BELLARY THERMAL POWER PROJECT
PROJECT INFORMATION

1.0	Owner / BHEL	:	Karnataka Power Corpn. Ltd., Shakthi Bhavan No. 82 Race Course Road, Bangalore – 560 001, Karnataka, India.
2.0	Owner / BHEL's Consultant	:	Later
3.0	Project Title	:	Bellary Thermal Power Station
4.0	Location	:	Kudatini Village Bellary Dist Karnataka State, India.
5.0	Latitude and Longitude	:	15°11' 58" N Latitude 76° 43' 23 E Longitude
6.0 A	Elevation above mean sea level	:	478 meters
6.0 B	Barometric Pressure	:	725 mm
7.0	Climatic Conditions		
(a)	Temperature		
(i)	Monthly Basis		
	Mean of daily maximum temp.	:	42.5°C (in the month of April)
	Mean of daily minimum temp.	:	19.5° C (in the month of Dec)
(ii)	Monthly Basis		
	Mean of daily maximum temp.	:	37.5°C
	Mean of daily minimum temp.	:	19.5°C
(iii)	Highest temp. recorded	:	44.1°C
(iv)	Lowest temp. recorded	:	14.6°C
(b)	Relative Humidity	:	Varies between 11% and 70%
(c)	Rainfall		
	Annual average rain	:	492 to 846 mm most of which occurs during August to October
(d)	Wind Speed		
(i)	Annual mean wind speed	:	8.4 km / hr
(ii)	Maximum mean wind speed	:	19 km / hr in the month of July
8.0	Wind Load		
	Calculations for wind effect shall be in accordance with IS:875-1987 (part-3) taking into account the following		
(a)	Basic wind speed of 39 m / sec as given in Fig. 1 of the code		
(b)	Factor K1 shall be taken as 1.06		
(c)	Terrain category shall be 2 and corresponding values shall be taken for K2		
(d)	Factor K3 shall be taken as 1.0		
9.0	Wind Loading for Stack		
(a)	For wind pressure as per clause 8.0		
(b)	For RC stacks as per IS: 4998		
10.0	Seismic data (as per IS: 1893 latest issue)		
(a)	Zone	:	Zone III
(b)	Importance factor (I)	:	2.5 for electrical equipment 1.5 for others.
11.0	Auxiliary power supply	:	Auxiliary electrical equipment to be supplied against this contract shall be suitable for

			operation on the following supply system.
(a)	For motors rated above 175 KW	:	11000V, 3 phase, 3 wire, 50 Hz medium earthed AC 3300V, 3 phase, 3 wire, 50 Hz medium earthed AC
(b)	For motor control centre	:	415V, 3 phase, 3 wire solidly earthed AC
(c)	For motor rated 175 KW and below	:	415, 3 phase, 3 wire solidly earthed AC
(d)	DC motor starters, DC solenoids, DC alarm, control and protections	:	220 / 230V DC, 2 wire, unearthed DC
(e)	AC control & protective devices	:	230 V 1 phase, 50Hz, 2 wire AC supply. The single-phase 110V AC supply shall be derived by CONTRACTOR BY PROVIDING 415V/110V control transformers of adequate rating with MCCB /MCB on both the primary and secondary sides.
(f)	Uninterrupted power supply	:	230 V, 1 phase, 50Hz, 2 wire AC supply from UPS system for I&C (including indicator recorders) and UCMS only
(g)	AC solenoids, indicators / recorders, space heaters (for motors rated 30KW and above)	:	240V DC, 220V DC or 110V AC, 240V 1 phase, 2 wire 50 Hz AC system with effectively earthed neutral. The power supply shall be derived by the Contractor by providing 415V / 240V transformer of adequate rating with MCCB / MCB on primary / secondary sides.
(h)	Winding heating of motors below 30KW	:	24V 1 Phase, 50 Hz, AC with one point earthed. This shall be derived by the Contractor by providing 415V 3 phase, 3 wire, AC supply through an adequately rated step-down transformer of adequate rating with MCCB / MCB on primary / secondary sides.
(i)	Solid state controls (including solenoid valves)	:	24V DC, 2 wire, supply from UPS for instrumentation system only.
(j)	Lighting fixtures	:	240V, 1 phase, 2 wire, 50 Hz system
(k)	Lighting fixtures and space heaters in panels	:	240V, 1 phase, 2 wire, 50 Hz system
(l)	The above voltages may vary as follows		
	All devices shall be suitable for continuous operation over the entire range of voltage and frequency indicted below without any change in their performance.		
i.	AC supply	:	Voltage variation $\pm$ 10% Frequency variation $\pm$ 5% Combined voltage & frequency variation $\pm$ 10%
ii.	DC supply	:	Voltage variation +10% - 20%

Technical specification for the Sewage Treatment Plant

1.0 Project

Sewage Treatment plant of 38/50 KLD to be installed for Bellary Thermal Power Project for both Plant buildings toilets and canteen outlet.

2.0 Scope of Work

- Concept development and detailed engineering.
- Fulfillment of Statutory Obligations of State/Central, Approval of the concept, Design, Drawings & Documents by Customer.
- Total Civil Works for system requirement like Inlet Collection Sump (Raw Sewage), Pavement for Packaged STP (Pre-fabricated), Treated Water outlet from STP, Sludge drying System, MCC Rooms, Cable trenches etc.
- Fabrication of all equipments.
- Supply of Equipments, Pumps, Motors etc, Mandatory Spares and erection of all equipments.
- Testing, pre commissioning & commissioning and handing over of the plant to the Customer.

3.0 Flow rate logistics

Total flow	: 38 m3/day avg. (approx 750 inhabitants operated in three shifts)
Operating hours	: 24 hrs
Flow rate	: 1.5 m3/hr
Mode	: Manual
Space required	: To be specified by the successful Bidder

4.0 Quality Logistics

S.No	Description	Unit	Inlet	Outlet	Standards
1	PH	-	7.2 – 7.8	7 – 8.5	5.5 – 9
2	Total dissolved solids	Mg/l	600 – 800	600 – 800	<2100
3	Total suspended solids	Mg/l	150 – 250	20 – 30	<20
4	BOD	Mg/l	200 – 300	<20	<20
5	COD	Mg/l	400 – 600	<250	<250
6	Chlorides	Mg/l	200 – 400	200 – 400	<1000
7	Sulphides	Mg/l	5 – 15	<5	<5
8	Oil & grease	Mg/l	5 - 10	5 -10	<10

5.0 Codes & Standards

All design, fabrication, inspection, and testing of the plant will be done with respect to the latest Indian Standards. Incase of non-availability of standards, good engineering practice will be adopted.

Standards to be followed:

Pressure vessels	– ASME SEC VIII
Pumps	– IS 5120
Piping	- IS 1239
Others	– Available IS standards.

6.0 Concept

- The sewage generated from various sources will be collected in the Inlet collection Sump.
- The sewage is pumped to other unit through bar screen.
- The sewage is let to Aeration tank with SAFF media where biological treatment takes place. The aerated Sewage water is led to Clarisettler, the clarified water is sent to Chlorine contact tank where hypochlorite dosing is done. The settled sludge is pumped to sludge drying beds.

- The chlorinated water is pumped to Multi Grade filter using Filter feed pump.
- The treated water will be discharged to Outlet Sump from there it is used for Plantation/gardening & flushing purpose.

7.0 Equipments list

Bar screens, Sewage transfer pump, Aeration tank, Air blower, SAFF media, Diffusers, Clarisettler, Clarisettler internals, Sludge pump, Sludge drying beds, Chlorine contact tank, Chlorine dosing system, Filter feed pump, Multi Grade filter, Interconnecting pipes, Electrical system & Mandatory Spares.

8.0 Painting

Internal	: 3 Coats of Epoxy Paint
External	: 2 Coats of Epoxy & Enamel Finish

Bellary - STP

Payment Terms

The total contract will be split in to three (3) contracts.

a) Supply portion
b) Civil & Structural works
c) Erection & Commissioning.

The quoted contract value of (b) civil & Structural works should be between 20 to 25 % of the total contract value.
The quoted contract value of (c) Erection & Commissioning should not be less than 10% of the contract value of supply portion (a).

PAYMENT TERMS: -

Contract-A: Supply of Materials	
10%	**Engineering** On design documents/drawing completion & approval (pro-rata)
80%	**Supply** supply price payable on pro-rata basis on production of a) Material Despatch Clearance Certificate from BHEL & proof of dispatch (MDCC-55%) b) Material Receipt Certificate from KPCL / MPSEB (25%)
5%	Completion of trial operation
5%	Completion of PG test
Contract –B : Civil & Structural works **Civil works**	
90%	On completion - prorata against agreed billing schedule (BOQ is to be furnished by vendor for approval)
10%	On Handing over of the plant to the owner.
Contract C : E & C	
75%	prorata mechanical erection completion (placement 40% & alignment 35%)
15%	prorata commissioning –sub system wise
5%	Completion of trial operation
5%	PG test & Handing over of STP to KPCL / MPSEB