not new and which shall be of a quality that is in accordance with Good Industry Practices.

5.2. Knowledge of Adverse Information:

5.2.1. As of the Commencement Date, Contractor is not aware of any facts, conditions or events which would affect the ability of Contractor to provide the O & M Services in accordance with these Conditions.

5.2.2. Contractor has familiarized itself with the nature and extent of the O & M Services required to be provided under these Conditions and with all other requirements under Applicable Law

5.3. Organization, Standing and Qualification:

Contractor is validly existing and in good standing under Applicable Law and has all necessary power and authority to carry on its business as presently conducted and to perform its obligations under these Conditions. Contractor is, or will be prior to the date on which the O & M Services are to be commenced duly qualified or licensed to provide these services.

5.4. Due Authorization:

5.4.1. Each of the execution, delivery and performance by the Contractor of all contracts entered into pursuant to these Conditions shall be duly authorized by all necessary action on the part of Contractor.

5.4.2. Neither the execution and delivery by Contractor of the O&M Contract, nor the consummation by Contractor of any of the transactions contemplated hereby, requires the consent or approval of, the giving of notice to, the registration with, the recording or filing of any document with, or the taking of any other action in respect of, any governmental authority or agency, except:

a) Such as have been duly obtained, given, registered, recorded, filed or taken and are in full force and effect or are not yet required; and

b) Filings and recordings expressly required pursuant to the O & M part of Contract. Contractor holds, or will obtain, any and all licenses, permits and approvals on a timely

basis. Contractor has no reason to believe that any of those not yet required will not be readily obtainable or done in the ordinary course of business upon due application there for

5.5. Litigation:

In the aggregate, there are no pending or, to the knowledge of Contractor, threatened actions, investigations or proceedings before any court, governmental authority or arbitrator, which would have material adverse effect on the ability of Contractor to perform its obligations under these Conditions

6. INSURANCE:

6.1. General Conditions:

6.1.1. Without limiting the Contractor's obligations, responsibilities and liabilities under these Conditions, the Contractor shall be required to provide and maintain in full force and effect, at his expense the insurance coverage's specified in Schedule [5] throughout the O&M Period. Any deductibles on the insurance shall be to the account of the Contractor.

6.1.2. Maintenance of insurance shall not relieve the obligation of the Contractor to remedy or repair any damage to the Facility in case such damage is caused due to the fraud, negligence, willful misconduct or breach of any obligations of the Contractor under these Conditions(including failure to perform the O & M Services in accordance with Good Operating Practices)at the Contractors cost promptly and regardless of the extent of settlement of claims by the underwriters or the time taken for settlement of claims. Any amounts not insured or not recovered from the insurers shall be borne by the Contractor to the extent any such liability or damage is caused due any breach of any obligations of these Conditions (including failure of the Contractor to perform the O & M Services in accordance with the Good Operating Practices) by the Contractor or any willful misconduct, negligence on the part of the Contractor.

6.1.3. The terms of the Insurance shall be approved by the Employer.

6.1.4.The Contractor within the 14 days from work order shall submit to the Employer evidence that the insurances required under Schedule [5] of these Conditions has been obtained as approved by the Employer.

6.1.5. The Contractor shall not make any alteration to the terms of any insurance without the prior approval of the Employer. If the Contractor fails to effect and keep in force any of the insurance it is required to effect and maintain under these Conditions, or fails to provide satisfactory evidence and copies of policies in accordance with this Sub-Clause, the Employer may affect insurance for the relevant coverage and pay the premiums due and may claim the same from the Contractor.

The insurances;

a) shall be in the name of the Employer and the Employer shall be the sole loss payee,

b) shall be extended to cover liability for all loss and damage to the Employer's property arising out of the Contractor's performance of his obligations or failure to do so under these Conditions and any fraud, gross negligence or wilful misconduct on his part, and

6.1.6. If the Contractor fails to effect and keep in force insurance which is required to be maintained under these Conditions, and the Employer neither approves the omission nor effects insurance for the coverage relevant to this default, any moneys which would have been recoverable pursuant to such insurance shall be paid by the Contractor.

6.1.7. The insurance shall cover all the electrical items, mechanical items, Instrumentation &automation items, all civil works, Storage structures etc. The insurance for the work of transmission main is optional. Since the responsibility of safety of all work lies with contractor, contractor may prefer to take the insurance of optional item also if deemed fit.

6.1.8 The natural calamity & fire etc. (standard perils) insurance shall be limited to Electrical & Mechanical equipments / assets of the pumping station installed indoor and / or outdoor. The beneficiary shall be GWSSB on A/c of bidder and "Standard Workman Compensation Policy" of manpower engaged for the work by the bidder should be on Account of the bidder c/o GWSSB. In short the bidder has to take adequate insurance cover for electro mechanical equipments (value shall not be less than estimated and / or accepted value) and man power engaged for O & M work as per rates / monthly amount as per prevailing minimum wages act without fail. It would be contractor's sole responsibility to see that insurance policies are bought & renewed in time. Failure to comply with this condition the contractor shall be entirely responsible for any litigation & financial liabilities.

7. INDEMNIFICATION:

7.1. Loss or Damage to Facilities:

The Contractor shall at its own expense make good any physical loss or damage to the Facilities occasioned by it in the course of the performance of its obligations under these Conditions if and to the extent such loss or damage is caused by the negligence, willful default or breach of statutory duty or failure to follow Good Industry Practices by the Contractor

7.2. Other Loss or Damage:

7.2.1. Except as otherwise stated in this Clause 7.2 or covered by Clause 7.3, the Contractor shall indemnify, defend and hold harmless the Employer against any and all liabilities, losses, damages and claims of whatever kind and nature, including all related costs and expenses incurred in connection therewith, in respect of personal injury to or death of third parties or any employee of the Employer or the in respect of loss of or damage to any third party property or property belonging to employee of the Employer by:

i) any breach by the Contractor of its obligations hereunder and

ii) any negligence, willful default or breach of statutory duty on the part of Contractor

7.2.2. Except as otherwise stated in this Clause 7.2 or covered by Clause 7.3, the Employer shall indemnify, defend and hold harmless the Contractor for all claims and losses of whatever kind and nature, including all related costs and expenses incurred in connection therewith, in respect of personal injury to or death of third parties or of any person employed by the Contractor in respect of loss of or damage to any third party property or property belonging to any person employed by the Contractor to the extent that the same arises out of any Employer's Risk

7.3. Accidents or Injury to Workmen:

7.3.1. The Contractor shall indemnify, defend and hold harmless the Employer or any Employer's Personnel against any and all claims for loss, damage and expense of whatever kind and nature (including all related costs and expenses) in respect of the death of or injury to any person employed by the Contractor in connection with the performance of the O&M Services and obligations hereunder except to the extent that such death or injury is caused by an Employer's Risk.

7.3.2. Neither Party shall be liable to the other Party for loss of use of the Facilities, loss of profit, loss of any contract or for any indirect or consequential loss or damage which may be suffered by the other Party in connection with the Contract, other than under Sub-Clause [13] and this Clause [7].

7.3.3. The total liability of the Contractor to the Employer, under or in connection with these Conditions other than as provided in Clause 7.3.2 & 14 shall not exceed the sum of the O & Price and the Delay Damages payable under these Conditions.

7.3.4. This Sub-Clause shall not limit liability of the Contractor in case of fraud willful default, gross negligence and liabilities arising due to breach of Applicable Law and the liability under another Clause of these Conditions that might impose a greater liability on the Contractor

8. INSPECTION:

8.1. General Provisions:

8.1.1. The Employer may check the operation of the Facilities or designate an organization of his choice to carry out inspections regularly. The Employer or the organization appointed by him shall check that the Contractor is performing the tasks for which he is responsible with due diligence. The Contractor shall at his cost provide all the assistance the Employer requires to complete these inspections

8.1.2. Before any inspection, the Employer shall give prior notice to the Contractor, indicating the name(s) of the person(s) empowered to carry out such inspection in the name of the Employer

8.2. Measurement and Analysis:

8.2.1. The Employer has the right to perform any analysis or inspection he deems necessary.

Before any inspection, the Employer shall give a prior written notice to the Contractor.

8.2.2. The water quantity, for any such test, analysis or inspection shall be measured by flow-meters installed at the Facility, which are acceptable to the Employer, provided they are maintained and calibrated as per requirements of this contract.

8.2.3. Other parameters like Pressure temperature and speed shall be measured by certified calibrated meters provided by the contractor and, which are acceptable to the Employer

8.2.4. The flow meters shall be inspected and certified upon their availability by the Employer and the Contractor. Thereafter, the said meters shall be tested and their accuracy verified once in every six (6) months by the Contractor. After each inspection, the flow-meters shall both be

sealed in the presence of representatives of the Employer and the Contractor in a manner that is adequate to prevent the tampering of said meters by any person.

8.2.5. The Contractor shall be responsible for the security and protection of flow-meters at the designated point. If there is any malfunctioning of the meters, it should be repaired at the Contractor's cost, as per manufacturer's technical recommendations.

8.3. Plant Complex Visits:

8.3.1. At the end of each month, or at the initiative of the Employer, a visit shall be organized so that both Parties can check the condition of the installations at the Facilities.

8.3.2. A report shall be drawn up to record the opinions of both Parties. The Employer reserves the right to call in equipment manufacturers or specialized technicians for these visits.

8.3.3. These visits shall provide an opportunity for examining maintenance programs and operating procedures and improvements requiring additional investments.

8.3.4. Any test, visit, analysis or inspection and any approval thereof shall not in any way alter/modify or dilute the responsibility of the Contractor to fulfil his obligations under these Conditions.

9. RECORDS AND REPORTS:

9.1. Operating Records and Data:

The Contractor shall:

9.1.1. Prepare and maintain, on a current basis and in accordance with generally accepted Indian accounting principles, proper, accurate and complete books and records and accounts of all transactions related to the Facilities including a log book at the site which shall contain inter alia the following details

a) Reading from the different meters, indicators and recorders (including but not limited to consumption of energy, volume of water conveyed, operating times of the different items of equipment etc which may be updated on a daily basis); and

c) Report of visits by persons other than those of the Employer and the Contractor to the Facility

9.1.2. Establish and maintain a weekly and monthly reporting system to provide storage and ready retrieval of operating data relating to the Facilities, including such information necessary to verify calculations made pursuant to these Conditions or the O & M part of contract and provide the same to the Employer on a monthly basis

9.1.3. Provide to the Employer or such persons notified by it access to the Facilities and to data in relation to the Facilities, at all times.

9.1.4. At the Employer's request, at the end of every month, make a copy of the system performance data for that month as recorded by the instrument and control system on CDs / DVDs and printed document there from and deliver the same to the Employer with one week.

9.1.5. Provide support to the Employer to meet the data requirements of all competent authorities and under Applicable Law

9.2. Reports:

9.2.1. The Contractor shall submit the reports mentioned in Schedule [4] at times indicated in the said Schedule.

9.2.2. The Contractor shall also provide the Employer with such reports as are required by the Employer and shall comply with all reporting requirements prescribed under these Conditions and the O & M part of Contract. In addition the Contractor shall submit the following information to the Employer.

9.2.3. Upon obtaining knowledge thereof, shall submit prompt written notice of:

i) Any litigation or material claims, disputes or actions, threatened or filed, concerning the Facilities or the services to be performed hereunder;

ii) Any refusal or threatened refusal to grant, renew or extend or any action pending or threatened that might affect the granting, renewal or extension of any clearance, permit or license;

iii) Notwithstanding the aforementioned materiality, all penalties or notices of violation issued by any authority under Applicable Law;

9.3. The Contractor shall promptly submit to the Employer any material information concerning new or significant aspects of the operations of the Facilities, any material complaint about the Facilities from any person or entity with a benefice complaint who complains directly tithe Contractor and, upon Employer's request, shall promptly submit any other information concerning the Facilities or the services performed by the Contractor.

9.3.1. The Employer may from time to time specify any changes to be made to any of the format of any report or plan required hereunder.

9.3.2. If the Contractor is required by any Applicable Law to produce any projection, report or another document relating to the provision of the O & M Services of the Facilities or the Employer requests a report regarding other information relating to the Facilities, the Contractor shall prepare a draft of such document at the request of the Employer, as soon as practicable and in any event within any time limit prescribed by Applicable Law.

9.3.3. If the Contractor is required by any Applicable Law to produce any projection, report or another document, it shall prepare such report diligently and submit the same to the Employer as soon as possible thereafter. Wherever practicable, such reports shall be submitted to the Employer for review seven days before the same is issued. The Contractor shall take into account any comments or revisions proposed by the Employer thereon.

9.4. Procurement:

9.4.1. The Contractor is responsible for the procurement of all goods and services necessary to ensure compliance with its obligations under these Conditions.

9.4.2. The Contractor shall procure and keep in readiness spare parts required for urgent repairs, materials, supplies and other consumable items, and maintains an adequate inventory thereof Facilities.

9.4.3. The Contractor shall submit a report for every fiscal quarter to the Employer reflecting the status of the inventory for spare parts, materials and other consumable items.

9.4.4. The Contractor shall procure the Alum, Lime and Chlorine Gas. Necessary arrangement for procurement of Chlorine Gas in tonners/cylinders shall be made by the contractor. No extra charges shall be paid for hiring/Purchasing the tonners/Cylinders.

10. PAYMENT:

10.1. The Contractors request(s) for payment shall be made to the GWSSB in writing, accompanies by invoice(s) along with presence sheet of personnel of particular month duly certified by our Engineer on site, claims etc. as appreciate.

10.2. Payment shall be made by GWSSB as per procedure subsequent to the submission of such invoice(s)/ claim(s) by the Contractor.

10.3. The GWSSB will deduct from the amount payable to the Contractor, any amount paid by GWSSB on behalf of the Contractor (e.g. telephone bills, DGVCL penalty for Power factor or any other dues and liquidated damages as per clause and, as per tender terms and condition. Any telephone bills submitted by telephone department, the payment of telephone bills will be borne by Contractor.) GWSSB will provide telephone facilities on site.

10.4. Contractor will provide Security Guards services for all assets in GWSSB head works premises for 24 hours of a day and 365 days of the year for the whole contractor period'

10.5. The contractor will get O & M work payment only for the deployed staff and insurances during the period of defect liability for pumping machinery & electromechanical works. The base for payment will be approved estimated rates

11. LIQUIDATED DAMAGES:

11.1. For quantity of water reaching entry of ESRs and Sumps

The System shall be capable to deliver the designed capacity of water demand at the respective GSRs and ESRs. However in the initial stage the demand may not get developed fully, due to downstream use being less. In such case the bidder shall give the full test for the system as per the system design for a period of minimum 3 days in a month during the O&M period of ten years. For the regular supply during the O&M period, the bidder shall get the demand requirement from the employer and run the system accordingly as per the varying demand during the O&M period.

If the quantity of water received at sump/ESR inlet is less by more than 1.5% of the designed and planned demand as above during that period then the liquidated damages will be deducted at rate of Rs. 40/- per 1000 liters of short fall. However no liquidated damages shall be recoverable, if there is no supply from the source of water as well as from the upstream reaches.

11.2. Leakages in pipeline.

The contractor shall ensure that leakages from transmission mains due to faulty air release valves, scour valves, joints, damage to pipeline are urgently attended.

If the quantity of water received at receiving sump/ water treatment plant inlet is less by more than 3% of the water pumped from the source pumping station, then the liquidated damages will be deducted at rate of Rs. 40/-per 1000 liters of short fall.

11.2A. for the quality of treated water reaching WTP Clear Water reservoir

If the Contractor fails to maintain any parameter of the treated water quality within the guaranteed limits as per relevant IS specifications, the monthly instalment due shall be reduced on pro-rata basis for the number of days water quality falling below the guaranteed requirements.

11.3. For Higher Power consumption, due to lower pump efficiency:

At Testing / Commissioning stage, the following minimum guaranteed parameters must be achieved for the pumps and motors installed for this work shall be as under:

a. For each pump, the minimum efficiency shall be as mentioned in contract / HIS.
b. For each motor, the minimum efficiency shall be as per contract.

Note: No negative tolerance shall be allowed in above.

During Testing/ Commissioning, each pump and motor set shall be tested and efficiency shall be worked out up to TWO Decimal. The combined efficiency of each pump and motor set shall also be worked out. If the guaranteed combined efficiency of each pump motor set found lesser than the specified above, then the pump and/or motor set shall be liable for rejection. Therefore, the contractor shall rectify/ repair / replace the system/ part and retesting/ re- commissioning to be carried-out for the pump and/or motor set within a week period. Thereafter, In case, the guaranteed combined efficiency of each pump and motor set not meeting the above guaranteed combined efficiency, then the pump and/ or motor set shall be rejected. No any claims from the Contractor against this shall be entertained.
During O&M Period: Minimum guaranteed combined efficiency of each Pump and motor set during the O & M period of 10 years as below table:

	At Commissioning	At the end of 3rd year of operation	At the end of 4th year of operation	At the end of 5th year of operation
Combined efficiency of pump sets (η)	As per price bid / contract (is)	ηs1 =is - 0.25	ηs2 = ηs1 - 0.25	ηs3 = ηs2 - 0.25

Power input at each motor (KW)	$\frac{Q \times H \times 100}{367.2 \times is}$	$\frac{Q \times H \times 100}{367.2 \times \eta s1}$	$\frac{Q \times H \times 100}{367.2 \times \eta s2}$	$\frac{Q \times H \times 100}{367.2 \times \eta s3}$

Where,

H = Total Design Head in meter as per the Contractor's design.
Q = Total Design Flow

is= Efficiency as specified in price bid,

ηs1= Corrected Efficiency at end of Third year of operation
ηs2= Corrected Efficiency at end of Fourth year of operation
ηs3= Corrected Efficiency at end of Fifth year of operation

The energy audit and efficiency measurement of combined pump and motor set shall be carried out as per the above schedule and minimum guaranteed combined efficiency shall be achieved. It shall be carried out at the period specified in the above table.

In case, the guaranteed parameters observed lesser than the above specified table, then the contractor is liable for liquidated damages for loss in Capitalized cost and the same will be recovered from contractor bills/ Security Deposit as under:

a. Liquidated damage at end of 3rd year (in Rs): {(Actual Power consumption at motor input observed at the end of 3rd year in KW) – (Power consumption at motor input as mentioned in above table corresponding to defect liability period)} x Rest. 22,050/- per kW (one time).

b. Liquidated damage at end of 4th Year (in Rs): {(Actual Power consumption at motor input observed at the end of 4th year in KW) – (Power consumption at motor input as mentioned in above table corresponding to 4th year figure)} x Rs. 22,050/- per kW (one time).

c. Liquidated damage at end of 5th Year (in Rs): {(Actual Power consumption at motor input observed at the end of 5th year in KW) – (Power consumption at motor input as mentioned in above table corresponding to 5th year figure)} x Rs. 22,050/- per kW (one time).

The above liquidated damages (mentioned in the above (a) to (c)) are applicable for the each pump motor set, which are being procured for the project.

The GWSSB is at the liberty to carry out energy audit and efficiency measurement at any intermediate time. If any reduction in the efficiency found compare to the minimum efficiency (for such intermediate period, the specified minimum efficiency shall be worked out on the prorate basis), the contractor shall have to pay liquidated damages as per the prescribed formula for the difference in efficiency (i.e. measured efficiency).

The energy audit shall be carried out as per the above schedule, from the Government agency approved by the GWSSB.

Note: If the combined efficiency found better than the above guaranteed parameters, no credit or benefit will be given to the contractor.

11.4. For delay in Restoration:

The Restoration Period shall be subject to the following liquidated damages & penalties for its failure to carry out.

Reno.	Type of work Restoration	period
1	Replacement of sluice valve/Sluice Gate	1 day
2	Cleaning of clarifier/Sump/ESR	2 days
3	Minor Breakdown /Repairing	12 Hrs
4	Pump breakdown	3 days
5	Motor rewinding	5 days
6	Replacement of pipes of all diameter & type	2 days
7	Replacement of Valves/Specials	1 day
8	Pressure Gauge/Water meter for all dia and all types of meter	1 day

In case of non comply of the restoration period as above the recovery / deduction at the rate of Rs. 250/- per Hour shall be made from the payment due for first two hours delayed and their after Rs.5000/- per hours shall be made from the payment due for stand by pump set only. For working pump set including Electrical accessories like control panel board etc., the recovery shall be at the double rate than stand by pump set.

11.5. For the non-compliance of employment of key personnel:

If the successful bidder does not recruit/depute the key personnel identified as per schedule, then liquidated damages will be deducted at double the rate of applicable scale of GWSSB or the rate quoted, whichever is higher.

12. FORCE MAJEURE:

In this Clause, ″Force Majeure″ means an event or circumstance, which materially and adversely affects the ability of the affected Party to perform its obligations.

i) Which is beyond a Party's control,
ii) which such Party could not reasonably have provided against before entering into the O & M part of Contract;
iii) which, having arisen, such Party could not reasonably have avoided or overcome, and

iv) which is not attributable to the other Party, Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) above are satisfied:

v) war, hostilities (whether war be declared or not), invasion, act of foreign enemies)

vi) rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war,

vii) riot, commotion, disorder, strike or lockout by persons other than the Contractor's Personnel and other employees of the Contractor;

viii) As result of war, explosive materials, harmful radiation or contamination by radioactivity, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio- activity, and

ix) Natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity. Heavy rainfall, cyclone, strike and lockout.

12.1. Notice of Force Majeure:

12.1.1. If a Party is or will be prevented from performing any of its obligations under these Conditions by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 7 days after the Party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure.

12.1.2. The Party shall, having given notice, be excused performance of such obligations for so long as such Force Majeure prevents it from performing them.

12.1.3. Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract.

12.2. Duty to Minimize Delay:

12.2.1. Each Party shall at all times use all reasonable endeavours to minimize any delay in the performance of the Contract as a result of Force Majeure.

12.2.2. A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.

12.2.3. Notwithstanding anything else herein contained the Employer may terminate the O & Part of Contract if the Force Majeure event continues for more than a period of 90 days.

13. TERMINATION:

Termination shall mean the termination of the O&M part of Contract by the Employer or the Contractor in accordance with Clause 13.1 or 13.2 respectively.

13.1. Termination by Employer:

The Employer may terminate the O & M part of Contract by notice on:

i) the dissolution or insolvency of the Contractor, pursuant to an order of a court or the bankruptcy of the Contractor; or;

ii) if 45 days having passed since the Contractor is in material breach of his obligations under these Conditions, or

iii) if the Contractor ceases to carry on its business; or

iv) abandonment;

v) The subsisting Force Majeure event as provided in Clause 12.2.3 above.

13.2. Payments upon Termination:

13.2.1. Upon termination or as soon as practicable thereafter an account shall be taken of the net amount owing from the Employer to the Contractor or from the Contractor to the Employer (as the case may be). The Employer shall forthwith pay to the Contractor (if the balance is due tithe Contractor) all moneys due to the Contractor. If the account shows a balance due to the Employer from the Contractor, the Contractor shall forthwith pay any such balance to the Employer.

13.2.2. As part of the calculation made pursuant to clause 13.1 of the amounts due to the Contractor on Termination, the following amount shall be taken into account.

13.2.2.1. The portion of the O & M Price outstanding and payable by the Employer for the period prior to the Termination;

13.2.2.2. Any Delay Damages or indemnities for which the Contractor would be liable under these conditions up to the date of Termination;

13.2.2.3. Any other amounts due to the Employer under these Conditions by the Employer including return of any amount of the O & M Price paid in advance by the Employer to the Contractor under Clause [10].

13.3. In case of a Termination by the Employer in accordance with Clause 13.1 the Employer may recover other than the amounts due to him under Clause 13.2.2.2, any costs incurred by him in finding any replacement contractor

13.4. Successor to the Contractor upon Termination:

13.4.1. The Contractor shall use all endeavours to facilitate the appointment and commencement of duties of any person to be appointed by the Employer to operate and maintain the facilities (the “Successor Contractor”) so as not to disrupt the normal Operation & Maintenance of the facilities and shall provide full access to the Facilities and to all relevant information, data and records relating thereto by the Successor Contractor and its representatives and accede to all reasonable requests made by such persons in connection with preparing for taking over the Operation & Maintenance of the Facilities;

13.4.2. Promptly after Termination, the Contractor, shall deliver to (and shall, with effect from Termination, hold on trust for and to the order of) the Employer or (if so required by the Employer by written notice) to the Successor Contractor all property in its possession or under its control owned by the Employer or leased or licensed to the Employer;

13.4.3. The Contractor shall transfer to the Successor Contractor, as from the date of Termination, its rights as the Contractor under all contracts entered into by it in the performance of its obligations under these Conditions or relating to the Operation & Maintenance of its obligations under these Conditions or relating to the Operation & Maintenance of the Facilities. Pending such transfer, the Contractor shall hold its rights and interests there under for the account and to the order of the Successor Contractor.

13.4.4. The Employer shall be reimbursed any cost and expenses incurred by the Employer due to default of the Contractor in discharging its obligations under this Clause [13].

13.4.5. The Contractor shall, upon Termination of the O & M part of Contract, co-operate with the Employer and the Successor Contractor and comply with all reasonable requests thereof, including the execution of documents etc.

13.4.6. Upon Termination of the O & M part of Contract on expiry of the terms of the O & M part of Contract, the Parties agree that: -

13.4.7. The Contractor will use reasonable efforts to ensure a transition to the next Contractor that will avoid operating difficulties for the Facilities.

13.4.8. For a six (6) month period after Termination or six (6) months prior to the expiration of the O &M part of Contract, the Contractor shall, at his expense, provide sufficient assistance to the Employer in the hiring and training of replacement personnel for those Facilities.

13.4.9. Notwithstanding anything else herein contained the Employer shall be entitled to terminate the O & M part of Contract, at any time at the Employer's convenience, by giving notice of such termination to the Contractor. The termination shall take effect 28 days after issuance of the notice of termination.

13.4.10. On the expiry of the O & M Contract or Termination of the O & M Contract, all the installations, works and equipment placed under the Contractor's responsibility shall behanded over to the Employer, at no cost, in good working order, except for normal wear and tear. The Employer may perform any inspections; tests or expert appraisals he shall consider necessary with a view to checking that the property is in good working order. The Contractor shall also hand over any unutilized spares, consumables etc. Purchased for the Facilities.

13.4.11. At the end of O & M Period, the Contractor shall be entitled to receive an O & Completion Certificate within thirty (30) days

13.4.12. The delivery of such O & M Completion Certificate will relieve the Contractor from his responsibility as regard to the operation & maintenance of the Facilities and confirm that the Contractor has fulfilled all of his obligations under these Conditions.

14. CONFIDENTIALITY AND INTELLECTUAL PROPERTY RIGHTS:

14. 1. Confidential Information:

Subject to Clause [14.2], the Contractor shall at all times during the O & M Period and for a period of two years after that:

14.1.1. use all efforts to keep all information regarding the terms and conditions and any data or information acquired under or pursuant to these Conditions confidential and accordingly shall not disclose the same to any other person; and

14.1.2. not use any document or other information (whether technical or commercial) obtained by them it by virtue of these Conditions or the Contract concerning the Employer's undertaking for any purpose other than performance of the obligations under these Conditions; Provided that the provisions of this Clause 14.1 shall not apply to information, which at the time of disclosure was in the public domain other than by breach at the foregoing obligations of confidentiality.

14.2. Disclosure of Confidential Information:

The Contractor shall not be entitled to disclose the terms and conditions of these Conditions and any data or information acquired by it under or pursuant to these Conditions without the prior written consent of the Employer unless such disclosure is made in good faith:

14.2.1. To any outside consultants engaged by or on behalf of the Contractor and acting in that capacity, having made them aware of the requirements of this Clause [14].

14.2.2. To the lenders, any security trustee, any bank or other financial institution and its advisers from which the Contractor is seeking or obtaining finance, having made them aware of the requirements of this Clause [14].

14.2.3. to the extent required by Applicable Law;

14.2.4. to any insurer under a policy of insurance; or

14.2.5. to the Contractor's Personnel having made them aware of the requirements of this Clause [14];

14.3. Information:

The Contractor shall:

14.3.1.make available to the Employer without charge such materials, documents and data of any nature (except any materials documents and data protected by legal privilege or which is subject to any duty of confidentiality to any third party) acquired or brought into existence in any manner whatsoever by it as the Employer may request for the purposes of exercising its rights or carrying out its duties in respect of the Facilities or exercising its rights under or performing its obligations under these Conditions.

14.3.2. make available to the Employer other such materials and documents and data acquired or brought into existence by third parties as the Employer may request for the purposes referred to in sub-paragraph (I) above

14.4. Third Party Intellectual Property:

The Contractor shall:

14.4.1. Procure that any intellectual property owned or developed by third parties and utilized by the Contractor in connection with the performance of its obligations under these Conditions is licensed to the Contractor for the purposes of the Operation & Maintenance or repair of the Facilities and otherwise for the purposes of the Facility; and

14.4.2. Ensure that the Contractor shall have the right to sub-license that intellectual property to the Employer and any Successor Contractor for use in connection with the operation, maintenance and repair of the Facilities. These licenses should survive termination under these Conditions. The Contractor shall grant all such sub-licenses. If any fee is payable to the licensor in consideration of any such sub-license, the Contractor shall pay such amount during the O & M Period and each such license shall be irrevocable

14.4.3. Indemnify and hold harmless the Employer against any action, claims, damages, losses caused to the Employer by the owner of the Intellectual Property due to the allegedly unauthorized or improper use of this intellectual property by the Contractor for the fulfilment of his obligations under these Conditions.

14.5. Successor Contractor:

If the licenses and sub-licenses of intellectual property granted under this Clause respectively shall survive termination of the O & M part of Contract in accordance with the terms of this Clause, the Employer shall be permitted to grant sub-licenses of intellectual property licensed to it there under to any Successor Contractor of the Facilities for use only in connection with the operation, maintenance and repair of the Facilities provided that such Successor Contractor concludes an agreement with the Contractor or, as the case may be, the licensor of any such intellectual property on terms which it may reasonably require any payment in connection with those sub-licenses. Where intellectual property has been sub-licensed to the Employer under this Clause and such sub-license is not subject to revocation by the Contractor there under, the Contractor shall take such actions as the Employer may request in connection with the grant of licenses to any Successor Contractor for the purposes set out above.

15. ARBITRATION AND DISPUTE RESOLUTION:

A) Settlements of Disputes :

i. If any dispute of any kind whatsoever may arise between the Employer and the Contractor in connection with or arising out of the Contract, including without prejudice to the generality of the foregoing any question regarding its existence validity or termination, or the execution of the works whether during the progress of the work or before or after the termination, abandonment or breach of the contract, the either parties shall have to raise/ refer their disputes/ differences / claims in writing to the other party, within a period of 30 days on occurrence of such events, to resolve any such dispute or difference.

ii. The contractor shall have to refer their disputes to the concerned Superintending Engineer. After receipt of the dispute from the contractor under this clause, the Superintending Engineer In-charge of works shall have to submit their report to the Chief Engineer within a period of 90 (Ninety) days. The Chief Engineer shall offer an opportunity to the contractor to be heard and to furnish evidence in support of their disputes within 30 (Thirty) days after the

receipt of the disputes duly compiled by Superintending Engineer. After hearing the contractor regarding their disputes along with their documentary support and the concern Superintending Engineer & Executive Engineer in charge of the work, the Chief Engineer shall give decision within a period of 120 (One Hundred Twenty) days or the contractor is dissatisfied with the decision within 120 (One Hundred Twenty) days after the contractor has been heard. If The Chief Engineer does not give decision within 120 (One Hundred Twenty) days or the contractor is dissatisfied with the decision of the Chief Engineer, the contractor shall within 30 (thirty) days after receiving the instruction or decision, appeal to the Member Secretary, GWSSB. After hearing both the parties the Member Secretary, GWSSB will give reasonable decision within 180 (One Hundred Eighty) days from the date of receipt of appeal by the contractor. The decision of the Member Secretary, GWSSB shall be final and binding on both the parties. If the Member Secretary, GWSSB does not give decision within 180 (One Hundred Eighty) days after the date of appeal by the contractor, the contractor will have right to refer the dispute to arbitration tribunal as per provision of clause "Arbitration".

B) Arbitration :

i. Subject to Clause (A) mentioned above and in the event of any dispute or difference arising out of or in any way relating to all concerning these contracts or the construction or effect of these contracts shall on the initiative of either party to the contract be referred to "The Arbitration Tribunal Constituted Under The Provision Of Gujarat Public Work Contract Dispute Arbitration Tribunal Act, 1992".

ii. The arbitration shall be conducted in accordance with the provisions of the "Gujarat Public Work Contract Dispute Arbitration Tribunal Act, 1992" or statutory modifications there on. The Arbitration shall be held at such place and time as the Tribunal may determine.

iii. The decision of the tribunal shall be final and binding upon both the parties. The expenses of the arbitration shall be paid as may be determined by the Tribunal.

iv. Performance of the contractor under the contract shall if reasonably be possible, continue during the arbitration proceedings and payments due to the contractors by the owner shall not be withheld, unless they are the subject matter of the arbitration proceedings.

v. The dispute is deemed to have arisen on the date, on which Member Secretary, GWSSB shall not give his decision as mentioned above in Clause (A) or in the case of intimation of any decision, the contractor intimates in writing that he has finally refused to accept the offer made by GWSSB.

vi. Where any dispute arises between the parties to the work contract either party shall irrespective of whether such works contract provides for any arbitration or not, refer, within one year from the date that Member Secretary, GWSSB has not given the decision as per Clause (A) such dispute in writing to the Tribunal for arbitration in such form and accompanied by such documents or other evidence any by such fees, as may be prescribed.

vii. Legal jurisdiction: All question relating to this Tender shall be governed by the law of India and shall be subject to jurisdiction of court at Gandhinagar, Gujarat.

16. GOVERNING LAW AND JURISDICTION:

These Conditions and the O & M part of Contract shall be governed in accordance with Indian Law. The Contractor agrees that any legal action or proceedings arising out of these Conditions may be brought in the courts or tribunals at Gandhinagar in India and irrevocably submits themselves to the jurisdiction of such courts or tribunals. The Employer may, however, in its absolute discretion commence any legal action or proceedings arising out of these Conditions in any other court, tribunal or other appropriate forum, and the Contractor hereby consents to such jurisdiction.

17. MATERIAL, TOOLS AND TEST EQUIPMENTS:

All materials required for the O&M of the project shall be new and of best quality and suitable for the purpose intended. These shall be got approved from the Engineer in charge before use.

17.1. Electricity Supply:

Contractor shall keep good liaison with concerned Electric Authority for power supply in case of electric power failure (break down/shut down) it shall be the responsibility of the agency to inform all the concerns as well as to contact concern authorities to restore the power supply. The contractor shall keep good liaison with concern substation for voltage Up and Down and restore the power. The vehicle kept at site by the contractor shall be provided for this purpose along with operation and maintenance staff in case of requirement as per direction of Engineer in charge or his representative without any extra claims.

17.2. Work Order Book:

A bound half sheet size work order book shall be provided by the contractor and handed over to the owner for maintaining at the work site. This shall be a permanent record. The contractor or his Resident engineer shall sign against instructions & orders recorded by the Engineer in-charge or his representative for the maintenance work. He may take out a copy thereof if necessary. He shall take prompt action as per the instruction/orders of the owner and necessary compliance shall be recorded against each instruction/order.

17.3. Electrical Installations:

All electrical work shall be carried out as per the provisions of Indian Electricity Act, Indian Electricity Rules, Instructions and requirement of authority/authorities i.e. Electrical Inspector and Gujarat Urja Vitran Nigam Limited or as mentioned in the Volume of General Condition for contract.

17.4. Accident on the works:

The contractor 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 Govt. labour department authority and shall pay all necessary compensation as per rules. Contractor shall also be fully responsible for any loss to any individual or public property occurred due to him or his worker's negligence under the scope of this contract.

17.5. Use of site:

The contractor shall not unreasonably encroach the site with materials and equipment. The contractor shall not use land for any private purpose.

17.6. Compliance:

The contractor shall be bound by all ordinance acts, codes, rules, regulations and orders of which in any way affects conduct of works, or workmen engaged for the work. The contractor shall be responsible for any violation of any govt. rules & regulations. It shall be the responsibility of the contractor against any claim or liability arising from violation of above.

17.7. Accommodation for Staff:

Contractor shall provide necessary accommodation to their labours & engineers at his own cost. However, owner shall give vacant staff quarters available at each head works, subhead works or available in the jurisdiction at the rate prescribed by the owner.

17.8. Transportation:

Contractor shall have to make his own arrangements for conveyance of his staff at his cost. No facility will be provided by the owner.

17.9. Medical:

Contractor shall provide medical facility to his staff at his cost.

18. CONTRACTOR'S STAFF & THEIR CONDUCT ETC.:

18. 1. Nationality & Address:

All employees shall be Indian Nationality and it shall be contractor's responsibility to give temporary and permanent address: Convicted or penalized person shall not be employed.

18.2. Salary to Employees:

Contractor shall strictly follow labour laws and shall also ensure regular monthly salary payment to his staff. The owner will not take any liability of any of his employees appointed for operation and maintenance under this contract. Contractor shall submit monthly certificate for full payment to his staff on or before 10th of every month. Owner reserves the right to conform the contents of the certificate from contractor's employee for their last pay. The owner will not be responsible for any delayed payment/ compensation/ overtime or any other claims by employees of contractor during the tender period and even after the tender period.

18.3. Identification Dress Code with Badge/ Identity Card:

Contractor shall have to provide special dress code with identification badge with name plate strip to be displayed on front pocket to each staff as approved by Engineer in charge along with Identity Card etc.

18.4. Holidays and Leave:

Holidays and leaves shall be given to staff as per relevant labour rules. During holidays/ causal leave/earned leaves etc. and contractor shall arrange for the substitute. The owner shall not make any separate payment of overtime for these substitutes provided by the contractor during above periods.

18.5. Conduct:

All employees of the contractor shall follow the instruction of Engineer in charge. If any employee misbehaves with Engineer in charge he/she shall be immediately removed from duty and substitute for that shall be employed by the contractor. If contractor fails to do so,

non-refundable penalty of Rs.200/- (Rupees Two hundred only) per day per such case will be levied, this amount shall be recovered from the bill or any due amount of Agency.

18.6. Visitors:

The plant is one of its own kinds. Visitors are expected to visit this plant. It is expected that all staff and Engineers be present and follow the directives of Engineer in charge.

SCHEDULE 1

Operation and Maintenance Services

The Contractor shall be required to perform the following services under these Conditions:

The Contractor shall be responsible for corrective maintenance of civil, hydraulic, mechanical, electrical and computing equipment as well as miscellaneous equipment.

The Contractor shall be responsible for carrying out regular servicing and lubrication of rotary machines, complying with maintenance instructions as defined in the Operation and Maintenance Manual and ensuring that electromechanical equipment and motors operate correctly at all times.

The Contractor shall ensure that measurement systems are calibrated, within the valid period of certification and operate correctly at all times.

The Contractor is responsible for the maintenance of the landscaped areas inside the Employer plant fences.

The Contractor shall be responsible for maintenance of civil structures including intakes, pump houses, reservoirs, administration buildings, workshops, garages, etc.

The Contractor will operate and maintain in a state of continuous operational readiness all plant and systems to meet the flow requirements. It shall remain the Contractor's responsibility to ensure that plant systems are at all times able to operate to the maximum capacity of the installed duty plant.

All water conveyed by the Contractor shall be metered by the meters installed at the inlet of the raw water pumping stations at terminal ends and at the entry of sumps at all pumping stations. The meters shall be inspected and certified as to its accuracy jointly by the Employer and the Contractor.

Provided here are certain standard services that GWSSB could require. However GWSSB may wish to review this and make changes depending on the exact nature of services they require from the Contractor.

The Contractor shall be entitled to appoint a representative who shall together with Employers Representative on the last day of each month or if such day is not a working day on the following day, jointly carry out a reading of water meters and jointly certify the record of such readings.

For the duration of the O & M period, the Contractor will be responsible for the supply and control of lubricants, spare parts and consumable materials excluding electrical power, necessary for the continuous operation of the works.

The Contractor will manage the consumables and utilities services to ensure their most economic consumption and to minimize wastage.

The quantities of all the unutilized spare parts and consumable materials will be fully handed- over to the Employer at the end of the O&M period.

The store's inventory, the issuing and recording of spare parts will be the responsibility of the Contractor.

The Contractor is also responsible for providing spare parts and material required for the operation and maintenance during the operation period, and shall bear the cost for the same, including the cost of storing and safeguarding.

The Contractor will make all necessary arrangements to ensure the continuous supply of spare parts and material for the works; and the rate of advance supply of these materials shall be in such quantities and amounts as would ensure uninterrupted operation.

All the furniture and administrative office equipment etc. required shall be furnished by the Contractor. Costs of operating administrative office and supplies shall be borne by the Contractor.

The Contractor shall take out subscriptions for standard telephone lines/ wireless sets. Running cost for the telephone / wireless sets will be borne by the Contractor.

Cost of operation and maintenance and housekeeping of housing complexes including domestic water supply and drainage, roads, gardens, electrical installations, etc. will be borne by the contractor.

The Contractor will provide staff personnel for the full term of O & M as per schedule of establishment given in Annexure- I.

Contractor has to do painting to Every Civil Structures including Pump House, Valves, pipeline etc. with the same quality of paint used while construction of structures or as directed by Executive Engineer at and interval of every two and half years. If Contractor fails to do same, this work will be carried out by GWSSB and expenditure occurred will be deducted from contractor's Bill.

SCHEDULE - 2

Performance Guarantees

The Contractor shall guarantee that:

a) The total transmission losses in the raw water and / or treated water system shall not exceed 5 %.

b) The total reduction in duty point efficiency of the pumps after one year of operation shall not exceed 0.25% than the guaranteed efficiency of each type of pump.

(The Bidder to fill the format and specify guaranteed efficiency of each type of pump)

SCHEDULE- 3

O & M Price

The Contractor shall be paid at the quoted rates per month. The amount withheld against them from the bill of the main contract shall be released by end of each year.

SCHEDULE- 4

REPORTS

MONTHLY REPORT

The monthly report shall include but not be limited to:

Volume of water conveyed, to each consumers off-take point end.

All the problem areas in the facility,

O & M works carried out during the month.

Electricity consumed totally.

Monthly materials consumption statement

SEMI- ANNUAL REPORT

A semi-annual report shall include the measurement of noise level at the site boundary at plant, to be indicated by the Employer.

ANNUAL REPORT

The Contractor shall provide the Employer by March 31 of the current year (n) with an annual report for the preceding year (n- 1). This report shall include:

*All technical statistics related to plant operation as supplied by the operation;

*A statement of works carried out during the preceding year n-1 in connection with the contractor's obligations under these conditions.

NOTE: The Employer may consider if it requires these reports or requires reports and provide for the same. This will need to be looked at in the light of reporting requirements in these Conditions. The Employer will also need to determine what information is required in these reports

SCHEDULE- 5

Insurances

Insurance against Injury to Persons and Damage to Property;

The Contractor shall insure against each liability for any loss, damage, death or bodily injury which may occur to any physical property (mechanical, electrical, automation work, all civil works, Storage etc. excluding pipe line) or to any person which may arise out of the Contractor's performance of his obligations under these Conditions during the O & Period.

This insurance shall be for a limit of per occurrence of not less than the amount of Rs. 5 Lacs, with no limit on the number of occurrences.

Insurance for Contractor's Personnel;

The Contractor shall effect and maintain insurance against liability for arising from injury, sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel.

The Employer shall also be indemnified under the policy of insurance, except that this insurance may exclude losses and claims to the extent that they arise from any act or neglect of the Employer or of the Employer's Personnel.

Contractor shall have to take insurance for Electrical, Mechanical and instrumentation equipment under this packages and whereas the insurance of other component like sump, pump house, pipeline will be optional. This General Insurance for the work will be in the name of GWSSB. The depreciated value is to be considered for the purpose of insurance for respective year. The insurance for skilled, semi- skilled and unskilled labour is compulsory. The same should be taken by agency as per labour act laws in force.

SECTION B

SPECIAL TERMS AND CONDITIONS

SECTION B:

SPECIAL TERMS AND CONDITIONS OF CONTRACT

FOR OPERATION & MAINTENANCE

PART- 1: Technical Conditions

1) The operation and maintenance of all the works included in this tender as per details given should be carried out by contractor at his own cost.

2) All the storage structures situated at H.W. sites should be kept in fill-up condition as per requirement during the full day period. (24 Hours)

3) A weekly report for supply of water with Quantity should be submitted to the office of the Engineer in charge concerned. A certificate of the concern in-charge Engineer for daily receipt of required Quantity of water at each head works / off take points at the end of week should be received and submitted with weekly report.

4) Electric bill for running the plant at head works site will be paid by department. Bill should be submitted to office for payment as soon as received from concern GVCL. If charges for delay in payment, levied on account of late payment, due to late submission of bill by contractor, then the same will have to be paid by contractor.

5) All the required electrical goods / fixtures like bulb, tube light, chock, starter, fuse, wire etc. required for operation and maintenance shall be procured by contractor at his own cost and lighting arrangement should be kept in good condition.

6) At the time of breakage in pipeline or valves for repairing purpose contractor shall have to make arrangement at his risk and cost for labours, fitter, required all materials like rubber packing, nut, bolts, gland, all required parts of valves in Plant & transmission main including transportation arrangement like pickup van, Jeep, welding machine, welding rods, Tractor etc. should be provided by contractor at his own cost. All consumable material should be of standard quality as approved by Engineer-in-charge of work.

7) All type of rising main and gravity main including chambers should be maintained and repaired by contractor at his own cost.

8) At the time of repairing or replacement of Pipes and valves required for repairing or replacement after verification by concerned engineer or his representative, fitting work of pipe or valves shall be carried out by contractor at his own cost including, labour, excavation cutting, fitting, welding, testing, refilling etc. complete. During the repairing work scrap materials received should be returned to concern departmental store at the cost of contractor after duly entering in register. Repairing work shall be started within

   One hour after breakage or leakage come into notice, care should be taken to prevent wastage of water otherwise recovery at the Rs.16/ per m^3 of cost of water will be made from contractor. Due to leakage and repairing work, contractor will be responsible for loss of any property or crop of private land owner and compensation will have to be paid by contractor, if

contractor fails to do so and complain is received by department than department will make the payment to private owners and recovery will be made from contractors bill.

9) Any type of valve or part of the valve not working properly after repairing and requires replacement, as per opinion of Engineer in charge or his representative, then required valve will supplied to the contractor free of cost from departmental store if available. Replacement shall be done by the contractor and old valve should be shifted to department store and entered in concerned register including cost of loading, unloading, carting stacking etc. complete.

10) Contractor shall have to do leak detection survey along the pipeline regularly such as Pipes joint leakage, pipe bursting etc. and leakage observations and repairing work record should be maintained section wise by contractor. Pipeline from head works to GSRs / ESRs all the valves fixed on it such as sluice valves scour valves, air valves, air cushion valves, butterfly valves, zero velocity valves, flow meters, water meters and valve chambers should be maintained by contractor. Quantity of water as pumped from head works same quantity should reach to distribution point. For any unauthorized connection taken or given by anybody the Contractor will be responsible for it. Prevention and removal of unauthorized

connection will be carried out by contractor and intimated to department. For unauthorized consumption of water or misuse of water recovery at the Rs.100 per $m^3$of cost of water will be made from contractor. All type of valves including air valve and scour valve should be inspected regularly by contractor, a programme for inspection for air valves & scour valve should be prepared by contractor and strictly observed it. Special care should be taken by contractor for air valves.

11) Roofing of the sump should be checked regularly so that water should not be polluted. Every care should be taken to prevent falling of birds and insects. All water storage structures like, sump located at head works sites shall be regularly cleaned and mud should be removed at every three months by contractor and record for it should be maintained. Planning for this work should be so done that it should not affect the supply of water.

12) During the period of contract a person other than responsible representative of contractor or persons employed by him should not enter into the premises of the head works site. Every care should be taken by contractor to prevent such type of unauthorized entry or interruption in the premises or surrounding the property of GWSSB.

13) Persons required for security of materials in the stores at sub head works sites will be deployed by contractor.

14) At any time during the visit of Engineer in charge or his representative if it is observed that the operation and maintenance is not carried out properly, water supply is stopped and contractor is responsible for it recovery will be made at double rate of contract for that particular day or contract will be terminated.

15) Operation and maintenance of meters installed at head works sites should be carried out by contractor and entry shall be made in the register at every one hours. If any meter is not working properly it should be properly repaired by contractor from any technician of such type of repairing work.

16) =After issue of work order contractor or his responsible representative should joint visit the site of every work accompany with officer concern. A list and position of works and all valves with dia and nos. a report will be prepared and should be jointly signed by contractor and department. A copy of same report shall be issued to contractor. At the time of completion of contract period same type of report should be prepared and possession of all the works and components should be handed over to department. If repairing & maintenance work is not done properly by contractor, the cost of repairing work will be recovered by department from contractor.

17) All the works executed under this project & covers in the scope of this tender will be deemed to be handed over to contractor from the date of successful commissioning of facility. Proper operation and maintenance of the same works/components shall be carried out by contractor and at the time of completion of contract period or termination of contract, contractor should have to give possession of all the work and components to the department in good condition. Before handing over the possession to the department account of contract will not be finalized and deposit will not be refunded to contractor. For all type of legal activities and expenditure for the same, contractor will be fully responsible.

18) During the period of contract for any type of dispute, decision of EIC, will be final and binding to both the parties.

19) Prescribed registers as maintained by agency during the period of operation and maintenance period shall be submitted to the department. All the materials received during repairing and replacement shall be deposited in departmental store at the cost of contractor. All repairing work should be carried by contractor at his own cost during the period of contract contractor should be fully responsible for injury to any public person omen engaged by contractor for work and contractor shall be fully responsible for compensation for it.

20) If water storage or supply could not be continued due to any reasons it should be informed to department. As per condition of contract required steps should be taken immediately by contractor to solve the problem and start the water supply. After starting the water supply department shall be informed accordingly.

21) Proper care is to be taken by contractor to keep neat and clean. Every component of headwork sites and maintenance of all the components shall be done by contractor.

22) Servicing of all the valves cleaning of all civil works and maintenance shall be carried out regularly by contractor and entered into the concerned registers.

23) History sheet shall be maintained by contractor for replacement of material in pipeline, or valves, spare parts of Electro-mechanical equipment.

24) Leakage repairing shall be carried out in proper way and technically workmen like manner. Repairing by rubber tubes or by fixing wooden Peg shall not be allowed. Register of leakage repairing shall be maintained with reasons properly.

25) All the works included in the scope of work shall be oil painted once during contract period at the cost of contractor.

26) All the gardens and plants situated at head works sites shall be supplied water and maintained properly by contractor. No any extra payment will be made on account of this work.

27) Telephone/wireless message shall be received and entered in the register and message should be conveyed to concern party head works for action. If any interruption in the system of any important message should convey immediately to concerned Engineer in charge.

28) All the information regarding labours, staff, vehicles etc. is incorporated in this tender for preparation of estimate. As per list staff having proper qualification/labours and vehicle shall be deployed by contractor. If due to negligence of contractor for providing sufficient staff and vehicles water is not supplied properly remaining labours/staff and vehicles will be deployed by department at the risk and cost of contractor and recovery for such expenditure will be made from the bill of contractor.

29) The contractor has to make all the arrangements required for the proper operation, maintenance and safety of all the works included in this contract at his own cost during the whole contract period.

30) Continuous patrolling with Jeep and Driver throughout the alignment should be carried out by the contractor.

31) All the storage structure located at H/W site should be kept in fill up condition as per the requirement during the full day period.

32) Separate log book for arrival & releasing of water from each storage structure will be maintained day to day by the contractor and shall be submitted to department at the end of month.

33) Repairing of all electro-mechanical and civil work shall be carried out at site including valve chamber located at site without any extra cost.

34) Except in unavoidable circumstances all the storage structures should be filled with water as per requirement & availability of electricity & pressure during the period of day or night. If electric supply is not available for 15 minute, contractor shall contact to concern GVCL to start the electric supply & intimate to Department with reasons for non- availability of electric supply.

35) List of all the assets, pipeline apparatus plants & machineries, all types of valves, chambers, pump houses, security cabin, office building, hydraulic civil structure, spare parts, store malts, wireless sets, telephone, air-conditioner, electric panels etc. will be handed over to contractor for Maintenance & Repair purpose & same has to return to Department with good conditions as soon as the project is taken over by department for further M&R period to any other party.

36) During the period of contract if water is not supplied satisfactorily at head works/ off take point at any day & reasons given by contractor is not suitable in the opinion of officer of department recovery at the double rate of contract rate will be made for such a day from the bill of contract.

37) Any damage / breakage found from mischievous element found in the system, the contractor should lodge police case immediately under intimation to concern Engineer in charge .

38) The total wastage of water due to leakage & all other reason should not be more than 1%,if it is more than prescribed quantity, recovery at the rate of Rs. 15/- per 1000 letter (Or as revised from time to time) shall be made from the running bill of contractor. Quantity wasted will be decided by Engineer in charge will be final.

39) The bidder should see the continuity of pumping for 24 hours for routine checking of pumping machinery as given in the tender. Contractor should carry out this work without disturbing the continuity of pumping but for major repairing work the restoration period will be as under:

I) Replacement of M.S. Pipe - 2 Days

ii) Replacement of all Control valves & sluice gates – 1 Day

iii) Replacement of DI /C.I. / HDPE / PVC Pipe – 2 Days

iv) Replacement of Air Valves, Scour Valves – 1 Day

v) Cleaning of water container of sump/ESR – 3 Days (once in 3 months)

vi) Replacement of Electro- Mechanical spares of equipment 1 Day or as per requirement

vii) For major repairing shut down will be given as per requirement.

40) Material consumption register in prescribed format should be maintained by the contractor. During the visit of Engineer- in- charge if required it should be produced.

41) Vehicles will have to be maintained and to be kept ready for whole contract period at Headwork's site by contractor and to be used for day to day routine checking. Any fault time for providing such facilities for betterment of operation period will be sublet to reduced payment by department and all logbooks to be maintained by contractor for such movement of vehicle.

42) "The Contractor" shall operate the complete Raw Water Pumping Stations, Treatment Plants, Treated Water Pumping Stations and associated services, on a continuous 24hours basis to supply all the flow conveyed through pipeline up to desired point of supply with assured quantity.

43) "The Contractor" shall operate and utilize all the control and monitoring systems, provided and if found to be necessary and if approved by the engineer, shall make adjustments within the operating range of the control system and equipment so that the plant operation matches the requirement.

44) "GWSSB" shall directly pay all the power bill to UGVCL but the Contractor will be required to furnish Electricity Consumption in the Schedules provided.

a) Telephone bills will have to be paid by the successful bidder. No reimbursement shall be made.

b) Electric /Battery operated flow meter has to be maintained by Contractor in case failure of batteries, same has to be replaced by contractor at his own cost.

45) All miscellaneous items, for example, vehicles, tools, testing equipment, cleaning or green keeping equipment, security and safety equipment, electrical fixtures, etc shall be provided by the Contractor at his expense.

46) a) The Contractor shall provide experienced managerial, technical, supervisory, administrative and non-technical personnel and labour necessary to operate and maintain the Raw Water Pumping Stations, Water Treatment Plants and treated water Pumping Stations including sumps and pipelines properly, safely and efficiently on a continuous 24 hours' basis for the term of the O & M Contract Period

b) The qualification and capability of the Contractor's personnel shall be appropriate for the task they are assigned to perform. The staff provided shall be fully trained in the operation of the Raw Water Pumping Station before being given responsibility for operating any part of the plant. If in the opinion of the Engineer, any member of the Contractors staff is considered to be insufficiently skilled or otherwise inappropriate for the task he is required to perform, he shall be replaced by the Contract with a person with the appropriate skills and experience for the task, to the approval of the Engineer. The Contractor will be required to submit to the Employer the Schedule of 'Manpower 'and 'Organization Chart'

c) The Curriculum Vitae (CV) /Resumes of the Contractors personnel shall be submitted to the Engineer for acceptance at least 7 days before the anticipated commencement of the 0 & M, period. Any change of personnel shall be promptly informed to the Engineer within a day's time. Normal time duty hours for the contractors' operation &maintenance personnel may be modified as necessary and agreed by the Engineer. Rotating shift schedule shall be established by the Contractor and agreed by the Engineer which will ensure that an adequate number of the Contractor's staff, fluent in Hindi as well as Gujarati is on duty at Plants 24 hours per day, 7 days per Week, Including all holidays

d) Contractor will submit one photograph of each personnel, with his resume, permanent address, etc and department will issue identity cards to each personnel. Any replacement in Employment by Contractor shall have to be reported in 24 hours to Engineer in charge concerned. Contractor has to put the name person on duty shift wise on display board. Display board shall be kept in each pumping station

47) a) The Contractor shall be responsible for safety on Site during the 0 & M of the Works by the Contractor.

b) The Contractor's duties with respect to Safety shall include the following;

i) Utilize safety awareness procedures in every element of operation and maintenance.

ii) Give emphasis to site including:

* Safe working and safety procedures as per rules and regulations of Governments regarding use of protective clothing, gloves, boots and helmet etc.

* Cleanliness of the plants as a whole.

* Awareness of hazardous conditions and accident reporting and necessary compliance.

* Safe practice in Pumping Stations.

* Safe practice in Treatment Plants.

48) a) The maintenance service provided by the Contractor for the period specified in the Contract shall ensure the continuous operation of the raw water Pumping Stations, Treatment Plants and Treated Water Pumping Stations and that the breakdown or deterioration in performance, under normal operating conditions, of any items, of Plant and equipment and component parts thereof is kept to a minimum.

b) The Contractor shall adhere to the manufacturer's recommendations with respect to equipment maintenance, the type and grades of lubricants to be used. Frequency of lubrication, adjustments to be made regularly and recommended spares to be held in store.

49) The Contractor shall be responsible for:

a) The maintenance of electrical, ventilation and air conditioning, plumbing and drainage installations.

b) General Building Maintenance and housekeeping.

c) Full maintenance of the site services, cabling and earthling systems, together with the site road lighting system. Painting of all Civil, Mechanical, Electrical structures which are open to sky every three years.

d) Site maintenance including the upkeep of landscaped areas.
e) Sumps & pipelines maintenance & repairs.

The building services and house-keeping maintenance shall be undertaken on all building and services installation.

The Contractor shall ensure that all unwanted or redundant items are removed from the building and sites. Depending on their condition such items shall either be placed into storage or disposed of site.

50) a)The store's inventory, the issuing and recording of spare parts will be the responsibility of the Contractor.

b) The Contractor is also responsible for providing spare parts and material required for the operation and maintenance during the operation period, including the cost of storing and safeguarding.

c) The Contractor will make all necessary arrangements to ensure the continuous supply of spare parts and material for the works and the rate of supply of these materials shall be in such quantities and amounts as would ensure uninterrupted operation.

d) Spare parts shall be supplied by the Contractor and the same will be used during Operation and Maintenance Contract period.

e) The contractor shall have to procure the required spares from original manufacture or authorized dealer at his cost.

f) The required spare parts which will be available with GWSSB will be issued to the contractor from its stock and subsequently contractor shall have to replace the same without any extra cost.

51) a) The Employer reserves the right to arrange the visits of VIP's dignitaries, public representatives and other persons of Social or Political repute, any organizations and when necessary, to the Raw Water Pumping Station. The Contractor shall offer full cooperation to the GWSSB on the occasions of such visits.

b) Inspection register will have to be maintained, wherein inspection officers will note their instructions duly dated signature. Successful bidder has to follow the instructions strictly.

52) On the date of Contract Completion or if the Contract is terminated, all the installations, works and equipment placed under the Contractor's responsibility shall be handed over tithe Employer, at no cost, in good working order. The Employer may perform any inspections, tests or expert appraisals he shall consider necessary with a view to checking that the property is in good working order and will certify to that effect to the Contractor while taking over.

53) No accommodation/ guest house/ transportation facility will be provided by the GWSSB to Contractor.

54) For smooth & efficient 0 & M of the plant, and in case of emergency just like fire, fault, accidents, or other rescues operation, the contractor must keep at least one four-wheeler like jeep or Matador type with seating arrangement. In working condition for 24 hours of a day & 365 days of the year for the whole contract period.

55) While handing over the spares to the contractor, Contractor should maintain the record of spares of inventory of utilization the spares.

56) In the event of any dispute or difference arising, the Jurisdiction of the court shall be Gandhinagar (Gujarat) only.

57) It is mandatory for the contractor to operate the pumping machinery not less than limit efficiency of pump. If deviation is noted in respective energy bill for succeeding month than corrective measures shall have to be taken by the contractor immediately otherwise the difference in amount based on m3/KWH will be invoked through O & M bills of successful bidders.

58) All protective Relays testing, Calibration system for service and maintenance of Relay shall be carried out systematically by trained personnel authorized in Power system protection at once in a three year during O & M contract Period Without any extra cost. The Contractor/Agency should be approved first prior to commence of work for such special testing of job. Proper testing equipment shall be used so to avoid the misleading of settings & call for nuisance tripping.

59) Contractor shall have to bear the expense for annual inspection fee for Electrical installation during the O&M contract period. No extra payment shall be given. Energy audit has been made mandatory by the Government of Gujarat; vide Gujarat Use of Electrical energy (Regulation) order, 1999. Contractor shall have to carry out energy audit per the said regulation in the first year and thereafter strictly as per prevailing regulation.

60) Repair of PLC based instrumentation and Automation work shall have to be carried out by System Integrator. The agency for System Integrator should be approved first prior to commence the work of such special type of job.

61) Contractor should provide security guard round the clock with uniform. He should also maintain register for visitors.

62) If any work specified in the scope of tender but not carried by the contractor, the recovery will be done at the double the market rate from the contractor.

SECTION C

TECHNICAL SPECIFICATION

AND

SCOPE OF SERVICES

1.0 TECHNICAL SPECIFICATION FOR ELECTRO-MECHANICAL ITEMS

1.1 GENERAL

These General Mechanical Electrical Technical Specifications are meant to amplify the specifications General Conditions of Contract. If any discrepancy is noticed between these conditions, General Conditions of contract, specifications, Bills of Quantities Drawings the most stringent of the above shallapply.

All electrical and mechanical installations shall be of high quality, safe, durable, complete fully operational including all necessary items, spares accessories whether or not specified in detail. All electrical and mechanical work shall be completed in accordance with the regulations stards to the satisfaction of the inspection agency authorized by owners. The general provisions, special provisions general requirements apply to all sections of this specification.

The contractor shall be fully responsible for the maintenance of electrical, mechanical and other installations till the entire work covered by this contract is satisfactorily completed by him hed over to the owner.

Article I. INTENT

Article II.

It is the intention of the specification drawings to design, supply, installation, testing commissioning ready for use for continuous dependable satisfactory operation.

Article III. SCOPE OFSPECIFICATION

These specifications covers Design, manufacture, factory testing, supply, delivery to site, unloading. Handling storage to site, complete installation including cement concrete foundation wherever necessary, final checkup, painting, performance testing commissioning of pumping machinery related electrical equipment's accessories to be supplied under these specifications on turnkey basis, to achieve a guaranteed co-ordinate commercial operation of the same to the entire satisfaction of thedepartment.

Any item of work, either supply /or erection of material/machinery which have not been specifically mentioned in this specification drawing but are necessary to complete the work for trouble free, efficient operation guaranteed performance of the entire plant offered shall

be deemed as included within the scope of this specification shall be provided by contractor without any extra cost to the client.

The following mechanical electrical equipment's are to be covered under this contract.

a) Pipes Fittings
b) Valves - (i) Butterfly valves (b) DPCV
c) Expansion Bellows
d) Vaccume Pump
e) Panel
f) Cable
g) Earthing
h) Foundation and trust block

Article IV. AMBIENTCONDITION

The equipment's are to be operated in tropical climate with high ambient temperature up to 50^{o} C. So the equipment shall be so designed that it will be suitable to operate under tropical climate with high humidity, dust fungus condition.

Article V. REGULATIONS STARDS

The installation shall conform in all respects to Indian Standard Code of Practice for pumping machinery electrical equipment installations. It shall also be in conformity with the current Indian Electricity rules, Indian Electricity Act, National Electrical code Regulations of the local Electrical Supply Authority in so far as these become applicable to the installation. Wherever these specifications call for a higher standard of material /or workmanship than those required by act of the above regulations, then these specifications shall take precedence over the said regulations standard. In general, the material, equipment workmanship not covered by the above shall conform to the relevant Indian standard.

The electrical installation work shall follow codes of the Indian standard specifications Rules (within the best meaning of the same) under this contract.

The machinery, equipment, component material shall conform to the latest revision of the standard:

Article VI. THIRD PARTY INSPECTION TESTING

The Engineer-In-Charge reserves the right to inspect test at manufacturer's works at all reasonable times during manufacture of items included in this contract. Tests on site of completed works shall demonstrate among other things. Agency have to submit QAP, Data sheet and Drawing for the following items like Pumps, Valves, Expansion Bellows, Flowmeter, Panel which to be approve from the respective authority and inspection to be carry out by TPI as witness by department at manufacturer site and than supply material at site for use. Inspection charges first bare by contractor same will reimbursed by department.

Article VII. PACKING PRESERVATION

i) Each spares shall be clearly marked or labeled on the outside of the packing with its description. When, morethanonespare-partispackedinasinglecase,ageneralDescription of the contents shall be shown on the outside of such case a detailed list enclosed. All cases, containers other packages must be suitably marked numbered for the purposes of identification.

j) All cases, containers or packages are liable to be opened for such examination as may be reasonable by the engineer.

k) In case of equipment supplied with grease/lubricants from imported origin, the supplier shall clearly indicate the indigenous equivalent of the grease/lubricant source of supply so as to enable to owner to procure these items from indigenous sources. Necessary initial filling of lubricating oil, grease etc. shall be arranged by the contractor with no extra cost to client.

Article VIII. PAINTING

All metallic surfaces equipment components shall first be thoroughly cleaned, degreased phosphate then be given two coats of zinc primer in then the surface shall be coated, painted with approved shade of paint. The resulting coating shall be uniform smooth shall adhere perfectly to the surface.

Technical Specification:-

1.0 ITEM No. 1: Polder Pump :

The pump set should be of sturdy construction to facilitate manual loading and unloading requirements. It should be repairable in workshop with minimum cost and should have fast wearing parts of replaceable. Feature and easy rewindibility of electric motors and of economy in repairs are overriding consideration after meeting the basic Hydraulic, Electrical and Mechanical performance needs. Pumps should generally confirm to IS: 8034 and motors should confirm to IS: 9283 with their latest amendment.

The duty point of the set should be located at the optimum efficiency point of the pump rating curves and there should not be steep fall in efficiency in the range of + 10% and – 25% in head variation. The verification of the pump sets performance will be as per relevant latest IS at rated voltage. The pump with lesser number of stages will be preferred.

The minimum overall (Pump and motor combined) efficiency without any negative tolerance. Minimum motor Horse Power rating, cable size, starting system and delivery pipe size should be mentioned in data sheet annexure-I attached herewith.

Pump:

The pump should confirm to IS: 8034 with latest revision. Bowls should be free from block holes, slag inclusion and other detrimental defects to pump operation. Bowls should be provided with renewable wearing rings except in radial flow type pump. Bowls provided with wearing rings should be suitable for water lubrication and shall be of superior quality. Casing should be hydraulically tested up to 1.5 times the shut-off pressure.

Impeller:

Impeller should be of mixed flow type, ensuring required performance and free of cavitations. It shall be dynamically balanced. Impeller shall be made of chrome steels materials, capable to handle raw water having turbidity up to 150 N.T.U. and maximum particle size of 8 mm. The material of impeller will be as per Annexure – II.

Shaft:

The pump shaft will be guided by bush bearings provided in bowl wherever required. Below the impeller shaft assembly shaft protection sleeve shall be provided. It shall have surface finishing of 0.75 Microns. The material of shaft shall be as per Annexure – II.

SUCTION HOUSING AND DISCHARGER OUTLET:

The Suction Housing and discharge outlets should be of fine grain C. I. confirming to IS: 210-1978-FG-200/260 and free from blow holes slag inclusion and other detrimental defects. Housing and casing should be hydraulically tested up to 1.5 times the shut-off pressure.

BEARING SLEEVE:

The single piece shaft shall be designed to for 0.05 mm maximum deflection at stuffing box face under worst condition of shut off head. Renewable shaft sleeves shall be provided. It shall have surface finishing of 0.75 Microns. The materials of shaft and Sleeve shall be of as per SS: AISI: 431.

MOTOR:

The motor shall confirm to IS: 9283 with latest revision. It should be designed for 400 + 10% and - 15% volts, 2900 RPM, 3 phase, 50 cycles. It should be totally enclosed squirrel cage induction type water cooled and water lubricated sealed against entry from outside water.

The windings shall be of wet type. The thrust bearings should be of wet type water lubricated and provided with metal tilting/carbon thrust pads, designed to take all axial load at most unfavorable running conditions.

The minimum percentage of margin over the input power required at pump design should be provided as mentioned here under in table I. Motor BKW shall be suitable to cover complete operating range.

Table I

MOTOR BHP	% OF PUMPING DESIGN POINT BHP
5 to 10 BHP	130 %
10 to 20 BHP	120 %
20 to 100 BHP	115 %
Above 100 BHP	110%

The power rating of motor thus selected should be higher than the power consumption on any point on the characteristic curve.

The effective Sealing shall be provided by high quality mechanical seal of appropriate design to prevent sandy and muddy water entrance in to motor. Suitably designed axial thrust bearing should be provided. Mechanical Seal having face combination TC/TC should be provided in the pump of reputed make. Full proof provision should be made in pump set to avoid any dry run, If the mechanical seal failed it should be water lubricated.

Stator and Motor should be impregnated with a superior varnish Class-B thermal insulation properties by vacuum pressure of epoxy paints on stator when cold rolled stamping used and rotor shall be painted with Polyurethane paint & backed for ½ hour under controlled temperature condition and not by manual or gravity flow to remove air pocket so that these are thoroughly filled up by varnish. Motor rotor should be preferably lead-shot blasted. Subsequently, rotor body should be baked repeatedly under controlled conditions to ensure long life of paint and hard finish to the surface to avoid corrosion before powder coating. The rotor shaft shall be as per Annexure-II and provided with sleeves having materials as per Annexure-II in the bearing portion. The windings should be accessible to facilitate checking and locating any faults without disturbing all the coils and also to enable replacement of any defective coils. It should be possible to

rewind the Stator with readymade pretested coils in order to save time during the repair. Kelvin bridge/digital resistance meter shall be treated preferable for measurement of hot and coldresistance of winding for evaluated temperature rise. Any deviation above should be indicated clearly. Full proofarrangement should be made for stopping the rotating of shifting of stampings inside thestatorbody due to operation of pump sets. Earth leakage current should not be more than 50 milli-amperes at rated voltage.

The quoted H.P. of motor should meet both the following conditions;

The motor should not get overloaded in the range of +10% and -25% of the specified pump head. The meaning of overload will be as per IS: 8034.

The motor shall have the name plate giving following information.

a) Name of the manufacturer
b) Motor make/model
c) Mfg's No and frame reference
d) Frequency Hz
e) Numbers of phase
f) Rated output in KW/HP and current in Ampere
g) Discharge in LPM
h) Head in Meter.
i) Rated voltage
j) Winding connection
k) Rated RPM
l) Year of manufacture

NOTE:

Starting method: Up to 7.5 H.P. D.O.L., 8 to 20 HP star / delta and 21 HP onward Autotransformer type. Vendors to submit cross sectional drawing of pump motor and non-return valve with clear indication of material specification for the major components covered under specification.

All SS parts should have minimum 1.5 to 2.5 Nickel and the hardness should be not less than 250 BHN.

The thrust bearing should be of Carbon material to minimize the friction losses and to take care of upward and downward axial thrust in both the directions.

Any type of threaded connection will not be allowed except Nuts and Bolts.

Foundation arrangement should be provided below the strainer to rest the pump set on ground. When required besides, the pump should be suitable to operate in hangingcondition without resting on the floor.

(1) Satisfactory performance report of similar pumps should be enclosed with the offer.

ACCESSORIES:

Following accessories are to be provided with polder pump set.

CABLE:

Motor shall be provided with three Core flat PVC waterproof and flexible copper cables of minimum 30 meters length and of suitable amperage / size in single length. The cross sectional areas should be sufficient so as not to cause voltage drop of more than 2.5% of nominal voltage i.e. 10 volts at 400 volts throughout the length of the cable size of the Flat Cable shall be sufficient to take ampere of motor.

MS CLAMPS:

The Polder pump set shall be provided with heavy duty MS Fabricated clamp of suitable size of minimum 10 mm thickness.

Please confirm following by striking either YES or NO as actually applicable to offer made:

A0	Pump as per IS: 8034 with latest amendment.	Yes/No
A1	Bowl individually tested to hydraulic test Pressure 1.5 times of shut off pressure	Yes/No
A2	All rotating parts should be individually balanced on balancing machine	Yes/No

	as per IS: 7940	
A3	Impeller mixed flow type	Yes/No
A4	Bowl materials as per Annexure-II	Yes/No
A5	Impeller material as per Annexure-II	Yes/No
A6	Pump shaft material as per Annexure-II	Yes/No
A7	Suction casing materials as per Annexure-II	Yes/No
A8	Bearing sleeve materials as per Annexure-II	Yes/No
A9	Casing wearing materials as per Annexure-II	Yes/No
A10	Discharge casing as per Annexure-II	Yes/No
B0	Motor as per IS:9283 of with latest amendment	Yes/No
B1	Wet type	Yes/No
B3	Tilting type Thrust pads	Yes/No
B4	Ball of tilting bearing as per Annexure-II	Yes/No
B5	Brass/ Carbon steel drain plug provided	Yes/No
B6	Compensating device provided	Yes/No
B7	Stator varnished by vacuum pressure method or EPOXY painted (if cold rolled stamping used)	Yes/No
B8	Rotor varnished by vacuum pressure method or Poly arc methane paint duty properly backed	Yes/No
B9	Rotor painted and baked under controlled condition or powder coated	Yes/No
B10	Winding easily assemble	Yes/No
B11	Winding subjected to 2.4 KV after 24 hours	Yes/No
B12	Matching grooves for stopping stamping from rotation and shifting	Yes/No
B13	The rotating component/assembly shall be dynamically balanced on machine for minimum 700 RPM	Yes/No
B14	Stamping treated chemically to recover unwanted substance and impurities and the material shall be as per Annexure-II	Yes/No
B15	Rotor lead/sand shot blasted	Yes/No
B16	Thrust plate lapping is done on machine and the limit is 0.3 Micron	Yes/No
B17	Entrance velocity of water in the pump should not be more than 3.6 meters/second	Yes/No
B18	SS/Brass suction Strainer provided	Yes/No
B19	Stud and nuts shall be of alloy steel.	Yes/No
B20	Stator is rewindable with readymade pretested coils in each type of motor offered	Yes/No
B21	Cable confirming to IS:694	Yes/No

NOTE: The material component should be as per relevant IS and with latest revision except that shown in Annexure-II.

Marking: The method of marking / embossing engraving pump set to be delivered under scope of contract shall ensure that all the information will remain legible even after transportation storage in open space etc. in general the legible and marking upon the goods shall indicate the following:

(1) Manufacturer's brand name and or trade mark.

(2) Purchaser's mark as GWSSB shall be hard punched on each pump and year of manufacturing.

(3) Any other important matter that the manufacturer deems fit to be inscribed.

Testing

INSPECTION AND TESTING AT MANUFACTURER'S WORKS:

Inspection and testing at manufacturer's works shall be carried out as specified below.

All instruments and equipment required for such tests shall be provided by the vendor and the instruments shall be calibrated and certified by an approved independent testing authority. The date of calibration certificate of the instruments shall not be more than one year prior to the inspection. All the tests shall be carried out as per the relevant IS Code. Brief description of the tests to be carried out is as follows:

1.0 HYDROSTATIC TESTS :

1.1 All the pressure containing parts shall be tested with water at one and half times the maximum discharge pressure on the head characteristic curve or twice the rated pressure whichever is higher.

1.2 Unless otherwise stated in data sheet, the hydrostatic test shall be conducted for a minimum duration of 30 seconds.

2.0 MECHANICAL BALANCING:

2.1 STATIC BALANCING:

Major rotating components of the pumps like impeller & shaft etc. shall be individually statically balanced.

2.2 DYNAMIC BALANCING:

In addition to static balancing impeller and pump rotating assembly shall be dynamically balanced at rated speed of rotation.

3.0 PERFORMANCE TESTING :

3.1 Each pump shall be tested for its full operating range in accordance with the relevant IS standards for testing site conditions shall be stimulated as near as possible. Test shall be carried out with minimum NPSH as available at site for rated discharge and maximum discharge. Each pump shall be tested at its rated speed with its own motor for its entire working range. Test shall preferably be conducted with actual drivecapacity motor. Duringpump testing, readings to the extent possible shall be taken to correspond to the net effective range specified in the data sheet and ever its full working range from its closed valve condition to full valve open condition. Head, flow and overall efficiency characteristic curves shall be drawn. The curves produced shall be used to determine the capability of pump sets to meet the guaranteed performance at site.

3.2 Pump shall be offered for visual inspection & performance testing of the pump shall be carried out at manufacturer's factory by department representative to the purchaser before dispatch. All other certificates shall be submitted for review. Components of pump and assembly shall not be painted before inspection.

4.0 MATERIAL TEST CERTIFICATE:

Material test certificate for the various pumps components shall be furnished for purchaser's approval.

5.0 PROTECTION PACKING FOR TRANSPORTATION :

Prior to dispatch from manufacturer works all equipment shall be adequately protected by painting or by other approved means for while period of transit, storage and erection, against corrosion and incidental damage, including the effects of vermin, sunlight, rain high temperature and humid atmospheres. The equipment shall be packed to withstand rough handling in transit and all packages shall be suitable for storage including possible delay in transit.

6.0 TENDER DRAWINGS/DATA :

The following drawing / data shall be submitted by the Bidders along with their bids.

6.1 Pump data sheets duly filled in.

6.2 Preliminary outline dimensional drawing showing the details of pumps and motor and general arrangement drawings and base plate detail.

6.3 Performance curves capacity, vs. total head, efficiency kW requirement range from shut-off duty point and maximum permissible to capacity of pump.

6.4 Typical cross sectional drawing catalogues showing type of construction.

ANNEXURE - II

Sr. No.	Particulars	Materials.
1	2	3
1.	Material of stator Casing	M.S. Carbon steel Seamless pipe or S.S. Welded pipe OR M.S. Sheet welded pipe.
2.	Stampings.	Silicon steel cold Rolled M-45 or M-47 or S-23 or Hot Rolled B-630 SAIL Material stamping of GKW preferred.
3.	a) Thrust Bearing Housing thrust Plate	1) Bearing Housing FG 200/260.
		2) Thrust Plate GM with fiber plate (Ferro Asbestos) or CI with Carbon Plate.
	b) Segments.	3) Segments - Bronze or Chrome steel
	c) Ball Retainer (If Provided)	4) Ball Retainer - Bronze OR steel.
4.	Bearing Bush	LTB3 or LTB4 of IS : 318-1981
5.	Motor Shaft with Rotating Sleeve	Motor Shaft Carbon Steel Grade C-45 with Rotating Sleeve AISI-410/SS-431 or Shaft of AISI-410.
6.	Pressure Sustaining components.	C.I. Grade FG 200/260 of IS: 210/1978.
7.	Impeller	AB-2 or GR 12 or 13 of IS: 1570 (part-VII) 1978 OR Gun Metal (85/5/5/5) or Nomi. (modified PPO) as per IS:8034.
8.	Neck ring / Casing Wear Ring (If Provided)	LTB 3 or LTB 4 of IS: 318/1981.
9.	Bowl	C.I. Grade FG 200 / 260 of IS: 210/1978.
10.	Shaft (Pump)	(Part-V) or 12 or 13 or AISI - 410/420.
11.	Suction Casing	C.I. Grade FG 260 of IS: 210/1978.
12.	Strainer	SS - 0.5 mm (Min. Thickness) or Brass - 1.0 mm (Min. Thickness)
13.	Sand Guard	Bronze or Nitrite Rubber NB- 70
14.	Coupling Sleeve	Chrome Steel AISI: 410.

Data Sheet for Polder Submersible Pump Motor Set

Sr.	**Particulars**	**Departmental Requirement**	**Bidders' Data**
No.			
DATA SHEET FOR LT Submersible Motor for Polder Pump			
Sr.	**Particulars**	**Departmental Requirement**	**Bidders' Data**
1	**General**		
1.1	**Make**		
1.2	Application	Pump Motor	
2	**Type**		

2.1	Type of motor	Submersible	
2.2	Rated Voltage	415 Volts	
2.3	No. of phases and frequency	3 Phase, 50 Hz	
2.4	Type of duty / designation	Continuous / S1	
2.5	Method of Starting	Auto Transformer Starter	
2.6	Class of insulation & temperature	Please specify	
	rise by thermometer		
2.7	Ambient reference temperature	45^{0}	
2.8	Type of Cooling	Please specify	
2.9	Degree of Protection	Please specify	
2.10	Nominal synchronus speed	1450/2900 RPM	
	Corrosponding to 50 Hz frequency		
2.11	Diameter	Please specify	
3	**Rating / Performance**		
3.1	Ratings in kW	Please specify **(Minimum**	
3.3	Efficiency of Motor		
	1) at Full Load	Please Specify	
	2) at Duty Point	Please Specify	
3.4	Power Factor		
	1) at Full Load	Please Specify	
	2) at Duty Point		
3.7	Full load current	Please Specify	
3.8	No load current	Please Specify	
3.9	Starting current	Please Specify	
3.10	RPM at duty point	Please Specify	
3.11	Input at duty point	Please Specify	
3.12	Type of bearings	Ball / Roller / Thrust	
3.13	Supply System fault level	20 MVA	
3.14	Supply Neutral	Resistance earthed	
4.0	**TESTING**		
4.1	Hydrostatic test	Test certificate (s) required	
4.2	Performance test as per IS	Required @ Manufacturer's	
	Specifications	works & to be witnessed	
		jointly by TPI & the	
		department for all pumps i. e.	
		100%	
4.3	Overall efficiency of pump motor set	Please Specify	
4.4	Static and dynamic balancing test	Test certificate (s) required	
4.5	Visual inspection check	To be carried out jointly by	
		TPI & department	
5.0	**COPPER CONDUCTOR CABLE**		
5.1	Size of cable	Please Specify	
5.2	Maximum current carrying capacity	Please Specify	
5.1	Length of cable	**30** meters in one length	

Certified pump set characteristic curves (For pump: discharge v/s head, discharge v/s power input, discharge v/s overall efficiency) of pumps to be submitted duly certified by the pump manufacturer duly marked at duty point with technical bid.

Notes: 1) Characteristic curse should cover completed range of operation i.e. minimum operation head to shut off head.

2. Please confirm materials as per specifications otherwise state the variation
3. Cross section drawing for both pump and motor showing clearance at bearing wearing run out and material specification for components.

Sizing of cable shall be done considering all considerating factor

2. 0SLUICE VALVES / GATE VALVES/SCOUR VALVES(Wherever Applicable):

DESIGNFEATURES

- All the valves above or equal to the size of 300 mm nominal bore shall be gear operated.
- It is a general requirement that the valves in the pump house shall be Sluice / Gate / Butterfly Valves and shall be motorized are of Cast iron (DI) body construction valves in the field pipe lines shall be Sluice / Gate / Butterfly Valves and shall be manually operated (through a suitable gear box mechanism in case of valves above 300 mm NB) and are of Cast iron construction unless otherwise stated.
- Th e valves shall be free from sharp projections, which are likely to catch hold stringy materials.
- Val ves shall close with clockwise rotation of the h wheel. The direction of closing opening shall be marked on the h wheel.
- Th e stuffing box gl shall be of one-piece design.

Article IX. FEATURES OFCONSTRUCTION

- Th e pump house valves shall be preferably with a mechanical and electrical indication of valve position an indication of the valve percentage opening. The valves for the field pipeline shall be manually operated. The valves shall be provided with a valve position locking arrangement (mechanical type).
- Slu ice / Gate Valves shall be provided with back seating arrangement.

- Renewable body wedge ring shall be provided.
- Valve shall be of double flanged type. Holes drilling flange thickness of valve flange mating companion flanges shall generally conform to the StandardIS 1538-1976.
- The valves shall be completely overhauled before placing in position.

Necessary joining materials viz. bolts, nuts, washers, packing etc. shall be provided by the contractor at his cost. The valves associated piping shall be fixed so as to have axis perfectly horizontal. The Valves associated piping shall be supported on RCC pedestals the associated piping shall be shall be secured with suitable clamping arrangement. For an easy access to the valves‟ manual operating wheel/ handle, necessary approach with operator's sting space shall be provided for all the valves of the pump house of the field pipelines.

- If required the contractor shall also carry out drilling of holes of appropriate diameter in flanges in required numbers.
- A wheel shall be provided for emergency operation. The h wheel drive shall be mechanically independent.
- The valve design shall take care of the pressure drop across the valve disc in case of partial opening of the valve shall take care of the erosion cavitation effect on the body disc during such operation.
- Valve(s) subjected to back pressure shall have the valve seat, disc the operator suitably designed to ensure trouble-free operation.
- Valve body shall be of Cast Iron (CI) material with flanged ends in pump house.
- The shaft diameter shall take into consideration, the maximum torque required for the valve operation, the maximum differential pressure across the valve disc when the valve is closed the shock load due to accidental closure of the valve disc.
- The disc shall be designed for maximum differential pressure across the valve as well as the shock load due to accidental closure of the valve. Disc design shall offer minimum head loss. Disc shall also offer minimum resistance to flow. Disc shape shall becontoured.

- Valve seats shall be of a design that permits removal replacement at site shall be securely clamped on the body or disc of the valve.
- Seat material shall be suitable for the operating conditions holingfluid may be suitably reinforced, if required.
- The seat design shall permit easy removal for replacement purposes without the need for removing the valve from the line. No deposited or welded seat rings permitted.
- The valve bearings shall be of 'self-lubricated' type shall not have any harmful effect due to handling fluid.
- Adjustable thrust bearing(s) shall be provided to hold the valve disc securely in the center of the valve seat.
- Operator (mechanical or electrical actuator) shall be used for opening, closing, controlling or holding the valve disc at the intermediate positions as when required. Operator sizing shall be done on the basis of the maximum torque requirement of the valve for seating/ unseating/ controlling/ holding the disc at the intermediate positions the time required for valve operation.
- Irrespective of whether the valve is operated by a power actuator or not, each Sluice Valve / Gate Valve shall be provided with awheel for manual operation. The h wheel associatedgearing arrangement shall be designed to limit the maximum manual effort to around twenty (20) kg for valve operation. Valves located at inaccessible position, shall be provided with extension spindle floor st or h lever/ round chain to facilitate manual operation.
- Valve to be operated through gearing arrangements / or by power actuator, shall be provided with adjustable mechanical stop limiting device to prevent over travel of the valve disc in „open‟ or „closed‟ position.

Article X. REQUIREMENT FORVALVES

The valves shall satisfy the following requirements.

Size	: As perData-sheet
Bodytest pressure	: As perData-sheet
Seatpressure	: As perData-sheet

Article XI. MATERIAL OF CONSTRUCTION (MOC)

Body(Pump House)	: Cast Iron -CI
Body(FieldValves)	: Cast Iron -CI
Spindle	: Stainless steelSS410.
Operation (PumpHouseValves)	: Motorized controlling operationthrough Electric Actuator (only ON / OFF operation is not acceptable)
Operation (FieldPipelineValves)	: Manual operation through a suitable gear box
Application	: RawWater

Material test certificate shall be furnished.

Article XII. INSPECTION PERFORMANCETESTS

- Manufacturer shall conduct all tests stage inspections required to ensure that the equipment offered by him conform to the specification requirement.
- Test certificates for all shop tests shall be furnished to Engineer-In-Charge for approval.
- The Engineer-In-Charge or his Representative shall witness the tests.
- The Contractor shall arrange for inspection of valves at manufacturer′spremises shall arrange for testing of valves for body test pressure seat test pressure of all the valves to be supplied in presence of Engineer-In-Charge in line with the approved Quality Assurance Plan.
- Defects noted during inspection, test operation of valves shall be rectified by the contractor at his own cost without any extra claim to the entire satisfaction of the Engineer-In-Charge.

Article XIII. TESTS FORVALVE

(a) MATERIALTEST

Material to be used for the valve components shall be of tested quality. Chemical analysis mechanical tests on materials to be used shall be done as per relevant Standard.

(b) NON-DESTRUCTIVETEST

Valve body disc shall be subjected to Non-Destructive Testing (NDT). Components subjected to NDT shall be stamped for identification.

(c) HYDROSTATICTEST

Each valve body shall be subjected to hydrostatic test as specified. For valves subjected to back pressure condition, leakage test shall be carried out on both sides of the disc.

(d) PERFORMANCETEST

Each valve complete with operating device shall be shop operated at least three (3) times from fully closed to fully open conditions reverse, hold at intermediate positions under no flow condition, to prove the workability of the assembly.

(e) TESTS ATSITE

Performance of the valves shall be tested at site at actual working condition.

Article XIV. CLEANING

Prior to factory inspection, all manufacturing waste such as metal chips debris all other foreign matter shall be removed from interior of valve. All mill scale, rust, oil, grease, chalk all other deleterious material shall be removed from the interior exteriorsurfaces.

Article XV. PAINTING

Valves shall first be given two coats of zinc base primer after completely cleaning the surface then it shall be coated with three coats of epoxy paint. The resulting coating shall be uniform smooth shall adhere perfectly to the surface.

Article XVI. TECHNICALPARTICULARS

a.	ApplicableStandard	:	IS - 14846-2000 / API 600/603/ BS1414
b.	Application	:	RawWater
c.	Liquiddata	:	Specific Gravity 1.0kg
d.	Type	:	Doubleflanged
e.	Hand wheel	:	Required foroperation
f.	Bolts andnuts	:	Carbon steel

g.	Bodytestpressure	:	As per DataSheet
h.	Seattestpressure	:	As per DataSheet
i.	Connection	:	To be provided on pipeline in betweenpump Discharge the common header
j.	Flange thicknessandholes	:	As per IS: 1538(latest)

Article XVII. HWHEEL

A wheel shall be provided for emergency operation. The h wheel drive shall be mechanically independent of the motor drive any gearing should be such as to permit emergency manual operation in a reasonabletime.

Article XVIII. TESTS INSPECTION

- All valves shall hydrostatically tested by the manufacturer before dispatch. The pressure shall be obtained without any significant hydraulic shock. Testing shall be carried on before application of paint or other similar treatment unless otherwise agreed between the purchasers the manufacturer. There shall be no air entrapped within the part of the valves subjected to testpressure.
- Valve shall be offered by vendor for visual inspection before shipment. Valves shall be tested as per the relevant Standard.
- The hydrostatic testing shall be witnessed by the purchaser or his representative / TPI.

Article XIX. MATERIAL OFCONSTRUCTION

•All sluice valves at the pump-house shall be of body Cast Iron, Spindle SS.

•All valves shall be supplied with matching companion flanges with necessary bolts, nuts gaskets.

Article XX. NOMINALPRESSURES

- Valve shall be designated by nominal pressure (PN) defined as the maximum permissible working pressure (MPa) at 20 deg. C temperature as under:
- PN 0.25, PN 0.6, PN 1.0, PN 1.6 and PN 2.5

Article XXI. TEMPERATURERATINGS

All valves shall be suitable for continuous use at their PN designation within the temperature range of -10^{0} c to 65^{0} c.

Article XXII. BODYENDS

Flanges shall be at right angles to the axis of the bore concentric with the bore. Flanges shall be drilled unless otherwise specified bolt holes shall be off centers.

Article XXIII. BEARINGS

The bearings shall be suitable for the maximum loads imposed during service.

Article XXIV. MATERIALS

This Standardis based on materials specified in IS unless otherwise agreed; the materials shall be of a grade equivalent to those given in IS or superior. Other material may be used as per agreement between the manufacturer the purchaser.

Article XXV. OPERATION

All valves shall be capable of operated at a differential pressure across the wedge. Worm gear or any other suitable type of operator can be used.

Article XXVI. DIRECTION FOROPERATION

- Unless otherwise specified, manually operated valves shall be closed by turning h wheel in a clockwise direction when facing the hand wheel.
- All operating device shall be provided with suitable stops to prevent movement of the shaft beyond the limit corresponding to the fully closed position of the disc.
- All operating device shall be packed with grease for life time operation. Operating device shall be totally enclosed weather proof for general application.
- Operating device shall be self-locking type. Valve shall be capable of being locked in at any intermediate positions.

The operating device h-wheels shall be marked „CLOSE‟ or „SHUT‟ to indicate the direction of closer. The operating device shall be provided with arrangement to indicate the valve position.

Article XXVII. TESTCERTIFICATES

The manufacturer shall issue a test certificate confirming that the valves have been tested in accordance with this Standardstating the actual pressures medium used in the test.

SR. NO.	PARTICULARS	DESCRIPTION	DATA TO FILL UP BY CONTRACTOR
1.0	Make	Pl. furnish detail	
2.0	Manufacturing Std.	IS : 14846 – 2000 or latest rev.	
3.0	Size range and Qty.	As per SOQ	
4.0	Fluid / Specific gravity	Water / 1.0	
5.0	Pressure Rating	PN : 1.6	
6.0	Stem	Rising Spindle	
7.0	Ends	Flanged, FF as per IS-1538 having off center bolt holes	
8.0	Bonnet	Bolted	
9.0	Disc.	Solid wedge	
10.0	Operation	Electric Actuator operated	
11.0	Seat- Body & Disc	Renewable	
12.0	Direction of Closing	Clockwise (marked on HW)	
13.0	Repacking /Back Seat Bush Arrangement	Required (above 300 mm size)	
14.0	Channel & Shoe Arrangement	Required (600mm & above)	
15.0	Gear Box arrangement	Required (350 mm & above)	
	Material Of Construction		
17.0	Body / bonnet /Disc	C.I IS 210 GR.FG 260	
18.0	Stem	SS, AISI – 304 (M)	
19.0	Body & Disc seat	SS, AISI – 304 (M)	
20.0	Stem nut & Stuff. Box Bush	Bronze IS 318 GR LTB2	
21.0	Stuffing box & Gland	DI, GR 500/7	
22.0	Channel & Shoe lining	S.S. BS 970 Gr 304 S16	
23.0	Gland Packing	Greasy Jute Packing	
24.0	Bolts, studs & nuts	CS IS 1367 Class 4.6/4	
25.0	Hand wheel /Cap	CI	
26.0	Details applicable require for Electrically Operated Valve		
26.1	Actuator make / model	Pl. furnish detail	
26.2	Actuator Torque capacity / RPM	Pl. furnish detail	
26.3	Power supply	3 Phase, 415 V, AC, 50 Hz.	
26.4	Valve opening/closing time	Vendor to specify	
27.0	Electric Actuator Requirements	Fwd. & reverse integral starter for local & remote mode & cable up to actuator motor with all accessories as per specifications as applicable	
28.0	Body/Shell test	24 Kg / Cm²	Required
29.0	Seat test	16Kg / Cm²	Required

NOTE: 01. Manufacturer / supplier shall submit separate data sheet for each duty.
02. For components (marked-M) material certificates shall be furnished
03. Actuator of MOV shall be as per specifications of Elect. Actuator attached separately

3.0 DUAL PLATE CHECK VALVES (NON RETURN/REFLUXVALVES) (Wherever Applicable):

DESIGN REQUIREMENTS FOR DUEL PLATE CHECK VALVES (DPCV)

a) The design manufacture of the valves shall comply with all currently applicable statutes, regulations safety codes in the locality where the equipment will be installed. Nothing in this specification shall relieve the contractor of thisresponsibility.

b) The non-return valves shall be of Dual Plate Check Valve (DPCV) type design. It shall be free from sharpprojections.

c) The valves shall be designed for minimum headloss

d) The valves shall have flanged ends. Flange confirming to IS: 1538.

e) The valve shall be suitable for mounting on a horizontal pipeline flow direction shall be clearly embossed on the valvebody.

f) Valves shall possess high speed closing characteristics be designed for minimum slam condition whenclosing.

g) Dual plate check valves shall conform to API 594. They shall have metal to metal sealing. The spring action shall optimize the equal closing rates of each plate especially when the friction coefficients are uneven due to one plate resting upon one another. The plates shall not drag on the seat while opening. The plates shall not vibrate under full or partial flowcondition.

h) In case of the nozzle check valve, the disc shall be correctly positioned at all times to achieve fully non-slam closure. The spring shall be fully shielded from the flow stream by the central flow diffuser.

i) Sealing shall be metal to metal. The disc shall be stable shall not vibrate under full or partial load conditions. The pressure designation of the valve shall be as per the Datasheet.

Article XXVIII. CLEANING

Prior to factory inspection, all manufacturing waste such as metal chips debris all other foreign matter shall be removed from interior of valve. All mill scale, rust, oil, grease, chalk all other deleterious material shall be removed from the interior exterior surfaces.

Article XXIX. PAINTING

Valves shall first be given two coats of zinc base primer after completely cleaning the surface then it shall be coated with three coats of coal tar epoxy paint. The resulting coating shall be uniform smooth shall adhere perfectly to the surface.

Article XXX. TESTS INSPECTION

- Valves shall be manufactured tested as per the relevant Standard, i.e. as per API 594 / 598 (with PN rating as per Data Sheet), with its latest revisions.

- Valves shall be offered for visual inspection dimensional checks.
- The hydrostatic water tightness testing shall be witnessed by the purchaser Manufacturer/ contractor shall submit the manufacturing quality assurance plan of the valve to TPI get approval of Engineer-In-Charge before manufacturing.

Article XXXI. MATERIAL OF CONSTRUCTIONTECHNICALPARTICULA

SR. NO.	DESCRIPTION	PARTICULARS
1	Standard	API 594 / 598
2	Size	As per Data-sheet
3	Working pressure	As per Data-sheet
4	Type	Duel Plate Check Valves (DPCV)
5	Ends	Flanged, with companion flanges, nut, bolt, Gaskets.
6	Other requirements	Liquid handled – Raw Water

SR. NO.	DESCRIPTION	PARTICULARS
7	Body	C.I IS 210 GR.FG 260
8	Bolts, studs and nuts	Carbon steel IS 1367 class 4.5
9	Body test	As per stard
10	Seat test	As per stard
11	Face to face dimension	As per stard
12	Companion flanges erection hardware	Required as per IS 1538 (table IV and VI)

SUBJECT: DATA SHEET FOR DUAL PLATE CHECK VALVE (NON RETURN/REFLUX VALVES)

SR. NO.	PARTICULARS	DETAILS	PARTICULARS
1.0	Make	Pl. furnish detail	
2.0	Standard	API 594	
3.0	Size in mm / Qty	As per BOQ	
4.0	Fluid	Water	
5.0	Sp Gravity	1.0	
6.0	Pressure Rating	PN 1.6 / Class 300	
7.0	Ends	Flanged, flanges as per IS-1538 Table IV & VI	
8.0	MATERIAL OF CONSTRUCTION		
8.1	Body	CS, ASTM A 216 Gr WCB (M)	
8.2	Plates	CS, ASTM A 216 Gr WCB (M)	
8.3	Body Seat	SS to BS 970 Gr 304 S16(M)	
8.4	Plate Seat / Face	SS to BS 970 Gr 304 S16(M)	
8.5	Hinge Pin / Stop pin	SS, AISI 410 (M)	
8.6	Springs	S.S AISI –304 (M)	
8.7	Bolts, studs & nuts	Carbon Steel IS :1367 Class 4.6 / 4 hot dipped galvanised	
9.0	ACCESSORIES		
9.1	Drain Plug	Not Require	
9.2	Lifting Eye Bolts	Require	
9.3	Support foot	Not Require	
9.4	By Pass Arrangement	Not Require	
10.0	DRAWINGS		
10.1	General outline dimensional drg.	Pl. furnish detail	
10.2	C.S. drawing with parts	Pl. furnish detail	
10.3	QA plan	Pl. furnish detail	
11.0	TESTING		

11.1	Shell test	To be witnessed	24 Kg / Cm²
11.2	Seat test	To be witnessed	16 Kg / Cm²

M – Denotes material test certificate required

4.0 EXPANSION BELLOW (Wherever Applicable):

GENERAL

SS Expansion joint shall be a metallic flexible connector fabricated of plies of metal to provide stress relief in piping systems due to thermal, mechanical other movements. It provides flexibility concurrent movements.

a) Compensate, Lateral, Axial, and Torsion Angular movements.
b) Low movement forces
c) Reduced fatigue factor
d) Reduced heatloss

Article XXXII. OPERATINGPRINCIPLES

SS Expansion Joints are flexible, reinforced bellows which are used in piping systems to meet the following major needs

e) To protect piping by absorbing any difference in dimension due to temperature variation or line movement.
f) It shall be protect equipment such as supports and anchors, pumps and valves etc., other equipment.
g) It shall be useful for simple connection of misaligned pipes.
h) Movement Accommodation:

Expansion contraction, as well as rapid movements (dynamic stresses), are absorbed by multidirectional often simultaneous deflections:

Article XXXIII.
Article XXXIV. TESTING

An SS Expansion joint is assessed on every vital performance criterion:-

a. UTS
b. Radiographictest
c. Liquid Penetrationtest
d. Deflection
e. Heat build-up
f. Life Cycle Test with load

g. Vacuum test

h. Hydraulic test

i. Stiffness test

j. Vibration test.

Article XXXV. DESIGN

SS Expansion Joint by the user should be based on the following points.

Article XXXVI. MECHANICAL DATA

i) All Bellows shall have IS: 2062 plate flanges. The hole-drilling dimension shall be as per IS: 1538 to match with the pump outlet flange or valve flange as the case may be, however, selection of the flange thickness as per IS: 6392, Table 17 for PN 1.6 and IS: 6392 Table 23 for PN 2.5 may be done for these M. S. flanges of the expansion bellows.

j) All Bellows shall be hydro tested, by our internal inspection department at 24 kg/sq.cm pressure For PN 1.6 and 37.5 kg/sq.cm for PN2.5.

k) M.O.C. of Bellows element liner shall be SA 240 TP304.

l) M.O.C. of Tie Rods and Nuts shall be IS1367.

m) M.O.C. of Weld ends and Lugs shall be IS2062.

Piping Stress Analysis for the piping system where the Expansion Joint is to be fitted can be provided by the contractor on specified data.

Article XXXVII. ACCESSORIES INSTALLATION

a) ACCESSORIES

i) CONTROLUNITS

The Control Unit assembly, consisting of two or more control rods and stretcher plates are placed according to SS Expansion Joints from flange to flange. This minimizes possible damage of the SS Expansion Joint caused by excessive motion of the bolt line, due to failure of anchor or equipment, it also absorbs static pressure thrust developed at the joint limits the extension compression movements, if required to prevent damage to the main equipment without hampering its basic need. Inadequate support of pipelines, incorrect anchoring, and considerable temperature variations may cause many abnormal movements. As such undesirable destructive movements can effectively be encountered by using control units.

ii) PROTECTIVE SHIELDS /COVER

The Protective Shields/Cover should be used on the SS Expansion Joint that carries high temperature. It protects the environment in the event of leakage/ splash and protects the SS Expansion Joint from fire during a flash fire.

iii) INTERNALSLEEVES

A device which minimizes contact between the inner surface of the bellow and the liquid flowing it, so as to protect the inner surface from corrosion to ensure that no foreign materials remain on the corrugation.

iv) COMPANSION/ COUNTERFLANGES

Article XXXVIII.

Companion/ Counter Flanges for the pipeline for which the SS Expansion Joint is to be fitted can also be supplied with the SS Expansion Joint, if required.

b) INSTALLATION OFACCESSORIES

i) INSTALLATION

- Piping sections where SS Expansion Joints are accommodated should be anchored properly to take care of stresses/ Reaction forces due to internal pressure.
- Taking into consideration the above, solid and belting anchor points should be selected particularly where change in direction of piping elbows are near to the pump etc.

ii) ANCHORINGPOINTS

An SS Expansion Joint must always be installed between two anchoring points (fixed supports). If it is not possible to install anchoring points (support points), stabilizing devices must be used.

iii) BUCKLING

- In order to avoid pipe buckling, guide collars must be provided regularly along the pipe length. A guide collar must also be provided on either side of the SS Expansion Joint. Maximum service life depends on careful correct installation. Transport
- Expansion Joints to area of installation in packed condition. Flange face of companion flanges in pipeline should be smooth without any sharp edges. For large size of Expansion Joints installed in horizontal ducts, lifting lugs welded to flanges should be used to hoist joint in position. Joints should only be fitted after all work on the pipeline flanges have been complete

anchors supports have been established. This is to avoid any accidental damage due to welding splatter or sharp objects to ensure that the joints are not overstressed.

- The bolts on the flanges must be tightened evenly. Uneven tightening may lead to hazardous leakage. Faulty fitting may lead to failure of the expansion joints.

DOCUMENT: TECHNICAL DATA SHEET FOR METALLIC EXPANSION BELLOWS

SR. NO.	PARTICULARS	DESCRIPTION	BLANK DATA TO BE FILLED BY BIDDER
1.0	LIQUID DATA		
1.1	Fluid / Specific gravity	Water with 2-3 ppm Residual Chlorine / 1.0	
1.2	Temperature	ambient	
2.0	EXPANSION BELLOWS DATA		
2.1	Make	Pl. furnish	
2.2	Manufacturing Standard	EJMA / ASME	
2.3	Size range and quantity	As per SOQ	
2.4	Overall length in mm	As per SOQ	
2.5	Pressure Rating	PN : 1.6	
2.6	Axial expansion in mm	5	
2.7	Axial compression in mm	15	
2.8	Mode of installation	Horizontal	
2.9	Ends	Flanged, FF as per IS-1538 having off center bolt holes	
2.10	No of Convolution	Pl. furnish	
2.11	Thickness of Weld End	Pl. furnish	
2.12	Thickness of internal sleeve	Pl. furnish	
2.13	Qty. & Position of Rods	Min. 3 nos @ 120 Deg. interval	
3.0	MATERIAL OF CONSTRUCTION		
3.1	Bellows (M)	SS 304	
3.2	Internal Sleeves (M)	SS 304	
3.3	Flanges (M)	CI / MS	
3.4	Lugs	CI / MS	
3.5	Rods	IS 1367 VI 1994 Cl 4.6	
3.6	Hardware	C.S IS 1367	
4.0	TESTING		
4.1	Hydrostatic Test pressure	24 kg / sq.cm	

M- Denotes material test required

5.0 PIPES SPECIALS (Wherever Applicable):

GENERAL

- The scope of work is to manufacture and supply pipes, which shall be in conformity with

IS: 3589 – 2000 (latest) and IS 5504 (latest) from M. S. Plates conforming to IS: 2062 - 1999 or hot rolled steel coils conforming to IS: 10748-2004 of required sizes with internal lining of solvent free Food-grade Epoxy (confirming to BS-6920) external coating of 3 Layer Poly Ethylene (3 LPE) - confirming to DIN 30672 or any other appropriate Standard. The Dry Film Thickness (DFT) of internal epoxy lining shall be minimum 406 micron total thickness of external 3 LPE coating shall be 3.7 mm on body of pipe 3.3 mm on weld joint.

- The M. S. Pipes, manufactured at the factory shall be provided with bevel ends. After the final inspection of the pipe, the pipe bevel ends on both the sides shall be coved with suitable protectors such that the pipe ends does not get damaged during transportation, loading unloading work. Also, varnishing will be carried out at the inside out side of the pipe cut back portion to avoid the corrosion of the un- coated metal during storage period. The varnishing can be removed after wards at the time of the welding field joint coating. The spiders on both ends of the pipe shall be of adequate size stiffness to keep the pipe in circularity during handling storage. It will not be less than 80 mm OD pipe. The spider pipe shall be a heavy duty pipe with at least 6 mm wall thickness. If possible, the pipe vender shall avoid the welding of the spider pipe with the main pipe adopt some other means for this purpose as it damages the internal surface of the pipe metal.
- All the Piping Work in side of the Pump House shall be externally coated with Zinc Rich Primer and suitable Epoxy Paint (Total DFT 200 microns). All the piping work out side of the Pump House including the pump discharge piping discharge header shall be externally coated with 3 LPE coating of 3.7 mm DFT on body of pipe 3.3 mm on weld joint.
- The pipes shall be of uniform bore straight in axis.
- The flanges of the straight pipes shall be square to the axis of the pipe. The faces of the flange shall be parallel. The bolt holes circle shall be concentric with the bore bolt holes equally spaced. In straight pipes, the bolt holes in one flange shall be located in line with those in other.
- The faces of the flanges of the fittings shall be square to the directional axes. The holes shall be located symmetrically off the center line. The intersecting axes of the tees shall be perpendicular to each other.
- The bolt holes on flanged pipes fittings shall be drilled with the help of drilling jig. The blank flanges are to be machined drilled.
- All nuts bolts used for jointing the pipes fittings shall be of cast steel or hot dipped galvanized.
- The approximate quantity for the pipe fittings shall be furnished in schedule of quantity.
- The quantity of pipes is for tender purpose only. So during ordering of pipes and fittings,

Contractor has to measure the actual quantities required as per execution of the site and prior approval should be taken from Engineer-In-Charges /client.

- The Pump discharge pipe lines in the pump house, shall be provided with necessary air venting arrangement like, air valves or ball valves (manually operated) of adequate size and rating for venting of air during start-up of the pumps.
- The reducers shall be prepared by conical bending of M S Plates in either single piece (with one long seam weld joint) or half round pieces (with 2 nos. of long seam weld joints). The minimum length of reducers shall be at least equal to or more than the major diameter of the pipes to be connected. At Shop, the testing of the welding joints shall be carried out by UT Die Penetrating Testing to ensure the soundness of the weld joints. After installing the Reducers at site, selected portion Radiographic Testing of site weld joint shall be carried out after Weld Visual Inspection.

Sr. No.	Description	Particulars
1	Plates / HR coil	IS: 2062, Gr, E 250 BR / IS: 10748 Gr. III Fe 410
2	Welding and Electrodes	ASME-SECT-IX, IS-7310, IS:7307, IS:814, IS:3613, IS:6419, IS:7280
3	Inside Food Grade Epoxy / Outside Epoxy Coating	IS : 3589
4	Fabrication and Manufacturing of Pipe	IS : 3589 / or IS: 5504

6.0 INSTALLATION, TESTING COMMISSIONING

ERECTION –GENERAL

- The Contractors staff shall include adequate competent erection engineers with proven, suitable, previous experience on similar contracts to supervise the erection of the Works sufficient skilled, semi-skilled unskilled labor to ensure completion of Works in time. The Contractor shall not remove any representative, erector or skilled labor from the Site without prior approval of the Engineer's Representative.
- The Contractor shall ensure that no installation or erection work shall commence until full unconditionally approved working drawings, signed stamped by the Employer are available at Site.
- The contractor's erection staff shall arrive on the Site on dates to be agreed by the Engineer-In-Charge. Before they proceed to the Site, however, the Contractor shall first

satisfy himself, as necessary, that sufficient plant of his (or his sub- contractor's) supply has arrived on Site so that there will be no delay on this account.

- One erection engineer who shall be required to be the contractor's representative shall be conversant with the erection commissioning of the complete Works. Should there be more than one erector, one shall be in charge the Contractor shall inform the Engineer-In-Charge or his representative in writing which erector is designated as his representative is Engineer-In- Charge. Erection engineer is to report to Project Manager.
- The Contractor shall be responsible for setting up erecting the plant to the line levels of reference of the positions, levels dimensions alignment, appliances labor in connection therewith. The checking of setting out of any line or level by the Engineer-In-Charge or his representative shall not in any way relieve the Contractor of his responsibility for the correctness thereof.
- Erection of Plant shall be phased in such a manner so as not to obstruct the work being done by other contractors or operating staff who may be present at the time. Before commencing any erection work, the Contractor shall check the dimension of structures where the various items of Plants are to be installed shall bring any deviations from the required position, lines or dimensions to the notice of the Engineer-In-Charge. Plant shall be erected in a neat workmanlike manner on the foundations at the locations shown on the approved drawings. Unless otherwise directed by the Engineer-In-Charge, the Contractor shall adhere strictly to the aforesaid approved drawings. If any damage is caused by the Contractor during the course of erection to new or existing Plant or buildings or any part thereof, the Contractor shall at his cost make good, repair or replace the damage, promptly effectively as directed by the Engineer-In-Charge to the Engineer-In-Charge satisfaction.
- The Contractor shall align all equipment holding down bolts shall inform the Engineer-In-Charge before proceeding with grouting-in the items concerned. The Contractor shall ensure that all equipment is securely held remains in correct alignment before, during after grouting-in.
- The approval by the Engineer-In-Charge of the contractor's proposals for rigging hoisting any items of the Plant into final positions shall not relieve the Contractor from his responsibility for damage to completed structures, parts or members thereof or other installed equipment. He shall at his own cost make good, repair or replace any damaged or injured items, whether structural, electrical, architectural, or of any other description, promptly effectively to the satisfaction of the Employer.
- No Plants or other loads shall be moved across the floors of structures without first covering the floors with timber of sufficient size so that applied loads will be transferred to

floor beams girders of steel or concrete. If it is required to reduce bending stresses deflection, the beams girders shall be provided with temporary supports.

- During erection of the plant, the Engineer-In-Charge will inspect the installation from time to time in the presence of the contractor's Site representative to establish conformity with the requirements of the Specification. Any deviations deficiencies found or evidence of unsatisfactory workmanship shall be corrected as instructed by the Engineer-In-Charge.

Article XXXIX. LEVELING GROUTING OFMACHINERY

- He shall undertake sufficiently in advance chipping of any unevenness of concrete on foundations, anchor bolt pockets, cutouts etc., to achieve uniform level of reference for erection. All concrete surfaces receiving grout shall be hacked as required to ensure better bonding with grouting.
- Contractor shall undertake the inspection of all components to be erected sufficiently in advance to check their soundness conformity to drawings the inspection records shall be signed by the Engineer-In-Charge as approval for undertaking the installation of the components. Any damage, shortfalls etc. shall be made good to the satisfaction of the Engineer-In-Charge.
- All grout for equipment shall be carried out using non-shrinkable continuous grout materials with suitable frame work of at least 12mm thickness. Surfaces to receive the grout shall be hacked roughened laitance shall be removed by wire brushing or blast of air. Concrete surface shall be blown off by compressed air before commencing grouting. Grouting shall be done inone
- continuous operation from one side such that grout flows in a single wave until grout reaches all confined spaces with no air pockets air form all confined spaces is expelled. A hydro static head of 150 mm shall be maintained during grouting operations. All grouting shall be carried out in the presence of the Engineer-In-Charge representative. All lines levels shall be checked up after grout is set. Block outs shall be closed using cement concrete of the same grade as that of the parent structure.

Article XL. PRE-COMMISSIONING

- After the Completion of erection, Pre-commissioning activities listed below shall be carried out to make the Plant ready for Commissioning. All instruments, materials provisions necessary for conducting site tests shall be provided by the Contractor at his own cost.

- Upon completion of erection of each piece of equipment, facility or discrete part of the plant, mechanical checks tests shall be carried out according to the contractor's check list. The mechanical checks tests shall be to establish that:
- The Plant is erected in accordance with the contractor's construction drawings, pipe work drawings, instrument diagrams, etc. issued for the Plant.
- The materials are installed mechanically function in accordance with the Contract Applicable codes as listed in the Contract are followed for Materials workmanship.
- Items such as painting, thermal insulation final clean-up which do not materially affect the operation or safety of the Plant will be excluded. All these items shall be listed completed after Pre-commissioning or commissioning at the discretion of the Contractor, but before acceptance.

The Contractor shall prepare maintain at site test forms records which shall include:

i. Description of type of test or check,
ii. Date times of test or check,
iii. Identification of equipment facilities,
iv. Test pressure, test data results, including remarks, if any,
v. Signature of the contractor's personnel attesting to data recorded, if any.

- Checks, tests records thereof shall be carried out by the Contractors construction forces.
- Engineer-In-Charge or his representative shall attend such check test whereverthe Engineer-In-Charge"orhisrepresentative'switnessorattesting of the check or test is required. For this purpose, the Contractor shall keep the Engineer-In-Charge informed of a day-to-day test plan schedule. The test plan schedule may be revised from time to time to reflect the actual progress of the work test.
- Any item, if found incomplete or requiring repair or adjustment, it shall be marked as such on the test records then reported by the Contractor to the Engineer-In-Charge the contractor's personnel in charge of the relevant construction area.
- Checking procedures shall be repeated until all the items on the check list are cleared.
- A complete set of test records shall be held over to the Engineer-In- Charge on completion.
- The tests on the different Mechanical Electrical equipment shall include but not limited to:
- Pumps, Piping Valves
- Complete piping installation shall be subjected to hydrostatic test at a pressure of 1.5 times the shut off pressure of pump or twice the working pressure of pump whichever is higher to test the soundness of the joints. Provision of the necessary pumps, gauges, blank flanges, tapings etc. for carrying out these tests shall be included in the Contract.
- Leakage tests shall be carried out on all erected pipe work, pumps valves immediately after

erection where possible before being built-in.

- Operating tests shall be conducted on valves.
- The pump set shall be tested for performance. The vibration noise levels shall be checked to be within the specified.
- The pump shall be tested throughout the operating range with all working (excluding standby) for all the pumps. No negative tolerance shall be permitted on any parameters visibly head, discharge efficiency. All the pumps will be tested for efficiency at duty point after installation.

PUMPMOTORS

Condition of winding insulation be tested insulation values shall be restored to required level by suitable heating arrangements locally.

CRANES

The crane lifting tackle shall be tested for the safe working load at factory. The Contractor shall arrange the test load. Deflection speed tests shall also be conducted at site with load in presence of Engineer in- charge.

INSTRUMENTATION

The tests on the instrumentation equipment shall include but shall not be limited to:

- All cables shall be tested for polarity, continuity insulation resistance. The common mode DC voltage at each signal input terminal shall be measured recorded.
- The pre-commissioning tests on the various main categories of plant shall be as listed below:
- The resistance of each electronic loop shall be measured
- Electronic equipment shall have been energized for at least 24 hours before testing begins
- The zero setting of each display instrument including any local indicator on or associated with a transmitter shall be checked
- The correct calibration of each item in each control or monitoring loop shall be checked by the introduction of appropriate signal at each source, at
- five cardinals points of the range for increasing decreasing signals

The following tests methods shall beused:

- Pressure operated devices – dead weight testers or portable calibrators
- Level operated devices – actual level variation or simulation thereof. Instrument zero reading shall be checked against a benchmark.
- For controlling devices, the Contractor shall demonstrate the correct operation of the loop including the regulating devices. Each automatic controller shall be set to the appropriate estimated values of the terms. It will be optimized during the plant start-up. Each control valve shall be optimized during the plant start- up. Each control valve shall be checked by operation of the manual controlonthe associated controller the correct stroking verified. Valve positioners, electro-pneumatic converters gauges shall be checked during these tests.
- All systems shall be checked for "fail-safe"operation.
- Initiating devices not covered by the foregoing e.g. plant stop/start controls shall be checked in conjunction with the testing of the associated switchgear machine.
- The Contractor shall also demonstrate the data transfer as per data transfer schedule between Pumping Stations.

Article XLI. COMMISSIONING

After the completion of Pre-commissioning activities the final checks preparations necessary for start-up of the plant shall be carried out. The Contractor shall submit to the Engineer-In-Charge a written notice of mechanical completion which shall include:

i. Identity of a part of the Plant considered mechanically complete
ii. A copy of all relevant completed test reports
iii. The date on which the completion of the tests was achieved
iv. Check list
v. A request for issuance of a Mechanical Completion Certificate in respect ofthat part.

Within fourteen (14) days from the date of receipt of the Contractor's written notice, the Engineer-In-Charge shall:

i. In the case of acceptance, issue a Mechanical Completion Certificate.
ii. In the case of objection, submit a rejection statement setting forth remaining items to be completed or defects or deficiencies to be corrected before Mechanical Completion status can beaccepted.
iii. When the Engineer-In-Charge rejects the contractor's notice, the Contractor

shall take any necessary action to complete or correct the items marked give the Engineer-In-Charge a second Notice of Mechanical Completion.

Commissioning activities of the Plant listed below shall be carried out to enable the start-up operation after the issuance of a Mechanical Completion Certificate by the Engineer-In-Charge. Procedures are described as below:

i. Commissioning Procedure shall be carried out in a methodical sequence as follows

A) Warming up,
B) Start-up,
C) Initial running,
D) Operability adjustment,
E) Stable operation
F) Final adjustment

At all stages of commissioning sequence, the plant shall be operated at optimum Plant conditions. To ensure this, the Contractor may make minor adjustment to the conditions indicated in the Operation Maintenance Manual as necessary.

The Contractor shall check the operating conditions of the plant by constantly monitoring operating data.

The Contractor shall specify for each discrete part of the plant the operational data to be recorded the manner in which the data is to be taken.

All the operating data shall be recorded by the Engineer-In-Charge on the forms to be mutually agreed. A copy of the operating log analytical data from initial operation through to the completion of Performance Test shall be made available by the Engineer-In-Charge to the Contractor for evaluation.

6.0 LT POWER and CONTROL CABLES (Wherever Applicable)

- The scope shall cover supply, laying, testing and commissioning of medium voltage PVC / XLPE cables.
- All cables shall carry tag numbers for easy identification. In case of control cables all cores shall be identified at both sides by their terminal numbers using PVC ferrules as per interconnection diagrams.

PVC / XLPE Insulated Cables (Medium Voltage)

1.1 kV grade PVC / XLPE insulated, Aluminum conductor GI strip / wire armored LT Cable as per IS 1554 (part I) / IS 7098 (part I) (for XLPE) with latest amendment.

RTD / BTD / Signal Cables:

Vendor is fully responsible for the sizing of all cables in their scope of supply considering factors like maximum distance between Panel/Control Room and the Units/Motors. Specifications for cables for RTD / BTD / Analog signals shall be as follows:

Cables shall be of 660V/1100V grade, single / multi-pair / Triad / Core cables as per BOQ/Price bid. Triad / Multi Core Signal cables shall be annealed, tinned, high conductivity 0.5/1.0/1.5 sq.mm stranded copper conductor, Polyester tapped PVC insulated nos. of cores twisted into pair, laid up collectively, individual pair / triad shielded and overall shielded with aluminum Mylar tape, armored with galvanized steel wire/strip, overall sheathed with PVC, conforming to IS:1554 and IEC:189 Part II.

Splicing and Termination

- Branch circuit wiring shall be spliced only in switch boxes, panel switch socket outlet boxes light fixtures outlets and circular junction boxes. They shall be made only with approved porcelain connectors. No joints shall be allowed within the conduit pipes, cable entry pipes or ducts for cable laying and wire pulling.

Testing:

Cables shall be tested in accordance with IS: 1554 / 7098.

Finished Cable Tests at Manufacturer's Works:

The finished cables shall be tested at manufacturer's works. Following routine tests for each and every length of cable and copy of test results shall be furnished for each length of cable along with supply. If specified, the cables shall be tested in presence of client's representative.

1. Voltage Test:

Each core of cable shall be tested at room temperature at 3 kV A.C. R.M.S. for duration of 5 minutes.

2. Conductor Resistance Test:

The D.C. Resistance of each conductor shall be measured at room temperature and the results shall be corrected to 20° c. to check the compliance with the values specified in IS
8130 - 1976.

Cable Test before and after laying of cables at site:-

1. Insulation Resistance test between phases, phase to Neutral and phase to earth.
2. Continuity test of all the phases, neutral and earth continuity conductor.
3. Sheathing continuity test.
4. Earth resistance test of all the phases and neutral.

Sealing and Drumming:

- Cable shall be supplied in non-returnable drums as per IS 10418 standard. Cable identification details like Voltage, size, name, etc. shall be written on Drums also as per
IS.

7.0 EARTHING SYSTEM (Wherever Applicable)

Standards

The following standards and rules shall be applicable:

1. IS: 3043 - 1987 Code of practice for Earthing.
2. IS: 2309 -1989 Code of practice for the protection of buildings and allied structures against lightning.
3. Indian Electricity Act and Rules / Electrical inspector / statutory norms

All codes and standards mean the latest. The installation shall generally follow the Indian Standard Code of Practice or the British Standard Code of Practice in absence of Indian standard.

General

- The resistance of any point in the earth continuity system of the installation to the main earth electrode shall preferably not exceed 1.0 ohm.
- The earth resistance shall be maintained with suitable soil treatment, (If required).
- The main earth loop shall be laid at a depth of 500mm below ground level.
- All medium (LT) and high voltage (HT) equipment (above 230V) shall be earthed by two separate and distinct connections with earth.
- Lightening protection shall be provided as per IS: 2309. Self-conducting structures may not be provided with aerial rod and down conductors but shall be connected to the Earthing grid at minimum two points of the base. An independent Earthing network shall
- Be provided for lightening protection and this shall be bonded with the main Earthing network minimum at two points at the buried electrodes.
- Plant instrument system clean Earthing, UPS system clean/safety earth shall be separate from the electrical Earthing system.
- The main earth electrodes after being driven into the ground shall be protected at the top by constructing brick masonry chamber of size 400 mm x 400 mm x height 300 mm shall be provided with 6mm thick Chequered plate cover / CI cover hinged with CI frame for housing of funnel and pipe.
- The earth electrodes shall be situated at a distance not less than 3.0 m from the building fencing structure and equipment foundations.
- The distance between two electrodes shall not be less than 3 meter.
- The surrounding the electrodes, soil shall be treated up with salt, coke and charcoal.
- The earth system connection shall generally cover the following:

1. Equipment Earthing for personnel safety
2. Transformer, DG and System neutral Earthing
3. Static and lightning protection
4. Current and potential transformer secondary neutral
5. Metallic non-current carrying parts of all electrical apparatus such as transformers, switchboards, bus ducts, motors, neutral Earthing resistors, capacitors, UPS, battery charger panels, welding receptacles, power sockets, lighting/power panels, control stations, lighting fixtures ceiling fan and exhaust fan, Street light, flood light pole circuit / cable.
6. Fence and Gate for electrical apparatus (e.g. transformer yard, etc.)
7. Cable shields armourand Shield wire.

Scope of work

The scope of work shall cover supply, laying, installation, connecting, testing and commissioning of:

- Plate (600 x 600 x 3mm Copper plate) / Pipe (40 mm Dia B class G.I pipe) type Earthing station with G.I Pipe / Copper plate of size as per BOQ / IS.
- Earthing Copper strips from Plate Earthing station and G.I strip for Pipe earth, to equipotential bar / earth grid.
- Earthing G.I / Copper strips / wires from earth grid / equipotential bar to power panels, DBs, motors, Indoor / Outdoor lighting systems, etc.
- Bonding of Non-current carrying parts, and metallic parts of the electrical installation.
- Qty. of pits mentioned are minimum or higher as per soil resistivity. Measurement of soil resistivity to be carried out by contractor at no extra cost.
- All the Earthing material and installation and construction of Earth Pit, chamber etc. Shall be as per IS 3043 and BOQ.
- **PRESSURE GAUGE (Wherever Applicable)**
-
- Industrial Model Heavy Duty Pressure gauges shall be provided on discharge of each pump and on common discharge header of each pump. Pressure gauge shall be bourdon type with a dial size of 150 mm in diameter and calibrated for the required range of duty heads of pumping machinery to be installed as per range available in the market unless specified otherwise in the price bid. The gauge shall be supplied complete with impulse tubing, two valve manifold with drain cock / calibration valve, fittings etc. The pressure gauges shall have an accuracy of ± 1% full scale and weather protection class IP 65. All wetted parts material shall be SS 316.
- Pressure gauge shall comply with IS 3624 / BS 1780. Pressure gauge shall have siphon & cock arrangement. Glycerin filled dial shall be provided as the gauge is subjected to pressure pulsation and / or vibrations. The internal parts of pressure gauge shall be stainless steel.
- The minimum diameter for round pressure gauge shall be 150 mm unless specified otherwise in data sheet.
- The zero and span of pressure gauge shall not change by more than ±0.1 % of the span per 0C changes in ambient temperature.
- The pressure gauge shall have to be fitted on individual delivery of pump as well as on the common discharge header.

DATA SHEET (PRESSURE GAUGE)			
SR.No	Particulars	Dept.Requirement	Bidder's Data
1.0 GENERAL			
1.1	Make	As per vendor list	
1.2	Service	Individual Pump desch.and Common header	
1.3	Fluid	Raw water	
1.4	Area of Classification	Non-hazardous	

2.0	MATERIAL OF CONSTRUCTION		
2.1	Type	Bourden	
2.2	Sensor & other wet parts	SS 316	
2.3	Process connection	½" NPT (M)	
2.4	Dial size	150 MM	
2.5	Material of dial	Aluminum with white background & black numerals	
2.6	Glass	Shatterproof	
2.7	Housing material	Die cast aluminum with epoxy	
2.8	Accuracy	+ or – 1 %of full scale or better	
2.9	Over range protection	125 %of maximum pressure	
2.10	Gauge protection	IP 65	
2.11	Temperature	50 Degree Celsius Ambient	
2.12	Range	As per BOQ	
2.13	Accessories	Snubber ,3 way isolationvalve,all other installation hardware	
2.14	Diaphram seal M.O.C	SS 316	
2.15	3 way isolation Valve	SS 316	
2.16	Impulse Tube Fitting M.O.C	SS 316	

1) SPECIFICATION FOR CUBICAL CONTROL PANEL BOARD STARTER:

Supply of fully automatic air break type panel up to 7.5 H.P. D.O.L Star-Delta from 8-20 H.P. above 20 H.P up to 9 0HP auto transformer control panels& for 100 HP and more than 100 HP Micro process type Soft starter based panel for Pumps suitable for operation on 415 (+ 10% -15%) Voltage, 3 Phase, 50 + 3% Hz A.C. Supply, Control Panels shall be comprising of isolator overload relays, contactors and accessories. The details of equipment accessories for each type of panels are given in enclosed data sheet.

ENCLOSURES :

The control panel shall be dust and vermin proof and fabricated out of minimum 1.5 mm CR sheets. D.O.L. and Star Delta Control Panel shall be wall-mounting type only. Autotransformer panel shall be wall mounting-cum-pedestal type. All items inside the panel shall be mounted on minimum 1.5 mm steel base plate. All metal parts shall be thoroughly cleaned, degreased and made free from rust. after application of zinc chromate primer the control planets shall be stove enameled with two coats of final paint. The color shade of panel shall be 631 of IS:5. The size of the enclosure should be as per requirement.

All bolts, nuts, screws, washers shall be Galvanized zinc/ Cadmium plated and passively, and full projection from dust ruler lining should be provided. There shall be two-cable to submersible motor and capacitor connection (Three entry for star-delta starter). There should be one suitable entry on bottom of control panel for incoming cattle. Layout on the door will be as per drawing (attached).

The cable entries for incoming and outgoing cable shall be provided with rubber grommets, at bottom of panel.

WIRING AND TERMINALS:

Power and control wiring shall be done with P.V.C. insulated copper conductor having 660/1100 V grade insulation control wiring shall be done with 1.5 sq. mm. copper conductors and shall be terminated with adequately sized compression type lugs for connections to the equipment terminals and the terminal strips. Each wire shall be identified at both ends by PVC ferrules. Not more than 2 wires to be terminated at one terminal and proper type and size at terminals should be used keeping in view the components for which they are used, so, that sufficient surface contact can be achieved. screws and bolts should be used as per corresponding size and hole. That should be done to the satisfaction of inspection authority incoming and outgoing connections to be made an terminals only. Clip on type terminals shall be used for wiring up to10mm2 and for conductors larger than 10 mm2 bolt type terminals shall be provided. Terminal may also be

permissible on epoxy insulator with copper strip and Hardware of proper size. The Size of Incoming cable should be provided as per table here under.

Sr. No.	Type of Control Panel	Size of incoming conductor Terminal	Terminal strip for outgoing conductor		
1	D.O.L. Up to 3 H.P. PANEL	1 x 3 x 2.5 sq. mm	1 No.	-	2.5 sq. mm
2	D.O.L. Up to 5 H.P. PANEL	1 x 3 x 2.5 sq. mm	1 No.	-	2.5 sq. mm
3	D.O.L. Up to 7.5 H.P. PANEL	1 x 3 x 4.0 sq. mm	1 No.	-	4.0 sq. mm
4	S.D.8 to 10 H.P. PANEL	1 x 3 x 6.0 sq .mm	2 No.	-	4.0 sq. mm
5	S.D. 11 to 15 H.P. PANEL	1 x 3 x 6.0 sq. mm	2 No.	-	4.0 sq. mm
6	S.D. 16 to 20 H.P.PANEL	1 x 3 x 10.0 sq. mm	2 No.	-	6.0 sq. mm
7	ATS 21 to 30 H.P.PANEL	1 x 3 x 16.0 sq. mm	1 No.	-	16.0 sq. mm
8	ATS 31 to 35 H.P.PANEL	1 x 3 x 25.0 sq. mm	1 No.	-	16.0 sq. mm
9	ATS 36 to 45 H.P.PANEL	1 x 3 x 25.0 sq. mm	1 No.	-	25.0 sq. mm
10	ATS 46 to 50 H.P.PANEL	1 x 3 x 25.0 sq. mm	1 No.	-	25.0 sq. mm
11	ATS 51 to 60 H.P.PANEL	1 x 3 x 35.0 sq. mm	1 No.	-	35.0 sq. mm
12	ATS 61 to 70 H.P.PANEL	1 x 3 x 35.0 sq. mm	1 No.	-	35.0 sq. mm
13	ATS 71 to 80 H.P.PANEL	1 x 3 x 25.0 sq. mm	1 No.	-	50.0 sq. mm
14	ATS 81 to 90 H.P.PANEL	1 x 3 x 25.0 sq. mm	1 No.	-	50.0 sq. mm
15	Microprocessor Softstarter91 to 100 H.P.PANEL	1 x 3 x 25.0 sq. mm	1 No.	-	70.0 sq. mm
16	Microprocessor Softstarter101 to 110 H.P.PANEL	1 x 3 x 25.0 sq. mm	1 No.	-	70.0 sq. mm
17	Microprocessor Softstarter 111 to 120 H.P.PANEL	1 x 3 x 35.0 sq. mm	1 No.	-	70.0 sq. mm
18	Microprocessor Softstarter 121 to 130 H.P.PANEL	1 x 3 x 35.0 sq. mm	1 No.	-	95.0 sq. mm
19	Microprocessor Softstarter 131 to 140 H.P.PANEL	1 x 3 x 35.0 sq. mm	1 No.	-	95.0 sq. mm
20	Microprocessor Softstarter 141 to 150 H.P.PANEL	1 x 3 x 35.0 sq. mm	1 No.	-	95.0 sq. mm
21	Microprocessor Softstarter 151 to 160 H.P.PANEL	1 x 3 x 35.0 sq. mm	1 No.	-	Above 95 sq. mm.

EARTHING

Provision shall be provided for connecting the earth. All non-Current carrying metallic parts of the equipment shall be earthed Two “L” shaped earth bus of aluminum (19 mm x 3 mm) will be connected between base plate and the body of the panel. Also necessary provision o Earthling of door shall be made to connect main Earthling.

NAME PLATE :

Labels shall be provided for each equipment mounted on the panel and all labels shall be engraved in Gujarati Language on 3 ply-laminated sheets or anodized aluminum. These shall be fastened to the panels by screws and not by Adhesive. All mounted equipment shall have identification with paint inside the panels. Instruction for operation of panel shall be engraved in Gujarati language on 3 ply laminate sheet or anodized aluminum. These should be fastened to the front side of panel door by screws and not by Adhesive.

ACCESSIBILITY :

Checking and removal of components shall be possible without disturbing adjacent equipment. All auxiliary equipments shall be easily accessible incoming supply terminates shall be shrouded with plastic covers to prevent accidental contact.

ISOLATORS :

This shall be air break type and AC-3/AC-23 Motor duty and shall have manual closing and opening mechanism only.

The operating handle shall be mounted on the door of the panel. The switches shall be door interlocked mechanism to prevent opening of the door when the switch is in “ ON “ position. The safety precaution arrangement should be carried out by transparent. P.V.C. sheet at front side of the isolator of required capacity. The current rating shall be as per Table-1

Sr. No.	Type of control panel board	Capacity of Isolator	Capacity of Fuse base	Capacity of Fuse

1	D.O.L. Up to 3 H.P PANEL	16 AMP	16 AMP	16 AMP
2	D.O.L. Up to 5 H.P PANEL	16 AMP	16 AMP	16 AMP
3	D.O.L. Up to 7.5 H.P PANEL	25 AMP	32 AMP	20 AMP
4	S.D.8 to 10 H.P. PANEL	32/40 AMP	32 AMP	32 AMP
5	S.D. 11 to 15 H.P. PANEL	63 AMP	63 AMP	40 AMP
6	S.D. 16 to 20 H.P.PANEL	63 AMP	63 AMP	63 AMP
7	ATS 21 to 30 H.P.PANEL	100 AMP	100 AMP	63 AMP
8	ATS 31 to 35 H.P.PANEL	100 AMP	100 AMP	80 AMP
9	ATS 36 to 45 H.P.PANEL	125 AMP	100/125 AMP	100 AMP
10	ATS 46 to 50 H.P.PANEL	200 AMP	150/200 AMP	125 AMP
11	ATS 51 to 60 H.P.PANEL	200 AMP	150/200 AMP	160 AMP
12	ATS 61 to 70 H.P.PANEL	200 AMP	200 AMP	160 AMP
13	ATS 71 to 80 H.P.PANEL	200 AMP	250 AMP	160 AMP
14	ATS 81 to 90 H.P.PANEL	250 AMP	250 AMP	200 AMP
15	Microprocessor Softstarter 91 to 100 H.P.PANEL	250 AMP	250 AMP	200 AMP
16	Microprocessor Softstarter101 to 110 H.P.PANEL	250 AMP	250 AMP	250 AMP
17	Microprocessor Softstarter 111 to 120 H.P.PANEL	250 AMP	250 AMP	250 AMP
18	Microprocessor Softstarter 121 to 130 H.P.PANEL	350 AMP	350 AMP	350 AMP
19	Microprocessor Softstarter 131 to 140 H.P.PANEL	350 AMP	350 AMP	350 AMP
20	Microprocessor Softstarter 141 to 150 H.P.PANEL	350 AMP	350 AMP	350 AMP
21	Microprocessor Softstarter 151 to 160 H.P.PANEL	400 AMP	400 AMP	400 AMP

NOTE : Use of FSU / SFU also Permissible In which case fuse base is not required.
Rewire able type fuse for D.O.L. & Star-Delta Type cubical control panel board up to 20 H.P. for A.T.S. Control panel board link type H.R.C. Fuse.

CONTACTORS :
The contactors shall be air break type having AC-3 duty rating. The contactor shall be suitable for operation on 415 + 10 % - 15% voltage. Current as per Table-II
OVERLOAD RELAYS:
Overload relays shall be three element positive acting ambient temperature compressed type with in built single phasing prevention mechanism and adjustable setting range to ensure protection against overload and single phasing. Bimetal relays shall be manually reset type with reset push button provided on the front of panel door. Ratings shall be as per Table-II. Overload relays should be same make as per contactor as far as possible.

Sr. No.	Type of control panel board	Rating of contactor			
		Main	Delta/ Step	Star	Relay size AMP (Approx.)
1	D.O.L. Up to 3 H.P PANEL	16	-		3-5
2	D.O.L. Up to 5 H.P PANEL	16	-		6-10
3	D.O.L. Up to 7.5 H.P PANEL	22/25	-		10-16
4	S.D.8 to 10 H.P. PANEL	16	16	16	6-10
5	S.D. 11 to 15 H.P. PANEL	22/25	22/25	22/25	10-16
6	S.D. 16 to 20 H.P.PANEL	30/32	30/32	30/32	13-21
7	ATS 21 to 30 H.P.PANEL	63/70	30/32	22/25	30-50
8	ATS 31 to 35 H.P.PANEL	63/70	38/40	30/32	45-70
9	ATS 36 to 45 H.P.PANEL	80/110	38/40	30/32	55-90
10	ATS 46 to 50 H.P.PANEL	100/110	63/70	38/40	60-100
11	ATS 51 to 60 H.P.PANEL	125/130	63/70	38/40	60-100
12	ATS 61 to 70 H.P.PANEL	170/200	63/70	38/40	80-120
13	ATS 71 to 80 H.P.PANEL	170/200	100	50	90-100
14	ATS 81 to 90 H.P.PANEL	200	100	50	135-225

15	Microprocessor Softstarter 91 to 100 H.P.PANEL	200	125	50	135-225
16	Microprocessor Softstarter 101 to 110 H.P.PANEL	225	125	70	135-225
17	Microprocessor Softstarter 111 to 120 H.P.PANEL	250	140	70	135-225
18	Microprocessor Softstarter 121 to 130 H.P.PANEL	300	150	80/100	135-225
19	Microprocessor Softstarter 131 to 140 H.P.PANEL	300	150	100	180-300
20	Microprocessor Softstarter 141 to 150 H.P.PANEL	300	170	110	180-300
21	Microprocessor Softstarter 151 to 160 H.P.PANEL	400	170	125	180-300

Note: Overload relay should be provided considering

For or D.O.L. 16 times o maximum H.P.
For star Delta :- 0.96 times of Maximum H.P.
For A.T.S. up to 80 H.P. :- 1.5 times of Maximum H.P.
For Micro processor soft starter panel :- 1.4 times of Maximum H.P.
It should be within calculation range. It should be manually or auto reset type.

AUTO TRANSFORMER :

Auto transformers shall be air cooled type having 3 tapings of 60%, 70% and 80% The same should do wound with copper wire. The size of the wire should be determined as per the H.P. of the motor. Stampings of reputed make and winding wire with ' E ' Class insulation should be used. This should also be suitable for 6 starts per hour. Maximum temperature rise should not be more than 1150C as per ISS Kordnoffer Circuits as per ISS should be adopted in ATS Panel. There shall be an acrylic / Hylem sheet over &belw the transformer. Also to absorb humming Rubber sheet shall be provided below Auto Transformer.

A.T.S.

i) Ault transformer shall be vacuum impregnated.
ii) Testing of transformers should withstand full load starting current (6 x 1.5 x H.P. x Tapping2) for six starts per hour. Each kick of 15 seconds duration as per reliever. US.
iii) % age regulation of voltage should be within 10%
iv) Excitation current at no load at rated voltage should be less than 10% of rated current.
v) Lamination should be preferably CRGQ(Cold Rotted Grain Oriented) alternative CRNGO.

FUSES :

Fuses should be re-wireable type up to 20 H.P. and above 20 H.P. fuses should be HRC tink type, similarly 415 Volt control fuse should be used re-wireable type up to 20 H.P. and above 20 H.P. it should be HRC type with 6 AMP fuse link current rating shall be as per table-1 for main fuses. One set of spars links should be provided with the panels.

TIMER :

Thermal / Electrmneumats / Electronic timer for change over in star –delta and ATS panel should be provided. Control wiring may be change as per type of timer and contactors.

INDICATING INSTRUMENTS :

a) Ammeter :

Ammeter of suitable ranges 36 x 96 mm square for DOL, SD and ATS panels. Ammeter of class 2.5 % accuracy shall be as per IS:1248/1968. ammeter for all panels should be CT operated of proper of proper range and secondary of CT should be 5 Amp. CT Coil may also be mounted on side wall if require. CT's shall have an accuracy 1.5. the range of ammeters in panel should be provided as follows.

Sr. No.	Type and range of control panel board	Amp ranges
1	D.O.L. Up to 3 H.P PANEL	0-10-60 AMP
2	D.O.L. Up to 5 H.P PANEL	0-10-60 AMP
3	D.O.L. Up to 7.5 H.P PANEL	0-15-90 AMP
4	S.D.8 to 10 H.P. PANEL	0-20-120 AMP
5	S.D. 11 to 15 H.P. PANEL	0-30-180 AMP
6	S.D. 16 to 20 H.P.PANEL	0-40-240 AMP
7	ATS 21 to 30 H.P.PANEL	0-60-360 AMP
8	ATS 31 to 35 H.P.PANEL	0-75-450 AMP
9	ATS 36 to 45 H.P.PANEL	0-100-600 AMP

10	ATS 46 to 50 H.P.PANEL	0-100-600 AMP
11	ATS 51 to 60 H.P.PANEL	0-150-900 AMP
12	ATS 61 to 70 H.P.PANEL	0-150-900 AMP
13	ATS 71 to 80 H.P.PANEL	0-150-900 AMP
14	ATS 81 to 90 H.P.PANEL	0-200-1200 AMP
15	Microprocessor Softstarter 91 to 100 H.P.PANEL	0-200-1200 AMP
16	Microprocessor Softstarter 101 to 110 H.P.PANEL	0-250-1500 AMP
17	Microprocessor Softstarter 111 to 120 H.P.PANEL	0-250-1500 AMP
18	Microprocessor Softstarter 121 to 130 H.P.PANEL	0-250-1500 AMP
19	Microprocessor Softstarter 131 to 140 H.P.PANEL	0-300-1800 AMP
20	Microprocessor Softstarter 141 to 150 H.P.PANEL	0-300-1800 AMP

VOLTMETERS :

Voltmeter should be of range 0-500 volts direct reading type and it should be 96 x 96 mm square size of class 2.5% accuracy for D.O.L. Star Delta and A.T.S. Control Panels. Village selector switch shall be provided for knowing the voltage across the three phases. Voltmeter shall be moving lion type as per per ISS.

INDICATING LAMPS : (22.5 MM)

Light Emitting Diod red color lamp should be used at 230 V and size of lam holder should be 25/30 mm. Off

Fault-trip
Slart(ATS)
Run(ATS) on SPP

PUSH BUTTONS (22.5 MM DIA) :

Push button colors shall be as follows and plain comminuted :

Stop	Red
Start	Green
Reset	Black
Time falls	Yellow

SINGLE PHASING PREVENTOR :

Single phasing prevent or should be operating on negative phasing sequence components principals and voltage sensing type only and with 2-3 seconds tutelage. It should be operate satisfactory from 320 / 480 V. Cut off voltage should be 320 V and 480 V. by pass toggle switch should be built in feature. There must be an ir dictation when 3 Phase are balanced. When one fuse blows, indication light would go off. The wiring diagrams of SPP should be provided on the unit (SPP)

INCOMING CABLE

The length of cable for D.O.L./S.D./ATS panels shall be provided with 3 meters suitable size flat PVC copper submersible cable of 660/1100 V grade duly crimped with lugs of bath reds. And an additional wire of 2.5 sq. mm (Black) single core shall be provided with 3- phase incoming cable from neutral point to GEB supply.

CAPACITOR:

GEB approved capacitor should be provided with necessary connections inbuilt with testing certificate from GEB of APP Type. Test Certificate shall have to be provided in duplicate to the consignee in original in duplicate. Capacity of capacitor shall be as tabulated below with panel board.

Sr. No.	Particulars of Control Panel Board	Capacity in KVAR
1	D.O.L. Up to 3 H.P PANEL	0
2	D.O.L. Up to 5 H.P PANEL	0
3	D.O.L. Up to 7.5 H.P PANEL	3
4	S.D.8 to 10 H.P. PANEL	4
5	S.D. 11 to 15 H.P. PANEL	6
6	S.D. 16 to 20 H.P.PANEL	8
7	ATS 21 to 30 H.P.PANEL	10
8	ATS 31 to 35 H.P.PANEL	12
9	ATS 36 to 45 H.P.PANEL	16
10	ATS 46 to 50 H.P.PANEL	19
11	ATS 51 to 60 H.P.PANEL	22
12	ATS 61 to 70 H.P.PANEL	26
13	ATS 71 to 80 H.P.PANEL	30
14	ATS 81 to 90 H.P.PANEL	34
15	Microprocessor Softstarter 91 to 100 H.P.PANEL	38
16	Microprocessor Softstarter 101 to 110 H.P.PANEL	42

17	Microprocessor Softstarter 111 to 120 H.P.PANEL	46
18	Microprocessor Softstarter 121 to 130 H.P.PANEL	50
19	Microprocessor Softstarter 131 to 140 H.P.PANEL	54
20	Microprocessor Softstarter 141 to 150 H.P.PANEL	58
21	Microprocessor Softstarter 151 to 160 H.P.PANEL	62

TEST AND INSPECYION :

1. Tests shall be carried out at manufacturer's works under his care and expenses.
2. Following tests as per applicable code shall be conducted during inspection.
   a) H.V.I.R ad panets 2.5 KV for power test circuit for 1 Min.1.5 KV FOR CONTROL CIRCUIT.
   b) Megger All panets test as per relevant IS
   c) Functional test (All panels)
   d) Temperature rise test for autotransformer only one from each category out of lot of any number of panels offered for inspection.

EQUIPMENT MAKES:

Unless approved in writing equipment / components of following make and cover and above approved by EIL shall only be acceptable.

MCCB	L & T SIEMENS, ELCON , STANDARD, C & S, GE, HAVELLS, SCHNEIDER, HPL, INDO-ASIAN, BCH
Contactors	L & T, SIEMENS, YULE, JMP, KILBURN, C & S, GE (UPTO 170AMP), BCH, SCHNEIDER, HAVELLS,PECO
Overload relays	L & T, SIEMENS, SCHNEIDER, GE , YULE, JMP, KILBURN, C & S, BCH, HAVELLS,TM, GS, PECO
Timers	L & T, JMP (JYOTI), ELLICO,C & S, BCH, GELCO
Push Buttons (22.5 mm)	L & T, SIEMENS, TEKNIC, VAISHNO, RAAS (TC / C&S), MATHURA.
CT Coil	Approved by EIL OR CPRI / ERDA tested
Door Push button	REPUTED
Meters	AE, IMP, MECO, GRD, RISHABH (L & T), SHANTI, INDOTECH, NIPPON.
Terminals	TOSHA, ELMEX, TECHNOPLAST, PI, CONNECT WELL, AIRON.
Single Phase Preventer (Auto switch)	MINILEC, GELCO, ELICO, AMBLIN, OR Any other make approved by EIL and CPRI/ ERDA Tested as per GWSSB Specification for each rating.
Incoming Cable	DARSHAN PLUS, SABAR, AROLEX, CHANDRESH, GOODLUCK, JAINSON, SUPER STAR, YOGICAB, KEI, PELEC, MECAB, NIKI
Voltmeter selector switch	SULZER, RECOM, KAYCEE, MATHURA.
Indicating Lamps (LED)	AIRON, ESSEN, IEC, BCH, VAISHNO, CONCORD, TECHNIC, ELCOM, MATHURA.
Rewire able fuse	WILLY, KEW, SUPER.
Auto Transformer	SUN, ELEMBICA, SUECO, ELTECH OR any other make approved by CEIL and CPRI / ERDA Tested as per GWSSB Specification for each Rating.
Capacitor	G.E.B. Approved make.

I.S. SPECIFICATION:

a)	IS : 13947 / Part-I	General requirement of switchgear and control gear voltage not exceeding 1000 Volts.
b)	IS : 2705	Specifications for Current Transformer.
	IS : 13947 Part-II	Degree of protection provide for switchboard.
	IS : 13947 Part-IV	Contractor AC Voltage not exceeding 1000 Volts.
c)	IS : 5124-1964	Code of practice for installation and maintenance of induction motor starter AC voltage not to exceeding 1000 Volts,
	IS : 13947 (Part-I & IV)	Motor starter for voltage not exceeding 1000 Volts.
d)	IS : 1248	Indicating instruments.

Data Sheet of D.O.L. Control Panel

Sr. No.	Description	Quantity
1	MCCB (for Motor)	1 No.
2	Contactor	1 No.
3	Overload Relay	1 No.
4	Push Buttons	
	Motor Start	1 No.
	Motor Stop	1 No.
5	Indicating Lamps	
	Motor on	1 No.
	Overload Trip	1 No.
	SPP	1 No.
6	Voltmeter Digital Analouge type & Ammeter Digital type	1 No.
7	Voltmeter Selector Switch	1 No.
8	Ammeter	1 No.
9	Ammeter Selector Switch	1 No.
10	Ammeter – CT	1 No.
11	Single phasing preventor (Auto switch)	1 No.
12	Capacitor	1 No.
13	MCB for capacitor	1 No.
14	4” x 4” Cooling fan	1 No.

NOTE : The use of contactors and overload relays in control panel shall be of one make as far as possible

Data Sheet of Star – Delta Control Panel

Sr. No.	Description	Quantity
1	MCCB (for Motor)	1 No.
2	Contactor	3 Nos.
3	Overload Relay	1 No.
4	Timer	1 No.
5	Push Buttons	
	Motor Start	1 No.
	Motor Stop	1 No.
6	Indicating Lamps	
	Motor on	1 No.
	Overload Trip	1 No.
7	SPP	1 No.
8	Voltmeter Digital Analouge type & Ammeter Digital type	1 No.
9	Ammeter – CT	1 No.
10	Ammeter Selector Switch	
11	Single phasing preventor (Auto switch)	1 No.
12	Capacitor	1 No.
13	Control Fuses	3 No.
14	MCB for capacitor	1 No.
15	4” x 4” Cooling fan	1 No.

NOTE : The use of contactors and overload relays in control panel shall be of one make as far as possible

Data Sheet of A.T.S. Control Panel

Sr. No.	Description	Quantity
1	MCCB (for Motor)	1 No.
2	Contactor	3 Nos.
3	Overload Relay	1 No.
4	Timer	1 No.
5	Push Buttons	
	Motor Start	1 No.

	Motor Stop	1 No.
6	Indicating Lamps	
	Motor on	1 No.
	Overload Trip	1 No.
	SPP	1 No.
7	Digital Multi Function Meter	1 No.
8	Voltmeter	1 No.
9	Voltmeter Selector Switch	1 No.
10	Ammeter	1 No.
11	Ammeter – CT	1 No.
12	Single phasing preventor (Auto switch)	1 No.
13	A.T.S. starter	1 No.
14	Capacitor	1 No.
15	MCB for capacitor	1 No.
16	4” x 4” Cooling fan	1 No.

9.0 ABBREVIATION

1	ANSI	AMERICA NATIONAL STARDS INSTITUTE
2	LOA	LETTER OF AWARD
3	BKW	BRAKE KILOWATT POWER
4	CI	CAST IRON
5	DI	DUCTILE IRON
6	NDT	NON-DESTRUCTIVE TEST
7	DPCV	DUAL PLATE CHECK VALVE
8	MOC	MATERIAL OF CONSTRUCTION
9	TEFC	TOTALLY ENCLOSED CLOSED FAN COOLED
10	AWWA	AMERICAN WATER WORKS ASSOCIATION
11	NB	NOMINAL BORE
12	PN	NOMINAL PRESSURE
13	BIS	BUREAU OF INDIAN STARDS

20.0 Vendor list

LATEST GUJARAT WATER SUPPLY and SEWERAGE BOARD (GWSSB) APPROVEDVENDOR LIST SHALL BE MADE APPLICABLE. CAN BE DOWNLOADED FROM BELOW GIVEN WEB ADDRESS:

1. https://gwssb.gujarat.gov.in/other-info

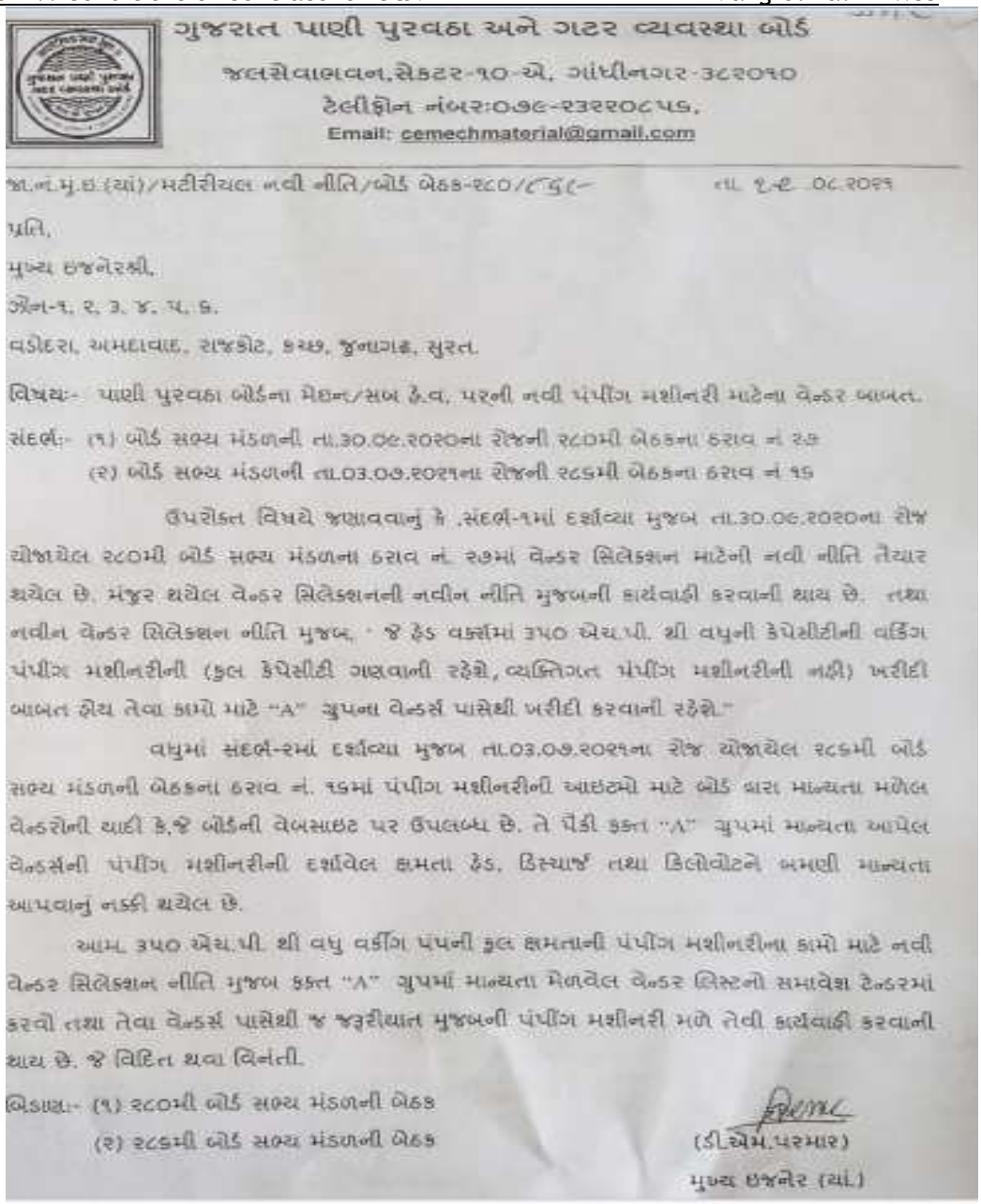
As decided in 280th meeting held on 30/09/2020 it has been decided that "In the head works/sub head works, if the working capacity of pumping m/c is 350 & above horse power (H.P) only 'A' group manufacturer are only to be considered

Also it has been decided in 286th meeting held on 03/07/2021 that the manufacturer falls under 'A' group, the capacity in terms of Head (H), Discharge (Q) & Kilowatt (KW) has to be considered double than the capacity shown in the vender list.

This guide line is issued in accordance with the C.E (Mech.) GWSSB's letter No. મુ.ઈ. (ચાં) / મટીરીયલનવીનીતિ / બોર્ડબેઠક - 280/869 તા. 12/08/2021. (Letter attached herewith (next page))

Vendor list is available on GWSSB website. Which is as under.

https://gwssb.gujarat.gov.in/downloads/Vendor_List_as_on_18112021.pdf



ગુજરાત પાણી પુરવઠા અને ગટર વ્યવસ્થા બોર્ડ

જલસેવાભવન,સેક્ટર-૧૦-એ, ગાંધીનગર-૩૮૨૦૧૦

ટેલીફોન નંબર:૦૭૯-૨૩૨૦૮૫૬,

Email: cemechmaterial@gmail.com

જા.નં.મુ.ઇ.(યાં)/મટીરીયલ નવી નીતિ/બોર્ડ બેઠક-૨૮૦/૮૬૮- તા. ૧૯.૦૮.૨૦૨૧

પ્રતિ,

મુખ્ય ઇજનેરશ્રી,

ઝોન-૧, ૨, ૩, ૪, ૫, ૬,

વડોદરા, અમદાવાદ, રાજકોટ, કચ્છ, જુનાગઢ, સુરત.

વિષયઃ- પાણી પુરવઠા બોર્ડના મેઇન/સબ ફે.વ, પરની નવી પંપીંગ મશીનરી માટેના વેન્ડર બાબત.

સંદર્ભઃ- (૧) બોર્ડ સભ્ય મંડળની તા.૩૦.૦૯.૨૦૨૦ના રોજની ૨૮૦મી બેઠકના ઠરાવ નં ૨૭

(૨) બોર્ડ સભ્ય મંડળની તા.૦૩.૦૭.૨૦૨૧ના રોજની ૨૮૬મી બેઠકના ઠરાવ નં ૧૬

ઉપરોક્ત વિષયે જણાવવાનું કે ,સંદર્ભ-૧માં દર્શાવ્યા મુજબ તા.૩૦.૦૯.૨૦૨૦ના રોજ યોજાયેલ ૨૮૦મી બોર્ડ સભ્ય મંડળના ઠરાવ નં. ૨૭મા વેન્ડર સિલેક્શન માટેની નવી નીતિ તૈયાર થયેલ છે. મંજુર થયેલ વેન્ડર સિલેક્શનની નવીન નીતિ મુજબની કાર્યવાહી કરવાની થાય છે. તથા નવીન વેન્ડર સિલેક્શન નીતિ મુજબ, " જે ફેઇડ વર્ક્સમાં ૩૫૦ એચ.પી. થી વધુની કેપેસીટીની વર્કિંગ પંપીંગ મશીનરીની (કુલ કેપેસીટી ગણવાની રહેશે, વ્યક્તિગત પંપીંગ મશીનરીની નહી) ખરીદી બાબત હોય તેવા કામો માટે "A" ગ્રુપના વેન્ડર્સ પાસેથી ખરીદી કરવાની રહેશે."

વધુમાં સંદર્ભ-૨માં દર્શાવ્યા મુજબ તા.૦૩.૦૭.૨૦૨૧ના રોજ યોજાયેલ ૨૮૬મી બોર્ડ સભ્ય મંડળની બેઠકના ઠરાવ નં. ૧૬માં પંપીંગ મશીનરીની આઇટમો માટે બોર્ડ દ્વારા માન્યતા મળેલ વેન્ડરોની યાદી કે,જે બોર્ડની વેબસાઇટ પર ઉપલબ્ધ છે. તે પૈકી ફક્ત "A" ગ્રુપમાં માન્યતા આપેલ વેન્ડર્સની પંપીંગ મશીનરીની દર્શાવેલ ક્ષમતા ફેઇડ, ડિસ્ચાર્જ તથા કિલોવોટને ધ્યાને માન્યતા આપવાનું નક્કી થયેલ છે.

આમ, ૩૫૦ એચ.પી. થી વધુ વર્કીંગ પંપની કુલ ક્ષમતાની પંપીંગ મશીનરીના કામો માટે નવી વેન્ડર સિલેક્શન નીતિ મુજબ ફક્ત "A" ગ્રુપમાં માન્યતા મેળવેલ વેન્ડર લિસ્ટનો સમાવેશ ટેન્ડરમાં કરવો તથા તેવા વેન્ડર્સ પાસેથી જ જરૂરીયાત મુજબની પંપીંગ મશીનરી મળે તેવી કાર્યવાહી કરવાની થાય છે. જે વિદિત થવા વિનંતી.

બિડાણઃ- (૧) ૨૮૦મી બોર્ડ સભ્ય મંડળની બેઠક

(૨) ૨૮૬મી બોર્ડ સભ્ય મંડળની બેઠક

(ડી.એમ.પરમાર)

મુખ્ય ઇજનેર (યાં.)

ડી. જી. રામચંદાણી
મુખ્ય ઇજનેર

ગુજરાત પાણી પુરવઠા અને ગટર વ્યવસ્થા બોર્ડ
નર્મદા, જળ સંપત્તિ, પાણી પુરવઠા અને કલ્પસર વિભાગ
જલસેવા ભવન, એરફોર્સની સામે, સેક્ટર-૧૦ એ,
ગાંધીનગર-૩૮૨૦૧૦.
ફોન : ૯૯૭૮૪૪૧૧૦૧-૦૫, ફેક્સ : ૦૭૯ ૨૩૨ ૨૫૯૨-૯૯
E-mail : gwssb.monicell@gmail.com, setechcell@gmail.com

જા.નં./ટેકસેલ/ટેંડર ક્લોઝ ફેરફાર/પરિપત્ર /૨૪૪ તા.૧૧/૦૨/૨૦૨૧

પરિપત્ર

વિષયઃ- ટેન્ડરમાં રાખવામાં આવતાં પ્રાઇઝ વેરીએશન કલોઝમાં તેમજ અન્ય કલોઝમાં ફેરફાર કરવા બાબત.

સંદર્ભઃ- તા.૦૬/૦૨/૨૦૨૧ના રોજ મળેલ ૨૮૨મી બોર્ડ બેઠકની કાર્યવાહી નોંધ

પ્રસ્તાવનાઃ-

ટેન્ડરમાં રાખવામાં આવતાં પ્રાઇઝ વેરીએશન અને અન્ય કલોઝ બાબતે મુખ્ય ઇજનેરશ્રીઓના સૂચનો મળેલ. જે મુજબ પ્રવર્તમાન ટેન્ડરની જોગવાઇઓ પ્રમાણે જો કોઇ પણ કારણોસર કામમાં વિલંબ થાય અને કામ પૂર્ણ થવાની સૂચિત તારીખ પછી જો ઠેકેદારશ્રી માલ-સામાન સપ્લાય કરે તો ભાવોમાં વધારો મળવાપાત્ર થતો નથી પરંતુ ઘટાડો થાય તો તે મુજબનું ચૂકવણું કરવામાં આવે છે. આ ઉપરાંત, ટેન્ડરની પ્રવર્તમાન જોગવાઇ મુજબ પાઇપોના જથ્થામાં વધારો થાય અથવા જો નવી આઇટમનો ઉમેરો થાય તેવા કિસ્સા માટે ઠેકેદારશ્રીને પ્રાઇઝ વેરીએશનનો વધારો મળવા પાત્ર થતો નથી.

આ અંગે ક્ષેત્રિય કચેરીના સૂચન મુજબ બોર્ડ સભ્ય મંડળની બેઠક નં. ૨૮૨ તા. ૦૬/૦૨/૨૦૨૧માં ટેન્ડરમાં રાખવામાં આવતાં પ્રાઇઝ વેરીએશન કલોઝમાં તેમજ અન્ય કલોઝમાં ફેરફાર કરવા જરૂરી મંજુરી આપવાનું ઠરાવેલ છે.

પરિપત્ર-

પાણી પુરવઠા યોજનાના ટેન્ડરમાં રાખવામાં આવતાં પ્રાઇઝ વેરીએશન કલોઝમાં નીચેની વિગતે ફેરફારને આધીન અમલવારી કરવાની રહેશે.

(૧) કામ પૂર્ણ કરવાની મુદત જ્યારે અને જેટલા દિવસો પૂરતી પેનલ્ટી વગર ઠેકેદારની જવાબદારી ન હોવાના લીધે લંબાવવામાં આવે, ત્યારે તે સમયગાળા દરમ્યાન મૂળ ટેંડરમાં દર્શાવેલ પાઇપના જથ્થા પૂરતુ લીધેલ પાઇપના માલસામાન ઉપર પ્રાઇઝ વેરીએશન મળવા પાત્ર થશે જે કીસ્સામા સમય મર્યાદા પેનલ્ટી સાથે લંબાવી છે ત્યાં મુદત વધારવામાં પેનલ્ટીના છેલ્લા દિવસો છે તેમ ગણવાનુ રહેશે.પેનલ્ટીના છેલ્લા દિવસોમાં ખરીદ કરેલ પાઇપો પર પ્રાઇઝ વેરીએશનના કારણે વધારો મળવા પાત્ર રહેશે નહી, પરંતુ જો ભાવો ઘટે તો તે વેરીએશનની રકમ કાપવામાં આવશે.

C.E. Surat Zone
Inward No. ૭૬૨
Date. ૧૨-૦૨-૨૦૨૧

change in tender Clause_Paripatra_100220221.doc

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પાઈપની આઈટમમાં એક્સ્સેસ અને એક્ટ્રા આઈટમ પર પ્રાઈઝ વેરીએશન મળવાપાત્ર રહેશે નહી.

(૨) ટેંડરોમાં સિવિલ/યાંત્રીકના કામો સાથે મરામત અને નિભાવણીની જોગવાઈઓ સાથે બહાર પાડવામાં આવે છે, તેવા ટેન્ડરોમાં ઈજારદારો મરામત અને નિભાવણીને અંદાજીત કિમત કરતા ઓછા ભાવો ભરી શકશે નહી. ઈજારદારે કુલ મરામત અને નિભાવણીના સમય માટે એક જ ભાવ ભરવાના રહેશે, મંજૂર થયેલ ટેન્ડર મુજબની મરામત અને નિભાવણીની કુલ રકમ પૈકી દર વર્ષે ટેન્ડરમાં દર્શાવેલ શિડયુઅલ ઓફ પેમેન્ટ મુજબ કરવાનુ રહેશે. ઉક્ત બાબતઓ અમલ ઓનલાઈન ટેન્ડરોમાં પણ કરી શકાશે.

આ બાબતે ઉપરોક્ત ટેન્ડર ક્લોઝમાં સુધારાની બાબતનું સરખામણી પત્રક માર્ગદર્શીકા તરીકે આ સાથે સામેલ છે.

બિડાણ: સરખામણી પત્રક

(ડી. જી. રામચંદાણી)
મુખ્ય ઈજનેર

<u>નકલ સાદર રવાના પ્રતિ,</u>

- માન. સચિવશ્રી (પા.પુ), નર્મદા, જળસંપતિ, પાણી પુરવઠા અને કલ્પસર વિભાગ, બ્લોક નં- ૭, નવમો માળ, સચિવાલય, ગાંધીનગર.
- માન. અધ્યક્ષશ્રીના કાર્યકારી સચિવશ્રી, ગુ.પા.પુ. અને ગ.વ્ય.બોર્ડ, ગાંધીનગર.
- માન. સભ્ય સચિવશ્રી, ગુ.પા.પુ. અને ગ.વ્ય.બોર્ડ, ગાંધીનગર.
- અધિક સચિવ અને મુખ્ય ઇજનેરશ્રી, નર્મદા, જળસંપતિ, પાણી પુરવઠા અને કલ્પસર વિભાગ, બ્લોક નં- ૭, નવમો માળ, સચિવાલય, ગાંધીનગર.
- મુખ્ય કાર્યકારી અધિકારીશ્રી, વાસ્મો, ગુ.પા.પુ. અને ગ.વ્ય.બોર્ડ, ગાંધીનગર.
- મુખ્ય ઇજનેરશ્રી, ઝોન-૧, વડોદરા, ઝોન-૨, અમદાવાદ, ઝોન-૩, રાજકોટ, ઝોન-૪, કચ્છ-ભૂજ, ઝોન- ૫, જુનાગઢ.
- પ્રોજેક્ટ ડાયરેક્ટરશ્રી, અર્બન સેલ, ગુ.પા.પુ. અને ગ.વ્ય.બોર્ડ, ગાંધીનગર.
- ચીફ જનરલ મેનેજરશ્રી (પ્રોજેક્ટ), જી.ડબલ્યુ.આઈ.એલ., ગાંધીનગર
- માસ્ટર ફાઇલ.

	Prevailing		Revision
1	**(CLAUSE-1) Security Deposit:** In case the contractor quotes less than the rates of .....% (% of estimated cost for O&M with respect to capital cost)of estimated cost for O&M work, the difference between O&M cost as per .....% (% of estimated cost for O&M with respect to capital cost) of the contract value and their quoted price shall have to be paid by the contractor in the form of security deposit to GWSSB, in addition to the required security deposit as per O&M contract.	1	**(CLAUSE-1)** In the tenders Civil/ Mechanical Capital works with operations and maintenance, the bidder cannot quote the rates less than the estimated cost. The bidder shall quote the single amount for complete O & M Period which shall be divided between the years as per the Schedule of Payment mentioned in the Tender Documents.
2	**(CLAUSE-59) Price Variation Clause:** The variation shall not be taken in to consideration for extension of time limit if any granted at the request of the Contractor. In case where time limit is extended on request of the Contractor any increase in such price variation shall not be admitted to the Contractor but decrease in such price variation as above shall be made applicable. Price variation effect shall be calculated by concerned Division & shall be verified by paying authority prior to making payment.	2	**(CLAUSE-59)** If the time limit is extended without penalty and the delay does not pertains to the contractor, then in such case Price Variation on the pipes shall be applicable restricted to the Bill of Quantities mentioned in tenders. If the time limit is extended with the penalty, than days on which penalty is arrived shall be counted from the actual date of completion. For pipes purchased during the penalty days, positive price variation shall not be applicable, where as negative variation is applicable. For Excess and Extra items price variation shall not be applicable. Price variation effect shall be calculated by concerned Division & shall be verified by paying authority prior to making payment.

SCOPE OF SERVICES

The Scope of work / service to be done / provided by the contractor under this bid will be as under:

Operation and maintenance Scope:

(1) The works shall include Operation & Maintenance of R.C.C., E.S.R., R.C.C. U/G Sump, Pump House, Pipeline, Pumping machinery & other ancillary works etc for Five years. Scope of work includes operation, maintenance, repairing & replacement of spare parts of following mechanical electrical, instrumentation & civil equipment.

(2) Operation and maintenance of following structure for the period of 120 months from the start of O&M period. All civil structures like staff quarters, pump house, compound wall etc of the works should be maintained for their excellent serviceability and shall be painted **once in every Two and half years,** during contract period with the same type of paint originally applied at the time of construction of the structure. All the flooring and finishing of all the building shall be maintained and replacement of the same shall be done by of the flooring of same type, specification and colour. The repairs shall be carried out in such a manner that it should fully merge with the original flooring without any noticeable variation at the repaired locations.

All the plumbing fixtures like taps, cocks, valves, hoses, showers, faucets, pipes shall be maintained in good working condition and replacements, if any, shall be made with the same type and style so that the repairs are not noticeable.

(3) All the water retaining and water conveying concrete or masonry structures like all sumps, inlets of pump houses, storage structures like ESRs and GSRs, tanks, channels, chambers shall be maintained free from any leakages. Any cracks, if observed shall be treated with either epoxy based grout / crystalline waterproofing agents / cementations grouts or any other appropriate method suitable for the nature and location of crack, as approved by the Engineer In Charge.

(4) All pumping main / Gravity main line of different dia and different type connected with head works should be maintained properly.

(5) Maintenance of electrical and electrical equipment at head/ Sub head works including emergency brake down works with cost thereof.

(6) Supply of all type of consumables material excluding material to be supplied by GWSSB as mentioned in Schedule –A of this Tender and also re-carting the un- serviceable or serviceable material to the departmental store.

(7) All type of spare parts for Electrical / Mechanical equipment. All electrical/mechanical works including repairs shall be done under supervision of mechanical wing of GWSSB and a certificate shall be produced at the end of each month regarding satisfactory maintenance of electrical/mechanical equipment carried out during that month.

(8) Submission of daily / weekly / monthly report to GWSSB.

(9) Submission of running bills along with all required evidence and documents.

(10) Two coats of oil paints / cement paint of approved make to all metallic and wooden Structures including over exposed piping arrangement are under scope of agency. The scope covers painting of all building's exterior with Cement paint and inside with lime/distemper point in first six months of taking over of O&M.

(11) The toner of chlorine Cylinder will be supplied by the contractor including loading, unloading and carting arrangement from to all H.W. & Sub H.W. site should be carried out by the contractor at his own cost and also empty Cylinder should be loaded unloaded and carted from HW/Sub HW site to concern by the contractor at his own cost. The rate includes cost of alum required for above work including carting, loading & unloading. The agency shall have to follow all applicable acts as per their latest revision for transportation of Chlorine cylinders such as Public Liability Act, Gas Cylinder Act etc. (If Applicable)

(12) All necessary safety provision for the security and safety of labours, Public properties etc.as per prevailing rules and regulations shall be followed during maintenance period.

(13) Maintain the record of filter plant as per PH manual and submit the same to the Executive Engineer, Public Health Works Division, along with the certificate of receiving the quantity of treated water from the concerned Deputy Executive Engineer. Wastage of water in WTP exceeding 2% of daily output shall be deducted from the bills of agency at the rates quoted by the agency for additional quantity.

(14) Submission of the bacteriological test report of clear water from departmental laboratory once in a month AT agency cost in case of epidemic frequency of testing should be as directed by Engineer-in-charge for which no additional charge shall be claimed.

(15) Chlorine gas to be supplied by contractor at his own cost. Rates include the cost of chlorine gas of GACL. And the necessary permission and license etc. required for this type of chemicals are to be obtained by the agency including all safety measures & devices are to be make available at site and store by the agency. (If Applicable)

Chemical analysis and Bacteriological analysis of water would be done by the contractor on weekly / monthly basis at head works / sub head works.

(16) All necessary safety provision for the security and safety of labours, Public properties etc. as per prevailing rules and regulations shall be followed during maintenance period.

(17) Maintenance of Garden/ Trees / Plantation within the premises of work site.

(18) In short, this tender includes cost of all civil, mechanical & electrical works including cost of consumables excluding electricity & irrigation charges but including routine & emergency brake down works with cost of material, labour etc.

(19) Contractor has to depute one responsible person with mobile telephone facility at concerned Sub Division Office all the working days for attending the complain regarding prompt

repairing and leakages and quantity of water receiving at all the faced works which are under scope of the works

(20) It is the responsibility of the contractor to ensure that residual chlorine is available at all points of service throughout the year. The agency shall have to provide proof of availability of residual chlorine at all villages along with the bill. If supporting documents are not furnished along with the bill, No payment for work of chlorination shall be made. At feeding points, excess chlorination more than 2 ppm shall be avoided at all cost except with written permission of EIC. If residual chlorine at any consumer end is not available, arrangements for boosting chlorination doses shall be made by the agency at his own cost till the validity of the tender. For such cases of boosting, only electricity shall be supplied free of cost. All other arrangements including chlorination equipments, connections, availability of chlorine gas at site etc shall be made by the agency at no extra cost.

(21) Regional Water Supply Scheme (RWSS) as described in the specification are proposed to be supplied with water. The agency has to quote rates for demand of RWSS only. Due to addition/ subtraction of villages, increase/decrease in quantum of water supply may happen. Any increase/decrease in excess of 10% shall be paid/ deducted @ rates quoted by the agency on actual supply at tail end on pro-rata basis. No payment/deduction shall be made till 10% deviations.

(22) The details of current establishment enclosed are of indicative nature only. The agency is at liberty to provide less/more staff for smooth O&M of the scheme. The primary objective of GWSSB is to provide safe and reliable network for drinking water to villages and no compromise on this shall be made.

(23) Scope of work of GWSSB :

a. Supervision of entire Maintenance of the work and scrutinizing / running account bills submitted by the agency and payment of passed bill as per the availability of funds.

b. Payment of Electric consumption bill to Electric Utility Company shall be made by GWSSB. However, as bills are received at site, contractor shall have to make arrangements for its submission to GWSSB within 4 days of its receipt to enable office to make payment in time. In case of delay in Submission of Bill, Penalty as imposed by UGVCL will have to be borne by the contractor.

c. Payment to irrigation authority for usage of raw-water shall be made by GWSSB.
Penalty, if any, imposed by Irrigation dept for non working of water meter shall be borne by Contractor.

d. Supply of DI / M.S. pipe free of cost in case of major break down in DI / MS pipeline. However necessary bend, tee, tapes etc. shall be prepared on site with this pipe and pipe shall be carted by contractor at this cost and for the remaining materials and condition will be as per Schedule A.

Scope of work includes operation, maintenance, repairing & replacement of spare parts of following mechanical, electrical, instrumentation & civil equipment.

(24) The contractor would be responsible for smooth, efficient & satisfactory operation & maintenance and repairing, replacement of spares, any works related to raw water Pumping Stations, Treatment Plants, Treated water Pumping Stations, GSRs & ESRs & pipelines on the round clock basis for the period of 60 calendar months from the date of contract of plant shortly described as above.

(25) The scope of work of contractor includes operation, maintenance and repair of each & every structures, all pipeline, Electro- mechanical and instrumentation and control systems constructed / installed under the said project

(26) Each & Every structure as mentioned above like pump house, Treatment Plants, Treated water Pumping Stations, GSRs, ESRs, store, go down, security cabin, compound wall, shade, Air valve C.C. pillar, Air valve, Sluice valve, riser pipe air valve, Zero velocity valve, Butter fly valve, bypass arrangement, chamber for different type of valve should be colored by Oil Paint / Acrylic emulsion paint / black Japan as per the instruction of Engineer-in-charge (Once in two and half year period) at his own cost as under :

e. Exterior paint shall be Acrylic Emulsion Paint colour (like APEX) :pump house, Treatment Plants, Treated water Pumping Stations, GSRs, ESRs, sump, store,

f. Oil Paint colour : All type of Doors, Windows, Ventilation, Shutter, Pump, Motor, All valves & equipment in side pump house, Transformer yard, D.P. structure, Transformer etc

g. Black Japan Colour: Air valve, Sluice valve, Riser pipe of air valve, Zero velocity valve, Butter fly valve (outdoor), bypass arrangement etc.

(27) Water sump, ESR & suction structure shall be cleaned every three months or earliest if required. The floating debris of articles if any shall also be required regularly to be removed from the sump for cleaning purpose.

(28) The scope of the contractor includes operation, maintenance & replacement of spares.

(29) The scope of work also includes providing necessary tools and tackles for day-to-day O&M routine maintenance, preventive maintenance and breaking down maintenance

(30) Also minor and major repairs to the equipment involved in the plant have to be carried out by the contractors during O&M period.

(31) The Scope of Work also includes to repairing of Existing structures and components.

(32) The scope also includes cleaning of sump, removing of foreign materials like debris, sand, fish, frogs or any other dead or live Ahimals and also cleaning of strainers of each pump quarterly so that 24 hrs. required quantity of water is made available from the sump.

(33) The disposal of the foreign particles like sand, dead or alive Ahimals etc. from sump to suitable place as shown by GWSSB will be in the scope of contractor.

(34) Repairing & replacement of damage strainer of each pump set, repairing of dewatering pump-motor sets, chain pulley block etc. as well as any items to be procured for replacement will be in the scope of contractor.

(35) The scope of works also includes the calibration of all meters e.g. pressure gauge, Ammeter, voltmeter, relay, revectors meter, Energy meters, temp scanners, flow meters etc. for measurement of accurate readings once in a year or as and when required.

(35) All these capacitor panel must be kept in working condition to keep UGVCL power factor more than 0.95 by the contractor. If any additional capacitors irrespective of rating required to maintain the power factor for rebate shall be procured and fitted in HT or LT panels at his own cost. No spares for capacitor panel & LT capacitor panel in any circumstances will be provided by GWSSB. Any penalty levied by concern UGVCL on account of poor power factor (i.e. less than 0.9) will be recovered from the contractor from his monthly O&M bill.

(36) Daily record about the incoming flow & outgoing flow at each & every sump of all head work site should be maintained by the Contractor as per the Performa is to be supplied by the GWSSB and will be send day to day directly to EIC.

(37) Hourly record of raw water analysis and treated water analysis at all Treatment Plants should be maintained by the Contractor as per the Performa is to be supplied by the Department and will be send day to day directly to EIC.

(38) Contractor shall have to carry out Relay testing, Scheme testing & primary injection tests once in three years' maintenance period at his own cost by specialised personnel in power system protection to ensure system operational stability & reliability for pumping station. For specialised testing of this job, contractor shall have to take the approval from GWSSB for carrying out job by specialised personnel

(39) The scope of work also includes attending of all types of cable faults for pump motor set, street light etc.

(40) Drawl of raw water from Sump, transfer of raw water to WTP and pumping and transfer of Treated water by means of system, control and operation of plant.

(41) Routine maintenance of all buildings, transmission main, installation and equipment and area lighting, gardening.

(42) Management of the plant in administrative and financial operations connected to the plant management.

(43) All sluice valve/B.F. Valves/Air Valves/Zero velocity valves/Air cushion valve to be kept under working condition.

(44) Area lighting –The premises of various works are provided with mercury/sodium vapor lamps, fluorescent tubes and also ceiling fans/exhaust fans inside the various structures. Daily on/ off operation and routine cleaning of all type of electric fixtures. Replacement of lamps/ Tubes/ Fans in case of failure at contractors cost.

(45) Maintenance of garden –Normally watering the trees once a day or more if required. Grass cutting, removal of shrubs, weeds, around tree to be done as directed. Remarking the ponds around the tree after loosening with soil with supply of additional earth if required. Cutting of branches if required, for straight growth of tree/plant and development of garden

(46) Roads to be kept neat and clean.

(47) All buildings, bathroom, toilet to be kept cleaned & washed daily. Consumable requirement for cleaning such as acid, harpic, phenyl, air freshener, washing powder, brooms, wire brushes, duster, bamboos, toilet shop, lotion waste, kharata shall be provided and used as required. All ventilators, windows/ doors to be clean and good condition.

(48) To keep watch on overflowing of sump. If such overflow take place the agency shall have to bear the damages caused to surrounding properties.

(49) Maintaining rising and gravity transmission main. If any leakage breaking of pipe found, same shall have to be rectified within 12 hrs. All materials equipment's and labour shall have to be employed by the agency to attend such repairs.

(50) All air valves shall be repainted every year and numbered with radium paint.

DOCUMENTS RECORDS / LOG BOOK

The contractor will be responsible for keeping up to date records of documents including History Card for equipment and maintaining every day log book relating to various analysis performed and to prepare and submit a daily report of Pumping Station performance. The contractor shall maintain an updated log book and details of operational parameters like pumping hours, Amperes, Flow meter reading, H.T. Voltage, Power Factor, energy meter reading, pressure and other reading required are recorded in every shift at regular interval e.g. hourly or as agreed mutually (by GWSSB).

Printing of log sheets, registers and all necessary stationery required for maintaining records of operations and maintenance has to be arranged by the contractor at his cost. Format of log sheets, registers will be made available to the successful tenderer by GWSSB.

The Scope of work also includes attending of all HT & LT cables faults including end terminations of cables, changing of lugs or changing HT / LT cables.

ADDITIONAL SCOPE OF WORK

For additional work, if any, which is not included in the scope at present shall be executed by the contractor on authorization in writing from GWSSB.

The rate of such additional work will be worked out by the Contractor based on the cost of materials and labour and shall be furnished to GWSSB. The contractor shall be entitled for full cost of materials, direct labour and cost of operation of equipment/machinery etc. required to execute the work.

For such additional work, the contractor shall maintain time sheets of personnel

Engaged and equipment/machinery used for the execution of work. Only such labour and other costs based on the above records shall be applicable to the rates payable for above additional work

NOTICE BOARD / DISPLAY BOARD

The contractor shall provide a Notice Board/Display Board at appropriate locations detailing precautions to be taken by operation and maintenance personnel in work conformity with Industries and Labour Regulations and Department of Explosives.

GENERAL ROUTINE MAINTENANCE

General routine preventive maintenance schedule for various equipment shall be adopted from O&M Manual. However the general routine maintenance to be carried out by the Contractor's personnel will include but not limited to the following:

a) If it is observed that power consumption per MLD of water pumped is increased, the contractor has to trace out the fault and rectify the same to bring to the standard Value.
b) De-weeding and cleaning of the Transformer yard and other places.
c) Drying and refilling of silica gel in the breather of the transformer
d) Regular watering on the earth-pits.
e) Check for any oil leak in the transformer and intimating and repairing of the same.
f) Air blowing of motors, H.T & L.T. panel etc
g) Check for any loose connection in all electrical equipment and rectification of the same.
h) Replacement of gland packing for the pump, sluice valves etc. whenever required.
i) Greasing of bearing and lubricating all moving parts as per the schedule.
j) Tightening of all loose nut-bolts and other fasteners.
k) Cleaning of sump and strainer of each pump at regular intervals.
l) Lubricating and test operation of the valves.
m) General cleaning of all equipments and building.
n) Checking and replacement of bulbs, tubes, chokes, starters, switches, control etc. thorough out plant and including street and head lights.
o) Watering of plants and tree.

PREVENTIVE MAINTENANCE CHECKS:

The contractor shall adopt a preventive maintenance checks schedule as per original equipment manufacturer O & M schedule under intimation to the Employer. The preventive maintenance checks and their tasks frequencies will not be limited to the following:

Checks to be performed daily

a) Vibration in the pump sets, moving assemblies etc.
b) Tightness
c) Check condition of oil & grease & replace if necessary
d) Rise in temperature of bearings in motor, in moving parts and other units etc.
e) Working of gauges and other measuring devices.
f) Observations on water quality.

Checks to be performed weekly

i. Pipeline leakages
ii. Tightness of all electrical connections

iii. Tightness of all cable connections

iv. Temperature rise due t loose connections

v. Watering of earthing pits

vi. Operation of all sluice and butterfly valves, scour and pressure relief valves, gates and air valves.

vii. Contractor shall be equipped with dewatering pump of capacity of pumping water equal to 5 kilometre length of pipe line in 24 hours, the unit shall also consist of power generating set. One such set is required every 25 kilometre of pipe line section.

viii. All parts of the machinery and electrical equipments liable to wear and tear shall be replaced by the contractor every 6 months

ix. Current and voltages in all electrical equipments.

Checks to be performed monthly

a) Gland packing

b) Wear and tear of moving parts.

c) Adoption of electrical energy conservation consumption methods.

d) Electrical contacts

e) Motors

f) Metering of electrical equipment

g) Maintenance of EOT, Crane, Valve actuator, Battery, etc. shall be carried our as approved by the Engineer-in-charge.

Checks to be Performed Quarterly

a) Relay testing and calibration if possible of meters, gauges, instruments, flow meters, flow indicator units, Level gauges and flow meters signals.

b) Speed of motors

a) Cleaning, checking/tightening of HT and LT circuit/panel

b) Tightening of PMCC

c) Auxiliary DB, Capacitor bank

d) Battery and Battery charger

Checks to be performed annually

a) Overhauling requirement of all equipment

b) Improvement required if any in operation of plant

c) Testing and calibration of all instruments

d) 11 KV VCB cleaning, testing.

e) Transformer cleaning, checking silica gel, oil checking filtering/ replacing.

MINOR REPAIR GENERALLY ENCOUNTERED IN THE PLANT

Electrical works

a) For H.T. Installations

i. Replacement of jumpers

ii. Replacement of insulator (Porcelain)

iii. Replacement of Air- Break Switch

b) For Both H.T. & L.T. Installations

i. Replacement of no- volt coil for VCB

ii. Replacement of Cable lugs including terminations

iii. Replacement of burnt out HRC fuses

iv. Replacement of moving and fixed contacts or contractors

v. Repairs to isolators and switch fuse units and replacement of it and fuse base units.

c) Pump sets

i. Replacement of coupling bolt and nuts including rubber bushes

ii. Replacement of worn out impeller nut

iii. Replacement of spindle nut in the sluice valve.

iv. Replacement of terminal plate in the motor

v. Replacement of faulty/dead spares in the battery charger and battery control panel.

vi. Replacement of gland packing, graphite packing from the pump sets.

d) Valves

i. Replacement of gland packing, bolt and nuts including rubber bushes

ii. Replacement of worn out Rubber packing and nut bolts.

iii. Replacements of Spindle and nut in the sluice valve.

COMPUTER MONTHLY REPORT

The contractor has to provide at site one computer with colour printer of A-4 size to keep all the records, data maintenance schedules, spares available for the plant. Monthly statements for electricity consumed, total hours of pump operation, total qty. of pumping in MLD, average power factor, monthly consumable and repair maintenance during the month shall be furnished by the contractor.

Extent of work (Mechanical & Electrical)

The scope includes Comprehensive Operation & Maintenance & Repairs of pump sets with co-ordinate Accessories, piping system, pump house, Mechanical & Electrical equipments & instrument etc. comprehensive whole pumping Station located at various Headwork's ……

1 Operation & Maintenance of Mechanical Works:

(a) Operation & maintenance of pumps.

(b) Valves (butterfly / sluice / check – non return / reflux).

(c) Expansion bellow, MS / GI pipe work with specials.

(d) Electromagnetic flow meters on common discharge header & pressure gauges.

(e) Material handling system viz. motorized chain pulley block arrangement with girders & accessories.

2 Operation & Maintenance of Electrical Works:

(a) 11 KV switchyard with two pole structure with all required accessories.

(b) Distribution transformer servicing including replacement of required spares etc.

(c) LT/HT Motor control centre panel with required switch gears.

(d) Automatic power factor correction panel.

(e) Grounding (earthling) system with accessories.

(g) Power (LT/HT) & control cables with jointing kits & accessories including cable carrier system.

(h) General lighting arrangement with accessories.

(i) Safety accessories with exhaust fan.

(i) Installation, testing & commissioning of all the above equipments & accessories.

(j) Licensing work with local electricity authority including Electrical department procedure for approval with including preparation of electrical Installation Drawing and release of power.

3 Repairing work of Civil Works:

(a) Construction of thrust blocks & supports for pipe work.

(b) Drawing of holes in sumps, pump house etc. for pipes & plugging them properly (if required).

(c) Construction of grouting blocks for DP structure & chain link fencing, repairing of pedestal (plate form) of transformer as required.

4 Operation & Maintenance Work:

(a) Comprehensive Operation & maintenance of entire electro mechanical apparatus of pumping station to provide efficient and uninterrupted service as per detailed specifications for ten years.

SCOPE OF WORK AND SERVICES:-

The scope of work and services included but not limited to, under this contract, is Operation, Preventive maintenance and repairs of the plant Mechanical- Electrical- Instrumentations System and Equipments of Pumping stations.

INSTRUMENTATION & CONTROL SYSTEM COMPRISING OF (on each pumping station)

(1) Flow measuring system.
(2) Level measuring system
(3) Temperature scanners.
(4) Pressure measuring system
(5) Instrumentation panels.
(6) MIMICS Annunciation with Alarm system.

ANNEXURE –I
SCHEDULE FOR ESTABLISHMENT

The contractor shall employ the minimum staff for each package as under with qualification and experience stated below, Contractor may employ additional staff over and above minimum prescribed as per his requirement in order to run the system efficiently. The staff mention below its obligatory.

Sr. No.	Designation	Qualification	Experience
1.	Supervisor	Diploma Mechanical / Civil with 1 year experience of O&M of WTP/ Water Supply Scheme.	• 1 Person for overall coordination and reporting purpose to be deployed at MHW site. Contact number of the person is to be declared to beneficiaries for complain redressal.
2	Electrician	PWD supervisory certificate pass & having license of Govt. of Gujarat for HT Installations or ITI (Electrician) with NCTVT Certificate	• 1 Competent electrician with qualification is to be provided separately at MHW site (Total 1 Nos). Services of electrician should be available 24X7 when required for which extra person can be deployed by agency.
3	Operators:	Diploma/ ITI. Experience of water supply scheme is preferable.	• MHW - Round the clock 2 Operators at main Headwork in shift shall be provided for operation of Pumping Machinery • 1 Operator at each sub headwork as per the requirement of pumping hours are to be deployed in shift manner. • Appropriate arrangements for substitute shall be made in case of leave.
4	Helper	Stout Body physique (Unskilled)	• 1 helper with each Operator as mentioned above shall be provided in shift manner according to operator. • Appropriate arrangements for substitute shall be made in case of leave.
5	Pipe Fitter/ Linemen/Valve	Experience of maintenance and repairing	• Fitter/ Lineman/ Valve man shall be provided as per requirement to operate and maintain

	men for MS/AC /HDPE/PVC pipe	work of pipeline network.	scheme smoothly and as instructed by Engineer in Charge. Enforced labour laws shall be followed. Manpower shall provide such that all the Main Valves/ Branch valves shall be operated regularly on daily basis. Repairing of pipeline shall be carried out as per schedule.
6	Security	From registered licensee service provider.	• Round the clock 2 security persons at Main head work and all Sub head works are required to be deployed in 8 hour shift manner. • Security provided must be hired from registered licenced security service provider. • Appropriate arrangements for substitute shall be made in case of leave.
7	Gardner	Gardening experience	• A Gardner with proper gardening equipment's should be provided for maintenance of horticulture, cutting of grass etc. at Main head works separately. The services of same Gardener shall made available to all sub head works also.
8	Sweeper	Stout Body physique (Unskilled)	• Force of cleaning persons should be provided for good housekeeping. Toilets are to be cleaned regularly at least twice a day.
9	Utility Vehicle with Driver	Utility Vehicle for Maintenance with driver having valid License.	• 2 Utility Vehicle shall be provided with skilled driver having valid Indian driving license.
10	Basic Water Testing Laboratory Instruments with analyst	Science Pass out with appropriate experience	• Basic laboratory instruments like 1) Turbidity meter (handheld), 2) table top pH meter, 3) Chloroscope, 4) water distiller, 5) Jar test apparatus with accessories shall be provided in addition to the online water testing analyzer for stationary or mobile water testing at site with science passed out analyst having water testing experience.

For Civil work

Sr. No.	Operating Staff (For existing & proposed scheme)	Nos.
1	Civil Engineer	1
2	Operator	1
3	Chlorination Plant Operator	1
4	Chemist - Lab Incharge	0
5	Line man	1
6	Helper	4
7	Chokidar - Sweeper - Gardener	1
8	Lab Incharge	0
9	Fitter	1
10	Valveman	0
11	Driver	0
	Total manpower	**10**

For Mech work

Sr. No.	Operating Staff (For existing & proposed scheme)	Nos.
1	Diploma Mechanical Engineer	0
2	Electrician	0
3	Operator	1
4	Helper	2
5	Sweeper	0
	Total manpower	**3**

Note:

The above staff shall be required minimum as per mutual agreement between contractor & GWSSB. The arrangement of reliever for weekly off/all holidays etc. shall be made by the contractor separately.

The adequate staff is required for normal operation & maintenance. The contractor has to call respective engineer for rectification of fault at any time of the day, during contract period. The contractor shall have to provide additional manpower for maintenance and repair on as and when require basis. No extra payment shall be made for hiring services of additional manpower.

However Superintending Engineer may give relaxation in qualification and experience for suitable cases and necessary recovery if any, will be made accordingly.

ANNEXURE- II

SCHEDULE OF ROUTINE CHECKING OF PUMPS AND VALVES

A) Daily in each shift:

1) Leakages through gland packing and tightening, loosening to ensure that extent of leakages is in drip form.
2) Bearing temperature If highly check up cause and take remedial action.
3) Noise &Vibration: If undue check up cause and take remedial action.
4) Pressure: If high or low, check up cause.
5) Check oil level for bearing lubricant and topping up if necessary.
6) Clean and remove dust from pumps, piping and valves etc.

B) Weekly:

1) Greasing to the stuffing boxes. Greasing to valve actuator gear

C) Monthly:

1) Check tightness of all nut bolts. Check coupling bushes for wear.
2) Checking and replacing gland packing if necessary (Pump & valve)
3) Check oil in air compressor. Check valve actuator bushes.

D) Quarterly:

1) Inspection of gland packing and replacing if necessary. Cleaning and oiling of gland bolts.
2) Checking and lubrication of all bearings.

E) Half Yearly:

1) Removing plant packing and checking wear on line shaft at gland portion.
2) Replacing gland packing.
3) Cleaning and examination of all bearings for flaws and checking and play. Replace oil/grease of bearing.
4) Replacing gland packing of sluice valves.

F) Records/Messages through Electronic Media.

Agency has to give SMS every day to concerned officer of GWSSB stating water pumped from each station from specific pump with flow meter reading, water supplied to villages etc as asked officers.

Sr. No	Name of Head Work	Capital cost of Electro-mechanical component
1	All Components Included in this Contract	

ANNEXURE- III

LIST OF THE TOOLS AND TACKLES TO BE PROVIDED AT EACHPUMPING STATION, TREATMENT PLANT FOR OPERATIONAND MAINTENANCE.

Sr.No.	Item	Quantity
1.	For spanner set size 6mm to 22mm	1 set.
2.	For spanner set size 6 mm to 52 mm	1 set
3.	Ringspannersetsize6mmto22mm	1 set
4.	RingSpannersetsize7mmto52mm	1 set
5.	Boxspannersetsize6mmto38mm	1 set
6.	Pipe wrenc hsize36"	1 No.
7.	Pipe wrench size24"	2 Nos.
8.	Screw driver size6",9"and12"(2Nos.ofeach size)	6 Nos.
9.	Insulatedplierssize12"	6 Nos.
10.	LongNosePliers8"	3 Nos.
11.	Adjustable screws panner size12"	3 Nos.
12.	Hammer1Lbx2Lb	2 Nos.
13.	Testers	6 Nos.
14.	Chisels12"x6"(2Nos.ofeachsize)	4 Nos.
15.	HackSaw Frame	6 Nos.
16.	Hack Saw Blade	6 packets.
17.	Hand gloves suitable for33KV	2 Pairs.
18.	Phawada	2 Nos.
19.	Ghamela	4 Nos.
20.	Tikam	2 Nos.

Sr.No.	Item	Quantity
21.	Kaichin (For Gardening)	2 Nos.
22.	Vile(For Gardening)	3 Nos.
23.	PlasticBucket10Litres	2 Nos.
24.	Rope1/2"	30 meter
25.	Torch/Battery	2 Nos.
26.	Multi Meter Digital	1 Nos.
27.	Crimping Tool Set	1 Set
28.	Bearing and Coupler puller	1 No. Of Each
29.	Portable Air blower for cleaning & De rusting of Panel	1 No.
30.	Heavy Duty Grease gun	1 No.
31.	Garden Scissors	1 No.
32	Dial Gauge with Magnetic stand for alignment checking	1 Set
33.	Precision Spirit Level	1 No.
34.	Filler Gauge with Magnetic stand for alignment checking	1 set
35.	Storage Bins & rack/cupboard for above tools	1 No.
36.	Portable Welding Set	1 No.
37.	Portable DG Set	1 No.
38.	Portable Dewatering Pump Set.	1 No.

Note:
Above list is only for guidance purpose. Requirement of any other tools or tackles for ensuring smooth & uninterrupted operation, maintenance & repairs of all the equipment in all the pumping stations shall have to be arranged by the Contractor as per instructions of the EIC.

SECTION–D

Periodical Statements

The contractor shall have to submit the periodical statements (1 to 12) as per annexure attached herewith.

Statement 1	Weekly report of attendance of Raw &Treated Water mains for O&M Work.
Statement 2	Monthly report of material consumed for O &M.
Statement 3	Quarterly Report of inventory of materials for O&M work.
Statement 4	Quarterly Report for calibration of instruments installed in equipment
Statement 5	Monthly Report of vehicles deployed for O&M work
Statement 6	Monthly report for staff deployed in O& M work.
Statement 7	Monthly report for maintenance.
Statement 8	Monthly report for pumping.
Statement 9	Daily Pumping Report
Statement 10	Daily Treated Water Quality Report
Statement 11	Monthly Treated Water Quality Report
Statement 12	Monthly water supply report of Sarpanch / Talati / Panchayat Member etc. of village panchayat sign.

Statement- 1

Name of Project :- Comprehensive operation and maintenance of water supply project including all required materials, labours and all type of machinery etc. complete for water system for pumping treated water (WTP-2.6 MLD) from RCC U/G Sumps at Main HW to sumps and different SHW and from RCC U/G Sumps at SHW to ESR at various Sub Head works and distribution system up to Village level sumps covered under mangrol Dalki Regional Supply Scheme Ta: Jalalpor Di: Navsari based on Kakrapar left bank canal for Five years excluding cost of enegry charges & Raw water charges.

Period: Week

Weekly report of attendance of Raw &Treated Water mains for O &M work

Sr. No.	Date of Visit	Air Valve no.	Status of air valve	Action taken for repairing	Vehicle used with No.	Remarks
1	2	3	4	5	6	7
1						
2						
3						
4						
5						
6						
7						

Signature of Contractor

Statement- 2

Name of Project :- Comprehensive operation and maintenance of water supply project including all required materials, labours and all type of machinery etc. complete for water system for pumping treated water (WTP-2.6 MLD) from RCC U/G Sumps at Main HW to sumps and different SHW and from RCC U/G Sumps at SHW to ESR at various Sub Head works and distribution system up to Village level sumps covered under mangrol Dalki Regional Supply Scheme Ta: Jalalpor Di: Navsari based on Kakrapar left bank canal for Five years excluding cost of enegry charges & Raw water charges.

Period: Month

Monthly report of material consumed for O & M

Sr. No.	Materials Used	Qty.	Average Cost	Issued/ Purchase by	Remarks
1	2	3	4	5	6
1					
2					
3					
4					
5					
6					
7					

Signature of Contractor

Statement- 3

Name of Project :- Comprehensive operation and maintenance of water supply project including all required materials, labours and all type of machinery etc. complete for water system for pumping treated water (WTP-2.6 MLD) from RCC U/G Sumps at Main HW to sumps and different SHW and from RCC U/G Sumps at SHW to ESR at various Sub Head works and distribution system up to Village level sumps covered under mangrol Dalki Regional Supply Scheme Ta: Jalalpor Di: Navsari based on Kakrapar left bank canal for Five years excluding cost of enegry charges & Raw water charges.

Period: Quarter

Quarterly report of material consumed for O & M

Sr. No.	Material	Part No(if any)	Qty.	Average Cost	Remarks
1	2	3	4	5	6
1					
2					
3					
4					
5					
6					
7					

Signature of Contractor

Statement- 4

Name of Project :- Comprehensive operation and maintenance of water supply project including all required materials, labours and all type of machinery etc. complete for water system for pumping treated water (WTP-2.6 MLD) from RCC U/G Sumps at Main HW to sumps and different SHW and from RCC U/G Sumps at SHW to ESR at various Sub Head works and distribution system up to Village level sumps covered under mangrol Dalki Regional Supply Scheme Ta: Jalalpor Di: Navsari based on Kakrapar left bank canal for Five years excluding cost of enegry charges & Raw water charges.

Period: Quarter

Quarterly report of material for calibration of Instruments installed

Sr. No.	**Name of Instrument** (Pressure Gauge, Flow meter, Relay, Voltmeter, Ammeter etc.)	**Instrument No. (if any)**	**Qty.**	**Date of calibration**	**Remarks**
1	2	3	4	5	6
1					
2					
3					
4					
5					
6					
7					

Signature of Contractor

Note: Calibration report shall be submitted along with calibration certificate.

Statement- 5

Name of Project :- Comprehensive operation and maintenance of water supply project including all required materials, labours and all type of machinery etc. complete for water system for pumping treated water (WTP-2.6 MLD) from RCC U/G Sumps at Main HW to sumps and different SHW and from RCC U/G Sumps at SHW to ESR at various Sub Head works and distribution system up to Village level sumps covered under mangrol Dalki Regional Supply Scheme Ta: Jalalpor Di: Navsari based on Kakrapar left bank canal for Five years excluding cost of enegry charges & Raw water charges.

Period: Month

Monthly report of Vehicles deployed for O &M work

Sr. No.	Type of Vehicle	Model &Year of Manufacture.	Registration no.	Working condition	Remarks
1	2	3	4	5	7
1					
2					
3					
4					
5					
6					
7					

Signature of Contractor

Statement- 6

Name of Project :- Comprehensive operation and maintenance of water supply project including all required materials, labours and all type of machinery etc. complete for water system for pumping treated water (WTP-2.6 MLD) from RCC U/G Sumps at Main HW to sumps and different SHW and from RCC U/G Sumps at SHW to ESR at various Sub Head works and distribution system up to Village level sumps covered under mangrol Dalki Regional Supply Scheme Ta: Jalalpor Di: Navsari based on Kakrapar left bank canal for Five years excluding cost of enegry charges & Raw water charges.

Period: Month

Monthly report of Staff deployed for O &M work

Sr. No.	Name of Person	Designation	Age	Qualification	Experience.	Remarks
1	2	3	4	5	6	7
1						
2						
3						
4						
5						
6						
7						

Signature of Contractor

Statement- 7

Name of Project :- Comprehensive operation and maintenance of water supply project including all required materials, labours and all type of machinery etc. complete for water system for pumping treated water (WTP-2.6 MLD) from RCC U/G Sumps at Main HW to sumps and different SHW and from RCC U/G Sumps at SHW to ESR at various Sub Head works and distribution system up to Village level sumps covered under mangrol Dalki Regional Supply Scheme Ta: Jalalpor Di: Navsari based on Kakrapar left bank canal for Five years excluding cost of enegry charges & Raw water charges.

Period: Month

Monthly report of maintenance work

Sr. No.	Date	Nature of work attended	Remarks
1	2	3	4
1			
2			
3			
4			
5			
6			
7			

Signature of Contracto

Statement- 8

Name of Project :- Comprehensive operation and maintenance of water supply project including all required materials, labours and all type of machinery etc. complete for water system for pumping treated water (WTP-2.6 MLD) from RCC U/G Sumps at Main HW to sumps and different SHW and from RCC U/G Sumps at SHW to ESR at various Sub Head works and distribution system up to Village level sumps covered under mangrol Dalki Regional Supply Scheme Ta: Jalalpor Di: Navsari based on Kakrapar left bank canal for Five years excluding cost of enegry charges & Raw water charges.

Period: Month

Monthly report for Pumping

Sr. No.	Date	Pumping Set				Total in Hrs.	Incoming Flow MLD.	Outgoing Flow MLD.	Remarks
1	2	3				4	5	6	7
		P-1 Hrs.	P-2 Hrs.	P-3 Hrs.	P-4 Hrs.				
1									
2									
3									
4									
5									
6									
7									

Signature of Contractor

Statement- 9

Name of Project :- Comprehensive operation and maintenance of water supply project including all required materials, labours and all type of machinery etc. complete for water system for pumping treated water (WTP-2.6 MLD) from RCC U/G Sumps at Main HW to sumps and different SHW and from RCC U/G Sumps at SHW to ESR at various Sub Head works and distribution system up to Village level sumps covered under mangrol Dalki Regional Supply Scheme Ta: Jalalpor Di: Navsari based on Kakrapar left bank canal for Five years excluding cost of enegry charges & Raw water charges.

Daily Pumping Report

Sr. No.	Pump No.	Pump Starting Time	Pump Stopping Time	Pumping Hours	Supply Reservoir Level(M)		Flowmeter Reading(m^3)		Total Water Pumped
					Initial	Final	Initial	Final	
1									
2									
3									
4									
5									
6									
7									

Signature of Contractor

Statement- 10

Name of Project :- Comprehensive operation and maintenance of water supply project including all required materials, labours and all type of machinery etc. complete for water system for pumping treated water (WTP-2.6 MLD) from RCC U/G Sumps at Main HW to sumps and different SHW and from RCC U/G Sumps at SHW to ESR at various Sub Head works and distribution system up to Village level sumps covered under mangrol Dalki Regional Supply Scheme Ta: Jalalpor Di: Navsari based on Kakrapar left bank canal for Five years excluding cost of enegry charges & Raw water charges.

Period: Day

Daily Treated Water Quality Report

Hour	Raw Water Flow (MLD)	Raw Water Quality			Treated Water Flow (MLD)	Treated Water Quality		
		pH	Alkalinity	Turbidity		pH	Alkalinity	Turbidity
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								

Hour	Raw Water Flow (MLD)	Raw Water Quality			Treated Water Flow (MLD)	Treated Water Quality		
		pH	Alkalinity	Turbidity		pH	Alkalinity	Turbidity
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								

Signature of Contractor

Statement- 11

Name of Project :- Comprehensive operation and maintenance of water supply project including all required materials, labours and all type of machinery etc. complete for water system for pumping treated water (WTP-2.6 MLD) from RCC U/G Sumps at Main HW to sumps and different SHW and from RCC U/G Sumps at SHW to ESR at various Sub Head works and distribution system up to Village level sumps covered under mangrol Dalki Regional Supply Scheme Ta: Jalalpor Di: Navsari based on Kakrapar left bank canal for Five years excluding cost of enegry charges & Raw water charges.

Treatment Plant:

Month: Month

Monthly Treated Water Quality Report

Date	Instances of variation from Guaranteed Treated Water Quality	Date	Instances of variation from Guaranteed Treated Water Quality
1		16	
2		17	
3		18	
4		19	
5		20	
6		21	
7		22	
8		23	
9		24	
10		25	
11		26	
12		27	
13		28	

14		29	
15		30	
		31	

Signature of Contractor

Statement- 12

Name of Project :- Comprehensive operation and maintenance of water supply project including all required materials, labours and all type of machinery etc. complete for water system for pumping treated water (WTP-2.6 MLD) from RCC U/G Sumps at Main HW to sumps and different SHW and from RCC U/G Sumps at SHW to ESR at various Sub Head works and distribution system up to Village level sumps covered under mangrol Dalki Regional Supply Scheme Ta: Jalalpor Di: Navsari based on Kakrapar left bank canal for Five years excluding cost of enegry charges & Raw water charges.

Month:

Monthly Water Supply Report

Date	Sign	Date	Sign
1		16	
2		17	
3		18	
4		19	
5		20	
6		21	
7		22	
8		23	
9		24	

10		25	
11		26	
12		27	
13		28	
14		29	
15		30	
		31	
Total No's of days water supply :			

Signature of Contractor

Signature of Work Charge Karkun
Signature of Assistant Engineer
Signature Of DEE

જુથ પા.પુ.યોજનામાંસમાવિષ્ટ ગામ/પરાઓનીદૈનિકપાણીપુરવઠો આપ્યાની વિગત દર્શાવતુંપત્રક																																	
વર્ષ (------)																																	
ક્રમ	તાલુકો	ગામનુનામ	ક્રમ	પરાનુનામ	વસ્તિ (૨૦૧૧મ જીવ)	હાલનીવસ્તિ (૨૦૧૬ મુજબ)	જુથયોજનાસા થેજોડાણછે? હા /ના		તાંત્રીક રીતે પા.પુ. ન આપી શકાના		માહે																				કુલ	
											૧		૨		૩		૪		૫		૬		૭		૮		૯		૧૦		૧૧		૧૨			
							ગામ	પરા	ગામ	પરા	ગામ	પરા	ગામ	પરા	ગામ	પરા	ગામ	પરા	ગામ	પરા	ગામ	પરા	ગામ	પરા	ગામ	પરા	ગામ	પરા	ગામ	પરા	ગામ	પરા	ગામ	પરા	ગામ	પરા