

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-GEN-4011

Specification Name : Specification for 9 Mtr 300 Kg PSC Pole

SANTOSH KUMAR PATRA	SATYA PRASAD NAYAK	SHANTAPRIYA JENA	Ranjan Kumar Sahoo	ANUP JAWASE	VARUN BHATNAGAR
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPWODL	TPCODL	TPNODL	TPSODL	TPWODL	TPWODL
08-02-2023	09-02-2023	14-02-2023	14-02-2023	15-02-2023	17-02-2023

*Property of TATA POWER ODISHA DISCOMs – Not to be reproduced without permission of TPCODL/ TPNODL/ TPSODL/
TPWODL*

CONTENTS

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS/REQUIREMENTS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. MINIMUM TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE OF DEVIATIONS

1. SCOPE:

This specification covers the technical requirements of design, manufacturing, Testing, inspection before dispatch at manufacturer's works packing, Loading, forwarding and unloading at site/store PSC poles having length of 9 Meter working load of 300 Kg to ensure trouble free and efficient operation.

2. APPLICABLE STANDARDS:

The poles shall comply with relevant provisions made in the following Indian Standards:

IS: 1678/1998	Specification for Prestressed concrete poles for overhead Power traction and telecommunication lines
IS: 2905/1989	Method of test for concrete poles for Overhead Power and Telecommunication lines.
IS 6003:1983	For intended wire for prestress concrete
IS 8112:1989	For intended wire for prestress concrete
IS 383: 1970	Specification for coarse and fine aggregate from natural resources for concrete
IS 9103:1999	Concrete and mixture
IS 456: 2000	Plain and reinforced concrete code of practice
REC 15/1979	Prestressed cement concrete poles (FOS/2.5) for 11 KV and LT lines.
IS 8112	43 Grade Ordinary Port Land Cement.
IS 8041	Rapid Hardening Portland Cement
IS 1343	Pre-Stressed Concrete

3. CLIMATIC CONDITIONS OF THE INSTALLATION:

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	150cm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m
8	Wind Speed	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

TPCODL/ TPNODL/ TPWODL/ TPSODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Kmph. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. GENERAL TECHNICAL REQUIREMENTS: (9 MTR. 300KG PSC POLE)

Sl. No.	Particulars	Unit	Requirements
1	Name of the Manufacturer & Address		To be specified
2	Type of pole		Pre- Stress Concrete
3	Factor of Safety		2.5
4	Overall Length of Pole Meters	Mtr.	9
5	Working Load Kg	Kg	300
6	Point of application of load		600 mm below from top
7	Depth of plantation	mm	1500
8	Overall Dimensions		
i)	Bottom Depth	mm	355
ii)	Top Depth	mm	185
iii)	Breadth	mm	100
9	Reinforcement Detail:		
i)	Diameter of Pre-stressing wire	mm	4
ii)	No. of Tensioned wires	Nos.	20
iv)	Length of each Pre-stressing wire	Mtr.	9
v)	Ultimate Tensile Strength	Kg/cm ²	17500
vi)	Steel Quantity	Kg/pole	22
vii)	Length of Earth Wire	Mtr	7.3
10	Concrete Detail		
i)	Cement Type		Ordinary Portland Cement
ii)	Grade		43/53 Grade
iii)	Type		M 42
ii)	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)
iii)	Concrete Quantity	Cubic meter/po	0.243 m ³
iv)	Concrete covering to wires	mm	22
11	GI earthing wire	SWG	6
12	Weight of PSC Pole	Kg	607
13	GI Earth Wire with top & bottom 200mm(min) projection outside.		250mm (from Top)
			1900 (from bottom)
14	18mm Holes at a distance from Top		100, 200,1000 mm
15	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
16	Tolerances Dimensions		a) ±15 mm on overall length of pole
			b) ±5 mm on sectional dimension
			c)0.5% on the uprightness of pole

Sl. No.	Particulars	Unit	Requirements
17	Marking (embossed/engraved/painted)		“Property of TPCODL/TPNODL/TPWODL/TPSODL, Odisha”, material code and P.O. No. with date along with the following details: 1. Manufacturer’s name. 2. Month and Year of manufacture. 3. Serial number of the pole 4. Position of centre
18	Depth of planting (Red Colour Painted)		A strip of 20-30 mm shall be painted with oil paint of red colour, on all over of the pole at a planting depth.

5. GENERAL CONSTRUCTIONS/REQUIREMENTS:

- The pole shall be manufactured as per TPCODL/TPNODL/TPWODL/TPSODL tender drawing and specification such that strength in the direction of the line shall not be less than one quarter of the strength required in transverse direction. The ultimate transverse load shall be assumed to act at 600mm below the top of the pole.
- 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 TPCODL/TPNODL/TPWODL/TPSODL approved lab / agency and submit the same for approval prior to commencement of work. This activity shall be completed within 30 days of issuance of PO. TPCODL/TPNODL/TPWODL/TPSODL shall within seven days provide comments / approval for the same. OPC 43/53 grade shall only be used in concrete.
- Curing of poles shall commence after setting of the concrete. The pole shall be covered with well burlaps, gunny bag and kept continuously moist, until transfer of prestress (de- tensioning). After this the curing may be continued either by providing moist covers as before or by immersion of the poles in the curing vat.
- Pre-stressing shall be done using a dynamometer.
- All tendon shall be cut flushing the surface and shall not remail projected. End capping at both end of the 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.
- Cement - Dalmia, Ultratech, Lafarge, Birla, Ambuja, ACC, Shree, Nuvoco. 4mm steel tendon – TATA, Bajrang, SAIL, Jindal, RINL.

6. MARKING:

Every pole shall be embossed/engraved/painted with “Property of TPCODL/TPNODL/TPWODL/TPSODL, Odisha”, material code and P.O. No. with date along with the following details.

- Manufacturer’s name.
- Month and Year of manufacture.
- Serial number of the pole
- Position of centre
- Depth of planting (Red Colour Painted)

A strip of 20-30 mm shall be painted with oil paint of red colour, on all over of the pole at a planting depth.

7. TESTS CERTIFICATE:

The bidder shall be required to submit complete set of the following test reports along with the offer

1. Transverse Strength Test
2. Ultimate Transverse Strength Test
3. Cube test
4. Dimensional Check

Acceptance test:

1. Dimensional Check for overall length, cross sectional, dimensional & uprightness
2. Transverse Strength Test
3. Test for Cover
4. Concrete Mix M42
5. Marking above Planting depth

8. TESTS:

The bidder shall furnish test certificates as mentioned above. In the event of any discrepancy in the test reports, i.e., any test report not acceptable same shall be carried out without any cost implication to TPCODL/TPNODL/TPWODL/TPSODL.

9. PRE DISPATCH INSPECTION:

Material shall be subject to inspection by a duly authorized representative of the TPCODL/TPNODL/TPWODL/TPSODL. Inspection may be made at any stage of manufacture at the option of the TPCODL/TPNODL/TPWODL/TPSODL and the equipment if found unsatisfactory as to workmanship or material is liable to rejection. Supplier shall grant free access to the places of manufacture to TPCODL/TPNODL/TPWODL/TPSODL representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPWODL/TPSODL authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications.

Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/TPNODL/TPWODL/TPSODL. Following documents shall be sent along with material

- a) Test reports
- b) MDCC issued by TPCODL/TPNODL/TPWODL/TPSODL

- c) Invoice in duplicate
- d) Packing list
- e) Drawings
- f) Delivery Challan
- g) Guarantee / Warrantee card
- h) Other Documents (as applicable).

10. INSPECTION AFTER RECEIPT AT STORES:

The material received at TPCODL/TPNODL/TPWODL/TPSODL Store/Site 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 the report shall be sent to Engineering department.

11. GUARANTEE:

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/manufacturing of items under the 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 day's time frame and to the entire satisfaction of TPCODL/TPNODL/TPWODL/TPSODL, failing which TPCODL/TPNODL/TPWODL/TPSODL will be at liberty to get it replaced/rectified at the bidder risks and cost and recover all such expenses plus the company's own charges (@20% of total expenses incurred) from the bidder or from the "Security from Performance Deposit" as the case may be.

12. PACKING:

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

13. TENDER SAMPLE:

Not Applicable.

14. QUALITY CONTROL:

The bidder shall submit QAP indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

15. TESTING FACILITIES:

Supplier/ Manufacturer shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant Indian standards.

16. MANUFACTURING ACTIVITIES:

The successful bidder shall submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer.

17. SPARES, ACCESSORIES AND TOOLS:

The bidder shall make his own arrangement for all the tools, plants and machineries such as formwork, electrically /Mechanically operated Mixer, Vibrator, Submersible Pump, Testing Machine, Gauges, Chain Pulley block, Gantries, measuring instrument, tension test assembly etc. required for manufacturing, inspection and testing of PSC Poles.

18. DRAWINGS AND DOCUMENTS:

Following drawings and documents shall be submitted in line with the requirement of Tender specifications:

- a) Signed & Stamped Copy of clause wise compliance of technical specification & Schedule of Deviations.
- b) Work Experience details.
- c) Type test certificates.
- d) Drawing 1 set of Hard Copy & Soft copy PDF File containing complete information about manufacturing.
- e) Signed & stamped copy of pre-bid queries.

19. GUARANTEED TECHNICAL PARTICULARS:

Bidder shall have to comply & submit clause wise compliance of this specification.

20. SCHEDULE OF DEVIATIONS:

(TO BE ENCLOSED WITH TECHNICAL 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 the purchaser's specifications:

Sl. No.	Clause No.	Details of deviation with justifications

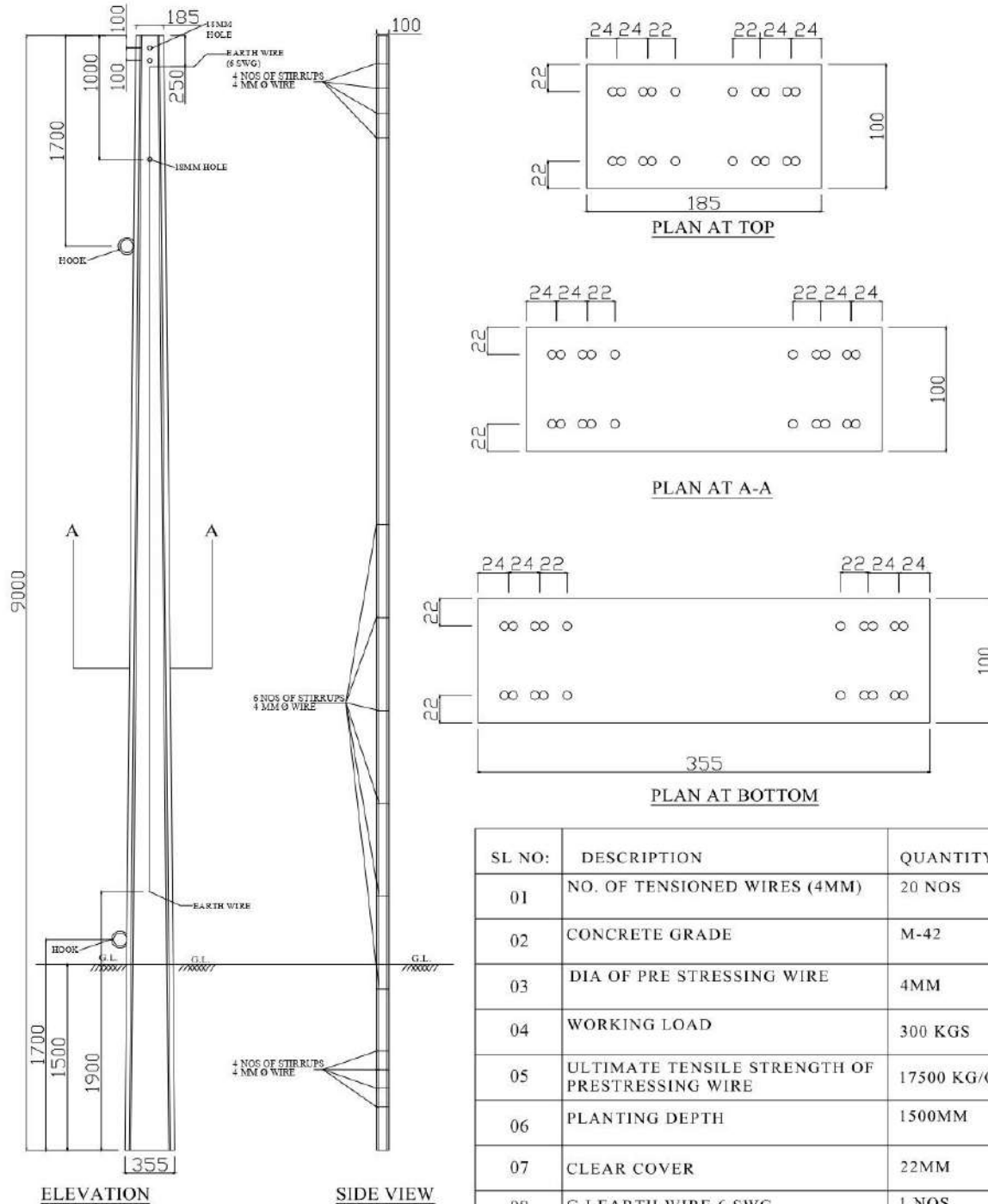
We confirm that there are no deviations apart from those detailed above.

Seal of the Company:

Signature

Designation

9 Mtrs /330KG PSC POLE



LEGENDS:-

- 1) DENOTES TENSIONED WIRE
2) DENOTES POSSIBLE OF EARTH WIRE
ALL DIMENSION ARE IN MM.

MARKING:

"MONTH & YEAR OF MFG."
 "MAKERS SERIAL NO."
 "TPCODL/TPNODL/TPWODL/TPSODL"
 "P.O. NO."