

**SECTION - VIII**  
**TECHNICAL SPECIFICATIONS**



**TECHNICAL SPECIFICATIONS OF STEEL TUBULAR POLES OF VARIOUS  
SIZES FOR OVERHEAD POWER LINES  
AGAINST NIT No: SE/Proc/03/2019-20**

**1. SCOPE:**

- 1.1. 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 overhead lines.

**2. STANDARD:**

- 2.1. The tubular steel poles shall conform to the latest edition of Indian Standard specifications IS-2713 (Part-I & III): 1980 (amended up-to date) except where specified otherwise in this specification.

**3. MATERIALS:**

- 3.1. The materials used in construction of tubular steel poles shall be of the tested quality of steels of minimum tensile strength 410 MPa (: 42.0 Kgf/mm<sup>2</sup>) and yield strength 240MPa.
- 3.2. The materials, when analyzed in accordance with IS: 228 (Part-III: 1972) and IS: 228 (Part-IX) shall not show sulphur and phosphorous contents of more than 0.060 percent each.

**4. TYPE, SIZE AND CONSTRUCTION:**

- 4.1 Tubular Steel Poles shall be swaged type.
- 4.2. 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.
- 4.3. 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 amended up to date.
- 4.4. The length of joints on swaged poles shall be in accordance with clause No.5.4 of IS: 2713(Part-I): 1980 amended up to date.
- 4.5. Poles shall be well-finished, clean and free from harmful surface defects. Ends of the Poles shall be cut square. Poles shall be straight, smooth and cylindrical. The weld joints, if any, shall be of good quality, free from scale, surface defects, cracks, etc.



- 4.6. Tolerances for outside diameter, thickness, length, weight and straightness shall be in accordance with IS: 2713 (Part-I): 1980 amended up to date.
- 4.7. The poles shall be coated with black bituminous paint conforming to IS: 158-1968 throughout 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.
- 4.8. Base Plate of the size 350x350x5 mm shall be welded at the bottom of steel tubular poles. Weight of base plate shall not be less than 4.80 kgS and shall be clearly specified in the furnished GTP.
- 4.9. Steel tubular poles shall be provided with steel pole cap.

## **5. EARTHING ARRANGEMENTS:**

- 5.1. The earthing of steel tubular poles shall be facilitated by welding a 75mm piece of 75x40x6mm galvanized channel at a height of 300mm from ground level (black paint). The channel piece shall be provided with an 18mm dia hole and 16mm galvanized bolt with GI flat and spring washer. The hot dip galvanizing of the channel piece shall be carried out after cutting and drilling of hole so that no rusting takes place at the connection point of earth.

## **6. MARKING:**

- 6.1 The pole shall be Mouse Stamped (metal stamped). On each pole in addition to the marking as mentioned in the IS: 2713 (Part I & III) of 1980 (amended up to date) the following shall be mouse stamped (metal stamped) one meter above the earthing hole of earthing arrangement:
  1. CE P&P,KPDCL
  2. Name of the Firm.
  3. Month and year of manufacture.
- 6.2 The pole at a height of planting depth from the bottom of the Pole shall have inscription as "GL".



## **7. GUARANTEED TECHNICAL PARTICULARS:**

- 7.1. The bidder shall furnish all necessary guaranteed technical particulars in the prescribed proforma enclosed hereinafter. The specific technical requirements of steel tubular poles is attached herewith as Annexure-A.



## **8. INSPECTION/TESTS:-**

Inspection/Tests shall be carried out strictly as per IS: 2713 (Part-I, III) amended up to date.

### **8.1 Stage Inspection**

- i. Pipes shall be ISI Marked and original Test certificates to be furnished
- ii. Measurement of dimensions of pipes i.e. Length, Diameter and thickness.
- iii. Measurement of dimensions of base plate and cap.
- iv. Protection against corrosion.
- v. The supplier shall also submit the test certificates from original manufacturer/reputed laboratory certifying the requisite tensile strength of the Steel Tubes at the time of stage inspection without which the inspection shall not be treated as confirmed.
- vi. Test certificates showing chemical analysis for sulphur and phosphorous content shall also be submitted at the time of stage inspection.

### **8.2 Final Inspection: -**

- i. Quality of workmanship.
- ii. Earthing arrangement and markings.
- iii. Weight of Pole.
- iv. Deflection test.
- v. Permanent set test.
- vi. Drop test.
- vii. Measurement of overall length and length of sections.
- viii. Straightness of Pole.

8.3 The supplier shall submit two copies of inspection reports (Stage as well as Final) complete in all respects including Tensile Strength test certificate, Chemical analysis test certificates, material purchase invoices and all other related documents to the office of Chief Engineer P&P Wing KPDCL Srinagar and SE Procurement (KPDCL). The proforma for Stage as well final inspection is attached herewith as Annexure-B & C.

8.4 Number of poles selected for conducting different tests shall be in accordance to clause no. 10.1.2: of IS: 2713 (Part-I) amended up to date.

8.5 Tests shall be carried out before supply of each consignment at the manufacturers' works and test certificates should be submitted to the purchaser for approval prior to delivery.



- 8.6 Re-tests, if any, shall be made in accordance with IS: 2713 (Part-I) amended up to date.
- 8.7 Purchaser reserves the right to inspect during manufacturing process and depute his representative to inspect/test at the works.
- 8.8 If any extra cost is required for carrying out the above specified tests, the same shall be borne by the manufacturer.
9. **DEVIATION:** -  
Any deviation in technical specification shall be clearly indicated with sufficient reasons thereof. Purchaser shall however reserve the right to accept and/or reject the same without assigning any reasons what-so-ever.

JE	AEE	Executive Engineer	Superintending Engineer Procurement (KPDCL)
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**ANNEXURE- A**

**TECHNICAL REQUIREMENTS FOR STEEL TUBULAR POLES**  
**(SWAGED TYPE)**

S.no	Description	8.0 meter Long	9.0 meter Long	11.0 meter Long
1.	Standards	IS:2713(Part-I and II):1980 as amended up to date	IS:2713(Part-I and II):1980 as amended up to date	IS:2713(Part-I and II):1980 as amended up to date
2	Type of Pole	Swaged type	Swaged type	Swaged type
3	Designation	410 SP 15	410 SP 33	410 SP 56
4	Overall Length	8 meters	9 meters	11.0 meters
5	Planting depth	1.5 meters	1.5 meters	1.80 meters
6	Height above ground	6.5 meters	7.5 meters	9.20 meters
7	Effective length of each section a)Bottom b)Middle c)Top	4.5 meter 1.75 meter 1.75 meter	5.0 meter 2.0 meter 2.0 meter	5.60 meter 2.70 meter 2.70 meter
8	Outside diameter and thickness of each section a)Bottom b)Middle c)Top	139.7x5.40mm 114.3x4.50mm 88.9x3.25mm	165.1x5.40mm 139.7x4.50mm 114.3x3.65mm	193.7 x 5.40 mm 165.1 x 4.50 mm 139.7 x 4.50 mm
9	Class of Tubes: a) Bottom b) Middle c) Top	Heavy Medium Light	Heavy Light Light	Medium Light Light
10	Joint length(in cms) a) Bottom(J2) b) Top(J1)	30 cm 23 cm	35 cm 30 cm	40 cm 35 cm
11	Approx. weight of Pole	119.0 Kgs	164.0 Kgs	241 Kgs
12	Point of application of load from top at a distance of	0.3 meter	0.3 meter	0.60 meter
13	Breaking load (kgf)	499	612	713 kgf



14	Working load with factor of safety of 2.5 (kgf)	200	245	285 kgf
15	Crippling load (kgf)	354	435	502 kgf
	Load for permanent set not exceeding 13mm (kgf)	243	297	347 kgf
16	Load for temporary deflection of 157.5mm (kgf)	140	157	140 kgf
17	Tolerance	IS:2713(Part-I and II):1980 as amended up to date	IS:2713(Part-I and III):1980 as amended up to date	IS:2713(Part-I and III):1980 as amended up to date
18	Finish			
19	Manufacturing clause			

**JE**

**AEE**

**Executive Engineer**

**Superintending Engineer  
Procurement (KPDCL)**



**Guaranteed Technical Particulars**  
**(To be furnished by the bidders)**

S. No	Description	Tenderer's Response
1	Type of pole offered	
2	a) Whether tubes are of seamless construction or welded type.	
	b) 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 diameter and thickness of section	
	a) Bottom	
	b) Middle	
	c) Top	
6	Approximate Weight of Pole (Kgs)	
7	Approximate Weight of Base Plate (Kgs)	
8	Breaking Load (Kgf)	
9	Working Load (Kgf)	
10	Weight / meter	
	a) Top section (Kgs)	
	b) Middle section (Kgs)	
	c) Bottom section (Kgs)	
11	Crippling Load (Kgf)	
12	Load for permanent set	
13	Load for temporary deflection	
14	Joint Length	
	(J1)	
	(J2)	

Signature of the tenderer: \_\_\_\_\_

Name: \_\_\_\_\_

Designation: \_\_\_\_\_



**Proforma for Stage Inspection****A. GENERAL DETAILS:**

Name of the Firm	
Place of Inspection	
Name of the Inspector/ Agency	
Name of the Departmental Representative	
Offered Material Description	
Material Specification as per IS-	
Purchase Order No/Date	
Stage Inspection letter No/Date	
Date of Inspection	
Quantity offered for Inspection	
Sampling as per IS-	
Number of Sampled Poles	
Make of Steel Tubes	
Whether Steel Tubes ISI marked (Yes/No)	
ISI marking details (IS/Licence No)	

**B. OBSERVED DETAILS AS PER INSPECTION/TESTS CONDUCTED:**

S.No	Requirements as per GTP/IS with Tolerance	Pole No.1	Pole No.2	Pole No.3	Pole No.4	Pole No.5
<b>Length in Mtrs</b>						
Bottom						
Middle						
Top						
<b>Thickness in Mtrs</b>						
Bottom						
Middle						
Top						
<b>Outer Diameter in Mtrs</b>						
Bottom						
Middle						
Top						
<b>Class of Tubes</b>						
Bottom						
Middle						
Top						



<b>Base Plate</b>						
Size of Base Plate: (350x350x5) mm						
Weight of Base Plate						
<b>Painting material availability</b>						
<b>Whether metal engraving stamp for marking available</b>						
<b>Inspection tools/Testing facilities</b>						
Drop Test facility						
Deflection Test bench						
Digital Weighing Machine						
Precision Tools availability						

**C. DETAILS OF TEST CERTIFICATES FOR TENSILE STRENGTH & CHEMICAL COMPOSITION:**

Test Certificate No/Date	
Material Purchase Challan/Invoice No/Date	
Test Certificate issued by	
Challan/Invoice issued by	
Test Certificate issued in favour of	
Challan/Invoice issued in favour of	
Whether Test Certificate duly attested (sign/stamp) both by the original manufacturer & supplier firm (Yes/No)	
Whether Challan/Invoice duly attested (sign/stamp) both by the original manufacturer & supplier firm (Yes/No)	

**Remarks:**

The above inspection has been conducted strictly as per GTP of above mentioned Purchase Order and IS-2713:1980 amended up to date. The tensile strength and chemical composition properties has been taken as per the certificates issued by



\_\_\_\_\_, details of which have been mentioned above.  
Copies of test certificates as well as Challan/Invoice is enclosed.

*As per the observed inspection and test certificate for tensile strength & chemical composition, the material offered conforms to the requirements of GTP of above mentioned Purchase Order and IS-2713:1980 amended up to date and is hereby recommended for manufacturing of finished poles.*

Mr. _____	Mr. _____	Mr. _____
M/S _____	Designation: _____	Designation: _____
Supplier Firm's representative	Departmental Representative	Inspector _____



**Proforma for Pre-Delivery/Final Inspection****A. GENERAL DETAILS:**

Name of the Supplier Firm	
Place of Inspection	
Name of the Inspector/ Agency	
Name of the Departmental Representative	
Offered Material Description	
Material Specification as per IS-	
Purchase Order No/Date	
Final Inspection letter No/Date	
Stage Inspection Certificate No/Date	
Date of Final Inspection	
Quantity offered for Final Inspection	
Quantity Inspected for Final Inspection	
Sampling as per IS-	
Number of Sampled Poles	
Make of Steel Tubes	
Whether Steel Tubes ISI marked (Yes/No)	
ISI marking details (IS/Licence No)	

**B. OBSERVED DETAILS AS PER INSPECTION/TESTS CONDUCTED:**

S. No	Requirements as per GTP/IS with Tolerance	Pole No.1	Pole No.2	Pole No.3	Pole No.4	Pole No.5
<b>i. Type of Pole</b>	Swaged					
<b>ii. Length in mm</b>						
Overall Length						
Bottom Section						
Middle Section						
Top Section						
Planting Depth						
Height above ground						
<b>iii. Outer Diameter in mm</b>						
Bottom Section						
Middle Section						
Top Section						



<b>iv. Class of Tubes</b>						
Bottom						
Middle						
Top						
<b>v. Joint Length in mm</b>						
Top (J1)						
Bottom (J2)						
<b>vi. Weight of Pole</b>						
<b>vii. Deflection Test</b>						
<b>viii. Permanent Set Test</b>						
<b>ix. Drop Test</b>						
<b>x. Protection against Corrosion (Painting status)</b>						
<b>xi. Base Plate (Weight &amp; Size)</b>						
<b>xii. Pole Cap</b>						
<b>xiii. Straightness of Pole</b>						
<b>xiv. Earthing Arrangement</b>						
<b>xv. Marking</b>						

**Remarks:**

The above inspection has been conducted strictly as per GTP of above mentioned Purchase Order and IS-2713:1980 amended up to date.

QUANTITY OFFERED: \_\_\_\_\_

QUANTITY INSPECTED: \_\_\_\_\_

QUANTITY ACCEPTED: \_\_\_\_\_

*As per the observed inspection, the material offered conforms to the requirements of GTP of above mentioned Purchase Order and IS-2713:1980 amended up to date and is hereby accepted and recommended for dispatch.*

Mr. \_\_\_\_\_

M/S \_\_\_\_\_

Supplier Firm's representative

Mr. \_\_\_\_\_

Designation: \_\_\_\_\_

Departmental Representative

Mr. \_\_\_\_\_

Designation: \_\_\_\_\_

Inspector \_\_\_\_\_