Kashmir Power Distribution Corporation Ltd.
Office of the Chief Engineer Planning & Procurement,
PDD Complex, Bemina, Srinagar.
Email: ceppkpdcl@gmail.com

TECHNICAL SPECIFICATIONS

AND

GUARANTEED TECHNICAL PARTICULARS

FOR

STEEL TUBULAR POLES OF VARIOUS SIZES FOR OVERHEAD POWER LINES

Prepared by	Checked by	Checked by	Checked by	Approved by
Er. Javid Ahmad Sidiqui (AEE) Er.Sheikh Abid (JE)	Er. Manzoor Ahmad Dar Executive Engineer, Procurement Circle, KPDCL	Er. Muzafar Mukhtar Shah, Superintending Engineer, Procurement Circle,KPDCL	Er. Muzafar Mukhtar Shah Chief Engineer, P&P Wing, KPDCL, Srinagar.	Techno Economic Committee vide No. MD/KPDCL/ TS-I/3266-72 Dated 06-01-2023
Specification/GTP No: CE/P&P/SPEC-GTP/2023/ST Poles/020		Date of Issue: 07/01/2023		Revision:0

This Tender Specification and Guaranteed Technical Particulars are for tendering purpose only and may be subjected to the modification by the purchaser as per actual field requirement. Contractor/Supplier to submit the Guaranteed Technical Particulars (GTP) and Drawings, after the award of the Contract, for approval of the Purchaser.

In case any discrepancy is noticed in this Specification/GTP, please report to Chief Engineer P&P, KPDCL.

CLIMATIC AND ISOCERAUNIC CONDITIONS (CIC)

1.	The climatic and Isoceraunic conditions at the site of work are approximately given asunder:	
	Description	Kashmir
i)	Max. temp of air in shade	30.6^0C
ii)	Min. temp of air in shade	-20^0C
iii)	Max. temp of air in sun	45^0C
iv)	Height above sea level (App.)	1600 Mtrs.
v)	Max. relative humidity	90%
vi)	Min. relative humidity	15%
vii)	Average no. of thunderstorm days per year	54
viii)	Average rainfall	80 cm
ix)	Wind Zone	WZ –3
x)	Average number of rainy days per year	106
xi)	Seismic Zone	SZ–5
xii)	Area of installation	Heavy Snow Zone
2.	**Communication and Transport:** The nearest railway station is Udhampur on the broad gauge line and is connected to the Divisional Stores by a metal road. The equipment is required to pass en-route through various tunnels on NH-44 (Nandni, Nashri and Jawahar Tunnel). The weight and maximum dimensions of the packages suitable for transportation through tunnel route are as follows:- **1.** Length=7.0 m **2.** Width=3.0 m **3.** Height=4.55 m **4.** Weight=40 MT The supplier shall get the permissible weight and dimensions confirmed from the Highway Authorities before proceeding with the manufacture of the equipment. It will be the responsibility of the supplier to ensure timely and proper delivery of the equipment on door delivery basis, at Srinagar, through road transport. The supplier shall also ensure that the weights and dimension of the packages which are suitable to be carried by road transport up to Srinagar.	
3.	**Additional conditions**	
i	Permitted Noise Level	45 dB
ii	Induced Electromagnetic disturbance	1.6 kV
iii	Pollution class/Creepage distance	III/ 25mm/kV
iv	Isoceraunic Level (days/year)	50
v	Condensation	Occasional

TECHNICAL SPECIFICATIONS OF STEEL TUBULAR POLES OF VARIOUS SIZES FOR OVERHEAD POWER LINES

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) of various sizes for overhead lines.

1.2 It is not the intent to specify completely herein all details of the design and construction of equipment. However, the equipment shall conform in all respects to high standards of engineering, design and workmanship and shall be capable of performing in continuous commercial operation up to the Bidder's guarantee in a manner acceptable to the Purchaser, who will interpret the meanings of drawings and specification and shall have the power to reject any work or material which, in his judgment, is not in accordance therewith.

1.3 The equipment offered shall be complete with all components necessary for their effective and trouble free operation. Such components shall be deemed to be within the scope of Bidder's supply irrespective of whether those are specifically brought out in this specification or not.

2. STANDARD:

2.1. The tubular steel poles shall conform to the latest edition of Indian Standard specifications IS-2713 (Part-I-II):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 Kg-f/mm^2) and yield strength 240 MPa.

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^o. The upper edge needs 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 from both internally and externally 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. M.S 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 kg and shall be clearly specified in the furnished GTP.

4.9. Steel tubular poles shall be provided with steel pole cap.

5. EARTHING ARRANGEMENTS:

The earthing of steel tubular poles shall be facilitated by welding a 75 mm piece of 75x40x6 mm galvanized channel at a height of 300 mm from ground level (black paint) as per drawing No. CE/P&P/Drg./2022-STP-E001 Dated 30-03-2022 available at the official website of KPDCL. The channel piece shall be provided with two holes one each from 40 mm side having 18 mm diameter and 16 mm 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 /metal stamped in addition to the marking as mentioned in the IS: 2713 (Part I & II) of 1980 (amended up to date). The following information shall be mouse/metal stamped on the pole one meter above the earthing channel piece of the earthing arrangement:

1. CE P&P Wing, 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 herein after. The Guaranteed Technical Particulars of steel tubular poles is enclosed 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 Purchaser. 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.

10. CHALLENGE CLAUSE:

The purchase reserves the right to have the material, received after inspection by the authorized inspecting officer, again tested for any parameter(s) from approved/NABL accredited testing house/in house technique of the purchaser. the result if found deviating/unacceptable or in non-compliance with the approved GTP, the lot shall be rejected and bidder shall arrange to replace lot within thirty (30) days of such detection at his cost including to & fro transportation

ANNEXURE-A

GUARANTEED TECHNICAL PARTICULARS FOR STEEL TUBULAR POLES OF VARIOUS SIZES (SWAGED TYPE)

S.No	Description	8.0 meter Long	9.0 meter Long	11.0 meter Long	13.0 meter Long
1.	Standards	IS:2713(Part-I-II) :1980 as amended up to date. (Read with Amendment-I dated September-1986 and Amendment-II dated June-2018	IS:2713(Part-I-II) :1980 as amended up to date. (Read with Amendment-I dated September-1986 and Amendment-II dated June-2018	IS:2713(Part-I-II) :1980 as amended up to date. (Read with Amendment-I dated September-1986 and Amendment-II dated June-2018	IS:2713(Part-I-II) :1980 as amended up to date. (Read with Amendment-I dated September-1986 and Amendment-II dated June-2018
2	Type of Pole	Swaged type	Swaged type	Swaged type	Swaged type
3	Designation	410 SP 15	410 SP 33	410 SP 56	410 SP-69
4	Overall Length (mm)	8000	9000	11000	13000
5	Planting depth (mm)	1500	1500	1800	2000
6	Height above ground (mm)	6500	7500	9200	11000
7	Effective length of each section a) Bottom (mm) b) Middle (mm) c) Top (mm)	 4500 1750 1750	 5000 2000 2000	 5600 2700 2700	 5800 3600 3600
8	Outside diameter and thickness of each section a) Bottom (mm) b) Middle (mm) c) Top (mm)	 139.7x5.40 114.3x4.50 88.9x3.25	 165.1x5.40 139.7x4.50 114.3x3.65	 193.7 x 5.40 165.1 x 4.50 139.7 x 4.50	 193.7x5.90 165.1x5.40 139.7x4.50
9	Joint length a) Bottom (J2) (mm) b) Top (J1) (mm)	 300 230	 350 300	 400 350	 400 350
10	Approx. weight of Pole (kg) (The weight of any single pole shall not fall by more than 10% &weight of bulk supply shall be within 92.5% of its calculated value.)	119.00	164.00	241.00	302.00

11	Distance of Point of application of load from top (mm)	300	300	600	600
12	Breaking load (kg-f)	499	612	713	642
13	Working load with factor of safety of 2.5 (kg-f)	200	245	285	257
14	Crippling load (kg-f)	354	435	502	456
15	Load for permanent set not exceeding 13 mm (kg-f)	243	297	347	312
16	Load for temporary deflection of 157.5 mm (kg-f)	140	157	140	81
17	Tolerance	IS:2713 (Part-I-II): 1980 as amended up to date	IS:2713 (Part-I- II) :1980 as amended up to date	IS:2713 (Part-II) :1980 as amended up to date	IS:2713 (Part-II) :1980 as amended up to date
18	Finish				
19	Manufacturing clause				
20.	Dimensions of M.S Base Plate welded to pole bottom and painted with Black Bituminous paint. (mm)	350x350x5	350x350x5	350x350x5	350x350x5
21	Length of GI Earthing Channel 75x40x6 mm welded to the pole at a height of 300 mm above Ground level	75	75	75	75
22	M.S Pole Cap thickness (mm)	3	3	3	3

Guaranteed Technical Particulars
(To be furnished by the bidders)

S.No	Description	8.0 meter Long	9.0 meter Long	11.0 meter Long	13.0 meter Long
1.	Standards				
2	Type of Pole				
3	Designation				
4	Overall Length (mm)				
5	Planting depth (mm)				
6	Height above ground (mm)				
7	Effective length of each section a) Bottom (mm) b) Middle (mm) c) Top (mm)				
8	Outside diameter and thickness of each section a) Bottom (mm) b) Middle (mm) c) Top (mm)				
9	Joint length a) Bottom (J2) (mm) b) Top (J1) (mm)				
10	Approx. weight of Pole (kg) (The weight of any single pole shall not fall by more than 10% & weight of bulk supply shall be within 92.5% of its calculated value.)				
11	Distance of Point of application of load from top (mm)				
12	Breaking load (kg-f)				

13	Working load with factor of safety of 2.5 (kg-f)				
14	Crippling load (kg-f)				
15	Load for permanent set not exceeding 13 mm (kg-f)				
16	Load for temporary deflection of 157.5 mm (kg-f)				
17	Tolerance				
18	Finish				
19	Manufacturing clause				
20.	Dimensions of M.S Base Plate welded to pole bottom and painted with Black Bituminous paint. (mm)				
21	Length of GI Earthing Channel 75x40x6 mm welded to the pole at a height of 300 mm above Ground level				
22	M.S Pole Cap thickness (mm)				

Signature of the tenderer: _____

Name: _____

Designation: _____

ANNEXURE-B

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
Length (mm)						
Bottom						
Middle						
Top						
Thickness (mm)						
Bottom						
Middle						
Top						
Outer Diameter (mm)						
Bottom						
Middle						
Top						
Base Plate						

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

C. <u>DETAILS OF TEST CERTIFICATES FOR TENSILE STRENGTH & CHEMICAL COMPOSITION:</u>

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)	

<u>Remarks:</u>

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_____

ANNEXURE-C

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/License 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
i. Type of Pole	Swaged					
ii. Length (mm)						
Overall Length						
Bottom Section						
Middle Section						
Top Section						
Planting Depth						
Height above ground						
iii. Outer Diameter (mm)						
Bottom Section						
Middle Section						
Top Section						
iv. Class of Tubes						

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

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: _____

QUNATITY 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. _____ Mr._____ Mr._____

M/S_____ Designation: _____ Designation: _____

Supplier Firm's representative Departmental Representative Inspector_____