



**PRODUCT STANDARD
PULVERISERS
HYDERABAD**

Product
STD no.

BA35029

Rev No. 01

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GRINDING ELEMENTS FOR BHEL XRP BOWL MILL

1.0 GENERAL:

This specification governs the procurement of grinding elements consisting of Grinding Rolls and matching Bull Ring Segments for OEM Supplies of XRP1003 Bowl Mill. The guaranteed wear life is 8000 running hours for blended coal, having average ash content of about 14-31.9% & meeting the technical requirements / performance requirements for the Bowl Mills.

2.0 QUALIFYING REQUIREMENTS:

The bidder shall satisfy the following minimum qualifying requirements by submitting documentary evidences along with the technical offer, failing which the offers shall be summarily rejected.

2.1 Proven Experience: Documentary evidence to be submitted for the followings.

Evidence of the established performance of wear life of minimum 6000 hours (without repair or rebuild of the wear area) for 37" to 72" size Grinding Rolls with matching bull ring segments.

The above shall be for XRP 803 to HP 1203 type BHEL make or other similar design (Raymond Mill) coal mills for power plant applications with typical high ash Indian coal as given in Annexure I.

2.1.1 Bidder should have supplied minimum of 13 sets of Grinding rolls & Bull ring segments in the above range in India and must have achieved a proven life of 6000 hours under the coal condition of Annexure I during last five years from the date of issue of the present enquiry.

2.1.2 The evidences shall be submitted in the following format.

Name of Site	Mill type	Size of grinding roll	Date of supply	Life achieved in hrs.	Coal Type as Per Annexure I
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Revisions

PREPARED

S GHATGE

APPROVED

T MOHAN RAO

DATE

28.09.16



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2.2 Manufacturing facilities and proven process:

2.2.1 Vendors to note that at present BHEL is using the Grinding elements as per the following details:

Rolls and Bull ring segments are manufactured using proven casting process.

The Inserts of the rolls are made up of hard metal matrix composite composing of high chrome and ceramic, the high chrome iron having following Chemical composition:

C = 2.5-3.4 %, Cr = 18.0-27.0 %, Mo= 0.5-1.3 %, Ni-0.3-1.3%,
Mn = 0.5 - 1.5 %, Si = 1.0 % max., S-0.1% Max, P-0.1% Max

This High-Chrome alloy is reinforced with ceramic particles, evenly distributed. The hardness of inserts is in the range of 58 – 66 RC.

These inserts are embedded into a base metal, which is either ductile iron (SG iron) / Hi-Chrome / any other equivalent material, forming a roll by Static / centrifugal process with overall dimensions as per BHEL drawing.

The Chemical composition of SG iron: C- 3.2-3.5%, Si-2.5-3.0%, Mn-0.3% max. Mg-0.04-0.07%.

Any bidder following the above manufacturing process will be qualified subject to meeting the clause 2.1.

However, the above Chemical Composition/Process/ technology do not absolve the supplier from guarantee responsibility. The Heat treatment procedure shall be established by the vendor and shall be indicated in Quality Plan.

2.2.2 ANY OTHER PROCESS FOLLOWED & MEETING 2.1

In case the bidder is having a manufacturing process different from 2.2.1, the bidder shall have all the necessary facilities for the manufacture of Grinding rolls and bull ring segments. The process used for manufacture shall be a proven one and the evidences as submitted in 2.1 above shall be for the same process of manufacture. Details of their manufacturing facilities shall be submitted.

In case any of the sub-process is out sourced / subcontracted, the tie-up letter with the agency along with details of their facilities and capabilities shall also be submitted for acceptance by BHEL.

The information given by the bidder is liable for evaluation by BHEL

2.2.3 **Traders / stockiest / mediators are not allowed to quote. Only manufacturers who are having relevant facilities, proven process and experience will be considered for the supply.**

[Handwritten Signature]



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2.3 Infrastructure for providing Technical Services for:

Bidder shall have the sufficient infrastructure in India for the following after sales services

- Supervision of erection and commissioning.
- Performance monitoring with respect to wear life, output, fineness, coal characteristic etc.

Documentary evidences/confirmation for the above shall be submitted.

3.0 MATERIAL CODE: See Table

4.0 QUANTITY REQUIRED PER MILL

- 1) 3 Nos. Grinding Rolls.
- 2) 1 set of matching Bull Ring Segments.

5.0 MANUFACTURING PROCESS AND QUALITY PLAN:

- 5.1** Dimensions: The overall dimensions of the Grinding Roll and Bull Ring Segments shall be as per BHEL Drawings.
- 5.2** A detailed manufacturing process (along with the process control parameters) and manufacturing and test facilities data shall be submitted for review by BHEL.
- 5.3** Material used for the manufacture of the Grinding rolls and Bull ring segments shall be specified along with the technical details. The specifications shall be submitted for acceptance by BHEL. The details of the patented portion of the technology need not be provided, however the generic name of the proven patented technology along with the broad details shall be provided.
- 5.4** A Quality plan with stage wise inspection and acceptance criteria shall be submitted for approval by BHEL and/or customer.

6.0 INSPECTION:

- 6.1** The inspection of items will be as per the approved Quality plan.
- 6.2** Inspection of the material will be based on the applicable process of manufacture acceptable to BHEL. The tests like chemical composition, microstructure, hardness and NDT etc as applicable will be part of the approved Quality plan.
- 6.3** The overall dimension of the grinding roll and bull ring segments shall be as per BHEL drawing.
- 6.4** The bullring segments shall be assembled in Check Bowl. After assembling of the segments, final gap should not be more than 20 mm. The drawing for the check Bowl and the arrangement for segment assembly on Check Bowl shall be furnished by BHEL.

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- 6.5 The number of segments i.e. Plain, Half, Quarter, Keyed & Shim for each size of the mill shall be shown on Check Bowl drg. However, additional shims/ segment to fill the gap upto 20 mm shall be supplied by the vendor which may be required at site during assembly.

7.0 GUARANTEES:

- 7.1 **Wear Life:** The minimum guaranteed wear life shall be 8000 hours, for the blended coal (Imported coal of ash content of 14% and Indian washed coal containing ash of 31.9%) having average ash content of 26.5% and may go as high as 31.9% and the coal may contain shale and sand stone with alpha quartz contamination.

Supplier shall depute his representative while conducting the mill capacity and performance test with originally installed worn out grinding elements after the guaranteed wear life during the Performance Guarantee (PG) test of mills along with BHEL team as per the customer approved PG test procedure and guarantees given there off.

Guaranteed wear life is considered to have been met with only when the mill PG test results are achieved. Typical Mill PG Test requirement is as per Annexure II.

- 7.2 The supplier shall give back to back guarantee as applicable for BHEL customer for wear life of grinding elements. The compensation imposed by the customer shall be passed on to the supplier on back to back guarantee basis.
- 7.3 Consistency in mill output to minimum 90% of the rated capacity and pulverized fuel fineness of minimum 70% through 200 mesh and 99% through 50 mesh at the end of guaranteed wear life.
- 7.4 Failure due to manufacturing defects (generally leading to breakage/ catastrophic failure of grinding elements) shall be replaced and installed immediately.

8.0 INSPECTION AT SUPPLIERS WORK

Tests and inspection are to be conducted in the presence of BHEL/ customer representatives as per approved Quality plan. The representatives shall have free access at all times while the work on the contract is being performed. The supplier shall offer all the tools and tackles required for inspection to the inspection agency.

9.0 TEST CERTIFICATE:

All the rolls shall be identified with a serial number punched. The Bull ring segments set shall be numbered by paint for each set. Supplier shall supply 3 copies of Test certificates with following information for rolls and bull ring segments.

1. BHEL order number
2. Supplier's reference and name.
3. Heat No. / Roll no.
4. Results of chemical analysis, Hardness Test and all other tests or any other tests as per approved QAP
5. Drawing no., Material Code
6. Consignment/ Identification no.



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10.0 ACCESSORIES

Wear measurement gauge for project site, and any other items/consumables required shall be supplied by the supplier at no extra charge to BHEL.

11.0 DOCUMENTS

11.1 Three Copies of test certificates are to be provided.

12.0 PACKING:

All components are to be suitably packed set wise to prevent Corrosion and damage during transit. Machined/ Ground surfaces shall be properly protected with suitable anti-corrosive compound. Each package shall be legibly marked with following information.

1. BHEL Order No.
2. Consignment/ Identification No.
3. Roll No. / Set No.
4. Drawing no., Material Code
5. Weight in Kg
6. Suppliers Name

13.0 SUPERVISION & SERVICES:

- 13.1 Personnel for supervision for Erection and commissioning shall be deputed within a period of one week from the notice given by BHEL.
- 13.2 Mill performance shall be monitored for the guaranteed period and supplier shall visit the site periodically (approximately after every 2000 hours of operation) and record the grinding elements wear life along with BHEL/ CUSTOMER.
- 13.3 Supplier shall depute his representative while conducting the mill capacity and performance test with originally installed worn out grinding elements after the guaranteed wear life during the Performance Guarantee (PG) test of mills along with BHEL team.
- 13.4 Coal quality (including rejects) shall be monitored for the guaranteed period and supplier shall visit the site periodically and record the coal quality along with BHEL/ Customer. In case BHEL is not able to visit site periodically, vendor will be given clearance to visit site on his own to monitor & record coal quality. The data so collected and visit report shall be submitted to BHEL.

14.0 TABLE FOR MATERIAL CODE

Var No.	Mill Type	Item Description	Drawing No.	Malt. Code
01	XRP-1003	Grinding roll 50"	16100090057	BA9735029014
02	XRP-1003	Bull ring segment set	26110090116	BA9735029022

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Signature



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ANNEXURE - I

TYPICAL COAL ANALYSIS (INDIAN COAL):

Parameter	Unit	Coal Analysis Data (as available)					
		Coal 1	Coal 2	Coal 3	Coal 4	Coal 5	Coal 6
Proximate Analysis (as recd)							
Moisture	%	18	14	18	16	15	15
Ash	%	46	45	38	45	45	45
Volatile Matter	%	16	20	20	19	20	19.5
Fixed Carbon	%	20	21	24	20	20	20.5
Hard Grove Index		45	47	60	50	47	42
Abrasion Index (YGP)	mg steel/ kg coal	85	80	80	80	80	80
Ash Analysis (as recd)							
Silica (SiO ₂)	%	64.86	62.4	59.79	59.54	62.5	59.6
Alumina (Al ₂ O ₃)	%	23.8	27.31	25.36	29	27.3	30.75
Iron Oxide (Fe ₂ O ₃)	%	6.52	4.96	7.2	6.42	4.9	6.5
Balance	%						

Remark: The shale and sand stone content of coal may be as high as 20% with alpha quartz contamination up to 5.0 mm size. The effect of these shale, sand stone and alpha quartz content shall be considered for wear life guarantees of Mill wear parts.

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ANNEXURE-II

TYPICAL MILLS PG TEST REQUIREMENT:

Coal Pulveriser Capacity at Rated Fineness

Performance testing shall be conducted on coal pulverisers towards establishing their guaranteed capacity meeting the specification requirement. Corrections may be applied for the variation in coal characteristics i.e.HGI & Total Moisture of test coal with respect to specified design coal.

Capacity demonstration test shall be carried out for the following conditions.

(a) The Contractor shall demonstrate capacity output on one coal pulverizer (of Employer's choice) of each Steam Generator for establishing its capacity at 100% mill loading at rated pulverized coal fineness with specified design coal with new set of grinding elements.

(b) Further, Contractor shall also demonstrate capacity output on four coal pulverizers (of Employer's choice) of each Steam Generator, not less than the 90% of guaranteed value of (a) above, at 100% mill loading with the originally, installed grinding elements in after the guaranteed wear life of grinding elements.

Capacity test as mentioned at (a) & (b) above shall be demonstrated at the following condition occurring simultaneously during testing:

Rated Pulverised coal fineness	i) Not less than 70% through 200 mesh and
	ii) Not less than 99% through 50 mesh screen
Test coal	Any available coal from the specified range

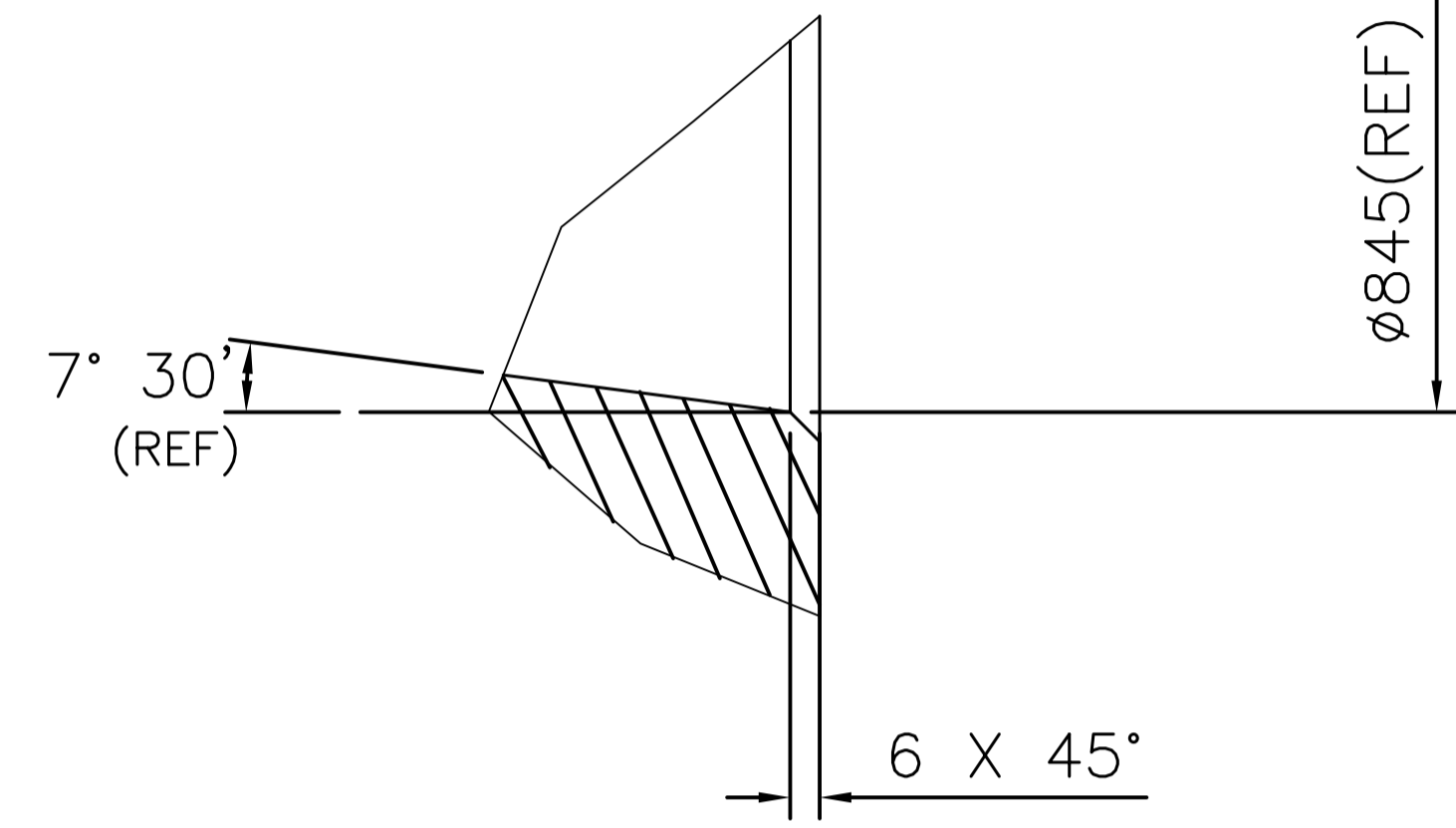
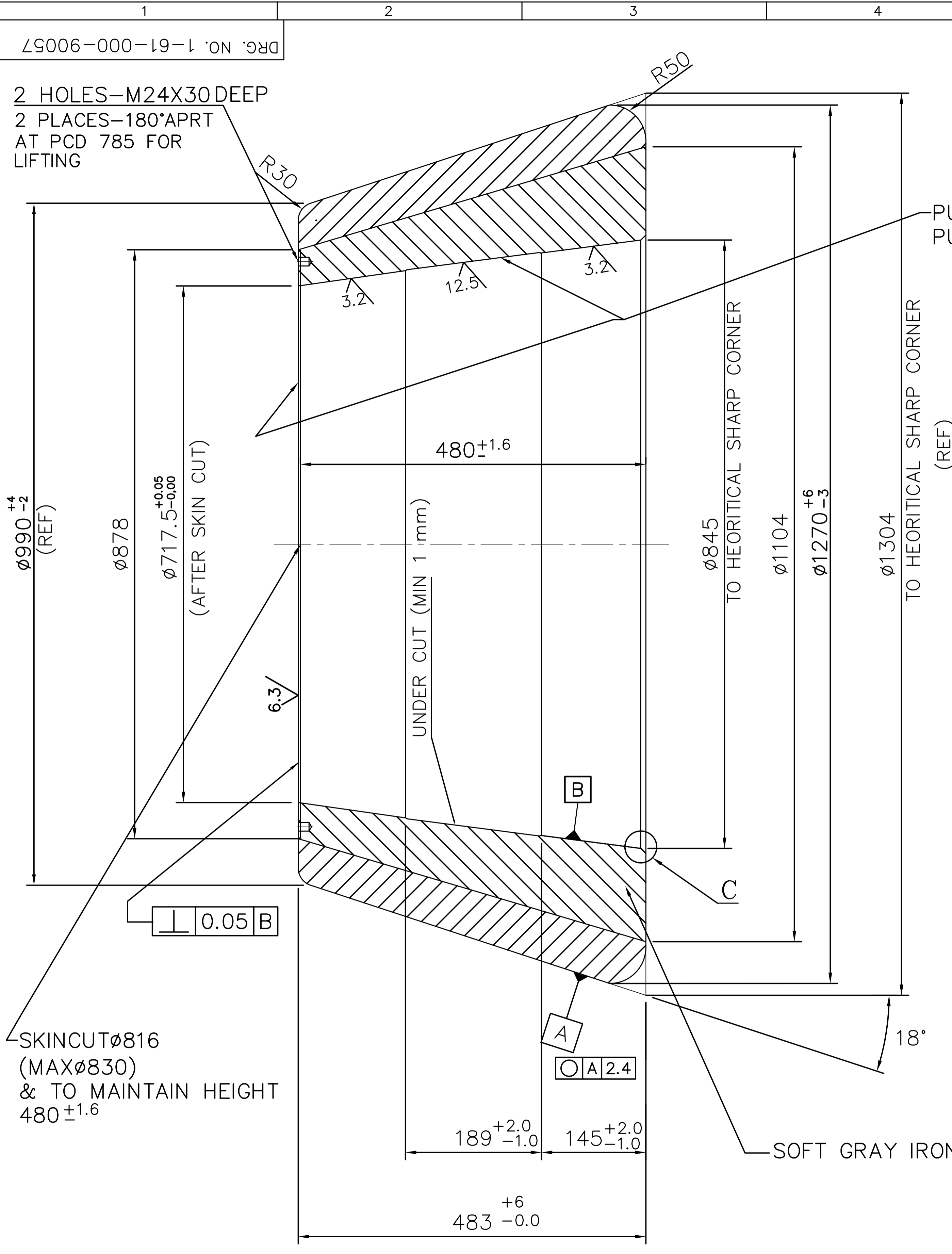
In case the Contractor successfully demonstrates the guaranteed capacity of coal pulverisers as stated above remaining coal pulverisers of corresponding steam generator will also be considered to have successfully met the above capacity guarantee requirement. However, in the event of any of the coal pulverizers not meeting the guarantee test, all the coal pulverizers of corresponding steam generator will have to be tested by the contractor to demonstrate guaranteed capacity.

During the demonstration of the mill capacity output, manufacturer's operating instructions will be followed and mill will be operated with the specified range of coals without any such readjustment that requires a shutdown of the mill or reduction of the load and / or any replacement of any mill wear parts.

For the purpose of testing to demonstrate the capacity, if HGI (grindability) and total moisture vary from those given in coal characteristics, the above pulverizer measured capacity shall be corrected using the capacity correction curves furnished by the Contractor and approved by the Employer. HGI versus coal pulverizer capacity curve shall be furnished for HGI variation upto a value above which the capacity remain constant.

[Handwritten Signature]

INVENTORY NO. 16190057.DWG
SIGN. AND DATE REF. DRG. NO. 16190057.DWG
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DETAIL-C

NOTES:

1. TOLERANCE FOR UNTOLERENCED DIM FOR CASTING AA0230402 - CLASS3
2. FOR MACHINED DIMENSION AA 0230208 MEDIUM CLASS
3. TAPER MUST BE CHECKED WITH PLATE GUAGE WITH MINIMUM 80% OF ITS CONTACT AREA. CHECKED AT 3 PLACES 120°APART.
4. FOR NIHARD, MINIMUM HARDNESS IS 550 BHN
5. MANUFACTURE AS PER CUSTOMERS / BHEL APPROVED QP.
6. COAT THE MACHINED BORE SURFACE WITH BLUE LACQUER AND REMOVE THE BLUE LACQUER BEFORE ASSY.

ITEM NO.	DESCRIPTION	DRAWING NO.	VAR. NO.	RAW MATERIAL SIZE OR CASTING DRG. NO. OR FORGING DRG. NO.	MATERIAL SPECN.	NET WT.	GROSS WT.
	INSERTS TYPE	PATTERN M-67-497	02		BA9116811011	1880.00	2180.00
	CASTING - NIHARD	PATTERN M-67-425	01		BA9116850084	1880.00	2180.00
					HY19768	1	

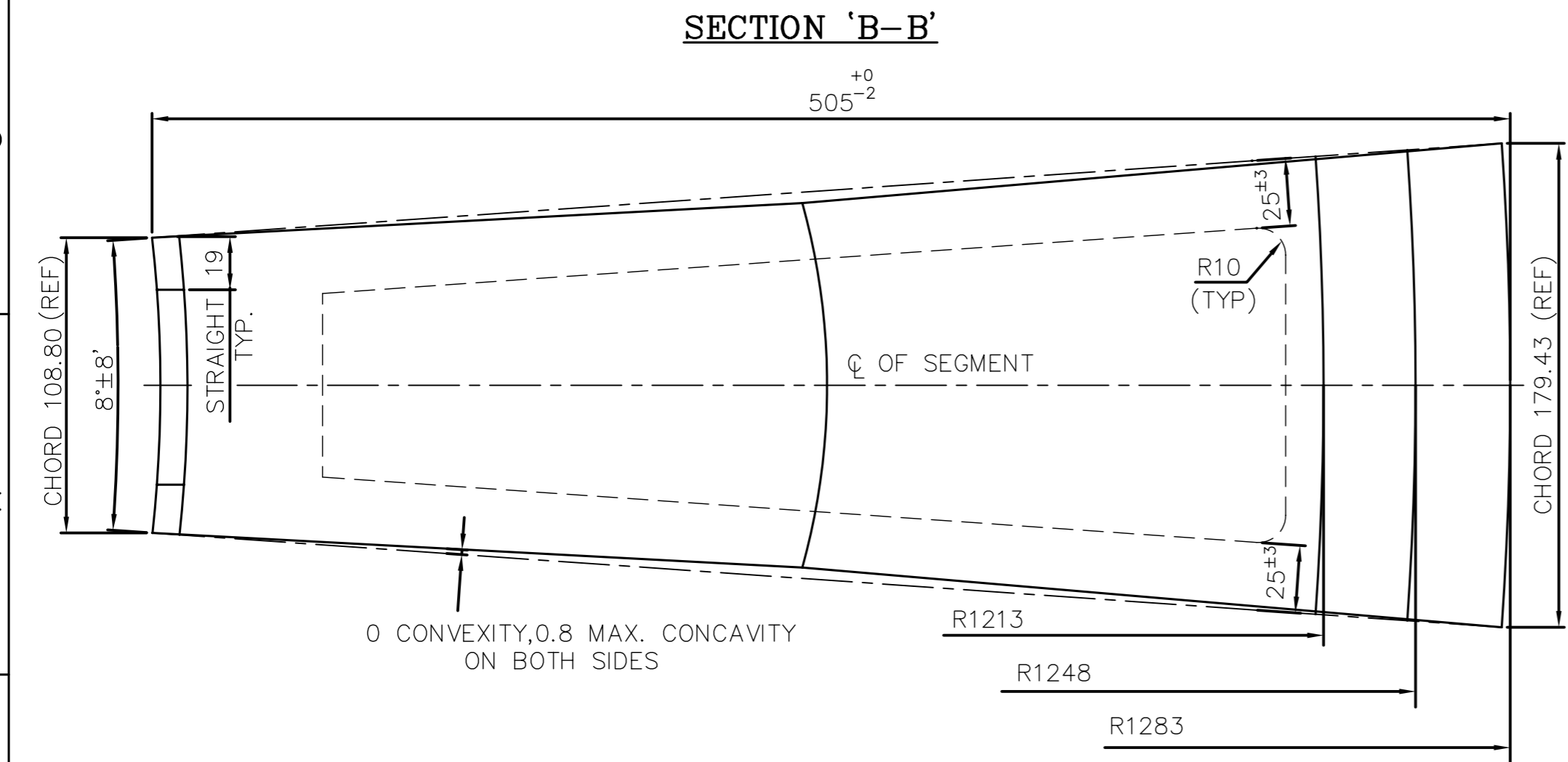
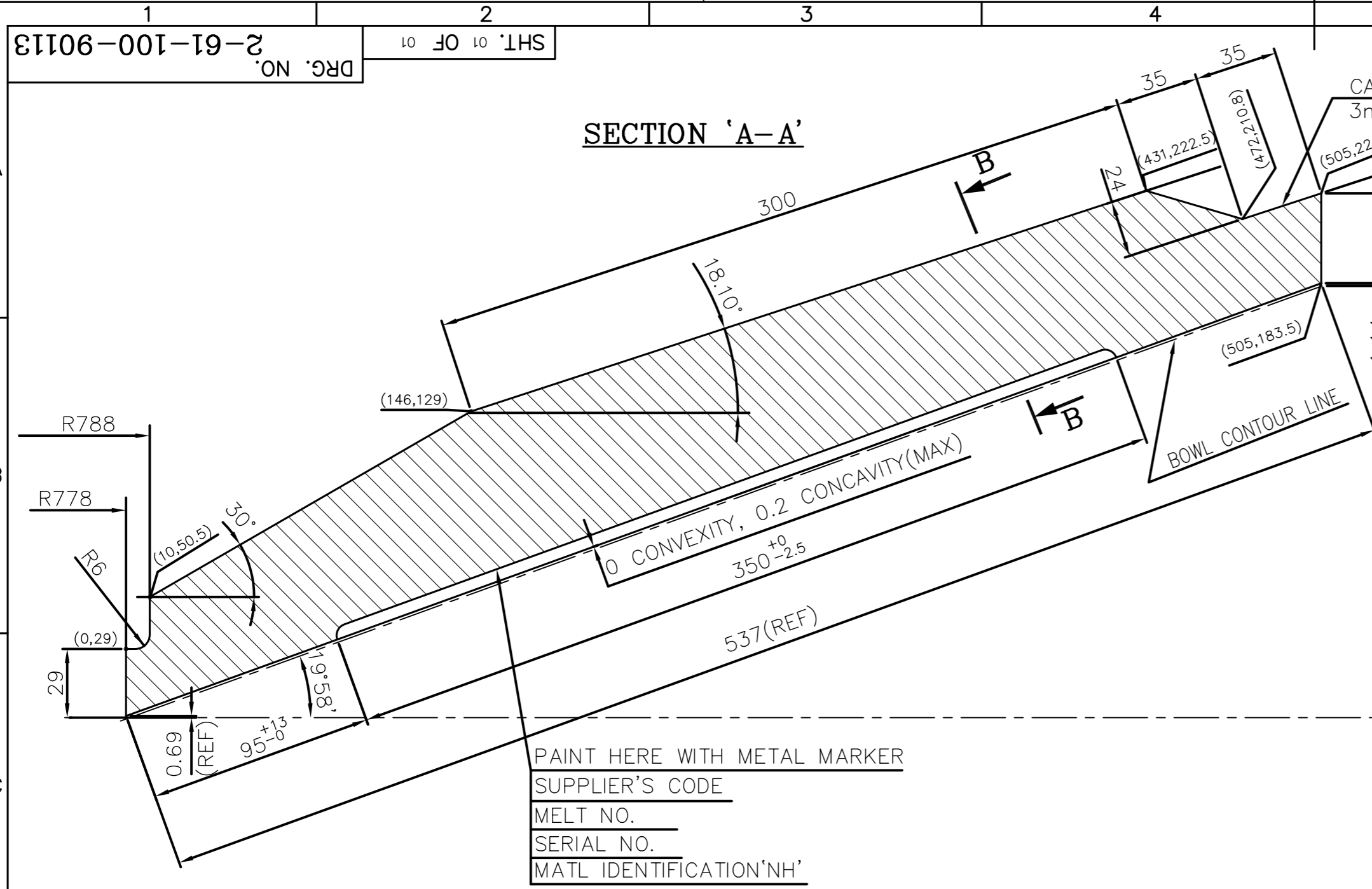
THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED.

1. REF. TO HY0230261 FOR UNSPECIFIED TOLERANCES.
2. CHAMFER M/CD. SHARP EDGES 1.2 TO 1.0 AT 45°.
3. INTERNAL M/CD. CORNER RADII 1 TO 0.7
4. THE SURFACE ROUGHNESS WHERE-EVER NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWN OUT SIDE THE BACK SLASH GIVEN OR THE TOP MOST RIGHT CORNER OF THE DRG.

TYPE OF PRODUCT		XRP 1003			
NAME OF CUSTOMER/PROJECT		BHARAT HEAVY ELECTRICALS LIMITED HYDERABAD			
DRN.	NAME	SIGN.	DATE	NO.OF VAR.	
CHD.	E.M.A.K.		15-07-02		
APPD.	S.GHATGE		15-07-02		
APPD.	RAMANNA		15-07-02		
DEPT. 446	UNTOL. DIMS. C/M/F	SCALE 1:2	WEIGHT (KG) 1880.00	REF. TO ASSY DRG.	ITEM NO. ---
CODE PULV.					NO.OF ITEMS ---
TITLE		DRAWING NO.		REV.	
GRINDING ROLL 50"		1-61-000-90057		04	
SHEET NO.		NO OF SHEETS			

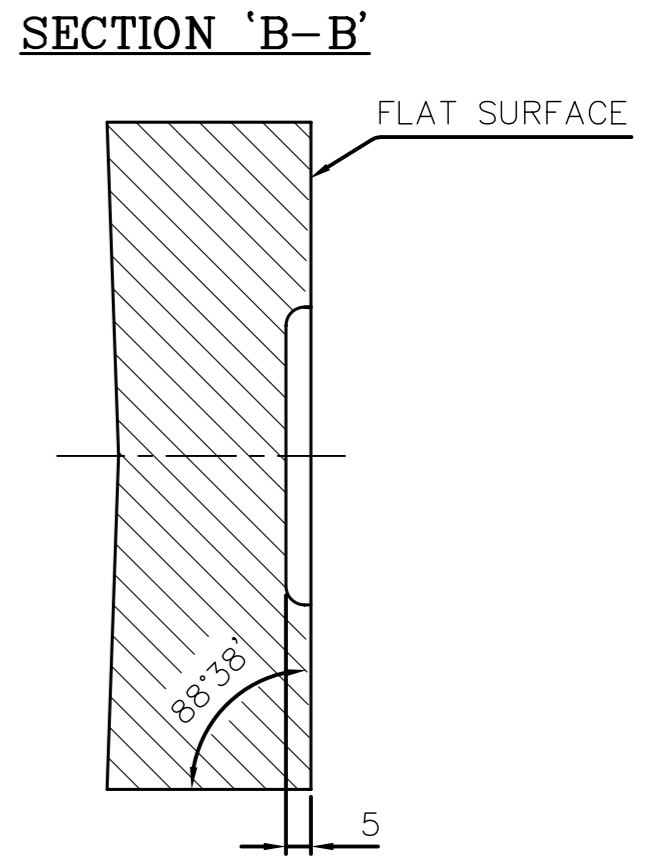
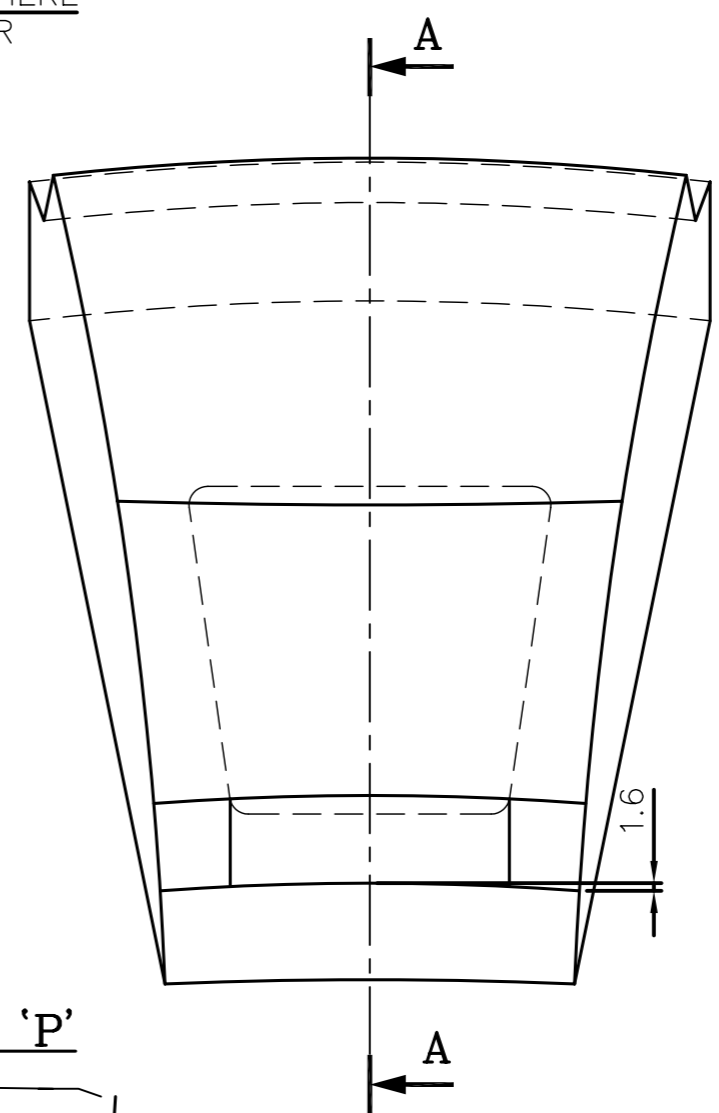
REV.	DATE	ALTERED CHD./APPD.	REV.	DATE	ALTERED CHD./APPD.	REV.	DATE	ALTERED CHD./APPD.	E.M.ASHOK
04	15-07-02								
DRG. REDRAWN									

INVENTORY NO. SIGN. AND DATE REF. DRG. NO. COMPUTER FILE NAME 261910113.DWG THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY



REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED
04	7.8.99	DRAWING REDRAWN. INCORPORATING ALL PREVIOUS REVISIONS.									

CAST PATTERN NO.433 HERE
3mm RAISED CHARACTER



NOTES: -

1. BULLRING SEGMENT PLAIN AND KEYED SHOULD BE ASSEMBLED AND MATCHED AS A SET IN THE BOWL AND NUMERED SERIALLY.
2. TOLERANCE FOR NON-TOLERANCED DIMENSIONS SHOULD BE AS PER AA0230402 DEGREE OF ACCURACY 3.
3. DURING ASSEMBLY AND MATCHING ONE NUMBER OF PLAIN SEGMENT MAY BE EITHER ADDED OR DELETED FROM THE TOTAL QUANTITY. REFER BULL RING ASSY.DRG NO.2-61-100-90116
4. BHEL PATTERN NO M-67-433

ITEM NO	DESCRIPTION	DRAWING NO.	VAR. NO.	RAW MATERIAL SIZE OR CASTING DRG.NO. OR FORGING DRG.NO.	MATERIAL SPECN.	NET WT.	GROSS WT.	QUANTITY
02	CASTING		02		BA9117053170	33.80		1
					HY 19770			
01	CASTING		01		BA9116953428	33.80		1
					HY 19769			

THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED...

1. REF.TO HY0230261 FOR UN TOLERANCES.
2. CHAMFER M/CD SHARP EDG 1.2 TO 1.0 AT 45°.
3. INTERNAL M/CD CORNER RADI 1 TO 0.7.
4. THE SURFACE ROUGHNESS WHEREVER NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWN OUT SIDE BACK SLASHES GIVEN AT THE TOP MOST RIGHT CORNER OF THE DRG.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

BHARAT HEAVY ELECTRICALS LTD. HYDERABAD

NAME	SIGN.	DATE	NO.OF VAR.
DRN.			-NA-
CHD.			
APPD.			

DEPT. PULV.ENGGR. CODE 446

UNTOL. DIMS. GR. Q/M/F

SCALE 1:2

WEIGHT (KG) 33.80

REF. TO ASSY. DRG. C-101-00276/A

ITEM NO. -NA-

NO.OF ITEMS -NA-

TITLE BULLRING SEGMENT PLAIN (DEVELOPMENT)

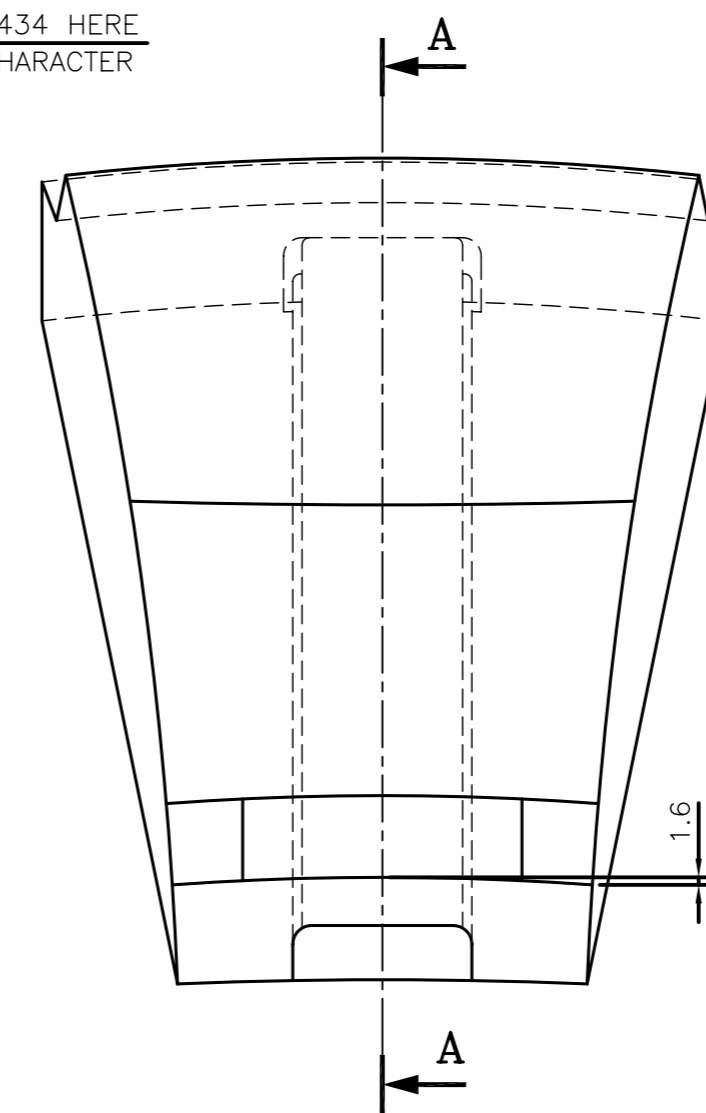
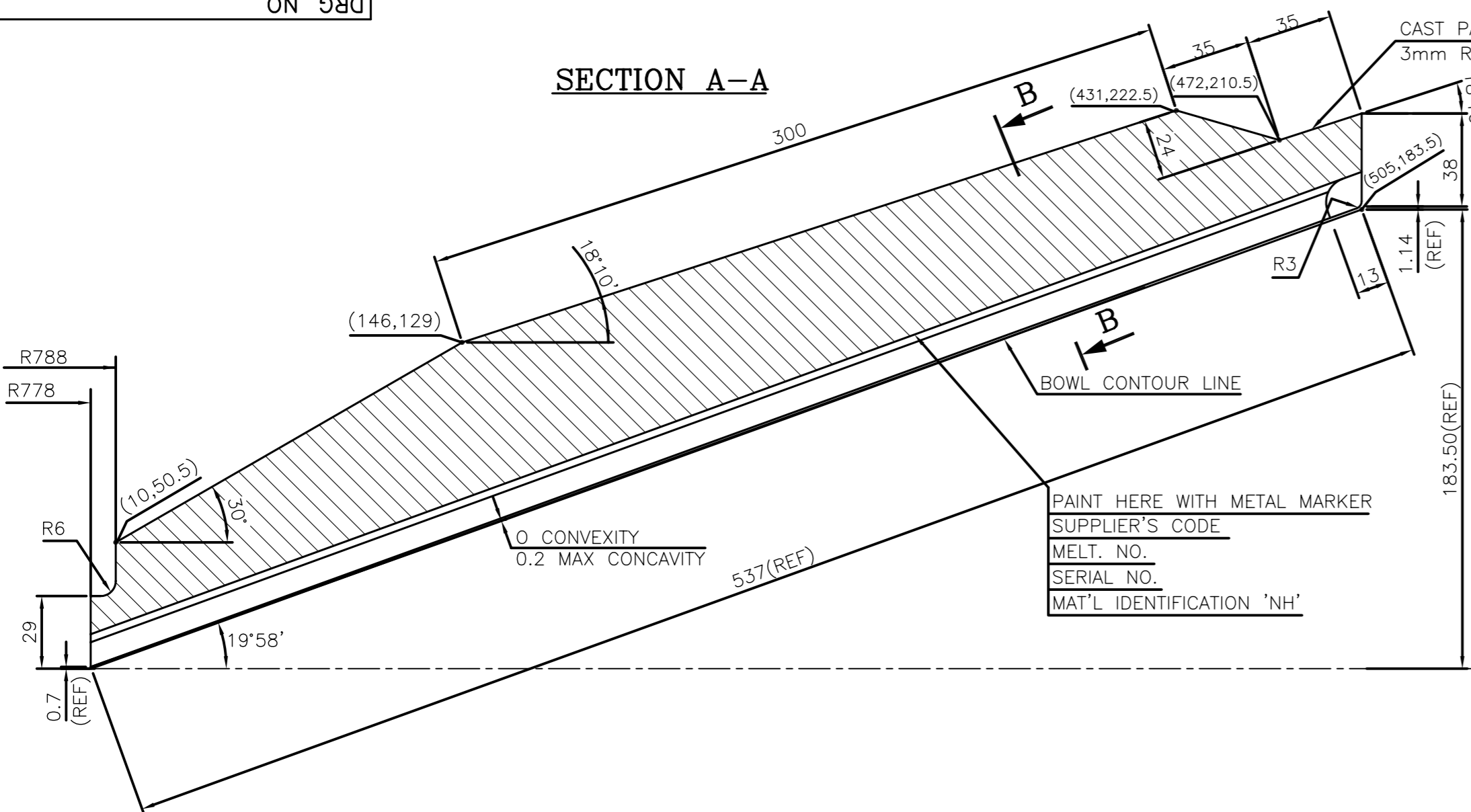
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REV. **04**

SHT. No 01 NO. OF SHT. 01

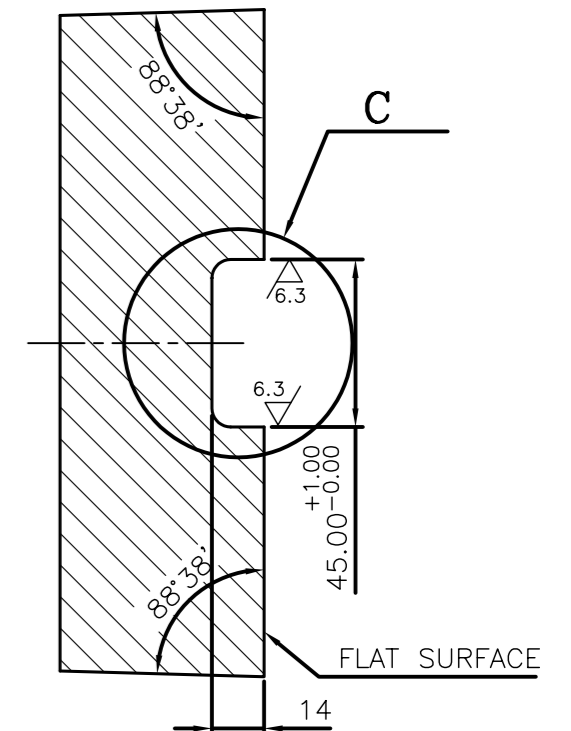
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SECTION A-A

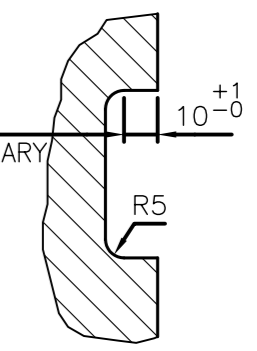


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SECTION B-B



DETAIL-C



NOTE:-

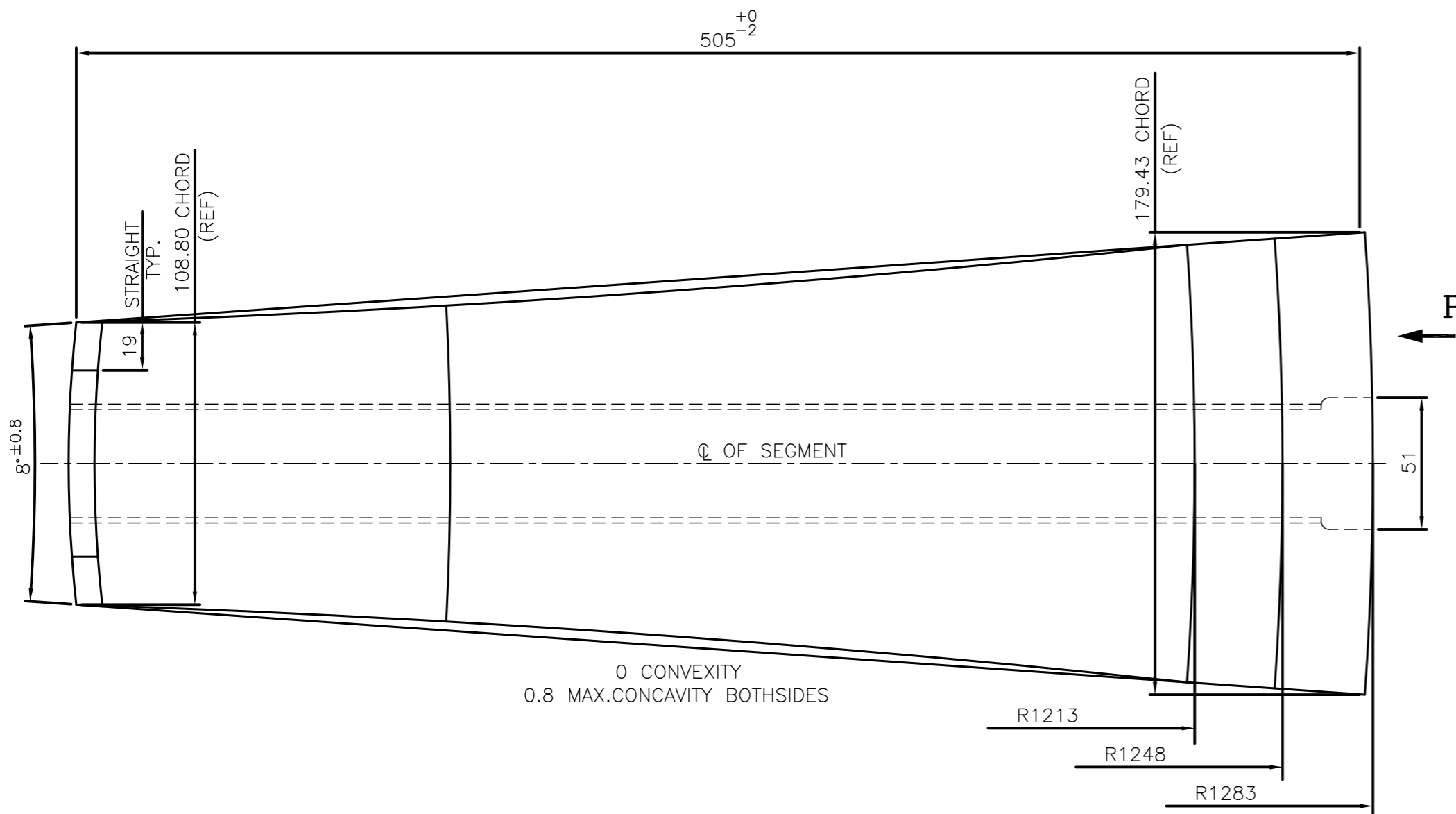
1. BULLRING SEGMENTS PLAIN, RIBBED AND KEYED SHOULD BE ASSEMBLED AND MATCHED AS A SET IN THE CHECK BOWL AND NUMBERED SERIALLY.
2. TOLERANCE FOR NON-TOLERANCED DIMENSIONS SHOULD BE AS PER AA0230402 DEGREE OF ACCURACY 3

ITEM NO	DESCRIPTION	DRAWING NO.	VAR. NO.	RAW MATERIAL SIZE OR CASTING DRG.NO. OR FORGING DRG.NO.	MATERIAL SPECN.	NET WT.	GROSS WT.	QUANTITY
02	BULL RING SEGMENT CASING		02		BA9117053288	33.00		1
					HY 19770			1
01	BULL RING SEGMENT CASING		01		BA9116953436	33.00		1
					HY 19769			1

THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED...

1. REF. TO HY0230261 FOR UN TOLERANCES.
2. CHAMFER M/CD SHARP EDG 1.2 TO 1.0 AT 45°.
3. INTERNAL M/CD CORNER RADI 1 TO 0.7.
4. THE SURFACE ROUGHNESS WHEREVER NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWN OUT SIDE BACK SLASHES GIVEN AT THE TOP MOST RIGHT CORNER OF THE DRG.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		BHARAT HEAVY ELECTRICALS LTD. HYDERABAD	
DEPT. PULV ENGG CODE 446	UNTOL. DIMS. GR. 1/2	SCALE NTS	WEIGHT (KG) 33.00
REF. TO ASSY. DRG. 2-61-196-00196	ITEM NO. -NA-	NO. OF ITEMS -NA-	
TITLE BULL RING SEGMENT KEYED (DEVELOPMENT)		DRAWING NO. 2-61-100-90114	
SHT. No 01		NO. OF SHT. 01	



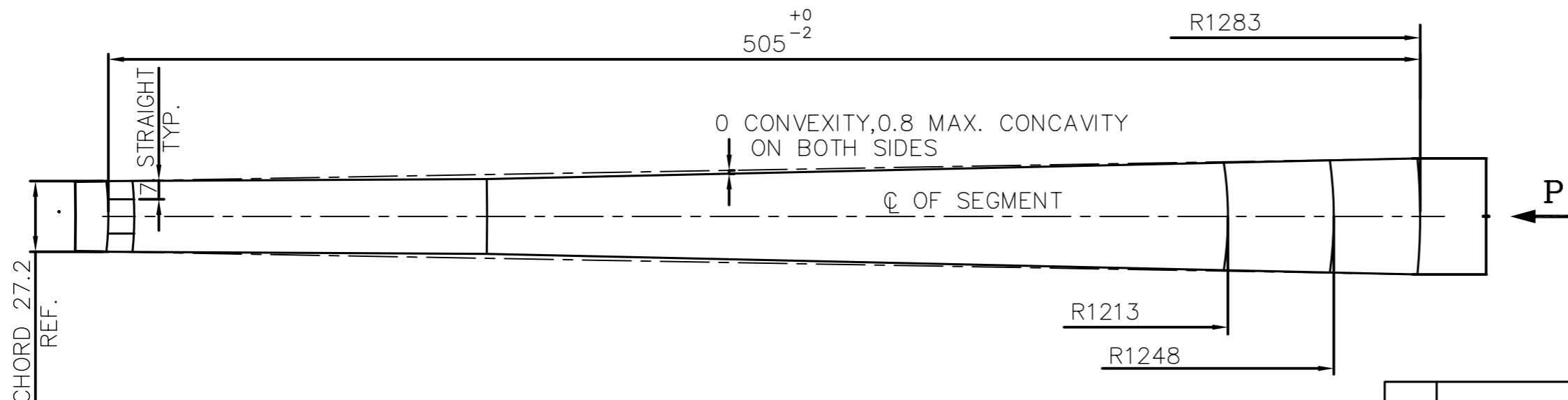
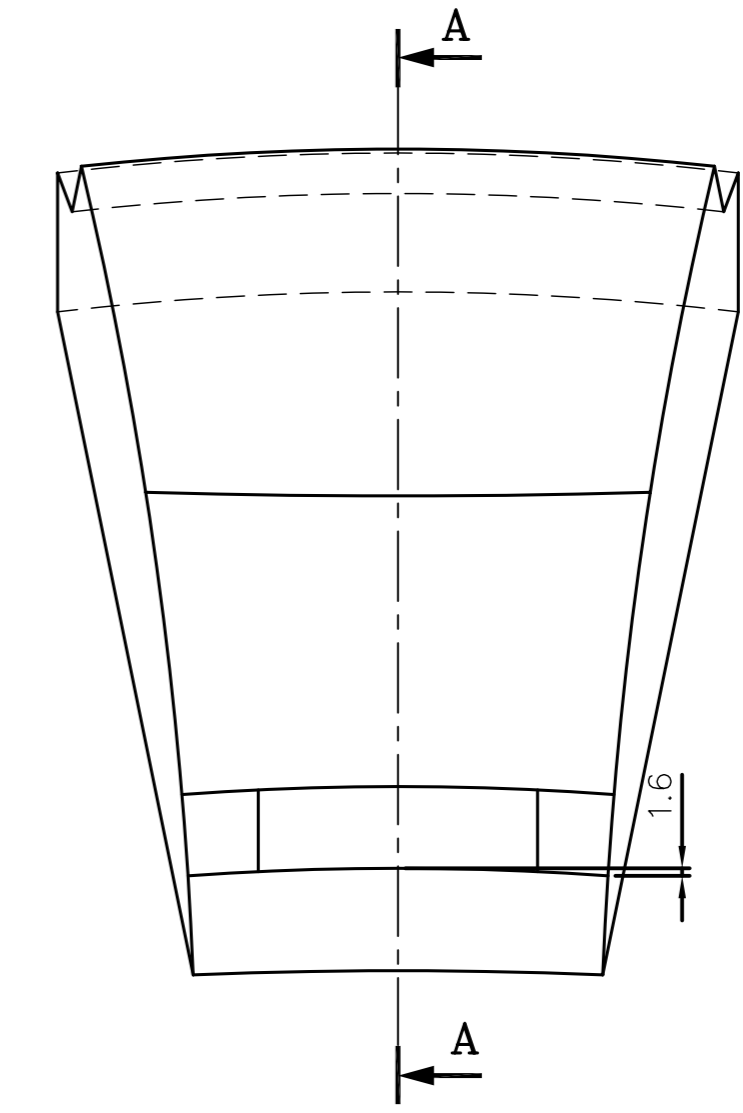
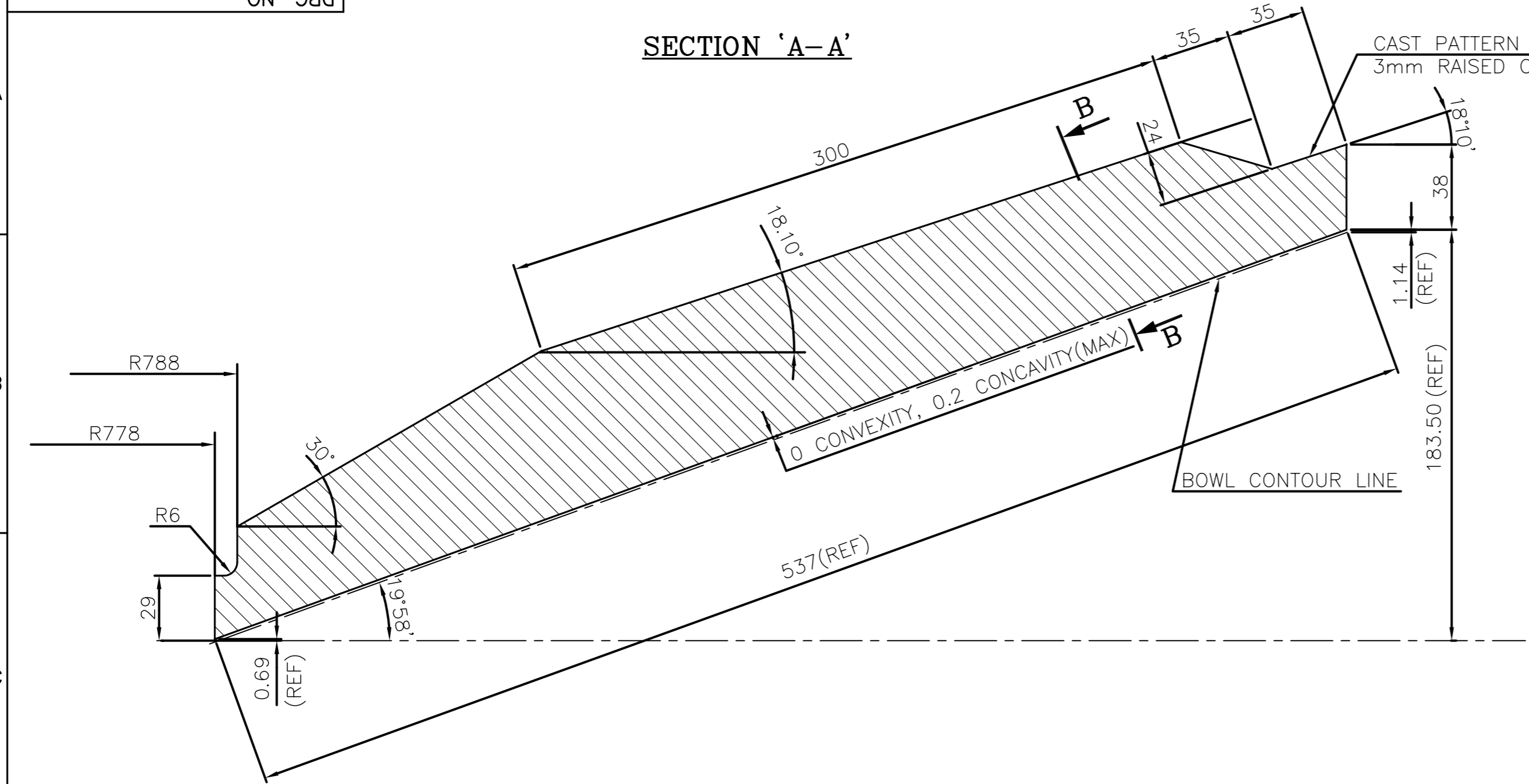
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		CHD/APPD			CHD/APPD			CHD/APPD			CHD/APPD
05	7.8.99										

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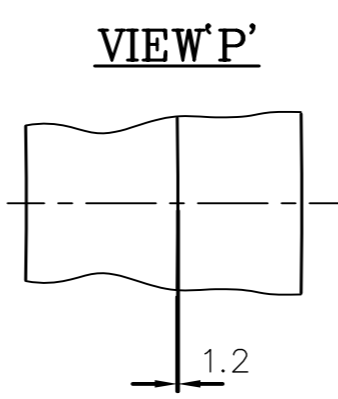
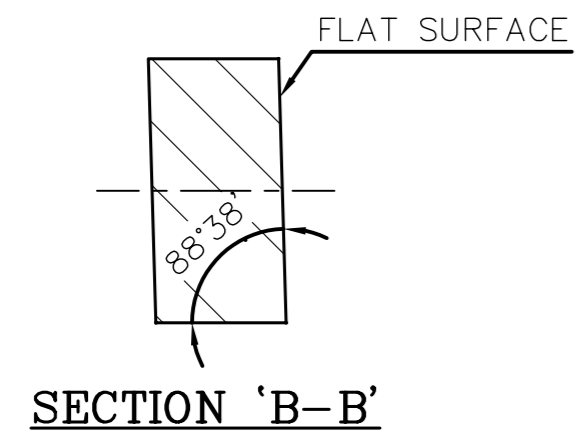
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DRG. NO. 2-61-100-90115
SHT. OF 10



NOTES: -

1. TOLERANCE FOR NON-TOLERANCED DIMENSIONS SHOULD BE AS PER AA-0230-402 DEGREE OF ACCURACY 3.
2. BHEL PATTERN NO M-67-435



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					HY 19770			
01	CASTING		01		BA9116953444	8.50		1
					HY 19769			

THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED...

1. REF. TO HY0230261 FOR UN TOLERANCES.
2. CHAMFER M/CD SHARP EDG. 1.2 TO 1.0 AT 45°.
3. INTERNAL M/CD CORNER RADI 1 TO 0.7.
4. THE SURFACE ROUGHNESS WHEREVER NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWN OUT SIDE BACK SLASHES GIVEN AT THE TOP MOST RIGHT CORNER OF THE DRG.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		BHARAT HEAVY ELECTRICALS LTD. HYDERABAD	
DEPT. PULV ENGG CODE 446	UNTOL. DIMS. GR. Ø/M/F	SCALE 1:2	WEIGHT (KG) 33.80
REF. TO ASSY. DRG. C-101-00276/4	ITEM NO. -NA-	NO. OF ITEMS -NA-	
TITLE BULL RING SEGMENT QUARTER (DEVELOPMENT)		DRAWING NO. 2-61-100-90115	REV. 02
SHT. No 01		NO. OF SHT. 01	

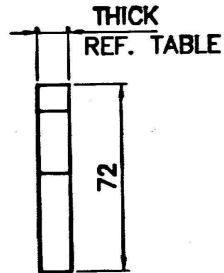
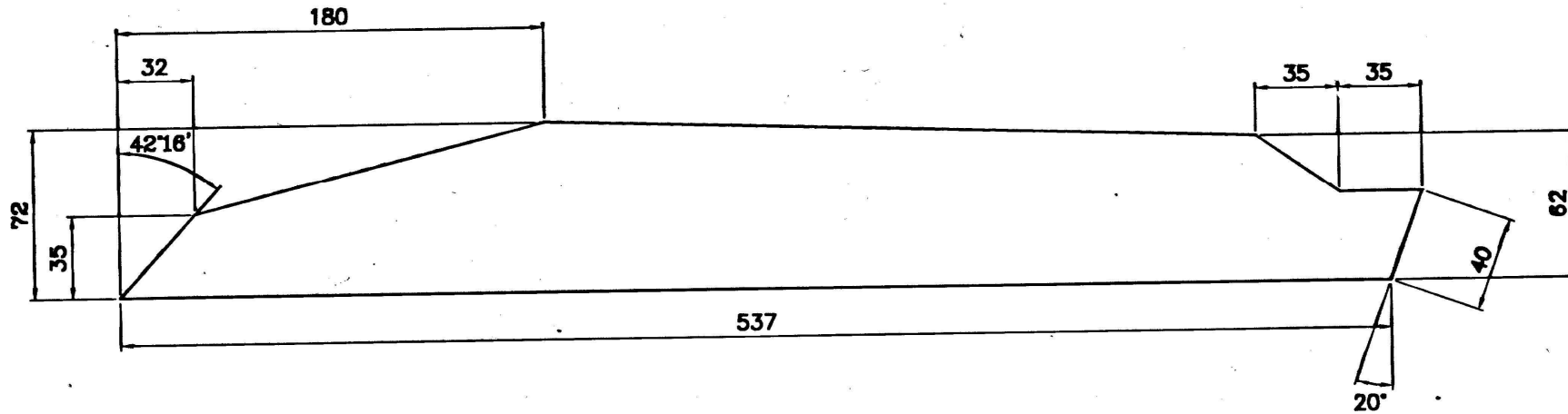
REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED
ZONE		CHD/APPD	ZONE		CHD/APPD	ZONE		CHD/APPD	ZONE		CHD/APPD

DRAWING REDRAWN. INCORPORATING ALL PREVIOUS REVISIONS.

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. 3-61-100-90151



NOTE :-

BREAK ALL SHARP EDGES AND CORNERS UNLESS OTHERWISE SPECIFIED.
SHIM SET TO BE SECURELY WRAPPED OR WIRED AND MARKED WITH VARIANT NO. & DRG. NO.

03	01	PL. 12x72x552		AA1011819090	3.18
				AA10119	2
02	01	PL. 6 x72x552		AA1011808030	1.56
				AA10108	1
01	01	PL. 3.15x72x552		AA1011711133	0.84
				AA10111	1
VAR. NO	ITEM NO	DESCRIPTION	DRAWING NO	MATERIAL CODE	UNIT WT.
				MATERIAL SPEC.	QTY.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT **1003 XRP BOWL MILL**



BHARAT HEAVY ELECTRICALS LTD. HYDERABAD

DRN.	A.C.S./PAVAN	SIGN.	R. P. Rao	DATE	25-10-96	NO. OF VAR.
CHD.	N.D. SAMUAL	SIGN.	[Signature]	DATE	25-10-96	03
APPD.	G. KISTAIAH	SIGN.	[Signature]	DATE	02-11-96	

REV.	DATE	ALTERED	CHECKED	APPD.	DEPT. PULV. ENCG	GRADE OF TOL. DIM.	SCALE	WEIGHT (KG)	REF. TO ASSY DRG.	ITEM NO.	NOLDF. ITEMS
					446	E/M/T	1:2	REFER TABLE	2-61-100-90116	03	10/05
ZONE					TITLE			CARD CODE	DRAWING NO.	REV.	
					SHIM (BULL RING ASSEMBLY)			N.A.	3-61-100-90151	00	
					SHEET NO. 01		NO OF SHEETS 01				

390151.DWG/1095 INVENTORY NO SIGN. AND DATE REF. DRG. NO. THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

