



**Bharat Heavy Electricals Limited**  
Industrial Valves Plant  
Goindwal Sahib (Punjab)

**Enquiry No.**  
**2324-031E**

**Date:**  
**15.07.2023**

**NOTICE INVITING TENDER (NIT)**

Dear Sir / Madam,

BHEL Goindwal Sahib (Punjab) invites offers from interested bidders / suppliers for submission of their offer through e-procurement mode at <https://eprocurebhel.co.in/>. Offers in any other mode will not be accepted. In case of any difficulty faced while registering on BHEL's e-Procurement portal developed by NIC, queries may be addressed to 0120-4001002, 0120-4001005 and 0120-6277787; email: [support-eproc@nic.in](mailto:support-eproc@nic.in). These details are also available on 'Contact Us' page of the portal.

**This tender is referred to M/s. BL Casting, Barnala (Punjab).**

<b>Tender enquiry no. &amp; date</b>	2324-031E dated 15.07.2023
<b>Form of contract</b>	Supply
<b>Tender / Item description</b>	Supply of castings
<b>Material standard / Drawings</b>	As per attached TDC(s) & Sample Drawings
<b>Location(s) of Supply / Work</b>	BHEL, Industrial Valve Plant, Goindwal Sahib, Dist. Tarn Taran -143422 (Punjab)
<b>Earnest Money Deposit (EMD)</b>	Not Applicable
<b>Quotation parts</b>	Two Part Bid
<b>Tender download / Bid submission start date</b>	<b>15.07.2023 (16:30 Hrs. IST)</b>
<b>Tender download / Bid submission end date</b>	<b>25.07.2023 (12:00 Hrs. IST)</b>
<b>Tender / Bid opening date</b>	<b>25.07.2023 (15:30 Hrs. IST)</b>
<b>Validity of offer (In days)</b>	30 days from the actual date of techno commercial bid opening (Part I)
<b>Risk Purchase</b>	Not applicable
<b>Liquidated damages (LD)</b>	Not applicable
<b>Reverse auction</b>	Not applicable
<b>Non-disclosure agreement</b>	Applicable
<b>Contact person details</b>	Sumeet Bansal, Sr. Manager 01859-224 628, <a href="mailto:sbansal@bhel.in">sbansal@bhel.in</a>  Sahil Malhotra, Manager 01859-224 603, <a href="mailto:sahil@bhel.in">sahil@bhel.in</a>

## PART-I (TECHNO-COMMERCIAL BID)

(To be filled by bidder & submit with offer as pdf file only)

<b>Tender Enquiry No. &amp; Date</b>	2324-031E dated 15.07.2023
<b>Tender Description</b>	Supply of Castings

Bidder must note following points:

1. This workbook is protected, except for cells where comments / confirmation is to be given by bidder.
2. Bidder is advised not to unprotect / tamper the sheet / alter the terms mentioned in the sheet.
3. Any alteration to terms mentioned by BHEL will be considered as tampering and bidder's offer shall be liable for rejection.
4. **Bidders are advised to only fill the unprotected cells (shaded cells) by dropdown or writing the comments as applicable as their confirmation. Bidders are advised to submit duly filled & signed 'PDF' file as techno-commercial (Part-I) bid'. Failure on the part of bidder in not returning this duly filled-up techno-commercial bid and / or submitting incomplete replies may lead to rejection of bidder's quotation.**
5. All the commercial terms and conditions shall be indicated by vendor in this format only and nowhere else in his quotation. However, in case the space for vendor's reply is not sufficient against a particular question, the vendor shall furnish same by way of separate annexure / sheet attached to this questionnaire, indicating cross-reference of respective clauses.

### BIDDER'S DETAILS

Sl. no.	Elements	Remarks
1	Bidder's Name / Name of the Firm	
2	Quotation reference no. & date	
3	Contact Person Name / Number / Designation	Name: Contact No: Designation:
4	Email ID (s) - (Can be provided more than one)	
5	Mobile No. (s)	
6	Tel. No. (s)	
7	Fax No.	
8	Registered Address	
9	Address for Correspondence	
10	Bidder Type (Indian / Foreign):	
11	Company's Establishment Year	
12	Company's Nature of Business (Tick the relevant option √)	( ) Manufacturer ( ) Dealer/ Trader/ Stockist/Channel Partner/Agent/etc.
13	Company Category (Micro unit as per MSME / Small unit as per MSME /	
14	Status of the Company / Firm * (Relevant documents must be enclosed) (Tick the relevant option √)	( ) Public Limited; ( ) Private Limited ( ) Partnership Firm; ( ) Single Ownership
15	Name of Owner / Partner's of Firm	
16	GST No.	

### TECHNICAL CONDITION DETAIL

Sl. no.	Elements	Response	Remarks
1	Technical : Supply of Castings as per tender documents (if selected 'Accepted with deviation', please mention the deviation clearly)	Select from the drop down list	

### COMMERCIAL CONDITIONS & DETAILS

Sl. no.	Elements	Response	Remarks (if any)
1	IGST supply (%)	Select from drop down list	
2	SGST supply (%)	Select from drop down list	
3	CGST supply (%)	Select from drop down list	
4	<b>Delivery destination:</b> FOR, BHEL, Stores Industrial Valves Plant 433, Industrial Complex Goindwal Sahib- 143 422 District: Tarn Taran (Punjab), India (refer tender terms & conditions for details)	Select from the drop down list	
5	Firm Price: The quoted / finalised rates shall be firm till execution of the supplies.	Select from the drop down list	
6	Validity: 30 days from techno commercial bid opening. (refer tender terms & conditions)	Select from the drop down list	
7	Delivery period: Within 120 days from placement of PO / LOI. (refer tender terms & conditions)	Select from the drop down list	
8	Payment term: (Refer clause no. 13 of General Contract conditions (GCC))	Select from the drop down list	
9	<b>Warranty Period:</b> Supplier shall give a warrantee for a period of 18 months from the date of receipt. In case of non-acceptance of this term bid will be rejected. (Refer clause no. 18 of GCC)	Select from the drop down list	
10	Please attach valid MSE certificate latest MSME Guidelines (Refer clause no. 25 of GCC)	Select from drop down list	
11	Make in India (MII) (Refer clause no. 26 of GCC)	Local Content Declaration	Select from drop down list
		Details of location at which local value addition will be made is as follows:	Select from drop down list

**PART-I (TECHNO-COMMERCIAL BID)**

(To be filled by bidder & submit with offer as pdf file only)

**Tender Enquiry No. & Date**

2324-031E dated 15.07.2023

**Tender Description**

Supply of Castings

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5. All the commercial terms and conditions shall be indicated by vendor in this format only and nowhere else in his quotation. However, in case the space for vendor's reply is not sufficient against a particular question, the vendor shall furnish same by way of separate annexure / sheet attached to this questionnaire, indicating cross-reference of respective clauses.

12	<b>Non-Disclosure Agreement:</b> Please comply clause no. 23 of GCC in Tender Terms & Conditions	Select from the drop down list	
13	<b>Restrictions Under Rule 144(XI) of The General Financial Rules (GFR), 2017:</b> Please comply clause no. 27 of GCC in Tender Terms & Conditions	Select from the drop down list	
14	I have thoroughly gone through the attached tender terms & conditions and understood the above techno-commercial requirements	Select from drop down list	

We further, confirm that we have quoted the rates in the tender considering Inter-alia the

1. Tender Document(s)
2. Additional Document(s) (if any)
3. BOQ Document (Price Bid Format-Part-II)
4. Corrigendum (if any)
5. Pre Bid Meeting Minutes (if any)

We hereby certify that we have fully read and thoroughly understood the tender requirements and accept all terms and conditions of the tender including all corrigendum/addendum issued (if any). Our offer is in confirmation to all the terms and conditions of the tender including all corrigendum/addendum (if any) and minutes of the pre-bid meeting (if any). In the event our offer is found acceptable and Order is placed /Contract is awarded to us, the complete tender document shall be considered for constitution of Order / Contract Agreement.

[Validate](#)[Print](#)[Help](#)**Wise BoQ**

Tender Inviting Authority: BHEL IVP Goindwal Sahib

Name of Work: Supply of Castings

Contract No: 2324-031E dated 15.07.2023

Name of the Bidder/ Bidding Firm / Company :

**PRICE SCHEDULE**

(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevant columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only )

NUMBER #	TEXT #	TEXT #	NUMBER #	TEXT #	NUMBER #	NUMBER #	TEXT #
Sl. No.	Item Description	Item Code / Make	Quantity	Units	BASIC RATE In Figures To be entered by the Bidder in Rs. Per KG	TOTAL AMOUNT excluding taxes in Rs. P	TOTAL AMOUNT In Words
1	2	3	4	5	7	11	13
1	WCB/WCC- 2" & 3", UPTO C500 CASTING	G92110070000	513.30	KG		0.00	INR Zero Only
2	WCB/WCC- 4" & ABOVE, UPTO C500 CASTING	G92110080000	439.92	KG		0.00	INR Zero Only



BHEL IVP  
GOINDWAL SAHIB

## SPECIAL TERMS AND CONDITIONS

Tender enquiry no. 2324-031E Dated 15.07.2023 Due date 25.07.2023

Tender Description: Supply of castings

This tender is through e-procurement mode. Tender documents can be downloaded from <https://eprocurebhel.co.in>

This tender is referred to M/s. BL Casting, Barnala (Punjab).

### S1 SCOPE OF SUPPLY

Material shall be supplied as per the applicable latest Technical Delivery Conditions (TDC)/ Material Standard requirements/Drawings/RT Shooting sketch and other requirements as given in the Purchase Order. The applicable TDC for 1) TDC:0412 Rev28 (or latest applicable), 2) Wherever tolerances are not specified in drawing, for untoleranced dimensions in castings VL:STDC:023 Rev00. TDC(s) and drawings are enclosed alongwith tender documents.

[TABLE I]

Sr. No.	#Material Group	Description	Qty	UoM
1	G92110070000	2" & 3" WCB/WCC Upto 500 Class	513.30	Kg
2	G92110080000	4" & above WCB/WCC Upto 500 Class	439.92	Kg

# Material group given above represents all castings under respective class range. This rate schedule is for tendering purpose only. Actual PO will be released as per material codes and unit weights given in [TABLE II] below.

[TABLE II]

S.No	Material	Material Description	Drawing	Qty	Unit Est wt (Kg)	Total Weight (Kg)
<b>G92110070000 - 2" &amp; 3" WCB/WCC Upto 500 Class</b>						
1.	920242950000	2-300-SV-BODY-FL-WCB	2V247701775R	3	23	69
2.	920082480000	2-C300-SV-YOKE-WCB	2V247601776R	3	12	36
3.	922002960000	BODY_3_C150_GV_BW_WCB-N289	2VN28905875R	5	23.6	118
4.	920270370000	BODY-3-C150-GV-FL-WCB	2VN02505872R	5	26.5	132.5
5.	920342830000	WEDGE-3-C150-GV-WCB	3VN02506598R	10	3.08	30.8
6.	922003600000	YOKE-3-C150-GV-WCB	2VN31305937R	10	12.7	127
						<b>513.3</b>
<b>G92110080000 - 4" &amp; above WCB/WCC Upto 500 Class</b>						
7.	922016950000	BODY-WCB-6-C150-GV-BW-NC24	2VNC2414166R	3	45.5	136.5
8.	922014250000	BODY-6-C150-GV-FL-WCB -NC06	2VNC0613591R	3	48	144
9.	922014270000	WEDGE-6-C150-GV-WCB-NC06	2VNC0613610R	6	6.9	41.4
10.	922017000000	YOKE CUM BONNET-6-C150-GV-WCB-NC64	2VNC6414171R	6	19.67	118.02
						<b>439.92</b>



BHEL IVP  
GOINDWAL SAHIB

## SPECIAL TERMS AND CONDITIONS

Tender enquiry no. 2324-031E Dated 15.07.2023 Due date 25.07.2023

**Tender Description:** Supply of castings

**PART-I: TECHNO-COMMERCIAL BID** should contain *all the documents/confirmations as per following details:*

- a) Acceptance of Techno-Commercial terms and conditions shall be attached along with bid document. This can be attached either by signing each page of terms and conditions or a confirmation statement.

*IF THE OFFER IS NOT ACCOMPANIED WITH ACCEPTANCE OF TERMS AND CONDITIONS, IT SHALL BE CONCLUDED THAT ALL THE TERMS AND CONDITIONS ARE ACCEPTABLE AND NO CLAIM WHATSOEVER SHALL BE ENTERTAINED LATER ON.*

- b) MSE vendors should submit **Udyam Registration Certificate/UAM** for availing applicable benefits for MSE vendors as per tender terms. Validity of document shall be considered as on date of Part I opening as per the latest available notification from Govt.

### **S2 LOADING**

100% loading shall be done to the L1 bidder. Bidder shall be required to develop the pattern.

### **S3 PRICE BASIS**

- a) Rates shall be quoted on **rate INR per kg basis on FOR GOINDWAL basis.**
- b) **Rates shall be inclusive of pattern and development cost.** The pattern cost shall be borne by the vendor. Payment shall be released as per the actual weight of supplies or established weights [ref – TABLE II of clause S1], whichever is lower.
- c) Unloading of material at Main Stores of BHEL shall be arranged by BHEL.
- d) Order of enquiry item sl. no. shall be maintained in the quotation.
- e) Quoted rates shall be firm till the receipt of all supplies.

### **S4 DELIVERY SCHEDULE**

Delivery shall be within 120 days from date of Purchase Order.

### **S5 TEST CERTIFICATE**

It is the responsibility of successful vendor to ensure that all the castings are supplied with IBR TC or MTC as applicable.

### **S6 MSE and MII purchase preference**

MSE and MII purchase preference are not applicable in tender enquiry.

### **S7 Bid Validity**

30 days from the actual date techno commercial bid opening (Part I).

### **S8 RADIOGRAPHY**

Consistent radiography quality is to be ensured and to be maintained uniformly in bulk supply with adequate process and method controls. Since the required castings are of radiographic quality, BHEL reserves the right to conduct radiographic testing of sample pieces at its own arrangement and derive



## SPECIAL TERMS AND CONDITIONS

Tender enquiry no. 2324-031E Dated 15.07.2023 Due date 25.07.2023

Tender Description: Supply of castings

conclusion of soundness of casting supplied against the said lot/heat based on the results of such testing.

- Standard requirement of radiography of castings shall be as applicable TDC.
- Any additional requirement shall be specifically called for in PO.
- BHEL intends to get delivery of castings along with radiographed sets as ordered. The claim of vendor for payment of supplies against any PO can be put on hold if the requisite no. of radiographed sets has not been delivered. BHEL shall reserve the right to select any sample from a lot offered and get it radiographed at vendor's works.

Vendor will be required to submit radiographic films and test reports. BHEL will review and evaluate radiography films and RT reports and reserves the discretion to do so at the premises of the vendor.

Radiography procedure shall be as per ASME B 16.34 and as mentioned in BHEL's TDCs. All the radiography films shall be dispatched to BHEL without delay either before the castings are being dispatched or along with the castings. Vendor shall undertake radiography on new development as per applicable TDC.

**RT charges: Fixed RT charges @ Ir<sub>192</sub>: Rs 0.99 & Co<sub>60</sub>: Rs 1.50 per sq. cm shall be paid on actual verified film area.**

### **S9 INSPECTION REQUIREMENTS FOR CASTINGS**

1. For RT as well as non-RT castings, the seller shall give advance notice of minimum 03 working days for inspection to the purchaser. Inspection will be carried out within 03 working days from the proposed date of inspection.

In case of time taken by BHEL is more than 03 working days, delivery extension on account of delay may be provided to seller for number of days beyond 03 working days for the delayed portion only.

2. All required tests (Physical properties, Chemical properties, Heat Treatment, NDE, Visual, Surface finish etc.) as called in referred material standard/BHEL/TDC/drawing etc shall be carried out by vendor at no extra cost. **BHEL may decide to inspect itself/arrange third party at vendors' works itself as and when necessary with prior intimation to the vendor.** No additional charges shall be claimed for such inspections. Third party inspection charges will be borne by BHEL.
3. Sample castings are to be identified by vendor in the delivery challan as "Sample" and the dimensional reports and RT reports are to be provided to BHEL along with supply. Also mention "Sample" on castings with white paint.
4. RT castings have to be mentioned "RT" on castings with white paint.
5. Material code as mentioned in PO is to be mentioned on all casting with paint.

### **S10 REPAIR OF CASTINGS**

- a) All castings shall be supplied free of defects like shrinkage, hot tears and process variable defects like sand inclusion, slag inclusion, gas entrapment etc. If any casting is found containing defects more than allowable limit, the same shall be upgraded at foundry itself before dispatch to BHEL



BHEL IVP  
GOINDWAL SAHIB

## SPECIAL TERMS AND CONDITIONS

**Tender enquiry no. 2324-031E Dated 15.07.2023 Due date 25.07.2023**

**Tender Description: Supply of castings**

- with necessary documentation, enabling BHEL to make use of such castings immediately for production.
- b) If castings are found defective at different stages of manufacturing, the same shall be repaired at the defective area and the repaired castings shall be accepted after performing requisite NDT at vendor's cost. BHEL shall decide about the areas to be repaired in all such cases.
  - c) Castings, that are found defective after receipt at BHEL, necessary repair of the castings will be carried out by BHEL and repair charges @ Rs. 19.10 per cc for Carbon Steel grades shall be deducted from any of the running bills of the vendor.
  - d) In case of rejection of casting after machining/ assembly/testing due to defects more than allowable limits or major variation in dimensions etc. then the entire cost incurred till that stage shall be deducted from any of the running bills of the vendor.

**These Special terms & conditions and GCC collectively are the part of tender terms and conditions. Any term in special terms and conditions will supersede the GCC.**



## General Conditions of Contract (GCC) of MM Tenders

**BHARAT HEAVY ELECTRICALS LIMITED**

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

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## General Conditions of Contract (GCC) of MM Tenders

**BHARAT HEAVY ELECTRICALS LIMITED**

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

### 1. Instruction to Bidder

Quotations shall be submitted before due date and time. Late offers are liable to be rejected, so please ensure to submit bid well within due date and time. Techno-commercial part will be opened on due date.

**Based on evaluation of techno-commercial offers, Price bids of bidders who qualify from techno-commercial evaluation shall be opened. BHEL may decide to open the Price bid same day at 1700 hrs. If not opened on the same day, all qualifying bidders shall be notified for date of opening of Price bids by email/fax/post/courier/E-procurement system generated email.**

#### 1.1 Instruction to Bidder (In case of Non-E-Procurement / Paper/ Manual/ Hard Copy based tenders)

Sealed Tenders can be dropped in the tender box labeled as 'Tender box for MM contracts'. This tender box is located at the entrance of Admin block BHEL Goindwal. Quotations can also be submitted through e-mail at [tendermm\\_ivp@bhel.in](mailto:tendermm_ivp@bhel.in). Offers received in time shall be considered only when offers are complete in all respects. In case of bulky tenders, please handover quotation to Sh. Rakesh Kumar/SDGM - Head-MM or Sh. Sumeet Bansal / Sr. Manager - MM [Contact: 01859 224 615 / 628]. Bid can be sent to following address:

**BHEL, Industrial Valve Plant,  
#433, Industrial Complex,  
Goindwal Sahib, Distt. Tarn Taran,  
Punjab-143422.**

#### 1.2 Instruction to bidder (In case of E-Procurement)

1. Interested bidders / suppliers shall submit their offer through e-procurement mode at <https://eprocurebhel.co.in/>.
2. **Offers in any other mode will not be accepted.**
3. Procedure for submission of tender is available in the "Bidder Manual Kit" at e-tender portal <https://eprocurebhel.co.in/>.
4. In case of any difficulty faced while registering on BHEL's e-Procurement portal developed by NIC, queries may be addressed to 0120-4001002, 0120-4001005 and 0120-6277787; email: [support-eproc@nic.in](mailto:support-eproc@nic.in). These details are also available on 'Contact Us' page of the portal.
5. Before uploading scanned documents if any, the bidders shall sign on all the statements, documents, certificates uploaded by him, owning responsibility for their correctness / authenticity.
6. **Disclaimer clause:** Neither the Organization (Bharat Heavy Electricals Ltd.) nor the service provider is responsible for any failure of submission of bids due to failure of internet or other connectivity problems or reasons thereof.

### 2. Scope of Supply

Material shall be supplied as per the applicable latest Technical Delivery Conditions (TDC)/ Material Standard requirements/BPS/Drawing and other requirement as given in the Tender Enquiry. National & International material Standards shall have to be arranged by vendors themselves. Latest applicable revisions of standards/procedures to be referred.





## General Conditions of Contract (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

All required tests as called in referred material standard/BHEL/TDC/drawing etc. shall be carried out by vendor at no extra cost. Material Test Certificates (MTC), inspection reports and Compliance/Guarantee Certificate are to be provided along with the supplies.

### 3. Price Basis

1. Order of enquiry item sl. no. shall be maintained in the quotation.
2. The rates quoted shall be firm and fixed. No price variation is proposed and allowed.
3. Rates quoted should be FOR BHEL Goindwal basis. The offers quoted on other than FOR Goindwal basis are liable to be rejected.

In case bidder has quoted Ex-works prices, then he/she will be given an opportunity to accept price basis as FOR Goindwal either by accepting delivery as FOR Goindwal in same quoted price or by providing loading factor on his/her quoted ex-works prices to make them FOR prices.

**Variation in GST or any other statutory levies during contractual delivery period shall be to BHEL's account.**

### 4. Discrepancy in Words And Figures

1. If, in the price structure quoted for the required goods/ services/ works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity}, the unit price shall prevail and the total price corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.
2. If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
3. If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject of (a) and (b) above.
4. If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date upto which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the purchaser, the bid is liable to be ignored.
5. Bids should be free from correction, overwriting, using corrective fluid, etc. Any interlineation, cutting, erasure or overwriting shall be valid only if they are attested under full signature(s) of person(s) signing the bid else shall be liable for rejection.
6. All overwriting/cutting, etc will be numbered by bid opening officials and announced during bid opening.

### 5. Evaluation in Case of More Than One L-1 Bidder

In the course of evaluation, if more than one bidder happens to occupy L1 status, effective L1 will be decided by soliciting discounts from the respective L1 bidders.

In case more than one bidder happens to occupy the L1 status even after soliciting discounts, the L1 bidder shall be decided by a toss / draw of lots, in the presence of the respective L1 bidder(s) or their representative(s).

Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.

Signature Not Verified  
Signed By: RAKESH  
KUMAR  
Location: BHEL Goindwal  
Signing Date: 05.04.2023





## General Conditions of Contract (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

#### 6. Reverse Auction

In case, it is declared in special terms & conditions of tender enquiry that RA is applicable for the NIT, then RA will be conducted as per following clause:

BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on <https://www.bhel.com/>) for this tender. RA shall be conducted among the techno-commercially qualified bidders as per RA guidelines.

Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered for RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking.

#### 7. Conflict of Interest among Bidders / Agents

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. ***The bidder found to have a conflict of interest shall be disqualified.*** A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

- a) they have controlling partner (s) in common; **or**
- b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; **or**
- c) they have the same legal representative/agent for purposes of this bid; **or**
- d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; **or**
- e) Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid. **or**
- f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent/dealer. There can be only one bid from the following:
  1. The principal manufacturer directly or through one Indian agent on his behalf; and
  2. Indian/foreign agent on behalf of only one principal.**or**
- g) a Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid; **or**
- h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business.





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### 8. Validity of Offers

The offers shall be kept open for acceptance 'for number of days mentioned in special terms and conditions' from the date of opening of the tender. In case of tender extension, the bid validity shall be considered from the date of tender opening.

### 9. Supplied Material Adjustment

Item/s pending in previous PO has to be billed in previous PO only. Otherwise, BHEL will be free to adjust the supplies in previous PO. Any implication of tax will be on supplier's account. For this it is desirable that vendor should reconcile the pending PO statement every month/frequently with BHEL. Vendor can also view these details at Portal (<https://trichy.bhel.com/mm/index.jsp>).

### 10. Delivery Schedule

Supplies shall be affected and completed as per schedule mentioned in special terms and conditions. Commencement of delivery period shall be reckoned from the date of PO / LOI or any other agreed milestone.

### 11. Liquidated Damaged (LD)

- Time is the essence of the contract.
- The ordered items shall be delivered as per the delivery period mentioned in the Purchase Order.
- In case the supplier supplies the ordered items beyond the delivery period specified, Liquidated Damages -LD - as detailed below shall be will be levied from the supplier without prejudice to any other relief /compensation available to BHEL, Punjab under any other condition of the contract/applicable legal provisions.
- Failure to dispatch the materials in the time as per the delivery mentioned in our Purchase Order (PO) would make the supplier liable to an un-conditional LD at the rate of 0.5% of the undelivered order value per week of the delay or part thereof subject to a maximum of 10% of the undelivered order value.
- Any deviation from the above LD clause, loading will be applied to the extent to which it is not agreed by the bidder (at offered value).
- Indigenous: In case of Ex-works delivery terms, the document date (Invoice/Challan date) in Goods Receipt (GR) document shall be reckoned for LD deduction. In case of FOR Delivery terms, the posting date in GR document shall be reckoned for LD deduction.
- Import: For CFR terms, BL date will be considered for LD calculation.

BHEL reserves the right to receive or not receive the material after the due date of PO. Applicable GST shall also be recovered from suppliers/contractors on LD amount. For this Debit note will be issued by BHEL indicating the respective supply invoice number.

### 12. Acceptance of Material Supplied

- The supply shall strictly as per the specifications in the tender /purchase order.
- Delivery of the ordered items as per the delivery terms in the Purchase Order does not automatically constitute acceptance of the delivered items.
- Acceptance of the materials supplied will be based on the inspection and certification documents by the supplier as stipulated in the Purchase order. However, BHEL reserves the right to test the

Signature Not Verified

Signed By: RAKESH

KUMAR

Location: BHEL, Goindwal

Signing Date: 05.04.2023





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material supplied, if required, at BHEL Lab or any other approved/accredited lab and the result will be binding on the supplier.

4. The acceptance or otherwise of the delivered items will be separately communicated to the supplier by BHEL through B2B portal within 15 days from the delivery of items or delivery of the required test certificates /other documents whichever is later.
5. In case of rejection of the delivered items, either part or full, the vendor shall replace the rejected items as per the specification in the Purchase order/tender at their cost within 30 days of communication of rejection to the supplier. The supplier shall be given maximum two opportunities to replace the rejected items.
6. After the clearance of the 1st lot, in case of rejection of the delivered items, either part or full, if the supplier fails to replace the rejected items within 30 days of communication of the rejection, the same shall be treated as failure to execute the contract and actions as per the Guidelines for Suspension of Business Dealings with Suppliers /Contractors available in the webpage: <https://www.bhel.com> would be taken against such supplier.

### 13. Payment Terms

1. Payments shall be made to the Seller within the mentioned days (as per below table) from the date of receipt and acceptance of material.

Type of Bidder	Payment Terms (Number of days)
Micro & Small Enterprises (MSEs)	45 days
Medium Enterprises	60 days
Non MSME	90 days

To be considered as Micro, Small or Medium enterprise, bidder must be manufacturer of offer product and relevant valid certificate as per latest MSME guidelines is to be submitted along with bid.

**MSME bidders can avail benefits of payment through TReDS (Trade Receivable e Discounting System).**

In case of any deviation from standard payment term mentioned above, BHEL shall load on the item price at 'Base rate of SBI (as applicable on the date of bid opening; Techno-commercial bid opening) + 6% for the period of relaxation sought by bidders.

2. Documents to be submitted (if applicable)
  - i) Tax invoice (Invoice shall be GST compliant and should contains all the required information such as GST No, HSN code etc.)
  - ii) Transporter copy along with material/consignment.
  - iii) Material Test Certificates (MTC) and
  - iv) Compliance Certificate.
3. GST registration number is to be submitted by qualified vendor as per GST law.
4. It is mandatory to mention proper material codes in the invoices and separate invoices to be raised for different POs.
5. **BHEL releases payment through EFT mode ONLY. Necessary details may please be submitted by filling required format before release of payment.**





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### 14. Taxes & Duties

Payment of GST portion will be released to vendor only upon completion of statutory requirement and further subject to following:

- Vendor declaring such invoice in his GSTR-1 and
- Receipt of goods and Tax invoice by BHEL and
- Confirmation of payment of GST thereon by vendor on GSTN portal.
- Above is subject to receipt of goods/service and tax invoice thereof along with vendor declaring invoice in his return and paying GST within timeline prescribed for availing ITC by BHEL.

Following may please be noted for availing Input Tax Credit (ITC) by BHEL:

- Since ITC can be availed only when BHEL is in possession of GST Tax invoice and after receipt of goods. Thus, vendor to ensure timely dispatch of goods and Tax invoice. It may be noted that in case of any delay in receipt of Tax Invoice and/or receipt of goods, the ITC availment by BHEL will get delayed thus entailing additional cash outflow & may even get denied if ITC availment timelines are breached.
- Further ITC can be availed only when vendor has declared such invoice in his outward supply Return GSTR-1 and after GST thereon has been paid by him at the time of filing of monthly Return.
- If GST credit is delayed/denied to BHEL due to non/delayed receipt of goods and/or tax invoice or expiry of timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, GST amount shall be recoverable from vendor along with interest levied/leviable on BHEL.
- Further, in case vendor delays declaring such invoice in his return and GST credit availed by BHEL is denied or reversed subsequently as per GST law, GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from vendor/contractor along with interest levied/leviable on BHEL.

### 15. Liability Under Reverse Charge (RCM)

Any GST liability arising on BHEL under Reverse Charge (RCM) before actual receipt of goods and/ or Invoice thereof would be subject to recovery of Interest leviable for the period between the date of such liability and actual date of eligibility of ITC based on receipt of goods, receipt of Invoices and other conditions specified in GST Law as applicable.

### 16. Access to Manufacturing Premises

While Purchase Orders placed on the vendor are under execution, authorized representatives of BHEL shall be allowed free access to the manufacturing facilities for the purpose of inspection or monitoring the progress of purchase orders. This access will also be extended to representatives of BHEL's customers accompanying the authorized representative/s of BHEL (which shall be intimated in advance), if our contractual requirements with our customers call for the same.

### 17. Inspection

- The seller shall give adequate notice, of 1 week or as mutually agreed period, in writing to the Purchaser about the date and place at which the goods will be ready for inspection/ testing, as provided for in the contract.





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2. Purchaser or his authorized representative shall be entitled to carry out inspection of material and workmanship/Surveillance Audit at Seller's premises or at his sub-contractor's premises at all reasonable times during execution of contract; Such inspection, examination and testing, if made, shall not absolve the Seller from his obligations under the contract. No additional charges shall be claimed for such inspections. Moreover, all required infrastructure (testing, tools etc) have to be arranged by supplier.
3. Any inspection carried out before supply by vendor/incoming stage at BHEL notwithstanding, if any defect/non-conformity is noted during processing, the same shall be attended/replaced by vendor at no extra cost.
4. BHEL representative from unit or CQ is authorized to carry out audits along with TPIA at vendor's works before clearing the items for dispatch.
5. Necessary tooling including thread gauges etc. have to be arranged by vendor. Only in exceptional cases, based on BHEL discretions item/nature, BHEL may consider request to provide gauges if available with BHEL. But in no case this shall be linked with delivery of material.

### 18. Warrantee and Corresponding Repair / Replacement of Goods

Goods shall comply with the specifications for material, workmanship and performance. Unless otherwise specified, vendor shall give a warrantee against design & manufacturing defects for a period of 18 months from the date of receipt. In case of non-acceptance of this term, bid shall be liable for rejection.

If the delivery is found non-compliant during the warranty period, leading to rejection, the Seller shall arrange free replacement / repair of goods, within one month from the date of intimation. Corresponding quantity shall be treated as unsupplied against respective purchase order till replacement is received at BHEL. In the event of the Seller's failure to comply, Purchaser may take action as appropriate, including repair / replenish rejected goods, at the risk & cost of the Seller.

All incidental charges like freight, insurance and customs duty in respect of return of defective items are to vendor's account only. BHEL will inform related invoice, quantity etc. to supplier. Supplier has to give advance intimation / plan (Transporter, Vehicle details) for the lifting of material. Further supplier has to provide requisite documents (such as Credit Note, e-Way Bill etc.) to lift the rejected material. Material should be lifted within one month from date of intimation. After one-month, BHEL will not be responsible for rejected material and BHEL shall have the right to dispose off such rejected material.

The defective parts and components shall be collected by your Indian agent or / authorized person, only after completing the replacement / repairs. If the supplier fails to replace / rectify the defective/ damaged items on free of cost within one month of reporting from our end, the same shall be treated as failure to execute the contract and actions as per the Guidelines for Suspension of Business Dealings with Suppliers /Contractors available in the webpage: <https://www.bhel.com> would be taken against such supplier without prejudice to the other remedies available to BHEL under the contract and law in this regard.





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### 19. LOI (Letter of Intent)

BHEL may issue LOI prior to the PO for any reason whatsoever. The LOI in such cases is to be treated as PO for all practical purposes and all the Terms & Conditions of the tender shall be applicable from the date of issue of LOI.

### 20. Sub-Contract

The purchase order or any part thereof shall not be sub-contracted, assigned or otherwise transferred without previously obtaining the BHEL's consent in writing.

### 21. Risk Purchase

1. In the event of any successful Tenderer's failure to fulfil any of the tender / Contract obligations including supply of whole or any part of the ordered items as per Contract / Agreement, BHEL has the right to terminate the contract and purchase from elsewhere, at the risk and cost of the defaulted supplier, either the whole of the goods or any part which the supplier has failed to deliver or dispatch within the time stipulated in the contract or if the same were not available, the best and nearest available substitute thereof. The supplier shall be liable for the additional expenditure/difference in Cost, if any, including consequential losses which BHEL may sustain by reason of risk purchase in addition to the applicable LD as per the Purchase order/contract.
2. The decision of BHEL with regard to the additional expenditure / difference in cost and consequential losses incurred by BHEL shall be final and binding on the supplier.
3. The amount recoverable under risk purchase shall be recovered from the defaulted supplier in all or any of the following manners:
  - from dues available in the form of Bills payable to defaulted supplier, SD, BGs against the same contract.
  - from the dues payable to defaulted supplier against other contracts in the same Region/Unit /any other region/unit. In-case recoveries are not possible with any of the above available options, Legal action shall be initiated for recovery against defaulted supplier.

### 22. Force Majeure

1. Notwithstanding the provisions contained in other clauses, the supplier shall not be liable for imposition of any such sanction so long the delay and/or failure of the supplier in fulfilling its obligations under the contract is the result of an event of Force Majeure. For purposes of this clause, Force Majeure means an event beyond the control of the supplier and not involving the supplier's fault or negligence and which is not foreseeable and not brought about at the instance of the party claiming to be affected by such event and which has caused the non – performance or delay in performance. Such events may include, but are not restricted to, wars or revolutions, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes excluding by its employees, lockouts excluding by its management, freight embargoes and Acts of GOD.
2. If a Force Majeure situation arises, the supplier shall promptly notify the Purchaser/Consignee in writing of such conditions and the cause thereof within twenty-one days of occurrence of such event. Unless otherwise directed by the Purchaser/Consignee in writing, the supplier shall continue to perform its obligations under the contract as far as reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

Signature Not Verified

Signed By: RAKESH

KUMAR

Location: BHEL, Goindwal

Signing Date: 05.04.2023





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3. If the performance in whole or in part or any obligation under this contract is prevented or delayed by any reason of Force Majeure for a period exceeding sixty days, either party may at its option terminate the contract without any financial repercussion on either side.
4. In case due to a Force Majeure event the Purchaser/Consignee is unable to fulfil its contractual commitment and responsibility, the Purchaser/Consignee will notify the supplier accordingly and subsequent actions taken on similar lines described in above sub-paragraphs.

### 23. Non-Disclosure Agreement

All Drawing and technical documents relating to the product or it's manufacture submitted by one party to the other, prior or subsequent to the formation of contract, shall remain property of the submitting party. Drawing, technical documents or other technical information received by one party, shall not without the consent of the other party, be used for any other purpose than that, for which they were provided. Such technical information shall not without the consent of the submitting party, otherwise be used or copied, reproduced, transmitted or communicated to a third party. Patterns supplied by BHEL will remain BHEL's property which shall be returned by the bidder on demand to BHEL. Bidder shall in no way share or use such intellectual property of BHEL to promote his own business with others. ***BHEL reserves the right to claim damages from the bidder, or take appropriate penal action as deemed fit against the bidder, for any infringement of the provisions contained herein.***

### 24. Clarifications

The correspondence exchanged against the tender from both tenderer and BHEL through email/e-procurement are considered as valid document legally though it is not signed. It is treated as valid confirmations made on behalf of the respective company and very much comes under the legal ambit of the business transaction and hence it is binding on both the parties to the business. Any transaction pertaining to the tender from both the parties of business done round the clock irrespective of the office or business hours of the companies, are valid legally and binding on both the parties. This applies to the extent only in such cases where deadline time for transaction is not specifically declared by either or both the parties to the business.

### 25. Preferences for Micro and Small Enterprises (MSEs)

Preferences as mentioned in “Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012” & “Public Procurement Policy for Micro and Small Enterprises (MSEs) Amendment Order, 2018”, or as per latest guidelines issued by government shall be given to Micro and Small enterprises.

Main points which are mentioned in the above orders are as follows:

- 25% Procurement of the tender value shall be made from MSE (Micro, Small Enterprises) firms.
- 25% of the 25% quantity (i.e. 6.25% of the tender quantity) offered to the MSE's shall be reserved for MSE's owned by SC/STs. Failure to participate by any MSE owned by SC/ST's; this 6.25% quantity shall be procured from other MSEs.





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- 3% from within the 25% quantity offered to the MSE's shall be reserved for women owned MSE's. Failure to participate by any MSE owned by women; this 3% quantity shall be procured from other MSEs.
- EMD shall be exempted for MSE's. All these benefits are subject to production of all statutory documents
- In tender, participating Micro and Small Enterprises quoting price within price band of L1+15 per cent 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 and Small Enterprise shall be allowed to supply up to 25 per cent of total tendered value. In case of more than one such Micro and Small Enterprise, the supply shall be shared proportionately (to tendered quantity).

MSE suppliers can avail the intended benefits only if they submit **Udyam Registration Certificate** along with the offer. No other document shall be considered for availing MSE benefits. Non-submission of such document will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents is not cleared before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required document is to be uploaded on the portal.

*Note: It may however be noted that MSE guidelines as on date (Date of Technical Bid Opening Part-1) shall prevail.*

### 26. Preference to Make in India

This procurement shall be governed by notification no. P-45021/2/2017-PP (BE-II) dated 16.09.2020 of Government of India issued by DPIIT and subsequent circulars issued afterwards. Accordingly, the minimum local content, the margin of purchase preference and the procedure for purchase preference to make in India shall be adhered.

### 27. Restrictions Under Rule 144(XI) of The General Financial Rules (GFR), 2017

All provisions of Order No. F.No.6/18/2019-PPD of Department of Expenditure (DoE) shall be applicable for this tender enquiry (Order copy is available at <https://doe.gov.in/procurementpolicy-divisions>). Accordingly, any bidder from a country which shares a land border with India (except the countries to which the Govt. of India has extended lines of credit or in which the Govt. of India is engaged in development projects for which list is available at <https://www.mea.gov.in/>) will be eligible to bid in this tender only if the bidder is registered with the Competent Authority as specified in Annex I of the said Order of DoE.

Updated list of the countries to which lines of credit have been extended or in which development projects are undertaken are available on the Ministry of External affairs website (<https://www.mea.gov.in/>)

For the purpose of this order, definition of Bidder from a country which shares a land border with India shall be same as defined in the Annex III of the said order.





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Registration with the competent authority as stipulated in the said order is responsibility of bidder.  
**Bidder has to submit a certificate certifying following along with offer:**

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this bidder fulfils all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be Attached]."

### 28. Resolution of Disputes

The Parties agree that if at any time (whether before, during or after the arbitral or judicial proceedings), any Disputes (which term shall mean and include any dispute, difference, question or disagreement arising in connection with construction, meaning, operation, effect, interpretation or breach of the contract/tender which the Parties are unable to settle mutually), arise inter-se the Parties, the same may, be referred by either party to Conciliation to be conducted through Independent Experts Committee to be appointed by competent authority of BHEL from the BHEL Panel of Conciliators.

Notes:

1. No serving or a retired employee of BHEL/Administrative Ministry of BHEL shall be included in the BHEL Panel of Conciliators.
2. Any other person(s) can be appointed as Conciliator(s) who is/are mutually agreeable to both the parties from outside the BHEL Panel of Conciliators.

The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided in Annexure-X to this GCC.

The Annexure-X together with its appendices will be treated as if the same is part and parcel hereof and shall be as effectual as if set out herein in this GCC.

Except as provided elsewhere in this Contract, in case amicable settlement is not reached between the parties, in respect of any dispute or difference; arising out of the formation, breach, termination, validity or execution of the Contract; or, the respective rights and liabilities of the Parties; or, in relation to interpretation of any provision of the Contract; or, in any manner touching upon the Contract, then, either Party may, by a notice in writing to other Party, refer such dispute or difference to sole arbitration of an arbitrator appointed as per the Arbitration and Conciliation Act, 1996 (India) or statutory modification or re-enactment thereof and the rules made thereunder and for the time being in force.

The Arbitrator shall pass a reasoned award and the award of the Arbitrator shall be final and binding upon the parties.

This contract shall be governed, construed and interpreted in accordance with the laws of India.





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Subject as aforesaid, the provisions of Arbitration & Conciliation Act 1996 (India) or statutory modification or re-enactment thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceeding under this clause.

The seat of arbitration shall be Tarn Taran, Punjab, India.

The cost of arbitration shall be borne as per the award of the Arbitrator.

Subject to arbitration in terms of clause above, the Courts at Tarn Taran, Punjab, India shall have exclusive jurisdiction over any matter arising out of or in connection with this Contract.

Notwithstanding the existence or any dispute or difference and/or reference for the arbitration, the vendor/contractor shall proceed with and continue without hindrance the performance of its obligation under this Contract with due diligence and expedition in a professional manner except where the Contract has been terminated by either Party in terms of this Contract.

### **In Case of Contract with Public Sector Enterprise (PSE) or a Government Department, the following shall be applicable:**

In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSEs)/Port Trusts inter se and also between CPSEs and Government Departments/Organizations (Excluding disputes concerning Railways, Income Tax, Customs & Excise Departments, such dispute or difference shall be taken up by either party for its resolution through AMRCD as mentioned in DPE OM No.05/003/2019-FTS-10937 dated 14<sup>th</sup> December, 2022 and the decision of AMRCD on the said dispute will be binding on both the parties.”

Set off : BHEL shall have the right to recover any money which in the sole opinion of BHEL is due from the supplier from any money due to the supplier under this Contract or any other contract or from the Security Deposit/BG furnished by the supplier under this Contract or any other contract.

### **29. Fraud Prevention Policy**

The Bidder along with its associate / collaborators / sub-contractors / sub-vendors / consultants / service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <https://www.bhel.com/> and shall immediately bring to the notice of BHEL management about any fraud or suspected fraud as soon as it comes to their notice.

### **30. Preventive Checks to Eliminate Suspected Cartel Formation**

The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). 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.





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In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.

### 31. Suspension of Business Dealings with Suppliers / Contractors

The offers of the bidders who are under suspension as also the offers of the bidders, who engage the services of the firms debarred across BHEL, shall be rejected. The list of firms debarred across BHEL is available on BHEL web site <https://www.bhel.com/>.

### INTEGRITY COMMITMENT, PERFORMANCE OF THE CONTRACT AND PUNITIVE ACTION THEREOF:

#### 31.1. Commitment by BHEL:

BHEL commits to take all measures necessary to prevent corruption in connection with the tender process and execution of the contract. BHEL will during the tender process treat all Bidder(s) in a transparent and fair manner, and with equity.

#### 31.2. Commitment by Bidder/ Supplier/ Contractor:

31.2.1. The bidder/ supplier/ contractor commits to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India.

31.2.2. The bidder/ supplier/ contractor will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to relevant guidelines issued from time to time by Govt. of India/ BHEL.

31.2.3. The bidder/ supplier/ contractor will perform/ execute the contract as per the contract terms & conditions and will not default without any reasonable cause, which causes loss of business/ money/ reputation, to BHEL.

If any bidder/ supplier/ contractor during pre-tendering/ tendering/ post tendering/ award/ execution/ post-execution stage indulges in mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, then, action may be taken against such bidder/ supplier/ contractor as per extant guidelines of the company available on <https://www.bhel.com/> and/or under applicable legal provisions

### 32. General

1. BHEL will not be bound by any power of attorney granted by the vendors or by changes in the composition of the firm made subsequent to the execution of the contract. They may, however,





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- recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the vendor concerned.
2. BHEL reserves the right to extend the due date of opening, which shall be informed. Validity of offer shall be deemed to be revised accordingly.
  3. BHEL reserves the right to accept or reject any part or whole of the tender of a bidder by assigning a valid reason thereof. BHEL reserves the right to cancel the tender without assigning any reason thereof and without any obligation before any commitment.
  4. Acceptance of all terms and conditions, in the form of signed copy of T&C or confirmation separately written, shall be submitted along with quotation. If nothing is mentioned, it shall be concluded that these terms and conditions are acceptable.
  5. BHEL may increase/decrease item/s based on BHEL requirement before price bid opening. Suitable price implication may be asked from suppliers.
  6. BHEL may drop item/items from tender at any stage of tender before placing PO. BHEL may also delete PO with consent with supplier within delivery date of PO.
  7. After releasing PO, it is assumed that supplier has accepted PO if we do not receive acknowledgement from supplier within 5 days of date of PO.
  8. In case of unscheduled holiday on opening day of tender, the next working day will be treated as scheduled prescribed day of opening of tender.
  9. On the due date of tender opening, only technical bids will be opened. The opened technical bids will be evaluated by us and clarifications required, if any, will be called for from the bidders on technical and commercial points. If no reply is received from the vendor for the clarification raised by BHEL with in the final cut-off date, those vendors offer will be processed with the documents available / submitted against this tender. Offers not meeting the required specification and technical condition will be summarily rejected. The price bids of technically suitable bidders will be opened on a later date with prior intimation to techno-commercially suitable bidders.
  10. Ranking L-1, L-2 etc. shall be done for individual item for the techno-commercially acceptable offers on landed cost to BHEL, IVP Goindwal basis and BHEL reserves the right to place order for individual items with different vendors.
  11. BHEL reserves the right to negotiate with L1 vendor or re-float the tender for items where, L1 price is not the lowest acceptable price; BHEL reserves the right to increase or decrease the tender quantity.
  12. If supplier is mentioning delivery destination within state/ outside state depending upon his location of factory, Free on Road etc. these are assumed as on FOR Goindwal. If supplier is wishing to give delivery on Ex works basis, then he has to clearly mention about it.
  13. The bidder has to keep track of any changes by viewing the addendum(s) / Corrigendum(s) issued by the Purchaser on time-to- time basis in the E-Procurement platform. The Company calling for tenders shall not be responsible for any claims/problems arising out of this.
  14. Unregistered suppliers, who are techno-commercially qualified against the open tender, are requested to register with BHEL as permanent supplier by submitting the Supplier Registration Form (SRF) in online supplier registration portal (<https://supplier.bhel.in/>).
  15. The General Conditions of Contract and the Special Conditions in each enquiry and the resulting purchase order constitute the entire contract between the parties. In case of any discrepancy between the provisions of General Conditions of Contract and Special Conditions of the Tender,

Signature Not Verified

Signed By: RAKESH  
KUMAR  
Location: BHEL, Goindwal  
Signing Date: 05.04.2023





**General Conditions of Contract (GCC) of MM Tenders**  
**BHARAT HEAVY ELECTRICALS LIMITED**

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

the provisions in Special Conditions of the Tender shall prevail and interpretation of BHEL of such condition/clause will be final and binding on both the parties ..





## General Conditions of Contract (GCC) of MM Tenders

**BHARAT HEAVY ELECTRICALS LIMITED**

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

### Annexure-X

#### **BRIEF PROCEDURE FOR CONDUCT OF CONCILIATION PROCEEDINGS**

1. The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided herein:
2. The party desirous of resorting to Conciliation shall send an invitation/notice in writing to the other party to conciliate specifying all points of Disputes with details of the amount claimed. The party concerned shall not raise any new issue thereafter. Parties shall also not claim any interest on claims/counter-claims from the date of notice invoking Conciliation till the conclusion of the Conciliation proceedings.
3. The party receiving the invitation/notice for Conciliation shall within 30 days of receipt of the notice of Conciliation intimate its consent for Conciliation along with its counter-claims, if any.
4. The Conciliation in a matter involving claim or counter-claim (whichever is higher) up to Rs 5 crores shall be carried out by sole Conciliator nominated by BHEL while in a matter involving claim or counter-claim (whichever is higher) of more than Rs 5 crores Conciliation shall be carried out by 3 Conciliators nominated by BHEL.
5. The Parties shall be represented by only their duly authorized in-house executives/officers and neither Party shall be represented by a Lawyer.
6. The first meeting of the IEC shall be convened by the IEC by sending appropriate communication/notice to both the parties as soon as possible but not later than 30 days from the date of his/their appointment. The hearings in the Conciliation proceeding shall ordinarily be concluded within two (2) months and, in exceptional cases where parties have expressed willingness to settle the matter or there exists possibility of settlement in the matter, the proceedings may be extended by the IEC by a maximum of further 2 months with the consent of the Parties subject to cogent reasons being recorded in writing.
7. The IEC shall thereafter formulate recommendations for settlement of the Disputes supported by reasons at the earliest but in any case, within 15 days from the date of conclusion of the last hearing. The recommendations so formulated along with the reasons shall be furnished by the IEC to both the Parties at the earliest but in any case, within 1 month from the date of conclusion of the last hearing.
8. Response/modifications/suggestions of the Parties on the recommendations of the IEC are to be submitted to the IEC within time limit stipulated by the IEC but not more than 15 days from the date of receipt of the recommendations from the IEC.
9. In the event, upon consideration, further review of the recommendations is considered necessary, whether by BHEL or by the other Party, then, the matter can be remitted back to the IEC with

Signature Not Verified  
Signed By: RAKESH  
KUMAR  
Location: BHEL, Goindwal  
Signing Date: 05.04.2023





## General Conditions of Contract (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
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Punjab-143422 (INDIA)

- request to reconsider the same in light of the issues projected by either/both the Parties and to submit its recommendations thereon within the following 15 days from the date of remitting of the case by either of the Parties.
10. Upon the recommendations by the Parties, with or without modifications, as considered necessary, the IEC shall be called upon to draw up the Draft Settlement Agreement in terms of the recommendations.
  11. When a consensus can be arrived at between the parties only in regard to any one or some of the issues referred for Conciliation the draft Settlement Agreement shall be accordingly formulated in regard to the said Issue(s), and the said Settlement Agreement, if signed, by the parties, shall be valid only for the said issues. As regards the balance issues not settled, the parties may seek to resolve them further as per terms and conditions provided in the contract.
  12. In case no settlement can be reached between the parties, the IEC shall by a written declaration, pronounce that the Conciliation between the parties has failed and is accordingly terminated.
  13. Unless the Conciliation proceedings are terminated in terms of para 22 (b), (c) & (d) herein below, the IEC shall forward his/its recommendations as to possible terms of settlement within one (1) month from the date of last hearing. The date of first hearing of Conciliation shall be the starting date for calculating the period of 2 months.
  14. In case of 3 members IEC, 2 members of IEC present will constitute a valid quorum for IEC and meeting can take place to proceed in the matter after seeking consent from the member who is not available. If necessary, videoconferencing may be arranged for facilitating participation of the members. However, the IEC recommendations will be signed by all members. Where there is more than one (1) Conciliator, as a general rule they shall act jointly. In the event of differences between the Members of IEC, the decision/recommendations of the majority of the Members of IEC shall prevail and be construed as the recommendation of the IEC.
  15. The Draft Settlement Agreement prepared by the IEC in terms of the consensus arrived at during the Conciliation proceedings between the Parties shall be given by the IEC to both the parties for putting up for approval of their respective Competent Authority.
  16. Before submitting the draft settlement agreement to BHEL's Competent Authority viz. the Board Level Committee on Alternative Dispute Resolution (BLCADR) for approval, concurrence of the other party's Competent Authority to the draft settlement agreement shall be obtained by the other party and informed to BHEL within 15 days of receipt of the final draft settlement agreement by it. Upon approval by the Competent Authority, the Settlement Agreement would thereafter be signed by the authorized representatives of both the Parties and authenticated by the members of the IEC.
  17. In case the Draft Settlement Agreement is rejected by the Competent Authority of BHEL or the other Party, the Conciliation proceedings would stand terminated.





## General Conditions of Contract (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

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18. A Settlement Agreement shall contain a statement to the effect that each of the person(s) signing thereto (i) is fully authorized by the respective Party(ies) he/she represents, (ii) has fully understood the contents of the same and (iii) is signing on the same out of complete freewill and consent, without any pressure, undue influence.
19. The Settlement Agreement shall thereafter have the same legal status and effect as an arbitration award on agreed terms on the substance of the dispute rendered by an arbitral tribunal passed under section 30 of the Arbitration and Conciliation Act, 1996.
20. Acceptance of the Draft Settlement Agreement/recommendations of the Conciliator and/or signing of the Settlement Agreement by BHEL shall however, be subject to withdrawal/closure of any arbitral and/or judicial proceedings initiated by the concerned Party in regard to such settled issues.
21. Unless otherwise provided for in the agreement, contract or the Memorandum of Understanding, as the case may be, in the event of likelihood of prolonged absence of the Conciliator or any member of IEC, for any reason/incapacity, the Competent Authority/Head of Unit/Division/Region/Business Group of BHEL may substitute the Conciliator or such member at any stage of the proceedings. Upon appointment of the substitute Conciliator(s), such reconstituted IEC may, with the consent of the Parties, proceed with further Conciliation into the matter either de-novo or from the stage already reached by the previous IEC before the substitution.
22. The proceedings of Conciliation under this Scheme may be terminated as follows:
- On the date of signing of the Settlement agreement by the Parties; or,
  - By a written declaration of the IEC, after consultation with the parties, to the effect that further efforts at conciliation are no longer justified, on the date of the declaration; or,
  - By a written declaration of the Parties addressed to the IEC to the effect that the Conciliation proceedings are terminated, on the date of the declaration; or,
  - By a written declaration of a Party to the other Party and the IEC, if appointed, to the effect that the Conciliation proceedings are terminated, on the date of the declaration.
  - On rejection of the Draft Settlement Agreement by the Competent Authority of BHEL or the other Party.





## General Conditions of Contract (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

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Punjab-143422 (INDIA)

23. The Conciliator(s) shall be entitled to following fees and facilities:

Sr. No.	Particulars	Amount
1	Sitting fees	Each Member shall be paid a Lump Sum fee of Rs 75,000/- for the whole case payable in terms of paragraph No. 27 herein below.
2	Towards drafting of settlement agreement	<p>In cases involving claim and/or counter-claim of up to Rs 5crores. Rs 50,000/- (Sole Conciliator)</p> <p>In cases involving claim and/or counter-claim of exceeding Rs 5 crores but less than Rs 10 crores. Rs. 75,000 (per Conciliator)</p> <p>In cases involving claim and/or counter-claim of more than Rs 10 crores. Rs 1,00,000/- (per Conciliator)</p> <p>Note: The aforesaid fees for the drafting of the Settlement Agreement shall be paid on Signing of the Settlement Agreement after approval of the Competent Authority or Rejection of the proposed Settlement Agreement by the Competent Authority of BHEL.</p>
3	Secretarial expenses	<p>Rs 10,000/- (one time) for the whole case for Conciliation by a Sole Member IEC.</p> <p>Where Conciliation is by multi member Conciliators –Rs 30,000/- (one time)- to be paid to the IEC</p>
4	Travel and transportation and stay at outstation	As per entitlement of the equivalent officer (pay scale wise) in BHEL.
	<p>i Retired Senior Officials of other Public Sector Undertakings (pay scale wise equivalent to or more than E-8 level of BHEL)</p>	
	Others	As per the extant entitlement of whole time Functional Directors in BHEL.

Signature Not Verified

Signed By: RAKESH

KUMAR

Location: BHEL, Goindwal

Signing Date: 05.04.2023





## General Conditions of Contract (GCC) of MM Tenders BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
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5	Venue for meeting	Unless otherwise agreed in the agreement, contract or the Memorandum of Understanding, as the case may be, the venue/seat of proceedings shall be the location of the concerned Unit / Division / Region / Business Group of BHEL. Without prejudice to the seat/venue of the Conciliation being at the location of concerned BHEL Unit / Division / Region / Business Group, the IEC after consulting the Parties may decide to hold the proceedings at any other place/venue to facilitate the proceedings. Unless, Parties agree to conduct Conciliation at BHEL premises, the venue is to be arranged by either Party alternately.
---	-------------------	--

24. The parties will bear their own costs including cost of presenting their cases/evidence/witness(es)/expert(s) on their behalf. The parties agree to rely upon documentary evidence in support of their claims and not to bring any oral evidence in IEC proceedings.

25. If any witness(es) or expert(s) is/are, with the consent of the parties, called upon to appear at the instance of the IEC in connection with the matter, then, the costs towards such witness(es)/expert(s) shall be determined by the IEC with the consent of the Parties and the cost so determined shall be borne equally by the Parties.

26. The other expenditures/costs in connection with the Conciliation proceedings as well as the IEC's fees and expenses shall be shared by the Parties equally.

27. Out of the lump sum fees of Rs 75,000/- for Sitting Fees, 50% shall be payable after the first meeting of the IEC and the remaining 50% of the Sitting Fees shall be payable only after termination of the conciliation proceedings in terms of para 22 hereinabove.

28. The travelling, transportation and stay at outstation shall be arranged by concerned Unit as per entitlements as per Serial No. 3 of the Table at para 23 above, and in case such arrangements are not made by the BHEL Unit, the same shall be reimbursed to the IEC on actuals limited to their entitlement as per Serial No. 4 of the Table at Para 23 above against supporting documents. The IEC Member(s) shall submit necessary invoice for claiming the fees/reimbursements.

29. The Parties shall keep confidential all matters relating to the conciliation proceedings. Confidentiality shall extend also to the settlement agreement, except where its disclosure is necessary for purposes of its implementation and enforcement or as required by or under a law or as per directions of a Court/Governmental authority/ regulatory body, as the case may be.

30. The Parties shall not rely upon or introduce as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the Disputes that is the subject of the Conciliation proceedings:

Signature Not Verified

Signed By: RAKESH

KUMAR

Location: BHEL, Goindwal

Signing Date: 05.04.2023





## General Conditions of Contract (GCC) of MM Tenders

### BHARAT HEAVY ELECTRICALS LIMITED

Industrial Valve Plant: 433, Industrial Complex,  
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Punjab-143422 (INDIA)

- a. Views expressed or suggestions made by the other party in respect of a possible settlement of the Disputes;
  - b. admissions made by the other party in the course of the Conciliator proceedings;
  - c. proposals made by the Conciliator;
  - d. The fact that the other Party had indicated his willingness to accept a proposal for settlement made by the Conciliator.
31. The Parties shall not present the Conciliator(s) as witness in any Alternative Dispute Resolution or Judicial proceedings in respect of a Disputes that is/was the subject of that particular Conciliation proceeding.
32. None of the Conciliators shall act as an arbitrator or as a representative or counsel of a Party in any arbitral or judicial proceeding in respect of a Disputes that is/was the subject of that particular Conciliation proceeding.
33. The Parties shall not initiate, during the Conciliation proceedings, any arbitral or judicial proceedings in respect of a Disputes that is the subject matter of the Conciliation proceedings except that a Party may initiate arbitral or judicial proceedings where, in his opinion, such proceedings are necessary for preserving his rights including for preventing expiry of period of limitation. Unless terminated as per the provisions of this Scheme, the Conciliation proceedings shall continue notwithstanding the commencement of the arbitral or judicial proceedings and the arbitral or judicial proceedings shall be primarily for the purpose of preserving rights including preventing expiry of period of limitation.
34. The official language of Conciliation proceedings under this Scheme shall be English unless the Parties agree to some other language.





## General Conditions of Contract (GCC) of MM Tenders

**BHARAT HEAVY ELECTRICALS LIMITED**

Industrial Valve Plant: 433, Industrial Complex,  
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Punjab-143422 (INDIA)

### Appendix-I of Annexure-X

#### FORMAT FOR SEEKING CONSENT FOR REFERRING THE DISPUTES TO CONCILIATION THROUGH IEC

To,

M/s. (Stakeholder's name)

**Sub: Resolution of the Disputes through conciliation by Independent Expert Committee (IEC).**

Ref: Contract No/MoU/Agreement/LOI/LOA& date \_\_\_\_\_.

Sir,

With reference to above referred Contract/MoU/Agreement/LOI/LOA, you have raised certain Disputes/claims. Vide your letter dated\_\_\_\_ you have requested BHEL to refer the Disputes/claims to IEC for Conciliation.

We are enclosing herewith Format (3) for giving consent and the terms and conditions of BHEL Conciliation Scheme, 2018 governing conciliation through IEC. You are requested to give your unconditional consent to the said terms and conditions of the Scheme by returning the same duly sealed and signed on each page. On receipt of your consent, matter will be put to the Competent Authority for consideration and decision.

Please note that BHEL has also certain claims against you (if applicable). BHEL reserves its right to agree or not to agree conciliation of the said disputes through BHEL and this letter is being issued without prejudice to BHEL's rights and contentions available under the contract and law.

Yours faithfully,

**Representative of BHEL**





## General Conditions of Contract (GCC) of MM Tenders

**BHARAT HEAVY ELECTRICALS LIMITED**

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

### Appendix-II of Annexure-X

#### FORMAT FOR GIVING CONSENT BY CONTRACTOR/VENDOR/CUSTOMER/COLLABORATOR/CONSORTI UM PARTNERS FOR REFERRING THE DISPUTES TO CONCILIATION THROUGH IEC

To,

BHEL

.....

**Sub: Resolution of Disputes through Conciliation by Independent Expert Committee (IEC).**

Ref: Contract/MoU/Agreement/LOI/LOA No

& date \_\_\_\_

With reference to above referred contract, our following bills/invoices/claims submitted to BHEL are still unpaid giving rise to Disputes:

SL. no.	Claim Description	Bill submitted to BHEL (no. and date)	Amount of the bill/claim	Amount received from BHEL	Outstanding Amount

Accordingly, we request you to kindly refer the Disputes in respect of above claims to IEC for Conciliation.

We hereby agree and give our unconditional consent to the terms and conditions of BHEL Conciliation Scheme, 2018 governing conciliation through IEC. We have signed the same on each page and enclosed it for your consideration.

Yours faithfully,

**(Signature with stamp)**

**Authorized Representative of Contractor  
Name, with designation Date**





## General Conditions of Contract (GCC) of MM Tenders

**BHARAT HEAVY ELECTRICALS LIMITED**

Industrial Valve Plant: 433, Industrial Complex,  
Goindwal Sahib, Dist. Tarn Taran,  
Punjab-143422 (INDIA)

### Appendix-III of Annexure-X

#### STATEMENT OF CLAIMS/COUNTER CLAIMS TO BE SUBMITTED TO THE IEC BY BOTH THE PARTIES

1. Chronology of the Disputes
2. Brief of the Contract/MoU/Agreement/LOI/LOA
3. Brief history of the Disputes:
4. Issues:
5. Details of Claim(s)/Counter Claim(s):

Sl. No.	Description of claim(s)/Counter Claim	Amount (in INR) Or currency applicable in the contract	Relevant contract clause

6. Basis/Ground of claim(s)/counter claim(s) (along with relevant clause of contract)

**Note**– The Statement of Claims/Counter Claims may ideally be restricted to maximum limit of 20 pages. Relevant documents may be compiled and submitted along with the statement of Claims/Counter Claims. The statement of Claims/Counter Claims is to be submitted to all IEC members and to the other party by post as well as by email.





Product: Steel Castings for Boilers & Valves

#### Revisions record:

Rev. 21 – 1) CI 8 – requirements of test bar added. 2) CI 7 Table 1 – SV, SRV and QC NRV RT quantum for body casting modified. 3) Isolating valve, product name modified. 4) CI 8 a) clarity on need for re qualification of castings added. 5) CI 12 modified to include drawing details, 6) CI 13.4 A – clarity to submit IBR certificate and MTC added.  
Rev. 22- Dt: 26/06/2014 1) CI 7.0 Table 1 –RT area of QCNRV body revised. 2) CI.8.0 a) Modified. 3) Sketch of Zones of RT –RT zones of SV and SRV base castings modified based on Engineering review.  
Rev. 23 Dt: 06/10/2015: Cl. 2, 4, 5, 6, 7, 8, 13, 15 modified to incorporate API 6D 24<sup>th</sup> Edition requirements.  
Rev 24 Dt: 23/12/2015: CI 1, 2, 3,5, 6, 7, 8, 9, 10, 13, 14 & 15 modified.  
Rev: 25 Dt: 11/02/2017: CI 1 changed to indicate the use of latest revisions of referred codes, standards, specifications, drawings, procedures, etc; Requirements of API 6D removed from CI 2, 4, 5, 7, 13 & 15 since the API 6D certificate license was not applied for; Definitions for relevant, linear and rounded indications provided in CI 7; CI 2 to 10, 12, 13 & 15 revised to bring better clarity; Type 3.2 certification updated as per BS EN 10204-2004 in CI 13.2.  
Rev: 26 : Dt: 21/02/2018 - SA/ASTM A 995 Gr 4A (CD3MN) added in CI 1 & 5 based on Engineering/Valves input; Creep testing requirements removed and referred to SIP:RM:01.  
Rev: 27 : Dt: 01/04/2022 - CA15 added in CI 1; CI.5a updated;Table 2: Spring loaded Bypass Valves & Knife Edge Gate Valve –NDE requirements added;CI 7.2 modified to include NDE requirements for machined casting; CI.13.3 added for Machined castings; CI.13.4 added for Certification of Product Attest Items; CI.13.5 added for Certification of Certified Items; CI.15- updated; Shooting Sketch added for Spring Loaded Bypass Valves.  
*Rev.28: Dt.01/12/2022 – Cl.1 updated;Table 1- Impact testing requirements for SRV for SCR application added*

### 1. MATERIAL SPECIFICATIONS:

**All the codes, standards, specifications, drawings & procedures, etc., referred in this TDC shall be of latest revision as on the date of Enquiry/Purchase Order, whichever is earlier, unless specified otherwise.**

Carbon Steel (CS) : SA / ASTM A216 WCB, WCC & 352 LCB, LCC  
Alloy Steel (AS) : SA / ASTM A217 WC6, WC9, C12A  
Martensitic Stainless Steel (MSS): SA / ASTM A217 CA15  
Austenitic Stainless Steel (ASS) : SA / ASTM A351 CF3M, CF8, CF8C & CF8M;  
Duplex Stainless Steel (DSS) : Duplex SA / ASTM 995 Gr. 4A(CD3MN)  
Additional Requirement : As listed below (Supplementary to above material specifications)  
Size, Quantity, Grade/Class : As per Purchase Order & Drawing / Pattern.

### 2. CHEMICAL COMPOSITION AND PROCESS:

- a) Melting: As per the Specification, Fully Killed.  
Carbon= 0.25% maximum: for SA / ASTM A216 WCB only.  
Carbon= 0.15% maximum: for SA / ASTM A217 WC6 & WC9 (For the castings used in QCNRV, CRHNRV, TOA Valves & Conventional valves having contours for welding).

Product Analysis on test bar for each melt including residual elements shall be carried out.

- b) All raw materials used in steel making including incoming scrap shall be checked by supplier to ensure freedom from radioactivity. (Applicable for SS material only)  
c) Tolerance for chemistry shall be as per the above applicable material specifications/standards specified in CI 1.

### 3. DIMENSIONS AND TOLERANCES:

Dimensions & their tolerances shall be as per applicable drawings. For untoleranced dimensions: VL: STDC: 023.

### 4. HEAT TREATMENT (HT):

CS – Castings of High Pressure Valve. (Cl.900, Cl.1500 & above), QCNRV & CRHNRV: Shall be in Annealed Condition.

AS – Castings: Normalized and Tempered.

Normalizing Temperature: SA/ASTM A217 WC6, WC9: 920-950°C and for C12A: 1050-1080°C.

Tempering Temperature: SA/ASTM A217 WC6: 680°C min.; WC9: 720°C min.; C12A: 750-780°C.



**Product: Steel Castings for Boilers & Valves**

All other materials: Heat treatment shall be as per the applicable material specification & grade.

**5. MECHANICAL TESTS:**

- a) Test bars to be cast integral with the casting or separately. If cast separately, they shall be cast at the same time as the castings and from the same ladle. A metal strip with heat number stamped shall be fused with the test bar during casting, to maintain traceability.

If one (1) casting is made from more than one heat, separate test bars for each cast to be poured and all test bars shall satisfy the requirements. Tests mentioned in Table 1 shall be conducted per heat *per* Heat treatment batch, as per ASTM A370.

Perform tensile tests at room temperature in accordance with the procedures specified in ASTM A370. Perform a minimum of one tensile test. All yield strengths shall be determined using 0.2 % offset method of ASTM A370. The results of the tensile test(s) shall satisfy the applicable material specification requirements. Hardness testing shall be as per ASTM E10 or E18.

If the results of the tensile test(s) do not satisfy the applicable requirements, two additional tests on two additional test specimens (removed from the same TC with no additional heat treatment) may be performed in an effort to qualify the material. The results of each of these tests shall satisfy the applicable requirements.

Table 1.

No	TEST	MATERIAL SPECIFICATIONS					
		SA/ASTM A216, 217	SA/ASTM A352	SA/ASTM A351	SA/ASTM A995		
1	Tension Test	As per the Material Specification					
2	Hardness Test	As per the Specification	225 HBW max.	Not applicable	Not Applicable		
3	Bend Test Specimen 1" x ¾"		Bend Angle	Dia of Pin	Not applicable	S3 of SA703	Not applicable
		WCB	90°	2t			
		WCC	90°	2t			
		WC6	120°	3t			
		WC9	90°	3t			
C12A	90°	2t					
4	Charpy- U Impact for all QCNRV, CRHNRV bodies for IBR.	As per IBR. At Room temperature. Acceptance: Avg /Single=36J/32J min.	Not applicable	Not applicable	Not applicable		
5	Charpy- V Impact for CE Marking- Pressure Equipment Directive (PED) items as Specified in the Purchase Order.	At 20 Deg.C temperature. Acceptance:Avg/Single=40J/27J min.	As per Specification	Not applicable	Not applicable		
6	Charpy- V Impact for LPBP bodies	At 20 Deg.C temperature. Acceptance: Avg/Single=27J/21J min.	Not applicable	Not applicable	Not applicable		
7	Charpy- V Impact for SRV Base, Bonnet (SCR application)	At "-33 Deg. C" temperature. Acceptance: Average of three specimens shall be 20J min; minimum impact energy for one specimen shall not be less than 2/3 of the average energy required for three specimens	Not applicable	Not applicable	Not applicable		



**Product: Steel Castings for Boilers & Valves**

b) **Creep testing** & reporting shall be carried out as per SIP:RM:01 (latest revision) whenever indicated in the Enquiry/Purchase Order/Engineering Drawing.

**6. FETTLING, DRESSING & CLEANING:**

- Dressing of castings-Free from risers, in gates, notches, undercuts, deep marks etc.
- Fused wires, parting line fins, chills etc. shall be removed by grinding.
- Gas cutting if employed shall be done before Heat treatment.
- Preheat the material to 200°C before gas cutting the Alloy steels.
- Castings shall be blast cleaned both inside and outside for the removal of fused sand, scales etc.
- Visual inspection: 100% as per MSS-SP:55. Acceptance: Type 1: none accepted; Type 2-12: A & B only accepted.

**7. NON DESTRUCTIVE TESTING (NDT) AFTER HEAT TREATMENT**

The NDE requirements for the castings shall meet the following as shown in Table-2 below. Castings shall be free from surface and internal defects like porosity, shrinkage, sand inclusion, crack, cold shut and other harmful defects. All castings shall be of Radiographic Quality.

1. Radiographic Testing Procedure (RT) : As per ASME B16.34
2. Magnetic Particle Inspection (MPI) : As per ASTM E709
3. Liquid Penetrant Inspection (LPI) : As per ASTM E165

**Table: 2**

Product	Components	Characteristics	Type of NDE Check				
			RT	RT Area	RT Acc. Std	MT \$	MT Area
Conventional Valves (Gate, Globe & Check)	Body, Bonnet Pr.part yoke, Cover,	< 600 Class	10%#	ASME B 16.34 / On critical area as indicated in the Drawing.	As per Table: 3	--	--
	Body, Bonnet, Cover	600 Class & above	100%			--	--
	Body, Bonnet, Cover	1500 Class & above	100%			100%	All accessible surfaces including belly.
	Wedge	All Special Class Valves	--			--	100%
Knife Edge Gate Valve	Body	All	LPI shall be performed in all machined surfaces				
Spring Loaded Bypass Valves	Body, Bonnet, Cap	All	100%	Area shown in the sketch (Annexure-1). The areas where RT cannot be carried out MPI shall be done.	As per Table: 3	100%	All accessible surfaces including belly.
Safety Valve	Base	Flanged ends of All Castings	100%	Critical Zones as given in the Drawing/ area shown in the sketch (Annexure-1). The areas where RT cannot be carried out MPI shall be done.	Class 2 of ASTM E446 / E186. For Butt weld ends as per Table- 3	100%	All accessible surfaces
		Weld ends of All Castings	100%			--	--
Safety Relief Valve	Base	All	100%			All area	Class-2 of ASTM E446 / E186.
	Bonnet		10%#	--	--		
QC NRV, CRH NRV	Body	150 & 300 Class	100%	Butt Weld Ends	As per Table: 3	100%	All accessible surfaces including belly.
		600 Class & above	100%	Critical Zones as given in the	As per Table: 3	100%	



**Product: Steel Castings for Boilers & Valves**

	Body (Special)	All		Drawing/ area shown in the sketch (Annexure-1).The areas where RT cannot be carried out MPI shall be done.			
Soot Blower Valve	Body	All	10%#	Critical Zones as given in the Drawing/ area shown in the sketch (Annexure-1).The areas where RT cannot be carried out MPI shall be done.	As per Table: 3	--	--
Isolating Valve/ device	Body	< 600 Class	100%	Critical Zones as given in the Drawing/ area shown in the sketch Annexure-1).The areas where RT cannot be carried out MPI shall be done.	As per Table: 3	--	All accessible surfaces including belly.
		600 Class & above				--	
		1500 Class & above				100%	
LP Bypass Valve	Body	All	100%	Critical Zones as given in the Drawing/ area shown in the sketch Annexure-1).The areas where RT cannot be carried out MPI shall be done.	As per Table: 3	--	--

\$ LPI can be substituted for MPI in all inaccessible area and for stainless steel castings # Refer CI 7.1

**Table: 3**

Type Of Discontinuity	Acceptance Level Category	< 600 CLASS		≥ 600 CLASS	
		Thickness ≤2"	Thickness >2"	Thickness ≤2"	Thickness >2"
Gas Porosity	A	A2	A3	A1	A2
Sand/Slag inclusion	B	B3	B3	B2	B2
Shrink Type-1	C	CA2	CA3	CA1	CA2
Shrink Type-2	C	CB3	CB3	CB2	CB2
Shrink Type-3	C	CC3	CC3	CC2	CC2
Crack	D	NONE	NONE	NONE	NONE
Hot Tear	E	NONE	NONE	NONE	NONE
Un-fused Inserts (Chills/Chaplets)	F	NONE	NONE	NONE	NONE

a. Butt welding ends shall be free of shrinkage, crack & hot tear.  
 b. For butt weld ends Gas hole/Porosity and sand inclusions to be within level A1 & B1 respectively

**NDE for SS material:** Castings shall be checked for radioactive contamination and reported. Survey meter shall be used to measure near the surface. Acceptance limits: Shall be less than 0.1 milli Rontgen (MR) per hour or 1 micro Sievert per hour.

7.1 # 10% Sampling shall be done as follows: (Wherever specified): The vendor shall select 10% of the Casting from the lot consisting of same size and type, (along with melt number / Sl.nos of the castings covered in the lot) for Radiography. A lot to be specified as the total number of castings as above, supplied in 4 months



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period (Jan-Apr, May-Aug, Sep-Dec). The vendor shall radiograph these specified castings and incorporate the lot size and melt no and Sl.no in the RT reports along with the other Sl.nos of the other castings covered in the lot. If the identified casting is defective then 2 more castings shall be radiographed. If these 2 castings are defect free then the lot is acceptable. If any one of these castings is defective then all the remaining castings shall be radiographed and all defective areas shall be repaired. BHEL will carry out audit on the lots at the vendor works at any time.

**7.2 a) Raw Casting: Valve Body (Conventional Valves & Spring Loaded Bypass Valves):**

**Surface NDE (MPI & LPI):-** Testing as per ASME B16.34.

1. **Relevant indication: Surface-rupture NDE indication with major dimensions > 1.6 mm (1/16 in).**
2. **Linear indication: Surface NDE indication whose length is  $\geq$  three times its width.**
3. **Rounded indication: Surface NDE indication whose length is < three times its width.**

**Acceptance for MPI & LPI:** As per TOA ST-E 0006 & ST-E-0005

4. Cracks are not permitted.
5. For linear indications other than cracks, indications must be separated by a distance greater than the length of an acceptable indication. Maximum allowable length of the indication shall be:
  - a) 1.6 mm for thickness upto 16.0 mm
  - b) 3.1 mm for thickness over 16.0 mm and below 50.8 mm
  - c) 4.7 mm for thickness over 50.8 mm
6. For rounded indications, 4 or more indications in a line separated by 1.5 mm or less edge to edge are unacceptable. Maximum allowable diameter of the indication shall be:
  - a) 3.1 mm for thickness less than 16.0 mm
  - b) 4.7 mm for thickness 16.0 mm and above
  - c) Four or more indications in a straight line, and the distance between adjacent indications is 1.6mm and less edge to edge
  - d) More than ten indications in the area 38.7 cm<sup>2</sup> selected so as to include as many as possible. However, the longest side of the area should be less than 152.4mm

**b) Raw Casting: Components other than Valve Body(Conventional Valves & Spring Loaded Bypass Valves):**

**Surface NDE (MPI & LPI):-** Testing and acceptance as per ASME B16.34

1. **Relevant indication: Surface-rupture NDE indication with major dimensions > 1.6 mm (1/16 in).**
2. **Linear indication: Surface NDE indication whose length is  $\geq$  three times its width.**
3. **Rounded indication: Surface NDE indication whose length is < three times its width.**

**Acceptance for MPI & LPI:**

4. Cracks are not permitted.
5. For linear indications other than cracks, indications must be separated by a distance greater than the length of an acceptable indication. Maximum allowable length of the indication shall be:
  - a) For thickness(t) up to 13mm= 8mm,
  - b) For thickness from 13 to 25mm = 13mm
  - c) For thickness above 25mm=18mm.
6. For rounded indications, 4 or more indications in a line separated by 1.5 mm or less edge to edge are unacceptable. Maximum allowable diameter of the indication shall be:
  - a) For thickness up to 13mm =8mm
  - b) For thickness above 13mm =13mm

**c) Machined Casting: Valve Body(Conventional Valves & Spring Loaded Bypass Valves):**

**Surface NDE ( LPI):** Testing as per ASME B16.34 on all accessible machined area

**Acceptance for LPI:** As per TOA ST-E-0005. Following relevant indications are unacceptable.

**1. Butt Weld ends**

- a) Rounded indications of dia > 1.5 mm.
- b) Linear indications of length > 0.5 mm.



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- c) Four or more indications in a line separated by 1.5 mm or less edge to edge.
- d) Ten or more acceptable indications in an area of 38.7 cm<sup>2</sup> with one side not exceeding 152.4 mm.

## 2. Self-Sealing Bore Area

- a) Any Linear indication
- b) Rounded indications of dia > 1.5 mm.
- c) Ten or more acceptable indications in an area of 38.7 cm<sup>2</sup> with one side exceeding 25 mm.

## d) Machined Casting: Knife Edge Gate Valve Body:

**Surface NDE ( LPI):** Testing as per ASME B16.34 on all accessible machined area

**Acceptance for LPI:** As per TOA ST-E-0005. Following relevant indications are unacceptable.

- a) Rounded indications of dia > 1.5 mm.
- b) Linear indications of length > 0.5 mm.
- e) RT Films shall be reviewed and RT reports shall be verified by BHEL approved TPI. MPI for Special bodies shall be witnessed by BHEL approved TPI

## 8. DEVELOPMENT STAGE OF CASTING:

- a) During developmental stage, of new castings or change to an existing casting on account of change in dimension which warrants pattern correction, Foundry to ensure, first sample pieces meet dimensional, NDE & Quality requirements in this TDC, before starting bulk production. Sample castings, 3 castings with nominal bore (NB) ≤ 100mm. & 1 casting with NB > 100 mm for each type shall be inspected for dimension and RT requirements at BHEL/Vendor works by BHEL personnel. One Test bar for each melt/heat treatment batch shall be supplied along with casting for test at BHEL. RT shall be carried out on entire area of the casting to the acceptance requirement of Table-2 & 3. In addition 100% MPI on all critical areas like change of sections, riser & in gate portions shall be carried out. Casting to be inspected for dimensions after proof machining wherever necessary. If machining operation is involved the same shall be done and defect free condition shall be ensured. If any defect noticed in RT and machining, the type of defect shall be analyzed and accordingly size of gate, runner, riser and pouring methodology to be modified to get defect free casting. Sampling shall be continued till achieving sound casting. After satisfactory development of sampling bulk production shall be started. However weld repaired areas identified in visual examination for doubtful indications to be probed by MPI. Accepted sample castings may be considered for fixing the nominal weight of the castings.
- b) During developmental stage RT on sample castings of Yoke, Yoke Clamp & Wedge/Disc shall meet Level-3 of ASTM E446/E186/E280.
- c) Radiography not required after satisfactory development of casting & production based on established method for following parts: SRV Bonnet, Disc Holder, Upper and Lower adjusting rings, Packed cap, Cover Plate, Yoke and SRV guide flanges.

## 9. REPAIR:

Castings with unacceptable cracks, hot tears, shrinkage, etc. to be rectified by grinding & if required by welding. Welding to be done by qualified welder and qualified procedure as per ASME Section IX. For IBR items welders shall be qualified as per IBR.

Guidelines for repair of steel castings shall be as per SIP:VS:17 for activities like defects require/ not require weld repair, welding, Post Weld Heat Treatment, NDE and surface treatment. All repaired areas after PWHT shall be NDE tested and Hardness tested. Hardness shall meet material specification.

For PED (CE-Marking) castings, permanent joining (welding and weld repair) of components must be carried out by suitably qualified personnel according to suitable operating procedures. Also Non-Destructive tests of permanent joints must be carried out by suitable qualified personnel.



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The procedures and personnel must be approved by a competent third party which at the manufacturer's discretion, may be - A notified body, - A third party organization recognized by a Member State of European Community.

#### 10. SURFACE TREATMENT:

SS castings to be pickled & passivated (after repair & HT if any) as per ASTM A380. Satisfactory passivity of the surface to be checked using SS passivity test kit (Free iron test). After passivation, rinsing & test, the rinsed demineralised water to be checked for chloride with 1% Silver nitride, which shall not exceed 0.5 PPM.

#### 11. DIMENSIONAL CHECK:

For all QCNRV & CRHNRV Body Castings: Thickness of the body shall be checked throughout the surface on a grid of 100mm x 100mm and recorded & submitted to BHEL.

#### 12. MARKING AND PACKING:

Representation of Marking and identification shall be as per drawing. Also following details to be marked on each casting, on a raised pad using low stress stamps and Castings shall be suitably packed to avoid damage during transit.

1. Foundry code, 2. **Material** specification, grade & **Heat**/melt number, 3. Size and 4. Class rating.

#### 13. INSPECTION AND CERTIFICATION:

##### 13.1 For Attested Items (As per Engg material code/Drawing): For IBR items.

Products shall be inspected at works and the applicable IBR Form must be countersigned by the Inspecting Authority as indicated below in case the shop/mill/foundry is not recognised as a "Well known Foundry" under IBR:

- Imported Items:** Inspecting Authority approved by IBR, for the Country of origin.
- Indigenously Supplied items:** Director of Boilers/Chief Inspector of Boilers/Inspecting Authority approved by IBR, for the respective state.

Certification in IBR Form III-F for IBR items from "IBR-Well Known Foundry" or "Inspecting Authority", as applicable, to be submitted. IBR Form III-F & a separate Test certificate of type 3.1 or 3.2 as per BS EN 10204 in English language with following details, shall accompany the product:

1. Purchase Order No. (BHEL), TDC No & its revision no, Test certificate no & date.
2. **Material** Specification, Grade & **Class** with applicable year of code, Heat Number, Quantity & Size
3. Steel making process, Chemistry including incidental elements - Heat wise, Product analysis, Carbon Equivalent (CE).
4. Heat treatment details of the material and test bars.
5. Mechanical test results-Tensile (UTS, YTS (**0.2% offset**), % elongation, % reduction in area), Impact & Hardness and NDE test results with reference & acceptance standard.
6. Repair details including HT, if any, Cleaning & Surface treatment details.
7. Any other information like clearance of sample casting.
8. Dimensional Inspection Report, where applicable.
9. **For SS:** Measured Radioactivity levels at 5cm from the surface of the castings shall be reported in the Test Certificate stating the measured value at the specified distance (not to be recorded in IBR Form).
10. **Creep test report as per the format suggested in Cl 5 of this TDC (applicable only for IBR application).**

13.2 For PED 2014/68/EU (CE-marking), test certificates of type 3.1 or 3.2, with details specified in Cl 13.1 for separate test certificate, shall be submitted as per BS EN 10204.

- Type 3.1 – Suppliers shall have ISO 9001:2015 certification certified by Notified Body recognized by European community and test certificate certified by suppliers authorized inspection representative.
- Type 3.2 – Components inspected and test certificates certified by both the supplier's authorized inspection representative and Notified Body recognized by European community.



Product: Steel Castings for Boilers & Valves

13.3 **Machined Casting:** In addition to Cl.13.1 (or) Cl.13.2 , as applicable, the following test reports shall be furnished,

1. Dimensional Report
2. LPI Report Signed by NDE Level II qualified Personnel

13.4 **For Product Attested Items (as per Engg material code/Drawing):**

All tests specified have to be carried out by foundry and test results to be furnished in the test certificate of type 3.1 or 3.2 as per BS EN 10204 and shall contain the following information in English language only:

1. Purchase Order No. (BHEL), TDC No & its revision no, Test certificate no & date.
2. Material Specification, Grade & Class with applicable year of code, Heat Number, Quantity & Size
3. Steel making process, Chemistry including incidental elements - Heat wise, Product analysis, Carbon Equivalent (CE).
4. Heat treatment details of the material and test bars.
5. Mechanical test results-Tensile (UTS, YTS (0.2% offset), % elongation, % reduction in area), Impact & Hardness and NDE test results with reference & acceptance standard.
6. Repair details including HT, if any, Cleaning & Surface treatment details.
7. Any other information like clearance of sample casting.
8. Dimensional Inspection Report, where applicable.
9. For SS: Measured Radioactivity levels at 5cm from the surface of the castings shall be reported in the Test Certificate stating the measured value at the specified distance.

13.5 **For Certified Items (as per Engg material code/Drawing):**

In addition to Cl.8 requirements, all tests specified in the material specification have to be carried out by foundry and test results to be furnished in the test certificate of type 3.1 as per BS EN 10204 and information in English language only

14. **AUDIT CHECKS AT BHEL:**

BHEL reserves the right to carry out audit checks for chemistry, HT condition, mechanical test and NDT on representative test bars or job. Items found defective during check or subsequent processing at BHEL will be rejected.

15. **END USE:**

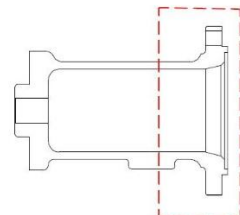
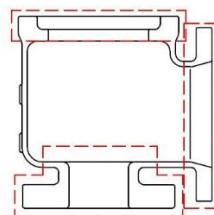
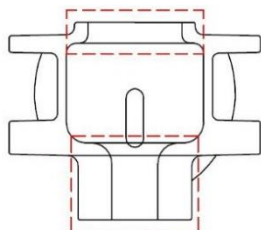
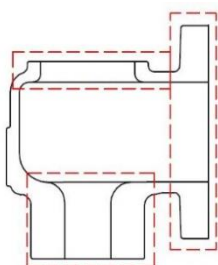
For use in valves and other components like flanges, fittings etc. for high temperature & high pressure applications meeting IBR, ASME Section I, ASME VIII Div 1, ASME B16.34 and PED 2014/68/EU (CE-marking).

**Annexure-1:Sketch of zones for RT**

**SV and SRV Base castings**

**Base**

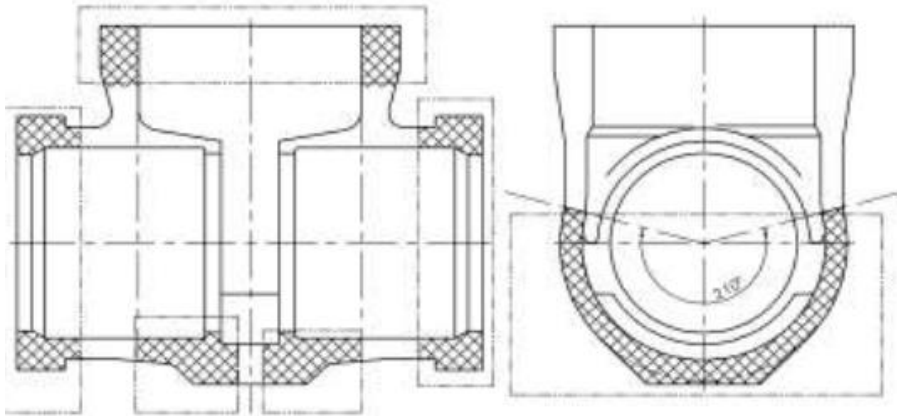
**Bonnet**





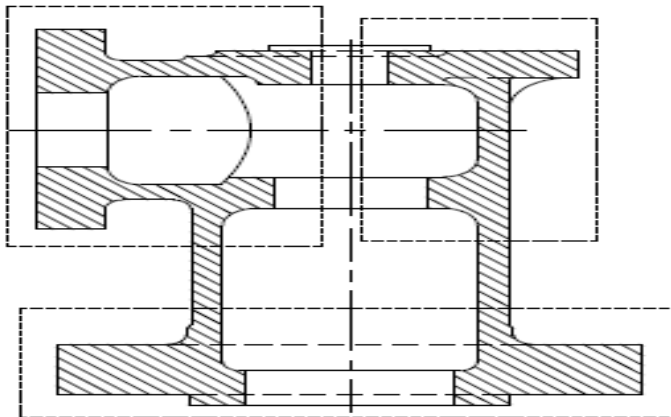
Product: Steel Castings for Boilers & Valves

**Reheater Isolating Device Body**




 Radiography Area

**Soot Blower Valve Body**



PART CODES : 920243870000, 920131810000, 920243870100, 920131810100

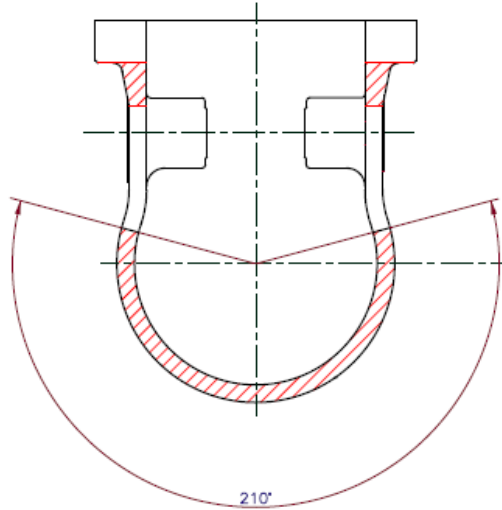
LRD IE, LRD IIE & WB IE - 2.5" 600#

 — RADIOGRAPHY AREA

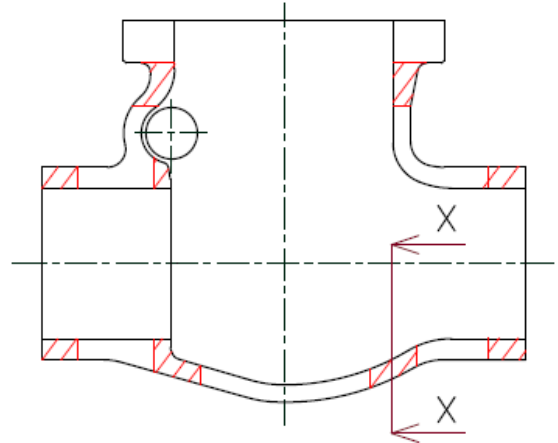


Product: Steel Castings for Boilers & Valves

**Quick Closing Non Return Valve Body**

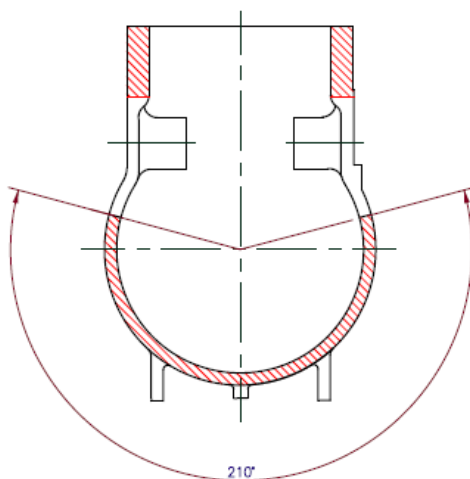


SECTION – XX

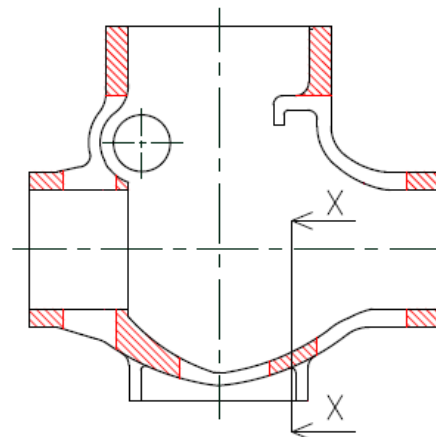


RADIOGRAPHY REQUIREMENT

**Cold Reheat Non Return Valve Body**



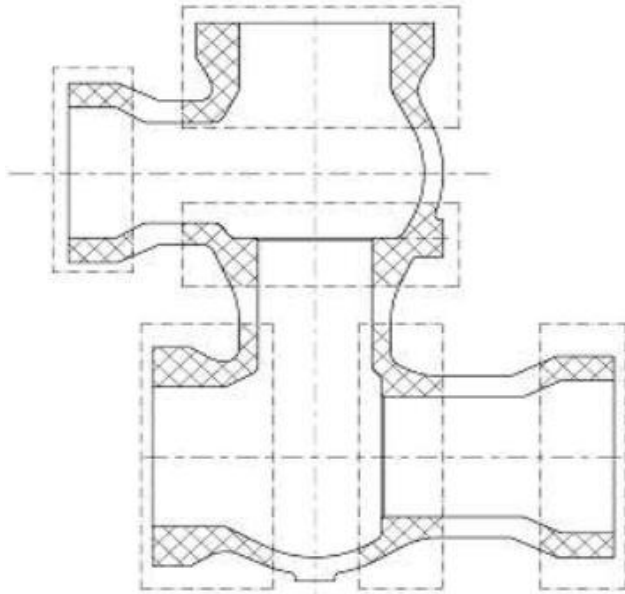
SECTION – AA




RADIOGRAPHY REQUIREMENT



**LP Bypass Stop cum Control Valve Body**

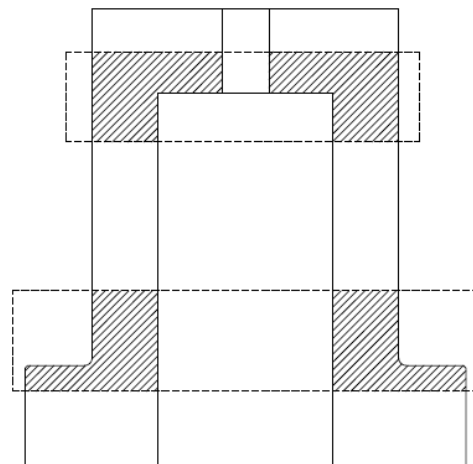
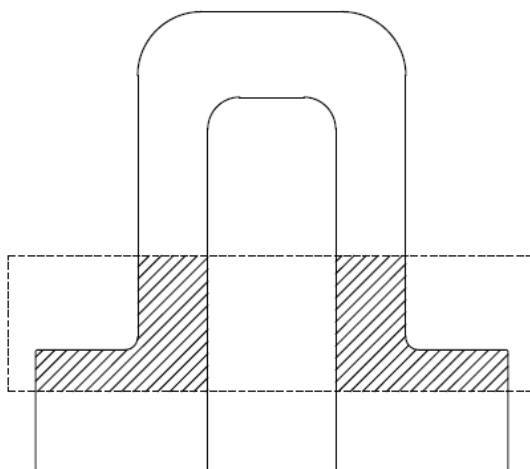


 Radiography Area

**Spring Loaded Bypass Valve**

**Cap**

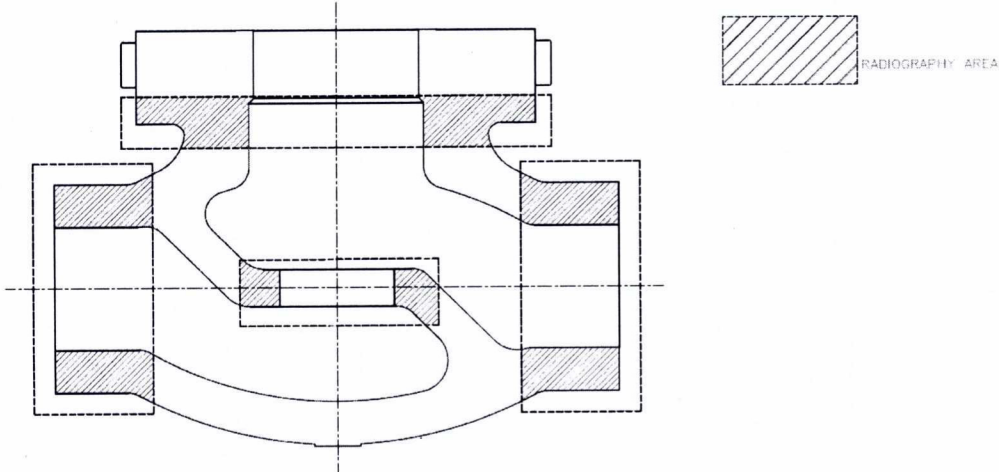
**Bonnet**



**Body**



Product: Steel Castings for Boilers & Valves



<i>N Nagamuthu Pandian</i> 29/11/22	<i>K Jeyakumar</i> 29/11/22	<i>S. Lakshmi</i> 29/11/22	<i>Ajay Kumar Gupta</i> 29/11/22	<i>J.V.V. Aruna Kumar</i> 01/12/2022
N Nagamuthu Pandian	K Jeyakumar	S. Lakshmi	Ajay Kumar Gupta	J.V.V. Aruna Kumar
Manager/QA	AGM/Valves/Engg& Mktg	SDGM/QA	AGM/Valves/Purchase	AGM/QA&BE
<b>Prepared By</b>	<b>Reviewed By</b>			<b>Approved By</b>



70-006

# Bharat Heavy Electricals Limited

High Pressure Boiler Plant, Tiruchirappalli-620 014, India.

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Phone : --

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## PRODUCT ENGINEERING/VALVES

VL:STDC:023

REV.00

PAGE 1 OF 6

### TDC FOR UNTOLERANCED DIMENSIONS IN CASTING & FORGING DRAWINGS


#### Scope :

This technical delivery condition specifies the tolerance for the untoleranced dimension for the castings and forgings wherever tolerances are not specified in the applicable drawing applicable material TDC.

#### A. Castings :

Nominal dimension (in mm)		Tolerance on diameter & height (in mm)
UPTO	4	$\pm 0.5$
OVER	4 UPTO 16	$\pm 1.0$
OVER	16 UPTO 65	$\pm 1.5$
OVER	65 UPTO 125	$\pm 2.0$
OVER	125 UPTO 250	$\pm 2.5$
OVER	250 UPTO 500	$\pm 3.0$
OVER	500 UPTO 1000	$\pm 4.0$
OVER	1000 UPTO 1600	$\pm 5.0$


B. Forgings : As per Table (1), (2), (3) & (4)



PREPARED



CHECKED



APPROVED

(S. KUMAR)  
SM/PE/VSB  
28/2/94

TABLE 1. LENGTH, WIDTH, HEIGHT, MISMATCH, RESIDUAL FLASH AND TRIMMED FLAT OF DROP, PRESS AND UPSET FORGINGS (NORMAL TOLERANCES)

DROP, PRESS & UPSET FORGINGS - TOLERANCES FOR: LENGTH, WIDTH & HEIGHT																					
MISMATCH	RESIDUAL FLASH (+) TRIMMED FLAT (-)	TRIM LINE		WEIGHT (KGS) ABOVE TO (INCL)	DIFFICULTY OF MATERIAL		COMPLEXITY		MISMATCH ; RESIDUAL FLASH & TRIMMED FLAT (Ø DIA & LENGTH FOR UPSET FORGINGS) NOTE: CENTRE TO SURFACE; STEP IN ONE DIE; + $\frac{1}{3}$ , - $\frac{1}{3}$ OF TOTAL TOLERANCE INTERNAL DIMENSION: REVERSE + AND - SIGNS.												
		ASYMMETRIC	STRAIGHT OR SYMMETRIC		M1	M2	1 >0.63	2 >0.32	3 >0.16	4 ≤0.16	MM										
											TO (INCL)	32	100	160	250	400	630	1000	1600	2500	
0.4	0.5	/	/	0-0.4	/	/	/	/	0	32	100	160	250	400	630	1000	1600	2500			
0.5	0.6	/	/	0.4-10	/	/	/	/	32	100	160	250	400	630	1000	1600	2500				
0.6	0.7	/	/	10-18	/	/	/	/	100	160	250	400	630	1000	1600	2500					
0.7	0.8	/	/	18-32	/	/	/	/	160	250	400	630	1000	1600	2500						
0.8	1	/	/	32-56	/	/	/	/	250	400	630	1000	1600	2500							
1	1.2	/	/	56-10	/	/	/	/	400	630	1000	1600	2500								
1.2	1.4	/	/	10-20	/	/	/	/	630	1000	1600	2500									
1.4	1.7	/	/	20-50	/	/	/	/	1000	1600	2500										
1.7	2	/	/	50-120	/	/	/	/	1600	2500											
2	2.4	/	/	120-250	/	/	/	/	2500												
2.4	2.8	/	/		/	/	/	/													
QUALITY		(NORMAL)																			

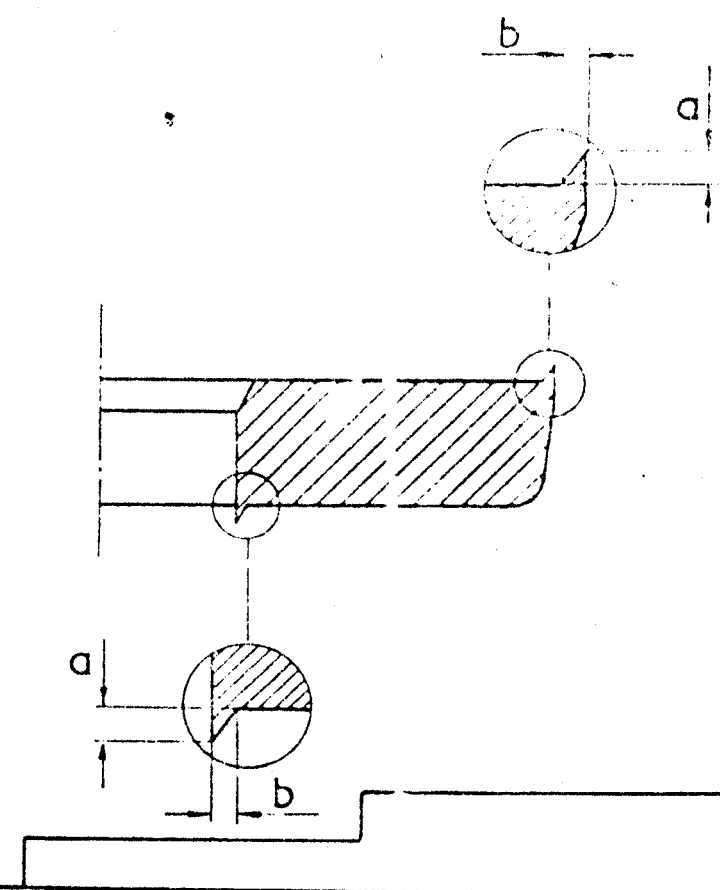


TABLE 3 STRAIGHTNESS, FLATNESS AND CENTRE TO CENTRE DIMENSIONS FOR DROP, PRESS AND UPSET FORGINGS

DROP, PRESS AND UPSET FORGINGS																
NOTE. QUALITY E DOES NOT APPLY TO UPSET FORGINGS																
RANGE OF TOLERANCES FOR STRAIGHTNESS AND FLATNESS																
LENGTH ABOVE TO (INCL)		MM														
		0 100	100 125	125 160	160 200	200 250	250 315	315 400	400 500	500 630	630 800	800 1000	1000 1250	1250 1600	1600 2000	2000 2500
QUALITY	NORMAL	0.6	0.7	0.8	0.9	1	1.1	1.2	1.4	1.6	1.8	2	2.2	2.5	2.8	3.2
RANGE OF TOLERANCES FOR CENTRE TO CENTRE DIMENSIONS																
LENGTH ABOVE TO (INCL)		MM														
		0 100	100 160	160 200	200 250	250 315	315 400	400 500	500 630	630 800	800 1000	1000 1250				
QUALITY	NORMAL	$\pm 0.3$ 0.6	$\pm 0.4$ 0.8	$\pm 0.5$ 1	$\pm 0.6$ 1.2	$\pm 0.8$ 1.6	$\pm 1$ 2	$\pm 1.2$ 2.4	$\pm 1.6$ 3.2	$\pm 2$ 4	$\pm 2.5$ 5	$\pm 3.2$ 6.4				

TABLE 4 FILLET, EDGE RADII AND BURRS FOR DROP, PRESS AND UPSET FORGINGS

DROP, PRESS AND UPSET FORGINGS		
FILLET AND EDGE RADII TOLERANCES		
r MM	+	-
ABOVE - TO (INCL)		
0 - 10	50%	25%
10 - 32	40%	20%
32 - 100	32%	15%
> 100	25%	10%
BURR TOLERANCES (AND PARTING LINE FINIS FOR UPSET FORGINGS)		
WEIGHT (kg)	a	b
ABOVE - TO (INCL)		
0 - 1	1	0.5
1 - 6	1.6	0.8
6 - 40	2.5	1.2
40 - 250	4	2



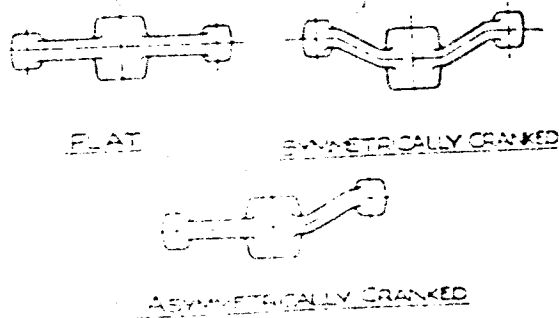


Fig. 1. Die lines

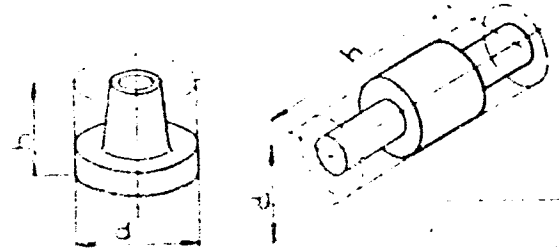


Fig. 2. Enveloping shapes of circular forgings

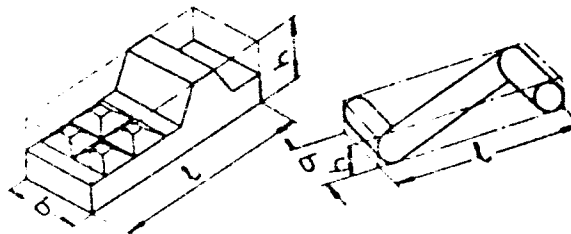


Fig. 3. Enveloping shapes of non-circular forgings

NOTE :

1. The type of steel used is determined as falling within one of the following categories :
  - a. M1 - steel with carbon content not more than 0.65% and total of specified alloying elements not more than 5%
  - b. M2 - steel with carbon content above 0.65% or total of specified alloying elements above 5%.
2. Complexity factor of a forging is the ratio of the weight of the forging to the weight of the overall shape necessary to accommodate the maximum dimensions of the forging.

The resulting complexity factor is determined as falling within one of the following categories :

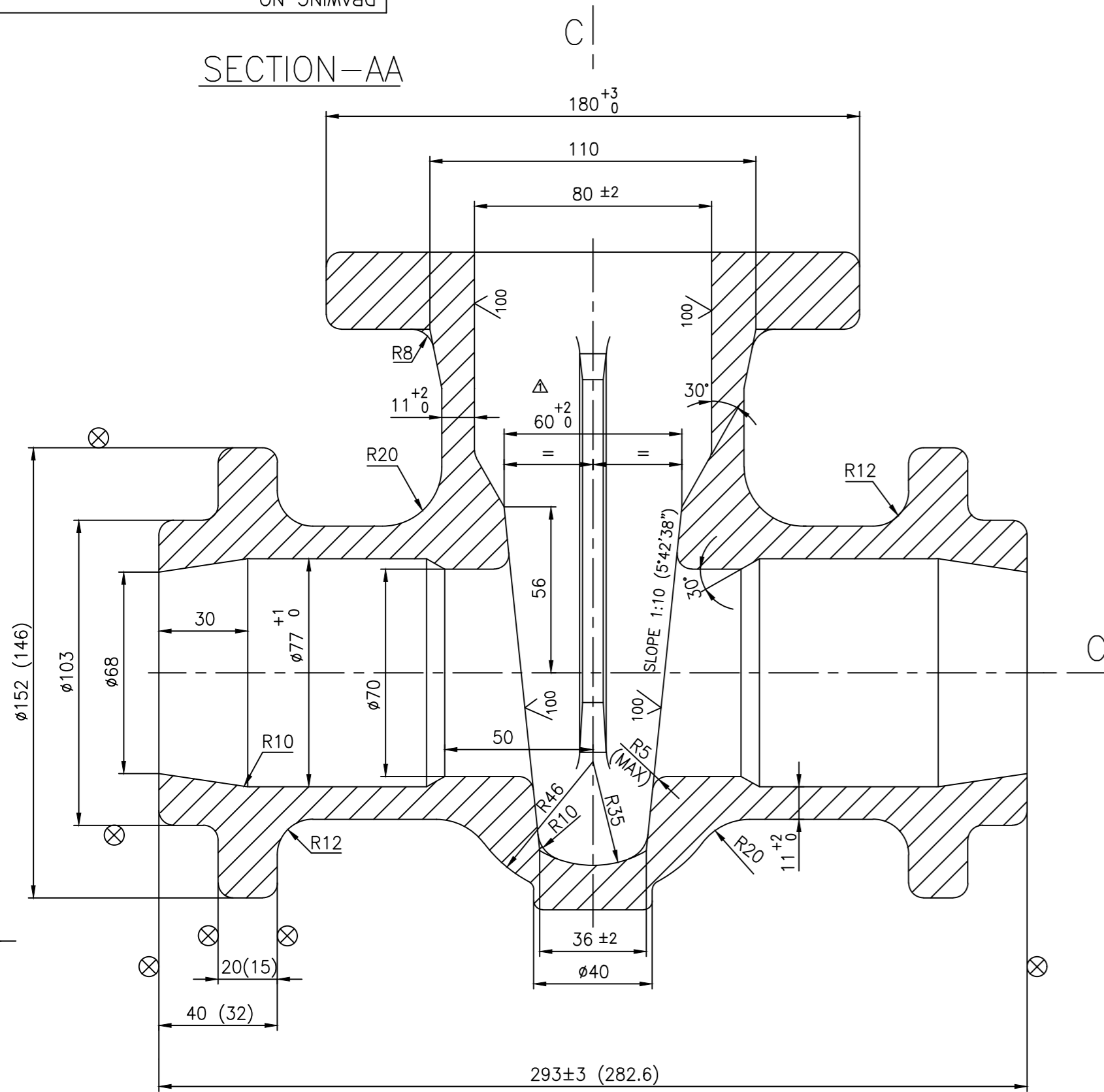
- S4 - Upto and including 0.16
- S3 - Above 0.16 upto and including 0.32
- S2 - Above 0.32 upto and including 0.63
- S1 - Above 0.63 upto and including 1.00

-----

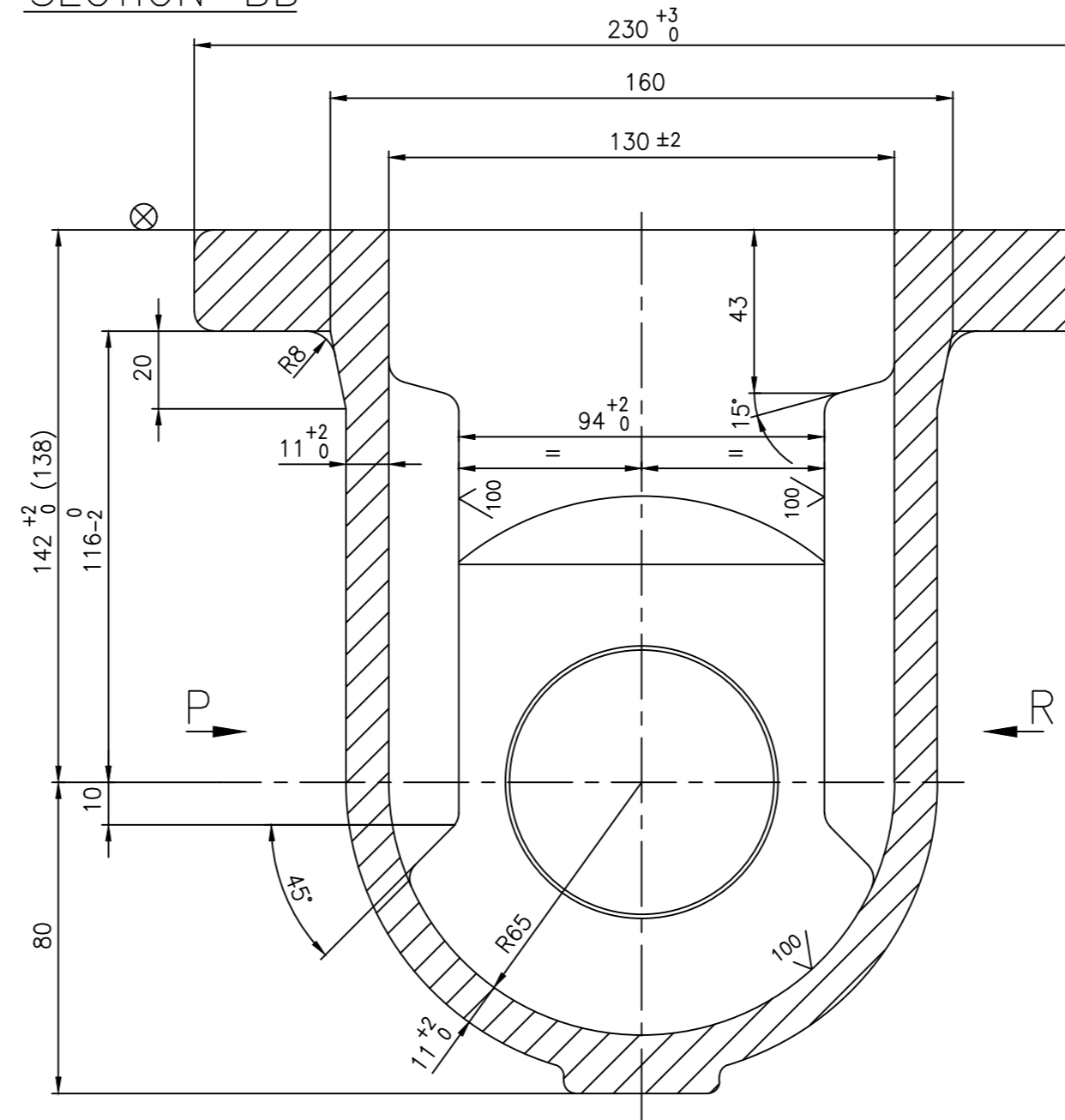




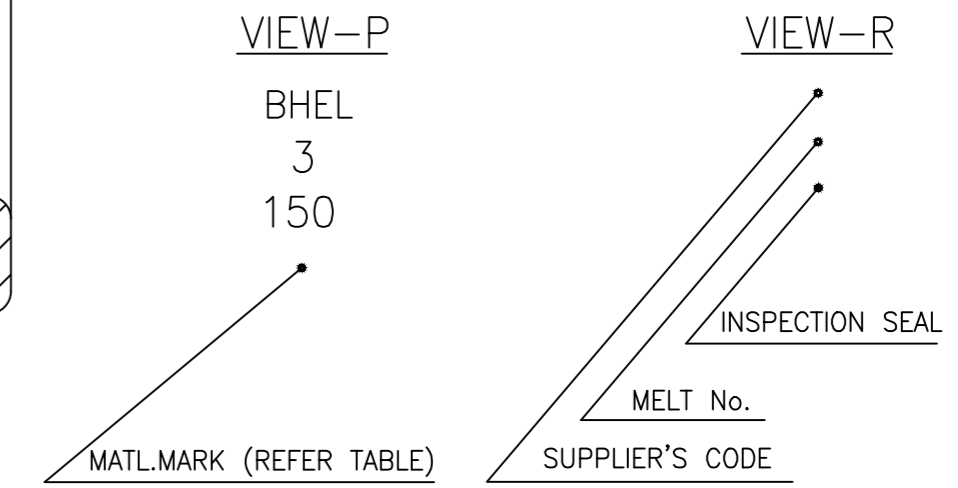
SECTION-AA



SECTION-BB



CAST IDENTIFICATION MARK



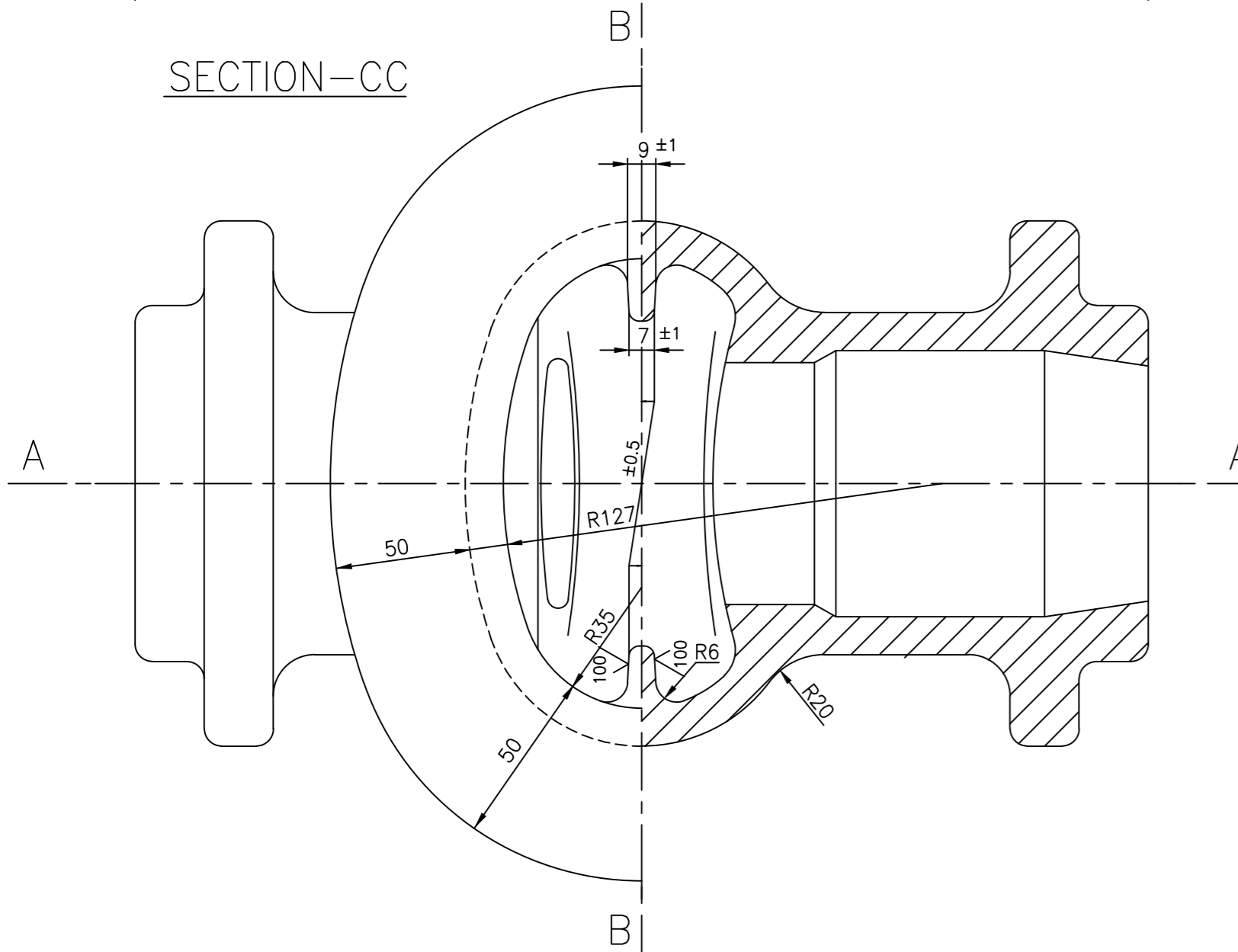
NOTES:-

1. CASTING SHALL COMPLY WITH REQUIREMENTS OF LATEST APPLICABLE TDC
2. NECESSARY MACHINING ALLOWANCES HAVE BEEN ADDED ON ALL MACHINABLE SURFACES.
3.  $\sqrt{100}$  CASTING SURFACES MUST BE OF HIGH QUALITY WITHOUT SURFACE UNEVENNESS.
4. UNSPECIFIED CASTING RADII R3 TO R5.
5. PERMISSIBLE DEVIATIONS OF NON-TOLERANCED CASTING DIMENSIONS REFER LATEST APPLICABLE TDC
6. HEIGHT OF CASTING LETTERS-20mm.
7.  $\otimes$  SURFACES TO BE MACHINED.
8. FINISHED MACHINED DIMENSIONS ARE INDICATED WITHIN BRACKETS.
9. MELT No. & INSPECTION SEAL TO BE PUNCHED REST OF THE DETAILS ARE TO BE CAST.
10. RISER REMAINS ARE TO COMPLETELY REMOVED SUITABLY.

\* SPECIAL NOTES:-

1. GUIDE RIB DIMENSIONS TO BE MAINTAINED WITHIN THE TOLERANCES INDICATED
2. BOTH GUIDE RIBS TO BE COPLANER AND TRUELY VERTICAL.
3. PROPER MATCHING FOR GUIDE RIBS WITH MACHINED WEDGE TO BE ENSURED BEFORE ACCEPTING CAST BODIES PREFERABLE AT THE FOUNDRY.

SECTION-CC



REV 02	DATE 30.09.19	ALTERED R.P.SINGH	REV 01	DATE 26.09.97	ALTERED N.D.PAL
		CHD & APPD SAMEER AND SSK			CHD & APPD A.WISHWANATHAN
DRAWING REDRAWN IN CAD			SL.NO.05 INCLUDED		
DIMENSION 60 <sup>+2</sup> WAS 60±2					

05	SA351 CF8	92 200 933	SA351 CF8 ATTEST	SH	46	--	--	2VN67705875R/1	01
04	SA217 WC9	92 200 299	SA217 WC9 ATTEST	NT	20	--	--	2VN29205875R/1	01
03	SA217 WC6	92 200 298	SA217 WC6 ATTEST	NT	20	--	--	2VN29105875R/1	01
02	SA216 WCC	92 200 297	SA216 WCC ATTEST	NR	10	--	--	2VN29005875R/1	01
01	SA216 WCB	92 200 296	SA216 WCB ATTEST	NR	10	--	--	2VN28905875R/1	01
SL No.	MATERIAL MARK TO BE CAST	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No COMPONENT CODE	ITEM No

CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

**BHARAT HEAVY ELECTRICALS LTD.**  
UNIT: HIGH PRESSURE BOILER PLANT.  
TIRUCHIRAPALLI - 620014.

DRN	T.R.R.MURTHY	SIGN	DATE 23.05.95	NO.OF VAR.
CHD	N.DHANAPAL		26.05.95	-
APPD	A.WISHWANATHAN		13.06.95	

DEPT VL  
CODE 320

SCALE NTS.  
WEIGHT (KG). 18.5

REFERENCE INFORMATION CAD:C205875R

TITLE **BODY**  
(3" C150)

CARD CODE U 01

DRAWING NO. 2-V-0000-05875R

REV 02

DRAWING NO: 2-V-0000-05937R

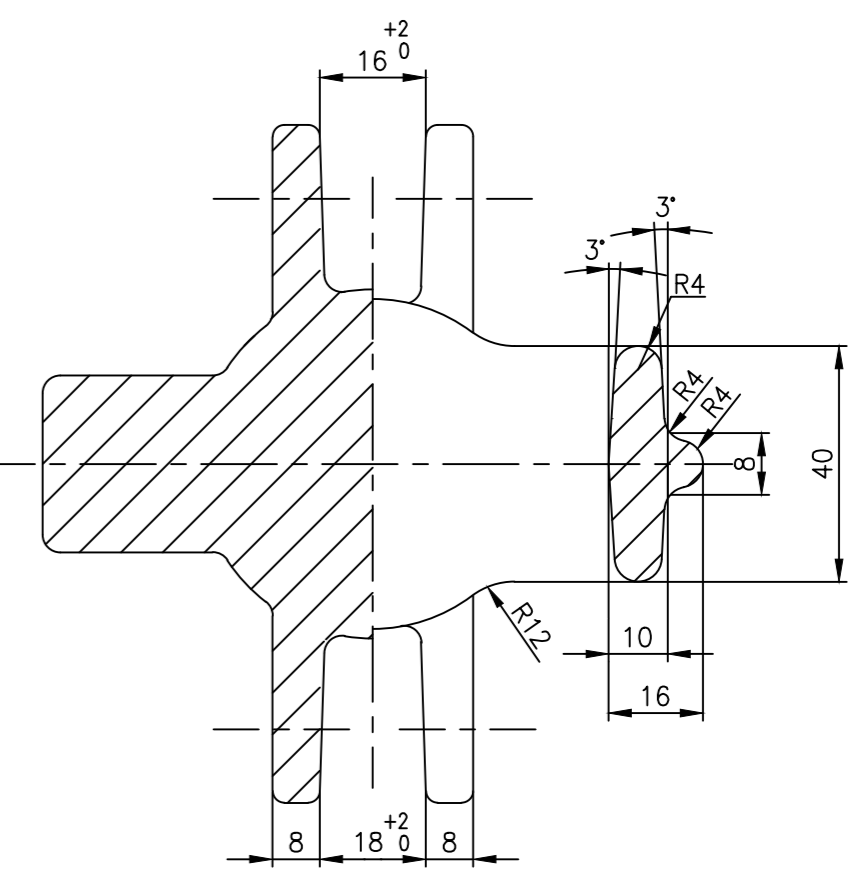
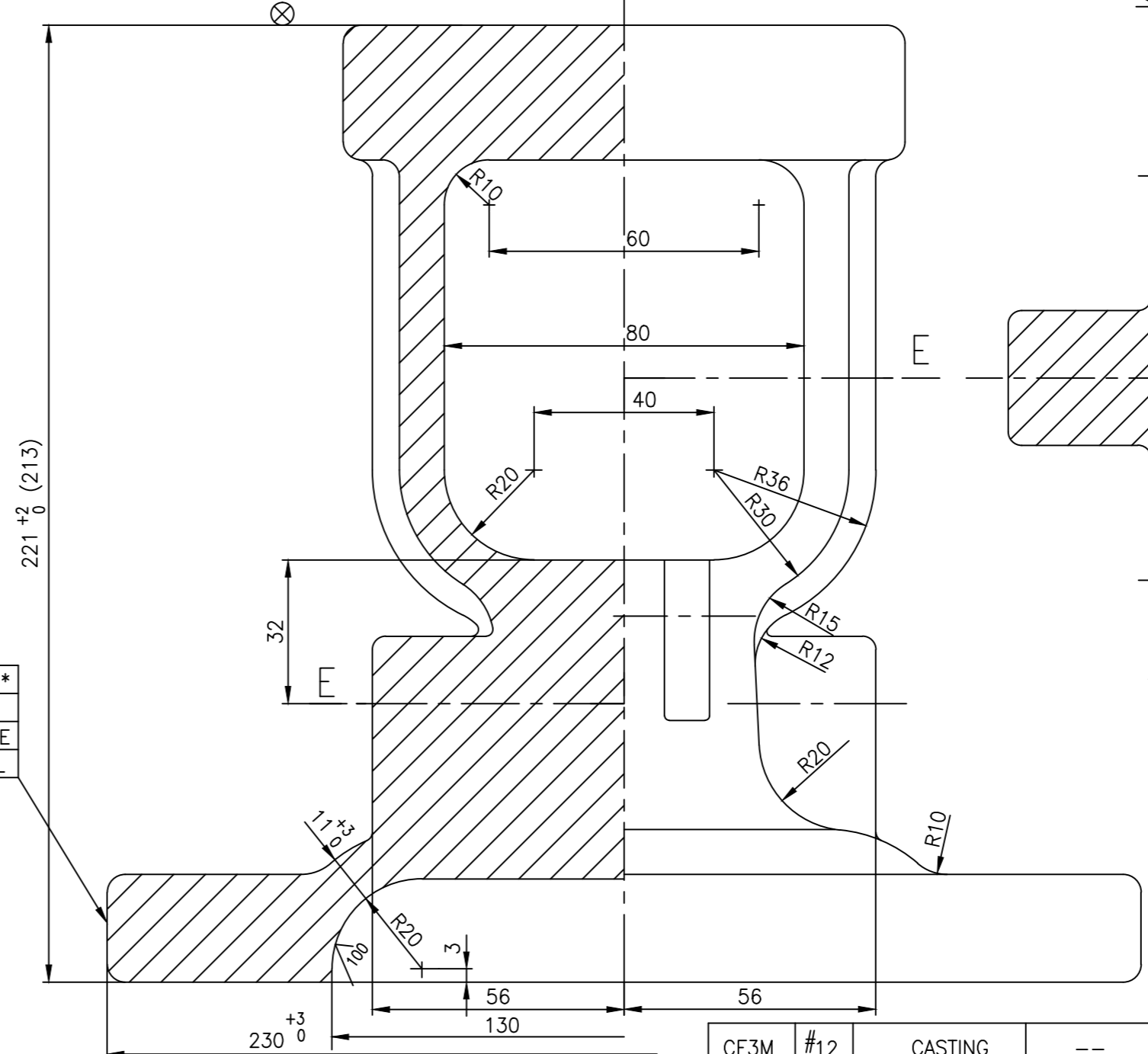
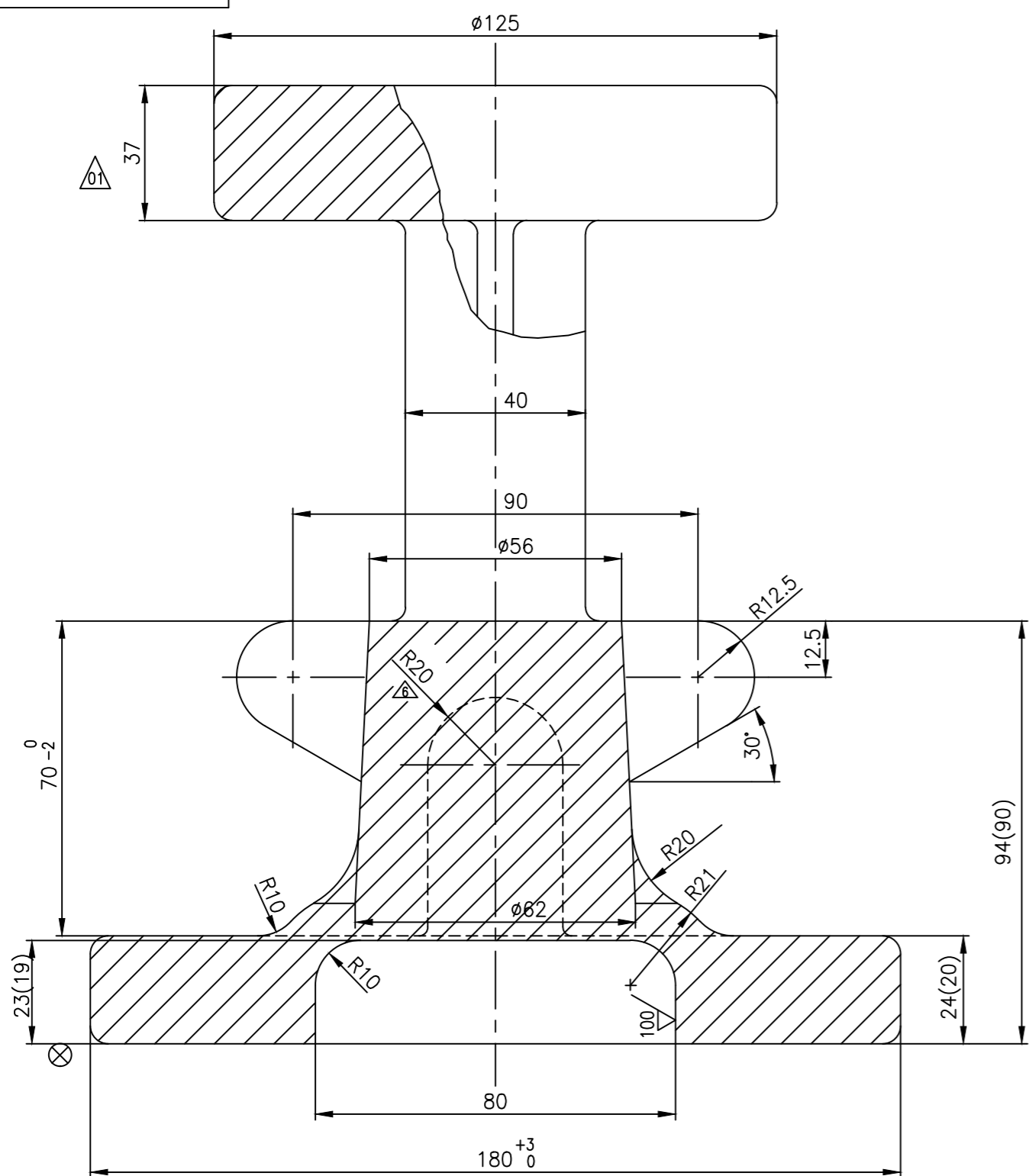
SECTION-AA

ALL DIMENSIONS ARE IN MILLIMETRES. FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCP / QP

SECTION-BB

SECTION-EE

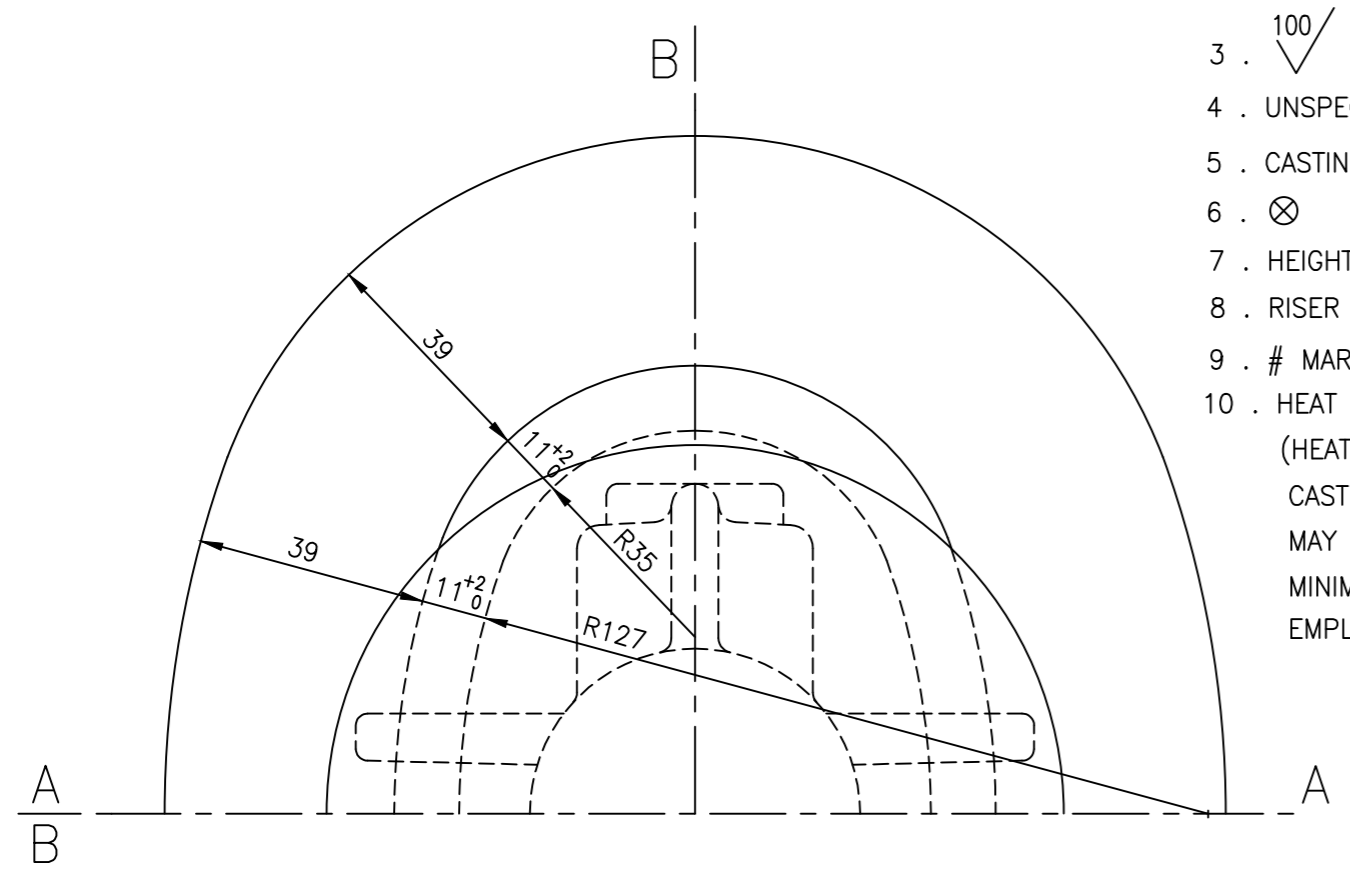
100



3"-150C  
MATERIAL MARK \*  
MELT NUMBER  
SUPPLIER'S CODE  
INSPECTION SEAL

NOTES:

- NECESSARY MACHINING ALLOWANCES HAVE BEEN ADDED ON ALL MACHINABLE SURFACES
- FINISHED MACHINED DIMENSIONS ARE INDICATED WITHIN BRACKETS FOR INFORMATION
- CASTING SURFACES MUST BE HIGH QUALITY WITHOUT SURFACE UNEVENNESS
- UNSPECIFIED CASTING RADII 3 - 5 MM
- CASTING SHALL COMPLY WITH THE REQUIREMENTS OF LATEST APPLICABLE QUALITY PROCEDURE.
- SURFACES TO BE MACHINED
- HEIGHT OF CAST LETTERS 12 MM
- RISER REMAINS ARE TO BE COMPLETELY REMOVED SUITABLY.
- # MARKED ITEMS IGC TEST SHALL BE CONDUCTED.
- HEAT TREATMENT FOR ASTM 995 CD3MN AS PER ASTM STANDARD ASTM-995 TABLE 1 (HEAT TO 2050°F [1120°C] MINIMUM FOR SUFFICIENT TIME TO HEAT CASTING UNIFORMLY TO TEMPERATURE AND WATER QUENCH, OR THE CASTING MAY BE FURNACE COOLED TO 1850°F [1010°C] MINIMUM, HOLD FOR 15 MIN MINIMUM AND THEN WATER QUENCH. A RAPID COOL BY OTHER MEANS MAY BE EMPLOYED IN LIEU OF WATER QUENCH.)



CF3M #12	CASTING	---	A351 CF3M CERTIFY	SH	---	---	---	2.V.UB23.05937R	05
CF8M #11	CASTING	---	A351 CF8M CERTIFY	SH	---	---	---	2.V.UA97.05937R	05
CD3MN 10	CASTING	---	SA995 CD3MN CERTIFY	REF. NOTE	---	---	---	2.V.NK66.05937R/1	05
CF3M 09	CASTING	---	A351 CF3M CERTIFY	SH	---	---	---	2.V.NK61.05937R/1	05
CF8 #08	CASTING	---	A351 CF8 CERTIFY	SH	---	---	---	2.V.U635.05937R/1	05
LCB 07	CASTING	---	A352 LCB CERTIFY	NR	---	---	---	2.V.M768.05937R/1	05
CF8M 06	CASTING	---	A351 CF8M CERTIFY	SH	---	---	---	2.V.N338.05937R/1	05
CF8 05	CASTING	---	A351 CF8 CERTIFY	SH	---	---	---	2.V.N286.05937R/1	05
WC9 04	CASTING	---	A217 WC9 CERTIFY	N & T	---	---	---	2.V.N391.05937R/1	05
WC6 03	CASTING	---	A217 WC6 CERTIFY	N & T	---	---	---	2.V.N390.05937R/1	05
WCC 02	CASTING	---	A216 WCC CERTIFY	NORMALISED	---	---	---	2.V.N389.05937R/1	05
WCB 01	CASTING	---	A216 WCB CERTIFY	NORMALISED	---	---	---	2.V.N313.05937R/2	05
*MATL. MARK	No OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No. ITEM No

DCP No.	ALTD: RPS	APPD: SSK	DCP No.	ALTD: RPS	APPD: SSK
-	CHD: MK	DT: 27.09.22	-	CHD: SAB	DT: 24.06.20
REV 08	SL. No. 12 INCLUDED				
ZONE -					
REV 07	SL. No. 11 INCLUDED. WEIGHT UPDATED.				
ZONE -					
REV 06	DIMENSION R20 INCLUDED. REFER DCP: 802577				
ZONE -					

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TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

**BHARAT HEAVY ELECTRICALS LTD.**  
UNIT: HIGH PRESSURE BOILER PLANT.  
TIRUCHIRAPALLI-620014.

DRN	R.T.S.GNANAM	SIGN	DATE	NO.OF VAR.
CHD	N.DHANAPAL		17.06.97	-
APPD	A.VISWANATHAN		17.06.97	-

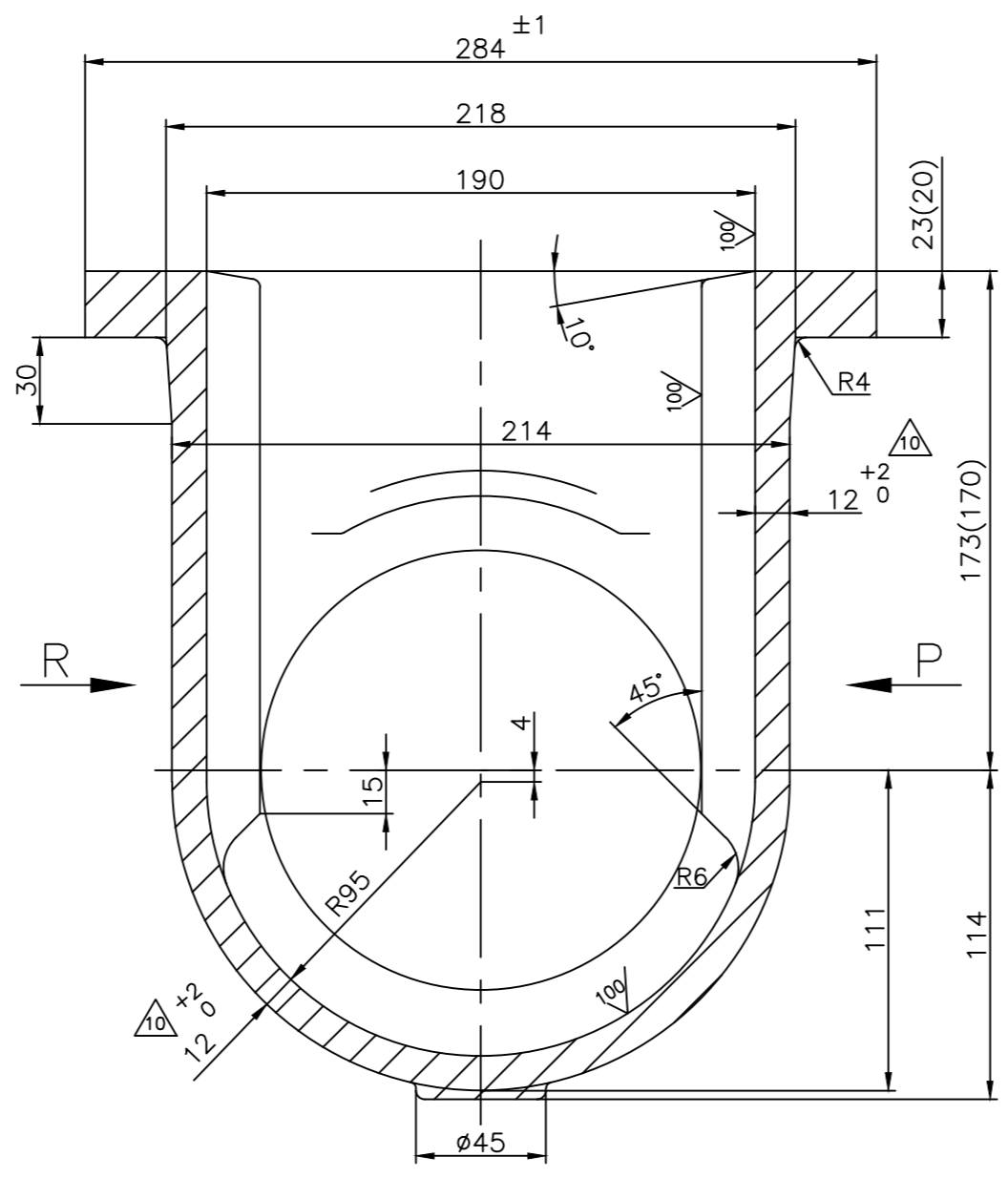
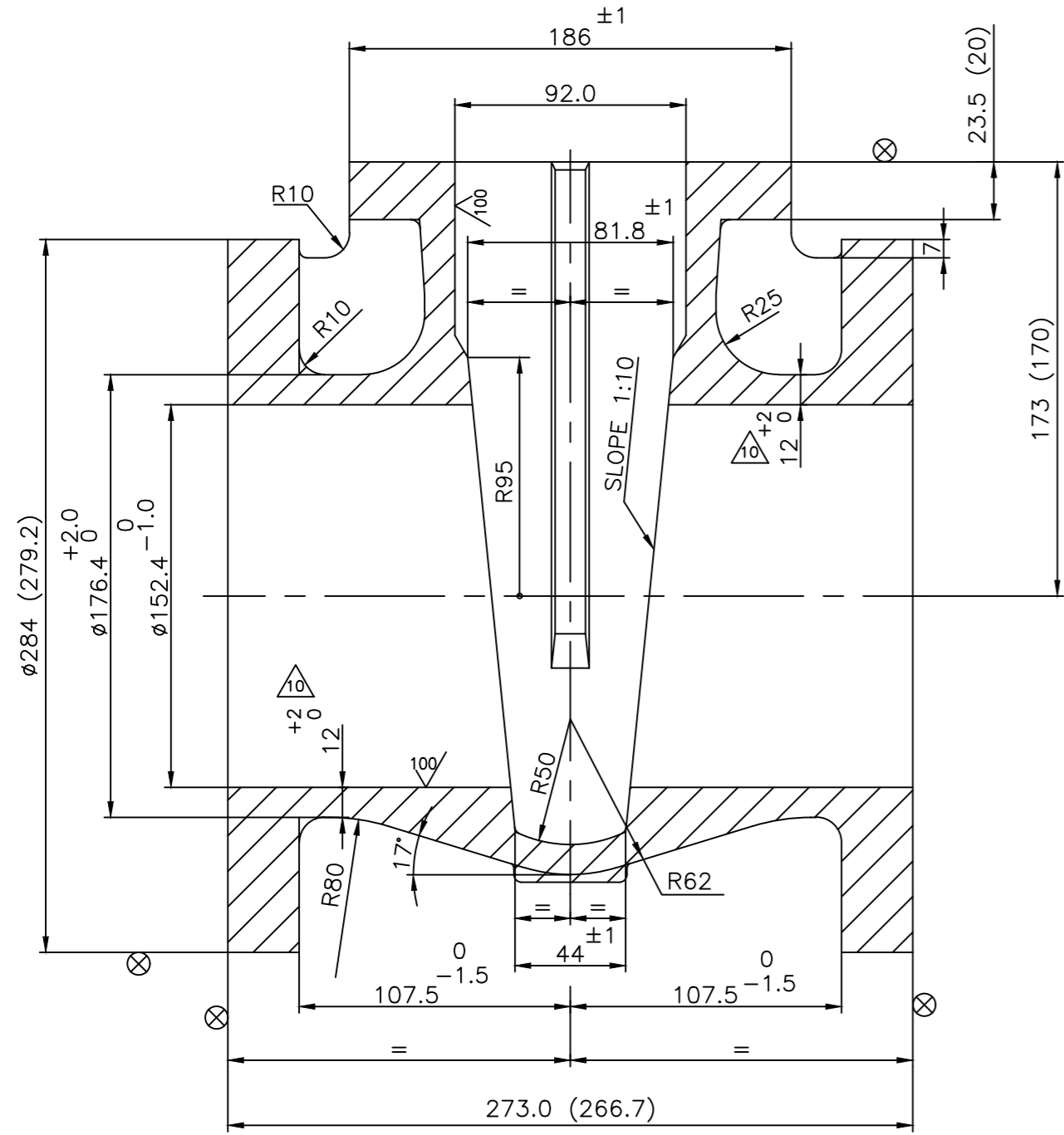
DEPT VL / CODE 320 / TITLE YOKE CUM BONNET (3"-150C GV SG)

SCALE NTS / WEIGHT (KG) 12.7 / REFERENCE INFORMATION CAD REF: C205937R

CARD CODE U 01 / DRAWING NO. 2-V-0000-05937R / REV 08

SECTION - BB

SECTION - AA

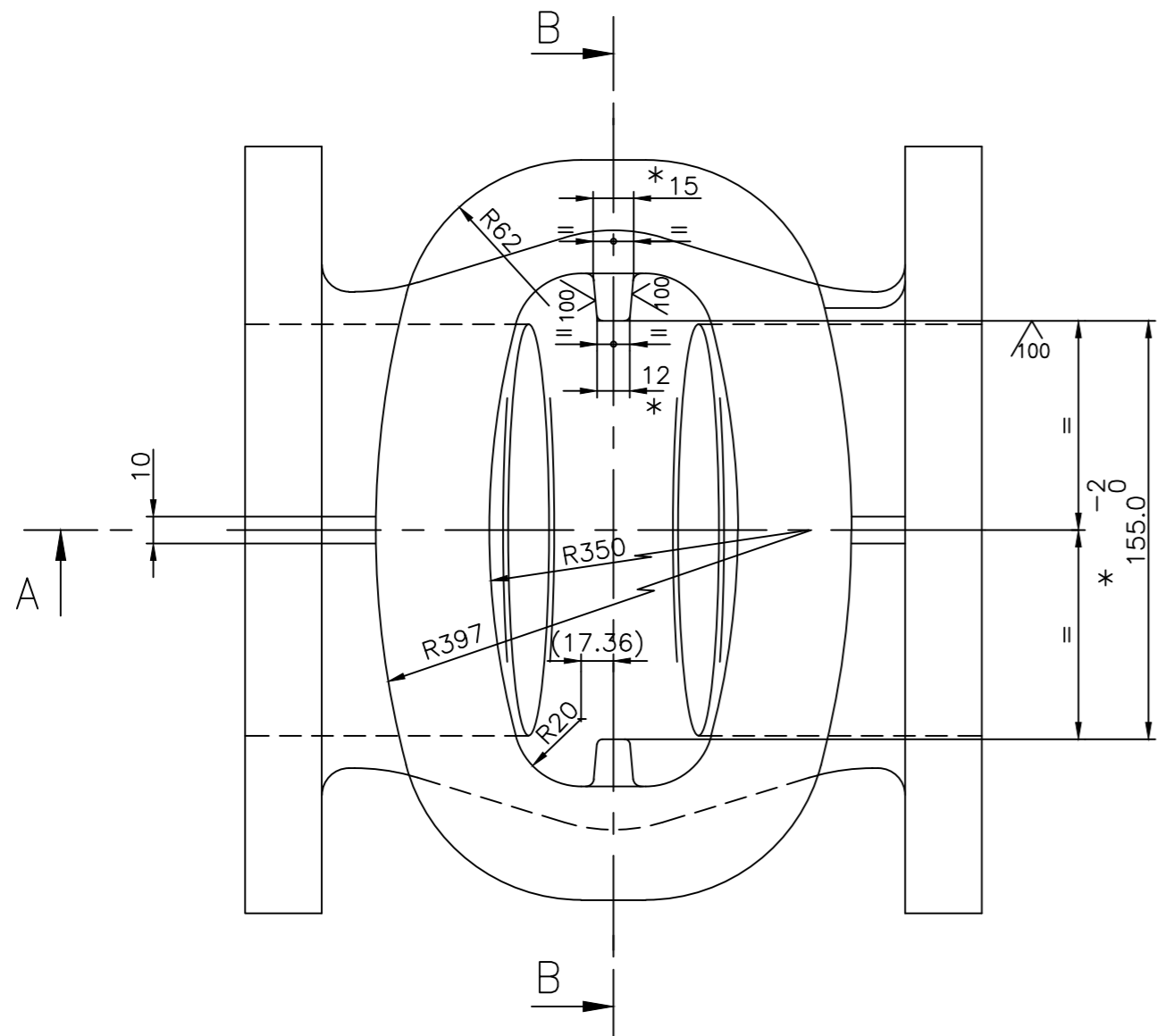
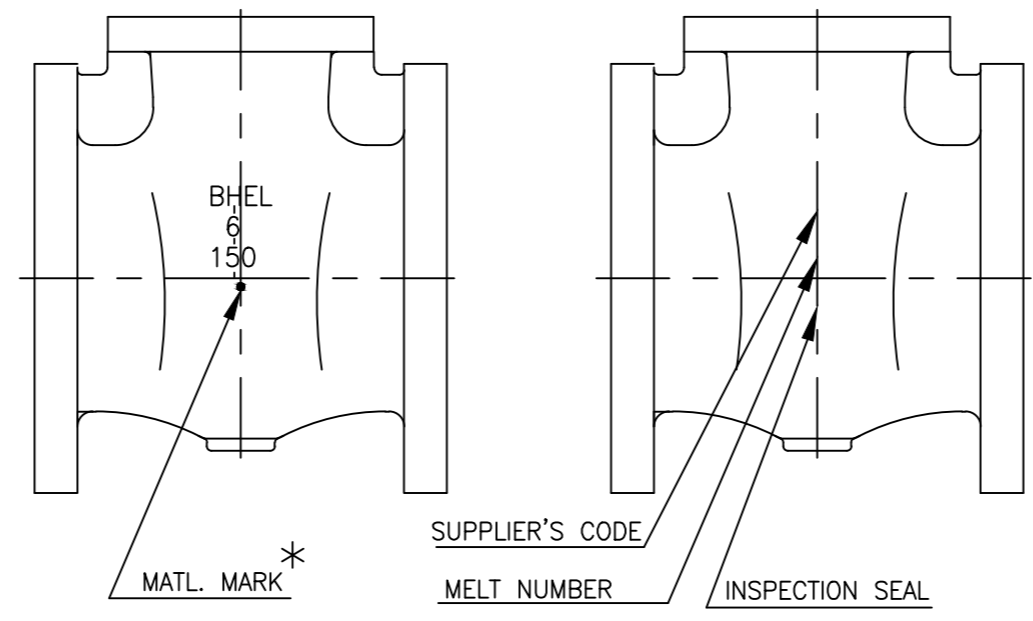


NOTE:-

01. NECESSARY MACHINING ALLOWANCES HAVE BEEN ADDED ON ALL MACHINABLE SURFACES.
02. PERMISSIBLE DEVIATIONS OF NON TOLERANCED CASTING DIMENSIONS REFER APPLICABLE TDC
03. FINISH MACHINED DIMENSIONS ARE INDICATED WITHIN BRACKETS FOR INFORMATION ONLY.
04. LETTERS- BHEL, SIZE, MATL. & SUPPLIERS CODE ARE TO BE CAST IN THE INDICATED ZONE.
05. CASTING SHALL COMPLY WITH THE REQUIREMENTS OF APPLICABLE SPECIFICATION.
06. UNSPECIFIED CASTING RADII = R2 TO R3
07. HEIGHT OF CASTING LETTERS = 12 mm
08. ⊗ INDICATES SURFACE TO BE MACHINED.
09. <sup>100</sup>✓ INDICATED CASTING SURFACES SHALL BE OF HIGH QUALITY WITHOUT SURFACE UNEVENNESS.
10. HEAT TREATMENT FOR SA995 CD3MN AS PER ASME STANDARD SA-995 TABLE 1  
(HEAT TO 2050°F [1120°C] MINIMUM FOR SUFFICIENT TIME TO HEAT CASTING UNIFORMLY TO TEMPERATURE AND WATER QUENCH, OR THE CASTING MAY BE FURNACE COOLED TO 1850°F [1010°C] MINIMUM, HOLD FOR 15 MIN MINIMUM AND THEN WATER QUENCH. A RAPID COOL BY OTHER MEANS MAY BE EMPLOYED IN LIEU OF WATER QUENCH.) SA351 CF8
11. # MARKED ITEMS IGC TEST SHALL BE CONDUCTED.

VIEW - P

VIEW - Q



\* SPECIAL NOTE

01. GUIDE BAR DIMENSIONS TO BE MAINTAINED WITHIN THE TOLERANCE INDICATED.
02. BOTH GUIDE RIBS TO BE COPLANAR AND TRUELY VERTICAL.

MATL. MARK	No OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No. COMP. CODE	ITEM No
CF3M #08		CASTING	-	SA351 CF3M ATTEST	SH	-	42.4	-	2-V-UB25-13591R/1 92 206 251 0000	001
CF8M #07		CASTING	-	SA351 CF8M ATTEST	SH	-	42.4	-	2-V-UA99-13591R/1 92 206 119 0000	001
CF3M 06		CASTING	-	SA351 CF3M ATTEST	SH	-	42.4	-	2-V-NP76-13591R/1 92 203 849 0000	001
CF8 #05		CASTING	-	SA351 CF8 ATTEST	SH	-	42.4	-	2-V-U937-13591R/1 92 203 749 0000	001
CD3MN 04		CASTING	-	SA995 Gr.CD3MN PRODUCT ATTEST	REFER NOTE	-	42.4	-	2-V-NP33-13591R/2 92 203 494 0000	001
CF8M 03		CASTING	-	SA351 CF8M ATTEST	SH	-	42.4	-	2-V-NP27-13591R/1 92 203 483 0000	001
CF8 02		CASTING	-	SA351 CF8 ATTEST	SH	-	42.4	-	2-V-NP03-13591R/1 92 203 389 0000	001
WCB 01		CASTING	-	SA216 WCB ATTEST	NORMALISED	-	42.4	-	2-V-NC06-13591R/3 92 201 425 0000	001

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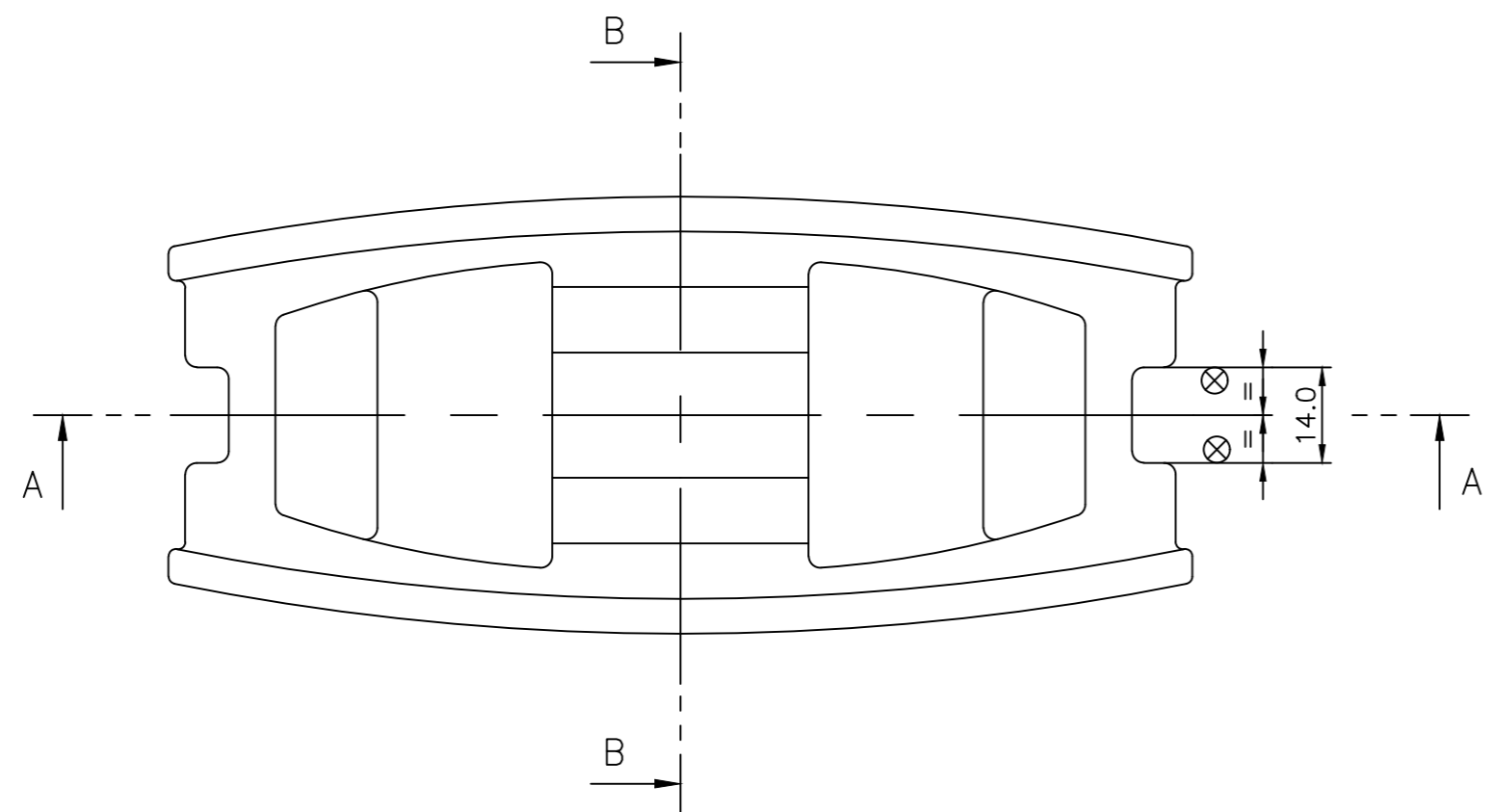
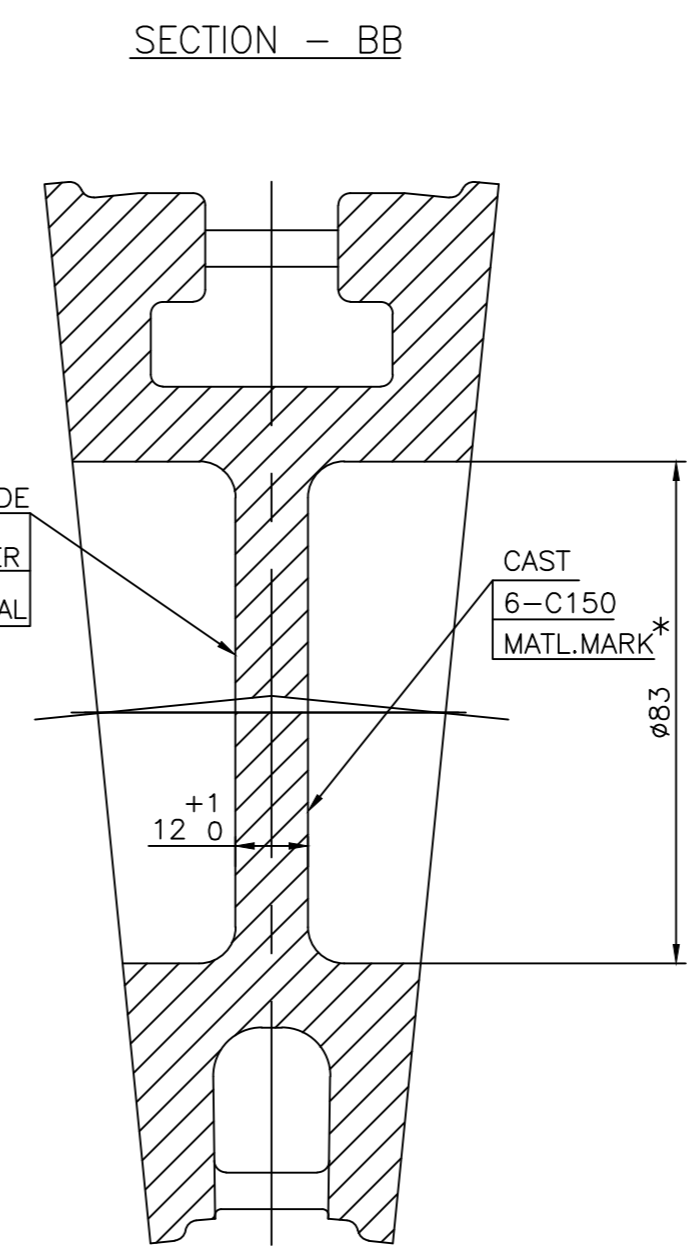
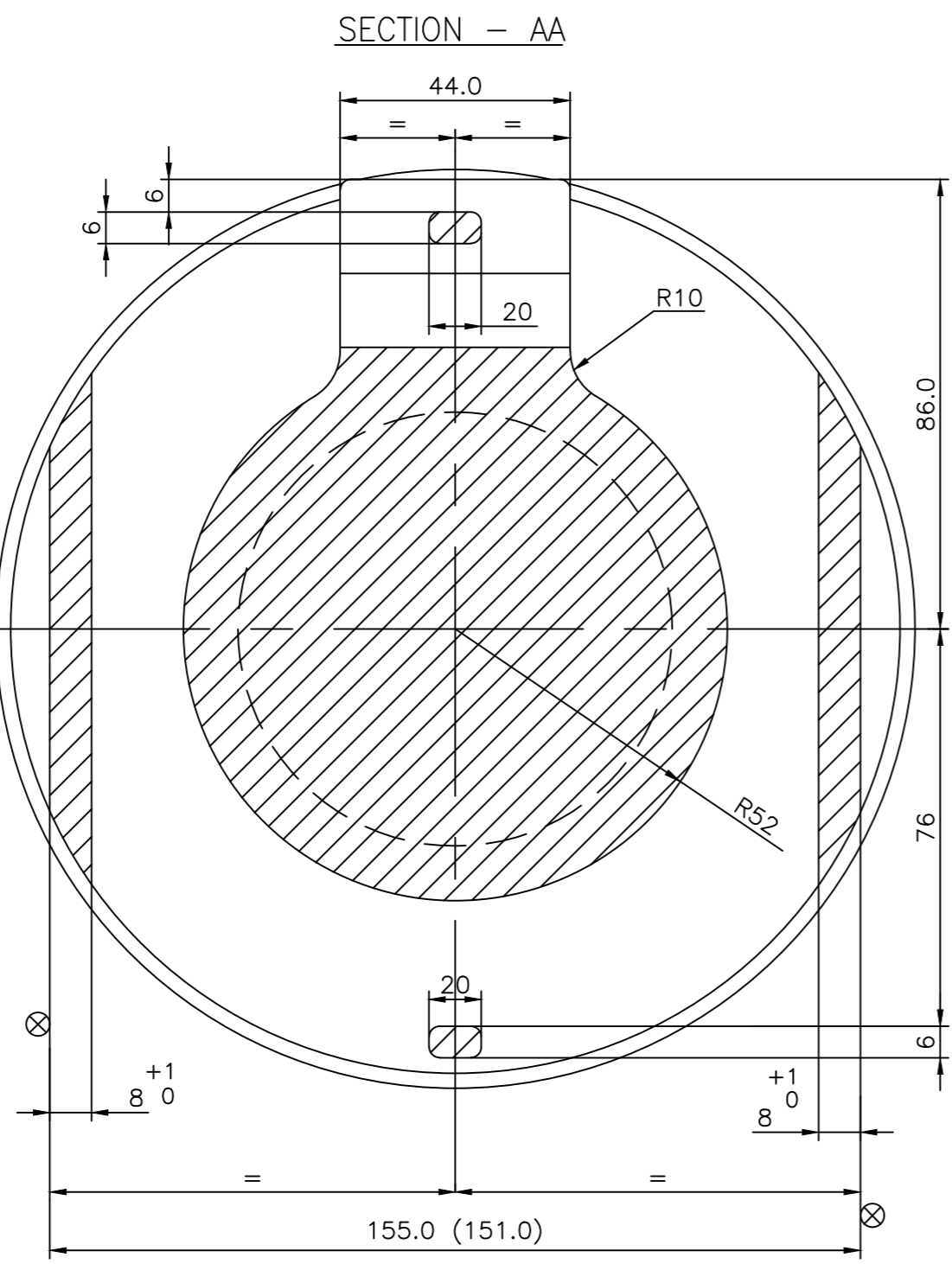
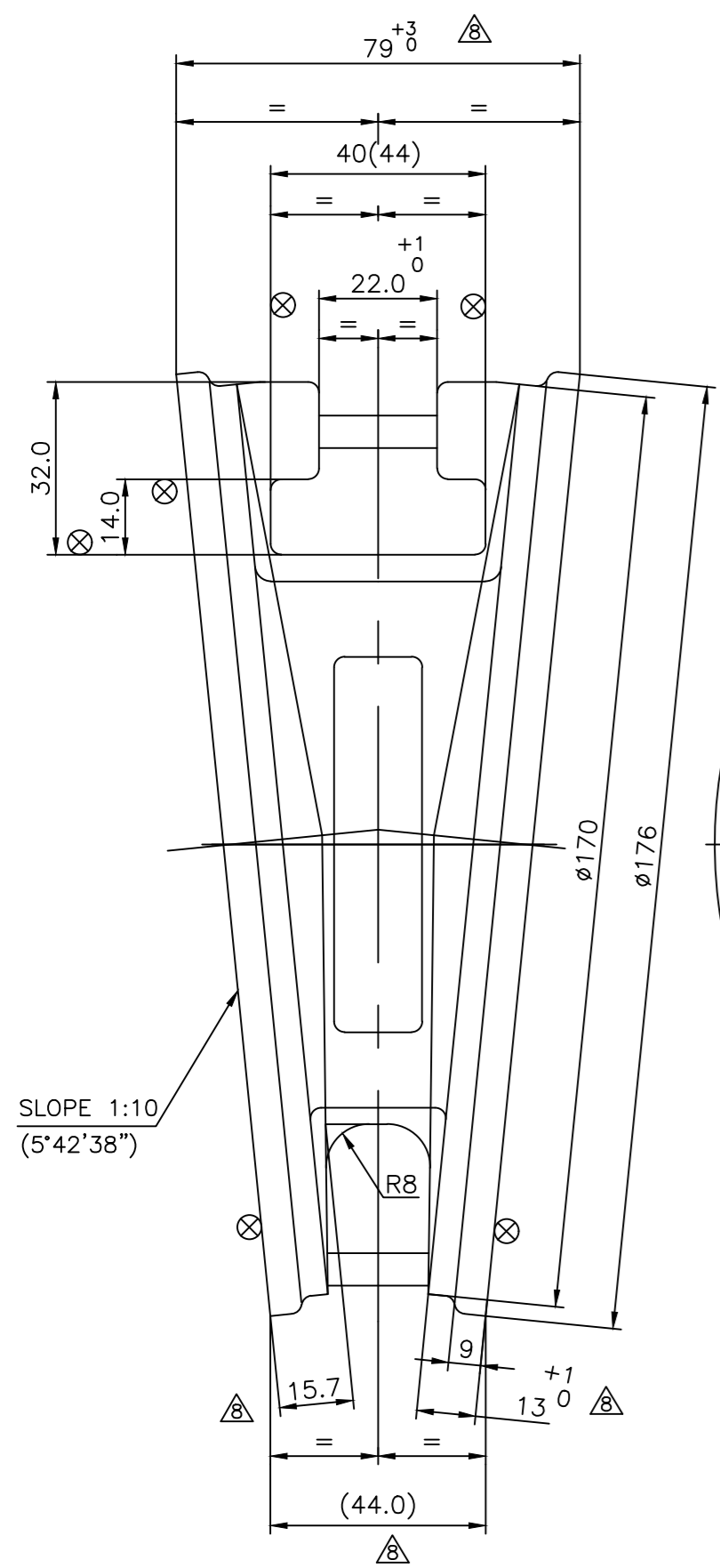
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

**BHARAT HEAVY ELECTRICALS LTD.**  
UNIT: HIGH PRESSURE BOILER PLANT.  
TIRUCHIRAPALLI-620014.

DRN	M.SRINIVASAN	SIGN	DATE	NO. OF VAR.
CHD	P. BOOMINATHAN		15.03.04	-
APPD	K.S.RAMAN		15.03.04	-

DEPT	VL	SCALE	WEIGHT (KG)	REFERENCE INFORMATION	NO. OF ITEMS
CODE	320	NTS	REF. TABLE	CAD :C213591R	-
TITLE	BODY ( 6" - C150-FL)			DRAWING NO.	REV
	U 01			2-V-0000-13591R	10

DCP No.	ALTD: RPS	APPD: SSK	DCP No.	ALTD: RPS	APPD: SSK
802736	CHD: MK	DT: 11.11.22	-	CHD: MK	DT: 27.09.22
REV 10	TOLERANCE FOR WALL THICKNESS		REV 09	SL. No. 08 INCLUDED.	
ZONE -	+2 0 WAS +1 0		ZONE -		



**NOTE**

01. NECESSARY MACHINING ALLOWANCES HAVE BEEN ADDED ON ALL MACHINABLE SURFACES.
02. FOR PERMISSIBLE DEVIATIONS ON NON TOLERANCED CASTING DIMENSION REFER APPLICABLE TDC
03. FINISH MACHINED DIMENSIONS ARE INDICATED WITHIN BRACKETS FOR INFORMATION ONLY.
04. LETTERS- SIZE, MATL. & SUPPLIERS CODE ARE TO BE CAST IN THE INDICATED ZONE.
05. CASTING SHALL COMPLY WITH THE REQUIREMENTS OF APPLICABLE TDC
06. UNSPECIFIED CASTING RADII = R2 TO R3
07. HEIGHT OF CASTING LETTERS = 5 mm
08. ⊗ INDICATES SURFACE TO BE MACHINED.
09. HEAT TREATMENT FOR ASTM 995 CD3MN AS PER ASTM STANDARD ASTM-995 TABLE 1  
(HEAT TO 2050°F [1120°C] MINIMUM FOR SUFFICIENT TIME TO HEAT CASTING UNIFORMLY TO TEMPERATURE AND WATER QUENCH, OR THE CASTING MAY BE FURNACE COOLED TO 1850°F [1010°C] MINIMUM, HOLD FOR 15 MIN MINIMUM AND THEN WATER QUENCH. A RAPID COOL BY OTHER MEANS MAY BE EMPLOYED IN LIEU OF WATER QUENCH.)
10. # MARKED ITEMS IGC TEST SHALL BE CONDUCTED.

CF3M	#09	CASTING	-	A351 CF3M CERTIFY	SH	-	5.4	-	2.V.UB25.13610R/92 206 253 0000	004
CF8M	#08	CASTING	-	A351 CF8M CERTIFY	SH	-	5.4	-	2.V.UA99.13610R/92 206 131 0000	004
WC9	07	CASTING	-	A217 WC9 CERTIFY	NT	-	5.4	-	2.V.NQ29.13610R/92 206 023 0000	004
CF3M	06	CASTING	-	A351 CF3M CERTIFY	SH	-	5.4	-	2.V.NP81.13610R/1/92 203 942 0000	004
CF8	#05	CASTING	-	A351 CF8 CERTIFY	SH	-	5.4	-	2.V.U937.13610R/2/92 203 752 0000	004
CD3MN	04	CASTING	-	A995 Gr.CD3MN CERTIFY	REFER NOTE	-	5.4	-	2.V.NP33.13610R/3/92 203 495 0000	004
CF8	03	CASTING	-	A351 CF8 CERTIFY	SH	-	5.4	-	2.V.ND72.13610R/2/92 203 340 0000	004
CF8M	02	CASTING	-	A351 CF8M CERTIFY	SH	-	5.4	-	2.V.ND10.13610R/2/92 203 153 0000	004
WCB	01	CASTING	-	A216 WCB CERTIFY	NT	-	5.4	-	2.V.NC06.13610R/2/92 201 427 0000	004

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**TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT**  
DRG.REDRAWN WITH REV.08 ON 15.02.2020

<b>DRN</b>	M.SRINIVASAN	<b>SIGN</b>		<b>DATE</b>	04.04.03	<b>NO. OF VAR.</b>	
<b>CHD</b>	P.Boomnathan				04.04.03		
<b>APPD</b>	K.S.RAMAN				04.04.03		

**BHARAT HEAVY ELECTRICALS LTD.**  
UNIT: HIGH PRESSURE BOILER PLANT.  
TIRUCHIRAPALLI-620014.

<b>DEPT</b>	VL	<b>SCALE</b>	NTS	<b>WEIGHT (KG)</b>	REF. TABLE	<b>REFERENCE INFORMATION</b>	CAD :C213610R
<b>CODE</b>	320					<b>DRAWING NO.</b>	2-V-0000-13610R
<b>TITLE</b>	WEDGE					<b>REV</b>	11

**MATL.MARK \***  
No OFF DESCRIPTION MATL CODE MATL SPECN HEAT TREATMENT SCRAP SORT NET WT (kg) GROSS WT (kg) DRAWING No. ITEM No

DCP No.	ALTD: RPS	APPD: SSK	DCP No.	ALTD: TS	APPD: SSK	DCP No.	ALTD: RPS	APPD: SSK	DCP No.	ALTD: RPS	APPD: SSK
-	CHD: MK	DT: 28.09.22	-	CHD: RPS	DT: 05.10.21	-	CHD: SAB	DT: 28.09.20	802553	CHD: SAB	DT: 15.02.20
<b>REV 11</b>	SL. No. 09 INCLUDED		<b>REV 10</b>	SL. No. 08 INCLUDED		<b>REV 09</b>	SL. No. 07 INCLUDED		<b>REV 08</b>	DIMN. 79 <sup>+3</sup> , (44.0), 15.7 & 13 <sup>+3</sup> WERE 75.0, (40.0), 13.7 & 11 <sup>+1</sup> RESPECTIVELY	
<b>ZONE</b>			<b>ZONE</b>			<b>ZONE</b>			<b>ZONE</b>		

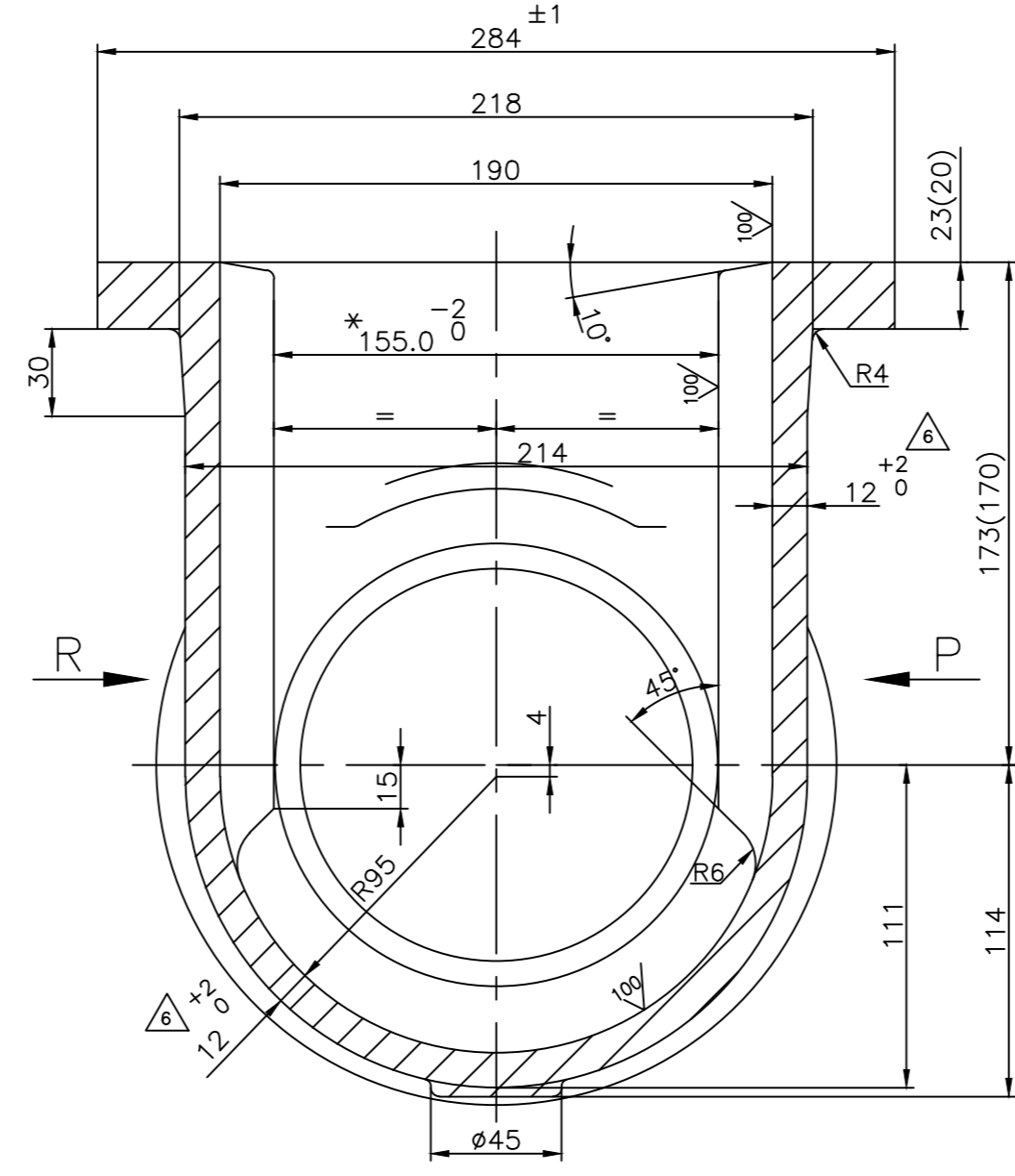
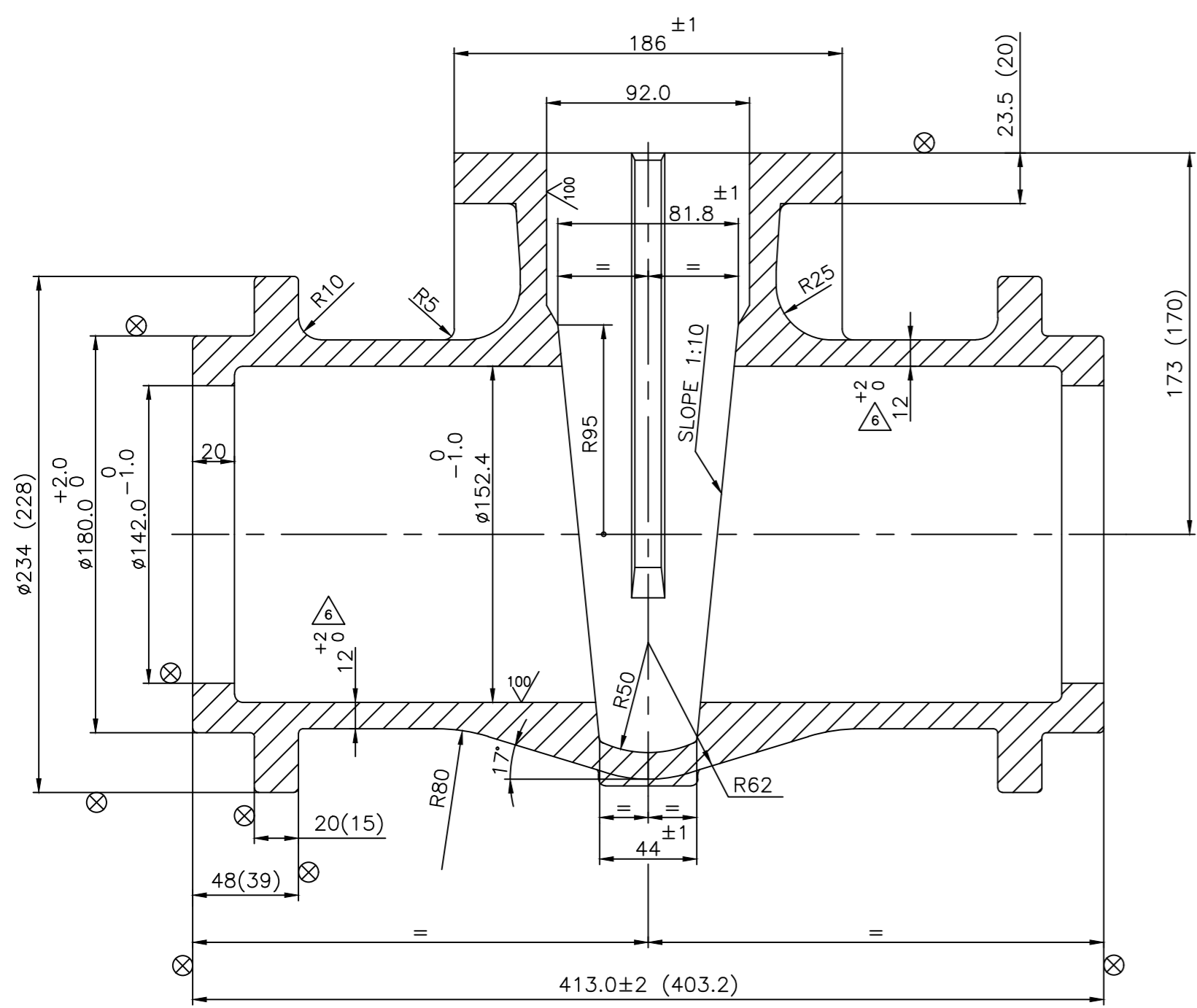
DRAWING NO. 2-V-0000-14166R

ALL DIMENSIONS ARE IN MILLIMETRES. FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCP / QP

100/

SECTION - AA

SECTION - BB

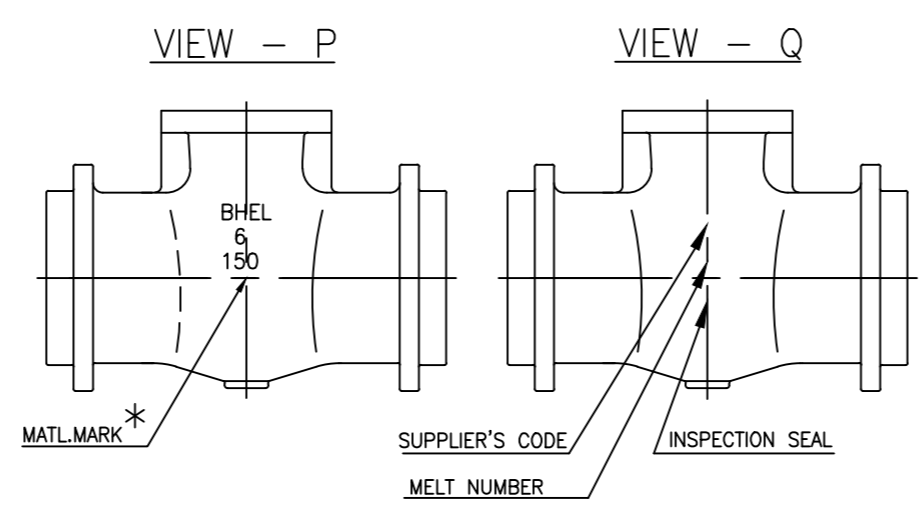
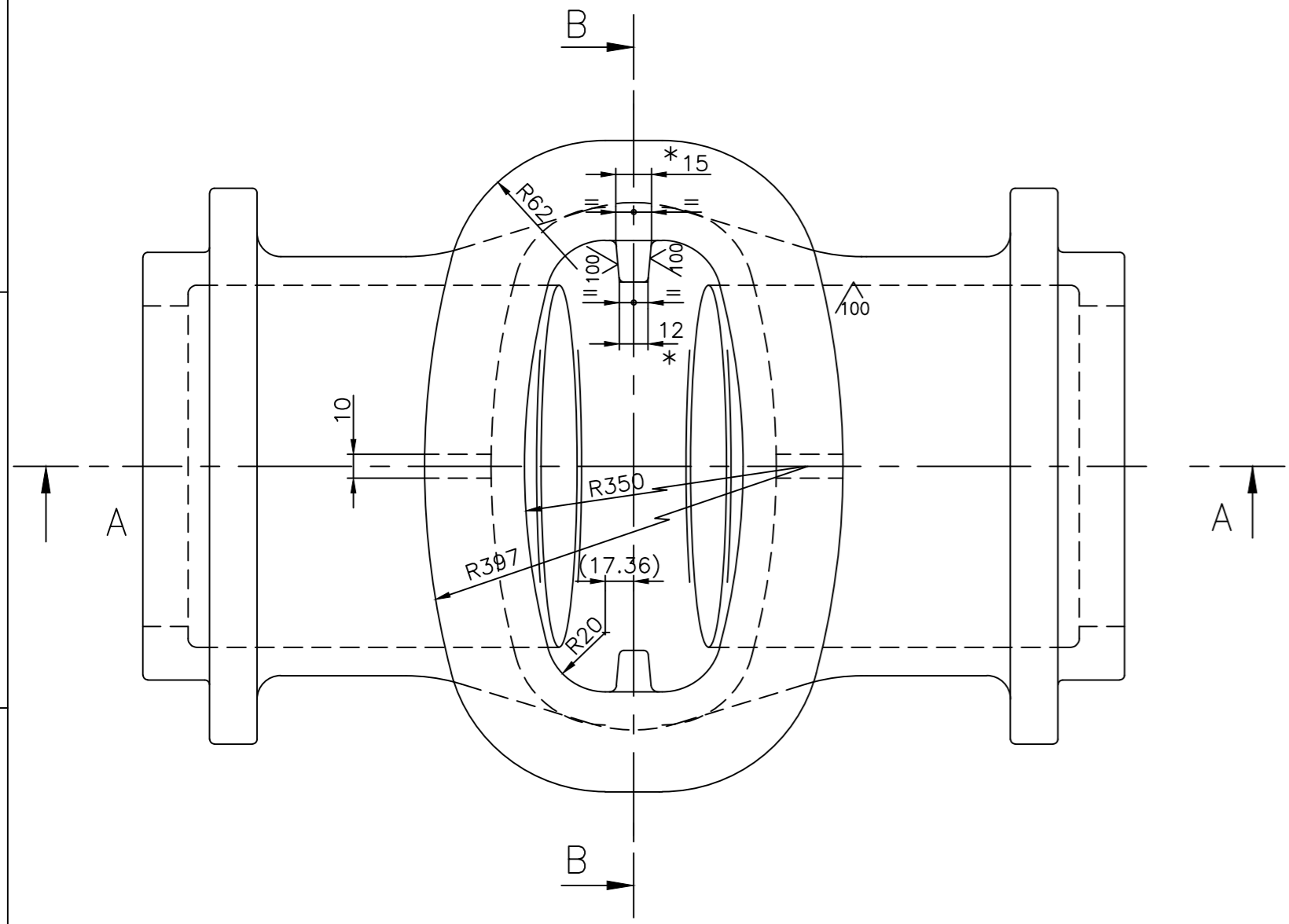


NOTE

01. NECESSARY MACHINING ALLOWANCES HAVE BEEN ADDED ON ALL MACHINABLE SURFACES.
02. <sup>100</sup>INDICATED CASTING SURFACES SHALL BE OF HIGH QUALITY WITHOUT SURFACE UNEVENNESS.
03. FINISH MACHINED DIMENSIONS ARE INDICATED WITHIN BRACKETS FOR INFORMATION ONLY.
04. LETTERS- BHEL, SIZE, MATL. & SUPPLIERS CODE ARE TO BE CAST IN THE INDICATED ZONE.
05. CASTING SHALL COMPLY WITH THE REQUIREMENTS OF APPLICABLE SPECIFICATION.
06. UNSPECIFIED CASTING RADII = R2 TO R3
07. HEIGHT OF CASTING LETTERS = 12 mm
08. ⊗ INDICATES SURFACE TO BE MACHINED.
09. HEAT TREATMENT FOR ASME 995 CD3MN AS PER ASME STANDARD ASME-995 TABLE 1 (HEAT TO 2050°F [1120°C] MINIMUM FOR SUFFICIENT TIME TO HEAT CASTING UNIFORMLY TO TEMPERATURE AND WATER QUENCH, OR THE CASTING MAY BE FURNACE COOLED TO 1850°F [1010°C] MINIMUM, HOLD FOR 15 MIN MINIMUM AND THEN WATER QUENCH. A RAPID COOL BY OTHER MEANS MAY BE EMPLOYED IN LIEU OF WATER QUENCH.)

\* SPECIAL NOTE

01. GUIDE BAR DIMENSIONS TO BE MAINTAINED WITHIN THE TOLERANCE INDICATED.
02. BOTH GUIDE RIBS TO BE COPLANAR AND TRUELY VERTICAL.



WCB	No	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No. COMP. CODE	ITEM No
WC9	06	CASTING	-	SA 217 WC9 ATTEST	NT	-	38.0	-	2.V.NQ29.14166R/1 922060220000	001
CF3M	05	CASTING	-	SA 351 CF3M ATTEST	SH	-	38.0	-	2.V.NP81.14166R/1 922038790000	001
CD3MN	04	CASTING	-	SA995 GR.CD3MN ATTEST	REFER NOTE	-	38.0	-	2.V.NP53.14166R/1 922035830000	001
CF8	03	CASTING	-	SA 351 CF8 ATTEST	SH	-	38.0	-	2.V.ND72.14166R/1 922033380000	001
CF8M	02	CASTING	-	SA 351 CF8M ATTEST	SH	-	38.0	-	2.V.ND10.14166R/1 922031600000	001
WCB	01	CASTING	-	SA216 WCB ATTEST	NR	-	38.0	-	2.V.NC24.14166R/1 922016950000	001

CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

**TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT**

**BHARAT HEAVY ELECTRICALS LTD.**  
UNIT: HIGH PRESSURE BOILER PLANT.  
TIRUCHIRAPALLI-620014.

DRN	M.SRINIVASAN	SIGN		DATE	28.08.07	NO. OF VAR.	
CHD	P. BOOMINATHAN				28.08.07		-
APPD	M. RAJAKUAMR				28.08.07		-

DEPT	VL	SCALE	WEIGHT (KG)	REFERENCE INFORMATION	NO. OF ITEMS
320		NTS	38.0	CAD :C214166R	-

**TITLE**  
BODY  
( 6" - C150 - BW )

**CARD CODE**  
U 01

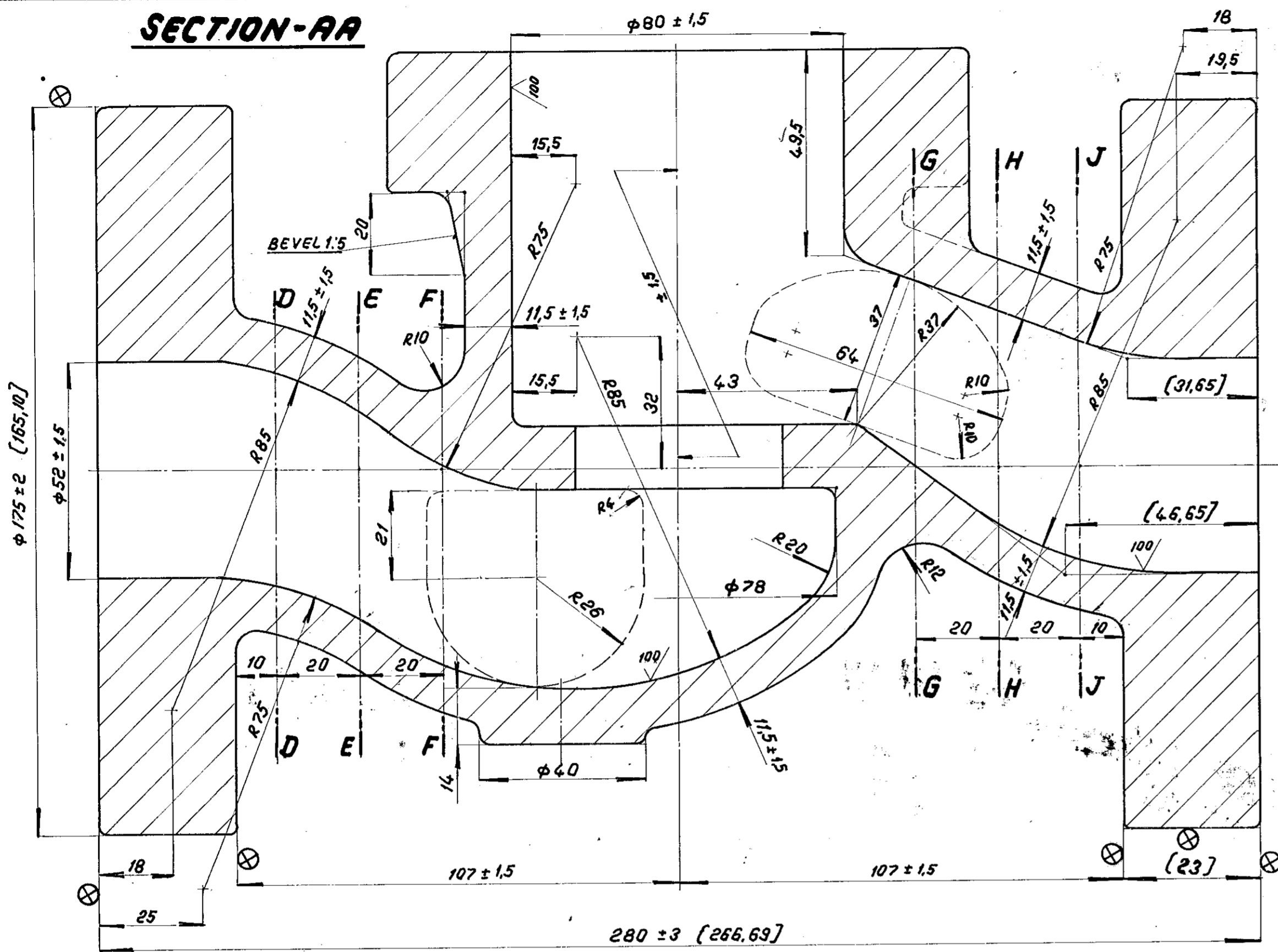
**DRAWING NO.**  
2-V-0000-14166R

**REV**  
06

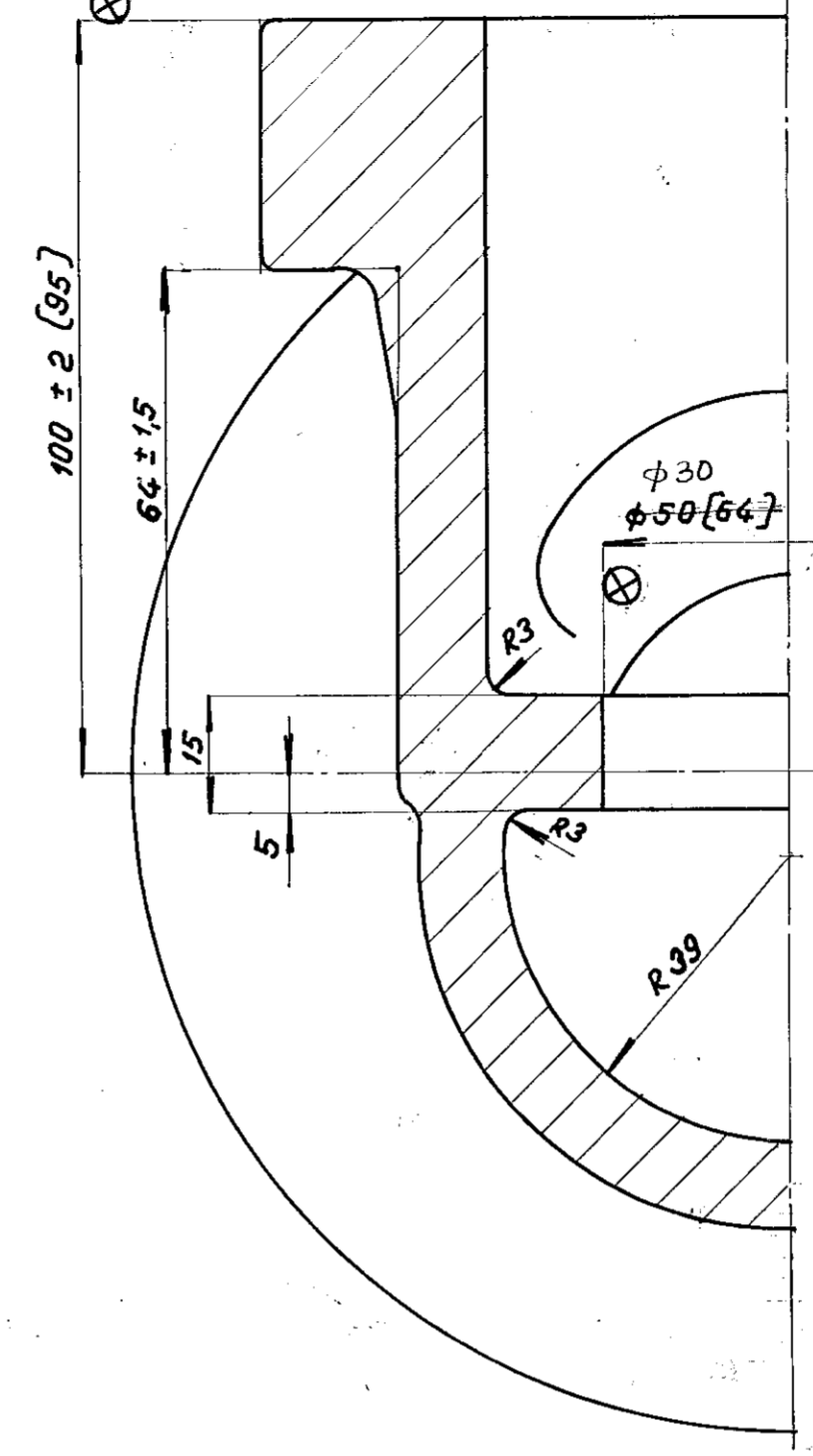
DCP No.	ALTD: RPS	APPD: SSK	DCP No.	ALTD: RPS	APPD: KRS
802736	CHD: MK	DT: 11.11.22	-	CHD: SSK	DT: 28.09.20
REV 06	TOLERANCE FOR WALL THICKNESS		REV 05	SL. No. 06 INCLUDED.	
ZONE -	+2 0 WAS +1 0		ZONE -		



**SECTION-AA**



**SECTION-BB**

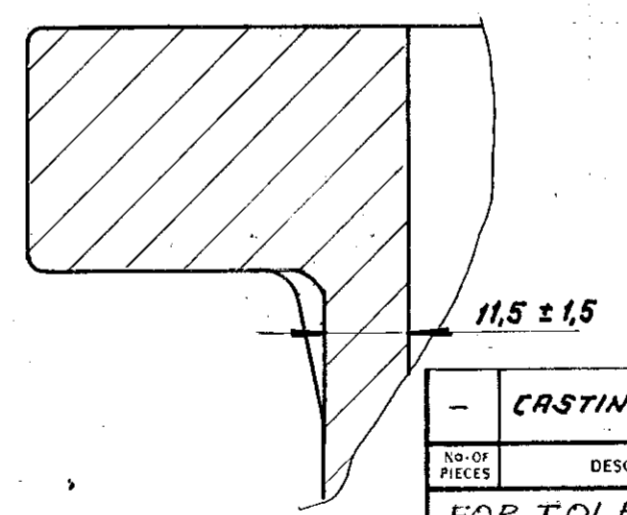


- NOTES:-**
- CASTING SHALL COMPLY WITH REQUIREMENTS OF APPLICABLE TDC.
  - NECESSARY MACHINING ALLOWANCES HAVE BEEN ADDED IN THIS DRG. ON ALL MACHINABLE SURFACES.
  - ⊗ INDICATES THE SURFACES WHICH ARE TO BE MACHINED FURTHER.
  - 100% INDICATES THE CASTING SURFACES WHICH MUST BE OF HIGH QUALITY WITHOUT SURFACE UNEVENNESS.
  - UN SPECIFIED CASTING RADII, R5 MAX.
  - ALL DETAILS IN VIEW, EXCEPT MELT NO. & INSPECTION SEAL ARE TO BE CAST. HEIGHT OF CASTING LETTERS - 12 mm.
  - FINISH - MACHINED DIMENSIONS ARE INDICATED WITHIN BRACKETS FOR INFORMATION ONLY.

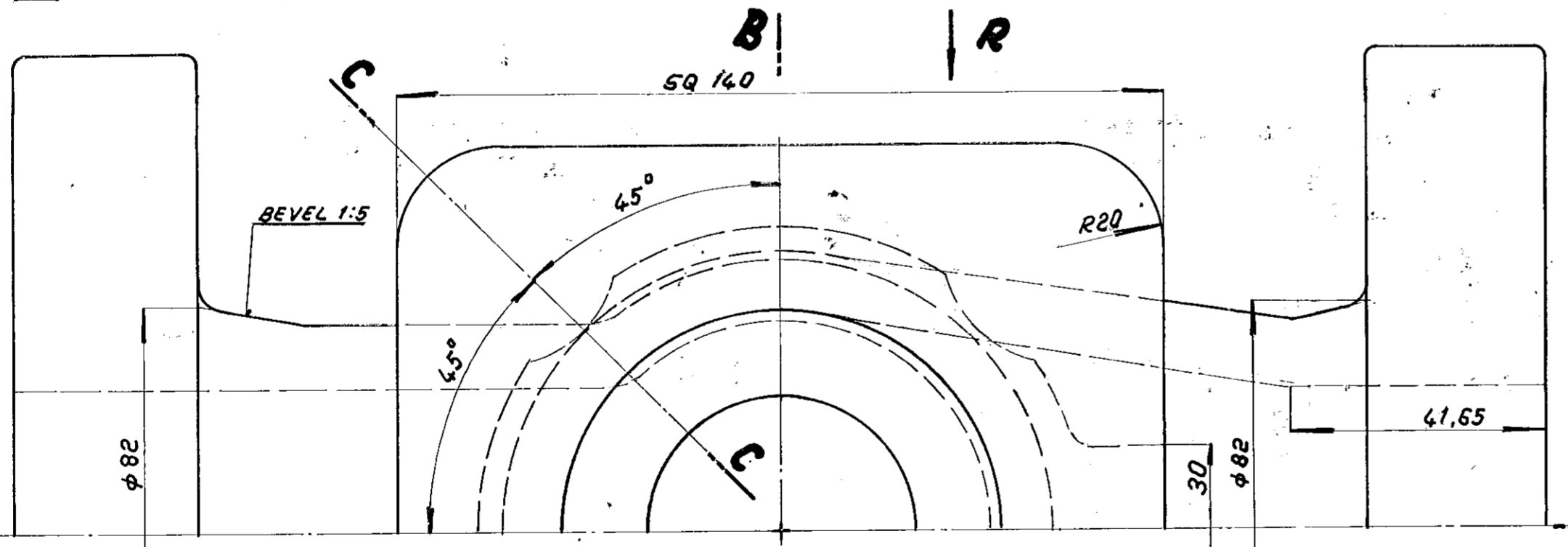
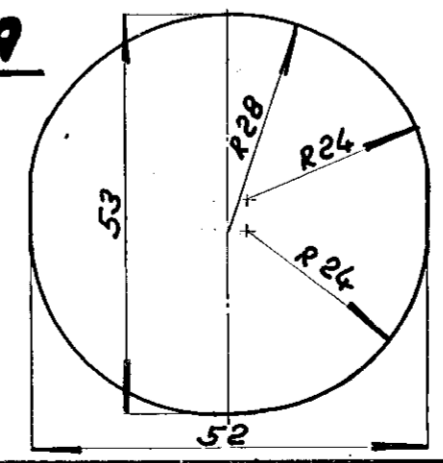
CAST IDENTIFICATION MARKING  
 VIEW-P: BHEL 2 300 WCB  
 VIEW-R: SUPPLIER'S CODE MELT No. INSPECTION SEAL.

REV. DATE	ALTD.	BY	REASON
03	9.5.2000	MDH/ANP/ALD	1. SEAT RING SORE 4000 REDUCE TO 30
02	28.2.97	CHD/SAPPD	2. REFER DCN NO. CS/1086
NOTES UPDATED			REFER DCN. CS: 0662

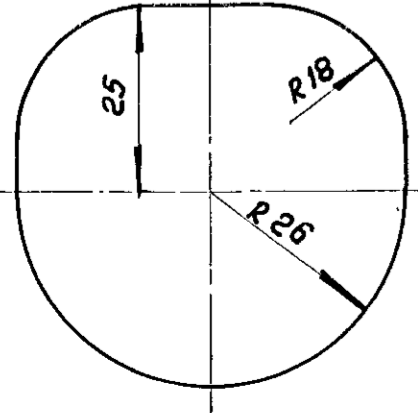
**SECTION-CC**



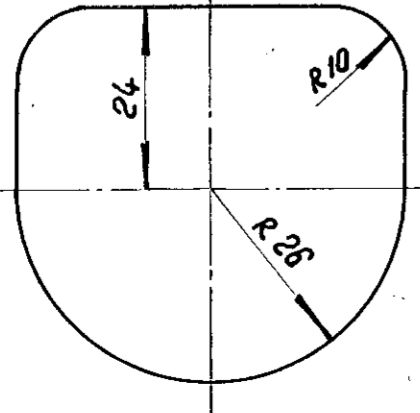
**SECTION-JJ**



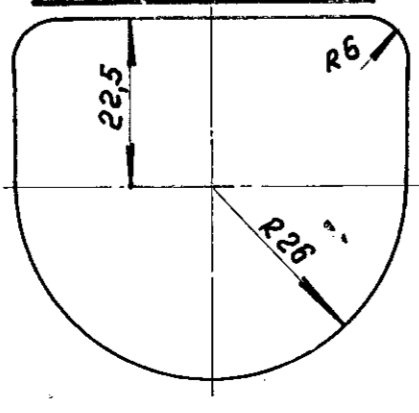
**SECTION-DD**



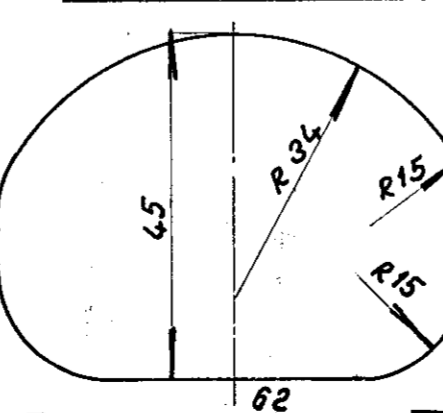
**SECTION-EE**



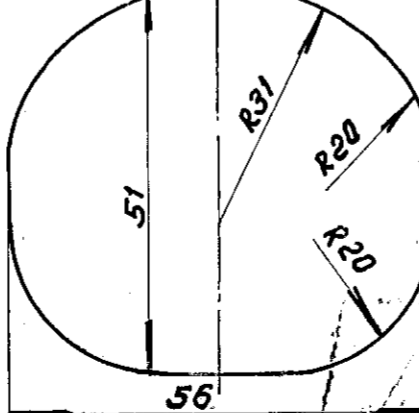
**SECTION-FF**



**SECTION-GG**



**SECTION-HH**



CASTING	92024-295	ASTM A 215-GR. WCB	ATTEST	10
NO. OF PIECES	DESCRIPTION	MATL. CODE	FINAL MATERIAL	ITEM NO.

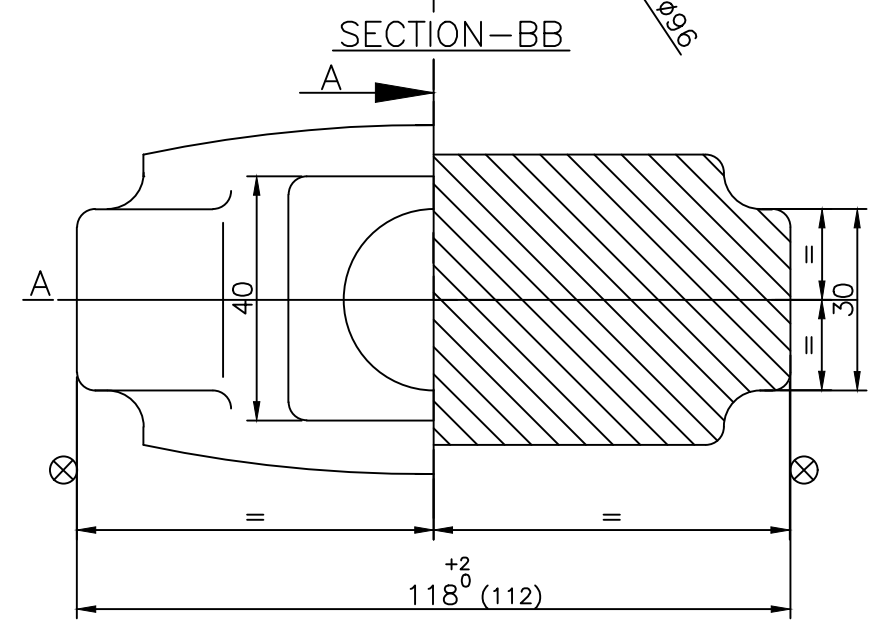
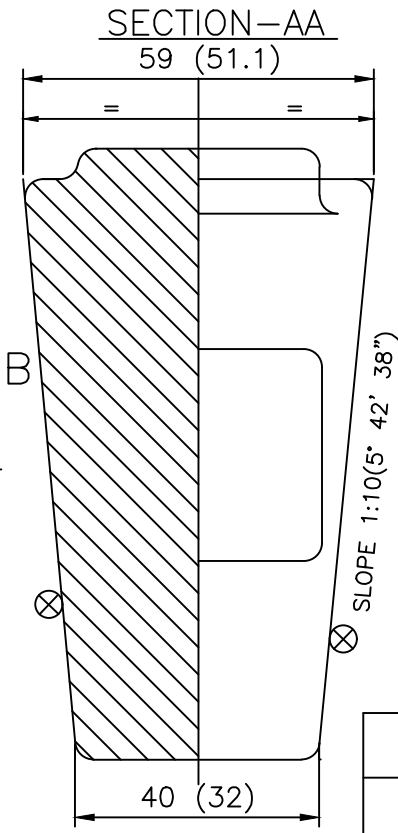
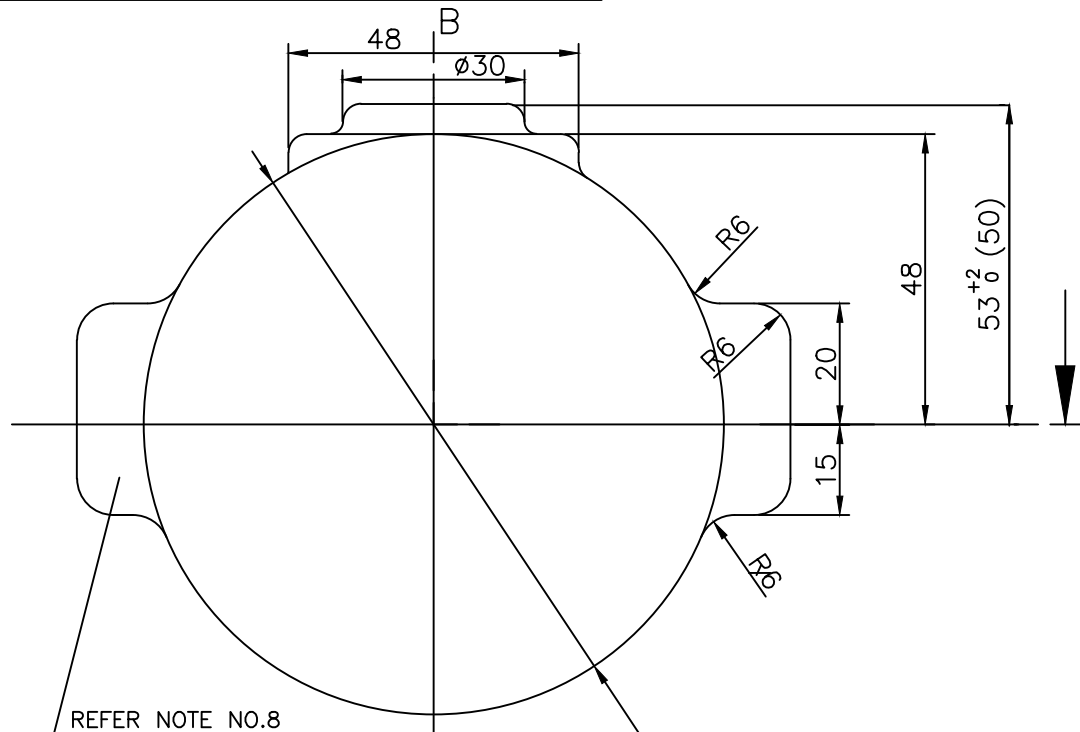
FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCP/QP

<b>BHARAT HEAVY ELECTRICALS LTD., BOILER PLANT UNIT, TIRUCHIRAPALLI - 14</b>			
FIRST ANGLE	SCALE	DRAWN	TOTAL NET WT. (Kg)
	1:1	S. Somasundaram	N 20
		CHECKED	TYPE
		APPROVED	GROUP
ALL DIMENSIONS IN MILLIMETRES		DATE	NEW/OLD DRG. No.
		8.6.74	

<b>CAUTION</b>		TITLE	
THE INFORMATION CONTAINED IN THIS DRAWING IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LTD., BOILER PLANT UNIT TIRUCHY- 620014 AND SHALL NOT BE USED WITHOUT EXPRESS WRITTEN PERMISSION IN ANY FORM OR PART THEREOF FOR ANY OTHER PURPOSE THAN FOR WHICH IT IS SENT TO YOU.		<b>BODY</b>	
		DRAWING No.	REVISION
05-228		<b>2.V. 247701775R</b>	03

DATE	ALTERED	BY	REASON
01	28/9/94	MDH/ANP/ALD	1) NOTE No. 1 & 3 MODIFIED.
			2) NOTE No. 10 REMOVED
			3) DCN No. CS 8392

DRAWING NO: 3-V-0000-06598R



**NOTE**

- NECESSARY MACHINING ALLOWANCES HAVE BEEN ADDED ON ALL MACHINABLE SURFACES
- ⊗ SURFACES TO BE MACHINED
- UNSPECIFIED CASTING RADII R3-R5
- 100/√ CASTING SURFACES MUST BE HIGH QUALITY WITHOUT SURFACE UNEVENNESS
- PERMISSIBLE DIMENSIONAL DEVIATION OF CASTING SURFACES REFER CHART
- FINISHED MACHINED DIMENSIONS ARE INDICATED WITHIN BRACKETS
- CASTING SHALL MEET THE REQUIREMENTS OF TDC (WITH LATEST REVISION)
- THE FOLLOWING IDENTIFICATION MARKING TO BE PUNCHED IN THE ZONE SPECIFIED IN THE DRG
 

3"-150C
MATL. MARK
SUPPLIERS CODE
MELT NO.
- # MARKED ITEMS IGC TEST SHALL BE CONDUCTED.
- HEAT TREATMENT FOR SA995 CD3MN AS PER ASME STANDARD SA-995 TABLE 1. (HEAT TO 2050°F [1120°C] MINIMUM FOR SUFFICIENT TIME TO HEAT CASTING UNIFORMLY TO TEMPERATURE AND WATER QUENCH, OR THE CASTING MAY BE FURNACE COOLED TO 1850°F [1010°C] MINIMUM, HOLD FOR 15 MIN MINIMUM AND THEN WATER QUENCH. A RAPID COOL BY OTHER MEANS MAY BE EMPLOYED IN LIEU OF WATER QUENCH.)

* MATL. MARK	NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No. COMP. CODE	ITEM No
CF3M #11		CASTING	--	A351 CF3M CERTIFY	SH	--	2.75	--	3-V-UB23-06598R 92 206 245 0000	--
CF8M #10		CASTING	--	A351 CF8M CERTIFY	SH	--	2.75	--	3-V-UA97-06598R 92 206 129 0000	--
CF3M 09		CASTING	--	A351 CF3M CERTIFY	SH	--	2.75	--	3-V-NK74-06598R 92 203 929 0000	--
CD3MN 08		CASTING	--	SA995 CD3MN CERTIFY	REFER NOTE	--	2.75	--	3-V-NK66-06598R 92 203 859 0000	--
CF8 #07		CASTING	--	A351 CF8 CERTIFY	SH	--	2.75	--	3-V-U635-06598R 92 203 550 0000	--
LCB 06		CASTING	--	A352 LCB CERTIFY	NR	--	2.75	--	3-V-M768-06598R 92 200 896 0000	--
WC9 05		CASTING	--	A217 WC9 CERTIFY	N & T	--	2.75	--	3-V-N292-06598R 92 200 700 0000	--
WC6 04		CASTING	--	A217 WC6 CERTIFY	N & T	--	2.75	--	3-V-N291-06598R 92 200 678 0000	--
CF8M 03		CASTING	--	A351 CF8M CERTIFY	SH	--	2.75	--	3-V-N338-06598R 92 200 406 0000	--
CF8 02		CASTING	--	A351 CF8 CERTIFY	SH	--	2.75	--	3-V-N286-06598R 92 200 311 0000	--
WCB 01		CASTING	--	A216 WCB CERTIFY	NR	--	2.75	--	3-V-N025-06598R 92 034 283 0000	--

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TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: **CS** DRG REDRAWN WITH REV.06 ON.10.04.18

 BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI-620014. 365-191 02.03.2021	DRN	R.P.SINGH	SIGN	DATE	NO.OF VAR.
	CHD	S.SATHEESKUMAR		10.04.18	—
	APPD	K.RAJASEKARAN		10.04.18	—

DEPT	VL	SCALE	WEIGHT (KG).	REFERENCE INFORMATIONS	NO. OF ITEMS
CODE	320	NTS	REF. TABLE		—
TITLE	WEDGE (3"-150C)		CARD CODE	DRAWING NO.	REV
			U 01	3-V-0000-06598R	10

DCP No.	ALTD: RPS	APPD:SSK	DCP No.	ALTD:TS	APPDSSK
-	CHD: MK	DT: 28.09.22	-	CHD: RPS	DT:05.10.21
REV 10	SL. No. 11 INCLUDED.		REV 09	SL. No. 10 INCLUDED.	
ZONE -			ZONE -		