01

NIT No. .....

Municipal Corporation , Bikaner.

Name of Work: - **Operation & Maintenance of Sewage Pumping Station (RUIDP), Complete in all respect, Public Park Bikaner for One Year.**

Name of Contractor: - .....

Technical Bid

Date of Sales : **28.09.2015 to 09.10.2015**	Date of receipting : 12-10.2015	
Tender Cost Rs. **30,00,000/-**	Earnest Money Rs. = **60000/-**	Tender Fess : **5000/-**
Earnest Money Cheque Draft No. :	Date :	
Earnest Money M.C.B. Receipt No. :	Date :	
Earnest Fees M.C.B. Receipt No. :	Date :	

Observe carefully plant & machinery of SPS before tendering SPS will be handed over to the qualified tender on current running condition. (Including all major/ minor repair of each parts of pumping station)

Enclosed: - Conditions

JEn (2-7) AEn

Executive Engineer,
Municipal Corporation,
Bikaner.

Signature of Contractor .....

Municipal Corporation , Bikaner.

Tender Document

O & M SPS: - Operation & maintenance of sewage pumping station and switchyard at Public Park, Bikaner.

The Complete tender document consists of following parts:

Part A

Tender form

Part B

B1 Instructions and guidance to tenderers

B2 General Conditions of Contract of GoR (Enclosed separately)

B3 Special Conditions of Contract, with annexes

B4 Work description

B5 Technical specifications, with annexes

Part C

Bill of Quantities & Rates

Part A

Tender forms

The Tenderer has to fill in all forms (if applicable) in this document and to submit them duly signed and stamped, They shall be used for the evaluation of his offer, the assessment whether tender is substantial.

The Tenderer shall not change nor add or delete the texts of the forms. This might lead to rejection of the tender. The papers shall remain bound in the file issued to the Tenderer. The supporting papers as indicated in the tender documents shall be bound in a file, in the same order thy appear hereafter.

Form	Designation	What to do?	Supporting Papers
1	Tender Letter	To be filled in, signed and stamped	
2	General information about the tenderer	To be filled in, signed and stamped	1. Minimum 3 to 5 years experience shall prefer of O&M of STP/SPS plant -y 2. Earnest Money in required form; 3. Last three year I.T.R. 4. Labour liecence. 5. Sale Tax Clearence. 6. E.S.I and Pf. Registration 7. Service Tax Registration 8. Firm Registration Copy 9. Undertaking for not Black listed firm in any Govt./semi Govt. Department(By Notary)

Signature of the authorized representative ……..

1. Tender Letter

To
The Commissioner,
Municipal Corporation,
Bikaner.

Subject: **Operation & Maintenance of Sewer Pumping Station (RUIDP), Public Park Bikaner for One Years.**

Ref: **Your NIT No.**

Dear Sir,

1. Having carefully examined all the parts of the tender documents and the addenda (if any) for the above mentioned works, having obtained all requisite information affecting this tender, having visited the site and being aware of all conditions and difficulties likely to affect the execution of the contract, we, the undersigned, hereby offer to execute the operation and maintenance job as described in the Tender Documents and to execute the whole of the said works in conformity with the specifications, conditions of contract, technical conditions, O&M manual, bills of quantities as shown in our offer, for the sum indicated in the financial offer and such other sum as may be ascertained in accordance with the Contract.
2. We declare that we have read and understood and that we accept all clauses, conditions, description drawing of the tender documents, and subsequent addenda (if any) without any change, reservations and conditions. If any change reservation or condition had been made in our tender we herewith withdraw it.
3. We declare that we guarantee for the correct execution of the work as desired in the tender document.
4. We undertake, if our tender is accepted, to commence the work within 10 days of the work order and to complete the work in the stipulated time for completion.
5. If our tender is accepted we will provide a security deposit in the required form as stipulated in tender document.
6. Unless and until the formal agreement is prepared and signed, this tender, together with your written acceptance thereof shall constitute a binding contract between us.
7. We agree to abide by this tender for the period of 90 days from the last date of submission of the tender and it shall remain binding upon us and may be accepted by you at any time before the

expiration of that period, and not to make any modifications in its terms and conditions which are not acceptable to you.

8. Together with the tender we submit the earnest money of Rs
   1) …….. as
   2) ……..

   Dated this ……. Day …….. 2015.
   3) ……. In the capacity of
   4) ……....

Name :

Address:

Telephone: …… Telefax: …… Telex: …….

Signature of the authorized representative …….

---

1. Amount if Earnest Money
2. Indicate the form in which it is provided
3. Signature of the authorized Representative of the firm
4. Designation
5. Name of Tenderer

2. General information about the Tenderer

The information asked in the following paras are essentially required to be filled in signed and stamped and supported with the related documents in the sequences as stated. They shall be used for the evaluation of the offer.

1	**Read understood and accept tender documents and addenda (Yes/No)**	
2	**Status of the firm (individual, partnership, Limited firm)**	
3	**Structure and organization**	
	Name of Firm :	
	Address :	
	Telephone No.	
	Fax No.	
	Description of Company (e.g. General contractor, civil engineering contractor supplier of equipment etc.)	
	Registration as Contractor (Class and name of registering authority)	
4	**Power of attorney of the representative of the tenderer**	
	- **Name of the Representative** - **Address** - **Telephone office Fax office** - **Telephone residence**	

Contd. …….

Signature of the authorized representative ……..

5	**Earnest Money**	
	Form of Earnest Money (Demand Draft/Cash)	
	Name of Bank **No and date of DD/B.C.** **Amount Rs.** **Valid up to (date)**	
6	**Latest ITR**	

Supporting documents required:

1 Power of Attorney

2 Earnest Money in the required form

3 Latest Income Tex Clearance Certificate

4 Latest Sales Tex Clearance Certificate and Registration Certificate under-RST Act

Signature of the authorized representative ……..

PART – B 1

Instructions & guidance to tenderers

1.1 Type of tender

The present tender is for the operation and maintenance (including preventive maintenance) of all plant and machinery installed in Sewage Pumping Station at Public Park, Bikaner including Main Control Room, PLC Room, DG set and switchyard. The work includes operation & maintenance of all valves, piping, submersible sewage pumps, civil works, electrical, mechanical & instrumentation installation and equipments, DG set, switchyard & it's equipments, internal and external lighting etc. This will also includes the de-silting of wet wells, input chamber and screen chamber once in month including immediate disposal of sludge from premises and general cleaning of all the units of Sewage Pumping Station.

1.2 Eligibility for tendering

Any Indian Contractor who meets the following eligibility can apply for participation:

i) It should be registered as AA, A, B or C class contractor in Municipal Corporation, or AA or A in other department like PHED, PWD or irrigation department of State Govt. registered in equivalent class in MES, Railway, Telecom & CPWD of Central Govt. or other State/Central Govt. department. /Undertaking, The registration to shall be valid to the date of validity of tender.

1.3 Cost of tendering

All costs associate with the preparation and submission of the tender will be borne by the tenderer.

1.4 Tenderer to inform himself fully

The tenderer shall be deemed to have made himself fully aware of all external conditions and risks including but not limited to the general site conditions, availability of labour and employment practices in the region, availability and quality of construction and al other external factors. He is supposed to be fully aware latest rules/circular about deduction of royalty, contractor tax and income tax act.

The tenderers are supposed to have visited the sites before filling in the tender documents and assessed all external conditions and risks, Tenderers shall carefully examine the tender documents and fully inform themselves as to the conditions and the matters which may in any way affect the work or the cost thereof should of. Should a tenderer find any discrepancies in the document or be in doubt as their meaning, he should submit any issue/questions in writing at least 10 days before last date of submission of the tender of Municipal Corporation, Bikaner (MCB).

The MCB will Endeavour to clarify the issues. Any resulting interpretation or modification of the tender document shall be issued to all tenderers as an addendum (S) which will become part of the tender document. The addendum(S) will be communicated to all the tenderers through fax (if fax No. provided) and registered post.

No claims or conditions except as otherwise expressly provided in the tender document will afterwards be accepted due to non-inspection of the site, misunderstanding of the tender document or incorrect information obtained from any source except in writing by MCB.

1.5 Correspondence

The Tenderer shall provide full details of his address, telephone and fax numbers together with the name (S) of the Person (S) to whom all communications related to the Tender be directed. All correspondence from the Tenderer to the MCB shall be addressed to the Commissioner, Municipal Corporation, Bikaner, as detailed in the NIT.

2. Tender Document

2.1 Organization of the tender document

The complete set of tender document consists of parts and sections as stated below. They shall be read in conjunction with all addenda (if any) issued prior to the date of submission of the tender.

Part A – Tender forms

Part B – Technical Tender document (this document)

1. Instruction and guidance to Tenderers

2. General conditions of Contract (of the GoR, w.e.f. 31.12.12 amended up to date)

   General conditions of Contract

   General schedules to be used during execution

3. Special conditions of Contract

4. Work description

5. Technical specifications

   Technical specifications

   Annexes

Part C – Financial tender document

1. Bill of Quantities / Schedule of rates

2.2 Omissions, errors and clarifications

Tenderers shall carefully examine the specifications and fully themselves as to the conditions and matters, which may in any way affect the work or the cost thereof. Should a Tenderer find discrepancies or omissions in the documents or should he be in doubt as to their meaning he should notify the department in writing.

Any resulting interpretation or modification of the tender document shall be issued to all Tenderes as an addendum, which will become a part of the tender documents. The Tenderers shall acknowledge in writing the receipt of each addendum.

No claims or conditions except as otherwise expressly provided will afterwards be accepted due to non-understanding or mis-interpretation of the tender documents.

3. Preparation of the offer

Document to be included in the offer
The offer submitted by the Teacher shall include the following document:

1. All relevant tender forms duly complete, signed and stamped in the order as presented in Part A
2. All supporting documents as requested in Part A and in the following paragraphs
3. Duly signed Part B (signed and stamped on all pages)
4. Earnest money in the required form
5. Bill of Quantities/Schedule of rates (duly complete and all pages signed and stamped)
6. Power of attorney where ever required.

Details concerning the required documents are presented hereafter and in Part A.

3.2 Earnest money

The Tender shall submit interest free earnest money as stipulated in the NIT in the form of cash, Banker's cheque or demand draft of nationalized / scheduled banks. The demand draft should be in the name of "commissioner, Municipal Corporation, Bikaner", payable at Bikaner.

The Tenderer enlisted with Municipal Corporation Bikaner or any other Govt. body or equments body. Subject to the specific provisions given in section II of rules for enlistment of contractors in Public Works Departments, shall deposit concessional earnest money of ½% (half percent) as against the normal earnest money of 2% (two percent) of estimated cost of the work on production of certified copy of the relevant enlistment order renewed under the latest rules for "Enlistment of Contractors" under rule 334 of P.W.F. & A.R. effective from 23.03.2001 (amended up to date) valid up to the date of validity of offer. The other tenderers shall be required to deposit earnest money equal to 2% (Two Percent) of estimated cost of the work as specified in NIT. Any tender not accompanied with the earnest money shall be rejected.

If any tenderer withdraws his tender prior to expire of said validity period or mutually extended period or makes modifications in the rates, terms and conditions of the tender within the said period, which are not acceptable to the department, or fails to commence the work in the specified period/fails to execute the agreement and fails to furnish the Security Deposit, the department shall, without prejudice to any other right or remedy, be at liberty to forfeit the amount of earnest money given in any form absolutely. If any contractor, who having submitted a tender does not execute the agreement or start the work or does not complete the work and other the work has to be put to retendering, he shall stand debarred from participating in such retendering in addition to forfeiture of Earnest Money/Security Deposit and other action under agreement. If such situations arise with the tenderers with concessional earnest money, the amount to be extent of full earnest money shall be liable to be forfeited/recovered.

The Earnest Money, lodged by the contractor, if any, at the time of tendering will be adjusted towards security Deposit.

The earnest money of the unsuccessful tenders will be returned to them as early as possible after the award of the contract or expire of the validity period of the offer, whichever is earlier.

3.3 Qualification schedules and supporting documents

1. The eligibility of the Tenderers will be assessed on the basis of the following documents to be included in the tenders. The tenderer shall complete all the following forms presented in Part A of the tender documents and will provide the all necessary certificates and supporting documents:

a) Power of Attorney

b) A brief profile of the structure and organization of the firm(s) (Part A)

c) Copy of the registration of that firm under contractor's registration rules.

d) Certificate stating that price of individual item has been given in the price bid exactly as required in "H" Schedule as per groups or individual.

e) Copy of the receipt of deposition of Earnest money.

The Tenderer is advised to complete the details above with extreme care since they will be the basis for the first step of evaluation of the Tender. Only relevant and to the point information shall be indicated in the schedules. Any items not applicable shall be indicated "Not applicable". The supporting documents must contain all the complementary information and the information required to assess the capacity to complete the work. Failure to provide any of the information may lead to the rejection of the offer.

The Tenderer should also submit the latest income Tax Clearance Certificate and Sales Tax Clearance Certificate preferably with the Part A of the tenders, but essentially before the signing of the Agreement.

2. He must have experience of Three Year's operation & maintenance of STP/SPS/ETP.
3. His annual turn over of any one Year should be equal or more than 100 lacks in Last three Years.

Note: - All certificates shall be duly attested either by a Notary Public or Gazetted Officer.

3.4 Bill of Quantities / schedule of rates (Part C of tender document)

The tenderer shall duly complete all the rates asked for. He must not add or delete any item from the Bill of Quantities. All rates quoted must be inclusive of material, transport, labour, duties and taxes and all other incidental and overheads etc. in order to complete the work corresponding to the specification of the tender document with respect of all minor/major repairs of all components of SPS.

In the 'BOQ' scheduled quantities of 'event oriented items' have been mentioned for evaluation purpose. However payment shall be made for work actually performed irrespective of quantity indicated in the BOQ for evaluation purpose. Various activities, which are to be performed, are mentioned in 'BOQ' of the tender documents.

The Quality and the workmanship have to correspond to the specifications of the Tender Documents, drawings, the Indian Standards, other standards mentioned and to the state of the art and technology, as in practice.

The tenderer shall give lump sum rates in the BOQ.

The Tenderer shall not insert any commercial or other conditions in the Bills of Quantities. Conditional tenders are liable to be rejected summarily. The lowest offer shall be the one whose sum total cost of all the items is the least.

3.5 Taxes and duties

Rates should be quoted inclusive of mining royally, control and all other taxes and duties etc. The contractor is bound for the deductions of mining royalty, sales tax, service tax, income tax and any other surcharge from his bills as per latest circular rates.

3.6 Validity of the offer

The offer shall remain valid for 180 days from the date of opening of the price bid.

4. Submission of the tender

The submission of the tender shall be in accordance with the following procedure. Failure to comply with these instructions may result in the rejection of the Tender.

The tender shall be submitted in a seals envelope to be addressed to the office of Commissioner, Municipal Council, Bikaner as indicated in the NIT and bearing the name and the address of the Tenderer and the following identification:

Tender for: - Operation & Maintenance of Sewage Pumping Station & Switchyard Complete in all respect at Public Park, Bikaner.

NIT No:-

Do not open before: 3.00 PM on ……..
The Envelope shall contain the following documents:

a) The original, completely filled in Tender Documents, signed and stamped on all pages.
b) All original information / supporting documents as mentioned in section B and desired in Part Photocopies of all supporting documents of non-technical nature (ITCC, STCC, Power of Attorney etc.) shall be duly attested by a notary or a gazetted officer.
c) Earnest Money in desired form (if deposited in cash, then copy of receipt)
d) The filled in, signed and stamped original Bills of Quantities (Part C)

All erasures and other corrections in the tender shall be initialed by the person signing the tender Tenderer should not offer conditional rebates. Instead of doing so, they shall offer competitive price on department terms and conditions, if they offer any conditional rebate, the same shall not be considered for comparison but department shall avail the rebate even without fulfilling the conditions stipulated.

4.1 Deadline for submission of tenders

Tenders must be submitted up to the time and date and at the place mentioned in the NIT. Any tender received after the deadline either by postal delay or on any reasons will not be opened and considered.

Modification (if not specifically asked for by the MCB) or withdrawal of the tender during validity of the offer will result in forfeiture of the earnest money.

4.2 Opening of the tenders

The Envelope of tender will be opened at the office of the Commissioner, Municipal Council, Bikaner at the date and time indicated in the NIT, in the presence of the representatives of interested Tenderers who shall sign a register evidencing their presence.

The Tenderer's name, the presence or absence of the earnest money, total price for the work and such other details as department might consider appropriate will be announced at the opening.

4.3 Withdrawal of tender

A tender once submitted shall not be withdrawn within the validity period. Earnest Money of a Tenderer, who withdraws his tender within this period, shall be forfeited.

5. Tender evaluation

5.1 Confidential treatment

The tender will be evaluated by the MCB Information relating to the examination, clarification and comparison of the Tenders and recommendations for the award of the Contract shall not be disclosed to Tenderers or to any other person not officially concerned with the evaluation process until the award to the successful Tenderer has been announced. Any effort by a Tenderer to influence the evaluation process or the recommendations and decisions for award shall result in the rejection o its tender

The complete filled in BOQ will be checked for any kind of arithmetical, transcription or typing errors. In the case of discrepancies, the same will be resolved as per procedure laid down at Sr. No. 15 of 'General conditions of Contract of GoR mentioned in Sec. B2 of the tender document.

The Tenderers will not makes any correspondence with the MCB after opening of tender unless specifically asked by MCB in writing. Any communication from the tenderer after tender submission affection prices tendered or intention to do so shall result in rejection of the offer and forfelture of earnest money except when negotiations are invited by MCB through a written communication.

6. Award of the Contract

6.1 MCB's right to reject any or all tenders

MCB reserves the right to reject any or all tenders without assigning any reason prior to the award of the Contract without incurring any liability to the affected Tenderer(s) or any 0obligation to inform them of the reasons for the rejection.

6.2 Award

Normally, MCB will award the Contract to the prequalified Tenderer whose corrected tender price in lowest. In case his price, however, is considered to be high, MCB reserves the right to negotiate with the lowest Tenderer as per provisions of PWF&AR.

6.3 Notification of award

Prior to the expiration of the validity period, MCB will inform the successful Tenderer by fax, telegram, confirmed by registered letter, that his tender has been accepted (Letter of Award), This letter of award shall indicate the Corrected Tender Price which will be the Contract Sum.

The Tenderer shall sign the agreement with the Municipal Council, Bikaner within 10 days after dispatch of the letter of award. The successful Tenderer shall provide the security deposit before or at the time of signing the contract.

If the Tenderer fails to reply by the stipulated date, his tender shall be liable for dis qualification. Or if he does not accept the award, his Earnest Money shall be forfeited and from those who deposit concessional Earnest Money, the recovery of full Earnest Money (i.e. 2%) shall be made from their enlistment fee and from the available Earnest Money or from any payment with the department.

The Completion period of the contract shall start 10 days after the date of award of the contract.

6.4 Agreement

The Following duly filled in and signed document shall be part of the agreement:

a) From of agreement

b) Letter of award

c) Signed Tender Document

d) Supporting document submitted by tenderer

e) Correspondence, if any, after opening of the tender and before issue of award.

Signature of Tenderer ……..

Executive Engineer
Municipal Corporation
Bikaner

7. Priority of contract documents

The documents forming part of the agreement are to be taken as mutually explanatory documents c one another. In case of discrepancies they shall be explained and adjusted by the Commissioner Municipal Council, Bikaner. The priority of the Contract documents shall be as follows:

(1) Contract Agreement (Annex 1)

(2) Letter of award

(3) Special Conditions of Contract with their annexes.

(4) General Conditions of Contract with their annexes.

(5) Instructions and Guidance to Tenderers with their annexes.

(6) Work description

(7) Technical specifications

(8) Bills of Quantities with prices

8. Type of Contract

The present contract is a Turn-key Contract for operation & maintenance of Sewage Pumping Station and switchyard at Public Park, Bikaner (Including all major/minor repair of each part of SPS)

9. Authorities

9.1 Commissioner, Engineer in Charge, Representatives

The work shall be implemented by the Commissioner, Municipal Council, Bikaner who shall be the competent authority for the O&M work. The competent authority shall appoint Engineer(s) in Charge as Representatives who shall carry out such duties and exercise such authority as my be delegated to them.

The competent authority shall inform the names of Engineer-In-Charge to the contractor.

10. Communication between the MCB and the Contractor

10.1 Addresses for notices

Notices with legal and contractual issues shall be addressed to the competent authority's office Notices with technical issues shall be addressed to the respective Engineer in Charge.

Any notice given by the Contractor to the competent authority or the Engineer in Charge under the terms of the Contract shall be sent by post, courier, cable, telex or fax to or submitted in person to the receipt clerk and having obtained a receipt thereof in the office of the competent authority or the Engineer in Charge only or the addresses as he shall indicate for this purpose only.

All certificates, notices or instructions to be given to the Contractor by the competent authority or the Engineer in Charge under the terms of the Contract shall be sent by post, courier, cable, or fax or left at the Contractor's principal address or the address as the Contractor shall indicate for this propose only.

10.2 Liaison with departmental authority

The maintenance contractor shall be fully responsible for keeping constant and communicating with the concerned authorities including Commissioner (Adm.), Commissioner (Dev), Executive Engineer, Asstt. Engineer and Junior Engineer so as to inform the status of maintenance and seek instructions to meet any eventuality or development and to perform the job satisfactorily.

11. Period of Contract

The Period of contract of the Work of operation and maintenance of Sewage Pumping Station, at Public Park, Bikaner shall be calculated from the commencement date, which is 10 days after the date of award of contract. The period of contract may be extended on the same rate, terms and conditions for maximum one year in terms of 3 months period on mutual consent of the department and the contractor.

12. Handing over / taking over

The Municipal Council, Bikaner shall hand over the complete pumping station premises from inlet chamber to outfall sewer including pumping station machinery, control rooms, DG set, inside & outside lightings, portable containers, switchyard and other equipments and all ancillary units in working conditions on the basis of as is where is, at the time of handing over to the contractor on award of contract for its operation, maintenance, safety and security of these equipments etc. Handing over/ Taking over of site will be done on inventory list of all the fixed and loose equipments & appurtenances at Sewage Pumping Station. The inventory list will be prepared by concerning JE/AE of MCB, in which detail of items, quantity, make and preset condition (working/non-working) will be mentioned. The date of taking over by the contractor shall be date of start of work. The contractor shall hand-over all the equipments in working condition on completion of the contract as per inventory list. The MCB reserves the right to operate all Bank Guarantees or part of the Bank Guarantees to meet out any losses in case of damages/theft/mishandling etc. of the Govt. properties due to negligence of the contractor. If losses/damages caused by the contractor are more than the bank guarantee & other deposits available with department then contractor shall have to deposit the differences amount. If not deposited, then MCB may recover the dues under various acts & clauses.

13. Staff and Administrative office of contractor at site.

Staff:

Contractor has to establish one functional administrative office (with operational telephone/ mobile phone facility) at Sewage Pumping Station, which is subjected to inspection at any point of time. Minimum Supervisory staff, required to fulfill the requirement of scope of work to the satisfactory of Engineer-in-charge, shall be available at all the times and to be stationed at established office/camp office of the contractor. Contractor shall have to deploy his operating staff round the clock in three shifts so that pumping can be done whenever the water is available in the wet wells, depending on the availability of power or as directed by Engineer in Charge. Contractor shall ensure the availability of technical staff against each category, as per annexure 3.

All staff relative to the mechanical, electrical & instrumentation installations should be well qualified, so as to operate the electrical / mechanical / instrumentation installations properly. Electrician should be at least ITI holder with good knowledge of electrical items such as motors, panels, DG set, transformer, CT, PT, etc. Pump driver should be well qualified, so that he can operate the pump from PLCC and computer software.

The attendance register shall be maintained at site and watched. The persons appointed by the contractor shall be available in prescribed uniform with identification mark of firm and identity card with photographs. In case minimum staff is not found on duty, following deduction from the contractors will be made:-

Rs. 500/- per day of Supervisor / skilled person
Rs. 300/- per day for labors / helpers / unskilled persons

It is necessary to give weekly off to every staff. Casual leave admissible to staff considered as 10 days per annum. At least 5 holidays, but not more than holidays admissible to employees of Govt. of Rajasthan are to be given to the employees by the contractor. The contractor shall employ adequate relieving staff to cover absentee on public holidays/ festivals weekly holidays, casual leaves, long leave, other holidays or compensatory holidays to ensure that the required minimum staff or general shift are available. No extra payment on this account will be payable to the contractor. Labour Laws should be followed by Contractor.

Unless the reliever comes on duty the staff from the earlier shift can not be relieved and has to perform overtime and same is to be paid by the contractor. No overtime payment will be made by the department to the contractor on this account.

14. Safety Precautions

Adequate safety precautions against fire, flooding, lighting, electric shocks, hazardous gases accident,/ mishaps duty to moving, non-moving heavy equipment etc. shall be strictly observed by the contractor at his risk & cost. Suitable safety article like safety shoes, gloves, safety belts, helmet, ear muff/ plug, welding shield, insulated tools, gas mask, sand bags, alarms etc. shall be provided by the contractor at his own cost. A fully equipped necessary medical first aid and apparatus with oxygen filled cylinder should be available at each installation at all times.

In the event of any damage/ loss of life and property the contractor shall be solely responsible and liable for compensation and damages.

15. Power Charges

The electric power shall be provided by JVVNL at the Sewage pumping station. All expenses of power charge shall be born by the MCB, but increase in power charges due to non-maintenance of requisite power factor or any surcharge due to power consumption in excess of MDI shall be born by the contractor and deducted from his running payment from time to time. The contractor will ensure that there is no misuse of power irrespective use in functional necessity.

In case of fault in capacitor bank contractor should change the capacitors immediately so that power factor should be always more than 0.90. Failing which he will be sole responsible of power factor surcharge and amount of this surcharge will be deducted from his running bill payment. For this purpose contractor may be allowed to procure capacitor bank of various capacity in advance as a spare.

In case of non availability of power in rainy days or more than one hour in non-rainy days, the contractor will get permission from the Engineer in charge to operate DG set. The diesel will be arranged by the contractor to operate DG set for which no separate payment will be made. The average diesel consumption of DG set is 35 liter per hour. The mobile oil and coolant will be arranged by the contractor for which no separate payment will be made. The contractor will ensure that mobile oil and coolant are arranged and used in DG set as per maintenance instructions of the manufacturer. Oil and coolant changing will be done in presence of JE/ AE of MCB and it will be entered in logbook of the DG set. The contractor will maintain a logbook of DG set and get verified the same by AE/JE of MCB. The contactor will ensure that at least 150 liter diesel should be available in fuel tank of DG set at any time.

16. Arrangement of tools and tackles and heavy equipments:

All sort of toots, special tools, tackles and test instruments required for operation & maintenance of the sewage pumping station & sw2itchyard shall be arranged by the contractor at his own cost. Any repairs to the articles of T&P necessitated due to its use shall be carried out by contractor at his own cost. if the contractor fails to repair T&P articles, the MCB shall recover the charges for repairs and damages.

17. Liaison with other turn-key/ O&M Contractors

The contractor shall be fully responsible for keeping liaison with the original contractors and, whose address and contact reference shall be given on demand. The contractor shall be fully responsible for all correspondence and communications and to take necessary steps or guidance to keep the system running.

18. Terms of payment:

Tenderers are requested to quote their composite rates for 1 Years. However the contract may be extended for next 6 months with mutual consent on same rates, & conditions. Tenderer should not offer conditional rebate. They should offer competitive price on departmental terms & conditions. if they offer any conditional rebate, the same shall not be considered for comparison but department shall avail the rebate without fulfilling the conditions stipulated. The due payment for the work allotted shall be payable as below;

a) The operation and maintenance cost quoted by tenderer shall be payable on monthly basis (i.e. 1/6 of the composite rate quoted for 6 months.) The contractor shall submit his bill at the end of every month along with the following record/ documents/certificates duly verified and countersigned by the Engineer-in-Charge as on evidence of the contractor's satisfactory performance. The payment shall be made monthly within fifteen days of the presentation of the bill to the MCB with the required certificates mentioned below. No price variation shall be admissible on any item of the BOQ as per clause no 45 of general conditions of tender document,

b) Signed and duly verified copy of abstract of log book for pumping station in the format (given at annexure4) all required log books shall be arranged by the contractor at his own cost.

c) Certificate that all instructions given in inspection book, have been attended within a reasonable period.

d) Certificate about bread down, if any, has been attended.

e) Certificate about routine, periodical & preventive, maintenance, as required, has been done by the contractor and return submitted in the format given by the Engineer-in- charge.

f) Certificate of payment of wages to contractor's staff.

18.1 Repairs

18.1.1 Spares from authorized dealers/manufactures;

All electrical and mechanical machinery at site will be repaired by contractor on own cost. No extra payment to be made by the department. All spare parts to be used by the contractor shall be made of authorized dealer/ manufacturer.

18.1.2 Emergency for spare

Whenever E/C feels that maintenance agency is delaying the procurement of some particular spare or consumable which in his opinion may hamper the proper working of pumping station and switchyard, then he may procure the same through some other agency and such the cost incurred would be recovered from the payment due of maintenance agency or his deposit. Such situation would be considered as an unsatisfactory performance of maintenance agency and liable to be penalized.

18.3 Delisting Works

For carrying out the desalting of wet wells [2 no. } intent chamber [1no.] and screen chambers [4no.] required during operation and maintenance of sewage pumping station and switchyard the contractor has to quote lump sum rate separately on monthly basis. Cleaning of screens [4no.] will be done at least 6 times in a day by lifting one by one screen, while desolating of wet wells will be done at least once in a month. The desalting work of wet wells will be done one after one. Before starting de-silting, entry of sewage water will be stopped in the wet well to be desolated by closing sluice gates (1 in inlet chamber and 1 on interconnection of wet wells) and sewage water will be pruned out up to lowest level. The floating material shall be removed once in a week from each wet well. The contractor will ensure that only well trained and experienced labour with safety equipments is engaged for de-silting work. All the safety measures are to be adopted strictly. Necessary safety equipments like helmets, gas masks proper rope, safety belts in good and correct condition will be made available by the contractor. No one will be allowed to enter wet well/chamber without bearing safety equipments. In case of any mishap, the contractor shall be solely responsible for it and he has to face all the legal consequences. The sludge taken out from the wet well/chambers shall be disposed off within 24 hours from pumping station premises to the suitable disposal site (most probably land fill site near Seagate) as directed by the competent authority. The contractor should consider the cost of disposal of sludge in his quoted rates. The carriage of sludge, he has to arrange necessary tractor and trolly for which no extra payment will be given by the MCB. After disposal of sludge from site, the premises shall be cleaned immediately by sweeping and there shall be no stack of sludge or garbage at pumping Station site.

18.2 Desilting Works

For carrying out the desilting of wet wells [2 no.} intent chamber [1no.] and screen chambers [4no.] required during operation and maintenance of sewage pumping station and switchyard. The Contractor will be done desilting the above wet well, inlet chambers & screen chambers as per requirement of direction given by Engineer-in-Charge.

18.3 Statutory Deductions

The Statutory deductions such as mining royalty sales tax service tax income tax etc. Shall be deducted from every running bill to be paid to the contractor as per rules / orders in force at the time of payment. The contractor can take refund from the concerned department after assessment as per rules of concerned department.

18.4 Compensation

In case of unsatisfactory performance by contractor in operation and maintenance of Sewage Pumping Station and Switchyard, compensation @ 0.25% of contract value per week of unsatisfactory performance subject to maximum of 10% of contract value shall be levside.Regarding such liquidity damages the decision of the Commissioner, Municipal Council , Bikaner shall be final preventive maintenance non repair of mechanical/ instrumentation equipments within reasonable time or non-compliance of the clauses of the contract to the satisfaction of the Engineer incharge.

18.5 Deduction against delayed operation & maintenance of sewage Pumping Station & Switchyard

a. In case if motor or any component including pump is burnt or damaged due to any reason, it shall be the sole responsibility of the contractor to rewind/ replace the same as per standards of the equipment / component as per provisions of the contract, for which no payment will be made by the department.
b. In the event of any damage / loss of life and property in the wet wells, chambers and pump house on pumping station the contractor shall be solely responsible and liable for compensation and damages.
c. The contractor shall be held responsibly for any interruption in pumping of sewage water due to breakdowns and appropriate amount will be recovered form his bill if the breakdown takes place due to negligence of the contractor's staff bad results in interrupting pumping for more than two hours at a stretch. The amount of recovery shall be as per point 'a' of this clause.
d. In case of sudden break down, Engineer incharge will decide whether the break down is attributable to contractor's poor preventive maintenance or not. If break down is found on the part of contractor then cost of repair / replaced by him at his cost. The decision of Engineer incharge regarding cause of failure / break down shall e final. In case of difference of opinion between contractor & MCB the decision of the competent authority will be final. However during the tendency fo such decision immediate action for rectification/ removal for cause of failure shall be initiated by the contractor as per terms & conditions of contract / direction of Engineer incharge
e. In case of break down due to non-availability of diesel for DG Set, the amount of recovery shall be made as two times of actual from the contractor.

18.6 Execution of the work against the risk and cost of contractor

The MCB shall reserve the right to get the work done on the risk and cost of contractor without rescinding the contract after a notice given to the contractor and he fails to commence the work within 2 hours. In such case, compensation for delay in rectification of leakage/ burst shall be levied as per relevant clause. Contractor shall be fully responsible for repairing of all installations of pumping station and switchyard due to non preventive or faulty maintenance done by him for which no payment shall be allowed on this account. Contractor shall be responsible for safety & security of pumping station, switchyard and their appurtenances etc. Any loss or damages occurred due to negligence will be repaired by contractor free of cost. Also damaged parts will be replaced free of cost.

19. Site books

For the purpose of quick communication between the Engineer in Charge and the Contractor site books shall be maintained at all sites, where work is being carried out. If the Contractors site agent is leaving site he shall not take the site book with him, it shall always be readily available at site. Any instructions or order which the Engineer in charge may like to issue to the contractor may be recorded by him in the site book.

20. Insurance

It shall be the responsibility of contractor to get the men, machinery, and plant etc, insured as per norms, insurance charges shall be borne by the contractor. The MCB shall not liable for or in respect of any damages or compensation payable by law in respect of or in consequence of any accident of injury to any person in the employment of the contractor and contractors shall indemnify and save the MCB harmless against all such damages and compensations and against all actions suits, claims, costs or expenses arising there from. The contractor shall insure against such liabilities and shall continue such insurance during the whole of the time that any persons are employed by him on the works.

This Agreement made this _____ day of _____ 2015 between_____ (hereinafter called " which expression shall, where the context so admits, be deemed to include his heirs, successors, executors and administrators) of the one part & Municipal Council, Bikaner (hereinafter called the "MCB" which expression shall, where the context so admits, be deemed to include his successors in office and assigns) of the other part.

WHEREAS the MCB is desirous to carry out the work of Operation &Maintenance of Sewage pumping station & switchyard at Public Park, Bikaner (O&M-SPS)

WHEREAS the MCB has accepted a tender by the contractor for the execution, and completion of such works, NOW THIS AGREEMENT WITNESSES AS follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the conditions of Contract hereinafter referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz.:

a) Form of agreement
b) Letter of award
c) Signed Tender Documents
d) Supporting documents, submitted by the tendered
e) Correspondence if any, between MCB & the tendered after opening of tender and award contract.

3. In consideration of the payments to be made by the MCB to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the MCB to execute and to complete the work, in conformity in all respects with the provisions of the Contract.
4. The MCB hereby covenants to pay the Contractor in consideration of the provisions, execution, completion of the work, the Contract Price or that sum as may become payable under the conditions of the Contract at the times and In the manner prescribed by the Contract.
5. The following are the salient data of the agreement:

- Contract sum: Rs_____
- Security deposit + performance guarantee: Rs_____ (10 % of the Contract sum)
- Time for completion: 12 months from the date of commencement.

IN WITNESS thereof the parties to these preset have hereto set and subscribed their respective hands the day, month and year first above written.

SIGNED for and on behalf of the Municipal Council, Bikaner

Commissioner, Municipal Council, Bikaner **Witness**

SIGNED for and on behalf of the Contractor ……

Annexure 2

Requirement of Staff

S.NO.	Category	Shift
1.	Electrician	For general shift
2.	Pump Driver	For all three shifts
3.	Chowkidar	For all three shifts
4.	Sweeper (three person)	For general shifts
5.	Security Person	For general shift

Annexure 3

Inventory Schedule (to be arranged by the Contractor)

A) ELECTRICAL ITEMS:

1. Local Push Button
2. Indicating Bulb
3. Selector Switch
4. Rotary Switch
5. Miniature Circuit Breaker
6. HBC/ HRC link fuses up to 250KVA (2A, 4A, 6A, 8A, 10A, & 50A), as required
7. HBC / HRC link fuses up to 11KV (50A, 65A, 100A, 250A, 400A) , as required
8. Vacuum bottle (11KV, 400A for breaker)
9. Tripping Coil, 30V DC,
10. Cable, as required
11. Contactor, as required
12. Motor Protection Relay, as required
13. Earth fault relay and thermal overload relay
14. Capacitors, as required
15. igniters for HPSV lamp, as required
16. Transformer oil, as required
17. Mobile oil, as required
18. Insulators
19. Insulating taps (LT & HT)
20. Cooling agent and fuel required for DG set

B) MECHANICAL ITEMS :

1. Grease AP3 & Silicon
2. Glands Packing 16mm and others
3. Bering DE and NDE
4. Rotating assemblies for pumps.
5. Rubber sheet
6. Nut & bolts

C) INSTRUMENTATION ITEMS:

1. Pressure gauge
2. Lugs for each type of cable, as required

3. Cables, as required

Note: The make & specifications of spares shall be the same as installed on equipments at Sewage pumping station at Public Park, Bikaner or the best suite equivalent, as approved by Engineer In charge.

B -4 – work description

20.1 Scope of work for contractor

The work of Operation and Maintenance (routine, periodical, preventive and breakdown) of Sewage Pumping station & switchyard complete in all respect located in Public Park, Bikaner is a complete job. The scope of work, basically, comprises of the following jobs:

a) Operation and maintenance (routine, periodical, preventive and breakdown) of all plant and machinery installed in Sewage pumping station at Public Park Bikaner

b) Operation and maintenance of all electrical, mechanical & instrumentation installation of sewage pumping station i.e. all pumps, motors, cranes, exhaust fans, diesel generating set, values, piping, internal & external lighting, panels, PMCC, transformer, lighting arrestor, drop out fuse, isolators etc.

c) routine check up and routine / periodical / preventive and breakdown maintenance of all the equipment / machinery, as per manufacturers manual / instructions and the standard engineering practice or as directed by Engineer-in-Charge.

d) All electrical / mechanical / instrumentation installations are to be thoroughly examined, opened and maintained periodically and checked for their working, as per manual provided by the manufacturer standard practice.

e) all measuring equipments / devices for measuring pressure, discharge, levels etc. are to be operated and periodically maintained, as per manufacturers manual.

f) all special tools /spare parts tackles etc. required for proper operation and preventive maintenance shall be provided by the tenderer. The cost of such items is deemed to be included in the rates quoted by the tenderer.

g) if any part or equipments, which in the opinion of contractor and Engineer-in-Charge may result in break down, is to be replaced during the preventive maintenance by the contractor.

h) Any device for preventive maintenance or of operation, which tenderer feels necessary to avoid major breakdowns of control panels, motors or other units, may be provided by the tenderer.

i) the contractor has to clean one by one screens (4 nos.) at least 6 times in a day by lifting of the screens by Electrically Operated cranes.

j) All floating material shall be removed twice in a week from both the wet wells and will be recorded in log book.

k) De-sitting / cleaning of wet wells (2 nos.) shall be done by the contractor once in a month.

l) After desilting, the taken out sludge will be disposed off within 24 hrs from the sewage pumping station premises at disposal site near Gogagate.

m) The pumps are likely to be operated for 16 hours a day at present. The contractor shall have to deploy operating staff round the clock in three shifts, so that pumping can be done whenever the water is available in the wet, well, depending upon the availability of power or as directed by the Engineer In charge, for 24 hours.

n) To operate sluice valves (4 no.) by Actuators with taking special care to operate actuators.

o) Normally there should not be any break down in the system. However, if break down occurs because of damage/ burning of any part or equipment, then the same shall have to be replaced / repaired by the contractor, without any loss of time.

p) In case of opening / loosening of welding joints/ nut bolts of any part of any equipment, the contractor will arrange re-welding / replacing and tightening of nut bolts, without any loss of time.

q) The contractor has to maintain the log book / record book, as stipulated in Tender Document.

r) The contractor shall have to run DG set in case of power failure with written permission from MCB. in case of emergency, permission on phone may taken and confirmed later on. No any payment of diesel shall be done by MCB as per clause 15.

s) The contractor shall be responsible for carry out watch & ward for all the installations in the premises as well the appurtenances of pumping stations & switchyard. Security guards shall be made available round the clock for safety of campus and all other electro-mechanical installations.

t) The contractor shall maintain telephone/ mobile phone in operational condition for communication and reporting purpose.

u) The contractor shall maintain fire extinguishers, first aid boxes, in the premises. He shall also refill the fire extinguishers as per the requirement.

v) The contractor shall maintain the equipments for safety of person / public viz. breathing apparatus, weather cock etc., as per prevailing safety norms.

w) If any specialized work is involved during preventive or breakdown maintenance, the same should be got carried out by special agency, with prior approval of Engineer incharge, as stipulated under section B of Tender Document.

x) Contractor shall submit the daily report to the office of Engineer-in-Charge regarding day to day activities done, any failure / defect / difficulty experienced, P.F. obtained along with daily pumping report on phone, besides recording the same in prescribed log books.

y) In the event of strike by the operation & maintenance staff employed by the contractor, the department shall be empowered to operate and maintain the pumping station, at the sole risk and cost of the contractor.

The complete work as defined above includes operation, maintenance, periodical overhauling of all machinery, electrical equipments, mechanical equipments of main pumping station at Public park Bikaner.

20.2 Unit-wise details of Operation & Maintenance

The unit-wise detail of Operation and Maintenance is described as below:

20.2.1 PUMP HOUSE

1) Operation and Maintenance

a) For the purpose of operating pumps, it shall be the responsibility of the contractor to properly control, operate, maintain and safely keep all electrical / mechanical / instrumentation units such as pump, motor, valves with actuators, HT/ LT panel, battery charger, ICP panels, capacitors, DG Sets etc. in working order.

b) Pumps / motors / cranes / exhaust fans, and all other equipment, fittings etc. shall be operated and periodically overhauled as prescribed in the manuals provided by the manufactures, standard engineering practice and as per the direction of Engineer In charge.

c) All electrical installations including PLCC shall also be thoroughly examined, overhauled opened and maintained periodically and checked for their performance as per manual provided by the manufacturer, standard practice under the directions of the Engineer Incharge.

d) All type of valves and actuators shall also be operated and periodically maintained as per manufacturer's manual & standard practice.

e) All measuring equipments / devices for measuring pressure, discharge, water levels, current, voltage, temperature etc. shall be operated and periodically maintained and calibrated as per manufacturers manual.

f) Measuring equipments / devices, relays etc. requiring calibration or testing, shall be got tested, and calibrated from manufacturers / authorized or reputed firms.

g) If any motor is burnt due to any reason, the same shall be removed, repaired, rewinding, tested and re-installed in position for operation by the contractor, cost against material and labour will be borne by the contractor. No extra payment shall be made by the department (MCB).

h) In case of break down or faculty running of pump, it shall be removed, repaired and re-installed by the contractor without loss of time, for which payment will be made by MCB.

i) The pump should be cleaned, after removal & opening every month, so that the full rated discharge of pump is ensured. If discharge is reduced to less than 75% of rated discharge, the extra power charge may be recovered from the contractor.

j) The contractor will ensure correct operation of actuators. If any fault including burning of motor occurs, it shall be responsibility of the contractor. No extra payment for replacing or rewinding of motor or repairs of actuator shall be paid.

2) General Maintenance

The pump house and its surroundings up to 100 M distance from pump house, ICP rooms shall be kept clean and in dry condition, properly ventilated and illuminated. For the purpose of illumination. replacement of fitting / fixtures shall be done by the contractor. The electrical control panels, PLCC relays, capacitors, cranes, pumps and motors, walls of pump house, MCC room, stair cases, railing, battery room, DG Set etc. shall be kept and maintained, dust, oil / grease free to the satisfaction of the Engineer Incharge.

21. Records and Log Books

The following printed record/ log book shall be maintained and produced periodically by the contractor for proper monitoring by the Engineer-in-charge. The Completed records/ logbook shall be deposited with Engineer-In-Charge.

a) Log book of pumping showing voltage, current in all phases, interruption of power if any, hourly power factor (to be recorded on basis of JVVNL meter which is normally installed at GSS and or the power factor meter installed at the pump house). The format of log book shall be finalized in consultation with Engineer-In-Charge. However a model format of log book is enclosed at Annexure..... A separate log book for DG set showing operation hours, diesel entry and load given to DG set hall also be maintained.

b) History Sheets of Overhauling / maintenance / replacement of consumables / non consumable items related to all the important electrical / mechanical equipments which will be duly verified by the incharge of pumping stations.

c) A return in the format prescribed at Annexure ..... shall be prepared & submitted to the Engineer-In-charge on the real day of due date.

The observations in the log books should be recorded on hourly basis. Printed log books shall be provided by the contractor at his own cost. The log books shall be securely kept in the pump house under the charge of a responsible person and shall be made available to any officer of the department on demand. Log books of the previous month shall be deposited to the Engineer-in-Charge every month. All the log books will be deposited to the Engineer Incharge after completion of the contract.

An inspection register will be maintained at pumping station by the contractor. Instructions recorded in the register shall be complied with immediately under the directions of the Engineer-In-Charge & the compliance shall be recorded in books.

Signature of Tenderer ……..

Executive Engineer
Municipal Corporation
Bikaner

Part B-5-Technical Specifications

22 The technical specifications of pumping machinery and instruments at sewage pumping station public park, Bikaner is as under:-

22.1 Submersible Non clog pump set

DESCRIPTION	DETAILS	
Make	Aqua Make	Kishor Make
Model	ANS 60 LT	ASTR-SA-250-500
No. of Stages	Single	Single
Capacity at Duty Point	800 M3/HR	816 M3/HR
Total Head	14 M	14 M
Pump Efficiency	79%	79%
Impeller	CF 8 M	ASTM A-743,Gr CF 8 M
Impeller Shaft	SS 410	ASTM A-276:Type 410
Impeller sleeve	SS 410	SS 410
Pump Column Pipe Size	250 MM	250 MM
Pump Discharge Size	450 MM	450 MM
Year of Commissioning	2006	2014

22.2 Motorized Sluice Valve

DESCRIPTION	DETAILS
	450 NB
Make	Upadhyaya Valves Mfrs, Pvt. Ltd.
Type	Non-Rising Stem
Rating	PN 1.0
Mode of Operation	Motorized with actuators

22.3 225 KVA DG SET

DESCRIPTION	DETAILS
Engine Make	Kirloskar
Model	6SL880TA
No. of Cylinders	6
Engine Configuration	Vertical In Line
Bore and Stroke	118*135

Compression Ratio	15.5: 1
Battery Capacity	24VDC
Alternator Size	UC 22 D
Alternator Make	Kirloskar
Alternator Insulation Class	H
Fuel Consumption At 75% Average Load Factor Ltr/Hr	36.2
Noise Level at 3 M distance	103-106

22.4 Power Motor Control Centre Panel

Make : Risha Control Engineers Pvt. Ltd.

Construction : Floor Mtg. Indoor Fixed

Degree of protection : IP-54

Cable Entry : Bottom

PVC Heat Shrink Sleeve : Black Sleeve with colored tap for R/Y/B-Phase. Black Band is used to identify neutral

Rear access door shall be provided with lock

Surface finish : Powder coating

Interior Exterior : Grey Shade no. RAL 7032.

22.5 Capacitor

DESCRIPTION	DETAILS
Rated voltage	415 V AC 3 Phase
Rated Frequency	50 HZ
Maximum over voltage capacitor with stand	105% of rated voltage
Capacitor control	On/OFF by contractor operated auto / manual Mode
Quantity	8 nos

22. 6 Transformer 11/ 0.433 kv.

DESCRIPTION	DETAILS
Make	RTS
Installation	Outdoor
Painting	IS 5 Shade 631
Grounding Conductor	GI Flat 50 x 6
Rating	11 KV/ 0.433 KV. 250 KVA

23. General procedure for operation of pump sets

Following general points should be checked while operating the submersible sewage pump set:

a. Dry running of the pumps should be avoided.

b. Pumps should be operated only within the recommended range on the head discharge characteristics of the pump.

- If pump is operated at point away from duty point, the pump efficiency normally reduces.
- Operation near the shut off should be avoided, as the operation near the shut off causes substantial recirculation within the pump, resulting in overheating of water in the casing and consequently, in overheating of the pump.

c. Voltage during operation of pump motor sat should be within + /- 10% of rated voltage. Similarly current should be below the rated current. As per name plate on the motor.

d. Sum of low and medium specific speed draw lesser power at shut off head and power required increases from shut off to normal operating point. Hence in order to reduce starting load on motor, pump shall be started against closed delivery valve.

e. It is also necessary to control opening of delivery valve during pipeline filling period, so that the head on the pump is within its operating range, in order to avoid operation on low head and consequent overloading. This is particularly important during charging of the pumping main initially or after shutdown. As head increases the valve shall be gradually opened. The pumps of High specific speed draw more power at shut off. Such pumps should be started within the delivery valve open.

f. The running of the duty pumps and the standby should be scheduled so that no pump remains idle for long period and all pumps are in ready to turn condition. Similarly unequal running should be ensured so that all pumps do not wear equally and become due for overhaul simultaneously.

g. If any undue vibration or noise is noticed, the pump should be stopped immediately and cause for vibration or noise be checked and rectified.

h. Frequent starting and stopping should be avoided, as start or stop causes overloading of motor, starter, contractor and contacts. Though overloading lasts for few seconds, it reduces life of the equipment.

24. Energy Conservation

The operation should ensure energy conservation to the maximum possible extent.

a) As far as possible when outflow pump starts, the reservoir level should be as near as possible to maximum WL. On practical consideration the level should be about 0.5 m blow maximum WL, so as to prevent overflow due to any likely delay in starting. Operation under such situation shall cause minimum static head and thus energy can be saved.

b) Recommendations for operation plan :

- WL in the reservoirs serving as suction sump to the pumps shall be at maximum permissible level at the time of switching ON the pumps.
- Overflow in the reservoir should be avoided.
- The aspect that the motor does not get overloaded due to operation at lower head, Shall be ensured.

25. Undesirable Operation of pump set

Following undesirable operations of pump set should be avoided:

25.1 Operation at Higher Head

The pump should never be operated at head higher than maximum recommended head. Such operation results in excessive recirculation in the pump, overheating of water and the pump. As useful guide, appropriate marking on pressure gauge should be made.

25.2 Operation at Lower Head

If the pump is operated at lower head than recommended minimum head, radial reaction on the pump shaft increases, causing excessive unbalanced forces on shaft, which, may cause failure of the pump shaft. As useful guide, appropriate markings on both pressure and ammeter are made.

25.3 Operation of the pump with Low Submergence

Minimum submergence above the bell mouth or strainer is necessary, so as to prevent air entry into the suction of the pump, which give rise to vortex phenomenon causing excessive vibration, overloading of bearings, reduction in discharge and efficiency. As useful guide the lowest permissible water level be marked on water level indicator.

25.4 Operation with Occurrence of Vortices

The vibration continues even after taking all precautions, vortex may be cause. All parameters necessary for vortex-free operation should be checked. Chapter of manual on water supply and treatment discusses the aspect in details.

26. Starting the pump set

26.1 Checks before starting

Following points should be checked before starting the pump:

a) Power is available in all 3 phases.
b) Trip circuit for relays is in health state.
c) Check voltage in all 3 phases.
d) The voltage in all phases should be almost same and within +/- 10% of rated voltage, as per permissible voltage variation.
e) Check and ensure that the pump is free to rotate.
f) Check over-current setting if the pumps are not operated for a week or so.
g) Before starting it shall be ensured that the water level in the wet well is above low water level and inflow from the interceptor sewer is adequate.
h) Check and ensure that the pumps are on Auto or Manual Mode.

26.2 Starting of Pumps

Procedures for starting and operation of Submersible Pump shall be as follows:

a) Close delivery valve, and then loosen slightly.
b) Switch on the motor and check correctness of direction of rotation. If the pump does not rotate, it should be switched off immediately.
c) Check pressure gauge reading to ensure that pump has built up required shut off head.
d) When the motor attains steady speed and pressure gauge becomes steady, the delivery valve should be gradually opened in steps to ensure that the head does not below recommended limit.
e) Check that ammeter reading is less than rated motor current.
f) Check for undue vibration and noise.
g) Voltage should be checked every half an hour and should be with permissible limit.

27. Stopping the Pump set

27.1 Stopping the pump Set under normal condition

Steps to be followed for stopping the pump of low and medium specific speed are as follows:

a) Close the delivery valve gradually (Sudden or fast closing should not be resorted to, which can give rise to water hammer pressure).
b) Switch off the motor.

27.2 Stopping the pump Set after power failure/ I Tripping

If power supply to the pumping station fails or trips, following action should be immediately taken to ensure that the pumps do not restart automatically on resumption of power supply:

a) Close the delivery valves on pumps is necessary, manually as actuators can not be operated due to non-availability or power.
b) All switches and breakers shall be operated to open i.e. off-position.

28. Automation of Pumping Station

PLC is used for automation of main and intermediate pumps operation in addition to monitoring various parameters viz, level, pressure, status of valves etc. For level measurement in main reservoir ultrasonic transmitters are used. All the signals in the plant/pumping stations are monitored by PLC. The PLC is programmed such that it will monitor all the signals from the field instruments; operate the pump. If any condition which is not favorable to start the pump will be indicated with the reasons in the form of status lights or instruction on the VDU.

If operator desire to carry out operation in auto-mode, he will keep the switch on control panel in auto-mode. In this position all the conditions are checked by the PLC and if found to be OK the pump will be started. In the case of abnormal condition the pump will be tripped, Even if the temperatures of winding and bearing of the motor exceeds the pump will get tripped.

29. Mode of operation & maintenance of various installations

29.1 Pumps

29.1.1 OPERATION

Procedure for pump operation has already been described at clauses 23 to 28 of this section.

29.1.2 PREVENTIVE MAINTENANCE

1) <u>Daily maintenance</u>

a) Clean the pump, motor and other accessories.
b) Check coupling bushes/rubber spider.

2) <u>Routine Observations of irregularities</u>

The pump operator should be watchful and should take appropriate action on any irregularity noticed in the operation of the pumps. Particular attention should be paid to following irregularities.

a) Changes in sound of running pump and motor.
b) Abrupt changes in bearing temperature.
c) Changes in Voltage.
d) Changes in current.
e) Changes in vacuum gauge and pressure gauge readings.
f) Sparks or leakage current in motor, starter, switch gears, cable etc.
g) Overheating of motor.

3) <u>Monthly Maintenance</u>

a) Clean and apply oil to thee gland bolts.
b) Inspection of mechanical seal for wear and replacement if necessary.
c) Cleaning of impellers (removal of polythene etc.)

29.1.3 BREACKDOWN MAINTENANCE

a) Opening of the casing, rotator assembly and find out the reasons for break down.
b) All modification, rectification, replacement shall be done except impeller.
c) Pumps can not be run when pipe line is under repair.
d) Only impeller shall be referred to original manufacturer for repair.

29.2 Motors

29.2.1 OPERATION

Procedure for pump operation has already been described at clauses 23 to 28 of this section.

29.2.2 PREVENTIVE MAINTENANCE

1) <u>Daily Maintenance Schedule for Motors</u>

a) Clean external surface of motor.
b) Examine earth connections and motor leads.
c) Check temperature of motor and check whether overheated. They permissible maximum temperature is above the level, which can be comfortably felt by hand. Hence temperature observation should be taken with RTD or thermometer (Note: In order to avoid opening up motors, a good practice is to observe the stator temperature under normal working conditions. Any increase not accounted for, by seasonal increase in ambient temperature should be suspected).
d) In case of oil bearing

- Examine bearing to check whether oil rings are working.
- Note bearing temperature.
- Add oil if necessary..

2) <u>Monthly Maintenance</u>

a) Check belt tension. In case where this is excessive it should immediately be reduced.
b) Blow dust from the motor.
c) Examine oil in oil lubricated bearing for contamination by dust, grit, etc. (this can be judged from the color of the oil).
d) Check functioning and connections of anti-condensation heater (space heater) if provided.

29.2.3 BREACKDOWN MAINTENANCE

1. Opening of cover and find out reasons of break down.
2. Clanging of bearing only.

NEVER RUN MOTOR WHEN VOLTAGE IS MORE THAN 3.7KV OR LESS THAN 2.9 KV AND ALSO WHEN REPAIR WORK AT COUPLING/PUMP IS GOING ON. REPAIR OF MOTOR SHALL BE REFERED TO ORIGINAL MANUFACTURER & GET IT REPAIRED.

A. PREVENTIVE MAINTENANCE (motor)

1. Checking of vibrations, bed plates and foundation bolts, tightening of bolts.
2. Checking of bearing temperature, winding temperature indicators, transmitter connections etc.
3. Checking of cable connections in the terminal box for any damages for electric burning.
4. Anti condensation heaters are working or not and if no do rectification.
5. Cleaning of air flow duct & dust ring, etc.
6. Bearing lubrication/greasing as per schedule.

29.3 L.T. PANEL/415 V PMCC

A. OPERATION

Making of circuit breaker ON/OFF of all the motors, fans, lights and other fittings equipments as and when required and as per direction of AEN in charge.

B. PREVENTIVE MAINTENANCE

a) Checking of all indicators, ON/OFF indicators, operating mechanism etc.
b) Checking of control voltage at panels and rectification.
c) Checking of are chutes, its cleaning, greasing, and replacement if needed.
d) Checking of operating mechanism for closing, tripping etc.
e) Cleaning of dust, dirt, moisture, discoloration in chassis and checking of electrical connection.
f) Checking of MCCB's and its functioning.

C. BREAK DOWN MAINTENANCE

1. Do operating mechanism replacement if found defective.
2. Replace push buttons, switches, meters etc. if found defective.

D. MAINTENANCE SCHEDULE FOR L.T. STARTERS, BREAKERS & PANELS

I) Daily

Clean the external surface.

Check for any spark or leakage current.

Check for overheating.

II) Monthly

Blow the dust and clean internal components in the panel, breaker and starter.

Check and tighten all connections of cable, wires, jumpers and bus-bars. All carbon depositions shall be cleaned.

Check relay setting.

29.4 CAPACITOR CPNTROL PANEL

A. OPERATION

Making ON/OFF capacitor bank to maintained the power factor. It shall be always more than 0.9.

B. PREVENTIVE MAINTENANCE

a) Checking of control voltage & ON/OFF operation of breaker at 80% Voltage.
b) Checking of capacitor bank for discharging.
c) Operating mechanism is to be checked for ON/OFF position and making contacts. Also checking of automatic controlling mechanism if provided (APFC relay).
d) Checking of all electrical connections, terminals indicators, dust dirt, moisture, noise, smell discoloration is to be checked & rectified.

C. BREAK DOWN MAINTENANCE

1. If capacitor bank burnt out then replace the same with good one.
2. Replacement of operation mechanism if found functioning unsatisfactory.

D. MAINTENANCE SCHEDULE

Pre-requisites for Satisfactory Functioning of Capacitors.

Ensure following points :-

i) A capacitor should be firmly fixed to a base.
ii) Cable lugs of appropriate size should be used.
iii) Two spanner should be used to fasten or loosen capacitor terminals. One spanner should hold the lower nut and the upper nut should be held by the other spanner to avoid damage to or breakage of terminal bushings and leakage of oil.
iv) To avoid damage to the bushing, a cable gland should always be used it should be firmly fixed to the cable-entry hole.
v) The capacitor should always be earthed appropriately at the earthing terminal to avoid accidental leakage of the charge.
vi) There should be a clearance of at least 75 mm on all sides for every capacitor unit to enable cooler running and maximum thermal stability. Ensure good ventilation and avoid proximity to any heat source.
vii) While making a bank, the bus bar connecting the capacitors should never be mount directly on the capacitor terminals . It should be indirectly connected through flexible loads so that capacitor bushings do not get unduty stressed.
viii) Ensure that the cables, fuses and switchgear are of adequate ratings

Operation and Maintenance of Capacitors

i) The supply voltage at the capacitor bus should always be near about the rated voltage the fluctuations should not exceed 4/- 10% of the rated voltage of the capacitor.
ii) Frequent switching of the capacitor should be avoided. There should always be a interval of about 60 seconds between any two switching operations.
iii) The discharge resistance efficiency should be assessed periodically be sensing shorting is required to discharge the capacitor even after one minute of switching off. If the discharge resistance fails to bring down the voltage to 50 V in one minute, it needs to be replaced.

iv) Leakage or breakage should be rectified immediately. Care should be taken that no appreciable quantity of imp regnant has leaked out.

v) Before physically handling the capacitor, the capacitor terminals shall be shorted one minute after disconnection from the supply to ensure total discharging of the capacitor.

DO NOT REPLACE WITH OTHER MAKE & TYPE.

29.5 24v DC BATTERIES & BATTERY CHARGER

A. OPERATION

1. Making ON/OFF circuit breaker at panel as and when required and as per direction of AEN in charge .
2. Make all controlling connections only with batteries for 15 minutes by isolating the charger once in a month .

B. PREVENTIVE MAINTENANCE

1. Checking of all electrical connections, terminals, indicators, dust, dirt, moisture, noise smell, and discolouration are to be checked.
2. Checking of circuit breaker ON/OFF and interlocked mechanism from batteries to charger unit & replaced if needed.
3. Checking of specific gravity of electrolyte in batteries and removal of deposition of dust, dirt and copper sulphate etc. on terminals.
4. Checking of voltage and terminals copper strips in batteries.

C. BREAK DOWN MAINTENANCE

1. Replacement of the batteries if found defective.
2. Breaker and interlocked mechanism replacement if found defective.

D. MAINTENANCE SCHEDULE

Maintenance schedule as under shall be applicable for D.C. Batteries

a) Daily :- Check voltage and specific gravity of the batteries and battery supply for the tripping circuit.

b) Monthly :- Check the battery charging & fuses and clean contact faces.

c) Monthly :- Apply petroleum jelly of grease to battery terminals.

d)

NEVER MAKE ON WHEN INPUT VOLTAGE IS MORE THAN & LESS THAN PRESCRIBED LIMITS.

DO NOT REPLACE WITH OTHER TYPE & MAKE

29.6 EXAUSTFAN

A. OPERATION

Making ON/OFF through 415 Fan DB as & when required.

B. PREVENTIVE MAINTENANCE

1. Checking of bearing condition, fan motor, supports with wall, clamping bolts etc. & wiring.

C. BREAK DOWN MAINTENANCE

Replacement of the items, which found burnt/damaged or broken etc.

29.7 AIR CONDITIONER

A. OPERATION

1. Making ON/OFF as & when required to control the temp & humidity in the room .

B. PREVENTIVE MAINTENANCE

1. Cleaning of grills, pads from dust.
2. Removal of condensate water from chassis.
3. Checking of electrical connection, compressor connections, fan connections etc.
4. Aesthetic aspect shall be maintained.

C. BREAK DOWN MAINTENANCE

1. Refilling of gas as & when required.
2. Replacement of compressor with same model/size
3. Repair of cooling/copper tubes if needed.

29.8 SLUICE VALVES WITH ACTUATORS

A. OPERATION

Making the valve open and close as and when necessary

B. PREVENTIVE MAINTENANCE

1. Checking for full travel of the gate of valve.
2. Checking of the lubrication of bearings and removal of leakages.
3. Placing of glands in the stuffing box and tightening of nuts and bolts.
4. Checking of gear box its lubrication.
5. Checking limiting switch accuracy n actuators.
6. Checking operation of actuator manually when power is not available of electrical motor is not operating.

C. BREAK DOWN MAINTENANCE

1. Replacement of the glands & stuffing box cover etc. if found defective.
2. Replacement of the gear assembly if found defective.
3. Replacement and repairing of spindle, its nut with gate, locking key if found defective and even if not working satisfactorily.
4. Rewinding of motor, if required including unlowering, lowering and re-installing in position after rewinding and other repairs.

D . OPERATING SCHEDULE

- Check gland packing of the value at least once in a month. It should be ensured that packing inside the stuffing box is in good trim and impregnated with grease. It may be necessary to change the packing as often as necessary to ensure that the leakage is within limit.
- Grease should be applied to reduction gears one in a month.
- Check tight closure of the value once in 3 months.
- A valve normally kept open or closed should be operated once every three months to full travel of gate and an jamming developed due to long unused shall be freed.
- Inspect the value thoroughly for flaws in guide channel, guide lugs, spindle, spindle nut, stuffing box etc. once in a year.
- Important DON'T for sluice valve is that it should never be operated with oversize hand wheel or cap or spanner as this practice may result in rounding of square top and hand wheel or cap or spanner may eventually slip.

Another important DON'T for sluice valve is that it should never be operated with under throttled i.e. particularly open condition, since such operation may result in undue chatter, wear and failure of value spindle.

- ❖ NEVER CLOSE THE VALVE OF THAT PUMP WHICH IS IN RUNNING POSITION.
- ❖ NEVER OPEN THE VALVE OF THAT PUMP WHICH IS UNDER REPAIR.
- ❖ NEVER APPLY EXCESSIVE FORCE TO ENSURE END POSITION OF THE VALVE
- ❖ NEVER OPERATE ACTUATOR IN WRONG DIRECTION.

29.9 NON RETURN VALVES

A. OPERATION

- Check proper operation of hinged door and tight closure under no-flow condition once in 3 months.
- The valve shall be thoroughly inspected annually. Particular attention should be paid to hinges and pins and soundness off hinged door.
- Condition of dampening arrangement should be critically examined once in year and necessary maintenance and rectification as per manufactures instructions shall be carried out.
- Checking of the noise, vibration etc. when the valve gates open and closed during the pump operation.

B. BREAK DOWN MAINTENACE

1. Replacement of any broken parts if found with good one or repaired one.
2. Replacement of nut bolts if found defective/broken etc.

29.10 HEADER PIPELINE AND DISMANTLING JOINTS

A. OPERATION

1. Checking of line pressure, suction pressure, delivery pressure, and valve postion.
2. Doing ON/OFF position of dismantling joints while replacement of any equipment in the assembly line is needed.
3. Removal of any type of leakage in header pipeline.

B. PREVENTIVE MAINTENANCE

1. Checking of lightening of nut, bolts etc.

C. BREAK DOWN MAINTENANCE

1. Replacement of nuts, bolts, pressure gauges, associated pipeline installations on assembling if found defective.
2. Removal of leakages in the pump house.

29.11 FIRE EXTINGUISHERS

A. OPERATION

- Use of fire extinguishers in case of any fire fighting is needed in and around the pump house.

B. PREVENTIVE MAINTENANCE

1. Checking of CO_2 gas present in the bottle and removal of any leakage if found.
2. Replacement of nozzle if found defective/broken.
3. Refilling of gas if found emptying.

29.11 EARTHING AND LIGHTING PROTECTION UNIT

A. PREVENTIVE MAINTENANCE

1. Checking of terminals, joints of conductor strips and connection with pits.
2. Checking of unit series resistance, shut capacitance, leakage current etc. as and when required.

B. BREAK DOWN MAINTENANCE

- Replacement of parts/items, jointing of conductor strips, terminal if found defective.

29.13 CABLE AND CABLES TRAYS

A. OPERATION

- Checking of heading of cable

B. PREVENTIVE MAINTENANCE

1. Cleaning of cables and cables trays from dust, dirt, oil, grease etc.
2. Entries in the pump house should be restricted from mouse and other small insect/animal/birds etc.

- Replacement of parts/items, jointing of conductor strips, terminal if found defective.

C. BREAK DOWN MAINTENANCE

- Replacement of damaged one with good one if found

NEVER USE SHARP IRON BLADES ON CABLES.

29.14 LIGHTING/ILLUMINATION SYSTEM.

A. OPERATION

- Making ON/OFF through switches the necessary illumination required in the pump house switchyard and around campus.

B. PREVENTIVE MAINTENANCE

- Checking of the terminals, electrical connections, mechanical fittings/fixtures in position for its satisfactorily.

C. BREAK DOWN MAINTENANCE

- Replacement of parts, items etc. if found defective/damaged/burnt out with good one of reputed equivalent make.

NEVER ON THE SWITCHES WHEN PARTICULAR FEEDERLINE IS UNDER REPAIR.

A. OPERATION

Making ON/OFF position of all units for its working and controlling, checking of display units calibration if needed, removal of faults in the controlling circuits etc. as and when necessary required and as per direction of A.E.N. in charge.

B. PREVENTIVE MAINTENANCE

1. Controlling of temp and humidity around the panel.
2. Checking of electrical connections from transmitters to panel to controlling units, push buttons, ON/OFF switches, fuses, breakers etc. for any type of damages and find out the causes of failure.

DO NOT TEMPER WITH THE SETTING OF THE PARTS/ITEMS INSTALLED FOR ANY REPAIR
DO NOT DO BREAK DOWN MAINTENANCE WITH OTHER VENDORS

29.16 Wet well/inlet chamber/screening chambers/

1. All foreign floating matters in the sump/intake shall be manually removed at least once in a month and shall be shall be disposed off away from pump house with adequate safety measure.
2. De-silting of intake/sump shall be carried out once in a month preferably before onset of monsoon. Care should be taken do dump the removed silt away from pump house.

29.17 Pump House/Control Room Building

1. The pump house should be cleaned daily. Good house keeping and cleanliness is necessary for pleasant environment.
2. Entire pump house, superstructure and sub-structure shall be adequately illuminated and well ventilated. Poor lighting state air etc. crate unpleasant environment and have an adverse effect on will of the staff to work.
3. Wooden flooring and M.S. grating wherever damaged should be repaired on priority.
4. It is observed that at many places, roof leaks badly and at times the leakage water drips on the panel/motor which is dangerous and can cause short circuit and electric accidents. All such leakages should be rectified on priority.
5. All facilities in sub-structure i.e. stair case, floors, walkway etc. should be cleaned daily.
6. Painting of civil works should be carried out at least once in two years.

Municipal Corporation , Bikaner.

LOG BOOK FOR PUMP OPERATIONS

Date & Shift	Pump Set	Start Time	Stop Time	Hours Run		Indicator Readings							Remarks
				Set Combination	Hours	Voltage (V)	Current (A)	Power factor					

Signature of Pump Operator

Junior Engineer **Asset. Engineer**

FORMAT FOR DAILY/PERIODICAL PREVENTIVE MAINTENANCE

S. No.	Daily check up done or not	Defects date wise No. of defects	Date of rectification	Weekly Preventive Maintenance		Fortnightly Preventive Maintenance		Monthly preventive Maintenance		Quarterly/Half Yearly/ Yearly Maintenance	
				Schedule Date	Actual performance date	Schedule date	Actual performance date	Schedule Date	Actual performance date	Schedule Date	Actual performance date

Signature of Contractor's Representative

Junior Engineer **Asset. Engineer**

HISTORY SHEET

Equipment No…… Sr. No…… Unit No…… Card No…….

Date	Nature of Maintenance P.M./BDM	Observation	Details of work done	Material used/ replaced	Man hours	Signature of	
						Contractor	JE/AE

O&M SPS: Operation & maintenance of Sewage Pumping Station & switchyard at Public Park, Bikaner.

30. Explanatory note for the Bill of quantities

30.1 Bills of Quantities for the work

The bills of quantities (BOQ) shall be read in conjunction with the General Conditions, the Special Conditions, the work Description, and the Technical Specifications. All relevant Indian Standards and the PWD Specifications as well as the state of the art technology have to be considered for the execution of the works. For these reasons, general descriptions and specifications are not repeated or summarized in the BOQ. Before entering rates and prices the Tenderer has to carefully study the relevant sections of the Contract. Particular attention has to be put on the following conditions:

Particular attention has to be put on the following conditions:

The present contract is turn Key Contract. For his financial offer contractor has to consider the makes and the specifications of the equipments, as given in tender document. If no makes are specified only makes of reputed manufacturers of equipment corresponding to the State of technology and to the latest Indian standards are accepted. It is clearly stated that the fact that the tenderer has agreed to provide the materials and equipment of specifications prescribed in the tender document does not release him to ask for the final approval of Engineer-in-Charge for the equipment and material to be used for the work in case the contract is awarded to him.

Other rates agreed upon shall be fixed according to clause 18 of the special condition of the contract.

The whole Cost of complying with the provision of the contract shall be included in the items provided in the BOQ. Where no specific items are provided the cost for such items shall be deemed to be included in the rates entered in the BOQ.

Note:

1. Composite rate 12 months is to be quoted.
2. Tenderer should not offer conditional rebate. They should offer compositive price on department terms and conditions. If they offer any conditional rebate, the same shall not be considered for comparison. However department shall avail the rebate without fulfilling the conditions stipulated.
3. Rates of repair if appurtenance in pump house & switchyard are required is including in “H” – Schedule rate.

Date & Signature of the Tenderer ……..

Municipal Corporation , Bikaner.

Name of Work: - **Operation & Maintenance of Sewer Pumping Station (RUIDP), Complete in all respect, Public Park Bikaner for One Year.**

Name of Contractor: - .....

Last date of receipt of Tender document : **18.10.2015 upto 3:00 PM**

Date of Opening of Financial Bid : **19.10.2015 at 4:00 PM**

Earnest Money : **5000/-**

Financial Bid

"H" Schedule

S. No.	Item	Period	Rate to be quoted by Contractor (Per Month)	Amount
1.	Operation of Plant & Machinery system for performance of work included in the scope of work and other terms & conditions and technical specification as per tender document including all major/minor repair & maintenance in scope of tender and regular desilting of chamber, wet wells, screens etc. as per requirement and satisfaction of Engineer-In-Charge.	12 Months		
	TOTAL AMOUNT :-			

JEn(Z7) AEn

Executive Engineer,
Municipal Corporation,
Bikaner.

Signature of Contractor .....

E:\e\e\kaleem G\new copy of o&m (Sps).docx