

## Annexe 1 – list of specification for the bidders

### 1. General notes

- Given different factors: space availability, power constraints, existing equipment constraints, etc. It is preferable to request a mandatory site visit from the bidders
- Request the submission of plans for the upgrades installation. Plans should accompany specifications and BOQs of all equipment, plumbing, electrical and accessories related to the installation of upgrades.
- Bidders must provide clear and detailed operation and maintenance manuals of installed equipment.
- Revise the power availability and maximum load available during day hours and share with bidders.

### 2. Existing equipment

The table below includes a summary of the existing equipment with its specifications as per the manual shared by Tidetechnocrates for the bidders to take into consideration while designing a solution and selecting the equipment:

Existing equipment	Specifications
Septage screening unit	8mm & 16mm inclined bar screen, Carbon steel with galvanized coating.
Sludge pump	Submersible pump, max flow rate-10,000 LPH up to 4% solids, float sensor with auto cut off. Single phase 1.3 KW.
Holding Tank	Underground concrete tank, 40 m3 storage volume.
Flocculent Dosing system	Continuous duty dosing system, up to 200 LPH. Three phase 1.1 KW.
Dewatering unit	Screw press with a capacity of 2000 LPH 50 to 70kgDS/hr, Screw-1 Nos, Screw speed: 3- 5rpm Three phase 1.8 KW.
Sludge dryer	Low temperature sludge dryer, Moisture removal rate: 50kg/h. Three phase 20 KW.
Liquid treatment (MBBR)	Blowers: Power-1.1kW, 3ph, Capacity-25cum/hr, pressure0.4Kg/cm2, Aeration: Sparger pipe with 3mm holes.  Media: Surface area-580sqm/cum, Sp.gr-1.01g/cm2 MOC- Thermosetting resin,

	<p>Aeration zone and liquid settling zone, Retention time 1.5 days. Three phase 1.1 KW.                  Design load:                  - COD: 500 mg/L                  - BOD: 250 mg/L                  - TSS: 400 mg/L                  - pH: 6.5 – 8.5</p>
Liquid treatment	<p>PSF &amp; ACF: Capacity-4000LPH, Operating pressure- 1.5kg/cm<sup>2</sup>, Filter Sand (silex), 900iv Coconut shell-based carbon, NB25 MPV</p> <p>UV disinfection: Capacity: 4000LPH, Number of lamps-4, Power-514W, 220- 240V / 50 60Hz, MOC-Stainless Steel 316L</p>

### 3. Specifications for upgrades

The content below includes minimum requirements for the additions proposed upgrades. The bidders should comply with the below specs or equivalent.

#### 3.1 Dissolved air flotation:

High Efficiency Dissolved air flotation		
Type	horizontal-flow and combined type, high efficiency flotation solid - liquid separation equipment	
Operating condition	Working environment: indoor / outdoor For inlet wastewater: pH 4~10, flow ≤ 5T/H, temperature ≤ 45°C	
Item	Design	Remark
Design capacity	5 T/hour	
Components	Specifications	Remark
Tank material of construction	Q235A Carbon steel, corrosion proof, sealcoat asphalt-base from inside resistant to high TDS (>10000 ppm), Epoxy coat from outside.	Metal sheet thickness minimum 6 mm. Internal sealcoat minimum thickness 300 µm. Outside epoxy coat minimum thickness 150 µm Factory acceptance test done by TUV SGS or TOV
Reinforcement	Bending press forming, no dead angle on plate surface	
Sludge hopper material of construction	Q235A Carbon steel, corrosion proof, sealcoat asphalt-base from inside resistant to high TDS (>25000 ppm),	Metal sheet thickness minimum 6 mm. Internal sealcoat minimum thickness 300 µm.
Chemical Reaction tanks		

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Material of construction	Q235A Carbon steel, corrosion proof, sealcoat asphalt-base from inside resistant to high TDS (>10000 ppm), Epoxy coat from outside.	Metal sheet thickness minimum 6 mm. Internal sealcoat minimum thickness 300 µm. Outside epoxy coat minimum thickness 150 µm
Retention time	~ 3 minutes	
Quantity	2 integrated tanks	For coagulation & flocculation processes
Air dissolving unit		
Dissolved air tank	Q235A carbon steel	Metal sheet thickness minimum 8 mm
Water level switch	SS304	
Pressure gauge	Measuring range 0~1.0 MPa	Liquid filled, 2 Pcs, SS304
Safety valve	SS304	
Air inlet solenoid valve	SS304	
Air compressor		
Pneumatic Panel	Including moisture and oil removal filters	
Type	Piston type	
Reflux pump		
Head	40 m	minimum
MOC	SS304	
Dissolved air/water pipe MOC	UPVC	
Diffusers	UPVC	
Water pipes	UPVC	Or Q235A corrosion proof, Outside epoxy coat Minimum thickness 150 µm.
Scum scraper		
Type	Chain plate	
Chains & sprockets MOC	SS304 + Polyamide	SS304 rollers
Main shaft and bracket	Q235A	sealcoat Minimum thickness 300 µm.
Scraper blade	SS304 + black rubber	
Driving mode	Direct start-up	
Rotation speed	7 RPM	
Water discharge		
Adjustable weir	Material of construction 304	Mechanical adjustment
Connections		
Wastewater inlet	Minimum DN65 CS corrosion proof Flange	Epoxy coat Minimum thickness 150 µm.
Scum discharge	Minimum DN65 CS corrosion proof flange	Epoxy coat Minimum thickness 150 µm.
Bottom sludge discharge	Minimum DN65 CS corrosion proof flange	Epoxy coat minimum thickness 150 µm.
Clarified water discharge	Minimum DN65 CS corrosion proof flange	Epoxy coat minimum thickness 150 µm.

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Accessories		
Automatic sprinkling system	High pressure sprinkler	Automatic cleaning of the scum collection tank
Control system		
Electrical components	Schneider electric, ABB, or Siemens	
Signal exchange	Automatic Stop/Run of the unit with external signal exchange for chemical dosing,	Delayed stop controlled with timer.
Control cabinet	SS304, IP55 and cover protection	
Corrosion protection instructions		
<ul style="list-style-type: none"> <li>- The supplied equipment carbon steel Q235A outer hull and the structural components should guarantee a smooth surface, with shot peening, and the rust removal should be in accordance with the level Sa2.5 specified by GB8923-88 "Rusting grade and de-rusting grade of the steels surface before paint coating".</li> <li>- One coat of internal epoxy zinc-rich primer, film thickness 50 <math>\mu</math> m, one coat 846-1(Silver-yellow) 125 <math>\mu</math> m, one coat 846-2(black) 125 <math>\mu</math> m.</li> <li>- One coat of external spraying epoxy zinc-rich primer, film thickness 50<math>\mu</math>m; One coat of epoxy intermediate paint (Sigma Cover 410), film thickness 50<math>\mu</math>m. One coat of polyurethane finish (SigmaDur 188), film thickness 50<math>\mu</math>m, total film thickness 150<math>\mu</math>m.</li> <li>- Paint Brand: SIGMA COATINGS or equivalent</li> <li>- Spraying method: high-pressure airless spraying, oil free</li> <li>- Epoxy Color: Cream RAL1013 (can be customized)</li> <li>- Stainless steel parts: Pickling &amp; Passivation.</li> </ul>		

### 3.2 Automatic Polymer preparation system:

Capacity		500L/hour matured polyelectrolyte
#	Item	
1	Material of Construction	SS304
2	Bending press forming, no dead angle on plate surface, sheet thickness	3 mm
3	Water flow control	Rotameter
4	Delivery capacity [L/hour]	500
5	Number of mixing tanks	3
6	Mixing paddles type	Propeller
7	Minimum Maturation time on full delivery capacity [min]	30
8	Solution Concentration / dosing ratio / Adjustable by VFD	0.1%~0.25%
9	Motors protection	IP55
10	Control cabinet (components Schneider Electric)	MOC SS304, dry run protection, Signal exchange automatic run/stop, dosing pumps, fault signal.

### 3.3 Coagulant preparation system: Batching type

1	Material of Construction	HDPE + SS304
2	Water inlet	DN20 Minimum
3	Delivery port	DN20 Minimum
4	Drainage	DN20 Minimum
5	Dosing pumps	Metering diaphragm pump (1+1)
6	Solution preparation time	~ 30
7	Motors protection	IP55
8	Control cabinet	s control with signal exchange

### 3.4 Alkaline solutions preparation system: Batching type

1	Material of Construction	HDPE + SS304
2	Water inlet	DN20 Minimum
3	Delivery port	DN20 Minimum
4	Drainage	DN20 Minimum
5	Dosing pumps	Metering diaphragm pump (1+1)
6	Solution preparation time	~ 30
7	Motors protection	IP55
8	Control cabinet	s control with signal exchange
9	pH regulation controller	

### 3.5 Inline static mixer for the coagulation:

1	Capacity	Up to 2500 LPH
2	Material of construction	UPVC

