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| Doc. Title | Technical Specification for Back Clamp of 33kV V cross Arm | |
| Doc. No | ENG-EHV- Back Clamp of 33kV V cross Arm | Eff. Date: 22/03/2022 |
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| Prepared by: Ranjan Kumar Sahoo | Reviewed by: Priya Kumar Sharma | Approved & Issued By: Mahendra Kumar Pandey |

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| Initiator | | HOG (ENGINEERING) | |
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1.0 SCOPE

This specification covers technical requirements for manufacture, testing at manufacturer's place, packing, supply and unloading at TPSODL stores/site of Back Clamp of 33kV V cross Arm.

2.0 APPLICABLE STANDARDS

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with latest editions of the following standards/IEC and shall conform to the regulations of local statutory authorities.

- a) IS 2062:2011 - For Hot rolled medium and high tensile structural steel- specification
- b) IS 2633-1986- Methods for testing uniformity of coating of zinc coated articles.
- c) IS 1852-1985 - For Rolling and cutting tolerances for hot rolled steel products
- d) IS 2629-1985 - For Recommended practice for hot dip galvanized of iron and steel
- e) IS 4759-1996 - For Hot dip zinc coatings on structural steel and other allied products-specification
- f) IS 808-1989 - Dimensions for Hot Rolled Steel Beam, Column, Channel and Angle Sections
- g) IS 2633-1986 - Methods for testing of uniformity of coating of Zinc.


Note: Latest revision of all above stated IS shall be prevailed.

3.0 CLIMATIC CONDITIONS OF THE INSTALLATION

- a) Maximum altitude above sea level 100m
- b) Max. Ambient Temperature: 50 deg. C
- c) Max. Daily average ambient temp: 35 deg. C
- d) Min. Ambient Temperature: 0 deg. C
- e) Maximum Relative Humidity: 95%
- f) Average No. of thunderstorm days per annum:70
- g) Average Annual Rainfall: 1500 mm
- h) Average No. of rainy days per annum: 120
- i) Earthquakes of an intensity in horizontal direction – equivalent to seismic acceleration of 0.3g.
- j) Earthquakes of an intensity in vertical direction – equivalent to seismic acceleration of 0.15g
- k) Wind velocity: 300/hr, 200 km/hr and 160km/hr

Environmentally, some of the regions, where the work will take place includes coastal regions, subject to high relative humidity, which can give rise to condensation. On shore winds will frequently be salt laden. On occasions the combination of salt and condensation may create pollution conditions for outdoor insulators. Some places are in heavily industrial polluted areas. Therefore, Outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty corrosive and humid coastal atmosphere. The design of equipment and accessories shall be suitable to withstand seismic

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forces corresponding to an acceleration of 0.1g.

4.0 GENERAL TECHNICAL REQUIREMENTS & CONSTRUCTIONS

| SL. NO. | TECHNICAL PARTICULARS | DESIRED VALUE |
|---------|--|-----------------------------------|
| 1 | Material | Hot-Dip Galvanized |
| 2 | Grade of Steel | E 250 A |
| 3 | Minimum Tensile Strength | 410 N/mm ² |
| 4 | Yield Stress | 250 N/mm ² |
| 5 | Percentage Elongation (Min.) at Gauge Length | 23% |
| 6 | Mass of Zinc Coating | 705 gm/m ² |
| 7 | Zinc Coating Thickness | 100-micron, 6 Dip(min) |
| 8 | Chemical composition | Grade: E 250 (As per IS: 2062) |
| 9 | Galvanizing | As per IS:2629, IS:2633 & IS:4759 |

All finished steel shall be well and cleanly rolled to the dimensions, sections and masses specified. The finished material shall be reasonably free from surface flaws; laminations; rough/jagged and imperfect edges and all other harmful defects. Minor surface defects may be removed by the manufacturer/supplier by grinding provided the thickness is not reduced locally by more than 4 percent below the minimum specified thickness. Welding shall carried out by approved procedure by competent operators with approved electrodes and that the welding is ground smooth to the correct nominal thickness; and Zinc Coating shall be applied by hot-dip galvanizing on steel products fabricated or assembled as specified in relevant IS/IEC.

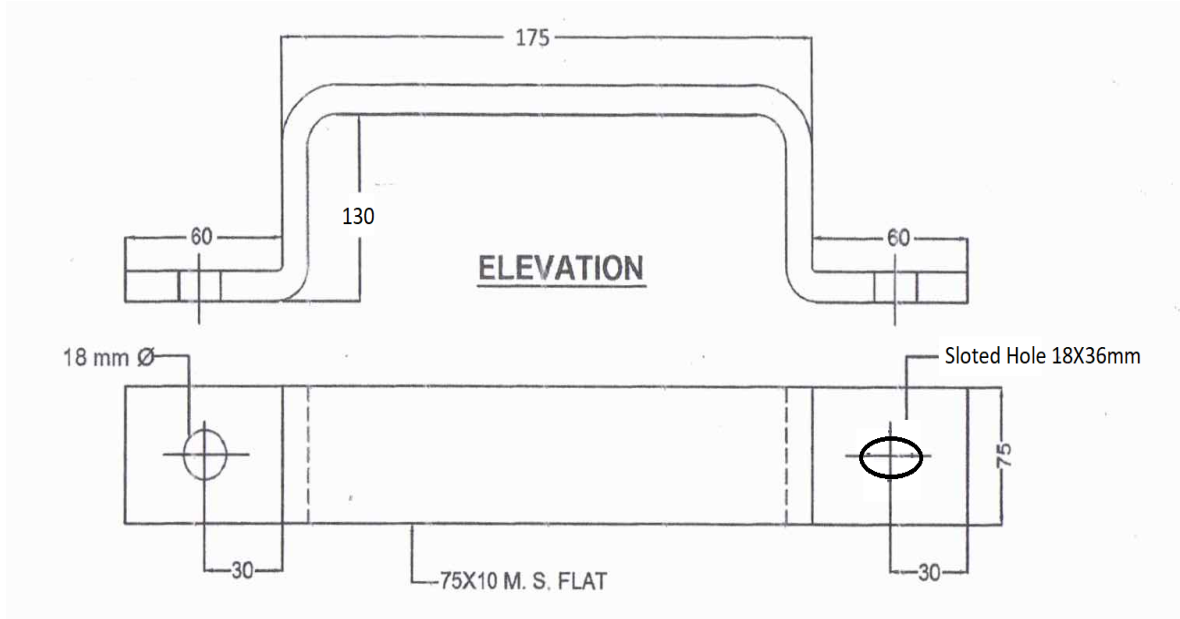
Zinc coating shall be uniform, adherent, reasonably smooth and free from such imperfections as flux, ash bare patches, black spots, pimples, lumpiness, runs, rust stains, bulky white deposits and blisters.

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Indicative Drawing:

The shown drawing shall be indicative in nature and will be finalized during detailed engineering.



5.0 MARKING

Engraved Marking (Punching before galvanisation) shall be as per the following –


1. Property of TPSODL,
2. Manufacture's name or trademark,
3. Month & Year of Manufacturing.

6.0 TESTS

All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC. All routine/acceptance tests shall be witnessed by the purchaser/his authorized representative. All components shall also be type tested as per the relevant standards.

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| Tests | IS to be referred |
| Visual test | As a routine test |
| Dimensional tests | As per the drawing |
| Tensile strength | IS 2062 |

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| | Bend test | IS 2062 |
| | Impact test | IS 2062 |
| | Hot dip galvanizing | IS 4759 : 1996 |

7.0 TYPE TEST CERTIFICATES

The bidder shall furnish the type test certificates of Back Clamp of 33kV V cross Arm as mentioned above as per the corresponding standards. All the tests shall be conducted at NABL accredited labs as per the relevant standards. Type tests should have been conducted during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TPSODL.

8.0 PRE-DISPATCH INSPECTION

Equipment shall be subjected to inspection by a duly authorized representative of TPSODL. Inspection maybe made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free accessto the places of manufacture to TPSODL's representatives at all times when the work is in progress.

Inspection by TPSODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC(Material Dispatch Clearance Certificate) is issued by TPSODL.

Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPSODL.
- c) Invoice in duplicate
- d) Packing list
- e) Drawings & catalogue
- f) Guarantee / Warrantee card
- g) Delivery Challan
- h) Other Documents (as applicable)


9.0 INSPECTION AFTER RECEIPT AT STORES

The material received at TPSODL, Berhampur, Odisha store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering and contracts department.

10.0 GUARANTEE

Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an

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integrated product delivered under this contract. In the event any defect is found by the Company up to a period of at least 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract whichever is later. In the event any defect is found by the Company up to a period of 12 months from the date of commissioning or 24 months from the date of last supplies made under the contract, whichever is earlier, supplier shall be liable to undertake to replace/rectify such defects at his own costs.

11.0 PACKING

Bidder shall ensure that all the equipment covered under this specification shall be prepared for rail/road transport in a manner so as to protect the equipment from damage in transit.

12.0 TENDER SAMPLE

Bidder shall submit the sample of material with the offer at TPSODL Engineering Dept.

13.0 QUALITY CONTROL

The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. TPSODL's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.

14.0 MINIMUM TESTING FACILITIES

Bidder shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards

15.0 MANUFACTURING ACTIVITIES

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

16.0 SPARES, ACCESSORIES AND TOOLS


Bidder shall provide a list of recommended spares with quantity and unit prices for 3 years of operation after commissioning. The bidder shall provide a list of complete set of accessories and tools required for erection & maintenance along with the installation procedure.

17.0 DRAWINGS AND DOCUMENTS

Following drawings & documents shall be prepared based on Purchaser's specifications and statutory requirements with complete BOM and shall be submitted with the bid:

| Sl. No. | Description | For Approval | For Review | Final Submission |
|---------|----------------------|--------------|------------|------------------|
| 1 | Technical Parameters | √ | | √ |
| 2 | GA Drawing | √ | | √ |

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| 3 | Installation Instruction | | | √ |
| 4 | Manuals, Catalogues & Drawings | | √ | √ |
| 5 | Dimension drawing | | √ | √ |
| 6 | QA & QC Plan | √ | √ | √ |
| 7 | Routine, Acceptance & Type Test Certificates | √ | √ | √ |

- a) General description of the equipment and all components including brochures
- b) General arrangement drawings
- c) Type Test Certificates.
- d) Experience List
- e) Manufacturing schedule and test schedule.

After the contract, four (4) copies of the drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval and shall subsequently provide four (4) complete sets of final drawings, one of which shall be auto positive suitable for reproduction, before the dispatch of the equipment. Soft copy (Compact Disk CD) of all the drawing, test certificates shall be submitted after the final approval of the sameto the purchaser.

Following Drawings/Documents shall be submitted after the award of the contract: Drawings/documents to be submitted after the award of the contract:

18.0 GUARANTEED TECHNICAL PARTICULARS

The Bidder shall submit guaranteed technical particulars as per technical specification at TPSODL Engineering for approval.

19.0 SCHEDULE OF DEVIATIONS

All deviations from this specification shall be set out by the bidder, clause by clause in the below mentioned tabular format. Unless specifically mentioned in this schedule, the tender shall be deemed to confirm TPDDL's Specification.

| Sl. No. | Clause No. | Details of deviation with justifications |
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We confirm that there are no deviations apart from those detailed above.

Seal of the Company

Signature

Designation

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