

**PROJECT : PROPOSED STP FOR SARAGHARI SRAI**

**BILL OF QUANTITIES FOR SEWAGE TREATMENT PLANT (100 M<sup>3</sup>/DAY)**

S.NO.	DESCRIPTION	UNIT	QTY	RATE (Rs.)	AMOUNT (Rs.)
1.0	<p>Supply installation testing and commissioning of fully automatic sewage treatment plant based of Thermax/ Ewaltz/ Wock Oliver/ Ion exchange on ADVANCED MOVING BED BIO RECTOR (MBBR) TECHNOLOGY with MBBR Bio media.(with air diffuser system) with sewage handling capacity 100 m<sup>3</sup> per day. The fully automatic STP will be complete in all streams with central control and equipments, step ladder, inspection walk way, protection rail and all electrical accessories. The raw sewage RCC collection sump with automatic SS bar screens shall be a part of the STP. The STP shall be skid mounted package type only. It should be internally FRP lined and externally enamel coated. It must have all equipments inbuilt complete with tertiary treatment. It include all necessary chemical dosing system as required by the manufacturer's design. All the equipment, piping, pumps, blowers and electrical panel to be inbuilt. Complete with inlet, outlet, overflow, vent, M.S. cover, drain channel with M.S. gratings. the rates quoted are inclusive of all the items except civil works as required for full running of the STP plant including comprehensive 1 years warranty including consumables/chemicals etc all inclusive. the contractor shall also submit a monthly water quality report of the treated water from an approved lab.</p> <p>■ <u>The STP shall be designed based on the following parameters (Raw water characteristics) :</u>  <u>The all STP civil work will be in client scope</u>  <u>Raw sewage characteristics</u></p> <ul style="list-style-type: none"> <li>● Flow rate-100 M<sup>3</sup>/Day</li> <li>● PH - 6.5 - 8.5</li> <li>● BOD - 250 - 300 Mg/l</li> <li>● TSS - 300 - 400 Mg/l</li> <li>● COD - 600 - 800 mg/L</li> <li>● Oil &amp; Grease - 50-100 mg/L</li> </ul> <p>■ <u>Effluent discharge standard after basic Tertiary treatment :-</u></p> <ul style="list-style-type: none"> <li>● PH - 7.0 - 8.5</li> <li>● BOD - &lt; 20mg/l</li> <li>● TSS - &lt; 50 mg/l</li> <li>● COD - 50 mg/l</li> <li>● Oil &amp; Grease - &lt; 5 mg/l</li> </ul>				

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	<p><b><u>Effluent discharge minimum standard after Ultra filtration:-</u></b></p> <p>PH - 7.0 - 8.0</p> <p>BOD - &lt;5mg/l</p> <p>TSS - &lt;1mg/l</p> <p>COD - &lt;20mg/l</p> <p>Oil &amp; Grease - &lt;1mg/l</p> <p>The STP shall consist of following units but not limited to these unit as may be required by the manufacturer's design.The entire civil work design &amp; drawings to be provided by the vendor.</p>				
i)	<p><b><u>FULLY AUTOMATIC BAR SCREENS made of Stainless Steel 316 grade only:</u></b></p> <p>2 Nos of automatic rotor inclined bar screens of suitable in size to remove the foreign particle with having provision for automatic lifting arrangement etc. complete as per design.</p>	Nos.	2		
ii)	<p><b><u>COLLECTION CUM EQUALIZATION TANK MINIMUM CAPACITY 50 KL : RCC TANK TO BE PROVIDED BY CLIENT:</u></b></p> <p>Collection cum Equalization tank for sewage equalization. Supply, installation commissioning of air diffusers with EPDM Seat for equalization tank complete in all streams with SS piping valves, distribution grid. All submerged piping valves, and grid should be rust proof. Quantity as per design. Tank will be provided by client</p>	Lot	1		
iii)	<p><b><u>TWO STAGE AERATION TANK IN MSFRP( MINIMUM CAPACITY: 14 KL each)</u></b></p> <p>Supply, Installation, Testing &amp; commissioning of Two stage inbuilt Aeration tank with 6mm MS thickness and complete FRP coated inside, and PU painted outer along with support structure, ISI standard ladder, walkway, with air diffuser and piping complete in all streams &amp; of said capacity. Fine air bubble jet diffuser with EPDM seat to be provided in Aeration chamber.</p>	Lot	1		
iv)	<p><b><u>SECONDARY SETTLING TANK IN MSFRP [CLARIFIER] [ CAPACITY to be specified by the vendor]:</u></b></p> <p>Supply, Installation, Testing &amp; commissioning of Inbuilt Secondary settling tank with 6mm MS thickness and 2mm complete FRP inside, and PU painted outer (clarifier) filled with tube deck media of adequate capacity, with inbuilt flocculation chamber and hopper bottom type with arrangement of easy sludge lifting and recirculation line. It should be well interconnected to sludge pump.This tank shall consist of air lift arrangement capable of transferring settled sludge from this tank to aeration tank and sludge holding tank. Scum removal system shall be included.</p>	Lot	1		

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v)	<b><u>ONLINE CHLORINE CONTACT CUM CLARIFIED WATER TANK (5M<sup>3</sup> CAPACITY) : RCC TANK TO BE PROVIDED BY CLIENT</u></b> Chlorine contact cum clarified water tank with baffles for chlorine mixing and desired minimum volume. This tank is also acting as a tank/ sump for the treated water disposal pumps (filter feed pumps) complete with inlet/outlet, drain connection.	Lot	1		
vi)	<b><u>AIR BLOWER:</u></b> Supply, Installation, Testing & commissioning of Air distributing system with 2 nos. (1 Duty + 1 stand by) twin-type air blower of 180m <sup>3</sup> /hr air discharging capacity at the pressure of 0.35 kg/cm <sup>2</sup> (1000 rpm) each including fine bubble membrane type diffusers complete with valves & air distribution grid complete as per design. Air blower should be complete with 5 hp 4 pole motor, along with pully, v belt, protection cage, pressure gauges, safty valve, base frame, and viberation elemination pads. Blower shall be complete with all inlet, outlet pipe line, NRV and distribution chanel. Air Blower <b>Make:- Everest/Kay International/Beta.</b>	Nos.	2. (1W+1S)		
(vii)	<b><u>Bio Media</u></b> Supply, installation and commissioning of poly propylene MBBR Bio Media with minimum surface area of 700 m <sup>2</sup> /m <sup>3</sup> complete in all streams, specific density:- 0.9 <b>Make: Ewaltz Technologies/Cool Deck/Welcome</b>	7 M3	Lot		
viii	<b><u>ALL PIPING AND VALVES</u></b> Supply, installation, testing and commissioning of various sizes, types of upvc piping and valves for 100 cum STP project. <b>Make: Jindal/Bhushan/ Tata</b>				
a)	All Submerged piping, fitting for Air/water of SS 316 grade with Ball valve, NRP, Tee Union, Elbow complete	Lot	1		
b)	All non submerged piping, fitting for air/water MS C class. with Ball valve, NRP, Tee Union, Elbow complete	Lot	1		
ix)	Supply ,installation, testing and commissioning of level indicator/controller for auto operation of system for all sewage holding tanks with high & low level alarm complete with auxillary No/NC central.	Lot	1		
a)	Supply of all required Civil & Mechanical/Electrical drawings by the contractor.	Job	1		
	<b>Note: <u>Associated civil work for STP is excluded from STP's vendor scope.</u></b>				
2.0	<b>SEWAGE TRANSFER PUMPS :</b>				

S.NO.	DESCRIPTION	UNIT	QTY	RATE (Rs.)	AMOUNT (Rs.)
3.0	<p>Providing, fixing, testing and commissioning of fully submersible, non-clog sewage handling type pump for raw sewage transfer from equalization tank to bioreactors tank. The pump shall have complete SS construction TEFC induction motor including pressure gauge, lifting arrangement for the pump, all necessary piping, valves, level controller, probes, cable etc. and other accessories as required Solid handling shall be 30-35 mm.  <b>Make: Grundfos/ Lubi/ Mather &amp; Platt. Specification to be provided by the vendor:-</b></p> <ul style="list-style-type: none"> <li>● 5.0 M<sup>3</sup>/hr</li> <li>● 10 m head</li> <li>● 1.0 HP (.75 KW) or as required</li> <li>● 30mm- 35mm solid handling non-clog sewage application submersible pump</li> </ul> <p><b>SLUDGE DISPOSAL PUMP : 1 NOS</b></p>	Nos.	2 (1W+1S)		

S.NO.	DESCRIPTION	UNIT	QTY	RATE (Rs.)	AMOUNT (Rs.)
	<p>Providing, fixing, testing &amp; commissioning of horizontal, centrifugal Sludge disposal pump for the disposal of sludge to sludge holding tank. The pump shall be installed in the packaged system and must have CI casing, bronze Impeller &amp; SS shaft &amp; sleeve with mechanical rotary shaft seal connected by a flexible tier type coupling to TEFC induction motor mounted on a common channel base-plate with coupling guard, 150 mm dia pressure gauge with GM isolation cock, suitable vibration eliminator pads of approved design. Motor to be suitable for including all necessary piping, valves and other accessories and concrete foundation complete as required. <b>Make:Grundfos/Lubi/Matter &amp; Platt</b></p> <ul style="list-style-type: none"> <li>● 5.0 M<sup>3</sup>/hr</li> <li>● 15 m</li> <li>● 1.0 HP (.75 KW). Or as required</li> <li>● Centrifugal sludge disposal pump 2800 rpm</li> </ul>	Nos.	1		
4.0	<p><b>ONLINE CHEMICAL AND CHLORINE DOSING SYSTEM</b></p> <p>Supply, installing, testing &amp; commissioning of online chemical dosing system with 3 nos of metering pumps and dosing tanks of 2mm SS316 .Dosing sysetm shall be mounted in the packaged STP with all relevant piping, interconnecting controls,cables etc complete in all respects. <b>Pump Make: Milton Roy/Asia LMI/Etatron</b></p>	Nos.	3		
5.0	<p><b>FILTER FEED PUMPS :</b></p> <p>Providing, fixing, testing &amp; commissioning of Horizontal centrifugal pumps for filtration process. The pumps shall be made of CI casing, bronze Impellar, SS shaft &amp; sleeve, Mechanical Seal are connected to a TEFC induction motor mounted on a common channel base frame with coupling guard, 150 mm dia pressure gauge with GM isolation cock, suitable vibration eliminator pads of approved design. Motor to be suitable for 400/440 V, 3 Phase, 50 cycles AC power supply, including all necessary piping, valves and other accessories and concrete foundation complete as required. <b>Make: Grundfos/Lubi/Mather &amp; Platt</b></p> <ul style="list-style-type: none"> <li>● 5.0 M<sup>3</sup>/hr</li> <li>● 35 m</li> <li>● 2.0 HP (1.5 KW),or as required</li> <li>● Horizontal Centrifugal pump</li> </ul>	Nos.	2. (1W+1S)		

S.NO.	DESCRIPTION	UNIT	QTY	RATE (Rs.)	AMOUNT (Rs.)
6.0	<p><b>MULTI GRADE FILTER (MGF) :</b></p> <p>Supply, installation, testing &amp; commissioning of vertical self supporting multigrade sand filter of FRP, pressure gauges at inlet &amp; outlet, sample cock, MS class 'C' face piping, CI butterfly valves and all accessories, with initial charge of filter media for multigrade sand filter, <b>Make: Ewartz Technologies/Pentair/Aventura</b></p> <ul style="list-style-type: none"> <li>● 5 M<sup>3</sup>/hr</li> <li>● 3.5 kg/Sq.cm</li> <li>● Dia - 610mm, Height - 1800 mm</li> </ul>	Nos.	1		
7.0	<p><b>ACTIVATED CARBON FILTER (ACF):</b></p> <p>Supply, installation, testing &amp; commissioning of vertical self supporting multigrade activated carbon filter of FRP, pressure gauges at inlet &amp; outlet, sample cock, MS class 'C' face piping, CI butterfly valves and all accessories, with initial charge of filter media for multigrade sand filter, <b>Make: Ewartz Technologies/Pentair/Aventura</b></p> <ul style="list-style-type: none"> <li>● 5 M<sup>3</sup>/hr</li> <li>● 3.5 kg/Sq.cm</li> <li>● Dia - 610mm, Height - 1800 mm</li> </ul>	Nos.	1		
8.0	<p><b><u>Ultra Filtration Membranes</u></b></p> <p>Supply, Installation, Testing &amp; commissioning of Ultra filtration Capacity : 4 m3/hr Operating pressure : 3.5 kg/cm2 Membrane Area : 23 Sq. Mt. Preservative : Glycerin 35% Potting Material : PVC/ABS Operation : PLC Filtration Pore Size : 45000 Dalton Recovery : 90% Membrane Configuration : Capillary Housing : FRP/SS <b>Make: Dow/Oltramare/Hydranautic</b></p>	Lot	1		
9.0	<p><b><u>Membrane Feed Pump</u></b></p> <p>Supply, Installation, Testing &amp; commissioning of Membrane Feed Pump: Centrifugal type Pump MOC : SS Capacity : 5m3/hr Head : 20 Mt. Motor : 1/2900- Hp/RPM <b>Make: Grundfos/Lubi/Mather &amp; Platt</b></p>	Nos	2. (1W+1S)		

S.NO.	DESCRIPTION	UNIT	QTY	RATE (Rs.)	AMOUNT (Rs.)
10.0	<b>Membrane Back Wash Pump</b> Supply, Installation, Testing & commissioning of Membrane Feed Pump: Centrifugal type Pump MOC : SS Capacity : 7m3/hr Head : 30 Mt. Motor : 1/2900- Hp/RPM <b>Make:</b> <b>Grundfos/Lubi/Mather &amp; Platt</b>	No.	1		
11.0	<b>Hydraulic Filter Press</b> Supply, Installation, Testing & commissioning of Sludge Filter Press Capacity : 50 ltr/Batch Type : PTF compressed Model : PTFM-18x18 <b>Make: Welcome/Pharmatech/NMP</b>	No	1		
12.0	<b>Screw Pump</b> Screw Pumps Capacity : 2m3/h Head : 35 mwc MOC : CI <b>Make : Roto/Tushaco/Rotomech</b>	No	1		
13.0	Supply, Installation, Testing & commissioning of Water Flow Meter : Type : Electromagnetic <b>Make</b> <b>: Janus/Elegant Control/Switzer</b>	No	2		
14.0	Bypass arrangement (During maintenance of STP) packaged STP should have maintenance accessability points.It should be designed for easy maintenance and complete with sewage bypass arrangement.	Job	1		
	<b><u>NOTES :client will terminate the 3 phase electric connecton with earthing and a fresh water line near STP</u></b> <ul style="list-style-type: none"> <li>Contractor shall include all electrical mechanical items as required to operate the system automatically/ manually, including electrical wiring cables, cable tray, control panel and connection to the various equipment's, other accessories complete as required. Only main power supply with the earthing to the STP main control panel shall be provided by the owner. The specifications for Electrical Panel given below.</li> <li>STP should follow all the concern Indian and Local norms.</li> </ul>				

S.NO.	DESCRIPTION	UNIT	QTY	RATE (Rs.)	AMOUNT (Rs.)
15.0	<p><b>ELECTRICAL PANEL :</b></p> <p>Electrical control panel should be installed in the packaged STP .Supply, installation testing and commissioning of electrical panel, front accessible only, free floor standing conforming to minimum IP-55 degree of protection. All incomings/outgoings shall be arranged in modular compartments. The panel steel structure shall undergo several tanks pre-treatment process before painting. The sheet steel shall be all of 2.0 mm thick CRCA sheet. All the operable compartments of the panel shall be completely shrouded, provided with padlocking arrangement on all compartments including bus bar and cable alley chambers. The panel should be sychronized with programable logic control</p> <p>The panel designed shall not exceed 2200 mm and the maximum operating height for any switchgear shall not be more than 1600 mm. The panel shall be provided with minimum 75 mm base channel frame fabricated from ISMC sections. All bus bar links in the panel shall be solid bus bars with coloured PVC shrinkable sleeves. No wires will be acceptable. Continuous earth bus shall run all round the panel with earthing studs provided at minimum 2 places. The control wiring shall be carried with min. 2.5 mm<sup>2</sup> copper wires and shall be adequate for remote operation of the starters.</p>				
	<p>Proper sized cable termination gland plates shall be provided on cable alleys and knock outs for same shall be provided at fabrication stage itself. Panel shall be so designed as to have min. 20% spare feeders/space. Panel shall undergo epoxy powder coating with required color shade. All cable terminations shall be from top/bottom. All bus bars shall be of aluminium, electrolytic grade only. Maximum design density shall not exceed a 0.8 amps/mm<sup>2</sup>. All bus bars shall be insulated with coloured heat shrinkable PVC sleeved. All bus bar supports shall be SMC supports.</p>				
	<p>All starter shall be provided with auto/manual switch, over load relay with single phase preventing feature, ON/OFF/TRIP indication lamps, ON/Off push buttons, contactors suitable for remote/local operation, contacts for building automation system, indication &amp; spare potential free contacts, level controllers level switches etc. as required. the STP shall be compatible with the building managment system(BMS) through BACNET/RS 485 ports. To be specified by the vendor.</p>	No	1		
16	<p>The contractor shall run, maintain and operate the plant for a period of 84 months from the day of commisioning including cost of all the consumables/ chemicals including complete comprehensive maintainence of the entire plant and equipment. The contractor shall also submit a monthly treated water report to SGPC to show th proper running of the plant</p>	No	1		
	TOTALT				
	<b>TOTAL</b>				