Shri Mata Vaishno Devi University

Tender Document

for

Survey, Design, Supply, Installation, Commissioning, Testing, Operation and Maintenance (Five years) of Sewage Treatment Plant based on Moving Bed Bio Reactor Technology (MBBR) of 500 KLD, 250 KLD,200 KLD Capacity complete in all respects to cater the requirement of Hostels, Academic & Residential area at SMVD University, Kakryal, Katra.

TENDER NO. SMVDU/Engg/17/1762 **Dated: 22-11-2017**

Last Date for submission of Tender : 14th December,2017
: upto 1500 hours

Address: SHRI MATA VAISHNO DEVI UNIVERSITY, P.O. KAKRYAL- 182 320, KATRA (J&K)

Website : www.smvdu.ac.in

NOTICE INVITING TENDER

For and on behalf of the Registrar, Shri Mata Vaishno Devi University, Kakryal, Katra (J&K) sealed tenders are invited in two-Bid format from reputed companies (original manufacturer of STP) having experience, technical competence, capacity and financial wherewithal for establishment of a state-of-art 500 KLD, 250 KLD, 200 KLD Capacity Sewage Treatment Plant based on MBBR technology containing the components mentioned in BOQ of the NIT appended herewith which must accompanied with Earnest Money in the form of Demand Draft of the amount mentioned below pledged to the Registrar, SMVD University as provided below:-

S. No	Description of work	Approx. cost of work	Time of completion	Amount of CDR / FDR
1	**Survey, Design, Supply, Installation, Commissioning, Testing, Operation and Maintenance (Five years) of Sewage Treatment Plant based on Moving Bed Bio Reactor Technology (MBBR) of 500KLD, 250KLD, 200 KLD Capacity complete in all respects to cater the entire requirement of Hostels, Academic & Residential area at SMVD University, Kakryal, Katra and its disposal based on proven eco friendly technology.**	**380.00 lakh**	**120 days**	**8.00 lakh**

The tenders complete in all respects must reach the office of the Registrar, SMVDU, Katra on or before 14th December, 2017 upto1500 hrs. The Technical Bids shall be opened on the same day or any other subsequent day, in which case the date shall be dully notified in advance on University's Official website. The Bid shall be opened in presence of such Bidders who may choose to be present for the same. The date of opening of financial Bids shall be intimated only to be shortlisted Bidders after evaluation of Technical Bids.

The tender documents containing detailed terms and conditions can be downloaded from our website www.smvdu.ac.in. Cost of Tender documents (`2,000.00) in the shape of Demand Draft in favor of Registrar, SMVD University,Kakryal, Katra (J&K) must accompany with the downloaded Tender Form.

The tender document complete in all respects should be accompanied with a Demand Draft of `2,000/- (Rupees Two thousand only) (non-refundable/ non-transferable) favouring Registrar, SMVDU towards the cost of tender along with EMD in the shape of DD from Scheduled/ Nationalized bank pledged in favour of Registrar, SMVDU valid upto 90 days should reach the office of Registrar SMVDU Kakryal , Katra through Speed Post/ Registered A.D. / reputed courier service by or before 14thDecember, 2017 upto 1500 hrs

For and on behalf of
Shri Mata Vaishno Devi University

Registrar
SMVD University

Survey, Design, Supply, Installation, Commissioning, Testing, Operation and Maintenance (Five years) of Sewage Treatment Plant based on Moving Bed Bio Reactor Technology (MBBR) of 500 KLD, 250 KLD, 200 KLD Capacity complete in entire requirement of Hostels, Academic & Residential area at SMVD University, Kakryal, Katra and its disposal based on proven eco friendly technology.

Annexure-I

Detailed terms and conditions in respect of Tender Notice issued vide No. **SMVEU/Engg/17/ 1762** **Dated: 22-11-2017** .

The Bidders shall submit their bids for the work viz. Survey, Design, Supply, Installation, Commissioning, Testing, Operation and Maintenance (Five years) of Sewage Treatment Plant based on Moving Bed Bio Reactor Technology (MBBR) of 500 KLD, 250 KLD, 200 KLD Capacity complete in entire requirement of Hostels, Academic & Residential area at SMVD University, Kakryal, Katra and its disposal based on proven eco friendly technology

The following shall be detailed eligibility conditions for the bidders.

1. Bidder must be an approved manufacture/supplier of Sewage Treatment Plant duly registered under the Companies Act, 1956 and must be at least 05 years old in the running. The bidder should be an ISO 9001 certified, BIS recognized in designing and execution of STP with its own in house quality plans.
2. The Bidder must have a carried out Satisfactory Annual Maintenance Contract of at least 05 STPs, two of which should have a capacity of 500 KLD or more for the past three years.
3. Bidder must be income tax payee and shall submit attested copies of the Income Tax Returns / Income Tax Assessment Order for the last three years 2014-15, 2015–16 and 2016-17. Bidder shall also submit proof of PAN.
4. Bidder must have a cumulative turnover of at least Rs.5.0 crores during the last three financial years i.e. 2014-15, 2015–16 and 2016-17. Attested copies of audited balance sheets and profit and loss of account for the last three years be attached.
5. The bidder must have carried out design, supply, installation, testing and commissioning of Combined/Stand alone Sewage Treatment Plant of at least 500 KLD capacity of MBBR Technology during the last three years viz. 2014-15, 2015–16 and 2016-17.

OR

6. The bidder should have satisfactorily/successfully designed, erection, testing and commissioned one STP with MBBR Technology and capacity not less than 80% of the capacity of tendered work (or) two works each with above technology and capacity not less than 50% of the capacity of tendered work (or) 3 works each with MBBR technology and capacity not less than 40% of the capacity of tendered work.

General Conditions:

1. Tenders shall be submitted only in the prescribed format. The prescribed format for submitting Technical and Financial Bids are available and the tender forms can be downloaded from the official webpage (www.smvdu.ac.in) and shall be accompanied by a demand draft for Rs.2,000.00 drawn in favor of Registrar, SMVD University, Kakryal, Katra (J&K). If a demand draft for Rs.2,000.00 is not submitted along with the downloaded tender forms, such tenders will be summarily rejected.

2. The Bidders should submit Technical Bid and Financial Bid separately. Technical Bid and Financial Bid should be submitted in separate covers and each of these covers should be sealed. On the cover containing financial Bid, the following should be clearly written: "Financial Bid for Sewage Treatment Plant-3 No. of different Capacities at SMVDU". On the cover containing technical Bid, the following should be clearly written: "Technical Bid for Sewage Treatment Plant-3 No. of different capacities at SMVDU". These two covers should be put in another separate cover which should also be sealed and on this cover the following should be written clearly "Bid for establishment of Sewage Treatment Plant- 500 KLD, 250 KLD & 200 KLD at SMVDU". Each page of the tender form, schedules etc., should be signed and stamped with the seal of the Company.

3. The Technical Bids will be scrutinized first followed by financial Bids. In the first stage those Bidders whose Technical Bids confirms to the terms and conditions of NIT will be shortlisted. Financial Bids of these short listed Bidders will be opened separately. The short listed Bidders will be informed the date of opening of the Financial Bids. The short listed companies will be informed primarily by India Post. Therefore, the Bidders should indicate his correct postal address in their Technical Bid. They may also submit the details of their working Telephone & Fax numbers and e-mail ID for this purpose. The undersigned may also inform the short listed Bidders by telephone, fax or email though it is not mandatory on the undersigned to do so. The undersigned is not responsible if the information on the date of opening of the financial Bids does not reach the Bidders in time due to the failure of the Postal Department. Shri Mata Vaishno Devi University is not responsible if the telephone, fax or emails of the Bidders are not working or the intimation does not reach the Bidders in time for any other reason.

4. All such offer, along with the terms and conditions duly signed and enveloped as described above, must reach the office of Registrar, SMVDU on or before 14th December,2017 upto 1500 hrs in person or by Registered Post / Speed Post / courier addressed to the Registrar, SMVD University, Kakryal, Katra so as to reach on or before the scheduled date and time. The tenders received after the due date and time shall not be considered.

5. The University shall not be responsible for any postal delay. Any conditional tender or tenders, which are not appropriately sealed in the two-bid format, as explained above, or tenders received after the stipulated date and time, shall not be entertained. Any cutting or overwriting in the Tender Documents will also make the bid liable for rejection. The Technical Bids shall be opened by the Tender Committee on the same day or any other specified date at SMVDU Kakryal, Katra in the presence of the Bidders who may choose to be present. In case of change in date and time of opening of Technical Bids, same shall be

intimated. The date of opening of Financial Bids shall be intimated only to the eligible short-listed Bidders after evaluation of the Technical Bids.

6. The Bidders should go through the technical details mentioned in the Annexure-II and stick to the specifications mentioned there in while quoting the rates. The rate should include all incidental expenditure such as transportation of the Sewage Treatment Plant-500 KLD, 250 KLD, 200 KLD to the site, insurance including transit insurance etc.

7. The Bidders should quote separately for each of the item mentioned in the Annexure-II.

8. The rate quoted should be inclusive of all taxes. Rates mentioned in the quotations should be in Indian Rupees. All costs of importing any components will be the responsibility of the Bidders.

9. Tenders should be typed neatly or written in ink and tenders filled in with pencil will be summarily rejected. All tender documents and schedules shall be signed on all pages and the seal of the company shall be affixed on all tender documents and schedules on each page. All corrections if any should be duly attested. Any tenders which have corrections which are not attested by the Bidders will be summarily rejected.

10. Any Government body in India should not have blacklisted the Bidder/OEM its subsidiary, dealing in similar products.

11. The tender should be filled in neatly quoting the rates both in words and figures, without any cutting/over writing. In case of any cutting/overwriting the same should be authenticated under the signatures of the Bidders.

12. Conditional, illegible, ambiguous tender(s) or tender(s) received after the stipulated date and time shall be out rightly rejected.

13. The STP contractor shall be completely responsible for the design of all components, structural details & supervision of the civil works, material, Supply, Installation, Testing of the Mechanical, Electrical pipes, Fittings & other accessories.

14. Operation Maintenance of the entire system including consumables for the specified period. Operation & Maintenance shall be done strictly as per the client' guidelines and requirements.

15. Work under this contract is time-bound and has to be completed within the time limit set in the tender. Work shall be executed in accordance with an agreed schedule within the overall time frame.

16. The Bidders shall maintain secrecy of tender documents, drawings or any other record connected with the work given to them. The unsuccessful Bidders shall return all drawings given to them.

17. The rate quoted by the Contractor in item tenders shall be on correct basis and not the amount worked out by them. The rate quoted in words will be correct basis and not the rate shown in figures in case of discrepancy between them.

18. The University reserves absolute right to reject any or all Bids without giving any reason whatsoever. University also reserves the right to cancel the tender without assigning any reason.

19. Tenders not submitted on the lines indicated above are liable to be rejected without correspondence.

20. Request for extension in last date of receipt of tender shall not be entertained on any grounds.

21. The University reserves the right to order additional quantity or reduce the quantity of the material advertised at the time of placement of order for which the quoted rates shall be valid.

22. All legal proceeding in connection with the order/tender will be subject to the jurisdiction of local court of Jammu and Kashmir State alone.

23. In case of any doubt, dispute or differences arising out of the contract, the same shall be referred to the Arbitrator to be appointed by the Hon'ble Vice Chancellor SMVDUniversity for arbitration to be appointed under J&K Arbitration & Conciliation Act, 1997 whose decision shall be final.

24. The University shall not be bound to accept the lowest or any tender and reserves to itself the right of accepting the whole or a portion of any of the tender, as it may deem fit, without assigning any reason thereof.

25. Any form of canvassing by the Tenderer to influence the consideration of their tender shall render the tender liable to summary rejection.

26. In order to avoid delay caused by postal correspondence and to expedite the process, the University may require the successful Tenderer to hold technical & commercial negotiations with the University.

27. The conditions hereinafter deals with system details and supplementary conditions of the contract in addition to those stipulated in foregoing clauses which alongwith schedules and Annexure, shall be deemed to form part of detailed specification for equipment. The Tenderer are advised to study and familiarize themselves with the terms and conditions of the tender.

28. All materials shall be of the Government approved quality, new and unused and be capable of satisfactory operation when exposed to the local atmospheric conditions.

29. The Tenderer is required to submit a statement of facts in details as to their previous experience in performing a similar or comparable work and business and technical organization, financial resources and manufacturing facilities available and to be used in performing the contract.

30. **Force Majeure:** If during the currency of Contract, there is any out–break of war/ natural calamity, which whether financially or otherwise affects the execution of the Contract the firm unless contract is terminated under provision of this Clause shall make his / her best efforts to complete the Contract. However after outbreak of such war / natural calamity, Shri Mata Vaishno Devi University shall be entitled to terminate the Contract at any time by giving notice in writing. Force Majure is hereby defined as a 'Clause' which is beyond the control of SMVDU / Firm and – which consequently affects the performance of the Contract.

31. The contractor shall comply with the provisions of the Apprentices Act, 1961, Minimum Wages Act, 1948, Workmen's Compensation Act, 1923, Contract labour (Regulation and Abolition) Act, 1970, Payment of Wages Act, 1936, Employers Liability Act, 1938, Maternity Benefits Act, 1961, the Industrial

Disputes Act, 1947 etc as may be applicable, and the rules and regulations made there under from time to time. Failure to do so shall amount to breach of the contract and the Unit-in-charge may, at his discretion, terminate the contract. The contractor shall also be liable for any pecuniary liability arising on account of violation by him of the provisions of the Act.

32. <u>Specific Conditions:</u>

a) The entire STP shall be installed preferably above the ground. The design shall be as per final architectural approval and final architectural planning requirements. If space availability is a constraint then the STP may need to be constructed in multiple levels. Proper arrangements for ventilation/ exhaust/passage have to be provided accordingly in the construction plant.

b) It is proposed to utilize the entire treated effluent for "Horticulture/flushing" purpose. Therefore the system components have to be provided accordingly.

c) For sludge handling, a proper sludge handling network/centrifuge shall be provided, and it is recommended to collect the de-watered compressed sludge into HDPE bags for disposal to the final destination as per the approval of the Pollution Authorities.

d) **Disposal of Solid Waste:** The disposal of all solid waste including from sludge handling network as generated from the STP during construction, commissioning, and O & M shall be the responsibility of the contractor. The solid waste shall be disposed off in accordance with the J&K Pollution Control Board's Norms to the site identified by the Unit In-charge. Loading, unloading, transportation of solid waste shall be to the contractor's account.

e) The evacuated grit and screenings are to be disposed from the STP site by the contractor to the site identified by the Unit In-charge from time to time and the rates shall cover this item also.

f) The successful Bidder may have to provide an acoustic enclosure for STP and shall ensure no foul smell or noise is there during the operation or its idle state.

g) Successful Bidder has to secure necessary certificate from J&K State Pollution Control Board before handing over, confirming that the treated effluent is within IS limits for recirculation to Horticulture, flushing or to discharge into natural stream .

33. <u>Location (Site Information)</u>

i. The Bidders should establish the Sewage Treatment Plant of 500 KLD, 250 KLD & 200 KLD for the University Hostel, Academic & Residential area. Necessary power connection will be provided by the Shri Mata Vaishno Devi University.

ii. Before filing this tender, Contractor shall visit the site and satisfy himself as to be conditions prevalent there, especially regarding repairs to the existing structures to be used in this work, nature and extent of ground, working condition, stacking of materials, installation of tools, plants,

accommodation and movement of labour, supply of water and power for satisfactory completion of the work contract.

34. Scope of Work

The proper execution of work involves provision of all plants, equipment, materials, liaison and performance of all operations needed for ***Survey, Design, Supply, Installation, Commissioning, Testing, Operation and Maintenance (Five years) of Sewage Treatment Plant based on Moving Bed Bio Reactor Technology (MBBR) of one 500KLD, 250KLD, 200 KLD Capacity complete in all respects to cater the entire requirement of Hostels, Academic & Residential area at SMVD University, Kakryal, Katra and its disposal based on proven eco friendly technology*** and securing necessary approval from State Pollution under Residential scheme for Shri Mata Vaishno Devi University. They will broadly include the following : -

a) Planning and designing of the sewage treatment plant as per latest standard laid down by Government of India, State Govt.'s. I.S.I. Standards.
b) Execution of works includes all civil, electrical, mechanical, civil Designing & Drawing, plumbing processing equipments etc. including manufacture, supply and erection as per the details provided in the Technical Specification in **Annexure-II** to the NIT.
c) Any other allied work required for the functioning of the treatment plant conforming to the Statutory Acts, Rules, Standards etc.
d) Equipment and connecting piping shall be so installed as to prevent any obstruction for general movement.
e) Equipment shall be installed in a manner to provide adequate ventilation for all motors.
f) Adequate provision shall be made in the equipment mounting to prevent excessive noise transmission directly or through piping and structures.
g) Overall design factor for individual elements shall be as per the Manual of Sewerage, Govt. of India, New Delhi.
h) All work shall be planned, designed and executed based on latest IS codes of practice and other relevant codes applicable to civil/electrical/mechanical/ plumbing works.
i) The sludge will be handled properly so that the cakes are formed to be used as manure by installing mechanical sludge handling/beds.
j) The rate should include all taxes, supervision erection of mechanical, electrical equipments and operation of system for five years after taking over.
k) The firm will submit quotation on turnkey basis along with schematic and process scheme consumable, power etc. required along with cost of maintenance.
l) The successful Bidder shall provide the architectural and structural drawings/working drawings of complete piping route/plan, foundation works for electrical & mechanical equipment, MOC and other plumbing work till the site of STP for approval of the Competent Authority.
m) The University shall have power to make any alteration, omissions, additions to or substitutions for the original specifications, drawings, designs and instructions that may appear to be necessary, advisable during the progress of work, and the contractor shall be bound to carry out the work in accordance with any instruction which may be given to him in writing, signed by the Unit In-charge. Such alteration, addition or substitution shall not invalidate the contract and any altered, additional or substituted work shall be carried out by

the contractor on the same conditions in all respects on which he agreed to do the main work and at the same rate as are specified in tender for the main work. The time of completion of the work shall be extended on in the proportion that the altered, additional or substituted work bears to the original contract work and the certificate of the Unit In-Charge shall be conclusive as to such proportion. The rates of such additional, altered or substituted work shall be determined in accordance with following provisions in their respective order.

Designing of Civil work

a) Civil structures of the Sewage Treatment Plant shall have to be designed for the total sewage flow 500 KLD, 250 KLD & 200 KLD within the available land / site for the project.

b) Cost of structural design and drawings for civil works will deem to be included in the quoted price of work.

c) The Bidders have to provide Architectural and working drawings of Fencing around the treatment plant battery limits, entry gate, storm water outlets, Rain Protection Canopies on Electrical Drives, All manholes, vent pipes, railings & supports as required.

d) The Bidder shall be required to execute as a part of scope of work, any other item not specified above or indicated in the tender but essentially required for satisfactory and desired functioning of the plant. The Bidder shall provide a defined scheme based upon this process along with sizes of different tanks and equipment and take guarantee of the treated effluent to the standard required as per Pollution Control Board norms. Without restricting to the generality of the foregoing, the work shall consist of:-

Designing of all civil works consist of:-

a) Bar Screen Chamber
b) Oil & Grease Trap
c) Raw Sewage Collection Tank
d) Grit Chamber
e) Foundation for Reinforced Cement Concrete (RCC) Tanks
f) Pump Room
g) Centrifuge Building

a. Mechanical Equipment

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

a) Coarse Screen/Fine Screen
b) Grit Proportional Wire
c) Raw Sewage Lifting Pumps
d) Grit Removal Arrangement
e) Air Blower
f) Multi Grade Sand Filter Column
g) Activated Carbon Filter Column
h) Poly Electrolyte Dozing System
i) Ozone Dozing System
j) Any other equipments required for functioning of STP or as per client's requirement.
k) MBBR Tanks
l) Secondary Clarifier Tanks
m) Clear Water Tank
n) Treated Water Tank
o) Sludge Holding Tank

b. Electrical Equipment

Design, Supply, Erection, Commissioning and Testing of all Electrical equipment generally comprising of:

a) Electric motors for all equipments as required.
b) Motor control center completes with all internal wiring and accessories.
c) Electrical cables from M.C.C panel to all electric motors and units.
d) Electric earthing stations as per I.E.E. rules.
e) All internal lighting & exhaust system etc.

c. Piping Work

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

a) All above mentioned civil structure and tanks.
b) For the interconnection of the various equipments, sludge sump, pump house and control room.
c) All interconnecting piping between various units bypass etc.
d) Effluent piping within limits as shown on the drawings.

35. Power & Water

Power & Water for erection, testing and commissioning shall be provided at one point near the site of work against payment of charges as per rules of the University. The contractor shall extend the lines as required to his site of work at his cost.

36. Storage of Material and Safe Custody

Lockable storage space, if available at site shall be made available to the successful Bidder by the SMVDU. However, the contractor shall be responsible for security and safe custody of his equipment installations, till they are formally taken over by the SMVDU. Non-availability of lockable storage space due to any reasons shall not relieve the contractor of his contractual obligations in any way.

37 Measurement

All works shall be measured in accordance with relevant IS Standards not withstanding general or local practices unless where specifically described otherwise in the specific sections of the specifications. All measurements shall be taken by the SMVDU in the presence of the successful Bidder/ or his authorized representative and shall be jointly signed by both the parties. Payments shall be released against invoice of the contractor based on the joint measurements recorded as per the terms of payment specified in the order.

38 Material Inspection, Examination & Testing

All materials and equipment shall be new. On arrival of the materials at site they shall be inspected and checked by the SMVDU to ensure that the materials conform to the specifications and standards. The SMVDU and his representatives shall at all reasonable time have free access to the contractor's/manufacturers works. They shall have full powers to examine the materials and workmanship of the various items being manufactured at the contractors/manufacturer's works or at any other place from where the material or equipment is obtained. The contractor shall give every facility to the Unit-In-Charge and his representatives and necessary help for inspection, examination & test as specified in Indian standards. Original test certificates of the manufacturer shall be submitted by the Contractor for all major equipments before they are accepted by the SMVDU. Acceptance of any material or equipment shall in no way relieve the Contractor of his responsibility for meeting the requirements of the contract. Consultant will also visit the works/ site to satisfy himself that items being supplied / executed are as per contract condition.

39 Delivery:

(i) Delivery and installation & commissioning of the 03 No. Sewage Treatment Plant of different capacities should commence simultaneously within one month from the date of placement of order and should be completed within 120 days.

(ii) In case of failure to execute the contract, the University shall have the right to order risk contract at the cost of supplier or / and cancel the contract and claim reasonable compensation / damages. The contract of the supply shall be repudiated if the work is not executed within the prescribed period and to the satisfaction of the University.

(iii) As soon as the allotment letter is issued to the Contractor/ Bidder, he will submit to SMVDU, his program to complete the works by the time indicated in the contract, in the form of a Bar Chart for review of the SMVDU and make suggested modifications before his approval of the same. The approved bar chart shall be diligently and strictly followed with a view to complete the works as per schedule. The progress & planning of works

shall be reviewed from time to time and he may modify the same depending upon the exigencies of the work and stage of the works.

40 Performance Criteria of the Plant

It shall be the Contractor's responsibility to ensure the quality of the treated sewage to comply with the local Authorities requirement for the various applications and the following characteristics whichever is stringent. Latest Guidelines issued for regulation of Hotels and Restaurants under Water and Air act by JK pollution control Board shall be adhered to in letter and spirit.

The treatment plant shall be designed to treat the influent based on the following parameters and expected to fulfill the University's requirement as described below:

1. STP-500 KLD

S. No	Description	Consultant's Requirement/ Recommendation
1	**Flow Capacity**	
	Total daily ultimate flow in Cum/day	500 m^3/day
	Peak factor	3.00 hours
2	**Quality of the Untreated Effluent**	
	BOD	150 to 400 mg/lit
	Suspended solids	200- 400 mg/lit
	COD	250 to 600 mg/lit
	pH	5.5 to 8.5
	Oil & grease	20 to 50 mg/lit
3	**Quality of the Treated Effluent**	
	BOD	< 10mg/lit
	Suspended solids	< 30mg/lit
	COD	< 250mg/lit
	pH	6.5 to 8
	Oil & Grease	< 10mg/lit
4	**Treatment Methodology**	Moving Bed Bio-Reactor

2. STP-250 KLD:

S. No	Description	Consultant's Requirement/ Recommendation
1	**Flow Capacity**	
	Total daily ultimate flow in Cum/day	250 m^3/day
	Peak factor	3.00 hours
2	**Quality of the Untreated Effluent**	
	BOD	150 to 400 mg/lit
	Suspended solids	200- 400 mg/lit
	COD	250 to 600 mg/lit
	pH	5.5 to 8.5
	Oil & grease	20 to 50 mg/lit
3	**Quality of the Treated Effluent**	
	BOD	< 10mg/lit

	Suspended solids	< 30mg/lit
	COD	< 10mg/lit
	pH	6.5 to 8
	Oil & Grease	< 10mg/lit
	Odour / Odourless	
4	**Treatment Methodology**	Moving Bed Bio-Reactor

3. STP 200 KLD:

S. No	Description	Consultant's Requirement/ Recommendation
1	**Flow Capacity**	
	Total daily ultimate flow in Cum/day	200 m^3/day
	Peak factor	3.00 hours
2	**Quality of the Untreated Effluent**	
	BOD	150 to 400 mg/lit
	Suspended solids	200- 400 mg/lit
	COD	250 to 600 mg/lit
	pH	5.5 to 8.5
	Oil & grease	20 to 50 mg/lit
3	**Quality of the Treated Effluent**	
	BOD	< 10mg/lit
	Suspended solids	< 30mg/lit
	COD	< 10mg/lit
	pH	6.5 to 8
	Oil & Grease	< 10mg/lit
	Odour / Odourless	
4	**Treatment Methodology**	Moving Bed Bio-Reactor

Treated Sewage shall be connected to a tertiary filtration treatment and shall be treated for use for irrigation , flushing purpose or discharge into natural drains. The contractor shall carefully consider the operation loading for the Sewage Treatment Plant. The total capacity of intermediate and final storage tank shall be designed for 2 days retention period. The final storage tank can be for 1 day retention period.

41 Description of Process

The treatment process shall comprise the following stages:-

- Physical treatment — coarse bar screening
- Primary treatment — Dissolved air flotation for removal of Suspended solids & Aeration Tank
- Secondary treatment — Aeration
- Tertiary treatment — Filtration
  Chlorination/ Ozonation
  Filtration and polishing

The scheme of treatment includes following components

(i) Sewage Collection.

(ii) Bar Screen.

(iii) Equalization-Tank for equalizing the domestic sewage.

(iv) Oil & Grease Trap.

(v) M.B.B.R. (Reactor)

(vi) Secondary Clarifier

(vii) Multi Grade Filter.

(viii) Chlorine Contact Tank.

(ix) centrifuge

(x) Final Disposal

42 Basic Design Consideration for Sewage Treatment Plant

The project of sewage treatment is to stabilize decomposable organic matter present in sewage so as to produce an effluent and sludge which can be disposed of in the environment without causing health hazards or nuisance. Before proceeding with the design of the treatment plant, it is essential to know the variations in quantity and characteristics of the raw sewage and the quality of the final effluent desired. The Bidders has to account following parameters while designing the STP

a. Degree of treatment:

The degree of treatment will mostly will be decided by the regulatory agencies and the extent to which the final products of treatment are to be utilized. These regulatory bodies might have laid down standards for the effluent or might specify the conditions under which the effluent could be discharged into a natural stream, sea or disposed of on land. These regulatory bodies may be the local body or a State Pollution Control Board. The method of treatment adopted should not only meet the requirements of these regulatory agencies but also result in the maximum use of end products consistent economy.

b. Design period:

The Bidders has to design Sewage treatment to meet the requirements over a 30 year period after its completion.

c. Population Served:

Estimates for present and future population of areas of involved in the project are made to determine the quantity of sewage to be treated. These estimates would have formed a part of the main sewerage project itself.

d. Sewage Flows :

The quantity of sewage and its characteristics show a marked range of hourly variation and hence peak, average and minimum flows are important considerations. The process loadings in the sewage treatment are based on the daily average flows and the average characteristics as determined from a 24 hour weighted composite sample. In the absence of any data, an average flow of 150 lpcd may be adopted. The hydraulic design load various from component of the treatment plant with all

appurtenances, conduits, channels etc. being designed for the maximum flow which may vary from 2.0 to 3.5 times the average flow. Sedimentation tanks are designed on the basis of average flow, while consideration of both maximum and minimum flow is important in the design of screen and grit chambers.

e. Temperature:

Observation of temperature of sewage is useful in indicating the solubility of oxygen which affects oxygen transfer capacity of aeration equipments and rate of biological activity. Extremely low temperature affects adversely the efficiency of sedimentation. Normally the temperature of domestic and municipal sewage is slightly higher than that of the water supply.

f. Hydrogen Ion concentration:

The hydrogen ion concentration, more conveniently expressed as pH, is a valuable parameter in the operation of biological units. The pH of fresh domestic sewage is slightly more than that of the water supply to the community. However, the onset of septic conditions may lower the pH while the presence of industrial wastes may produce extreme fluctuations.

g. Colour and Odour:

Fresh domestic sewage has a slightly soapy and earthy odour and cloudy appearance depending upon its concentration. With passage of time, the sewage becomes stale, darkening in colour with a pronounced smell due to microbial.

h. Solids:

Though sewage contains only 0.1 percent solids, the rest being water, still the nuisance caused by the solids cannot be overlooked, as they are highly putrescoble and therefore need proper disposal. The sewage solids may be classified into suspended and dissolved fractions which may be further subdivided into volatile and non-volatile solids. Knowledge of the volatile or organic fraction of solid which is putrescible becomes necessary as this constitutes the load on biological treatment units or oxygen resources of a stream when sewage is disposed of by dilution. The estimation of suspended solids, both organic and inorganic, gives a general picture of the load on sedimentation and grit removal processed in sewage treatment. Dissolved inorganic fraction is to be considered when sewage is used for land irrigation or reuse of sewage is planned.

i. Nitrogen:

The principal nitrogenous compounds in domestic sewage are proteins, amines, amino-acids and urea. Ammonia nitrogen in sewage results from the bacterial decomposition of these organic constituents. Nitrogen being an essential component of biological protoplasm, its determination in waste is necessary for proper biological treatment or land irrigation. Where nitrogen content is inadequate, it becomes necessary to supplement with addition of salts containing nitrogen. Generally domestic sewage contains sufficient nitrogen, to take care of the needs biologic treatment.

j. Phosphorus:

Phosphorus is contributed to domestic sewage from food residues containing phosphorus and their breakdown products. The use of increased quantities of synthetic detergents add substantially to the phosphorus content of sewage. Phosphorus just as nitrogen is an essential nutrient for biological processes. Generally domestic sewage contains adequate quantities of phosphorus.

k. Chlorides :

Concentration of chlorides in sewage above the normal chloride content of water supply is used as an index of the strength of the sewage. The daily contribution of chlorides averages to about 8 gm per person. Based on an average sewage flow of 150 lpcd, this would result in the chlorides content of sewage being 50 mg/l higher than that of the water supplied. Any abnormal increase should indicate discharge of chloride bearing wastes or saline ground water infiltration, the latter adding to the sulphates which may lead to excessive generation of hydrogen sulphide.

l. Biochemical Oxygen Demand:

The Biochemical Oxygen Demand (BOD) of sewage or of polluted water is the amount of oxygen required for the biological decomposition of biodegradable organic matter under aerobic conditions. The oxygen consumed in the process is related to the amount of decomposable organic putrescibility of the sewage is to be determined. The standard BOD test is carried out for a period of 5 days at 20o C and is expressed as BOD5.

m. Chemical Oxygen Demand:

The Chemical Oxygen Demand (COD) test gives a measure of the oxygen required for chemical oxidation. This does not differentiate between biologically oxidisable and non-oxidisable material. However, the ratio of the BOD does not change significantly for a particular waste and hence this test could be used conveniently for interpreting performance efficiencies of the treatment units. In situations where the presence of toxic materials is like to interfere with the BOD, this test is very useful.

Technology Certificate: The supplier shall issue a certificate stating that-

a) The Sewage Treatment Plants to be installed is of the latest technology. In support of this, Bidder shall furnish design validation from Central Pollution Control Board (CPCB)/J&K State Pollution Control Board (JKPCB)/National Environmental Engineering Research Institute (NEERI), Nagpur/IIT.

b) The Sewage Treatment Plants may be upgraded as and when required by the University.

c) The Sewage Treatment Plant shall be promptly and properly serviced by them whenever desired and such service will remain available to University for 5 years from the date of its commissioning, failing which the company / manufacturer will be blacklisted.

43 Contract Rates

The Contract rates and prices shall be deemed to include all labour, materials, equipments, temporary works and buildings, insurance, sales tax, all taxes and duties, establishment charges, profit, supervision, transport, testing and other charges and fees and other incidental expenses that may be incurred for proper execution, completion and maintenance of the works, and shall include for all obligations imposed upon him by the specifications, schedules and drawings pertaining to the work.

44 Place of Manufacture and Inspection:

The Bidders shall state in his tender the place of manufacture and inspection of the Sewage Treatment Plants for SMVDU offered in the tender. The University or his duly authorized representative/Agency shall have access to the supplier's work place at any time during working hours for the purpose of inspecting the manufacture of the Sewage Treatment Plant-500 KLD,250 KLD,200 KLD and the supplier shall provide all necessary facilities for such inspection. No supplies unless otherwise directed shall be dispatched without prior inspection and approval by SMVDU and the charges on account of inspection shall be borne by the supplier.

45 Guarantee And Defects Liability

All Works covered by this contract shall be guaranteed by the Contractor against faulty material and workmanship for a period of 12 months from the date of successful commissioning and handing over to SMVDU to his entire satisfaction. Any part found defective shall be replaced free of all costs by the contractor. If performance of equipment during guarantee period is not satisfactory, the guarantee period shall be extended for further periods as decided by SMVDU, considering the time taken to achieve satisfactorily performance.

46 Warranty:

Bidder shall be fully responsible for the manufacturer's warranty in respect of proper quality and workmanship of all the components of Sewage Treatment Plant-500 KLD,250 KLD, 200 KLD etc. covered by the tender for a period of 12 months from the date of satisfactory installation of the Sewage Treatment Plant-500 KLD, 250 KLD & 200 KLD equipment. The provision for extended warranty with terms and conditions thereof, if any, may also be specifically mentioned.

The supplier shall be responsible to replace free of cost *(including transportation and insurance expenses)* to the University, whole or any part of supplies which under normal and proper use becomes dysfunctional within one week from the SMVD University lodging such a complaint or informing the supplier in this regard. This agreement will be valid for the entire maintenance period of 5 years.

In case the supplier fails to rectify / replace the defective / damaged STP equipment including transit damages, shortage within one week from the date of intimation of such shortage / damages, it shall have to pay penalty @ 5% per month on the value of such materials and such amount equal to penalty shall be deducted from the Annual operation and maintenance charges payable to the successful Bidder, by the University.

47 Permits & Licenses

All licenses and permits for the work under Government control (local/Central) authorities shall be obtained by the University and the requisite fees shall be borne by the contractor for the same.

48 Insurance

The contractor shall insure all equipment, materials, machinery and installations as a whole until successful completion and handing over to the SMVDU. Insurance policy should cover for all kinds of erection risks, fire, theft, or loss in transit. All workers and third party shall be insured in accordance with the Workmen Compensation Act in the event of an accident.

49 Operation & Maintenance

i. Sewage Treatment Plant-500 KLD, 250 KLD & 200 KLD shall be maintained by the successful Bidder to the entire satisfaction of SMVDU for a period of five years after the installation and successful commissioning. Bidder shall specifically spell out the arrangements envisaged for carrying out the maintenance of the plant. The supplier shall however execute a separate agreement with SMVDU for the maintenance of Sewage Treatment Plant-500 KLD, 250 KLD,200 KLD.

ii. The successful bidder shall ensure proper functioning of the system as a whole during the maintenance period of five years, which shall begin on the date of actual commissioning of the plant. All preventive/routine maintenance and breakdown/corrective maintenance required for ensuring maximum uptime shall have to be provided by the successful Tenderer.

iii. The preventive/routine maintenance shall be undertaken by the successful Tenderer on regular basis. The maintenance record shall be properly maintained and submitted from time to time to SMVDU. In case, the routine visit is not conducted as per the mandated schedule, suitable penalty shall be imposed for each such deviation and the same shall be debited from the amount payable under Annual maintenance contract.

iv. In respect of breakdown/corrective maintenance, whenever a complaint is lodged by the University, the successful Tenderer shall attend to the same within a reasonable period of time (03 days) and in any case the breakdown shall be corrected within a period not exceeding 07 days from the date of lodging of complaint, failing which suitable penalty on per day basis shall be imposed by SMVDU, which shall have to be paid by the firm, failing which it shall be recovered from the Annual maintenance charges.

v. If the system is found damaged/defective due to non-maintenance, the cost for correcting the breakdown system will be deducted from the payment chargeable under Annual maintenance contract.

vi. Successful Bidder shall provide all necessary manpower including skilled and unskilled labor, consumables, chemicals etc. as required for the complete operation and maintenance as per requirements

vii. Successful Bidder shall perform fortnightly testing of the required parameters of the influent and effluent quality, for BOD, COD, TDS, Oil

and Grease and Phosphate (as P) from JK Pollution Control Board (JKPCB) or labs approved by JKPCB/NABL and submits the same to SMVDU on fortnightly basis.

viii. Experience, Qualification and minimum staff required for O&M: For all O&M work, the successful Bidder shall provide skilled staff who have adequate qualifications and sufficient experience of similar works. O&M personal to be provided by the successful Bidder shall be suitably qualified & the successful Bidder will get their antecedents verified by the local police and CV resume duly vetted by the competent authority of SMVDU before engaging them. The contractor shall be includes the availability of the minimum man power throughout the year in his quotes rates for O&M of the plant.

ix. Company shall get the final test reports done from an approved External Testing agency on monthly basis for the influent and effluent quality, suitable to ensure proof that the entire Plant is running satisfactorily.

x. The incoming/treated sewage water/digested sludge shall be tested for the following parameters on fortnightly basis and SMVDU, may order analysis of additional parameters required to check the efficiency and efficacy of the plant.

a. Physical and chemical parameter for Influent/Effluent

S.No.	Parameter	Influent	Effluent
1.	pH		
2.	BOD **3 days@27^0**		
3.	Total Suspended Solids		
4.	Oil and Grease		
5.	Phosphate as P		

Note: All the above tests shall be performed on a 24 hour composite sampling (2 hourly composite) at least once a month.

b. Bacteriological analysis of treated Effluent: (Once in a month)

S.No.	Date of sample	Influent (MPN/100ml)	Effluent (MPN/100ml)
1.	24 hour composite		

c. Physical chemical analysis of biological sludge: (Once in month)

S.No.	Parameter	Biological sludge
1.	Appearance	
2.	Odour	
3.	Moisture percentage	
4.	Organic content (percentage of Total solids)	

xi. The Chemicals and reagents required for testing will be arranged by the successful Bidder from his own sources. The contractor will employ its own staff for testing purpose. However, SMVDU will be at liberty to get random sampling and testing done on its own or from any other agency.

xii. The successful Bidder has to ensure a maximum of cleanliness in the operation and maintenance of the plant. At any time, the plant, its equipment and its surroundings have to be kept clean and proper failing which a suitable penalty will be levied which shall be equivalent to per day Operation and maintenance charges to be recovered from the Annual Maintenance Contract.

50 Earnest Money Deposit:

(i) The Bidders should submit an EMD of **`8,00,000 /- (Rupees Eight lakh only)** in the form of DD pledged to the Registrar, Shri Mata Vaishno Devi University, Kakryal Katra. There shall be no relaxation/ concession to any Unit/Agency whatsoever in regard to the amount of EMD to be paid.

(ii) EMD should be included along with the Technical Bid in the cover containing Technical Bid as the Technical Bid will be opened first. The Bidders should NOT include EMD in the cover containing Financial Bid. If the EMD is not found in the cover containing Technical Bid, the tender will be rejected.

(iii) Tenders received without enclosed EMD in the cover containing Technical Bids will be summarily rejected. EMDs other than in the form of DD will not be accepted and the tenders with EMD in the form of other than DD will be summarily rejected. The EMD amount will not bear any interest. SMVD University will not entertain any request for adjusting the EMD from the tender due / running bills or from the EMD / Security Deposit of / for any other Bidders. In case of withdrawal of tender by the Bidders within the Validity period of the offer or before finalization of the order, the EMD amount paid will be forfeited.

(iv) The earnest money of the Bidders shall be forfeited if they withdraw their tender or raise the price of their offer within the validity period. The earnest money shall also be forfeited in case of the Bidders who do not comply with the purchase order placed on them within the validity period of the offer or violate any terms and conditions contained herein, for this purpose purchase order shall be deemed to have been placed from the date of letter of intent.

(v) Earnest money deposited shall be released in favour of the unsuccessful Bidders(s) within one month after finalization of the order.

51 Security Deposit:

(i) The successful Bidders(s) shall furnish security deposit equivalent to 10% (ten percent) of the value of the contract in the form of Bank Guarantee from Nationalized/ Scheduled Bank pledged to the Registrar, Shri Mata Vaishno Devi University, Kakryal,Katra valid upto the end of Maintenance Contract period of five (05) years. Such security deposit shall be furnished within one month from the date of receipt of supplies. Failure to do so within the stipulated period will make the contract liable for cancellation

together with forfeiture of the E.M.D at the discretion of Hon'ble Vice Chancellor, Shri Mata Vaishno Devi University. The EMD of the successful Bidders of the contract could also be adjusted as security deposit subject to its validity.

(ii) The security deposit will be released within one month from the date of completion of agreed contract and no interest will be paid thereon.

52 Payment Terms:

a) 10% of project cost (interest free recoverable mobilization advance) to be released against submission of equivalent amount of bank guarantee (valid till 90 days) 7 days after issuance of letter of award. The recovery of the advance shall commence from the first running account bill onward in the manner full advance shall be recovered when 50% of the work is completed.

b) 5% of Project Cost against submission and approval of all shop drawings including procedures and deliverables mentioned scope of the work namely Pre-delivery Inspection and design validation, Method Statement, etc. and to be released on a pro–rata basis on the satisfaction of SMVD University

c) 60% of Project Cost on pro–rata basis after delivery of material and equipment at site (No part shipment of a full equipment will be entertained for payment)

d) 10% of Project Cost on pro–rata basis against installation at site to the satisfaction of SMVD University.

e) 15% of Project Cost on Testing & Commissioning.

f) 10% on Project Cost on final submission of all As built drawing including O&M manuals, maintenance charts, training manpower of the client etc. to be satisfaction of SMVD University and securing necessary approval for SMVD University including obtaining of all license and approval from statutory authorities, subject to the condition that 10% of the project cost is deposited with SMVD University as Security Deposit valid up to the end of maintenance contact period of Five (5) years.

53 Escalation

No escalation either on material or labour (market or statutory) shall be allowed during the currency of this contract.

55. Penalty:

In case of failure on the part of the Bidders to install & commission the Sewage Treatment Plant-500 KLD, 250 KLD, 200 KLD and execute the work in full or part thereof within the delivery schedule stipulated in the award of work, a penalty @ 0.5% *(half percent)* per week of unfinished work subject to a maximum of 10% *(five percent)* of the cost of unfinished portion of the contract shall be levied at the discretion of the SMVD University.

56. Prices, Taxes & Levies Etc

a) Prices quoted must be firm and FOR work site and it should include all the components of taxes, local levies (entry tax and toll tax payable at Lakhanpur), prices for transit insurance, freight, installation, etc. at destination site, discount, if any, should be shown separately while quoting rates per unit.

b) Sales Tax, J&K GST, Service Tax or any other tax chargeable at present rates shall be borne by the Bidders. However any variation in taxes during execution of work shall be borne by the University.

57. Validity of the offer: The Tender should be unconditionally valid for a period of 120 days. Quoted prices shall be fixed and not fluctuating with the market price. The rates approved as per the NIT would be valid for further contract during the validity period.

58. Jurisdiction: All questions, disputes, or difference arising under and out of, in connection with the contract, if concluded, shall be subject to the jurisdiction of Courts at Jammu/(J&K), India.

59. Training: The Tenderer shall make provision of imparting training to SMVDU staff on operation and maintenance of Sewage Treatment Plant-500 KLD,250 KLD, 200 KLD. Cost of training shall be built up as a part of the quoted cost for maintenance by the Bidder and no separate cost offer on this account shall be accepted.

a. The successful Bidder shall formulate a training module covering the entire duration of the project period including five years of AMC. The proposal of such module with details on courses covered with duration of each session covered shall be submitted within 20 days from the date of issuance of Letter of Award.

b. Such training module shall commence immediately after the commissioning of the units for a period of 07 days at the beginning and during the regular maintenance period, the training session shall be conducted at an interval 45 days during the first year of AMC, at an interval 60 days during the 2nd year of AMC and at an interval of 90 days for the remaining period of AMC and each session should not be less than two days.

c. **Penalty:** In case of failure on the part of the firm to provide training during the stipulated time as per the schedule, a penalty of Rs.5000/- will be levied for the each session missed and the penalty shall be recovered from the amount payable to the supplier under Annual Maintenance Contract.

60. Changes:

No variation or modification, or waiver of any of terms and provisions of these specifications shall be deemed valid unless mutually agreed upon in writing by both the parties.

61. CANCELLATION/ TERMINATION OF CONTRACT IN FULL OR PART

Subject to other provisions contained in this Clause, the undersign may, on the recommendations of Engineer–Incharge, SMVDU without prejudice to his any other rights or remedy against the contractor in respect of any delay, inferior workmanship, any claims for damages and / or any other provisions of this

contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the aforesaid situations.

62. <u>Agreement</u>:

The successful Bidders shall be required to execute an agreement on a valid stamped paper for strict compliance of the terms and conditions of the contract, vis-à-vis the NIT and work order within a period of 15 days after the placement of order. The supplier shall bear the legal expenses, which shall be incurred on the execution of the agreement.

Registrar
SMVD University

SCHEDULE –A

S.No.	Particular / Criterion		
1	Name of the Firm Organization with complete details, including Address (Telephone No./ Contact Mobile No. / Fax No. / E-mail) alongwith brief description of background (The background may be as a separate).	:	
2	Date of establishment of the Firm. Details of Registration No. of the firm/ company. Location of Head Office, Regional Office and Branch Office.	:	
3	Please specify whether you are submitting you tender as a proprietor of the firm or as a partner of the firm or Director of the Company.	:	
4	Name of the Proprietor / Partner / Directors of the tendering firm / Company together with technical qualifications. Organization Charts, Manpower Strength and details of key personnel.	:	Attached / Not Attached
5	Past experience in the field along with performance certificates (please enclose testimonials / documentary evidence)	:	Attached / Not Attached
6	Annual turnover in the last three years as per audited balance sheet, a copy whereof to be enclosed along with profit and loss account statements.	:	Attached / Not Attached
7	a) PAN (proof to be enclosed) b) ITR statements / Income Tax Assessment Order (for the last 03 years to be enclosed) c) Service Tax Registration No.	:	Attached / Not Attached
8	Detail of EMD (in form of DD only)	:	Amount: Name of issuing Bank: Date of issue
9	Duration of validity of Bid	:	
10	Does the Bidders owe by himself or by		

(

	proxy or on behalf of any other person any money / due in connection what so ever to the SMVDU.	:	Yes/ No
11	GSTRegistration Number (attach copy)	:	
12	Tender Fee ` …….	:	SMVDU Receipt No. & date _____ Or DD No. _____ dated _____ Bank _____ Payable at_____
13	Attested copy of valid BIS Certificate attached or not:	:	
14	Literature / leaflets on products	:	Attached / not attached
15	Copy of Certificate,	:	Attached / not attached
16	Authenticate Photostat copies of test certificates from	:	Attached / not attached
17	Any other documents / information required to be provided as per terms and conditions and requirements of the tender document (indicate item wise)	:	Attached / not attached

I certify that I am authorized to furnish the information given in the Schedule-A on behalf of the firm I represent and that it is true to the best of my knowledge and belief

Signature of Bidder_____

Name of the Firm & Address _____

_____

_____

_____

SCHEDULE –'B'
Financial Bid

Shri Mata Vaishno Devi University, Kakryal, Katra (J&K)

Name of the Tender: _____

NIT No. with Date: _____

Amount of CDR/FDR with number & date: _____

To

The Registrar,
Shri Mata Vaishno Devi University
Kakryal, Katra

Sir,

I _____S/o Shri _____ R/o_____ in capacity as Proprietor of a firm/ Partner of a firm/ Director of Company, hereby submit my tender for the Survey, Design, Supply, Installation, Commissioning, Testing, Operation and Maintenance (Five years) of Sewage Treatment Plant based on Moving Bed Bio Reactor Technology (MBBR) of 500 KLD, 250 KLD & 200 KLD Capacity complete in all respects to cater the requirement of Hostel, Residential & Academic area of Shri Mata Vaishno Devi University for an amount mentioned below:-

1.	Total Cost of the project (Lump sum Amount)	Rs._____ (in words) _____
2.	Maintenance cost for 5 yrs	Rs._____ (in words) _____
3.	Total Cost (1+2) (Lump sum Amount)	Rs._____ (in words) _____

I affirm that the rates offered are inclusive of all taxes, duties, freight, insurance, carriage, etc. I further affirm that I have read and fully understood the tender notice and agree to abide by all the terms and conditions laid therein, which are being signed in token of my acceptance.

Signature of Bidders _____

Name in Block Letters _____

Name of the Firm & Address _____

_____

Annexure-II

Technical Specifications

A. Sewage Treatment Plant-500 KLD, 250 KLD & 200 KLD

Survey, Design, Supply, Installation, Commissioning, Testing, Operation and Maintenance (Five years) of Sewage Treatment Plant based on Moving Bed Bio Reactor Technology (MBBR) of one 500KLD, 250KLD, 200 KLD Capacity complete in all respects to cater the entire requirement of Hostels, Academic & Residential area at SMVD University, Kakryal, Katra and its disposal based on proven eco friendly technology.

DESIGN CRITERIA		
S.No	**Description**	**Consultant's Requirement/ Recommendation**
1	**Flow Capacity** Total daily ultimate flow in Cu.m/day Peak factor	 500 KLD 3.00 hrs
2	**Quality of the Untreated Effluent** BOD Suspended solids COD pH Oil & grease	 250 to 300 mg/lit 250 mg/lit 400 to 500 mg/lit 6 to 8.5 10 to 20 mg/lit
3	**Quality of the Treated Effluent** BOD Suspended solids COD pH Oil & Grease	 < 30mg/lit < 50mg/lit < 150mg/lit 6.5 to 8.5 < 10mg/lit
4	**Other Design Data** Surface area of MBBR Media Clarifier loading rate	 400 m^2/m^3 16-24 m^3/m^2/day
5	**Location & Position of STP**	Attached as per Survey Report
6	**Availability of Area**	To be Specified by the Bidder as per given drawings/ locations.
7	**Treatment Methodology**	MBBR Technology
		(CONTRACTOR) Dated:

SPECIFICATION FOR PIPING WORK

1.0 SCOPE OF WORK

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

Without restricting to the generality of the foregoing, the piping work shall consist of:-

- All gravity pipes between various units.
- Pressure pipes from pumps to aeration tank, treated effluent disposal.
- All other pipes, valves and control gates necessary and required.
- All piping shall be of suitable material/make, to be as per the approval of the Unit-In-Charge.

2.0 PIPES (FOR TREATMENT PLANT)

a. All pipes under pressure / gravity shall be cast iron double flanged pipes class “A”, conforming to I.S. 1537 or S&S C.I. pipe to I.S.1536 class LA.

b. Fittings for double flanged and S/S pipes shall conform to I.S: 1536.

c. Sluice valves shall be non-rising type spindle with wheel conforming to I.S: 780 of reputed make e.g. Kirloskar.

d. Pipes, fittings and valves shall be jointed with 3mm thick rubber gasket conforming to I.S: 638 and units and bolts S/S pipes shall be jointed with refined pig lead Tyton joints.

e. Pipes shall be laid true to level and gradient and properly supported by brick masonry or concrete pillars at appropriate places.

f. If required the pipes can be fabricated from heavy duty M.S Black pipes and then painted, as per required specifications.

g. All pipes shall be tested to a hydrostatic pressure 100 psi. for at least 30 minutes without any leakage.

3.0 VALVES

Valves for effluent outlet shall be 80mm and sludge outlet shall be 100mm dia. Both valves in each unit shall cast iron butterfly valves manually operated. **Other valves necessary and required shall be standard cast iron full way valves.**

4.0 SPECIFICATION FOR MECHANICAL EQUIPMENT

4.1 SCOPE OF WORK

Work under this section shall consist of providing detailed design, labor, materials and equipment necessary and required to provide all mechanical equipments for the treatment plant. All the works shall conform to the list of Indian Standards on Sewerage and Sewage treatment as stand enclosed in the annexure

5.0 GENERAL

All Mechanical Equipment shall be provided with proper protection from the external environment, in the form of coverings, tin-sheds etc.

6.0 DIFFUSED AERATION

Diffused aeration is an efficient way to transfer oxygen to a water body. A compressor on shore pumps air through a hose, which is connected to an underwater aeration unit. Attached to the unit are a number of diffusers. These diffusers come in the shape of discs, plates, tubes or hoses constructed from glass-bonded silica, porous ceramic plastic, PVC or perforated membranes made from EPDM (ethylene propylene diene Monomer) rubber. Air pumped through the diffuser membranes is released into the water. These bubbles are known as *fine bubbles*. The EPA defines a fine bubble as anything smaller than 2mm in diameter. This type of aeration has very high oxygen transfer efficiency (OTE). On average, diffused air aeration diffuses approximately 2–4 cfm (cubic feet of air per minute).

Fine bubble diffused aeration is able to maximize the surface area of the bubbles and thus transfer more oxygen to the water per bubble. Additionally, smaller bubbles take more time to reach the surface so not only is the surface area maximized but so are the number of seconds each bubble spends in the water, allowing it more time to transfer oxygen to the water. As a general rule, smaller bubbles and a deeper release point will generate a greater oxygen transfer rate.

However, almost all of the oxygen dissolved into the water from an air bubble occurs when the bubble is being formed. Only a negligible amount occurs during the bubbles transit to the surface of the water. This is why an aeration process that makes many small bubbles is better than one that makes fewer larger ones. The breaking up of larger bubbles into smaller ones also repeats this formation and transfer process.

6.1 Blowers and Aeration System:

The treatment plant shall be provided with rotary positive displacement roots type blowers with a common base and a central electric control panel, belt drive system, drip proof induction type electric motors, necessary valves including a pressure release valve and suitable filter and silencing. All piping and related accessories necessary to connect the blowers to the plant air header shall be provided by the plant manufacturer. All air piping from the blower-motor unit to the air header shall be approved steel pipe with malleable iron fittings. Flexible reinforced rubber connecting sleeves shall be provided wherever required. There shall be 100% standby arrangements for blowers.

6.2 Air Diffusers

Each diffuser drop-pipe shall be equipped with non- clog fine bubble diffuser of sufficient quantity to keep pressure loss through the drop-pipe assembly to a minimum. The air diffusion devices shall be designed to distribute air to cover the entire length of the tanks and to have efficiency such that an adequate supply of oxygen is maintained in the tanks to treat the effluent load for which the plant is designed.

7.0 SEWAGE RELIFT PUMPS, SLUDGE RECIRCULATION, FILTER FEED PUMPS, FILTERED WATER PUMPS

(Each type of pumps shall be min. N+1 redundancy (N working + 1 standby)

7.1 Raw sewage re-lift pumps shall be compact, mono-block, dry motor submersible type with non-clog free flow open impellers and with solid handling capacity of required size.

Sludge return, filter feed & soft water pumps shall be horizontal non-clog centrifugal pumps for the required discharge and head and of required specifications. Pump shall be directly connected to an electric motor by means of a flexible coupling and mounted on a common C.I. or M.S. base plate.

7.2 Each sludge return pump shall have a capacity suitable for re-circulating 100% sludge. The second pump shall be a standby.

8.0 CHEMICAL DOSING PUMPS

8.1 Provide chemical dosing pumps complete with plastic suction and delivery piping, solution tank, mixing tank and feed arrangement.

8.2 Pumps shall be complete with motor control center, cabling and connection.

9.0 PRESSURE FILTER

Complete Pressure filter with dual filter media of appropriate capacity.

10.0 ACTIVATED CARBON FILTER

Complete Activated Carbon filter of appropriate capacity.

11.0 CHLORINATION UNIT

Providing gravity feed type chlorination plant working on differential pressure principle. The unit shall include solution tank, one mixing tank and feed arrangement with suitable device to control the dosage.

All fabricated surfaces shall be painted after thoroughly freed from dust and grease and dried with a coat of red oxide primer and three coats of finish paint as per provisions of I.S:1477-1971 and I.S:1477-1971.

12. Specification for Electrical Work

Work under this section shall consist of providing detailed designing, labour, materials and equipment necessary and required to provide all electrical equipment for the treatment plant.

12.1 Without restricting to the generality of the foregoing the electrical installation work shall consist of:-

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

13.0 GENERAL

13.1 All electrical motors and other equipment shall be suitable for 400 volts, 3 phase, 50 cycles or 220 volts, single phase, 50 cycles, A.C., Supply motor

1 H.P. or below shall be single phase. All motors installed in open area must have space heaters and the circuits should have provision for automated operation.

13.2 All motors shall be rated 10% above the required H.P.

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

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

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

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

13.7 All electrical work shall be executed by authorized and qualified persons competent to undertake such works under the rules and regulations of the local electric supply authority.

14.0 MOTORS

Electric motors shall be totally enclosed fan cooled induction type squirrel cage motors conforming to I.S: 325.

Each motor shall be provided with a starter and stop push button switch suitably mounted near each motor. This shall be in addition to the main switchgear provided in the switchboard cubicle. Not required for sludge/effluent pump).

15.0 MOTOR CONTROL CENTRE

Company shall supply and install cubicle type motor control center fabricated from 16 gauge M.S. sheet and angle irons. The cubicle shall be stove enamel painted inside and outside. Provision of space for switchgear for future installations shall be made as specified below:-

The Switchgear shall comprise of:-

- Incoming switch fuse unit of required rating.
- Flush panel mounted voltmeter on incoming main with selector switch for reading voltage between each phase 0-500 volts.
- Bus bar chamber with copper bus bars of required capacity.
- Isolation S.F. Units one for each motor.
- Isolation S.F. Unit for yard lighting circuit 60 amps.
- Isolation S.F. unit for pump house and control room lighting circuit 15 amps.
- Push button operation DOL starters for motors / pumps upto 7.5 H.P. and automatic star-delta starters for motor 7.5 H.P. and above for all motors.
- Space for two starters for future installations.
- One flush mounted Ampere meter for each 3 Phase motor.
- Three phase indicating lamps on incoming main.
- On/Off Neon indicating lamps for each motor.

- All interconnection color-coded wiring from incoming S.F. unit to switches, starters, motors and other accessories. All wiring inside the panel shall be with copper conductors.
- Provision of remote starting (from plant room)

16.0 CABLING

16.1 Company shall supply install and commission all cables from the M.C.C. panel to each motor. Underground cables shall be laid to a minimum depth of 900 or as specified by the Consultant and shall be protected with sand and bricks on top. Cables running on surfaces shall be neatly clipped to aluminum saddles at suitable intervals.

16.2 All cables shall be "Tropodur" PVC sheathed cables of 1100 volts grade conforming to I.S: 1554 part-I. All cabling work shall be as per standard practice in accordance with i.e. rules.

17.0 EARTHING

17.1 Company shall provide two earthing stations independent of each other separated by 3 m from the building.

17.2 Earth plates shall be buried in a pit 1.2x1.2 m wide and at a depth of at least 3 m. below ground level. The connection between main bars shall be made by means of three 5mm brass studs fixed at 100mm centers. The pit shall be filled with coke breeze loose soil and salt. A G.I. pipe 20mm dia. With perforations shall be placed vertically on the periphery to reach to ground level. A manhole of brick masonry 30x30x24 Consultant to surround the pipe shall be provided over the pit for inspection.

17.3 All conduit runs metal clad equipment, main switches, plug, boxes metallic fittings shall have effective earthing using appropriate size of G.I. wire and proper clips to comply with the requirements of the rules.

Wiring:

All wiring shall be in accordance with the relevant Indian Standard. All wire shall be run in continuous lengths from controller to valve. All cable jointing shall be contained in waterproof containers and adequately sealed against moisture penetration with commercially available joiners designed for direct burial. All joints shall be in a valve box. Adequate wire (1000 mm) shall be left at valves during installation to enable future replacement of valves without the need for excessive jointing of wires. Wires shall be laid below or beside the pipe reticulation system in a common trench with the pipes. Wires not in pipe trenches should be in suitably sized heavy duty electrical conduit.

Annexure

List of Indian Standards on Sewerage and Sewage System

1	**IS: 5600-1970**	Indian Standard Code: Specification for Sewage and Drainage Building Elements
2	**IS 6279 :1971**	Indian Standard Code: Equipment for grit removal devices
3	**IS 6280:1971**	Sewage screens
4	**IS 7784: Part 1& 2: Sec 1 to 5**	Indian Standard Code: Code of practice for design of cross drainage work Part 1 General features
5	**IS 9110:1979**	Indian Standard Code: Hand operated augers for cleaning water closet. pipe and sewer
6	**IS 9213:1979**	Indian Standard Code: BOD Bottle
7	**IS 10037 : PT1 to 3 :1981**	Indian Standard Code: Requirements for sludge dewatering equipment. Part 1 sludge drying beds-sand, gravel and under drains
8	**IS 10261 :1982**	Indian Standard Code: Requirement for sewing tank (clarifier equipment) for waste water
9	**IS 10552:1983**	Indian Standard Code: Buckets to be used in power driven buckets type sewer cleaning machine
10	**IS :4733-1972**	Method of sampling test sewage effluent

	Approved Makes of Major Components for Sewage Treatment Plant	
1	Air blower	Swam Pneumatics or Equivalent
2	Blower Motor	Bharat Bijlee /Crompton Greaves/ Siemens / Kirloskar or Equivalent
3	Submersible Non Clog Pump	Beacon Usha / Roto / Beacon Weit or Equivalent
4	Disinfection Pump	Asia Lmi / Blue & White or Equivalent
5	Gear Boxes	Greaves Gear or Equivalent
6	Cable	Finolex / Polycab / Delto /Havells or equivalent
7	Sludge Transfer Pump	Roto/ Kirloskar / Ksb / Kishnorw or equivalent
8	Butter Fly Valve	ISI
9	Control Panel	L&T / Siemens / English Electric Component / Auto Switch or Equivalent
10	Gun Metal Valve	Any ISI make
11	HDPE / PVC Pipe Class III	Finolex / Supreme / Oro / Trustlene or Equivalent with fitting
12	GU/MS Pipe Heavy Class paint / epoxy paint	Jidal Hissar/Surya/Prakash or equivalent
13	Solution Tank	HDPE or equivalent
14	Diffuser	Standard Membrane (Make)
15	Structural Steel	Tata / Rathi / Ispat /Sail or equivalent

BILL OF QUANTITIES