WEST BENGAL STATE ELECTRICITY DISTRIBUTION COMPANY LTD.
Office of The Material Controller,Central Stores & Purchase Department.
Bidyut Bhaban(10th Flr.), Bidhannagar,Kolkata-700091

TECHNICAL SPECIFICATION FOR TUBULAR

STEEL POLES FOR OVERHEAD LINES

SCOPE :

1.1 This specification covers the general requirements towards design, manufacture, testing at manufacturers works, supply and delivery for tubular steel poles of circular cross section (swaged type) for overhead lines.

2.0 STANDARD :

2.1 The tubular steel poles shall conform to the latest edition of Indian Standard specification IS: 2713 (Part – I, III) : 1980 or any other authoritative standards (as amended up-to- date) except where specified otherwise in this specification.

3.0 Topography and Climatic Condition :

3.1 The materials offered, shall be suitable for operation in tropical climate and will be subjected to the sun and inclement weather and shall be able to withstand wide range of temperature variation. For the purpose of design, average atmospheric temperature may be considered to be 50 ^{o}C with humidity nearing saturation.

4.0 Materials :

4.1 The materials used in construction of tubular steel poles shall be of the tested quality of steels of minimum tensile strength 540 MPa (: 55 Kgf/mm2).

4.2 The materials, when analysed in accordance with IS : 228 (Part-III : 1972) and IS : 228 (Part-IX) shall not show sulpher and phosphorous contents of more than 0.060 percent 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 if at an angle of about 45o. 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.

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

5.5. 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 culindrical. The weld joints, if any, shall be of good 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, upto 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.

6.0 Earthing Arrangements :

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

7.0 Tests and Test Certificates :

7.1 The following tests shall be conducted on finished poles :

A. Tensile test and chemical analysis for sulpher and phosphorous ,
B. Deflocation test,
C. Permanent set test, and
D. Drop test.

7.2 In addition to above verification of dimensions as per IS : 2713 (Part-III) : 1980 shall be carried out during acceptance lots.

7.3 Number of poles selected for conducting different tests shall be in accordance to clause No. 10.1.1 and No. 10.1.12: of IS: 2713 (Part-I) 1980.

7.4 Tests shall be carried out before supply of each consignment at the manufacturers woks and test certificates should 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 tenderer.

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8 Marking :

8.1 The poles shall be marked with designation, manufacturer's identification, year of manufacture and name of the purchaser: WBSEB.

8.2 The poles may also be marked with the ISI certification mark if applicable.

9.0 Guaranteed technical particulars :

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

10.0 Schedule of requirement :-

10.1 The schedule of requirement given in the price schedule of Annexure is tentative and may vary at the time of placement of order.

10.2 The tenderer shall fill the schedule of price given at Annexure and submit the same in quadruplicate.

11.0 Price :-
The tenderers are required to quote variable price as per the price variation formula enclosed hereinafter. The tenderer shall also indicate the maximum ceiling limit of such price variation clearly in their offer.

12.0 Performance :-

12.1 The tenderer shall furnish a list of the major supplies effected during the last 3 (three) years indicating the volume of supply and actual delivery dates alongwith the bids.

12.2 Tenders may not be considered if the past manufacturing experience is found to be less that 3 (three) years.

13.0 Deviation :-

13.1 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.

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ANNEXURE –'A'

SPECIFIC TECHNICAL REQUIREMENTS FOR TUBULAR STEEL POLES : SWAGED TYPE

	9 meters long	11 meters long	13 meters long
1) **Standard**	IS: 2713 (Pat-I and III): 1980 as amended upto date		
2) **Type of Pole**	Swaged Type		
3) **Designation**	540 SP 28	540 SP 52	540 SP 72
4) **Overall Length**	9 meters	11 meters	13 meters
5) **Planting depth**	1.5 meters	1.8 meters	2.0 meters
6) **Height above ground**	7.5 meters	9.2 meters	11.0 meters
7) E**ffective length of Each section.**			
a) Bottom	5.0 meters	5.6 meters	5.80 meters
b) Middle	2.0 meters	2.7 meters	3.60 meters
c) Top	2.0 meters	2.7 meters	3.60 meters
8) **Outside diameter and Thickness of each Section.**			
a) Bottom	139.7x 4.50 mm	165.1x4.50 mm	219.1x5.90 mm
b) Middle	114.3x3.65 mm	139.7x4.50 mm	193.7x4.85 mm
c) Top	88.9x3.25 mm	114.3x3.65 mm	165.1x4.50 mm
9) J**oint Length (in cm.):**			
a) Bottom (J2)	30 cm.	35 cm.	45 cm.
b) Top (J1)	23 cm.	30 cm.	40 cm.
10) **Approximate weight of Pole**	113 Kg.	175 Kg.	343 Kg.
11)P**oint of application of load below/top (mtr.)**	0.3 mtr.	0.6 mtr.	0.6 mtr
12) **Breaking load (in Kgf)**	478	567	1084
13) **Working load with factor of Safety : 2.5 (in Kgf)**	191	227	435 Kg.
14) **Crippling load (in Kgf)**	339	403	770 Kg.
15) L**oad for permanent set Not exceeding 13mm (in Kgf)**	232	276	527 Kg.
16) L**oad for Temporary Deflection of 157.5 mm (in Kgf)**	76	74	121
17) **Tolerance**	As per IS : 2713 (Part-I & Part-III): 1980		
18) **Finish**		-do-	
19) **Manufacturing clause**		-do-	

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Annexure 'B'

TECHNICAL GUARANTEED AND OTHER PARTICULARS.
(To be filled in by the Tenderer)

1. Type of Pole offered
2. a) Whether tubes are of seamless constn. Or welded type.
   b) Is it manually welded tubes? If so, state name/address of manufacturer
   c) It is 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 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

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PRICE VARIATION FORMULA

Price variation for steel without any ceiling limit will be accepted by us. For the calculation of Price Variation the necessary formula is given below. Price variation other than steel will not be accepted.

X) Basic rates of H.R. Coil(2mm to 10mm) announced by SAIL vide their latest Circular in force 30 days prior to the date on which the tender is due. The same should be submitted along with the tender.

Y) Final price of H.R. Coil(2mm to 10mm) announced by the SAIL which is in force one month prior to the date of offering of inspection along with the Test Certificates.

A) Difference in price/pole in Rs. …… due to enhanced price of H.R. Coil.

W) Weight of each pole in Kg. Without considering tolerance.

C% Advalorem S.T.(if applicable) depending on the place from which the steel is supplied).

The formula is given below considering the fact that 1.1764M/T of H.R. Coil is required for fabrication of 1 M/T Black Steel pipe.

$$A = \frac{[\,(Y-X) + C\% \times (Y-X)] \times 1.1764 \times W}{1000}$$

The claim (if any) arising our of price escalation should be fully substantiated by valid documents.

ANNEXURE-II

PRICE VARIATION FORMULA :

Price variation for steel without any ceiling limit will be accepted by us. For the calculation of Price Variation, the necessary formula is given below. Price variation other than steel will not be accepted.

X) Basic rates of H.R. Coil(2mm to 10mm) announced by SAIL vide their latest Circular in force 30(Thirty) days prior to the date on which the tender is due. The same should be submitted along with the tender.

Y) Final price of H.R. Coil(2mm to 10mm) announced by the SAIL which is in force one month prior to the date of offering of inspection along with the Test Certificates.

A) Difference in price/pole in Rs. …… due to enhanced price of H.R. Coil.

W) Weight of each pole in Kg. Without considering tolerance.

C% Advalorem S.T.(if applicable depending) on the place from which the steel is supplied).

The formula is given below considering the fact that 1.1764M/T of H.R. Coil is required for fabrication of 1 M/T Black Steel pipe.

$$A = \frac{[(Y-X) + C\% \times (Y-X)] \times 1.1764 \times W}{1000}$$

The claim (if any) arising out of price escalation should be fully substantiated by valid documents.