



ODISHA POWER TRANSMISSION CORPORATION LIMITED

**OFFICE OF THE GENERAL MANAGER
EHT (O&M) CIRCLE, CUTTACK**

TEL NO. 0671-2300226 FAX NO. 0671-2300547

TENDER SPECIFICATION NO.- 15/2013-14

FOR

**PROCUREMENT OF HARD WARE FITTINGS AND CLAMPS AND
CONNECTORS FOR DIFFERENT WORKS UNDER EHT (O&M) CIRCLE
CUTTACK
OPTCL**

PART-I

SECTION-I-	INSTRUCTION TO TENDERERS.
SECTION-II-	GENERAL CONDITIONS OF CONTRACT
SECTION-III-	LIST OF ANNEXURE
SECTION-IV-	TECHNICAL SPECIFICATION.
SECTION - V-	TECHNO COMMERCIAL BID

PART-II

- 1. PRICE BID**
- 2. PRICE SCHEDULE**

Request for online tender documents – From dt-27.11.2013 (10.00 Hrs) to dt-11.12.2013(12.30 Hrs)

Issue of online tender documents (bid sheets)- From dt-27.11.2013 (10.01 Hrs) to dt-11.12.2013(12.31 Hrs)

Last date of submission of online tender – up to dt-11.12.2013(15.00 Hrs)

Date of opening of Tender - 12.12.2013(11.00 Hrs)



ODISHA POWER TRANSMISSION CORPORATION LTD.

REGD. OFFICE: JANPATH, BHUBANESWAR – 751 022,

ODISHA

e-TENDER NOTICE NO. 15 /2013-14

For and on behalf of ODISHA POWER TRANSMISSION CORPORATION LTD General Manager, EHT (O&M) Circle, Cuttack, invites Tenders from reputed manufacturers/suppliers in two part bidding system for supply of **Hard Ware Fittings & Clamps Connectors**.. The interested bidders would be required to enroll themselves on the tender portal www.tenderwizard.com/OPTCL .Complete set of bidding documents are available at www.tenderwizard.com/OPTCL from 27.11..2013 (10.00 Hrs) up to 11.12..2013 (12.30 Hrs). Interested manufacturers/Suppliers may visit OPTCL's official web site <http://www.optcl.co.in> and www.tenderwizard.com/OPTCL for detail specification.

N.B:- All subsequent addendums/corrigendum to the tender shall be hosted in the OPTCL's official web site <http://www.optcl.co.in> and www.tenderwizard.com/OPTCL only.

GENERAL MANAGER



NOTICE INVITING TENDER

ODISHA POWER TRANSMISSION CORPORATION LTD.,

REGD. OFFICE: JANPATH, BHUBANESWAR – 751 022,

ODISHA, INDIA.

e-TENDER NOTICE NO- 15/2013-14.

For and on behalf of the ODISHA POWER TRANSMISSION CORPORATION LTD., the undersigned invites bids under two-part bidding system in e-tendering mode only as per the following details.

Sl. No	Tender Specification No	Description of materials.	Qty. In Nos.	INDIAN RUPEES			Last date of submission & Date of opening of Tender
				Earnest Money Deposit	Cost of Tender Spec.Document	Tender Processing Fee	
1.	G.M EHT(O&M) CIRCLE, CUTTACK	Single Tension hardware fittings complete set suitable for		Rs.41570	Rs.6000/ + Rs300/- (VAT)	Rs.4157/-	up to dt- 11.12.2013(15.00 Hrs) and 12.12.2013 at 11.00 hr
		ACSR Panther Conductor	175				
		ACSR Zebra Conductor	145				
		ACSR Moose Conductor	122				
		Double tension hardware fittings complete set suitable for					
		ACSR Panther Conductor	97				
		ACSR Zebra Conductor	15				

		ACSR Moose Conductor	5				
		Single suspension hardware fittings complete set suitable for					
		ACSR Panther Conductor	100				
		ACSR Zebra Conductor	50				
		ACSR Moose Conductor	52				
		Double tension hardware fittings complete set suitable for twin ACSR Moose Conductor	67				
		Double suspension hardware fittings complete set suitable for twin ACSR Moose Conductor	16				
		Vibration damper suitable for					
		ACSR Panther Conductor	215				
		ACSR Zebra Conductor	100				
		Mid span joint					
		ACSR Panther Conductor	160				
		ACSR Zebra Conductor	60				
		Repair Sleeve suitable for					
		ACSR Panther Conductor	125				
		ACSR Zebra Conductor	65				
		ACSR Moose Conductor	5				
		For G.I. Earthwire					
		Suspension clamp	120				

		Tension clamp	80				
		vibration damper	20				
		Mid span joint	80				
		Flexible Earth Bond	20				
		Spacer clamp suitable for twin moose conductor	477				
		Spacer T clamp suitable for twin moose run and twin moose drop conductor	28				
		Spacer T clamp suitable for twin moose run and single moose drop	24				
		Spacer T clamp suitable for twin moose run and single Zebra drop	67				
		T clamp suitable for single moose run and single moose drop	50				
		T clamp suitable for single moose run and single zebra drop	67				
		Bi- metallic Straight through clamp suitable for 132KV side Auto Transformer Bushing and for single moose conductor	27				
		Bi-metallic pad clamp suitable for single moose conductor (pad portion bi-metallic)	122				
		Bi-metallic Pad clamp suitable for twin moose conductor (pad portion bi-metallic)	28				

		Bi-metallic Straight through clamp suitable for 132KV CT/PT stud & moose conductor	42				
		3 bolted PG clamp suitable for ACSR Moose conductor	60				
		PA rod for ACSR Panther Conductor	4				

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

The bidders who want to submit bid shall have to pay Rs6300/- (Rupees Six thousand three hundred only non refundable including VAT @ 5%) towards the tender cost, in the form of Demand draft/Cash only, drawn in favour of EHT (O&M) Circle Cuttack , payable at Cuttack at the office of the undersigned on or before the last date & time of submission of tender.

The bidders shall have to submit non refundable amount of **Rs. 4157/- (Rupees four thousand one hundred fifty seven only)** towards the tender processing fee in the form of Demand draft, drawn in favour of K.S.E.D.C.Ltd, Payable at Bangalore. **The said demand draft is to be submitted along with the EMD & tender cost at the office of the undersigned on or before the last date & time of submission of tender.**

The bidders shall scan the Demand Draft/Pay order/ Bank guarantee towards EMD , Tender Cost and tender processing fee and upload the same in the prescribed form in .gif or .jpg format in addition to sending the original as stated above.

The prospective bidders are advised to register their user ID, Password, company ID from website www.tenderwizard.com/OPTCL by clicking on hyper link "Register Me".

Any clarifications regarding the scope of work and technical features of the tender can be had from the undersigned during office hours.

Minimum qualification criteria of bidders: AS STIPULATED IN SECTION-II, PART-I (G.T.C.C) OF THE TENDER SPECIFICATION.

GENERAL MANAGER

EHT (O&M) CIRCLE,CUTTACK

COMMERCIAL SPECIFICATION.

PART-I

SECTION-I

INSTRUCTIONS TO TENDERER

1. Submission of Bids: -

The bidder shall submit the bid in Electronic Mode only i.e www.tenderwizard.com/OPTCL. The bidder must ensure that the bids are received in the specified website of the OPTCL by the date and time indicated in the Tender notice. Bids submitted by telex/telegram will not be accepted. No request to collect the Bids in physical form will be entertained by the OPTCL.

The OPTCL reserves the right to reject any bid, which is not submitted according to the instruction, stipulated above. The participants to the tender should be registered under ODISHA Sales Tax, Act, VAT Act / Central sales Tax Act.

1. For all the users it is mandatory to procure the Digital Signatures.
2. Contractors / Vendors / Bidders / Suppliers are requested to follow the below steps for **Registration**:
 - a. Click “Register”, fill the online registration form.
 - b. Pay the amount of Rs. **2247/-** through DD in Favour of **KSEDCL** Payable at Bangalore. This registration is valid for one year.
 - c. Send the acknowledgment copy for verification.
 - d. As soon as the verification is being done the e-tender user id will be enabled.
3. After viewing Tender Notification, if bidder intends to participate in tender, he has to use his e-tendering User Id and Password which has been received after registration and acquisition of DSCs.
4. If any Bidder wants to participate in the tender he will have to follow the instructions given below:
 - a. Insert the PKI (which consist of your Digital Signature Certificate) in your System.
(Note: Make sure that necessary software of PKI be installed in your system).
 - b. Click / Double Click to open the Microsoft Internet Explorer (This icon will be located on the Desktop of the computer).
 - c. Go to Start > Programs > Internet Explorer.

- d. Type www.tenderwizard.com/OPTCL in the address bar, to access the Login Screen.
 - e. Enter e-tender User Id and Password, click on “Go”.
 - f. Click on “Click here to login” for selecting the Digital Signature Certificate.
 - g. Select the Certificate and enter DSC Password.
 - h. Re-enter the e-Procurement User Id Password
5. To make a request for Tender Document, Bidders will have to follow below mentioned steps.
 - Click “Un Applied” to view / apply for new tenders.
 - Click on Request icon for online request.
 - Enter the required fields including details of D.D for tender Processing fee.
 6. After making the request Bidders will receive the Bid Documents which can be checked and downloaded by following the below steps:
 - Click to view the tender documents which are received by the user.
 - Tender document screen appears.
 - Click “Click here to download” to download the documents.
 7. After completing all the formalities Bidders will have to submit the tender and they must take care of following instructions.
 - Prior to submission, verify whether all the required documents have been attached and uploaded to the particular tender or not.
 - Note down / take a print of bid control number once it displayed on the screen
 8. Tender Opening event can be viewed online.
 9. Competitors bid sheets are available in the website for all.
 10. **For any e-tendering assistant contact help desk number mentioned below.**

- **Bangalore – 080- 40482000.**

2. Division of Specification.

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

Part-I Consists of

SECTION-I-	INSTRUCTION TO TENDERERS.
SECTION-II-	GENERAL CONDITIONS OF CONTRACT
SECTION-III-	LIST OF ANNEXURE
SECTION-IV-	TECHNICAL SPECIFICATION.
SECTION – V-	TECHNO COMMERCIAL BID

Part-II Consists of

[i] Abstract of price components as per Annexure-IV

[ii] Schedule of prices as per Annexure-V

The Tenderers are required to submit the tenders in two parts viz. Part-I (Techno commercial) & Part-II (Price bid).

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

The Purchaser may alter the quantities of materials/equipment at the time of placing orders. Initially the purchaser may place orders for lesser 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 tenderer for any particular item, if considered necessary in the interest of the Purchaser to get the goods/equipment earlier.

4. 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.

5. Mode of submission of Tenders.

[A] Tenders shall be submitted in electronic mode only.
(www.tenderwizard.com/OPTCL)

[B] **Telegraphic or FAX tenders** shall not be accepted under any circumstances.

6. Earnest money deposit:

The tender shall be accompanied by Earnest Money deposit of value specified in the notice inviting tenders against each bid. Tenders without the required EMD will be rejected out rightly

The earnest money deposit shall be furnished in shape of **Bank Draft**: -To be drawn in favour of **EHT (O&M) Circle, Cuttack, payable at Cuttack.**

NOTE:-

- (i) No adjustment towards EMD shall be permitted against any outstanding amount with the **ODISHA POWER TRANSMISSION CORPORATION LTD.**
- (ii) In the case of un- successful tenderer, the EMD will be refunded after the tender is decided. In the case of successful Tenderer, this will be refunded only after furnishing of security money.
- (iii) Suits, if any, arising out of this clause shall be filed in a Court of law to which the jurisdiction of High Court of ODISHA extends.

- (iv) EMD will be forfeited if the tenderer fails to accept the letter of intent and/or purchase order issued in his favour or to execute the order, placed on them.
- (v) Tenders not accompanied by Earnest Money shall be disqualified.

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: -

i) Tenderers are requested to quote-‘FIRM’ Price. No deviation from **FIRM PRICE** will be entertained irrespective of deviation..

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

Tenderers 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 tenderer may seek clarification in writing from the GM EHT (O&M) Circle, Cuttack, This, however, does not entitle the Tenderer 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:

Part-I of the Tender shall Contain the following documents.

- [i] Declaration Form. [As per Annexure-I]
- [ii] Earnest Money. [As per **Annexure-VIII**]
- [iii] Photostat copies of type test certificates of materials/equipments offered as stipulated in the Technical Specification.
- [iv] Abstract of Terms & conditions in prescribed proforma as per **Annexure-II.**
- [v] General Terms & Conditions of supply offer as per Section-II of the Specification.
- [vi] Data on past experience as per the Specification.
- [vii] Sales tax clearance certificate for the previous year. The permanent account number [PAN] of the firm is required under Income tax Act.

11. Documents/Papers to accompany Part-II Bid.

- (a) Part – II of the tender shall consist of the following
 - (i) Abstract of Price Component, as per Annexure-IV
 - (ii) Schedule of prices in the prescribed proforma as per Annexure-V

12. Conditional Offer:

Conditional offer shall not be accepted.

13. General: -

- (i) 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.
- (ii) For evaluation, the price mentioned in words shall be taken if there is any difference in figures and words in the price bid.
- (iii) Notice inviting tender shall form part of this specification.
- (iv) . The EMD, if any, shall be returned to the unsuccessful bidders.
- (vi) It should be distinctly understood that the part-II of the bid shall contain only details/documents relating to price, as mentioned herein above. Inclusion of any of the documents/information etc. shall render the bid liable for rejection.
- (vii) The tenderer must submit the EMD amount, cost of tender document and Tender processing fee in a sealed cover envelope super scribing the tender specification number, Tender Notice No & Date opening of tender clearly on the envelope cover. The said envelope is to be submitted in the office of the purchaser on or before the date and time of opening of technical bid

PART-I
SECTION-II

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

1. **Scope of the contract:**

The scope of the contract shall be to design, manufacture, supply of materials/equipments as per the specification at the consignee's site, and rendering services in accordance with the enclosed technical specification and bill of quantity.

2.0 **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 General Manager,EHT (O&M) Circle, Cuttack 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. **Manner of execution:**

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's representative.

4. **Inspection and Testing:**

- [i] The purchaser's representative shall be entitled at all reasonable times during manufacture to inspect, examine and test at the supplier's premises, the materials and workmanship of all equipments/materials to be supplied under this contract and if part of the said equipment/material is being manufactured in other premises, the supplier shall obtain for the purchaser's representative permission to inspect, examine and test as if the equipment/material were being manufactured in the contractor's premises. Such inspection, examination and testing shall not relieve the supplier from his obligations under the contract.
- [ii] The Supplier shall give to the purchaser adequate time/notice (at least clear 15 days for inside the state suppliers and 20 days for outside the state suppliers) in writing for inspection of materials indicating the place at which the equipment/material is ready for testing and inspection and shall also furnish the shop Routine Test Certificate, Calibration certificates of Testing instruments, calibrated in Govt. approved laboratory with authenticity letter of that laboratory along with the offer for inspection. A packing list along with the offer, indicating the quantity which can be delivered in full truck load/Mini truck load to facilitate issue of dispatch instruction shall also be furnished.
- [iii] Where the contract provides for test at the Premises of the supplier or any of his sub-vendors, the supplier shall provide such assistance, labour, materials, electricity, fuel and instruments, as may be required or as may be reasonably demanded by the Purchaser's representative to carryout such tests efficiently. The supplier is required to produce shop routine test Certificate, calibration certificates of Testing Instruments before offering their materials/equipment for inspection & testing. The test house/laboratory where tests are to be carried out must be approved by the Govt. A letter pertaining to Govt. approved laboratory must be furnished to the purchaser along with the offer for inspection.
- [iv] After completion of the tests, the Purchaser's representative shall forward the test results to the Purchaser. If the test results conform to the specific standard and specification, the Purchaser shall approve the test results and communicate the same to the supplier in writing. The supplier shall provide at least five copies of the test certificates to the Purchaser.
- [v] The Purchaser has the right to have the tests carried out at his own cost by an independent agency whenever there is dispute regarding the quality of supply.
- [vi] If the firm fails to present the offered items for inspection/testing as per their inspection call due to any reason(s) during the visit of inspecting officer at the testing site ,the firm shall have to bear all expenses towards repetition of inspection and testing of the total offered quantity or part thereof.

5. **Rejection of Materials.**

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. If the supplier fails to do so, the Purchaser may:-

- [a] At its option replace or rectify such defective equipments/materials and recover the extra costs so involved from the supplier plus fifteen percent and/or.
- [b] Terminate the contract for balance work/supplies, with enforcement of penalty Clause as per contract for the un-delivered goods and with forfeiture of Performance Guarantee/ Composite Bank guarantee.
- [c] Acquire the defective equipment/materials at reduced price, considered equitable under the circumstances.

6. **Language and measures:**

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. **Right to reject/accept any tender:**

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 Tenderers on individual merits of the Tenderer. 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 of the materials. It may be clearly understood by the Tenderer that the purchaser need not assign any reason for any of the above action [s].

8. **Delivery:-**

- [a] Time being the essence of the contract; the equipment shall be supplied within the delivery period, specified in the contract. The Purchaser, however, reserves the right to reschedule the delivery and change the destination if required. The delivery period shall be reckoned from the date of placing the Letter of Intent/Purchase order, as may be specified in LOI/Purchase order.
- [b] The desired delivery period shall be as indicated at Appendix-II (Quantity & Delivery Schedule) of Section-IV (Technical Specification).

9. **Despatch instructions.**

- I] The equipments/ materials should be securely packed and dispatched directly to the specified site at the supplier's risk by Road Transport only.

II] **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 judgement 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 judgement 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 as provided in Clause-15 (I) of this section, 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 for penalty for delay as defined in clause-21 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 as provided in clause 15(I) of this Section, supplier shall be liable to the Purchaser for penalty for delay as set out in Clause-21 of this section 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 penalty 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: -**

- [i] The stores covered by this specification should be guaranteed for satisfactory operation and against defects in design, materials and workmanship for a period of at least 18 [eighteen] months from the last date of delivery or 12 [twelve] months from the date of commissioning whichever is earlier. The above guarantee certificate shall be furnished in triplicate to the purchaser for his approval. Any defect noticed during this period should be rectified 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 21 (ii) shall apply.
- [ii] Equipment/material failed or found defective during the guarantee period shall have to be guaranteed after repair/replacement for a further period of 12 months from the date of commissioning or 18 months from the date of receipt at the store/site after such repair/replacement whichever is earlier . The Bank Guarantee is to be extended accordingly. Date of delivery as used in this clause

shall mean the date on which the materials are received in OPTCL'S stores/site in full & good condition which are released for Despatch by the purchaser after due inspection.

14. **VAT REGISTRATION, VAT CELARANCE CERTIFICATION, PAN CARD & AUTHORIZED DEALERSHIP CERTIFICATE :** Attested legible Xerox copies of Income Tax PAN Card, VAT Registration & clearance Certificate & authorized dealership certificates (if applicable) 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. **TEST CERTIFICATE:**

Necessary manufacturer certificate/test certificate in respect of the materials/spares covered under the Purchase Order, shall be submitted before dispatch of

materials for approval. Test certificate in respect of materials should conform to relevant ISS.

The test certificate from ISI approved testing laboratory will also be accepted as and where applicable.

16. **SUBMISSION OF PROOF REGARDING MANUFACTURER'S CERTIFICATE/ AUTHORISED DEALERSHIP CERTIFICATE, PRICE LIST OF THE MANUFACTURER, PAST EXPERIENCE OF EXECUTION OF ORDER PERFORMANCE CERTIFICATE, TECHNICAL LITERATURE AND DRAWING, TYPE 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 of execution of Purchase Orders need to be furnished by the bidders. The tender shall be accompanied with dimensional drawing and technical literature, leaflets, manuals if any.

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

18. (a) **STANDARDS:** The materials offered shall confirm to relevant ISS.

- (b) **QUANTITY VARIATION:** The quantity to be ordered may undergo revision at the time of placement of orders.

19. **B.G. towards security deposit, 100% payment and performance guarantee:**

- [i] For manufacturers situated Inside & out side the state of ODISHA.

A Composite Bank Guarantee as per the Proforma enclosed at Annexure-VII of the specification for 10% [ten percent] of the total FORD cost of the purchase order, shall be furnished from any nationalized/scheduled bank having a place of business at Bhubaneswar, to the office of General Manager EHT (O&M) Circle, Cuttack within 15 days from the date of issue of the purchase order,. The BG shall be executed on non judicial stamp paper worth of Rs.29.00 [Rupees twenty nine] only or as per the prevalent rules, valid for a period of 20 months from the last date of stipulated delivery period, for scrutiny and acceptance, failing which the supply order will be liable for cancellation without any further written notices. The BG should be accompanied by a confirmation letter from the concerned bank and should have provision for encashment at Bhubaneswar, before the Bank Guarantee is accepted and all concerned intimated. The B.G should be revalidated as and when intimated to you to cover the entire guarantee period.

- [ii] No interest is payable on any kind of Bank Guarantee.
- [iii] In case of non-fulfillment of contractual obligation, as required in the detailed purchase order/Specification, the composite Bank guarantee shall be forfeited.

20. (A) Terms of Payment.

- (i) 100% value of each consignment with 100% Excise duty, Entry Tax, if any, and sales tax in full as applicable along with freight & Insurance charges will be paid on receipt of materials in good condition at stores/desired site and verification thereof, subject to furnishing and approval of Composite Bank Guarantee at the rate of 10% (Ten percent) of the cost of supplied materials, as stipulated under clause-19 of this specification & on prior approval of guarantee certificate & Test certificate by the Purchaser.
- (ii) **Payment of Freight & Insurance charges and Entry Tax.**

Freight & Insurance Charges & Entry Tax, incorporated in the Purchase contract shall be paid after receipt of materials at stores/desired site in good condition and on production of authenticated documentary evidence, otherwise no Freight, Insurance charges & entry taxes shall be payable.

[B] The supplier shall furnish Composite Bank Guarantee of appropriate amount to OPTCL covering 10% of F.O.R. Destination cost of the purchase order well in advance (within 15 days from the date of issue of the purchase order) before despatch of materials.

21. Penalty for Delay in Completion of Contract

- I) If the Supplier fails to deliver the materials/equipments within the delivery schedule, specified in the contract including delivery time extension, if any, granted thereto, the Purchaser shall recover from the Supplier, penalty for a sum of half percent (0.5 percent) of the Ex-works price of the un-delivered equipment for each calendar week of delay or part thereof. For this purpose, the date of receipted chalan shall be reckoned as the date of delivery. The total amount of penalty shall not exceed five percent (5%) of the ex-works price of the unit or units so delayed. Equipment will be deemed to have been delivered only when all its components and accessories as per technical Specification are also delivered. If certain components & accessories are not delivered in time, the equipment will be considered delayed until such time as the missing parts are delivered.
- II) If the Supplier fails to rectify /replace the equipment/material within 30 days from the date of intimation of the defect, so noticed by the purchaser within the guarantee period then the penalty for sum of one half of the one percent (0.5%) of

the total Purchase order amount for each calendar week of delay shall be recovered by the purchaser within the guarantee period. For this purpose, penalty date will start from the 30th. day from the date of issue of letter on defectiveness of equipment/material, so supplied, by the purchaser. The total amount of penalty in this case shall not exceed 10% (TEN PERCENT) of the purchase order amount. The purchase order amount shall mean ex-works price + freight & insurance and all taxes & duties. If the defects so intimated within the guarantee period will not be rectified by the

Supplier within the stipulated period as per clause 18 (i), then whole of the B.G. will be forfeited by the purchaser, without any intimation to the Supplier.

22. **Insurance**

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 awaiting 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. **Certificate of Exemption from Excise Duty/Sales tax.**

Offers with exemption from Excise duty including sales tax shall be accompanied with authenticated proof of such exemption. Authenticated proof for this clause shall mean attested Photostat copy of exemption certificate. Any claim towards Excise duty/ Sales Tax shall be paid on actual basis subject to production of authenticated documentary evidence.

25. **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 Tenderers. The Supplier(s) shall be responsible for any discrepancy noticed in the documents, submitted by them along with the bid(s)

26. **Validity.**

Prices and conditions contained in the offer should be kept valid for a minimum period of 180 days from the date of opening of the tender, failing which the tender shall be rejected.

27. **EVALUATION.**

(i) Evaluation of bids will be on the basis of the FOR DESTINATION PRICE (By Road Transport) including Excise Duty, sales Tax & other levies as may be applicable. The FORD PRICE shall consist of the following components

- a) Ex-works price.
- b) Packing & Forwarding charges.
- c) Freight
- d) Insurance.

- e) Excise Duty.
- f) Sales Tax.
- g) Other levies.

28. **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.

29. **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:-

- [i] **Purchaser:** General Manager EHT (O&M), Circle, OPTCL, Cuttack
(Odisha)
Telephone No. 0671 - 2300226
FAX No.0671 - 2300547
- [ii] **Supplier:** Address
Telephone No.
Fax No.

30. **Outright Rejection of Tenders**

Tenders shall be outrightly rejected if the followings are not complied with.

- [i] The tenderer shall submit the bid in electronic mode only and shall submit the cost of tender document and Tender processing fee on or before the date and time of opening of the bid.
- [ii] The Tender shall not be submitted telegraphically or by FAX.
- [iii] The prescribed EMD shall be submitted on or before the date and time of submission of the bid.
- [iv] The Tender shall be kept valid for a minimum period of 180 days from the date of opening of tender.
- [v] The tenderer shall upload the scanned copy of latest type test certificates (for the tests, carried out on the tendered equipments, being offered). Such type tests should have been conducted within last five years from the date of opening of this tender in a Government approved laboratory/CPRI in presence of any Government Organisation's representative(s).
- [vi] The schedule of prices should be filled up fully to indicate the break-up of the prices including taxes and duties. Incomplete submission of this schedule will make the tender liable for rejection.
- [vii] The Tenderer should quote 'FIRM' price only and the price should be kept valid for a minimum period of 180 days from the date of opening of the tender.
- (viii) The tenderer shall upload the scanned copy legibly written user's certificate to prove the satisfactory operation of the offered equipments/materials for a

minimum period of 2 (two) years from the date of commissioning/use as per the tender specification. User's certificate shall include the detailed address of the user with Equipment/Material, Name and type as per this specification, number of years of satisfactory use/operation & date of issue of this user's certificate with official seal written in English only & clearly visible must be furnished. At least one of the user's certificates shall be from state or Central Govt. or their Undertakings.

PART-I
SECTION-III
[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 of Part-I	ANNEXURE-II
3	Abstract of price component [to accompany Part-II of this specification]	ANNEXURE-III
4	Schedule of prices to accompany Part-II	ANNEXURE-IV
5	Composite Bank Guarantee form for security deposit, payment and performance	ANNEXURE-V
6	Chart showing particulars of E.M.D.	ANNEXURE – VI

ANNEXURE - I
DECLARATION FORM

To

The General Manager (Elect:)
EHT O&M Circle, OPTCL, Cuttack

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 supply the materials/equipments covered therein complete 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 to have the materials/equipments delivered within the time specified in the Tender.
3. * I / We hereby guarantee the technical particulars given in the Tender supported with necessary reports from concerned authorities.
4. * I/We certify to have submitted the bid electronically by remitting *cash/money order /D.D./ remitting 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 Composite B.G. in the manner, acceptable to ORISSA POWER TRANSMISSION CORPORATION LTD., and for the sum as applicable to *me/us as per clause-19 of section-II of this specification within 15 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 the EMD deposited by us shall be forfeited by OPTCL.

Signed this day of 2013

Yours faithfully

Signature of the Tenderer

with seal of the company

[This form should be dully filled in by the tenderer and uploaded at the time of submission of tender.]

* (Strikeout whichever is not applicable).

ANNEXURE-II

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

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.	
1(c)	Tender Processing Fee: D.D No. & Date.	
2	Manufacturer's supply experience including user's certificate furnished or not.[As per clause No.16 of Section-II.]	Yes/No
3	Delivery :- Whether agreeable to OPTCL's desired delivery period as indicated at Appendix-I (Quantity & Delivery Schedule) of Section-IV (Technical Specification).	Yes/No
4	Guarantee:- Whether agreeable to OPTCL's terms. [As per clause-8 of Section-II]	Yes/No
5	Whether agreeable to furnish Composite B.G. in case his tender be successful [As per clause-19 of Section-II]	Yes/No
6.	Terms of payment:- Whether agreeable to OPTCL's terms or not [As per clause-20 of Section-II]	Yes/No.
7.	Nature of price:- FIRM	Yes/No
8.	Penalty:- Whether agreeable to OPTCL's terms or not (As per clause-21 of Section-II)	Yes/No
9.	Validity: - Whether agreeable to OPTCL's terms or not [As per clause-26 of Section-II]	Yes/No
10.	Whether recent type test certificates from any Government approved laboratory are furnished or not. [As per clause-16] of section-II]	Yes/No
11.	Whether materials are ISI/ISO marked.	Yes/No
12.	Manufacturer's name and it's trademark.	Yes/No
13.	Whether registered under ODISHA Sales Tax Act. 1947	Yes/No
18.	Whether declaration form duly filled in furnished or not.	Yes/No.

Place: -

Date: -

Signature of the Tenderer
with seal of the company

ANNEXURE-III

ABSTRACT OF PRICE COMPONENT [TO ACCOMPANY PRICEBID]

1	Price basis	F.O.R. Purchaser's destination Stores/sites.
2	Packing & forwarding	
3	Rate of Insurance charges	
4	Rate of Freight charges	
5	Rate of excise duty	
6	Rate of sales Tax	
7	Rate of other taxes/levies /duties etc.	
8	Rate of entry tax.	
9	Nature of price.	
10	Whether MODVAT benefit if any, has been fully passed on to the purchaser.	Yes / No.

Place

Date:

Signature of Tenderer

With seal of company

NB:- Abstract of price component shall be done for equipment/material offered, for testing & commissioning charges, if any. All the above prices will be taken during bid price evaluation.

ANNEXURE-IV.

SCHEDULE OF PRICES TENDER SPECIFICATION No.

Item No.	Description.	Qty (unit)	Unit Ex-factory Price.	Unit Packing & Forwarding.	Unit Freight Charges.	Unit Insurance Charges.	Unit landing cost at destination store/site excluding ST,ED & Entry tax.
1.	2.	3.	4.	5.	6.	7.	8.

Unit E.D.	Unit S.T.	Unit Entry Tax.	Unit landing Cost including All taxes & Duties.	Total landing cost Including all taxes & duties.
9.	10.	11.	12= (8+9+10+11)	13= (3X12)

Signature of Tenderer

Name, Designation and Seal

NB: -

1. The tenderer should fill up the schedule properly and in full. The tender will be rejected, if the schedule of price is submitted in incomplete form. No post tender correspondence will be entertained on break-up of prices. Also, the supplier should agree for delivery at sub-station site.
2. In case, where F&I components are not specifically indicated in this schedule, 5% of the ex-works price shall be taken towards F&I components for the purpose of comparison of price.

3. The Tenderer shall certify in the price bid that MODVAT benefit, if any, has been fully passed on to the purchaser while quoting the tender price.
4. Conditional offers will not be acceptable.
5. The bidder is to clearly indicate the period up to which the tax holidays are available to them.
6. Price bid in any other format will not be acceptable and the offer will be rejected.
7. Test charges (Routine/type) if any, mandatory spares, if any, maintenance equipment charges, if any, as per Technical Specification, supervisory charges, if any, (in case of equipments by taking 30 Man days) shall be indicated separately, row-wise.
8. All the above charges will be taken into account, during bid price evaluation.

[Indicate the name of the bank]

to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the OPTCL stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the OPTCL by reason of any breach by the said supplier [s] of any of the terms or conditions or failure to perform the said Bid . Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____

3. We undertake to pay the OPTCL any money so demanded not withstanding any dispute or disputes so raised by the contractor [s] in any suit or proceeding instituted/pending before any Court or Tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the supplier(s) shall have no claim against us for making such payment.

4. We, the _____ further agree that the guarantee
[Indicate the Name of the Bank]

herein contained shall remain in full force and effect during the aforesaid period of 240 days [two hundred forty days] and it shall continue to be so enforceable till all the dues of the OPTCL under or by virtue of the said Bid have been fully paid and its claims satisfied or discharged or till Managing Director, ODISHA POWER TRANSMISSION CORPORATION LTD. certifies that the terms and conditions of the said Bid have been fully and properly carried out by the said Supplier [s] and accordingly discharges this guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the _____ we shall be discharged from all liability under this guarantee thereafter.

5. We, the _____ further agree with the OPTCL that

[Indicate the name of the Bank]

the OPTCL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Bid or to extend time of performance by the said Supplier [s] from time to time or to postpone for any time or from time to time any of the powers exercisable by the OPTCL against the said supplier [s] and to forbear or enforce any of the terms and conditions relating to the said bid .

Further it is to state that we shall not be relieved from our liability by reason of any such variation, postponement or extension being granted to the said Supplier [s] or for any forbearance act or omission on the part of the OPTCL or any indulgence by the OPTCL to the said Supplier[s] or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the name, style and constitution of the Bank or the supplier [s].

7. We, _____ lastly undertake not revoke this
[Indicate the name of the Bank]

Guarantee during its currency except with the previous consent of the OPTCL in writing.

8. We the _____ Bank further agree that this guarantee shall also be irrevocable at our place of business at Bhubaneswar (indicate the name of the branch)in the state of ODISHA.

Notwithstanding any thing contained here in.

- 1) Our liability under this bank guarantee shall not exceed Rs.----- (Rupees-----).
- 2) The bank guarantee shall be valid up to dt.-----

3) We are liable to pay the guaranteed amount or any part there of under this bank guarantee only & only if you serve upon us at -----branch at Bhubaneswar a written claim or demand on or before dt.-----.

Dated _____ Day of _____

For _____

[Indicate the name of Bank]

Witness ((Signature, names & address)

1.

2.

ANNEXURE-V

PROFORMA FOR COMPOSITE BANK GUARANTEE FOR SECURITY DEPOSIT PAYMENT AND PERFORMANCE

This Guarantee Bond is executed this _____ day of _____ 2012 by us the _____ Bank at _____

P.O. _____ P.S. _____

District _____ State _____

1. WHEREAS the ODISHA POWER TRANSMISSION CORPORATION LTD., a body corporate constituted under the Electricity Act, 2003 [hereinafter called "the OPTCL" which shall include its successors and assigns has placed orders No. _____ Date _____ [hereinafter called "The Agreement"] on M/s. _____ [hereinafter called "The Supplier"] which shall include its successors & assigns for supply of materials.

AND WHERE AS the supplier has agreed to supply materials to the OPTCL in terms of the said agreement AND

WHEREAS the OPTCL has agreed [1] to exempt the supplier from making payment of Security [2] to release 100% payment of the cost of materials as per the said agreement and [3] to exempt from performance guarantee on furnishing by the Supplier to the OPTCL, a Composite bank Guarantee of the value of 10 % [ten percent] of the contract price of the said agreement.

NOW THEREFORE, in consideration of the OPTCL having agreed [1] to exempt the Supplier from making payment of Security [2] releasing 100% payment to the

Supplier and [3] to exempt from furnishing performance guarantee in terms of the said agreement as aforesaid, we, the _____ [Bank][hereinafter referred to as 'the Bank'] do hereby undertake to pay to the OPTCL an amount not exceeding Rs. _____ [Rupees _____] against any loss or damage caused to or suffered by or would be caused to or suffered by the OPTCL by reason of any breach by the said Supplier [s] of any of the terms or conditions contained, in the said agreement.

2. We the (_____ Bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on demand from the OPTCL stating that the amount claimed is due by way of loss or damage caused to or suffered by the OPTCL by reason of any breach by the said Supplier [s] of any of the terms or conditions, contained in the said agreement or by reason of the supplier's failure to perform the said agreement. Any such demand made on the bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____ [Rupees _____]

3. We the _____ Bank} also undertake to pay to the OPTCL any money so demanded notwithstanding any dispute or disputes raised by the supplier [s] in any suit or proceeding instituted/pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the Supplier [s] shall have no claim against us for making such payment.

4 We, (_____ Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be

taken for the performance of the said agreement and that it shall continue to do so enforceable till all the dues of the OPTCL under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Managing Director, ODISHA POWER TRANSMISSION CORPORATION LTD. certifies that the terms and conditions of the said agreement have been fully and properly carried out by the said Supplier [s] and accordingly discharges this Guarantee.

Unless a demand or claim under this guarantee is made on us in writing on or before the [Date_____], we shall be discharged from all liability under this guarantee thereafter.

5. We,(_____Bank) further agree that the OPTCL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Supplier [s] and we shall not be relieved from our liability by reason of any such variations or extension being granted to the said supplier [s] or for any forbearance, act or omission on the part of the OPTCL or any indulgence by the OPTCL to the said Supplier [s] or by any such matter or thing whatsoever which under the law relating to sureties would but these provisions have effect of so relieving us.
6. This guarantee will not be discharged due to the change in the name , style and constitution of the Bank and supplier [s].
7. We,[_____Bank] lastly undertake not to revoke this guarantee during its currency except with the previous consent of the OPTCL in writing.

8. We the _____ Bank further agree that this guarantee shall also be irrevocable at our place of business at Bhubaneswar (indicate the name of the branch)in the state of ODISHA.

Not with standing any thing contained herein.

- 1) Our liability under this bank guarantee shall not exceed Rs.------(Rupees-----).
- 2) The bank guarantee shall be valid up to dt.-----
- 3) We are liable to pay the guaranteed amount or any part thereof under this bank guarantee only & only if you serve upon us at -----branch at Bhubaneswar a written claim or demand on or before dt.-----.

Dated _____ Day of _____

For _____

[Indicate the name of Bank]

Witness ((Signature, names & address)

1.

2.

ANNEXURE-VI

CHART SHOWING PARTICULARS OF EARNEST MONEY DEPOSIT FURNISHABLE BY
TENDERERS

1.	Central and State Government Undertakings	Exempted
2.	All other inside & outside state units.	The amount of EMD as specified in the specification /Tender Notice in shape of bank guarantee /DD.

NB: - REFUND OF E.M.D.

[a] In case of unsuccessful tenderers, the EMD will be refunded immediately after the tender is decided. In case of successful tenderer, this will be refunded only after furnishing of Composite Bank Guarantee referred to in clause No.19 of Section-II of this specification.

Suits, if any, arising out of EMD shall be filed in a court of law to which the jurisdiction of High Court of ODISHA extends.

[b] Earnest Money will be forfeited if the tenderer fails to accept the letter of intent/purchase order, issued in his favour or revises the bid price[s] within the validity period of Bid.

**PART-I(SECTION-IV)
TECHNICAL SPECIFICATION
OF THE HARDWARES AND CLAMPS CONNECTORS**

SECTION – IV

**TECHNICAL SPECIFICATION FOR HARDWARE FITTINGS AND
CLAMPS AND CONNECTORS.**

**SUITABLE FOR GALVANISED STEEL STRANDED GROUNDWIRE
(7/3.15mm), POWER CONDUCTOR (ACSR PANTHER,ACSR
ZEBRA, ACSR MOOSE)**

1.0 SCOPE

This Specification covers design, manufacture, testing at manufacturer's Works, supply and delivery of hardware fittings ,clamps connectors and other accessories suitable for use in 132 KV and 220 KV Over-head transmission lines of OPTCL. The hard wares to be supplied shall be **CONFIRMING TO ISS AND IEC**. The firm shall submit the samples of different items as mentioned in schedule of quantity.

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.

i)	IS:5561 - 1970	Aluminium Clamps and Connectors
ii)	IS:2121 Part I & II	Conductor & earth wire accessories for overhead power lines.
iii)	IS:9708	Stock Bridge Vibration Dampers on overhead power lines.
iv)	IS:2633	Method of testing of uniformity of coating on zinc coated articles
v)	IS:209	Specification for Zinc.
vi)	BS:916	Specification for Hexagonal bolts and nuts.
vii)	IS 10162	Specification of Spacers

3.0 MATERIALS AND DESIGN

Aluminium and aluminium 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 aluminium 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 earth wire accessories 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 of worth 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 conductor and earth wire accessories 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 or to the earth wire 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 and hardware shall be free from cracks, shrinks, slender air holes, burrs or rough edges.

The design of the accessories 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 and ground wire 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 authoritative 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 AND GROUND WIRE

5.0 MID SPAN COMPRESSION JOINTS: (FOR ACSR -PANTHER, ZEBRA, MOOSE AND GROUNDWIRE 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 aluminium (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 "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.

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 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 aluminium 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 galvanised 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 galvanised. 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 ACSR- PANTHER , ZEBRA, MOOSE CONDUCTOR AND GROUNDWIRE)

Compression type repair sleeves shall be offered to provide reinforcement for conductor with broken or damaged aluminium strands/galvanised 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 ($1/6^{\text{th}}$) of the strands in the outermost layer and damaged or severed. The repair sleeves after compression should present a smooth surface.

8.0 SUSPENSION CLAMPS: FOR GROUND WIRE

Suspension 4.3.19. In clamps for suitable size are require for holding the galvanized steel stranded ground wire at suspension points. The suspension clamps shall be suspended from the lower hanger or 'D' belt of 16 mm. dia. And should, therefore, be supplied with a suitable attached that would allow the clamps to swing freely both in the transverse and longitudinal direction. The clamps shall be so designed that the effect of vibration both on the ground wire and the fittings itself is minimum.

The clamps shall be manufactured and finished so as to avoid sharp radia of curvature, ridges which might lead to localized pressure and damage the ground wire in service.

The clamps shall be made of heat treat malleable iron one Eye hook made of forced steel. The entire assembly shall be hot dip galvanized.

The clamping surface shall be smooth and formed to support the ground wire on long easy curves to take care or required steel vertical and horizontal angles.

The clamps shall permit the groundwire to slip before the failure of the latter occurs. The leg of U-bolt holding the keeper piece of the clamps shall be kept sufficient long and shall be provided with threads, nuts and locking nuts for fixing the flexible earthing bond between the suspension clamps and tower structures.

9.0 TENSION CLAMPS (DEAD END ASSEMBLY) FOR GROUND 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% 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.

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.

10.0 BONDING PIECES (FLEXIBLE COPPER EARTHING BOND FOR EARTH WIRE 7/3.15mm)

The tenderer shall offer flexible copper earthing bonding pieces for connecting the ground wire suspension and tension clamps and tower legs suitable for earthing.

Each bond piece shall have suitable compression type galvanized steel lug or thimble on either end for making connections to clamp and tower legs. The size, strength, etc. of the bonding piece is given in this Specification.

12.0 CLAMP

12.1 ARMOUR GRIP SUSPENSION CLAMPS

Armour Grip Suspension Clamp shall consist of 2 neoprene insert, one set of armour rods made of aluminium alloy, two aluminium housing having inner profile matching with the profile of the armour rods page and supporting strap made of aluminium 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.

12.2 TENSION CLAMPS

The Tension Clamps shall be made out of aluminium alloy and of compression type suitable for PANTHER / ZEBRA/MOOSE conductor for both 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.

12.3 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.

12.4 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.

13.0 TESTS, TEST CERTIFICATE AND PERFORMANCE REPORTS

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

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

- a) Visual examination
- b) Dimensional verification
- c) Failing load test
- d) Slip strength test (for clamps & vibration dampers)
- e) Electrical resistance test
- f) Resonance frequency test (for vibration dampers)
- g) Fatigue test (for vibration dampers)
- h) Mass pull off test (Slipping Strength of messenger cable of vibration dampers)
- i) Clamp Bolt Torque test (for vibration dampers)
- j) Galvanizing test.

13.2 ACCEPTANCE TEST FOR HARDWARES

- a) Dimensional verification.

- b) Ultimate tensile test.
- c) Slip strength test.
- d) Electrical resistance test.
- e) Heating cycle test
- f) Breaking strength of full string assembly.
- g) Galvanizing test.
- h) Tests on P.A. Rod
- i) Tests on Locking Devices.

13.3 SPECIFIC TECHNICAL REQUIREMENTS FOR CONDUCTOR ACCESSORIES AND INSULATOR HARDWARES

Conductor	Panther/zebra/Moose	GSS ground wire
a) Type	ACSR Panther/zebra/Moose	Ground wire.
b) Material	Aluminium conductor steel reinforced	Galvanised stranded steel wire.
c) Strand & Wire diameter.	Furnished separately	7/3.15 mm.
d) Weight per Km.	974/1622/2004 Kg per Km	426 Kg/Km. 9.4mm.
e) Overall diameter	21/28.62/31.77mm 0.13750/0.06915/0.05 552 Ohm/KM	3.375Ohm/Km
f) A.C. Resistance at 20 deg. C when corrected to standard weight.	9241.9/13289/16120 Kg	5710 Kg. 1393 Kg.
g) Minimum breaking load/Ultimate tensile strength.	3806/4325 Kg 6120/9240mm	5150mm.

h) Maximum working tension at minimum temperature & 2/3 full wind.

i) Maximum Sag at maximum temperature & no wind.

DISC Insulator (for suspension & tension Insulator strings of 132, 220 & 400 KV class), Accordingly hard ware fittings to be designed.

Sl. No.	DESCRIPTION	70 KN	90 KN	120 KN	160KN
1	Type of Insulator	Ball & socket	Ball & socket	Ball & socket	Ball & socket
2	Size of ball & socket(mm)	16	16	20	20
3	Dimensions				
(a)	Disc diameter(mm)	255	255	280	305
(b)	Ball to ball spacing(mm)	145	145	145	170
(c)	Creepage distance of the single insulator-mm	430	430	430	475
4	Electro-mechanical strength of single insulator-kN	70	90	120	160
5	Materials of shell	Porcelain	Porcelain	Porcelain	Porcelain

Single
Suspension

Single
Tension

Double
Suspension

Double
Tension

**String Arrangements for
132/220/400 KV :**

No. of insulator discs. **9/14/24** **10/15/25** **2x9/2x14/2x24** **2x10/2x15/2x25**

1672/2340 1851/3003 1837/2243 2132/3082

**Length of
string
assembly
(mm)**

14.0 VIBRATION DAMPERS (SUITABLE FOR BOTH ACSR CONDUCTOR:
PANTHER/ZEBRA/MOOSE AND G.S.S. GROUND WIRE 7/3.15 MM.)

- i) Type : 4R Stock Bridge Type**
- ii) Distance between conductor : 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 Kgs.**
- vi) Mass pull-of: As per I.S.S.**

SCHEDULE OF GUARANTEED TECHNICAL PARTICULARS

**LINE HARDWARE AND ACCESSORIES FOR 132/220 KV & GROUND WIRE
7/3.15mm**

	HARDWARES	Suspension	Tension
i	Maker's name and Address		
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 Galvanised
b)	Chain Link	NA	Forged Steel galvanised
c)	Ball hook / Ball Link (HH)	Forged Steel galvanised	Forged Steel galvanised
d)	Socket Eye (HH)	Forged Steel galvanised	NA
e)	Ball Clevis	Forged Steel galvanised	Forged Steel galvanised
f)	Socket Clevis	Forged Steel galvanised	Forged Steel galvanised
g)	Yoke Plate	Mild Steel Galvanised	Mild Steel Galvanised
h)	Arcing Horn	Mild Steel Galvanised	Mild Steel Galvanised
I)	Clamp Suspension	A.G.S. Clamp	NA
J)	Dead End/Cross arm strap	NA	NA
k)	Dead end clamp(Compression)	NA	Extruded Aluminium Alloy
iv	Standard specification to which the Hardwares conform	IS 2486, IS: 2004,IS:617, IS-2633, & IS-733	
v	Standard specification to which conforming	IS: 2486	
vi	Galvanising		
a)	Ferrous parts	Hot Dip Galvanised	
b)	Spring washers	Electro Galvanised	

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 Hardwire Fittings	120 kN	160 kN	160 kN
b)	For Double Tension Hardwire Fittings	120 kN	160 kN	160 kN
c)	For Single Suspension Hardwire Fittings	70 kN	70kN	90 kN
d)	For Double Suspension Hardwire Fittings	70 kN	90 kN	90 kN
B.	TENSION CLAMPS	Suitable for Panther, Zebra & Moose (AAAC/ACSR)		
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 Galvanised		
b)	Spring washers	Electro Galvanised		
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	Panther (AAAC/ACSR)	Zebra (AAAC/ACSR)	Moose (AAAC/ACSR)
i	Type	AGS Type		
ii	Type of material used for retaining rod for AGS assembly giving reference of ISS	Aluminium Alloy 6061/ Equivalent	Aluminium Alloy 6061/ Equivalent	Aluminium 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	Not less than 40% of IACS	Not less than 40% of IACS	Not less than 40% of IACS

	conductivity of IACS i.e. International Annealed Copper Standard				
vi	Slipping strength of cushioned suspension assembly	8% to 15% of UTS of Conductor	20 to 29 KN	20 to 29 KN	20 to 29 KN
vii	Breaking strength of suspension Clamp	7000kgf	7000kgf	9000kgf	9000kgf
viii	Physical properties of neoprene cushion				
a)	Minimum Tensile Strength	2000 psi	2000 psi	2000 psi	2000 psi
b)	Minimum ultimate Elongation	300%	300%	300%	300%
ix)	Ageing (guaranteed life of the assembly)	40 years	40 years	40 years	40 years
x)	Hardness	65 to 80 A	65 to 80 A	65 to 80 A	65 to 80 A
D	Midspan compressions joints for	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.	Galvanised Steel	N.A.	Galvanised 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	Aluminium (kg)	1.2	1.2	2.032	2.032
b	Galvanised Steel (kg)	N.A.	0.295	N.A.	0.410
ix	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			
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 Sleeve	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 (mm)	32	32	40	40
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			
F	Vibration Damper	For AAAC & ACSR ZEBRA			
i	Total weight of the damper (Kg)	4.5 Approx			
		Left	Right		
ii	Weigh of each damper mass (kgs.)	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	60 Φ x 195		55 Φ x 165	
v	Material of :				
	1. Damper mass	Cast iron hot dip galvanised.			
	2. Messenger cable.	High tensile galvanised steel wire.			
vi	Galvanising				
a	Ferrous parts	Hot Dip Galvanised			
b	Spring washers	Electro Galvanised			
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 strands	9- 11
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
xvi i	Percentage variation in reactance after fatigue test in comparison with that before the fatigue test (%)	20
G Midspan compression joint For 7/3.15mm Galvanised Stranded Steel Wire		
i	Material	Galvanized Steel
ii	Size	OD 20.2 x Length 230
iii	Suitable for groundwire	Yes (7/3.15)
iv	Weight in kg	0.85
v	Minimum failing load	50 KN
vi	Galvanization	
a	Ferrous parts	Hot Dip Galvanised
b	Spring washers	Electro Galvanised
c	Quality of zinc used	99.5%
d	Number of dips which the clamp can withstand	4 / 1 minute dip
vii	Standard to which conforming	IS 2633
H Suspension Clamps For 7/3.15mm Galvanised Stranded Steel Wire		
i	Materials	Malleable Cast Iron / Galvansied Steel
ii	Size	As per Drawing
iii	Suitable for groundwire	Yes (7/3.15)
iv	Weight in kg	
v	Slip strength	12-17 KN
vi	Minimum failing load	70 KN
vii	Galvanising	
a	Ferrous parts	Hot Dip Galvanised
b	Spring washers	Electro Galvanised

c	Quality of Zinc used	99.5%
d	Number of dips which the clamp can withstand	4/1 minute dips
viii	Standard to which conforming	IS 2486 and IS 2633
I Compression type dead end assemblies For 7/3.15mm Galvanised 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	3.694
v	Slipping strength	95% of UTS of Conductor
vi	Minimum failing load	70 KN
vii	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
d	Number of dips which the clamp can withstand	4/ 1 minute dips
vii	Standard to which conforming	IS 2486 and IS 2633
Flexible copper bond		
i	Drawings enclosed	<u>Yes</u>
ii	Stranding	<u>37/7/0.417</u>
iii	Cross sectional area (Sq.mm)	<u>75.6</u>
iv	Minimum copper equivalent area (Sq.mm)	<u>34 (each individual wire)</u>
vi	Length of copper cable (mm)	<u>500</u>
vii	Material lugs	<u>Tinned Copper</u>
viii	Bolt Size	
	(i) Diameter (mm)	<u>16</u>
	(ii) Length (mm)	<u>40</u>
ix	Resistance (Ohm)	<u>0.0004 (as per IS:2121)</u>
x	Total weight of flexible copper bond (kg)	<u>0.45 (approx)</u>

INSULATOR HARDWARES (BOTH SUSPENSION AND TENSION)

A) 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 -do- 11,500/16,500 Kgs (120 KN/160 KN)
- iii) Socket Eye Horn - do- 9,000/11,500 /16500Kgs (90 KN/120 KN/160 KN)
Holder.
- iv) Socket Clevis. -do- 9,000/11,500/16,500 Kgs.
- v) Ball Clevis -do- 9,000/11,500/16,500 Kgs.
- vi) Clevis Eye -do- 9,000/11,500/16,500 Kgs.
- vii) Socket Eye. -do- 9,000/11,500/16,500 Kgs.
- vii) Bottom / Top Yoke plate :
 - Double suspension Mild Steel 9,000/11,500 /16500Kgs.
 - Double Tension -do- 16,500 Kgs.
- ix) Arcing Horn -do- —
- x) Suspension Clamp. Aluminium Alloy and Neoprene. —
- xi) Tension Clamp. All.Alloy & Steel. 11,500/16500 Kgs.
- xii) Ball Pin High tensile forged steel 90% of UTS of conductor.
(hot-dip galvanised)
- xiii) Security Clip Brass (R-Type)
Minimum failing load Single Suspension :9,000/11,500/16500
String (KN) Single Tension : 11,500/16,500
Double Suspension : 9,000/11,500/16500
Double Tension : 11,500/16,500

B) 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	Aluminium Alloy and neoprene	Aluminium Alloy and Steel	Aluminium Alloy and Neoprene	Aluminium 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)	7,000/11,500	90% of UTS of conductor	7,000/11,500	90% of UTS of conductor

14.1 VIBRATION DAMPERS (SUITABLE FOR BOTH ACSR CONDUCTOR: PANTHER/ZEBRA/MOOSE AND G.S.S. GROUND WIRE 7/3.15 MM.)

- i) Type : 4R Stock Bridge Type
- viii) Distance between conductor : 74.5 mm. & axis of the Vibration Damper.
- ix) Messenger Cable : 130 Kg/mm sq. quality (19 strands)
- x) Bolt size : 16 mm. (dia.)
- xi) Slip strength of messenger Cable: 500 Kgs.
- xii) Mass pull-of: As per I.S.S.

15. CLAMPS CONNECTORS

15.1 SCOPE:

This specification covers the design, manufacture, assembly, inspection, testing, packing and delivery of clamps & connectors (fittings), suitable for “MOOSE” Conductor (54/7/3.53 mm) or “Zebra” Conductor (54/7/3.18),”Panther” Conductor(30/7/3.0 mm). The material offered shall be complete with all components that are necessary for efficient operation. Such parts shall be deemed to be within scope of the supply whether specifically mentioned or not. Fittings shall confirm in all respect to the highest standard of engineering, design, and workmanship and shall be capable of performing trouble free continuous operation.

15.2 CLIMATIC CONDITIONS:

The overall climate is moderate hot, humid, tropical, highly polluted and conducive to rust and fungus growth. The clamps/connector shall be given tropical and fungicidal treatment and shall be capable of satisfactory operation under the hot and humid climatic conditions that would prevail at sites. The climatic conditions are prone to wide range of variation in ambient conditions. The materials offered shall be suitable for installation at any of the switchyards in Odisha.

15.2 All casting shall be free from shrinking, blow holes, surface blisters, cavities, cracks, other defects and quality of product shall be uniform throughout. All sharp edges and corners shall be blurred and rounded off.

15.3 Assembly shall be designed and manufactured in such a way so as to have minimum contact resistance.

15.4 The fittings offered shall be inherently resistive to atmospheric corrosion or be suitable to protect against corrosion both during storage as well as in service.

15.5 The clamps/connector shall not cause any damage to the conductor in any way.

15.6 All bolts, clamps, etc. shall have suitable locking arrangements to safe guard against vibration and loosening.

15.7. No part of a clamp shall be less than 15 mm thick for fittings suitable for ACSR Panther/ Zebra/ Moose conductor.

15.8 All ferrous parts shall be hot dip galvanized confirming to IS:2633.

15.9 For bimetallic connectors, copper alloy liner of minimum thickness of 2 mm shall be cast integral with aluminum body.

15.10 Connectors shall be designed to be corona free in accordance with the requirements stipulated in IS: 5561

15.11 The required bolts and nuts for terminal connector must be hot dip galvanized/stainless steel with suitable check nut.

7.0 SPECIFIC REQUIREMENTS:

16.1 MATERIAL:

The clamps and connectors shall be made of materials listed below:

- i) For connecting ACSR conductor aluminum alloy casting conforming to designation A6 of IS: 617.
- ii) Bolts, nuts, plain washers and spring washers for all items: Hot dip galvanized mild steel/stainless steel.
- iii) Split pin shall be made of stainless steel.

16.2 The clamps shall be designed to withstand the flow of continuous current as follows:

ACSR Moose/Zebra/ Panther Conductor- 2000 Amp

The temperature rise when carrying full load current shall not exceed 45°C above site ambient temperature of 40°C. The rated current for which the clamp connectors are designed with respect to the specified ambient temperature shall be marked on each component of clamps and connectors.

17.0 DESIGNS:

Responsibility of satisfactory design of the clamps/connectors to safely withstand the specified mechanical stresses and carry the rated current without exceeding the temperature rise specified, shall solely rest with the bidder. For this purpose, a minimum factor of safety 2 (two) shall be taken into account.

18.0 TEST:

Individual fittings, clamps, connectors shall be subjected to following Type, Acceptance and Routine Tests.

18.1 CLAMPS & CONNECTORS IS:5561 -(1970):

Type Test:

- a) Tensile test:
- b) Resistance test:
- c) Temperature rise test. :
- d) Short time current test:
- e) Dimensional check:
- f) Galvanizing test:
- g) Corona test :} For the fittings suitable for twin
- h) Radio interference test. :} Moose and above size

19.0 INTERCHANGEABILITY:

All fittings shall be of standard design and made to gauge or jig and shall be interchangeable in all respects with similar items.

20.0 (a) True copies of all the Type Test Certificates of Govt. recognized

Laboratory in respect of the offered items only shall be furnished.

(c) Descriptive literature, dimensional drawings catalogues, etc. shall be submitted for the offered items.

(d) Offers without samples and type tests reports will be out rightly rejected.

SPACER: General : Spacers shall conform to IS:10162 . Spacer are located at a suitable spacing to limit short circuit forces and also to avoid snapping of sub conductors during short Circuit condition.

Constructional features: No magnetic materials shall be used in the fabrication of spacers except for GI Nuts & Bolts.

Spacers design shall be made to take care of fixing & removing during installation & maintenance. The design of spacer shall be such that the conductor does not come in contact with any sharp edge.

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 upto M16 and having length upto 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 IS 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 adherent 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 end manufactured that contact resistance is reduced to minimum.
6. Welding of aluminum shall be by inert gas shielded tungsten arc 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 centre and locate the individual parts during cementing.

Characterstics as per IS398 Part II/1976

ACSR Zebra 54+7/3.18

Area-428.9 Sq.mm
 Outer Diameter-28.62
 Weight in Kg-1620
 Brkd in Kg13466.4

ACSR MOOSE 54+7/3.53

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

ACSR Panther 30+7/3.00

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

SCHEDULE OF QUANTITY. (Appendix-I)

Sl.No 1.	Description of materials	Quantity required	Desired Delivery	Destination	Remarks.
1	2	3	4	5	6

1	Single Tension hardware fittings complete set suitable for		Within Three months from the date of P.O.	Any store within the State of Odisha (will be indicated in the P.O)
a	ACSR Panther Conductor	175		
b	ACSR Zebra Conductor	145		
c	ACSR Moose Conductor	122		
2	Double tension hardware fittings complete set suitable for			
a	ACSR Panther Conductor	97		
b	ACSR Zebra Conductor	15		
c	ACSR Moose Conductor	5		
3	Single suspension hardware fittings complete set suitable for			
a	ACSR Panther Conductor	100		
b	ACSR Zebra Conductor	50		
c	ACSR Moose Conductor	52		
4	Double tension hardware fittings complete set suitable for twin ACSR Moose Conductor	67		
5	Double suspension hardware fittings complete set suitable for twin ACSR Moose Conductor	16		
6	Vibration damper suitable for			
a	ACSR Panther Conductor	215		
b	ACSR Zebra Conductor	100		

7	Mid span joint				
a	ACSR Panther Conductor	160			
b	ACSR Zebra Conductor	60			
8	Repair Sleeve suitable for				
a	ACSR Panther Conductor	125			
b	ACSR Zebra Conductor	65			
c	ACSR Moose Conductor	5			
9	For G.I. Earthwire				
a	Suspension clamp	120			
b	Tension clamp	80			
c	vibration damper	20			
d	Mid span joint	80			
e	Flexible Earth Bond	20			
10	Spacer clamp suitable for twin moose conductor	477			
11	Spacer T clamp suitable for twin moose run and twin moose drop conductor	28			
12	Spacer T clamp suitable for twin moose run and single moose drop	24			
13	Spacer T clamp suitable for twin moose run and single Zebra drop	67			
14	T clamp suitable for single moose run and single moose drop	50			
15	T clamp suitable for single moose run and single zebra	67			

	drop				
16	Bi- metallic Straight through clamp suitable for 132KV side Auto Transformer Bushing and for single moose conductor	27			
17	Bi-metallic pad clamp suitable for single moose conductor (pad portion bi-metallic)	122			
18	Bi-metallic Pad clamp suitable for twin moose conductor (pad portion bi-metallic)	28			
19	Bi-metallic Straight through clamp suitable for 132KV CT/PT stud & moose conductor	42			
20	3 bolted PG clamp suitable for ACSR Moose conductor	60			
21	PA rod for ACSR Panther Conductor	4			

PART – II
PRICE BID

1. PRICE:

- (i) Bidders are required to quote their price(s) for goods offered indicating they are 'FIRM'
- (ii) The prices quoted shall be FOR Destination only at the consignee's site/store inclusive of packing, forwarding, Freight & Insurance. In addition, the break-up of FOR Destination price shall be given as per schedule. The Tenderer has to certify in the price bid that MODVAT benefit if any, has been fully passed on to the Purchaser, while quoting the tender prices.

2. INSURANCE :

Insurance of materials/equipments, covered by the Specification should normally be done by the Suppliers with their own Insurance Company unless otherwise stated. The responsibility of delivery of the materials/equipments at destination stores/site 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 equipments/materials damaged or lost which will be reported by the Consignee within 30 days of receipt of the equipments/materials at Destination without awaiting for the settlement of their claims with the carriers and underwriters.

3. CERTIFICATE FOR EXEMPTION FROM EXCISE DUTY/SALES TAX:

Offers with exemption from excise Duty/ Sales tax shall be accompanied with authenticated proof of such exemption. Authenticated proof for this clause shall mean Photostat copy of exemption certificates, attested by Gazetted Officers of State or Central Government.

4. PROPER FILLING UP OF THE PRICE SCHEDULE:

- (i) In case where Freight & Insurance charges are not furnished, 5% of the Ex-works price shall be considered as the freight & Insurance charges.
- (ii) The tenderer should fill up the price schedule properly and in full. The tender may be rejected if the schedule of price is submitted in incomplete form.

5. NATURE OF PRICE INDICATED IN SPECIFICATION SHALL BE FINAL.

The nature of price indicated in the Clause-13, Section – I of PART –I of the Specification shall be final and binding.