

# TECHNICAL SPECIFICATION FOR STEEL TUBULAR POLES FOR OVERHEAD LINES

## 1. SCOPE :

This specification covers the general requirements towards design, manufacture, testing at manufacturer's works, supply and delivery for tubular steel poles of circular cross section (Swaged type) for use in overhead lines.

## 2. STANDARD :

The tubular steel poles shall conform to the latest edition of Indian Standard specification IS: 2713 (Part - I, II): 1980.

## 3. TOPOGRAPHY AND CLIMATIC CONDITION of SITE :

The climatic and isoceraunic conditions at site are given below:

|     |   |   |
|-----|---|---|
| (a) | Maximum Ambient temp (°C)                               | : 45  |
| (b) | Minimum ambient temp. (°C)                              | : 4   |
| (c) | Maximum relative humidity                               | : 100%  |
| (d) | Average number of thunderstorm day per annum.           | : 75  |
| (e) | Maximum No. of rainy days/annum                         | : 120 days  |
| (f) | Average Rainfall  | : 1000 mm. to 3000 mm.                              |
| (g) | Maximum Wind pressure/wind speed                        | : 150 Kg/ Mtr. Sq.                                  |
| (h) | Height above sea level (m) not exceeding                | : 1000  |
| (i) | Earthquake acceleration horizontal seismic co-efficient | : As per IS:1893 (2016)<br>For Class-III & IV Zones |

## 4.0 MATERIALS :

4.1 The materials used in construction of tubular steel poles shall be of the tested quality of steel of minimum tensile strength 410 MPa (42 Kg/mm<sup>2</sup>).

4.2 The materials, when analysed in accordance with IS: 228 (Part-III: 1972) and IS: 228 (Part-IX) shall not contain sulphur and phosphorous more than 0.060% each.

## 5.0 TYPES, SIZE AND CONSTRUCTION :

5.1 Tubular Steel Poles shall be swaged type.

5.2 Swaged poles shall be made of seamless or welded tubes of suitable lengths swaged and jointed together. No circumferential joints shall be permitted in the individual tube lengths of the poles. If welded tubes are used they shall have one longitudinal weld seam only: and the longitudinal welds shall be staggered at each swaged joint.

5.3 Swaging may be done by any mechanical process. The upper edge of each joint shall be chamfered at an angle of about 45°. The upper edge need not be chamfered if a circumferential weld is to be deposited in accordance with clause No. 5.3 2 of IS: 2713 (Part-I):1980.

5.4 The length of joints on swaged poles shall be in accordance with clause No. 5.4 of IS: 2713 (Part-I): 1980.

5.5 Poles shall be well-finished, clean and free from harmful surface defects. Ends of the poles

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shall be cut square. Poles shall be straight, smooth and cylindrical. The welded joints, if any, shall be of best quality, free from scale, surface defects, cracks etc.

- 5.6 Tolerances for outside diameter, thickness, length, weight and straightness shall be in accordance with IS: 2713 (Part-I): 1980.
- 5.7 The poles shall be coated with black bituminous paint conforming to IS: 158-1968 throughout, internally and externally, up to the level which goes inside the earth. The remaining portion of the exterior shall be painted with one coat of red oxide primer as specified in IS: 2074-1979.
- 5.8 The Cap of Steel Tubular Poles of sizes 9 Mtr. and 11 Mtr. should be welded.

**6.0 EARTHING ARRANGEMENTS :**

For earthing arrangement a through hole of 14mm diameter shall be provided in each pole at height of 300mm above the planting depth.

**7.0 TESTS AND TEST CERTIFICATES :**

- 7.1 The following acceptance tests shall be conducted on finished poles:
  - a) Deflection test,
  - b) Permanent set test,
  - c) Drop test.
- 7.2 In addition to above, verification of dimensions as per IS: 2713 (Part-II): 1980 shall be carried out during acceptance test.
- 7.3 Number of poles selected for conducting different tests shall be in accordance with clause No. 10.1.1 and 10.1.2: of IS: 2713 (Part-I) 1980.
- 7.4 Tests shall be carried out before supply of each consignment at the manufacturer's works and test certificates shall be submitted to the purchaser for approval prior to delivery.
- 7.5 Re-tests, if any, shall be made in accordance with IS: 2713 (Part-I) 1980.
- 7.6 Purchaser reserves the right to inspect during manufacturing and depute his representative to inspect/test at the works.
- 7.7 If any extra cost is required for carrying out the above specified tests, the same shall be borne by the manufacturer.
- 7.8 The poles may also be marked with the ISI certification mark if applicable.
- 7.9 A Certificate in support of Tensile Test Parameter and Chemical parameter for sulphur and phosphorous conforming to relevant IS Code is to be provided from the supplier of the Steel material.

**8.0 MARKING:**

8.1 The poles shall be marked with designation, manufacturer's identification, year of

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manufacture and name of the purchaser.

- 8.2 Name of the purchaser in the form of "WBSEDCL" shall be punched/ engraved in each pole at a height of 3m and 3.3m from bottom of the pole for 9 mtr. and 11 mtr. respectively. Each alphabet of WBSEDCL shall be of size ¾ inch to 1(one) inch in height and ¾ inch width with ½ inch spacing between letters

**9.0 GUARANTEED TECHNICAL PARTICULARS :**

The tenderer shall furnish all necessary guaranteed technical particulars in the prescribed proforma enclosed hereinafter.

**10.0 DRAWING :**

Drawing shall be according to Tender Document.

**11.0 Documents to be submitted at the time of physical delivery at Consignee Stores:-**

The following documents to be submitted by the vendors to the Consignee Stores, at the time of despatch to stores by the vendors:-

- (i) Copy of Purchase Order.
- (ii) Copy of Despatch Instruction.
- (iii) Inspection Test Certificate.
- (iv) Guarantee Certificate.
- (v) Proforma Invoice.
- (vi) Challan in triplicate.
- (vii) Way bill, if applicable.

**Enclo: SCHEDULE -'A'**

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**SCHEDULE - 'A'**

**SPECIFIC TECHNICAL REQUIREMENTS FOR  
TUBULAR STEEL POLES: SWAGED TYPE**

|     |   | 9 meter long                                       | 11 meter long      |
|-----|---|--|--------------------|
| 1)  | <b>Standard</b>                                       | IS 2713(Part-I and II): 1980 as amended up to date |                    |
| 2)  | <b>Type of Pole</b>                                   | Swaged Type  |                    |
| 3)  | <b>Designation</b>                                    | 410 SP-31  | 410 SP-55          |
| 4)  | <b>Overall length</b>                                 | 9 meters   | 11 meters          |
| 5)  | <b>Planting Depth</b>                                 | 1.5 meters   | 1.8 meters         |
| 6)  | <b>Height above ground</b>                            | 7.5 meters   | 9.2 meters         |
| 7)  | <b>Effective length of each section</b>               |  |                    |
|     | a) <b>Bottom</b>                                      | 5 meters   | 5.6 meters         |
|     | b) <b>Middle</b>                                      | 2 meters   | 2.7 meters         |
|     | c) <b>Top</b>   | 2 meters   | 2.7 meters         |
|     | d)  |  |                    |
| 8)  | <b>Outside diameter and thickness of each section</b> |  |                    |
|     | a) <b>Bottom</b>                                      | 165.1 mm X 4.50 mm                                 | 193.7 mm X 4.85 mm |
|     | b) <b>Middle</b>                                      | 139.7 mm X 4.50 mm                                 | 165.1 mm X 4.50 mm |
|     | c) <b>Top</b>   | 114.3 mm X 3.65 mm                                 | 139.7 mm X 4.50 mm |
| 9)  | <b>Joint length</b>                                   |  |                    |
|     | a) <b>Bottom (J2)</b>                                 | 350 mm   | 400 mm             |
|     | b) <b>Top (J1)</b>                                    | 300 mm   | 350 mm             |
| 10) | <b>Approximate weight of the Pole</b>                 | 147 Kg   | 227 Kg             |
| 11) | <b>Point of application of load</b>                   | 0.3 meter from top                                 | 0.6 meter from top |
| 12) | <b>Breaking load</b>                                  | 517 kgf  | 650 kgf            |
| 13) | <b>Working load with factor of safety 2.5</b>         | 207 kgf  | 260 kgf            |
| 14) | <b>Crippling load</b>                                 | 367 kgf  | 462 kgf            |
| 15) | <b>Load for permanent set not exceeding 13mm</b>      | 251 kgf  | 316 kgf            |
| 16) | <b>Load for temporary deflection of 157.5 mm</b>      | 139 kgf  | 130 kgf            |
| 17) | <b>Tolerance</b>                                      | As per IS: 2713 (Part-I & Part-II): 1980           |                    |
| 18) | <b>Finish</b>   | As per IS: 2713 (Part-I & Part-II): 1980           |                    |
| 19) | <b>Manufacture clause</b>                             | As per IS: 2713 (Part-I & Part-II): 1980           |                    |

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**GUARANTEED TECHNICAL PARTICULARS.**

(To be filled in by the Tenderer)

1. Type of Pole offered
2. a) Whether tubes are of seamless construction Or welded type.  
b) Is it manually welded tubes? If so, state name/address of manufacturer  
c) Is it ERW tubes? If so, state name/address of manufacturer.
3. Overall length
4. Effective length of section  
a) Bottom  
b) Middle  
c) Top
5. Effective dia. and thickness of section  
a) Bottom  
b) Middle  
c) Top
6. Approximate weight (Kg.)
7. Breaking Load (Kg.)
8. Working Load (Kg.)
9. Weight/Mtr.  
i) Top Section (kg)  
ii) Middle Section (kg)  
iii) Bottom Section (kg)
10. Crippling load (kg)
11. Load for permanent set
12. Load for temporary deflection
13. Joint length  
(i) J1 - (ii) J2 -
14. Standard according to which the Pole will be manufactured and tested
15. Tolerance
16. Finish
17. Manufacture clause

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