

Vasai Virar City Municipal Corporation
Water Supply Department

Name of work : Recycling/Reuse of wastewater, Tertiary Treatment plant (TTP) of 5 MLD net output capacity at Bolinj.

Quotation notice – WS / /2018-19

We are hereby issuing this Notice Inviting Quotation from contractors, vendors & suppliers for various items proposed under "**Recycling/Reuse of Wastewater, Tertiary treatment plant of 5 MLD net output capacity at Bolinj**" for Vasai Virar City Municipal Corporation. Contractors, vendors & suppliers of such works are requested to send their Quotations in sealed envelope as per the quotation format, from 30 / 07/ 2018 to 07 / 08 / 2018.

Sr. No	Item Description	Unit	Qty	Item Rate (Rs.)
1)	<p>Ultrafiltration Technology - There is existing MBBR plant at Bolinj. UF Technology is proposed as tertiary treatment after Existing MBBR plant at Bolinj. The inlet water for the UF plant shall be the treated sewage coming out of the MBBR plant at Bolinj. The Treated water shall be utilised for non-domestic purpose like for Railway Car shed, Gardens, flushing and Industrial process. O & M cost/KL shall be given separately. The Rates shall include Design, Supply, Installation, Testing, Commissioning, Civil and structural works, Electro-Mechanical works, storage tanks and Extended warranty for 10 yrs. of Operations. Warrantee shall also include the specific power consumption and consumables for the O & M of the plant. The UF MOC shall be suitable for minimum 10 years of full replacement warrantee.</p> <p>Note: - The outlet parameters of the treated water shall meet the CPHEEO standards for Recycling & Reuse of Sewage. Also the Detail Technical specification for the same is given below.</p>			
	a) Bolinj STP (Ex. MBBR Technology STP)	MLD	5	
2)	<p>Ultraviolet (UV) Disinfection: - The treated sewage from UF Plant shall be supplied for Disinfection with UV. O & M cost/KL shall be given separately. The Rates shall include Design, Supply and Installation, Testing, Commissioning, civil and structural works, Electro-Mechanical works, storage tanks and Extended warranty for 10 yrs. of Operations. Warrantee shall also include the specific power</p>			

	consumption and consumables for the O & M of the plant. The UV MOC shall be suitable for minimum 10 years of full replacement warranty. Note: - Also the Detail Technical specification for the same is given below.			
	b) Bolinj (Product water from UF)	MLD	5	
3)	Reverse Osmosis (RO) – The Product water from MBR/Ultra Filtration Plant after Disinfection i.e., UV shall be supplied to the RO plant. The outlet water quality of RO shall be such that, it can be utilised for human drinking purpose. O & M cost/KL shall be given separately. The Rates shall include Design, Supply, Installation, Testing, Commissioning, civil and structural works, Electro-Mechanical works and storage tanks and Extended warranty for 10 yrs. of Operations. Warrantee shall also include the specific power consumption and consumables for the O & M of the plant. The RO MOC shall be suitable for minimum 10 years of full replacement warrantee.			
	a) Bolinj	MLD	1	
4)	Pump – Pumping Machinery required to pumping the recycled water from sump to Elevated Storage Reservoirs. O & M cost shall be given separately. The desired technical specification & required flow and head for the pumps are provided in subsequent column			
	Type of Pumps Horizontal Centrifugal/Vertical turbine			
4.1	Submersible pump Specification: Providing, Installing, Testing, Commissioning of non-clog Submersible Sewage Pumps, as specified below. Capacity - ...MLD Pump Head in mWC- ...mtr. Efficiency of the pumps ...% Required Motor rating HP- ... HP Solid Handling size – 100 mm Sp Gravity – 1.05 MOC			

	<p>Casing – CI EN-GJL 250 suitable for 4 to 10 pH</p> <p>Impeller – Shall be of Single, Multi vanes or S-TUBE type CI EN-GJL 250</p> <p>Shaft - SS 329 ;</p> <p>MOTOR Casing - CI EN-GJL 250</p> <p>Motor Parts – CI IS 210 Gr. FG 220</p> <p>Fasteners – BHT Steel</p> <p>Guide Pipe –SS 304</p> <p>Lifting Chain – SS 304</p> <p>Mech. Seal – Mechanical Seal shall be of SIC vs SIC for Primary & SIC vs Carbon for Secondary,</p> <p>The pump must equipped with a method of restoring impeller to casing clearance in axial direction, to restore the pump efficiency at site, without dismantling the pump and machining for replacement of wear rings.</p> <p>Motor cooling must be achieved by a cooling jacket, using the pumped media /coolant to cool the motor. The pump impeller must be equipped with a system to ensure a pumped flow of liquid through the cooling jacket and also incorporate a device to prevent the liquid channels from blocking with hair and foreign material.</p>			
<p>4.2</p>	<p>Submersible pump Specification: Providing, Installing, Testing, Commissioning of non clog Submersible Sewage Pumps, as specified below.</p> <p>Capacity - ...MLD Pump Head in mWC- ...mtr.</p> <p>Efficiency of the pumps ...%</p> <p>Required Motor rating HP- ... HP</p> <p>Solid Handling size – 100 mm</p>			

	<p>Sp Gravity – 1.05</p> <p>MOC</p> <p>Casing – CI EN-GJL 250 suitable for 4 to 10 pH</p> <p>Impeller – Shall be of Single, Multi vanes or S-TUBE type CI EN-GJL 250</p> <p>Shaft - SS 329 ;</p> <p>MOTOR Casing - CI EN-GJL 250</p> <p>Motor Parts – CI IS 210 Gr. FG 220</p> <p>Fasteners – BHT Steel</p> <p>Guide Pipe –SS 304</p> <p>Lifting Chain – SS 304</p> <p>Mech. Seal – Mechanical Seal shall be of SIC vs SIC for Primary & SIC vs Carbon for Secondary,</p> <p>The pump must equipped with a method of restoring impeller to casing clearance in axial direction, to restore the pump efficiency at site, without dismantling the pump and machining for replacement of wear rings.</p> <p>Motor cooling must be achieved by a cooling jacket, using the pumped media /coolant to cool the motor. The pump impeller must be equipped with a system to ensure a pumped flow of liquid through the cooling jacket and also incorporate a device to prevent the liquid channels from blocking with hair and foreign material.</p>			
a	STP-2 to ESR @ MIDC :- (Flow=5.00 mld , m3 /hr. =208.33, Head=14.78 m, Pumping length= 2890 m, Construct sump depth = 4.5m)	No	2	
5	Instrumentation Works: Supply installation, testing Commissioning of following ONLINE Monitoring instruments and Integrations with CPCB Web Link.			
6	Field Instrumentation with online monitoring Interface.			
	pH Analyzer	Per	1	

6.1	Principal: Electrochemical	No		
6.2	COD BOD TSS TOC Analyzer Principal: UV - Vis Full Spectrum as per the CPCB Guideline	Per No	1	

Treated Sewage Quality of Existing MBBR Technology Plant which shall be feed to the Inlet of UF Plant:-

Sr. No.	Parameters	Unit	Discharge Standards
1	pH	-	6.0 to 8.0
2	Total Suspended Solids (TSS)	mg/l	<20.0
3	BOD ₅ at 20° C	mg/l	<10.0
4	COD	mg/l	<100.0
5	Oil & Greases	mg/l	<10.0
6	Fecal Coliform	MPN/100 ml	<500.0

Technical Specification for Ultra-Filtration

a) Microporous membrane

The UF system shall use a pressurised microporous, hollow fibre membrane from an organic polymer as ultrafiltration membrane.

Technical Specification of UF Module

1. Ultra filtration modules shall be made from high strength, hollow fiber membranes that offer the following features:-
2. Pore size: 0.04- 0.02 μm nominal pore diameter for removal of bacteria, viruses, and particulates including Colloids.
3. Hollow fibers Membrane with four Connections in each module.
4. Outside-In flow configuration with air scouring Facility.
5. UF Membrane shall be Provided with all necessary chemical cleaning Facility like CIP System and CEB System.
6. The pressurized vertical vessel shall be of shell-and-tube design.
7. Membrane shall have high chlorine tolerance.
8. Normal Operating Pressure: 2.5 kg/cm².
9. Maximum Allowable Pressure: 5 kg/cm².
10. Trans Membrane Pressure: 1.5-2.0 kg/cm².
11. Flux Rate of each Membrane shall be in the range of 40-50 LMH.
12. Operating pH range 2-11.
13. The hollow fiber membranes to be made from **PVDF** material to provide full replacement warrantee for a period of 10 years.
14. MOC of End Caps shall be as per the manufacturer's specifications.
15. MOC of central permeate tube, feed & reject port shall be UPVC.
16. MOC of Membrane housing shall be U-PVC
17. The active Surface area should not be more than 600 Sq.ft.
18. Defect liability period shall be for 2 years from date of issue of virtual completion certificate.
19. UF Module shall be provided with 5 years Onsite Warranty

Membrane Element Life

The Contractor shall define the guaranteed membrane element life in the pro-rated membrane warranty. The Contractor is advised that the following criteria shall be used for the purposes of defining membrane module life:

- a) Failure to meet the specified filtrate quality criteria;
- b) Failure to meet specified integrity test requirements; and,
- c) Failure to restore the permeability of the membrane to allow the system to achieve the specified MC and RC CIP frequency requirements at the design flow using only the duty membranes.

The Contractor shall provide all details of membrane life and pro-rata warranty life as required in the Technical Particulars required for Process Equipment and the

Technical Particulars required for Equipment Performance Guarantees. The membrane manufacture should give 5 years warranty for the life of the Membrane out of that two years should be full replacement basis and balance 3 years to be on Pro rate basis.

Technical Specification for UV Disinfection System:-

1. Minimum UV transmittance shall be $\geq 75\%$
2. System shall give > 6 log reduction of E-Coli. / Faecal Coliform.
3. System shall withstand the maximum operating pressure of 102 psi (7 bars).
4. System shall withstand the maximum operating temperature of 70°C .
5. UV lamp type shall be medium pressure variable intensity.
6. Maximum power consumption shall be ≤ 8.5 kW
7. Lamp Life shall be $\geq 16,000$ Hours with lamp life factor of ≥ 0.90 .
8. Total head loss across the disinfection system shall be < 200 mm.
9. Construction Materials

Housing	SS-316
Internal	High grade fused silica (Quartz)
Seals	EPDM & Viton

Treated water Quality

Treated water shall meet the following specifications:

TSS = 5 PPM

Faecal Coliform = Nil

Technical Specification for Reverse Osmosis Membrane:-

The following are the approved R.O. membrane specifications for proposed STP.

1. Rejection of dissolved salts shall be between 99.1% to greater than 99.9%.
2. The nominal pore size of the membrane shall be < 1 nanometre.
3. The typical operating pressure shall be 14 kg/cm^2 & the membranes shall be physically strong enough to withstand the operating pressure of 42.18 kg/cm^2 .
4. The membranes, membrane modules, and membrane cassettes shall be by one manufacturer.
5. Maximum pressure drop should not be more than 3.5 kg/cm^2 per housing or 0.85 kg/cm^2 per element.
6. The membrane must have a chlorine tolerance of 1000+ ppm-hours.
7. Membrane shall work under varying pH range of 4-11.

8. The material used for the manufacturing of the membrane fibers shall be suitable for providing a full replacement warrantee for a minimum period of 10 years.
9. The materials used to hold hollow membrane fibers in place shall be chemically resistant to high concentrations of chlorine and high pH wash respectively.
10. Clean-In-Place System: The membranes shall be cleaned “in-place” without removal from the membrane tank. The system shall consist of a chemical feed pump (if required) and storage tank (if required) and include all interior piping, valving, and in-tank piping and supports.

Treated water Quality

Treated water shall meet the following specifications:

Biochemical Oxygen Demand (BOD) = Nil

Turbidity = Nil

TDS < 100 ppm Total Coliform = Nil

Table 7.19 Recommended norms of treated sewage quality for specified activities at point of use

	Parameter	Toilet flushing	Fire protection	Vehicle Exterior washing	Non-contact impoundments	Landscaping, Horticulture & Agriculture			
						Horticulture, Golf course	crops		
							Non edible crops	Crops which are eaten	
							raw	cooked	
1	Turbidity (NTU)	<2	<2	<2	<2	< 2	AA	< 2	AA
2	SS	nil	nil	nil	nil	nil	30	nil	30
3	TDS	2100							
4	pH	6.5 to 8.3							
5	Temperature °C	Ambient							
6	Oil & Grease	10	nil	nil	nil	10	10	nil	Nil
7	Minimum Residual Chlorine	1	1	1	0.5	1	nil	nil	nil
8	Total Kjeldahl Nitrogen as N	10	10	10	10	10	10	10	10
9	BOD	10	10	10	10	10	20	10	20
10	COD	AA	AA	AA	AA	AA	30	AA	30
11	Dissolved Phosphorous as P	1	1	1	1	2	5	2	5
12	Nitrate Nitrogen as N	10	10	10	5	10	10	10	10
13	Faecal Coliform in 100 ml	Nil	Nil	Nil	Nil	Nil	230	Nil	230
14	Helminthic Eggs / litre	AA	AA	AA	AA	AA	<1	<1	<1
15	Colour	Colourless	Colourless	Colourless	Colourless	Colourless	AA	Colourless	Colourless
16	Odour	Aseptic which means not septic and no foul odour							

All units in mg/l unless specified; AA-as arising when other parameters are satisfied;
A tolerance of plus 5% is allowable when yearly average values are considered.

Terms & Conditions:-

- 1) Interested contractors are required to specify the specifications given in the above table in addition to the specifications mentioned above with sealed quotations shall be submitted in the Name of City Engineer, Water Supply Department from date 30 / 07/ 2018 to 07 / 08 / 2018. up to 3.00 pm V.V.C.M.C Head Office, Water Supply Department Opp. Virar Police Station, Bazaar ward, Virar East, Maharashtra 401305
- 2) All the Rates of items shall be inclusive of all taxes.
- 3) Quotation Notice No., Name of the work as well as firm / company name should be mentioned on the sealed quotation packet.
- 4) Conditional, late and incomplete quotes shall not be considered.
- 5) The contractor / agencies will have to submit the demand for proof of existence of their firm.
- 6) The Quotation Notice is available at VVCMC website.

**City Engineer
Vasai Virar City Municipal
Corporation**

Note: - The required site visit/inspections shall be carried out by the vendor/supplier, before providing the Techno-Commercial Offer. Only informative assistance shall be provided by PCMC officials.