

कदम कदम मिलाना है ग्राहक सफल बनाना है

Marching Towards Business Excellence

 ENQUIRY TWO PART BID BP_200101 E-TENDER	भारत हेवी इलेक्ट्रिकल्स लिमिटेड, पिपलानी, भोपाल- ४६२०२२ (भारत) सामग्री प्रबंधन विभाग BHARAT HEAVY ELECTRICALS LIMITED, PIPLANI, BHOPAL-462022 (INDIA) MATERIALS MANAGEMENT DIVISION			ENQUIRY NO E5963003 ENQUIRY DATE 01/05/26 ENQUIRY DUE DATE 11/05/26
	TIN NO- 23573000001 PHONE NO : 91-755-2500100	ECC NO- AAACB4146PXM009	MPCT NO- HEL/05/01/0001/S15/11/79 FAX : 91-755-2500023 www.bhel.com	

ENQUIRY

SUPP NAME AND ADDRESS	SUPP CODE	REV CD	REV NO	REV DATE	NO OF CATY2	NO OF CATY3	ENQ NO OF ITEMS	INDENT NO
	0	1	0	NA	1	2	1	121364505
	GUARANTEE CERTIFICATE		Y	SUPPLY CONDITION	SUPPLIER'S IDENTIFICATION MARK SHOULD BE			
	TEST CERTIFICATE		Y		ON EACH JOB.			
	INSTRUCTION BOOKLET		N	TECHNICAL CONDITION	AS PER DRG.			
	SAMPLE		N					
	GATE PASS		Y	INSPECTION CONDITION	BY BHEL TPIA AT VENDOR'S WORK.			

NOTE: QUOTE PRICE BOTH IN FIGURES & WORDS. IN CASE OF MISMATCH PRICE IN WORDS WILL BE VALID, QUOTATIONS NOT BEARING ENQUIRY NO AND DUE DATE LIABLE TO BE REJECTED.

SL NO	MATERIAL CODE	DESC	UNIT	ITEM QTY	QTY VR%	LOT NO	LOT QTY	DEST	DELIVERY DATE
1	BP9094874580	TA4502AZ END PLATE TO DRG.NO.44303292088 V-00 R-05.TO BE SUPPLIED IN PROPER PACKING. RUST PREVENTIVE TO BE APPLIED ALL OVER THE JOB.	NO	2000.000	30	1	1000.000	213	27/06/26
						2	1000.000	213	27/07/26

REMARK AS PER NIC E TENDER

DRAWING Y **PURCH SPEC** Y **CATALOUGE** N **Quality Surveillance Pl:** Y **TWO PART BID** Y

NOTE:BHEL,BHOPAL'S Standard Terms & Conditions BP200102C/BP205316 for imports and BP200102C/ BP205316 for indigenous procurements form a part of this Enquiry. Bidders may obtain from us copies of these terms and conditions if not already available.

Note: During Bid Evaluation, No loading of price with regard to preferential payment of within 45 days will be made on vendore falling under MSMED ACT - OCT 06

Please submit your lowest quotation in sealed envelop essentially superscribed with ENQUIRY NO, DUE DATE AND PARTY'S NAME so as to reach at TENDER ROOM, GROUND FLOOR, ADM BUILDING, BHEL, PIPLANI BHOPAL-462022 by 11.00 am of due date.

- 1.This is only a request for Quotation & not an order.
- 2.Small Scale industries should indicate SSI Regn. No. in Quotation/invoice.
- 3.In case you are not making an offer against this Enquiry, we request you to post a regret letter.
- 4.Indian vendors to please indicate GSTIN on their quotation.

SPECIAL REMARK: Bid to be submitted through e-procurement. Refer eproc link on BHEL Bhopal B2B site.

Documents Enclosed

- 1.Drawing.
- 2.Catalogue.
- 3.Purchase specification.
- 4.Quality Surveillance Plan.

NAME : SHRI MANENDRA SINGH

DESG : DY.MANAGER

0755-2505880

manendra1@bhel.in

SIGN & SEAL



MATERIAL MANAGEMENT - TRACTION MACHINES

HEAVY ELECTRICAL PLANT, BHOPAL

BHARAT HEAVY ELECTRICALS LIMITED

BHEL ENQUIRY NO. E5963003

DUE ON 11-05-2026

NIT TERMS & CONDITIONS:

SL. NO.	DESCRIPTION	DETAILS
1.	RATE CONTRACT TERMS	<p>We intend to enter into a Rate Contract (RC) for ordering up to 18 months from RC freeze date, i.e. RC is to be kept valid for ordering up to 18 months from RC freeze date.</p> <p>Purchase Ordering shall be done as per BHEL requirement against the finalised rate contract & within its validity. Dispatches to be made against our purchase order (computerized) only, which will be issued against this Rate Contract.</p> <p>BHEL reserves the right to cancel/ short close the Rate Contract for unordered qty at any point of time even before the expiry of RC validity without assigning any reason whatsoever it may be.</p>
2.	ITEM DESCRIPTION	TA4502AZ END PLATE TO DRG.NO.44303292088 V-00 R-05.TO BE SUPPLIED IN PROPER PACKING. RUST PREVENTIVE TO BE APPLIED ALL OVER THE JOB.
3.	TECHNICAL CONDITION	As per attached list of attached PQR, Drg, Spec & QAP.
4.	QUANTITY	2000 Nos
5.	QUANTITY VARIATION	± 30%
6.	SPLITTING OF ORDER	<p>Applicable,</p> <p>On 2 (two) eligible sources with quantity distribution ratio of 65% & 35% to L-1 and the other bidder accepting L-1 rates in sequence, subject to minimum 3 qualified bidders.</p> <p>For ascertaining bidder for 35% quantity, HESG equivalent rate of L-1 bidder shall be counter-offered to L-2, L-3 and so on sequentially until any bidder accepts the same.</p> <p>In case of only one or two qualified bidders, RC shall be done on Single Source.</p>
7.	DELIVERY SCHEDULE REQUIREMENT	Delivery of 1st lot of 1000 Nos. shall be within 60 days from date of placement of PO and there after 2nd lot of 1000 Nos. shall be within next 30 days from previous lot. Early delivery acceptable.
8.	DELIVERY TERMS	FOR Destination (BHEL Bhopal)
9.	DELIVERY INSTRUCTION	Supplier identification (viz. Vendor code, PO number, SN etc) is compulsory on each job.
10.	QAP	Applicable as attached with the tender
11.	INSPECTION CONDITION	By BHEL authorised TPIA at vendors works.
12.	SAMPLE	As per attached Drg, Spec & QAP. (As applicable)
13.	TEST CERTIFICATE	All Material TC with TPIA inspection report to be supplied along with material as per drg, Spec & QAP. and TC should incorporate Spec.



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14.	GUARANTEE / WARRANTY	As per BHEL GTC of ENQUIRY (BP200102C, Cl. No. 18)
15.	GUARANTEE/ WARRANTY CERTIFICATE	GUARANTEE/ WARRANTY Certificate to be supplied along with each lot of the material.
16.	INVOICE & DOCUMENTS SUBMISSION FOR PAYMENT.	For supply orders placed on Indian Suppliers: Irrespective of the value of the invoice amount, the bidder / vendor should necessarily upload the despatch & invoice details on BHEL SUVIDHA portal at https://suvidha.bhel.in/suvidha/ , prior to despatch. All documents as per PO checklist, along with additional documents (if any), must be uploaded on the portal. It is mandatory that tax invoices with a net amount (including taxes) exceeding Rs five lakhs uploaded on the portal are digitally signed using a Class 3 Digital Signature Certificate (DSC) issued by a licensed Certifying Authority. Submission of invoice document in hard copy is allowed for invoices with a net amount (including taxes) equal to and upto Rs five lakhs, in case they were not digitally signed and uploaded on the portal. The material will not be accepted inside BHEL in absence of the above.
17.	PAYMENT TERMS	As per attached BHEL GTC of ENQUIRY (BP200102C, Cl. No. 16) i.e. 100% payment in 90 days of receipt (45 days for Micro & Small and 60 days for Medium enterprises as registered in Udyam Certificate as per relevant MSME act in force) and subject to acceptance of material and relevant documents at BHEL. Any deviation from the above payment terms, if accepted (by BHEL), shall be loaded @ REPO rate + 4% for the purpose of bid evaluation.
18.	TECHNICAL PQR (T-PQR)	Technical Pre-Qualification Requirements (T-PQR) for procurement of the items is attached with the NIT. Compliance of all the points in T-PQR is mandatory. In absence of compliance of above and non-submission of documents required against the T-PQR, the Vendor's offer is liable to be rejected. Duly filled T-PQR with desired documents shall be submitted by the Vendor along with the offer. <i>Information/ compliance/ documents submitted by vendor shall be authentic in all aspects. In case any deviation/ false information/ forged documents are observed / revealed later on, BHEL is free to initiate appropriate punitive proceeding against the Vendor as per Prevalent Processes and Guidelines of Company.</i>
19.	FINANCIAL PQR (F-PQR)	Not applicable
20.	BID PARTS	Offer shall be submitted by the bidders in Two Parts, i.e. Part-I Technical cum Commercial bid & Part-II Price bid.
21.	PENALTY / LD	As per attached BHEL GTC of ENQUIRY (BP200102C, Cl. No. 9) i.e. 0.5% of the undelivered portion per week of delay or part thereof, subject to a maximum of 10% of the undelivered order value owing to delayed delivery.



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		Any deviation from the above terms, if accepted (by BHEL), shall be loaded @ Repo rate + 4% (at offered value) to the extent to which it is not agreed to, by the bidder for the purpose of bid evaluation.
22.	PRICE BASIS	Firm Price basis
23.	PRICING TERMS	As per attached BHEL GTC of ENQUIRY (BP200102C, Cl. No. 12)
24.	PRICE VALIDITY	As per attached BHEL GTC of ENQUIRY (BP200102C, Cl. No. 13) i.e. Offer shall be valid for a period of 90 days from the date of Techno- commercial (Part-I) bid opening date.
25.	TAXES & DUTIES	As per attached BHEL GTC of ENQUIRY (BP200102C, Cl. No. 14)
26.	EVALUATION CRITERIA	Overall L1 basis
27.	EVALUATION IN CASE OF MORE THAN ONE L-1 BIDDER	In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders. In case more than one bidder happens to occupy the L-1 status even after soliciting discounts, the L-1 bidder shall be decided by a toss/draw of lots, in the presence of the respective L-1 bidder(s) or their representative(s). Ranking will be done accordingly. Decision of BHEL in such situations shall be final and binding.
28.	BID SECURITY/ Earnest Money Deposit (EMD)	Not Applicable
29.	PERFORMANCE SECURITY (PBG)	Not Applicable
30.	REVERSE AUCTION	Not Applicable
31.	MSE PREFERENCE	Applicable as per attached BHEL GTC of ENQUIRY (BP200102C, Cl. No. 29)
32.	PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA)	Applicable as per attached BHEL GTC of ENQUIRY (BP200102C, Cl. No. 33). For this procurement, the local content to categorize a supplier as a Class I local supplier/ Class II local Supplier/ Non-local supplier and purchase preference to Class I local supplier, is as defined in Public Procurement (Preference to Make in India), Order 2017 dated 19.07.2024 issued by DPIIT. In case of subsequent orders issued by the nodal ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part-II bids against this NIT. The local content to categorize a supplier as a Class-I local supplier / Class-II local supplier / Non-Local supplier and purchase preference to Class-I local supplier, is as defined in above circular issued by DPIIT/ Nodal Ministry.



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		<p>Bidders to also inform the Actual Percentage of the Local Content and the Complete Address of the Location of Local Value Addition as per the attached MII format, failing which no purchase preference shall be granted.</p> <p>In case the bid value is more than Rs. 10 Crore, the declaration relating to the Actual Percentage of the Local Content and the Complete Address of the Location of Local Value Addition shall be Certified by the Statutory Auditor or Cost Auditor, if the OEM is a Company and by a Practicing Cost Accountant or a Chartered Accountant for OEM other than Companies as per the above circular.</p> <p>For contracts valuing more than Rs 10 Crores, local content (in cases of self-certification submitted by bidders at the time of tendering) will be re-verified during execution of contract by Cost/ Chartered Accountant/ Statutory Auditor/Cost Auditor (as applicable) and in case of defaults, penalty upto 10% of the contract value shall be imposed. However, contract once awarded shall not be terminated on this account.</p> <p><i>Bidders or successors can be debarred for false declarations for up to 2 years. Debarred suppliers not eligible for preference in any other procuring entity.</i></p>
33.	INTEGRITY PACT (IP)	Not Applicable
34.	RESTRICTION UNDER RULE 144 (xi) GFR	As per attached BHEL GTC of ENQUIRY (BP200102C, Cl. No. 34)
35.	CONFLICT OF INTEREST AMONG BIDDERS/ AGENTS AND THEIR DECLARATION	<p>A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. Bidders having a conflict of interest shall not be eligible to participate in the tender process.</p> <p>Treatment of cases regarding conflict of interest: -</p> <p>The bidder notes that a conflict of interest would said to have occurred in the tender process and execution of the resultant contract, in case of any of the following situations: -</p> <ol style="list-style-type: none"> i) If its personnel have a close personal, financial, or business relationship with any personnel of BHEL who are directly or indirectly related to the procurement or execution process of the contract, which can affect the decision of BHEL directly or indirectly; ii) The bidder (or his allied firm) provided services for the need assessment/ procurement planning of the Tender process in which it is participating; iii) Procurement of goods directly from the manufacturers /suppliers shall be preferred. However, if the OEM/ Principal insists on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer/ supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer/ supplier or the manufacturer/ supplier could bid directly but not both. In case bids are received from both the manufacturer/ supplier and the agent, bid received from the agent shall be ignored. However, this shall not debar more than one Authorised distributor



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		<p>(with/ or without the OEM) from quoting equipment manufactured by an Original Equipment Manufacturer (OEM) in procurements under a Proprietary Article Certificate.</p> <p>iv) A bidder participates in more than one bid in this tender process. Participation in any capacity by a Bidder (including the participation of a Bidder as a partner/ JV member or sub-contractor in another bid or vice-versa) in more than one bid shall result in the disqualification of all bids in which he is a party. However, this does not limit the participation of an entity as a sub-contractor in more than one bid if he is not bidding independently in his own name or as a member of a JV.</p> <p>The Bidder declares that they have read and understood the above aspects, and the bidder confirms that such conflict of interest does not exist and undertakes that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s), in this regard. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, the same will be considered as a violation of the tender conditions, and suitable action shall be taken by BHEL as per extant policies/ guidelines.</p>
36.	ANNEXURE-IX	<p>The Bidder/Supplier/Contractor will, when presenting his bid, declare whether other Family Firms or Sister Concern Affiliates/Subsidiary firms are participating in the same tender, so as to eliminate the possibility of cartel formation. Format for declaration is available in the NIT documents for this enquiry (Annexure-IX). Same is to be submitted with the offer.</p>
37.	SPECIAL CONDITIONS	<p>Bidders who fall under MSE (Micro & Small Enterprises only) and fail to upload 'UDYAM Registration Certificate (URC)' shall automatically be considered as Non-MSE supplier for this tender.</p> <p>Further, it is to be noted that MSE benefits are not being extended to Agent/ Dealer/ Trader/ Distributor (i.e. Other than manufacturer). Supplier has to also provide supporting document(s) such as Agreement Between OEM & Bidder(s) etc.</p> <p>Identification must. Soon after rejection of material, it is to be ensured by supplier that material should be taken back maximum within two weeks after communication for rectification/ replacement & supply back the rectified/ fresh material to BHEL Bhopal within 30 days from rejection. In the event of non-lifting of rejected material by supplier, BHEL will not be responsible for loss of such items to the supplier in any case.</p> <p>Offers of suppliers who are in 'HOLD/BANNED' status in BHEL Bhopal PMD shall not be considered.</p> <p>Unregistered vendors to submit documents required for registration to BHEL Portal Online (https://bhel.com/supplier-registration).</p>
38.	OTHER TERMS & CONDITIONS	<p>Other Terms & Conditions as per attached BHEL GTC of ENQUIRY (BP200102C).</p>



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		Any deviation of NIT, BHEL GTC of ENQUIRY (BP200102C) and BHEL PO Terms, where vendor response is not affirmative to be clearly indicated, else BHEL will consider that all above Terms & Conditions are acceptable to vendors.
39.	GEM REGISTRATION	As you are kindly aware that Government e-Marketplace (GeM) is a one stop portal to facilitate Online Procurement of Goods & Services required by various Government Departments/ Organizations/ PSUs. BHEL being a PSU, would like that its suppliers/ contractors also have visibility on this portal so that GeM can be used for procurement by BHEL. Hence, you are requested to get yourselves registered on GeM.
40.	TENDER FEE	Not applicable
41.	BID SUBMISSION WITHIN DUE DATE & TIME	No request for extension of tender due date will be entertained at the time of tender opening and after due date under any circumstances. Hence, all bidders are requested to submit their bid well within due date and time only. <i>BHEL reserves the right for extension of tender based on the situation without assigning any reason whatsoever it may be.</i>
42.	DOCUMENTS TO BE FURNISHED ALONG WITH YOUR QUOTATION	Signed and Sealed copy of: <ul style="list-style-type: none"> - NIT - BHEL GTC of ENQUIRY (BP200102C) - BHEL PO Terms Duly Filled, Signed and Sealed copy of: <ul style="list-style-type: none"> - Techno-Commercial Annexure - T-PQR along with all supporting documents - Annexure-IX in Company Letterhead - Annexure-A - OEM & MSE Declaration - PPP-MII Certificate for local content Others: <ul style="list-style-type: none"> - UDYAM Registration Certificate (<i>as applicable for MSME bidders only</i>)
43.	INVOICING THROUGH SUVIDHA PORTAL	For supply orders placed on Indian Suppliers, irrespective of the value of the invoice amount, the bidder / vendor should necessarily upload the despatch & invoice details on BHEL SUVIDHA portal at https://suvidha.bhel.in/suvidha/ , prior to despatch. All documents as per PO checklist, along with additional documents (if any), must be uploaded on the portal. It is mandatory that tax invoices with a net amount (including taxes) exceeding Rs five lakhs uploaded on the portal are digitally signed using a Class 3 Digital Signature Certificate (DSC) issued by a licensed Certifying Authority. Submission of invoice document in hard copy is allowed for invoices with a net amount (including taxes) equal to and upto Rs five lakhs, in case they were not digitally signed and uploaded on the portal. The material will not be accepted inside BHEL in absence of the above.

IT IS HEREBY MENTIONED THAT THIS IS E-TENDER SO OFFER SUBMITTED THROUGH E-PROCUREMENT PORTAL (www.eprocurebhel.co.in) SHALL ONLY BE CONSIDERED.

Techno-Commercial Annexure
(To be filled by supplier inline with NIT requirement and submit with offer)

Tender No.		E5963003 due on 11/05/2026		
Description :		Item: TA4502AZ END PLATE TO DRG.NO.44303292088 V-00 R-05.TO BE SUPPLIED IN PROPER PACKING. RUST PREVENTIVE TO BE APPLIED ALL OVER THE JOB. TENDER QTY.:- 2000 Nos (+/-30%). Delivery required as per NIT.		
Sr. No.	ELEMENTS	Standards	To be offered/confirmed by supplier	Remarks, if any
1	Quotation reference no. & date	As per supplier		
2	HSN / SAC code	As per supplier		
3	Quotation currency	In INR		
4	Contact person	As per supplier		
5	Phone / Mobile	As per supplier		
6	E-Mail	As per supplier		
7	Order to be placed on (Also provide supplier code at BHEL Bhopal, If registered)	As per supplier		
8	Address	As per supplier		
9	Please specify delivery in weeks/ days (Specify item wise, lot wise as per RFQ)	As per NIT/ Accepted with deviation (If select Accepted with deviation, please mention the deviation)		
10	Rate quoted on "Firm" price basis	Yes		
11	Quoted for all the items and full quantity of tender enquiry	Yes / No. (If "No" please mention item number with Qty of regreted items)		
12	Technical specifications	Accepted as per NIT / Accepted with deviation (If select Accepted with deviation, please mention the deviation)		
13	Inspection	As per NIT/ Accepted with deviation (If select Accepted with deviation, please mention the deviation)		
14	Test certificate & Gurantee certificate as per NIT and specification will be submitted along with each consignment	Yes (In case of "No" your offer may be rejected).		
15	Brand name, if any.	As per supplier		
16	Supply from	As per supplier		
17	Terms of delivery ("FOR DESTINATION " means freight & insurance upto destination in supplier's scope (Destination: CRX Divn, BHEL Bhopal)	Accepted/ Accepted with deviation (If select Accepted with deviation, please mention the deviation)		
18	Transit insurance (In supplier's scope)	As per NIT/ Accepted with deviation (If select Accepted with deviation, please mention the deviation)		
19	CGST RATE (IN %)	As per supplier		
20	SGST RATE (IN %)	As per supplier		
21	IGST RATE (IN %)	As per supplier		
22	UGST RATE (IN %)	As per supplier		
23	Are you manufacturer of quoted item (s).	Yes / No		
24	Are you registered under MSMED ACT 2006 as small or micro. NOTE: - Firms registered under medium scale shall not be considered eligible for MSE benefits.	Yes / No (If select Yes, please enclosed valid UDYAM certificate)		

Techno-Commercial Annexure
(To be filled by supplier inline with NIT requirement and submit with offer)

Tender No.		E5963003 due on 11/05/2026		
Description :		Item: TA4502AZ END PLATE TO DRG.NO.44303292088 V-00 R-05.TO BE SUPPLIED IN PROPER PACKING. RUST PREVENTIVE TO BE APPLIED ALL OVER THE JOB. TENDER QTY.:- 2000 Nos (+/-30%). Delivery required as per NIT.		
Sr. No.	ELEMENTS	Standards	To be offered/confirmed by supplier	Remarks, if any
25	Terms of Payment (100% payment in 90 days of receipt (45 days for Micro & Small and 60 days for Medium enterprises as registered in Udyam certificate as per relevant MSME act in force) and subject to acceptance of material and relevant documents at BHEL. Pl refer GTC BP200102C)	As per NIT/ Accepted with deviation (If select Accepted with deviation, please mention the deviation)		
26	SELF CERTIFICATION OF MINIMUM LOCAL CONTENT, IF MORE THAN 50% VALUE ADDITION IS IN INDIA. (Note- In case of tenders worth more than Rs. 10 crores, Suppliers shall necessarily submit certificate from statutory auditor or cost auditor or cost accountant or CA) Please also specify the amount of local content in India. EXAMPLE :if 100% INDIGENOUS (MADE IN INDIA) MARK "Y"/100%	As per supplier		
27	Details of location of value addition / manufacturing	As per supplier		
28	Submission of MII_Certificate with duly sealed & signed (Under Public Procurement Policy)	Yes / No		
29	Other Charges (If any)	Applicable / Not Applicable. (If applicable please mention percentage (%) / Value (along with type of charges).		
30	Penalty for delayed performance as per BP200102C & NIT	Yes / No (In case of "No", your offer will be loaded suitably)		
31	Confirmation that documents pertaining to technical PQR has been submitted	Yes / No		
32	Acceptance to "REVERSE AUCTION" if conducted (As per BHEL's RA policy)	Yes / No	Not applicable	
33	Submission of Declaration format with duly sealed & signed (Annexure IX, refer attached) regarding whether other family firms or sister concern affiliates / subsidiary firms are participating in the same tender.	(Yes / No) If No please specify the reason.		
34	Submission of Declaration format with duly sealed & signed (Annexure-A - OEM & MSE Declaration)	Yes / No		
35	General terms and conditions of enquiry (Form No. BP-200102C) and BHEL PO Terms & Conditions is Acceptable.	Yes (In case of "No" your offer may be rejected).		
36	Quotation Validity will be 90 days from the date of techno-commercial bid opening.	Yes / No		
37	Acceptance to Performance Security	Yes / No	Not applicable	

FIRST ANGLE PROJECTION

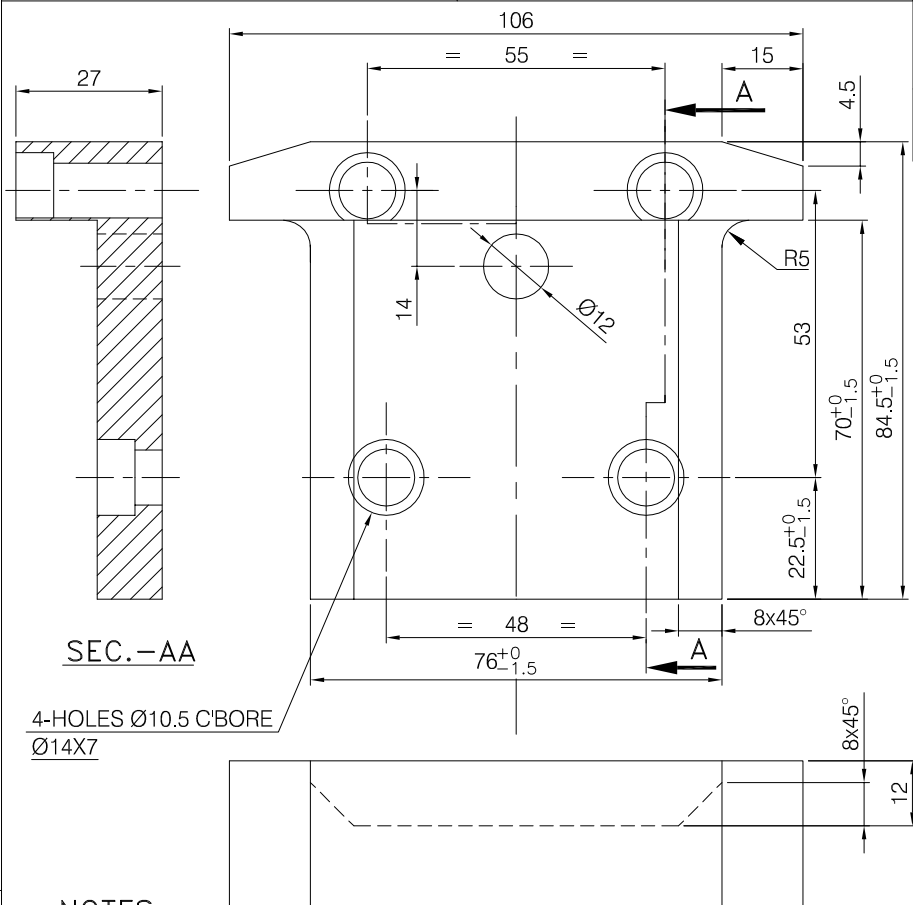
(ALL DIMENSIONS ARE IN mm)

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

REV. 02	DATE 19.08.19	ALTERED VK <i>Rijykr</i>
		CHECKED KD <i>[Signature]</i>
		APPROVED KD <i>[Signature]</i>
DRG. NO. IS INCORRECT BY TYPOGRAPHICAL MISTAKE.		
REV. 03	DATE 29.01.20	ALTERED VK <i>Rijykr</i>
		CHECKED KD <i>[Signature]</i>
		APPROVED KD <i>[Signature]</i>
C'BORE Ø14 WAS Ø22.		

REV. 01	DATE 03.08.19	ALTERED A.J. <i>Devin</i>
		CHECKED R.C. <i>Rohit</i>
		APPROVED R.C. <i>Rohit</i>
FINISH WT. 0.75 KG WAS 0.095KG.		
REV. 04	DATE 12.02.20	ALTERED VK <i>Rijykr</i>
		CHECKED KD <i>[Signature]</i>
		APPROVED KD <i>[Signature]</i>
TOL. ON DIMNS. 22.5 ⁺⁰ _{-1.5} , 70 ⁺⁰ _{-1.5} , 84.5 ⁺⁰ _{-1.5} & 76 ⁺⁰ _{-1.5} WERE NOT ON.		

ADDITIONAL INFORMATION		
STATUS OF DRAWING		
DISTRIBUTION OF PRINTS TME-1, TAM-3, TNX-1, PRM-4		
TOOL LIST		
ITEM	TOOL NO.	DESCRIPTION
-	1606719	DRILL JIG FOR 4 x Ø 10.5 + 1 X Ø 12
-	1606720	COUNTER BORE CUTTER Ø 14 PILOT Ø10.2



REV. 05	DATE 19.02.20	ALTERED VK <i>Rijykr</i>
		CHECKED AS <i>[Signature]</i>
		APPROVED AS <i>[Signature]</i>
TOOL LIST WAS NOT ON. SECTION LOCATION SHIFTED.		

NOTES:-

1. REMOVE SHARP EDGES BY LIGHT HAND GRINDING.
2. FORGING TO BE ULTRASONICALLY TESTED TO AA08501 18 CATEGORY-2.
3. MACHINE ALL OVER.

REF. DRG. NO.	001	END PLATE (FORGED)	STD	AA19331	KG	--
VAR00 QTY.	REMARKS	ITEM NO.	DESCRIPTION	MATL. CODE	A/C	UNIT
				MATL. SPECN.		QTY.

CARD TYPE 3	28	28	CARD TYPE 1	28	CARD TYPE 2
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SIGN. & DATE			DRN.	A. JHARIA	SIGN	<i>[Signature]</i>	DATE	17.07.19	NO. OF VAR.
			CKD.	KD		<i>[Signature]</i>		17.07.19	-
			APPD.	KD		<i>[Signature]</i>		17.07.19	
INVENTORY NO.	DEPT. TME	UNTOL. DIMS. GR.	SCALE	WEIGHT(KG)	REF. TO ASSY.DRG.	ITEM NO.	NO. OF ITEM		
	CODE 405	'F'	NTS	0.75	34303292100	006	001		
	TITLE				DRAWING NO.		REV		
END PLATE FORGING (DESIGN-IV)				44303292088		05			
TA4502AZ				10					
SHT.NO	01	NO.OF.SHT.			01				



CORPORATE PURCHASE SPECIFICATION

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CARBON STEEL FORGINGS, CLASS 2

1.0 GENERAL:

This specification governs the quality requirements of Carbon Steel Forgings, Class 2.

2.0 APPLICATION:

Suitable for general engineering purposes and for use in welded constructions.

3.0 CONDITION OF DELIVERY:

Normalised / Normalised and tempered..

Rough machining of the forgings shall be carried out, unless otherwise specified in the BHEL order/drawing.

4.0 COMPLIANCE WITH NATIONAL STANDARDS:

The material shall comply with the following National standards and also meet the requirements of this specification.

IS::2004 – 1991 (RA -2006) } Carbon Steel Forgings For General Engineering
Gr: 2 (20C8), } Purposes.

5.0 DIMENSIONS AND TOLERANCES:

The dimensions and tolerances shall be as specified on the order/ drawing. Wherever these are not specified, specified, the machining allowances and tolerances shall be as specified below:

For finish machined drawings : 3 ± 1 mm

For rough machined drawings : ± 1 mm

REVISIONS :

36th MOM OF MRC (FCF+HTM)

APPROVED :

INTERPLANT MATERIAL RATIONALISATION
COMMITTEE-MRC (FCF+HTM)

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HARDWAR

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JULY, 1980

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6.0 MANUFACTURE:

Forgings shall be manufactured from steel produced by the open hearth, electric or such other process as may be agreed to between BHEL and the manufacturer.

Steel shall be fully killed.

Sufficient discard shall be made from each ingot to ensure freedom from pipe, segregation and other defects.

The amount of hot working and finishing temperature shall be such as to ensure complete soundness and adequate uniformity of structure and mechanical properties after heat treatment. The forgings shall not be overheated.

The minimum reduction ratio when forgings are made out of ingots shall be 4:1.

For sizes above 250 mm ruling section, the minimum reduction ratio shall be 3.5:1

Note: Raw material like Ingots/Blooms/Billets required for forgings should be procured from BHEL approved sources along with test certificate."

7.0 FREEDOM FROM DEFECTS:

The forging shall be free from defects, such as cracks, fold, flakes, seams, segregation, nonmetallic inclusions and other injurious defects which may affect the utility of the forging.

8.0 HEAT TREATMENT:

Forgings shall be normalised / normalised and tempered at suitable temperature to achieve the mechanical properties specified.

Test pieces shall also be heat treated along with the forgings they represent.

9.0 FINISH:

As mentioned in the drawing.

10.0 CHEMICAL COMPOSITION:

The melt analysis of the steel and permissible variation in the composition of the forgings from the melt analysis shall be as follows:

Element	Percent		Permissible variation , percent
	min.	max.	
Carbon	0.15	0.25	± 0.02
Silicon	0.15	0.35	± 0.03
Manganese	0.60	0.90	± 0.04
Sulphur	---	0.040	+ 0.005
Phosphorus	---	0.040	+ 0.005



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NOTE:

1. Elements not quoted above shall not be added to the steel, other than for the purpose of finishing the heat and shall not exceed the following limits:

<u>Element</u>	<u>Percent, max.</u>
Nickel	0.30
Chromium	0.30
Copper	0.25
Molybdenum	0.05
Vanadium	0.05
Tin	0.05
Boron	0.0003

2. When steel is aluminium killed or killed with both aluminium and silicon, the requirements of minimum silicon content shall not apply. For aluminium killed steel the total aluminium content shall be within 0.02 to 0.05 percent.
3. Percent Cu + 10 X (percent Tin) shall not exceed 0.5%.
4. Carbon equivalent (Melt analysis) value (C.E.) = 0.42%, max.

$$C.E. = C + \frac{Mn}{6} + \frac{Cr+Mo+V}{5} + \frac{Ni + Cu}{15}$$

5. Mo ≤ 0.15%, limiting to meeting conditions of Cr + Mo + Ni = 0.5%.

11.0 TEST SAMPLES:

- 11.1** Unless otherwise specified in the order/drawing, test samples shall be taken from each melt and heat treatment batch. Test samples should be cut from the heat treated forgings by cold process only and shall receive no further heat treatment.

Test samples shall be cylindrical or rectangular in shape and cut at a distance of 12.5 mm below the heat treated surface.

- 11.2** When integral test pieces are not called for, a test sample, having similar reduction ratio and heat treatment, as the forgings it represents, shall be provided per heat, per heat treatment batch, for check testing at BHEL, along with the forgings. The samples shall be properly identified and correlated with the Heat/Heat treatment batch No./Test certificate No. Test samples shall be taken, at a distance 12.5 mm below heat treatment surface.

- 11.3** Test samples shall generally be taken in the longitudinal direction. However, for economic reasons or where the size/configuration does not permit the same, test samples may be taken in the transverse or radial direction.

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12.0 MECHANICAL PROPERTIES :

The test pieces, after being heat treated as per clause 7.0 above, shall show the following properties upto a limiting ruling section of 800 mm. Properties for thicker sections shall be subject to agreement between BHEL and the manufacturer.

Test methods are specified below:

- 12.1 Tensile : IS: 1608
 12.2 Hardness Test (Brinell) : IS:1500
 12.3 Charpy Impact Value (2mm U-Notch): IS:1499

The test is applicable for forgings of sizes above 16mm only.


Property	Sample (CI 11.3)	Limiting ruling section, mm		
		Upto & incl.100	> 100 & upto 400	> 400 & upto 800
Tensile strength, min, N/mm ²	Longitudinal Transverse/ Radial/ Tangential	430	390	370
Yield strength, min, N/mm ²	Longitudinal Transverse/ Radial/ Tangential	230	195	185
Elongation on 5.65√So gauge length percent, min.	Longitudinal Transverse/ Radial/ Tangential	24 12 16 18	23 11 15 17	21 9 13 15
* Hardness, Brinell, HB	----	120 – 167	111 – 156	111 - 156
Charpy Impact value (2mm U-Notch) min., joules	Longitudinal Transverse/ Radial/ Tangential	47 24 28 35	43 22 26 32	40 20 24 28

Note:

1. Unless otherwise stated on the order/drawing small forgings of non-critical nature weighing less than 300 kg shall be accepted on the basis of chemical composition and hardness.
 *2. Hardness test can be conducted only when tensile test can not be performed.

13.0 ULTRASONIC TESTS:

- 13.1 For forgings ordered by BHEL, Hyderabad: Unless other wise specified on the drawing, ultrasonic test shall be carried out as per BHEL standard AA 085 01 18 and norms of acceptance shall be as per category 2. ↑
- 3.13.2 For forgings ordered by other units: If specified on the drawing/order, ultrasonic test shall be carried out as per BHEL standard AA 085 01 18 and norms of acceptance shall be as per category 2, unless otherwise specified. ↑

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<p>14.0 ADDITIONAL TESTS: If specified in the drawing /order, the following tests shall be conducted:</p>										
<p>14.1 Bend Test (Longitudinal):</p> <p>The test pieces (230mm long and 32 mm square with edges rounded off, where the dimensions permit) shall be capable of being bent cold by direct pressure without fracture, until the sides are parallel, round a mandrel having a diameter of 44 mm when tested as per IS:1599.</p>										
<p>14.2 Magnetic particle test:</p>										
<p>14.3 Any other tests.</p> <p>"Norms of acceptance shall be as specified on the drawing/order. "</p>										
<p>15.0 SCOPE OF THIRD PARTY INSPECTION:</p> <p>Wherever, separate quality plan is not attached, the scope of third party inspection shall be as follows:</p> <ol style="list-style-type: none"> 1. Review of supplier's declared chemical composition. 2. Selection of test samples for mechanical tests and witness of mechanical tests. 3. Witness of Non-destructive tests as applicable. 4. Review of HT charts. 5. Dimensional inspection. 										
<p>16.0 TEST CERTIFICATES:</p> <p>Three copies of a test certificates shall be supplied, unless otherwise stated in the order, in the Test Certificate proforma annexed to this specification (Annexure -I).</p> <p>In addition, the supplier shall ensure to enclose one copy of the test certificate along with their dispatch documents to facilitate quick clearance of the material.</p> <p>The following details shall be furnished in the test certificate:</p> <p>Dimensional inspection. Details of heat treatment. Reduction ratio Chemical composition including trace elements. Results of mechanical tests. Results of Ultrasonic test Results of ultrasonic examination. Results of additional tests called for in the drawing/order.</p>										
<p>17.0 PACKING & MARKING:</p> <p>Forgings shall be suitably packed to prevent damage during transit. Machined surfaces shall be properly protected with anticorrosive compounds. Each package or forging (when supplied separately) shall be legibly marked with the following information:</p> <p>AA 193 31 - Carbon Steel Forgings, Class 2 (20C8). BHEL Order No. Suppliers Name Consignment/ Identification No. Batch No. Weight.</p>										
<p>18.0 REFERRED STANDARDS (Latest publications Including Amendments):</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 25%;">1) IS:1499</td> <td style="width: 25%;">2) IS:1500</td> <td style="width: 25%;">3) IS:1599</td> <td style="width: 25%;">4) IS:1608</td> </tr> <tr> <td>5) IS:2004</td> <td>6) AA 085 01 18</td> <td></td> <td></td> </tr> </table>			1) IS:1499	2) IS:1500	3) IS:1599	4) IS:1608	5) IS:2004	6) AA 085 01 18		
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5) IS:2004	6) AA 085 01 18									

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ANNEXURE-I: RECOMMENDED TEST CERTIFICATE FORMAT FOR FORGINGS

SUPPLIER'S NAME AND ADDRESS											
TEST CERTIFICATE FOR FORGINGS											
1. Customer: 2. TC No. & Date: 3. PO No.: 4. Process of Melting Ingot: 5. Deoxidisation Process: 6. Forging Method: 7. BHEL's Reference for Approval of Bloom 8. Discard: Top _____ %; Bottom _____ %	9. Reduction Ratio } Ingot to Bloom } Bloom to Blank 10. Batch No.: 11. Heat/Melt No. 12. Spec.No. 13. Test Bar Size & Nos. 14. Supplier of the ingot/billet/ Bloom and TC reference.										
15. FORGINGS COVERED BY TEST CERTIFICATE											
S.No.	Drawing No. & Item No.	Description	Quantity & Weight								
16. CHEMICAL COMPOSITION (PERCENT)											
Element	C	Si	Mn	S	P						
As Per Specn.	Min.										
	Max.										
Actual Values											
17. HEAT TREATMENT (To be accompanied by Recorder Chart, Whenever called for)											
Condition	Heating Rate, °C/hr.	Temp. °C	Soaking Time, Hrs.	Cooling Rate, °C/hr	Cooling Medium						
18. MECHANICAL PROPERTIES											
As Per Specn.	T.S. N/mm ²	Y.S. 0.5/0.2% Proof N/mm ²	% Elongation 5.65√So GL	% R.A. Min.	Hardness BHN (Min. 3 values)	Impact Value Joules	Bend Test				
							Angle of bend	Dia of mandrel	Result		
19. SURFACE FINISH (When called for in the order/drg.)											
20. DIMENSIONAL INSPECTION											
21. NON-DESTRUCTIVE TESTS											
Nature of Test	Acceptance level	Instrument used	Range	Results	Any other detail						
Ultrasonic											
Radiographic											
Dye penetrant/ Magnetic Particle											
22. METALLOGRAPHIC EXAMINATION (To be conducted if called for and photo micrographs to be attached along with a report)											
Location of Sample	Etchant used	Magnification	Constituent observed	Relative %							
Microstructure	Macroetch	Inclusion Rating									
23. OTHER TESTS IF ANY (MICROSCOPIC, SULPHUR PRINTS, ETC)											
24. IDENTIFICATION OF FORGINGS AS PER PURCHASE SPEC.											
We hereby certify that the items mentioned above have been tested and inspected in our presence and are found to be in accordance with drawings, specifications and purchase order.											
SIGNATURE, NAME & SEAL OF THE INSPECTING OFFICER DATE:						SIGNATURE, NAME & SEAL OF THE CHIEF OF QUALITY CONTROL/ CHIEF METALLURGIST OF THE SUPPLIER DATE:					
INSTRUCTIONS											
a) Details of all heat treatment processes carried out should be furnished sequentially in 17. b) Test certificates are to be furnished as per Purchase order and specification, in A4 size preferably in transparent paper. c) All the entries including signature should be in block colour ink. d) If testing is done by outside agencies, the original TCs shall be furnished. e) The actual TC may run into more than one A4 size paper, if needed, to facilitate filling up of details.											

