



**ODISHA POWER TRANSMISSION
CORPORATION LIMITED**

OFFICE OF THE SENIOR GENERAL MANAGER

CENTRAL PROCUREMENT CELL

JANAPATH, BHUBANESWAR-751022

TEL. NO. 0674- 2541801 FAX NO. 0674-2542964

TENDER SPECIFICATION NO.

**SR.G.M.-CPC-e-TENDER-HARD WARE FITTINGS– 71/2014-15
FOR**

PROCUREMENT OF HARD WARE FITTINGS AND ACCESSORIES

FOR CONDUCTOR & EARTH WIRE

PART-I

SECTION-I-	INSTRUCTION TO TENDERERS.
SECTION-II-	GENERAL CONDITIONS OF CONTRACT
SECTION-III-	LIST OF ANNEXURES
SECTION-IV-	TECHNICAL SPECIFICATION

PART-II PRICEBID

Request for online tender documents –From dt.25.11.2014 (10.00 Hrs.) to dt.26.12.2014 (12.30 Hrs.)

Last date of submission of online tender – Up to dt.27.12.2014 (13.00 Hrs.)

Date of opening of Tender - 29.12.2014 (15.00 Hrs)



ODISHA POWER TRANSMISSION CORPORATION LTD.

REGD. OFFICE: JANPATH, BHUBANESWAR - 751 022,

ODISHA

e-TENDER NOTICE NO.CPC- 71 / 2014-15

For and on behalf of ODISHA POWER TRANSMISSION CORPORATION LTD., Sr. G.M. (CPC) invites Tenders from reputed manufacturers in two part bidding system for supply of **Hard Ware Fittings & Accessories for Conductor & Earth wire**. 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 25.11.2014 (10.00 Hrs.) up to 26.12..2014 (12.30 Hrs.). Interested manufacturers 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.

SENIOR GENERAL MANAGER (CPC)



NOTICE INVITING TENDER

**ODISHA POWER TRANSMISSION CORPORATION LTD.,
REGD. OFFICE: JANPATH, BHUBANESWAR – 751022,
ODISHA, INDIA.**

e-TENDER NOTICE NO.CPC- 71/2014-15

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.	Sr.G.M.- CPC –e- Tender- Hard Ware Fittings - 71/2014-15	(A)Hard Ware Fittings for AAAC Panther (37/3.15mm) (i) Single Tension H/W fitting (ii) Double Tension H/W fitting (iii) Single Suspension H/W fitting(AGS Type) (iv) Double Suspension H/W fitting(AGS Type) (v)Vibration Damper (vi)Mid-span Joint (vii)Repair Sleeve (B)Hard Ware Fittings for AAAC Zebra (37/4.0 mm) (i) Single Tension H/W fitting (ii) Double Tension H/W fitting (iii) Single Suspension H/W fitting(AGS Type) (iv) Double Suspension H/W fitting (AGS Type) (v)Vibration Damper (vi)Mid-span Joint (vii)Repair Sleeve	34 17 52 20 30 136 131 31 35 38 19 60 78 152	3,13,800/-	Rs.10,000/- +VAT @5% (Rs.10,500/-)	Rs.5,000/- +Service Tax@12.36 % (Rs.5,618/-)	27.12.2014 (13.00Hrs.) & 29.12.2014 (15.00 Hrs.)

		(C)Hard Ware Fittings for AAAC Moose (61/3.55mm)				
		(i) Single Tension H/W fitting for Single AAAC Moose Conductor	26			
		(ii) Double Tension H/W fitting for Twin AAAC Moose Conductor	12			
		(iii) Single Suspension H/W fitting for Single AAAC Moose Conductor (AGS Type)	53			
		(iv) Double Suspension H/W fitting for Twin AAAC Moose Conductor (AGS Type)	9			
		(v)Vibration Damper	150			
		(vi)Mid-span Joint	55			
		(vii)Repair Sleeve	106			
		(D)Hard Ware Fittings for ACSR Panther (30+7/3.00mm)				
		(i) Single Tension H/W fitting	1643			
		(ii) Double Tension H/W fitting	262			
		(iii) Single Suspension H/W fitting(AGS Type)	3547			
		(iv) Double Suspension H/W fitting (AGS Type)	351			
		(v)Vibration Damper	9426			
		(vi)Mid-span Joint	1390			
		(vii)Repair Sleeve	940			
		(E)Hard Ware Fittings for ACSR Zebra (54+7/3.18mm)				
		(i) Single Tension H/W fitting	1005			
		(ii) Double Tension H/W fitting	318			
		(iii) Single Suspension H/W fitting (AGS Type)	2051			
		(iv)) Double Suspension H/W fitting (AGS Type)	495			
		(v)Vibration Damper	4455			
		(vi)Mid-span Joint	895			
		(vii)Repair Sleeve	898			
		(F)Hard Ware Fittings for ACSR Moose (54+7/3.53mm)				
		(i) Single Tension H/W fitting for Single ACSR Moose Conductor	100			

	(ii) Double Tension H/W fitting for Twin ACSR Moose Conductor	20				
	(iii) Single Suspension H/W fitting for Single ACSR Moose Conductor (AGS Type)	42				
	(iv) Double Suspension H/W fitting for Twin ACSR Moose Conductor (AGS Type)	82				
	(v) Vibration Damper	100				
	(vi) Mid-span Joint	256				
	(vii) Repair Sleeve	205				
	(G) Hard Ware Fittings for Earth Wire (7/3.15mm)					
	(i) Single Tension H/W fitting	25				
	(ii) Vibration Damper	30				

NOTE:-Part bidding is not allowed

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

The bidders who want to submit bid shall have to pay Rs. 10,500/- (Rupees Ten thousand five hundred only nonrefundable including VAT @ 5%) towards the tender cost, in the form of Demand draft/Cash only, drawn in favour of the D.D.O Head qrs, OPTCL, Bhubaneswar.

The bidders shall have to submit non-refundable amount of Rs. 5,618/- (Rupees Five thousand six hundred eighteen) only including Service Tax @ 12.36% towards the tender processing fee to K.S.E.D.C.Ltd, in e-payment mode. The e-payment of above amount is to be made to enable the bidder to down load the bid proposal sheets & bid document in electronic mode.

The demand draft/pay order for tender cost , processing fee are to be submitted along with the EMD at the office of the undersigned on or before the last date & time of submission of tender.

The bidder shall deposit the tender cost, tender processing fee & EMD BG prior to last date & time for submission of bid as notified in tender notice. Local micro & small enterprisers (MSEs) registered with respective DICs, Khadi, Village, Cottage & Handicrafts Industries, OSIC and NSIC can participate without payment of the cost of tender specification. They have to submit notarized hard copy of valid registration as local MSE as above on or before the date & time of opening of techno-commercial bid.

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, (G.T.C.C) OF THE TENDER SPECIFICATION.

**SENIOR GENERAL MANAGER,
CENTRAL PROCUREMENT CELL.**



**ODISHA POWER TRANSMISSION CORPORATION LTD.
CENTRAL PROCUREMENT CELL
JANAPATH, BHUBANESWAR - 751022
FAX NO.: 0674 - 2542964
TELEPHONE NO.: 0674 - 2541801**

**TENDER SPECIFICATION NO. SR.G.M.-CPC -TENDER-HARD WARE
FITTINGS-71/2014-15**

CONTAINING

- PART - I** **COMMERCIAL BID**
- SECTION - I** : **INSTRUCTION TO TENDERERS**
- SECTION - II** : **GENERAL TERMS AND CONDITIONS OF
CONTRACT (G.T.C.C.) (COMMERCIAL)**
- SECTION - III** : **LIST OF ANNEXURES (COMMERCIAL)**
- SECTION - IV** : **TECHNICAL SPECIFICATION**
- PART - II** **PRICE BID.**

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SECTION-I

COMMERCIAL SPECIFICATION

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 from any bidder to the OPTCL 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 deposited 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.

- (i) For all the users it is mandatory to procure the Digital Signatures.
- (ii) Contractors / Vendors / Bidders / Suppliers are requested to follow the below steps for **Registration**:
 - (a) Pay the amount of **Rs.2,247/-** to K.S.E.D.C.Ltd. in e-payment mode.
 - (b) Send the acknowledgment copy for verification.
 - (c) As soon as Click “Register”, fill the online registration form.
 - (d) the verification is being done the e-tender user id will be enabled.
- (iii) 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.
- (iv) 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
- (v) To make an 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.
- (vi) After making the request Bidders will receive the Tender 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.
- (vii) 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
- (viii) Tender Opening event can be viewed online.
- (ix) Competitors bid sheets are available in the website for all.
- (x) For any e-tendering assistant contact help desk number mentioned below.
- Bangalore - 080- 40482000.

The participants to the tender should be registered under ODISHA Sales Tax Act, VAT Act/Central sales Tax Act.

2. Division of Specification

The Specification is mainly divided into two parts viz. Part-I and Part-II.

Part- I Consists of

- (i) Section-I : Instructions to Tenderers.
- (ii) Section-II : General conditions of supply (commercial)
- (iii) Section-III: Schedules and forms etc.
- (iv) Section-IV: Technical Specification.

Part-II Consists of

Schedule of prices as per Annexure-V.

3. Tenders shall be in Two Parts

The Tenderers are required to submit the tenders in two parts Part-I (techno-commercial) and Part-II (Price Bid).

4. Opening of Bids

- (a) The part-I shall be opened on the date and time fixed by the OPTCL. Bids will be opened in Electronic mode in presence of the Tenderers or their authorized representatives [limited to one person only] on the due date of opening of tender who opt to remain present . After scrutiny of the technical particulars and other commercial terms, clarifications, if required, shall be sought for from the bidders. The Tenderers shall be allowed 15 days time for such activity.
- (b) On receipt of technical clarification the bids shall be reviewed/evaluated and those not in conformity with the technical Specification/qualifying experience, shall be rejected. If any of the technical proposals requires modification to make them comparable, discussion will be held with the participating bidders.
All the responsive bidders shall be given opportunity to submit the revised technical and revised price proposals as a follow up to the clarification on the technical proposals. The qualified bidders shall be given opportunity to submit revised price proposals within 15 days from the date of such discussion or within time frame mutually agreed, whichever is earlier.
- (c) When the revised price proposals are received, Only the revised technical and price proposals will be considered for bid evaluation. The price bids [Part-II] of such of the Tenderers, whose tenders have been found to be technically and commercially acceptable, including those supplementary revised price bids, submitted subsequently, shall be opened in the presence of the bidder's representative on a date and time which will be intimated to all technically and commercially acceptable Tenderers.
- (d) The bidders are required to furnish sufficient information to the Purchaser to establish their qualification/capability to manufacture and/or supply the

materials/perform the work. Such information shall include details of bidder's experience, its financial, managerial and technical capabilities.

- (e) The bidders are also required to furnish details of availability of appropriate technical staff and capability to perform after sales service where applicable. The above information shall be considered during the first stage of scrutiny and evaluation of bids and any bid which does not satisfactorily meet these requirements, shall not be considered for price bid evaluation.
- (f) The price bids of the technically and otherwise acceptable bids, shall only be evaluated as per the norms applicable in terms of this Specification.

5. 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 order for lesser quantity with full freedom to place extension orders for further quantity under similar terms and conditions of the original orders. Order may also be split among more than one Tenderer for any particular item if considered necessary in the interest of the Purchaser.

6. Procedure & Opening Time of Tenders

Tenders will be opened in the office of the Sr. General Manager (CPC) on the specified date and time in present of such of the Tenderers or their authorized representatives (limited to one person only) in case of each bidders who may desire to be present, at the time of opening the bids.

7. Bidder's Liberty to Deviate from Specification

The Tenderer may deviate from the Specification while quoting if in his opinion such deviation is in the line with the manufacturer's standard practice and conducive to a better and more economical offer. All such deviations should however be clearly indicated giving full justifications for such deviation. (Read with Clause-9, Section-II of the Specification).

8. Eligibility for Submission of Bids

Only those manufacturers who have deposited the cost of tender specification are eligible to participate in the tender. They should upload the scanned copy of the D.D/ money receipt as a proof of such payment. The local Micro & Small Enterprises (MSEs) register with respective DICs, Khadi, Village, Cottage &

Handicraft Industries, OSIC and NSIC can participate without payment of the cost of tender specification.

9. 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. (Read with Clause-10, Section-II of the Specification).

10. Mode of Submission of Bids

(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.

11. Earnest Money Deposit

(i) Earnest Money Deposit of value specified in the notice inviting tenders against each lot/bid is to be submitted on or before the last date and time of submission of tender. Tenders without the required E.M.D. or without documentary proof for exemption from furnishing E.M.D. as indicated at Annexure-VIII will be rejected outright. The local Micro & Small Enterprises (MSEs) registered with respective DICs, Khadi, Village, Cottage & Handicraft Industries, OSIC and NSIC can participate by submitting EMD deposit 50 % of the amount indicated in the notice inviting tender.

The earnest money deposit shall be furnished in one of the following forms subject to the conditions mentioned below:

(a)Cash: Payable to Drawing & Disbursing Officer, OPTCL (Hrs. Office, Bhubaneswar-751022.

(b) Bank Draft: To be drawn in favour of the Drawing & Disbursing Officer, OPTCL (Hqrs. Office), Bhubaneswar-751022.

(c) Bank Guarantee from any nationalized/scheduled Bank strictly as per enclosed proforma vide Annexure-VI to be executed on non-judicial stamp paper of appropriate value to be accompanied by the confirmation letter of the issuing Bank.

Note:

(i) The validity of the E.M.D. Bank Guarantee shall be 240 days from the date of opening of tender, failing which the tender will be liable for rejection.

- ii) No interest shall be paid on the Earnest Money Deposit. Up to Rs.25,000/- (Rupees twenty-five thousand) only the Earnest Money Deposit may be made either in cash or Bank Draft . Above Rs.25,000/- (Rupees Twenty Five Thousand only) the Earnest Money Deposit shall be furnished in shape of EMD Bank Guarantee, as per proforma attached.
- iii) No adjustment towards Earnest Money Deposit shall be permitted against any outstanding amount with the OPTCL.
- iv) The chart showing particulars of E.M.D. to be furnished by Tenderers of different categories is placed at Annexure-VIII.
- v) In the case of un-successful Tenderer the Earnest Money will be refunded immediately after the tender is decided. In the case of successful tenderer, EMD will be refunded only after furnishing of security money referred to at Clause-19 of section –II. 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.
- vi) Earnest Money will be forfeited if the Tenderer fails to accept the letter Of intent and /or purchase orders issued in his favour.
- vii) Tenders not accompanied by Earnest Money/documentary proof of Exemption of E.M.D. shall be summarily rejected.

12. Validity of the Bids

The tenders should be kept valid for a period of 180 days from the date of opening of the tender as notified in the tender notice failing which the tenders will be rejected.

13. PRICE

i) Tenderers are requested to quote-‘FIRM’ Price. No deviation from FIRM PRICE will be entertained irrespective of deviation clause No.7 of this part of the specification.

14. Revision of Tender Price By Bidders

a) After opening of tenders and within the validity period, no reduction or Enhancement in price will be entertained. If there is any change in price, the tender shall stand rejected and E.M.D. deposited shall be forfeited. In case of bidders who are exempted from depositing E.M.D. and who revise their price

within the validity period, the bids for similar items against subsequent tender call notice of OPTCL, may not be considered.

b) After opening of price bid if the validity period is not sufficient to place purchase order, the tenderers may be asked by the purchaser to extend the validity period of the bid under the same terms and condition as per the original tender.

However, the tenderers are free to change any or all conditions including price except delivery period of their bids at their own risk, if they are asked by the purchaser to extend the validity period of the bid prior to opening of price bid.

15. 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 Sr. General Manager (CPC) OPTCL. This however, does not entitle the Tenderer to ask for time beyond due date fixed for receipt of tender.

16. Documents to Accompany Bids

Tenderers are required to submit hard copy/documents of tender cost, tender processing fees, Earnest Money deposit and notarized hard copy of valid registration as local MSE to Sr. G.M (CPC), OPTCL on or before the last date & time of submission of bid. Tenderers are required to upload the Scanned/.pdf copy of the following document as vendor generic document and also upload the .xls bid documents as mentioned below:-

Part-I (Vendor Generic Document)

	Document Details	File Name
	Declaration Form duly filled in and signed. (As per Annexure -I)	Attachment1.pdf
	(a) Earnest Money (As per Annexure-VI) or Documents in support of exemption from Earnest Money Deposit if any (b) Tender cost (c) Tender Processing fee.	Attachment2.pdf
	Technical Specification conforming to the Purchaser's Specification along with drawings and literature.	Attachment3.pdf
	Photostat copies of latest type test certificate of materials/equipment offered. (Type tests should have been conducted within 5 years prior to the dated tender opening and	Attachment4.pdf

	not earlier).	
	List of orders executed for similar items during preceding four years indicating the customer's name & P.O. copies.	Attachment5.pdf
	Data on past experience as per Clause-7 of Section –II of the Specification.	Attachment6.pdf
	Sales Tax, Income Tax clearance certificates, for the previous year.	Attachment7.pdf
	Audited Balance Sheet & Profit Loss Accounts for the previous three years.	Attachment8.pdf
	Schedule of quantity and delivery in the prescribed proforma vide Annexure-III.	Attachment9.pdf
	Abstract of price components as per Annexure-VI	Attachment10.pdf
	Any other required document as per tender specification	Attachment11.pdf
	The notarized hard copy & soft copy of valid registration as local MSE (if any) on or before the date & time of opening of technical bid.	
	Any attachment having size more than 5Mb is to be divided into parts like Attachment1partI, Attachment1partII etc.	

Part-I (Techno-commercial Bid Sheet)

1	All the.xls sheets are to be down loaded and filled in completely and uploaded without any modification to the file name.	.xls sheet name /file name is not to be modified
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17. Documents/Papers to Accompany Part –II Bid

Part –II of the tender shall consists of the following.

Part-II (Price Bid Sheet)

1	All the .xls sheets are to be down loaded and filled in completely and uploaded without any modification to the file name.	.xls sheet name /file name is not to be modified
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18. Conditional Offer

Conditional offer shall not be accepted.

19. General

- (i) Over writing shall be avoided
- (ii) Erasures and other changes shall bear the dated initial of the person signing the tender.
- (iii) 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.
- (iv) For evaluation the price mentioned in words shall be taken if there is any difference in figure and words in the price bid.
- (v) Notice inviting tender shall form part of this Specification.
- (vi) The price bids of the technically and otherwise acceptable bids shall only be evaluated.
- (vii) It should be distinctly understood that the part-II of the bid shall contain only details/documents relating to price, as outlined in clause-17 mentioned herein above. Inclusion of any of the documents/information etc. shall render the bid liable for rejection.
- (viii) The tenderer must submit the EMD amount, cost of tender document (Form Fee) 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 cover envelope. The said envelope is to be submitted in the office of the purchaser on or before the last date and time of submission of Bids.

20. Expenses in respect of OPTCL's representative for witnessing the inspection & testing of the offered equipment/materials at the inspection and testing site

The expenses under the following heads, in respect of OPTCL's representative for witnessing the inspection & testing of the offered equipment/materials at the inspection and testing site, shall be borne by the contractor / supplier.

a) Hotel Accommodation

- I. Single room accommodation in 4 star hotel for the OPTCL inspecting officer of the rank of Assistant General Manager (Grade E-6) and above.
- II. Single room accommodation in 3 star hotel for the OPTCL inspecting officer of the rank below Assistant General Manager (Grade E-6).

N.B.: It is the responsibility of the contractor to arrange the hotel accommodation matching with their inspection and testing schedule, so that the inspecting officer can check-in the hotel one day prior to the date of inspection and check out after the completion of the inspection, subject to availability of the return travel ticket. In case of extended duration of inspection or non-availability of the return travel ticket, Contractor/supplier/manufacturer shall arrange for the extended stay of the inspecting officer in the Hotel accordingly. In case there is no hotel with prescribed standard in and around the place of inspection, the contractor/supplier/manufacturer shall suggest alternative suitable arrangement at the time of offer for inspection, which is subjected to acceptability of OPTCL inspecting officer.

b) Journey of the inspecting officer

(i) To and fro travel expenditure from the Head Quarters of the inspecting officer to the place of inspection/testing shall be borne by the contractor/supplier/manufacturer. Journey from the Head Quarters of the inspecting officer to the nearest Air Port by train (Ist/IIInd A.C) & A/C Taxi then by Air to the place of inspection/testing or to the nearest place of inspection/testing and then by train (Ist/IIInd A.C) & A/C taxi to the place of inspection/testing shall be arranged by the contractor/supplier/manufacturer.

(ii) For train journey, inspecting officer of the rank Assistant General Manager and above shall be provided with 1st class AC ticket and inspecting officer below the rank of Assistant General Manager shall be provided with 2nd class AC ticket.

(iii) The Air-ticket / train-ticket booking/cancellation is the responsibility of the contractor / supplier.

(iv) Moreover, if during the journey there is an unavoidable necessity for intermediate travel by road/ waterway/sea-route, the contractor/supplier shall provide suitable conveyance to the inspecting officer for travel this stretch of journey or bear the cost towards this. Any such possibilities shall be duly intimated to OPTCL at the time of their offer for inspection.

c) Local Conveyance

At the place of the inspection/testing, for local journey of the inspecting officer between Hotel and inspection/testing site and or any other places, Air-conditioned four wheeler vehicle in good condition shall be provided by the contractor/supplier/manufacturer.

d) Following points are also to be considered

- (i) All the above expenses shall be deemed to be included in the bidder's quoted price for that supply item. Bidder shall not be eligible to raise any extra claim in this regard.
- (ii) Contractor/supplier/manufacturer may assume that only in 40% of the inspection and testing offer cases, OPTCL inspecting officer, not below the rank of Assistant General Manager will witness the inspection and testing.
- (ii) In case of inspection and testing of some critical equipment/materials like Power transformers, OPTCL may depute more than one inspecting officer.
- (iii) Contractor/supplier/manufacturer shall judiciously plan the inspection/testing schedule and place of inspection/testing, so that optimum number of inspection/testing and minimum time shall be required to cover all the equipment/materials of the relevant contract package.
- (iv) It shall be the responsibility of the Contractor/Supplier to organize the above tour related matters of OPTCL inspecting officer including the matters related to overseas inspection/testing, if any.

PART-I

SECTION-II

GENERAL TERMS AND CONDITIONS OF CONTRACT [GTCC]

1. Scope of the contract

The scope of the contract shall be to design, manufacture, supply of 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 Senior General Manager[Central Procurement Cell] 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 equipments 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 carry out 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.

[vii] For PHASE-II delivery inspection call is to be offered by the bidder after 01.04.2015

5. Training facilities

The supplier shall provide all possible facilities for training of Purchaser's Technical personnel, when deputed by the Purchaser for acquiring firsthand knowledge in assembly of the equipment, its erection, commissioning and for its proper operation and maintenance in service, wherein it is thought necessary by the purchaser.

6. 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.

7. Experience of Bidders

The bidders should furnish information regarding experience particularly on the following points:

- [i]** Name of the manufacturer:
- [ii]** Standing of the firm and experience in manufacture of equipment/material quoted:
- [iii]** Description of equipment/material similar to that quoted, supplied and installed during the last two years with the name(s) of the Organizations to whom supplies were made wherein, at least one (1) certificate shall be from a state/central P.S.U.
- [iv]** Details as to where installed etc.
- [v]** Testing facilities at manufacturer's works.
- [vi]** If the manufacturer is having collaboration with another firm [s], details regarding the same.
- [vii]** A list of purchase orders of identical material/equipments offered as per technical specification executed during the last two years along with users certificate. User's certificate shall be legible and must indicate, user's name, address, designation, place of use, and satisfactory performance of the equipment/materials for at least two years from the date of commissioning. Wherein at least one (1) certificate shall be from a State/Central or P.S.U. Bids will not be considered if the past manufacturing experience is found to be un-satisfactory or is of less than 2 (two)

years on the date of opening of the bid and bids not accompanying user's certificate will be rejected.

8. 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.

9. Deviation from specification

It is in the interest of the tenderers to study the specification, specified in the tender schedule thoroughly before tendering so that, if any deviations are made by the Tenderers,(both commercial and Technical), the same are prominently brought out on a separate sheet under heading "Deviations Commercial" and "Deviations Technical".

A list of deviations shall be enclosed with the tender. Unless deviations in scope, technical and commercial stipulations are specifically mentioned in the list of deviations, it shall be presumed that the tenderer has accepted all the conditions, stipulated in the tender specification, notwithstanding any exemptions mentioned therein.

10. 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]

11. Supplier to inform himself fully

The supplier shall examine the instructions to tenderers, general conditions of contract, specification and the schedules of quantity and delivery to satisfy himself as to all terms and conditions and circumstances affecting the contract price. He shall quote price [s] according to his own views on these matters and understand that no additional allowances except as otherwise provided there in will be admissible. The purchaser shall not be responsible for any misunderstanding or

incorrect information, obtained by the supplier other than the information given to the supplier in writing by the purchaser.

12. Patent rights Etc.

The supplier shall indemnify the Purchaser against all claims, actions, suits and proceedings for the infringement of any patent design or copy right protected either in the country of origin or in India by the use of any equipment supplied by the manufacturer. Such indemnity shall also cover any use of the equipment, other than for the purpose indicated by or reasonably to be inferred from the specification.

13. 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).

14. Dispatch instructions

[I] The equipment/ 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.

15. Supplier's Default Liability

[i] The Purchaser may, upon written notice of default to the supplier, terminate the contract in circumstances detailed hereunder.

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

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

[ii] In the event, Purchaser terminates the contract in whole or in part 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-22 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-22 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.

16. 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

17. 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.

18. 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 22 (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

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

- [i]** For manufacturers situated Inside & outside 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 Sr. General Manager [Central Procurement Cell] OPTCL within 15 days from the date of issue of the purchase order. In case of successful bidder who is a local Micro and Small Enterprise (MSEs) registered with respective DICs, Khadi, Village, Cottage & Handicrafts Industries, OSIC and NSIC 5% (five percent)), shall be furnished from any nationalized/scheduled bank having a place of business at Bhubaneswar, to the office of Sr.General Manager [Central Procurement Cell] OPTCL 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.

[iv] B.G is to be furnished on the total quantity for both PHASE-I & PHASE-II delivery.

20. Import License

In case imported materials are offered, no assistance will be given for release of Foreign Exchange. The firm should arrange to import materials from their own quota. Equipment of indigenous origin will be preferred.

21. (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 if any, 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.

22. 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 challan 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 will not be rectified by the supplier within the guarantee period, then whole of the B.G. will be forfeited by the purchaser, without any intimation to the Supplier.

23. 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 waiting for the settlement of their claims with the carriers and underwriters.

24. 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.

25. Sales Tax clearance certificate and Balance sheet and profit & Loss Account

- (i)** Sales Tax clearance certificate for the previous year shall be enclosed with the tender.

(ii) Audited Balance Sheet and Profit & Loss Account of the bidder for the previous three years shall be enclosed to assess the financial soundness of the bidder(s).

26. 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.

27. 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).

28. 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.

29. 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.
- h) Mandatory spares, if any for maintenance of equipment. (At the discretion of the purchaser).
- i) Test charges, if any.
- j) Supervision of erection, testing and commissioning charges, if any.

- k)** Any other items, as deemed proper for evaluation by the purchaser.
- l)** Loading factors will be taken in to account during evaluation if the prices of some of the items, not quoted.

(II) Weightage shall be given to the Following factors in the Evaluation & Comparison of Bids

In comparing bids and in making awards, the Purchaser will consider other factors such as compliance with Specification, minimum qualification criteria as per clause-30, outright rejection of tenders clause-34 of this tender, relative quality, adaptability of Supplies or services, experience, financial soundness, record of integrity in dealings, performance of materials/equipments earlier supplied, ability to furnish repairs and maintenance services, the time of delivery, capability to perform including available facilities such as adequate shops, plants, equipment and technical Organization.

(III) The local MSE bidders shall be required to furnish their willingness to match their bid price with that of the lowest evaluated bidder without any price preference and in case they agree, they shall be eligible to get up to 30% of the tendered quantity to be distributed suitably among the willing MSE bidders failing which the said 30% of the tendered quantity be awarded to the lowest evaluated bidder.

30. Minimum Qualification Criteria of Bidders

All the prospective bidders are requested to note that their bids for tendered equipment can only be considered for evaluation if:

- i)** The bidder should have manufacture and supply experience of above rated or higher capacity equipments for a minimum period of 2 (two) years as on the date of opening of the tender
- ii)** At least 50% of the tendered quantity. Of above rated or higher capacity equipment should have been supplied within the above-stipulated period.
- iii)** The above rated or higher capacity equipment should have at least 2 (two) years successful performance from the date of commissioning. At least one of the performance certificates shall be submitted from Govt.of India/State Govt.(s) or their undertakings.
- iv)** The bidder should have conducted type tests on the tendered equipments in Government approved laboratory within five years from the date of opening of the tender.

31. 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.

32. 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.

33. Official Address of the Parties to the Contract

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

- [i] Purchaser:** Senior General Manager (Procurement)(CPC) OPTCL
Bhubaneswar-751022 (Odisha)

Telephone No. 0674 - 2541801

FAX No. 0674 - 2542964

- [ii] Supplier:** Address

Telephone No.

Fax No.

34. 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 & time of opening of technical bid. In case of local Micro & Small Enterprises (MSEs) registered with respective DICs, Khadi, Village, Cottage & Handicraft Industries, OSIC and NSIC participating in the tender, they have to submit notarized hard copy of valid registration as local MSE as above on or before the date & time of opening of the technical bid.
- [ii]** The tenderer shall submit the bid in electronic mode only
- [iii]** The Tender shall not be submitted telegraphically or by FAX.
- [iv]** The prescribed EMD shall be submitted on or before the date and time of opening of technical bid.
- [v]** The Tender shall be kept valid for a minimum period of 180 days from the date of opening of tender.
- [vi]** The Tender shall be submitted in two parts as specified.

- [vii]** The Tenders shall be accompanied by a list of major supplies effected prior to the date of opening of tender. Data of at least 2 (two) years shall be furnished.
- [viii]** 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 Organization's representative(s).
- [ix]** 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. Vide Clause-4(ii) of Part-II.
- [x]** 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.
- [xi]** 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.
- [xii]** Guaranteed Technical particulars & Abstract of terms and Conditions should be filled in completely.

35. Documents to be treated as confidential

The supplier shall treat the details of the specification and other tender documents as private and confidential and these shall not be reproduced without written authorization from the Purchaser.

36. Scheme/Projects

The materials/equipment covered in this specification shall come under "O&M" works.

SECTION - III
LIST OF ANNEXURES

The following schedules and proforma 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	Schedule of Quantity and Delivery	ANNEXURE-III
4	Abstract of price component [to accompany Part-II of this specification]	ANNEXURE-IV
5	Schedule of prices to accompany Part-II	ANNEXURE-V
6	Bank Guarantee form for earnest money deposit	ANNEXURE-VI
7	Composite Bank Guarantee form for security deposit, payment and performance	ANNEXURE-VII
8.	Chart showing particulars of E.M.D.	ANNEXURE - VIII
9.	Data on Experience.	ANNEXURE - IX
10.	Schedule of spare parts.	ANNEXURE-X
11.	Schedule of Installations.	ANNEXURE-XI
12	Deviation from specification (Technical)	ANNEXURE-XII(A)
13	Deviation from specification (Commercial)	ANNEXURE-XII(B)

ANNEXURE – I

DECLARATION FORM

To

Sir,

1. Having examined the above specification together with Tender conditions referred to therein I/We the undersigned hereby offer to supply the materials covered thereon 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 delivered within the time specified in the Tender.
3. I/We here guarantee the technical particulars given in the Tender supported with necessary reports from concerned authorities.
4. I/We certify to have purchased/down loaded a copy of the Specification by remitting Cash/Money order/ D.D./ remitting the cost of tender, herewith and this has been acknowledged by your letter No. _____ Dated _____
5. In the event of Purchase order being decided in my/our favour, I/We agree to furnish the Security Deposit in the manner acceptable to ODISHA POWER TRANSMISSION CORPORATION LTD. and for the sum as applicable to me/us 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.

Signed this _____ day of _____ 20 _____

Yours faithfully,

Signature of Tenderer
With Seal of the Company

(This form should be fully filled up by the Tenderer and uploaded along with the Tender in the vender generic document.)

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

1	(a) The tenderer shall submit the bid in electronic mode only & submit the tender cost on or before the date & time of opening of the technical bid. In case of Local MSE participating in the tender have to submit the notarized hard copy of valid registration as above on or before the date of opening of the technical bid. (b) Earnest money furnished. (A) Bank Guarantee, (B) Bank Draft.	
2	Manufacturer's supply experience including user's certificate furnished or not.[As per clause No.7 of Section-II.]	Yes/No
3	Deviations to the specification if any PHASE-I [list enclosed or not As per clause-9 of the Section-II] Deviations to the specification if any PHASE-II [list enclosed or not As per clause-9 of the Section-II]	(a) Commercial (b)Technical. (a)Commercial (b)Technical. (a) Commercial (b)Technical. (a)Commercial (b)Technical.
4	Delivery (period in months from the date of purchase order) PHASE-I PHASE-II	a)Yes/No b)Yes/No a)Yes/No b)Yes/No a)Yes/No b)Yes/No a)Yes/No b)Yes/No
5	Guarantee:- Whether agreeable to OPTCL's terms. [As per clause-18 of Section-II]	Yes/No
6	Whether agreeable to furnish Composite B.G. in case his tender be successful [As per clause-19 of Section-II]	Yes/No
7.	Terms of payment:- Whether agreeable to OPTCL's terms or not [As per clause-21 of Section-II]	Yes/No.
8.	Nature of price:- FIRM	Yes/No
9.	Penalty:- Whether agreeable to OPTCL's terms or not (As per clause-22 of Section-II)	Yes/No
10.	Whether STCC/ P&L A/C, Balance Sheet for the required period are furnished as per clause-25 of Section-II	Yes/No
11.	Validity: - Whether agreeable to OPTCL's terms or not [As per clause-28 of Section-II]	Yes/No
12.	Whether recent type test certificates from any Government approved laboratory are furnished or not. [As per clause-34[viii] of section-II]	Yes/No
13.	Whether guaranteed technical particulars in complete shape are furnished or not	Yes/No
14.	Whether dimensional design/drawings furnished or not	Yes/No
15.	Whether materials are ISI/ISO marked.	Yes/No
16.	Manufacturer's name and it's trademark.	
17.	Whether registered under Orissa Sales Tax Act. 1947/central tax Act	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

SCHEDULE OF QUANTITY AND DELIVERY (To be filled up by the tenderer)

Delivery Phase	LOT No	Description of materials	Quantity required	Desired Delivery	Destination	Remarks.
1	2	3	4	5	6	7
PHASE-I	LOT-I					
	LOT-II					
	LOT-III					
	LOT-IV					
PHASE-II	LOT-I					
	LOT-II					
	LOT-III					
	LOT-IV					

Place:

Date:

Signature of Tenderer

with seal of Company

ANNEXURE-IV

ABSTRACT OF PRICE COMPONENT [TO ACCOMPANY PRICEBID]

1	Price basis	F.O.R. Purchaser's destination Stores/site.
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.	Rate of Service Tax on supervision of erection testing and commissioning	
10.	Nature of price.	
11.	Whether MODVAT benefit, if any has been fully passed on to the purchaser while quoting the price.	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 - V
(To Accompany Price Bid Part-II)

SCHEDULE OF PRICE

The bidders have to down load the price bid sheets (in .xls format) from the tender portal and filled in all the required cells and upload the same without making any modification to the sheet name and file name.

N.B. :-

1. The Tenderers should fill up this schedule properly & in full. The tender may be rejected if the schedule of price is submitted in incomplete form. No post tender correspondence will be entertained on break up of prices.
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. Conditional offers will not be acceptable.
4. Price Bid in any other format will not be acceptable and the offer will be rejected.

ANNEXURE-VI

PROFORMA FOR BANK GUARANTEE FORM FOR EARNEST MONEY DEPOSIT

Ref	Date	Bank Guarantee No:
1	<p>In accordance with invitation to Bid No. _____ Dated _____ of ODISHA POWER TRANSMISSION CORPORATION LTD. [OPTCL][herein after referred to as the OPTCL for the purchase of _____ Messers _____ Address _____</p> <p>_____ wish/wished to participate in the said tender and as a Bank Guarantee for the sum of Rs. _____ [Rupees _____ Valid for a period of 240 days [Two hundred forty days] is required to be submitted by the Tenderer. We the _____ [Indicate the Name of the Bank] [Hereinafter referred to as 'the Bank'] at the request of M/S _____ [Herein after referred to as supplier (s)] do hereby unequivocally and unconditionally guarantee and undertake to pay during the above said period, on written request by the Sr. General Manager [CPC] ODISHA POWER TRANSMISSION CORPORATION LTD. _____ [Indicate designation of the purchaser] an amount not exceeding Rs. _____ to the OPTCL, without any reservation. The guarantee would remain valid up to 4.00 PM of _____ [date] and if any further extension to this is required, the same will be extended on receiving instructions from the _____ on whose behalf this guarantee has been issued.</p>	
2.	We the _____ do hereby, further undertake	

[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 notwithstanding 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 and 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.

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

2. 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 invocable at our place of business at _____ , of Bhubaneswar in the state of Odisha. [Indicate the name of the Bank]

‘Notwithstanding anything contained herein above’

a) Our liability under the bank guarantee shall not exceed Rs._____ (In words Rupees_____).

b) This bank Guarantee shall be valid up to_____.

c) We are liable to pay guaranteed amount or any part thereof under this bank guarantee only if you serve upon us at _____ branch of Bhubaneswar in the state of Odisha a written claim or demand on or before _____ (date of expiry of guarantee).

Dated _____ Day of _____

For _____

[Indicate the name of Bank]

Witness ((Signature, names & address)

1.

2.

ANNEXURE-VII

PROFORMA FOR COMPOSITE BANK GUARANTEE FOR SECURITY DEPOSIT PAYMENT AND PERFORMANCE

This Guarantee Bond is executed this _____ day
of _____ 2011 by us the _____ Bank at

P.O. _____ P.S. _____
District _____ State _____

1. WHEREAS the ORISSA 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. _____

3. We the _____ Bank} also undertake to pay to the OPTCL any money so demanded not withstanding 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, ORISSA 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 invokable at our place of business at_____ of Bhubaneswar in the state of Odisha. [Indicate the name of the Bank]

'Notwithstanding anything contained herein above.

a)Our liability under the bank guarantee shall not exceed Rs._____(In words Rupees_____).

b)This bank Guarantee shall be valid up to_____ .

c)We are liable to pay guaranteed amount or any part thereof under this bank guarantee only if you serve upon us at _____branch of Bhubaneswar in the state of Odisha a written claim or demand on or before _____ (date of expiry of guarantee).

Date at _____ the, _____ day of 201_____

For _____
[Indicate the name of Bank]

Witness (Name, Signature & Address)

- 1.
- 2.

ANNEXURE-VIII

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.

ANNEXURE-IX

DATA ON EXPERIENCE

- [a] Name of the manufacturer.
- [b] Standing of the firm as manufacturer of equipment quoted.
- [c] Description of equipment similar to that quoted [supplied and installed during the last two years with the name of the organizations to whom supply was made].
- [d] Details as to where installed etc.
- [e] Testing facilities at manufacturer's works.
- [f] If the manufacturer is having collaboration with another firm, details regarding the same and present status.
- [g] A list of purchase orders, executed during last three years.
- [h] A list of similar equipments of specified MVA rating, voltage class, Impulse level, short circuit rating, Designed, manufactured, tested and commissioned which are in successful operation for at least two years from the date of commissioning with legible user's certificate. User's full complete postal address/fax/phone must be indicated. (Refer clause No.7 of the Part-I, Section-II of the specification).

Place:

Date:

Signature of tenderer

Name, Designation, Seal

ANNEXURE-X

SCHEDULE OF SPARE PARTS FOR FIVE YEARS OF NORMAL OPERATION & MAINTENANCE

SL. No	Particulars	Quantity	Unit delivery rate	Total price

Place:

Date:

Signature of Tenderer
Name, Designation, Seal

ANNEXURE-XI

SCHEDULE OF INSTALLATIONS

<u>Rated MVA</u>	Rated Voltage	Place of installation and complete postal address	Year of commissioning

Place:

Date:

Signature of Tenderer
Name, Designation, Seal

ANNEXURE-XII(A)

DEVIATION FROM SPECIFICATION (TECHNICAL)

The tenderer shall enter below, deviation if any, from the conditions of contract as herein.

Sl. No.	Clause No. of Specification	Particulars of deviation

Date:

Place:

SIGNATURE OF TENDERER
NAME:
DESIGNATION:
(SEAL)

ANNEXURE-XII(B)

DEVIATION FROM SPECIFICATION (COMMERCIAL)

Deviation from the condition of contract (commercial)

The tenderer shall enter below, deviation if any, from the conditions of contract as herein.

Sl. No.	Clause No. of Specification	Particulars of deviation
---------	-----------------------------	--------------------------

Date:

Place:

SIGNATURE OF TENDERER
NAME:
DESIGNATION:
(SEAL)

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 of Prices in Annexure-V of Section – III. 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 (Annexure-V of Section-III) properly and in full. The tender may be rejected if the schedule of price is submitted in incomplete form as per clause-34 (ix) of Section-II of the Specification.

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.



**ORISSA POWER TRANSMISSION CORPORATION LIMITED
CENTRAL PROCUREMENT CELL,
JANAPATH, BHUBANESWAR - 751022.**

**SECTION - IV
TECHNICAL SPECIFICATION
FOR
HARDWARE FITTINGS AND ACCESSORIES FOR AAAC/
ACSR PANTHER, ZEBRA & MOOSE CONDUCTOR AND
GALVANISED STEEL STRANDED GROUNDWIRE (7/3.15MM)**

1.0 SCOPE

This Specification covers design (if required), manufacture, testing at manufacturer's Works, supply and delivery of, power conductor and ground wire accessories and hardware fittings for string insulators suitable for use in 132 KV and 220 KV Over-head transmission lines & Sub-stations of OPTCL. The hardware to be supplied shall be as per drawings to be approved by OPTCL AND CONFIRMING TO ISS AND IEC. The firm shall submit his drawings in line with the Specification of OPTCL indicating clearly all dimensions on the body of the drawing for approval of OPTCL and only after which the manufacturing shall be started.

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

2.0 STANDARDS

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

i)	IS:2486 Part-II & III	Insulator fitting for overhead power lines with a nominal voltage greater than 1,000 volts.
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.

3.0 MATERIALS AND DESIGN

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

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

Metal fittings of specified material for conductor and 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 the white 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 galvanizing and shall be well fabricated and greased. All other treads shall be cut before galvanizing. The bolt treads shall be undercut to take care of increase in diameter due to galvanizing.

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 GALVANIZING

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& GROUNDWIRE

5.0 MID SPAN COMPRESSION JOINTS (FOR AAAC/ACSR PANTHER, ZEBRA & MOOSE CONDUCTOR AND GROUND WIRE)

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

The sleeves shall be of circular shape suitable for compression into hexagonal shape.

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

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

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

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

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

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

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

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

Vibration dampers shall be of approved design. The clamps of the vibration dampers shall be made of aluminum alloy, so designed as to prevent any damage while fixing on the conductor

during erection or in continued operation. The fastening bolts should be approved by the Employer. The spring washers should be electro galvanized and of minimum 2 mm thickness. The messenger cable shall be made from high tensile strength steel strands in order to prevent subsequent drop of weight in service.

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

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

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

7.0 REPAIR SLEEVE

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

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

8.0 TENSION CLAMPS /DEAD 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.

9.0 INSULATOR HARDWARES

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

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

Each insulator string shall generally include the following hardware components.

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

	g) Line side arcing horn-2Nos. h) Compression type dead end clamps. i) Clevis.
--	--

10.0 CLAMPS

10.1 ARMOUR GRIP SUSPENSION CLAMPS

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

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

10.2 TENSION CLAMPS

The Tension Clamps shall be made out of aluminum alloy and of compression type suitable for PANTHER / ZEBRA/MOOSE conductor for both AAAC and ACSR. The tension clamps shall not permit slipping or damage to failure of the complete conductor or any part thereof at a load less than 90% of the ultimate strength of conductor. The mechanical efficiency of tension / clamps shall not be affected by method of erection involving come / along or similar clamps or tension stringing operation during or after assembly and erection of tension clamp itself. The tension clamp shall be of a design that will ensure unrestricted flow of current without use of parallel groove clamps.

The clamps shall be as light as possible.

10.3 ARCING HORNS

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

10.4 UNIVERSAL JOINTING COMPOUND

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

11.0 TESTS, TEST CERTIFICATES AND PERFORMANCE REPORTS

The fittings and accessories for the power conductor and G.S.S. ground wire, insulator and hardware 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. Six sets of type and routine test certificates and performance reports are to be submitted by the bidder.

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

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

11.1 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.

11.2 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.

11.3 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	Aluminum conductor steel reinforced	Galvanized 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.
e) Overall diameter	21/28.62/31.77mm	9.4mm.
f) A.C. Resistance at 20 deg. C when corrected to standard weight.	0.13750/0.06915/0.05552 Ohm/KM	3.375Ohm/Km
g) Minimum breaking load/Ultimate tensile strength.	9241.9/13289/16120 Kg	5710 Kg.
h) Maximum working tension at minimum temperature & 2/3 full wind.	3806/4325 Kg	1393 Kg.
i) Maximum Sag at maximum temperature &	6120/9240mm	5150mm.

no wind.

DISC Insulators (for Suspension & Tension Insulator strings of 132, 220 & 400 KV)

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

Length of string 1672/2340 1851/3003 1837/2243 2132/3082

assembly
(mm)

GENERAL REQUIREMENTS FOR HARD WARE FITTINGS FOR POWER CONDUCTOR & GROUND WIRE

I) ACCESSORIES.

A) MID-SPAN COMPRESSION JOINTS (SUITABLE FOR AAAC/ACSR PANTHER,ZEBRA &MOOSE CONDUCTOR AND G.S.S. GROUND WIRE- 7/3.15 MM)

	Suitable for ACSR Panther/ zebra/ Moos e	Suitable for G.S.S. ground wire-7/3.15 mm
i) Type	Compression	Compression
ii) Material		
a) Outer sleeve	Extruded Aluminum	Extruded Aluminum.
b) Inner sleeve	Steel (galvanized)	Steel (Galvanized)
	Before Compression n	After Compre ssion
	Before Compression	After Compr ession
iii) Dimension of Compression joint for	Outer dia:38mm Inner	Adjacent Size 32 mm.

Aluminum part.	Dia:23mm. Minimum length : 610mm. Minimum weight 1.2 kg. (approx.)	Diagona l Size : 37mm.
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iv)Dimension of compression joint for Steel Part	Outer dia:18mm Inner dia. 9.3 mm Adjacent Size : 15.1mm Minimum Length : 203mm. Minimum weight : 0.28Kg (app.)	Adjacent size : 15.1mm. 10mm. Minimu m	Outer dia.18mm. Inner dia. : size : 17.4mm Length 203mm.	Adjace nt Size : Diagon al
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v) Minimum failing load.	95% of ultimate tensile strength of conductor	95% of ultimate tensile strength of ground wire
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vi) Electrical resistance 20 Deg. C 75% of measured resistance of the equivalent length of conductor.

vii)

Galvanizing :

(a) Ferrous Parts. Hot-dip galvanized (HDG) Hot dip galvanize d.

b) No. of dips 4 dips for 1 minute withstand. 4 dips 4 dips

viii) Minimum Corona formation voltage 110% of maximum line to ground voltage

B) VIBRATION DAMPERS

(SUITABLE FOR AAAC/ACSR PANTHER,ZEBRA &MOOSE CONDUCTOR AND G.S.S. GROUND WIRE- 7/3.15 MM)

- 1) Type : 4R Stock Bridge Type
- 2 Distance between conductor : 74.5 mm. & axis of the Vibration Damper.
- 3 Messenger Cable : 130 Kg/mm sq. quality (19 strands)
- 4 Bolt size : 16 mm. (dia.)
- 5 Slip strength of messenger Cable : 500 Kg.
- 6 Mass pull-of : As per I.S.S.

C) REPAIR SLEEVES

(SUITABLE FOR AAAC/ACSR PANTHER,ZEBRA&MOOSE CONDUCTOR AND G.S.S. GROUND WIRE-7/3.15MM)

	Suitable for ACSR panther/Zebra/Moose.	Suitable for G.S.S. Ground wire.
i) Type	Compression	Compression.
ii) Material	Extruded aluminum.	Steel
iii) Min. failing load	95% of UTS of conductor.	95% of UTS of ground wire.
iv) Length	241/279 mm.	200 mm (150 mm. min.)
v) Dimension :		
a) After compression	21mm	11.5 mm
(i) Adjacent side		

- b) Before Compression
- (i) Outer diameter

21mm.
38/48mm.
11.5mm.
 - (ii) Inner diameter

23/40mm

- vii) Electrical Resistance at 20 deg. C

Not more than
75% of the resistance of equivalent length of conductor.

vii) Galvanizing :

Hot - dip galvanized

- a) Ferrous parts

- b) No. of dips for one-minute stand.

4 dips

D) INSULATOR HARDWARES (BOTH SUSPENSION AND TENSION)

String hard wares :

Material and strength

Description of item	Material	UTS
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i)	Bolt hook	Forged Steel	9,000/ 11,500/16,500 Kg. (90 KN/120KN/160KN)
ii)	Anchor Shackle	-do-	11,500/16,500 Kg. (120 KN/160 KN)
iii)	Socket Eye Horn Holder.	- do-	9,000/11,500 /16500Kgs (90 KN/120 KN/160 KN)
iv)	Socket Clevis.	-do-	9,000/11,500/16,500 Kg.
v)	Ball Clevis	-do-	9,000/11,500/16,500 Kg.
vi)	Clevis Eye	-do-	9,000/11,500/16,500 Kg.
vii)	Socket Eye.	-do-	9,000/11,500/16,500 Kg.
ii)	Bottom / Top Yoke plate :		
	Double suspension	Mild Steel	9,000/11,500 /16500Kg.
	Double Tension	-do-	16,500 Kg.
ix)	Arcing Horn	-do-	—
x)	Suspension Clamp.	Aluminum Alloy and Neoprene.	—
xi)	Tension Clamp.	All. Alloy & Steel.	11,500/16500 Kg.

xii) Ball Pin High tensile forged steel (hot-dip galvanized) 90% of UTS of conductor.

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

E) HARD WARE FITTINGS SUITABLE FOR AAAC CONDUCTOR.

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

All 'D' shackles should be perfect in manufacturer and shall be subjected to "X-Ray test at the time of inspection. All the hardware & fittings should be manufactured strictly in accordance with ISS. In case of deviation in technical specification, the same shall be duly approved from the Sr. general Manager [C.P.C.], OPTCL.

1. Dimensions of insulator string along with hardware fitting.

The various limiting dimensions of the single suspension / double suspension suspension and single/double tension hardware fittings shall be as per the sketches.

2. Interchangeability.

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

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

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

2.4 Ball and socket designation.

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

3. Security clips and split pins.

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

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

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

4. Arcing horn.

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

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

II) CLAMPS

	Single suspension string	Single tension string	Double suspension string	Double tension string.
i) Type	AGS Type	Compression Type	AGS Type	Compression Type
ii) Material	<u>Aluminum Alloy and neoprene</u>	Aluminum Alloy and Steel	Aluminum Alloy and Neoprene	Aluminum Alloy and Steel

ii) Minimum slip strength	Not less than 15%	90% of UTS of conductor	Not less than 15% of UTS of conductor	90% of UTS of conductor
iv) Minimum failing load (kg)	7,000/11,500	90% of UTS of conductor	7,000/11,500	90% of UTS of conductor

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

1. The suspension assembly shall be suitable for (for 220 kV) Zebra Conductor/ 132 KV Panther Conductor (37/3.0 mm)/ and 220 KV Moose Conductor (61/3.45 mm).
2. The suspension clamp along with standard preformed armor rods or armor grip suspension clamp set shall be designed to have maximum mobility in any direction and minimum moment of inertia so as to have minimum stress on the conductor in the case of oscillation of the same.
3. The suspension clamp along with armor grip suspension clamp set shall have a slip strength between 20 to 29 KN 37/4.00 mm² and as per ISS for other conductors. The tightening torque for the bolts, wherever applicable shall be specified by the manufacturer to achieve the above slip strength.
4. The suspension assembly shall be designed, manufactured and finished to give it a suitable shape, so as to avoid any possibility of hammering between suspension assembly and conductor due to vibration. The suspension assembly shall be smooth without any cuts, grooves, abrasions, projections, ridges or excrescence which might damage the conductor.
5. The suspension assembly/clamp shall be designed so that it shall minimize the static and dynamic stresses developed in the conductor under various loading conditions as well as during wind induced conductor vibrations. It shall also withstand power arcs and have required level of corona/RIV performance.

IV) Suspension assembly (Armor Grip Clamp)

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

V) Fasteners (Bolts, Nuts & Washers)

1. All bolts and nuts shall conform to IS-6639 – 1972. All bolts and nuts shall be Hot DIP galvanized. All bolts and nuts shall have hexagonal heads, the heads being truly concentric, and square with the shank, which must be perfectly straight.
2. Bolts up to M16 and having length up to ten times the diameter of the bolt should be manufactured by cold forging and thread rolling process to obtain good and reliable mechanical properties and effective dimensional control. The shear strength of bolt for 5.6 grade should be 310 mpa minimum as per IS-12427. Bolts should be provided with washer face in accordance with IS-1363 Part-I to ensure proper bearing.
3. Fully threaded bolts shall not be used. The length of the bolt shall be such that the threaded portion shall not extend into the place of contact of the component parts.
4. All bolts shall be threaded to take the full depth of the nuts and threaded enough to permit the firm gripping of the component parts but not further. It shall be ensured that the threaded portion of the bolt protrudes not less than 3 mm and not more than 8 mm when fully tightened. All nuts shall fit and be tight to the point where shank of the bolt connects to the head.
5. Flat washers and spring washers shall be provided wherever necessary and shall be of positive lock type. Spring washers shall be electro-galvanized. The thickness of washers shall conform to IS-2016-1967.
6. The bidder shall furnish bolt schedules giving thickness of components connected, the nut and the washer and the length of shank and the threaded portion of the bolts and size of holes and any other special details of this nature.

7. To obviate bending stress in bolt, it shall not connect aggregate thickness more than three time its diameter.
8. Bolts at the joints shall be so staggered that nuts may be tightened with spanners without fouling.
9. Fasteners of grade higher than 8.8 are not to be used and minimum grade for bolts shall be 5.6.

GENERAL

1. All ferrous parts including fasteners shall be hot dip galvanized, after all machining has been completed. Nuts may however be tapped (threaded) after galvanizing and the threads oiled. Spring washers shall be electro-galvanized. The bolt threads shall be undercut to take care of the increase in diameter due to galvanizing. Galvanizing shall be done in accordance with IS-2629-1985 and shall satisfy the tests mentioned in 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 and 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.

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

TYPE TESTS:

The following type tests shall be conducted on hardware fittings.

A. On Suspension Hardware Fittings only

- (a) Magnetic power loss test.
- (b) Clamp slip strength Vs torque
- (c) Mechanical strength test.
- (d) On one test on elastomer.

B. On Tension Hardware Fittings only

Electrical resistance test for IS 2486 (Part-I) 1971
Dead end assembly.

(a) Heating cycle test for -do-
dead end assembly.

(b) Slip strength test for IS 2486 (Part-I)
dead end assembly.

(c) Mechanical strength test.

C. On Both Suspension and Tension Hardware Fittings

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

D. On Suspension Hardware Fittings only

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

E. On Tension Hardware Fittings only

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

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

F. For Hardware Fittings

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

G.Tests on Conductor Accessories

H. Type tests

I. Mid span Compression Joint for Conductor and Earth wire

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

J.Repair Sleeve for Conductor

- (a) Chemical analysis of materials.

SCHEDULE OF GUARANTEED TECHNICAL PARTICULARS

HARDWARES AND ACCESSORIES FOR 132KV&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 Galvanized
b)	Chain Link	NA	Forged Steel galvanized
c)	Ball hook / Ball Link (HH)	Forged Steel galvanized	Forged Steel galvanized
d)	Socket Eye (HH)	Forged Steel galvanized	NA
e)	Ball Clevis	Forged Steel	Forged Steel galvanized

		galvanized		
f)	Socket Clevis	Forged Steel galvanized	Forged Steel galvanized	
g)	Yoke Plate	Mild Steel Galvanized	Mild Steel Galvanized	
h)	Arcing Horn	Mild Steel Galvanized	Mild Steel Galvanized	
l)	Clamp Suspension	A.G.S. Clamp	NA	
J)	Dead End/Cross arm strap	NA	NA	
k)	Dead end clamp(Compression)	NA	Extruded Aluminum Alloy	
iv	Standard specification to which the Hardware conform	IS 2486, IS: 2004,IS:617, IS-2633, & IS-733		
v	Standard specification to which conforming	IS: 2486		
vi	Galvanizing			
a)	Ferrous parts	Hot Dip Galvanized		
b)	Spring washers	Electro Galvanized		
c)	Quality of zinc used	99.5%		
d)	Number of dips which the clamp can withstand	4/ 1 minute dips		
vii	Standard to which conforming	IS 2633		
viii	Reference to drawing No.			
ix	Minimum failing load in kg	For AAAC / ACSR Panther (132 KV)	For AAAC / ACSR Zebra (220 KV)	For AAAC / ACSR Moose (220 KV)
a)	For Single Tension 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 AAAC/ACSR Panther, Zebra & Moose		

i	Type	Compression type tension clamp		
ii	Material	Ext. Al. Alloy/ Ext. Al.		
iii	Breaking Strength	95% of UTS of Conductor		
iv	Slipping strength	95% of UTS of Conductor		
v	Galvanizing			
a)	Ferrous parts	Hot Dip Galvanized		
b)	Spring washers	Electro Galvanized		
c)	Quality of zinc used	99.5%		
d)	Number of dips which the clamp can withstand	4/ 1 minute dips		
vi	Standard to which conforming	IS 2633		
vii	Electrical Conductivity			
	a. Results of heating cycle test carried out			
	b. Electrical resistance	Not more than 75% of equivalent length of conductor		
viii	Reference to type tests and other tests reports attached			
ix	Make of bolts and nuts used			
C	SUSPENSION CLAMPS	AAAC/ACSR Panther	AAAC/ACSR Zebra	AAAC/ACSR Moose
i	Type	AGS Type		
ii	Type of material used for retaining rod for AGS assembly giving reference of ISS	Aluminum Alloy 6061/ Equivalent	Aluminum Alloy 6061/ Equivalent	Aluminum Alloy 6061/ Equivalent
iii	minimum tensile strength of retaining rod material	35 kg/mm ²	35 kg/mm ²	35 kg/mm ²
iv	Chemical composition of retaining rod material	As per IS:733	As per IS:733	As per IS:733
v	Electrical conductivity of Armor Rod material (in percentage of the conductivity of IACS i.e. International Annealed Copper Standard	Not less than 40% of IACS	Not less than 40% of IACS	Not less than 40% of IACS
vi	Slipping strength of cushioned suspension assembly	8% to 15% of UTS of Conductor	20 to 29 KN	20 to 29 KN
vii	Breaking strength of suspension Clamp	7000kgf	7000kgf	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	Mid-span Compressions Joints	Panther		Zebra	
		AAAC	ACSR	AAAC	ACSR
i	Type	Compression Type			
ii	Suitable for	AAAC Panther	ACSR Panther	AAAC Zebra	ACSR Zebra
iii	Materials				
a	Outer Sleeve	Ex. Al. Alloy	Ex. Al.	Ex. Al. Alloy	Ex. Al.
b	Inner Sleeve	N.A.	Galvanized Steel	N.A.	Galvanized Steel
iv	Outer Sleeve				
a	Outer Dia. Before compression (mm)	Ø 38	Ø 38	Ø 48	Ø 48
b	Flat to Flat After compression (mm)	32	32	40	40
v	Length of Outer Sleeve				
a	Before compression (mm)	610	610	711	711
b	After compression (mm)	655	660	760	768
vi	Inner Sleeve				
a	Outer Dia. Before compression (mm)	N.A.	Ø 18	N.A.	Ø 19.2
b	Flat to Flat After compression (mm)	N.A.	15.1	N.A.	16.1
vii	Length of Inner Sleeve				
a	Before compression (mm)	N.A.	203	N.A.	241
b	After compression (mm)	N.A.	230	N.A.	273
viii	Weight of Sleeve				
a	Aluminum (kg)	1.2	1.2	2.032	2.032
b	Galvanized Steel (kg)	N.A.	0.295	N.A.	0.410
ix	Galvanizing				

a	Ferrous parts	Hot Dip Galvanized			
b	Spring washers	Electro Galvanized			
c	Quality of zinc used	99.5%			
d	Number of dips which the clamp can withstand	4/ 1 minute dips			
x	Standard to which conforming	IS 2633			
xi	Slipping strength of mid span joint expressed as percentage of UTS of conductor	95%			
xii	Breaking strength of mid span joint expressed as percentage of UTS of conduct	95%			
xiii	Conductivity of Compression joint expressed as percentage of conductivity of cable	100% of equivalent length of conductor			
xiv	Resistance as percentage of measured resistance of equivalent length of conductor	Not more than 75% of equivalent length of conductor			
E	Repair Sleeves	AAAC/ACSR Panther		AAAC/ACSR Zebra	
i	Type	Compression type			
ii	Suitable for	AAAC Panther	ACSR Panther	AAAC Zebra	ACSR Zebra
iii	Outside diameter or length of sleeve				
a	Before compression (mm)	Ø 38	Ø 38	Ø 48	Ø 48
b	After compression Flat to Flat (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 Dampers	AAAC /ACSR Panther, Zebra & Moose	
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 galvanized.	
	2. Messenger cable.	High tensile galvanized steel wire.	
vi	Galvanizing		
a	Ferrous parts	Hot Dip Galvanized	
b	Spring washers	Electro Galvanized	
c	Quality of zinc used	99.5%	
d	Number of dips which the clamp can withstand	4/ 1 minute dips	
vii	Standard to which conforming	IS 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	135	

	(kg /sq. mm)	
xi	Mass pull - off strength (KN)	5
xii	Clamping torque (KGM)	7
xiii	Slipping strength of the damper clamp	
	1.Before fatigue test (KN)	2.5
	2. After fatigue test (KN)	2
xiv	Magnetic power loss per vibration damper (Watts)	1 watt at 500 amps
xv	Min. corona extinction voltage under dry conditions (KV)	154
xvi	Radio interference voltage under conditions 1 MHZ, AT 154 KV (Microvolt)	Below 1000
xvii	Percentage variation in reactance after fatigue test in comparison with that before the fatigue test (%)	20
I	Compression type Tension Clamp/ Dead end Assembly for 7/3.15mm Galvanized Stranded Steel Wire	
i	Materials	Forged steel
ii	Size	As per drawing
iii	Suitable for ground wire	Yes (7/3.15)
iv	Weight in kg	3.694
v	Slipping strength	95% of UTS of Conductor
vi	Minimum failing load	70 KN
vii	Galvanizing	
a	Ferrous parts	Hot Dip Galvanized
b	Spring washers	Electro Galvanized
c	Quality of zinc used	99.5%
d	Number of dips which the clamp can withstand	4/ 1 minute dips
vii	Standard to which conforming	IS 2486 and IS 2633

Characteristics as per IS 398 Part II/1976

AAAC Panther - 37/3.15 mm

Area - 288 Sq.mm
Outer Diameter- 22.05 mm
Weight - 794.1 Kg. per Km.
Brkd. - 84.71 KN

AAAC Zebra - 37/4 mm

Area - 465 Sq.mm
Outer Diameter- 28 mm
Weight - 1280.5 Kg. per Km.
Brkd. - 136.38 KN

AAAC Moose -61/3.55 mm

Area - 604 Sq.mm
Outer Diameter- 31.95 mm
Weight - 1666.3Kg. per Km.
Brkd. - 167.99 KN

ACSR Panther 30+7/3.00 mm

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

ACSR Zebra 54+7/3.18 mm

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

ACSR MOOSE 54+7/3.53 mm

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

APPENDIX-I

SCHEDULE OF QUANTITY

Sl. No.	Description of materials	Quantity required (In Set)		Desired Delivery	Destination	Remarks
		Phase-I	Phase-II			
1	2			4	5	6
(A)	Hard Ware Fittings for AAAC Panther (37/3.15mm)			PHASE-I Within Three months from the date of P.O. PHASE-II Commencement- Dt. 01.04.2015 & Completion- Dt. 30.06.2015	Any store within the State of Odisha (will be indicated in the P.O)	
(i)	Single Tension H/W fitting	0	34			
(ii)	Double Tension H/W fitting	0	17			
(iii)	Single Suspension H/W fitting (AGS Type)	0	52			
(iv)	Double Suspension H/W fitting (AGS Type)	0	20			
(v)	Vibration Damper	0	30			
(vi)	Mid-span Joint	82	54			
(vii)	Repair Sleeve	101	30			
(B)	Hard Ware Fittings for AAAC Zebra (37/4.0mm)					
(i)	Single Tension H/W fitting	0	31			
(ii)	Double Tension H/W fitting	0	35			
(iii)	Single Suspension H/W fitting (AGS Type)	0	38			
(iv)	Double Suspension H/W fitting (AGS Type)	0	19			
(iv)	Vibration Damper	30	30			
(vi)	Mid-span Joint	0	78			
(vii)	Repair Sleeve	88	64			
(C)	Hard Ware Fittings for AAAC Moose (61/3.55mm)					
(i)	Single Tension H/W fitting for Single AAAC Moose Conductor	0	26			
(ii)	Double Tension H/W fitting for Twin AAAC Moose Conductor	0	12			
(iii)	Single Suspension H/W fitting for Single AAAC Moose Conductor (AGS Type)	5	48			
(iv)	Double Suspension H/W fitting for Twin AAAC Moose Conductor (AGS Type)	0	9			
(v)	Vibration Damper	105	45			
(vi)	Mid-span Joint	38	17			

(vii)	Repair Sleeve	76	30			
(D)	Hard Ware Fittings for ACSR Panther (30+7/3.00mm)					
(i)	Single Tension H/W fitting	0	1643			
(ii)	Double Tension H/W fitting	0	262			
(iii)	Single Suspension H/W fitting (AGS Type)	0	3547			
(iv)	Double Suspension H/W fitting (AGS Type)	0	351			
(v)	Vibration Damper	0	9426			
(vi)	Mid-span Joint	182	1207			
(vii)	Repair Sleeve	260	680			
(E)	Hard Ware Fittings for ACSR Zebra (54+7/3.18mm)					
(i)	Single Tension H/W fitting	425	580			
(ii)	Double Tension H/W fitting	111	207			
(iii)	Single Suspension H/W fitting (AGS Type)	482	1569			
(iv)	Double Suspension H/W fitting (AGS Type)	189	306			
(v)	Vibration Damper	1005	3450			
(vi)	Mid-span Joint	341	554			
(vii)	Repair Sleeve	436	462			
(F)	Hard Ware Fittings for ACSR Moose(54+7/3.53mm)					
(i)	Single Tension H/W fitting for Single ACSR Moose Conductor	70	30			
(ii)	Double Tension H/W fitting for Twin ACSR Moose Conductor	0	20			
(iii)	Single Suspension H/W fitting for Single ACSR Moose Conductor (AGS Type)	0	42			
(iv)	Double Suspension H/W fitting (AGS Type) for Twin ACSR Moose Conductor	52	30			
(v)	Vibration Damper	65	35			
(vi)	Mid-span Joint	209	47			
(vii)	Repair Sleeve	106	99			
(G)	Hard Ware Fittings for Earth Wire (7/3.15mm)					
(i)	Single Tension H/W fitting	0	25			
(ii)	Vibration Damper.	0	30			