



TITLE

4 X 270 MW BHADRADRI TPS TECHNICAL SPECIFICATION FOR SEWAGE TREATMENT PLANT

SPECIFICATION NO.

PE-TS-411-673A-A001

VOLUME: II B

REV 00

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DATASHEET A FOR STP

SL. NO.	DESCRIPTION	
1.	Capacity of STP	60 m3/day with an average flow of 6 m3/hr
2.	SEWAGE PUMPS	
2.1	Type	Submersible grinder type
2.2	Quantity per sump	2 X 100 %
2.3	Capacity	As per P & ID of Sewage Treatment plant
2.4	MOC casing	Cast Iron to IS 210 FG 260
2.5	MOC impeller	Stainless Steel AISI 304
2.6	MOC shaft	SS 410
3.	AERATION TANK	
3.1	Quantity	One (1)
3.2	MOC	RCC
3.3	Type	Extended type aeration tank above ground
3.4	Size	As per 16 hour retention time (Minimum 12 m3) with an average flow of 6 m3/hr
4.	HOPPER BOTTOM SECONDARY CLARIFIER	
4.1	Quantity / Capacity	One (1) / 60 m3/day
4.2	MOC	RCC
4.3	Type	Hopper bottom (Above ground) with tube settlers
4.4	Size	To suit the sewage inflow of 60 m3/day with an average flow of 6 m3/hr
4.5	Rise rate	Less than 0.5 m3/hr/m2
5.	FILTER PRESS	
5.1	Capacity / Type	6 m3/hr / Plate type
5.2	MOC	
5.2.1	Feed head, moving plate and roller	CI
5.2.2	Plates	PP
5.2.3	Inlet Nozzle	SS
5.2.4	Filterate cock	PP
6.	CLEAR WATER TRANSFER PUMP	
6.1	Type	Horizontal centrifugal
6.2	Quantity	Two (2) Nos. (1W+1S)
6.3	Capacity	Suitable to empty the clear water sump in one

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		hour or 25 m ³ /hr (min.) whichever is higher
6.4	MOC Casing	CI to IS 210 Gr. FG 260
6.5	MOC Casing Impeller / shaft / shaft sleeve	SS316 / SS410
6.6	Other fasteners	CS
6.7	Base plate / mounting plate	MS as per IS 2062
7.	SEWAGE RECYCLE PUMP	
7.1	Type	Horizontal centrifugal
7.2	Quantity	Two (2) Nos. (1W+1S)
7.3	Capacity	To suit system requirement or minimum 6 m ³ /hr whichever is higher
7.4	MOC Casing	CI to IS 210 Gr. FG 260
7.5	MOC Casing Impeller / shaft / shaft sleeve	SS316 / SS410
7.6	Other fasteners	CS
7.7	Base plate / mounting plate	MS as per IS 2062
8.	AIR BLOWER (Common for aeration tank, Common sewage collection sump & Sludge holding tank)	
8.1	Type	Twin lobe rotary
8.2	Quantity	Two(2) Nos.(1W+1S)
8.3	Capacity	To suit system requirement
8.4	MOC casing	CI to IS 210 Gr. FG 260
8.5	Side plates / gear cover	CI to IS 210 Gr. FG 260
8.6	Impeller	SS 304
8.7	Diffuser	EPDM
9.	SODIUM HYPOCHLORITE DOSING TANK	
9.1	Type	Vertical cylindrical
9.2	Quantity	One (1)
9.3	Capacity	Minimum One day requirement
9.4	Material of construction	HDPE
10.	SODIUM HYPOCHLORITE DOSING PUMP	
10.1	Quantity	2X100 %
10.2	Capacity and head	As per requirement
10.3	Material of construction	PP



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11.	FLOCCULATION TANK	
11.1	Quantity	One (1)
11.2	MOC	RCC
11.3	Capacity	As per system requirement or 1 m3 whichever is higher
11.4	Agitator	One (1), MOC SS 316
12.	PIPING	
12.1	Sewage transfer piping	CI
12.2	Air	CS
12.3	Hypochlorite piping	PVC (Sch. 20 min.)
13.	CLEAR WATER TANK	
13.1	Quantity	One (1)
13.2	MOC	RCC
13.3	Capacity	As per system requirement or 25 m3 whichever is higher
14.	VALVES	
14.1	Butterfly Valve	Type : Wafer / double flanged Body : CI to IS 210 GF 260 + Epoxy Disc : SGI Bonnet Seat : EPDM
14.2	Diaphragm Valve	Body : CI to IS 210 GF 260 Bonnet : CI to IS 210 GF 260 (sealed Type) Compressor : SS 304 Stem : AISI 410 Diaphragm : Neoprene rubber 65+/-5 Shore A / Back butyl 65+/-5 Shore A Lining: EBONITE LINED TO 3.0mm THK.(UP TO 80NB) & 4.0mm THK.(HDNB & ABOVE) HARDNESS: 90 TO 100 SHORE A Hand wheel MOC : SG IRON
14.3	Gate valve	Body: CI 210 Gr FG 260. Type :Outside screw and rising stem type Stem, seat ring and wedge facing ring: SS, Rating: PN 10 (min). Other parts of the valve: As per IS: 14846.
14.4	Ball valve/plug valve	Type :Full bore Rating: PN 10 (min). Body: cast Iron/carbon steel Ball: stainless steel Seat ring: PTFE Stem: Stainless steel Seat: Nitrile rubber,PTFE
14.5	Non return valve	These valves shall be swing check type or dual plate type



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		Swing check type (non corrosive application) Body and disc: Cast iron. Hinge pin and door/disc pin: Cast steel ASTM A216 Gr.WCB Disc facing ring: stainless steel Body Seat ring: Stainless steel
15.	SEWAGE SUMPS (OUTSIDE STP AREA)	
15.1	Sewage sump S1, S2, S3, S4, S5, S6, S7, S8, S9 and S10	Minimum effective dimensions as per P & ID of sewage treatment plant.
15.2	MOC	RCC
15.3	Type	Covered at top, below ground
15.4	Accessories	Coarse bar screen (MOC : MSEP) at each sump location
15.5	Handrail	To be provided by bidder
15.6	No. of chain pulley block and capacity	One no. at each sump location, capacity as per specification requirement
16.	COMMON SEWAGE COLLECTION SUMP (INSIDE STP AREA)	
16.1	Capacity	Minimum effective dimensions as per P & ID of sewage treatment plant.
16.2	MOC	RCC
16.3	Type	Covered at top, below ground
16.4	Handrail	To be provided by bidder
16.5	No. of chain pulley block and capacity	One no., capacity as per specification requirement.
17.	Sludge Holding tank	
17.1	Quantity	One no. no. two compartments
17.2	Capacity	24 m3 (effective) each compartment
17.3	MOC	RCC
18.	Filter Press Feed Pump	
18.1	Type	Horizontal Screw
18.2	Quantity	Two (2) Nos. (1W+1S)
18.3	Capacity	To suit system requirement or minimum 6 m3/hr whichever is higher
18.4	MOC Casing	CI to IS 210 Gr. FG 260
18.5	MOC shaft / Rotor	Stainless Steel AISI 316
18.6	MOC stator	Stainless Steel AISI 316
18.7	Other fasteners	CS
18.8	Base plate / mounting plate	MS as per IS 2062

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ELECTRIC HOIST

Sl.no	DESCRIPTION	TECHNICAL PARTICULARS
1.0	Type	Steel wire electric hoist with electrically operated trolley
2.0	Scope (Qty., Capacity, Lift, Travel Length)	As per specification and layout requirement
3.0	Type of service	Indoor
4.0	Overload test	125% of SWL
5.0	Design Ambient temperature	50° C
6.0	General Design	As per IS: 3938 / 1983 or latest, Class-II duty
7.0	Operating speed	
7.1	Hoisting speed	3 MPM.
7.2	Trolley speed	15 MPM
8.0	Type of transmission	Through Electric motor and gear box.
9.0	Wire Rope	
9.1	Construction / core	6 x36/ 6X37 (Steel core)
9.2	Code	IS:2266
9.3	Number of falls	Min. 4
9.4	Factor of safety	Not less than 5
10.0	Load Hook and block	NORMALISED HOOK ONLY
10.1	Type of load hook	Plain shank trapezoidal section with safety latch.
10.2	Load hook Code	IS: 15560
10.3	Load hook Material	As per IS:15560
10.4	Hook suspension	Thrust bearing
10.5	Material of block suspension	Fabricated from steel plate, Material: IS: 2062
11.0	Gearing	
11.1	Type	Spur / Helical
11.2	Gear/ pinion material	as per IS 3938
11.3	Lubrication	Oil splash/ grease lubricated
11.4	Bearing type	Antifriction Ball / Roller
12.0	Trolley drive	
12.1	Wheel	Single flange taper thread
12.2	Wheel conform to (Std. / code)	IS: 3938
12.3	Wheel material	As per IS:3938



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12.4	Bearing type	Antifriction Ball / Roller	
12.5	Trolley type	Rolled structural steel with side plates extended beyond wheel flanges to protect wheels.	
12.6	Hardness	Max hardness 200 BHN	
13.0	SHEAVE		
13.1	Material	Fabricated from steel plate. IS: 2062 Gr. A or Gr. B / as per IS: 3938	
13.2	Bearing type	Antifriction Ball / Roller.	
14.0	BRAKE (HOIST and TROLLEY)		
14.1	Type	DC EM brakes disc type (fail to safe).	
14.2	Capacity	As per IS 3938.	
14.3	Number	One number for each motor.	
15.0	ROPE DRUM		
15.1	Material	Cast iron, cast steel or mild steel.	
15.2	Flange / Flangeless	Flanged	
15.3	Type of groove	As per manufacturers standard to suit the layout requirement.(Shall be decided during detail engineering)	
17.0	TYPE OF DSL		
17.1	CT travel	PVC Shrouded bus bar conductor type DSL	
18.0	MOTORS		
18.1	Type	Sq. Cage induction, TEFC, S4 duty, 40% CDF.	
18.2	Number of start	150 starts / hr	
18.3	Voltage , Phase and Frequency	415V $\pm 10\%$, 3 phase, 4 wire, 50 Hz	
18.4	Class of insulation	Class "F" and temperature rise limited to class B.	
18.5	Type of enclosure	TEFC	
18.6	Degree of protection provided for enclosure	IP-54/IP-55 depending upon Indoor / Outdoor application	
18.7	Margin	Motor rating will be calculated keeping margin of at least 15% over the maximum power requirement in the duty condition specified.	
19.0	LIMIT SWITCHES	Hoisting	Trolley
19.1	Type	Snap action, self actuating type	Lever type



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20.0	Control panel	* Fabricated from Cold rolled sheet steel not less than 2.5mm for front & rear & 2mm for side, top & bottom portion with gland plate of 3mm thick. * Degree of protection shall be IP 54. * Power on indicating lamps shall be provided * Panel illumination lamps operated by door switch. * 2 nos earthing terminals on panel. * 20 % spares terminals (clip on type) shall be provided. * Power and control terminals (clip on type) shall be on separate channels. * Gland plate shall be double brass compression type.
20.1	Qty	1 No.
21.0	Pendent Push buttons	Up /down / forward / Reverse push buttons. Indicative marking for easy operation shall be provided.
22.0	Power cables	FRLS / EPR flexible Cu cable / Aluminum cable
23.0	Control cable	FRLS / EPR flexible Cu cable
24.0	Control Voltage	110 V
25.0	Painting	A) Structural Surface preparation : De greasing and Mechanical cleaning with wire brush or hand tool. (SA 1/ ST 2 / ST 3 as applicable) Primer : Red oxide Zinc phosphate (Alkyd medium)- 2 coat , DFT 35 µ per coat. Finish Coat : Synthetic enamel (Alkyd medium) as per IS: 2932- 2 coats, DFT 35 µ per coat. Total DFT : 140µ B) Electrical /Control Panel Surface preparation: Seven tank process Primer : Red Oxide Zinc phosphate (Alkyd medium)- 2 coat , Minimum DFT 35 µ per coat. Finish Coat : Synthetic enamel (Alkyd medium) as per IS: 2932- 2 coats, Minimum DFT 35 µ per coat. Total DFT : 140 µ
MANUAL HOIST (CHAIN PULLEY BLOCK)		
1	Type	Chain pulley block with/without travelling trolley
2	General Design	IS: 3832
3	Duty Class as per IS:3832	Class –II



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4	Hoisting Mechanism	
a)	Type	Hand operated gear transmission
b)	Type of gear	Spur / Helical
c)	Load Chain	
i)	Type	Link type
ii)	Material	T (8) as per IS: 6216
iii)	Conforms to (Std./Code)	IS: 6216
d)	Hand Chain	
i)	Type	Link type
ii)	Material	Mild steel Grade 30
iii)	Conform to Std.	IS:2429 (Part I)
e)	Load Hook & Hook Block	
i)	Type of load hook	Plain shank- Trapezoidal section
ii)	Load hooks conforms to	IS: 15560
iii)	Type of hook suspension	Swivelling type with lock
iv)	Type of make of bearing	Thrust ball bearing of hook suspension
v)	Type & Material of hook	Carbon steel/forged steel As per IS 15560
f)	Gears/ Pinion	
i)	Type	Spur
ii)	Material	Alloy steel / carbon steel
iii)	Type of Bearing	Antifriction ball bearing / Roller
h)	Sprockets:	
	Type of bearings used	Antifriction ball bearing / Roller
i)	Method of lubrication	
	Bearings	Grease
	Gearing & Pinions	Grease
	Sprockets	Grease
j)	Brakes	
	Type	Screw and friction disc type
5	Trolley and Bridge drive	
a)	Trolley	
i)	Type	Geared (Manually operated)
ii)	Material of frame	Mild steel (IS:2062 Grade A or B)
b)	Drive Chain	
i)	Type	Link type
ii)	Material	Steel Gr.30 as per IS 2429 (part 1)
c)	Wheel	
i)	Number of pairs of wheel	Two in each trolley/bridge
ii)	Flange	Single flanged

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iii)	Wheel material	Cast Iron Gr. FG 200 as per IS:210
iv)	Type of bearings need	Antifriction
d)	Gears	
i)	Type	Spur / helical
ii)	Material	EN8
iii)	Type of bearings used	Antifriction
e)	Method of lubrication for	
i)	Bearings	Grease
ii)	General	Grease
iii)	Sprockets	Grease
6	Painting	As per manufacturer standard