

BILL OF QUANTITIES FOR 500 KLD STP (MBBR)

S.NO	DESCRIPTION	UNIT	QTY	AMOUNT
1.00	MBBR BASED SEWAGE TREATMENT PLANT OF 500 KLD			
	General Notes:- Contractor shall ensure submission of detailed GA drawings (Plan & Section), P & I diagram, schematic diagram for the below mentioned components and additional components such as inserts, puddle flanges, vent pipes etc. if so required to complete working of the STP and got it approved by the Owner's/ Architect / Consultants before start the installation of the same.			
	Planning,Designing,Detailing,Supplying, Erection,Testing and Commissioning of Sewage treatment plant based on MBBR based technology of average flow rate of 500 cu.m/day for recirculation of treated sewage /effluent for the use of horticulture. The Scope of work consist of design and execution of all ectrical,mechanical, plumbing and processing,ancillary equipments and works etc required to complete, getting approval from state pollution control board and other statutory bodies as well as from consultant (consultant) /Client including the cost of STP building for electrical room, treated sewage storage tank etc.			
	Note: The rate also be included the cost of trial run for period of two month from the date of handing over and operation and maintenance of the plant for a period of one year from the expiry of trial run period including the cost of consumables complete as specification as directed .Obtain required no. of test report of treated/raw sewer during trial run. Tentative raw sewage generation & characteristics for designing of the plant are mentioned below. The bidder has to take this own judgment for designing the system			
	Average daily flow (cum/day) : 500 CuM per day			
	pH : 5.5 - 8.5			
	BOD (5 days at 20 degree C) (mg/l) : 150-400			
	COD (mg/l) : 250-600			
	Suspended solids (mg/l): 200-400			
	Oil & grease (mg/l) :20-50			
	The treated effluent characteristics shall be as per local pollution control board standards. The treated effluent (indicative) shall have following standard:-			
	BOD : Less than 10 Mg/l			
	COD : Less than 30 mg/l			
	Suspended solids: Less than 10 mg/l			
	Oil & grease : Less than 10 mg/l			
	pH : 6.5 - 8.0			
	Odor-Odorless			
	On the basis of the above and as per site condition the detailed drawing along with design calculation (Hydraulics, process, Structure etc.) shall be submitted for the approval of the same before the start of the work The STP has to be designed and installed by the approved vendor.All the water retaining structure shall be designed as per provision of IScode for water retaining structure			
B	List of Electro Mechanical			
1	Shop Drawings			

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	The shop drawings & design of STP shall be prepared by the agency, as per site condition / available space most of the unit will be placed below/above ground under road/green area/ as per site condition, equipment and Panel room will be above/below the ground level as per approved drawings.The structural design shall be carried as per provision of IS code. The agency has to get their structural drawing checked and approved by Client. The STP shall be comprising of the following units of required size as per detail process and hydraulic design.	set	1	
2	SS 304 Coarse Screen			
	Suitable size Screen chamber with minimum free board 400 mm and minimum size of 2.0 m x 0.6 m x 0.2 m LD + 0.8 m FB. The Manual Screen shall have Handle for Lifting. The unit shall be designed for peak flow. In addition to Manual Coarse a manual fine Screen shall be provided as stand by.			
	Cost of manual SS 304 Coarse Screen			
	Complete Electrical & mechanical Works screening material excluding civil works.	set	1	
	Make of Screen - Oxybee Solutions / Standard Membrane/ Thermax Ltd./ Ion Exchange India Ltd/ Degrement Ltd.			
3	Raw Sewage pump			
	Supply, installation, testing and commissioning of vertical fully floodable type submersible Raw Sewage pump of non-corrosive material in close coupled design single stage, suitable for handling 20 mm dia solids for transferring raw sewer with float switch for automatic start / stop and pump switchover arrangement with panel and wiring. (The shop drawing of the pumps along with its characteristics curves, model and technical data etc. are to be submitted for approval before purchase of pump).Star delta suitable starter complete in all respect for automatic/manual operation of pump,start and stop push button contactor with required overload protection and single phase preventor.			
	Material of Construction (M.O.C):			
	Corrosion Resistant in general			
	: Casing — Cast Iron			
	Impeller — Ductile cast iron/SS			
	: Bearings — Anti friction, prelubricated ball bearings, packed with grease for life.			
	Motor: — Dry Motor with built in over load protection, Pressure gauge 4"dia			
	Protection - IP68. Insulation Class - F			
	Cost of Raw Sewage Lifting Pump complete with uPVC / SS 304 pipings, sluice valves, non return valves, fittings etc as required. - Complete including Electrical & mechanical Works , excluding civil works			
	(Note 1set means 1 Pump & alied works)			
	Capacity - 30 cum/hr, Head - 12 M, Solid handling -20MM			
	Make of Pumps - KSB, Grundfos , Kirloskar, Willo	set	2	
4	Air Distribution Grid in Equalization Tank			
	RCC 1 no., Suitable size Equalisation tank with hydraulic retention time Min.10 Hrs HRT of STP designing Average flow with free Board 500 mm. The effluent of equalisation tank is agitated with diffused air that is fed by an air blower, including pipe non-corrosive material and its complete system.			
	Equalisation tank - Electrical & mechanical Works	set	1	
5	Air Distribution Grid in MBBR SUPPORTER Tank			
	RCC 2 nos. Suitable size MBBR SUPPORTER Tanks, each having 5 hr hydraulic retention time. Each reactor consist of suitable size with Air grid cPVC/ SS-304 pipe material of construction or corrosion resistant material,Air diffusers (fine bubble).			

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	Cost of Aeration Grid with Air diffuser- Complete System comprising of suitable size of air grid pipe, MOC of pipe- cPVC / SS-304 with fine bubble Air diffusers (tubular type, Rating -5 -6 cfm at normal working condition, MOC diaphragm- Neoprene/silicon) - Complete including Electrical & mechanical Works , excluding civil works.			
	Make of diffuser - Rehau, Techpro , PP Aqua, Thermax, Ion Exchange, Degrement	Lot	1	
6	ROTARY AIR BLOWERS			
	Providing and Installation of Rotary air blowers for air scouring, driven through v-belt or directly coupled through flexible coupling. Motor shall be of suitable HP for 400-440 volts, 1500RPM, 3 phase, along with air filter, non-return valve, safety valve, base plate and necessary air piping fittings, valves, flowmeters etc.			
	(Blower capacity -750 cum/hr at 5000 mm wc shall be provided. It is used for equalisation tank and - (1 working +1 stand by) Blowers shall be fully automatic controlled with PLC			
	ROTARY AIR BLOWERS - Electrical & mechanical Works , excluding civil works	each	2	
	Make- Kay, Everest , Usha , Swam, Akash			
7	Tube Deck Media			
	RCC 1 No. Lamella / Tube Settler maximum Hydraulic loading 1.75 cu.m/sq.m/hr and with approved quality media. (1 units)			
	Electrical & mechanical(1 No.)	Lot	1	
	Civil(1No.)-will be paid separately in civil work			
	Make of diffuser - Oxybee Solutions / Thermax/Ion Exchange			
8	Sludge Recirculation Pumps			
	Providing and installation horizontal single/multistage centrifugal monoblock Sludge Recirculation Pump set with CI body, CI impeller, coupled with totally enclosed fan cooled induction motor mounted on common structural base plate with all pump accessories complete as per specifications inclusive rubber vibration eliminators motor suitable for 415 volts, 1500RPM, 3 phase 50 HZ. A/c supply, complete with CPVC / SS 304 pipings, sluice valves, non return valves, fittings etc as required.			
	Cost of Sludge Recirculation Pump set (Type of pump - Horizontal Centrifugal nonclog mechanical seal, 1500 RPM) Complete with uPVC / HDPE pipings, sluice valves, non return valves, fittings etc as required. - Complete including Electrical & mechanical Works , excluding civil works			
	Capacity - 10 cum/hr, Head- 10 M			
	Solid handling - 7 MM			
	Make of Pumps - Grandfos, KSB , Kirloskar, Willo, Roto	each	2	
9	OxiLyte (Mixed Oxidant) Generation System			
	Providing and fixing of OxiLyte (Mixed Oxidant) Generation System, based on ECA Technology, producing non toxic mixed Oxidant Solution at 1000 ppm of Oxidant Concentration. The solution should be at a pH 3+-0.5 suitable for 24x7 operations should produce 30 litre per hour. The system should be supplied complete with appropriate dosing pumps , valves, piping, fittings, chemical dosing tank etc. complete in all respect.	No.	1.0	
	Make - Oxybee Solutions / Thermax/Ion Exchange			
10	FILTER FEED PUMPSETS			
	Providing and installation horizontal single/multistage centrifugal monoblock pumping set with CI body, CI impeller, coupled with totally enclosed fan cooled induction motor mounted on common structural base plate with all pump accessories complete as per specifications inclusive rubber vibration eliminators motor suitable for 415 volts, 1500RPM, 3 phase 50 HZ. A/c supply, complete with CPVC / SS 304 pipings, sluice valves, non return valves, fittings etc as required.			
	Type of pump - Horizontal single/multistage centrifugal, monoblock			
	Capacity - 25 cum/hr, Head - 35 M	each	2	
	Make of Pumps - Grandfos, KSB , Kirloskar, Willo, Jhonson			

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11	MULTI GRADE FILTER			
	Providing and installation of mild steel pressure vessel (as per IS:2825) 6 mm thick natural rubber lining fabrication standard multi grade filter complete in all respects, with dished ends, supporting legs, manhole cover, frontal pipe work fitting with valves. Filter shall be provided with inlet, outlet pressure gauge, sample cocks, charge of filter media graded sand and internals consisting of strainers fitted on plate for collection.			
	Dia of vessel -1400mm (minimum) & 1.5 m height			
	Shell thickness -6mm (minimum.) Filtration rate - 20,000 lph/sqm (min.) & Dish end thickness-8mm (minimum.)			
	Nozzie plate -10mm thick (minimum.) Manhole -450mm			
	Flow Rate - 25 cum/hr,			
	MULTI GRADE FILTER - Electrical & mechanical Works , excluding civil works	each	1	
	Make - Oxybee Solutions /Thermax/ Ion Exchange/ Degrement.			
12	ACTIVATED CARBON FILTER			
	Providing and installation of mild steel pressure vessel (as per IS:2825) 6 mm thick natural rubber lining fabrication standard multi grade filter complete in all respects, with dished ends, supporting legs, manhole cover, frontal pipe work fitting with valves. ACF shall be provided with inlet, outlet pressure gauge, sample cocks, charge of approved quality activated carbon media. Provision of backwash and recharging of activated carbon etc. complete			
	Dia of vessel -1400mm (minimum) & 1.5 m height			
	Shell thickness -6mm (minimum.) Filtration rate - 20,000 lph/sqm (min.) & Dish end thickness-8mm (minimum.)			
	Nozzie plate -10mm thick (minimum.) Manhole -450mm			
	Flow Rate - 25 cum/hr,			
	ACTIVATED CARBON FILTER - Electrical & mechanical Works, excluding civil works	each	1	
	Make - Oxybee Solutions / Thermax/ Ion Exchange/ Degrement.			
13	Screw type Sludge Feed Pump			
	Providing and installation horizontal Suitable size Screw type Sludge Feed Pump. The sludge of sludge sump is agitated with diffused air that is fed by an air blower including pipe non-corrosive material and its complete system.			
	Cost of Screw type sludge feed pump set with CI body, SS screw and shaft coupled with to a totally enclosed fan cooled induction motor complete with uPVC / HDPE pipings, sluice valves, non return valves, fittings etc as required. Motor suitable for 415 volts, 3 phase 50Hz. A/c supply with control auto start float switch / level controller for automatic operation - Electrical & mechanical Works , excluding civil works			
	Capacity - 2 cum/hr (minimum) Head - 20 m			
	Type of pump - Screw type	each	2	
	Make - Roto Pumps/Thermax/ Ion Exchange/ Degrement./ Kirloskar or equivalent			
14	Filter Press for Sludge Dewatering			
	Providing and fixing 24 plates 600 x 600mm size filter press - 1no. with sludge tank of 1000 ltrs. (min.) capacity alongwith piping, fittings valve etc. complete in all respects.			
	Make - Oxybee Solutions / Kirloskar/ Jhonson/KSB/ Wilo	set	1	
15	Treated Water Transfer Pump Sets			

S.NO	DESCRIPTION	UNIT	QTY	AMOUNT
	Providing and installation horizontal single/multistage centrifugal monoblock pumping set with CI body, CI impeller, coupled with totally enclosed fan cooled induction motor mounted on common structural base plate with all pump accessories complete as per specifications inclusive rubber vibration eliminators motor suitable for 415 volts, 1500RPM, 3 phase 50 HZ. A/c supply, complete with CPVC / SS 304 pipings, sluice valves, non return valves, fittings etc as required.			
	Type of pump - Horizontal single/multistage centrifugal, monoblock			
	Capacity - 25 cum/hr, Head - 35 M			
	Treated Water Transfer Pumps - Electrical & mechanical Works , excluding civil works (A set means 1 Pump with allied work)	set	2	
	Make of Pumps - Grandfos, KSB , Kirloshkar, Willo, Jhonson			
16	Motor Control Panel			
	Providing and fixing dust and vermine proof cubical type motor control panel centre for the various pumps, blower etc. required. It is fabricated from 2mm thick CRCA sheet with stove enamelled finish and comprising of - Panel should have at least 5% spare feeders.			
	Make of Switchgear- L&T, Schneider,Siemens, ABB			
	a. One incoming Main Four Pole MCCB with microprocessor based release having variable current settings of O/L, S/C & inbuilt E/F protection release of required capacity suitable rating. Including Extended rotary operating mechanism with door interlocking with defeat feature and padlock facility. MCCB should have spreader links & phase barriers			
	b. MCCB/MPCB, one for each motor			
	c. Fully automatic DOL / star delta starters suitable for different motors / pumps used in the STP. Upto 7.5 HP DOL may be used and above star/delta starter used with push buttons one for each motor and on/off indicating lamps.			
	d. Single phasing preventors of appropriate rating for each motor. e rotary type selector switch			
	f Panel type Digital ampere meters with one set Suitable C.Ts, one for incoming main and one for each above 7.5 HP motor shall be provided with rotary selector switch to monitor line currents.			
	g Panel type Digital volt meters , on incoming main with rotary selecting switch to monitor voltage between phase to neutral and phase to phase.			
	h R,Y&B phase indicating lamp (LED type) with 6A control SP MCB for incoming main			
	I Rotary switch for manual or auto operation for each pump			
	j Fully taped separate aluminium bus bar of required capacity for normal and emergency supply.			
	k ON, OFF, TRIP Indication (LED type).			
	l The panel shall be pre-wired with coded wiring. All interconnecting wiring from incoming main to switchgear, meters and accessories within the switchboard panel shall have suitable copper ferrules	each	1	
	Make - Oxybee Solutions / As per OEM approved standard			
17	Electrical works			
	Electrical works(including supply, installation and termination of cables of suitable size as per HP of all pumps with all structural supports, clamps and cable trays as per approved design/specifications,installation will be as per relevant Indian standard and CPWD specification alongwith control cable of suitable size).(1 lot). Any other electrical and mechanical item required to complete the work.	set	1	
	Make - Polycab / Finolex /Havells / RR Kabel			
18	Flow Meter			
	Providing and fixing digital type flow meter complete in all respects.	No	1	
	Make - Aster / Kranti			

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19	Interconnecting Piping Providing and fixing all interconnecting piping with all required isolation, control valves for making the system complete functional as per site. All Sewage Piping shall be of uPVC/HDPE pipes. Submerged Air Piping shall be of cPVC pipes. Non-Submerged Air Piping shall be of MS B Class pipes.	set	1	
	Make - Supreme / Astral / Prince (For cPVC and uPVC) Make - Jain / Dutron /Equivalent (For HDPE) Make - TATA / Jindal / Surya			
20	Final painting of plant with colour coding as per PCB norms	Job	1	
21	M.S. Platform with ladder for the STP Plant should be [provided as per proper design and suitability of the plant which should facilitate the operator for the proper maintenance of the plant	Set	1	
	Drawing of STP with sections, plan, hydraulic drawings, single line drawing, P&ID design , calculations etc, required to complete the job shall be provided by the tenderer			
	Details of Civil works : Bar Screen Chamber, Oil & Greece Trap, grit chamber, Equalisation tank, Break water tank, Fludized media reactor, treated water tank, Sludge holding tank, Sludge drawing beds, etc. Shall be provided by the tenderer			
	MBBR BASED SEWAGE TREATMENT PLANT (OP BASED STP) OF 500 KLD (ELECTRO-MECHANICAL) (SUB TOTAL)			0