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	TP SOUTHERN ODISHA DISTRIBUTION LIMITED, BERHAMPUR		
	TECHNICAL SPECIFICATION		
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1. SCOPE:

This specification covers technical requirements for manufacturing, performance & testing at manufacturer's place, packing, supply and unloading at stores/site, PCC poles for use in overhead 11 KV and L.T. power lines and double pole structures complete for efficient and trouble free operation at the site.

2. APPLICABLE STANDARDS


The PCC poles shall conform to the requirements stated in latest editions of relevant applicable standards as follows:

- a) IS 1678 Specification for Pre Stressed Concrete Poles for Overhead Power Lines.
- b) IS2905 Method of Test for Concrete Poles for Overhead Power Lines.
- c) IS 6003 for Indented Wire for Pre Stressed Concrete.
- d) IS 8112 For 43 Grade Ordinary Port Land Cement.
- e) IS 12269 For 53 Grade Ordinary Port Land Cement.
- f) IS 8041 For Rapid Hardening Portland Cement
- g) IS 383 Specifications for Coarse And Fine Aggregate from Natural Sources for Concrete.
- h) IS 9103 Concrete Admixtures.
- i) IS 456 Plain And Reinforced Concrete-Code Of Practice.
- j) IS 1343 for Pre-Stressed Concrete
- k) REC Manual 13/1977: Manual for Solid PCC Pole.
- l) IE Rules and Electricity Act, 2003.

3. CLIMATIC CONDITIONS OF THE INSTALLATION :

- a) Maximum altitude above sea level 1,000m
- b) Maximum ambient air temperature 50°C
- c) Maximum daily average ambient air temperature 35°C
- d) Minimum ambient air temperature 0°C
- e) Maximum relative humidity 95%
- f) Average number of thunderstorm days per annum (isokeraunic level) 70
- g) Average number of rainy days per annum 120
- h) Average annual rainfall 150cm
- i) Earthquakes of an intensity in horizontal direction - equivalent to seismic acceleration of 0.3g
- j) Earthquakes of an intensity in vertical direction - equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

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- k) Wind velocity of 300 km/hr, 200 km/hr and 160 km/hr
- l) Wind Pressure of 126kg/sq m up to an elevation of 10 mtrs

Environmentally, some of the regions, where the work will take place includes coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions for outdoor insulators. Some places are in heavily industrial polluted areas. Therefore, Outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive and humid coastal atmosphere. The design of equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.1 g.

4. GENERAL TECHNICAL REQUIREMENTS :

9 M 300 KG PSC POLE				
Sr. No.	Detail	Unit	Required Specification	
1	Name of the Manufacturer & Address		To be specified	
2	Type of pole		Pre- Stress Concrete	
3	Factor of Safety		2.5	
4	Min. depth of planting in ground	M	1.5	
5	Dia. Of pretension wire	MM	4	

5. GUARANTEED TECHNICAL PARTICULARS :


9 M 300 KG PSC POLE				
SL NO.	DESCRIPTION	UNITS	AS SPECIFIED BY TPSODL	AS FURNISHED BY VENDOR
1	Overall Length of Pole Meters	Mtr.	9	
2	Working Load Kg	Kg	300	

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3	Point of application of load		600 mm below from top	
4	Depth of plantation	Mm	1500	
5	Overall Dimensions			
	a) Bottom Depth	Mm	355	
	b) Top Depth	Mm	185	
	c) Breadth	Mm	100	
	Reinforcement Detail:			
	a) Diameter of Pre-stressing wire	Mm	4	
	b) No. of Tensioned wires	Nos.	20	
	c) No. of Un-tensioned wire	Nos.	--	
	d) Length of each Pre-stressing wire	Mtr.	9	
	e) Ultimate Tensile Strength	Kg/cm ²	17500	
	f) Steel Quantity	Kg/pole	14.20	
6	Concrete Detail			
	a) Cement Type		Ordinary Portland Cement	
	b) Grade		43 Grade	
	c) Type		M-420	
	d) Concrete mix strength	Kg/cm ²	a) 210 Kg/cm ² at time of transfer of prestress (min)	
		Kg/cm ²	b) 420 Kg/cm ² at age of 28 days (min)	
	e) Concrete Quantity	Cubic meter/pole	0.243 m ³	
	f) Concrete covering to wires	mm	20	
7	GI earthing wire	SWG	6	
	Length of Earth Wire	Mtr	7.8Mtr (200mm each at Top & Bottom)	
8	Weight of PSC Pole	Kg	607	
9	Standard confirming to:			
	Pole		IS: 1678 /2000	
	Cement		IS: 8041	
	Aggregates		IS: 383/1970	
	Pre-stressing wire		IS: 6003/1983	
	Concrete Mix		IS: 456/2000	
10	Tolerances Dimensions		a) ±15 mm on overall length of pole	
			b) ±5 mm on sectional dimension	

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		c)0.5% on the uprightiness of pole	
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6. GENERAL MANUFACTURING REQUIREMENTS:

- a) The poles shall be manufactured as per TPSODL tender drawings and specifications complying to the requirements of all applicable IS Codes such that its strength in the direction of the line shall not be less than one quarter of the strength required in transverse direction.
- b) Mix design done earlier, not prior to one year may be considered adequate for work provided there is no change in source and the quality of the materials otherwise BA shall carry out Concrete Mix Design from TPSODL approved lab/ agency and submit the same for approval prior to commencement of work. Mix design shall specify 3, 7 and 28 days' cube strengths along with other details as per relevant IS. This activity shall be completed within 30 days of issuance of PO. TPSODL shall within seven days
Provide comments / approval for the same.
- c) Pre-stressing shall be done using dynamometer. 4MM dia. Indented wires shall only be used. The concrete strength at transfer of pre-stress shall not be less than half the 28 days characteristic strength of cube.
- d) All tendons shall be cut flushing the surface and shall not remain projected. End capping at both ends of each pole shall be done preferably with sealing compound / applying three coats of anti- corrosive bituminous paint confirming to IS: 9862/1981 after grinding the exposed reinforcement.

7. APPROVED MAKES

Cement - Grasim, Ultratech, Vikram, Birla Uttam, Binani, Gujrat Ambuja, ACC, Shree. 4MM Dia. Steel tendons – TATA, Ushamartin, Bajrang.

8. MARKING

Every pole shall be embossed/engraved/painted with "Property of TPSODL, Berhampur", material code and P.O. No. with date along with the following details.


- i) Manufacturer's name.
- ii) Month and Year of manufacture.
- iii) Serial number of the pole
- iv) Position of Centre
- v) Planting Depth

A strip 20-25mm wide shall be painted with two or more coats to give an even shade of synthetic enamel paint in red colour on one major face at planting depth (1.5M for 9M 160KG pole and 1.8M for 11M 365KG pole from bottom of pole).

Another strip 20-25mm wide shall be painted to mark the position of Centre of pole at 4.10M for 9M 160KG pole and 5.0M for 11M 365KG pole from the bottom of pole.

9. QUALITY ASSURANCE AND CONTROL:

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The bidder shall have adequate in house testing facilities for carrying out all tests as per approved TPSODL Inspection and Testing Plan. All inspections and testing shall be carried out in accordance with relevant IS Codes in the bidder's testing facility. The bidder shall replace the materials / reject the work if test reports are not acceptable to TPSODL without any extra claim on this account. TPSODL's engineer-in-charge shall have free access to the bidder's manufacturing facility.

10. ACCEPTANCE TESTS:

The bidder shall perform all tests as per enclosed ITP for acceptance of material. The transverse strength test on poles shall be conducted in accordance with IS 2905. A pre-stressed concrete pole shall be deemed not to have passed the test if cracks wider than 0.1 mm appear at a stage prior to the application of the design transverse load at first crack and the observed ultimate transverse load is less than the design ultimate transverse load.

11. PRE-DISPATCH INSPECTION :

Material shall be subject to inspection by a duly authorized representative of TPSODL. Inspection may be made at any stage of manufacture at the discretion of the TPSODL and the material, if found unsatisfactory as to workmanship or material, is liable to rejection. The bidder shall grant free access to the places of manufacture to TPSODL's representatives at the times when the work is in progress. Inspection by TPSODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing material in accordance with the specifications. Material shall be dispatched after specific MDCC(Material Dispatch Clearance Certificate) is issued by the TPSODL.

Following documents shall be sent along with material:

- a) Test reports
- b) MDCC issued by TPSODL
- c) Invoice in duplicate
- d) Packing list
- e) Delivery Challan
- f) Other Documents (as applicable)


12. INSPECTION AFTER RECEIPT AT STORES

The material received at the TPSODL store will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection and one copy of report shall be sent to Project Engineering department.

13. GUARANTEE :

The bidder shall stand guarantee towards materials, workmanship & quality of process/manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the company up to a period of 12 months from the date of supply, the bidder shall be liable to undertake to replace/rectify such defects at its own costs, within 45 days' time frame, and to the entire satisfaction of TPSODL, failing which TPSODL will be at liberty to get it replaced/rectified at the bidder's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of total expenses incurred), from the bidder or from the "Security cum Performance Deposit" as the case may be.

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14. PACKING:

The bidder shall ensure that all material covered under this specification shall be prepared for rail/road transport in a manner so as to protect the material from damage in transit.

15. MANUFACTURING ACTIVITIES :

The bidder shall submit Pole Casting Schedule clearly elaborating various manufacturing activities with quantities. This Schedule should be in line with the Inspection & Testing Plan. The schedule shall be submitted within 15 days from the release of the order.

16. DRAWINGS:

The bidder shall provide the material in accordance with the drawing nos. TPD-S-116-C-052 Rev.-05, TPD-S-116-C-053, Rev.-06.

17. SCHEDULE OF DEVIATIONS:

The bidders shall set out all deviations from this specification, Clause by Clause in this schedule. Unless **specifically** mentioned in this schedule, the tender shall be deemed to confirm the TPSODL's specifications.

SCHEDULE OF DEVIATIONS:

(TO BE ENCLOSED WITH BID)

All deviations from this specification shall be set out by the bidders, clause by clause in this schedule. Unless specifically mentioned in this schedule, the tender shall be deemed to confirm TPSODL's specifications.

S.No	Clause No.	Details of deviation with justifications
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We confirm that there are no deviations apart from those detailed above.

Seal of the Purchaser:

Designation:

Signature:

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