ଓଡ଼ିଶା ବିଦ୍ୟୁତ୍ ଶକ୍ତି ସଂଚାରଣ ନିଗମ ଲି୫.

ODISHA POWER TRANSMISSION CORPORATION LTD.
(A Government of Odisha Undertaking)
CIN: U40102OR2004SGC007553 /GTIN: 21AAACO7873L1Z6
REGD. OFFICE: JANPATH, BHUBANESWAR – 751 022,
OFFICE OF THE GENERAL MANAGER, (Elect)
EHT (O&M) CIRCLE: CHAINPAL, AT/PO: CHAINPAL COLONY,
PIN-759104, and DIST: ANGUL (ODISHA)
E-mail-ehtm.cle.chp@optcl.co.in

OPEN TENDER SPECIFICATION NO. CHP-02/2024-2025

FOR

SUPPLY OF SINGLE TENSION HARDWARE FITTINGS SUITABLE FOR ACSR ZEBRA CONDUCTORS FOR UTILIZATION IN DIVERSION OF 220KV TTPS-KANIHA-RPH DC LINE FROM LOC NO. 97 TO 108 PASSING THROUGH LEASE HOLD AREA OF MCL, KANIHA OCP MINE AND RESTRINGING OF CONDUCTORS FROM GANTRY AT 400/220/33KV GRID S/S, MERAMUNDALI TO DEAD END TOWER AT DIFFERENT LINES UNDER EHT O & M) DIVISION ,CHAINPAL

SECTION-I-	**INSTRUCTION TO BIDDERS**
SECTION-II-	**GENERAL CONDITIONS OF CONTRACT**
SECTION-III-	**TECHNICAL SPECIFICATION**
SECTION-IV	**PRICE BID**
SECTION-V-	**LIST OF ANNEXURE**

Sale of tender documents:	**From dt- 29.01.2025 (10.00 Hrs)**
	To dt- 13.02.2025 (01.00 Hrs)
Last date of submission of tender:	**Upto dt- 14.02.2025 (01.30 Hrs)**
Date of opening of Tender:	**On dt- 14.02.2025 (03.30 Hrs)**
Cost of Tender Spec Document :	**Rs.2000/ + Rs360/- (GST@18%)= Rs 2360/-**

ISSUED TO,

M/S.....

.....

.....

ଓଡ଼ିଶା ବିଦ୍ୟୁତ୍ ଶକ୍ତି ସଂଚାରଣ ନିଗମ ଲି୫.

ODISHA POWER TRANSMISSION CORPORATION LTD.

(A Government of ODISHA Under Taking)
Regd. Office: Janpath, Bhubaneswar-751022, Odisha
OFFICE OF THE GENERAL MANAGER: ELECT.
EHT (O&M) CIRCLE: CHAINPAL, AT/PO: CHAINPAL COLONY,
DIST: ANGUL (ODISHA), Pin-759104, Email-ehtm.cle.chp@optcl.co.in
CIN:U40102OR2004SGC007553/ GTIN:21AAACO7873L1Z6

OPEN TENDER NOTICE NO. CHP-02 / 2024-25

NOTICE INVITING TENDER

For and on behalf of ODISHA POWER TRANSMISSION CORPORATION LTD, Sr.General Manager, EHT (O&M) Circle, Chainpal invites Tenders from reputed bidders fulfilling the eligibility criteria and having valid PAN & GST registration Certificate for **"**Procurement of Single Tension Hardware fittings Suitable for ACSR Zebra Conductor utilization in diversion of 220KV TTPS-Kaniha-RPH DC Line from Loc No.97 to 108 Passing through lease hold area of MCL , Kaniha OCP Mine and Restringing of conductors from Gantry at Meramundali GSS to Dead end tower of different lines under EHT (O & M) Division, Chainpal.

The above Tender is a single-part bidding system in **manual paper mode** only as per the following details.

Open Tender Specification No: CHP-02/2024-25

Sale of tender documents:	**From dt- 29.01.2025 (10.00 Hrs)**
	To dt- 13.02.2025 (01.00 Hrs)
Last date of submission of tender:	**Upto dt- 14.02.2025 (01.30 Hrs)**
Date of opening of Tender:	**On dt- 14.02.2025 (03.30 Hrs)**
Cost of Tender Spec Document :	**Rs.2000/ + Rs360/- (GST@18%)= Rs 2360/-**
Earnest Money Deposit:	***Rs. 4000.00/- (Rupees Four Thousand)***

The bidders can view the tender documents from website free of cost.

ELIGIBILITY FOR SUBMISSION OF BIDS:-

Bidders should not have any legal suit against OPTCL / GRIDCO Ltd / SLDC are only eligible for submission of Bids. Firms banned / blacklisted for business dealings by any organization are not eligible to participate in the tender. Participation in the tender by suppression of the above facts shall invite penal action, whenever detected.

The bidders must have in possession of following qualifications for participation in tender:-

1. **Manufacturer More Than 2years/Authorized Dealer.**
2. **GST Registration Certificate.**
3. **Permanent Account Number (PAN) issued by Income Tax Department.**
4. **Experience regarding supply of above material to any State/Central, GOVT./PSU organization within Last Three Years with performance of at least One Year.**

The bidders can view the tender documents from website free of cost. The bidders who want to participate in the tender shall have to pay Rs.2360/- (Rupees Two Thousand Three Hundred Sixty Only) non refundable including GST @ 18%) towards the cost of tender document, in the form of Demand draft /Cash drawn in favour of EHT (O&M) Circle Chainpal, Payble at UCO Bank, TTPS Branch (In case the D.D made from any other nationalized bank payable at any clearing branch at Talcher/Angul will be allowed, But the bidders have to deposit the collection fee (Bank transaction fee) along with the paper cost. The collection fee & Paper cost is Nonrefundable) and the same is to be submitted to the office of the undersigned on or before the last date & time of Opening of tender. Additional amount of Rs.100/-(One Hundred only) may be paid extra for postal delivery of the tender specification. The undersigned shall not be held responsible for any postal delay.

N.B:- Tender Paper must be purchased from this office only within stipulated period. No other mode like downloaded paper from website will be accepted.

* NSIC/MSME certificate holders may participate with discount of Paper Cost. But they have to pay EMD @50% as mentioned above. The documents proof regarding NSIC/MSME should be submitted along with the bids, else bid will be rejected.

TELEPHONES / CONTACTS

1. Sr. General Manager: 9438907324

2. TA to General Manager: 9438907808

3. Manager(F):9438907790

NOTE: -

1. In case the due date for opening of tender happens to be a holiday, then tenders would be received & opened on the next working day at the same time.
2. Please note that the tenders against this tender enquiry are being invited through **Paper mode (Hard Copy of Tender documents has to submit)**. In case of any clarification the prospective bidders may contact this office as mentioned above.

SR.GENERAL MANAGER
EHT (O&M) CIRCLE, CHAINPAL

PART-I

SECTION-I

INSTRUCTIONS TO BIDDER

1. Submission of Bids: -

2. Submission of Bids: -

- The bidders shall seal the original bid in an inner and an outer envelope, duly marking the envelopes as "original".
- The inner and outer envelops shall :

a) be addressed to OPTCL at the following shall :

OFFICE OF THE GENERAL MANAGER: ELECT.
EHT (O&M) CIRCLE: OPTCL, CHAINPAL, AT/PO: CHAINPAL COLONY,
DIST: ANGUL (ODISHA), Pin-759104, Email-***ehtm.cle.chp@optcl.co.in***

b) Bear the name of the work, Bid reference number, and the date of opening as mentioned in tender notice / cover page.

c) Bidder should not write their name or any other information on the body of the sealed envelope. Super scribing any other information on the body of the envelop, Conditional tender, Incomplete tender, Telegraphic / Fax / E-mail (etc.) Tenders & Tenders not accompanied with requisite amount of E.M.D. will be rejected. The authority reserves all rights to reject any, all or part of the Tender, alter/modify the requirement/ delete any part of the tender without assigning any reason thereof.

- The inner envelop shall indicate the name and address of the bidder to enable the bid to be returned unopened in case it is declared "late" or is otherwise unacceptable.
- If the outer envelope is not sealed and marked as required, OPTCL will assume no responsibility for the bid's misplacement or premature opening. A bid opened prematurely for this cause will be rejected by this office and returned to the bidder.
- Bids in any other form and incomplete bids shall be summarily ignored.
- Bids may be either submitted in person or may be sent by registered post with acknowledgement due, so as to reach within stipulated date and time as mentioned in tender notice / cover page.
- Bids must be received by the OPTCL at the address specified not later than the time and date specified for receipt of the bids as indicated in the Tender Notice, or as extended by OPTCL.
- The OPTCL may, at its discretion, extend this deadline for the submission of bids above, in which case all rights and obligations of the OPTCL and bidders previously subject to the deadline will thereafter be subject to the new deadline as extended.
- The OPTCL will not be liable for any postal delay in delivering the tender when the tenders are sent by post.

N.B.- 1) Bidder must be submitted Two Inner envelope consists of One Price Bid & another is Technical Bid. Initially the technical bid will be opened & sample will be tested. Then the price Bid of Technically qualified bidder will be opened. No conditions will be accepted in any circumstances. The bidder has to submit the sample of each item before opening of Tender.

2) The bidder may visit this office for verifying the product design & submit the sample & offer accordingly.

3. Division of Specification.

The specification is mainly divided into two parts viz. Part-I & Part-II.

SECTION-I- INSTRUCTION TO BIDDERS.

SECTION-II- GENERAL CONDITIONS OF CONTRACT

SECTION-III- TECHNICAL SPECIFICATION

SECTION-IV- PRICE SCHEDULE

SECTION-V- LIST OF ANNEXURE

4. Purchaser's Right Regarding Alteration of Quantities Tendered.

The Purchaser may alter/add/delete the quantities of materials /equipment at the time of placing orders. Initially the purchaser may place orders for lesser/same /more quantity with full freedom to place extension orders for further quantity under similar terms and conditions of the original orders. Orders may also be split among more than one bidder for any particular item, if considered necessary in the interest of the Purchaser to get the goods/equipment earlier or quality of material.

5. Purchaser's right to accept/reject bids:

The purchaser reserves the right to reject any or all the tenders without assigning any reasons what so ever if it is in the interest of OPTCL, under the existing circumstances

6. Earnest money deposit:

a) Earnest money deposit:

b) The tenderers are required to deposit EMD of Rs.4000.00 in shape of Demand Draft in favor of GM, EHT (O&M) Circle Chainpal, Payable at UCO Bank, TTPS Branch, Talcher. (In case the D.D made from any other nationalized bank payable at any clearing branch at Talcher/Angul is allowed, the bidders however have to deposit the collection fee (Bank transaction fee) along with the paper cost. The collection fee & Paper cost is Nonrefundable).

c) No interest shall be paid on earnest money deposit.

d) No adjustment towards EMD shall be permitted against any outstanding amount if any remained with this Office. In case of less deposit of EMD, the tender shall be liable for rejection.

e) The EMD of successful bidders can be refunded on written request after deposit of Security deposit.

f) **The EMD not claimed for refund within a period of three years from the date of issue of Purchase/ Work orders and the Security Deposit not claimed for refund within three years from the date of expiry of Guarantee period shall be forfeited.**

g) In case of NSIC/MSME certificate holders 50% of EMD deposit shall be applicable.

7. Validity of the Bids: -

The tenders should be kept valid for a period of **180** days from the date of opening of the tender, failing which the tenders will be rejected.

8. PRICE: -

The bidders are advised to quote their rate as per the price schedule and shall remain firm inclusive of all taxes & duties, labour charges etc. within the validity of the tender

9. **Bidders to be fully conversant with the clauses of the Specification:**

Bidders are expected to be fully conversant with the meaning of all the clauses of the specification before submitting their tenders. In case of doubt regarding the meaning of any clause, the bidder may seek clarification in writing from the SR.**GM, EHT (O&M) Circle, Chainpal**. This however does not entitle the Bidder to ask for time beyond due date, fixed for receipt of tender.

10.Documents to Accompany Bids.

Tenderers are required to submit tenders in the following manner:

- Qualification for participating in the Bid as mentioned above .
- Declaration Form as per **Annexure-I** (duly signed).
- Earnest Money (Demand Draft)
- Abstract of Terms & conditions in prescribed proforma as per Annexure-II. To be entered in the bid sheets provided.
- General Terms & Conditions of contract as per Section-II of the Specification. (All the required documents are to be submitted.)
- Data on past experience if any **as per** the Specification.(Document to be Submitted)
- GSTIN certificate, permanent account number [PAN] of the firm is required under Income tax Act..
- Any other document required, is to be submitted.

10. Conditional Offer:

Conditional offer shall not be accepted.

11. General Instruction to the Bidders : -

- The tender paper cost (Form fee non refundable) for an amount of **Rs 2360/-** is to be paid in shape of DD/Cash
- The EMD amount as specified is to be paid in shape of DD.
- In the event of discrepancy or arithmetical error in the schedule of price, the decision of the purchaser shall be final and binding on the Tenderer.
- Notice inviting tender shall form part of this specification.
- The EMD, shall be returned to the unsuccessful bidders after finalization of tender on written request.
- It should be distinctly understood that the price bid shall contain only details/documents relating to price, as mentioned herein above.
- **The Tenderer must submit the EMD amount in shape of DD and cost of tender document in shape of DD/Cash in a sealed cover envelope super scribing the Tender Notice No & Date opening of tender clearly on the envelope cover along with the bid. The said envelope is to be submitted in the office of the purchaser on or before the last date and time of submission of tender.**

PART-I

SECTION-II

GENERAL TERMS AND CONDITIONS OF CONTRACT [G.T.C.C.]

1. Scope of the contract:

This specification covers "Procurement of Single Tension Hardware fittings Suitable for ACSR Zebra Conductor utilization in diversion of 220KV TTPS-Kaniha-RPH DC Line from Loc No.97 to 108 Passing through lease hold area of MCL , Kaniha OCP Mine and Restringing of conductors from Gantry at Meramundali GSS to Dead end tower of different lines under EHT (O & M) Division, Chainpal." as per technical requirement mentioned in Section– IV of the tender specification. The scope of contract shall be to deliver the material on Rail/Road transport at destinations of OPTCL site store as specified in the schedule of quantity. The bidder should quote the make of items and indicate whether the materials bear ISI mark. The bidder should also provide the GSN Code for the quoted product

2. Definition of terms:

For the purpose of this specification and General Terms and Conditions of contract [GTCC], the following words shall have the meanings hereby indicated, except where otherwise described or defined.

2.1 "The Purchaser" shall mean the Sr.General Manager, EHT (O&M) Circle, Bhubaneswar for and on behalf of ODISHA POWER TRANSMISSION CORPORATION LTD., Bhubaneswar.

2.2 "The Engineer" shall mean the Engineer appointed by the Purchaser for the purpose of this contract.

2.3 "Purchaser's Representative" shall mean any person or persons or consulting firm appointed and remunerated by the Purchaser to supervise, inspect, test and examine workmanship and materials of the equipment to be supplied.

2.4 "The supplier" shall mean the bidder whose bid has been accepted by the purchaser and shall include the bidder's executives, administrators, successors and permitted assignees.

2.5 "Equipment" shall mean and include all machinery, apparatus, materials, and articles to be provided under the contract by the suppliers.

2.6 "Contract Price" shall mean the sum named in or calculated the bid.

2.7 "General Condition" shall mean these General Terms and Conditions of Contract.

2.8 The Specification" shall mean both the technical as well as commercial parts of the specification annexed to or issued with GTCC and shall include the **schedules** and drawings, attached thereto as well as all samples and pattern, if any.

2.9 "Month" shall mean "Calendar month".

2.10 Writing" shall include any manuscript, type written, printed or other statement reproduction in any visible form and whether under seal or under hand.

2.11 "FOR Destination costs" shall mean the cost of equipment and material at the consignee's store/site. The cost is inclusive of Excise duty, Sales tax and other local taxes, packing, forwarding and insurance and freight charges.

2.12 The term "Contract document" shall mean and include GTCC, specifications, schedules, drawings, form of tender, Notice Inviting Tender, covering letter, schedule of prices or the final General Conditions, any special conditions, applicable to the particular contract.

2.13 Terms and conditions not herein defined shall have the same meaning as are assigned to them in the Indian Contract Act, failing that in the ODISHA General Clauses Act.

3. <u>INSPECTION & TESTING</u>:

The product (Single Tension Hardware Fittings for ACSR Zebra) will be **inspected by the office of the undersigned at manufacturing site before dispatch of material**. The cost for above Inspection will be borne by the Firm without extra cost to OPTCL. All materials supplied under the contract shall be manufactured in the manner, set out in the specification or where not set out, to the reasonable satisfaction of the Purchaser.

4. <u>SAMPLE</u>: The sample/products of all bidders shall be scrutinized by a sample scrutiny committee to be constituted by the purchaser. Accordingly bidder or their authorized representatives should present with samples in the undersigned office for demonstration before opening of tender. The bidders, whose samples are approved by the committee, shall be considered for opening of price Bid. ***In no case, the bidders shall be allowed for change of sample. No extra will be paid by OPTCL for above sample demonstration.***

5. <u>Rejection of Materials.</u>

In the event any of the equipments /material supplied by the manufacturer is found defective due to faulty design, bad workmanship, bad materials used or otherwise not in conformity with the requirements of the Specification, the Purchaser shall either reject the equipment /material or ask the supplier in writing to rectify or replace the defective equipment /material free of cost to the purchaser. The Supplier on receipt of such notification shall either rectify or replace the defective equipment /material free of cost to the purchaser within 15 days from the date of issue of such notification by the purchaser.

6. <u>Language and measures</u>:

All documents pertaining to the contract including specifications, schedule, notices, correspondence, operating and maintenance instructions, drawings or any other writing shall be written in English language. The metric system of measurement shall be used exclusively in this contract.

7. <u>Right to reject /accept any tender</u>:

The purchaser reserves the right either to reject or to accept any or all tenders if the situation so warrants in the interest of the purchaser. Orders may also be split up between different Bidders on individual merits of the Bidder. The purchaser has exclusive right to alter the quantities of materials/ equipment at the time of placing final purchase order. After placing of the order, the

purchaser may defer the delivery schedule of the materials. It may be clearly understood by the Bidder that the purchaser need not assign any reason for any of the above action[s].

8. Delivery:-

The desired delivery period shall be within 30 days of placing purchase order.

9. Despatch instructions.

a) The equipments/ materials should be securely packed and dispatched directly to the specified site at the supplier's risk by Road Transport only after getting dispatch clearance/purchase order from the purchaser.

b) Loading & unloading of Ordered Materials.

It will be the sole responsibility of the supplier for loading and unloading of materials both at the factory site and at the destination site/store. The Purchaser shall have no responsibility on this account.

10. Supplier's Default Liability.

(I) The Purchaser may, upon written notice of default to the supplier, terminate the contract in circumstances detailed hereunder.

a) If in the judgment of the Purchaser, the supplier fails to make delivery of equipment/material within the time specified in the contract or within the period for which if extension has been granted by the Purchaser in writing in response to written request of the supplier.

b) If in the judgment of the Purchaser, the supplier fails to comply with any of the provisions of this contract.

(II) In the event, Purchaser terminates the contract in whole or in part the Purchaser reserves the right to purchase upon such terms and in such a manner as he may deem appropriate in relation to the equipment/material similar to that terminated and the supplier will be liable to the Purchaser for any additional costs for such similar equipment/material and/or price reduction for delay as defined in clause-20 of this section until such reasonable time as may be required for the final supply of equipment.

(III) In the event the Purchaser does not terminate the contract supplier shall be liable to the Purchaser for price reduction for delay as set out until the equipment is accepted. This shall be based only on written request of the supplier and written willingness of the Purchaser.

11. Force Majeure:

The supplier shall not be liable for any price reduction for delay or for failure to perform the contract for reasons of force majeure such as acts of god, acts of the public enemy, acts of Govt., Fires, floods, epidemics, Quarantine restrictions, strikes, Freight Embargo and provided that the supplier shall within Ten (10) days from the beginning of delay on such account notify

the purchaser in writing of the cause of delay. The purchaser shall verify the facts and grant such extension, if facts justify.

12. **Extension of time**:-

If the delivery of equipment/material is delayed due to reasons beyond the control of the supplier, the supplier shall without delay give notice to the purchaser in writing of his claim for an extension of time. The purchaser on receipt of such notice may or may not agree to extend the contract delivery date as may be reasonable but without prejudice to other terms and conditions of the contract.

13. **Guarantee period: -**

The material should be guaranteed for satisfactory operation and against defects in design, materials and workmanship for a period of at least 12(twelve) months from the last date of delivery **with complete replacement of the same**. The above guarantee certificate shall be furnished in triplicate to the purchaser for approval. Any defect noticed during this period should be rectified/replaced by the supplier free of cost to the purchaser provided such defects are due to faulty design, bad workmanship or bad materials used, within one month upon written notice from the purchaser failing which provision of clause- 20 shall apply.

14. **GST REGISTRATION CERTIFICATE, PAN CARD :** Attested legible Xerox copies of Income Tax PAN Card, GST Registration Certificate valid on the date of opening of the tender should be submitted along with tenders without which tender will be rejected at the time of opening. If required, the tenders shall have to produce original documents for verification any time after the opening of tender. Those who fail to produce the same and found not to be valid on the date of opening of the tender, their tenders will be rejected.

15. **SUBMISSION OF PROOF REGARDING MANUFACTURER'S CERTIFICATE/ AUTHORISED DEALERSHIP CERTIFICATE, PRICE LIST OF THE MANUFACTURER, PAST EXPERIENCE OF EXECUTION OF ORDER PERFORMANCE CERTIFICATE, TEST CERTIFICATE:**

Attested legible Xerox copies of necessary Manufacturer's certificate, valid authorized dealer certificate, Manufacturer's Price list and technical literature etc. should be furnished along with the tender. If required, the firms may be requested to produce such original certificates for verification. Past experience, if any, of execution of Purchase Orders need to be furnished by the bidders. The tender shall be accompanied with detail drawing and technical literature, leaflets, manuals if any.

16. **FREE REPLACEMENT:** Free replacement of materials lost / damaged during transit shall be made immediately on receipt of the intimation from the consignee /Paying Officer without waiting for settlement of the claim of bidders with Railway/Lorry/Insurance Company etc.

17. **STANDARDS:** The equipments shall strictly comply with relevant IS-15652:2006 (Latest edition along with amendments if any) or equivalent standard as regards material, design, manufacture and testing etc.

18. QUANTITY VARIATION: The quantity to be ordered may undergo revision at the time of placement of orders.

19. TERMS OF PAYMENT: -

100 % Payment along with full taxes & duties(as applicable)will be paid by the paying officer after receipt of materials in full and in good condition & due verification thereof by the consignee & approval of Guarantee Certificate from the undersigned and on receipt of funds from Head office in this regards. The bill in triplicate should be submitted to the paying officer along with completion report duly verified by the concerned Consignee.

20. PRICE REDUCTION FOR DELAY IN COMPLETION OF CONTRACT:

If the supplier shall fail to deliver the materials within the delivery period as stipulated under clause No.8 (Section-II) of this Tender document or any extension granted there to, the purchaser shall recover from the supplier penalty for a sum of half percent (i.e. 0.5 percent) of the contract price for each calendar week or part thereof of delay. However the total amount of penalty shall not exceed 5% (five percent) of the contract/ undelivered items price. Materials will be deemed to have been delivered only when all the component parts are also delivered. If certain components are not delivered in time, the supply will be treated as delayed until such time the missing/undelivered parts are delivered

21. SECURITY-CUM-PERFORMANCE DEPOSIT:

The successful tenderers will be required to deposit a Security Deposit-cum-Performance Guarantee amounting to 10% of the contract value **valid up to two months after the guarantee period** shall be deposited within 10 days (Ten) days of placement of the Work order in the shape of DD/Composite B.G. from a Nationalized Bank, drawn in favour of **GM**,**EHT (O&M) Circle, Chainpal** which will be refunded after two months of completion of the Guarantee period on written request subject to approval of guarantee certificate. The B.G. format will be issued by OPTCL during the placement of the work order. In the event of any breach or default in all or any condition of Work Order, security deposit will be forfeited. In case the security amount is not deposited, the same shall be deducted from the bill of the supplier. **Security Deposit not claimed for refund within three years from the date of expiry of Guarantee period shall be forfeited**

22. <u>Insurance</u>

The Supplier shall undertake insurance of stores covered by this Specification unless otherwise stated. The responsibility of delivery of the stores at destination in good condition rests with the Supplier. Any claim with the Insurance Company or transport agency arising due to loss or damage in transit has to be settled by the supplier. The Supplier shall undertake free replacement of materials damaged or lost, which will be reported by the consignee within 30 days of receipt of the materials at destination without waiting for the settlement of their claims with the carriers and underwriters.

23. Payment Due from the Supplier

All costs and damages, for which the supplier is liable to the purchaser, will be deducted by the purchaser from any money, due to the supplier, under any of the contract (s), executed with OPTCL.

24. Supplier's Responsibility.

Notwithstanding anything mentioned in the Specification or subsequent approval or acceptance by the Purchaser, the ultimate responsibility for design, manufacture, materials used and satisfactory performance shall rest with the Bidders. The Supplier(s) shall be responsible for any discrepancy noticed in the documents, submitted by them along with the bid(s)

25. Jurisdiction of the High Court of ODISHA.

Suits, if any, arising out of this contract shall be filed by either Party in a court of Law to which the jurisdiction of High court of ODISHA extends.

26. Correspondences.

i) Any notice to the supplier under the terms of the contract shall be served by Registered Post or by hand at the Supplier's Principal Place of Business.

ii) Any notice to the Purchaser shall be served at the Purchaser's Principal Office in the same manner.

Official Address of the Parties to the Contract

The address of the parties to the contract shall be specified:-

Purchaser: General Manager,
EHT (O&M) Circle, OPTCL, Chainpal,
OPTCL
AT/PO: CHAINPAL COLONY,
DIST: ANGUL (ODISHA), Pin-759104,
Email-**ehtm.cle.chp@optcl.co.in**

Supplier: Address

Telephone No.

Fax No.

27. Paying Officer and Consignee

- Paying Officer : Mentioned in Schedule quantity Table
- Consignee & Verifying Officer: Mentioned in Schedule quantity Table

28. Outright Rejection of Tenders

Tenders shall be out rightly rejected if the followings are not complied with:

1. Tenders shall be accompanied with the prescribed earnest money deposit, Paper Cost .
2. Tenders shall be kept valid for a minimum of 180 days from the date of opening of the tender.
3. Tenders shall be accompanied with clear valid Xerox copy of GST registration (if applicable), & clearance certificate, PAN card, which must be valid on the date of opening of the tender. All copies of documents and each page of the tender must be signed by the authorized representative of the bidders.
4. Abstract of general terms and conditions of contract.

5. Bidders not fulfilling the qualifying criteria as mentioned in **ELIGIBILITY FOR SUBMISSION OF BIDS.**

6. The bidders have to unconditionally comply with tender specification.

SECTION – III

(A) TECHNICAL SPECIFICATION

FOR

HARDWARE FITTINGS & ACCESSORIES SUITABLE FOR POWER CONDUCTOR FOR (ACSR PANTHER, ACSR ZEBRA & ACSR MOOSE AND AAAC PANTHER, AAAC ZEBRA & AAAC MOOSE)

1.0 SCOPE

This Specification covers design, manufacture, assembly, testing at manufacturer's Works, supply and delivery of hardware fittings for utilization in diversion of 220KV TTPS-Kaniha-RPH DC Line from Loc No.97 to 108 Passing through lease hold area of MCL , Kaniha OCP Mine and Restringing of conductors from Gantry at Meramundali GSS to Dead end tower of different lines under EHT (O & M) Division, Chainpal.". The hard wares to be supplied shall be as per drawings to be approved by OPTCL **AND CONFIRMING TO ISS AND IEC**. The firm shall submit his drawings in line with the Specification of OPTCL indicating clearly all dimensions on the body of the drawing for approval of OPTCL and only after which the manufacturing shall be started.

The hardware offered, shall be complete with all components, which are necessary or usual for the efficient performance and satisfactory maintenance. Such part shall be deemed to be within the scope of contract. The AGS type clamps shall have inbuilt AGS clamps/PA Rods.

2.0 STANDARDS

The materials covered under this Specification shall comply with the requirement of the latest version of the following standards as amended up to date, except where specified otherwise.

1)	IS:2486 Part-II & III	Insulator fitting for overhead power lines with a nominal voltage greater than 1,000 volts.
2)	IS:2121 Part I & II	Conductor & earth wire accessories for overhead power lines.
3)	IS:9708	Stock Bridge Vibration Dampers on overhead power lines.
4)	IS:2633	Method of testing of uniformity of coating on zinc coated articles
5)	IS:209	Specification for Zinc.
6)	BS:916	Specification for Hexagonal bolts and nuts.

3.0 MATERIALS AND DESIGN

Aluminum and aluminum alloys, malleable iron and forged steel, having required mechanical strength, corrosion resistance and machinability depending on the types of application for which accessories / fittings are needed, shall be employed. In manufacturer of the accessories / fittings, the composition of the aluminum alloys used shall be made available to Employer if required for verification.

The materials offered shall be of first class quality, workmanship, well finished and approved design. All castings shall be free from blow-holes, flaws, cracks of other defects and shall be smooth, close grained and true forms and dimensions. All machined surfaces should be free, smooth and well finished.

Metal fittings of specified material for conductor and string insulator fittings are required to have excellent mechanical properties such as strength, toughness and high resistance against corrosion. All current carrying parts shall be so designed and manufactured that contact resistance is reduced to the minimum.

All bolts, nuts, bolt-heads shall be the white worth's standard thread. Bolt heads and nuts shall be hexagonal. Nuts shall be locked in an approved manner. The treads in nuts and tapped holes shall be cut after galvanising and shall be well fabricated and greased. All other treads shall be cut before galvanising. The bolt treads shall be undercut to take care of increase in diameter due to galvanising.

All nuts shall be made of materials to Clause 4.8 of IS: 1367 (latest edition) with regard to its mechanical properties.

The general design of conductor and insulator fittings shall be such as to ensure uniformity, high strength, free from corona formation and high resistance against corrosion even in case of high level of atmosphere pollution.

All hooks, eyes, pins, bolts, suspension clamps and other fittings for attaching to the tower or to the line conductor shall be so designed that the effects of vibration, both on the conductor and the fittings itself, are minimized.

Special attention must be given to ensure smooth finished surface throughout. Adequate bearing area between fittings shall be provided and point or line contacts shall be avoided.

All accessories, clamps and hardware shall be free from cracks, shrinks, slender air holes, burrs or rough edges.

The design of the accessories, clamps and hardware shall be such as to avoid local corona formation or discharge likely to cause interference to Tele-transmission signals of any kind.

4.0 GALVANISING:

All ferrous parts of conductor accessories and insulator hardware shall be galvanized in accordance with IS: 2629-Recommended Practice for hot dip galvanizing of iron and steel or any other equivalent authorities' standards. The weight of zinc coating shall be determined as per method stipulated in IS: 2633 for testing weights, thickness and uniformity of coating of hot dip galvanized articles or as per any other equivalent authoritative standards.

The zinc used or galvanization shall conform to grade Zn 98 of IS: 209. The galvanized parts shall withstand four (4) dips of 1 minute each time while testing uniformity of zinc coating as per IS: 2633.

Spring washers shall be electro galvanized.

ACCESSORIES FOR CONDUCTOR & GROUNDWIRE

5.0 MID SPAN COMPRESSION JOINTS (FOR AAAC & ACSR PANTHER, ZEBRA & MOOSE CONDUCTOR AND GROUND WIRE OF 7/3.15 Sq. mm)

The Mid-Span Joints for conductor and earth wire shall be of compression type. The conductor mid-span joints shall comprise of outer aluminum sleeve of extruded aluminum (99.5% purity) and inner sleeve HDG Steel. All filler plug shall also be provided. The ground wire mid-span joints shall be of HDG steel. The sleeves shall be of circular shape suitable for compression into hexagonal shape.

The compression type mid-span straight joints shall be suitable for making joints in the ACSR/AAAC PANTHER,ZEBRA & MOOSE conductor or in the galvanized steel stranded ground wire.

The joints shall be so designed that when installed no air space is left within the finished joints. The joints shall have the conductivity as specified in relevant Clause.

The joints shall conform to IS: 2121 (latest edition) unless specified otherwise. The details of the joints both suitable for ACSR Conductors and ground wire are given in the technical particulars.

Instead of welding 2 separate aluminum materials as shown in the drawing, the entire jumper cone (pad and conduction holding portion) should be extruded from a single aluminum pipe.

The inner and outer diameters and lengths of the offered joints before and after compression shall be clearly shown in the drawings.

6.0 VIBRATION DAMPER (FOR AAAC & ACSR PANTHER, ZEBRA & MOOSE AND GROUND WIRE (7/3.15))

Vibration Damper having 4 resonance frequency characteristic commonly called 4R Damper shall be offered. The Damper shall eliminate fatigue on the conductor due to vibration and damp out the vibration effectively so that no damage due to vibration is caused to conductor / ground wire/ string.

The dampers are proposed to be used at all tension locations and also at suspension locations. One or more dampers are proposed to be used on tension/suspension locations depending upon the span.

Bidder shall also recommend the number of damper required to effectively damp out conductor or ground wire vibration for different values of span lengths and the distance of fixation.

Vibration dampers shall be of approved design. The clamps of the vibration dampers shall be made of aluminum alloy, so designed as to prevent any damage while fixing on the conductor during erection or in continued operation. The fastening bolts should be approved by the Employer. The spring washers should be electro galvanized and of minimum 2 mm thickness. The messenger cable shall be made from high tensile strength steel strands in order to prevent subsequent drop of weight in service.

Clamping bolts shall be provided with self locking nuts as designed to prevent corrosion of the threads. All ferrous parts including the messenger cable shall be hot dip galvanized. The end of the messenger cable shall be effectively sealed to prevent corrosion.

The vibration dampers and its attachment shall have smooth surface so that no corona occurs on them.

The clamps of the stock bridge vibration dampers shall be so designed that in case of loosening of the bolt or changing free parts of the clamp, it does not allow the damper to disengage from the conductor.

7.0 REPAIR SLEEVE

FOR AAAC & ACSR PANTHER, ZEBRA & MOOSE CONDUCTOR AND GROUNDWIRE

Compression type repair sleeves shall be offered to provide reinforcement for conductor with broken or damaged aluminum strands/galvanized steel ground wire broken in damaged steel strands. The repair sleeve shall be designed to make good a conductor of which not more than one- sixth ($1/6^{th}$) of the strands in the outermost layer and damaged or severed. The repair sleeves after compression should present a smooth surface.

8.0 TENSION CLAMPS (DEAD AND ASSEMBLY) FOR GOUND WIRE)

Compression type dead end assembly of G.S.S ground wire shall be required for use on the tension towers. The dead end assembly shall be supplied with complete jumper terminals, nuts and bolts suitable link pieces between the steel clevis and tower strain plates so as to provide sufficient flexibility not less than that of G.S.S ground wire and the tensile strength not less than 90% of that of the G.S.S ground wire.The assemblies shall comprise of compression type dead end clamps and one anchor shackle made of forged steel. The entire assembly shall be hot dip galvanized. Instead of welding 2 separate aluminum materials as shown in the drawing, the entire jumper cone (pad and conduction holding portion) should be extruded from a single aluminum pipe.

One of bolt holding joint per terminal of dead end assemblies shall be kept sufficiently long and threaded and shall be provided with nuts, washers and locking nuts for fixing the flexible earthing bond between the dead-end clamp and tower structures.

9.0 INSULATOR HARDWARES

The insulator disc hardware and string assemblies to be offered by the tenderer shall be suitable to meet the requirement given in the specific technical particulars as detailed hereinafter.

Hardware for suspension and tension insulator shall be suitable for insulator with normal pin shank diameter of 20 mm. in case of tension string unit and 16mm for suspension string unit.

Each insulator string shall generally include the following hardware components.

Single Suspension Set.	**Double Suspension Set.**
a) Ball Hook	a) Ball Hook.
b) Tower side arcing horn	b) Socket clevis with R-Type security clip-3 Nos.
c) Socket Eye with R-Type security clip.	c) Yoke Plate-2 Nos.
d) Line side arcing horn.	d) Tower side arcing horns-2Nos.
e) Armour grip suspension clamps f) Cushion g) Armour Grip Helix	e) Ball clevis – 2 Nos. f)Line side arcing homs-2 Nos. g) Clevis Eye. h) Armour Grip Suspension Clamp. i) Cushion j) Armour Grip Helix
Single Tension Set :	**Double Tension Set :**
a) Anchor Shackle.	a) Anchor Shackle.
b) Ball Eye.	b) Chain Link.
c) Tower side arcing horn.	c) Yoke Plate – 2 Nos. (Tower side-01 No. & Line Side-01 No.)
d) Socket Clevis with R-Type security clip.	d) Tower side arching horn.
e) Line side arcing horn	e) Ball Clevis – 2 Nos.
f) Compression type dead end clamp.	f) Socket Clevis with R-Type security clip – 2 Nos.
	g) Line side arcing horns. h) Compression type dead end clamps. i) Clevis

10.0 **CLAMP**

10.1 ARMOUR GRIP SUSPENSION CLAMPS

Armour Grip Suspension Clamp shall consist of 2 neoprene insert, one set of Armour rods made of aluminum alloy, two aluminum housing having inner profile matching with the profile of the Armour rods page and supporting strap made of aluminum alloy. The A.G. type suspension clamp shall be designed, manufactured and finished as to have a suitable shape without sharp edges at the end and to hold the respective conductor properly. It should, however, have sufficient contact surface to minimise damage due to fault current.

The A.G. Type suspension clamp shall permit the conductor to slip before the occurrence of failure of the conductor and shall have sufficient slip strength to resist the conductor tension under broken wire conditions. The clamp shall have slip strength of not less than 15 % of respective conductors.

10.2 **TENSION CLAMPS**

The Tension Clamps shall be made out of aluminum alloy and of compression type suitable for PANTHER/ZEBRA/MOOSE conductor for both AAAC & ACSR. The tension clamps shall not permit slipping or damage to failure of the complete conductor or any part thereof at a load less than 90% of the ultimate strength of conductor. The mechanical efficiency of

tension / clamps shall not be affected by method of erection involving come / along or similar clamps or tension stringing operation during or after assembly and erection of tension clamp itself. The tension clamp shall be of a design that will ensure unrestricted flow of current without use of parallel groove clamps. The clamps shall be as light as possible.

10.3 **ARCING HORNS**

Each hardware assembly shall have provision for attaching arcing horns of both adjustable and non/adjustable type across the suspension and tension strings or tower side. However each hardware assembly shall be provided with arching horn of fixed type on line side only.

10.4 UNIVERSAL JOINTING COMPOUND

BENDEX-HV' Universal jointing compound which is a chemically inert compound to be used as filler for the compression joints and dead end clamps to be supplied.

11.0 TESTS, TEST CERTIFICATE AND PERFORMANCE REPORTS

The fittings and accessories for the power conductor, insulator and hardwares shall be tested in accordance with IS: 2121, IS: 2486, IS: 9708 (For Vibration Dampers), BS: 916 for hexagonal bolts and nuts or any other authoritative equivalent standards. Type test, routine test certificates and performance reports are to be submitted by the bidder.

The Employer however, reserves the right to get all the tests performed in accordance with the relevant I.S. Specification as Acceptance Test in presence of Employer-s representatives.

The tenderer shall clearly state the testing facilities available in the laboratory at his Works and his ability to carry out the tests in accordance with this Specification. All the specified tests shall be carried out without any extra cost**.**

11.0 ACCEPTANCE TEST FOR POWER CONDUCTOR AND G.S.S. GROUND WIRE ACCESSORIES.

11.1 ACCEPTANCE TEST FOR POWER CONDUCTOR AND GROUND WIRE ACCESSORIES

a) Visual & Dimensional verification.
b) Failing load test.
c) Slip strength test. (For clamps & vibration damper)
d) Electrical resistance test.
e) Resonance Frequency test (for vibration dampers)
f) Fatigue test (for vibration damper)
g) Mass pull off test (Slipping strength of messenger cable for vibration damper)
h) Clamp bolt torque test (For vibration damper)
i) Galvanizing test.
j) Tests on P.A. Rod
k) Tests on Locking Devices.

11.2 ACCEPTANCE TEST FOR HARDWARES

l) Visual & Dimensional verification.
m) Ultimate tensile/Mechanical strength test.
n) Slip strength test. (For clamps)
o) Electrical resistance test.
p) Heating cycle test
q) Breaking strength of full string assembly.
r) Galvanizing test.

s) Tests on P.A. Rod
t) Tests on Locking Devices.

11.3 SPECIFIC TECHNICAL REQUIREMENTS FOR CONDUCTOR ACCESSORIES AND INSULATOR HARDWARES

CONDUCTOR	**Panther/Zebra/Moose**	**G.S.S Ground wire**
a) Type	ACSR Panther/Zebra/Moose	Ground wire
b) Material	Aluminum conductor steel reinforced	Ground stranded steel wire
c) Strand & Wire diameter.	Panther/Aluminium 30/3mm Zebra/all 54/3.18mm steel- 7/3.18mm Moose/ all 54/3.53mm steel- 7/3.53mm	7/3.15mm
d) Weight per Km.	974/1622/2004 Kg per Km	426 kg per km
e) Overall diameter	21/28.62/ 31.7mm	9.4mm
f) D.C. Resistance at 20°C when corrected to standard weight	0.13750/ 0.06915 / 0.05552 Ohm/KM	3.375 Ohms/km
g) Minimum breaking load/ Ultimate tensile strength.	144/ 13289 / 16120 Kg	5710 kg
h) Maximum working tension at minimum temperature & 2/3 full wind.	3806/ 4325 Kg	1393kg
i) Maximum Sag at maximum temperature & no wind.	6120/ 9240mm	5150mm

DISC INSULATOR

(For suspension & tension Insulator strings of 132, 220 and 400 KV) accordingly hard ware fittings to be designed)

Sl. No	DESCRIPTION	Suspension	Suspension	Tension	Tension
1	Electro Mechanical Strength of single insulator in KN	90 KN	120 KN	120KN	160KN
2	Type of Insulator	Ball & socket	Ball & socket	Ball & socket	Ball & socket
3	Size of ball & socket(mm)	16	16	20	20

4	Dimensions				
(a)	Disc diameter(mm)	255 mm	255 mm	280 mm	305 mm
(b)	Ball to ball spacing(mm)	145 mm	145 mm	145 mm	170 mm
(c)	Minimum Creepage distance of the single insulator-mm	430 mm	430 mm	430 mm	475 mm
5	Materials of shell	Porcelain	Porcelain	Porcelain	Porcelain

String arrangements for 132/ 220/ 400 KV:	Single Suspension	Single Tension	Double Suspension	Double Tension
No. of insulator discs.	9/14/24	10/15/25	2x9/2x14 /2x24	2x10/2x15 / 2x25
Length of string assembly (mm)	1672/ 2340	1851/ 3003	1837/ 2243	2132/ 3082

LONG ROD INSULATOR

(For suspension & tension Insulator strings of 132 & 220 KV) accordingly hard ware fittings to be designed)

FOR 132KV PORCELAIN LONG ROD INSULATORS				
Sl. No	DESCRIPTION	Suspension	Tension	
1	Type of Insulator	Ball & socket	Ball & socket	
2	Size & designation of ball & socket and standard to which it will conform (mm)	16 mm, Alt-B IS-2486-II	20 mm, Alt-B IS-2486-II	
3	No of insulator per string	One	One	
4	Outside dia of the LRI (mm)	200	205	
5	Creepage distance of insulator (mm)	4000	4300	
6	Mechanical strength of single LRI (KN)	90 KN	120 KN	
FOR 220KV PORCELAIN LONG ROD INSULATORS				
Sl. No	DESCRIPTION	Suspension	Suspension	Tension
1	Type of Insulator	Ball & socket	Ball & socket	Ball & socket
2	Size & designation of ball & socket and standard to which it will conform (mm)	16 mm	20 mm	20 mm
3	No of insulator per string	Two	Two	Two
4	Largest sheds diameter (mm)	210	210	215
5	Creepage distance of insulator (mm)	6125	6450	7130

6	Mechanical strength of single LRI (KN)	90 KN	120 KN	160 KN

132 KV Long Rod insulator				
Type of string	Size of long rod (mm)/ Unit	Minimum creepage distance (mm)	No. of unit	Electromechanical strength of insulator (KN)
Single Suspension	180x1450	3625	1	90 KN
Double Suspension			2	2x90 KN
Single Tension	205x1450	4300	1	120 KN
Double Tension			2	2x120 KN
220 KV Long Rod insulator				
Type of string	Size of long rod (mm)/ Unit	Minimum creepage distance (mm)	No. of unit	Electromechanical strength of insulator (KN)
Single Suspension	210x2175	6450	2	120 KN
Double Suspension			4	2x120 KN
Single Tension	215x2550	7130	2	160 KN
Double Tension			4	2x160 KN

GENERAL REQUIREMENT FOR HARD WARE FITTINGS FOR POWER CONDUCTOR & GROUND WIRE:

1) ACCESSORIES

A) MID-SPAN COMPRESSION JOINTS

(SUITABLE FOR AAAC/ ACSR PANTHER, ZEBRA & MOOSE CONDUCTOR)

	Suitable for AAAC/ ACSR Panther/ Zebra/ Moose	
i) Type	Compression	
ii) Material		
a) Outer sleeve	Extruded Aluminum	
b) Inner sleeve	Steel (galvanized)	
iii) Dimension of Compression joint for Aluminum part.	Before Compression	After compression
	Outer dia: 38mm Inner Dia: 23mm Minimum length: 610 mm Minimum weight 1.2kg	Adjacent side: 32mm Diagonal size: 37 mm

	(approx.)	
iv) Dimension of compression joint for Steel Part	Outer dia: 18 mm Inner Dia: 9.3 mm Minimum length: 203 mm Minimum weight 0.28 kg approx.)	Adjacent side: 15.1 mm Minimum: 10 mm
v) Minimum failing load.	95% of ultimate tensile strength of conductor	
vi) Electrical resistance 20 Deg. C	75% of measured resistance of the equivalent length of conductor.	
vii) Galvanising :		
(a) Ferrous Parts.	Hot-dip galvanized (HDG)	
(b) No. of dips 4 dips for 1 minute withstand.	4 dips	
viii) Minimum Corona formation voltage	110% of maximum line to ground voltage	

(B) VIBRATION DAMPERS

(SUITABLE FOR AAAC/ ACSR PANTHER, ZEBRA & MOOSE CONDUCTOR:

i) Type: 4R Stock Bridge Type

ii) Distance between conductors: 74.5 mm. & axis of the Vibration Damper.
iii) Messenger Cable : 130 Kg/mm sq. quality (19 strands)
iv) Bolt size : 16 mm. (dia.)
v) Slip strength of messenger Cable: 500 Kg
vi) Mass pull-of: As per I.S.S.

C) REPAIR SLEEVES

(SUITABLE FOR AAAC/ ACSR PANTHER, ZEBRA & MOOSE CONDUCTOR)

	Suitable for ACSR panther/Zebra/ Moose
i) Type	Compression
ii) Material	Extruded aluminum.
iii) Min. failing load	95% of UTS of conductor.
iv) Length	241/279 mm.
v) Dimension :	
a) After compression	
(i) Adjacent side	21 mm
b) Before Compression	
(i) Outer diameter 38/48 mm.	21 mm
(ii) Inner diameter 23/40 mm	11.5 mm

vi) Electrical resistance AT 20° C	Not more than 75% of the resistance of equivalent length of conductor.
vii) **Galvanizing :** a) Ferrous parts	Hot – dip galvanized
b) No. of dips for one-minute stand	4 dips

D) INSULATOR HARDWARES (BOTH SUSPENSION AND TENSION)

String Hardware: Material and strength

Description of item	Material	UTS
i) Bolt hook	Forged Steel	9,000/ 11,500/16,500 Kgs (90 KN/120KN/160KN)
ii) Anchor Shackle		11,500/16,500 Kgs (120 KN/160 KN)
iii) Socket Eye Horn Holder.		9,000/11,500 /16500Kgs (90 KN/120 KN/160 KN)
iv) Socket Clevis		9,000/11,500/16,500 Kgs
v) Ball Clevis		9,000/11,500/16,500 Kgs
vi) Clevis Eye		9,000/11,500/16,500 Kgs
vii) Socket Eye		9,000/11,500/16,500 Kgs
viii) Bottom / Top Yoke plate		
Double Suspension	Mild steel	9,000/11,500/16,500 Kgs
Double Tension	Mild steel	16, 500 Kgs
ix) Arcing Horn	Mild steel	---
x) Suspension Clamp	Aluminum Alloy & Neoprene	---
xi) Tension Clamp	All alloy & Steel	11,500/16,500 kgs
xii) Ball Pin	High tensile forged steel (HDG)	90 % of UTS of conductor
xiii) Security clip	Brass (R-Type)	

Minimum failing load String (KN)

Single Suspension	**9,000/11,500/16,500 Kgs**
Single Tension	**11,500/16,500 kgs**
Double Suspension	**9,000/11,500/16,500 Kgs**
Double Tension	**11,500/16,500 kgs**

B) HARDWARE FITTINGS SUITABLE FOR AAAC CONDUCTOR

The Hardware should be suitable for above type of conductor and as per drawing & specification marked on the body of the drawing.

All 'D' shackles should be perfect in manufacturing and shall be subjected to "X-Ray test at the time of inspection. All the hardware & fittings should be manufactured strictly in

accordance with ISS. In case of deviation in technical specification, the same shall be duly approved from the Sr. general Manager [C.P.C.], OPTCL.

1. Dimensions of insulator string along with hardware fitting.
The various limiting dimensions of the single suspension / double suspension and single/double tension hardware fittings shall be as per the sketches.

2. Interchangeability.
2.1 The hardware for insulator strings with disc insulators together with ball and socket fittings shall be standard design, so that this hardware are interchangeability with each other and suitable for use with disc insulators of any make conforming to relevant Indian/International standard.

2.2 The hardware fittings offered shall be suitable for employment of hot line maintenance techniques so that usual hot line operations can be carried out with ease, speed and safety. The technique adopted for hot line maintenance shall be generally bare hand method and hot stick method. The Bidder should clearly establish in the bid, the suitability of his fittings for hot line maintenance.

2.3 The line side yoke plate shall have a notch and a working hole of suitable size to facilitate the hot line working. The design of corona control ring or grading ring shall be such that it can be easily replaced by employing hot line maintenance technique.
2.4 Ball and socket designation.

The dimensions of the ball and socket shall be 20mm wherever 120 and 160 KN insulators are used and 16 mm when 90 KN insulators are used. The designation should be in accordance with the standard dimensions stated in IS-2486(Part-II)/ IEC 120. The dimensions shall be checked by appropriate gang after galvanizing only.

3. Security clips and split pins.

3.1 Security clips for use with ball and socket coupling shall be R-shaped, hump type which provides positive locking of the coupling as per IS-2486 (Part-III)/IEC-372. The legs of the security clips shall be spread after assembly in the works to prevent complete withdrawal from the socket. The locking device shall be resilient, corrosion resistant and of suitable mechanical strength. There shall be no risk of the locking device being displaced accidentally or being rotated when in position. Under no circumstances shall the locking devices allow separation of fittings.

3.2 The hole for the security clip shall be countersunk and the clip shall be of such design that the eye of clip may be engaged by a hot line clip puller to provide for disengagement under energised conditions. The force required to pull the security clip into its unlocked position shall not be less than 50 N (5 Kg.) or more than 500 N (50 Kg.)

3.3 Split pins shall be used with bolts and nuts. The Bidder must note that 2.5% extra fasteners are to be supplied without any extra cost to the Employer, to deal with losses during erection.

4.Arcing horn.

4.1 The arcing horn shall be either ball ended rod type or tubular type and shall be formed from galvanized mild steel and of approved types. The arcing horns shall be attached in an approved manner to all suspensions and tension insulator sets. The horns shall be attached to the insulator fittings, but not directly to conductor clamps or to the caps of insulator units. The design of the arcing horns shall be such as to reduce as far as reasonably possible, damage to the line conductors, clamps, insulators strings and arcing horns themselves under all flashover conditions. The general shape and method of attachment of the live end arcing horn shall also not restrict the replacement of insulators under live line condition.

4.2 The total effective arcing distance shall be 2130 mm 220 kV.

II) **CLAMPS**

	SINGLE SUSPENSION STRING	SINGLE TENSION STRING	DOUBLE SUSPENSION STRING	DOUBLE TENSION STRING
i) Type	AGS Type	Compression Type	AGS Type	Compression Type
ii) Material	Aluminum Alloy and neoprene	Aluminum Alloy and Steel	Aluminum Ally and Neoprene	Aluminum Alloy and Steel
ii) Minimum slip strength	Not less than 15%	90% of UTS of conductor	Not less than 15% of UTS of conductor	90% of UTS of conductor
iv) Minimum failing load (kg)	9,000/11,500	90% of UTS of conductor	9,000/11,500	90% of UTS of conductor

III) Suspension assembly: General (AGS Type with AGS Clamps)

1. The suspension assembly shall be suitable for 132kv ACSR Panther Conductor (30+7/3.0mm), 220 KV ACSR Zebra Conductor(54+7/3.18mm), ACSR Moose Conductor (54+7/3.53mm), AAAC Panther conductor (37/3.15mm), AAAC Zebra Conductor (37/4.0mm) & AAAC Moose Conductor (61/3.55mm).
2. The suspension clamp along with standard preformed Armour rods or Armour grip suspension clamp set shall be designed to have maximum mobility in any direction and

minimum moment of inertia so as to have minimum stress on the conductor in the case of oscillation of the same.

3. The suspension clamp along with Armour grip suspension clamp set shall have slip strength between **20 to 29 KN 37/4.00 mm²**and as per ISS for other conductors. The tightening torque for the bolts, wherever applicable shall be specified by the manufacturer to achieve the above slip strength.
4. The suspension assembly shall be designed, manufactured and finished to give it a suitable shape, so as to avoid any possibility of hammering between suspension assembly and conductor due to vibration. The suspension assembly shall be smooth without any cuts, grooves, abrasions, projections, ridges or excrescence which might damage the conductor.
5. The suspension assembly/clamp shall be designed so that it shall minimize the static and dynamic stresses developed in the conductor under various loading conditions as well as during wind induced conductor vibrations. It shall also withstand power arcs and have required level of corona/RIV performance.

IV) Suspension assembly: Armour Grip Clamp

1. The Armour grip suspension clamp shall comprise of retaining strap, support housing, elastomer inserts with aluminum reinforcements and AGS preformed rod set.

2. Elastomer insert shall be resistant to the effects of temperature up to 85 deg. C, ozone, Ultraviolet radiation and other atmospheric contaminants likely to be encountered in service. The physical properties of the elastomer shall be of approved standard. It shall be electrically shielded by a cage of AGS preformed rod set. The elastomer insert shall be so designed that the curvature of the AGS rod shall follow the contour of the neoprene insert.
3. The AGS preformed rod set shall be as detailed above in general except that the length of the AGS preformed rods shall be such that it shall ensure sufficient slipping strength and shall not introduce unfavorable stress on the conductor under all operating conditions.

V) Fasteners: (Bolts, Nuts & Washers)

1. All bolts and nuts shall conform to IS-6639 – 1972. All bolts and nuts shall be Hot DIP galvanized. All bolts and nuts shall have hexagonal heads, the heads being truly concentric, and square with the shank, which must be perfectly straight.

2. Bolts up to M16 and having length up to ten times the diameter of the bolt should be manufactured by cold forging and thread rolling process to obtain good and reliable mechanical properties and effective dimensional control. The shear strength of bolt for 5.6 grade should be 310 Mpa minimum as per IS-12427. Bolts should be provided with washer face in accordance with IS-1363 Part-I to ensure proper bearing.

3. Fully threaded bolts shall not be used. The length of the bolt shall be such that the threaded portion shall not extend into the place of contact of the component parts.

4. All bolts shall be threaded to take the full depth of the nuts and threaded enough to permit the firm gripping of the component parts but not further. It shall be ensured that the threaded portion of the bolt protrudes not less than 3 mm and not more than 8 mm when fully tightened. All nuts shall fit and be tight to the point where shank of the bolt connects to the head.

5. Flat washers and spring washers shall be provided wherever necessary and shall be of positive lock type. Spring washers shall be electro-galvanized. The thickness of washers shall conform to IS-2016-1967.

6. The bidder shall furnish bolt schedules giving thickness of components connected, the nut and the washer and the length of shank and the threaded portion of the bolts and size of holes and any other special details of this nature.
7. To obviate bending stress in bolt, it shall not connect aggregate thickness more than three time its diameter.
8. Bolts at the joints shall be so staggered that nuts may be tightened with spanners without fouling.
9. Fasteners of grade higher than 8.8 are not to be used and minimum grade for bolts shall be 5.6.

GENERAL:

1. All ferrous parts including fasteners shall be hot dip galvanized, after all machining has been completed. Nuts may however be tapped (threaded) after galvanizing and the threads oiled. Spring washers shall be electro-galvanized. The bolt threads shall be undercut to take care of the increase in diameter due to galvanizing. Galvanizing shall be done in accordance with IS-2629-1985 and shall satisfy the tests mentioned in are 2633-1986. Fasteners shall withstand four dips while spring washers shall withstand three dips of one-minute duration in the standard Preece test. Other galvanized materials shall be guaranteed to withstand at least six successive dips each lasting one minute under the Standard Preece test for galvanizing.
2. The zinc coating shall be perfectly adherence of uniform thickness, smooth, reasonably bright, continuous and free from imperfections such as flux, ash,

rust stains, bulky white deposits and blisters. The zinc used for galvanizing shall be of grade Zn 99.95 as per IS 209-1979.

3. Pin balls shall be checked with the applicable "G)" gauges in at least two directions, one of which shall be across the line of die flashing and the other 90 deg. to this line. 'NO GO' gauges shall not pass in any direction.
4. Socket ends, before galvanizing shall be of uniform contour. The bearing surface of socket ends shall be uniform about the entire circumference without depressions or high spots. The internal contours of socket ends shall be concentric with the axis of the fittings as per IS 2486/IEC-120. The axis of the bearing surfaces of socket ends shall be coaxial with the axis of the fittings. There shall be no noticeable tilting of the bearing surfaces with the axis of the fittings.
5. All current carrying parts shall be so designed and manufactured that contact resistance is reduced to minimum.
6. Welding of aluminum shall be by inert gas shielded tungsten are or inert gas, shielded metal arc process. Welds shall be clean, sound, smooth, and uniform without overlaps, properly fused and completely sealed. There shall be no cracks, voids incomplete penetration, incomplete fusion, under-cutting or inclusions Porosity shall be minimized so that mechanical properties of the aluminum alloys are not affected. All welds shall be properly finished as per good engineering practices.

Electrical Design:

The heavy duty suspension, and heavy duty tension insulator sets shall all comply with the technical requirements of schedule C and ISS and IEC and satisfy the test requirements stated in Section-7.

Mechanical design:

The mechanical strength of the insulators and insulator fittings shall be as stated in Schedule-C

The design shall be such that stresses due to expansion and contraction in any part of the insulator shall not lead to the development of defects.

Insulating material shall not engage directly with hard metal. All fixing materials shall be of approved quality, shall be applied in an approved manner and shall not enter into chemical action with the metal parts or cause fracture by expansion in service. Where cement is used as a fixing medium, cement thickness shall be as small and even as possible and proper care shall be taken to correctly center and locate the individual parts during cementing.

TECHNICAL SPECIFICATION FOR DESIGN, SUPPLY AND TESTING OF HARD WARE FITTINGS

Type tests:

The following type tests shall be conducted on hardware fittings.

A.On suspension hardware fittings only.

(a) Magnetic power loss test.
(b) Clamp slips strength vs. torque
(c) Mechanical strength test.
(d) On one test on elastomer.

B.On Tension hard ware fittings only.

(a) Electrical resistance test for Dead end assembly	IS 2486 (Part-I) 1971
(b)Heating cycle test for dead end assembly.	-do-
(c)Slip strength test for dead end assembly.	IS 2486 (Part-I)

(c) Mechanical strength test.

C.On both suspension and tension hardware fittings.

(a) Visual examination. IS-2486 (Part-I) 1971
(b) Verification of dimension. -do-
(c) Galvanizing / electroplating test. -do-
(d) Mechanical strength test of each component (Including corona control ring/grading ring and arcing horn)
(e) Mechanical strength test of welded joint.
(f) Mechanical strength test for corona control ring/ Grading ring and arcing horn. BS-3288 (Part-I)
(g) Test on locking device for ball and socket coupling. IEC – 3721984
(h) Chemical analysis, hardness tests, grain size, inclusion rating and magnetic particle inspection for forging/casting.

D. On suspension hardware fittings only.

(a) Clamp slips strength over as torque test for suspension clamp.
(b) Shore hardness test of elastomer cushion for AG suspension clamp.
(c) Bend test for rod set. IS-2121 (Part-I)
(d) Resilience test for Armour rod set. -do-
(e) Conductivity test for Armour rod set. -do-

E. On Tension hardware fittings only.

(a) Slip strength test for dead end assembly. IS-2121 (Part-I)

All the acceptance tests stated at clause shall also be carried out on composite insulator unit, except the eccentricity test at clause. In addition to these, all the acceptance tests indicated in IEC 1109 shall also be carried out without any extra cost to the employer.

F. For hardware fittings.

(a) Visual examination. IS-2121 (Part-I)
(b) Proof & test.

G. Tests on Conductor Accessories

H. Type tests

1) Mid span Compression Joint for Conductor and Earth wire

(a) Chemical analysis of materials.
(b) Electrical resistance tests. IS-2121 (Part-II) 1981 clause 6.5 & 6.6
(c) Heating cycle test. -do-
(d) Slip strength test. -do-
(e) Corona extinction voltage test (dry)
(f) Radio interference voltage test (dry)

2) Repair Sleeve for Conductor

(a) Chemical analysis of materials.

(b)Electrical resistance tests. IS-2121 (Part-II) 1981 clause 6.5 & 6.6

(c) Heating cycle test. -do-

(d) Slip strength test/ Failing Load test -do-

(e) Corona extinction voltage test (dry)

(f) Radio interference voltage test (dry)

(g) Visual Examination.

(h) Verification of Dimensions

3) <u>Vibration Damper for Conductor</u>. (IS 9708-1993, IS 2633-1986)

(a)Visual Examination

(b) Verification of Dimensions

(c) Resonance Frequency test

(d) Dynamic Characteristics test

(e) Damper efficiency test

(f) Clamp slip test (Before Fatigue test)

(g)Fatigue test (for 10 million cycle)

(h) Mass pull off test

(i) Clamp bolt torque test

(j) Galvanising test (Uniformity of Zinc coating)

(k) Magnetic power loss test

Characteristics as per IS:398 Part _II/1976

ACSR Panther 30+7/3.00 mm

Area-212.1 Sq.mm
Outer Diameter-21mm
Weight in Kg-973.1 Kg per Km
Brkd – 9241.9 Kg

ACSR Zebra 54+7/3.18 mm

Area-428.9 Sq.mm
Outer Diameter-28.62
Weight in Kg-1620 Kg per Km
Brkd in Kg- 13466.4

ACSR Moose 54+7/3.53 mm

Area-528.5 Sq.mm
Outer Diameter-31.77 mm
Weight in Kg-1996.2 Kg per Km
Brkd in Kg- 16593.9 Kg

AAAC Panther 37/3.15 mm

Area-288 Sq.mm
Outer Diameter-22.05mm
Brkd – 84.71KN

AAAC Zebra 37/4.0 mm

Area-465 Sq.mm
Outer Diameter-28mm
Brkd in Kg- 136.38KN

AAAC Moose 61/3.55 mm

Area-604 Sq.mm
Outer Diameter-31.95 mm

Weight in Kg-1666.00 Kg per Km
Brkd in – 167.99 KN

SCHEDULE OF GUARANTEED TECHNICAL PARTICULARS

HARDWARE FITTINGS AND ACCESSORIES FOR AAAC/ ACSR PANTHER/ZEBRA/MOOSE CONDUCTOR

A	HARDWARES	SUSPENSION	TENSION
i	Maker's name, Address and Country		
ii	Size and designation of ball and socket with standard specification to which conforming	16mm as per IS 2486	20mm as per IS 2486
iii	Material		
a)	Anchor shackle	NA	Forged steel Galvanized
b)	Chain Link	NA	Forged Steel Galvanized
c)	Ball hook / Ball Link (HH)	Forged Steel Galvanized	Forged Steel Galvanized
d)	Socket Eye (HH)	Forged Steel Galvanized	NA
e)	Ball Clevis	Forged Steel Galvanized	Forged Steel Galvanized
f)	Socket Clevis	Forged Steel Galvanized	Forged Steel Galvanized
g)	Yoke Plate	Mild Steel Galvanized	Mild Steel Galvanized
h)	Arcing Horn	Mild Steel Galvanized	Mild Steel Galvanized
I)	Clamp Suspension	A.G.S. Clamp	NA
J)	Dead End/Cross arm strap	NA	NA
k)	Dead end clamp (Compression)	NA	Extruded Aluminum Alloy
iv	Standard specification to which the Hardware conform	IS 2486, IS: 2004,IS:617, IS-2633, & IS-733	
v	Standard specification to which conforming	IS: 2486	
vi	**Galvanizing**		
a)	Ferrous parts	Hot Dip Galvanized	

b)	Spring washers	Electro Galvanized		
c)	Quality of zinc used	99.5%		
d)	Number of dips which the clamp can withstand	4/ 1 minute dips		
vii	Standard to which conforming	IS 2633		
Viii	Reference to drawing No.			
ix	Minimum failing load in kg	For AAAC/ ACSR Panther (132 KV)	For AAAC/ ACSR Zebra (220 KV)	For AAAC/ ACSR Moose (220 KV)
a)	For Single Tension Hardware Fittings	**120 KN**	**160 KN**	**160 KN**
b)	For Double Tension Hardware Fittings	**120 KN**	**160 KN**	**160 KN**
c)	For Single Suspension Hardware Fittings	**90KN**	**120KN**	**120KN**
d)	For Double Suspension Hardware Fittings	**90 KN**	**120 KN**	**120 KN**
B.	**TENSION CLAMPS**	**Suitable for AAAC/ ACSR Panther, Zebra & Moose**		
i	Type	Compression type tension clamp		
ii	Material	Ext. Al. Alloy/ Ext. Al.		
iii	Breaking Strength	95% of UTS of Conductor		
iv	Slipping strength	95% of UTS of Conductor		
v	Galvanising			
a)	Ferrous parts	Hot Dip Galvanized		
b)	Spring washers	Electro Galvanized		
c)	Quality of zinc used	99.5%		
d)	Number of dips which the clamp can withstand	4/ 1 minute dips		
vi	Standard to which conforming	IS 2633		
vii	Electrical Conductivity			
	a. Results of heating cycle test carried out			
	b. Electrical resistance	Not more than 75% of equivalent length of		

		conductor			
viii	Reference to type tests and other tests reports attached				
ix	Make of bolts and nuts used				
C	**SUSPENSION CLAMPS**	**AAAC/ ACSR Panther**	**AAAC/ ACSR Zebra**	**AAAC/ ACSR Moose**	
i	Type	AGS Type			
ii	Type of material used for retaining rod for AGS assembly giving reference of ISS	Aluminum Alloy 6061/ Equivalent	Aluminum Alloy 6061/ Equivalent	Aluminum Alloy 6061/ Equivalent	
iii	Minimum tensile strength of retaining rod material	35 kg/mm^2	35 kg/mm^2	35 kg/mm^2	
iv	Chemical composition of retaining rod material	As per IS:733	As per IS:733	As per IS:733	
v	Electrical conductivity of Armour Rod material (in percentage of the conductivity of IACS i.e. International Annealed Copper Standard	Not less than 40% of IACS	Not less than 40% of IACS	Not less than 40% of IACS	
vi	Slipping strength of cushioned suspension assembly	8% to 15% of UTS of Conductor	20 to 29 KN	20 to 29 KN	
vii	Breaking strength of suspension Clamp	9000kgf	12000kgf	12000kgf	
viii	Physical properties of neoprene cushion				
a)	Minimum Tensile Strength	2000 psi	2000 psi	2000 psi	
b)	Minimum ultimate Elongation	300%	300%	300%	
ix)	Ageing (guaranteed life of the assembly)	40 years	40 years	40 years	
x)	Hardness	65 to 80 A	65 to 80 A	65 to 80 A	
D	Mid-Span Compression Joints	Panther		Zebra	
		AAAC	ACSR	AAAC	ACSR
i	Type	Compression Type			
ii	Suitable for	AAAC Panther	ACSR Panther	AAAC Zebra	ACSR Zebra
iii	Materials				
a	Outer Sleeve	Ex. Al. Alloy	Ex. Al.	Ex. Al. Alloy	Ex. Al.
b	Inner Sleeve	N.A.	Galvanized Steel	N.A.	Galvanize d Steel
iv	Outer Sleeve				

a	Outer Dia. Before compression (mm)	Ø 38	Ø 38	Ø 48	Ø 48
b	Flat to Flat After compression (mm)	32	32	40	40
v	Length of Outer Sleeve				
a	Before compression (mm)	610	610	711	711
b	After compression (mm)	655	660	760	768
vi	Inner Sleeve				
a	Outer Dia. Before compression (mm)	N.A.	Ø 18	N.A.	Ø 19.2
b	Flat to Flat After compression (mm)	N.A.	15.1	N.A.	16.1
vii	Length of Inner Sleeve				
a	Before compression (mm)	N.A.	203	N.A.	241
b	After compression (mm)	N.A.	230	N.A.	273
viii	Weight of Sleeve				
a	Aluminum (kg)	1.2	1.2	2.032	2.032
b	Galvanized Steel (kg)	N.A.	0.295	N.A.	0.410
ix	Galvanizing				
a	Ferrous parts	Hot Dip Galvanized			
b	Spring washers	Electro Galvanized			
c	Quality of zinc used	99.5%			
d	Number of dips which the clamp can withstand	4/ 1 minute dips			
x	Standard to which conforming	IS 2633			
xi	Slipping strength of mid span joint expressed as percentage of UTS of conductor	95%			
xii	Breaking strength of mid span joint expressed as percentage of UTS of conduct	95%			
xiii	Conductivity of Compression joint expressed as percentage of conductivity of cable	100% of equivalent length of conductor			
xiv	Resistance as percentage of measured resistance of equivalent length of conductor	Not more than 75% of equivalent length of conductor			
E	Compression type Tension clamp/ dead end Assembly for 7/3.15mm Galvanized Stranded Steel Wire				
i	Materials	Forged steel			

ii	Size	As per drawing
iii	Suitable for ground wire	Yes (7/3.15)
iv	Weight in kg	3.69
v	Minimum failing load	70 KN
vi	Galvanising	
a	Ferrous parts	Hot Dip Galvanised
b	Spring washers	Electro Galvanized
c	Quality of zinc used	99.5%
d	Number of dips which the clamp can withstand	4/ 1 minute dips
vii	Standard to which conforming	IS 2486 and IS 2633

F	**Vibration Damper**	**For AAAC/ ACSR PANTHER, ZEBRA & MOOSE**	
i	Total weight of the damper (Kg)	4.5 Approx.	
		Left	Right
ii	Weigh of each damper mass (kg)	1.6	2.2
iii	Resonance frequencies		
	1. First frequency (Hz)	12± 1	18± 2
	2. Second frequency (Hz)	28± 2	36±2
iv	Dimensions of each damper mass	55 ϕ x 165	60 ϕ x 195
v	Material of :		
	1. Damper mass	Cast iron hot dips Galvanized.	
	2. Messenger cable.	High tensile Galvanized steel wire.	
vi	Galvanising		
a	Ferrous parts	Hot Dip Galvanized	
b	Spring washers	Electro Galvanized	
c	Quality of zinc used	99.5%	
d	Number of dips which the clamp can withstand	4/ 1 minute dips	
vii	Standard to which conforming	IS 2486 and IS 2633	
viii	No of strands in messenger cable strands	19	
ix	Lay ratio of messenger cable	9- 11	

	strands	
x	Min tensile strength of messenger cable (kg /sq. mm)	135
xi	Mass pull – off strength (KN)	5
xii	Clamping torque (KGM)	7
xiii	Slipping strength of the damper clamp	
	1.Before fatigue test (KN)	2.5
	2. After fatigue test (KN)	2
xiv	Magnetic power loss per vibration damper (Watts)	1 watt at 500 amps
xv	Min. corona extinction voltage under dry conditions (KV)	154
xvi	Radio interference voltage under conditions 1 MHZ, AT 154 KV (Microvolt)	Below 1000
xvii	Percentage variation in reactance after fatigue test in comparison with that before the fatigue test (%)	20

D	**Mid-span Compressions Joints**	**Panther**		**Zebra**	
		AAAC	ACSR	AAAC	ACSR
i	Type	Compression Type			
ii	Suitable for	AAAC Panther	ACSR Panther	AAAC Zebra	ACSR Zebra
iii	Materials				
a	Outer Sleeve	Ex. Al. Alloy	Ex. Al.	Ex. Al. Alloy	Ex. Al.
b	Inner Sleeve	N.A.	Galvanized Steel	N.A.	Galvanized Steel
iv	Outer Sleeve				
a	Outer Dia. Before compression (mm)	Ø 38	Ø 38	Ø 48	Ø 48

b	Flat to Flat After compression (mm)	32	32	40	40
v	Length of Outer Sleeve				
a	Before compression (mm)	610	610	711	711
b	After compression (mm)	655	660	760	768
vi	Inner Sleeve				
a	Outer Dia. Before compression (mm)	N.A.	Ø 18	N.A.	Ø 19.2
b	Flat to Flat After compression (mm)	N.A.	15.1	N.A.	16.1
vii	Length of Inner Sleeve				
a	Before compression (mm)	N.A.	203	N.A.	241
b	After compression (mm)	N.A.	230	N.A.	273
viii	Weight of Sleeve				
a	Aluminum (kg)	1.2	1.2	2.032	2.032
b	Galvanized Steel (kg)	N.A.	0.295	N.A.	0.410
ix	Galvanizing				
a	Ferrous parts	Hot Dip Galvanized			
b	Spring washers	Electro Galvanized			
c	Quality of zinc used	99.5%			
d	Number of dips which the clamp can withstand	4/ 1 minute dips			
x	Standard to which conforming	IS 2633			
xi	Slipping strength of mid span joint expressed as percentage of UTS of conductor	95%			
xii	Breaking strength of mid span joint expressed as percentage of UTS of conduct	95%			
xiii	Conductivity of Compression joint expressed as percentage of conductivity of cable	100% of equivalent length of conductor			
xiv	Resistance as percentage of measured resistance of equivalent length of conductor	Not more than 75% of equivalent length of conductor			
E	**Repair Sleeves**	AAAC/ACSR **Panther**		**AAAC/ACSR Zebra**	
i	Type	Compression type			
ii	Suitable for	AAAC Panther	ACSR Panther	AAAC Zebra	ACSR Zebra
iii	Outside diameter or length of sleeve				
a	Before compression (mm)	Ø 38	Ø 38	Ø 48	Ø 48
b	After compression Flat to Flat	32	32	40	40

	(mm)				
iv	Length of Sleeve				
a	Before compression (mm)	241	241	279	279
b	After compression (mm)	270	270	310	310
v	Material	Ex. Al. Alloy	Ex. Al.	Ex. Al. Alloy	Ex. Al.
vi	Weight of sleeve in (kg)	0.450	0.453	0.810	0.810
vii	Breaking strength as percentage of UTS of conductor	95%			
viii	Conductivity as percentage of conductivity of conductor	100% of equivalent length of conductor			
ix	Resistance as percentage of measured resistance of equivalent length of conductor	Not more than 75% of equivalent length of conductors			

SCHEDULE OF QUANTITY ALONG WITH DELIVERY SCHEDULE

Description of Material:- Supply of **Single Tension Hardware fittings** under EHT (O&M) Circle, Chainpal

Sl	Name of Grid/Line Sub Division	Name of Division	Single Tension Hardware fittings for ACSR Zebra
1	Line S/D Chainpal	**Name of Paying Officer :-***DGM, EHT (O&M) Division Chainpal, At/po- Chainpal Colony, Talchel, Angul-759104* **Consignee:- DGM**, *Line S/D Chainpal*	50 Nos.
2	220/33KV Grid S/S Rengali	**Name of Paying Officer :-***DGM, EHT (O&M) Division Chainpal, At/po- Chainpal Colony, Talchel, Angul-759104* **Consignee:-***SDO,220/33 KV Grid S/S Rengali*	100 Nos
	Total		150Nos.

SECTION-IV(Price Schedule)

Supply of Single Tension Hardware fittings under EHT (O&M) Circle, Chainpal

Sl No	Description of Materials	Unit	Requirement	Unit Ex-Price in RS.	Amount Ex-Price in RS.
1	**Single Tension Hardware fittings for Single ACSR Zebra Conductor** **Complete Set as per sample** (**Conductor Details:-** ACSR Zebra 54+7/3.18 mm Conductor Area – 428.9 Sq.mm Outer Diameter – 28.62 mm Weight – 1620 Kg. Per Km. Brkd. – 13466.4 Kg.)	Nos	150		
A	Sub Total Ex Price				
B	Freight Charges				
C	Sub Total				
D	GST on Sl-C				
E	Grand TOTAL Or Say				

Grand Total (In words).....
.....

N.B- Incomplete price bid shall not be accepted. Individual item & taxes shall be clearly mentioned on the table above.

Signature of the Bidder
with seal of the company

SECTION-V

[LIST OF ANNEXURES]

The following schedules and Performa are annexed to this specification and contained in Section-III as referred to in the relevant clauses.

1	Declaration form	ANNEXURE-I
2	Abstract of terms and conditions to accompany Section-II	ANNEXURE-II
3	Bidders information	ANNEXURE-III
4	Documents to accompany Bids	ANNEXURE-IV

ANNEXURE - I
DECLARATION FORM
DECLARATION FORM

To,

The Sr.General Manager (Elect.)
EHT (O&M) Circle, OPTCL
Chainpal

Sub: - Tender Specification No-_____
Sir,

1. Having examined the above specification together with terms & conditions referred to therein I/We the undersigned hereby offer to take up the work of Procurement of Single Tension Hardware fittings Suitable for ACSR Zebra Conductor utilization in diversion of 220KV TTPS-Kaniha-RPH DC Line from Loc No.97 to 108 Passing through lease hold area of MCL , Kaniha OCP Mine and Restringing of conductors from Gantry at Meramundali GSS to Dead end tower of different lines under EHT (O & M) Division, Chainpal.in all respects as per the specification and General conditions, at the rates, entered in the attached contract schedule of prices in the Tender.

2. I / We hereby undertake the work of Procurement of Single Tension Hardware fittings Suitable for ACSR Zebra Conductor utilization in diversion of 220KV TTPS-Kaniha-RPH DC Line from Loc No.97 to 108 Passing through lease hold area of MCL , Kaniha OCP Mine and Restringing of conductors from Gantry at Meramundali GSS to Dead end tower of different lines under EHT (O & M) Division, Chainpal as specified in the Tender.

3. I / We hereby guarantee the validity of the required documents from concerned authorities to be submitted as per the ELIGIBILITY FOR BID SUBMISSION mentioned in the Tender specification.

4.I/We certify to have submitted the bid physically by remitting DD towards the cost of tender, herewith and this has been acknowledged by your letter / money receipt No._____ Dated_____,

5.In the event of Tender, being decided in *my/our favour, * I/We agree to furnish the B.G. / Fixed Deposit in the manner, acceptable to ODISHA POWER TRANSMISSION CORPORATION LTD., and for the sum as applicable to *me/us as per Clause-21 of section-III of this specification within 10 days of issue of letter of intent/purchase order failing which *I/We clearly understand that the said Letter of Intent / Purchase order will be liable to be withdrawn by the purchaser, and will be suspended from being eligible for bidding / award of all future contract(s) of EHT (O&M) Circle, OPTCL, Chainpal for a period of three years from the date of committing such breach.

Signed this on……day of……., 2025

Yours faithfully

Signature of the Tenderer with seal of the company
* (Strike out whichever is not applicable)

ANNEXURE-II

ABSTRACT OF GENERAL TERMS AND CONDITIONS OF CONTRACT [COMMERCIAL] TO ACCOMPANY

1(a)	Cost of Tender Document: OPTCL Money Receipt No. & Date / D.D No & Date.	
1(b)	Earnest money furnished. Bank Guarantee No. & Date / D.D No. & Date.	
2	Manufacturer's supply experience including user's certificate furnished or not.	***Yes/No***
3	**Delivery :-** Whether agreeable to OPTCL's desired delivery period as indicated at in the specification	***Yes/No***
4	**Guarantee:-** Whether agreeable to OPTCL's terms.	Yes/No
5	Whether agreeable to furnish **Composite B.G.** in case his tender be successful	Yes/No
6.	**Terms of payment:-** Whether agreeable to OPTCL's terms or not	Yes/No.
7.	**Nature of price**:- FIRM	Yes/No
8.	**Price Reduction:-** Whether agreeable to OPTCL's terms or not	Yes/No
9.	**Validity: -** Whether agreeable to OPTCL's terms or not	Yes/No
10.	Whether recent type test certificates from any Government approved laboratory are furnished or not.	Yes/No
11.	Whether materials are ISI/ISO marked.	Yes/No
12.	Furnished Manufacturer's name and its trademark.	Yes/No
13.	Whether registered under GST	Yes/No
14.	Whether declaration form duly filled in furnished or not.	Yes/No.

Place: -

Date: -

Signature of the Bidder

with seal of the company

ANNEXURE-III

BIDDER'S INFORMATION

SL NO	The bidder shall furnish general information in the following format	
NAME OF THE BIDDER		
1	Address:-	
2	City	
3	Pin Code	
4	Contact person's Name :-	
5	Telephone No. office & Residence:-	
6	FAX No:-	
7	EMAIL:-	
9	GSTIN	
10	PAN NO.	

Place: -

Date: -

Signature of the Bidder

with seal of the company

ANNEXURE-IV

Documents to Accompany Bids

Sl.No.	Description	To be filled by the bidder.
1	Declaration Form. [As per Annexure-I]	
2	Photostat copies of type test certificates of materials offered as stipulated in the Technical Specification.	
3	Abstract of Terms & conditions in prescribed proforma as per Annexure-II.	
4	Signed Copy of General Terms & Conditions of supply offer i.e Section-II of the Specification.	
5	GST Registration certificate. The permanent account number [PAN] of the firm is required under Income tax Act.	
6	Signed copy of Schedule of quantity and delivery in the prescribed Proforma	

Place: -

Date: -

Signature of the Bidder

with seal of the company

ANNEXURE-V

REVERSE AUCTION PROCESS COMPLIANCE FORM

To,

The Sr. General Manager (Elect)

EHT (O&M) Circle, Chainpal

Sub:- Agreement to the process related Terms & Conditions for e-Reverse Auction.

Ref:- Tender Specification No.:_____

Dear Sir,

This letter is to confirm that:

- The under signed is authorized representative of the company.
- We have studied the Commercial Terms and the Business rules governing the Reverse Auction as mentioned in your tender and confirm our agreement to that.
- We also confirm that we have gone through the auction manual and have understood the functionality of the same thoroughly.
- We, hereby, confirm that we will honour the Bids placed by us during the tendering / e-Reverse auction process as called as e-RA.
- We also confirm that we will accept our Rank / Position that will be displayed when the Bidding Time for the Online Reverse Auction is over.

With regards,

Signature with Designation with company seal name & address (Person having power of attorney for the subject package)

[**To be submitted on Letter Head of the bidding firm/company with sign & stamp and along with Technical Bid]**