MATERIALS SPECIFICATION

The material, design, fabrication, and erection of the 60 CMD septage treatment plant shall conform to the manufacturer's specification which are derived from engineering principles, industry experiences, and the aforementioned standards specification.

All materials shall be new, previously unused, and in first class condition. Steel materials of unidentified analysis may be used provided they are tested and properly certified by a qualified testing laboratory.

Bidders must state here either "Comply" or "Not Comply" against each of the specifications stating the corresponding performance parameter of the equipment offered. Statements of "Comply" or "Not Comply" must be supported by evidence in a Bidders Bid and cross-referenced to that evidence. Evidence shall be in the form of manufacturer's un-amended sales literature, unconditional statements of specification and compliance issued by the manufacturer, samples, independent test data etc., as appropriate.

A statement that is not supported by evidence or is subsequently found to be contradicted by the evidence presented will render the Bid under evaluation liable for rejection. A statement either in the Bidders statement of compliance or the supporting evidence that is found to be false either during Bid evaluation, post-qualification or the execution of the Contract may be regarded as fraudulent and render the Bidder or supplier liable for prosecution subject to the provisions of ITB Clause 3.1(a)(ii) and/or GCC Clause 2(a)(11).

The Bidder should provide a Spare Parts Availability certification for the major equipment in the facility.

The bidder shall submit respective Certificates of Origin for all major equipment and should not be made in China.

Item	Specification	Statement of Compliance
A.	**SEPTAGE TREATMENT PLANT (SPTP) PRIMARY REQUIREMENTS**	
1	**Rock Trap System**	
a.	30 liter capacity slim type	
b.	Removable basket	
c.	Quick opening cover via 4 wing out	

d.	4” diameter leading pipe with cam-lock front connect and flange rear connect	
e.	2” diameter tank drain port	
f.	Material: All components SS 304	
2	**Macerator**	
a.	Min. Flow: 80 cubic meters per hour	
b.	Nominal capacity: 40 m3/hr	
c.	Shaft seal: single-acting, NBR O-rings	
d.	Inlet/Outlet Port: Flange DN 150 PN 16	
3	**Package Treatment Unit**	
	Minimum capacity: 30 LPS (108 cubic meters per hour)	
a.	**Trash Removal:**	
	Spiral type: shaft-less	
	Screen mesh: 6mm	
	Mesh type: Perforated	
	Liner: Stainless steel plates	
	Solid removal rate: 1.19 m3/hr	
	Solid removal screw: 1.5 kW	
	Compaction zone: built-in to reduce 40% in volume	
b.	**Grit Extraction**	

	Bottom and inclined screws: 90% removal	
	Solid extraction rate 0.65 m3/hr	
	Extraction screws: 0.55 kW + 1.1 kW	
	Minimum size sand extracted: 200 microns, density of 2.5 kg/dm3	
c.	**FOG extractor:**	
	FOG extraction type: floatation and surface skimming	
	Grease removal rate: 5 l/cycle	
	Grease removal motor: 0.12 kW	
	Air blower: 0.4 kW	
	Surface skimmer mount: stainless cable mounted	
	Chain drive: parallel shaft gear motor	
	Skimmer speed: 10 meters/minute	
	Tank and screen washing with solenoid valve for automated cleaning	
d.	**Construction Materials**	
	SS304L	
	Screen spiral: carbon steel	
	Integrated PLC control panel with circuit breaker and emergency stop button	
4	**Hyperbolic Mixer**	
a.	Gear Drive: 1.11 Kw, 220V, 60Hz, 3P	

b.	Impeller speed: 60 RPM	
c.	Output Torque: 200 Nm	
d.	Shaft: stainless steel 304	
e.	Main Impeller: 500mm diameter glass fiber reinforced plastic (GRP)	
f.	Support Paddles: 12” x 3” SS 316 Stainless Steel	
5	**Sludge Submersible Pump**	
a.	Min Flow: 200L/min	
b.	Max Head: 10 meters	
c.	Casing: Casted steel alloy	
d.	Rotor: Stainless Steel 304 with Hard Chrome Plating	
e.	Seal: Mechanical, carbon-ceramic	
f.	Motor Drive: Inverter motor 1.5 kw, 220 V, 60Hz	
	With guide rail	
6	**Chemical Tank with Mixer** (flocculant and lime or pH adjuster)	
a.	Drive motor: 0.1 Kw 4 pole 3 phase 220V 60 Hz, 1750 RPM IP55, Hallow shaft 90 deg. Configuration, 300 RPM output, reduction ratio: 7	
b.	Paddle: SS 304 shafting with 2 blades at 30 degrees pitch	
c.	PE Tank (Min. 1500-liters capacity for flocculant mixing and min. 200 liters	

	capacity for lime or pH adjuster) with two (2) 1" NPT ports. 1 for drain; 1 for outlet	
d.	Additional unit of PE Tank to serve as day tank or flocculant storage tank with min. 1,500 liters capacity	
7	**Polymer Dosing Pump**	
a.	Capacity: 12 LPM	
b.	Max Pressure: 0.3 Mpa	
c.	Drive Unit: Motor Driven	
d.	Motor rating: 0.2 Kw 4 pole 3 phase 220V 60 Hz	
e.	Inlet/Outlet: 1" diameter flanged	
8	**Flocculator Tank with Mixer**	
a.	Max Flow: 8 m^3/hr	
b.	Material: Stainless steel	
c.	Retention: 8-10 seconds @rated capacity	
d.	Outlet Port: 4" diameter NPT	
9	**Sludge Dewatering Unit**	
a.	Equipment/Model: Screw Press Dewatering Unit	
	a. Sludge Inlet Pipe: 4" diameter	
	b. Overflow Pipe: 2" diameter	
	c. Screw Conveyor: Conical shaft	
	d. Drum nominal diameter: 900 mm wedge wire section	

	e. Screw conveyor diameter: 890mm	
	f. Drum length: 3000 mm	
	g. Screen type: Wire wedge	
	h. Wire wedge mesh: 300 to 400 microns	
	i. Dryness control: pneumatically adjusted via two pneumatic cylinders	
	j. Dewatered sludge dryness: 15-20%	
	k. Internal cleaning system: NBR plate to clean the internal surface of the drum	
	l. Automatic moving external washing system: radial position lateral spray	
	m. Water consumption: 4.5 LPS	
	n. Water pressure: 5.0 Bars	
	o. External wash frequency: 20 seconds/ 20 minutes run	
	p. Internal wash frequency: Before operation and after operation	
	q. Inclination mounting: 15 degrees	
	r. Screw conveyor: micro alloy steel	
	s. Frame, bolts, drums, and all other components excluding screw and gear motor: SS AISI 304	
b.	Effluent to treat: municipal sludge	

c.	Inlet flow rate: 5 cubic meter/hr, 1% solids concentration and >> 3 cubic meter/hr, 3% solids	
d.	Liquid outlet: Diameter 60 mm	
e.	Inspection covers: Bolted	
f.	Power installed: 0.25 Kw, 460V, 60 Hz	
g.	Construction: screw conveyor: high tensile microalloy steel	
10	**Incoming Flow meter:** AC-powered remote version, 50 mm size	
11	**Dewatering flow meter:** AC-powered remote version, 100 mm size	
B.	**SPTP SECONDARY EQUIPMENT**	
1	**Equalization Tank/Transfer Pump**	
a.	Type: non-clog	
b.	Service: submersible	
c.	Min Capacity: 300L/min	
d.	Port: 2" NPT	
e.	Motor: 2.2kw 220V 3 phase	
2	**SBR Blowers**	
a.	Min. Capacity: 90cfm @ pressure 5100mmAq, 60Hz, 3 phase	
b.	With silencer and intake air filter	
c.	With pressure gauge and flexible joint	

3	**Equalization coarse diffusers:** 9” diameter disc type, EPDM membrane, ¾” connection ports	
4	**SBR fine diffusers:** 10” diameter disc type, EPDM membrane, ¾” connection ports (male)	
5	**Decanter pump**	
a.	Type: non-clog	
b.	Service: submersible	
c.	Capacity: 300L/min	
d.	Port: 3” NPT	
e.	Motor: 1.34 kw 220V 3 phase	
6	**WAS Transfer Pump**	
a.	Service: submersible or air lift pump	
b.	Capacity: 150L/min	
c.	Construction: PVC casing with SS304 air line	
7	**Anoxic Tank Mixer**	
a.	Gear Drive: 1.1Kw, 220V, 60Hz, 4 pole, 1Ph	
b.	Impeller speed: 60 RPM	
c.	Output Torque: 200 Nm	
d.	Shaft: stainless steel 304	
e.	Main Impeller: 500mm diameter glass fiber reinforced plastic (GRP)	

f.	Support Paddles: 12” x 3” SS 316 Stainless Steel	
8	**Dewatering Pump**	
a.	Capacity: 5 m3/hr	
b.	Service: submersible	
C.	**SPTP TERTIARY TREATMENT EQUIPMENT**	
1	**Chlorine dioxide generator system**	
a.	Capacity: 50-150 grams/hr	
b.	Operation: On-line oxidant level (ORP) monitoring	
c.	Efficiency: 80-90%	
d.	Generation: 2 precursor system (component A and B)	
e.	Power supply: 220 V 60 Hz	
f.	Operation: On-line oxidant level (ORP) monitoring	
2	**Flow meters**: standard water meter 6” pipe diameter	
3	**Filtration system:** sand filter and activated carbon filters	
4	**Chemical Treatment Tanks**	
a.	5cmh capacity chemical treatment tanks for pH adjustment, coagulation, flocculation and clarification	
b.	Polycarbonate corrugated sheet settlers	

c.	Epoxy coated 4mm MS Plate with square tubulars external supports	
5	**pH Adjustment Tank Agitator**	
	Drive motor: 0.47 Kw 4 pole 3 phase 220V 60 Hz, 1750 RPM IP55 100rpm Hallow shaft Gearmotor; SS shaft and agitator blades	
6	**pH Adjuster Dosing Pump**	
	7.8 L/hr, 0.31 ml/shot, 0.2Mpa pump meter	
7	**Coagulation Tank Agitator**	
	Drive motor: 0.47 Kw 4 pole 3 phase 220V 60 Hz, 1750 RPM IP55, Hallow shaft 90 deg. Configuration, 60 RPM output, reduction ratio: 7	
8	**Coagulant Dosing Pump**	
	7.8L/hr, 0.31/mL/shot, 0.2Mpa pump meter	
9	**Flocculation Tank Agitator**	
	0.47 Kw 4 pole 3 phase 220V 60 Hz, 1750 RPM IP55 60rpm Hallow shaft Gear motor; SS shaft and agitator blades	
10	**Flocculant Dosing Pump**	
	7.8L/hr, 0.31/mL/shot, 0.2Mpa pump meter	
11	**Chemical mixers for chemical preparation (for pH adjuster, coagulant, and flocculant)**	
	Drive motor: 0.47 Kw 4 pole 3 phase 220V 60 Hz, 1750 RPM IP55, Hallow shaft 90 deg. Configuration, reduction ratio: 7	
12	**Chemical tanks for chemical preparation (for pH adjuster, coagulant, and flocculant)**	

	Min. 0.20 cubic meter capacity (200 liters) PE tank with two (2) 1" NPT ports, 1 for drain, 1 for outlet	
13	**Decant Water Pump**	
	200L/min, 8M flow rate, 0.75kW, 220V 60Hz	
14	**Filter Feed Pump**	
	500L/min, 11M flow rate, 2.2kW, 220V 60Hz	
15	**Chlorine Dosing Pump**	
	Capacity: 7.2 L/hr	
D.	**SPTP SUPPORT SYSTEMS**	
1	**Water tanks:** 2 units of 10 cubic meter capacity PE tank	
2	**Booster pumps:** Capacity of 5 cubic meter/hr	
3	**Pressure Regulating Tank:** 2 units 82gal capacity SS material	
4	**Clarifier drain pump and drying bed pit pump:** 0.75kw, 3ph; 220V 60 Hz	
E.	**CIVIL WORKS**	
1.	**Primary, Secondary and Tertiary area, SBR, Holding Tank, Chemical Tanks**	
2	**Piping (mechanical works) process, recycle, potable water lines**	
a.	Inlet connections – camlock type Aluminum construction. Coupled to SS304 pipe via threaded connection with end flange connections.	

b.	Pipelines – for raw septage and screened septage, all are conveyed through PVC Gray Pipe Sch. 80. Joints are cement-bonded and connections for 8" diameter and 4" diameter pipe to isolation valves and to related equipment area flange connected. Smaller 2" diameter pipes for sludge dewatering unit in-feed, over flow and tank transfer lines are PVC Gray Pipe Schedule 80. Treated water lines for recycling and to be used for washings at the process equipment will be 1" diameter PVC Gray Schedule 80. Potable water and recycled water lines for washing are on ¾" diameter PVC Blue Schedule 40.	
c.	Compressed air pipeline – is multi-materials. Header line going to distribution line is mild steel. Downpipe from distribution line going to the air diffuser loop is stainless steel 304. The diffuser loop is 4" diameter PVC Gray Pipe Schedule 80. Air diffuser is High Density Polyethylene constructed with EPDM membrane.	
d.	Isolation valves – for the raw septage section is a full bore ball valve type secured in place via flanged connections. This eliminates clogging. Valves for the screened septage section is of butterfly type also in flanged connection. Smaller 2" diameter pipe utilizes true-union ball valves to allow disassembly during maintenance.	
e.	Brackets, hangers, and supports – fully submerged and wetted areas will be stainless steel 34 anchored using stainless steel 316 anchor bolts. Not wetted area will be epoxy coated mild steel materials.	
f.	Chutes for screenings, grit, and sludge cake are constructed from stainless steel 304 fabricated in accordance with correct positioning. Final surface finish is hairline like.	
g.	Hydro test for pressure lines and leak test for non-pressurized lines.	

h.	Vibration test during dry run and add additional support/brackets when necessary.	
3	**Electrical Controls at Primary and Secondary Treatment and Automation at SBR**	
	*Control panels (primary, secondary, remote, MCB, lightings, CO)	
a.	Fabrication, supply and installation of main control panel. The control panel cabinet material is powder coated steel for durability. The cabinet is accessible via two-weather tight door split opening. Control knobs and light indicators on one door and monitoring/ controller displays are mounted on the other. Wirings are color-coded, two (2) colors for single phase control power and three (3) colors for three phase load lines.	
b.	Fabrication, supply, and installation of remote control panel. The control panel cabinet material is stainless steel 304 with weather tight single door.	
c.	Fabrication of lay-outing and mounting powder-coated cable tray. Connections of rigid conduit from cable tray to each motor location. Connection of flexible conduit from the end of rigid conduit connected via cable glands for the submersible pump connections.	
d.	Lay-outing and wiring from MCP to remote control.	
e.	Lay-outing and wiring from MCP to each motor.	
f.	Lay-outing and wiring liquid level controls, limit switch, pressure switch, reversing switch, sensor, etc.	
g.	Lay-outing and wiring from lighting and C.O.	

h.	Terminating and commissioning of all loads.	
i.	Insulation testing of each wiring.	
j.	Testing and dry running of each motor loads.	
4	**Civil engineering designs:** provide designs for the construction of the control room, power/genset room, chemical storage room, laboratory room, potable and non-potable water area, scum trap, and drying bed	
5	**Construction of laboratory room, control and automation room, blower/genset room, and chemical storage room, administrative building, sludge drying area**	
F.	**OTHERS**	
1	**Temporary Facilities** (Office, electrical, water, etc.)	
2	**Operations Manual/Training for Staff**	
3	**Detailed engineering design:** 3 months engineering design phase and as-built drawings	
4	**Process proving and commissioning:** 1 month commissioning and 1 month process proving	
5	**Generator:** Supply, Delivery, Installation, Commissioning of Generator Set : 165 KVA standby duty, 3 phase, 60 hz, 1800 rpm @ 80 % power factor	
6	**Permits (only if applicable):** ECC, ESC, Building Permit, Discharge Permit, DENR Permit to Operate for GenSet	
7	**Supply and delivery of laboratory equipment and nutrient test kits for in-house testing of effluent**	

8	**Office furniture, fixtures and other materials:** limited to basic office tables and chairs together with the provision of three (3) air-conditioning units for the office, laboratory, and control panel room.	

**the equipment and corresponding specifications indicated above are minimum requirements and may be modified, or replaced, with justifications included in the bid documents. The final equipment and specifications proposed in the bid will still be subject to the evaluation of the bids and awards committee (BAC).*

This is to certify that we/I have checked and reviewed the Contract, Scope of Work submitted with this Bid. This is to certify further that this is a complete, unaltered and faithful reproduction of Section VI. Technical Specifications as published for this bidding in accordance with ITB Sections 19.1 and 19.2

Very truly yours,

_____

Authorized Representative

Signature Over Printed Name

_____

Position Title

Name of Firm: _____

Address: _____

Date Accomplished: _____