

BHEL NIT TERMS & CONDITIONS for GeM Portal

FOR CLAMPS & CONNECTORS FOR IOCL PANIPAT PROJECT

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3. **SCOPE OF SUPPLY AND BOQ (BIDDER TO SUBMIT UN-PRICE BID FORMAT AND ENCLOSED)**

SN	ITEM DESCRIPTIONS	QTY
1	SUPPLY- CLAMPS & CONNECTORS : 220KV, 50KA FOR 1S, 1000A, WEDGE CONNECTORS SUITABLE FOR SINGLE MOOSE TO SINGLE CONDUCTOR AS PER TS	10
2	SERVICES- CLAMPS & CONNECTORS : 220KV, 50KA FOR 1S, 1000A, INSTALLATION OF WEDGE CONNECTORS SUITABLE FOR SINGLE MOOSE TO SINGLE CONDUCTOR AS PER TS	6

4. **Technical specification No:** BHEL technical specification is applicable. No permissible Technical Deviation has been envisaged.
5. **Quantity Variation:** The quantity for individual items may vary up to any extent, however total quantity may vary +/- 30 % during contract execution stage. It is also to be noted that any items can be completely/partially deleted during detailed engineering stage.
6. **IMPORTANT INSTRUCTION FOR VENDOR APPROVAL:**
 - Final acceptance of technical qualified vendor for placement of order is subject to approval of CUSTOMER (IOCL). Bidder should be approved in POWERGRID as on opening of techno-commercial bid opening.
 - Bidder to mentioned QUOTED against every items in their UN-PRICED BID FORMAT.
 - PO/LOI shall be placed to L1 bidder project wise. However evaluation shall be done based on overall quantity as per NIT.

NAME & SEAL OF TENDERER

Enclosed:

- UN-PRICED BID FORMAT.

SCHEDULE OF PRICE BID

(BIDDERS TO STRICTLY ENSURE SUBMITTING THE PRICE BIDS IN THIS FORMAT)

PROJECT: IOCL PANIPAT PROJECT

ENQUIRY NO:

ITEM: CLAMPS & CONNECTROS

SN	DESCRIPTION OF ITEM	UNIT	QTY	HSN CODE	UNIT PRICE EX. WORKS (Rs.)	TOTAL EX. WORKS (Rs.)	UNIT FREIGHT & INSURANCE UP TO SITE (Rs.)	TOTAL FREIGHT & INSURANCE UP TO SITE (Rs.)	GST @..... % OF TOTAL EX- WORKS (Rs.)	GST @.....% OF (TOTAL FREIGHT & INSURANCE UP TO SITE)	TOTAL F.O.R. DESTINATION PRICE
1	SUPPLY- CLAMPS & CONNECTORS : 220KV, 50KA FOR 1S, 1000A, WEDGE CONNECTORS SUITABLE FOR SINGLE MOOSE TO SINGLE CONDUCTOR AS PER TS	NO	10								
2	SERVICES- CLAMPS & CONNECTORS : 220KV, 50KA FOR 1S, 1000A, INSTALLATION OF WEDGE CONNECTORS SUITABLE FOR SINGLE MOOSE TO SINGLE CONDUCTOR AS PER TS	NO	6								
A	TOTAL DELIVERED COST TO BHEL=										

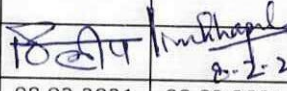
NOTE:

1. BIDDER TO MENTIONED QUOTED IN EVERY CELL AND ENSURE TO SUBMIT ALONG WITH THEIR TECHNO-COMMERCIAL BID.
2. THE PRICES MUST BE QUOTED IN THE PRESCRIBED UNIT ONLY.

SIGNATURE & SEAL OF TENDERER



BHARAT HEAVY ELECTRICALS LIMITED
TRANSMISSION BUSINESS ENGINEERING MANAGEMENT
NOIDA

DOCUMENT NO.	TB-411-316-013A	REV 00	PREPARED	CHECKED	APPROVED
TYPE OF DOC.	TECHNICAL SPECIFICATION	NAME	DKS	VK	AG
TITLE C-Wedge type TEE Connectors		SIGN			
		DATE	08.02.2021	08.02.2021	08.02.2021
		GROUP	TBEM		
		WO NO.	I19TB00003 REV00		

CUSTOMER	Indian Oil Corporation Limited (IOCL)
CONSULTANT	TATA Consulting Engineers Limited (TCE)

PROJECT	LSTK job for ISBL work of 220KV Grid Power Import at IOCL, Panipat Refinery
LOA. NO.	RPRC182491/26286965 dtd. 24.01.2020
WO. No.	26286965 dtd. 24.01.20120

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Remarks: It is to be noted that data and details of Guaranteed Technical Particulars (GTP) shall not be reviewed during Technical Evaluation/ Review, hence compliance of Guaranteed Technical Particulars (GTP) in line with Technical Specification shall be deemed to under complete compliance of bidder.

REV. NO.	DATE	ALTERED	CHECKED	APPROVED	
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SECTION 1:
CHECKLIST FOR TECHNICAL EVALUATION

Along with the technical offer/ bids, the bidder should submit this checklist confirming the inclusion of the enclosures as listed below,

Sl. No.	Documents to be enclosed	Bidder to confirm (Please tick "Confirmed")
1.	Unpriced BOQ duly mentioning "Quoted" for all the items, signed and sealed.	Confirmed
2.	Annexure-A, B, C & D duly filled, signed and sealed.	Confirmed
3.	Supporting documents for compliance of Technical Qualifying Requirement.	Confirmed

Note: Any bidder not meeting the above requirement is liable for non-evaluation.

The above checklist is reviewed and verified for,

NIT Reference No.:

Name of Bidder:

Name of Equipment/ Material:

Name of Project:

Date:

Bidder's Stamp & Signature

Project: LSTK job for ISBL work of 220KV Grid Power Import at IOCL, Panipat Refinery

Technical Specification: C-Wedge type TEE Connectors

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SECTION 1:

SCOPE, PROJECT SPECIFIC TECHNICAL REQUIREMENTS & BILL OF QUANTITIES

1. Scope

1. This technical specification covers the requirements of design, manufacture, inspection including third party inspection and testing at manufacturer's works before supply, proper packing and delivery to project site of C-Wedge type TEE Connectors complete in line with specification.

The specification comprises of following sections:

Section-1	:	Scope, Project Specific Technical Requirements & Bill of Quantities
Section-2	:	Equipment Specification under scope of Supplies
Section-3	:	Annexures
		Annexure A- Compliance Certificate
		Annexure B- Schedule of Technical Deviation/ Change request
		Annexure C- Guaranteed Technical Particulars
		Annexure D- Technical Checklist

2. In general, no deviation from the requirements specified in various clauses of this specification shall be allowed and hence, a certificate to this effect shall have to be furnished along with the offer (Annexure-A), however bidder shall furnish list of conflicts/ ambiguities/ deviations (Annexure-B), if any. Any conflicts/ ambiguities/ deviations mentioned elsewhere in technical offer shall not be reviewed.

Illumination system is required for the following project:

Name of the Customer	:	Indian Oil Corporation Limited (IOCL)
Name of Consultant	:	Tata Consulting Engineers Limited
Name of Main Contractor	:	Bharat Heavy Electricals Limited
Name of the Project	:	LSTK job for ISBL work of 220KV Grid Power Import at IOCL, Panipat Refinery

3. The commercial terms and conditions for supplies and services shall be as per notice inviting tender/ enquiry. Quoting the tender, shall deemed to have understood and complied all the technical requirements in line with technical specifications, drawings etc. in complete.

2. Codes & Standards

C-Wedge type TEE Connectors shall comply to the latest edition of applicable Indian standards but not limited to the following,

IS 617:1994	Aluminum and aluminum alloy Ingots and castings for general Engineering purposes.
IS 2121:1981 (Part -1 & 2)	Specification for conductors and earth wire accessories for overhead power lines
IS 2121:1992 (Part -3)	Specification for conductors and earth wire accessories for

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	overhead power lines.
IS 2121:1991 (Part -4)	Specification for conductors and earth wire accessories for overhead power lines
IS 5561:1970	Electric power connectors.
NEMA CC1	Electric power connectors for sub-station
NEMA CC3	Connectors for use between Aluminum or Aluminum Copper Overhead Conductors.

3. Specific Technical Requirements

1. The specific technical requirements for GI cable trays, cable tray cover and accessories are as follows,

Sl. No.	Description	Particulars
1)	Nominal system voltage	220kV
2)	Highest system voltage	245kV
3)	Current Rating	Compatible with conductor rating (1000A)
4)	Short circuit current	50kA for 1 second
5)	Frequency	50Hz
6)	Impulse withstand voltage (dry and wet)	1050kVp
7)	Power frequency with stand voltage (dry and wet)	460kVrms

2. The other hardware and accessories, as per requirement for complete assembly shall be supplied.

4. Bill of Quantities

1. Quantities for C-Wedge Connector shall be as per Annexure- BOQ for C-Wedge type TEE Connector. However, any item not appearing herein but required for completeness the work is deemed to be included in bidder's scope.
2. BHEL reserves the right for overall contract value variation up to $\pm 30\%$ due to any reason at the same unit rates, terms & conditions during execution of contract.

5. Drawings / Documents required for Engineering Manufacturing Clearance

The following drawings/ documents shall be used for providing engineering manufacturing clearance of illumination system and furthermore, it shall be used for delay analysis, if any from bidder.

1.	C-Wedge TEE type Connector- Drawing with Guaranteed Technical particulars
2.	C-Wedge TEE type Connector- Type Test Reports
3.	C-Wedge TEE type Connector- Quality Assurance Plan & Inspection Test Schedule

Date of Submission of first lot of drawings/ documents shall be counted from the date of

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submission of reasonably correct drawings/ documents only.

The successful bidder shall have to extend all possible supports like timely submission/ re-submission of drawings, visit to end customer to facilitate documents approval without any commercial implications to BHEL. Acceptance of bidder's documents shall be subject to end customer approval.

6. Type Testing

Bidder shall ensure that item/ materials of C-Wedge type TEE Connectors being procured should have valid type test certificates as per specified in IS/ IEC standards (amended up to date) at any ISO/IEC accredited laboratories.

Type test certificates shall not be more than seven (7) years old as on original scheduled date of technical bid opening. In those cases, where type test certificates are more than five (5) years old from original scheduled date of technical bid opening, OEM/ bidder shall carry out the type tests at any ISO/ IEC accredited laboratories prior to dispatch of equipment with no commercial implication to BHEL/Customer.

In case any of type tests have not been conducted on the offered design or there has been a change in the design after the type tests. The requisite tests shall be conducted by bidder on the offered design without any extra cost and delivery impact to BHEL/ Customer.

All acceptance and routine tests as per relevant standards and specification shall be deemed to be included in the bidder's scope.

7. Quality Plan

The successful bidder shall submit Quality Assurance Plan for C-Wedge type TEE Connectors with in-process inspection methods, tests, records, etc. for BHEL/ Customer approval. Customer hold points will also be included in the plan, which shall be mutually agreed by the BHEL/ Customer. In case bidder has reference Quality Assurance Plan agreed with BHEL/ Consultant/ Customer, same shall be submitted for specific project to BHEL/ Customer approval. There shall be no commercial implication to BHEL/ Consultant/ Customer on account of Quality Plan approval.

Superior quality control system shall be adopted to assure high product quality. Raw materials of the best commercial grade quality and high reliability shall be used in the manufacture items/ materials of illumination system. All materials shall be procured, manufactured, inspected and tested by vendor/ sub-vendor as per approved quality plan. The supplier shall perform all tests necessary to ensure that the material and workmanship conform to the relevant standards and comply with the requirements of the specification. Charges for all tests shall be deemed to be included in bidder's scope.

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8. Inspection & Testing

1. Items/ materials of C-Wedge type TEE Connectors shall be subject to inspection by BHEL/ Customer or authorized representative at bidder/ manufacturers' works. Hence, Bidder shall furnish all necessary information concerning the supply to BHEL/ Customer.
2. The inspector shall have free access to the manufacturer's/ supplier's works for the purpose of inspecting the process of manufacture in all its stages and he will have the power to reject any material, which appears to him to be of unsuitable description or of unsatisfactory quality.
3. Bidder shall give at least 2 weeks' advance notice to BHEL/ Customer, regarding the date of testing to enable him or his representative to witness the tests. All the tests must be done as per the approved QAP.

9. Packing and Dispatch

1. The items/ materials of C-Wedge type TEE Connectors shall be properly packed for selected mode of transportation i.e. sea, rail and road in such a manner that it is protected against the climatic conditions and for any damage during transportation, transit and storage. Crates/cases shall have skid bottoms for handling. Special notations such as 'Fragile', 'This side up', 'Weight', 'Owner's particulars\ 'PO nos.' etc., shall be clearly marked on the package together with other details as per purchase order.
2. The item/ materials may be stored outdoors for long periods before installation. The packing should also be suitable for outdoor storage areas with heavy rains/ high ambient temperature unless otherwise agreed and hence, Packing shall be suitable for long storage (minimum 1 year).

10. Definitions Used

The following expressions hereunder and elsewhere in the technical specification used and their grammatical variations shall unless repugnant to the subject or context thereof, have the following meanings hereunder respectively assigned to them, namely:

1. Battery Limit: The demarcated area within which the Unit is to be located.
2. Bid/Bidding Documents: The totality of the documents comprising the Bidding Document for the notice inviting tender.
3. Contract: The totality of agreement between Customer/ Purchaser/ Owner/IOCL and the Contractor/ LSTK Contractor/ BHEL as derived from the contract documents.
4. Contractor/ LSTK contractor: The bidder selected by the Customer/ Purchaser/ Owner/IOCL for the performance of the work and supply of materials. In this case, it is BHEL.
5. Customer/ Purchaser/ Owner: Indian Oil Corporation Limited.
6. Consultant: Any person(s)/ Firm nominated/ assigned by the Contractor/ LSTK Contractor/ BHEL for providing the engineering consultant services. In this case, it is TCE.
7. Bidder/ vendor: The bidder selected for this intended work shall be known as vendor.

Annexure- BOQ for C-Wedge type TEE Connector

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Sl. No.	Description	Unit	Quantity
A.	Supply		
1	C-Wedge type TEE Connector for single ACSR Moose Conductor to Single ACSR Moose Conductor (Voltage Rating: 220kV, Current Rating: 1000A and Short Circuit Level: 50kA for 1 second)	Nos.	10
B.	Service		
1	Installation of C-Wedge type TEE Connector for single ACSR Moose Conductor to Single ACSR Moose Conductor (Voltage Rating: 220kV, Current Rating: 1000A and Short Circuit Level: 50kA for 1 second)	Nos.	6

ACSR MOOSE: Outer Diameter = 31.77mm

ACSR MOOSE: Cross sectional = 0.5sq inch (645sqmm)

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SECTION 2:

EQUIPMENT SPECIFICATION UNDER SCOPE OF SUPPLIES

2.1 General

This section covers the general technical requirements of wedge type TEE Connectors. In case of any discrepancies between the requirements mentioned in this section and those specified in other sections of this specification, the latter shall prevail and shall be treated as binding requirements.

2.2 Applicable Standards

The C-Wedge type TEE connectors shall strictly conform to relevant IS/ IEC.

The Wedge type TEE connectors shall strictly conform to the following Indian and International standards as appropriate:

S.N.	STANDARDS	APPLICABLE FOR
1.	IS 617:1994	Aluminium and aluminium alloy Ingots and castings for general Engineering purposes.
2.	IS 2121:1981 (Part -1 & 2)	Specification for conductors and earth wire accessories for overhead power lines
3.	IS 2121:1992 (Part -3)	Specification for conductors and earth wire accessories for overhead power lines.
4.	IS 2121:1991 (Part -4)	Specification for conductors and earth wire accessories for overhead power lines
5.	IS 5561:1970	Electric power connectors.
6.	NEMA CC1	Electric power connectors for sub-station
7.	NEMA CC3	Connectors for use between Aluminium or Aluminium Copper Overhead Conductors.

2.3 TEE Connectors

- 2.3.1 Wedge connector should be FIRED-ON or powder actuated or manual driven.
- 2.3.2 The power booster (in case of fired-on or powder actuated connector) should be colour coded for proper installation of wedge connectors.
- 2.3.3 Wedge connector members- tapered 'C' shaped spring member and wedge should be made from a special Aluminium alloy of high ductility and electrical conductivity. When Installed, it will provide a tenable electrical and mechanical connection for solid or stranded conductor combinations including.
- 2.3.4 The dimensions for the wedge shall be manufactured to close tolerance to ensure repeatability and reliability of the connection.
- 2.3.5 All sharp edges and burrs shall be removed.
- 2.3.6 The wedges shall be burnished to achieve optimum surface roughness for electrical contact.
- 2.3.7 The wedge connector shall meet the current cycle test requirements as per ANSI C119.4-1998 Class AA. When connected, as specified samples shall indicate electrical stability for terminated connectors. The resistance of connection, when measured as specified shall be stable throughout test. The sample shall be tested to 500on/off

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- current cycle with the control conductor raised between 175°C to 180°C above ambient. Or the Boltless C-Type Wedge Connector should be fully type tested as per IS: 5561 (latest amendment).
- 2.3.8 The wedge connector shall meet the mechanical requirements as per ANSI C119.4-1998 Class-3, minimum tension. When tested as specified or 5% of the rated cable strength of the weaker conductor. Or the Boltless C-Type Wedge Connector should be fully type tested as per IS: 5561 (latest amendment).
- 2.3.9 The Wedge connector shall meet the following thermal shock/salt spray test,
- Hours at 1500C
 - 15 minutes at 0C water, immediately from the oven
 - 30 minutes at 1500C
 - 20.75 hours at room temperature
- Or the Boltless C-Type Wedge Connector should be fully type tested for above tests as per relevant IS/IEC.
- 2.3.10 Salt spray corrosion, samples shall be subjected to a 30-day salt spray corrosion test. Each daily exposure shall consist of,
- 15 hours in 5% salt spray atmosphere
 - 1 hour in drying over at 100°C
 - 8 hours at room temperature
- Or the Boltless C-Type Wedge Connector should be fully type tested for above tests as per relevant IS/IEC.
- 2.3.11 During installation, the wedge of wedge shall be driven inside the "C" member at high velocity between the run & tap conductor so as to spread the "C" member to ensure high retentive force on the conductors. A locking tab, formed balance on the tool should prevent the wedge from loosening once it has been driven into position.
- 2.3.12 The wedge terminal shall have back up conductor cleaning capability during application. The wedge terminals should ensure stable & low contact resistance under varying load conditions & the thermal cycling effects.
- 2.3.13 An oxide inhibiting compound placed in the wedge & "C" member groove of Wedge Terminals.

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209037/2021/TBG-TB_ENG_SR**Bharat Heavy Electricals Limited**

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SECTION 3:
ANNEXURES

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ANNEXURE-A: COMPLIANCE CERTIFICATE OF TECHNICAL SPECIFICATION

The bidder shall confirm compliance to the following by signing and stamping this compliance certificate and furnishing same with the offer.

1. The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusion/ deviation with regard to same.
2. There are no deviation(s) with respect to specification other than those furnished in the schedule of deviations.
3. Only those technical submittals which are specifically asked for in Notice Inviting Tender (NIT) to be submitted at tender stage shall be considered as part of offer. Any other submission, even if made, shall not be considered as part of technical offer.
4. Any comments/ clarifications on technical/ inspection requirements furnished as part of bidder's covering letter shall not be considered by BHEL, and bidder's offer shall be construed to be in conformance with the specification.
5. Any changes made by the bidder in the price schedule with respect to the description/ quantities from those given in 'BOQ' of the specification shall not be considered (i.e., technical description & quantities as per the specification shall prevail).

Date:

Bidder's Stamp & Signature

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ANNEXURE-B: DEVIATION/ CHANGE REQUEST OF TECHNICAL SPECIFICATION

Bidder shall list out all technical potential deviation/ change request (s) along with clause with respect to technical specifications.

Sl. No.	Page No.	Clause No.	Deviation	Reason/ Justification(s)
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Any deviation not specifically brought out in this section shall not be admissible for any commercial implication at later stage. Except to the technical deviations listed in this schedule, bidder's offer shall be considered in full compliance to the tender specifications irrespective of any such deviation indicated / taken elsewhere in the submitted offer.

Date:

Bidder's Stamp & Signature

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ANNEXURE-C: GUARANTEED TECHNICAL PARTICULARS

Sl. No.	Description	Particulars to be filled by Bidder
1	General	
1.1	Name of the project	
1.2	Name of manufacturer (OEM)	
1.3	Country of origin	
1.4	Manufacturer works	
2	Type & Designation	
2.1	Type tested at (Name of laboratory)	
2.2	Address of laboratory	
2.3	Application	
2.4	Standards applicable	
3	For connection to	
3.1	Conductor size and arrangement	
4	Material of clamps/fittings (state percentage composition of constituents and impurities present).	
4.1	C-Clamp body	
4.2	Wedge body	
5	Maximum contact resistance (ohms) Continuous current rating of the clamps/fittings	
6	Maximum temp. rise of the clamps/fittings over ambient temp (50oC) when carrying full load current (oC)	
7	Maximum temp. rise of the clamps/fittings over ambient temp. (50oC) when carrying an estimated fault current of 50KA for 1 sec. (oC) i) - Rated terminal load ii) ii) Minimum failing load	
8	Factor of safety	
9	Minimum thickness of any part.	
10	Weight of each type of clamp complete with hardware fittings (KG)	
11	Machining accuracy of matching surface.	
12	Service Indoor/outdoor.	
13	Major dimensions of the clamps/fittings (with accompanied drawings).	
14	Mechanical test. i) Heat run test	

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	ii) Material Composition tests. iii) Tests for checking blow, holes cracks etc.	
15	List of routine test to be carried out.	
16	Whether the type tests are already carried out if Yes, enclose the type test certificates.	
17	Details of the type tests to be carried out if not carried out earlier.	
18	List of testing facilities available at your works for carrying out above type tests & routine tests & mechanical tests. If facilities not available at your works, please indicate the name and address of the firm/institute where these shall be carried out	

Date:

Bidder's Stamp & Signature

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ANNEXURE-D: TECHNICAL CHECKLIST

Sl. No.	Parameters/ Particulars	Requirement	Bidder's confirmation
1	Technical Qualifying Requirement		
1.1	The bidder to furnish relevant documents for meeting the qualifying requirement.	Confirmed	Yes
1.2	The technical bid shall be submitted by the Manufacturer.	Confirmed	Yes
1.3	All the documents shall be submitted in English.	Confirmed	Yes
2	Un-priced BOQ		
2.1	Confirm that all items have been quoted separately. Non-quoting of any item shall lead to non-evaluation of technical bid.	Confirmed	Yes
2.2	Any other accessories for the completeness of supply is deemed to be included in the offer, whether specifically mentioned in the specification or not.	Confirmed	Yes
3	Technical requirement		
3.1	Material of Clamps/ fittings	Clamp body (Designation 4600 of IS 617 :1994)	Yes
3.2	Continuous current rating of the clamps/fittings	Is it compatible with the conductor rating/ equipment rating?	Yes
3.3	Maximum temperature rise (35oC) of the clamps/fittings over ambient temperature (50oC) when carrying rated current		Yes
3.4	Nominal Breaking load of conductor is minimum 1100 kg and tensile load is 110 kg		Yes
3.5	Minimum thickness of any part is 10 mm		Yes
4	Type Tests		
4.1	Please confirm that there are no deviations from the technical specifications.	Deviations/ No Deviations are attached	Yes
4.2	Whether similar items offered have been supplied?	Similar clamps have been supplied earlier	Yes
4.3	Valid Type Test Reports (of identical Clamps & Connectors) for all offered Clamps & connectors as per spec are available.	List as mentioned below, 1. Temperature rise test 2. Short time current test	Yes

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Technical Specification: C-Wedge type TEE Connectors

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		3. Resistance test 4. Tensile test 5. Galvanization test 6. Measurement of RIV (dry) and Corona extinction voltage test (dry), if applicable	
4.4	The onus is on vendor to check the applicability of Type test reports vis-à-vis the clamps offered.		Yes
4.5	In case the type test reports are not found valid at detailed engineering stage, the same will have to be conducted without any commercial implication to BHEL		Yes

Date:

Bidder's Stamp & Signature