

Vasai Virar City Municipal Corporation

**(V.V.C.M.C Head Office) Opp. Virar Police Station, Bazaar ward, Virar East,
Maharashtra 401305**

Quotation Notice

Name of Project :- “Underground Sewerage System For Zone-3 of Nallasopara (E) Area In VVCMC ”.

Notice No: VVCMC/2023/

We are hereby issuing this Notice inviting quotation from developers, contractors, vendors & suppliers for various works proposed under “**Underground Sewerage System for Zone-3 of Nallasopara (E) Area in VVCMC**”.

You are therefore requested to submit the budgetary rates for below mentioned works at cevvcmc@gmail.com

Sr. No	Item Description	Unit	Qty	Item Rate (Rs.)	Amount (Rs)
1)	Process Design and Detail Engineering of STP with advance technology & effluent discharge parameter as per the NGT norms for the proposed Sewage Treatment Plant with all duties and taxes, etc. complete accessories and offer Extended warranty for 15 yrs. The Inlet Influent for the STP shall be the domestic sewage. The Treated water shall be utilised for non-domestic purpose like Gardens, flushing and Industrial process.				
a)	STP-3	MLD	103		
2)	Civil Works: Design (including Hydraulic design, STP unit sizing & RCC design) & Construction of STP including the cost of RCC Foundation, Structural & Civil Works of all the units like of inlet chamber, screen Channel, De-greasing unit, Grit separator unit, Equalisation tanks, aeration tanks, pre anoxic and post anoxic tank, sludge sump and pump house, Screw pump based sludge thickener, permeate tank, chlorine contact tank, Multi oxidant based chlorinator room, Sludge Holding Tank, , Chemical Storage Room, DG room, Staff Quarters, MCC & PLC Room, Administrative building cum laboratory, laboratory equipment's, tools and plants, spare parts,				

Sr. No	Item Description	Unit	Qty	Item Rate (Rs.)	Amount (Rs)
	Internal Roads, Compound Wall Storm water drains, pathways, Security room, Parking Space ,Landscaping etc. complete as turnkey job.				
a)	STP-3	MLD	103		
3)	Electro-Mechanical works:- The rates shall include all Mechanical units like Manual & Mechanical Coarse & Fine Screens, Blowers, Vortex Grit Unit, dewatering screw press , Multi oxidant based chlorinators, EOT Crane beams, guide rail and necessary piping work with required valves, gates etc., Electrical units like MCC & PCC panels, cables, HVAC /AC system, DG set, Internal Lightning, & Instrumentations items like PLC SCADA, Field Instruments, Analysers COD BOD TSS pH, Real Time Monitoring of Alkalinity, Aluminium, Boron, Cadmium, Calcium, Chloride, Chromium, Copper, Cyanide, Fluoride, Hardness, Iron, Magnesium, Manganese, Phenol, Silver, sulphate and Zinc Analyser at Treatment Outlet, Data Connectivity to CPCB/SPCB Server for STP Outlet etc. complete as turnkey job tanks and Extended warranty for 10 yrs. of Operations.				
a)	STP-3	MLD	103		
4)	Installation, Commissioning and Trial run The rate shall include Erection of all the Electro-Mechanical Units, successfully Commissioning giving satisfactory Trail run of Sewage Treatment Plant for 1 year (Capacity – 103 mld)				
a)	STP-3	JOB	1		
5)	Comprehensive Operation & maintenance cost for STP :				
i)	It shall include the cost of manpower, consumables, and spares required (excluding power consumption cost) for the O & M of the plant.	Per MLD/ year	103		
ii)	It shall include the specific power consumption cost required during the O & M of the plant. (Considering Power cost per unit Rs./kwh –Rs.7/-)	KWH/ year	103		
6)	Ultraviolet (UV) Disinfection: - The treated sewage from STP shall be supplied for Disinfection with UV. O & M cost/KL shall be given separately. The Rates shall include Design, Supply, Installation, Testing, Commissioning, civil and structural requirements and storage tanks and Extended warranty for 15 yrs. of Operations. Warrantee shall also include the specific power consumption and consumables for the O & M of the plant. The UV MOC shall be suitable for minimum 15 years of full				

Sr. No	Item Description	Unit	Qty	Item Rate (Rs.)	Amount (Rs)
	replacement warrantee.				
	STP-3	MLD	103		
Electro-Mechanical Equipment					
7	<p>Providing, Installing, Testing, Commissioning of non-clog Submersible Sewerage Pumps, as specified below.</p> <p>Detail Technical specification are mentioned in Annexure -1</p> <p>Capacity in MLD & Pump Head in mWC- in mtr. As specified below in, i) SPS to STP Primary Unit & ii) Recycle</p> <p>Duty conditions of the pumps are specified in following table.</p> <p>Efficiency of the pumps % Required Motor rating HP- Solid Handling size – 100mm Sp Gravity – 1.05 MOC Casing – CI EN-GJL 250 suitable for 4 to 10 pH Impeller – Shall be of Single, Multi vanes or S-TUBE type CI EN-GJL 250 Shaft - SS 329 ; MOTOR Casing - CI EN-GJL 250 Motor Parts – CI IS 210 Gr. FG 220 Fasteners – BHT Steel Guide Pipe –SS 304 Lifting Chain – SS 304 Mech. Seal – Mechanical Seal shall be of SIC vs SIC for Primary & SIC vs Carbon for Secondary, 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. 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>				
i)	SPS to STP Primary Unit				

Sr. No	Item Description	Unit	Qty	Item Rate (Rs.)	Amount (Rs)
a	Flow : 249.91 MLD, Flow for each Pump:- 10412.85m3/hr Head :- 22 m, HP: 1635 , Voltage Rating : 3.3kv	Nos	1W		
b	Flow : 103.36 MLD, Flow for each Pump:- 4306.56 m3/hr Head :- 22 m, HP: 680 , Voltage Rating : 3.3kv	Nos	1W + 1S		
c	Flow : 73.07 MLD, Flow for each Pump:- 3044.58 m3/hr Head :- 22 m, HP: 480 , Voltage Rating : 3.3kv	Nos	1W + 1S		
ii)	Recycle				
	Flow : 20.67 MLD, Flow for each Pump:- 861.25 m3/hr Head :- 40 m, HP: 205 , Voltage Rating : 3.3kv	Nos	1W + 1S		
8	DISMANTLING JOINT Providing, erecting and commissioning M.S. Dismantling joint as per requirement and Department's approved drawing and specifications, including machining and rubber rings and suitable for 16 kg/cm2 working pressure with required flanges of suitable size with nut bolts etc complete. The joint should have through long bolts so that during normal working pressure there should be no sliding movement of sliding flanges. L.O.F. (length over flange) should not be less than 75% of dia.				
i)	800 mm	Nos	1		
ii)	1000 mm	Nos	1		
iii)	1100 mm	Nos	1		
iv)	1200 mm	Nos	1		
v)	1400 mm	Nos	1		
vi)	1500 mm	Nos	1		
vii)	1600 mm	Nos	1		
viii)	1700 mm	Nos	1		
ix)	1800 mm	Nos	1		
9	VALVE ACTUATOR Providing, erecting Electric Valve Actuator for non-rising spindle type sluice valve of PN 1 & PN 1.6 rating, totally enclosed, weather-proof and dust proof construction with IP-68, protection class suitable for installation in any position without lubrication, leakage or other operational difficulty with special grease filled gear box and hand wheel for emergency manual operation which will automatically dis-engage on restoration of power to motor and with 10 watt				

Sr. No	Item Description	Unit	Qty	Item Rate (Rs.)	Amount (Rs)
	three phase space heater and continuous local mechanical position indicator and individually replaceable counter gear assembly and with two torque and four limit switches with S.S. flap and operated with gear driven cams and of rating 250 Volt, 5 Amp, AC/DC, torque switch dial and with TEFC squirrel cage induction Electric Valve actuator for non-rising spindle type Sluice valve,PN1/PN1.6 rating.				
i)	1200 mm	Nos	1		
ii)	1300 mm	Nos	1		
iii)	1400 mm	Nos	1		
iv)	1500 mm	Nos	1		
v)	1600 mm	Nos	1		
vi)	1700 mm	Nos	1		
vii)	1800 mm	Nos	1		
10	Electromagnetic Flow Meter Supply, install and commission Electromagnetic Flow Meter (EMF) As Per ISO 4064, for Raw/Pure water with accuracy +/- 0.5% of measured value & protection as per given specifications for size 100 mm- 1000mm including sensor, transmitter surge arrestor, cable GI duct if suitable size for 25 mtr built in GSM/GPRS (with Sim card and its charges, valid for 36 months) including the pipe cutting, levelling and installation of flow meter in the pipelines with necessary tool tackles, cranes including 36 months guarantee etc complete, as may be required at site & based on technical specifications including comprehensive maintenance for two years after the Guarantee period is over.				
i)	1700 mm	Nos	1		
11	SLUICE GATE Providing, erecting & commissioning of Gate Assy FG A102 Cast Iron Wall Thimble Mounted Sluice Gate generally as per IS 13349 Standard; Size as below, Suitable for seating as well as unseating type water head (from centre line of gate opening), CL-PL distance, Electrically Operated, Upward Opening, Rising spindle, Flush bottom closure arrangement, Open top type non-self-contained frame gate. Detail Technical specification are mentioned in Annexure -2				
i)	2500 (w) mm x 1600(h) mm	Nos	1		
12	SLUICE VALVE Providing double flange sluice valve confirming for IS- 14846				

Sr. No	Item Description	Unit	Qty	Item Rate (Rs.)	Amount (Rs)
	including worn gear arrangements as per test pressure, stainless steel spindle, caps, including inspection charges, transportation up to departmental store, unloading, stacking excluding GST levied by GOI & GOM in all respect etc. complete. PN - 1.6 (With bypass arrangement)				
i)	1200 mm	Nos	1		
ii)	1300 mm	Nos	1		
iii)	1400 mm	Nos	1		
iv)	1500 mm	Nos	1		
v)	1600 mm	Nos	1		
vi)	1700 mm	Nos	1		
vii)	1800 mm	Nos	1		
13	NON RETURN VALVE Providing and supplying ISI mark CI D/F reflux valves (non-return valves) of following dia including railway freight, inspection charges, unloading from railway wagon, loading into truck, transportation upto site, unloading, stacking excluding GST levied by GOI & GOM in all respect etc. complete. Reflux valves as per I.S.5312 Part I (1984) PN Rating 1.6 With By Pass Filter				
i)	1200 mm	Nos	1		
ii)	1300 mm	Nos	1		
iii)	1400 mm	Nos	1		
iv)	1500 mm	Nos	1		
v)	1600 mm	Nos	1		
vi)	1700 mm	Nos	1		
vii)	1800 mm	Nos	1		
14	MULTI RAKE MECHANICAL COARSE BAR SCREEN 'Providing, erecting & commissioning of Multi-rake Mechanical Coarse bar Screens: Technical Specifications as per Annexure 3 Given Below				
i)	Channel width: 2700 mm, Channel depth: 8000 mm SWD: 1300 mm, bar spacing: 20 mm	Nos	1		
15	MANUAL COARSE BAR SCREEEN 'Providing, erecting & commissioning of Screen Assy FG MS Fixed type manual coarse bar screen, suitable for channel dimensions:, Bar size:10X50 mm flat bars, Angle of inclination:				

Sr. No	Item Description	Unit	Qty	Item Rate (Rs.)	Amount (Rs)
	75 deg. To horizontal, MOC: SS 316L. (Including one no. rake comb				
i)	Channel width: 2700 mm, channel depth: 1750 mm, SWD: 1250 mm, bar spacing: 20 mm	Nos	1		
16	BELT CONVEYOR SYSTEM 'Providing, erecting & commissioning of Belt Conveyor & Geared Motor for Belt Conveyor Conveyor System with all allied accessories & discharge chute: Technical Specifications as per Annexure 4 Given Below				
i)	Belt Conveyor of Size 600mm wide x 6.0 m long	Nos	1		
17	VFD/ SOFT STARTER Designing, Providing, erecting & commissioning of VFD/ SOFT STARTER as per following requirement s for the below listed HPs of pumps Application Note: 1. Motor efficiency & power factor are estimated as 95.6% & 0.85 respectively. Transformer Enclosure Location: Integral to VFD Power to Motor / Motor Rated Amps: Application Rated Overload / Duration: 1.1 per unit of Motor Rated Amps / 60 Seconds Input Voltage / Frequency: 3300 V / 50 Hz Output Voltage: 3300 V Required Inverter KVA: @ 50 deg C Selected Inverter KVA: @ 40 deg C & KVA @ 50 deg C Full Load Inverter Amps of selected Inverter: Continuous Amps at site and room ambient conditions and altitude, amperes at 1000 met, 40C Drive inherent OL/duration above declared rating: 125% for 60 Seconds				

Sr. No	Item Description	Unit	Qty	Item Rate (Rs.)	Amount (Rs)
	<p>Application: Variable Torque Load</p> <p>Estimated Dimensions:</p> <p>Estimated Weight:</p> <p>Heat Loss to Equipment Room: in Kw</p> <p>Drive I/p PF @100% Load: ~0.95</p> <p>Bypass Contractor: As per suitable rating</p> <p>Typical Drive Eff. With Trafo @100%: ~95% (Transformer + Inverter) @ 100% Motor load and 100% frequency subject to IEC tolerance tested in loop back configuration at vendor, works by calculation method</p> <p>Conversion Configuration, Control: Phase-Shifted diode converter providing full IEEE 519 compliance, vector control multi-level inverter, included drive isolation transformer</p> <p>Surge Arrestors [required]: Customer to supply, External to VFD</p> <p>Required Transformer KVA: @ 50 deg C</p> <p>Included Drive Isolation Transformer: 3300 V ac Primary, rated Kva @ 50°C, 3 Phase, 50 Hz, Aluminium-wound, air cooled, 220°C insulation rating, thermal temperature detector switches in each Phase</p> <p>Construction: Self-standing Steel Plate</p> <p>Maintenance Access Needed: 3 Kv class, 4 Kv class and 6 Kv class: Front maintenance 10 Kv class and 11 Kv class: Front & rear maintenance</p>				
i)	1680 HP	Nos	1		
ii)	680 HP	Nos	1		
iii)	480 HP	Nos	1		
iv)	1260 HP	Nos	1		
v)	525 HP	Nos	1		
vi)	370 HP	Nos	1		
vii)	205 HP	Nos	1		

Sr. No	Item Description	Unit	Qty	Item Rate (Rs.)	Amount (Rs)
18	<p>TRANSFORMER (22000 / 3300 Volt)</p> <p>Power Transformer (With On Load Tap Changer)</p> <p>Providing, erecting and commissioning out door type copper wound transformer as per IS 1180 (Part I) : 2014 Level II continuously rated for 3 Ph, 50 Hz, at full load and temp. rise not exceeding 45° C by thermometer in oil and 50°C by the resistance in winding after continuous run resistance in winding after continuous run at full load rating, the transformer should have oil immersed winding having vector group DY 11, HT side connected in Delta and LT side connected in Star with neutral brought out connected to provided separate earthing. The transformer shall have power terminal arrangement, bushings / cable end box on HT side and cable end box on LT side. 2 Nos. channels with stoppers shall be provided and fixed on the provided plinth for mounting the transformer. The transformer should have following standard fittings. Transformer shall be of latest manufacturing standards as per amended IS specifications and the Load & No Load losses shall be as per IS.</p> <ol style="list-style-type: none"> 1) Oil conservator with filling hole with cap and plain oil level gauge. 2) Silica gel dehydrating breather charged with Silica Gel. 3) Oil drain valve. 4) Oil filter valve. 5) Lifting eyes / hooks. 6) Two earthing terminals. 7) Diagram and rating plate. 8) Air Vent. 9) Explosion Vent. 10) 100 mm dia thermometer with thermometer pocket 11) Four bi directional plain roller. 				

Sr. No	Item Description	Unit	Qty	Item Rate (Rs.)	Amount (Rs)
	12) Bucholtz relay. 13) Resistance Temp. detector. 14) Marshalling box. 15) Automatic Voltage Regulator (AVR). 16) Remote Tap Changing Controller (RTCC). With On Load Tap Changer - 15% to +5% in steps of 1.25% with RTCC, AVR and marshalling box				
i)	3200 KVA	Nos	1		
ii)	4000 KVA	Nos	1		
iii)	5000 KVA	Nos	1		
iv)	6000 KVA	Nos	1		
v)	8000 KVA	Nos	1		

Annexure 1

GENERAL SPECIFICATIONS FOR SUBMERSIBLE SEWERAGE/RECYCLE WATER PUMP

Type of Pumps

Submersible pumps shall be of the totally submersible centrifugal or mixed flow type capable of operating head as per site condition of water. The pumping unit shall be suitable for continuous operation, designed to meet the desired performance and capable of handling the pumped medium undue wear and tear

1. Machinery Directive (2006/42/EC). Standard used: EN 809: 1998 + A1: 2009.
2. EMC Directive (2014/30/EU)
3. ATEX Directive (2014/34/EU)
4. Standard of enclosure class (IP) (IEC 60529).
5. Referenced vibration standards: ISO5199:2002 and ISO10816
6. DIN flange standard (EN-1092-2): Pressure stage PN 10
7. The pumps shall be fitted with flanges according to EN 1092-2.
8. For pumps that are to be suitable for wet-pit & dry-pit installation: The pumps shall be equipped with cooling system with pumped media only.
9. Bearings shall be greased for life and designed for an L10 life time with a minimum of 60,000 service hours at the best efficiency point (BEP).
10. Painting and surface preparation: All cast iron parts shall be treated with cathodolysis and powder coating with a layer thickness of minimum 150 microns.
11. All pumps shall be capable of starting minimum 20 times per hour no matter installation method.

DESIGN & PERFORMANCE CONDITION

- A. The pumps shall be designed and constructed to operate in a media temperature of maximum 40°C (104°F) and in the operating conditions they are designed for.
- B. The pumps shall be designed for a life of 60,000 operating hours given the recommended service intervals stated by the pump manufacturer.
- C. Pumps vibration levels shall refer to the principals stated in the ISO 5199:2002 and ISO 10816-7:2009
- D. The pump(s) shall be tested in test facilities standardized according to ISO 9906:2012 Grade 3B with regularly calibrated instruments. Based upon selected test grades according to above standards, the manufacturer shall guarantee the following parameters:
 - Flow rate
 - Total head
 - Power input
 - Efficiency.

Motor

The motor shall be direct coupled to its pump and rated for continuous full load operation above or under water.

The insulation rating of the motor shall be Class F. The motor shall have degree of protection IP 68.

The pump motor shall be an induction type, NEMA B design with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. Oil filled motors shall not be considered acceptable or equal. The motor shall be NEMA-Design B. The stator windings and stator leads shall be insulated with moisture resistant Class F insulation rated for 155°C.

Motor operating voltage – 3300 V

- A. The pump motor shall be suitable for soft starter/ VFD
- B. Motor shall be capable of starting and accelerating the load with the applicable method of starting without exceeding the acceptable winding temperatures, when the supply voltage is in the range of 10% above of the rated motor voltage.
- C. The motor shall be compliant with the highest motor efficiency standard available in the market i.e. the IE3 classification with fulfilment of insulation class F (155 OC), temperature rise class B (600C/140°F).
- D. The motor shall be water tight, totally encapsulated motor meeting enclosure class IP68 (IEC 60529).
- E. To minimize vibrations and the load on bearings and shaft seal faces the motor shaft shall be short and designed with a stainless-steel conical shaft end.
- F. The motors shall be provided with proprietary monitoring and control units for inclusion in the motor such as;
 - 1. thermal switches built in to the stator windings
 - 2. Water in oil sensor in the oil chamber for continuous monitoring of motor enclosure and automatic cut-out in case of leakage with help of PMU

CONTORLS & MONITORING

The pumps shall be provided with proprietary monitoring and control units for inclusion in the motor controls supplied strictly by the pump manufacturer.

- A. Analog inputs shall include the following:**
 - 1. Winding temperature
 - 2. Bearing temperature
 - 3. Water-in-oil monitoring
- B. Digital inputs shall include the following:**
 - 1. High winding temperature
 - 2. Seal monitoring
 - 3. Over temperature
- C. The controller must also be able to provide the following functionality:**
 - Winding Overheating Protection
 - 1. Mechanical Seal leakage protection
 - 2. Terminal Chamber moisture protection
 - 3. Reverse Rotation Protection
 - 4. Bearings overheating protection
 - 5. Motor chamber moisture protection
 - 6. Low Level indicators
 - 7. Single phasing
 - 8. Phase loss

Annexure 2

Specifications for Cast Iron Sluice Gate

Supply of Cast Iron Gates

Design, supply, installing, testing & commissioning of Cast Iron / DI Gates

- a) Design Requirements and Construction Features, the construction of sluice gates shall be in accordance with the specification and generally as per IS: 13349. All sluice gates shall be of the rising spindle type.
- b) Frame: The frame shall be of the flange back type and shall be machined on the rear face to bolt directly to the machined face of the wall thimble.
- c) Seating Faces: Seating faces shall be made of full width, solid section; dove-tail strips of stainless steel. They shall be secured firmly by means of counter sunk fixings in finished dove-tail grooves in the frame and slide faces in such a way as to ensure that they will remain permanently in place, free from distortion and loosening during the life of the sluice gates.
- d) Wedging Devices: Sluice gates shall be equipped with adjustable side, top and bottom wedging devices as required providing contact between the slide and frame facing when the gate is in closed position.
- e) Lifting Mechanism:
 - (i) Sluice gate shall be operated through suitable lifting mechanism which shall incorporate suitable gearing if required, to keep the torque requirement within 7 kg.m.
 - (ii) Lifting mechanism shall incorporate a strong locking device suitable for use with a padlock or padlock and chain. |letter 'F'. S. No. Component Material
 - (iii) Lift mechanism shall be provided with a suitable position indicator to show the position of the gate at all times.
- f) Wall Thimbles the cross section of the thimble shall have the shape of the letter 'F'. S. No. Component Material.
 - (i) Wall Thimble Cast Iron :IS 210 Gr. FG 200
 - (ii) Frame and Slide Cast Iron: IS 210 Gr. FG 200
 - (iii) Seating faces Stainless Steel: ASTM Countersunk fixing A276 type 316
 - (iv) Wedge Stainless Steel: ASTM A743 CF8M or SS316
 - (v) Stem Stainless Steel: ASTM extension A276 type 316
 - (vi) Stem nut Stainless Steel: ASTM A743 CF8M
 - (vii) Stem Coupling Stainless Steel: ASTM A276 type 316
 - (viii) Fasteners, anchor Stainless Steel: ASTM bolts and nuts A276 type 316
 - (ix) Lifting mechanism, Pedestal gear house cover and stem guide Cast Iron : IS 210 Grade FG 200
 - (x) Lift nut Bronze: ASTM B 148 (CA952, CA954 or CA958)
- g) PAINTING: Following painting procedure shall be adopted for the gates :

Surface Preparation: Blast clean to near white metal finish.

Priming: 1 coat of red oxide epoxy primer before and after shop testing.

Finish Painting for gate assembly: Black coal tar epoxy paint. Minimum DFT 250 microns inclusive of priming.

Painting for yoke & headstock pillar: Epoxy red oxide primer and epoxy Grey paint. Minimum DFT 150 microns inclusive of priming

h) Annexure 3

Specification of Multi-rake Mechanical Coarse bar Screens

'Providing, erecting & commissioning of Multi-rake Mechanical Coarse bar Screens:

Mechanical Screen (Coarse) Inclined deep water screen Angle of inclination 75 degree.

103 MLD

- a) Mechanical Multi-rake type Coarse bar screens shall be front-raked with a multiplicity of raking combs carried by two endless revolving chains on sprockets.
- b) The screens shall be of rugged design, adequate strength and constructed with stainless steel plate thickness of 4 mm for the self-carrying framework.
The screen should be provided with facility to operate at twice the normal operating speed during high low / flooding / higher head loss condition. The screens shall be equipped with variable frequency drive & shall be able to operate in continuous mode at variable speed and shall be suitable for both forward operation and reverse operation. The screen shall be equipped with Auto Jam removal system. The design shall be such that screen field bars, rakes and tines, drive-chains, sprockets and bearings can be replaced without the need to remove the screen from the channel.
The screen field shall be of individually replaceable continuous solid taper-section bars of dimensions 12x6x50 mm.
- c) The screens are to be supplied with heavy-duty chains of the roller type made entirely from stainless steels and with a minimum breaking load of 112Kn. The chain pins shall be manufactured from Duplex steel.
- d) The drive motor shall be continuously rated with enclosure protected to IP55.
- e) Entire screen assembly except anchor fasteners & bolts shall be made of SS 316L. Fasteners & bolts shall be made of SS 316.

Annexure 4

Specification of BELT CONVEYOR

'Providing, erecting & commissioning of Belt Conveyor & Geared Motor for Belt Conveyor Conveyor System with all allied accessories & discharge chute

- a) For the disposal of screenings, a common motor driven endless belt conveyor shall be provided. The conveyor shall be designed in accordance with IS11592 or equivalent. The conveyor and chutes shall be suitable for handling occasional heavy objects which will cause shock loads.
- b) The construction of the frame and support shall be robust and torque resistant. Belt conveyor shall be of 20 deg. Trough type complete with drive assembly structures, idlers, pulleys and belt cleaners. Idlers and pulley shall be provided with anti-friction bearings.
The belt material shall be two poly nylon or equivalent with minimum 3 mm neoprene covering on carrying side. Splicing shall be employed to make the belt endless. The belt shall operate over three roll twenty degree, troughing idlers. The idlers shall rotate on precision type, deep groove, single row ball bearing with built-in close fitting triple labyrinth grease seal. The ends of the outer shell shall be counter bored and a full-length centre tube journaled concentricity. The outer shell, centre tube and precision die formed steel ends shall be brazed into an integral unit to provide concentricity. The ends of the centre tube shall be bored concentrically with each other after roll assembly to provide correct bearing alignment and to provide prestressing of boring. The centre tube shall be grease fit after assembly. Troughing idlers shall have means of adjustment or ensuring belt tracking. On the return run the belt shall operate over flat roll idlers having bearing, shaft and lubrication arrangements as above for carrying idlers. Spacing of idlers shall be of 1200 mm on carrying Run and 2400 mm on return run.
- c) The head and tail pulleys shall be manufactured from welded steel/any alloy steel and shall be provided with rubber lagging. Lagging for drive pulleys shall have herringbone grooving. Pulleys shall be equipped with taper lock bushings. The tail pulley shall incorporate a screw rake for adjusting belt tension. Head and tail pulleys shall be adequately guarded.
Shafting for pulleys shall be of heat-treated carbon steel. They shall be forged, ground and polished to obtain close diameter tolerances. The head shaft shall be provided with roller bearing pillow blocks.
- d) The belt conveyor shall be driven by a squirrel cage, TEFC motor. A V-belt drive arrangement shall be provided between the motor and a helical speed reducer, the latter shall be mounted on the end of the head shaft. The driving pulley shaft shall have back stops to prevent backward movement of the belt.
- e) The conveyor shall be supported on 150mm channel sections with 14-gauge steel deck plate between the two runs of the belt and the necessary supports to the floor. The floor supports shall be made out of steel plates having minimum 6 mm thickness. The conveyor shall be protected from weather by a 'dog box' type canopy.
- f) An adjustable belt scraper shall be provided on the hopper end of the conveyor belt. The scraper and attachments shall be of fibre reinforced plastic.
- g) Screenings discharge chutes shall be provided to transfer screenings from the screens to the troughed belt conveyor and from the conveyor discharge to skip. The latter chute shall extend beneath the belt scraper and shall allow access for maintenance of the belt scraper. Chutes shall be designed to minimize the accumulation of rags and stringy materials.
- h) The conveyor shall be fitted with an emergency stop operated by wire rope at foot level. Two Nos. belts way switches shall be provided on conveyor



Figure 2: Location of Discharge Point

Area available for STP-3 = 12,000 Sq.m (Approx.)

GL at STP: **3.5 m**

IL at STP: **-3.98 m**

IL at Discharge Point: **1.8 m**

***Note:** All the components of STP including the wet well shall be accommodated in the provided plot area for STP-3.

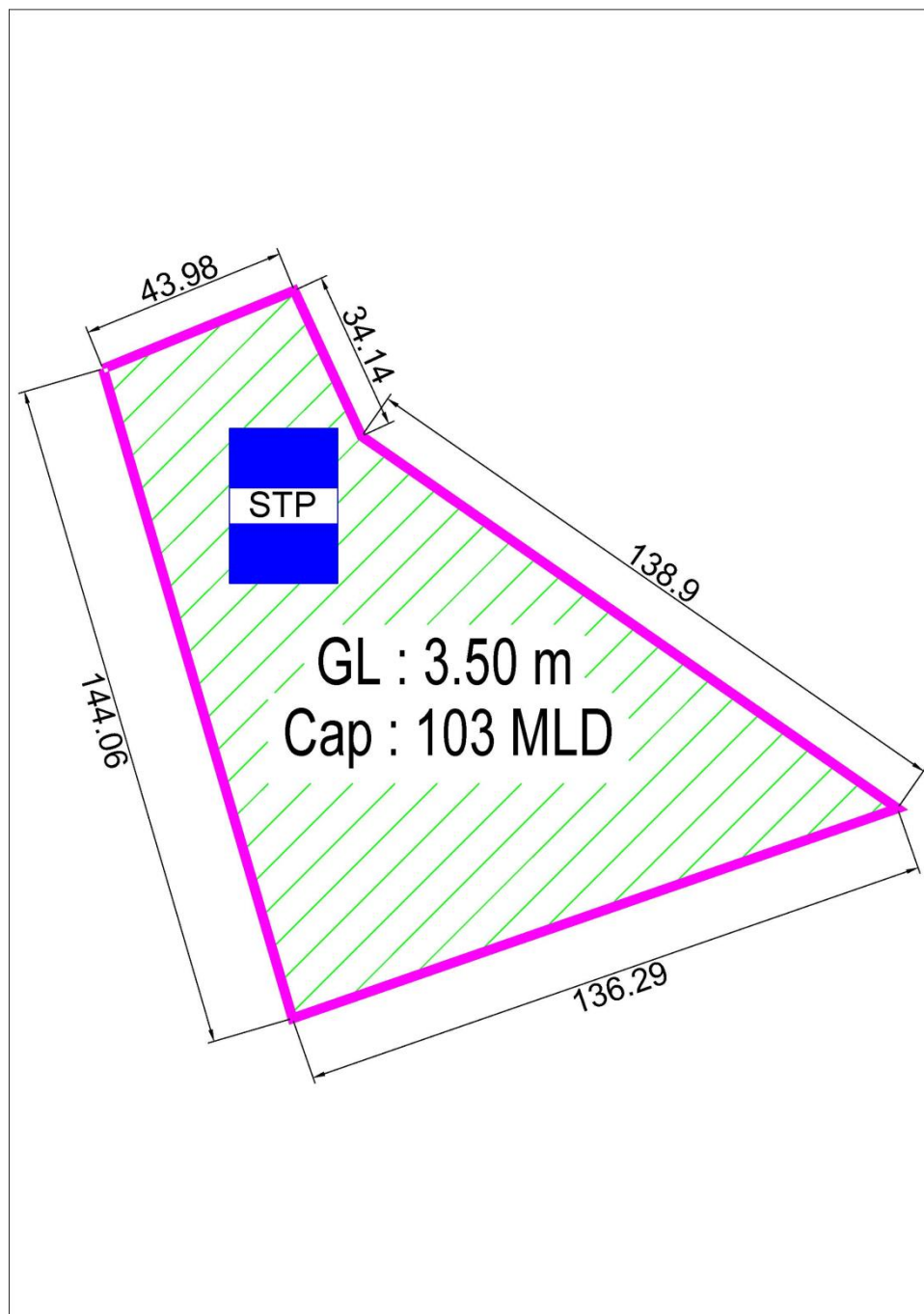


Figure 3: Plot Boundary Dimensions of Proposed STP behind Capital Mall

Inlet Raw Water Sewage Characteristics (Indicative)

Parameter	Unit	Limit
pH		7.2
BOD	mg/L	210
COD	mg/L	403
Total Suspended Solids (TSS)	mg/L	150
Total Dissolved Solids (TDS)	mg/L	80
Turbidity	NTU	7
Oil and Grease	mg/L	50
Faecal Coliform	(CFU/100 ml)	20000000
Chlorides	mg/L	142
Sulphate	mg/L	18.887
Phosphate	mg/L	0.017

Treated sewage discharge standard as NGT norms

Parameter	Unit	Limit
pH		<6.5-8.3
BOD	mg/L	< 10
COD	mg/L	<50
Total Suspended Solids (TSS)	mg/L	< 5
Turbidity	NTU	< 2
Total Nitrogen (TN)	mg/L	< 10
Phosphorus	mg/L	<1
Faecal Coliform	(MPN/100 ml)	BDL
Residual Chlorine	Mg/L	>=1

Sd/-

Executive Engineer

Vasai Virar City Municipal Corporation (VVCMC)

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 VVCMC officials.