

BHEL Tender Enquiry :: 15E0038Dt: 23.05.2015 Due On: 16.06.2015  
BHEL NIT No :: Dt \_\_\_\_\_  
Tender Item :: "SUPPLY OF AL STRIP FLEXIBLES"

## TENDER COVER PAGE (CHECK LIST)

This Tender consists of **33 pages** as below:

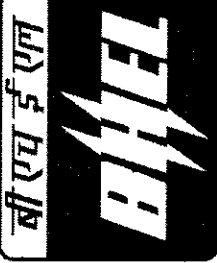
- Tender Cover Page - Page-1
- NIT - Page-2
- BHEL Tender Enquiry - Page-3
- Techno commercial Bid (PART-A) - Page-4 to 10
- Qualifying Criterion - Page-5
- General Conditions of Contract (GCC)-Annexure-A - Page-6 to 7
- Special Conditions of Contract (SCC) -Annexure-B - Page -8
- Technical Conditions of Contract (TCC) -Annexure-C - Page-9
- Unprice/Price Bid- Annexure-I(A) - Page-10
- Price Bid (PART-B) - Page-11 to 12
- Unprice/Price Bid- Annexure-I(B) - Page-12

### DOCUMENTS / STANDARDS / ANNEXURES:

- Quality Assurance Plan - Page-13
- Public Procurement Policy for MSEs Order 2012-Annexure-D - Page-14
- Welding Procedure Specifications - Page-15 to 33

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33 pages



भारत हेवी इलेक्ट्रिकल्स लिमिटेड  
(भारत सरकार का उपक्रम)  
**BHARAT HEAVY ELECTRICALS LIMITED**  
(A Govt. Of India Undertaking)

Component Fabrication Plant, Rudrapur - 263153

Distt. Udham Singh Nagar (Uttarakhand)

Tel: (05944) 257221/257205, Fax: (05944)243605


E-mail: [shilananand@bhel.in](mailto:shilananand@bhel.in) / [shyamb@bhel.in](mailto:shyamb@bhel.in)

ITEM DESCRIPTION	OTE No	BHEL NIT No
ANNUAL FRAME WORK AGREEMENT FOR FABRICATION OF SEGREGATED PHASE (SP) BUS DUCTS (ALUMINIUM) ON JOB WORK BASIS	15E0035	22630
ANNUAL FRAME WORK AGREEMENT FOR SILVER PLATING	15E0036	22641
ANNUAL FRAME WORK AGREEMENT FOR SUPPLY OF AL STRIP FLEXIBLE	156038	

DESIGN, MANUFACTURING, SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF 320 KVA SILENT DG SET

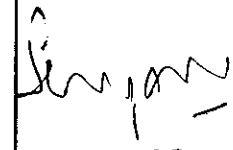
Sealed tenders in two bids are invited from reputed suppliers for "Above notified enquiries". Detailed tender documents can be obtained from the office of the undersigned either in person or can be downloaded from BHEL website [www.bhel.com](http://www.bhel.com) or CPP portal [www.eprocure.gov.in](http://www.eprocure.gov.in). Fully completed offers must reach BHEL RUDRAPUR office not later than 1400 Hrs on tender due date on 16.06.15 and techno-commercial bid shall be opened on 16.06.15 at 1500 hours. All corrigenda, addenda, amendments, time extensions, clarifications etc. if any to the tender will be hosted on BHEL website ([www.bhel.com](http://www.bhel.com)) & CPP portal [www.eprocure.gov.in](http://www.eprocure.gov.in) only. Bidders should regularly visit website(s) to keep themselves updated. **DGM (MM/CS)**

By Courier/Regd. Post/Speed Post

 <b>TENDER ENQUIRY</b> (Supplier's Copy)	Enquiry no. & Date	Due date for Quotation
	15E0038 23.05.15	16.06.15
<b>To,</b>  <b>OPEN TENDER ENQUIRY</b>		
<b>Bharat Heavy Electricals Ltd.</b> (A Govt. of India Under Taking) <b>Rudrapur - 263153 Distt. Udham Singh Nagar</b> <b>(Uttarakhand) India</b> <b>Phone no.- 05944-241400/242326</b> <b>Fax no. 05944-243605</b> <b>e-mail : shilanand@bhel.in</b> <b>manohar@bhel.in</b>		

Sl.No.	Description	Unit	Req. Qty.	Delivery Schedule
	ANNUAL FRAME WORK AGREEMENT FOR MANUFACTURING AND SUPPLY OF AL. STRIP FLEXIBLE ON FINISHED BASIS  <b>Terms &amp; Conditions</b> 1 List of Scope of Work (Including GCC, SCC & TCC) as given in Annexure A, B, C. 2 QAP for Al. Strip Flexible  Offer shall be invited in Two Bid System containing: A) <u>Techno-commercial bid</u> consisting of: i) Technical Offer ii) Unconditional Signed Copies of BHEL Terms & Conditions (GCC, SCC & TCC) iii) Un-priced Copy of Price Bid in Annexure-I(A). iv) Quantity as per Annexure-I(A). B) Price Bid as per Annexure-I(B)  4 To go for <b>REVERSE AUCTION EVENT</b> subsequent to techno-commercial suitability of offers. 5 Late & Delayed offers shall not be considered even if post by speed/regd. Post before due date. 6 Validity of offer shall be 03 months from the date of opening of tenders 7 Bidder shall immediately contact for any conflicting & contradicting terms, if any and get it clarified the doubts, if any. 8 Documents/Standards/Packing Instructions/ Annexures as per tender	Kgs.	20000	AS MENTIONED IN ANNEX-A

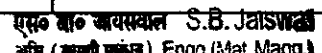
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Dear Sir,

Please submit your lowest quotation, subject to our terms and conditions written over leaf of the above mentioned items so as to reach us on or before the due date by 2.00 P.M.

**Enquiry No. & Due Date should be superscribed on the envelope containing the quotation**

  
 S.B. Jaiswal  
 Engg. (Mat. Mang.)  
 263153 Uttarakhand 263153

**FOR BHARAT HEAVY ELECTRICALS LTD.**  
**(SIGN. & NAME)**

# PART-(A) BID

Qualifying Criteria: 01 Page

Technical Bid : GCC, SCC, TCC & Documents/  
Standards/Drawing/Procedures etc.

Un Price Bid : 01 Page

***Please submit all the above in an envelope SUPERSCRIBED as  
"TECHNO COMMERCIAL BID".***

Page 4 of 33



एस० बा० जायसवाल S.B. Jaiswal  
अधि. (सामग्री प्रबंधन) Engg.(Mat. Mang.)  
बी.एच.ई.एल.-रुद्रपुर BHEL-Rudrapur  
वत्सराखण्ड-263153 Uttarakh: 263153

## Qualification Criteria

## Annexure-E

Sl. No.	Qualifying Criteria (ESSENTIAL)	Documents in support of Qualifying Criteria
1	Bidder should have qualified aluminium welder. ( Please submit certificate from NTPC, Lloyd's Register or any reputed / recognized agency as per standard) Welder qualification certificate must be for X-Ray quality welding.	Agency certificates
2	The offer will have to be submitted in TWO BID SYSTEM against this notified tender. PART- (A) BID: Qualifying Criteria, Technical Bid with Un Priced copy of quoted price bid. PART- (B) BID : Price Bid Bids not submitted as per above shall be SUMMARILY REJECTED.	QUOTE ACCORDINGLY
3	Rates must be quoted with MATERIAL as this is a SUPPLY ITEM & to be quoted on PER KG. BASIS ONLY else bid shall be REJECTED.	QUOTE ACCORDINGLY
<b>Note:-</b>	1. If required BHEL will do the inspection / assesment of works of Non PMD bidders before clearance of their technical bid. After successful qualification their offer will be considered for further processing. In case of disqualification their offer will not be considered for further action.	
Signature of Bidder ( with office seal)		

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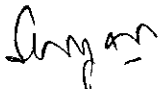
*S.B. Jaiswal*

एस० बी० जायसवाल S.B. Jaiswal  
अधि. ( सामग्री प्रबंधन ) Engg. (Mat. Mang.)  
बी.एच.ई.एल. - रुद्रपुर BHEL - Rudrapur  
उत्तराखण्ड-263153 Uttarakhand-263153

## GENERAL CONDITIONS OF CONTRACT (GCC):

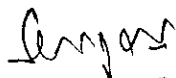
1.	Rates shall be quoted on <b>FOR BHEL RUDRAPUR</b> basis. (Address: STORE OFFICER COMPONENT FABRICATION PLANT BHARAT HEAVY ELECTRICALS LIMITED KICHHA BYE PASS ROAD NEAR FCI GODOWN U. S. NAGAR, UTTARAKHAND-263153																				
2.	Rates should be quoted for entering into Framework Agreement for 01 year. Rates quoted shall be firm for 01 year for ordering. Multiples Orders shall be placed during currency of year on firm rates.																				
3.	100% payment shall be made in 45 days after receipt and verification of material at store. Any deviation in payment terms will be loaded @ (SBI PLR rate + 6 %) annual interest for comparing standing.																				
4.	Validity of the quotation must be 3 months from the date of quotation.																				
5.	Late Delivery Penalty: The delivery of goods shall be made strictly as per time limit specified in delivery schedule. Failure to supply within this period will make the supplier liable to a penalty of ½% (half percent) of the total order value per week of delay or part thereof subject to a maximum of 10% of the total order value for the reasons attributable to the party.																				
6.	<p><b>BHEL reserves the right to:</b></p> <p>a. To place the order on more than one bidder , in each case/category up to maximum 03 bidders,</p> <table border="1" data-bbox="459 1258 1268 1617"> <thead> <tr> <th colspan="4">DISTRIBUTION OF TENDER QUANTITY (%)</th> </tr> <tr> <th>Slab</th> <th>L-1</th> <th>L-2</th> <th>L-3</th> </tr> </thead> <tbody> <tr> <td>03 bidders</td> <td>50</td> <td>30</td> <td>20</td> </tr> <tr> <td>02 bidders</td> <td>60</td> <td>40</td> <td></td> </tr> <tr> <td>1 bidder</td> <td>100</td> <td></td> <td></td> </tr> </tbody> </table> <p>b. To go for reverse auction instead of opening the sealed price bid, which will be decided after techno-commercial evaluation. In such case all qualified bidders will be intimated regarding procedure / modality for RA process prior to Reverse Auction and price will be decided as per the rules for Reverse Auction. However, if reverse auction process is</p>	DISTRIBUTION OF TENDER QUANTITY (%)				Slab	L-1	L-2	L-3	03 bidders	50	30	20	02 bidders	60	40		1 bidder	100		
DISTRIBUTION OF TENDER QUANTITY (%)																					
Slab	L-1	L-2	L-3																		
03 bidders	50	30	20																		
02 bidders	60	40																			
1 bidder	100																				

	<p>unsuccessful as defined in the RA rules/ procedures, or for whatsoever reason, then the sealed 'PRICE Bids' will be opened for deciding the successful bidder. BHEL's decision in this regard will be final and binding on bidder.</p> <p>c. Accept/ reject, any or all tenders or part thereof without assigning any reasons.</p> <p>d. To terminate the FA by giving a notice period of 15 days if the performance of the party is not found to be satisfactory.</p> <p>e. To counter offer systematically to all the techno-commercial qualified bidders who are participated in Reverse Auction.</p> <p>f. To finalize the Framework Agreement with maximum 03 bidders.</p>
7.	<p>Delivery schedule shall be in progressive lots or as per individual P.O. Bidder to submit their monthly manufacturing capacity of each type of flexible and combined capacity of all the 03 types of flexible.</p> <p>Delivery shall be as per monthly capacity of bidder as declared.</p>
	<p><b>Aluminium Base Price:</b></p> <p>i) Rates should be based on Nalco price of IC20 Ingot @ <b>Rs. 1, 46, 900/- PMT of 11.03.2015.</b> This is the basic NALCO price. ED, CST &amp; Octroi is extra. Rates based on any other base price shall NOT be acceptable.</p> <p>ii) Reference: Price circular no. dated: 11-March-2015.</p> <p>iii) Applicable rates shall be those of 1 month prior from the month in which delivery is being made e.g., if delivery of Aluminium Flexible is being made in September that the NALCO price of 01-August will be taken for operating PV Clause.</p> <p>iv) PVC ratio shall be <b>1:0.34 (one is to zero point three four).</b> PVC ratio other than mentioned above shall not be acceptable.</p>
9.	The Offered Bids against tender must reach at our office on or before due date. Late offers shall not be considered received after due date even if posted by speed/registered post before due date.
10.	The whole FA can be short closed / terminated without mentioning any reasons thereof.
11.	In addition to above terms and conditions, provision of public procurement policy of MSI's order 2012 shall also apply as per Annexure-'D'.
12.	<b>Other than BHEL PMD (registered) vendors, bidders to confirm the following conditions:-</b>
	a) Should have aluminium welding qualified welders.
	b) Should have trained staff for quality testing not less than ENGG. Graduate.
	c) Should have qualified Production Manager/Supervisor (ENGG. Graduate).

  
 एस० बी० जायसवाल S.B. Jaiswal  
 अभि. (सामग्री प्रबंधन) Engg. (Mat. Mang.)  
 बी.एच.ई.एल.-रुद्रपुर BHEL, Rudrapur  
 उत्तराखण्ड-263153 Uttarakhand-263153

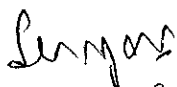
**SPECIAL CONDITIONS OF CONTRACT (SCC):**

1.	<p><i>The offer will have to be submitted in TWO BID SYSTEM against this notified tender.</i> <i>PART- (A) BID: Qualifying Criteria Technical Bid with Un Priced copy of quoted price bid.</i> <i>PART- (B) BID : Price Bid</i> <i>Bids not submitted as per above shall be <u>SUMMARILY REJECTED.</u></i></p>
2.	<p>Rates must be quoted with MATERIAL &amp; to be quoted on PER KG. BASIS ONLY else bid shall be rejected.</p>
3.	<p>Silver Plating shall be in the scope of BHEL RUDRAPUR.</p>
4.	<p>Although the purchases shall be made in "Nos.", however, total weight of finished aluminium component shall be verified for inspection &amp; payment purposes.</p>
5.	<p>Payment shall be made as per DRAWING WEIGHT. However, if actual weight is less than drawing weight payment shall be made as per ACTUAL WEIGHT.</p>

  
एस.बी. जयसवाल S.B. Jaiswal  
अभि. (सामग्री प्रबंधन) Engg.(Mat. Mang.)  
बी.एच.ई.एल.-रुद्रपुर BHEL-Rudrapur  
उत्तराखण्ड-263153 Uttarakhand-263153

**TECHNICAL CONDITIONS OF CONTRACT (TCC):**

1.	Material Specifications shall be as per IS 5082 / IS 737. Raw Material shall be procured from HINDALCO, BALCO & JINDAL ONLY & Invoice cum TC of HINDALCO, BALCO & JINDAL required with each consignment.
2.	Applicable Drawings & Quality Assurance Plan (QAP) of BHEL shall be followed as per P.O., Sample QP No. - QP/BD/RU/AL_FLEX Rev: 00 dated 23-May-15 is enclosed for reference.
3.	Availability of drawings / quality plan with latest revision must be ensured from Production Planning /Engineering/Quality Deptt of BHEL, Rudrapur before start of the work.
4.	100% DP TEST on all welding joints are to be carried out.
5.	10% Radiographic Test on welded joints are to be carried out & report to be submitted along with X-Ray Films.
6.	Test Certificates/Guarantee Certificate shall be required with material with each consignment.
7.	Inspection to be done before dispatch by BHEL/TPIA/CUSTOMER.
8.	Surface Finish should be suitable for Silver Plating.
9.	Packing should be done in Wooden Boxes & each Wooden Box should weigh approx. 30 kg. only. Each unit flexible shall be individually identifiable by PO No, Sl No & Drawing No..
10.	Welding Procedure Specifications (WPS : RU 10001, RU 11002, RU 11003, RU 10004)

  
एस० बी० जयसवाल S.B. Jaiswal  
अभि, (साफ़ी प्रबंधन) Engg. (Mat. Managt)  
सी.एच.ई.एल. - रुद्रपुर BHEL, Rudrapur  
दूरभाष: 253153 Udaipur

## UNPRICE / PRICE BID:

## A) UNPRICE BID FORMAT

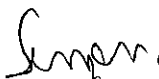
## B) PRICE BID (Please Fill all columns in this BID)

Sl. No.	Description	Quantity (Kg)	Basic Rate (Rs / Kg)	ED as applicable	CST as applicable	Landed Rate (Rs / Kg)
(A)	(B)	(C)	(D)	(E)	(F)	(G)= (D)+(E)+(F)
1	Weight Slab: up to 2.09 Kg / flexible	8000	QUOTED	QUOTED	QUOTED	QUOTED
2	Weight Slab: (2.10 to 4.945) Kg / flexible	6000	QUOTED	QUOTED	QUOTED	QUOTED
3	Weight Slab: (4.95 & above) Kg / flexible	6000	QUOTED	QUOTED	QUOTED	QUOTED

Special Instructions:-

- Rates should be based on Nalco price of IC20 Ingot @ Rs. 1, 46, 900/-PMT of 11.03.2015.  
This is the basic NALCO price, ED, CST & Octroi is extra. Rates based on any other base price shall NOT be acceptable.
- Applicable rates shall be those of 1 month prior from the month in which delivery is being made e.g., if delivery of Aluminium Flexible is being made in September that the NALCO price of 01-August will be taken for operating PV Clause.
- PVC ratio shall be 1:0.34 (one is to zero point three four).  
PVC ratio other than mentioned above shall not be acceptable.
- While quoting rates against column "D", bidder to ensure that they have gone through all Terms & Conditions of the tender enquiry and necessary impact of the same was taken while quoting rate in column "D".
- Column-D indicates Basic Rate in Rs / Kg.
- Column-G indicates Total Landed Rate in Rs / Kg. L1 rate will be decided based on the Slab wise landing rate mentioned in Column-G while Comparing Standing during evaluation (REVERSE AUCTION or PRICE BID).

(Bidder's Sign &amp; Seal)

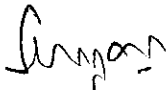
  
 S.B. Jaiswal  
 अति, (गणपति मंदिर, गणेश, गणेश)  
 गणेश, गणेश, गणेश  
 गणेश, गणेश, गणेश

# PART-(B) PRICE BID

Price Bid : 01 Page

Please submit the above in an envelope SUPERSCRIBED as "PRICE BID"

Page 11 of 33

  
एस० बी० जायसवाल S.B. Jaiswal  
अपि (साथी प्रबंधन) Engg.(Mat. Mang.)  
बी.एस.ई.एल.-रुद्रपुर BHEL-Rudrapur  
उत्तराखण्ड-263153 Uttarakhand-263153

## UNPRICE / PRICE BID:

## C) UNPRICE BID FORMAT

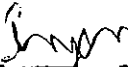
## D) PRICE BID (Please Fill all columns in this BID)

Sl. No.	Description	Quantity (Kg)	Basic Rate (Rs / Kg)	ED as applicable	CST as applicable	Landed Rate (Rs / Kg)
(A)	(B)	(C)	(D)	(E)	(F)	(G)= (D)+(E)+(F)
1	Weight Slab: up to 2.09 Kg / flexible	8000	QUOTE HERE	QUOTE HERE	QUOTE HERE	QUOTE HERE
2	Weight Slab: (2.10 to 4.945) Kg / flexible	6000	QUOTE HERE	QUOTE HERE	QUOTE HERE	QUOTE HERE
3	Weight Slab: (4.95 & above) Kg / flexible	6000	QUOTE HERE	QUOTE HERE	QUOTE HERE	QUOTE HERE

Special Instructions:-

- Rates should be based on Nalco price of IC20 Ingot @ Rs. 1, 46, 900/-PMT of 11.03.2015.  
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- Applicable rates shall be those of 1 month prior from the month in which delivery is being made e.g., if delivery of Aluminium Flexible is being made in September that the NALCO price of 01-August will be taken for operating PV Clause.
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(Bidder's Sign &amp; Seal)

  
 एस० बी० जयसवाल S.B. Jaiswal  
 अभि. (सापेक्ष प्रबंधन) Engg (Spec. Mang.)  
 पी.एच.ई.एल.-कटकुड़ा BH-1  
 उत्तराखण्ड-263153 Uttarakhand



# QUALITY ASSURANCE PLAN

QAP NO: QP/BD/RU/AL\_FLEX  
 REV: 00  
 DATE: 23.05.15  
 PAGE: 1 OF 1

ITEM: ALUMINIUM STRIP FLEXIBLE

SL. NO.	COMPONENT	CHARACTERISTICS	CATEGORY	METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS				REMARKS
								P	W	R	H	
1.0	Aluminium strip flexibles	a) Dimensions*	Major	Measurement	100 %	BHEL Appd Drg		3	1/2	-	-	* 5% random witness by 1/2 for characteristic (a)
		b) Surface finish	Minor	Visual	100 %	IS / BHEL'S CS		3	1/2	-	-	
		c) Chemical Composition	Major	Chemical	1 sample/lot	IS: 5082 / TDS		3/4	-	1/2	-	
		d) Tensile Strength	Critical	Mechanical	1 sample/lot	IS: 5082 / TDS		3/4	-	1/2	-	
		e) % of Elongation	Critical	Mechanical	1 sample/lot	IS: 5082 / TDS		3/4	-	1/2	-	
		f) Electrical Conductivity	Critical	Electrical	1 sample/lot	IS: 5082 / TDS		3/4	-	1/2	-	
		g) DP Test on weld	Critical	Electrical	10%	CS: AA0850131	CS: AA0850129	3/4	1/2	-	-	
		h) Radiography Test	Critical	Test	10%		GDGD-198	3/4	-	1/2	-	
		i) Silver Plating thickness for flexible connector (if reqd.)	Critical	Measurement	2% sample/lot		BHEL Approved Drawing	3	1/2	-	-	
		j) Weight of flexible (to be verified with BHEL appd drg)	Critical	Measurement	5 samples/lot		BHEL Approved Drawing	3	1/2	-	-	

### ABBREVIATIONS:

- R= REVIEWED BY
- P= PERFORMED BY
- W= WITNESS BY

H= HOLD (UNLESS A WRITTEN CLEARANCE IS OBTAINED FROM BHEL, MANUFACTURER SHALL NOT PROCEED TO NEXT STAGE)

IR= INSPECTION REPORT

TR= TEST REPORT/CERTIFICATE

TDS= TECHNICAL DATA SHEET

APPD DRG= APPROVED DRAWING

CS= CORPORATE STANDARD

1= BHEL-QC

2= BHEL'S THIRD PARTY INSPECTION AGENCY

3= MANUFACTURER / SUB-VENDOR

4= NABL APPROVED EXTERNAL LABORATORY / AGENCY

PREPARED BY: **Ravindra Kumar**  
 Engineer/Quality Control  
 BHEL Rudrapur

*Ravindra*  
**Faraaz Ali**  
 Sr. Engrg. (Qty. Control)  
 BHEL, Rudrapur  
 उत्तराखण्ड - 263153

APPROVED BY

*Engg*  
 Page 12 of 23  
 एस० बी० जायसवाल S.B. Jaiswal  
 अभि. (सागरी प्रबंधन) Engg. (Mat. Mang.)  
 बी.एस.ई.एल. - रुद्रपुर BHEL Rudrapur  
 उत्तराखण्ड-263153 Uttarakhand

## Public Procurement Policy for MSEs Order 2012

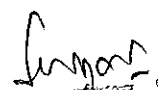
15E00 \_\_ Dt: \_\_.05.2015 Due On: \_\_.06.2015

In line with the order dated 23-03-2012 of Ministry of Micro, Small & Medium enterprises, New Delhi following provisions shall apply to the tenders floated against this TC MoU:

1. BHEL, CFP, Rudrapur has set an annual goal of procurement from Micro and Small Enterprises from the FY 2012-13 and onwards, with the objective of achieving an overall procurement of minimum of 20% of total annual purchases of products produced and services rendered by Micro and Small Enterprises in a period of 3 years.
2. Out of 20% target of annual procurement from Micro and Small Enterprises, a sub-target of 20% (i.e. 4% out of 20%) is earmarked for procurement from Micro and Small Enterprises owned by the Scheduled Caste or Scheduled Tribe entrepreneurs. In the even of failure of such Micro and Small Enterprises to participate in the tender process or meet tender requirements or L1 price, 4% sub-target for procurement earmarked for Micro and Small Enterprises owned by Scheduled Caste or Scheduled Tribe entrepreneurs shall be met from other Micro and Small Enterprises.
3. In tender, participating Micro and Small Enterprises quoting price within price band of L1+15% shall also be allowed to supply a portion of requirement by bringing down their price to L1 price in a situation where L1 price is from someone other than a Micro and Small Enterprise and such Micro & Small Enterprise shall be allowed to supply up to 20% of total tendered quantity. In case of more than one such Micro and Small Enterprise, the supply shall be shared proportionately (to tendered quantity).
4. Tender Cost is free for Micro and Small Enterprises
5. Micro and Small Enterprises are exempt from paying Earnest Money Deposit.

Note:

- a) All Micro and Small Enterprises and those Micro and Small Enterprises which are owned by the Scheduled Caste or the Scheduled Tribe entrepreneurs are required to submit LATEST & VALID CERTIFICATES for availing the benefits enumerated in "Public Procurement Policy for MSEs Order 2012".
- b) Out of the 358 items reserved for exclusive purchase from Micro and Small Enterprises, the following items are procured by BHEL, CFP, Rudrapur at present from Industrial Entrepreneurs:
  - a. Bolts & Nuts upto 10 mm<sup>2</sup> nominal CS.
  - b. Boots & shoes of all types including canvas shoes.
  - c. Conduit pipes
  - d. Hand Gloves of all types
  - e. Hand tools of all types
  - f. Crates, wooden & plastic
  - g. Lightning arresters upto 22 kV
  - h. Domestic Electric appliances as:
    - i. Measuring tapes & sticks as per BIS specifications.
    - ii. Metal Clad Switches up to 30 Amps
    - iii. Domestic (house wiring) PVC Cables and Wires (Aluminium)
    - iv. PVC Pipes upto 110 mm conforming to the prescribed
    - i. Screws of all types including High Tensile strength.

  
 एम. एम. प्रबंधक S.B. Jaiswal  
 अभि. ( सामग्री प्रबंधन ) Engg. (Mat. Mang.)  
 बी. एच. ई. एल. - रुद्रपुर BHEL Rudrapur  
 उत्तराखण्ड-263153 Uttarakhand-263153

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# WELDING PROCEDURE SPECIFICATIONS

WPS NO. : RU 10001

PROCESS : GTAW + GMAW

COMPONENT FABRICATION PLANT

BHEL, RUDRAPUR

Page 15 of 33

*S.B. Jaiswal*  
एस.बी. जयसवाल S.B. Jaiswal  
प्रो. (सामग्री प्रबंधन) Engg. (Mat. Mang.)  
बी.एच.ई.एल.-रुद्रपुर BHEL-Rudrapur  
पिनकोड-263153 Uttarakhand-263153

WELDING PROCEDURE SPECIFICATION

WPS NO. RU 10001  
REV. NO. 00  
REV. DT. 24.02.98

Company Name CFP, BHEL, RUDRAPUR

WPS No. RU 10001 Date 24.02.98

Rev. No. 00 Date 24.02.98

Supporting PQR No. 01 DT 24.02.98

Welding Process(es) GTAW + GMAW Type(s) MANUAL

JOINTS

DETAILS

Joint Design AS PER APPROVED PRODUCTION DRAWINGS

Backing YES

Backing Material BASE METAL / WELD METAL

RETAINERS NONE

BASE METALS

P.No. 21 Group No. ----

TO

P.No. 21 Group No. ----

OR

Spec.type/Chemical Analysis N.P.

TO

Spec.type/Chemical Analysis N.P.

THICKNESS RANGE

Base Metal : Groove : 5 - 24 mm Fillet : All Sizes

Pipe Dia Range: Groove : All Diameters Fillet : All Sizes

WORKED BY

*V.S. Yadav*  
(V. S. YADAV)  
ENGINEER

APPROVED BY

*G.O. G. Puri*  
(G. O. G. PURI)  
DGM (PQR)

Page 16 of 33

*S.B. Jaiswal*  
S.B. Jaiswal  
Engg. (Mat. Mang.)  
BHEL-Rudrapur  
263153

FILLER METALS

	GTAW	GMAW
Spec. No. (SFA) :	5.10	5.10
AWS No.(Class) :	ER 4043	ER 4043
F.No. :	23	23
A.No. :	N.A.	N.A.
Size of filler metal :	DIA 3.15 mm	DIA 1.6 mm

WELD METAL (THICKNESS RANGE)

Groove :	9.00 mm Max	18.00 mm Max
Fillet :	All Sizes	All Sizes
Electrode flux class :	N.A.	
Flux trade name :	N.A.	
Consumable Insert :	N.A.	
Others :	NIL	

POSITION

Position Groove :	1G	Temperature range:	NONE
Welding Progression:	NA	Time range :	NONE
Position of fillet :	1F		

PREHEAT

Preheat temp. :	Min. +16 C	Gas(es)	Flow rate
Interpass temp :	Max. +250 C	Shielding :	ARGON 5 - 21
Preheat Maint :	N.R	Trailing :	NIL NIL
		Backing :	NIL NIL

WORKED BY

*V.S. Yadav*  
(V.S. YADAV)  
ENGINEER

APPROVED BY

*G.C. GURUFANI*  
(G.C. GURUFANI)  
DESI (POK)

*Anjan* Page 19 of 33

ए.बी. जायसवाल S.B. Jaiswal  
अ.प्र. (समग्र प्रकल्प) Engg.(Mat. Mang.)  
बी.एल. रुद्रपुर BHEL-Rudrapur  
उत्तराखण्ड-263153 Uttarakhand-263153

ELECTRICAL CHARACTERISTIC

Current AC or DC : AC FOR GTAW Polarity : ---  
DC FOR GMAW RP (GMAW)  
Amps range : 200 - 280 A Volts Range : 12 - 30 V  
Tungsten Electrode type or size : Zirconia - Tungsten 4.00  
5 / 6mm ( For GTAW )  
Mode of metal transfer for GMAW : Spray  
Electrode wire feed speed range : N.A.

TECHNIQUE

String or weave bead : Stringer for GTAW  
Max Bead Width 15 mm for GMAW  
Orifice or gas cup size : DIA 6/8/10 mm  
Initial interpass cleaning : Brushing / Grinding / Chipping  
(Brushing, grinding etc.)  
Method of back gouging : Grinding  
Oscillation : Nil  
Contact tube to work distance : 3 mm Min  
Multipass or single pass : Multipass  
Multiple or single electrode : Single  
Travel Speed (Range) : 40 - 70 mm / Min (GTAW)  
200 - 300 mm / Min (GMAW)  
Peering : Not Permitted  
Electrode spacing : N.A.  
Others : Max. pass thickness  
less than 5 mm for GTAW  
and 8 mm for GMAW

WORKED BY  
*V.S. Yadav*  
(V.S. YADAV)  
ENGINEER

APPROVED BY  
*S.B. Jaiswal*  
(S.B. JAISWAL)  
DSM (PQM)

WPS NO. : RU 10001  
REV.NO. : 00  
REV.DT. : 24.02.98

Weld Layers	Process	Filler metal Class	metal dia	Current Type	Volt Amp.	Travel Range	Speed
Root Run	GTAW	ER 4043	3.15	AC	200 - 280	--	40-70 mm/Min
First run Subsequent layers	GMAW	ER 4043	1.60	DCRP	180-230	--	200-300

SPECIAL REMARKS : Ensure that approx. 12.5 mm area near the weld joint is thoroughly cleaned prior to welding.

WORKED BY

*V.S. Yadav*

(V.S. YADAV)  
ENGINEER

APPROVED BY

*G.C. Gururani*

(G.C. GURURANI)  
DGM(PQM)

Page 4 of 4

Page 19 of 33

*S.B. Jaiswal*

एस. बी. जयसवाल S.B. Jaiswal  
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वी.एच.ई.एल. - रुद्रपुर BHEL-Rudrapur  
उत्तराखण्ड-263153 Uttarakhand-263153

# WELDING PROCEDURE SPECIFICATIONS

WPS NO. : RU 10004

PROCESS : GTAW

COMPONENT FABRICATION PLANT

BHEL, RUDRAPUR

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*Singh*  
एस० बी० जायसवाल S.B. Jaiswal  
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वी.एच.ई.एल.-रुद्रपुर BHEL, Rudrapur  
कलकत्ता-263153 India

WELDING PROCEDURE SPECIFICATION

WPS NO. RU 10004

REV. NO. 00

REV. DT. 24.02.98

Company Name CFP, BHEL, RUDRAPUR

WPS No. RU 10004 Date 24.02.98

Rev. No. 00 Date 24.02.98

Supporting PQR No. 04 DT 24.02.98

Welding Process(es) GTAW Type(s) MANUAL

JOINTS

DETAILS

Joint Design AS PER APPROVED PRODUCTION DRAWINGS

Backing YES

Backing Material BASE METAL / WELD METAL

RETAINERS NONE

BASE METALS

P.No. 21 Group No. ----

TO

P.No. 21 Group No. ----

CP

Spec. type/Chemical Analysis N.P.

TO

Spec. type/Chemical Analysis N.P.

THICKNESS RANGE

Base Metal : Groove : 1.6 - 9.5 mm Filled : All Sizes

Pipe Dia Range: Groove : All Diameters Filled : All Sizes

WORKED BY

*V.S. Yadav*  
(V.S. YADAV)  
ENGINEER

APPROVED BY

*G.O.S. Purant*  
(G.O.S. PURANT)  
DEW. PQR

*S.B. Jaiswal*  
एस० बी० जयसवाल S.B. Jaiswal  
अभि. (सफ़ी प्रबन्ध) Engg. (Mat. Mang.)  
बी.एच.ई.एल.-रुद्रपुर BHEL-Rudrapur  
भारतखण्ड-263153 Uttarakhand-263153

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FILLER METALS

Spec. No. (SFA) : 5.10  
AWS No.(Class) : ER 4043  
F.No. : 23  
A.No. : N.A.  
Size of filler metal : DIA 3.15 mm

WELD METAL (THICKNESS RANGE)

Groove : 9.5 mm Max  
Fillet : All Sizes  
Electrode flux class : N.A.  
Flux trade name : N.A.  
Consumable Insert : N.A.  
Others : NIL

<u>POSITION</u>	<u>POSTWELD HEAT TREATMENT</u>
Position Groove : 1G	Temperature range: NONE
Welding Progression: N.A.	Time range : NONE
Position of fillet : 1F	

<u>PREHEAT</u>	<u>GAS</u>
Preheat temp. : Min. +16° C	Gas(es) Flow rate (l/min)
Interpass temp : Max. +150° C	Shielding : ARGON 5 - 20 Gr I
Preheat Maint : N.R	Trailing : NIL NIL
	Backing : NIL NIL

WORKED BY  
*V. S. Yadav*  
(V. S. YADAV)  
ENGINEER

APPROVED BY  
*G. C. Gururani*  
(G. C. GURURANI)  
DGM (PCM)

*S. B. Jaiswal*  
श्री श्री जयसर्वज्ञ S. B. Jaiswal  
जी. (मापनी प्रबंधन) Engg. (Mat. Mang.)  
डी. ए. ई. एल. - रुद्रपुर BHEL-Rudrapur  
कलकत्ता-263153 उदुपूर-263153




WPS NO. : RU 10004  
REV.NO. : 00  
REV.DT. : 24.02.98

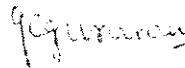
Weld Layers	Process	Filler metal Class	metal dia	Current Type	Volt Amp.	Travel Range	Speed
Root Run	GTAW	ER 4043	3.15	AC	150 - 210	--	60-100 mm/Min
First run Subsequent Layers	GTAW	ER 4043	3.15	AC	150 - 230	--	200-300

SPECIAL REMARKS : Ensure that approx. 12.5 mm area near the weld joint is thoroughly cleaned prior to welding.

WORKED BY


  
(V.S. YADAV)  
ENGINEER

APPROVED BY

  
(G.C. GURURANI)  
DGM (PGM)

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Page 2<sup>n</sup> of 33



एसो वी० जायसवाल S.B. Jaiswal  
अधि. (साप्लो प्रबंधन) Engg. (Mat. Mang.)  
भारतीय ई.एल.-मद्रास BHEL-Rudrapur  
कॉन्ट्रोलिंग-253153 उत्तरांचल-253153

# WELDING PROCEDURE SPECIFICATIONS

WPS NO. : RU 11002

PROCESS : GMAW

COMPONENT FABRICATION PLANT

BHEL, RUDRAPUR

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एस० बी० जयसवाल S.B. Jaiswal  
अधि. ( सामग्री प्रबंधन ) Engg. (Mat. Mang.)  
बी. एच. ई. एल. - रुद्रपुर BHEL-Rudrapur  
उत्तराखण्ड-263153 Uttarakhand-263153

WELDING PROCEDURE SPECIFICATION

WPS NO. RU 11002  
REV. NO. 00  
REV. DT. 24.02.98

Company Name CFP, BHEL, RUDRAPUR

WPS No. RU 11002 Date 24.02.98

Rev. No. 00 Date 24.02.98

Supporting PQR No. 02 DT 24.02.98

Welding Process(es) GMAW Type(s) MANUAL

JOINTS

DETAILS

Joint Design AS PER APPROVED PRODUCTION DRAWINGS

Backing YES

Backing Material BASE METAL / WELD METAL

RETAINERS NONE

BASE METALS

P.No. 21 Group No. ----

TO

P.No. 21 Group No. ----

OR

Spec. type/Chemical Analysis N.R.

TO

Spec. type/Chemical Analysis N.R.

THICKNESS RANGE

Base Metal : Groove : 5 - 24 mm Fillet : All Sizes

Pipe Dia Range: Groove : All Diameters Fillet : All Sizes

WORKED BY

*Y. S. Yadav*  
(Y. S. YADAV)  
ENGINEER

APPROVED BY

*G. C. Gupurani*  
(G. C. GUPURANI)  
DGM-PQM

FILLER METALS

Spec. No. (SFA) : 5.10  
AWS No.(Class) : ER 4043  
F.No. : 23  
A.No. : N.A.  
Size of filler metal : DIA 1.60 mm

WELD METAL (THICKNESS RANGE)

Groove : 24.00 mm Max  
Fillet : All Sizes  
Electrode flux class : N.A.  
Flux trade name : N.A.  
Consumable Insert : N.A.  
Others : NIL

---

POSITION : POSTWELD HEAT TREATMENT  
Position Groove : 1G : Temperature range: NONE  
Welding Progression: N.A. : Time range : NONE  
Position of fillet : 1F

---

PREHEAT : GAS  
Preheat temp. : Min. +150°C : Gas(es) Flow rate  
Interpass temp : Max. +250°C : Shielding : ARGON (l/min)  
Preheat Maint : N.R. : Gr-I 5 - 20  
Trailling : NIL NIL  
Backing : NIL NIL

---

WORKED BY

*V.S. Yadav*

(V.S. YADAV)  
ENGINEER

APPROVED BY

*G.C. Gupurani*

(G.C. GUPURANI)  
DGM (PCM)

*S.B. Jaiswal*  
एम्स सी० जयसवाल S.B. Jaiswal  
और (साफरी प्रवेशन) Engg. (Mat. Mang.)  
बी.एच.ई.एल.-रुद्रपुर BHE Rudrapur  
उतराखण्ड-263153 Uttarakhand 263153



WPS NO. : RU 11002  
REV.NO. : 00  
REV.DT. : 24.02.95

Weld Layers	Process	Filler metal Class	metal dia	Current Type	Volt Range	Travel Speed
Root Run	GMAW	ER 4043	1.60	DCRP	150-210	-- 200-300 mm/Min
First run Subsequent layers	GMAW	ER 4043	1.60	DCRP	180-250	-- 200-300

SPECIAL REMARKS : Ensure that approx. 12.5 mm area near the weld joint is thoroughly cleaned prior to welding.

WORKED BY

(V. S. YADAV)  
ENGINEER

APPROVED BY

(G. C. GURURANI)  
DGM (PCM)

Page 4 of 4

Page 23 of 33

एन. ए. जयसवाल M. B. Jaiswal  
अधि. (संयोजक प्रबंधक) कांगड़ा (Mst. Mang.)  
वी. ए. ई. ए. (एन. ए.) डी. ए. (एन. ए.)  
एन. ए. (एन. ए.) डी. ए. (एन. ए.)

# WELDING PROCEDURE SPECIFICATION

WPS NO.: RU 11003

PROCESS: GMAW

COMPONENT FABRICATION PLANT

BHEL, RUDRAPUR

Page 30 of 33

*S.B. Jaiswal*

एस० बा० जायसवाल S.B. Jaiswal  
अभि. (सामग्री प्रबंधन) Engg. (Mat. Mngt.)  
बी.एच.ई.एल.-रुद्रपुर BHEL-Rudrapur  
उत्तराखण्ड-263153 Uttarakhand-263153

# WELDING PROCEDURE SPECIFICATION

WPS NO: RU 11003

REV: 00

DATE: 19.04.2000

Company Name : CFP- BHEL, RUDRAPUR

WPS NO. : RU 11003

Date : 19.04.2000

REV No. : 00

SUPPORTING PQR NO. : 03

DATE :

Welding Process : GMAW Type (s) : Manual

## JOINTS : DETAILS

JOINT DESIGN : As per approved production drawings.

BACKING : Yes

BACKING MATERIAL : Base Metal / Weld Metal

## BASE METALS :

P.NO. : 21 to P.NO. : 21

Spec. type / Chemical Analysis : N.R.  
TO

Spec. type / Chemical Analysis : N.R.

## THICKNESS RANGE

Base Metal : Groove : 5-24 mm. Fillet : All sizes

Pipe dia. Range : Groove : All diameters Fillet : All sizes

## FILLER METALS:

SPA Spec. No. : 5.10

AWS Qualification no. : ER 4043

Filler metal F No. : 25

Weld material Analysis A No. : N.A.

Size of filler material : Dia. 1.6 mm. for GMAW

WORKED BY

(R.K. LAL)

APPROVED BY

(S.R. KAILA)

S.B. Jaiswal  
अधि. (सामग्री प्रबंधन) Engg. (Mat. Mang.)  
बी.एच.ई.एल.-रुद्रपुर BHEL-Rudrapur  
उत्तराखण्ड-263153 Uttarakhand

Page - 31 of 33

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**ELECTRICAL CHARACTERISTICS**

Current : DC                      Polarity : RP  
 Amps. : 180 TO 250  
 Voltage range : 18 TO 26  
 Tungsten Electrode Type or Size : N.A.  
 Mode of metal transfer for GMAW : Spray  
 Electrode wire feed speed range : 400 to 500 mm./min.  
 Other : NIL

**TECHNIQUE**

Travel Speed : 200 TO 300 MM/ Min.  
 String or Wave Bead : String  
 Orifice or Gas cup size : Dia. 10 mm.  
 Initial Interpass cleaning : Brushing with wire brush  
 (Brushing, Grinding etc.)  
 Method of back gauging : N. A.  
 Oscillation : N.A.  
 Contact tube to work distance : 3 mm. Minimum.  
 Multipass or Single Pass (per side) : Multipass  
 Travel speed range : 200 to 300 mm./min.  
 Single or Multiple Electrode : Single  
 Peening : Not permitted

Weld Layer:	Process	Filler Metal	Current	Voltage	Travel Speed
	Class	Dia.	Type	Range (V)	
Root run	GMAW	ER4043 1.60 mm.	DCRP	180-250 18-26	200-300 mm./min.
First run	GMAW	ER4043 1.60 mm.	DCRP	180-250 18-26	200-300 mm./min.
Subsequent run					

WORKED BY  
*(Signature)*  
 (R. K. LAL)

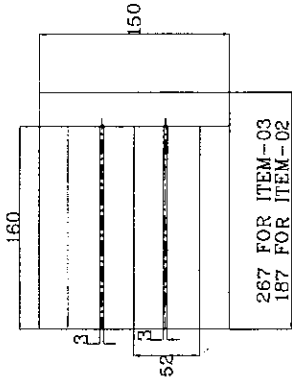
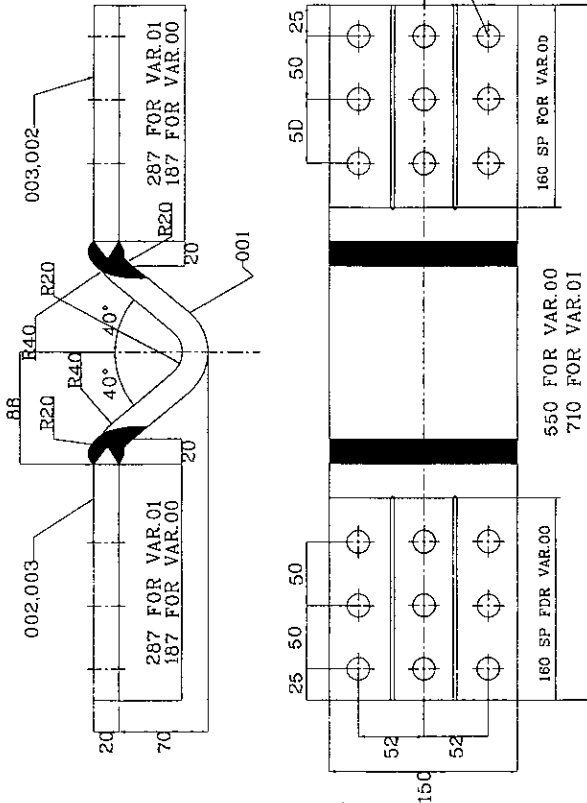
APPROVED BY  
*(Signature)*  
 (S. K. KAILA)

*(Stamp)*  
 (S. K. KAILA)  
 (R. K. LAL)

14



DRAWING No. 000001163E13



WT. OF VAR.00=4.870 KGS.  
WT. OF VAR.01=6.502 KGS.



SAMPLE DRG

ITEM - 002.003

NOTE - FOR WELDING REFER DRG NO 454100001013  
SILVER PLATING AREA 1477.60 SQ. CM. FOR VAR.00 & VAR.01

NOTE:-

- TRIM OFF SURPLUS LENGTH AFTER FORMING.
- REQD. QTY. OF SHEETS TO BE HELD TOGETHER AND BOTH END TO BE HOT PRESSED FUSED BEFORE DRILLING.
- CONDUCTIVITY OF AL. FLEXIBLE SHOULD BE 100% AT FINISH STAGE.
- HOT PRESS FUSED AL PORTION SHOULD WITHSTAND THE METALLOGRAPHY TEST.
- VARIATION OF THICKNESS AT BOTH ENDS (HOT PRESS FUSED PORTION) MUST NOT EXCEED 0.25mm.
- SILVER PLATING OF HOT PRESS FUSED PORTION SPECIFIED AND REF. DRG. NO. 454100000005(S.P.TK.13 TO 15 MICRON).

002	003	20X150X2B7 LG. AL FLAT	PSI2318	2.217
002	002	20X150X1B7 LG AL FLAT	PSI2318	1.401
044044	001	0.46TKX150X252 LG. AL SHY(SIBI/2H)26SWG	PSI2318	0.047
VAR.01	VAR.00	REMARKS	ITEM NO.	MATL CODE
			DRAWING NO.	UNIT WT
			VAR.	QTY.

ADDITIONAL INFORMATION

NAME OF PROJECT: 5X270 MW THERMAL POWER PROJECT AMRAVATI, MAHARASTRA(UNIT# 1 TO 5)

NAME OF CUSTOMER: M/S INDIABULLS POWER LTD.

DEPT: BHARAT HEAVY ELECTRICALS LIMITED

DRN: MUKESH GH

CODE: RUDRAPUR

CHD: B.P. CHOUDHARY

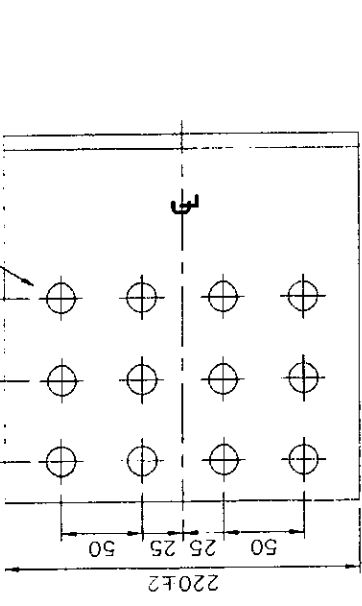
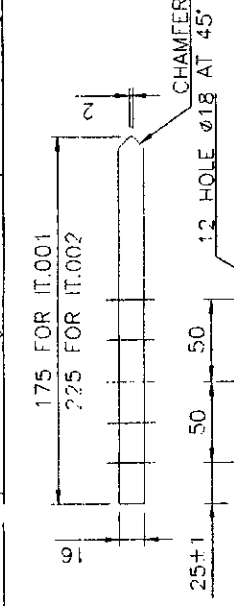
APPD: R. K. LAL

DATE: 15.02.12

DATE: 15.02.12

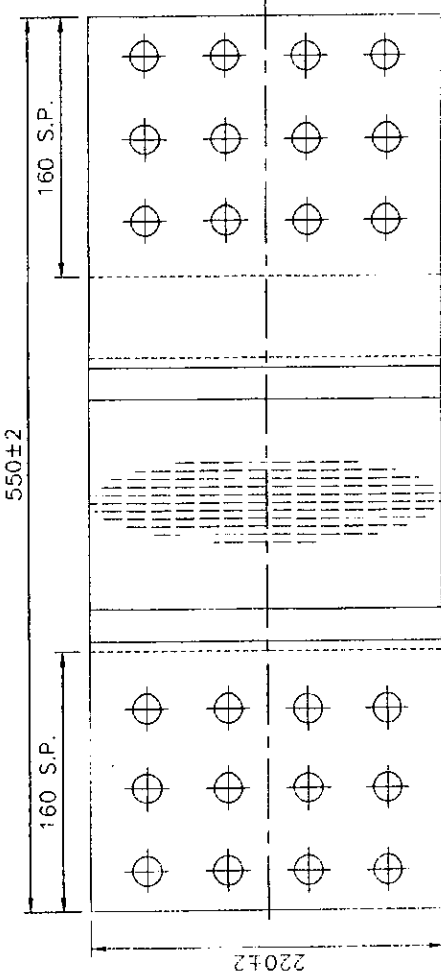
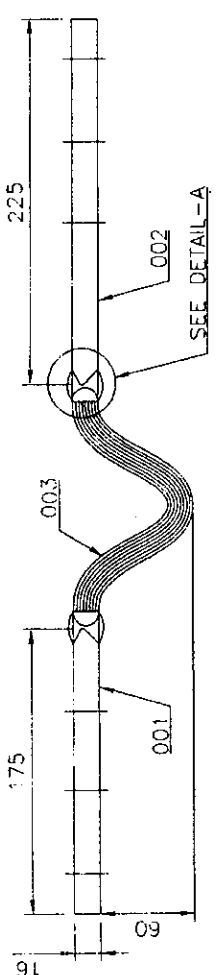
DATE: 15.02.12

REV	DATE	ALTERED	CHECKED	REV DATE	ALTERED	CHECKED
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DRAWING No. 31391100003				SHT NO 01 NO OF SHT 01		
REV 00				REV 00		



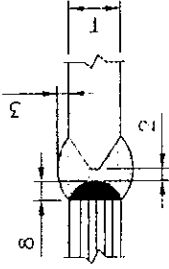
IT.001 TO 002

[SAMPLE Dwg.]



VAR-00

FINISH WT.	S.P. AREA
5.444 KG	1675 SOCM

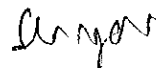


DETAIL-A

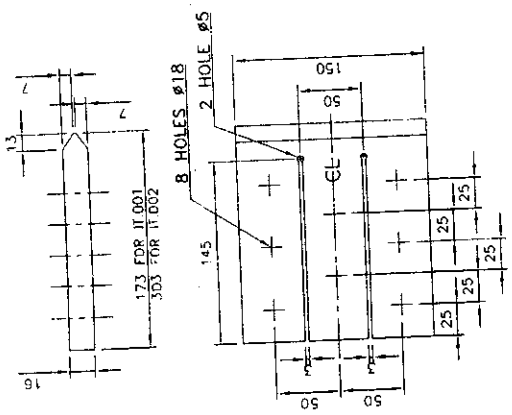
- NOTE:
1. ALL DIMENSION IN MM.
  2. ALL BURS TO BE REMOVED AFTER SLOTTING.
  3. SURFACES TO BE FLAT & FREE FROM BLEMISHES.
  4. TOLERANCES ONLY APPLICABLE AS MENTIONED.
  5. 100% DP TEST ON ALL WELDED JOINTS ARE TO BE CARRIED OUT.
  6. 10% RADIOGRAPHIC TEST ON WELDED JOINTS ARE TO BE CARRIED OUT.

VAR	00	001	002	003	0051
DESCRIPTION	16TKx220x175 LG AL.ALLOY FLAT	16TKx220x225 LG AL.ALLOY FLAT	0.46TKx220x87 LG AL.ALLOY STRIP	AA 123 19	0.061
ITEM NO.	001	002	003		
REMARKS	SEE DETAIL 001	SEE DETAIL 002	SEE DETAIL 003		
DRAWING					
MATL.SPCN.	GRADE:19501	GRADE:19501	GRADE:19501		
QTY.	1.592	2.067	0.061		

CUSTOMER		PROJECT/PRODUCT	
GENERAL		IPBD	
BHARAT HEAVY ELECTRICALS LIMITED RUDRAPUR		NAME: SARMA, DATE: 17/11/2014 DIN: RUPESH, DATE: 17/11/2014 APPO: PRK BINDAN, DATE: 17/11/2014	
UNITO. D.M.GR. C/M/P	SCALE	WEIGHT KG	REV
AL. STRIP FLEXIBLE FOR IP BUSDUCT		DRAWING NO. 31391316002 00	

  
 एस.बी. जायसवाल S.B. Jaiswal  
 इंजी. (सामग्री प्रबंधन) Engg (Mat Mang)  
 बी.एस.ई.एल. - रुद्रपुर BHEL-Rudrapur  
 उत्तराखण्ड-263153 Uttarakhand-263153

All Dimensions in 'mm'



**ITEM-001,002**

WT. OF VAR-00 = 4.662 KG  
 S.P. AREA OF VAR-00 = 1348 SQCM

ITEM NO.	DESCRIPTION	MATERIAL	QTY.
003	ALLOY SHEET (26 SIG) 0.45776150272 LG.		0.050
002	AL ALLOY FLAT 16 TX&150X303 LG.		1.880
001	AL ALLOY FLAT 16 TX&150X303 LG.		1.032
001	AL ALLOY FLAT 16 TX&150X173 LG.		0.001

REV.	DATE	BY	CHKD.	APPD.
00				

035  
001  
001



**BHARAT HEAVY ELECTRICALS LTD.**  
**RUDRAPUR**

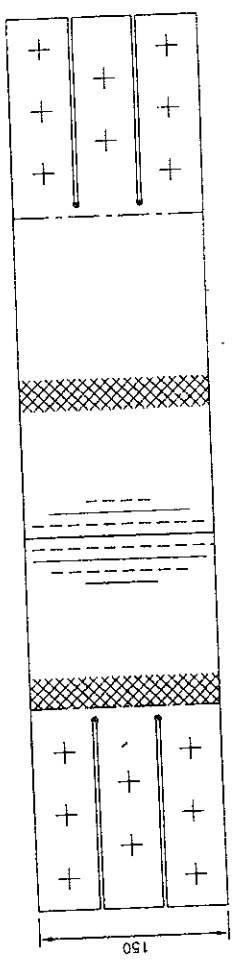
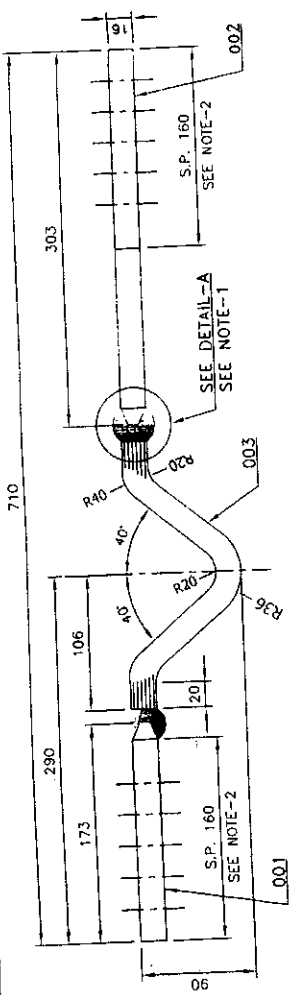
WEIGHT(KG) 4.662  
 SCALE N.T.S.

REV. NO. 01  
 NO. OF SHT. 01  
 DRAWING NO. 31391316001

SIZE A3

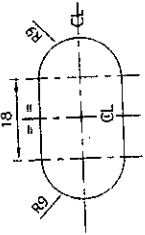
First Angle Projection

31391316001  
 ON DRAWING

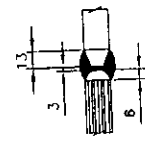


**VAR. 00**

**SAMPLE DRG**



**DETAIL-B**



**DETAIL-A**

**NOTES:-**

- FOR WELDING REFERENCE DRG. NO. 15410001013.
- FOR VAR.00 & 02 SHOWN DIMN. TO BE SILVER PLATED 13 TO 15 MICRON TK. IF REQUIRED IN MI SHEET/ ENGG. SPEC.
- FOR IT.006 & 008 SHOWN DIMN. TO BE SILVER PLATED TO 15 MICRON TK.
- FOR SILVER PLATING REF DRG. NO. 45410001025.
- ITEM-005 SHOULD BE GR.19500 H2, AS PER IS:737, WITH MINIMUM 45% IACS CONDUCTIVITY.

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.

S.B. Jaiswal  
 Engg (Mat. Mang.)  
 EHEL Rudrapur  
 263153 Uttarakhand

REF. DRG. NO. SIGN & DATE

RETRY NO.