

	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
		SHEET 1 of 2

1.0 SEWAGE GENERATION AND CHARACTERISTICS

The Sewage Treatment Plant is designed for the following sewage flow rate and characteristics are as follows:

Persons Envisaged	:	1200 [45 Ltrs/Capita as per CPHEEO, 1993].
Flow Rate	:	60 M ³ /day (Max).
BOD ₅	:	300 mg/l.
COD	:	600 mg/l.
TSS	:	450 mg/l.
pH	:	7 – 8.
Temperature	:	Ambient.

2.0 TREATED SEWAGE QUALITY

The treated sewage water shall be used for gardening purpose. The treated sewage will conform to the following quality standards:

BOD ₅	:	20 mg/l
COD	:	100 mg/l
TSS	:	30 mg/l
pH	:	7 – 8
Temperature	:	Ambient

Notes:

- The treated sewage quality standards shall be achieved at average sewage flow rates as well as peak sewage flow rates.

3.0 TECHNICAL SPECIFICATION

3.1 PROCESS DESCRIPTION

The treatment scheme shall be aerobic biological extended aeration treatment. Aerobic biological sludge generated shall be thickened in the Hopper Bottom Clarifier and aerobically digested/dried in a sludge holding tank and then transferred to filter press. The dry sludge shall be disposed manually by Customer. The Process Flow Diagram / P & ID is enclosed for reference.

The treatment scheme shall have following parts:

- Pre-Treatment**, which consists of raw sewage collection and pumping,
- Biological Treatment** comprising of aeration followed by clarification and chlorination, and
- Sludge Digestion/ Disposal** comprising of aeration of excess biological sludge, and sludge disposal through filter press.

Detailed description of each treatment step is given below:

The various raw sewages shall be collected by gravity at local sewage lifting stations at different areas and the same to be pumped by using 2 Nos (1W+1S) Sewage Lifting Pumps to an underground Centralized Sewage Collection Pit located in sewage treatment plant area. Collected raw sewage shall be pumped from the Centralized Sewage Collection Pit using 2 Nos (1W+1S) Sewage Lifting Pumps to the Aeration Tank. The Sewage Lifting Pumps shall be of submersible and heavy duty grinding type which shall cut and grind solids present in raw sewage into small fragments. The Sewage Lifting Pumps shall automatically interchange every 8 hours and shall automatically START at high level in the Sewage Collection Pit and STOP at low level. The Centralized Sewage Collection Pit shall also be provided with a coarse air bubble diffuser and an air line tapping from the Air Blower delivery header so as to allow continuous aeration in order to protect the Package STP site against unpleasant odours. Sludge recirculation line from Thickened

	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
		SHEET 2 of 2

Sludge Transfer pumps discharge header to Flocculation Chamber shall be provided to improve clarifier operation.

The Package Sewage Treatment Plant shall consist of an Aeration Tank, a Hopper Bottom Clarifier, sludge holding tank, filter press and a Treated Sewage Sump (Clean Water Tank). Aerobic biological treatment shall be carried out in the various compartments of the sewage treatment.

2 Nos (1W+1S) Air Blowers common for Centralized Sewage Collection Pit and Aeration Tank shall be provided to supply air through an underwater piping grid and fine air bubble membrane diffusers. Timers shall be provided in the Electric Panel such that the Air Blower in operation will automatically interchange every 8 hours.

Sodium hypochlorite solution dosing shall be carried out into the Treated Sewage Sump to control the BOD.

The stabilized sludge shall be free of offensive odours.

3.2 GENERAL REQUIREMENTS

1. All interconnecting piping/ fittings/ valves/ cabling shall be provided as required.
2. All interconnecting piping/ fittings/ valves in direct contact with sewage shall be of CI (Heavy Grade).
3. NaOCl dosing pipes shall be of PVC (sch 20).
4. The pipes carrying air shall be of Carbon Steel (IS 1239 Heavy Grade).
5. Internal painting of the package plant shall be suitable for withstanding effect of sewage and mixed liquid suspended solids.

4.0 CONTROL PHILOSOPHY.

The plant operation shall be carried out from the PLC based control system along with RIO panel. PLC shall be located in the STP area however RIO panel shall located outside STP area.

All pumps shall be fitted with check valves and pressure gauge on the discharge side. All pump shall be tripped automatically in case of low level in the pits and shall be start in auto.

Timer shall be provided by bidder in the Control Panel such that the sewage lifting pumps at Centralized Sewage collection pit & air blowers (located at Sewage treatment plant areas only) are in operation will interchange automatically every 8 hours.

Number of signals/ Annunciation shall be provided in PLC and the same shall be decided During Detailed Engineering stage.