

## 1.0 TUBULAR STEEL POLE (Non Swaged Type)

### 1. Scope

1.1 This Specification covers the design, fabrication, testing and supply of tubular steel poles commonly used in overhead power lines.

### 2. General

The steel pole shall be fabricated in several lengths and strengths as specified in Table 1 contained herein.

### 3 Descriptions

3.1 The steel poles shall be of non swaged design and shall consist of three (3) separate lengths of steel tubing non swaged at two joints to fabricate the poles. However, there are some numbers of poles as mentioned in the price and delivery schedule which shall be of folding type. The quantities of such folding poles shall be intimated at the time of contract.

3.2 The steel tubing used in pole fabrication shall be of steel of any approved process possessing a minimum tensile strength of 42 Kg/sq. mm and a chemical composition of not more than 0.06% sulphur and not more than 0.06% phosphorous.

3.3 The tubing diameter and tubing wall thickness shown in Table 1 for each length of pole are the minimum size to be used in fabricating each length of pole. It shall be the responsibility of the BIDDER to determine the adequacy of the component tubing shown for the load to be sustained. However, in no case the tubing diameter and wall thickness for any component tube be less than the value shown in Table 1.

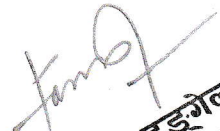
3.4 Tubular poles shall be made of welded tubes, non swaged and joined together. The upper edge of each joint shall be chamfered at an angle of about 45-degree. The steel poles shall be composed of three sections of diminishing diameters and minimum diameter thickness and lengths of pole shall be as shown in Table 1.

3.5 All tubes forming parts of the above supports shall be made from hot insulated seamless or continuously welded steel in accordance with BS 6323 or equivalent applicable Standards.

3.6 The whole length of the poles shall be painted with enamel red oxide

3.7 Each pole shall be provided with a steel top plate 3-mm minimum thickness welded to the end of the section. The top plate shall not project beyond the perimeter of the top section. Each pole shall also be provided with a welded base plate welded to the bottom of the pole.

3.8 The pole shall, be drilled in accordance with the drilling patterns as defined in the Figure. All the holes shall be of 18 mm dia. However, the manufacturer must get approval of the drilling pattern before manufacturing the poles. Each pole shall be marked with the appropriate length as shown in Figure.

  
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3.9 The folding type of poles shall be fabricated in such a way that the section pieces can be carried to the site and fitted on the site itself. The pole section on top shall have a flange and the section under it shall overlap to a length of 25 cm as shown in the diagram. The poles shall be drilled in such a way that the section in top could be securely fixed the section under it by two bolts of 5/8" x 7" at 90 degree each other.

3.10 Each pole shall be marked with the appropriate length a shown in table 1.the length of designation followed by the appropriate drilling pattern letter, shall be black stencil painted with numerical and letters approximately five (5) centimeters in height e.g-11-c the marking shall be located on the surface f the pole at distance of 1.5 meters above the deign ground line. The size of the base plate shall be (300\*300\*6mm).

3.11 The Approx weight of pole  $70 \pm 5$  Kg without Base Plate.

#### 4 Tolerances

4.1 The following tolerances shall be maintained:

a) Tolerance of diameter:  $\pm 1\%$

b) Tolerance on weight:  $\pm 7.5\%$  on each pole.

$\pm 5\%$  on a bulk load.

c) Tolerance on thickness:  $\pm 10\%$  on each sheet.

e) Straightness: The finished poles shall not be out of straightness by more than  $1/600$  of the height.

#### 5. Tests

5.1.The following test (s) shall be performed for the pole furnished.

a Tensile test and chemical analysis for sulphur and phosphorous

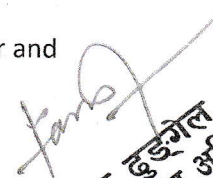
b. Deflection test

c. Permanent set test

d. Drop test

5.2 Number of poles selected for conducting tensile test and chemical analysis for sulphur and phosphorous shall be as given below:

Lot Size	No. of poles
Up to 500	1

  
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501 to 1000	2
1001 to 2000	3
2001 to 3000	4
3001 and above	5

5.3 Number of poles selected or conducting deflection test, permanent set test and drop test shall be as given below:

Lot Size	No. of poles
Up to 500	5
501 to 1000	8
1001 to 2000	13
2001 to 3000	18
3001 and above	20

The deflection test, permanent set test and drop test shall be conducted in succession on each of the poles selected.

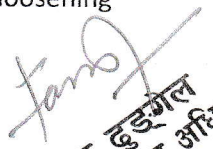
#### 5.4 Deflection Test

Each pole shall be rigidly supported for a distance from the butt end equal to the depth which it is to be planted in the ground. It shall then be loaded as cantilever and the appropriate deflection load of Table applied at right angles of the axis of pole 30 cm from the top of the poles up to 9 m ( overall ) and 60 cm from the top for poles over 9 m ( overall). For convenience in testing, the pole may be fixed horizontally and the load applied vertically. The temporary deflection due to the applied load at the point of application of load shall not exceed 157.5 mm.

5.5 Permanent Set Test This test shall be carried out immediately after the deflection test. After application of proper load specified in Table 1 the permanent set measured from the zero position after the release of the appropriate applied load at the point of application of the load shall not exceed 13 mm.

#### 5.6 Drop Test

The test shall be made in the case of swaged poles. The pole shall be dropped vertically with the butt end (bottom end) downwards, three times in succession from a height of 2 m on to a hardwood block 150 mm thick laid on concrete foundation. The pole shall not show any signs of telescoping or loosening of joints.

  
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As Per IS 1611 : 1998



STEEL TUBE FOR STRUCTURAL PURPOSES SPECIFICATION ( FOURTH REVISION)

Technical Details:

Poles as Per IS:2713	DESIGNATION	OVER-ALL LENGTH	PLANTING DEPTH	LENGTH OF SECTIONS			OUTSIDE DIAMETER AND THINCKNESS OF SECTIONS			APPROX WEIGHT OF POLE	BREAKING LOAD	LOAD FOR PERMANENT SET	LOAD FOR TEMPORARY DEFLECTION
				Bottom	Middle	Top	Bottom	Middle	Top				
-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	-13	
	(m)	(m)	(m)	(m)	(m)	(mm)	(mm)	(mm)	(kg)	N(kgf)	N(kgf)	N(kgf)	
410-SP - 2	7	1.25	4	1.5	1.5	114.3 X 4.50	88.9 X 4.05	76.1 X 3.25	70±5	3100 (316)	1940 (198)	941 (96)	

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