

**TECHNICAL SPECIFICATION OF
ELECTRICAL
MATERIALS**

“GROUP – D”

Tender Notice No. NESCO Utility / O&M Materials/58 / 8267, dtd.17.7.15

Details of require Materials: Group D

SI No	Item Description	Unit	Quantity
1	40mm G.I. Earthing Device	No.	300
2	PG Clamp (3 bolt type)	No.	300
3	VCB Stud Clamp/ T - Connector		
	i) 12 bolted type	No.	300
	ii) 8 bolted type	No.	200
4	33 KV. 'V' Cross Arms (GI)	No.	300
5	Danger Board (11KV)	No.	300
6	Danger Board (33KV)	No.	200

NB: 1. Bidders should put their authorized signature with office seal on each page of the documents.

2. Bidders should put their offer in the Guaranteed particulars column furnished in the tender documents.

3. Purchaser may ask to the bidder who will qualify in Techno- Commercial evaluation of the tenders for submission of Samples for verification , if required.

4. Purchaser reserves the right to increase or decrease the above quantities during placement of purchase order or may cancel any item/items without assigning any reason thereof .

Dy. General Manager (C&P)
NESCO Utility, Balasore, Odisha

Technical Specifications

40mm dia GI Earthing Device:

1. Scope :-

This specification provides for design, manufacturing, testing before dispatch, supply & delivery of Earthing Device (Heavy Duty) (for use in Sub-station earthing).

2. APPLICABLE STANDARDS :-

The Earthing Device must be made out of 40 mm nominal Bore & 3.2 mm (Medium Gauge- No minus Tolerance allowed) wall thickness Hot Dip G.I. Pipe (as per IS :- 1239,m Part-1, 1990 & REC construction Standard –J-2) , ISI marked of reputed Make & 2.5 mtrs length tapered finished smooth at one end for a length of 75 mm & Clamp at the other end.

Staggered drills hole of 12 mm Dia of interval of 150mm shall be made before galvanization.

The GI Earthing Clamp/ Strip (C- Clamp Type) is to be of 50mm width, 6mm thickness & flange length of 65 mm in each side. This should be suitable for termination of 4 nos of GI Flat earth electrodes. The Clamp/ Strip & Earthing pipe after fabrication will be hot dip galvanized confirming to IS: 2629/85 with latest amendments. The clamp shall have two holes in both sides suitable for 5/8 x 2” Bolt & provided with two GI bolts& Nuts in each side of 12mm dia 50mm long half threaded with spring washer as per IS: 3043/1982.The galvanization tests are to be conducted as per IS: 2633/72 & IS: 6745/72 & its latest amendments.

Guaranteed Technical Particulars of Earthing Device

(To be submitted along with Offer)

	Part	Bidder's Offer
1.	Location of Factory or Place of Manufacture	
2.	Maker's Name, Address & Country	
3.	Size of	
a	Pipe	
b	Earthing Strips	
4.	Length	
5.	Thickness of Pipe	
6.	Galvanization Process	
7.	Galvanization thickness	

a	For Earthing device	
b	For Connecting Flat	
8.	Galvanization tests to be conducted as per ISS	
9.	Any other Particulars (like details of Clamp/ G.I. Bolts)	
10.	Details of Drawings submitted	

PG Clamp:

This specification sets out the requirements for the manufacture, supply, testing and delivery of non-tension (bolted) connectors (commonly referred to as "parallel groove" or "PG" clamps) for use on overhead electricity distribution networks in a totally exposed environment.

PG clamps are primarily used for the no-load connection/disconnection of aluminium/ copper/ galv steel conductor combinations.

Items covered by this technical specification, are listed as follows:

ITEM No.	CONDUCTOR SIZES		No. OF BOLTS	STOCK CODE
	MAIN	TAP		
1	16/70 mm ² Al/SC-GZ	16/70 mm ² Al/SC-GZ	1	0411402
2	16/120 mm ² Al/SC-GZ	16/120 mm ² Al/SC-GZ	2	0411344
3	25/150 mm ² Al/SC-GZ	25/150 mm ² Al/SC-GZ	2	0411347
4	95/240 mm ² Aluminium	95/240 mm ² Aluminium	"U"	0411312
5	10/70 mm ² Copper	10/70 mm ² Copper	1	0411420
6	16/150 mm ² Copper	16/150 mm ² Copper	2	0411405
7	16/70 mm ² Al/SC-GZ	6/50 mm ² Copper	1	0104218
8	16/70 mm ² Al/SC-GZ	6/50 mm ² Copper	2	0411932
9	25/150 mm ² Al/SC-GZ	10/95 mm ² Copper	2	0411398
10	95/240 mm ² Aluminium	70/185 mm ² Copper	"U"	0411401
11	35/300 mm ² Aluminium	35/240 mm ² Copper	2 or "U"	2403222

2. References

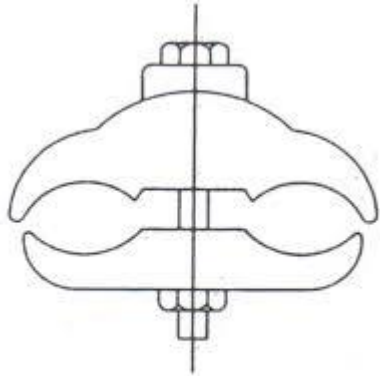
2.1 Applicable Standards

The connectors shall be designed, manufactured and tested in accordance with the relevant parts of the following Standards and all amendments issued from time to time except

where varied by this specification.

STANDARD	TITLE
AS 1110	ISO metric precision hexagon bolts and screws
AS 1111	ISO metric commercial hexagon bolts and screws
AS 1154	Insulator and conductor fittings for overhead power lines
AS 1214	Hot-dip galvanized coatings on threaded fasteners
AS 1275	Metric screw threads for fasteners
AS 1444	Wrought alloy steels - Standard, hardenability (H) series and hardened and tempered to designated mechanical properties

STANDARD	TITLE
AS 1531	Conductors - Bare overhead - Aluminium and aluminium alloy
AS 4680	Hot-dipped galvanized coatings on ferrous articles
AS 1746	Conductors - Bare overhead - Hard-drawn copper
AS 1789	Electroplated coatings - Zinc on iron or steel
AS 2738	Copper and copper alloys - Compositions and designations
AS 2837 (withdrawn)	Wrought alloy steels - Stainless steel bars and semi-finished products
AS 2848	Aluminium and aluminium alloys - Compositions and designations
AS 3607	Conductors - Bare overhead, aluminium and aluminium alloy - Steel reinforced
AS 4169	Electroplated coatings - Tin and tin alloys
AS/NZS 4325	Compression and mechanical connectors for power cables with copper or aluminium conductors
ESAA D(b)5	Current ratings of bare overhead line conductors
VDE 0212/5.62	Guidelines for insulator strings and conductor accessories for overhead power lines
DIN 48 215	Overhead power lines, clamps and connectors, technical delivery specifications
AS/NZS ISO 9001	Quality management systems -Requirements



Universal type PG Clamp

Aluminium PG Clamp (Three-bolt)



- **Aluminum PG clamp (three-bolt)** is applicable to tap-off connection of aluminum alloy conductors and ACSR / AAA conductors suitable for conductor size 55 mm² to 232 mm².
- **Material:**
 - Body: High strength, corrosion-resistant, aluminum 99.5.
 - Bolts: DIN 933, steel 8.8, Dacromet.
 - Nut: DIN934, Dacromet.
 - Pressure pad: aluminum alloy.
 - Spring washers: DIN 1 27, steel.
 - Conical washers (according to order): DIN 6796, corrosion-protected.
 - Stainless steel A2 bolts and nuts are available according to order.
 - Torque moments: M8:23Nm M10:46Nm.

VCB STUD CLAMP/ T- CONNECTOR

Suitable terminal connectors of bi-metallic type suitable for both horizontal and vertical connection shall be provided on the terminal pad both on the incoming and the outgoing side for connection of jumpers of ACSR or AAAC conductor. The size of the conductor may vary between 100 mm² and 232mm² depending upon the location of the circuit breaker. The terminal connection drawing and details are to be approved by the Purchaser before fabrication. The terminal connectors shall be bi-metallic type to avoid bi-metallic corrosion .

The bi-metallic connector should be made up with good quality alloy materials as mentioned below:

- i) Brass – Aluminium alloy one part suitable for Transformer bushing stud or VCB stud
- ii) Aluminium alloy other part suitable for Conductor size 100 mm² & 232 mm².
- iii) Bolts & Nuts with spring washer should be hot dip galvanized of suitable size.

Drawing : The drawing of the 8 bolted & 12 bolted T- connector are furnished with the tender . The bidder have to design in accordance of the drawing .

33KV 'V' Cross arm (GI)

33 KV 'V' cross arm made out of 100x50x6 mm M.S Channel as per REC Standard M-1. The cross arm shall be fabricated out of 100x50x6 mm size channel having 9.2 Kg/Mtr. After fabrication the cross arm shall be Galvanized as per IS-2633/1972.(Latest Amendment) , IS :2629/1985 (1st. Revision)conforming to REC construction standard & drawi

Guaranteed Technical Particulars of 33 KV 'V' Cross Arm

Sl. No.	Description	Specified	Bidders Offer
1	Type of Cross Arm	ISMC 100x50	
2	Channel Weight	9.2 Kg/mtr	
3	Grade of Steel	FY 250	
4	Steel Standard	IS:2062-1992	
5	Fabrication Standard	IS:802 (part - 2) - 1978	

6	Dimension	(100x50x6)mm	
7	Size of M S Flat welded at both ends	50x8mm	
8	Steel Tensile Strength	1500kgf/cm ²	
9	Working Load	400/ 450/ 550/600Kg	
10	Total Weight	19.7 Kg (approx.)	
11	Drawing enclosed		

Name & Signature of Bidder with seal

Danger Board

TECHNICAL SPECIFICATION OF DANGER NOTICE PLATE :

- a) The danger plate shall be affixed in a permanent manner on operating side of the panel, Substations, Distribution Boards , Electric poles etc..
- b) The danger notice plate shall indicate danger notice both in English and Odisha , English & Hindi and with a sign of skull and bones.
- c) The danger notice plate in general shall meet to requirements of local inspecting authorities.
- d) Dimension of the danger notice
 - I) For display at 33 KV installations – 250x200mm
 - II) For display at 11 KV installations – 250x200mm
 - III) The corners of the plate shall be rounded off.
- e) The danger notice plate shall be made from minimum 1.6 mm thick mild steel sheet and after due pre-treatment to the plate, the same shall be painted white with vitreous enamel paint on both front and rear surface of the plate.
- f) The letter, the figure, the conventional skull and bones shall etc. shall be positioned on the plate as per recommendations of IS : 2551-1982.
- g) The said letter, the figure and the sign of skull and bones be painted in single red colour as per IS : 5-1978.

- h) **Standards of Danger Plate:** The Danger Notice Plates shall comply with IS:2551-1982 or the latest amendment.
- i) The danger notice plate, if possible, be of ISI certification mark.
- j) The danger plate should be as per drawing enclosed or better look.
- k) Tests of Danger Plate:
 The following tests shall be carried out :
 I) Visual examination as per IS:2551-1982
 II) Dimensional check as per IS:2551-1982
 III) Test for weather proofness as per IS:8709-1977 (or its latest version)

GTP of LV/ 11KV DANGER BOARD

Sl.No.	Particulars Specified	Bidders Offer
1	Design of Danger plate shall be as per IS: 2551/1982	
2	Letters and Bone skulls marks Red Vitreous Enameled Background White Vitreous Enameled	
4	Back Side Black Vitreous Enameled	
5	Material 1.6mm Thick Mild Steel Plate	
6	Letter Language Oriya / English / Hindi	
7	2 nos of 2mm Thick lead washer and 2 nos of 6mm dia. Bolts and Nuts to be supplied with each number plate.	
8	Drawing	To be submitted by bidder

Name & Signature of Bidder with seal