



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.GM-C.P.C-III-PROCUREMENT-HARD WARE FITTINGS–02/2019-20

FOR

**PROCUREMENT OF HARD WARE FITTINGS, ACCESSORIES &
CLAMPS FOR ACSR PANTHER, ZEBRA & MOOSE CONDUCTOR**

PART-I COMMERCIAL BID

SECTION-I- INSTRUCTION TO TENDERERS

SECTION-II- GENERAL CONDITIONS OF CONTRACT

SECTION-III- LIST OF ANNEXURES

SECTION-IV- TECHNICAL SPECIFICATION

PART-II PRICE BID

Request for online tender documents -From dt.	18.09.2019	(11.00 Hrs) to
	dt. 14 . 10 .2019	(13.00 Hrs)
Last date of submission of online tender – up to dt.	15 . 10 .2019	(13.00 Hrs)
Date of opening of Tender	- dt. 16 . 10 .2019	(15.00 Hrs)



ODISHA POWER TRANSMISSION CORPORATION LTD.

REGD. OFFICE: JANPATH, BHUBANESWAR – 751 022,

ODISHA

e-TENDER NOTICE NO.CPC- 02 / 2019-20

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 & Clamps for ACSR Panther, Zebra & Moose Conductor** . 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 18.09.2019 (11.00 Hrs) up to 14.10.2019... (13.00Hrs). 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.

SR. GENERAL MANAGER (CPC)



NOTICE INVITING e TENDER

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

ODISHA, INDIA.

e-TENDER NOTICE NO.CPC- 02 /2019-20

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.

Tender Specification No.	Description of materials.	Qty. In Set	INDIAN RUPEES			Last Date of submission & Date of opening of Tender
			Earnest Money Deposit	Cost of Tender Document	Tender Processing fee	
Sr.GM-CPC-III-Procurement -Hard Ware Fittings - 02 2019-20	(A) Hard Ware Fittings & Accessories for ACSR Panther (30+7/3.00mm) Conductor					
	(i) Single Suspension Hardware Fitting (AGS Type) (Compatible for 90KN Long Rod)	200	RS	12,000/- (INR) + GST@12	Rs.5,900/- (Including GST @ 18%)	Last Date of submission- 15.10.2019 (13.00Hrs) Date of opening of Tender- 16.10.2019 (15.00Hrs)
	(ii) Double Suspension Hardware Fitting (AGS Type) (Compatible for 90KN Long Rod)	100	1,02,508/-	%= 13,440/-		
	(iii) Single Tension Hardware Fitting (Compatible for 120KN Long Rod)	700	-			
	(iv) Double Tension Hardware Fitting (Compatible for 120KN Long Rod)	100				
	(v) Vibration Damper for ACSR Panther	500				
	(vi) PA Rod for ACSR Panther	1000				
	(B)Hard Ware Fittings & Accessories for ACSR Zebra (54+7/3.18mm) Conductor					
	(i) Single Suspension Hardware Fitting (AGS Type) (Compatible for 120KN Long Rod)	350				
	(ii) Double Suspension Hardware Fitting (AGS Type) (Compatible for 120KN Long Rod)	200				
	(iii) Single Tension Hardware Fitting (Compatible for 160KN Long Rod)	300				
	(iv) Double Tension Hardware Fitting (Compatible for 160KN Long Rod)	350				

(v) Vibration Damper for ACSR Zebra	500				
(vi) Mid-Span Joints for ACSR Zebra	150				
(vii) PA Rod for ACSR Zebra	300				
(C) Clamps for ACSR Twin Moose (54+7/3.53mm) Conductor					
i) Spacer T clamp suitable for Twin Moose run & Twin Moose drop conductor (250mm spacing)	500				

NOTE;- Part Bidding is not allowed.

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

TENDER COST:

The bidders who want to submit bids shall have to pay non-refundable amount Rs. 13,440/- (Rupees Thirteen thousand four hundred forty) only including GST @ 12%) towards the tender cost, in the form of Demand draft/Pay order/Cash only, drawn in favour of the D.D.O Head Qrs, OPTCL, Bhubaneswar. They have to also submit notarized hard copy of GST registration certificate on or before the date & time of submission of techno-commercial bid.

TENDER PROCESSING FEE:

The bidders shall have to submit non-refundable amount of Rs.5,900/- (Rupees Five thousand & nine hundred) only including GST @ 18%) 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.

SUBMISSION OF TENDER COST, TENDER PROCESSING FEE & EMD :

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) **(In the state of Odisha)** based in Odisha and 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 **(In the state of Odisha)** as above on or before the date & time of submission of techno-commercial bid.

The demand draft/pay order for tender cost , processing fees 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 bidders shall scan the Demand Draft/Pay order/ Bank guarantee, towards EMD/ notarised hard copy of valid registration as local MSE (**In the state of Odisha**) (if any) and upload the same in the prescribed form in .gif or .jpg format in addition to sending the original as stated above.

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

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

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

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



FAX NO.: 0674 – 2542964
TELEPHONE NO: 0674 – 2541801

ODISHA POWER TRANSMISSION CORPORATION LTD.

CENTRAL PROCUREMENT CELL
JANAPATH, BHUBANESWAR – 751022

TENDER SPECIFICATION NO-Sr.GM-CPC-III-PROCUREMENT-HARDWARE FITTINGS -02/2019-20

CONTAINING

PART – I

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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COMMERCIAL SPECIFICATION.

PART - I

SECTION - I

INSTRUCTIONS TO TENDERER

1. Submission of Bids:-

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

1. For all the users it is mandatory to procure the Digital Signatures of Class-III.
2. Contractors / Vendors / Bidders / Suppliers are requested to follow the below steps for Registration:
 - (a) Click “Register”, fill the online registration form.
 - (b) Pay the amount of Rs. 2360/- through e-payment in favour of K S E D C Ltd Payable at Bangalore.
 - (c) Send the acknowledgment copy for verification.
 - (d) As soon as the verification is being done the e-tender user id will be enabled.
3. After viewing Tender Notification, if bidder intends to participate in tender, he has to use his e-tendering User Id and Password which has been received after registration and acquisition of DSCs.
4. If any Bidder wants to participate in the tender he will have to follow the instructions given below:
 - (a) Insert the PKI (which consist of your Digital Signature Certificate) in your System.
(Note: Make sure that necessary software of PKI be installed in your system).
 - (b) Click / Double Click to open the Microsoft Internet Explorer (This icon will be located on the Desktop of the computer).
 - (c) Go to Start > Programs > Internet Explorer.
 - (d) Type www.tenderwizard.com/OPTCL in the address bar, to access the Login Screen.
 - (e) Enter e-tender User Id and Password, click on “Go”.
 - (f) Click on “Click here to login” for selecting the Digital Signature Certificate.
 - (g) Select the Certificate and enter DSC Password.

(h) Re-enter the e-Procurement User Id Password

5. To make a request for Tender Document Bidders will have to follow below mentioned steps.
 - Click “Un Applied” to view / apply for new tenders.
 - Click on Request icon for online request.
6. 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.
7. After completing all the formalities Bidders will have to submit the tender and they must take care of following instructions.
 - Prior to submission, verify whether all the required documents have been attached and uploaded to the particular tender or not.
 - Note down / take a print of bid control number once it displayed on the screen
8. Tender Opening event can be viewed online.
9. Competitors bid sheets are available in the website for all.
10. **For any e-tendering assistant contact help desk number mentioned below.**
 - Bangalore – 080- 40482000.

The participants to the tender should be registered under GST Laws.

2. **Division of Specification.**

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

Part-I Consists of

- | | |
|-------------------|---|
| [i] Section-I | Instruction to Tenderers. |
| [ii] Section-II | General Terms & conditions of contract. |
| [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 viz. Part-I (Techno commercial) & Part-II (Price bid).

The Tenderers are required to submit the tenders in two parts Part-I, technical and 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 for opening of bids in Electronic mode in presence of such of the Tenderers or their authorized representatives [limited to one person only] on the due date of opening of tender who opt 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 proposal 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 (modification if any) 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, the original price proposals will be returned to the bidders unopened along with their original technical proposals. 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, capacity 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 services. The above information shall be considered during 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 orders for lesser quantity with full freedom to place extension orders for further quantity under similar terms and conditions of the original orders. Orders may also be split among more than one tenderer for any particular item, if considered necessary in the interest of the Purchaser to get the goods/equipment earlier.

6. Procedure and opening time of tenders.

Tenders will be opened in the office of the Senior General Manager [C.P.C.] on the specified date and time in presence of the Tenderers or their authorized representatives [limited to one person only] in case of each bidder 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 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 submit the money receipt as a proof of such payment. The local Micro and small Enterprises(MSEs)(**In the state of Odisha**) based in Odisha and registered with respective DICs, Khadi, Village, Cottage & Handicrafts 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 Tenders.

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

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

11. Earnest money deposit:

The tender shall be accompanied by Earnest Money deposit of value specified in the notice inviting tenders against each lot / bid. Tenders without the required EMD as indicated at **Annexure-VIII** will be rejected out rightly.

The local Micro and small Enterprises(MSEs)(**In the state of Odisha**) based in Odisha and registered with respective DICs, Khadi, Village, Cottage & Handicrafts Industries, OSIC and NSIC can participate by submitting Earnest Money Deposit @ fifty percent 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 (Hd.qrs. Office), Bhubaneswar - 751022
- (b) **Bank Draft:** -To be drawn in favour of Drawing & Disbursing Officer, OPTCL [H.Qrs.Office], Bhubaneswar-751 022.
- (c) Bank Guarantee from any Nationalized/Scheduled Bank strictly as per enclosed proforma vide **Annexure-VI** to be executed on non-judicial stamp paper worth Rs.29.00 or as applicable, as per prevailing laws in force and also to be accompanied by the confirmation letter of the issuing Bank Branch.

NOTE:

- (i). The validity of the EMD in the form of Bank Guarantee shall be at least for 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.
- (iii) E.M.D. in shape of cash may be submitted up to Rs. 25,000/- (Rupees Twenty-five Thousand) only. Above Rs. 25,000/- (Rupees Twenty-five thousand) the Earnest Money Deposit shall be furnished in any one of the forms indicated above (i.e. Through Bank Draft, Bank Guarantee/ National Savings Certificate).
- (iv) No adjustment towards EMD shall be permitted against any outstanding amount with the **ODISHA POWER TRANSMISSION CORPORATION LTD.**
- (v) The chart showing particulars of EMD to be furnished by Tenderers of different categories is placed at **Annexure-VIII.**
- (vi) In the case of un- successful tenderer, the EMD will be refunded after the tender is decided. In the case of successful Tenderer, this will be refunded only after furnishing of security money referred to at clause-19of Section-II.
- (vii) 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.
- (vii) EMD will be forfeited if the tenderer fails to accept the letter of intent and/or purchase order issued in his favour or to execute the order, placed on them.
- (viii) Tenders not accompanied by Earnest Money shall be disqualified.

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, 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 of period, no reduction or enhancement in price will be entertained. If there is any change in price, the tender shall stand rejected and the EMD deposited shall be forfeited.
- [b] After opening of price bid if the validity period is not sufficient to place purchase order, the tenderer 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 tender 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 Senior General Manager (Central Procurement Cell) 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 tenders in the following manner:

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

- [i] Declaration Form. [As per Annexure-I]
- [ii] Earnest Money. [As per **Annexure-VIII**], Tender Cost.
- [iii] Technical specification and Guaranteed Technical Particulars conforming to the Purchaser's Specification along with drawings, literatures and all other required Annexures, duly filled in.
- [iv] Photostat copies of type test certificates of materials/equipment offered as stipulated in the Technical Specification.
- [v] Abstract of Terms & conditions in prescribed proforma as per **Annexure-II**.
- [vi] General Terms & Conditions of supply offer as per Section-II of the Specification.
- [vii] List of orders executed for similar materials/equipment during preceding 2 (two) years indicating the customer's name, Purchase Order No. & Date, date of supply and date of commissioning etc.
- [viii] Data on past experience **as per Clause-7 of Section-II** of the Specification.
- [ix] GST Compliance Rating. The GST Identification Number(GSTIN) under GST Laws and permanent account number [PAN] of the firm under Income tax Act are required.
- [x] Audited Balance sheet & profit loss accounts of the bidder, for past (3) three years.
- [xi] Schedule of quantity and delivery in the prescribed Proforma vide Annexure, as appended.

[xii] List of Orders in hand to be executed.

[xiii] Deviation schedule.

(xiv) Local micro & small enterprisers (MSEs) **(In the state of Odisha)** based in Odisha and registered with respective DICs, Khadi, Village, Cottage & Handicrafts Industries, OSIC and NSIC have to submit notarized hard copy of valid registration as local MSE**(In the state of Odisha)** as above on or before the date & time of submission of techno-commercial bid and upload the scan/soft copy of the same in e-tender portal.

[xv]The bidder should not have any pending litigation or arbitration with OPTCL with regard to any project or related activity. The bidder should certify/declare the same in unequivocal terms by way of an affidavit duly sworn before a magistrate/notary.

17. Documents/Papers to accompanyPart-II Bid.

(a) Part – II of the tender shall consist of the following

(i) Schedule of prices in the prescribed proforma

18. Conditional Offer:

Conditional offer shall not be accepted.

19. General: -

- (i) In the event of discrepancy or arithmetical error in the schedule of price, the decision of the purchaser shall be final and binding on the Tenderer.
- (ii) For evaluation, the price mentioned in words shall be taken if there is any difference in figures and words in the price bid.
- (iii) Notice inviting tender shall form part of this specification.
- (iv) The price bids of the technically and otherwise acceptable bids shall only be evaluated. The EMD of others, if any, shall be returned to the bidders.
- (v) Tenderer can offer any lot or all the lots of the tender, if there are more than one lots. But the tender (bid) must be furnished separately for each lot. For each lot, the tenderer has to submit PART-I & PART-II of the bids separately.
- (vi) 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.
- (vii) 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 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.

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

The testing and inspection of the equipment/ materials at manufacturer works are in the scope of work of the Contractor/Supplier.

OPTCL inspecting officer, on receipt of offer for inspection from the contractor/supplier, proceeds to the manufacturer works to witness the Type/Acceptance/Routine test.

Important:

It is hereby informed to all the bidders that the relevant clauses of the contract specification, pertaining to inspection and testing of equipment/materials, are hereby supplemented with following additional terms and conditions.

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 (1st/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 (1st/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.
- (iii) In case of inspection and testing of some critical equipment/materials like Power transformers, OPTCL may depute more than one inspecting officer.
(iv) 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.
- (v) 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.

21.0 (a). Detailed information on any litigation or arbitration arising out of contract completed or under execution by it over the last five years. A consistent history of litigation by or against the bidder may result in rejection of bid.

21.0 (b). The bidder should not have any pending litigation or arbitration with OPTCL with regard to any project or related activity. The bidder should certify / declare the same in the unequivocal terms by way of an affidavit duly sworn before a magistrate/notary. Bid furnished by the bidder shall not be eligible for consideration if it is not accompanied by the affidavit. Further the bid / LOA/ LOI shall be liable for outright rejection/ cancellation at any stage if any information contrary to the affidavit / declaration is detected.

SECTION – II.

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

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PART-I

SECTION-II

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

1. Scope of the contract:

The scope of the contract shall be to design, manufacture, supply of equipment 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 "Basic Price (Taxable Value for goods) at the point of destination" shall mean the price quoted by the bidder for equipment and material at the consignee's store/site. The cost is inclusive of packing, forwarding, freight, insurance and all expenses and taxes and duties at the end of the supplier excluding goods and service tax. The Goods & Service Tax shall be shown in a separate column item wise alongside the Basic Price quoted at the applicable rate in the Tax Invoice. The applicable rate of GST shall refer to the HSN code of the material supplied. The Basic Price and GST thereon shall be the "FOR Destination Price" as quoted by the bidder.

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

shall have to bear all expenses towards repetition of inspection and testing of the total offered quantity or part thereof.

5. **Training facilities.**

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

6. **Rejection of Materials.**

In the event any of the equipment /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 equipment /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 Organisations 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/equipment 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, not- withstanding 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. **Despatch 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 judgement of the Purchaser, the supplier fails to make delivery of equipment/material within the time specified in the contract or within the period for which if extension has been granted by the Purchaser in writing in response to written request of the supplier.
- [b] If in the judgement of the Purchaser, the supplier fails to comply with any of the provisions of this contract.
- [ii] In the event, Purchaser terminates the contract in whole or in part as provided in Clause-15 (I) of this section, the Purchaser reserves the right to purchase upon such terms and in such a manner as he may deem appropriate in relation to the equipment/material similar to that terminated and the supplier will be liable to the Purchaser for any additional costs for such similar equipment/material and/or for price reduction 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 price reduction 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: - (As per clause 35 of the technical specification.

- [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 & out side the state of Odisha.

A Composite Bank Guarantee as per the Proforma enclosed at Annexure-VII of the specification for 10% [ten percent] of the taxable value plus GST thereon of the purchase order (In case of successful bidder who is a local Micro and small Enterprise (MSEs) **(In the state of Odisha)**, based in Odisha & 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 **30 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 2 months more than guarantee period (as indicated this clause-18 of above) from the last date of stipulated delivery period, for scrutiny and acceptance, failing which the supply order will be liable for cancellation without any further written notices. The BG should be accompanied by a confirmation letter from the concerned bank and should have provision for encashment at Bhubaneswar, before the Bank Guarantee is accepted and all concerned intimated. The B.G should be revalidated as and when intimated to you to cover the entire guarantee period.

- [ii] No interest is payable on any kind of Bank Guarantee.

- [iii] In case of non-fulfillment of contractual obligation, as required in the detailed purchase order/Specification, the composite Bank guarantee shall be forfeited.

20. 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% taxable value of each consignment with 100% Goods and Services Tax in full as applicable will be paid on receipt of materials in good condition at stores/desired site and verification thereof, subject to furnishing and approval of Contract cum Performance Bank Guarantee at the rate of 10% (Ten percent) of Taxable Value plus GST thereon

[In case successful bidder is a local Micro and small Enterprise (MSEs), based in Odisha & registered with respective DICs, Khadi, Village, Cottage & Handicrafts Industries, OSIC and NSIC, 5% (five percent) in place of 10% (ten percent) will be applicable].

b. Guarantee certificate,

c. Test certificate by the Purchaser.

- ii) TDS under GST Laws shall be deducted, as applicable and requisite TDS certificate will be issued.

- iii) Any statutory variation due to imposition of new tax or revision in rate of existing tax shall be paid/reimbursed based on scheduled delivery or actual delivery whichever is earlier (i.e. If delivery is within schedule period, statutory variation as applicable shall be paid, and if delivery is made beyond schedule date, any additional financial implication due to statutory variation shall be to the bidder's account)

[B] The supplier shall furnish Contract cum Performance Bank Guarantee of appropriate amount (10% or 5%) to OPTCL as indicated in (i) above, within 30 days from the date of issue of the purchase order.

22. Price Reduction Schedule for Delay in Completion of Supply under Purchase Order/Contract

(i) If the Supplier fails to deliver the materials/equipment within the delivery schedule, specified in the Purchase Order/Contract including delivery time extension, if any, granted with waiver of Price Reduction Schedule, the Purchaser shall recover from the Supplier, Price Reduction Schedule for a sum of half per cent (0.5 per cent) of the Taxable Value of the un-delivered equipment /materials 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 Price Reduction Schedule shall not exceed five per cent (5%) of the Taxable Value of the un-delivered equipment/materials. Equipment will be deemed to have been delivered

only when all its components, accessories and spares as per technical Specification are also delivered. If certain components, accessories and spares are not delivered in time, the equipment/materials will be considered delayed until such time as the missing components, accessories and spares are delivered.

(ii) During the guarantee period, if the Supplier fails to rectify/replace the equipment/material within 30 days from the date of intimation of defect by the purchaser, then the Price Reduction Schedule at the rate of half percent (0.5%) of the Total Taxable Value for each calendar week of delay or part thereof shall be recovered by the purchaser. For this purpose, Price Reduction Schedule shall be reckoned from the 30th day from the date of issue of letter on defectiveness of equipment/material. The total amount of Price Reduction Schedule in this case shall not exceed 10% (TEN PERCENT) of the Purchase Order/Contract amount except GST (i.e. Total Taxable Value). If the defects, so intimated are not rectified or equipment/materials not replaced by the supplier within the guarantee period, then whole of the C.P.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 awaiting 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. Rating under Goods and Services Tax and Balance sheet and profit & Loss Account:

The following documents are to be submitted at the time of Tender Submission:

- i. Compliance rating under Goods and Services Tax for immediate preceding financial year.
- ii. Audited Balance Sheet and Profit & Loss Account of the bidder for the previous three years to assess the financial soundness of the bidder(s).
- iii. GST registration certificate and PAN Card Copy.
- iv. Tax holiday/exemption certificate under GST or any other Act.
- v. TDS exemption certificate under the Income Tax Act or any other act.

26. **Certificate of Exemption from Goods and Services Tax.**

Offers with exemption from Goods and Services Tax shall be accompanied with authenticated attested Photostat copy of exemption certificate. Any claim towards Goods and Services Tax shall be paid on actual basis subject to payment of GST by the supplier. In case Outward supply details of the supplier of Goods in GSTR-1 do not match with GSTR -2 of OPTCL on GSTN portal, the same will be adjusted through debit/credit advice issued by OPTCL under intimation to the supplier after allowing cooling period of 3 months after the date of supply.

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 price bids will be on the basis of the FOR DESTINATION PRICE including Goods and Services Tax & other levies as may be applicable. The FORD PRICE shall consist of the following components:

- a) Taxable value of equipment/materials including mandatory spares, if any for maintenance of equipment. (At the discretion of the purchaser)
- b) Goods and Services Tax
- c) Other levies, if any.
- d) Test charges, if any.
- e) Supervision of erection, testing and commissioning charges, if any.
- f) Any other items, as deemed proper for evaluation by the purchaser.
- g) Loading will be made for items not quoted by the bidder at the highest rate quoted by other bidders unless particular item is included in other items.
- h) Any imposition of new tax or revision of tax shall be considered between due date of submission of bids and the date of price bid opening.

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 (**In the state of Odisha**) 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.
- iii)

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 tender cost on or before the date and time of submission of technical bid. In case of local Micro and small Enterprises(MSEs)(**In the state of Odisha**), based in Odisha & registered with respective DICs, Khadi, Village, Cottage & Handicrafts Industries, OSIC and NSIC participating in the tender they have to submit notarised hard copy of valid registration as local MSE as above on or before the date and time of submission of 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 submission 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.
- (xiii) (a) Detailed information on any litigation or arbitration arising out of contract completed or under execution by it over the last five years. A consistent history of litigation by or against the bidder may result in rejection of bid.
- (xiii) (b) The bidder should not have any pending litigation with OPTCL with regard to any project or related activity. The bidder should certify/declare the same in unequivocal terms by way of an affidavit duly sworn before a magistrate or a Notary. Bid furnished by the bidder shall not be eligible for consideration if it is not accompanied by the affidavit.

Further the bid / LOA/ LOI shall be liable for outright rejection/ cancellation at any stage if any information contrary to the affidavit / declaration is detected.

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 “-----
Scheme “

SECTION – III.

LIST OF ANNEXURES

[I TO XIII]

[PAGE 32 TO 47]

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	Schedule of deviations (Technical)	ANNEXURE-XII (A)
12	Schedule of deviations (Commercial)	ANNEXURE-XII (B)
13	Litigation /Arbitration	ANNEXURE-XIII

ANNEXURE - I

DECLARATION FORM

To

The Sr. General Manager (CPC)
OPTCL Head Qrs.BBSR,751022

Sub:- Tender Specification No-_____

Sir,

1. Having examined the above specification together with terms & conditions referred to therein * I/We the undersigned hereby offer to supply the materials/equipment covered therein complete in all respects as per the specification and General conditions, at the rates, entered in the attached contract schedule of prices in the Tender.
2. * I/We hereby undertake to have the materials/equipment delivered within the time specified in the Tender.
3. * I/We hereby guarantee the technical particulars given in the Tender supported with necessary reports from concerned authorities.
4. * I/We certify to have submitted the bid electronically by remitting *cash/money order/D.D./ remitting the cost of tender, herewith and this has been acknowledged by your letter/ money receipt No. Dated,
5. In the event of Tender, being decided in *my/our favour, * I/We agree to furnish the Composite B.G. in the manner, acceptable to ODISHA POWER TRANSMISSION CORPORATION LTD., and for the sum as applicable to *me/us as per clause-19 of section-II of this specification within 15 days of issue of letter of intent/purchase order failing which *I/We clearly understand that the said letter of Intent/Purchase order will be liable to be withdrawn by the purchaser, and the EMD deposited by us shall be forfeited by OPTCL.

Signed this day of 2016

Yours faithfully

Signature of the Tenderer with seal of the company

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

* (Strikeout whichever is not applicable).

ANNEXURE-II

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

(To be filled up by the tenderer as indicated in the excel sheet)

ANNEXURE-III

SCHEDULE OF QUANTITY AND DELIVERY

(To be filled up by the tenderer)

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

Signature of Tenderer

with seal of Company

ANNEXURE-IV

(To be filled up by the tenderer as indicated in the excel sheet)

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.

SCHEDULE OF PRICES

TENDER SPECIFICATION No.

Item No.	Description.	Qty (unit)	Unit Price(Taxable Value at Destination), in Rs.
1.	2.	3.	4.

Unit GST	Unit landing Cost including All taxes & Duties.	Total landing cost Including all taxes & duties.
5.	6= (4+5)	7= (6*3)

Signature of Tenderer

Name, Designation and Seal

NB: -

1. The tenderer should fill up the price schedule properly in Excel file in e-tender mode. The tender will be rejected, if the price bid is not submitted in accordance with the price schedule. No post tender correspondence will be entertained on break-up of prices. Also, the supplier should agree for delivery at the desired site.

2. The Tenderer shall give an undertaking in part-I of the bid that, entire implication of lower Tax and Input Tax Credit benefit have been fully passed on to the purchaser as per anti-profiteering and other provisions under GST Laws while quoting the tender price.

3. Conditional offers will not be acceptable.

(To be Stamped in accordance with Stamp Act and the Non-Judicial Stamp Paper of appropriate value should be in the name of Issuing Bank)

Ref No:

Bank Guarantee No.

Date:.....

BG Amount:.....

Validity Period:.....

This Guarantee Bond is executed this..... day of by us the..... Bank at , P.O..... , Dist....., State..... and Code No.....

Whereas the ODISHA POWER TRANSMISSION CORPORATION Limited, Janpath, Bhubaneswar, a company constituted under the Companies Act-1956 (hereinafter called OPTCL) has invited Tender vide e-NIT No..... Dated..... for the purpose of work under Package(s) No...../ purchase of ----- .

1. Now, therefore, in accordance with Notice Inviting Tender (e-NIT) No..... Dated of OPTCL, Ms/Shri.....Address..... Wish / wishes to participate in the said tender and as a Bank Guarantee for the sum of Rs..... [Rupees in **words**-----] valid for a period ofdays is required to be submitted by the bidder, as per Tender Specification, we the _____) [indicate the name, Address & Code of the bank] [hereinafter referred to as "Bank"] at the request of Ms/Shri..... [hereinafter referred to as "Bidder"] do hereby unequivocally and unconditionally guarantee and undertake to pay during the above said period on written request by the <Tender Issuing Authority, Central Procurement Cell (CPC) ODISHA POWER TRANSMISSION CORPORATION Ltd. , Bhubaneswar an amount not exceeding Rs..... to OPTCL., without any reservation. The guarantee would remain valid up to [Date] and if any further extension to this is required, the same will be extended on receiving instruction from ----- - on whose behalf this Bank Guarantee has been issued.

2. We, the _____ [indicate the name of the Bank, Address, Code] do hereby further undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from OPTCL. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs..... (Rupees in words.....)

3. We undertake to pay to OPTCL any money so demanded notwithstanding any dispute or disputes so raised by the bidder 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 thereunder and the bidder shall have no claim against us for making such payment.

4. We, the _____ Bank further agree that the guarantee herein contained shall remain in full force and effect during the aforesaid period of _____ days [in words]..... (as per Tender Specification) and it shall continue to be so enforceable till all the dues of OPTCL under or by virtue of the said Bid have been fully paid and its claims satisfied or discharged or till OPTCL certifies that the terms and conditions of the said Bid have been fully and properly carried out by the said bidder and accordingly discharges this guarantee. Unless a demand or claim under this guarantee is made on us or our Branch Office at Bhubaneswar <Mention Name, Address & Code of the Branch Office at Bhubaneswar of Issuing Bank> in writing on or before _____ we shall be discharged from all liability under this guarantee thereafter.

5. We the _____ Bank further agree with OPTCL that 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 Bidder from time to time or to postpone for any time or from time to time any of the powers exercisable by OPTCL against the said Bidder 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 granted to the Bidder or for any forbearance, act or omission on the part of OPTCL or any indulgence by OPTCL to the said Bidder or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have the 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/or of the Bidder.

- 7 We _____ [indicate the name of Bank, Address & Code] lastly undertake not to revoke this guarantee during its currency except with the previous consent of OPTCL in writing

8. We, the _____ Bank (Name, Address & Code) further agree that this guarantee shall also be invocable at our place of business at ----- Branch of **Bhubaneswar** (indicate Name, Address & Code of the Branch at Bhubaneswar) in the State of Odisha.”

“ Notwithstanding anything contained herein”

- a) Our liability under the bank guarantee shall not exceed Rs.------(Rupees in words-----) only.

b) This Bank guarantee shall be valid up to -----.

c) We or our Branch at Bhubaneswar <Mention Name, Address & Code.....> shall be liable to pay guaranteed amount or any part thereof under this guarantee only if you serve upon us at----- Branch of Bhubaneswar a written claim or demand on or before,

The Bank Guarantee is issued in paper form and Advice transmitted through SFMS with required details to the beneficiary's advising bank (ICICI Bank Bhubaneswar, IFSC Code ICIC0000061).

Dated, the _____ Day of _____

For _____ [Indicate name of Bank]

Signature

Full name

Designation

Power of Attorney No.

Date.....

Seal of the Bank.....

WITNESS: (SIGNATURE WITH NAME AND ADDRESS)

(1)

Signature

Full name

(2)

Signature

Full name

N.B.:

1. Name of the Bidder.:
2. BG No & Date :.....
3. Amount (In Rs.):.....
4. Validity up to :.....
5. E-NIT No.....
6. Package/Works No.....
7. Name, Address & Code of Issuing Bank:.....
8. Name, Address & Code Bhubaneswar Branch of the Issuing Bank:.....
9. The Bank Guarantee shall be accepted after getting SFMS advice as per details below.

Format for SFMS details

(The Unique Identifier for field 7037 is “OPTCL541405793”)

Sl. No	PARTICULARS	TYPE	DETAILS
1	Type of Bank Guarantee	Mandatory	EMD
2	Currency & Amount	Mandatory	
3	Validity Period(from—to --)	Mandatory	
4	Effective Date	Mandatory	
5	End date of lodgment of Claim	Mandatory	
6	Place of lodgment of claim	Mandatory	Bhubaneswar, Branch Name----- of Bhubaneswar

			Branch code----- of Bhubaneswar Branch Address ----- at Bhubaneswar
7	Issuing Branch IFSC Code	Mandatory	
8	Issuing Branch name & address	Mandatory	
9	Name of applicant and its details	Mandatory	
10	Name of Beneficiary and its details	Mandatory	
11	Beneficiary's Bank/Branch and IFSC Code	Mandatory	ICICI Bank Ltd IFSC Code-ICIC0000061
12	Beneficiary's Bank/Branch name and address	Mandatory	ICICI Bank Ltd Bhubaneswar Main Branch, Bhubaneswar
13	Sender to receiver information	Mandatory	
14	Purpose of Guarantee	Mandatory	EMD
15	Reference/Description of the underlined tender/contract	Mandatory	NIT No

[PROFORMA FOR COMPOSITE BANK GUARANTEE FOR SECURITY DEPOSIT PAYMENT AND PERFORMANCE]

(To be stamped in accordance with Stamp Act and the Non-Judicial stamp paper of appropriate value should be in the name of the Issuing Bank.)

Ref No:-

Bank Guarantee No.

Date:

BG Amount:.....

Validity Period:.....

This Guarantee Bond is executed this..... day of by us the..... Bank at , P.O..... , Dist....., State..... and Code No.....

Whereas the ODISHA POWER TRANSMISSION CORPORATION Limited, Janpath, Bhubaneswar, a company constituted under the Companies Act-1956 (hereinafter called OPTCL) has issued Letter of Award (LOA) No..... Dated..... for the purpose of work under Package No..... (herein after called “the Agreement”) to M/s/Shri , Address..... (herein after called the “Contractor”) for supply, erection, installation & commissioning and associated civil works under the above LoA and whereas OPTCL has agreed (1) to exempt demand of security deposit under the terms and conditions of the LOA (2) to release payment of the cost of the Contract Price to the Contractor on furnishing by the Contractor to OPTCL a Contract Performance Bank Guarantee (CPBG) of the value of 10% of the Contract Price of the said Agreement.

1. Now therefore, in accordance with the terms and conditions of LOA No. _____ dated _____ for the due fulfillment by the said Contractor of the terms and conditions contained in the said agreement, on production of a Bank Guarantee for Rs. _____ (Rupees _____) only, we the bank _____ [Indicate bank Name , Address & Code] (hereinafter referred to as “the Bank”) at the request of M/s/Shri _____ contractor do hereby undertake to pay to OPTCL, an amount not exceeding Rs. _____ (Rupees _____) only .
2. We, the _____ Bank [indicate the name of the Bank, Address & Code] do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from OPTCL. Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____ (Rupees----- In Words).
3. We, the Bank also undertake to pay to OPTCL any money so demanded not withstanding any dispute or disputes raised by the Contractor in any suit or proceeding instituted / pending before any court

or tribunal relating thereto, our liability under this present being absolute and irrevocable. The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor shall have no claim against us for making such payment.

4. We, the _____ Bank further agree that the guarantee herein contained shall remain in full force and effect during the aforesaid period of _____ days and it shall continue to be so enforceable till all the dues of OPTCL under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till OPTCL certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said contractor and accordingly discharges this guarantee.

Unless a demand or claim under this guarantee is made on us or our Branch Office at Bhubaneswar <Mention Name, Address & Code of the Branch Office at Bhubaneswar of issuing Bank> in writing on or before (Date), we shall be discharged from all liability under this guarantee thereafter.

5. We, the _____ Bank [indicate the name of the Bank, Address & Code] further agree with the Board that 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 or performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by OPTCL against the said contractor(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 contractor(s) or for any forbearance, act or omission on the part of OPTCL or any indulgence by OPTCL to the said contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have the effect of so relieving us.

6. This guarantee will not be discharged due to the change in the name, style or constitution of the Bank and/or of the contractor(s).

7. We, the _____ Bank [indicate the name of the bank, Address & Code] lastly undertake not to revoke this guarantee during its currency except with the previous consent of OPTCL in writing.

8. We, the _____ Bank (Name, Address & Code) further agree that this guarantee shall also be invocable at our place of business at **Bhubaneswar** (indicate Name, Address & Code of the Branch at Bhubaneswar) in the State of Odisha.

“ Notwithstanding anything contained herein”

a) Our liability under the bank guarantee shall not exceed Rs.------(Rupees in words-----) only.

b) This Bank guarantee shall be valid up to -----.

c) We or our Branch at **Bhubaneswar** <Mention Name, Address & Code.....> shall be liable to pay guaranteed amount or any part thereof under this guarantee only if you serve upon us at----- Branch of Bhubaneswar a written claim or demand on or before,

The Bank Guarantee is issued in paper form and Advice transmitted through SFMS with required details to the beneficiary's advising bank (**ICICI Bank Bhubaneswar**, IFSC Code ICIC0000061).

Dated, the _____ Day of _____

For _____ [Indicate name of Bank]

Signature.....

Full Name.....

Designation.....

Power Of Attorney.....

Dated.....

Seal of the Bank.....

WITNESS: (SIGNATURE WITH NAME AND ADDRESS)

1. Signature.....

Full Name.....

2. Signature.....

Full Name.....

N.B.:

1. Name of the Contractor.:
2. BG No & Date :.....

3. Amount (In Rs.):.....
4. Validity up to :.....
5. LOA No.....
6. Package No.....
7. Name, Address & Code of Issuing Bank:.....
8. Name, Address & Code of Bhubaneswar Branch of the Issuing Bank:.....
10. The Bank Guarantee shall be accepted after getting SFMS advice as per details below.

Format for SFMS details

(The Unique Identifier for field 7037 is “OPTCL541405793”)

Sl. No	PARTICULARS	TYPE	DETAILS
1	Type of Bank Guarantee	Mandatory	Contract Performance
2	Currency & Amount	Mandatory	
3	Validity Period(from—to --)	Mandatory	
4	Effective Date	Mandatory	
5	End date of lodgment of Claim	Mandatory	
6	Place of lodgment of claim	Mandatory	Bhubaneswar, Branch Name----- of Bhubaneswar Branch code----- of Bhubaneswar Branch Address ----- at Bhubaneswar
7	Issuing Branch IFSC Code	Mandatory	

8	Issuing Branch name & address	Mandatory	
9	Name of applicant and its details	Mandatory	
10	Name of Beneficiary and its details	Mandatory	
11	Beneficiary's Bank/Branch and IFSC Code	Mandatory	ICICI Bank Ltd IFSC Code-ICIC0000061
12	Beneficiary's Bank/Branch name and address	Mandatory	ICICI Bank Ltd Bhubaneswar Main Branch, Bhubaneswar
13	Sender to receiver information	Mandatory	
14	Purpose of Guarantee	Mandatory	Contract Performance
15	Reference/Description of the underlined tender/contract	Mandatory	LOA No----

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.

Rated MVA	Rated Voltage	Place of installation and complete postal address	Year of commissioning

Place: -

Date

Signature of Tenderer:

Name, Designation, Seal

ANNEXURE-XII

DEVIATION SCHEDULE.

Tenderer shall enter below particulars of his alternative proposal for deviation from the specification, if any.

A) Technical

(To be filled up by the tenderer as indicated in the excel sheet)

B) Commercial deviations.

(To be filled up by the tenderer as indicated in the excel sheet)

ANNEXURE – XIII

LITIGATION HISTORY

Year.	Award for or against bidder	Name of client, cause of litigation and matter in dispute	Disputed amount (current value in Rs.)

Place: -

Date

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 Bidders has to certify in the price bid that any implication of lower Tax and Input Tax Credit benefit as per anti-profiteering and other provisions under GST Laws, have been fully passed on to the Purchaser, while quoting the tender prices.

2. INSURANCE:

Insurance of materials/equipment, 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/equipment 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 equipment/materials damaged or lost which will be reported by the Consignee within 30 days of receipt of the equipment/materials at Destination without awaiting for the settlement of their claims with the carriers and underwriters.

3. CERTIFICATE FOR EXEMPTION FROM GOODS AND SERVICES TAX:

Offers with exemption from Goods and Services 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:

The Bidders 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.

SECTION – IV

(A) TECHNICAL SPECIFICATION

FOR

HARDWARE FITTINGS AND ACCESSORIES SUITABLE FOR ACSR PANTHER (30+7/3.00mm), ACSR ZEBRA (54+7/3.18mm) AND ACSR MOOSE (54+7/3.53mm) POWER CONDUCTOR

1.0 SCOPE

This Specification covers design, manufacture, assembly, testing at manufacturer's Works, supply and delivery of hardware fittings & accessories for string insulators suitable for use in 132 KV, 220 KV and 400KV Over-head transmission lines & ,Sub-Stations of OPTCL. The hard wares to be supplied shall be as per drawings to be approved by OPTCL AND CONFIRMING TO ISS AND IEC. The firm shall submit his drawings in line with the Specification of OPTCL indicating clearly all dimensions on the body of the drawing for approval of OPTCL and only after which the manufacturing shall be started.

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

2.0 STANDARDS

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

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

3.0 MATERIALS AND DESIGN

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

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

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

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

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

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

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

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

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

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

4.0 GALVANISING:

All ferrous parts of conductor accessories and insulator hardware shall be galvanized in accordance with IS: 2629-Recommended Practice for hot dip galvanizing of iron and steel or any other equivalent authorities' standards. The weight of zinc coating shall be determined as per method stipulated in IS: 2633 for testing weights, thickness and uniformity of coating of hot dip galvanized articles or as per any other equivalent authoritative standards. The zinc used or galvanization shall conform to grade Zn 98 of IS: 209. The galvanized parts shall withstand four (4) dips of 1 minute each time while testing uniformity of zinc coating as per IS: 2633.

Spring washers shall be electro galvanized.

ACCESSORIES FOR CONDUCTOR

5.0 MID SPAN COMPRESSION JOINTS

(FOR ACSR PANTHER, ZEBRA & MOOSE CONDUCTOR)

The Mid-Span Joints for conductor 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 sleeves shall be of circular shape suitable for compression into hexagonal shape.

The compression type mid-span straight joints shall be suitable for making joints in the ACSR PANTHER, ZEBRA & MOOSE conductor.

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 are given in the technical particulars.

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

6.0 VIBRATION DAMPER:

(FOR ACSR- PANTHER, ZEBRA & MOOSE CONDUCTOR)

Vibration Damper having 4 resonance frequencies 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 / 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 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 ACSR PANTHER, ZEBRA & MOOSE CONDUCTOR)

Compression type repair sleeves shall be offered to provide reinforcement for conductor with broken or damaged aluminum 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 INSULATOR HARDWARES

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

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

Each insulator string shall generally include the following hardware components.

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

9.0 CLAMP

9.1 ARMOUR GRIP SUSPENSION CLAMPS

Armour Grip Suspension Clamp shall consist of 2 neoprene insert, one set of Armour rods made of aluminum alloy, two aluminum housing having inner profile matching with the profile of the Armour

rods page and supporting strap made of aluminum alloy. The A.G. type suspension clamp shall be designed, manufactured and finished as to have a suitable shape without sharp edges at the end and to hold the respective conductor properly. It should, however, have sufficient contact surface to minimise damage due to fault current.

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

9.2 TENSION CLAMPS

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

9.3 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.

9.4 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.

10.0 TESTS, TEST CERTIFICATE AND PERFORMANCE REPORTS

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

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

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

10.1 ACCEPTANCE TEST FOR POWER CONDUCTOR 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.

10.2 ACCEPTANCE TEST FOR HARDWARES

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

11.3 SPECIFIC TECHNICAL REQUIREMENTS FOR CONDUCTOR ACCESSORIES AND INSULATOR HARDWARES

CONDUCTOR	Panther/Zebra/Moose	G.S.S Ground wire
a) Type	ACSR Panther/Zebra/Moose	Ground wire
b) Material	Aluminum conductor steel reinforced	Ground stranded steel wire
c) Strand & Wire diameter.	Panther/Aluminium 30/3mm Zebra/all 54/3.18mm steel- 7/3.18mm Moose/ all 54/3.53mm steel- 7/3.53mm	7/3.15mm
d) Weight per Km.	974/1622/2004 Kg per Km	426 kg per km
e) Overall diameter	21/28.62/ 31.7mm	9.4mm
f) D.C. Resistance at 20°C when corrected to standard weight	0.13750/ 0.06915 / 0.05552 Ohm/KM	3.375 Ohms/km
g) Minimum breaking load/ Ultimate tensile strength.	9241.9/ 13289 / 16120 Kg	5710 kg
h) Maximum working tension at minimum temperature & 2/3 full wind.	3806/ 4325 Kg	1393kg

i) Maximum Sag at maximum temperature & no wind.	6120/ 9240mm	5150mm
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DISC INSULATOR

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

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

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

LONG ROD INSULATOR

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

FOR 132KV PORCELAIN LONG ROD INSULATORS				
Sl. No	DESCRIPTION	Suspension	Tension	
1	Type of Insulator	Ball & socket	Ball & socket	
2	Size & designation of ball & socket and standard to which it will conform (mm)	16 mm, Alt-B IS-2486-II	20 mm, Alt-B IS-2486-II	
3	No of insulator per string	One	One	
4	Outside dia of the LRI (mm)	200	205	
5	Creepage distance of insulator (mm)	4000	4300	
6	Mechanical strength of single LRI (KN)	90 KN	120 KN	
FOR 220KV PORCELAIN LONG ROD INSULATORS				
Sl. No	DESCRIPTION	Suspension	Suspension	Tension
1	Type of Insulator	Ball & socket	Ball & socket	Ball & socket
2	Size & designation of ball & socket and standard to which it will conform (mm)	16 mm	20 mm	20 mm
3	No of insulator per string	Two	Two	Two
4	Largest sheds diameter (mm)	210	210	215
5	Creepage distance of insulator (mm)	6125	6450	7130
6	Mechanical strength of single LRI (KN)	90 KN	120 KN	160 KN

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

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

1) ACCESSORIES

A) MID-SPAN COMPRESSION JOINTS

(SUITABLE FOR ACSR PANTHER, ZEBRA & MOOSE CONDUCTOR)

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

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

(B) VIBRATION DAMPERS

(SUITABLE FOR ACSR PANTHER, ZEBRA & MOOSE CONDUCTOR:

- i) Type: 4R Stock Bridge Type
- ii) Distance between conductors: 74.5 mm. & axis of the Vibration Damper.
- iii) Messenger Cable : 130 Kg/mm sq. quality (19 strands)
- iv) Bolt size : 16 mm. (dia.)
- v) Slip strength of messenger Cable: 500 Kg
- vi) Mass pull-of: As per I.S.S.

(C) REPAIR SLEEVES

(SUITABLE FOR ACSR PANTHER, ZEBRA & MOOSE CONDUCTOR)

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

b) Before Compression	
(i) Outer diameter 38/48 mm.	21 mm
(ii) Inner diameter 23/40 mm	11.5 mm
vi) Electrical resistance AT 20° C	Not more than 75% of the resistance of equivalent length of conductor.

D) INSULATOR HARDWARES (BOTH SUSPENSION AND TENSION)

String Hardware: Material and strength

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

Minimum failing load String (KN)

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

E) HARDWARE FITTINGS SUITABLE FOR ACSR CONDUCTOR

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

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

1. Dimensions of insulator string along with hardware fitting.

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

2. Interchangeability.

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

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

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

2.4 Ball and socket designation.

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

3. Security clips and split pins.

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

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

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

4. Arcing horn.

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

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

II) CLAMPS

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

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

1. The suspension assembly shall be suitable for 132kv ACSR Panther Conductor (30+7/3.0mm), 220 KV ACSR Zebra Conductor(54+7/3.18mm) and 220KV ACSR Moose Conductor (54+7/3.53mm).
2. The suspension clamp along with standard preformed Armour rods or Armour grip suspension clamp set shall be designed to have maximum mobility in any direction and minimum moment of inertia so as to have minimum stress on the conductor in the case of oscillation of the same.
3. The suspension clamp along with Armour grip suspension clamp set shall have slip strength between **20 to 29 KN 37/4.00 mm²** and as per ISS for other conductors. The tightening torque for the bolts, wherever applicable shall be specified by the manufacturer to achieve the above slip strength.

4. The suspension assembly shall be designed, manufactured and finished to give it a suitable shape, so as to avoid any possibility of hammering between suspension assembly and conductor due to vibration. The suspension assembly shall be smooth without any cuts, grooves, abrasions, projections, ridges or excrescence which might damage the conductor.
5. The suspension assembly/clamp shall be designed so that it shall minimize the static and dynamic stresses developed in the conductor under various loading conditions as well as during wind induced conductor vibrations. It shall also withstand power arcs and have required level of corona/RIV performance.

IV) Suspension assembly: (Armour Grip Clamp)

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

V) Fasteners: (Bolts, Nuts & Washers)

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

6. The bidder shall furnish bolt schedules giving thickness of components connected, the nut and the washer and the length of shank and the threaded portion of the bolts and size of holes and any other special details of this nature.
7. To obviate bending stress in bolt, it shall not connect aggregate thickness more than three times 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 adherence of uniform thickness, smooth, reasonably bright, continuous and free from imperfections such as flux, ash, rust stains, bulky white deposits and blisters. The zinc used for galvanizing shall be of grade Zn 99.95 as per IS 209-1979.
3. Pin balls shall be checked with the applicable "G" gauges in at least two directions, one of which shall be across the line of die flashing and the other 90 deg. to this line. 'NO GO' gauges shall not pass in any direction.
4. Socket ends, before galvanizing shall be of uniform contour. The bearing surface of socket ends shall be uniform about the entire circumference without depressions or high spots. The internal contours of socket ends shall be concentric with the axis of the fittings as per IS 2486/IEC-120. The axis of the bearing surfaces of socket ends shall be coaxial with the axis of the fittings. There shall be no noticeable tilting of the bearing surfaces with the axis of the fittings.
5. All current carrying parts shall be so designed and manufactured that contact resistance is reduced to minimum.
6. Welding of aluminum shall be by inert gas shielded tungsten 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 center and locate the individual parts during cementing.

TECHNICAL SPECIFICATION FOR DESIGN, SUPPLY AND TESTING OF HARD WARE FITTINGS**Type tests:**

The following type tests shall be conducted on hardware fittings.

A. On suspension hardware fittings only.

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

B. On Tension hard ware fittings only.

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

C. On both suspension and tension hardware fittings.

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

D. On suspension hardware fittings only.

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

E. On Tension hardware fittings only.

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

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

F. For hardware fittings.

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

G. Tests on conductor accessories.

H. Type tests.

I. Mid span compression joint for conductor.

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

J. Repair sleeve for conductor.

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

- K. **Vibration Damper for Conductor.** (IS 9708-1993, IS 2633-1986)
- (a) Visual Examination
 - (b) Verification of Dimensions
 - (c) Resonance Frequency test
 - (d) Dynamic Characteristics test
 - (e) Damper efficiency test
 - (f) Clamp slip test (Before Fatigue test)
 - (g) Fatigue test (for 10 million cycle)
 - (h) Mass pull off test
 - (i) Clamp bolt torque test
 - (j) Galvanising test (Uniformity of Zinc coating)
 - (k) Magnetic power loss test

(B) TECHNICAL SPECIFICATION FOR CLAMPS/ CONNECTORS AND SPACERS

A. PG CLAMPS

1. SCOPE

The specification covers design, manufacture, assembly, inspection, testing at manufacturer's works, packing, supply and delivery at site of pressure Die cast, high strength, heat treated 4600 grade [Old Nomenclature; A6(M-Tempering)] Aluminium Alloy Spacers, clamps and connectors (fittings) suitable for PANTHER conductor (30+7/3.00mm), ZEBRA conductor (54+7/3.18mm) and MOOSE conductor (54+7/3.53mm) . The same are required for outdoor installation in 132,220 and 400KV lines and sub-stations of OPTCL as per approved drawings, layout and system design. The materials offered shall be complete with all components that are necessary for efficient operation. Such parts shall be deemed to be within the scope of supply whether specifically mentioned or not. Spacers, clamps and connectors shall conform in all respect no the highest standard of engineering, design and workmanship and shall be capable of performing trouble free continuous operation. No part of a clamp shall be less than 12mm thick for fittings suitable up to size of ACSR Panther conductor, 15 mm thick for fittings suitable for ACSR Zebra and ACSR Moose conductor. For bimetallic connectors, copper alloy liner of minimum thickness of 2mm shall be cast integral with Aluminium body.

2. STANDARDS

The terminal connectors under this specification shall conform strictly to the requirement of the latest version of the following standards as amended up-to-date, except where specified otherwise.

IS;5561	Power Connectors
IS;10162	Spacers for twin horizontal bundle conductors
IS;617	Aluminium & Aluminium Alloy
IS;2629	Recommended practice for hot dip galvanizing of iron and steel.
IS;2633	Method of testing uniformity of coating of zinc coated articles.

The materials conforming to any other authoritative standards which ensure equal or better performance shall also be acceptable. The salient point of these specifications and points of difference between these and the above specifications, shall be clearly brought out in the bid.

3. MATERIAL & WORKMANSHIP

The terminal connectors shall be manufactured from Aluminium Silicon Alloy and conform to designation A6 of IS:617 (latest edition).

The connectors shall be of best quality and workmanship, well finished and of approved design. Specific materials for clamps and connectors should have high current carrying capacity, high corrosion resistance and be free from corona formation.

All connectors or its components to be connected with ACSR conductor shall be of compression type having aluminium purity not less than 99.5%.

All bus bar clamps shall be made preferably from forged aluminum of purity not less than 99.5%. The thickness and contact surface should be maintained in such a way that the clamp should conform to IS;5561/1970 or ant latest revision thereof.

4. RATING

The connector rating shall match with the rating of the respective equipments for the terminal connectors and the connectors for bus bar and dropper should be of the following rating. Minimum thickness at any part of connector shall be 10(ten) mm. Indicative ratings are given below.

	Rating	400/220/132KV
1	Main bus bar connectors high level and low level (Amps)	3600/2000/2000

2	High level bus sectionalisation isolator (Amps)	3600/2000/2000
3	Connectors along the bay (Amps)	3600/2000/2000
4	Normal system voltage	400/220/132 KV
5	Highest system voltage	420/245/145 KV
6	Continuous current rating	/1600/800 A
7	Short circuit level for 3 sec	50/40/40 KA
8	Basic insulation level	-/1050/650 KVP
9	Number of phases	3
10	System earthing	Effectively earthed
11	Conductor temperature range	
	Minimum in C	3.5°
	Maximum in C	64.5°
12	Withstood load for min. 1 minute duration	1.2KN as per IS

5. EQUIPMENT CONNECTORS

Bimetallic connectors shall be used to connect conductors of dissimilar metal. The following bimetallic arrangement shall be preferred.

- i) Copper cladding of minimum 4mm thickness on the aluminum portion of connector coming in contact with the copper palm or stud of the equipment.
- ii) Alternatively, to provide cold rolled aluminum copper strip between the aluminum portion of the connector, the sheet thickness shall not be less than 2mm.

Sufficient contact pressure should be maintained at the joint by the provision of the required number of bolts or other fixing arrangements, but the contact pressure should not be so great as to cause relaxation of the joint by cold flow, the joint should be such that the pressure is maintained within the range under all conditions of service, to avoid excessive local pressure, the contact pressure should be evenly distributed by use of pressure plates, washers or suitable saddles of adequate area of thickness should be less than that of an equal length of conductor where measured individually test results showing the milli drop test and resistance should be enclosed with the bid.

All connectors shall be so designed and manufactured as to offer ease of installation as these are to be used in overhead installations, design shall be such that full tightening of nuts and bolts should be possible with the use of double wrench.

The connectors shall be such as to avoid local corona, sound or visible discharge.

6. TEMPERATURE RISE

The temperature rise of connectors when carrying rated current shall not exceed 45° C above reference design temperature of 50° C.

i)Acceptance test

- (a) Tensile test
- (b) Temperature rise test

ii)Routine Test

- (a) Visual inspection
- (b) Dimensional check

Type test reports from a recognized laboratory shall have to be submitted.

7. WEIGHTS

Weights of different materials uses in manufacture, such as aluminum, silicon, copper etc should be clearly indicated in the bid.

8. INTERCHANGE ABILITY

Corresponding parts of similar clamps and connectors shall be made to gauge or jig and shall be interchangeable in every respect.

9. TESTS

TYPE TESTS for PG Clamps

- (a) Pull out strength test
- (b) Resistance test
- (c) Temperature –rise test
- (d) Short time current test
- (e) Visual corona & RIV test
- (f) Cantilever strength test
- (g) Galvanising test

ACCEPTANCE TESTS for PG Clamps

- (a) Pull out strength test
- (b) Torque strength test
- (c) Visual examination
- (d) Dimension check

Galvanising test

B. TECHNICAL SPECIFICATION FOR SPACERS

1. GENERAL REQUIREMENT

The spacers shall conform to **IS 10162**. Spacers are to be located at a suitable spacing to limit the short circuit forces and also to avoid snapping of sub conductors during short circuit conditions.

2. CONSTRUCTIONAL FEATURES

No magnetic material shall be used in the fabrication of spacers except for GI bolts and nuts.

Spacer design shall be made to take care of fixing and removing during installation and maintenance.

The design of the spacers shall be such that the conductor does not come in contact with any sharp edge. Spacers shall have enough strength so as to restore normal spacing of the sub-conductors after displacement by winds, short circuits etc without permanent deformation or damage to either to conductor or assembly itself. They should have long life without fatigue or wear and shall have uniform and firm grip on the conductors. They shall have to withstand all the electro-magnetic and all electro-static forces under different operating conditions including dead short circuits.

The spacers should be able to accommodate for relative motion between sub-conductors in bundle, in order to avoid damaging stresses resulting from the action of wind, icing etc.

The materials used in manufacturing spacers shall be corrosion resistant. All the ferrous parts of the spacers shall be hot-dipped galvanized except spring washers which shall be electro-galvanized conforming to the relevant IS.

The spacers shall have complete ease of installation and shall be capable of removal /reinstallation without any damage.

No rubbing, other than that of the conductor clamp hinges or clamp swing bolts, shall take place between any parts of the spacers. Joint incorporating a flexible medium shall be such that there is no relative slip between them.

Spacers shall not damage or chafe the conductor in any way which might affect its mechanical strength and/or corona level. The clamp shall not damage the conductor at any time.

Any nuts used shall be locked in an approved manner against vibration loosening. The ends of bolts and nuts shall be suitably rounded/shielded wherever necessary for better corona performance.

The spacer assembly shall have outside surface smooth, and all edges and corners well rounded in a manner which shall ensure conformity with corona/RIV stipulation.

The electrical resistance between the conductor and components of the spacers shall be reasonable to give satisfactory performance in all respects.

The unit shall be corrosion resistant. Elastomers shall be resistant to ozone, low temperature, ultraviolet radiation and conductor temperature up to 65° C. The elastomer shall be electrically conducting and of approved standard.

The clamp grooves shall be in contact with the conductor over the entire clamping surface, except for rounded edges. Universal type bolted clamps, covering a range of conductor sizes shall not be permitted.

The groove of the clamp body and clamp cap shall be smooth and free of projections, grit or other material which cause damage to the conductor when clamp is installed.

2. **TYPE TESTS for Spacers**

- (a) Movement test
- (b) Clamp slip test
- (c) Resilience test
- (d) Clamp bolt torque test
- (e) Assembly torque test
- (f) Tensile load test
- (g) Galvanising test
- (h) Compression and pull off test
- (i) Vibration test
- (j) Corona test
- (k) Radio interference voltage test
- (l) Short circuit current test
- (m) Magnetic power loss test

ACCEPTANCE TESTS for Spacers

- (a) Movement test
- (b) Clamp slip test
- (c) Visual examination
- (d) Verification of Dimension
- (e) Clamp bolt torque test
- (f) Assembly torque test
- (g) Tensile load test

- (h) Compression and pull off test
- (i) Galvanising test
- (j) Clamp slip test

Characteristics as per IS:398 Part II/1976

ACSR Panther30+7/3.00 mm

Area-212.1 Sq.mm

Outer Diameter-21mm

Weight in Kg-973.1 Kg per Km

Brkd – 9241.9 Kg

ACSR Zebra 54+7/3.18 mm

Area-428.9 Sq.mm

Outer Diameter-28.62

Weight in Kg-1620 Kg per Km

Brkd in Kg- 13466.4

ACSR Moose 54+7/3.53 mm

Area-528.5 Sq.mm

Outer Diameter-31.77 mm

Weight in Kg-1996.2 Kg per Km

Brkd in Kg- 16593.9 Kg

SCHEDULE OF GUARANTEED TECHNICAL PARTICULARS

HARDWARES, CLAMPS AND SPACERS FOR ACSR PANTHER/ZEBRA/MOOSE & GROUND WIRE (7/3.15mm)

A	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 Galvanized	Forged Steel Galvanized
f)	Socket Clevis	Forged Steel Galvanized	Forged Steel Galvanized
g)	Yoke Plate	Mild Steel Galvanized	Mild Steel Galvanized
h)	Arcing Horn	Mild Steel Galvanized	Mild Steel Galvanized
l)	Clamp Suspension	A.G.S. Clamp	NA
J)	Dead End/Cross arm strap	NA	NA
k)	Dead end clamp	NA	Extruded

	(Compression)		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 ACSR Panther (132 KV)	For ACSR Zebra (220 KV)	For ACSR Moose (220 KV)
a)	For Single Tension Hardware Fittings	120 KN	160 KN	160 KN
b)	For Double Tension Hardware Fittings	120 KN	160 KN	160 KN
c)	For Single Suspension Hardware Fittings	90KN	120KN	120KN
d)	For Double Suspension Hardware Fittings	90 KN	120 KN	120 KN
B.	TENSION CLAMPS	Suitable for ACSR Panther, ACSR Zebra & ACSR Moose		
i	Type	Compression type tension clamp		

ii	Material	Ext. Al. Alloy/ Ext. Al.		
iii	Breaking Strength	95% of UTS of Conductor		
iv	Slipping strength	95% of UTS of Conductor		
v	Galvanising			
a)	Ferrous parts	Hot Dip Galvanized		
b)	Spring washers	Electro Galvanized		
c)	Quality of zinc used	99.5%		
d)	Number of dips which the clamp can withstand	4/ 1 minute dips		
vi	Standard to which conforming	IS 2633		
vii	Electrical Conductivity			
	a. Results of heating cycle test carried out			
	b. Electrical resistance	Not more than 75% of equivalent length of conductor		
viii	Reference to type tests and other tests reports attached			
ix	Make of bolts and nuts used			
C	SUSPENSION CLAMPS	ACSR Panther	ACSR Zebra	ACSR Moose
i	Type	AGS Type		
ii	Type of material used for retaining rod for AGS assembly giving reference of ISS	Aluminum Alloy 6061/ Equivalent	Aluminum Alloy 6061/ Equivalent	Aluminum Alloy 6061/ Equivalent
iii	Minimum tensile strength of retaining rod material	35 kg/mm ²	35 kg/mm ²	35 kg/mm ²
iv	Chemical composition of retaining rod material	As per IS:733	As per IS:733	As per IS:733

v	Electrical conductivity of Armour Rod material (in percentage of the conductivity of IACS i.e. International Annealed Copper Standard	Not less than 40% of IACS	Not less than 40% of IACS	Not less than 40% of IACS
vi	Slipping strength of cushioned suspension assembly	8% to 15% of UTS of Conductor	20 to 29 KN	20 to 29 KN
vii	Breaking strength of suspension Clamp	9000kgf	12000kgf	12000kgf
viii	Physical properties of neoprene cushion			
a)	Minimum Tensile Strength	2000 psi	2000 psi	2000 psi
b)	Minimum ultimate Elongation	300%	300%	300%
ix)	Ageing (guaranteed life of the assembly)	40 years	40 years	40 years
x)	Hardness	65 to 80 A	65 to 80 A	65 to 80 A

D	Mid Span compressions joints for	ACSR Panther	ACSR Zebra
i	Type	Compression Type	Compression Type
ii	Suitable for	ACSR Panther	ACSR Zebra
iii	Materials		
a	Outer Sleeve	Ex. Al.	Ex. Al.
b	Inner Sleeve	Galvanized Steel	Galvanized Steel
iv	Outer Sleeve		
a	Outer Dia. Before compression (mm)	Ø 38	Ø 48
b	Flat to Flat After compression (mm)	32	40
v	Length of Outer Sleeve		
a	Before compression (mm)	610	711

b	After compression (mm)	660	768
vi	Inner Sleeve		
a	Outer Dia. Before compression (mm)	Ø 18	Ø 19.2
b	Flat to Flat After compression (mm)	15.1	16.1
vii	Length of Inner Sleeve		
a	Before compression (mm)	203	241
b	After compression (mm)	230	273
viii	Weight of Sleeve		
a	Aluminum (kg)	1.2	2.032
b	Galvanized Steel (kg)	0.295	0.410
ix	Galvanising		
a	Ferrous parts	Hot Dip Galvanized	
b	Spring washers	Electro Galvanized	
c	Quality of zinc used	99.5%	
d	Number of dips which the clamp can withstand	4/ 1 minute dips	
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 conductor	95%	
xiii	Conductivity of Compression joint expressed as percentage of	100% of equivalent length of conductor	

	conductivity of cable	
xiv	Resistance as percentage of measured resistance of equivalent length of conductor	Not more than 75% of equivalent length of conductor

E	Repair Sleeve	ACSR Panther	ACSR Zebra
i	Type	Compression type	Compression type
ii	Suitable for	ACSR Panther	ACSR Zebra
iii	Outside diameter or length of sleeve		
a	Before compression (mm)	38 ϕ	48 ϕ
b	After compression Flat to Flat (mm)	32	40
iv	Length of Sleeve		
a	Before compression (mm)	241	279
b	After compression (mm)	270	310
v	Material	Ex. Al.	Ex. Al.
vi	Weight of sleeve in (kg)	0.453	0.810
vii	Breaking strength as % of UTS of conductor	95 %	
viii	Conductivity as percentage of conductivity of conductor	100% of equivalent length of conductor	
ix	Resistance as % of measured resistance of equivalent length of conductor	Not more than 75% of equivalent length of conductors	

F	Vibration Damper	For ACSR PANTHER, ZEBRA & MOOSE	
i	Total weight of the damper (Kg)	4.5 Approx.	
		Left	Right
ii	Weigh of each damper mass (kg)	1.6	2.2
iii	Resonance frequencies		
	1. First frequency (Hz)	12± 1	18± 2
	2. Second frequency (Hz)	28± 2	36±2
iv	Dimensions of each damper mass	55 φ x 165	60 φ x 195
v	Material of :		
	1. Damper mass	Cast iron hot dips Galvanized.	
	2. Messenger cable.	High tensile Galvanized steel wire.	
vi	Galvanising		
a	Ferrous parts	Hot Dip Galvanized	
b	Spring washers	Electro Galvanized	
c	Quality of zinc used	99.5%	
d	Number of dips which the clamp can withstand	4/ 1 minute dips	
vii	Standard to which conforming	IS 2486 and IS 2633	
viii	No of strands in messenger cable strands	19	
ix	Lay ratio of messenger cable strands	9- 11	
x	Min tensile strength of messenger cable (kg /sq. mm)	135	
xi	Mass pull – off strength (KN)	5	

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

SCHEDULE OF QUANTITY (Appendix-I)

Sl. No.	Description of materials	Quantity required in Sets/ Nos	Desired Delivery	Destination	Remarks
1	2	3	5	6	7
(A)	Hard Ware Fittings for ACSR Panther (30+7/3.00mm)		Within Three months from the date of issue of P.O.	Any store/ Site of OPTCL within the State of Odisha (will be indicated in the D.I)	
(i)	Single Suspension Hardware Fitting (AGS Type) (Compatible for 90KN Long Rod)	200 sets			
(ii)	Double Suspension Hardware Fitting (AGS Type) (Compatible for 90KN Long Rod)	100 sets			
(iii)	Single Tension Hardware Fitting (Compatible for 120KN Long Rod)	700 sets			
(iv)	Double Tension Hardware Fitting (Compatible for 120KN Long Rod)	100 sets			
(ii)	Vibration Damper for ACSR Panther	500 Nos			
(iii)	PA Rod for ACSR Panther	1000 Nos			
(B)	Hard Ware Fittings for ACSR Zebra (54+7/3.18mm)				
(i)	Single Suspension Hardware Fitting (AGS Type) (Compatible for 120KN Long Rod)	350 Sets			
(ii)	Double Suspension Hardware Fitting (AGS Type) (Compatible for 120KN Long Rod)	200 Sets			
(iii)	Single Tension Hardware Fitting (Compatible for 160KN Long Rod)	300 Sets			
(iv)	Double Tension Hardware Fitting (Compatible for 160KN Long Rod)	350 Sets			
(v)	Vibration Damper for ACSR Zebra	500 Nos			
(vi)	Mid-Span Joints for ACSR Zebra	150 Nos			
(vii)	PA Rod for ACSR Zebra	300 Nos			
(C)	Clamps for ACSR Moose Conductor (54+7/3.53mm)				
(i)	Spacer T clamp suitable for Twin Moose run & Twin Moose drop conductor (250mm spacing)	500 Nos			

END OF TENDER SPECIFICATION