

Bharat Heavy Electricals Limited**Heavy Plates & Vessels Plant**

Visakhapatnam – 530 012

Andhra Pradesh, INDIA

PAN - AAACB4146P, GST - 37AAACB4146P7Z8



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E-mail : sunil.sahoo@bhel.indnmurthy@bhel.innd@bhel.in**INVITATION TO TENDER****Ref: OS/21-22/R&D/5619/03/003****Date: 13.04.2022****Sub: Manufacturing of CNC Machining Components for Heat Exchangers of LCA-Tejas Mk-1 Aircraft against S.O. No. 5619 at Vendor works with free issue materials**

Dear Sir,

Sealed tenders are invited for the subject job in **two-part bid** system from the **Vendors** who are experienced in execution of similar jobs **subject to the following eligibility criteria:**

- (1) Bidder must have an experience in execution of similar jobs with strict dimensional compliance i.e. CNC Machining, Milling, Turning, Drilling, Precision Pressing etc., in Defence / Aero-space for Customers like ADA, BDL, DARE, DRDO, HAL, ISRO, Defence Forces etc. during the past 7 Years as on 31.03.2022. Bidders shall enclose Work Order, Work Completion Certificate and/or other relevant documents like Inspection Reports / Delivery Challans (duly acknowledged by Customer or Authorized Inspection Agency) in support of their experience in successful execution of similar jobs.
- (2) Bidders must have requisite CNC facilities for Drilling, Milling, Pressing, Surface Grinding operations etc., for machining & processing of high precision jobs and List of Machines & Facilities available with the bidder to be enclosed with the offer.
- (3) Bidders shall have Calibrated Surface Table, Digital measuring instruments like Vernier Calipers, Height Gauges, Go - No Go Thread Gauges, Radius Gauges etc. required for inspection of finished components and list of the same is to be enclosed with the offer.
- (4) Average Annual Turnover of the bidder for the last 3 years should be Rs.50 Lakhs. Bidder shall have to enclose IT Returns, Balance Sheet, Profit & Loss Account statement and other necessary documents in support of the same.
- (5) Bidder shall also have to enclose the documents of Registration of Firm/ Certificate of Incorporation/ Factory License, Udyam Registration (if registered with MSME), PAN & GSTIN Registration.
- (6) The works executed in own name of the individual / firm of the tenderer will only be considered for eligibility criteria.

1. LOCATION OF WORK SPOT:

The subject work is to be carried out at **Vendor's Works.**

2. VENDOR'S SCOPE OF WORK:

- a) Manufacturing of Components for Heat Exchangers of LCA-Tejas Mk-1 Aircraft which involves CNC Cutting, Machining, Milling, Turning, Drilling, Precision Pressing, Grinding etc., with free issue materials as per the drawings listed in Annexure-II, applicable standards & specifications. Details of the components to be manufactured are given in the Annexure – II.
- b) All the manufactured components shall conform to the dimension/standards mentioned in respective drawings.
- c) Flatness / Tolerance (Angular/Linear/Positional) / Surface Finish to be maintained strictly as per the drawings. All sharp corners to be rounded off.
- d) The manufactured components shall be free from burrs and surface marks.
- e) Dimensions and Run outs to be ensured by tools.
- f) Tolerances indicated are non-cumulative.
- g) All the required tools to be arranged by the Vendor at their own cost.
- h) Vendors shall have to strictly follow the dimensions and tolerances mentioned in the drawings.

- i) The finished components shall be securely packed in suitable lots and are to be delivered by the vendor to DGM (R&D), BHEL-HPVP, Visakhapatnam on door delivery basis.
- j) Any modification work due to revision of drawings during manufacturing is to be carried out by the vendor without any extra cost. Though not mentioned specifically, any activity which is required for completion of the work is deemed to be included in the scope of work of vendor.

3. **TRANSPORTATION:**

Collection & Transportation of free issue raw materials from BHEL - HPVP, Visakhapatnam to Vendor's works and Transportation of Finished Items from Vendor's works to R&D Dept., BHEL – HPVP, Visakhapatnam is in Vendor's scope.

4. **BHEL's SCOPE:**

The following shall be provided by BHEL:

- a) Issue of applicable Drawings & reference Documents
- b) Free issue raw materials & Header Tools at BHEL - HPVP, Visakhapatnam
- c) Liquid Penetrant Examination & Welding, wherever required
- d) Equipment details will be engraved by BHEL
- e) Drilling of Bolt Holes w.r.t. drawing pertaining to Mounting Brackets & Fuel Cooler Bracket

5. **INSPECTION:**

Inspection shall be carried out at Vendor works by M/s BHEL - HPVP (QC) and / or by an appointed agency / Customer. Instruments required for inspection of finished components are to be arranged by the vendor along with the calibration certificates. All the documentation related to inspection such as BHEL / TPI / Customer Clearance, Generation of Inspection Reports, Preparation of Final Documents as per BHEL standard formats etc., is in the scope of vendor and soft copy as well as hard copy of the same are to be submitted to BHEL-QA.

6. **DELIVERY:**

Finished components along with relevant inspection documents and all other certificates are to be delivered Within **3 months** from the date of issue of free issue raw materials at BHEL - HPVP to DGM (R&D Dept.), BHEL-HPVP, Visakhapatnam.

Note:

- a) In case the delivery period offered by the vendor is more than the tender delivery, Price quoted by the bidder shall be loaded for the additional delivery period @0.5 % per week or part thereof for the purpose of evaluation of Bidder Status.
- b) The delivery period will be calculated from the date of issue of materials at BHEL-HPVP, Visakhapatnam to the date of receipt of finished items at R&D dept., BHEL – HPVP Visakhapatnam against respective components. Date of issue and date of receipt will be considered for computation of delivery period.
- c) Free issue materials shall be collected within 4 days from the date of intimation by R&D / Outsourcing dept. without any failure. Any delay beyond 4 days shall be considered for levy of LD.

7. **PRICE:**

The prices shall be quoted as per **Annexure – I** for the detailed scope of work mentioned in the tender document. The quoted price shall be inclusive of all applicable taxes & duties **except GST** and Income tax shall be deducted at applicable rates from the vendor's bills. GST shall be reimbursable to the vendor as per applicable guidelines.

The prices shall be fixed & firm without any escalation during the entire period of contract and till completion of the work.

8. GOODS & SERVICES TAX (GST):

Bidders shall make a note of the following points of GST before submission of their offer:

- a) Vendors registered under GST Act shall have to mention their GSTIN no. (15 Digits) in their Technical Bid. If any specific exemption is available, a declaration with due supporting documents need to be furnished for considering their offer.
- b) Semi-finished goods are to be delivered by the Vendors in BHEL, HPVP premises within a maximum period of one year from the date of issue of the material, failing which the whole transaction will be considered as Supply and Sale and GST is required to be paid along with interest (calculated @ SBI Base Rate + 6%) along with penalty, if any, from the date of Challan on the whole value of materials. Hence vendors shall have to ensure that materials issued to them are returned within 365 days.
- c) After fabrication, the vendors shall have to deliver the Semi-Finished Goods by fulfilling the following formalities:
 - i) GST invoice should be raised by the vendors by paying GST on job work charges at applicable rates and by incorporating the HPVP GSTIN no. in the invoice for availing the reimbursement of GST from HPVP.
 - ii) The vendor shall also have to enter in their GST Return -1 (GSTR-1) the details of invoice raised for payment of GST so as to enable HPVP to avail input credit.

9. REVERSE AUCTION:

BHEL shall be resorting to Reverse Auction (RA) for this tender. RA shall be conducted among the eligible techno-commercially qualified bidders. Business Rules for Reverse Auction are given at Annexure – V and Guidelines for Reverse Auction are available on our website, www.bhel.com → supplier registration → Guidelines for Reverse Auction 2021, before submission of their offer.

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

BHEL will inform bidders the details of service provider who will provide business rules, all necessary training and assistance before commencement of online bidding. The bidders participating in the Reverse Auction shall have to necessarily submit '**Process Compliance Form**' (PCF) to the designated Service Provider.

Bidders are advised to read the 'Business Rules' (Annexure – V) indicating details of RA event carefully, before reverse auction event.

10. VALIDITY OF OFFER:

The offer shall be valid for a period of **3 months** from the date of reverse auction.

11. EVALUATION, COUNTER OFFER & ORDERING:

- a) For ordering, 3 bidders shall be considered and total Quantity of each item shall be distributed to the three bidders i.e. L1, L2 & L3 in the ratio of 45:30:25 respectively.
- b) Counter offer of L1 / negotiated rates of all the items shall be given to the respective L2 and next lowest bidders of each item for acceptance. Vendors, who accept counter offer rates shall only be considered for ordering.
- c) In case the counter offered L1 / negotiated rates of the items are acceptable to only one next lowest bidder, the total quantity of each item for ordering shall be distributed among the bidders in the ratio of 60:40.
- d) It may be noted that in case any of the next lowest bidders does not accept the counter offered L1 rates, all the items shall be ordered on L1 bidder only.
- e) BHEL reserves the right to cancel any order partly or in full in case the performance of any of the vendors is not satisfactory in meeting the quality requirements or committed delivery schedules and to distribute the same quantity among the balance eligible vendors.

12. RISK PURCHASE:

In case the vendor fails to execute the work within the scheduled time or due to any other reasons, BHEL-HPVP reserves the right to get the same completed through some other vendors at the risk & cost of the vendor and any additional expenditure incurred due to the same shall be charged to the vendor's account.

13. General Terms & Conditions, **whichever applicable**, shall be as per Annexure –III enclosed.

14. GENERAL:

- a) The bidders shall study the Tender documents, Drawings, Quality Documents and all other relevant documents in detail for understanding the scope of work and the processes involved before submission of offer. Bidders shall get clarifications, if any, from concerned officials on the scope of work, clarifications related to welding or any other details of the tender document, over phone between 09:00 AM and 04:00 PM on any working day or through e-mail.
 - b) Drawings, QAP, Clarifications related to Welding, other reference documents etc., shall be sent to the bidder's e-mail address upon their written/e-mail request.
 - c) **Conditional / Partial Price Bids** and any other deviations to the tender terms & conditions are not acceptable and BHEL reserves the right to reject such offers without further correspondence. Bidders shall confirm their acceptance to all the terms & conditions of the tender enquiry in the Techno-commercial Bids and any deviations mentioned in the Price Bids shall not be considered and such offers liable for rejection.
 - d) BHEL reserves the right to modify or cancel the tender enquiry at any stage without assigning any reasons thereof.
 - e) The General Terms & Conditions, if any, contradicting with the specific terms & conditions given in the tender, then specific terms & conditions shall only be considered.
- 15.** The following documents shall form part of the tender enquiry:
- a) Schedule of Rates : Annexure - I
 - b) Details of items & applicable drawings : Annexure – II
 - c) General Terms & Conditions : Annexure - III
 - d) Acceptance to Tender terms & conditions : Annexure – IV
 - e) Business Rules for Reverse Auction : Annexure - V
 - f) GST Compliance for Indigenous Suppliers : Annexure – GST

16. TENDER SUBMISSION (through e-mail only):

Techno-commercial bids along with the tender document duly signed & stamped by the bidder on all pages and a covering letter on Company's Letter Head addressed to Sr. DGM (Outsourcing), BHEL –HPVP, Visakhapatnam shall be sent through an e-mail to the e-mail ID technicalbid-hpvp@bhel.in

Price bid (Annexure – I) shall be sent separately through e-mail to another e-mail ID pricebid-hpvp@bhel.in

Offers completed in all respects along with all the supporting documents shall be sent to the above e-mails only latest by **14.00 Hrs.** on **23.04.2022** duly mentioning the Name of Work, Tender Ref. No. & Date and Technical Bid / Price Bid in the subject of the e-mail.

Note: Don't mark CC and BCC while submitting your offer as the system is designed to reject such mails having more than one recipient. Max. file size of the attachment shall be 20 MB only. In case the file size is more, bidder can submit their offer through multiple mails within the due date and time.

Bidders shall ensure correctness of the e-mail addresses while submitting their offer. There shall be no other e-mail address at the receiving end while submission of the above bids otherwise the system will reject such mails. Bidder shall be solely responsible for non-receiving of such mails at the above mentioned e-mail addresses and no communication in this regard will be entertained.

TENDERS RECEIVED AFTER THE DUE DATE & TIME ARE NOT ACCEPTABLE.

OFFERS SENT IN ANY OTHER FORM WILL BE TREATED AS INVALID AND WILL BE SUMMARILY REJECTED.

17. TENDER OPENING:

Techno-commercial Bids will be opened at 14.00 Hrs. on 23.04.2022. The bidders may depute their representatives at the time of opening of techno-commercial bids.

After evaluation of the techno-commercial bids, intimation regarding date & procedure of conducting reverse auction shall be given by the service provider to all the eligible techno-commercially qualified bidders through an e-mail in advance at an appropriate time.

For Bharat Heavy Electricals Limited,



D. N. MURTHY
Dy. Manager (OS)
Bharat Heavy Electricals Ltd.
HPVP, Vissakhapatnam-530 012

Schedule of Rates

Tender Enquiry Ref: OS/21-22/R&D/5619/03/003 dated 13.04.2022

Sub: Manufacturing of CNC Machining Components for Heat Exchangers of LCA-Tejas Mk-1 Aircraft against S.O. No. 5619
at Vendor works with free issue materials

Sl. No.	S.O. No.	Part No.	Description of Work	Unit	Qty.	Unit Rate (Rs.)	Amount (Rs.)
			Manufacturing of CNC Machining Components for Heat Exchangers of LCA-Tejas Mk-1 Aircraft which involves CNC Cutting, Machining, Milling, Turning, Drilling, Precision Pressing, Grinding etc., with free issue raw materials as per the drawings listed in Annexure-II and as per the detailed scope of work mentioned in the tender.				
Item No. 1 - SIDE BARS							
1.1	5619	203A	RAM Air Side Bar - Wide	No.	260		
1.2		203	RAM Air Side Bar	No.	3380		
1.3		205A	Bleed Air Side Bar - Wide	No.	260		
1.4		205	Bleed Air Side Bar	No.	4940		
1.5		203	RAM Air Side Bar	No.	6720		
1.6		205	Charge Air Side Bar	No.	6510		
1.7		207	Central Side Bar	No.	3255		
1.8		203	RAM Air Side Bar	No.	4600		
1.9		205	Charge Air Side Bar	No.	4200		
1.10		207	Central Side Bar	No.	2100		
1.11		203	Hot Air Side Bar	No.	2160		
1.12		205	Cold Air Side Bar	No.	2160		
1.13		203	Cold Air Side Bar	No.	2380		
1.14		205	Hot Air Side Bar	No.	2520		
1.15		114	Spacer Bar	No.	140		
1.16		116	Return Header Middle Bar	No.	140		
1.17		203	Fuel Side Bar - Hyd	No.	560		
1.18		205	Hyd Oil Side Bar	No.	210		
1.19		207	U-Shaped Side Bar - HYD	No.	210		
1.20		303	Fuel Side Bar - IDG	No.	980		
1.21		305	IDG Oil Side Bar	No.	420		
1.22		307	U-Shaped Side Bar - IDG	No.	420		
1.23		113	Spacer Bar	No.	140		
1.24		116	Return Header Middle Bar	No.	140		
1.25		203	Fuel Side Bar - GBX	No.	980		
1.26		205	GBX Oil Side Bar	No.	560		
1.27		207	U-Shaped Side Bar - GBX	No.	560		
1.28		303	Fuel Side Bar - Hyd	No.	840		
1.29		305	Hyd Oil Side Bar	No.	350		
1.30		307	U-Shaped Side Bar - HYD	No.	350		
			Total of Item no. 1		52445		

Sub: Manufacturing of CNC Machining Components for Heat Exchangers of LCA-Tejas Mk-1 Aircraft against S.O. No. 5619 at Vendor works with free issue materials

Item No. 2 - MOUNTING BRACKETS							
2.1	5619	108	Mounting Bracket	No.	226		
2.2		108A	Mounting Bracket - 1	No.	160		
2.3		108B	Mounting Bracket - 2	No.	124		
2.4		108C	Mounting Bracket - 3	No.	160		
2.5		112	Mounting Bracket - 1	No.	224		
2.6		113	Mounting Bracket - 2	No.	112		
2.7		110	Mounting Bracket	No.	240		
2.8		105	Mounting Bracket	No.	244		
2.9		112	Bracket - Hyd Side	No.	252		
2.10		113	Bracket - IDG Side	No.	126		
2.11		111	Bracket - GBX Side	No.	252		
2.12		112	Bracket - Hyd Side	No.	252		
			Total of Item no. 2		2372		
Item No. 3 - CONNECTORS							
3.1		105	Bleed Air Inlet Connector	No.	113		
3.2		106	Bleed Air Outlet Connector	No.	113		
3.3		109 D	Charge Air Outlet Connector	No.	113		
3.4		109 C	Charge Air By-pass Connector (SS Ferrule - 40 SZ, Male)	No.	113		
3.5		109 B	Charge Air Inlet Connector (SS Ferrule - 63 SZ, Male)	No.	113		
3.6		111	FTP Air In/Out Connector (Ferrule - 25 SZ)	No.	224		
3.7		110	Charge Air In/Out Connector (Ferrule - 50 SZ)	No.	224		
3.8		111	Hot Air Outlet Connector (Ferrule - 50 SZ)	No.	112		
3.9		109	Inlet / Outlet Connector (Ferrule - 63 SZ)	No.	452		
3.10		108	Hot Air Inlet Connector (Ferrule - 63 SZ)	No.	112		
3.11		113	Cold Air Outlet Connector (Ferrule - 80 SZ)	No.	112		
3.12		103	Cold Air Inlet Connector (Ferrule - 100 SZ)	No.	112		
3.13		109	IDG Oil Inlet Connector (ISO 7320 DN 12 Connector Port Connection)	No.	126		
3.14		108	GBX Oil Inlet/Outlet Connector (ISO 7320 DN 12 Connector Port Connection)	No.	252		
3.15		110	IDG Oil Outlet Connector (ISO 7320 DN 16 Connector Port Connection)	No.	126		
3.16		108	Hyd Oil Inlet/Outlet Connector (ISO 7320 DN 20 Connector Port Connection)	No.	252		
3.17		111	Fuel In / Out Connector (ISO 7320 DN 20 Connector Port Connection)	No.	252		
3.18		109	Hyd In /Out Connector (ISO 7320 DN 20 Connector Port Connection)	No.	252		
3.19		110	Fuel In / Out Connector (ISO 7320 DN 20 Connector Port Connection)	No.	252		
			Total of Item no. 3		3425		

Tender Enquiry Ref: OS/21-22/R&D/5619/03/003 dated 13.04.2022

Sub: Manufacturing of CNC Machining Components for Heat Exchangers of LCA-Tejas Mk-1 Aircraft against S.O. No. 5619 at Vendor works with free issue materials

Item No. 4 - Headers							
4.1	5619	115	Ram Air Flange	No.	320		
4.2		123	Ram Air Flange	No.	244		
4.3		110	Charge Air Headers Partitioner	No.	160		
4.4		119	Charge Air Headers Partitioner	No.	122		
4.5		114	Water Drain Port	No.	122		
4.6		115	Pressure Tapping Port	No.	224		
4.7		116	Fadec Cold Air Tapping Port	No.	112		
4.8		110	Baffle Plate	No.	113		
4.9		122	M6 Screw with Washer and Nut	No.	464		
4.10		4085-001	Body	No.	232		
4.11		4085-002	Seat	No.	232		
4.12		4085-003	Poppet	No.	232		
4.13		4085-004	Retainer	No.	232		
4.14		4085-008	Spacer	No.	1160		
4.15		111	Water Injector	No.	229		
			Total of Item no. 4		4198		
			Total		62440		
Total Amount in Words :							

Notes:

- L1 status shall be evaluated based on the total quoted value against each Item separately and load distribution shall be as per clause no. 11 of the tender enquiry.**
- The quantity indicated above is tentative and may vary slightly subject to the requirement at the time of ordering / execution. However, payment shall be made for the actual quantity only.
- The quoted price shall be inclusive of all applicable taxes & duties **except GST** and Income tax will be deducted from Vendor's bills at applicable rates. However, GST shall be reimbursed by BHEL on submission of proof of GST payment.
- The prices shall be fixed & firm without any escalation during the entire period of contract and till completion of work.
- The bidders are advised to go through all the drawings & documents before quoting the tender.
- The evaluation currency for this tender shall be **INR**.
- Tenderer should quote the amount in figures & words. It may be noted that corrections, overwriting etc. are not allowed. If there is a discrepancy between amount in figures & words, 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. If there is an error in the total corresponding to the addition or subtraction of sub-totals, the sub-totals shall prevail and total shall be corrected accordingly.

In case of mismatch between rate and amount in figures, rate in figures shall be taken into consideration for further evaluation and processing.

Signature of the Bidder with Stamp

ANNEXURE - II**LIST OF ITEMS TO BE FABRICATED & APPLICABLE DRAWINGS**

Tender Enquiry Ref: OS/21-22/R&D/5603&5604/19/025

Date: 04.01.2022

Sub: Manufacturing of Components for Su-30 & LCA Mk-1 Heat Exchangers against S.O. No. 5603 & 5604 at Vendor works with free issue materials

Sl. No.	S.O.	Part No.	Description of Item	Drawing No. & Rev. No.	Material Size & Specn.	Total Qty. (No.)
1) SIDE BARS						
1.1	5619	203A	RAM Air Side Bar - Wide	RD-41015301-P-203A, Rev 0	5 mm thick MDN 347A Plate	260
1.2		203	RAM Air Side Bar	RD-41013905-P-203, Rev 1	5 mm thick MDN 347A Plate	3380
1.3		205A	Bleed Air Side Bar - Wide	RD-41015301-P-205A, Rev 0	5 mm thick MDN 347A Plate	260
1.4		205	Bleed Air Side Bar	RD-41015301-P-205, Rev 1	5 mm thick MDN 347A Plate	4940
1.5		203	RAM Air Side Bar	RD-41013905-P-203, Rev 1	5 mm thick MDN 347A Plate	6720
1.6		205	Charge Air Side Bar	RD-41013905-P-205, Rev 0	5 mm thick MDN 347A Plate	6510
1.7		207	Central Side Bar	RD-41013905-P-207, Rev 1	5 mm thick MDN 347A Plate	3255
1.8		203	RAM Air Side Bar	RD-41011201-P-203, Rev 1	6.35 mm thick AA3003-O Plate	4600
1.9		205	Charge Air Side Bar	RD-41011201-P-205, Rev 1	6.35 mm thick AA3003-O Plate	4200
1.10		207	Central Side Bar	RD-41011201-P-207, Rev 1	6.35 mm thick AA3003-O Plate	2100
1.11		203	Hot Air Side Bar	RD-41013909-P-203, Rev 1	6.35 mm thick AA3003-O Plate	2160
1.12		205	Cold Air Side Bar	RD-41013909-P-205, Rev 1	6.35 mm thick AA3003-O Plate	2160
1.13		203	Cold Air Side Bar	RD-41013907-P-203, Rev 0	6.35 mm thick AA3003-O Plate	2380
1.14		205	Hot Air Side Bar	RD-41013907-P-205, Rev 0	6.35 mm thick AA3003-O Plate	2520
1.15		114	Spacer Bar	RD-41013911-P-114, Rev 0	6.35 mm thick AA5086 H11X Plate	140

Sl. No.	S.O.	Part No.	Description of Item	Drawing No. & Rev. No.	Material Size & Specn.	Total Qty. (No.)
1.16	5619	116	Return Header Middle Bar	RD-41013911-P-116, Rev 2	6.35 mm thick AA5086 H11X Plate	140
1.17		203	Fuel Side Bar - Hyd	RD-41013911-P-203, Rev 0	5 mm thick AA3003-O Plate	560
1.18		205	Hyd Oil Side Bar	RD-41013911-P-205, Rev 0	5 mm thick AA3003-O Plate	210
1.19		207	U-Shaped Side Bar - HYD	RD-41013911-P-207, Rev 0	5 mm thick AA3003-O Plate	210
1.20		303	Fuel Side Bar - IDG	RD-41013911-P-303, Rev 0	5 mm thick AA3003-O Plate	980
1.21		305	IDG Oil Side Bar	RD-41013911-P-305, Rev 0	5 mm thick AA3003-O Plate	420
1.22		307	U-Shaped Side Bar - IDG	RD-41013911-P-307, Rev 0	5 mm thick AA3003-O Plate	420
1.23		113	Spacer Bar	RD-41013912-P-113, Rev 0	6.35 mm thick AA5086 H11X Plate	140
1.24		116	Return Header Middle Bar	RD-41013912-P-116, Rev 2	6.35 mm thick AA5086 H11X Plate	140
1.25		203	Fuel Side Bar - GBX	RD-41013912-P-203, Rev 0	5 mm thick AA3003-O Plate	980
1.26		205	GBX Oil Side Bar	RD-41013912-P-205, Rev 0	5 mm thick AA3003-O Plate	560
1.27		207	U-Shaped Side Bar - GBX	RD-41013912-P-207, Rev 0	5 mm thick AA3003-O Plate	560
1.28		303	Fuel Side Bar - Hyd	RD-41013912-P-303, Rev 0	5 mm thick AA3003-O Plate	840
1.29		305	Hyd Oil Side Bar	RD-41013912-P-305, Rev 0	5 mm thick AA3003-O Plate	350
1.30		307	U-Shaped Side Bar - HYD	RD-41013912-P-307, Rev 0	5 mm thick AA3003-O Plate	350
			Total (Item No. 1)			52445
2) MOUNTING BRACKETS						
2.1	5619	108	Mounting Bracket	RD-41015301-P-108, Rev 0	40 mm thick MDN 347A Plate	226
2.2		108A	Mounting Bracket - 1	RD-41013905-P-108A, Rev 3	40 mm thick MDN 347A Plate	160
2.3		108B	Mounting Bracket - 2	RD-41013905-P-108B, Rev 4	40 mm thick MDN 347A Plate	124
2.4		108C	Mounting Bracket - 3	RD-41013905-P-108C, Rev 1	40 mm thick MDN 347A Plate	160

Sl. No.	S.O.	Part No.	Description of Item	Drawing No. & Rev. No.	Material Size & Specn.	Total Qty. (No.)
2.5	5619	112	Mounting Bracket - 1	RD-41011201-P-112, Rev 4	40 mm thick AA5086 H11X Plate	224
2.6		113	Mounting Bracket - 2	RD-41011201-P-113, Rev 5	40 mm thick AA5086 H11X Plate	112
2.7		110	Mounting Bracket	RD-41013909-P-110, Rev 3	40 mm thick AA5086 H11X Plate	240
2.8		105	Mounting Bracket	RD-41013907-P-105, Rev 2	40 mm thick AA5086 H11X Plate	244
2.9		112	Bracket - Hyd Side	RD-41013911-P-112, Rev 2	40 mm thick AA5086 H11X Plate	252
2.10		113	Bracket - IDG Side	RD-41013911-P-113, Rev 3	40 mm thick AA5086 H11X Plate	126
2.11		111	Bracket - GBX Side	RD-41013912-P-111, Rev 4	40 mm thick AA5086 H11X Plate	252
2.12		112	Bracket - Hyd Side	RD-41013912-P-112, Rev 4	40 mm thick AA5086 H11X Plate	252
			Total (Item No. 2)			2372
3) CONNECTORS						
3.1	5619	105	Bleed Air Inlet Connector	RD-41015301-P-105, Rev 1	90 mm Dia MDN 347A Rod	113
3.2		106	Bleed Air Outlet Connector	RD-41015301-P-106, Rev 1	90 mm Dia MDN 347A Rod	113
3.3		109 D	Charge Air Outlet Connector	RD-41013905-P-109D, Rev 0	90 mm Dia MDN 347A Rod	113
3.4		109 C	Charge Air By-pass Connector (SS Ferrule - 40 SZ, Male)	RD-STD-F-006, Rev 2	90 mm Dia MDN 347A Rod	113
3.5		109 B	Charge Air Inlet Connector (SS Ferrule - 63 SZ, Male)	RD-STD-F-008, Rev 3	90 mm Dia MDN 347A Rod	113
3.6		111	FTP Air In/Out Connector (Ferrule - 25 SZ)	RD-STD-F-001, Rev 4	44.5 mm Dia AA5086 H11X Rod	224
3.7		110	Charge Air In/Out Connector (Ferrule - 50 SZ)	RD-STD-F-002, Rev 4	63.5 mm Dia AA5086 H11X Rod	224
3.8		111	Hot Air Outlet Connector (Ferrule - 50 SZ)		63.5 mm Dia AA5086 H11X Rod	112
3.9		109	Inlet / Outlet Connector (Ferrule - 63 SZ)	RD-STD-F-003, Rev 4	76.2 mm Dia AA5086 H11X Rod	452

Sl. No.	S.O.	Part No.	Description of Item	Drawing No. & Rev. No.	Material Size & Specn.	Total Qty. (No.)
3.10	5619	108	Hot Air Inlet Connector (Ferrule - 63 SZ)	RD-STD-F-003, Rev 4	76.2 mm Dia AA5086 H11X Rod	112
3.11		113	Cold Air Outlet Connector (Ferrule - 80 SZ)	RD-STD-F-004, Rev 4	114.3 mm Dia AA5086 H11X Rod	112
3.12		103	Cold Air Inlet Connector (Ferrule - 100 SZ)	RD-STD-F-005, Rev 4	114.3 mm Dia AA5086 H11X Rod	112
3.13		109	IDG Oil Inlet Connector (ISO 7320 DN 12 Connector Port Connection)	RD-STD-C-001, Rev 2	44.5 mm Dia AA5086 H11X Rod	126
3.14		108	GBX Oil Inlet/Outlet Connector (ISO 7320 DN 12 Connector Port Connection)		44.5 mm Dia AA5086 H11X Rod	252
3.15		110	IDG Oil Outlet Connector (ISO 7320 DN 16 Connector Port Connection)	RD-STD-C-003, Rev 2	44.5 mm Dia AA5086 H11X Rod	126
3.16		108	Hyd Oil Inlet/Outlet Connector (ISO 7320 DN 20 Connector Port Connection)	RD-STD-C-005, Rev 3	44.5 mm Dia AA5086 H11X Rod	252
3.17		111	Fuel In / Out Connector (ISO 7320 DN 20 Connector Port Connection)		44.5 mm Dia AA5086 H11X Rod	252
3.18		109	Hyd In /Out Connector (ISO 7320 DN 20 Connector Port Connection)		44.5 mm Dia AA5086 H11X Rod	252
3.19		110	Fuel In / Out Connector (ISO 7320 DN 20 Connector Port Connection)		44.5 mm Dia AA5086 H11X Rod	252
			Total (Item No. 3)			3425
4) OTHER ITEMS						
4.1	5619	115	Ram Air Flange	RD-41013905-P-115, Rev 2	40 mm thick MDN 347A Plate	320
4.2		123	Ram Air Flange	RD-41011201-P-123, Rev 1	40 mm thick AA5086 H11X Plate	244

Sl. No.	S.O.	Part No.	Description of Item	Drawing No. & Rev. No.	Material Size & Specn.	Total Qty. (No.)
4.3	5619	110	Charge Air Headers Partitioner	RD-41013905-P-110, Rev 1	40 mm thick MDN 347A Plate	160
4.4		119	Charge Air Headers Partitioner	RD-41011201-P-119, Rev 0	40 mm thick AA5086 H11X Plate	122
4.5		114	Water Drain Port	RD-41013907-P-114, Rev 3	40 mm thick AA5086 H11X Plate	122
4.6		115	Pressure Tapping Port	RD-41013907-P-115, Rev 2	44.5 mm Dia AA5086 H11X Rod	224
4.7		116	Fadec Cold Air Tapping Port	RD-41013907-P-116, Rev 0	44.5 mm Dia AA5086 H11X Rod	112
4.8		110	Baffle Plate	RD-41015301-P-110, Rev 0	1.6 mm thick MDN 347A Sheet	113
4.9		122	M6 Screw with Washer and Nut	RD-STD-PBPV-005, Rev 0	15 mm Dia MDN 321A Rod	464
4.10		4085-001	Body	A1K-I4-4085-001-000	63.5 mm Dia AA5086 H11X Rod	232
4.11		4085-002	Seat	A1K-I4-4085-002-000	44.45 mm Dia BSL 168-T6-511 Rod	232
4.12		4085-003	Poppet	A1K-I4-4085-003-000	25 mm Dia MDN 321A Rod	232
4.13		4085-004	Retainer	A1K-I4-4085-004-000	44.45 mm Dia BSL 168-T6-511 Rod	232
4.14		4085-008	Spacer	A1K-I4-4085-008-000	15 mm Dia MDN 321A Rod	1160
4.15		111	Water Injector	RD-41015701-A-100, Rev 0	15 mm Dia AA 5086 Rod	229
			Total (Item No. 4)			4198
			Grand Total			62440

GENERAL TERMS & CONDITIONS**1. TECHNICAL DELIVERY CONDITIONS:**

The work should conform to the technical data given in our drawings, GMS, Shipping List Specifications, QAP, WPS etc.

2. PARTY'S SCOPE:

The scope of the party shall be as follows: -

- a) All welding equipments, baking oven, tools, jigs and fixtures, measuring instruments duly calibrated, handling facilities, testing facilities etc.
- b) All materials other than those mentioned under "Free Issue Materials", which are required for completion of the work.
- c) All consumables such as electrodes, gases, grinding wheels etc.

Note: Electrodes of specification mentioned in the drawings / WPS and of BHEL approved brands only shall be used and MTCs of the same shall be submitted to BHEL for verification before use.

3. REVISION OF DRAWINGS:

There may be minor changes in the drawings during execution. In such a case, party should accommodate the same without any extra claim.

4. WELDING QUALIFICATION: Qualification of required number of Welders is party's responsibility at their cost.**5. X-RAY:**

All welding shall be of X-ray quality where specified on drawings. Inspection would specify the quantum of X-ray based on drawings / code requirement. Party should strictly follow the WPS and QAP issued by BHEL during welding. Getting the welds radiographed and getting them cleared by inspection is the responsibility of the party.

6. RECTIFICATIONS / REJECTIONS:

Any rectification due to defective work, if required, shall be done by the party free of charge with a suitable technology approved before hand by BHEL in writing. The cost of material, if any used for rectification work / rejection work, will be estimated by BHEL and the same shall be debited to party's account. In case any rectification / rework is to be carried out due to defective material supplied by BHEL, the replacement material and consumables will be supplied by BHEL free of Cost.

7. SECURITY DEPOSIT:

Vendors shall have to submit a Bank Guarantee for **25%** of the material cost towards Security Deposit and safe custody of free issue materials within 15 days from the date of intimation by Outsourcing dept. The BG shall be valid for the entire contract period with a claim period of 12 months. This Bank Guarantee shall be released to the contractor after completion of work and on acceptance of the same by BHEL.

Bidder agrees to submit performance security required for execution of the contract within the time period mentioned above. In case of delay in submission of performance security, enhanced performance security which would include interest (SBI rate + 6%) for the delayed period, shall be submitted by the bidder. Further, if performance security is not submitted till such time the first bill becomes due, the amount of performance security due shall be recovered as per terms defined in NIT/contract, from the bills along with due interest.

8. PERFORMANCE BANK GUARANTEE:

Vendors shall have to submit Performance Bank Guarantee (claim period of 12 months) for 10% of the order value covering for the defects liability period. If PBG is not submitted, 10% of the order value shall be deducted towards PBG from the final bill and shall be refundable after performance guarantee period, if no defects are found during this period.

9. RAW MATERIALS ISSUE:

Raw materials shall be issued with appropriate processing allowance and invisible wastage over the theoretical requirement of raw materials (**Plates, Sheets, Sections and Pipes**).

10. TRANSFER / RETURN OF LEFT OVER MATERIALS:

Party should maintain proper records for receipt & use of all free issue materials. The left over materials & scrap as per the material accounting statement shall be returned to HPVP stores along with finished job. Material Transfer Vouchers (MTV) from one order to another or from one vendor to another and Material Return Vouchers should be submitted immediately after transfer / return. The material reconciliation statement shall be submitted by the contractor after verification and certification by BHEL along with the final bill **within 30 days from the date of completion of work**. Otherwise, recovery for the balance materials shall be made from any of their pending bills without further intimation.

11. MATERIAL RECONCILIATION:

Orders issued to the vendors have to be completed in all respects including Material Accounting within a maximum of **180 days** from the **date of issue of the first material** from BHEL - HPVP stores.

Cutting & Process Allowance: Maximum of 10% on the requirement of materials (**Sheets, Plates, and Rods**) is admitted towards **cutting & process allowance and invisible wastage**.

Rejection: Maximum 5% of rejection is allowed, rejected component shall also be supplied to BHEL, failing which material cost for the rejected components shall be recovered by BHEL from vendor bills.

Milling & Machining Scrap: Quantity of scrap generated from Milling & Machining shall be as per applicable drawings. However quantity of scrap shall be approved by BHEL at the time of material reconciliation. Milling & Machining scrap like chips, burrs etc. shall not be returned to BHEL.

If rejection and scrap is beyond above limits/applicable drawing requirements, it should be fully justified with cutting diagrams etc. which are to be approved in advance by BHEL. **Otherwise, the cost of raw materials beyond approved limits will be recovered from the contractor bills as per BHEL recovery rates including applicable taxes & duties.**

Material reconciliation including return of balance materials, off-cuts is to be completed within 20 days from the date of completion of the order. The material reconciliation statement shall be submitted by the contractor after verification and certification by BHEL-HPVP along with the final bill **within 30 days from the date of completion of work**. Otherwise, recovery for the balance materials shall be made from any of their pending bills without further intimation,

Repeated occurrence of inordinate delays in returning and settling the material accounting will entail BHEL the right to terminate the contract forthwith or impose a temporary suspension on further loading at the discretion of BHEL.

12. SCRAP & OFF-CUT NORMS:

Sl. No.	Description	Scrap Size (in mm)	Off-Cut (in MM)
1.	MDN & Aluminium Sheets & Plates	Below 50 × 50	50 × 50 & above
2.	Rolled sections Rod, angles etc. (other than -tubes, pipes)	Below 50	50 & above
3.	Tubes & Pipes	Below 40	40 & above

Note: Scraps mentioned above need not be necessarily returned to BHEL, however same should be part of material reconciliation.

13. INSPECTION:

Party shall contact our Quality Control Dept. for stages of inspection before commencement of job and should strictly follow the stages of inspection as per QAP.

14. WORKMANSHIP GUARANTEE:

The vendors should give workmanship guarantee for fabricated items for a period of 18 months from the date of last delivery of the order. Any defects due to incomplete work, faulty workmanship found in the fabricated items after delivery during the defects liability period shall be rectified / replaced by the vendor free of cost. Otherwise, the expenditure incurred towards the same will be recovered from the pending bills of vendors.

15. WORK PROGRESS:

The fabricator shall furnish a weekly report on the progress of work along with the status of availability of free issue materials and requirement of further materials, if any.

Outsourcing dept. personnel will visit vendor's works from time to time to assess and review the work progress. Free access shall be provided to BHEL or its inspection agency at all reasonable times of the day / night.

In case the progress is not satisfactory or supplies are delayed abnormally beyond the contractual delivery date, BHEL-HPVP, Visakhapatnam reserves the right to cancel the order in part or full or get the balance job in as is where is condition completed elsewhere by another agency at the risk and cost of Fabricator. The value of the work carried out by the party will be assessed by BHEL and the same shall be final. No compensation will be given to the fabricator in case of cancellation of order or diversion of balance job even if the jobs have been processed partly.

16. DELIVERY:

Finished items should be handed over to BHEL-HPVP on party's delivery challans along with Job completion certificate / Final Inspection Report from inspection agency / HPVP-QC department.

17. PENALTY:

If delivery exceeds the stipulated delivery schedule, penalty 1/2 % of the total value of order per week or part there of subject to a maximum of 10% on the total value of the order will be levied. However, time taken for the following will not be considered as delay on the part of the Sub-Contractor.

- 1) Intermediate operations, if any, carried out by BHEL.
- 2) Waiting time for BHEL / Third party Inspection beyond a normal time of 3 days.

18. PAYMENT TERMS:

Payment shall be made against RA Bills within 45 days from the date of submission of Bill.

90% payment will be made after handing over of the finished equipments along with all inspection documents to HPVP shops / Logistics dept. / ADM site / Lova Garden site, duly inspected & cleared by Inspection authority. Balance 10% payment shall be made along with the Final Bill against completion of total order in all respects including documentation.

Vendors shall have to submit the bills in the formats specified by HPVP-Outsourcing and the bills submitted in the specified format along with necessary supporting documents are only admitted for processing. The following documents shall be submitted along with the Final Bill: -

1. No Claim Certificate from the contractor
2. No Dues Certificate from BHEL
3. Work Completion Certificate from BHEL
4. Material Reconciliation Statement submitted by the Contractor and certified by concerned authority of BHEL (if applicable)
5. Workmanship Guarantee certificate from the contractor

19. SECRECY:

All the documents of BHEL inclusive of Drawings, GMS and Standards made available to the fabricator should be kept in strict confidence and under no circumstance be made available to others or allow others to make use of them. Such documents shall be returned to BHEL on demand after completion of the job. This secrecy clause is binding on the employees of the fabricators also. Violation of the same may lead to suspension of business with the vendor and necessary legal action.

20. SUB-LETTING:

In general, sub-letting of jobs will not be permitted. But in special circumstances, this may be allowed. In such case, the party should obtain written approval from BHEL-HPVP, Visakhapatnam before sub-letting.

21. FACTORY RULES AND REGULATIONS:

Party shall abide by all the rules and statutory regulations in force from time to time as per factories act. It shall be party's responsibility to ensure the safety of their workmen and fulfilling the ESI, PF and other relevant statutory regulations.

22. SAFETY:

- a) Contractor shall adhere to safe construction practices, guard against hazardous & unsafe working conditions and shall comply with the safety rules of BHEL and local authorities. He shall maintain First Aid facilities for all his employees and labour. Contractor's responsibility includes supply of welder kit, all safety items such as safety belts, white and colour glasses, goggles, safety helmets, safety shoes etc.
- b) *Contractor and his employees shall follow all fire & safety, security regulations of BHEL.*

23. HOUSE KEEPING:

During execution of work, the contractor at all times keep the working place and storage area clean and free from accumulation of waste materials, rubbish etc.,

24. ACCIDENT / DAMAGE / CONDUCT ETC.:

Contractor will be held responsible for any disorderly conduct / misconduct, indiscipline, theft, smoking etc., on the part of his men. He will ensure summarily eviction of such men from his premises failing which BHEL would remove them from the factory on his responsibility. Any damage to and or loss of equipment, machinery, building etc., to BHEL or BHEL employees, visitors or other contractors resulting from his own or any of his men's negligence shall be liable to be made good by him. Contractor shall be solely responsible for any accident in which you or your men or your equipment may be involved during the execution of contract on account of any reason what so ever.

25. TERMINATION OF CONTRACT:

In the event of any failure on the part of the contractor, BHEL reserves the right to terminate the contract by giving a notice of 2 weeks for any of the following lapses and contractual violations: -

- a) Failure to make labour payments in time as per the rules
- b) Failure to progress the job according to the agreed schedule
- c) Failure to mobilize adequate man power, tools & tackles and consumables in time
- d) Failure to adhere to Quality Standards of BHEL
- e) Refused to co-operate with other agencies working in the same area
- f) Failure to resolve labour disputes like strikes etc., within 7 days of occurrence
- g) Failure to comply with statutory regulations applicable at BHEL

BHEL shall also be free to intervene and take necessary remedial measures. All costs incurred with interest and overheads shall be recovered from contractor by such foreclosing or off-loading any part of the contract work.

26. DISPUTES:

Head of BHEL- HPVP Unit will be the final authority for any disputes arising out of this contract. The disputes / arbitration / settlement of contractual or legal issues shall be under the Jurisdiction of Visakhapatnam Court.

- 27.** For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017 & 28.05.2018 and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of Contract / PO / WO against this NIT.

In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and / or local content in respect of this procurement, same shall be applicable.

- 28.** 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.

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

Signature of the Bidder with Stamp

Acceptance to Tender Terms & Conditions

I / We hereby confirm that the Tender documents, Drawings, Quality documents etc. have been studied in detail and we have fully understood the scope of work.

I / We accept to all the Terms and Conditions of the Tender Enquiry and the prices quoted are in accordance with the same.

I / We give our acceptance to participate in reverse auction for this tender.

Tender documents duly signed on all the pages by the Owner / authorized representative of the bidder are attached herewith.

Signature of the Bidder with Stamp

BUSINESS RULES FOR REVERSE AUCTION (RA)

This has reference to tender no. **OS/21-22/R&D/5619/03/003, dated 13.04.2022**. BHEL shall finalize the Rates for **Manufacturing of CNC Machining Components for Heat Exchangers of LCA-Tejas Mk-1 Aircraft against S.O. No. 5619 at Vendor works with free issue materials** through Reverse Auction mode. BHEL has made arrangement with an authorized Service provider (details will be shared before reverse auction) for conducting RA. Bidders should go through the instructions given below and submit acceptance of the same.

The technical & commercial terms are as per (a) BHEL Tender Enquiry No. **OS/21-22/R&D/5619/03/003, dated 13.04.2022**, (b) Bidders' technical & commercial bid (in case of two-part bid) and (c) subsequent correspondences between BHEL and the bidders, if any.

1. Procedure of Reverse Auctioning:

- i) Price bids of all techno-commercially qualified bidders shall be opened.
- ii) **Reverse Auction:** The 'bid decrement' will be decided by BHEL.
- iii) The lowest bidder in sealed envelope price bid shall be shown as current L1 automatically by the system and no acceptance of that price is required. System shall have the provision to indicate this bid as current L1.
- iv) Bidders by offering a minimum bid decrement or the multiples thereof can displace a standing lowest bid and become "L1" and this continues as an iterative process. However, no bidder shall be allowed to lower its bid below the current L1 by more than 5 decrements at one go.
- v) After the completion of the reverse auction, the Closing Price shall be available for further processing.
- vi) **Wherever the evaluation is done on total cost basis, after Reverse Auction, prices of individual line items shall be reduced on pro-rata basis.**

2. Schedule for reverse auction: The Reverse Auction schedule will be intimated to all the eligible techno-commercially qualified bidders at a later stage.**3. Auction extension time:** If a bidder places a bid in the last 5 minutes of closing of the Reverse Auction and if that bid gets accepted, then the auction's duration shall get extended automatically for another 5 minutes, for the entire auction (i.e. for all the items in the auction), from the time that bid comes in. Please note that the auto-extension will take place only if a bid comes in those last 5 minutes and if that bid gets accepted as the lowest bid. If the bid does not get accepted as the lowest bid, the auto-extension will not take place even if that bid might have come in the last 5 minutes. In case, there is no bid in the last 5 minutes of closing of Reverse Auction, the auction shall get closed automatically without any extension. However, bidders are advised not to wait till the last minute or last few seconds to enter their bid during the auto-extension period to avoid complications related with internet connectivity, network problems, system crash down, power failure, etc.

The above process will continue till completion of Reverse Auction.

Complaints/ Grievances, if any, regarding denial of service or any related issue should be given in writing thru e-mail/ fax to M/s. {Service provider} with a copy to BHEL within 15 minutes prior to initial closing time of Reverse Auction.

4. Bid price: The Bidder has to quote the {.....} Price **except GST** but inclusive of Packing & Forwarding charges, all the routine & type tests as per tender scope, taxes, duties, freight and insurance as specified in tender document including loading (if indicated by BHEL due to deviations in technical/ commercial terms) for the Items specified. Details are as shown in Excel Sheet for calculation of total cost to BHEL (To be specified by Unit as per NIT conditions).**5. Bidding currency and unit of measurement:** Bidding will be conducted in **Indian Rupees per Unit** of the material as per the specifications mentioned in the tender.

In case of foreign currency bids, exchange rate (TT selling rate of State Bank of India) as on scheduled date of tender opening (Part-I bid) shall be considered for conversion in Indian Rupees. If the relevant day happens to be a Bank holiday, then the forex rate as on the previous bank (SBI) working day shall be taken.

6. **Validity of bids:** Price shall be valid for **3 months from the date of reverse auction**. These shall not be subjected to any change whatsoever.
7. **Lowest bid of a bidder:** In case the bidder submits more than one bid, the lowest bid at the end of Reverse Auction will be considered as the bidder's final offer to execute the work.
8. Unique user IDs shall be used by bidders during bidding process. All bids made from the Login ID given to the bidders will be deemed to have been made by the bidders/ bidders' company.
9. **Post auction procedure:** BHEL will proceed with the Lowest Bid in the Reverse Auction for further processing.
10. Any commercial/ technical loading shall be separately intimated to respective bidders prior to RA. The excel sheet provided in this regard shall cover all these aspects. Commercial/ technical loading if any, shall be added by the respective bidder in its price during Reverse Auction.
Modalities of loading & de-loading shall be separately intimated to the bidders. The responsibility for correctness of total cost to BHEL shall lie with the bidders.
11. Reverse auction shall be conducted by BHEL (through M/s {Service Provider}), on pre-specified date, while the bidders shall be quoting from their own offices/ place of their choice. Internet connectivity shall have to be ensured by bidders themselves.

During the RA process if a bidder is not able to bid and requests for extension of time by FAX/ email/ phone then time extension of additional 15 minutes will be given by the service provider provided such requests come before 5 minutes of auction closing time. However, only one such request per bidder can be entertained.

In order to ward-off contingent situation of connectivity failure bidders are requested to make all the necessary arrangements/ alternatives whatever required so that they are able to circumvent such situation and still be able to participate in the reverse auction successfully. Failure of power or loss of connectivity at the premises of bidders during the Reverse auction cannot be the cause for not participating in the reverse auction. On account of this, the time for the auction cannot be extended and neither BHEL nor M/s. {Service provider} is responsible for such eventualities.

12. **Proxy bids:** Proxy bidding feature is a pro-bidder feature to safe guard the bidder's interest of any internet failure or to avoid last minute rush. The proxy feature allows bidders to place an automated bid in the system directly in an auction and bid without having to enter a new amount each time a competing bidder submits a new offer. The bid amount that a bidder enters is the minimum that the bidder is willing to offer. Here the software bids on behalf of the bidder. This obviates the need for the bidder participating in the bidding process until the proxy bid amount is decrementally reached by other bidders. When proxy bid amount is reached, the bidder (who has submitted the proxy bid) has an option to start participating in the bidding process.

The proxy amount is the minimum amount that the bidder is willing to offer. During the course of bidding, the bidder cannot delete or change the amount of a proxy bid.

Bids are submitted in decrements (decreasing bid amounts). The application automates proxy bidding by processing proxy bids automatically, according to the decrement that the auction originator originally established when creating the auction, submitting offers to the next bid decrement each time a competing bidder bids, regardless of the fact whether the competing bids are submitted as proxy or standard bids. However, it may please be noted that if a manual bid and proxy bid are submitted at the same instant manual bid will be recognized as the L1 at that instant.

In case of more than one proxy bid, the system shall bid till it crosses the threshold value of 'each lowest proxy bid' and thereafter allow the competition to decide the final L1 price.

Proxy bids are fed into the system directly by the respective bidders. As such this information is privy only to the respective bidder(s).

13. Bidders are advised to get fully trained and clear all their doubts such as refreshing of Screen, quantity being auctioned, tender value being auctioned etc. from M/s. {Service provider}.

14. M/s. {Service provider}, shall arrange to demonstrate/ train the bidder or bidder's nominated person(s), without any cost to bidders. M/s. {Service provider}, shall also explain the bidders, all the business rules related to the Reverse Auction. Bidders are required to submit their acceptance to the terms/ conditions/ modalities before participating in the Reverse Auction in the process compliance form as enclosed. Without this, the bidder will not be eligible to participate in the event.
15. Successful bidder shall be required to submit the final prices (L1) in prescribed format (Annexure – VI) for price breakup, quoted during the Reverse Auction, duly signed and stamped as token of acceptance without any new condition (other than those already agreed to before start of auction), after the completion of auction to M/s. {Service provider} besides BHEL within two working days of Auction without fail.
16. Any variation between the final bid value and that in the confirmatory signed price breakup document will be considered as tampering the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings (as available on www.bhel.com).
17. Bidders' bid will be taken as an offer to execute the work/ supplies the item as per enquiry no. **OS/21-22/R&D/5619/03/003, dated 13.04.2022**. Bids once made by the bidder, cannot be cancelled/ withdrawn and bidder shall be bound to execute the work as mentioned above at bidder's final bid price. Should bidder back out and not execute the contract as per the rates quoted, BHEL shall take action as per extant guidelines for suspension of business dealings (as available on www.bhel.com).
18. Bidders shall be able to view the following on their screen along with the necessary fields during Reverse Auction:
 - a. Leading (Running Lowest) Bid in the Auction (only total price of package)
 - b. Bid Placed by the bidder
 - c. Start Price
 - d. Decrement value
 - e. Rank of their own bid during bidding as well as at the close of auction.
19. BHEL's decision on award of contract shall be final and binding on all the Bidders.
20. BHEL reserves the right to extend, reschedule or cancel the Reverse Auction process at any time, before ordering, without assigning any reason, with intimation to bidders.
21. BHEL shall not have any liability to bidders for any interruption or delay in access to the site irrespective of the cause. In such cases, the decision of BHEL shall be binding on the bidders.
22. Other terms and conditions shall be as per bidder's techno-commercial offers and other correspondences, if any, till date.
23. If there is any clash between this business document and the FAQ available, if any, in the website of M/s. {Service provider}, the terms & conditions given in this business document will supersede the information contained in the FAQs. Any changes made by BHEL/ service provider (due to unforeseen contingencies) after the first posting shall be deemed to have been accepted if the bidder continues to access the portal after that time.
24. Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action *as per extant BHEL guidelines for suspension of business dealings (as available on www.bhel.com)*, shall be initiated by BHEL.

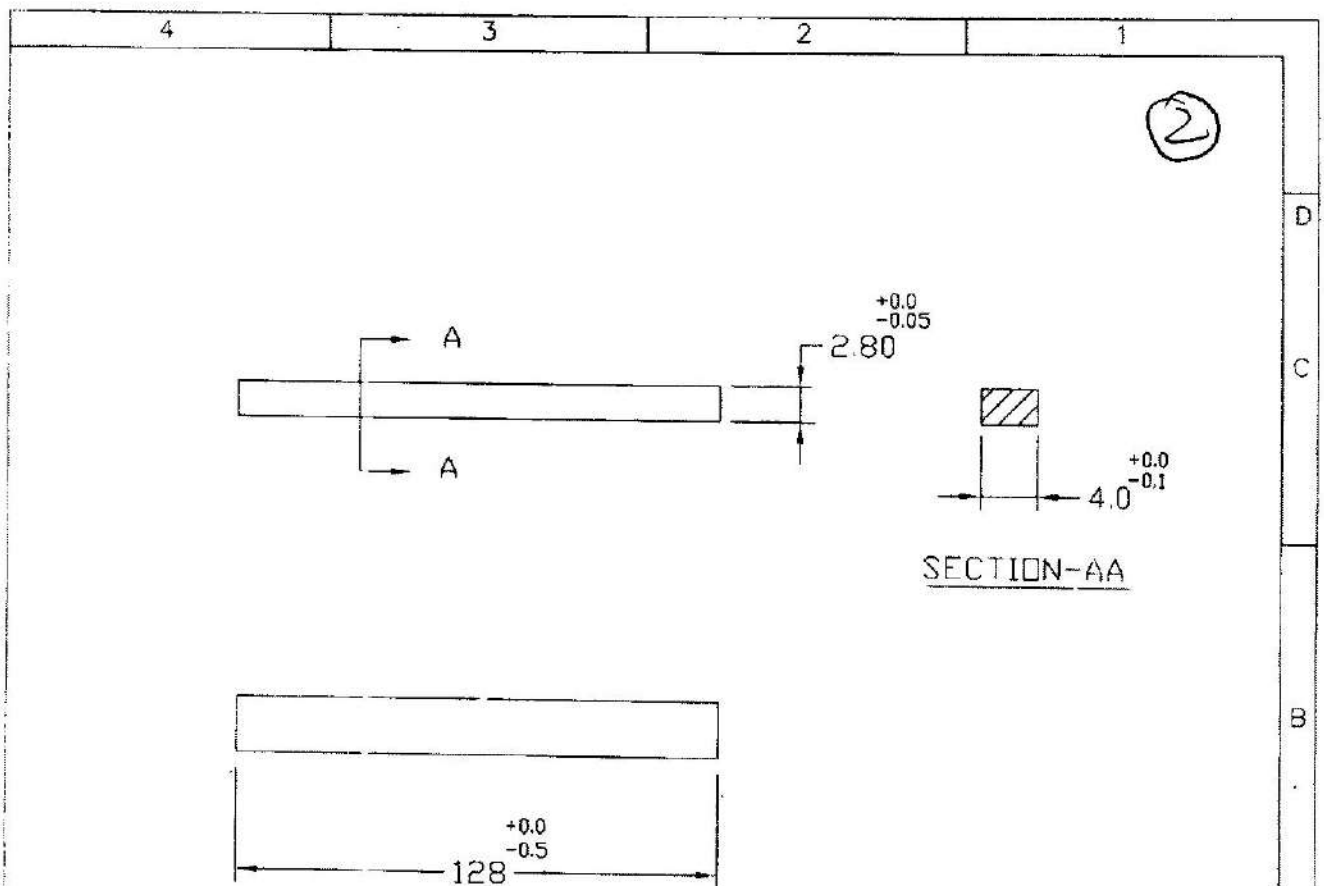
Signature of the Bidder with Stamp

PROCEDURE FOR GST PAYMENT

1. In Response to Tenders for Indigenous supplier will be entertained only if the vendor has a valid GSTIN which should be clearly mentioned in the offer. If any specific exemption is available, a declaration with due supporting documents need to be furnished for considering the offer.
2. Supplier shall mention their GSTIN in all their invoices and invoices shall be in the format as specified/prescribed under GST laws. Invoices shall necessarily contain Invoice number (in case of multiple numbering system is being followed for billing like SAP invoice no, commercial invoice no etc., then the Invoice No which is linked/uploaded in GSTN network shall be clearly indicated), item description as per PO, Quantity, Rate, Value, applicable taxes with nomenclature (like IGST, SGST, CGST & UTGST) separately, HSN/ SAC Code, etc.
3. All invoices shall bear the HSN Code for each item separately (Harmonized System of Nomenclature)/ SAC code (Services Accounting Code).
4. A declaration to the effect that all invoice particulars are/were uploaded in the GSTN network/ portal & all tax liability as per GST rules and regulations have been and will be discharged, shall be mentioned in the invoice. If not mentioned in the invoice, a separate declaration shall be submitted as per the requirement of BHEL.
5. All documents like Test Certificate, LR copy, Guarantee/Warranty certificate, work completion certificate, any other document mentioned in PO, shall be sent along with the vehicle/consignment where ever applicable. For all consignments received within the calendar month, input credit will be availed within that month in line with monthly returns filing cycle. In case of any discrepancy in the document or non-submission of documents mentioned in the PO, then BHEL will not be able to accept or account the material, in such case availing of tax credit will be deferred to next month or so.
6. In case of discrepancy in the data uploaded by supplier in the GSTN portal or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note (details to be uploaded in GSTN portal) for the shortages or rejections in the suppliers, within the calendar month notified by BHEL.
7. For any such delay in availing of tax credit for reasons attributable to supplier (as mentioned above), interest (calculated @ SBI Base Rate + 6%) along with penalty if any will be deducted for the delayed period i.e. from the month of receipt till the month tax credit is availed, from the running bills.
8. Under GST regime, BHEL has to discharge GST liability on LD recovered from suppliers/contractors. Hence applicable GST shall also be recoverable from suppliers/contractors on LD amount. For this Debit note will be issued by BHEL indicating the respective supply invoice number.
9. This is to inform that GST portion of invoice, shall be released only upon 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. Alternatively, BG of appropriate value may be obtained from vendor which shall be valid At least one month after the confirmation of date of payment of GST by vendor on GSTN portal and receipt of Tax invoice and receipt of goods, whichever is later. 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.
10. That 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.

Note : The above will be followed strictly for processing vendor payments to ensure GST Compliance.

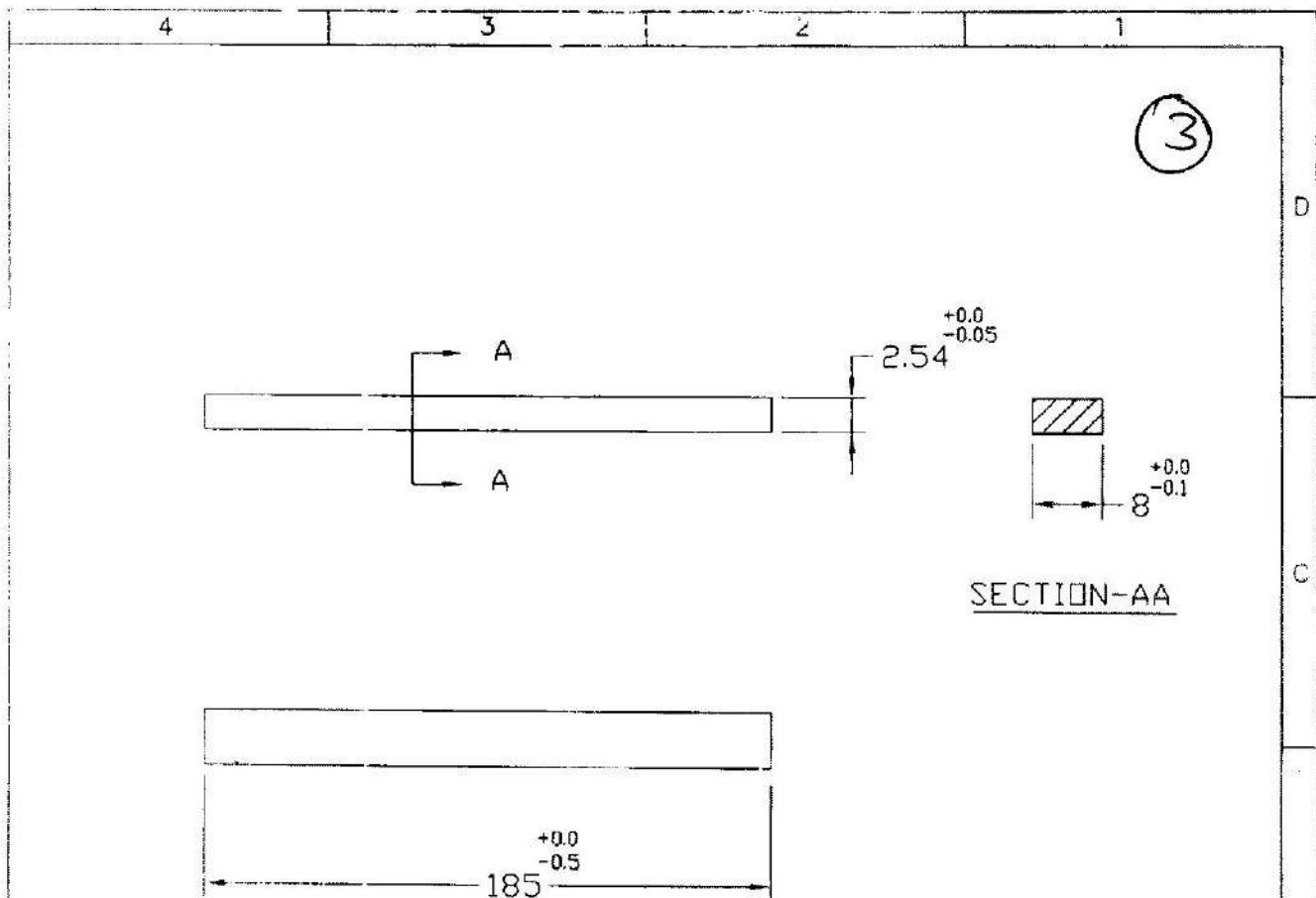
Signature of the Bidder with Stamp



NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH SHALL BE NOT MORE THAN 5 MICRONS ON ALL SURFACES.

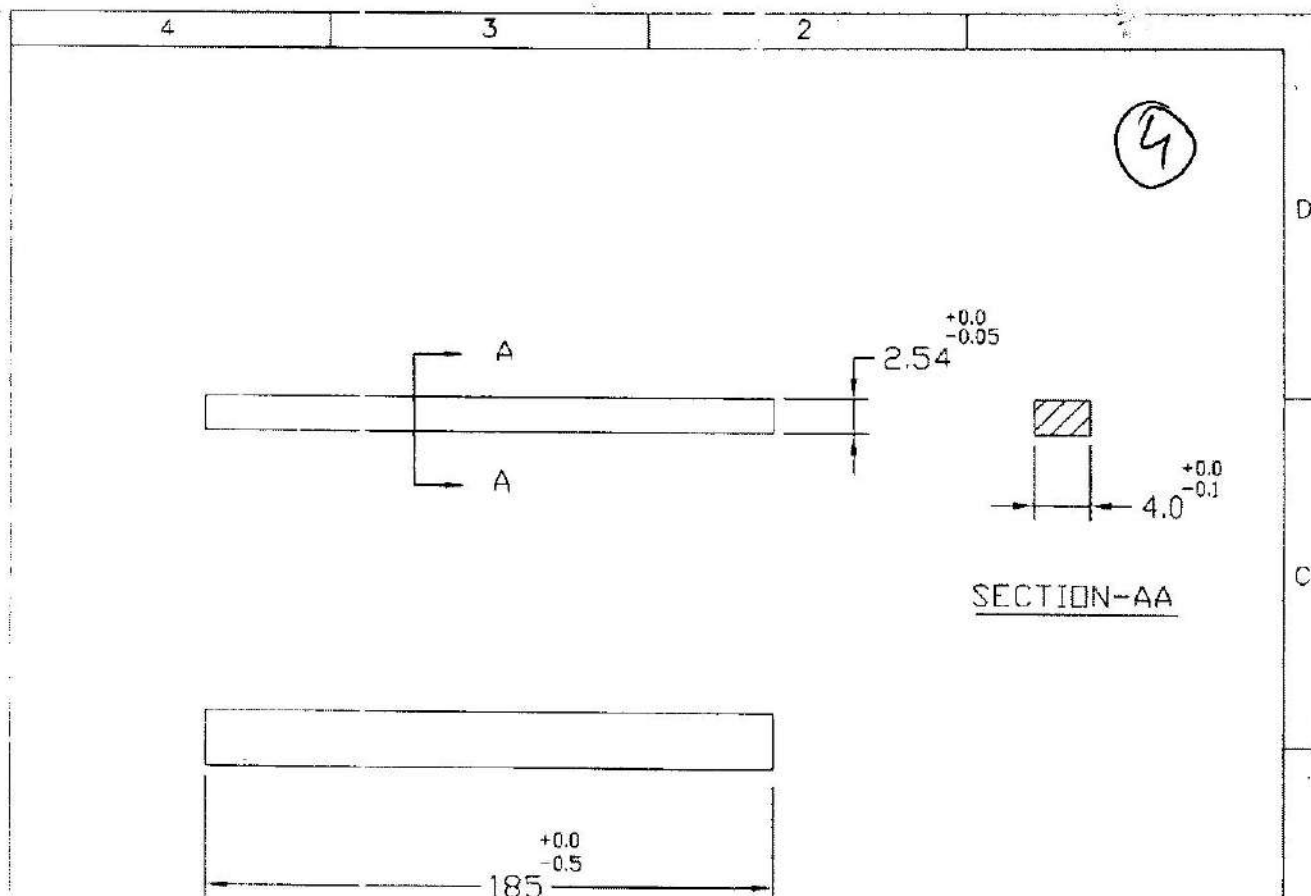
REF. DRG		1		QTY REDUCED BY FOUR NOS		PPD		CHD		APD	
RD-41C15301-A-200		REV NO.		ZONE		BRIEF RECORD		PPD		CHD	
QTY. 52 NOS.		B. Uma		28/03/05		RESEARCH & DEVELOPMENT		CUSTOMER : ADA, BANGALORE		PRECOOLER	
PART NO. 203		KssRao		29/03/05		RAM AIR SIDE BAR		WORK ORD. NO.:		NO. OFF:	
MATRL. MDN347A		APPROVED		A. Panigrahi		29/03/05		YR OF C : D		SIZE	
NOTES:		SCALE		NTS		2004		A4		DRAWING NO.	
1. DRAWING NOT TO BE SCALED										RD-41015301-P-203	
2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED										1	



NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH SHALL BE NOT MORE THAN 5 MICRONS ON ALL SURFACES.

REF. DRG.									
RD-41015301-A-200									
REV. NO.		ZONE		BRIEF RECORD		PPD		CHD	
QTY. 4 NOS.		Bharat Heavy Electricals Ltd		Bharat Heavy Electricals Ltd					
PART NO. 205A		Bharat Heavy Electricals Ltd		HEAVY PLATES & VESSELS PLANT					
MTRL. MDN347A		DRN		VISAKHAPATNAM - 530012 (A.P.)					
NOTES:		CHD		RESEARCH & DEVELOPMENT					
1. DRAWING NOT TO BE SCALED		APPROVED		CUSTOMER : ADA, BANGALORE					
2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		SCALE		PRECOOLER BLEED AIR SIDE BAR-WIDE					
		NTS		WORK ORD. NO.:		NO. OFF:			
				YR OF ORD		SIZE		DRAWING NO.	
				2004		A4		RD-41015301-P-205A	
								REV	
								O	



NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH SHALL BE NOT MORE THAN 5 MICRONS ON ALL SURFACES.

REF. DRG.		1		QTY REDUCED BY FOUR NOS		PPD		CHD		APD	
RD-41015301-A-200		REV. NO.		ZONE		BRIEF RECORD		PPD		CHD	
QTY. 76 NOS.		MATRL. MDN347A		DRN		B. Uma 28/03/05		RESEARCH & DEVELOPMENT		CUSTOMER : ADA, BANGALORE	
PART NO. 205		CHD		KssRao 29/03/05		PRECOOLER BLEED AIR SIDE BAR		WORK ORD. NO.:		NO. OFF:	
NOTES:		APPROVED		A. Panigrahi 29/03/05		YR OF ORD		SIZE		DRAWING NO.	
1. DRAWING NOT TO BE SCALED.		SCALE		NTS		2004		A4		RD-41015301-P-205	
2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.										1	

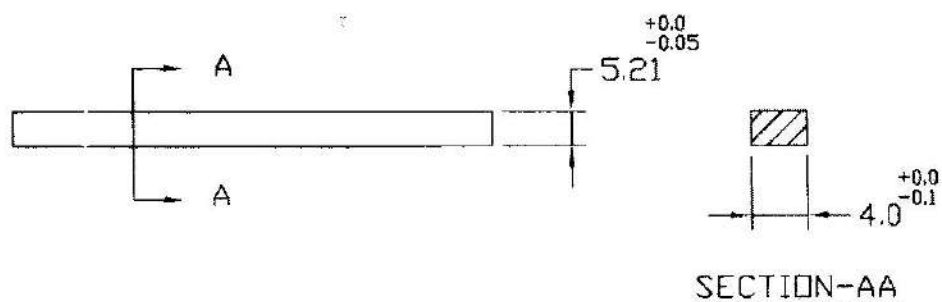
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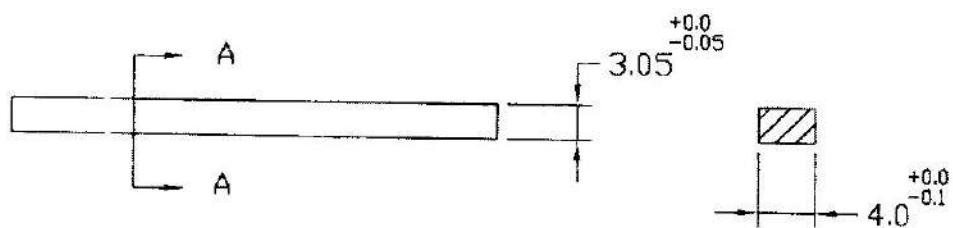
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NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH SHALL BE NOT MORE THAN 5 MICRONS ON ALL SURFACES.

REF. DRG.		1	---	HEIGHT & QTY REVISED.		B. Uma 22.09.03		22/09/03	
RD-41013905-A-200		REV NO.	ZONE	BRIEF RECORD		PPD	CHD	APD	
QTY. 64 NOS.		BHARAT HEAVY PLATE AND VESSELS LTD.							
PART No 203		VISAKHAPATNAM - 530 012, INDIA							
MATRL. MDN347A		DRN	Sd/KSSRao 26-03-2002	RESEARCH & DEVELOPMENT CUSTOMER : ADA, BANGALORE					
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHD	Sd/A.Panigrahi 27-03-2002	PRIMARY HEAT EXCHANGER RAM AIR SIDE BAR					
		APPROVED	Sd/A.Panigrahi 27-03-2002	WORK ORD. NO.				NO. OFF	
				YR OF ORD	SIZE	DRAWING NO.		REV	
		SCALE	NTS	1996	A4	RD-41013905-P-203		1	

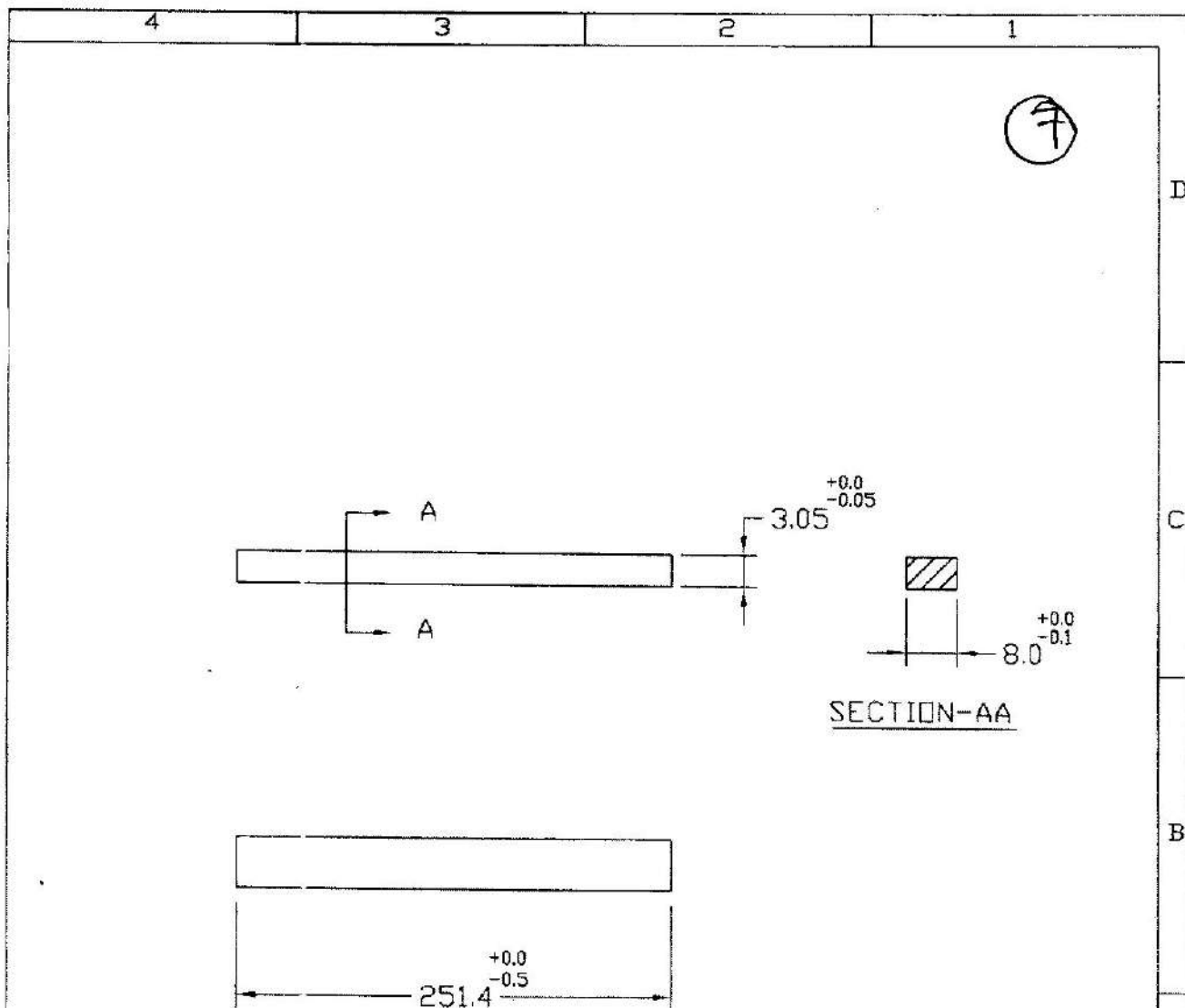


SECTION-AA

NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH SHALL BE NOT MORE THAN 5 MICRONS ON ALL SURFACES.

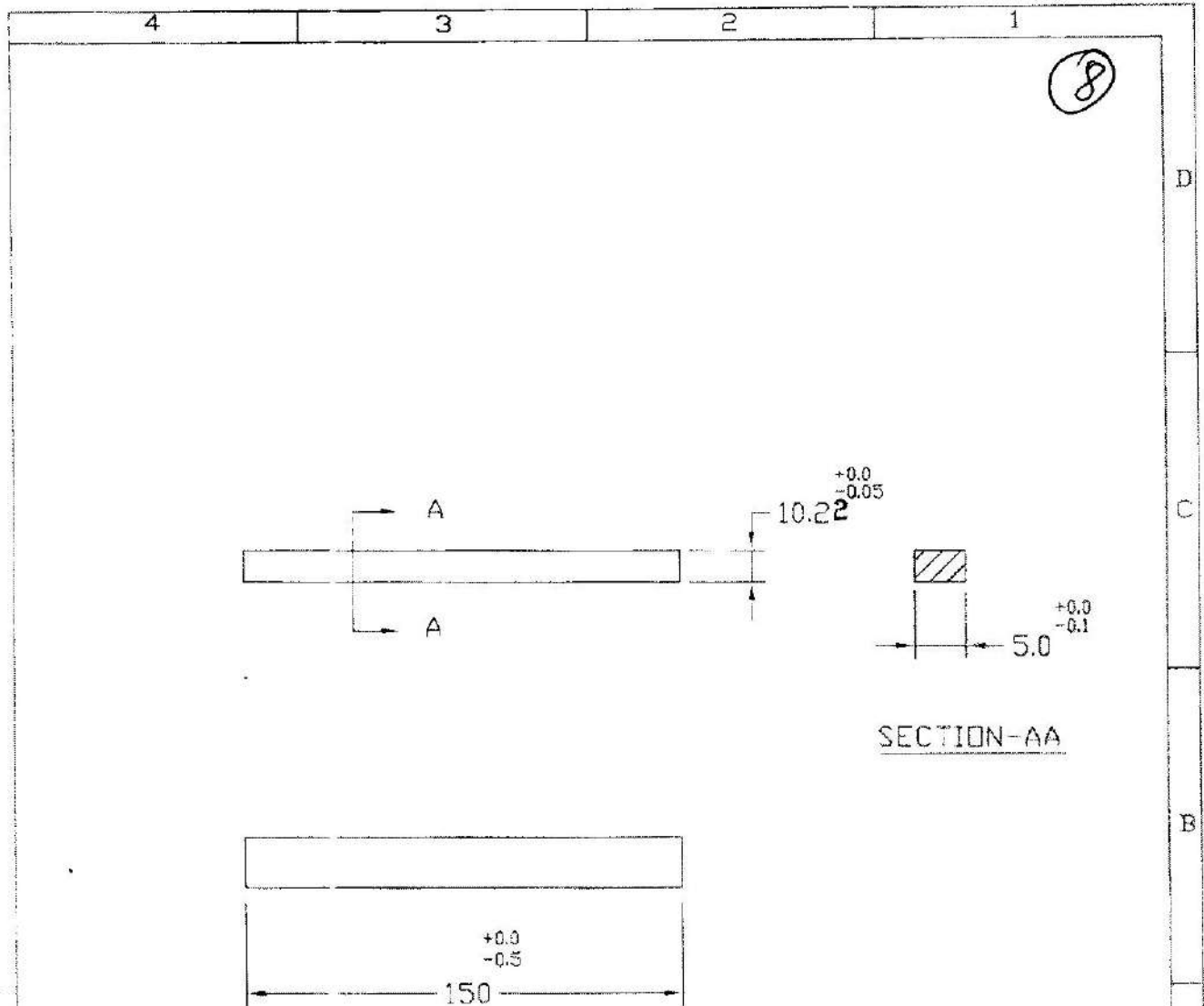
REF. DRG.	1	---	HEIGHT & QTY REVISED.	B. Uma	22.09.03	22/09/03	22/09/03
RD-41013905-A-200	REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD	
QTY.	62 NOS.	BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA					
PART No.	205	DRN	Sd/KSSRao	RESEARCH & DEVELOPMENT			
MATRL.	MDN347A		26-03-2002	CUSTOMER : ADA ,BANGALORE			
NOTES:		CHD	Sd/A.Panigrahi	PRIMARY HEAT EXCHANGER			
			27-03-2002	CHARGE AIR SIDE BAR			
	APPROVED	Sd/A.Panigrahi	WORK ORD. NO.	NO. OFF			
		27-03-2002	YR OF ORD	SIZE	DRAWING NO.	REV	
1. DRAWING NOT TO BE SCALED		SCALE	NTS	1996	A4	RD-41013905-P-205	1
2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.							



NOTES :

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2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH SHALL BE NOT MORE THAN 5 MICRONS ON ALL SURFACES.

REF. DRG. RD-41013905-A-200	1	1--	HEIGHT & QTY REVISED.	B. Uma 22.09.03	[Signature] 22/9/03	[Signature] 12/10/03
QTY. 31 NOS.	REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD
PART No. 207	 BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA					
MATRL. MDN347A	DRN	Sd/KSSRao 26-03-2002	RESEARCH & DEVELOPMENT			
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.	CHD	Sd/A.Panigrahi 27-03-2002	CUSTOMER : ADA, BANGALORE			
	APPROVED	Sd/A.Panigrahi 27-03-2002	PRIMARY HEAT EXCHANGER CENTRAL SIDE BAR			
	SCALE	NTS	WORK ORD. NO.		NO. OFF	
			YR OF ORD	SIZE	DRAWING NO.	REV
		1996	A4	RD-41013905-P-207	1	



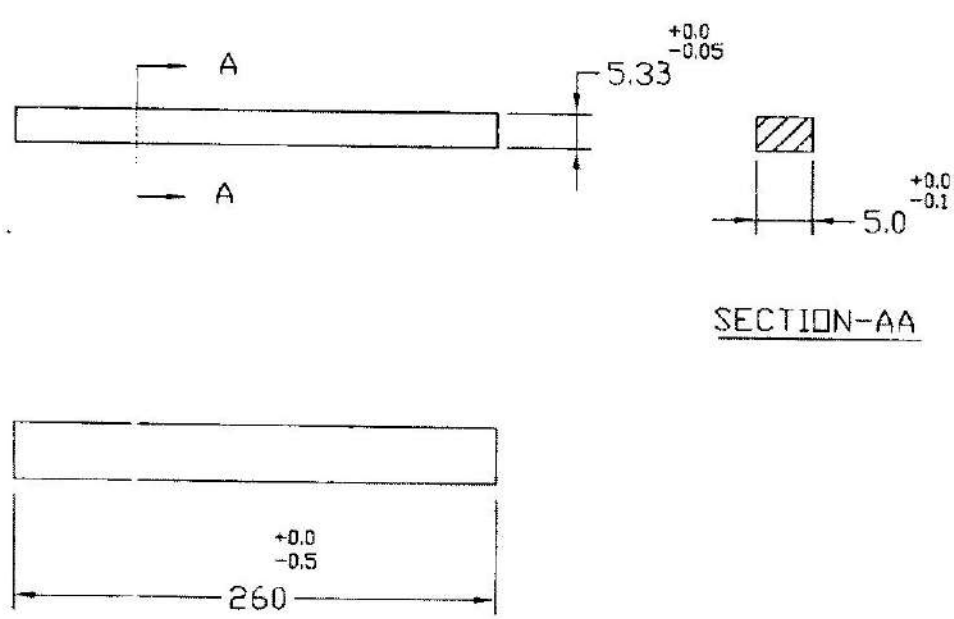
NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH SHALL BE NOT MORE THAN 5 MICRONS ON ALL SURFACES.

REF. DRG.		---		NOTE 3 CORRECTED.		B. Uma		19-07-03		19-07-03	
RD-41011201-A-200		REV NO	ZONE	BRIEF RECORD		PPD	CHD	APD			
QTY.	46 NOS	BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA									
PART No	203										
MATRL.	AA 3003 BS 4L59	DRN	B. Uma 05-04-02		RESEARCH & DEVELOPMENT						
				CUSTOMER : ADA, BANGALORE							
NOTES:		CHI	05/04/02		SECONDARY HEAT EXCHANGER RAM AIR SIDE BAR						
1. DRAWING NOT TO BE SCALED		APPROVED	A. 05/04/02		WORK ORD. NO.				NO. OFF.		
2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		SCALE	NTS		YR OF ORD	SIZE	DRAWING NO.			REV	
						A4	RD-41011201-P-203			1	

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B
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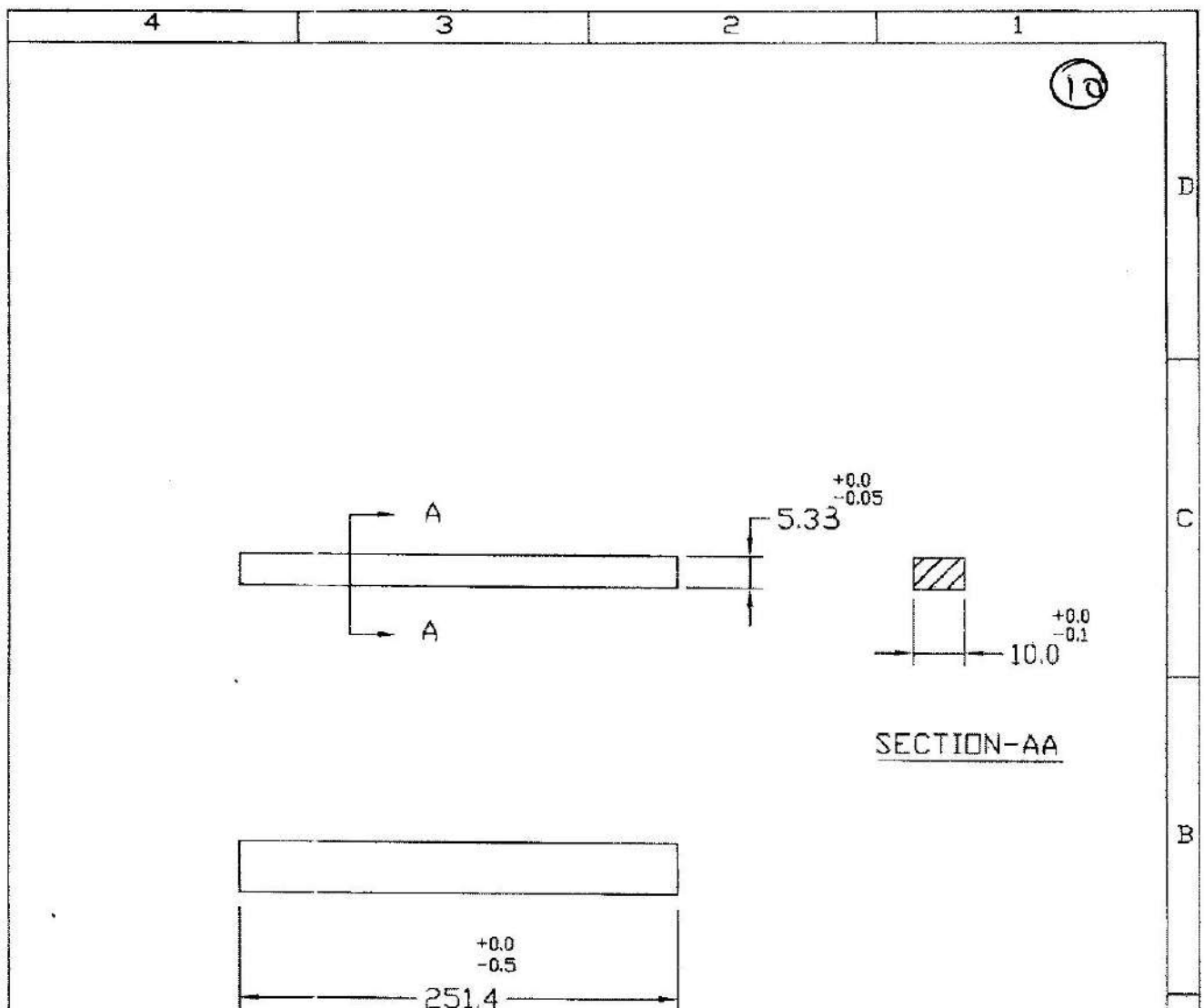
9



NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH SHALL BE NOT MORE THAN 5 MICRONS ON ALL SURFACES.

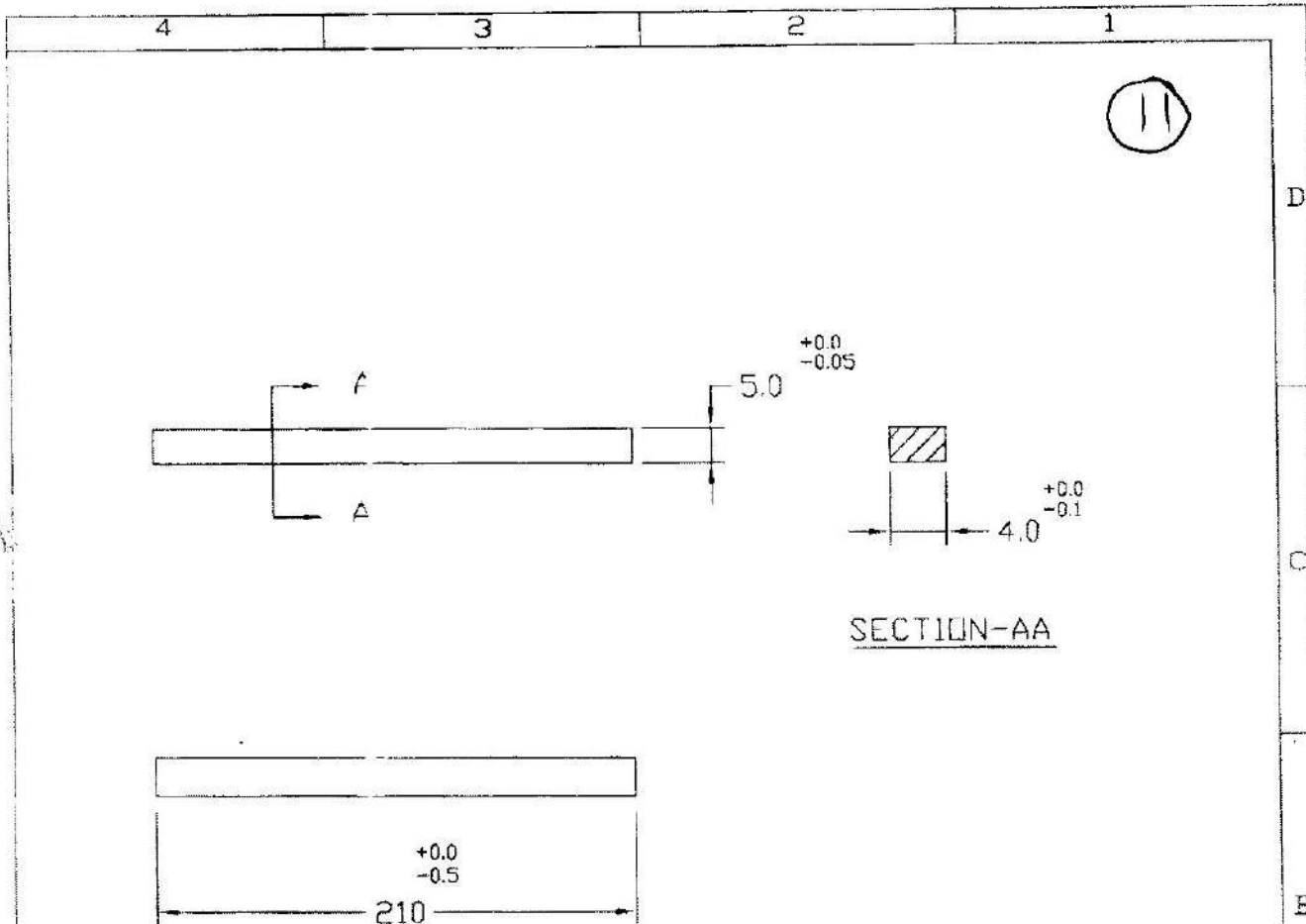
REF. DRG.	RD-41011201-A-200	1	---	NOTE 3 CORRECTED.	B. un	19-07-03	19-07-03	19-07-03
QTY.	42 NOS	REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD	
PART No.	205	BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA						
MATRL.	AA 3003/ BS 4L59	DRN	B. un	RESEARCH & DEVELOPMENT				
			05.04.02	CUSTOMER : ADA, BANGALORE				
NOTES:		CHD	CHD	SECONDARY HEAT EXCHANGER				
1. DRAWING NOT TO BE SCALED			05/04/02	CHARGE AIR SIDE BAR				
2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		APPROVED	APPROVED	WORK ORD. NO.	NO. OFF			
			05/04/02	YR OF ORD	SIZE	DRAWING NO.	REV	
		SCALE	NTS		A4	RD-41011201-P-205	1	



NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH SHALL BE NOT MORE THAN 5 MICRONS ON ALL SURFACES.

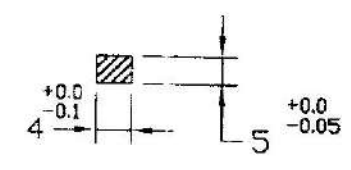
REF. DRG.	1	---	NOTE 3 CORRECTED.	B. L.	19.07.03	18/03	19/04/03
RD-41011201-A-200	REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD	
QTY.	21 NOS						
PART No.	207						
MATRL.	AA 3003/BS 4L59						
NOTES:	1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.						
	DRN	B. L.		RESEARCH & DEVELOPMENT			
		05.04.02		CUSTOMER : ADA, BANGALORE			
	CHD	18/03		SECONDARY HEAT EXCHANGER			
		05/04/02		CENTRAL SIDE BAR			
	APPROVED	18/04/02		WORK ORD. NO.		NO. OFF:	
	SCALE	NTS		YR OF ORD	SIZE	DRAWING NO.	REV
					A4	RD-41011201-P-207	1



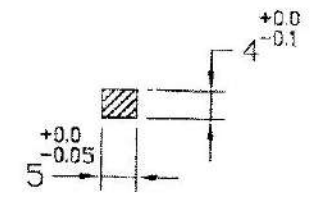
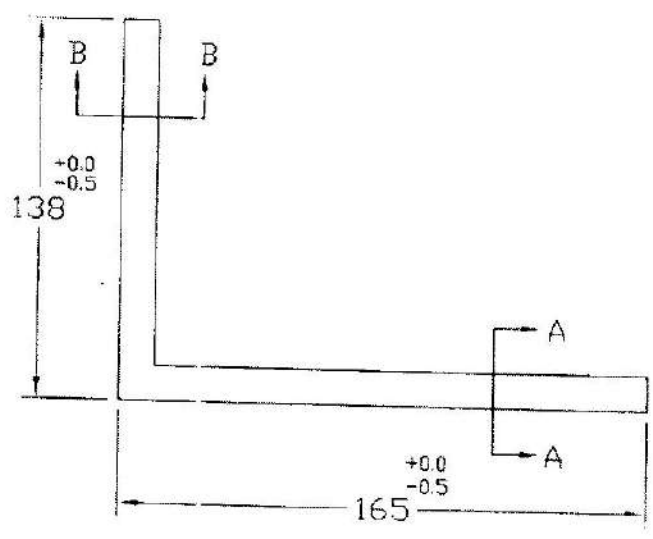
NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH SHALL BE NOT MORE THAN 5 MICRONS ON ALL SURFACES.

REF. DRG.		---		NOTE 3 CORRECTED.		B.W. 18-07-03		C.S.A. 18/08/03		H.21/08/03		
RD-41013909-A-200		REV NO.	ZONE	BRIEF RECORD		PPD	CHD	APD				
QTY.	36 Nos.	BHPU BHARAT HEAVY PLATE AND VESSELS LTD.										
PART NO.	203	VISAKHAPATNAM - 530 012, INDIA										
MATRL.	AA-3003/BS4L59	DRN	3.1mm 10-04-02	RESEARCH & DEVELOPMENT								
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHI	C.S.A. 10/04/02	CUSTOMER : ADA, BANGALORE								
		APPROVED	A. 10/04/02	REHEATER HOT AIR SIDE BAR								
		SCALE	NTS	WORK ORD. NO.		NO. OFF.		YR OF ORD		SIZE	DRAWING NO.	REV
				1999	A4	RD-41013909-P-203		1				



SECTION-BB

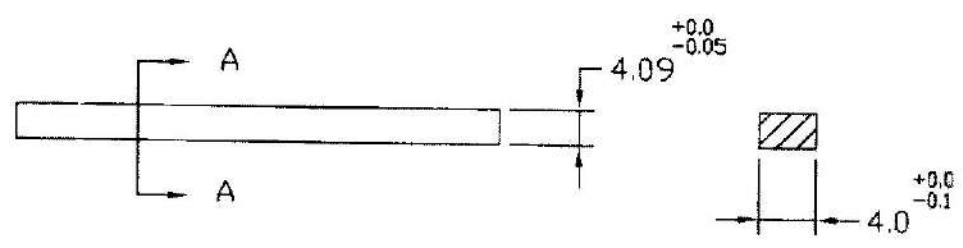


SECTION-AA

NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH SHALL BE NOT MORE THAN 5 MICRONS ON ALL SURFACES.

REF DRG.									
RD-41013909-A-200		REV NO.		ZONE		NOTE 3 CORRECTED.		BRIEF RECORD	
QTY. 36 Nos.		CHD		APD		PPD		CHD	
PART NO. 205		BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA							
MATRL. AA-3003/BS4L59		DRN		B.U.		RESEARCH & DEVELOPMENT		CUSTOMER : ADA, BANGALORE	
NOTES:		CHD		10/04/02		REHEATER		COLD AIR SIDE BAR	
1. DRAWING NOT TO BE SCALED		APPROVED		10/04/02		WORK ORD. NO.		NO. OFF.	
2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		SCALE		NTS		YR OF ORD		SIZE	
						1999		A4	
						DRAWING NO.		REV	
						RD-41013909-P-205		1	



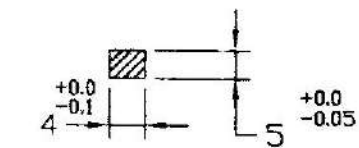
SECTION-AA

NOTES :

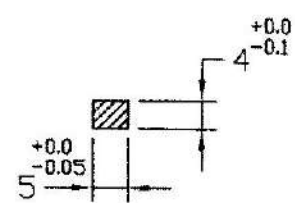
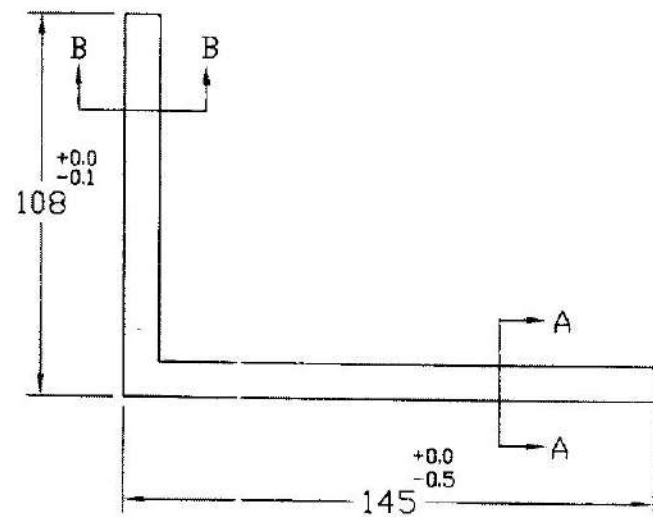
1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH SHALL BE NOT MORE THAN 5 MICRONS ON ALL SURFACES.

REF. DRG.							
RD-41013907-A-200		REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD
QTY.	34 Nos.	Bharat Heavy Plate and Vessels Ltd. VISAKHAPATNAM - 530 012, INDIA					
PART NO.	203						
MATRL.	AA 3003/ BS 4L59	DRN	B.uma 5.8.2000	RESEARCH & DEVELOPMENT			
NOTES: 1. DRAWING NOT TO BE SCALED. 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHD	WSS 05/08/00	CUSTOMER : ADA, BANGALORE			
		APPROVED	A.102 5/8/2000	CONDENSER COLD AIR SIDE BAR			
		SCALE	NTS	WORK ORD. NO.	NO. OFF		
				YR OF ORD	SIZE	DRAWING NO.	REV
				1996	A4	RD-41013907-P-203	0

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SECTION-BB



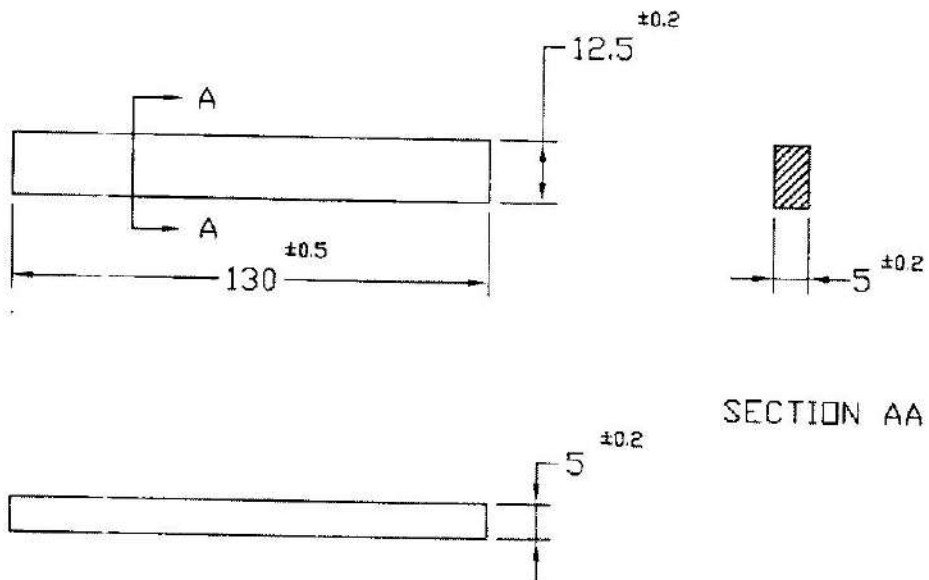
SECTION-AA

NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS: 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH SHALL BE NOT MORE THAN 5 MICRONS ON ALL SURFACES.

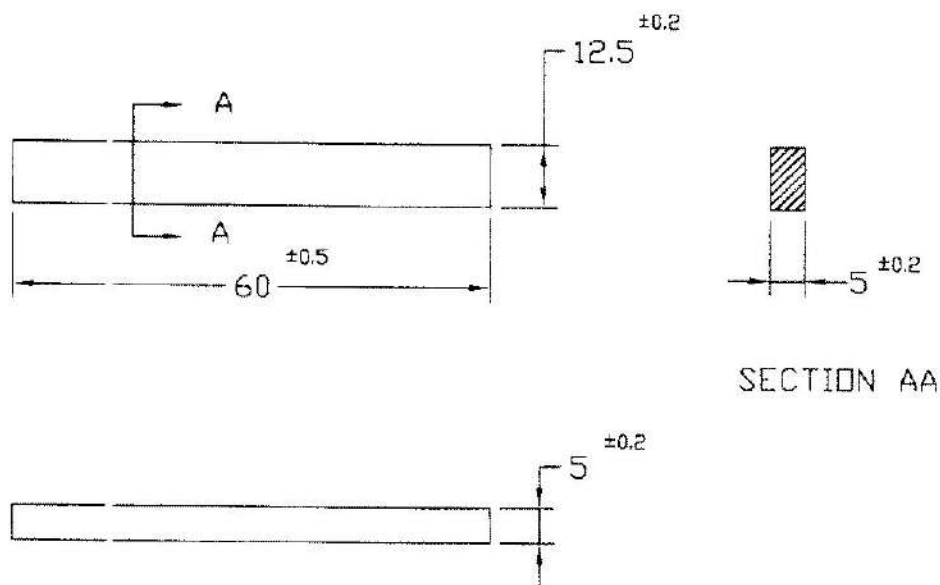
REF. DRG.																			
RD-41013907-A-200																			
QTY.		36 Nos.		REV NO.		ZONE		BRIEF RECORD		PPD		CHD		APD					
PART NO.		205		BHARAT HEAVY PLATE AND VESSELS LTD.															
MATERIAL		AA 3003/ BS 4L59		DRN		B.uma 5.8.2000		RESEARCH & DEVELOPMENT											
NOTES:		1. DRAWING NOT TO BE SCALED. 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHD		05/08/00		CUSTOMER : ADA, BANGALORE											
				APPROVED		[Signature]		CONDENSER HOT AIR SIDE BAR				WORK ORD. NO.				NO. OFF			
				SCALE		NTS		YR OF ORD		SIZE		DRAWING NO.				REV			
								1996		A4		RD-41013907-P-205				0			

13



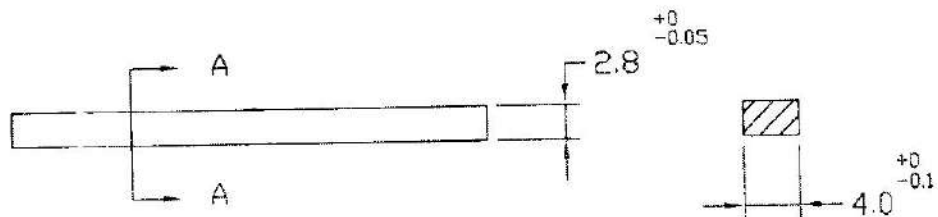
SECTION AA

REF. DRG.									
RD-41013911-A-100		REV NO.	ZONE	BRIEF RECORD		PPD	CHD	APD	
QTY.	2 Nos.	BHARAT HEAVY PLATE AND VESSELS LTD.							
ITEM No.	114	VISAKHAPATNAM - 530 012, INDIA							
MATRL.	AA 5086	DRN.	20-08-01		RESEARCH & DEVELOPMENT				
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHKD.	21/8/01		CUSTOMER: M/s A.D.A., BANGALORE				
		APPROVED	21/08/01		HYD.OIL-IDG OIL-FUEL COOLER(HE-1) SPACER BAR				
		SCALE	NTS		WORK ORD. NO.	410139 11	NO. OFF		
				YR OF ORD	SIZE	DRAWING NO.		REV	
				1999	A4	RD-41013911-P-114		0	

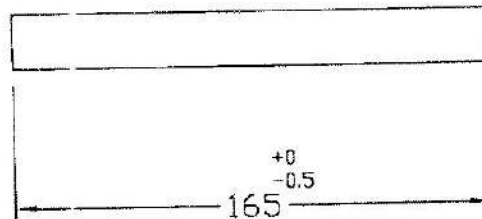


	2	C-2	BAR HEIGHT & QTY. REVISED	CSR 12.07.00	AP 31.07.00	AP 31.07.00
REF. DRG.	1	C-2	BAR HEIGHT MODIFIED	XSR 26.07.00	AP 31.07.00	AP 31.07.2K
RD-41013911-A-100	REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD
QTY.	2 Nos.	BHARAT HEAVY PLATE AND VESSELS LTD.				
ITEM No.	116	VISAKHAPATNAM - 530 012, INDIA				
MATRL.	AA 5085	DRN	CSR 29-04-00	RESEARCH & DEVELOPMENT		
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.	CHKD.	APR 20/4/00	CUSTOMER : M/s A.D.A.,BANGALORE			
	APPROVED	APR 01/05/00	HYD.OIL-IDG OIL-FUEL COOLER(HE-1) RETURN HEADER MIDDLE BAR			
	SCALE	NTS	WORK ORD. NO.	410139 11	NO. OFF	
			YR OF ORD	SIZE	DRAWING NO.	REV
			1999	A4	RD-41013911-P-116	2

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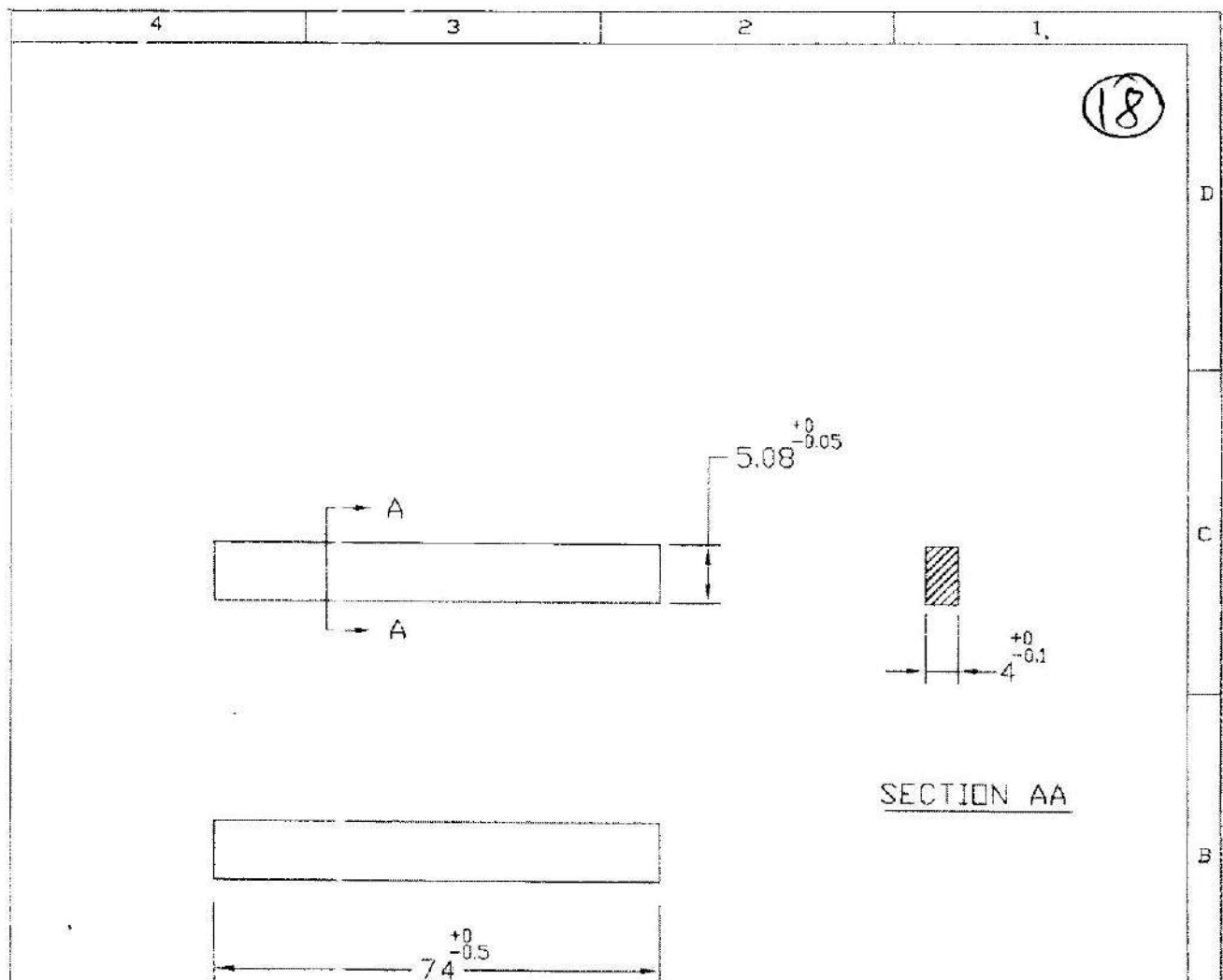
SECTION AA



NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH REQMT. IS 5 TO 10 MICRONS ON ALL SURFACES.

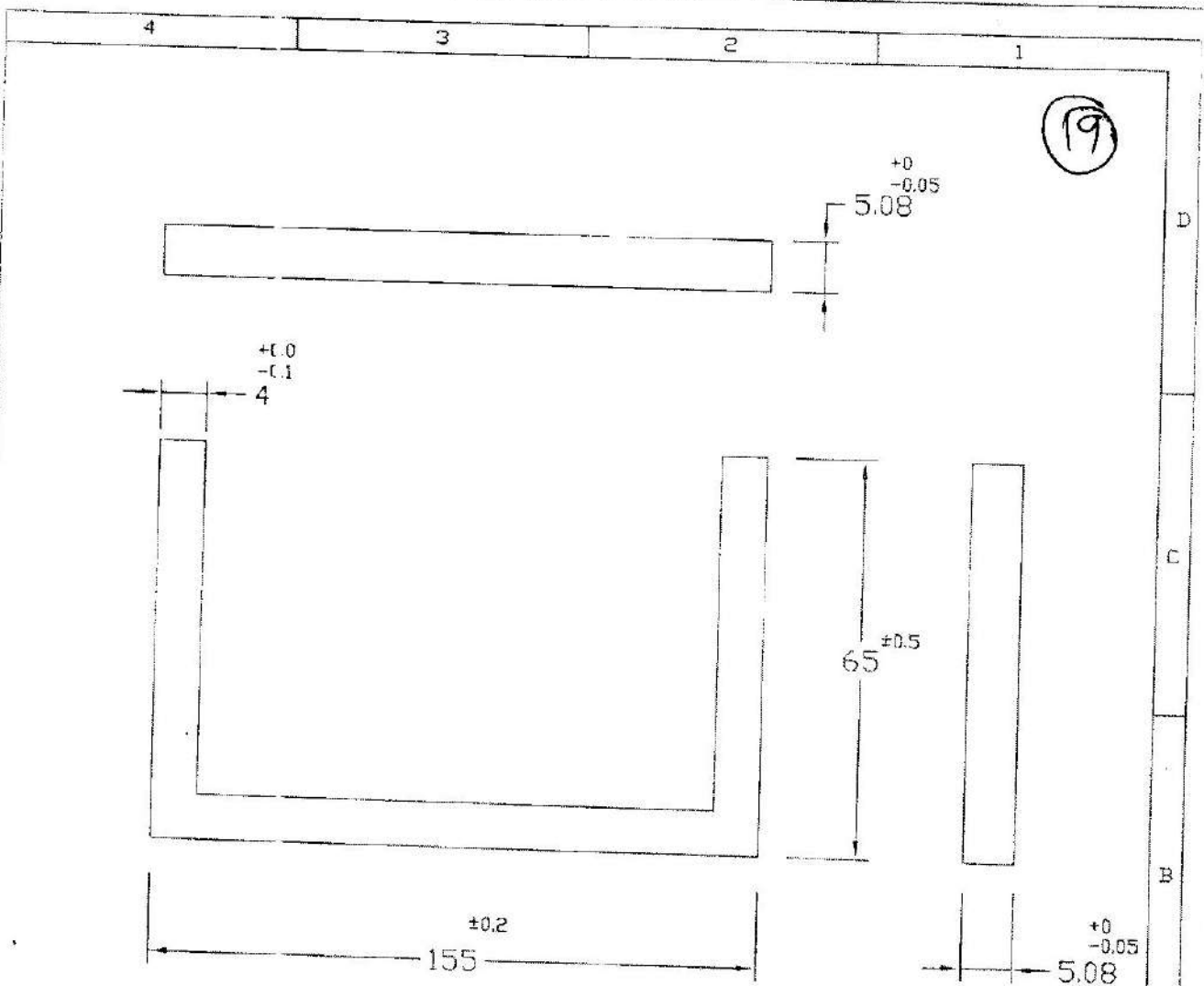
REF. DRG.No. RD-41013911-A-200		REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD
QTY.	8 Nos.	eltpu BHARAT HEAVY PLATE AND VESSELS LTD.					
ITEM No.	203	VISAKHAPATNAM - 530 012, INDIA					
MATRL.	AA 3003-O/ BS 4L59	DRN.	17-09-01	RESEARCH & DEVELOPMENT			
NOTES:		CHKD.	18/09/01	CUSTOMER : M/s A.D.A.,BANGALORE			
1. DRAWING NOT TO BE SCALED		APPROVED	18/09/01	HYD.OIL-IDG OIL-FUEL COOLER(HE-1)			
2. ALL DIMENSIONS ARE IN MM UNLESS OTHER-WISE STATED.		SCALE	NTS	FUEL SIDE BAR-HYD			
				WORK ORD. NO.	410139 11	NO. OFF	
				YR OF ORD	1999	SIZE	A4
				DRAWING NO.		RD-41013911-P-203	
						REV	0



NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH REQMT. IS 5 TO 10 MICRONS ON ALL SURFACES.

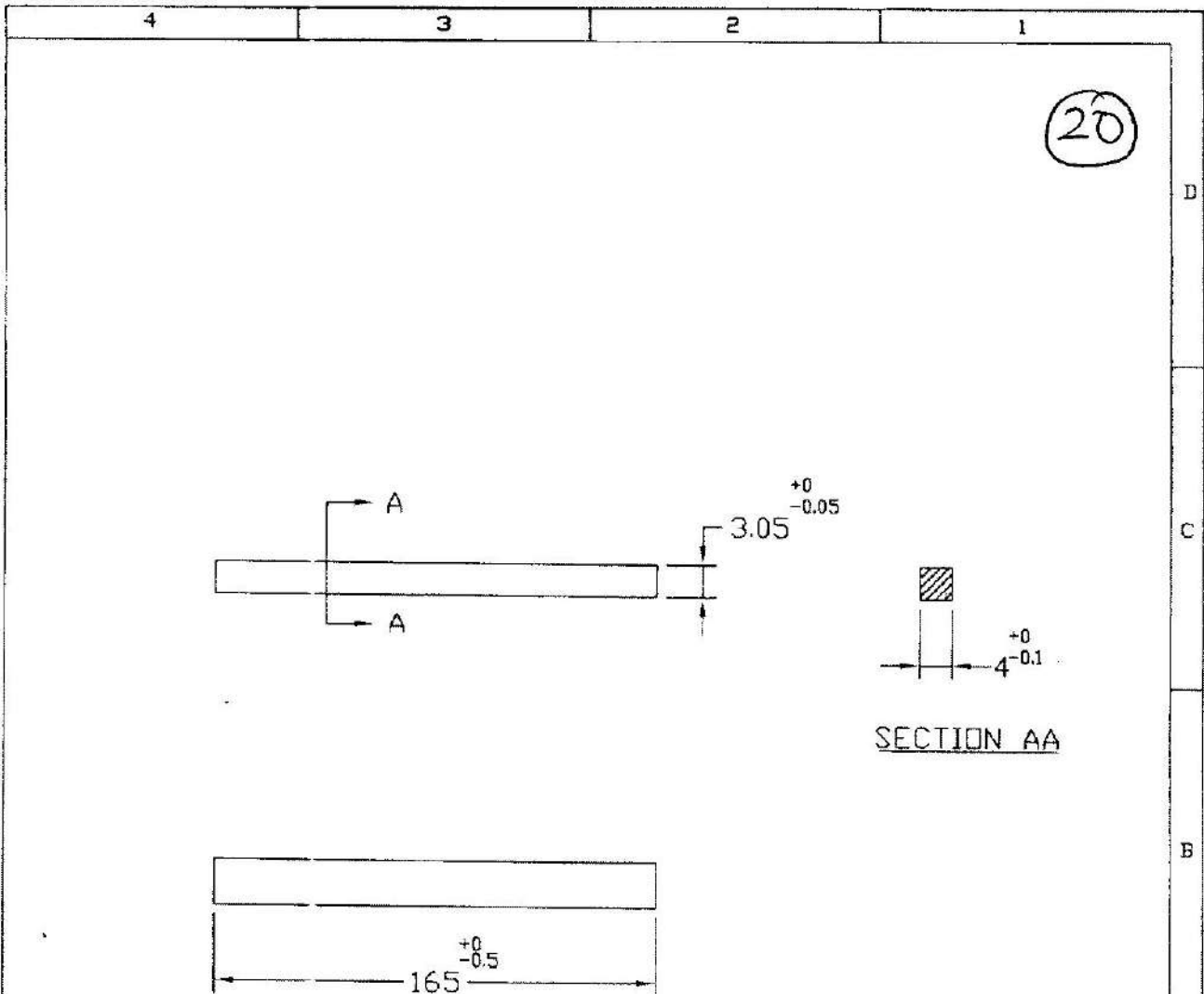
REF. DRG.No.		REV NO.		ZONE		BRIEF RECORD		PPD	CHD	APD
RD-41013911-A-200										
QTY.	3 Nos.	BHARAT HEAVY PLATE AND VESSELS LTD.								
ITEM No.	205	VISAKHAPATNAM - 530 012, INDIA								
MATRL.	AA 3003-O/ BS4L59	DRN	17-09-01		RESEARCH & DEVELOPMENT					
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHKD.	18/09/01		CUSTOMER : M/s A.D.A., BANGALORE					
		APPROVED	18/09/01		HYD.OIL-IDG OIL-FUEL COOLER (HE-1) HYD OIL SIDE BAR					
		SCALE	NTS		WORK ORD. NO. 410139 11		NO. OFF			
				YR OF ORD	SIZE	DRAWING NO.		REV		
					1999	A4	RD-41013911-P-205		0	



NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH REQMT. IS 5 TO 10 MICRONS ON ALL SURFACES.

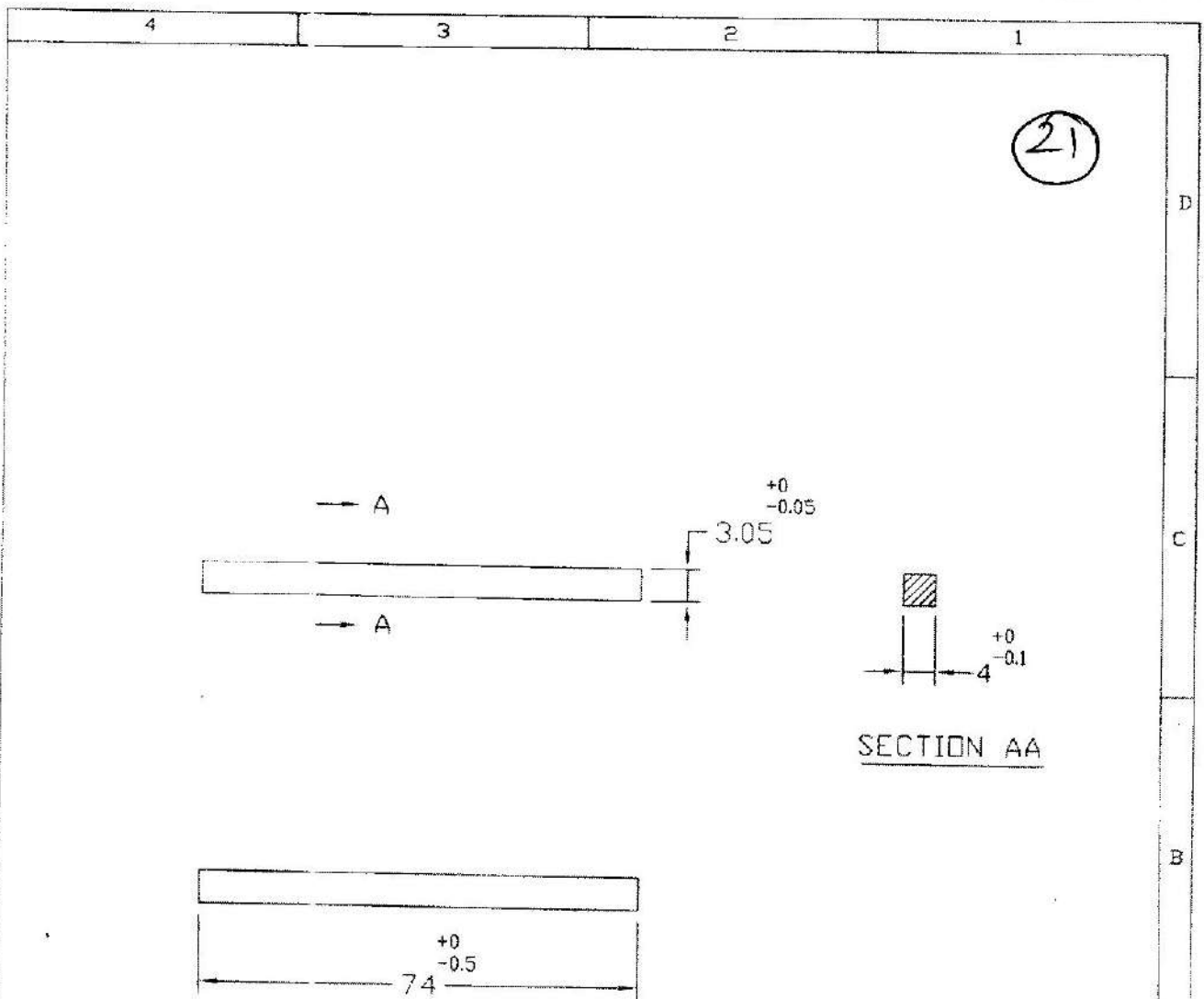
REF. DRG.No.		RD-41013911-A-200		REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD
QTY.	3 Nos	BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA							
ITEM No.	207	RESEARCH & DEVELOPMENT CUSTOMER : M/s A.D.A., BANGALORE							
MATRL.	AA 3003-O/ BS 4L59	DRILL	17-09-01	HYD.OIL-IDG OIL-FUEL COOLER (HE-1) U-SHAPED SIDE BAR-HYD					
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHKD.	12/9/01	WORK ORD. NO. 410139 11		NO. OFF			
		APPROVED	18/09/01	YR OF ORD	SIZE	DRAWING NO.	REV		
		SCALE	NTS	1999	A4	RD-41013911-P-207	0		



NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH REQMT. IS 5 TO 10 MICRONS ON ALL SURFACES.

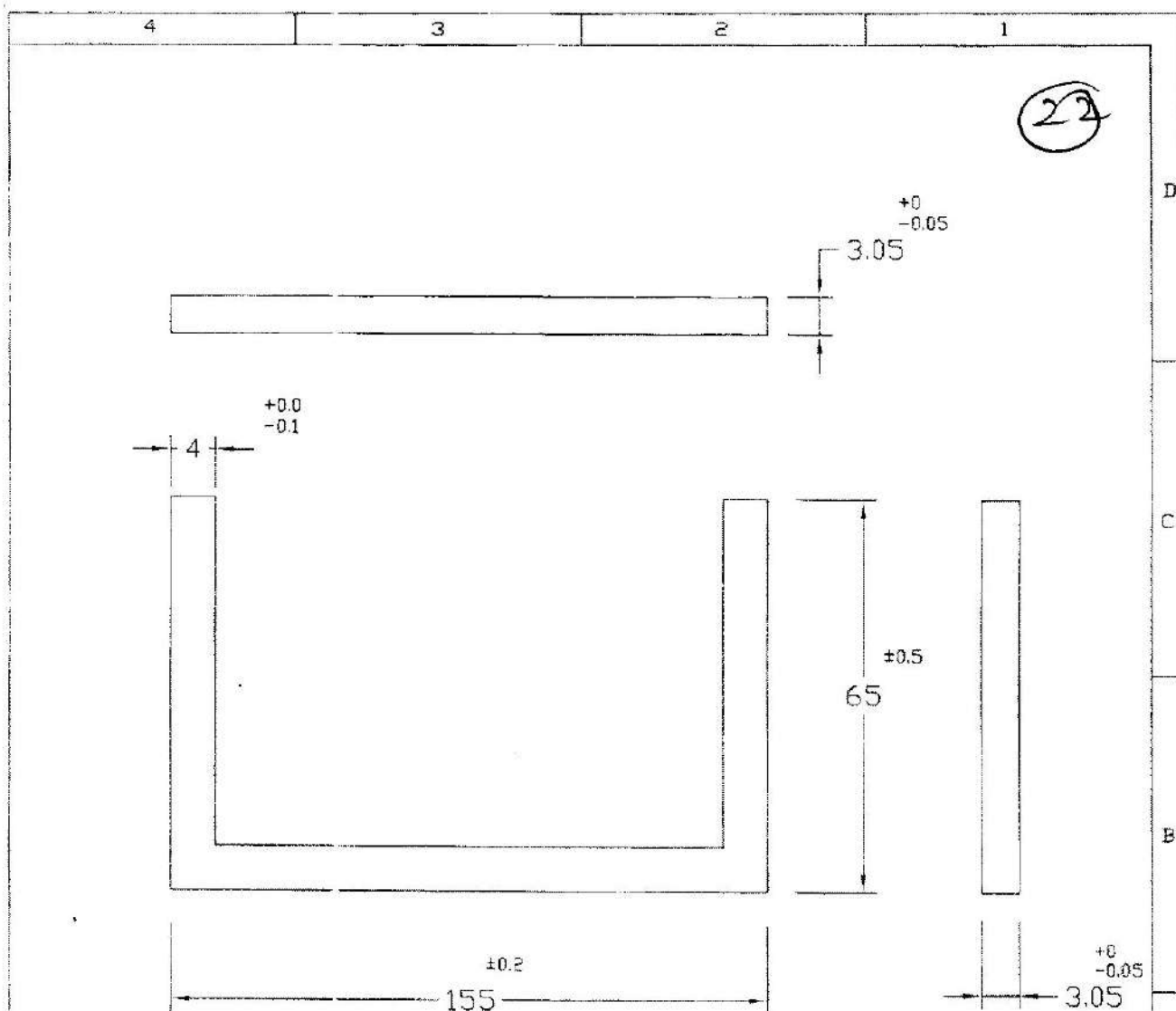
REF. DRG.No.									
RD-41013911-A-300		REV NO.	ZONE	BRIEF RECORD			PPD	CHD	APD
QTY.	14 Nos.	BHARAT HEAVY PLATE AND VESSELS LTD.							
ITEM No.	303	VISAKHAPATNAM - 530 012, INDIA							
MATRL.	AA 3003-0/ BS 4L59	DRN.	17-09-01	RESEARCH & DEVELOPMENT					
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHKD.	18/09/01	CUSTOMER : M/s A.D.A.BANGALORE					
		APPROVED	18/09/01	HYD.OIL-IDG.OIL-FUEL COOLER (HE-1) FUEL SIDE BAR-IDG					
		SCALE	NTS	WORK ORD. NO. 410139 11		NO. OFF			
				YR OF ORD	SIZE	DRAWING NO.		REV	
				1999	A4	RD-41013911-P-303		0	



NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH REQMT. IS 5 TO 10 MICRONS ON ALL SURFACES.

REF. DRG.No.		REV NO.		ZONE		BRIEF RECORD		PPD		CHD		APD	
RD-41013911-A-300													
QTY.	6 Nos.	BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA											
ITEM No.	305												
MATRL.	AA 3003-O/ BS 4LS9	DRN	U.S.R. 17-09-01		RESEARCH & DEVELOPMENT								
		CHK.	[Signature]		CUSTOMER : M/s A.D.A., BANGALORE								
		APPROVED	[Signature]		HYD.OIL-IDG.OIL-FUEL COOLER (HE-1)								
		SCALE	NTS		IDG OIL SIDE BAR								
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		WORK ORD. NO. 410139 11				NO. OFF							
		YR OF ORD		SIZE		DRAWING NO.				REV			
		1999		A4		RD-41013911-P-305				0			

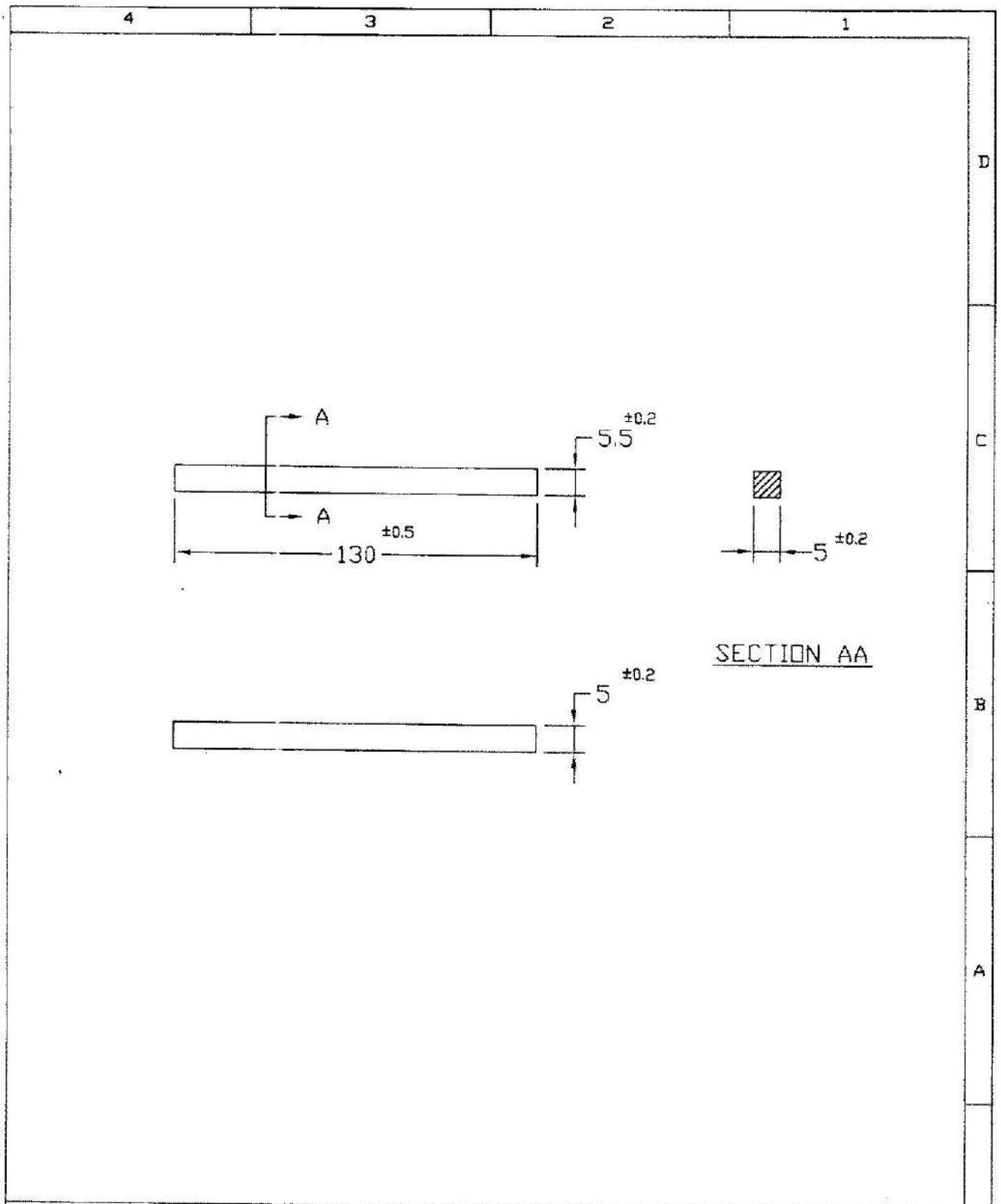


NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH REQMT. IS 5 TO 10 MICRONS ON ALL SURFACES.

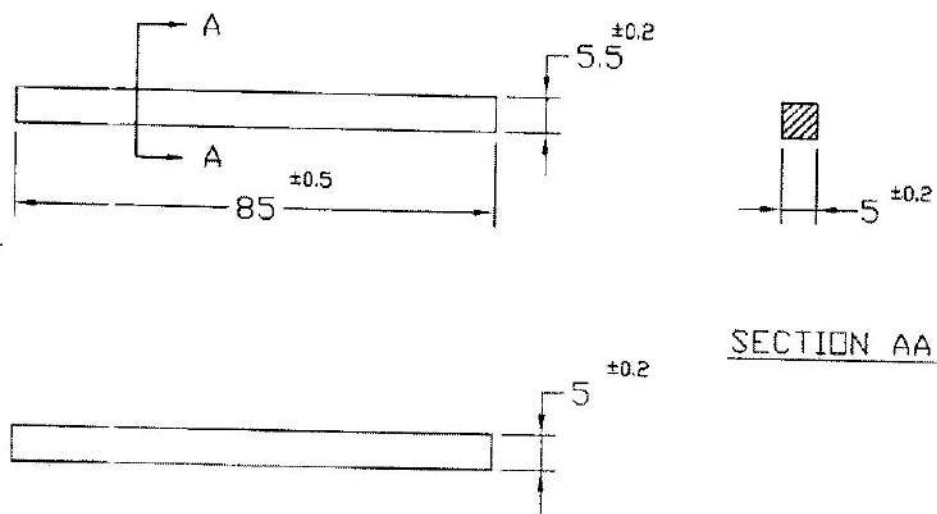
REF. DRG.No.		REV NO.		ZONE		BRIEF RECORD		PPD		CHD		APD	
RD-41013911-A-300													
QTY.	8 Nos.	BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA											
ITEM No.	307												
MATRL.	AA 3003-O/ 8S4LS9	DRN.	RESEARCH & DEVELOPMENT										
			CUSTOMER : M/S A.D.A., BANGALORE										
			HYD.OIL-IDG OIL-FUEL COOLER(HE-1)										
			U-SHAPED SIDE BAR-IDG										
NOTES:		CHKD.	WORK ORD. NO. 410139 11										
1. DRAWING NOT TO BE SCALED			NO. OFF										
2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		APPROVED	YR OF ORD										
			SIZE										
		SCALE	DRAWING NO.										
			REV										
			1999										
			A4										
			RD-41013911-P-307										
			0										

23



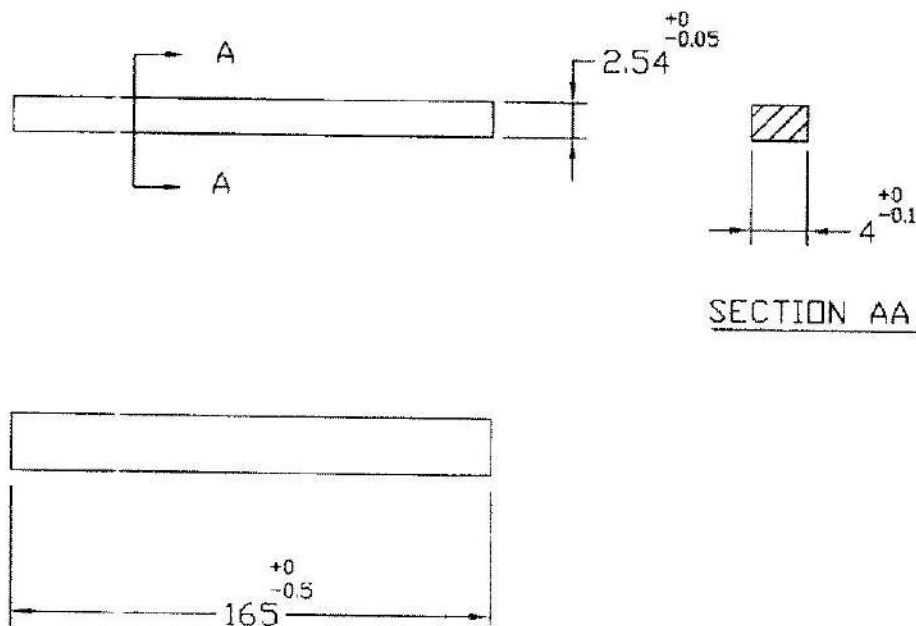
REF. DRG.		REV NO.		ZONE		BRIEF RECORD		PPD		CHD		APD	
RD-41C13912-A-100													
QTY.	2 Nos.	BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA											
ITEM No.	113												
MATL.	AA 5086	DRN.	RESEARCH & DEVELOPMENT CUSTOMER : M/s A.D.A., BANGALORE GBX OIL-HYD OIL-FUEL COOLER (HE-2) SPACER BAR										
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHKI.	20-08-01 21/8/01										
		APPROVED	21/8/01										
		SCALE	NTS										
		WORK ORD. NO.	410139 12		NO. OFF		8		YR OF ORD	SIZE		DRAWING NO.	
		1999		A4		RD-41013912-P-113						0	

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REF. DRG.		2	C-2	BAR HEIGHT & QTY. REVISED	KSR 17.07.00			
RD-41013912-A-100		1	C-2	BAR HEIGHT MODIFIED	KSR 26.07.00			
		REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD	
QTY.	2 Nos.	BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA						
ITEM No.	116							
MATL.	AA 5086	DRN.	RESEARCH & DEVELOPMENT					
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHKD.	CUSTOMER: M/s A.D.A., BANGALORE					
		APPROVED	GBX OIL-HYD OIL-FUEL COOLER (HE-2)					
		SCALE	RETURN HEADER MIDDLE BAR					
		WORK ORD. NO. 410139 12					NO. OFF	8
		YR OF ORD					SIZE	DRAWING NO.
			NTS	1999	A4	RD-41013912-P-116	2	

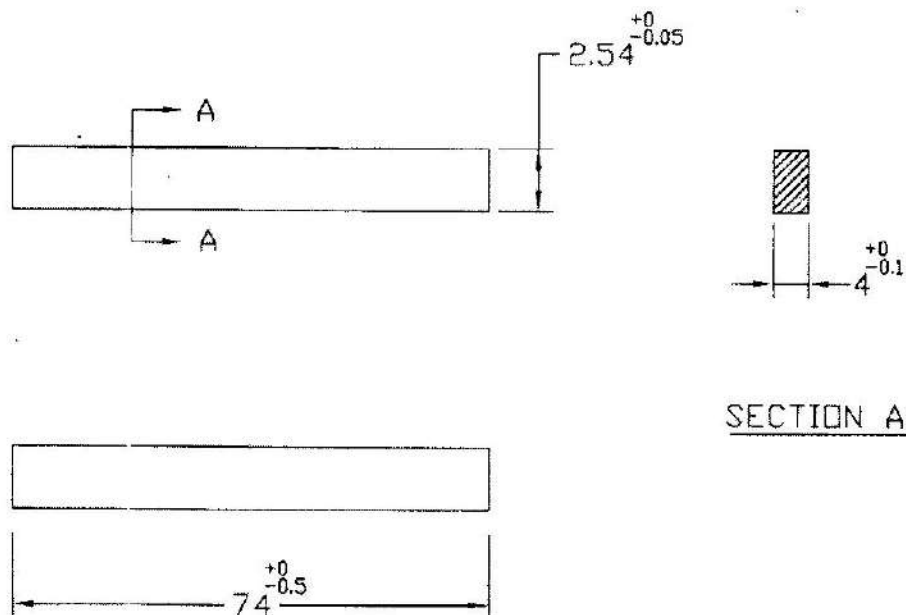
25



NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 MM OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH REQMT. IS 5 TO 10 MICRONS ON ALL SURFACES.

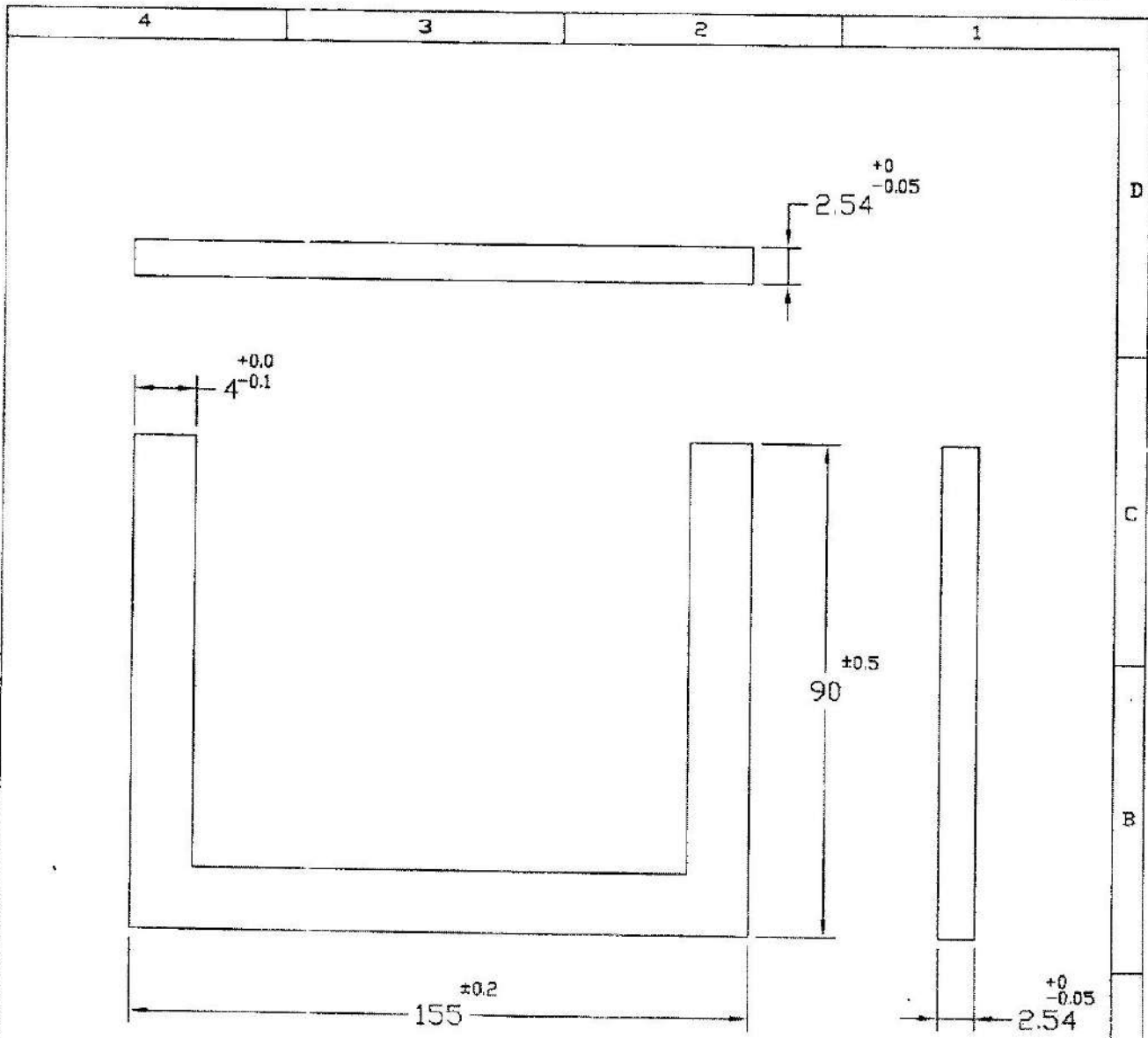
REF. DRG. RD-41013912-A-200		REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD
QTY.	14 Nos.	BHPU BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA					
ITEM No.	203	DRN.	17-09-01	RESEARCH & DEVELOPMENT			
MATL.	AA 3003-0/ BS 4LS9	CHKD.	18/9/01	CUSTOMER : M/s A.D.A., BANGALORE			
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		APPROVED	18/9/01	GBX OIL-HYD OIL-FUEL COOLER (HE-2)			
		SCALE	NTS	FUEL SIDE BAR-GBX			
		WORK ORD. NO. 410139 12			NO. OFF 8		
		YR OF ORD	SIZE	DRAWING NO.		REV	
		1999	A4	RD-41013912-P-203		0	



NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH REQMT. IS 5 TO 10 MICRONS ON ALL SURFACES.

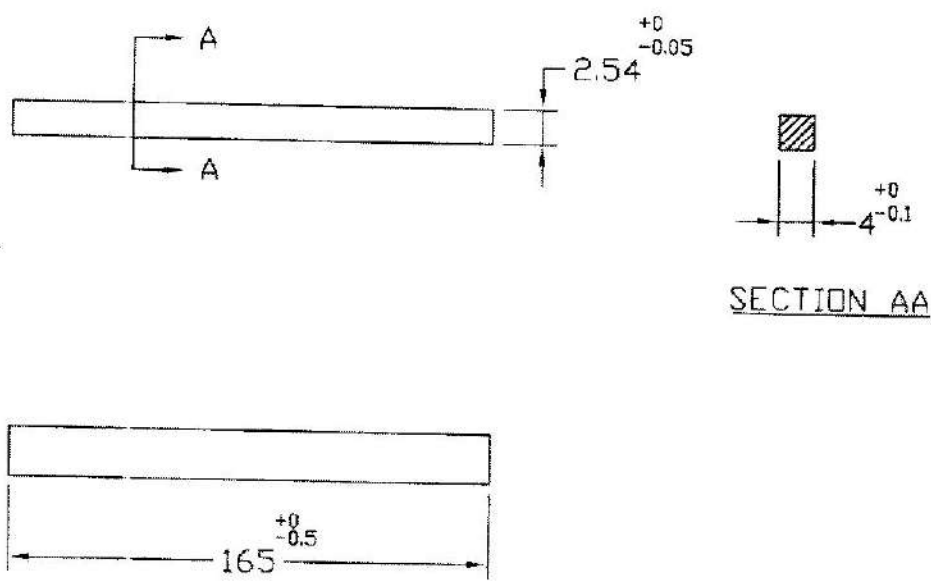
REF. DRG.									
RD-41013912-A-200		REV NO	ZONE	BRIEF RECORD		PPD	CHD	APD	
QTY.	8 Nos.	BHARAT HEAVY PLATE AND VESSELS LTD.							
ITEM No.	205	VISAKHAPATNAM - 530 012, INDIA							
MATL.	AA 3003-0/ BS4L59	DRN.	17-09-01	RESEARCH & DEVELOPMENT					
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHKD.	18/9/01	CUSTOMER : M/s A.D.A., BANGALORE					
		APPROVED	18/9/01	GBX OIL-HYD OIL-FUEL COOLER (HE-2)					
		SCALE	NTS	GBX OIL SIDE BAR					
				WORK ORD. NO. 410139 12		NO. OFF 8			
				YR OF ORD	SIZE	DRAWING NO.		REV	
				1999	A4	RD-41013912-P-205		0	



NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH REQMT. IS 5 TO 10 MICRONS ON ALL SURFACES.

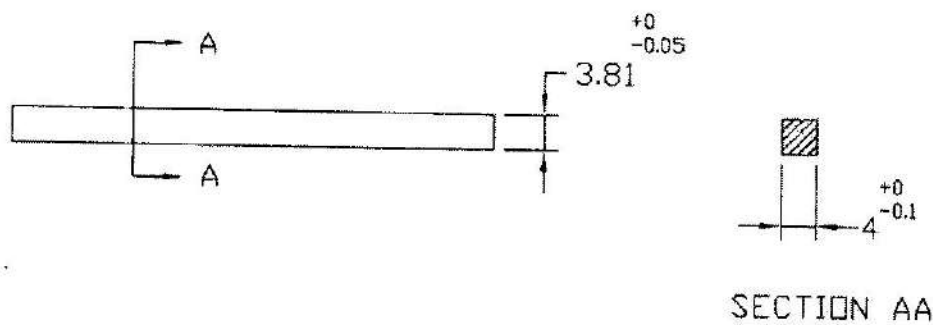
REF. DRG.		REV NO.		ZONE		BRIEF RECORD		PPD		CHD		APD	
RD-41013912-A-200													
QTY.	8 Nos	BHARAT HEAVY PLATE AND VESSELS LTD.											
ITEM No.	207	VISAKHAPATNAM - 530 012, INDIA											
MATL.	AA 3003-O/ BS 4L59	DRN.	CRS R.	RESEARCH & DEVELOPMENT									
			17-09-01	CUSTOMER : M/S A.D.A., BANGALORE									
		CHKI.	18/9/01	GBX OIL-HYD OIL-FUEL COOLER (HE-2)									
				U-SHAPED SIDE BAR-GBX									
NOTES:		APPROVED	18/9/01	WORK ORD. NO. 410139 12				NO. OFF 8					
1. DRAWING NOT TO BE SCALED		SCALE	NTS	YR OF ORD		SIZE		DRAWING NO.				REV	
2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.				1999		A4		RD-41013912-P-207				0	



NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH REQMT. IS 5 TO 10 MICRONS ON ALL SURFACES.

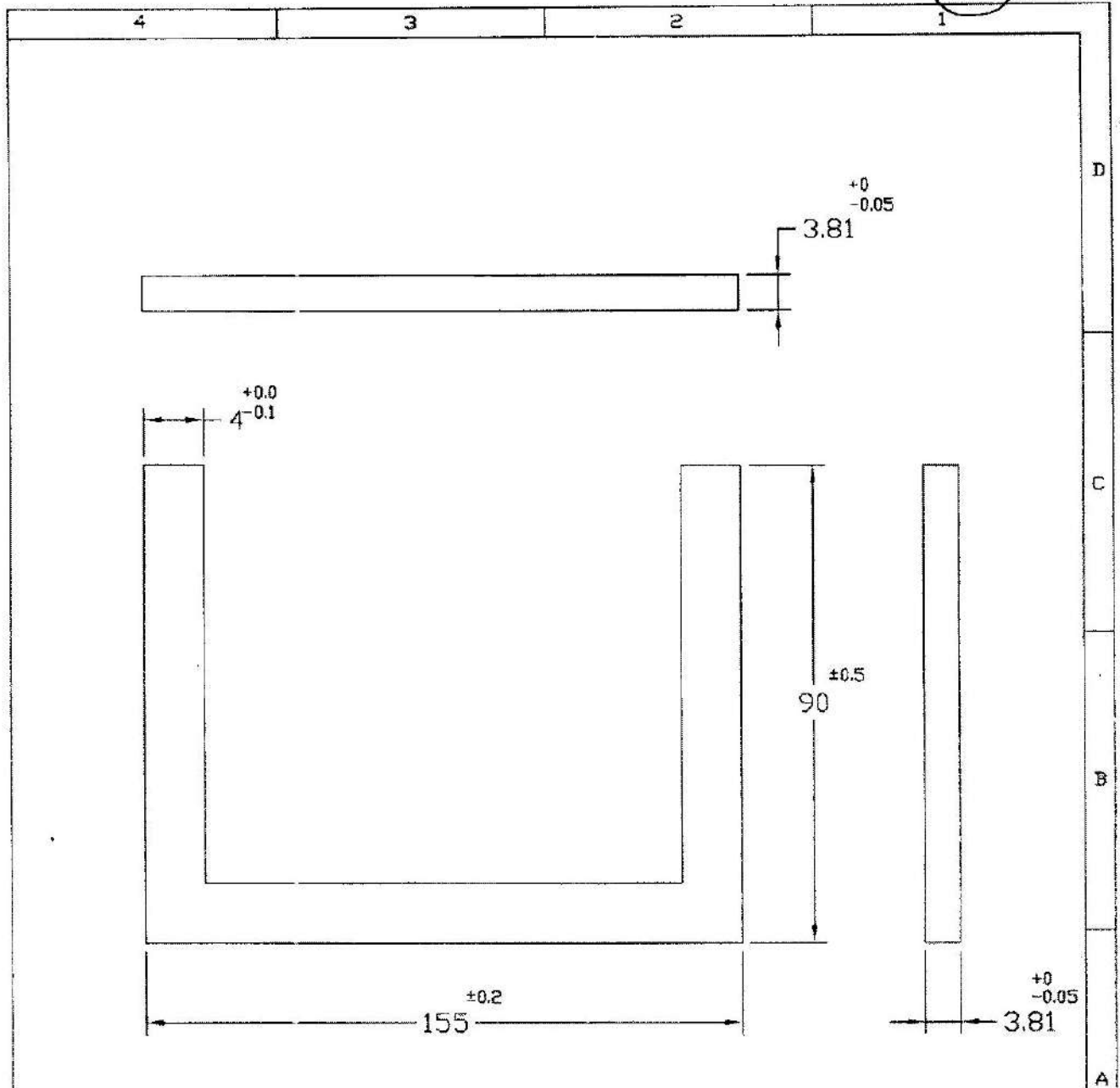
REF. DRG. RD-41013912-A-300		REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD
QTY.	12 Nos.	BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA					
ITEM No.	303						
MATL.	AA 3003-O7 BS 4L59	DRN.	17-09-01	RESEARCH & DEVELOPMENT			
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHKD.	18/9/01	CUSTOMER : M/s A.D.A., BANGALORE			
		APPROVED	18/9/01	GBX. OIL-HYD OIL-FUEL COOLER(HE-2)			
		SCALE	NTS	FUEL SIDE BAR-HYD			
		WORK ORD. NO. 410139 12 YR OF ORD 1999 SIZE A4 NO. OFF 8 DRAWING NO. RD-41013912-P-303 REV 0					



NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH REQMT. IS 5 TO 10 MICRONS ON ALL SURFACES.

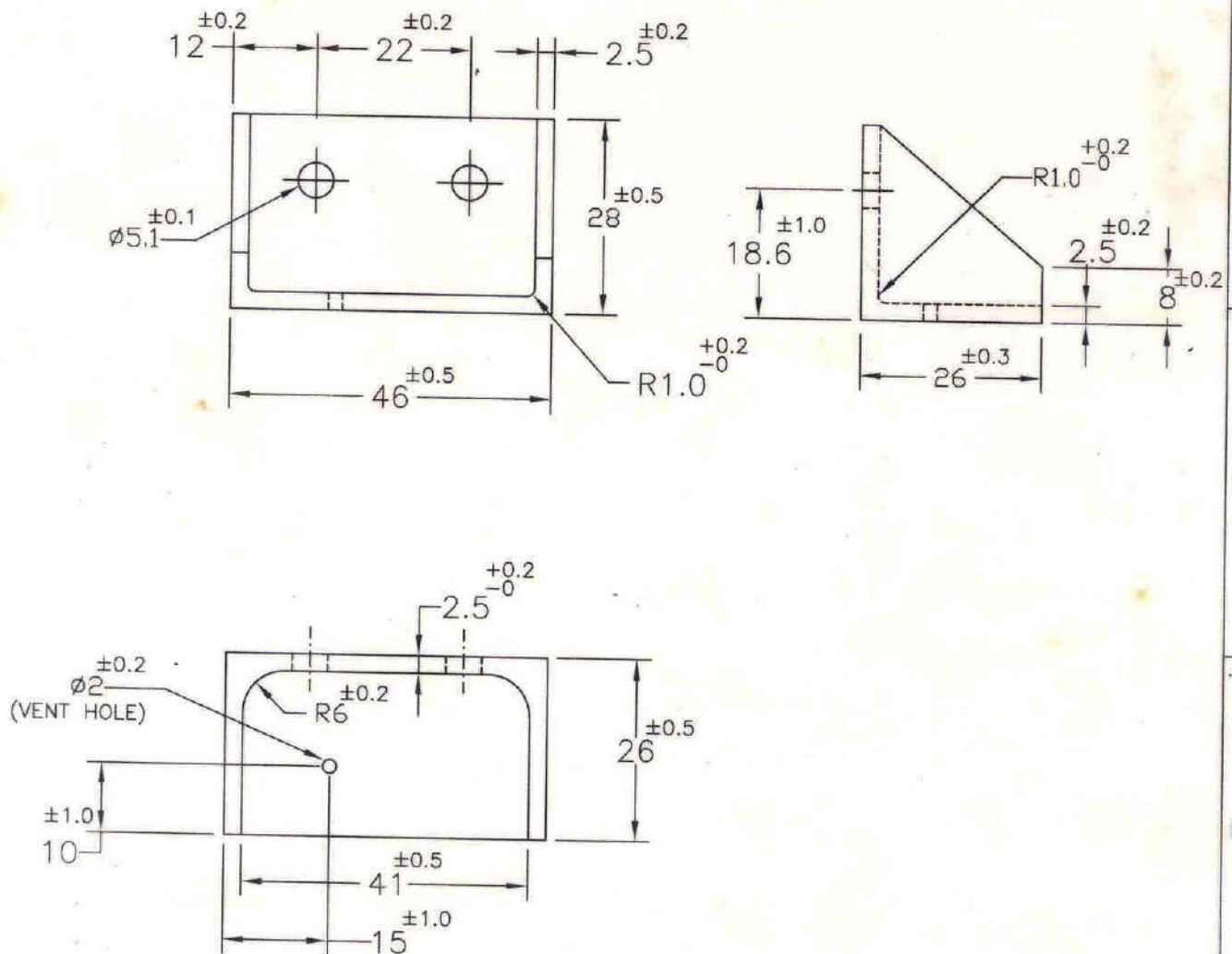
REF. DRG.		REV. NO.		ZONE		BRIEF RECORD		PPD		CHD		APD	
RD-41013912-A-300													
QTY.	5 Nos.	BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA											
ITEM No.	305												
MATL.	AA 3003-O/ BS 4159	DRN.	17-09-01			RESEARCH & DEVELOPMENT							
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHKD.	18/9/01			CUSTOMER : M/s A.D.A., BANGALORE							
		APPROVED	18/9/01			GBX OIL-HYD OIL-FUEL COOLER (HE-2)							
		SCALE	NTS			HYD OIL SIDE BAR							
					WORK ORD. NO. 410139 12		NO. OFF 8						
				YR OF ORD 1999		SIZE A4		DRAWING NO. RD-41013912-P-305		REV 0			



NOTES :

1. THE SIDE BARS SHOULD BE STRAIGHT/FLAT AND SHOULD BE FREE FROM BURRS AND SURFACE MARKS.
2. THE MAXIMUM DEVIATION ACCEPTABLE IN STRAIGHTNESS/FLATNESS IS 0.05 mm OVER THE ENTIRE LENGTH.
3. THE SURFACE FINISH REQMT. IS 5 TO 10 MICRONS ON ALL SURFACES.

REF. DRG. RD-41013912-A-300		REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD
QTY.	5 Nos.	BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA					
ITEM No.	307						
MATL.	AA 3003-O/ BS4L59	DRN.	RESEARCH & DEVELOPMENT				
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHKD.	CUSTOMER : M/s A.D.A., BANGALORE				
		APPROVED	GBX OIL-HYD OIL-FUEL COOLER (HE-2)				
		SCALE	U-SHAPED SIDE BAR-HYD				
			WORK ORD. NO. 410139 12		NO. OFF 8		
			YR OF ORD	SIZE	DRAWING NO.	REV	
		1999	A4	RD-41013912-P-307	0		



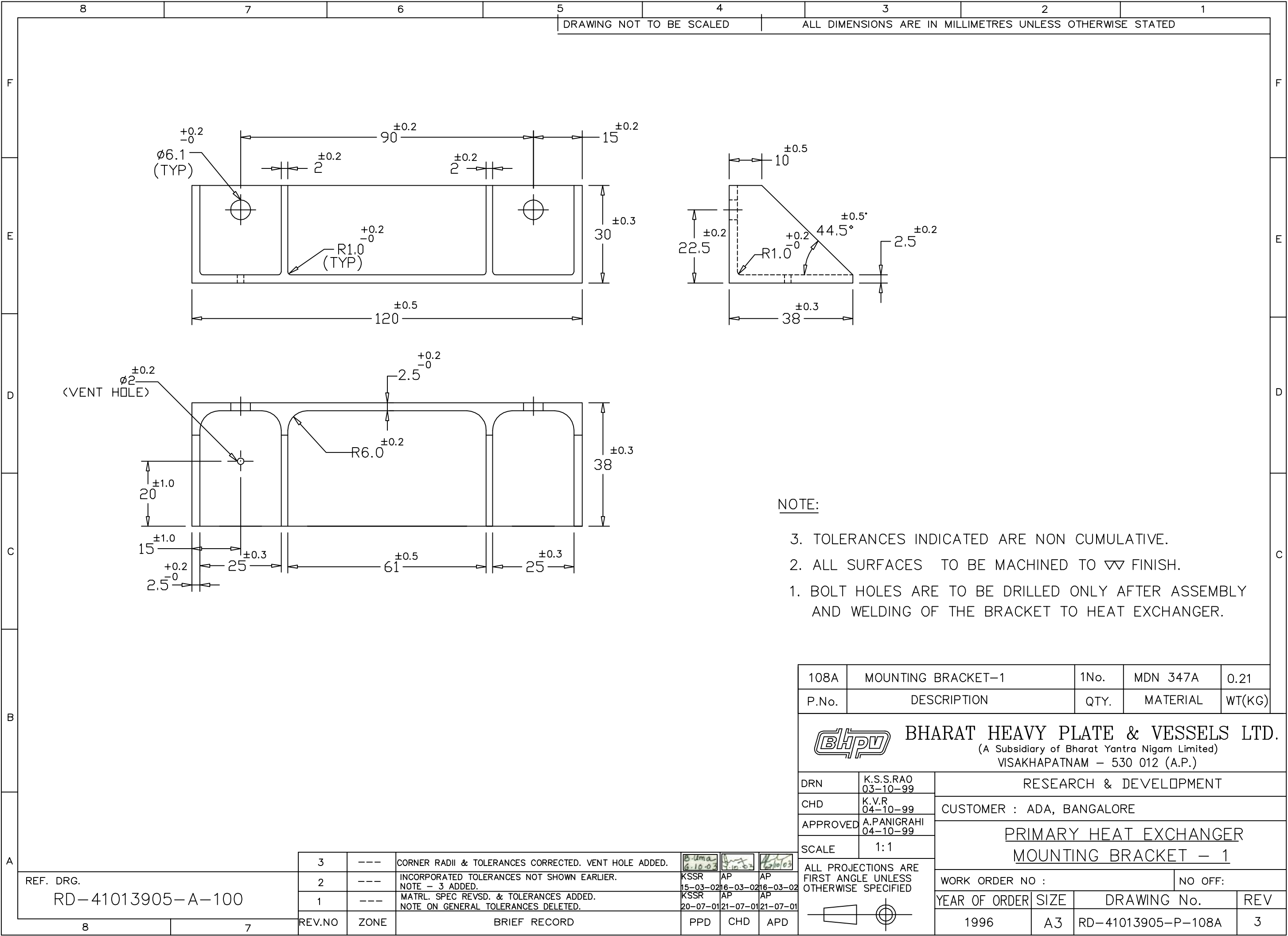
NOTE:

1. BOLT HOLES ARE TO BE DRILLED ONLY AFTER ASSEMBLY AND WELDING OF THE BRACKET TO HEAT EXCHANGER
2. ALL SURFACES TO BE MACHINED TO $\nabla\nabla$ FINISH.
3. TOLERANCES INDICATED ARE NON CUMULATIVE.

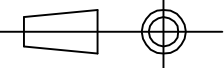
REF. DRG.							
RD-41015301-A-100		REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD
QTY.	2 NOS.	BHPV BHARAT HEAVY PLATE AND VESSELS LTD.					
PART NO.	108	VISAKHAPATNAM - 530 012, INDIA					
MATRL.	MDN347A	DRN	B.uma 28.03.05	RESEARCH & DEVELOPMENT			
NOTES: 1. DRAWING NOT TO BE SCALED. 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHD	Usha 29/03/05	CUSTOMER : ADA, BANGALORE			
		APPROVED	A 29/03/05	PRECOOLER MOUNTING BRACKET			
		SCALE	1:1	WORK ORD. NO.:	41015301	NO. OFF:	8
				YR OF ORD	2004	SIZE	A4
				DRAWING NO.	RD-41015301-P-108	REV	0

FORM NO. 0421/O

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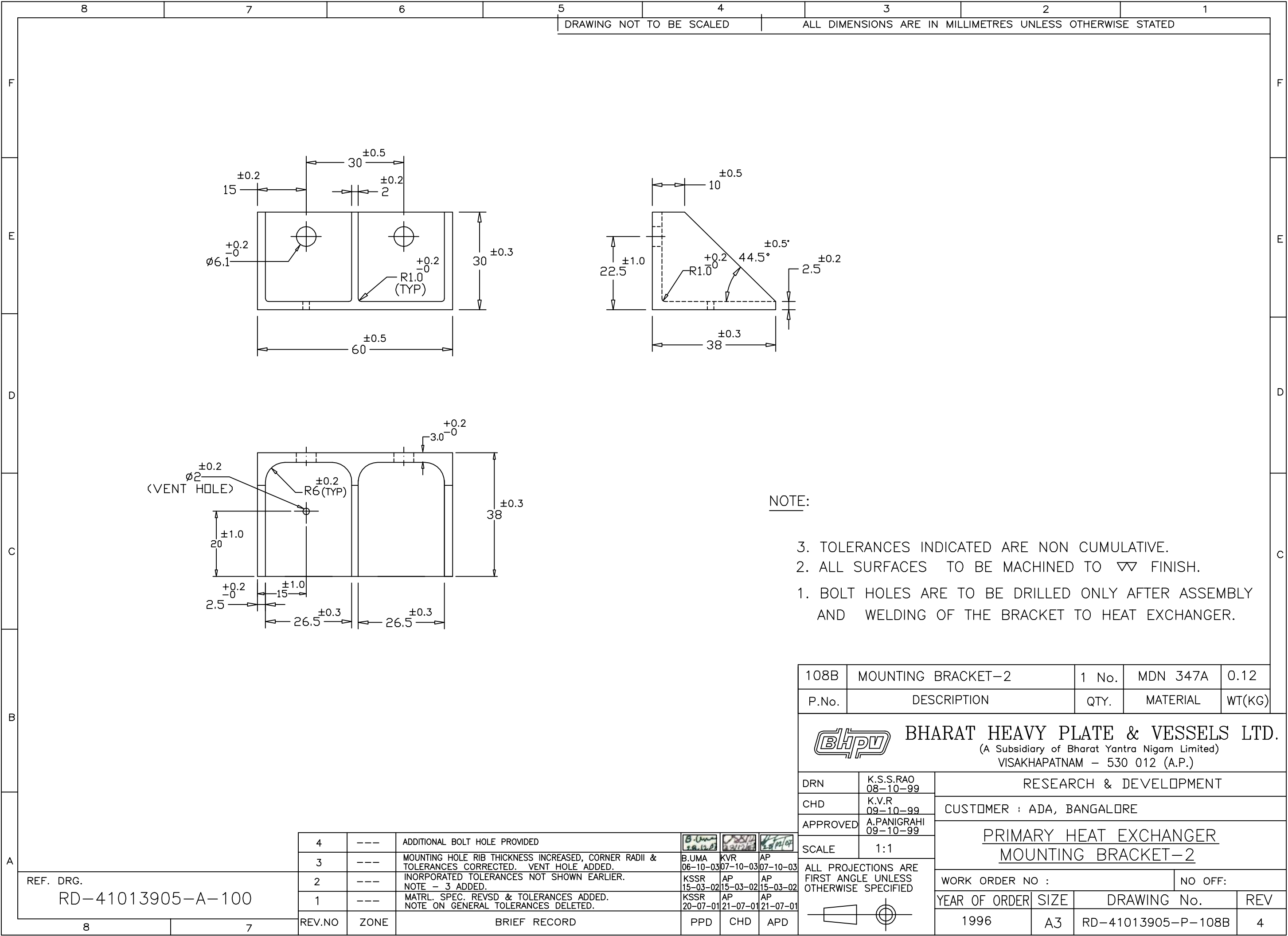
- NOTE:
- 3. TOLERANCES INDICATED ARE NON CUMULATIVE.
 - 2. ALL SURFACES TO BE MACHINED TO $\nabla \nabla$ FINISH.
 - 1. BOLT HOLES ARE TO BE DRILLED ONLY AFTER ASSEMBLY AND WELDING OF THE BRACKET TO HEAT EXCHANGER.

108A	MOUNTING BRACKET-1	1No.	MDN 347A	0.21
P.No.	DESCRIPTION	QTY.	MATERIAL	WT(KG)
 BHARAT HEAVY PLATE & VESSELS LTD. (A Subsidiary of Bharat Yantra Nigam Limited) VISAKHAPATNAM – 530 012 (A.P.)				
DRN	K.S.S.RAO 03-10-99	RESEARCH & DEVELOPMENT		
CHD	K.V.R 04-10-99	CUSTOMER : ADA, BANGALORE		
APPROVED	A.PANIGRAHI 04-10-99	PRIMARY HEAT EXCHANGER MOUNTING BRACKET – 1		
SCALE	1:1			
ALL PROJECTIONS ARE FIRST ANGLE UNLESS OTHERWISE SPECIFIED		WORK ORDER NO :		NO OFF:
		YEAR OF ORDER	SIZE	DRAWING No.
		1996	A3	RD-41013905-P-108A
				REV
				3

REF. DRG.		3	---	CORNER RADII & TOLERANCES CORRECTED. VENT HOLE ADDED.			
RD-41013905-A-100		2	---	INCORPORATED TOLERANCES NOT SHOWN EARLIER. NOTE - 3 ADDED.	KSSR	AP	AP
		1	---	MATRL. SPEC REVSD. & TOLERANCES ADDED. NOTE ON GENERAL TOLERANCES DELETED.	15-03-02	16-03-02	16-03-02
		REV.NO	ZONE	BRIEF RECORD	20-07-01	21-07-01	21-07-01
					PPD	CHD	APD

FORM NO. 0421/0

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NOTE:

- 3. TOLERANCES INDICATED ARE NON CUMULATIVE.
- 2. ALL SURFACES TO BE MACHINED TO $\nabla \nabla$ FINISH.
- 1. BOLT HOLES ARE TO BE DRILLED ONLY AFTER ASSEMBLY AND WELDING OF THE BRACKET TO HEAT EXCHANGER.

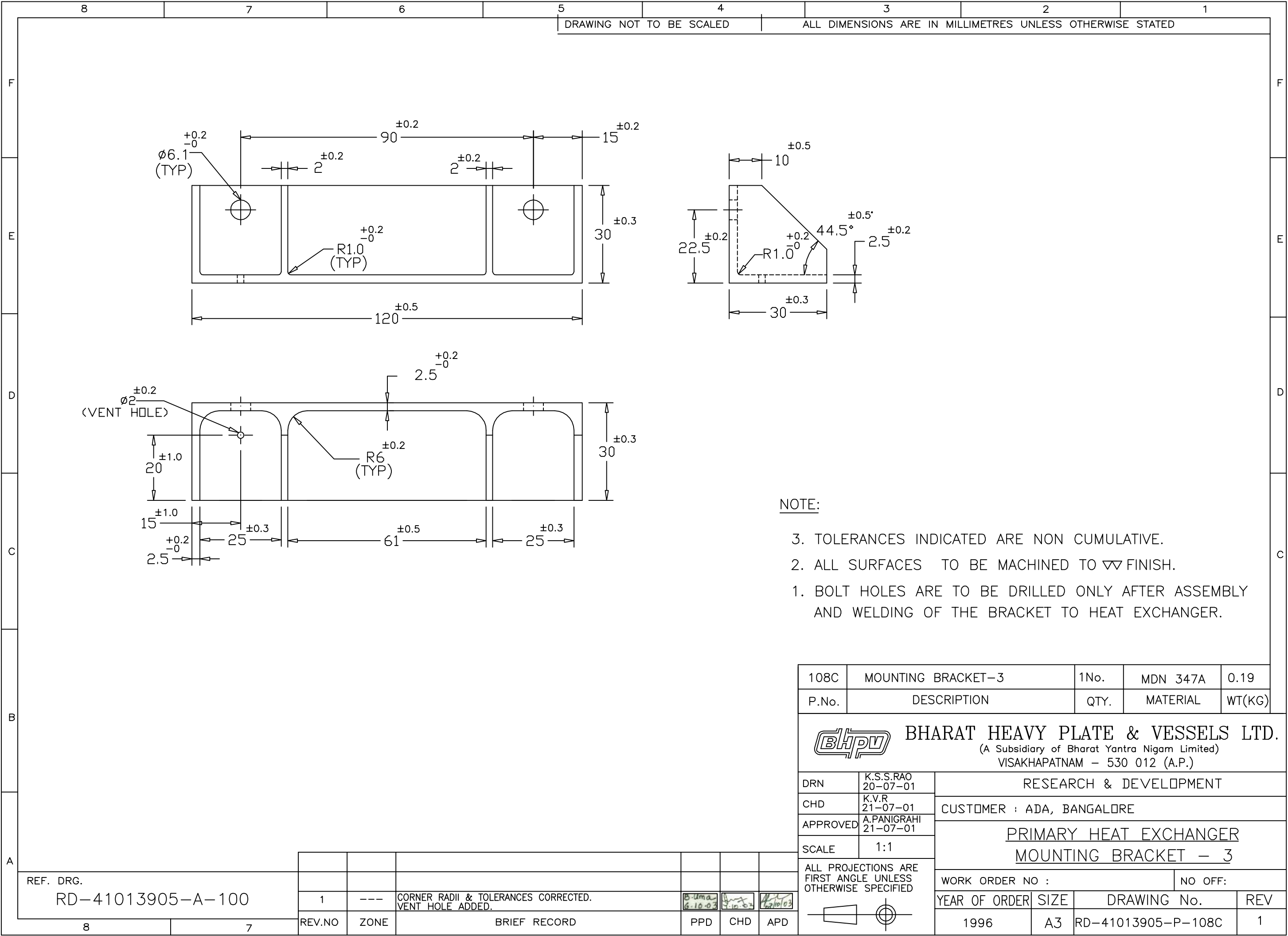
108B	MOUNTING BRACKET-2	1 No.	MDN 347A	0.12
P.No.	DESCRIPTION	QTY.	MATERIAL	WT(KG)
BHPV BHARAT HEAVY PLATE & VESSELS LTD. (A Subsidiary of Bharat Yantra Nigam Limited) VISAKHAPATNAM - 530 012 (A.P.)				
DRN	K.S.S.RAO 08-10-99	RESEARCH & DEVELOPMENT		
CHD	K.V.R 09-10-99	CUSTOMER : ADA, BANGALORE		
APPROVED	A.PANIGRAHI 09-10-99	PRIMARY HEAT EXCHANGER MOUNTING BRACKET-2		
SCALE	1:1	WORK ORDER NO : NO OFF:		
ALL PROJECTIONS ARE FIRST ANGLE UNLESS OTHERWISE SPECIFIED		YEAR OF ORDER	SIZE	DRAWING No.
		1996	A3	RD-41013905-P-108B

4	---	ADDITIONAL BOLT HOLE PROVIDED			
3	---	MOUNTING HOLE RIB THICKNESS INCREASED, CORNER RADII & TOLERANCES CORRECTED. VENT HOLE ADDED.	B.UMA 06-10-03	KVR 07-10-03	AP 07-10-03
2	---	INORPORATED TOLERANCES NOT SHOWN EARLIER. NOTE - 3 ADDED.	KSSR 15-03-02	AP 15-03-02	AP 15-03-02
1	---	MATRL. SPEC. REVSD & TOLERANCES ADDED. NOTE ON GENERAL TOLERANCES DELETED.	KSSR 20-07-01	AP 21-07-01	AP 21-07-01
REV.NO	ZONE	BRIEF RECORD	PPD	CHD	APD

REF. DRG.
RD-41013905-A-100

FORM NO. 0421/0

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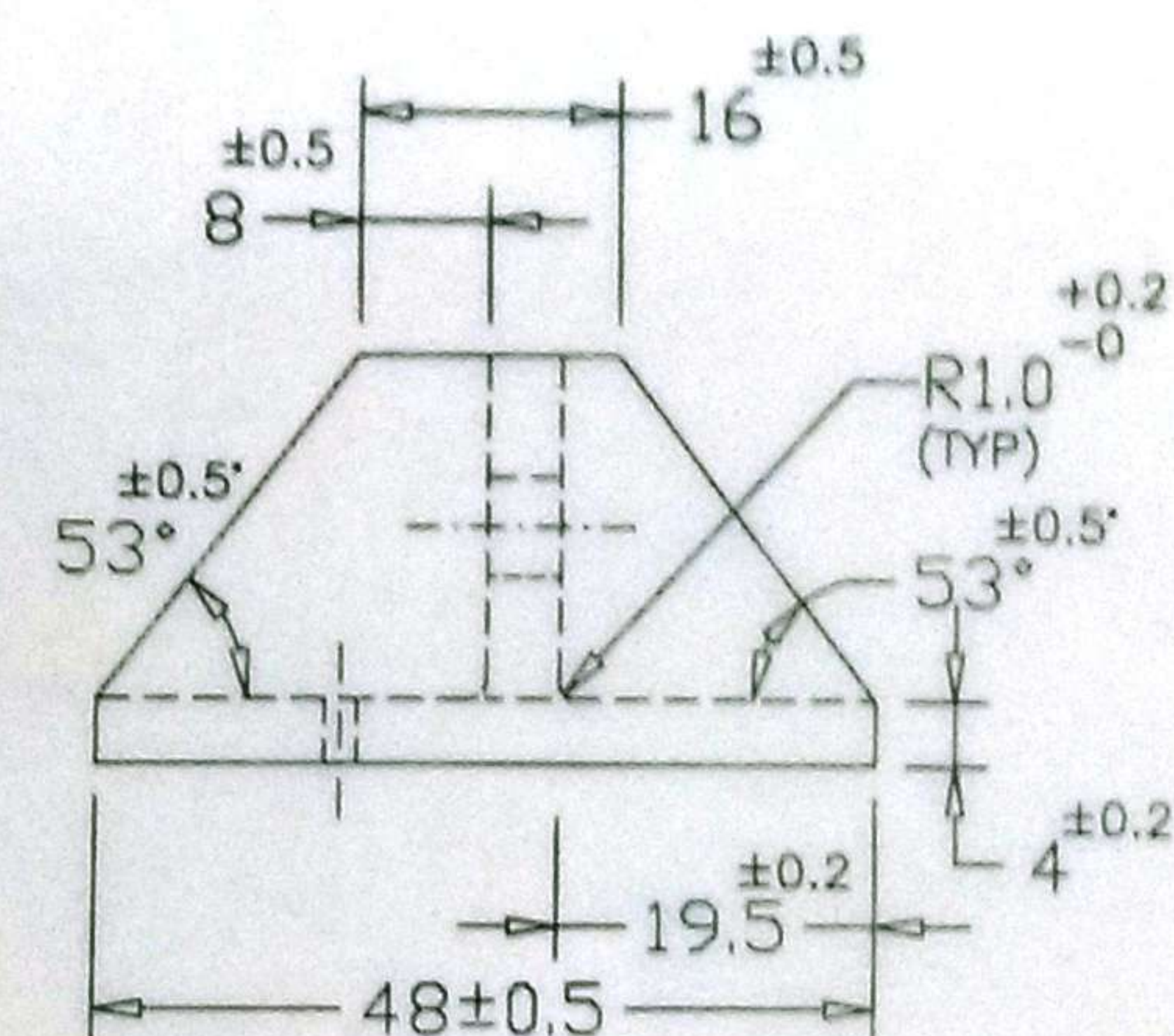


- NOTE:
- 3. TOLERANCES INDICATED ARE NON CUMULATIVE.
 - 2. ALL SURFACES TO BE MACHINED TO $\nabla\nabla$ FINISH.
 - 1. BOLT HOLES ARE TO BE DRILLED ONLY AFTER ASSEMBLY AND WELDING OF THE BRACKET TO HEAT EXCHANGER.

108C	MOUNTING BRACKET-3	1No.	MDN 347A	0.19
P.No.	DESCRIPTION	QTY.	MATERIAL	WT(KG)
BHARAT HEAVY PLATE & VESSELS LTD. (A Subsidiary of Bharat Yantra Nigam Limited) VISAKHAPATNAM - 530 012 (A.P.)				
DRN	K.S.S.RAO 20-07-01	RESEARCH & DEVELOPMENT		
CHD	K.V.R 21-07-01	CUSTOMER : ADA, BANGALORE		
APPROVED	A.PANIGRAHI 21-07-01	PRIMARY HEAT EXCHANGER MOUNTING BRACKET - 3		
SCALE	1:1	WORK ORDER NO : NO OFF:		
ALL PROJECTIONS ARE FIRST ANGLE UNLESS OTHERWISE SPECIFIED		YEAR OF ORDER	SIZE	DRAWING No.
		1996	A3	RD-41013905-P-108C
				REV
				1

REF. DRG.
RD-41013905-A-100

1	---	CORNER RADII & TOLERANCES CORRECTED. VENT HOLE ADDED.			
REV.NO	ZONE	BRIEF RECORD	PPD	CHD	APD



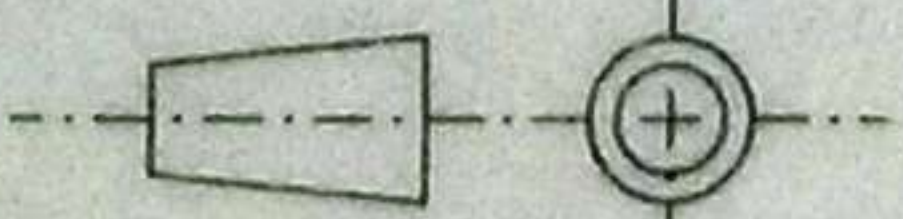
1. BOLT HOLES ARE TO BE DRILLED ONLY AFTER ASSEMBLY AND WELDING OF THE BRACKET TO HEAT EXCHANGER.
2. ALL SURFACES TO BE MACHINED TO $\nabla\nabla$ FINISH.
3. TOLERANCES INDICATED ARE NON-CUMULATIVE
4. ALL SHARP CORNERS SHALL BE ROUNDED OFF.

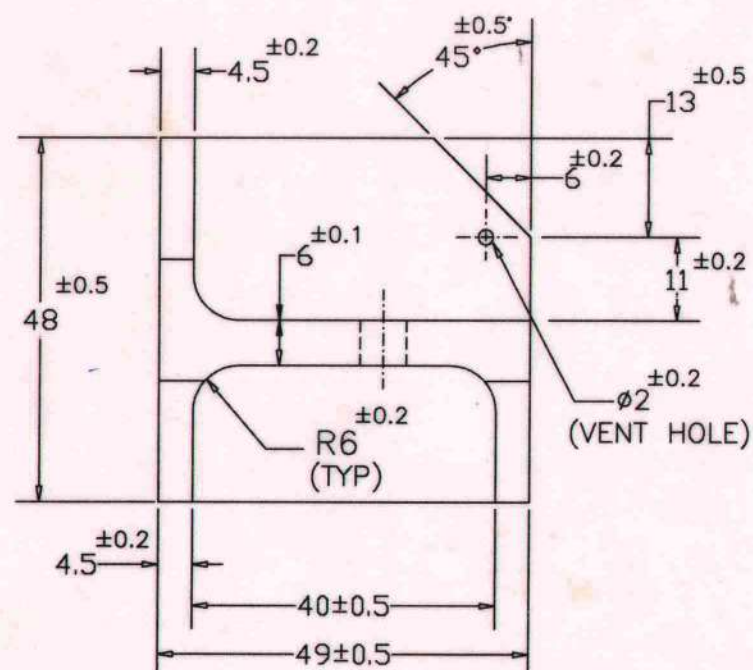
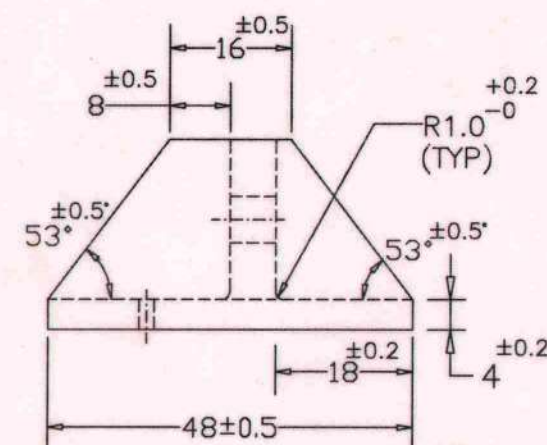
112	MOUNTING BRACKET-1	2	AA 5086	0.21
P.No.	DESCRIPTION	QTY. (NOS)	MATERIAL	WT(KG)

ВНРУ

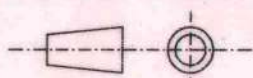
BHARAT HEAVY PLATE & VESSELS LTD.

(A Subsidiary of Bharat Yantra Nigam Limited)
VISAKHAPATNAM - 530 012 (A.P.)

DRN	B.U.A 03-10-99	RESEARCH & DEVELOPMENT		
CHD	K.P.P.RAO 04-10-99	CUSTOMER : ADA, BANGALORE		
APPROVED	A.P.A.P.S.RAO 04-10-99	SECONDARY HEAT EXCHANGER		
SCALE	1 : 1	MOUNTING BRACKET-1		
ALL PROJECTIONS ARE FIRST ANGLE UNLESS OTHERWISE SPECIFIED		WORK ORDER NO :	NO OFF:	
		YEAR OF ORDER	SIZE	DRAWING No.
			A3	RD-41011201-P-112
				REV
				4



1. BOLT HOLES TO BE DRILLED ONLY AFTER ASSEMBLY AND WELDING OF THE BRACKET TO HEAT EXCHANGER.
2. ALL SURFACES TO BE MACHINED TO $\nabla\nabla$ FINISH.
3. TOLERANCES INDICATED ARE NON-CUMULATIVE.
4. ALL SHARP CORNERS SHALL BE ROUNDED OFF.

DRN	B.U.M.A 04-10-99	RESEARCH & DEVELOPMENT			
CHD	K.S.S.RAO 04-10-99	CUSTOMER : ADA, BANGALORE			
APPROVED	A.PANPURA 04-10-99	SECONDARY HEAT EXCHANGER			
SCALE	1 : 1	MOUNTING BRACKET - 2			
ALL PROJECTIONS ARE FIRST ANGLE UNLESS OTHERWISE SPECIFIED 		WORK ORDER NO : 41011201		NO OFF: 543	
		YEAR OF ORDER	SIZE	DRAWING No.	REV
			A3	RD-41011201-P-113	5

5	---	BRACKET HEIGHT, MOUNTING HOLE DISTANCE MODIFIED.	B.uma 01.06.04	CSSD: 01/06/04	H.C. 06/06/04
4	---	RIB THICKNESSES INCREASED, CORNER RADII & TOLERANCES CORRECTED. VENT HOLE ADDED.	B.UMA 19.07.03	KVR 19.07.03	AP 19.07.03
3	---	ONE RIB REMOVED & 13 x 45° CUT INCORPORATED	B.UMA 06.11.02	KVR 07.11.02	AP 07.11.02
2	---	TOLERANCES CORRECTED, NOTE : 3 CHANGED.	KSSR 03.04.02	KVR 03.04.02	AP 04.04.02
1	E6	Ø6.5 MOUNTING HOLE SHIFTED BY 2.25 mm	KSSR 22.10.00	AP 23.10.00	AP 23.10.00
REV.NO	ZONE	BRIEF RECORD	PPD	CHD	APD

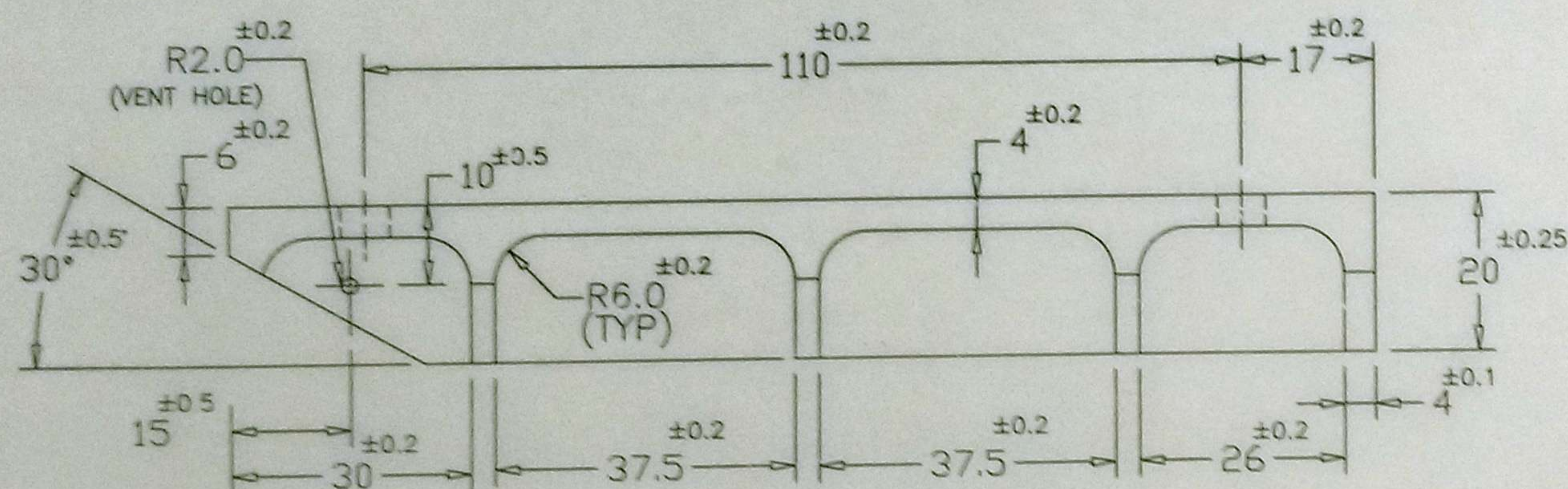
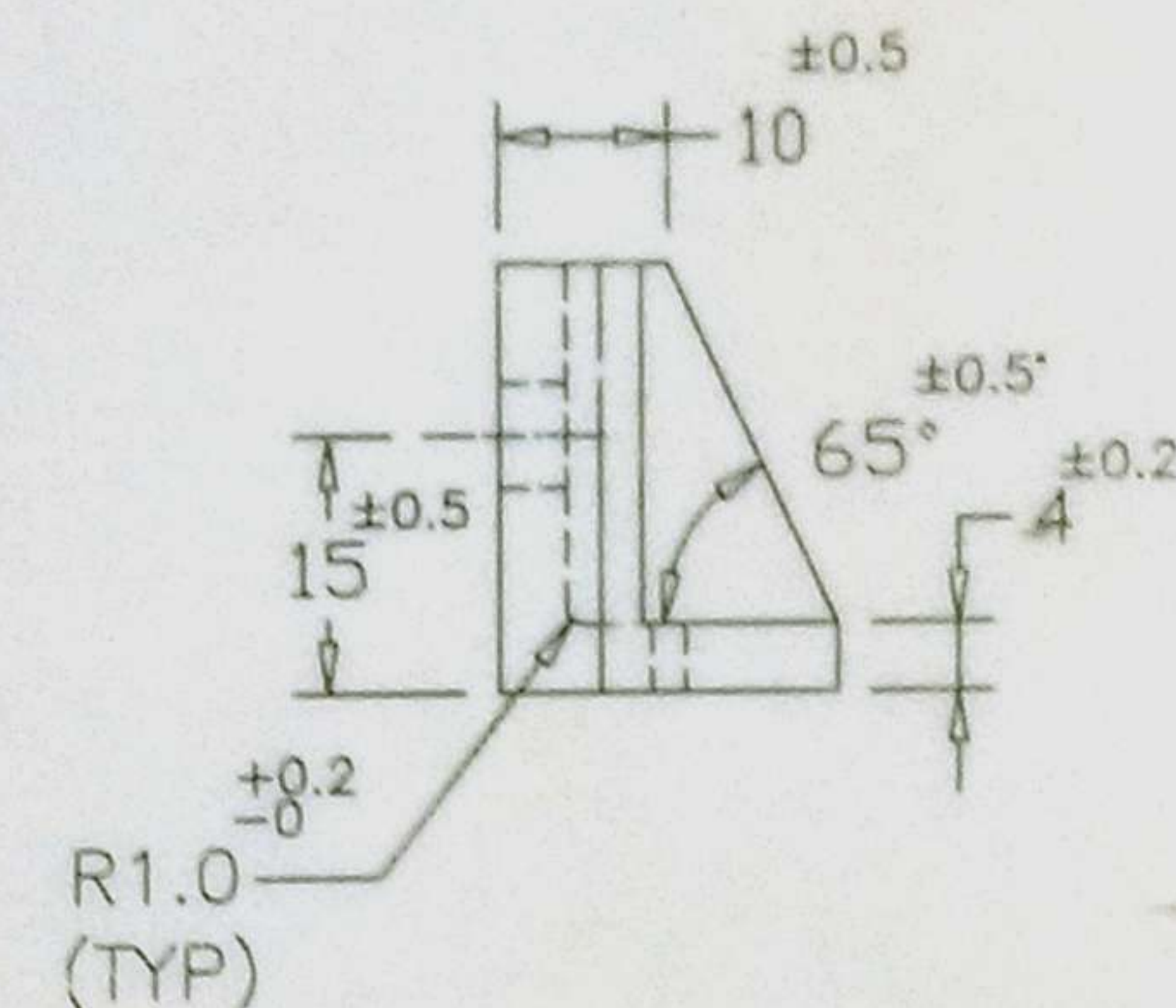
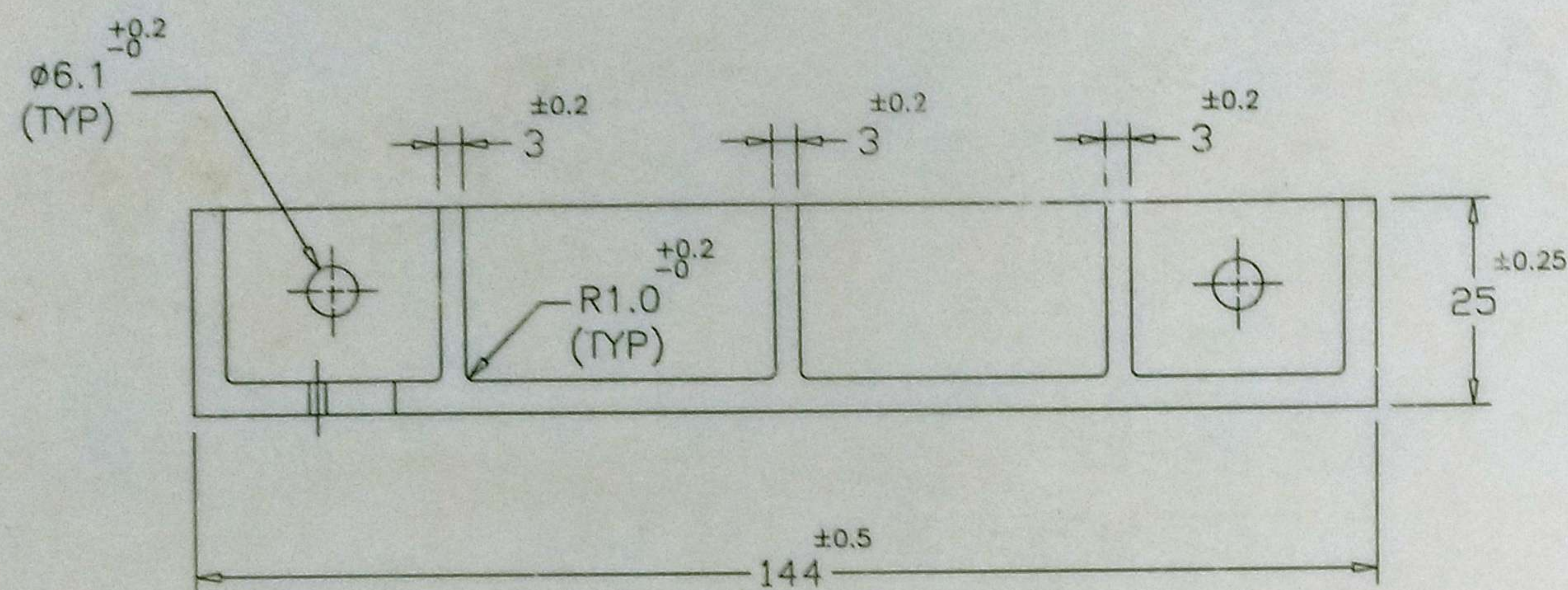
RD-41011201-A-100

FORM NO. 0471/0

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DRAWING NOT TO BE SCALED

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED



NOTES:

1. BOLT HOLES ARE TO BE DRILLED ONLY AFTER ASSEMBLY AND WELDING OF THE BRACKET TO HEAT EXCHANGER.
2. ALL SURFACES TO BE MACHINED TO $\nabla\nabla$ FINISH.
3. TOLERANCES INDICATED ARE NON CUMULATIVE
4. ALL SHARP CORNERS SHALL BE ROUNDED OFF.

110	MOUNTING BRACKET	2	AA 5086	0.15
P.No.	DESCRIPTION	QTY. (NOS)	MATERIAL	WT(KG)



BHARAT HEAVY PLATE & VESSELS LTD.

(A Subsidiary of Bharat Yatra Nigam Limited)

VISAKHAPATNAM - 530 012 (A.P.)

DRN	SLM	RESEARCH & DEVELOPMENT		
CHD	KSSRAD	CUSTOMER : ADA, BANGALORE		
APPROVED	APANIGRAH	REHEATER		
SCALE	1:1	MOUNTING BRACKET		
ALL PROJECTIONS ARE FIRST ANGLE UNLESS OTHERWISE SPECIFIED		WORK ORDER NO. : NO OFF		
YEAR OF ORDER		SIZE	DRAWING No.	REV
1999		A3	RD-41013909-P-110	3

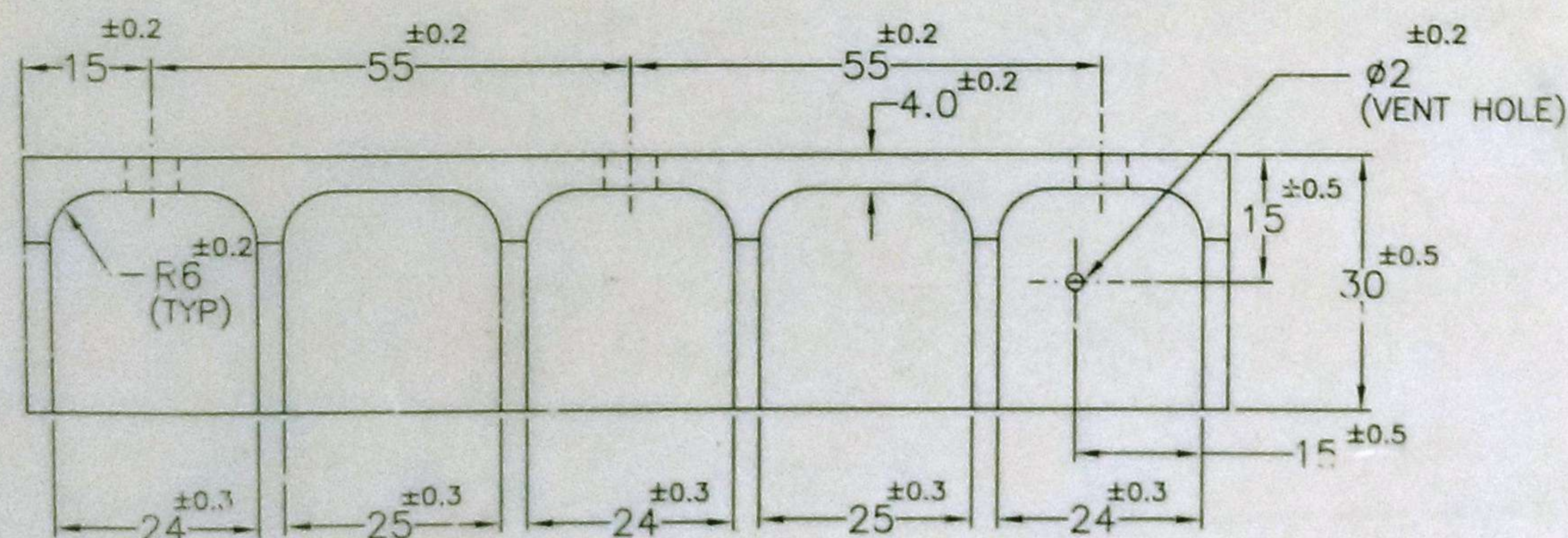
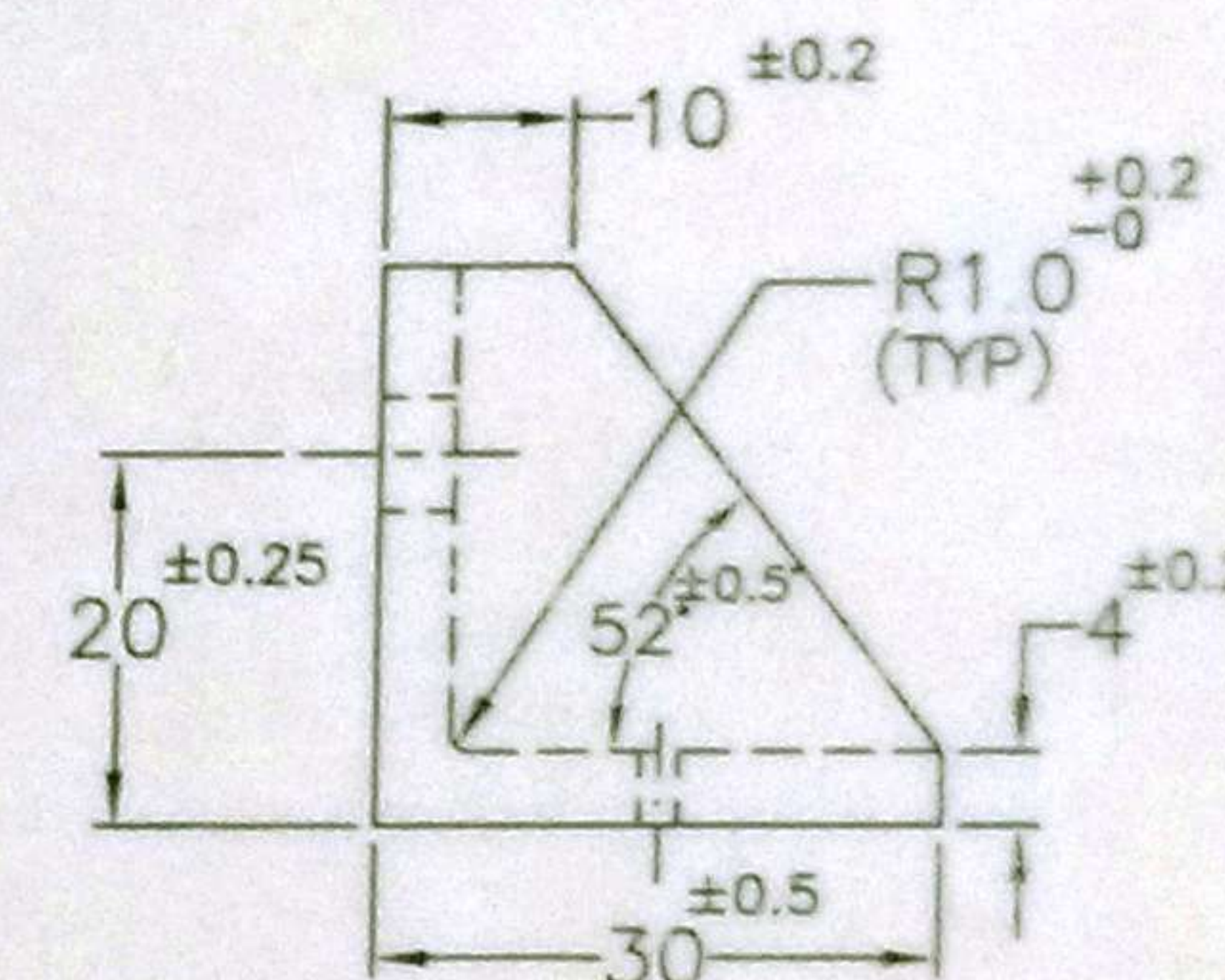
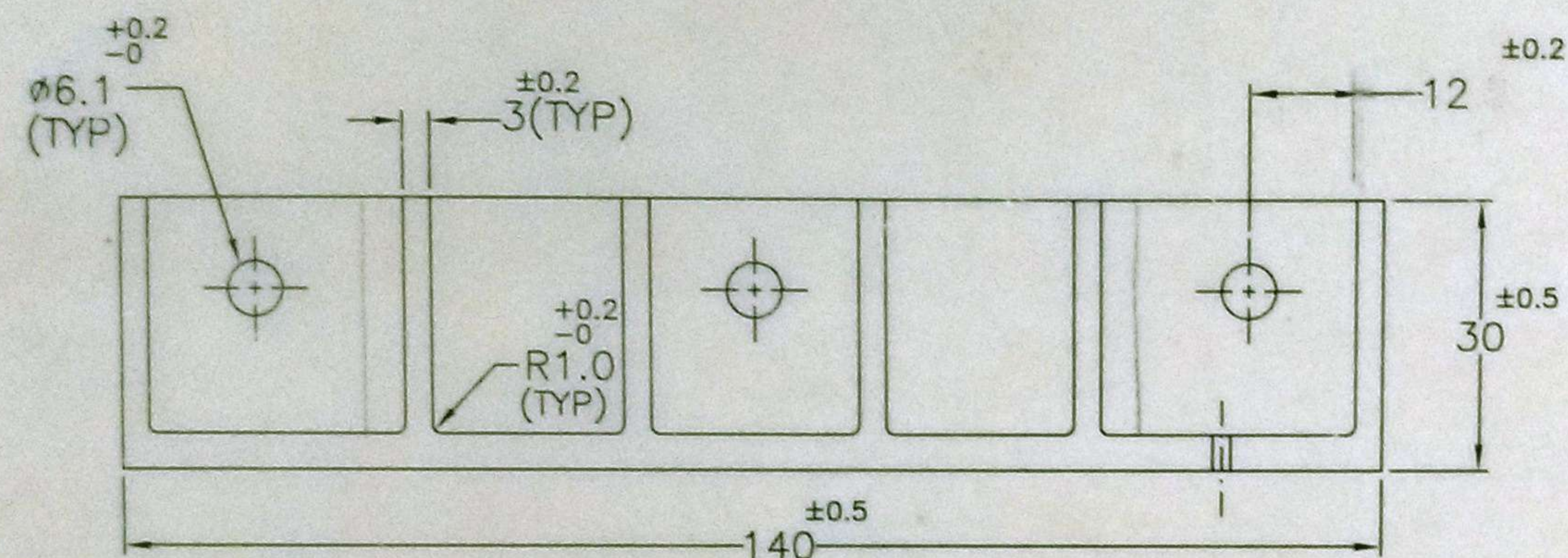
REF. DRG.

RD-41013909-A-100

3	---	LENGTH REDUCED TO 144 MM, THIRD MOUNTING HOLE REMOVED, CORNER RADII CORRECTED AND VENT HOLE ADDED.	18-07-99	KVR	AP
2	---	LENGTH EXTENDED TO 189 MM & THIRD MOUNTING HOLE PROVIDED	18-10-99	KVR	AP
1	---	TOLERANCES INCORPORATED	12-04-99	KVR	AP
REV.NO	ZONE	BRIEF RECORD	PPD	CHD	APD

DRAWING NOT TO BE SCALED

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED



NOTE:

1. BOLT HOLES ARE TO BE DRILLED ONLY AFTER ASSEMBLY AND WELDING OF THE BRACKET TO HEAT EXCHANGER.
2. ALL SURFACES TO BE MACHINED TO $\nabla \nabla$ FINISH.
3. TOLERANCES ARE NON CUMULATIVE.
4. ALL SHARP CORNERS SHALL BE ROUNDED OFF.

105	MOUNTING BRACKET	2	AA 5086	0.22
P.No.	DESCRIPTION	QTY (NOS)	MATERIAL	WT(KG)



BHARAT HEAVY PLATE & VESSELS LTD.

(A Subsidiary of Bharat Yantra Nigam Limited)
VISAKHAPATNAM - 530 012 (A.P.)

DRN	B.UMA 18-10-99	RESEARCH & DEVELOPMENT		
CHD	K.S.S.RAO 18-10-99	CUSTOMER : ADA, BANGALORE		
APPROVED	A.PANIGRAHI 18-10-99	CONDENSER MOUNTING BRACKET		
SCALE	1:1	WORK ORDER NO : _____ NO. OFF: _____		
ALL PROJECTIONS ARE FIRST ANGLE UNLESS OTHERWISE SPECIFIED		YEAR OF ORDER	SIZE	DRAWING No.
		1996	A3	RD-41013907-P-105
				REV
				2

REF. DRG.

RD-41013907-A-100

2

CORNER RADII AND TOLERANCES CORRECTED.
VENT HOLE ADDED.

1

INCORPORATED TOLERANCES & DETAILS NOT SHOWN EARLIER

REV.NO

ZONE

BRIEF RECORD

B.UMA

18-10-99

K.S.S.RAO

18-10-99

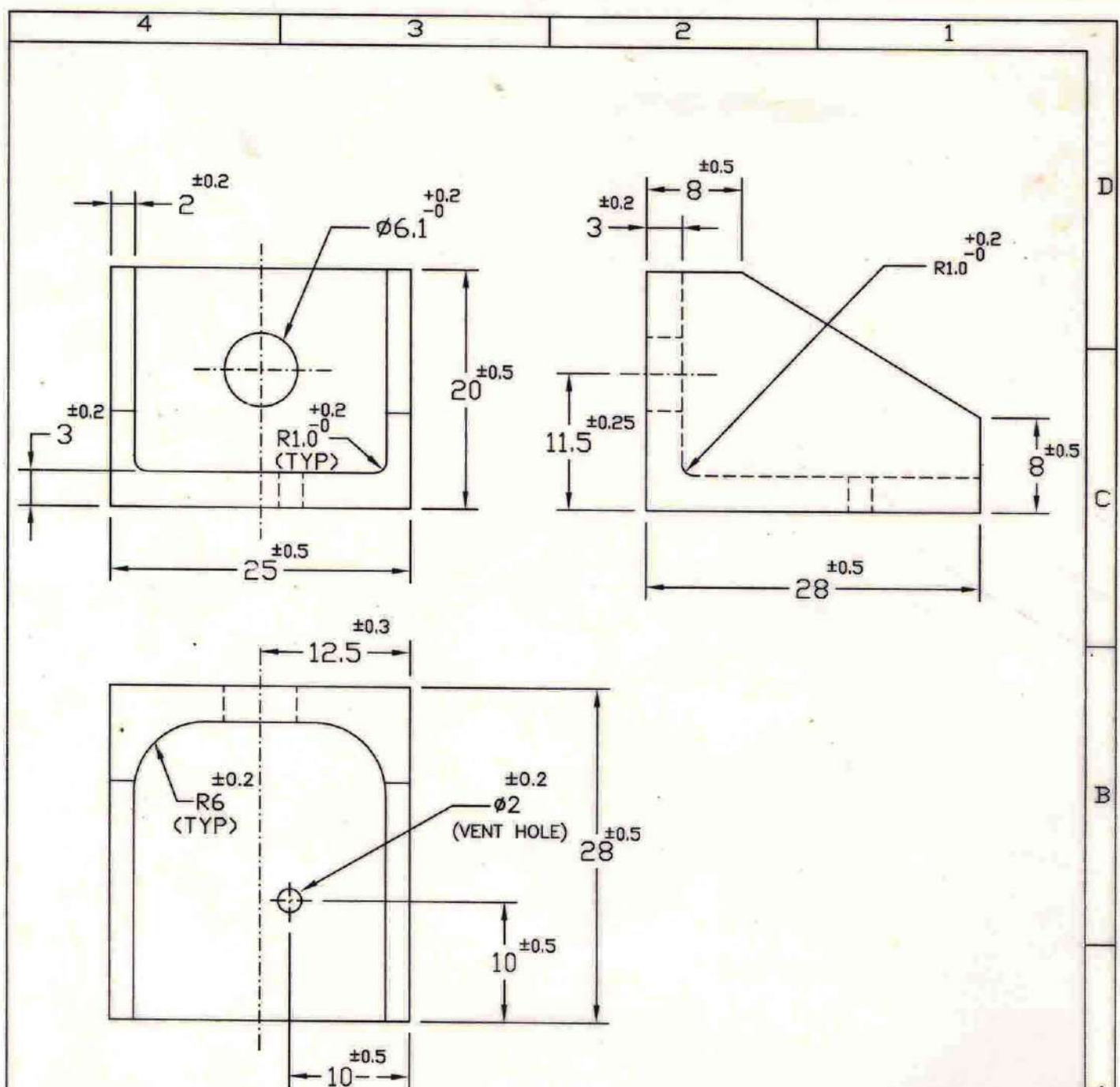
A.PANIGRAHI

18-10-99

PPD

CHD

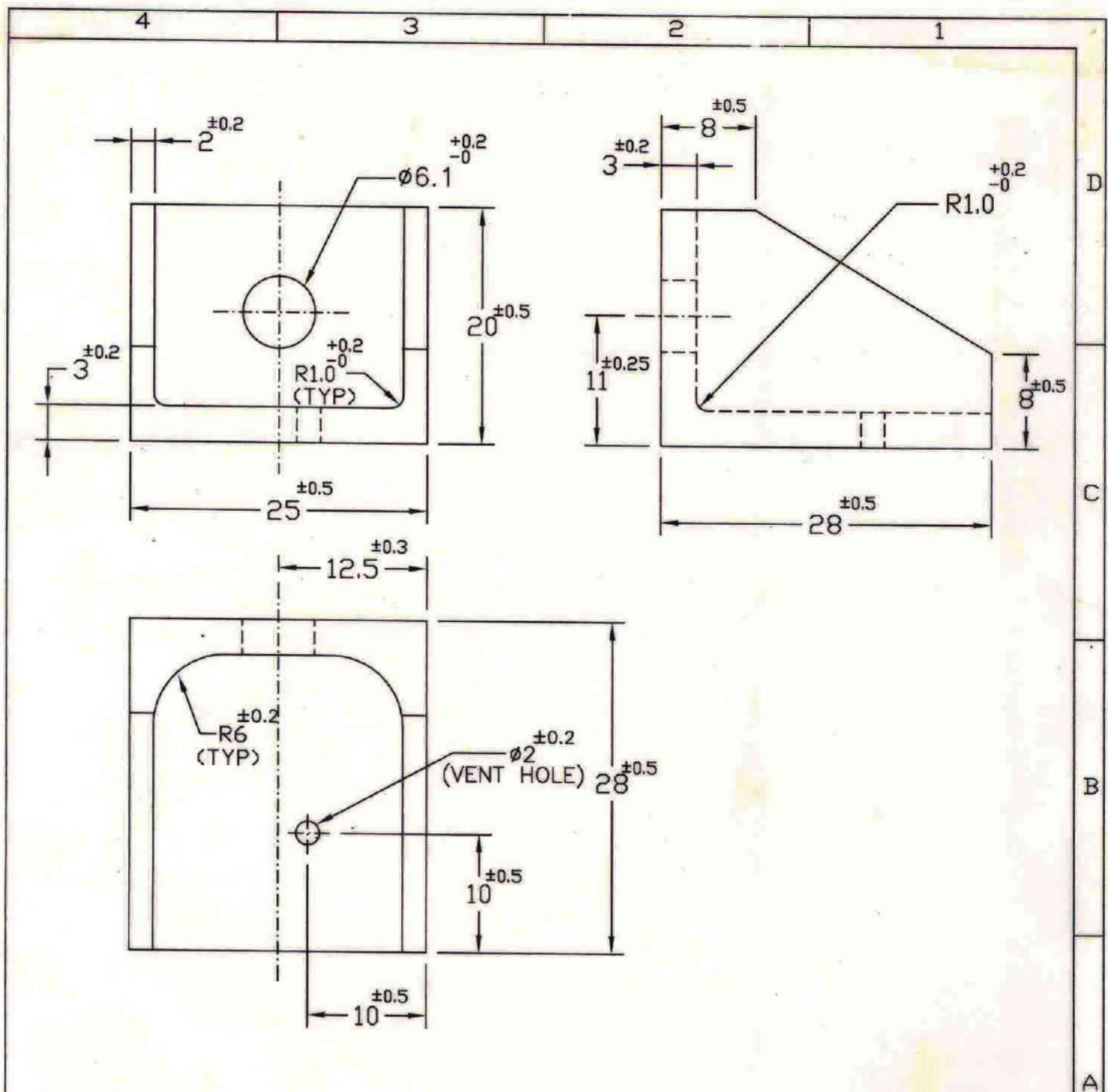
APD



NOTES :

1. BOLT HOLES ARE TO BE DRILLED ONLY AFTER ASSEMBLY AND WELDING OF THE BRACKET TO HEAT EXCHANGER.
2. ALL SURFACES TO BE MACHINED TO ∇ FINISH.
3. TOLERANCES INDICATED ARE NON CUMULATIVE.
4. ALL SHARP CORNERS SHALL BE ROUNDED OFF.

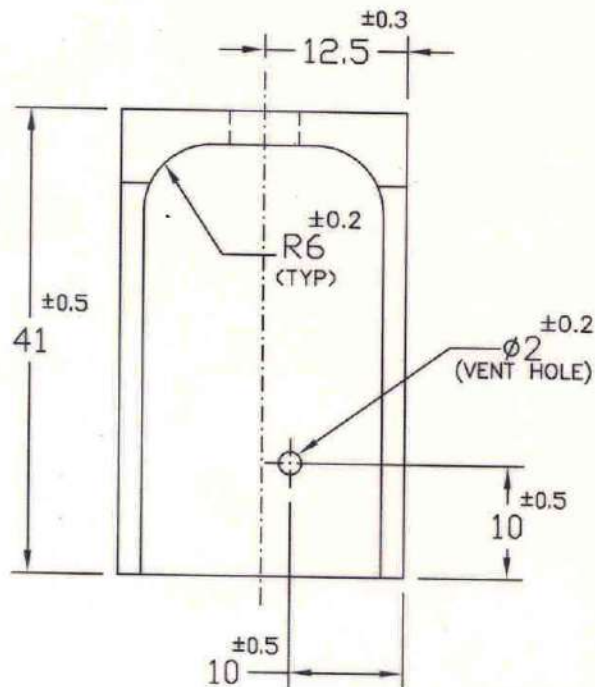
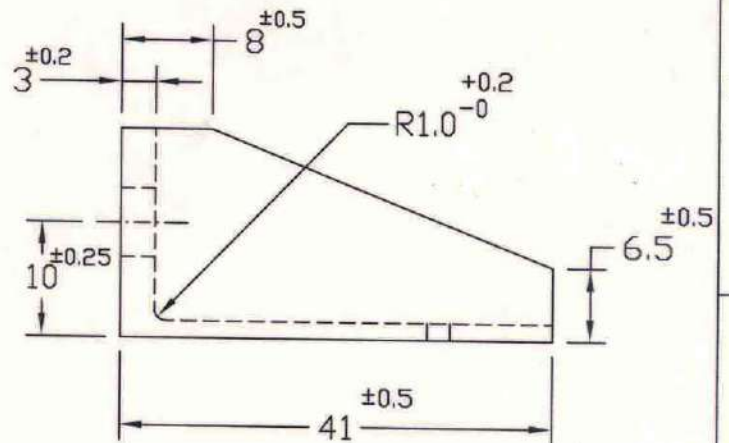
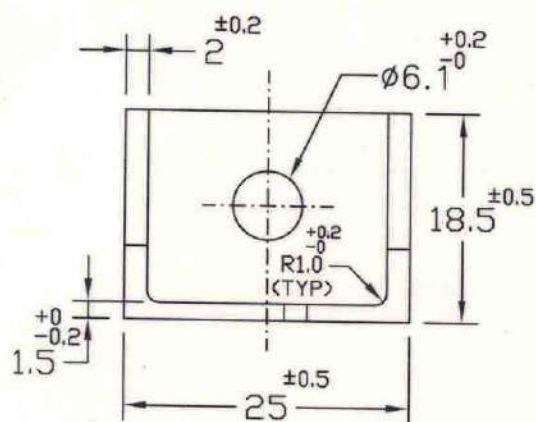
REF. DRG.	2	---	CORNER RADII CORRECTED, VENT HOLE ADDED.	CSN	11-11-03	11-11-03
	1	A-2	REF.DRG ADDED & NOTE 2 DELETED	KSSR	17-09-01	18-09-01
RD-41013911-A-100	REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD
QTY.	2 NOS.	BHARAT HEAVY PLATE AND VESSELS LTD.				
PART No.	112	VISAKHAPATNAM - 530 012, INDIA				
MATRL.	AA 5086	DRN	KYRRAO 05-07-99	RESEARCH & DEVELOPMENT		
NOTES :		CHD	KVRMURTHY 06-07-99	CUSTOMER : ADA, BANGALORE		
		APPROVED	A.P. ANTSRAN 20-07-99	HYD.OIL-IDG OIL-FUEL COOLER(HE-1)		
		SCALE	2 : 1	BRACKET- HYD SIDE		
				WORK ORD. NO.:	41013911	NO. OFF: 3
				YR OF ORD	SIZE	DRAWING NO.
				1999	A4	RD-41013911-P-112
						REV
						2



NOTES :

1. BOLT HOLES ARE TO BE DRILLED ONLY AFTER ASSEMBLY AND WELDING OF THE BRACKET TO HEAT EXCHANGER.
2. ALL SURFACES TO BE MACHINED TO $\nabla\nabla$ FINISH.
3. TOLERANCES INDICATED ARE NON CUMULATIVE.
4. ALL SHARP CORNERS SHALL BE ROUNDED OFF.

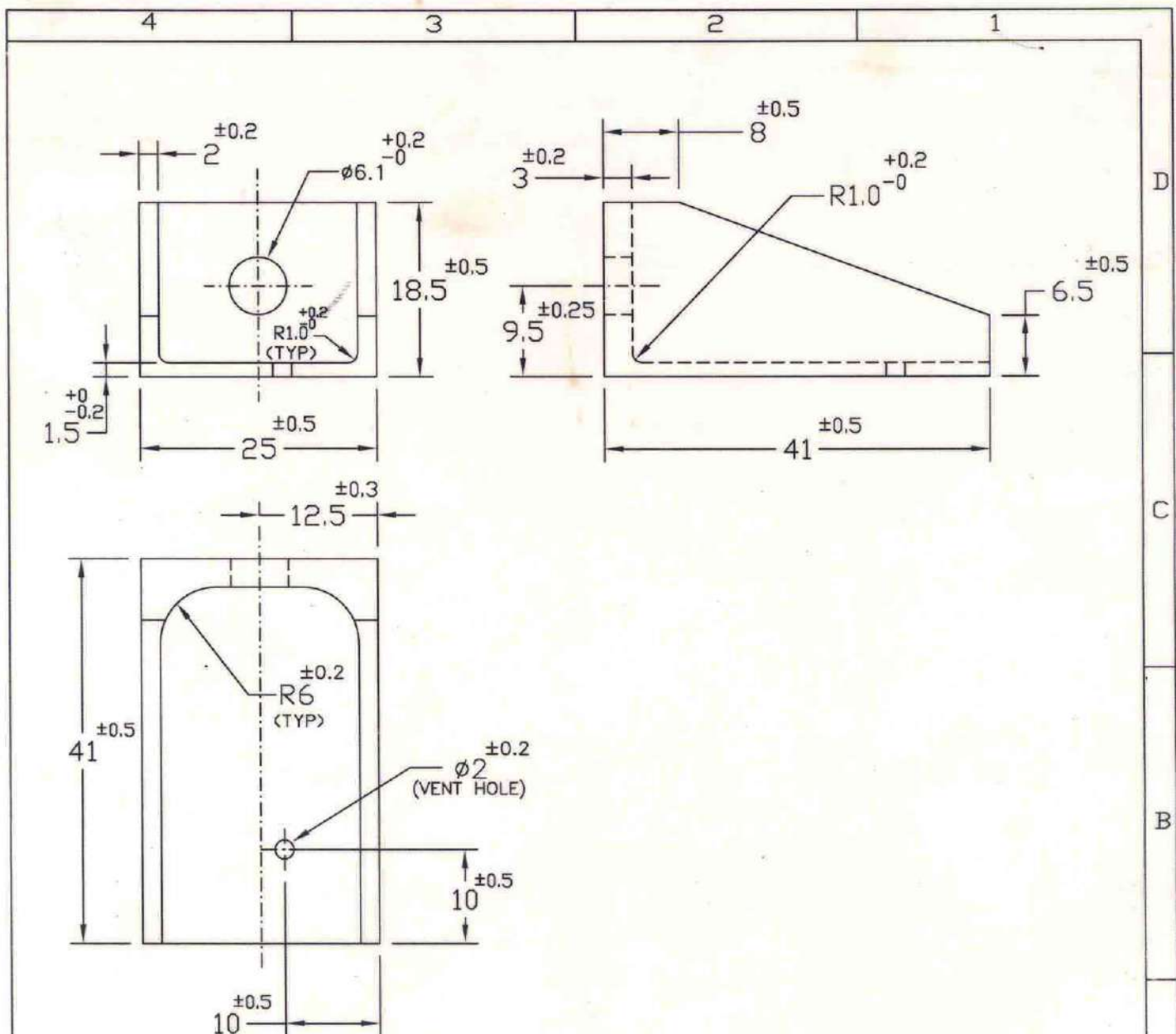
REF. DRG. RD-41013911-A-100		3	---	CORNER RADII CORRECTED, VENT HOLE ADDED.	11-4-03	11/11/03	11/11/03
		2	---	TOLERANCES ADDED & NOTE:2 DELETED	KSSR 17-09-01	KVR 18-09-01	AP 18-09-01
		1	C-2,C-3	BRAC.HT & HOLE HT. CHANGED	KSSR 18-09-99	AP 20-09-99	AP 20-09-99
		REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD
QTY.		1 NO.		BHPU BHARAT HEAVY PLATE AND VESSELS LTD.			
PART No.		113		VISAKHAPATNAM - 530 012, INDIA			
MATRL.		AA 5086		RESEARCH & DEVELOPMENT			
NOTES : 1. DRAWING NOT TO BE SCALED. 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		DRN	KSSRAO 05-07-99	CUSTOMER : ADA,BANGALORE			
		CHD	KVRMURTHY 06-07-99	HYD OIL-IDG OIL- FUEL COOLER (HE-1) BRACKET - IDG SIDE			
		APPROVED	A.PANFRAH 20-07-99	WORK ORD. NO.: 41013911		NO. OFF: 8	
		SCALE	2 : 1	YR OF ORD	SIZE	DRAWING NO.	REV
				1999	A4	RD-41013911-P-113	3



NOTES :

1. BOLT HOLES ARE TO BE DRILLED ONLY AFTER ASSEMBLY AND WELDING OF THE BRACKET TO HEAT EXCHANGER.
2. ALL SURFACES TO BE MACHINED TO $\nabla \nabla$ FINISH.
3. TOLERANCES INDICATED ARE NON CUMULATIVE.
4. ALL SHARP CORNERS SHALL BE ROUNDED OFF.

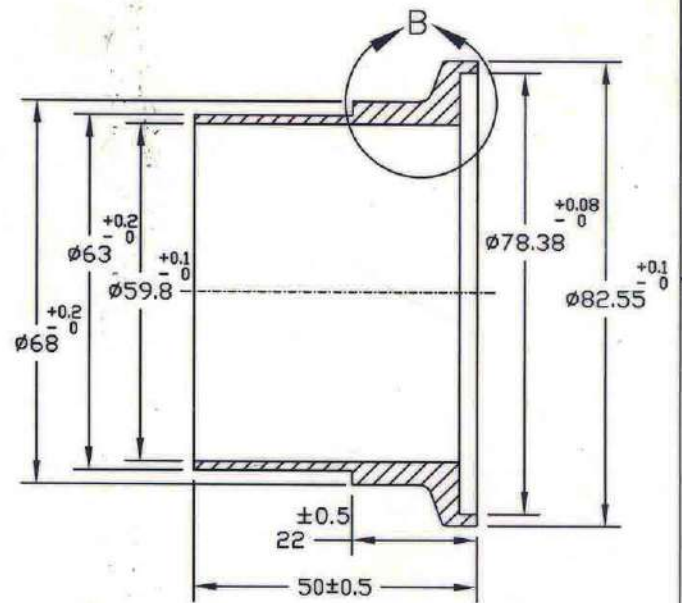
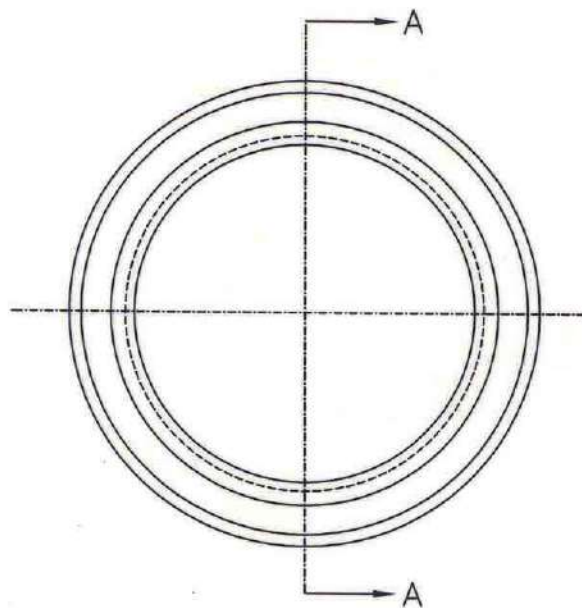
		4	---	CORNER RADII CORRECTED. VENT HOLE ADDED.	KSSR 11-11-03	KVR 11/11/03	AP 11/11/03	
		3	---	REF.DRG. ENTERED & NOTE 2 DELETED	KSSR 17-09-01	KVR 18-09-01	AP 18-09-01	
		2	C-4,D-1	BRACKET BASE PAD THK. MODIFIED	KSSR 18-09-99	AP 20-09-99	AP 20-09-99	
		1	C-2,C-3	BRAC.HT & HOLE HT. CHANGED	KSSR 16-08-99	AP 16-08-99	AP 16-08-99	
REF. DRG.		REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD	
RD-41013912-A-100								
QTY.	2 Nos.	 BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA						
PART No.	111							
MATRL.	AA 5086							
NOTES : 1. DRAWING NOT TO BE SCALED. 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		DRN	KSSRAD 05-07-99	RESEARCH & DEVELOPMENT				
		CHD	KVRMURTHY 06-07-99	CUSTOMER : ADA, BANGALORE				
		APPROVED	A.PANTHARAJ 20-07-99	GBX OIL-HYD OIL-FUEL COOLER (HE-2) BRACKET - GBX SIDE				
		SCALE	NTS	WORK ORD. NO.: 41013912		NO. OFF: 8		
				YR OF ORD	SIZE	DRAWING NO.		REV
				1999	A4	RD-41013912-P-111		4



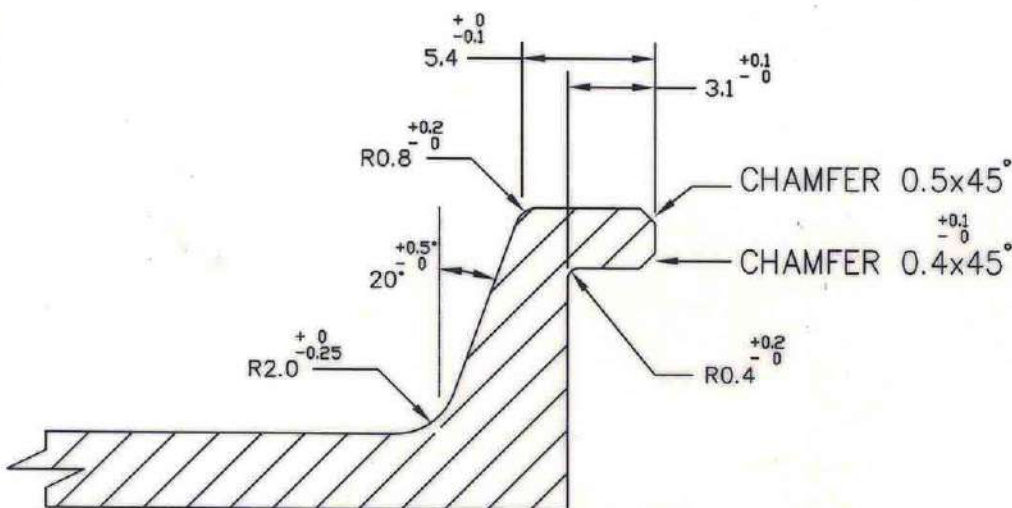
NOTES :

1. BOLT HOLES ARE TO BE DRILLED ONLY AFTER ASSEMBLY AND WELDING OF THE BRACKET TO HEAT EXCHANGER.
2. ALL SURFACES TO BE MACHINED TO $\nabla \nabla$ FINISH.
3. TOLERANCES INDICATED ARE NON CUMULATIVE.
4. ALL SHARP CORNERS SHALL BE ROUNDED OFF.

REF. DRG. RD-41013912-A-100		4	---	CORNER RADII CORRECTED. VENT HOLE ADDED.	CSN 11-4-03	11/11/03	11/11/03
		3	---	REF.DRG. ENTERED & NOTE 2 DELETED	KSSR 17-09-01	KVR 18-09-01	AP 18-09-01
		2	C-4,D-1	BRACKET BASE PAD THK. MODIFIED	KSSR 18-09-99	AP 20-09-99	AP 20-09-99
		1	C-2,C-3	BRAC.HT & HOLE HT. CHANGED	KSSR 16-08-99	AP 16-08-99	AP 16-08-99
		REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD
QTY.		2 Nos.		BHPU BHARAT HEAVY PLATE AND VESSELS LTD.			
PART No.		112		VISAKHAPATNAM - 530 012, INDIA			
MATRL.		AA 5086		DRN	RESEARCH & DEVELOPMENT		
NOTES : 1. DRAWING NOT TO BE SCALED. 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.				KSSRAD 05-07-99	CUSTOMER : ADA, BANGALORE		
				CHD	KVRMURTHY 06-07-99	GBX OIL-HYD OIL-FUEL COOLER (HE-2) BRACKET - HYD SIDE	
				APPROVED	A.PANTHAKY 20-07-99	WORK ORD. NO.: 41013912	
				SCALE	NTS	NO. OFF: 8	
						YR OF ORD	SIZE
				1999	A4	RD-41013912-P-112	4



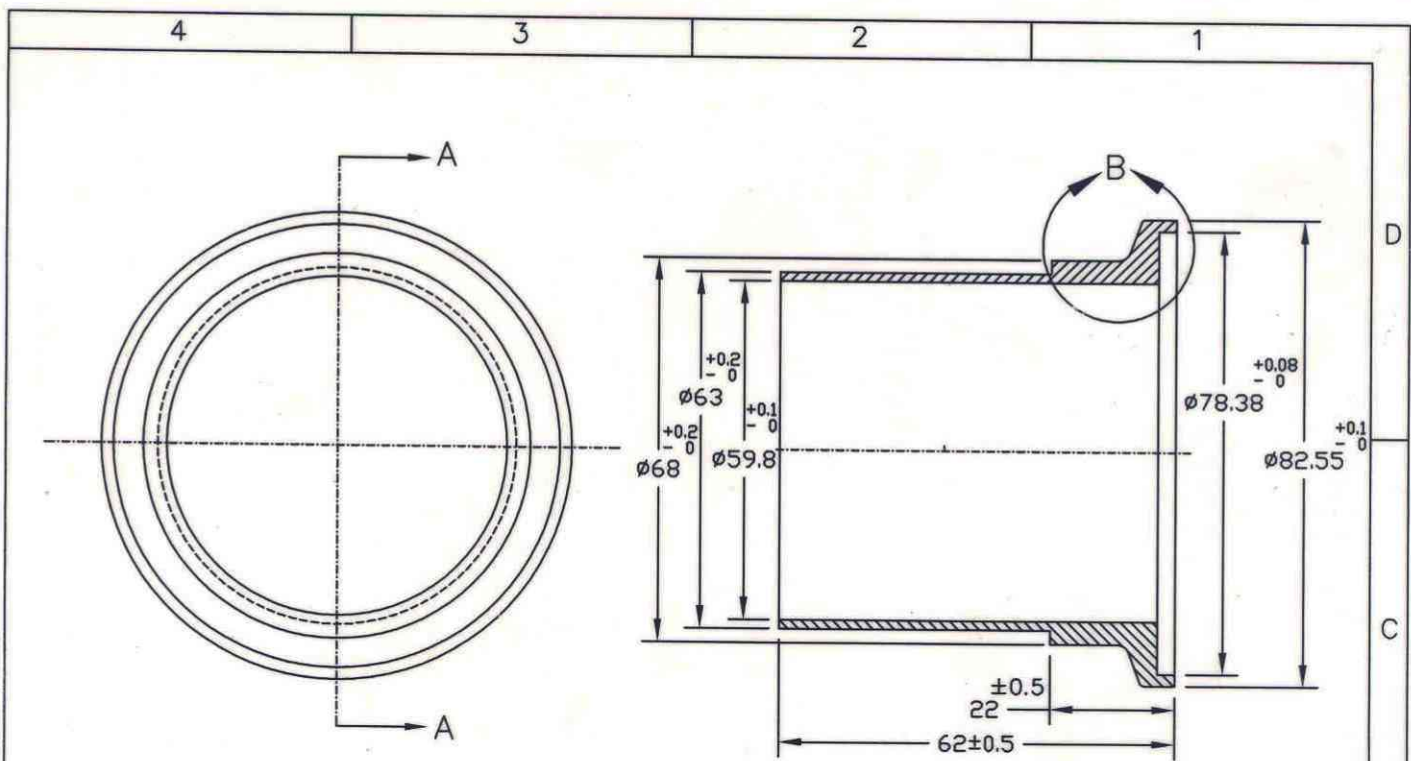
SECTION - AA



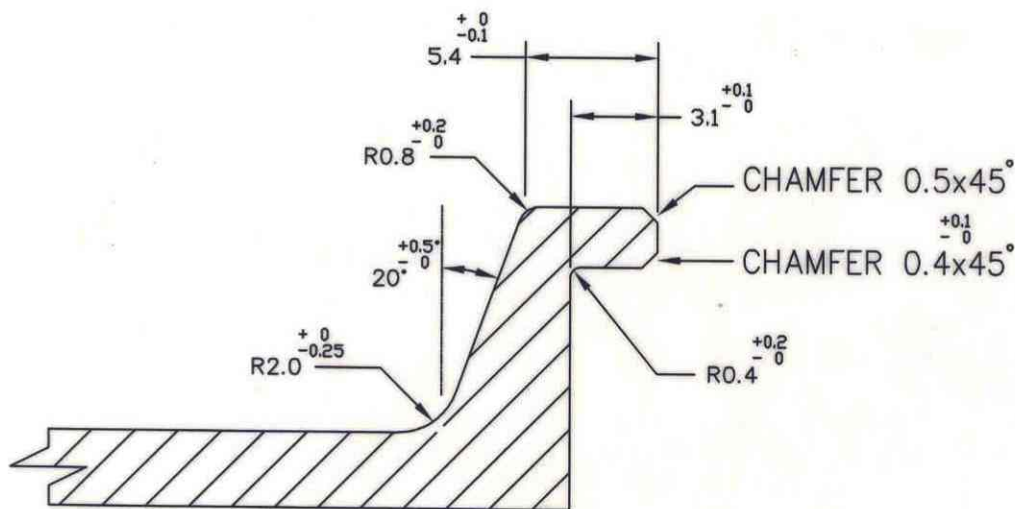
DETAIL - BB

1. THIS ITEM IS EQUIVALENT TO M/s INTERFLEX PART No. 1-2734-02-63-2E9
2. ALL SURFACES TO BE MACHINED TO $\nabla\nabla$ FINISH

REF. DRG.							
RD-41015301-A-100		1	---	MATERIAL SPECIFICATION REVISED.	B.Uma 10.05.08	CSP 10/05/08	A 10/05/08
REV NO.		ZONE	BRIEF RECORD		PPD	CHD	APD
QTY.		1 No.	 BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA				
PART NO.		105					
MATRL.		MDN 347A	DRN	B.Uma 28.03.05	RESEARCH & DEVELOPMENT CUSTOMER : ADA, BANGALORE		
NOTES: 1. DRAWING NOT TO BE SCALED. 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHD	KSSRao 29-03-05	PRECOOLER BLEED AIR INLET CONNECTOR (63 SZ, FEMALE)			
		APPROVED	A.Panigrahi 29.03.05	WORK ORD. NO.:		NO. OFF:	
		SCALE	NTS	YR OF ORD	SIZE	DRAWING NO.	REV
				2004	A4	RD-41015301-P-105	1



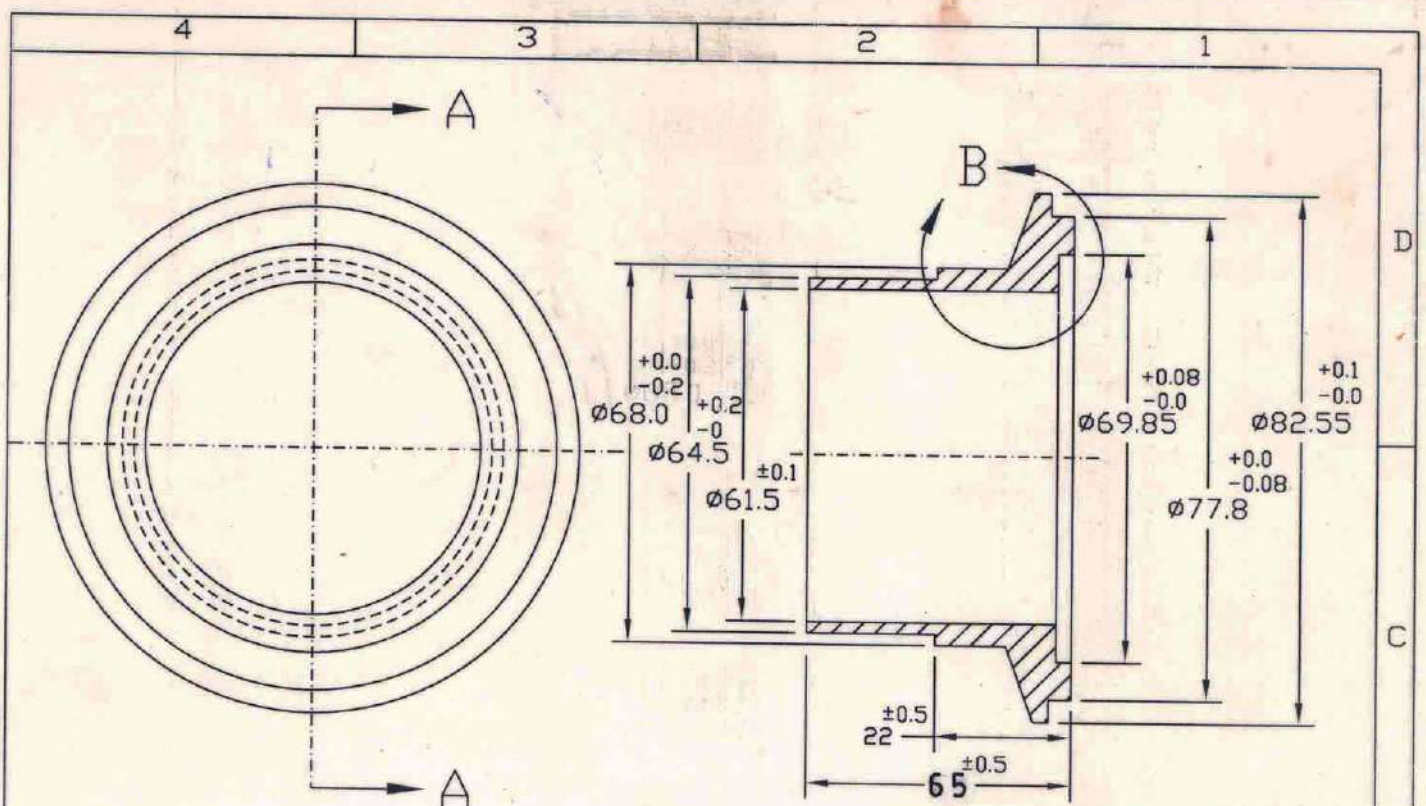
SECTION - AA



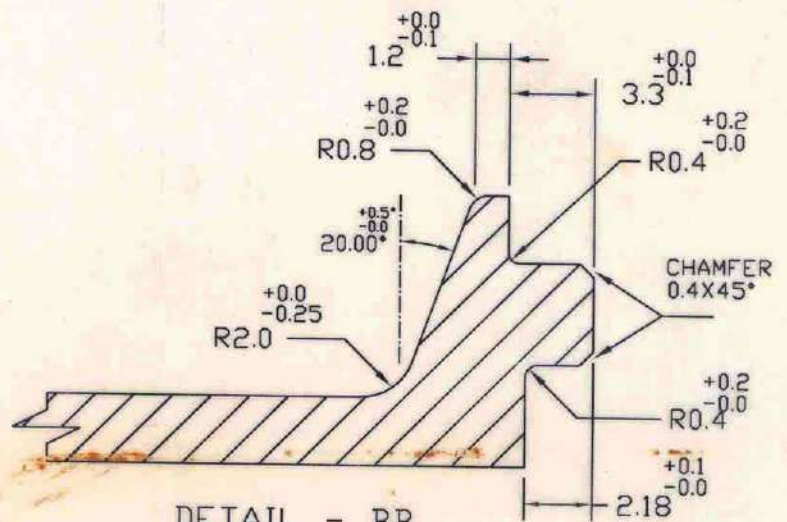
DETAIL - BB

1. THIS ITEM IS EQUIVALENT TO M/s INTERFLEX PART No. 1-2734-02-63-2E9
2. ALL SURFACES TO BE MACHINED TO $\nabla\nabla$ FINISH

REF. DRG.								
RD-41015301-A-100		1	---	MATERIAL SPECIFICATION REVISED.		B.Uma 10.05.08	CHD 10.05.08	APD 10.05.08
		REV NO.	ZONE	BRIEF RECORD		PPD	CHD	APD
QTY.		1 No.						
PART NO.		106						
MATRL.		MDN 347A						
NOTES: 1. DRAWING NOT TO BE SCALED. 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		DRN		B.Uma 28.03.05				
		CHD		KSSRao 29-03-05				
		APPROVED		A.Panigrahi 29.03.05				
		SCALE		NTS				
				RESEARCH & DEVELOPMENT				
				CUSTOMER : ADA, BANGALORE				
				PRECOOLER				
				BLEED AIR OUTLET CONNECTOR (63 SZ, FEMALE)				
				WORK ORD. NO.:				NO. OFF:
				YR OF ORD	SIZE	DRAWING NO.		REV
				2004	A4	RD-41015301-P-106		1



SECTION - AA

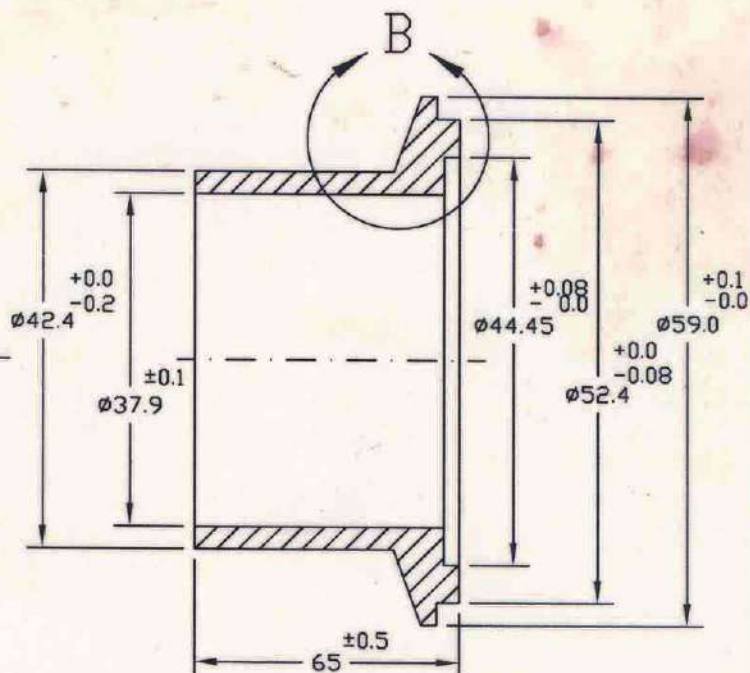
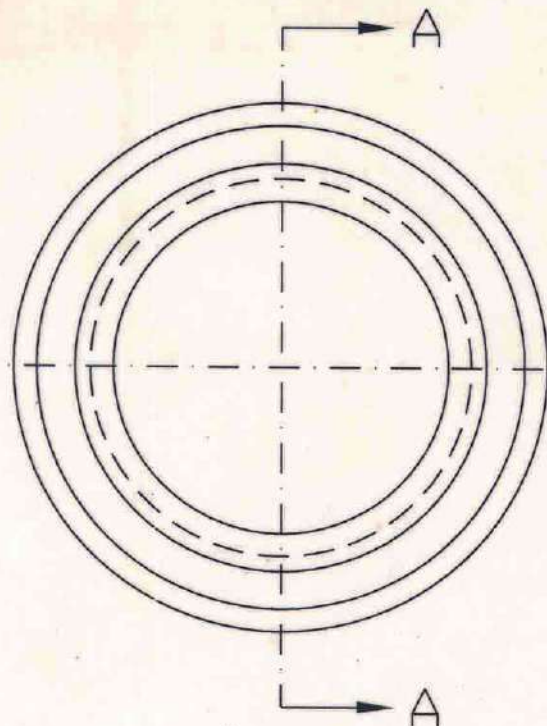


DETAIL - BB

NOTE :

1. THIS ITEM IS EQUIVALENT TO M/s INTERFLEX
PART No. 1-2734-03-63-1E
2. ALL SURFACES TO BE MACHINED TO $\nabla\nabla\nabla$ FINISH

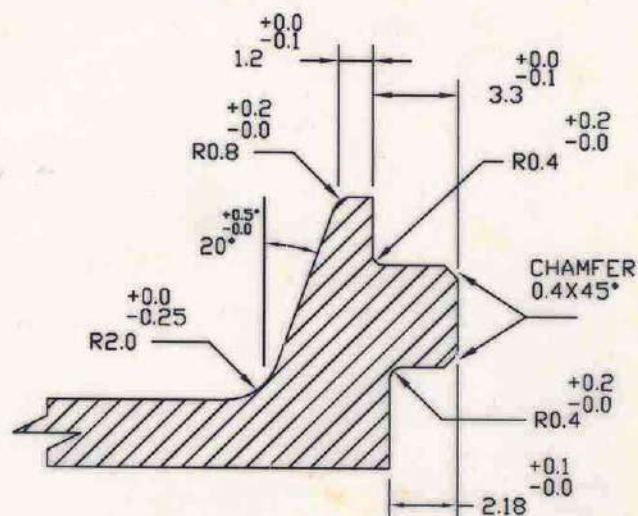
REF. DRG. RD-41013905-A-100		REV NO.	ZONE	BRIEF RECORD		PPD	CHD	APD
QTY.	IND	BHPU BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA						
PART NO.	109D							
MATL.	MDN 347A	DRN	B.uma 16/10/02	RESEARCH & DEVELOPMENT				
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHD	USM 16-10-02	CUSTOMER : ADA, BANGALORE				
		APPROVED	Ail 17-10-02	PRIMARY HEAT EXCHANGER CHARGE AIR OUTLET CONNECTOR				
		SCALE	NTS	WORK ORD. NO.	NO. OFF		REV	
				YR OF ORD	SIZE	DRAWING NO.		
					A4	RD-41013905-P-109D		0



SECTION - AA

REQMTS FOR THIS ITEM

SDG.ORD. NUMBER	PART NOS	PART NAME	QTY/ EQPT
41013905	109C	CHARGE AIR BY-PASS PIPE CONNECTOR	1ND

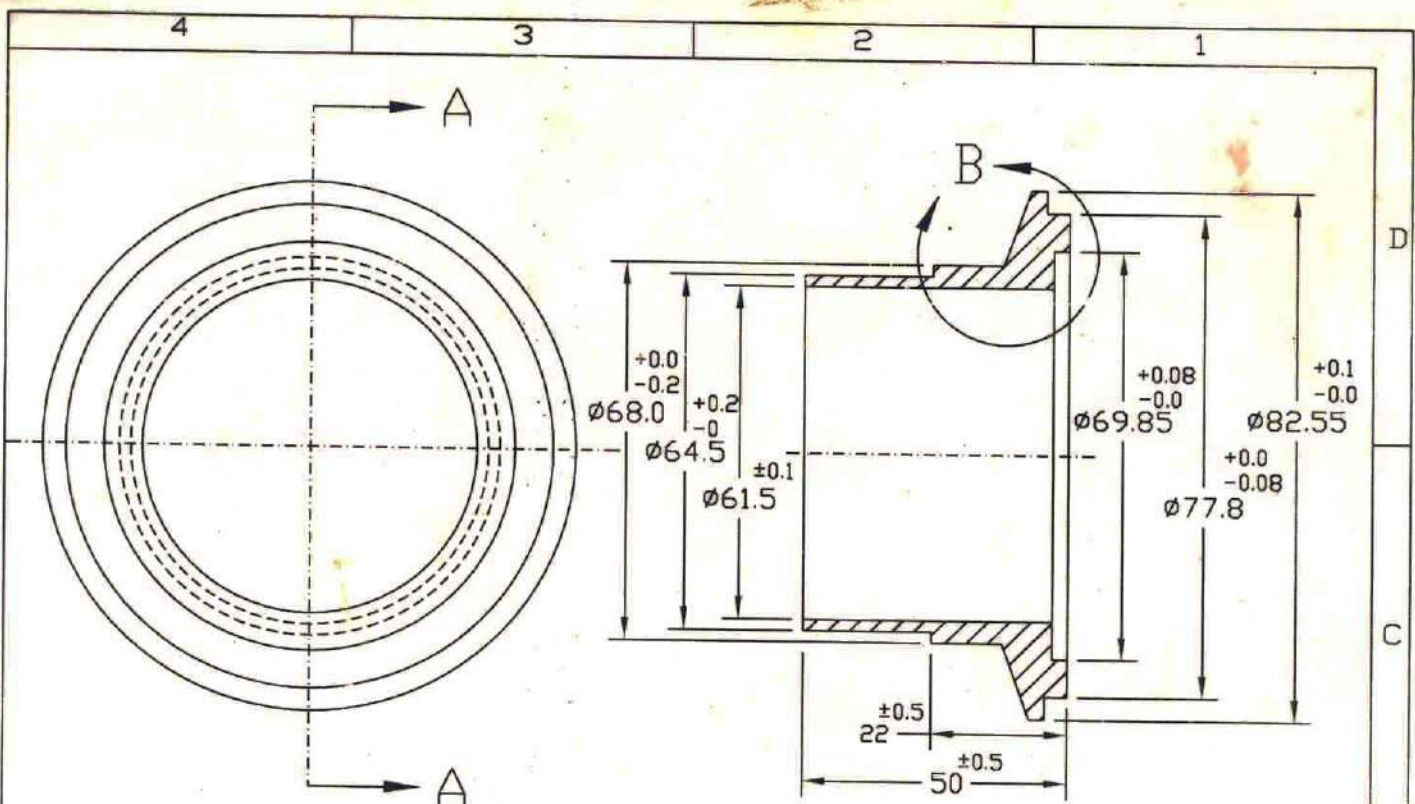


DETAIL - BB

NOTE :

- THIS ITEM IS EQUIVALENT TO M/s INTERFLEX PART No. 1-2734-03-40-1E
- ALL SURFACES TO BE MACHINED TO $\nabla\nabla\nabla$ FINISH

		2	B4	REQMT.TABLE CORRECTED	U.S.N. 20/3/02	21/05/02	21/3/02	
REF. DRG.		1	B4	REQMT.TABLE ADDED	KSSR 28-07-00	AP 31-07-00	AP 31-07-00	
RD-41013905-A-100		REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD	
QTY.		SEE TABLE						
PART NO.		SEE TABLE						
MATL.		MDN 347A						
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		DRN	U.S.N. 15/05/99	RESEARCH & DEVELOPMENT				
		CHD	21/05/99	CUSTOMER : A.D.A., BANGLORE				
		APPROVED	21/05/99	SS FERRULE-40 SZ, MALE				
		SCALE	NTS	WORK ORD. NO.		SEE TABLE	NO. OFF 8	
				YR OF ORD	SIZE	DRAWING NO.		REV
				A4	RD-STD-F-006		2	



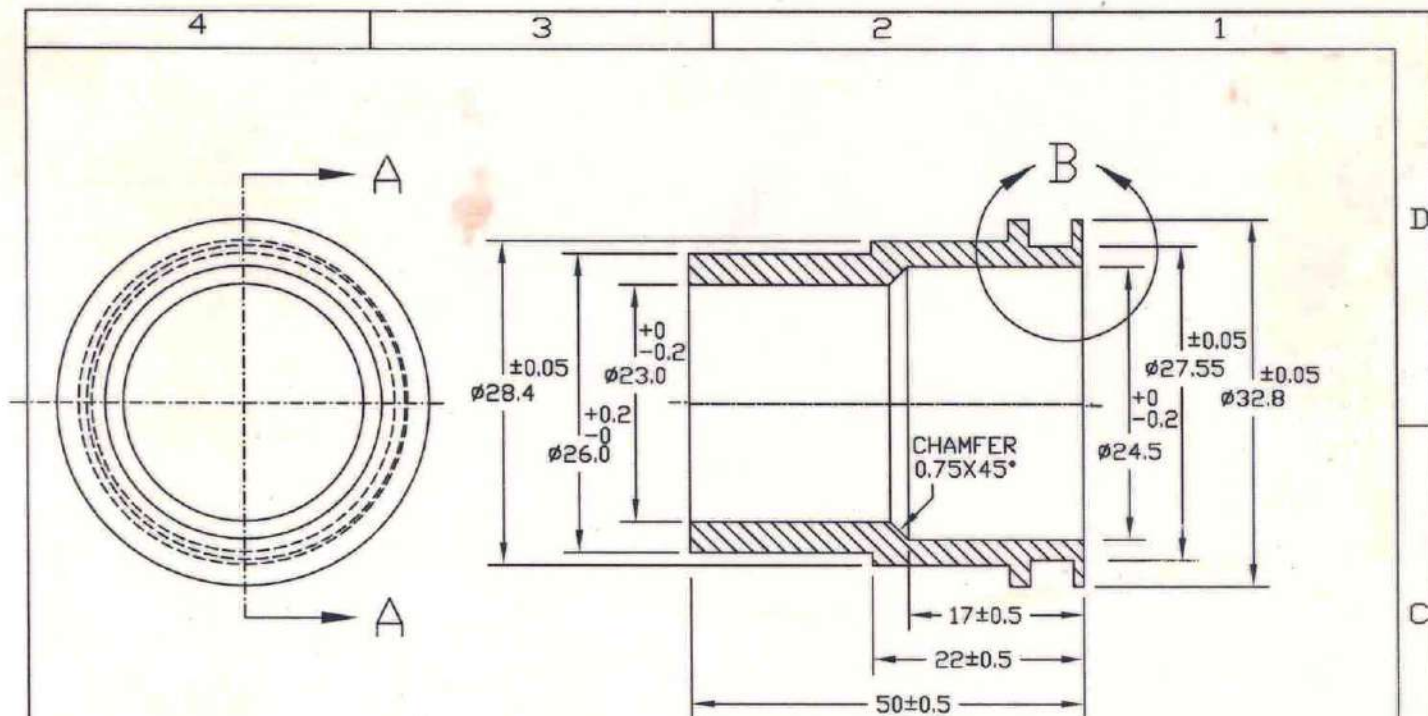
REQMTS FOR THIS ITEM

SDG.ORD. NUMBER	PART NOS	PART NAME	QTY/EQPT
41013905	109B	CHARGE AIR INLET CONNECTOR	1NO

NOTE :

1. THIS ITEM IS EQUIVALENT TO M/s INTERFLEX PART No. 1-2734-03-63-1E
2. ALL SURFACES TO BE MACHINED TO $\nabla \nabla \nabla$ FINISH

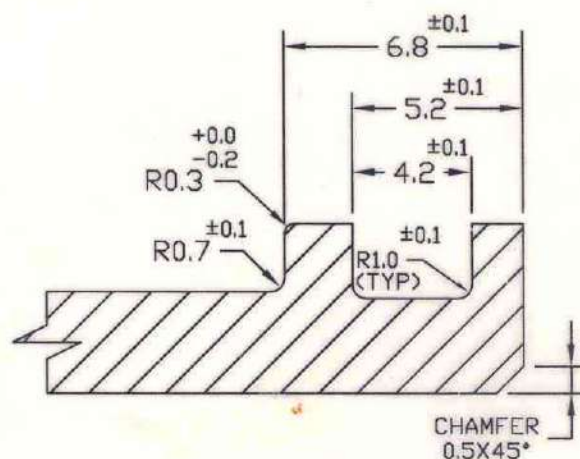
REF. DRG. RD-41013905-A-100	3	----	FERRULE PROFILE MODIFIED	B.uma	26/7/02	26/07/02	26/07/02
	2	B4	REQMT.TABLE CORRECTED	KSSR	20-03-02	21-03-02	21-03-02
	1	B4	REQMT.TABLE ADDED	KSSR	28-07-00	31-07-00	31-07-00
	REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD	
QTY.	SEE TABLE	BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA					
PART NO.	SEE TABLE						
MATL.	MDN 347A	DRN	B.uma	RESEARCH & DEVELOPMENT			
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHD	15/05/99	CUSTOMER : ADA, BANGALORE			
		APPROVED	15/05/99	SS FERRULE-63 SZ, MALE			
		SCALE	NTS	WORK ORD. NO.	SEE TABLE	NO. OFF	
				YR OF ORD	SIZE	DRAWING NO.	REV
					A4	RD-STD-F-008	3



SECTION - AA

REQMTS FOR THIS ITEM

WORK.ORD. NUMBER	PART NO	PART NAME	QTY/ EQPT
41011201 & 41013910	111	F.T.P. AIR I/O CONNECTOR	2NDS

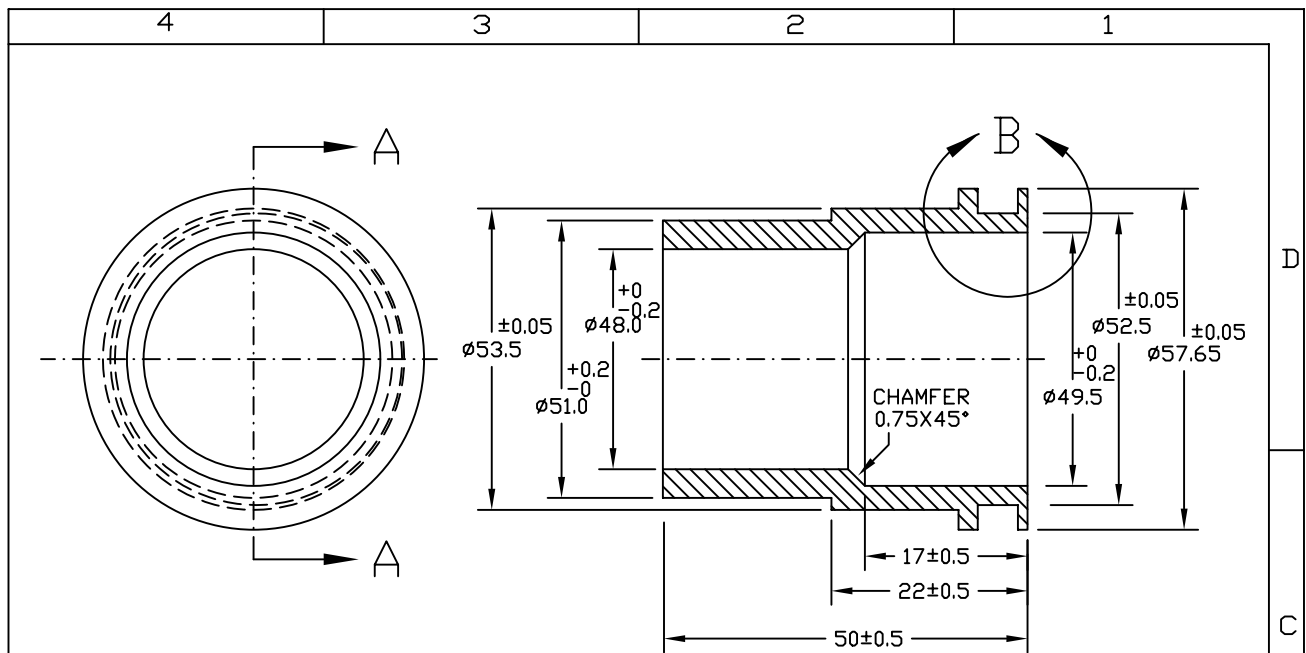


DETAIL - B

NOTE :

1. THIS ITEM IS EQUIVALENT TO M/s INTERFLEX
PART No. 1-22609-02-25-E
2. ALL SURFACES TO BE MACHINED TO ▽▽ FINISH

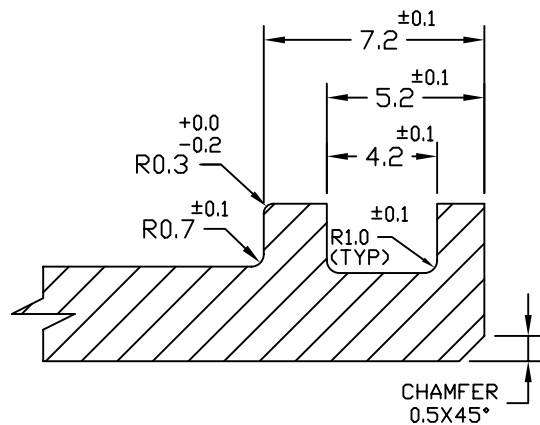
REF. DRG. RD-41011201-A-100	4	---	REQMT TABLE CORRECTED	B.U. 19.07.03	<i>[Signature]</i> 19/07/03	<i>[Signature]</i> 19/07/03
	3	C1-D4	FERRULE PROFILE MODIFIED	UMA 25.07.02	KSSR 26.07.02	AP 26.07.02
	2	B-4	REQMT.TABLE MODIFIED	UMA 02.04.02	KSSR 02.04.02	AP 03.04.02
	1	B-4	REQMT.TABLE ADDED	KSSR 28.07.00	AP 31.07.00	AP 31.07.00
	REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD
QTY.	SEE TABLE	BHPV BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA				
PART NO	SEE TABLE					
MATRL.	AA 5086	DRN	B.Uma 15.05.99	RESEARCH & DEVELOPMENT		
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHD	<i>[Signature]</i> 15/05/99	CUSTOMER : ADA, BANGALORE		
		APPROVED	<i>[Signature]</i> 15/05/99	FERRULE-25 SZ		
		SCALE	NTS	WORK ORD. NO.:	SEE TABLE	NO. OFF.:
				YR OF ORD	SIZE	DRAWING NO.
					A4	RD-STD-F-001
						REV 4



SECTION - AA

REQMTS FOR THIS ITEM

WORK ORD. NUMBER	PART NO	PART NAME	QTY/ EQPT
41011201 & 41013910	110	CHARGE AIR I/O CONNECTOR	2 NOS
41013906	107	HOT AIR ENTRY /EXIT CONNECTOR	2 NOS
41013907	111	HOT AIR OUTLET CONNECTOR	1 NO
41013908	109B	AIR EXIT (AVIONICS) CONNECTOR	1 NO

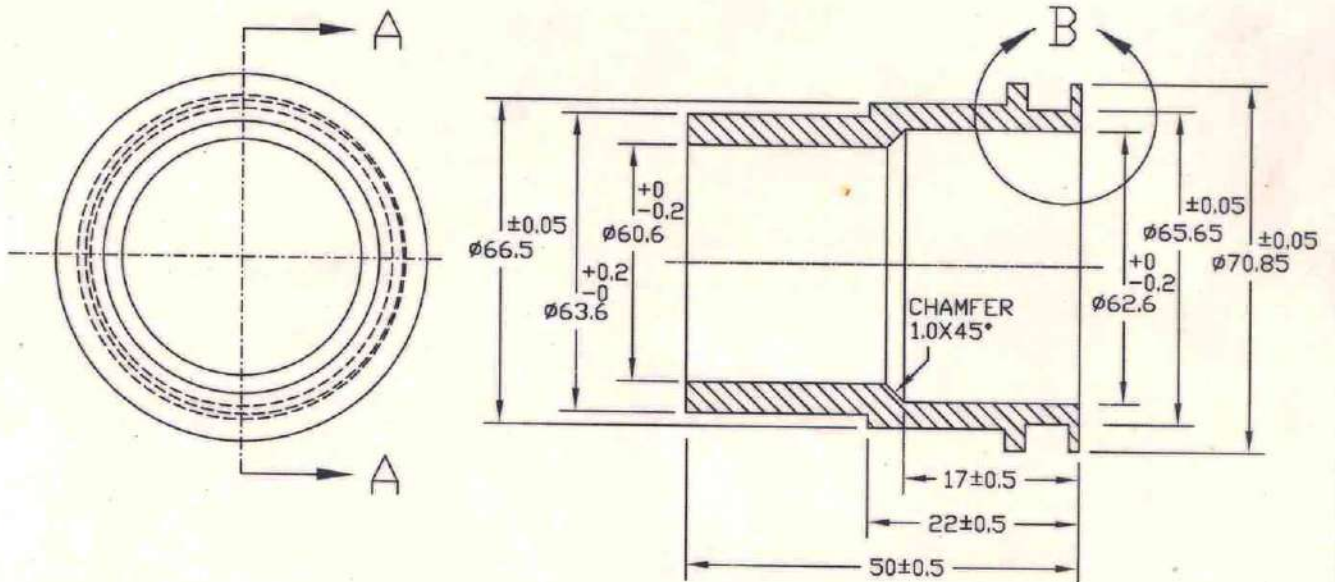


DETAIL - B

NOTE :

1. THIS ITEM IS EQUIVALENT TO M/s INTERFLEX PART No. 1-22609-02-50-E
2. ALL SURFACES TO BE MACHINED TO $\nabla\nabla$ FINISH

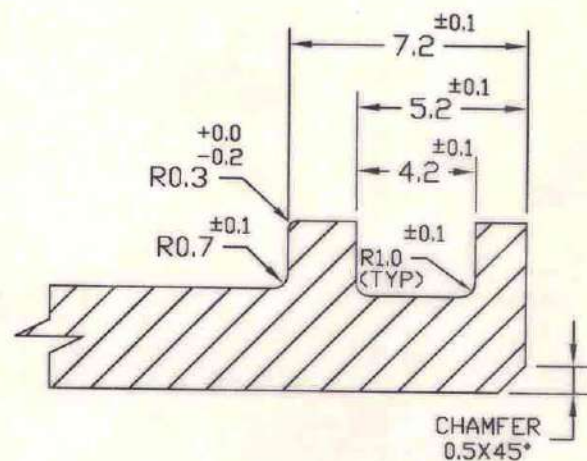
REF. DRG. RD-41011201-A-100 RD-41013906-A-100 RD-41013907-A-100 RD-41013908-A-100	4	---	REQMT. TABLE CORRECTED			
	3	C1-D4	FERRULE PROFILE MODIFIED	UMA 25.07.02	KSSR 26.07.02	AP 26.07.02
	2	B-4	REQMT. TABLE MODIFIED	UMA 02.04.02	KSSR 02.04.02	AP 03.04.02
	1	B-4	REQMT. TABLE ADDED	KSSR 28.07.00	AP 31.07.00	AP 31.07.00
	REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD
QTY.	SEE TABLE	BHPU BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA				
PART NO	SEE TABLE					
MATRL.	AA 5086	DRN		RESEARCH & DEVELOPMENT		
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.				CUSTOMER : ADA, BANGALORE		
		CHD		FERRULE-50 SZ		
		APPROVED		WORK ORD. NO.:	SEE TABLE	NO. OFF.:
		SCALE	NTS	YR OF ORD	SIZE	DRAWING NO.
				---	A4	RD-STD-F-002
				REV 8		
				4		



SECTION - AA

REQMTS FOR THIS ITEM

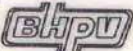
WORK ORD. NUMBER	PART NO	PART NAME	QTY/ EQPT
41013906	103	COLD AIR EXIT CONNECTOR	1ND
41013907	108	HOT AIR INLET CONNECTOR	1ND
41013909	109	INLET/OUTLET CONNECTOR	4NDS



DETAIL - B

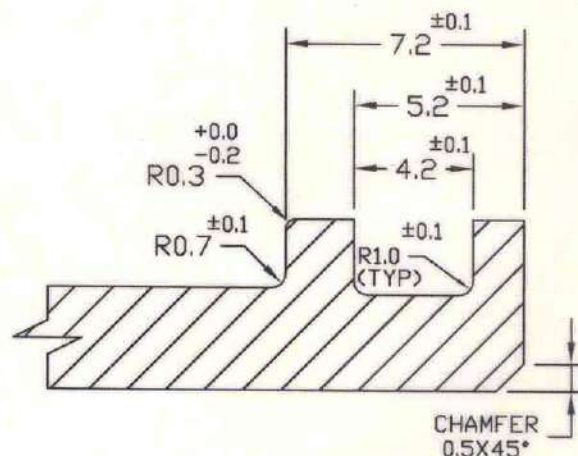
NOTE :

1. THIS ITEM IS EQUIVALENT TO M/s INTERFLEX PART No. 1-22609-02-63-E
2. ALL SURFACES TO BE MACHINED TO $\nabla\nabla$ FINISH

REF. DRG. RD-41013906-A-100 RD-41013907-A-100 RD-41013909-A-100		4	---	REQMT. TABLE CORRECTED.	B-um 19.07.03	KSSR 19.07.03	AP 26.07.03
		3	C1-D4	FERRULE PROFILE MODIFIED	UMA 25.07.02	KSSR 26.07.02	AP 26.07.02
		2	B-4	REQMT.TABLE MODIFIED	UMA 02.04.02	KSSR 02.04.02	AP 03.04.02
		1	B-4	REQMT.TABLE ADDED	KSSR 28.07.00	AP 31.07.00	AP 31.07.00
		REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD
QTY.	SEE TABLE	 BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA					
PART NO	SEE TABLE						
MATRL.	AA 5086	DRN	B-um 15.05.99	RESEARCH & DEVELOPMENT			
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHER-WISE STATED.		CHD	KSSR 15/05/99	CUSTOMER : ADA, BANGALORE			
		APPROVED	AP 15/05/99	FERRULE-63 SZ			
		SCALE	NTS	WORK ORD. NO.: SEE TABLE		NO. OFF.: 3	
				YR OF ORD	SIZE	DRAWING NO.	REV
			1996	A4	RD-STD-F-003	4	



WORK ORD. NUMBER	PART NO	PART NAME	QTY/ EQPT
41013907	113	COLD AIR OUTLET CONNECTOR	1 NO
41013908	107B	AIR ENTRY CONNECTOR	1 NO



DETAIL - B

1. THIS ITEM IS EQUIVALENT TO M/s INTERFLEX
PART No. 1-22609-02-80-E
2. ALL SURFACES TO BE MACHINED TO ▽▽ FINISH

4	---	REQMT. TABLE CORRECTED	B. um 18-07-03	CSSR 19/07/03	AP 21/07/03
3	C1-D4	FERRULE PROFILE MODIFIED	UMA 25.07.02	KSSR 26.07.02	AP 26.07.02
2	B-4	REQMT. TABLE MODIFIED	UMA 02.04.02	KSSR 02.04.02	AP 03.04.02
1	B-4	REQMT. TABLE ADDED	KSSR 28.07.00	AP 31.07.00	AP 31.07.00
REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD

REF. DRG.
RD-41013907-A-100
RD-41013908-A-100

QTY.	SEE TABLE
PART NO	SEE TABLE
MATRL.	AA 5086

NOTES:

1. DRAWING NOT TO BE SCALED
2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.

ВКРВ

BHARAT HEAVY PLATE AND VESSELS LTD.
VISAKHAPATNAM - 530 012, INDIA

DRN

B. W.
15.05.99

RESEARCH & DEVELOPMENT

CUSTOMER : ADA, BANGALORE

CHD

15/05/99

FERRULE-80 SZ

APPROVED

AP 15/05/99

WORK ORD. NO.	SEE TABLE
---------------	-----------

NO. OFF.

SCALE

NTS

YR OF BRD

SIZE	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100
------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

DRAWING NO.

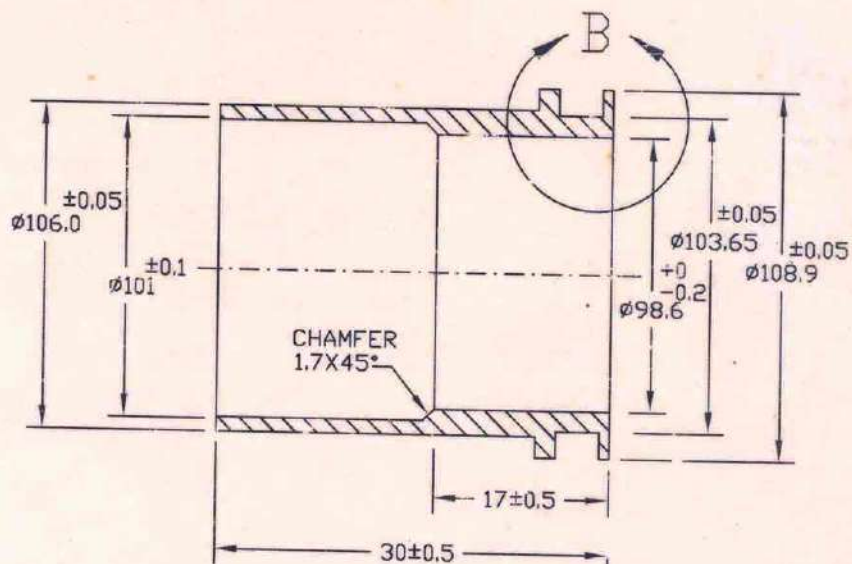
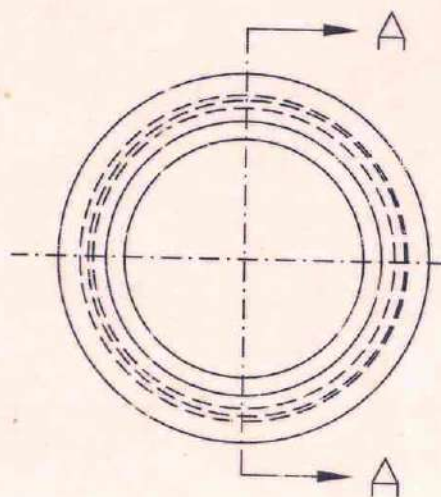
REV

1996

A4

RD-STD-F-004

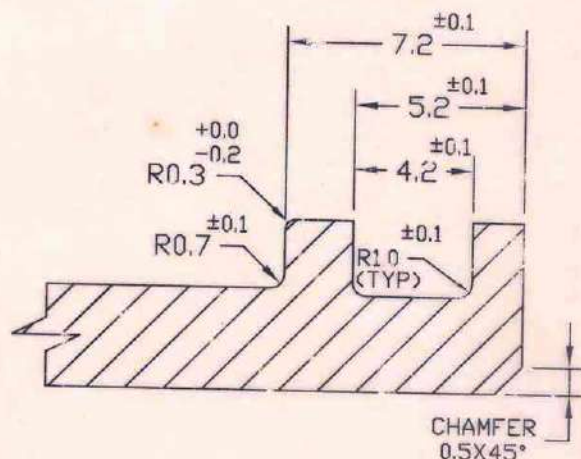
4



SECTION - AA

REQMTS FOR THIS ITEM

WORK ORD. NUMBER	EQPT NO	PART NAME	QTY/ EQPT
41013907	103	COLD AIR INLET CONNECTOR	1 NO



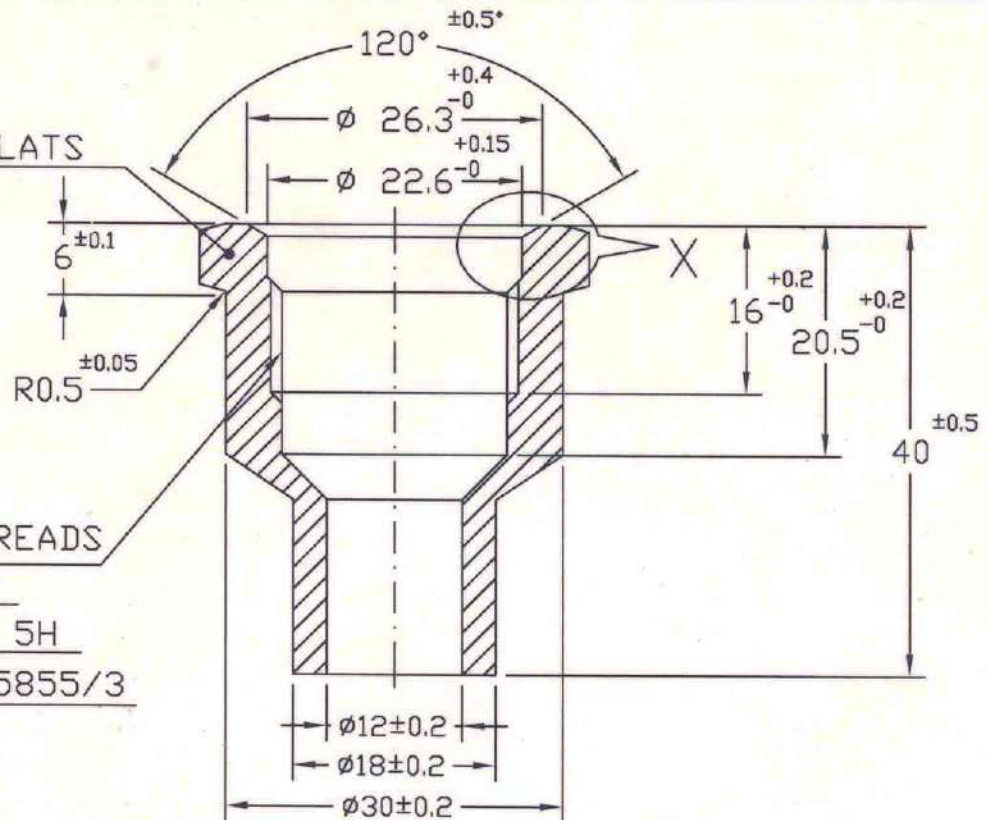
NOTE :

1. THIS ITEM IS EQUIVALENT TO M/s INTERFLEX PART No. 1-22609-02-100-E
2. ALL SURFACES TO BE MACHINED TO $\nabla\nabla$ FINISH

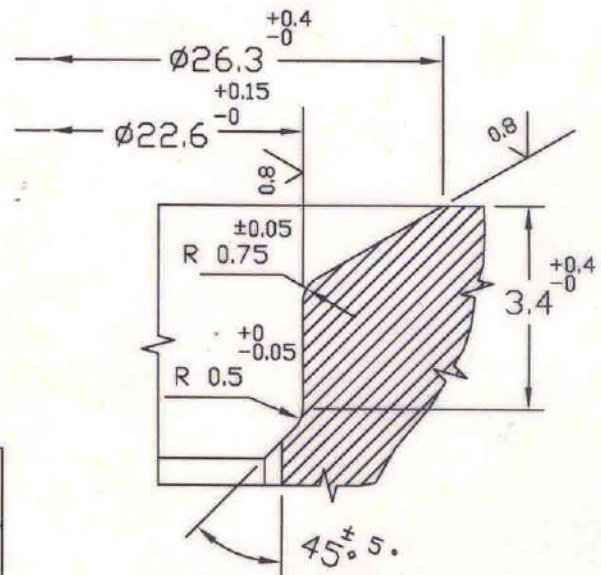
DETAIL - B

REF. DRG. RD-41013907-A-100	4	---	REQMT. TABLE CORRECTED, FERRULE PROFILE MODIFIED	B.uma	19-07-03	19/07/03	21/07/03
	3	C1-D4	FERRULE PROFILE MODIFIED	IJMA	25.07.02	KSSR	26.07.02
	2	B-4	REQMT. TABLE MODIFIED	UMA	02.04.02	KSSR	02.04.02
	1	B-4	REQMT. TABLE ADDED	KSSR	28-07-00	AP	31-07-00
	REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD	
QTY.	SEE TABLE	BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA					
PART No	SEE TABLE						
MATRL.	AA 5086	DRN	B.uma 15.05.99	RESEARCH & DEVELOPMENT			
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHER-WISE STATED.	CHD	CHD	15.05.99	CUSTOMER : ADA, BANGALORE			
	APPROVED	APPROVED	15/05/99	FERRULE-100 SZ			
	SCALE	SCALE	NTS	WORK ORD. NO.	SEE TABLE	NO OFF.	2
				YR OF ORD	SIZE	DRAWING NO	REV
				1996	A4	RD-STD-F-005	4

30 ACROSS FLATS
HEX. HEAD



INTERNAL THREADS
MJ 22 x 1.5P
TOL. CLS. 4H 5H
AS PER ISO 5855/3



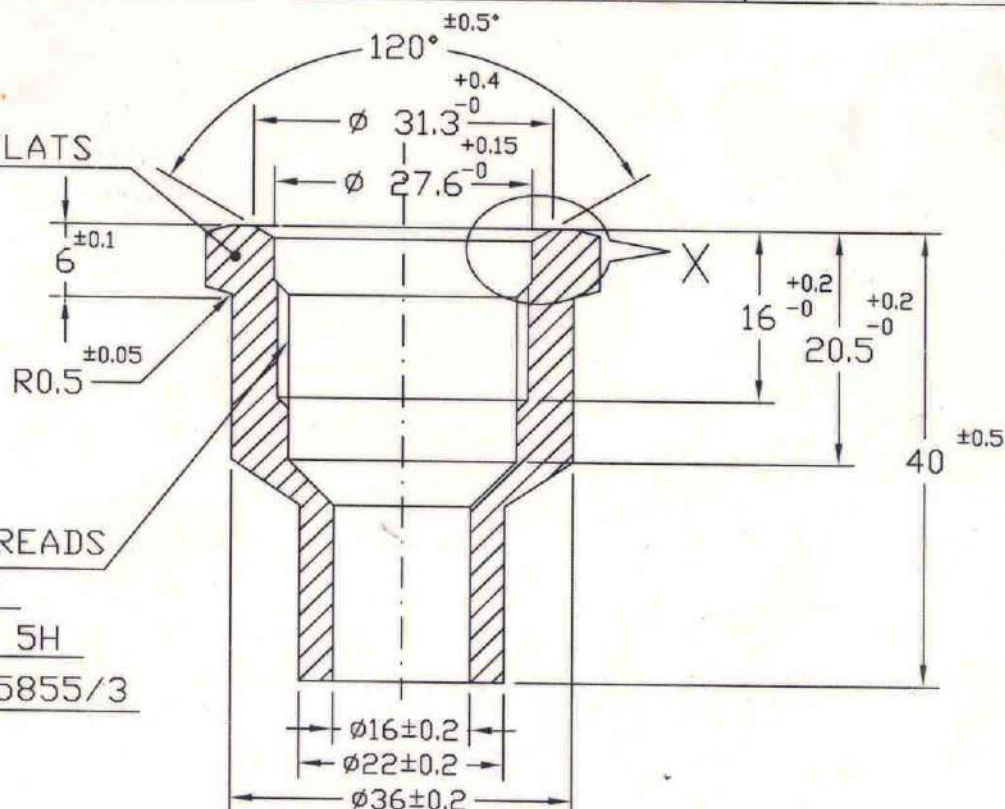
REQMTS FOR THIS ITEM

SDG. ORD. NUMBER	PART NO.	PART NAME	QTY/EQPT
41013911	110	IDG. OIL OUTLET CONNECTOR	1 No.

DETAIL-X

REF. DRG.		2	---	TOLERANCES ADDED & REQMT. TABLE REVISED	KSR	AP	AP
RD-41013911-A-100		1	A4	REQMT. TABLE ADDED.	17-09-99	26-06-00	26-06-00
REV NO.		ZONE	BRIEF RECORD		PPD	CHD	APD
QTY.	SEE TABLE	BHPV BHARAT HEAVY PLATE AND VESSELS LTD.					
ITEM No.	SEE TABLE	VISAKHAPATNAM - 530 012, INDIA					
MATRL.	AA 5086	DRN.	03-06-99	RESEARCH & DEVELOPMENT			
NOTES:		CHKD.	4/6/99	ISO 7320 DN 16 CONNECTOR			
1. DRAWING NOT TO BE SCALED		APPROVED	03/08/99	PORT CONNECTION			
2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		SCALE	NTS	WORK ORD. NO.	SEE TABLE	NO. OFF	8
				YR OF ORD	SIZE	DRAWING NO.	REV
				1999	A4	RD-STD-C-003	2

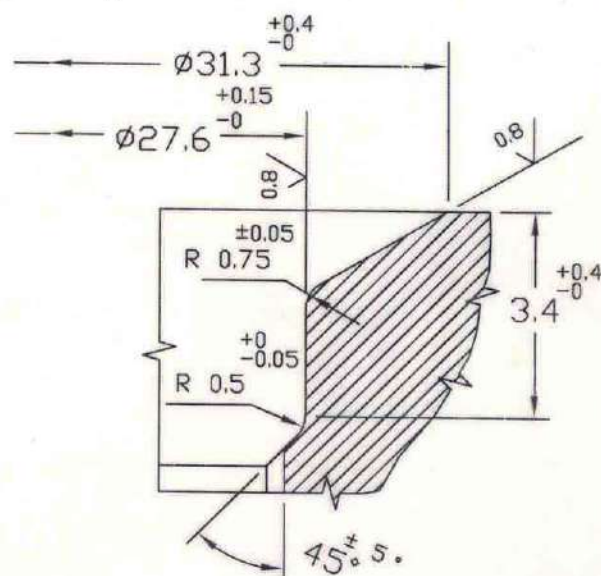
36 ACROSS FLATS
HEX. HEAD



INTERNAL THREADS
MJ 27 x 1.5P
TOL. CLS. 4H 5H
AS PER ISO 5855/3

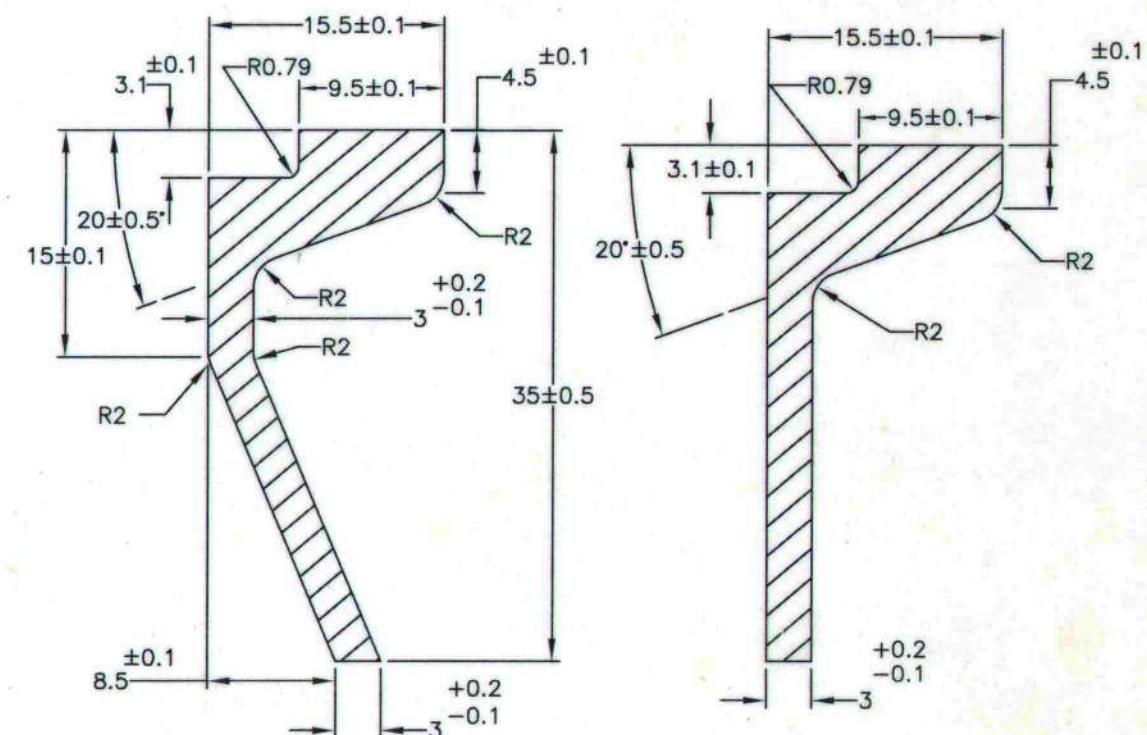
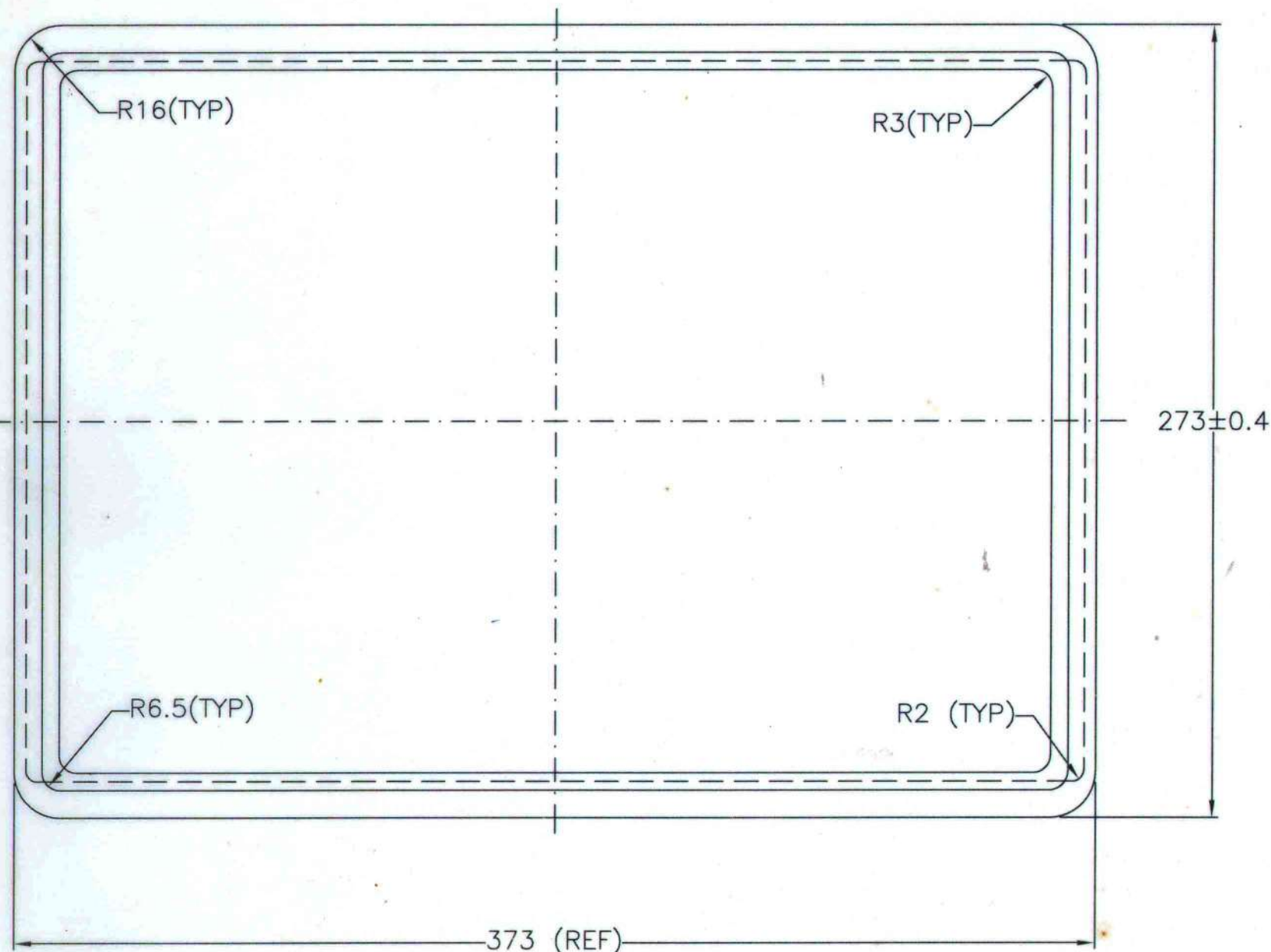
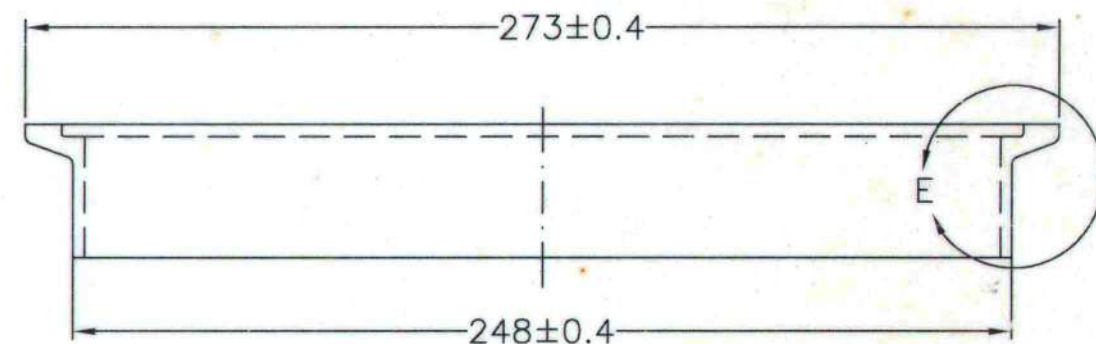
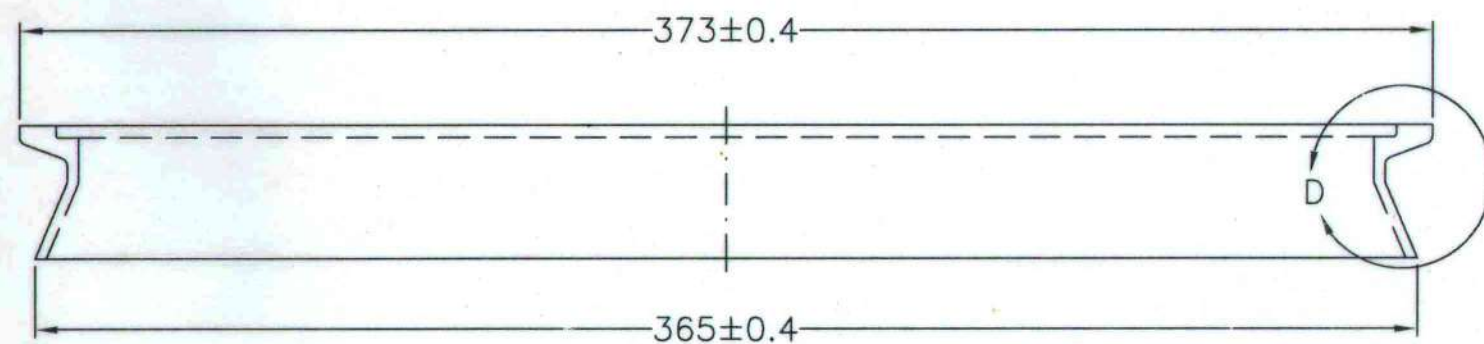
REQMTS FOR THIS ITEM

SDG. ORD. NUMBER	PART NOS.	PART NAME	QTY/ EQPT
41013911	108	HYD. OIL I/O CONNECTOR	2Nos.
	111	FUEL I/O CONNECTOR	2Nos.
41013912	109	HYD. OIL I/O CONNECTOR	2Nos.
	110	FUEL I/O CONNECTOR	2Nos.
41014701	103	FUEL I/O CONNECTOR	2Nos.



DETAIL-X

REF. DRG. RD-41013911-A-100 RD-41013912-A-100 RD-41014701-A-100	3	---	REQRMT. TABLE REVISED.	B. Uma	24-03-03	24-03-03	24-03-03
	2	---	TOLERANCES ADDED&REQMT.TABLE REVISED	KSSR	KVR	AP	17.09.01 18.09.01 18.09.01
	1	A4	REQRMT. TABLE ADDED.	KSSR	AP	AP	26.06.00 26.06.00 26.06.00
	REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD	
QTY.	SEE TABLE	BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA					
ITEM No.	SEE TABLE						
MATRL.	AA 5086	DRN.	K.S.P. Rao 03-06-99	RESEARCH & DEVELOPMENT			
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHD.	KVR Murthy 04-06-99	ISO 7320 DN 20 CONNECTOR PORT CONNECTION			
		APPROVED	A. Panigrahi 04-06-99	WORK ORD. NO. SEE TABLE		NO.OFF	
		SCALE	NTS	YR OF ORD	SIZE	DRAWING NO.	REV
				1999	A4	RD-STD-C-005	3

DETAIL-D
(SCALE 2:1)DETAIL-E
(SCALE 2:1)

NOTES :

- (1) ALL SURFACES TO BE MACHINED TO $\nabla\nabla$ FINISH.
- (2) TOLERANCES INDICATED ARE NON CUMULATIVE.

REF. DRG.

RD-41011201-A-100

8

7

REV.NO

ZONE

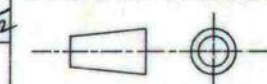
DIMENSIONAL TOLERANCES CORRECTED

BRIEF RECORD

PPD

CHD

APD

ALL PROJECTIONS ARE
FIRST ANGLE UNLESS
OTHERWISE SPECIFIED

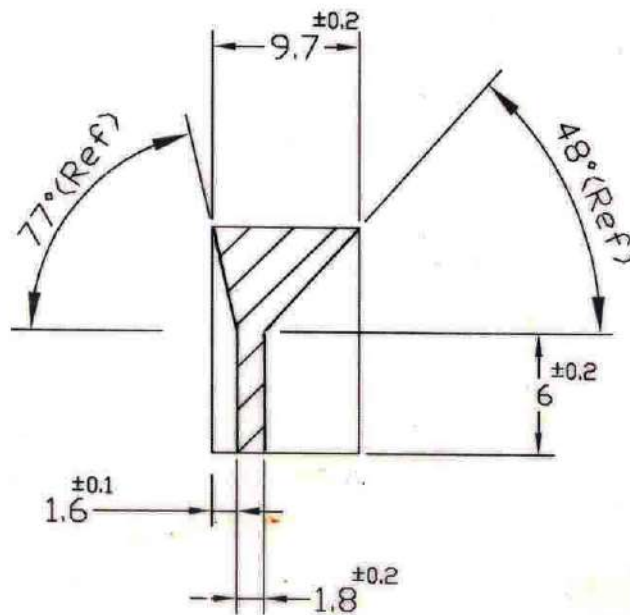
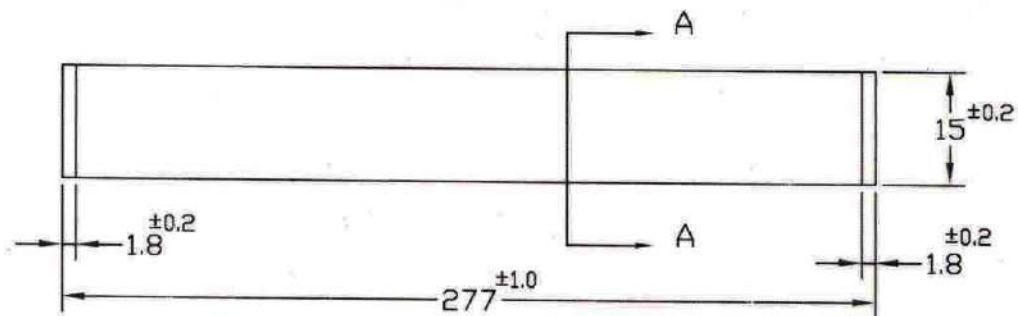
123	RAM AIR FLANGE	2	AA 5086	1.020
P.No.	DESCRIPTION	QTY. (NOS)	MATERIAL	WT(KG)



BHARAT HEAVY PLATE & VESSELS LTD.

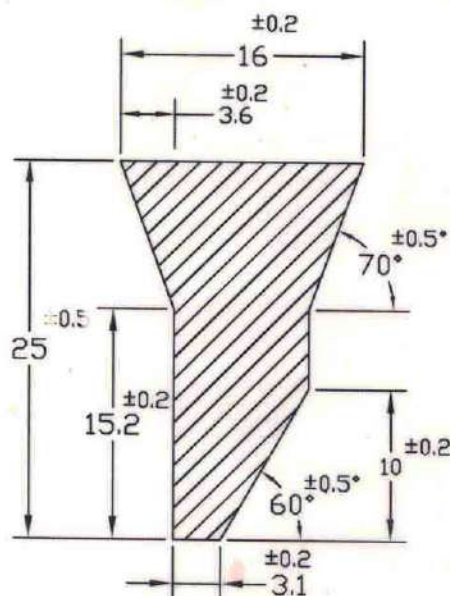
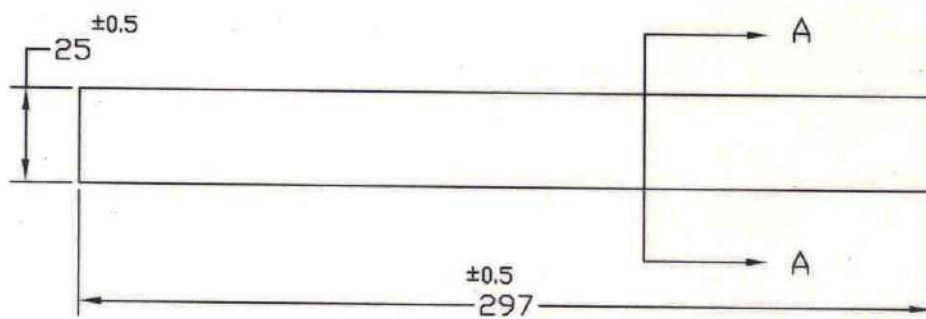
(A Subsidiary of Bharat Yantra Nigam Limited)
VISAKHAPATNAM - 530 012 (A.P.)

DRN	B. Uma 15.01.99	RESEARCH & DEVELOPMENT		
CHD	15.01.99	CUSTOMER : ADA, BANGALORE		
APPROVED	21/01/99	SECONDARY HEAT EXCHANGER RAM AIR FLANGE		
SCALE	1:2	WORK ORDER NO : 10011201-100		
ALL PROJECTIONS ARE FIRST ANGLE UNLESS OTHERWISE SPECIFIED		NO OFF: 10011201-100		
		YEAR OF ORDER	SIZE	DRAWING No.
			A3	RD-41011201-P-123
				REV
				1

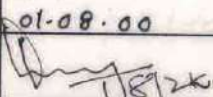
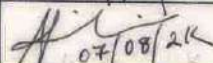


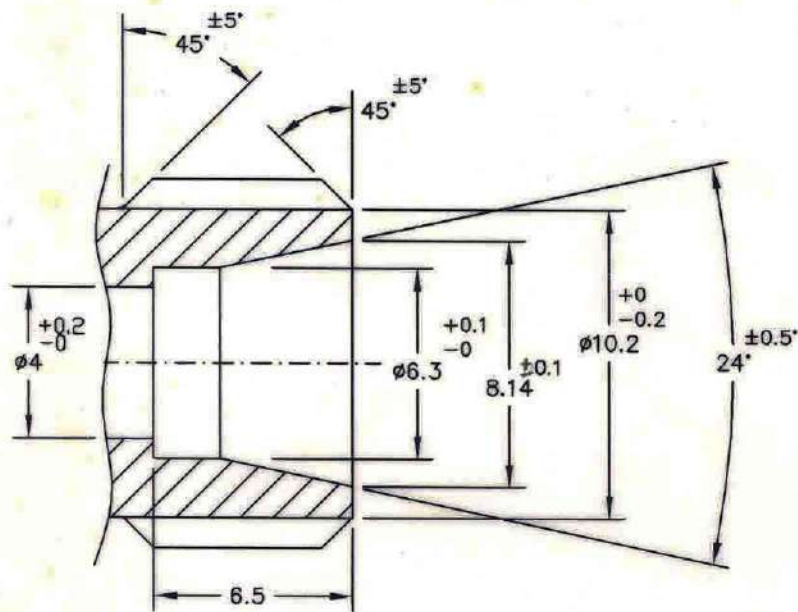
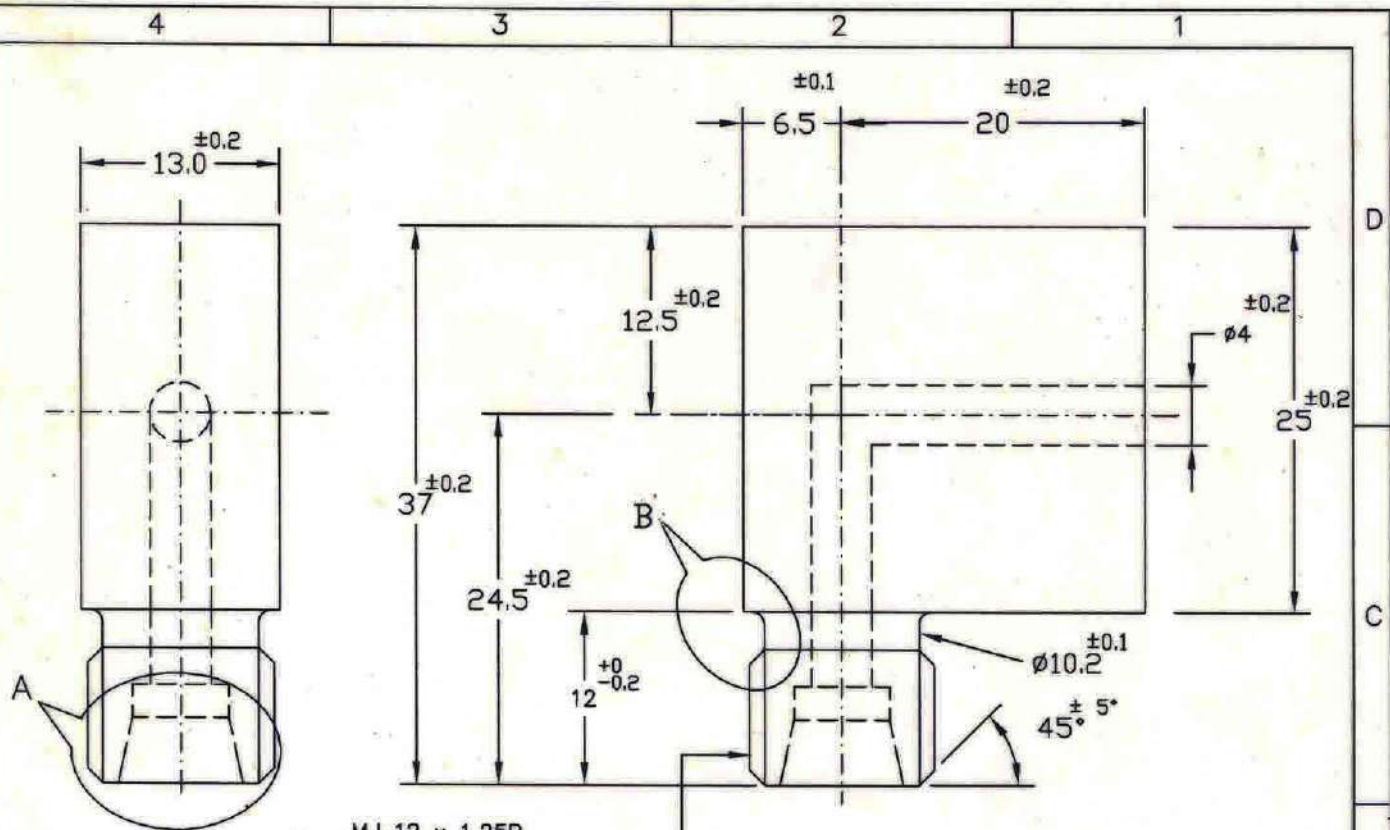
SECTION-AA

REF. DRG.									
RD-41013905-A-100		1	---	DIMENSIONS REVISED		B. Uma 10.12.02	<i>[Signature]</i> 11/12/02	<i>[Signature]</i> 11/12/02	
REV NO.		ZONE		BRIEF RECORD		PPD	CHD	APD	
QTY.		1No.		BHPV BHARAT HEAVY PLATE AND VESSELS LTD. VISAKHAPATNAM - 530 012, INDIA					
PART NO.		110							
MATRL.		MDN 347A		DRN	B. Uma 20-04-01	RESEARCH & DEVELOPMENT			
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.				CHD	K. V. Rao 21-04-01	CUSTOMER : ADA, BANGALORE			
				APPROVED	A. Panigrahi 21-04-01	PRIMARY HEAT EXCHANGER CHARGE AIR HEADERS PARTITIONER			
				SCALE	NTS	WORK ORD. NO. 41013905		NO. OFF 3	
						YR OF ORD	SIZE	DRAWING NO.	REV
						1996	A4	RD-41013905-P-110	1

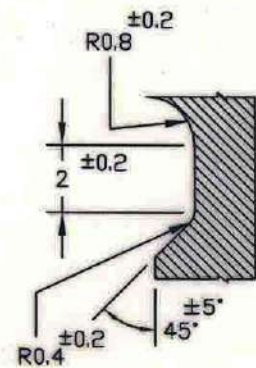


SECTION - AA

REF. DRG.									
RD-41011201-A-100		REV NO.	ZONE	BRIEF RECORD			PPD	CHD	APD
QTY.	1 NO	BHPV BHARAT HEAVY PLATE AND VESSELS LTD.							
PART No.	119	VISAKHAPATNAM - 530 012, INDIA							
MATRL.	AA 5086	DRN	B. Um 01-08-00	RESEARCH & DEVELOPMENT					
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHD		CUSTOMER : ADA, BANGALORE					
				SECONDARY HEAT EXCHANGER CHARGE AIR HEADERS PARTITIONER					
		APPROVED	 07/08/20	WORK ORD. NO. 119				NO. OFF: 3	
		SCALE	NTS	YR OF ORD	SIZE	DRAWING NO.			REV
					A4	RD-41011201-P-119			0

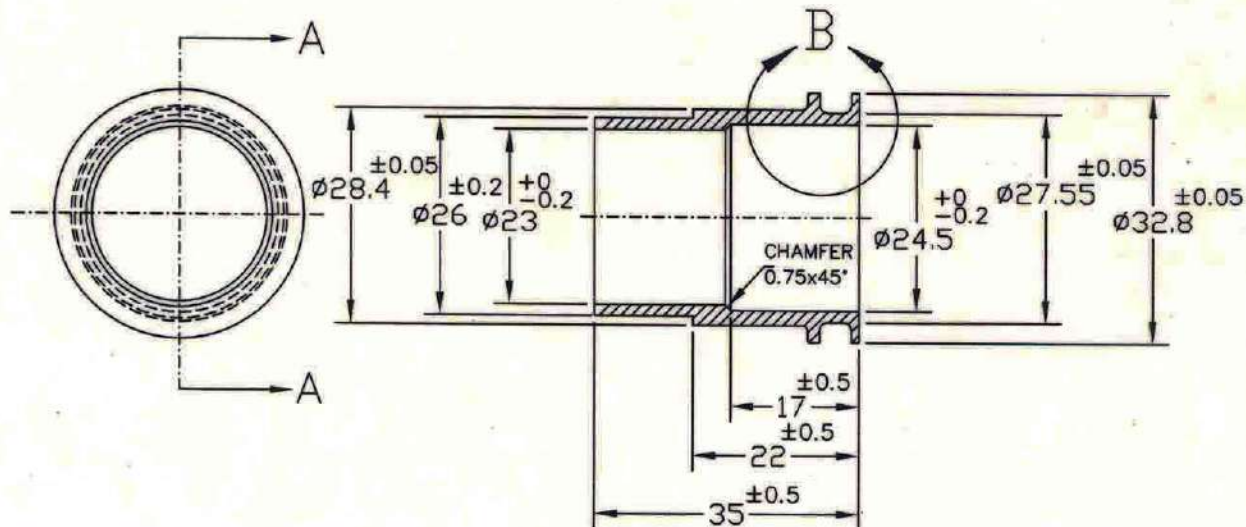


DETAIL-A



DETAIL-B

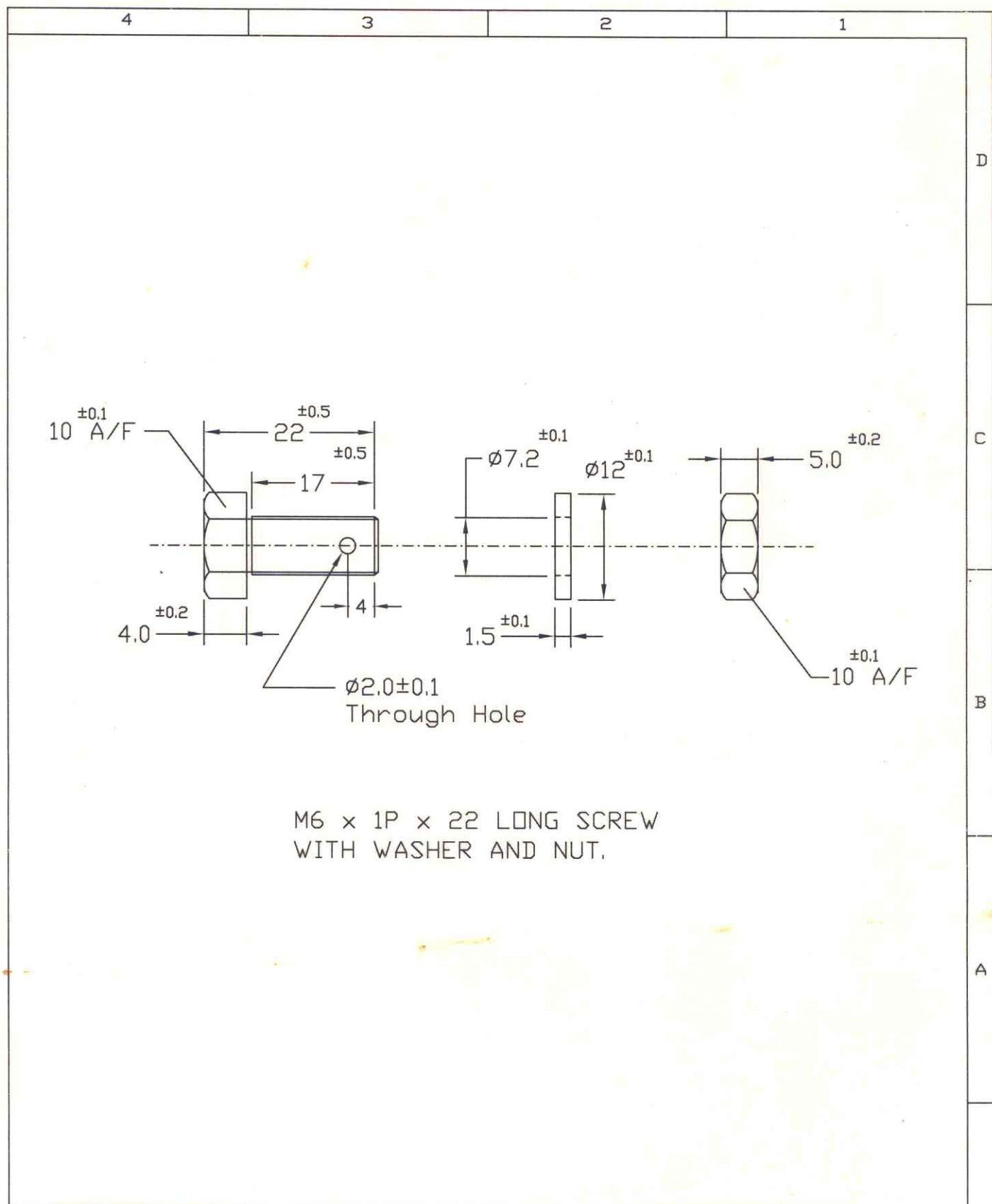
REF. DRG. RD-41013907-A-100		3	---	INTERFACE DETAILS REVISED	B.uma 28-12-07	28/12/07	28/12/07
		2	---	THREAD PITCH REVISED.	B.UMA 01-05-06	KSSR 01-05-06	AP 01-05-06
		1	---	MODIFIED CONNECTOR SHAPE. THREAD SHAPE.	B.UMA 10-04-02	KVR 10-04-02	AP 11-04-02
		REV NO.	ZONE	BRIEF RECORD	PPD	CHD	APD
QTY.		1 NO.		BHPV BHARAT HEAVY PLATE AND VESSELS LTD.			
PART NO.		114		VISAKHAPATNAM - 530 012, INDIA			
MATRL.		AA 5086		DRN	B.UMA 05-08-2000	RESEARCH & DEVELOPMENT	
NOTES: 1. DRAWING NOT TO BE SCALED. 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.				CUSTOMER : ADA, BANGALORE			
		CHD		KVRMURTHY 05-08-2000	CONDENSER		
				WATER DRAIN PORT-ISO 7321 DN 12			
		APPROVED		A.PANTABRAH 05-08-2000	WORK ORD. NO.: 41013907		NO. OFF:
SCALE		2:1		YR OF ORD	SIZE	DRAWING NO.	REV
				1996	A4	RD-41013907-P-114	3



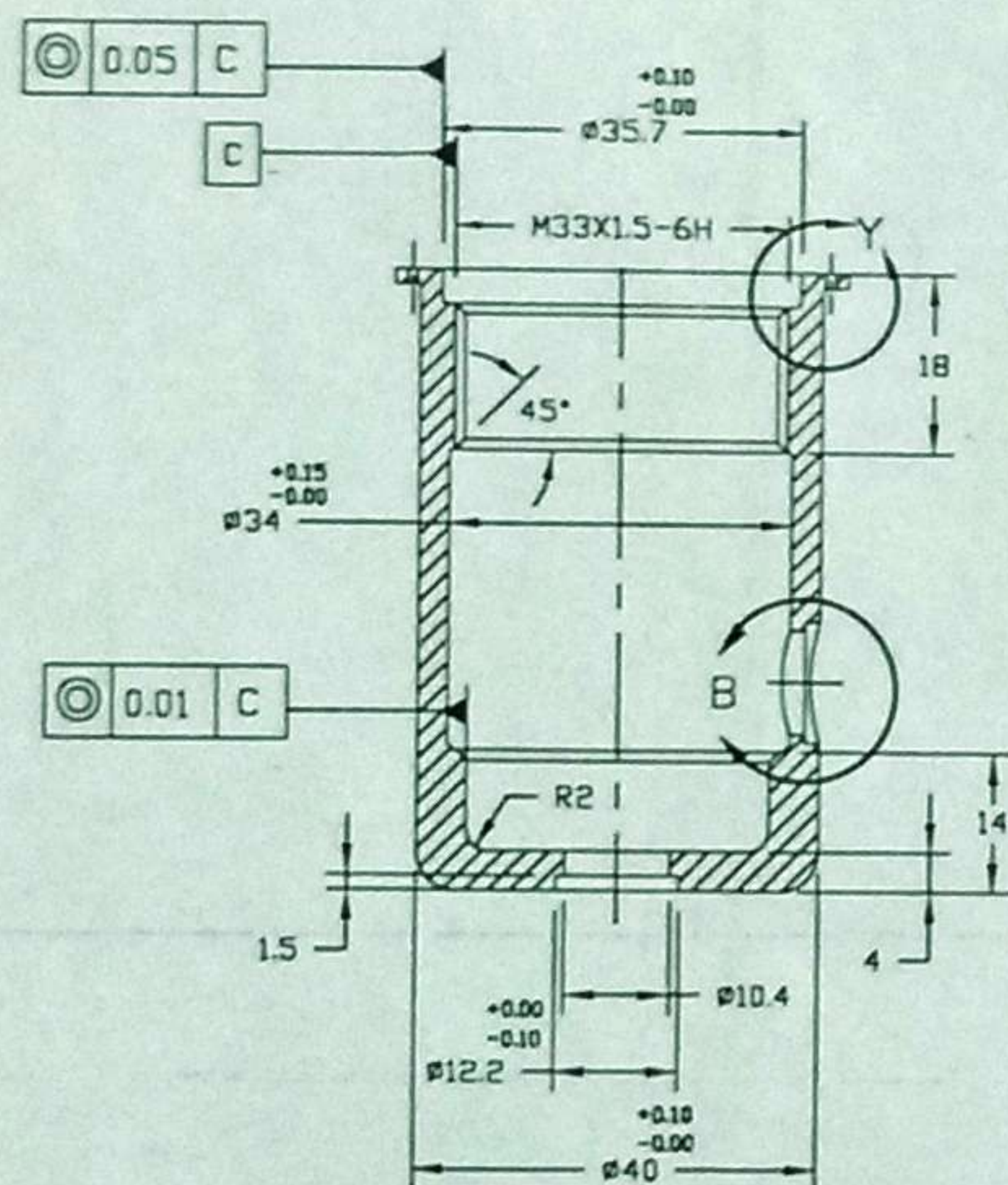
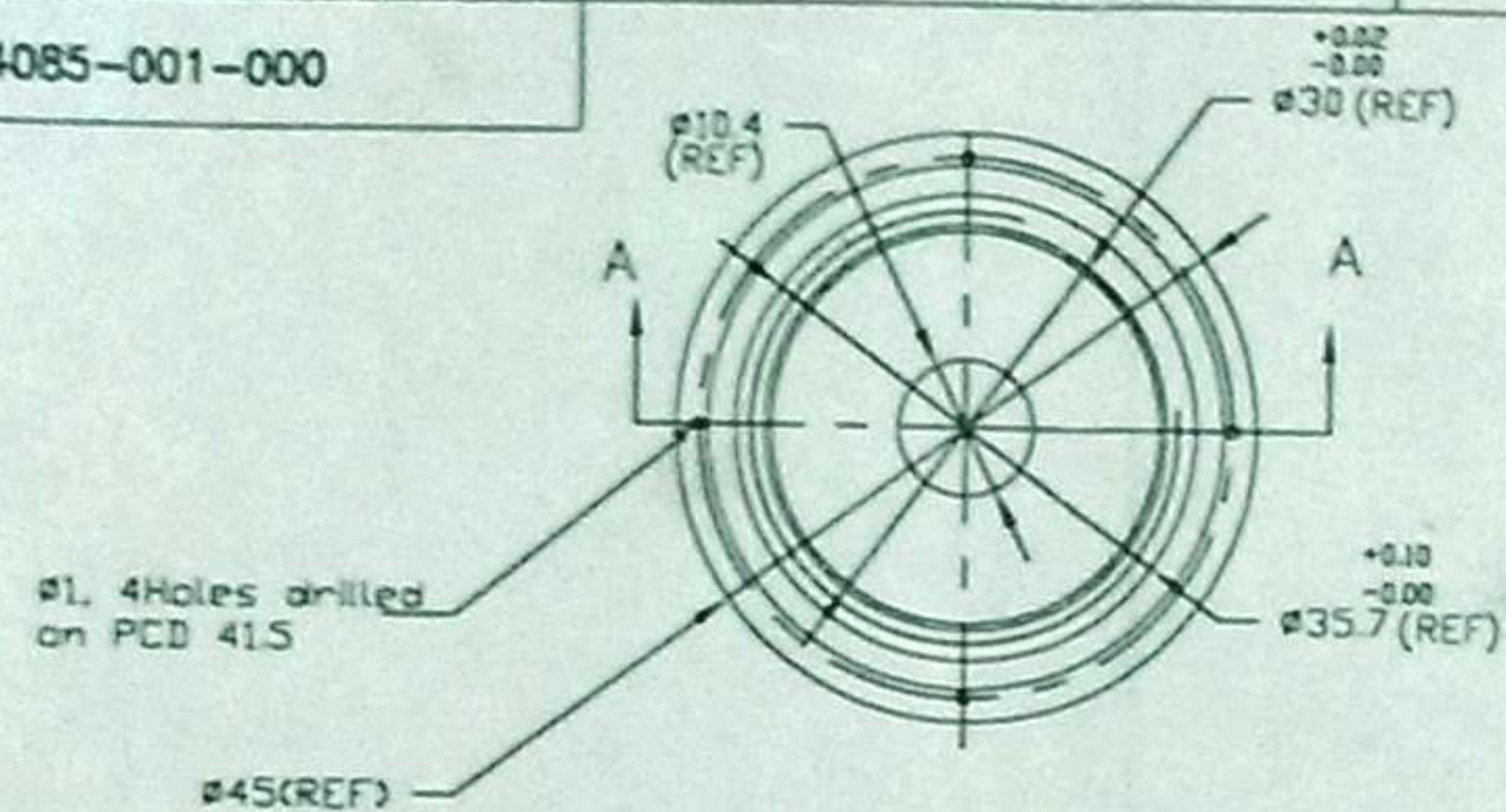
NOTE :

1. THIS ITEM IS EQUIVALENT TO M/s INTERFLEX
PART No. 1-22609-02-25-E
2. ALL SURFACES TO BE MACHINED TO $\nabla\nabla$ FINISH

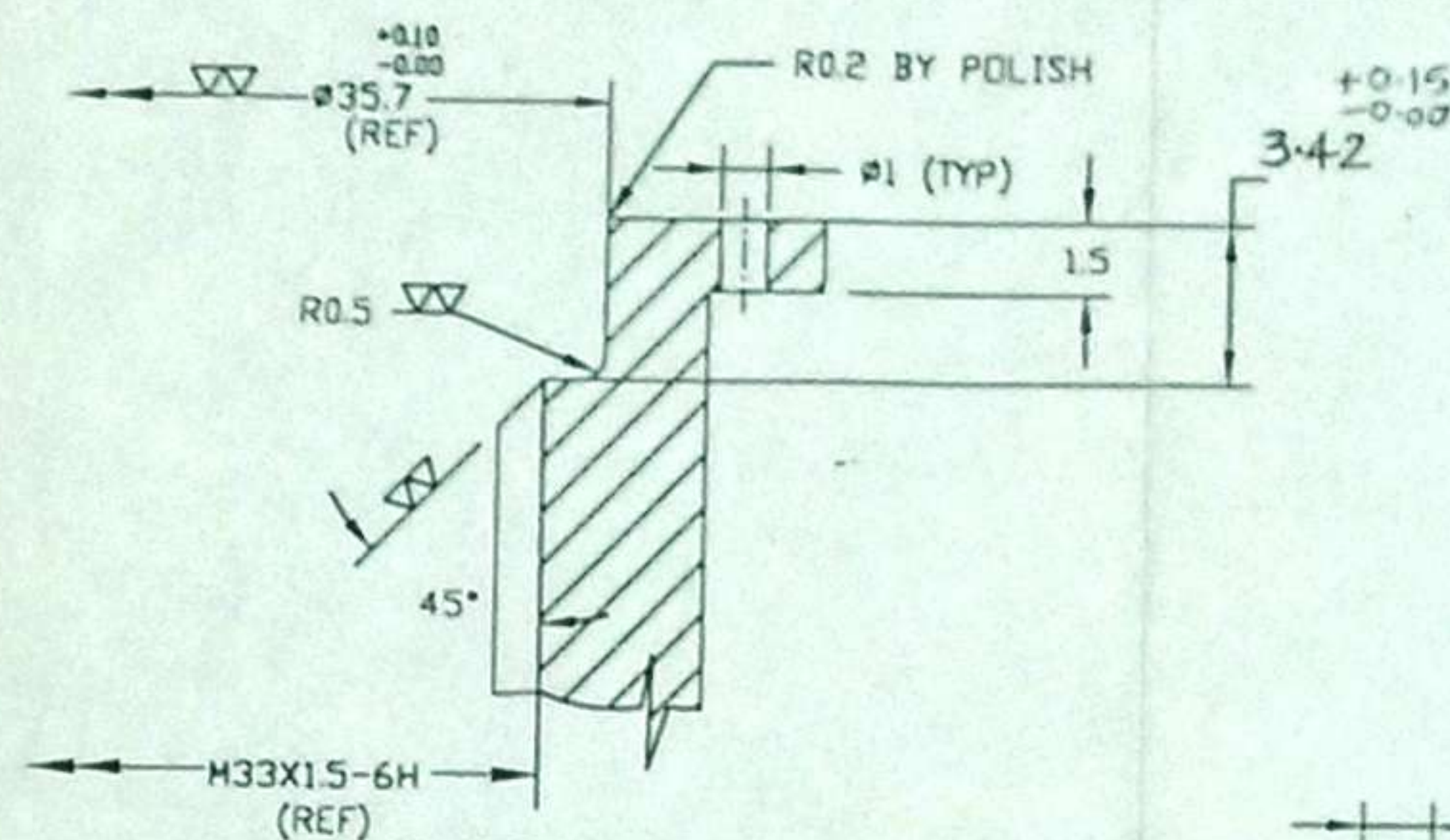
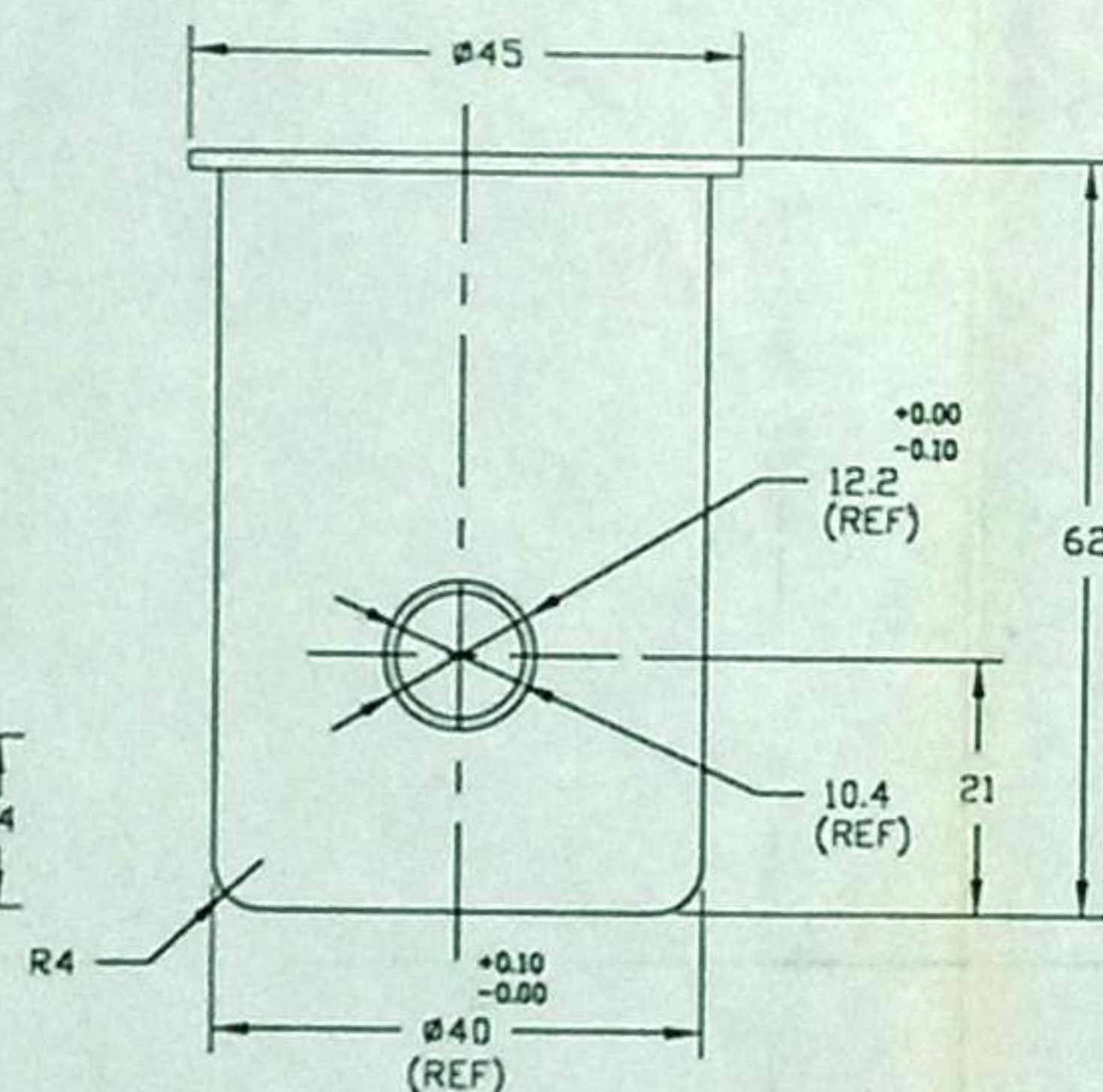
REF. DRG.								
RD-4103907-A-100								
		REV NO.	ZONE	BRIEF RECORD		PPD	CHD	APD
QTY.	1 No.	BHPU BHARAT HEAVY PLATE AND VESSELS LTD.						
PART NO.	116	VISAKHAPATNAM — 530 012, INDIA						
MATRL.	AA 5086	DRN	B. Uma 01.05.06	RESEARCH & DEVELOPMENT				
NOTES: 1. DRAWING NOT TO BE SCALED. 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHD	01/05/06	CUSTOMER : ADA, BANGALORE				
		APPROVED	01/05/06	CONDENSER				
		SCALE	1:1	FADEC COLD AIR TAPPING PORT				
				WORK ORD. NO.: 41013907		NO. OFF:		
				YR OF ORD	SIZE	DRAWING NO.	REV	
			2006	A4	RD-41013907-P-116	0		



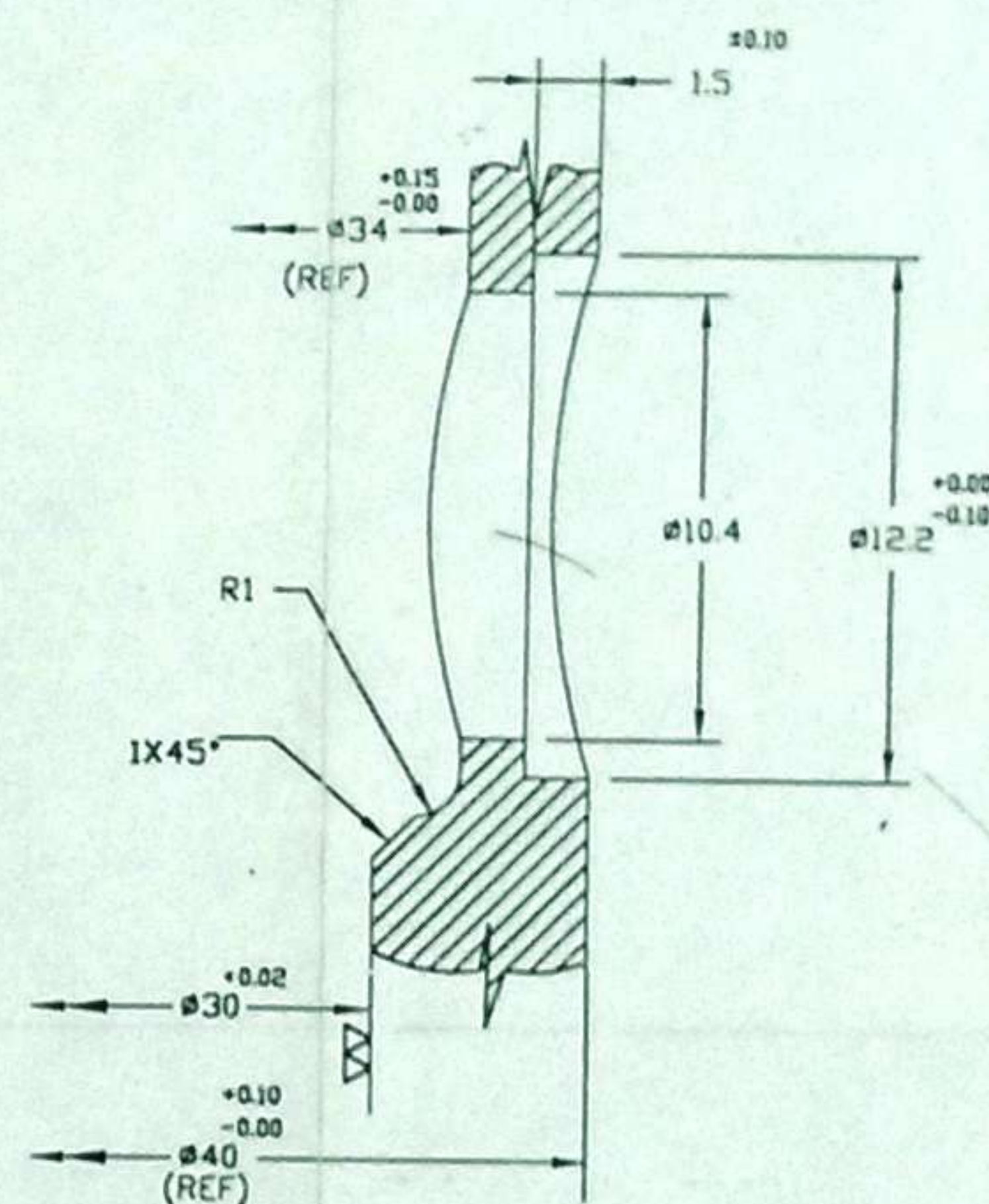
REF. DRG. RD-41013911-A-100 RD-41013912-A-100		REV NO.	ZONE	BRIEF RECORD		PPD	CHD	APD
QTY.	2 Nos.	BHARAT HEAVY PLATE AND VESSELS LTD.						
ITEM No.	122	VISAKHAPATNAM - 530 012, INDIA						
MATRL.	MDN 321A	DRN.	17-09-01	RESEARCH & DEVELOPMENT				
NOTES: 1. DRAWING NOT TO BE SCALED 2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.		CHKD.	18/09/01	CUSTOMER : M/s A.D.A.,BANGALORE				
		APPROVED	18/09/01	WORK ORD. NO. 410139 11, 12		NO. OFF		
		SCALE	NTS	YR OF ORD	SIZE	DRAWING NO.		REV
				1999	A4	RD-STD-PBPV-005		0



SECTION A-A



DETAIL-Y
SCALE 4:1



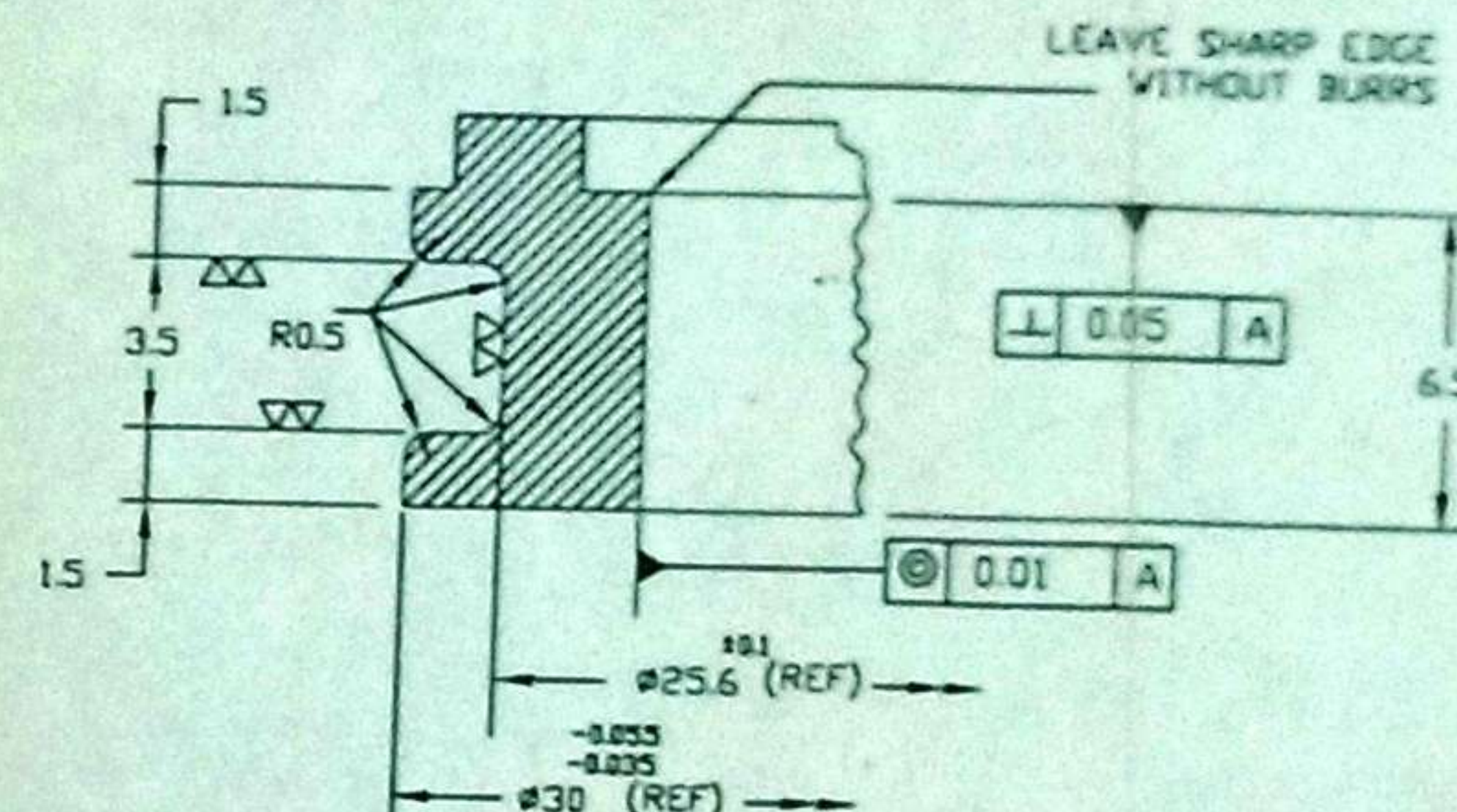
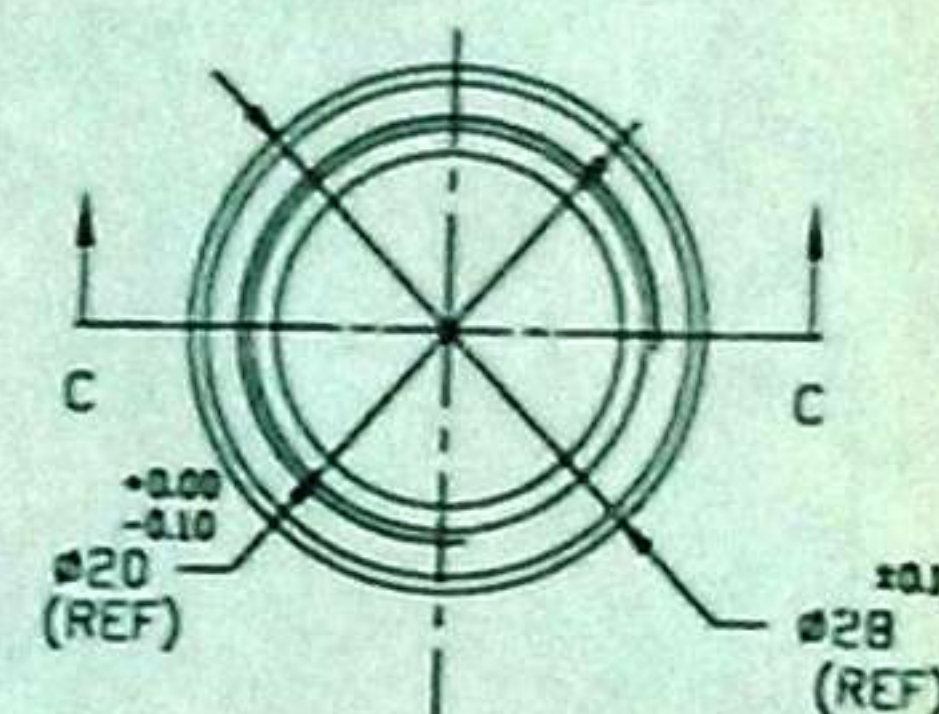
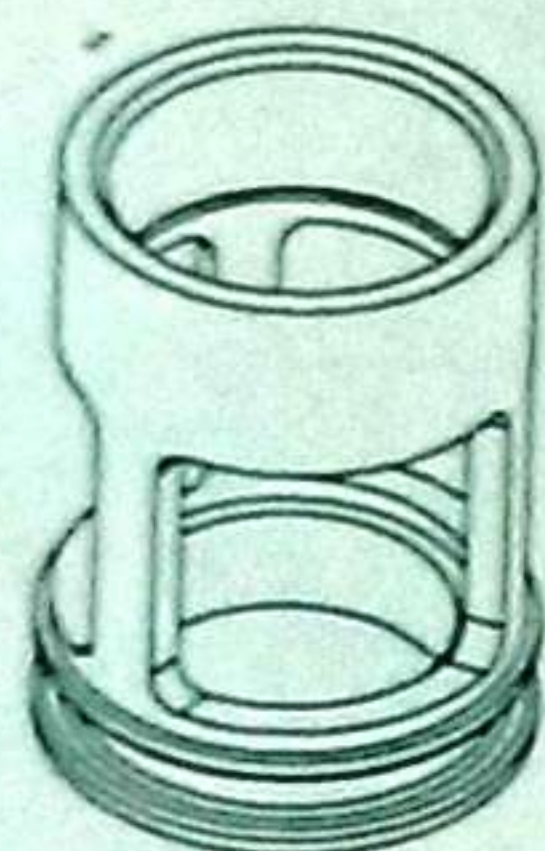
DETAIL-B
SCALE 4:1

NOTE:

1. BREAK CORNER & SHARP EDGES TO R0.2 & 0.2X45° RESPECTIVELY.
2. MARK PART NO.& INSPECTION STAMP ON TAG.
3. CARRY OUT NDT 006 AND 015.

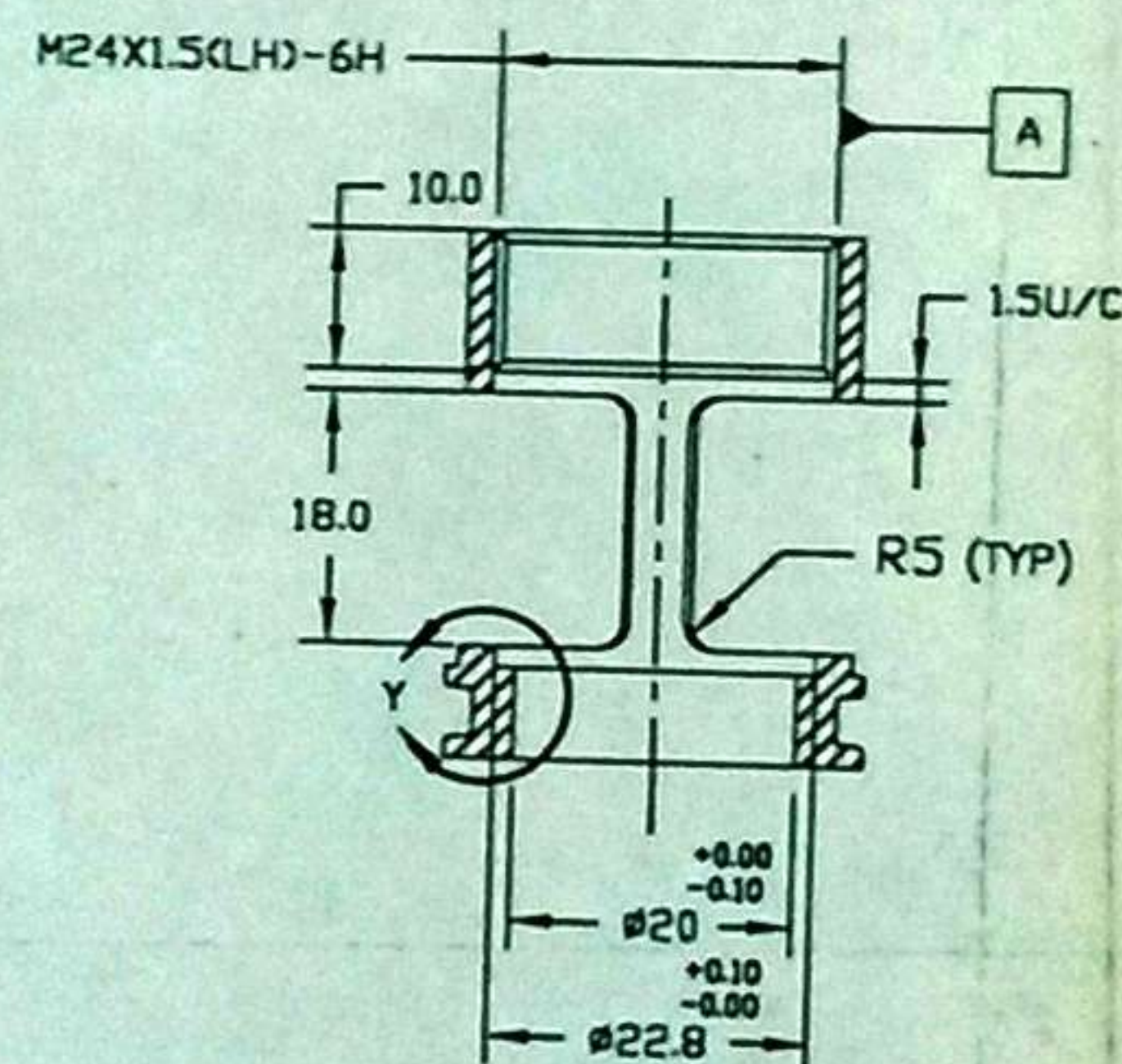
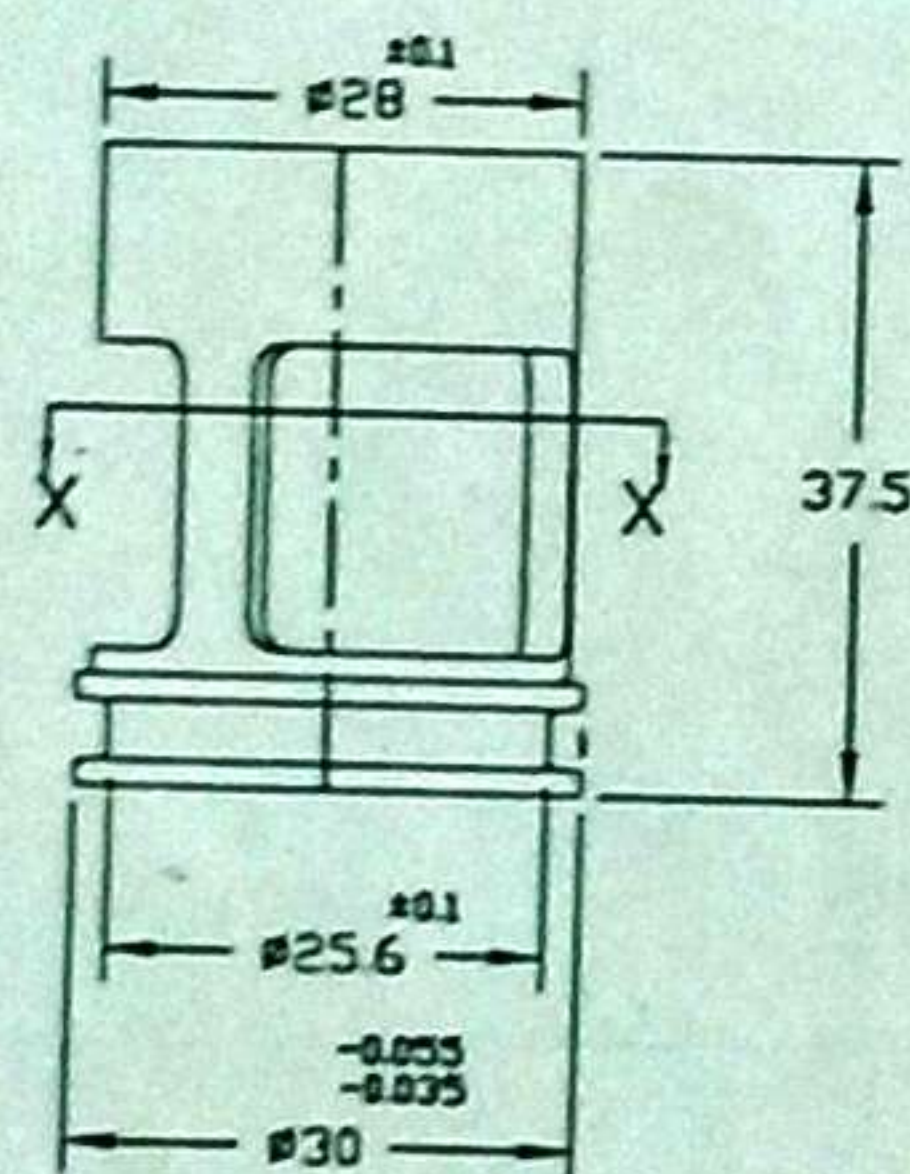
SCALE: 1 : 1		ADA AERONAUTICAL DEVELOPMENT AGENCY (MIN.OF.DEFENCE) BANGALORE-17,INDIA		DEC 99	NAME	DATE
MATERIAL	AL. ALLOY BAR 50AL=80	SPECN: 5086-T6	HEAT TREAT(kg/Sq.mm) OU ≥ 28	DRAWN	Anand	3-1-2000
UNSPECIFIED TOLERANCE	GENERAL ±0.3 mm	DIMENSIONS IN MM EXCEPT NOTED		CHECKED	Sathya	3-1-2000
	MACHINED ±0.15 mm			FINISH: REF. NOTE 4	CAL. WT. 0.071Kg	STRESS/WT CONTROL
	ANGULAR ±1/2°	NO. REQD.	NEXT ASSEMBLY			
SURFACE ROUGHNESS (CLA)	AS PRODUCED	1	A1K-14-4085-000-000	ENGINEER	P. J. Kumar	3-1-2000
	ROUGH ▽ 3.2 μm		A1K-14-5005-000-000	APPROVED	W. S. S.	3-1-2000
	MEDIUM ▽▽ 1.6 μm		IDENTIFIABLE PART: YES / NO			
	FINE ▽▽▽ 0.8 μm	ICY : YES / NO				
	SPECIAL			DWG. NO.	SHEET 1 OF 1	
	TITLE: BODY			A1K-14-4085-001-000		

A1K-I4-4085-002-000

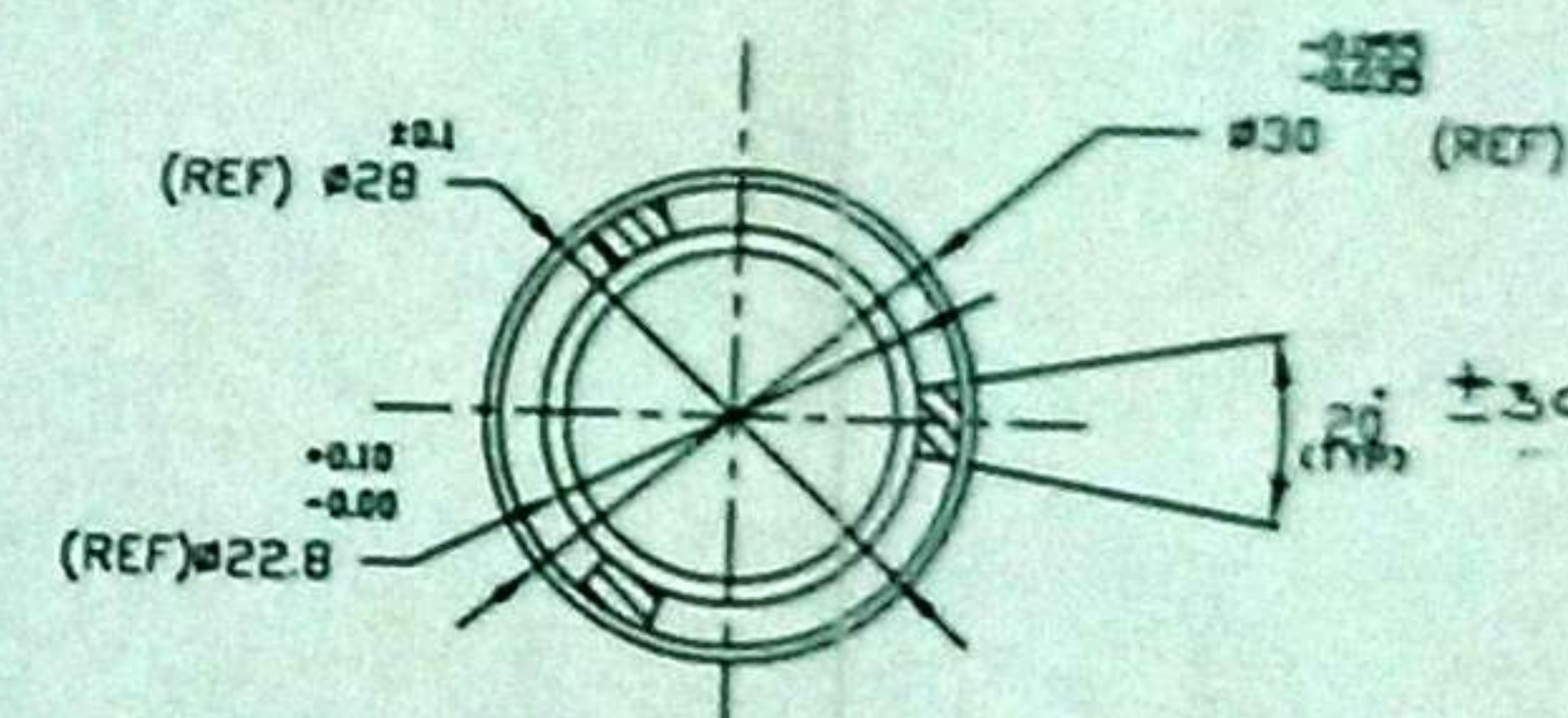


DETAIL 'Y'

SCALE 4:1



SECTION C-C



SECTION 'X-X'

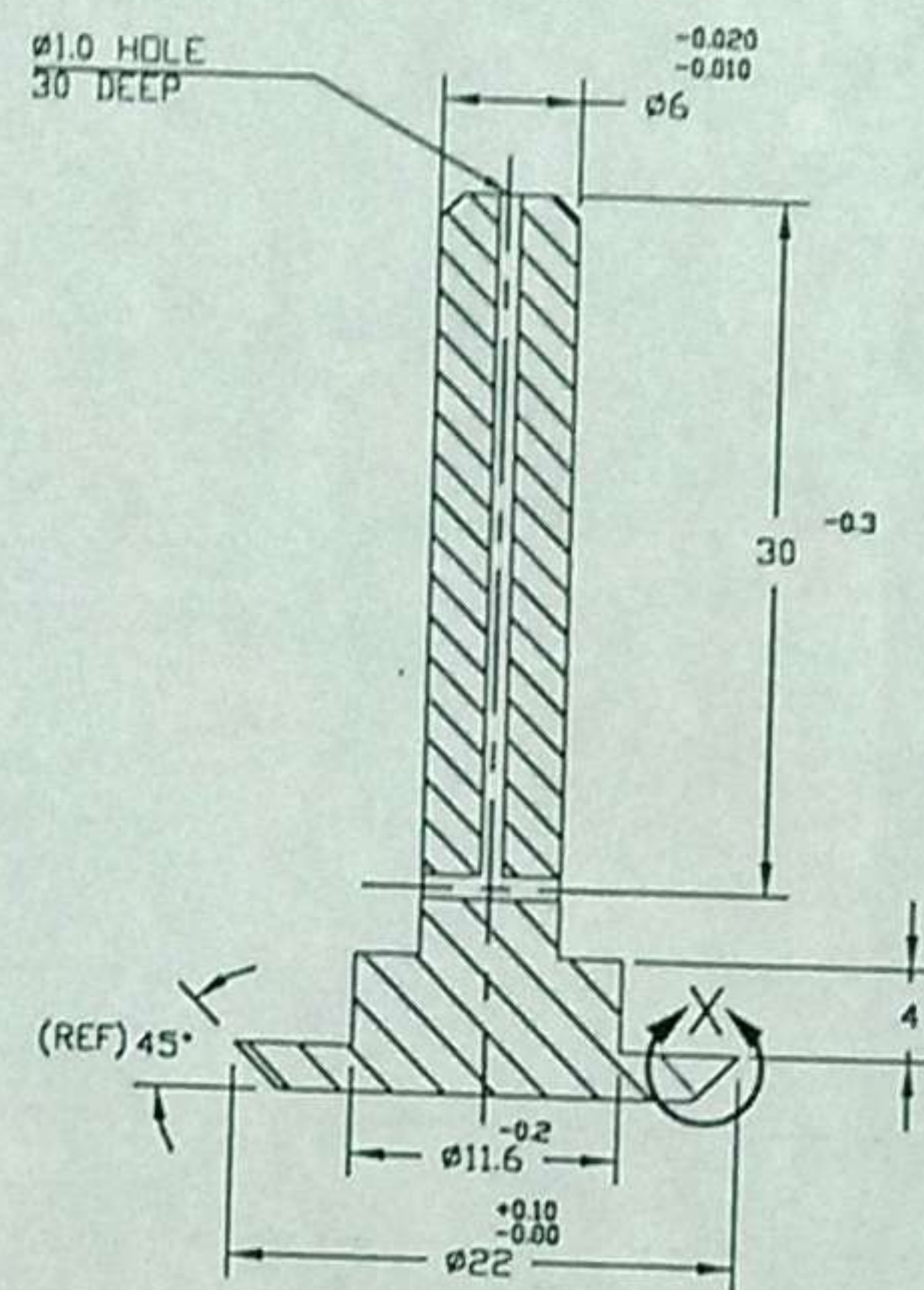
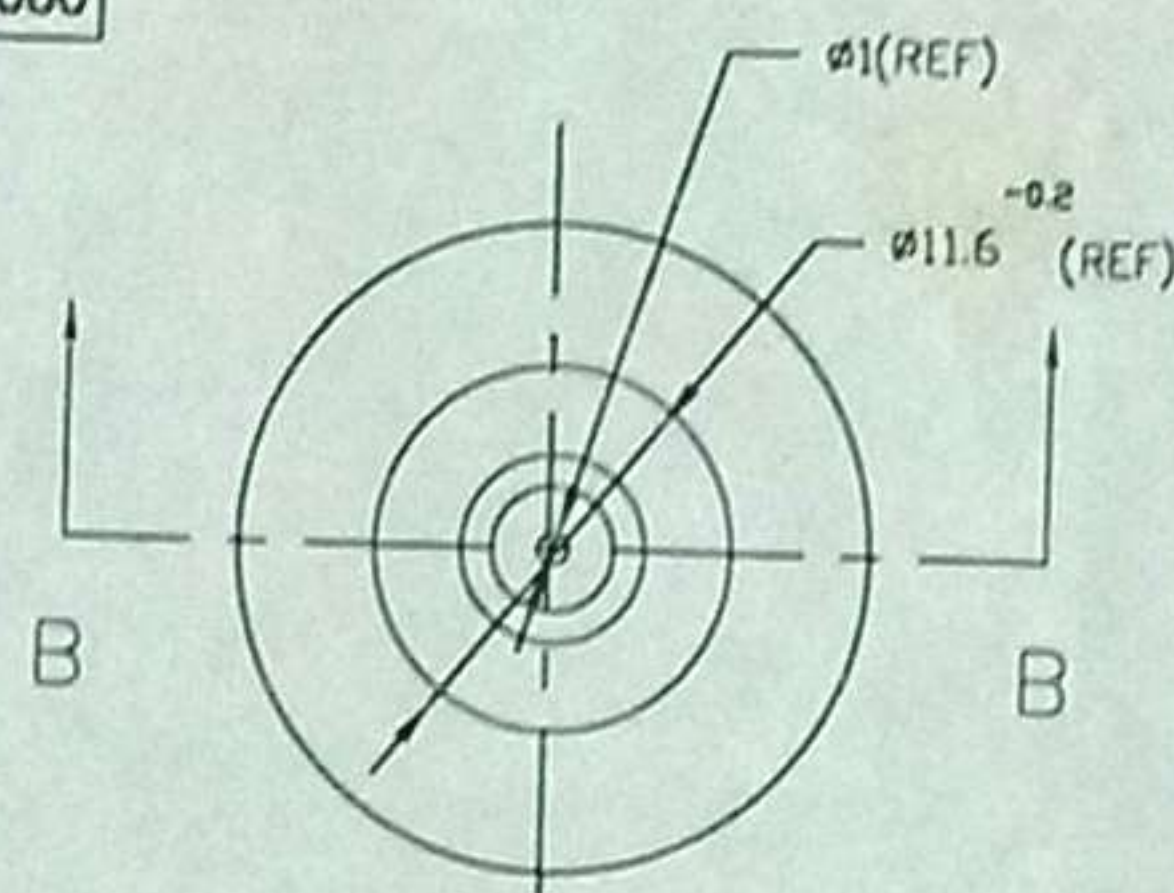
NOTE:

1. BREAK CORNER & SHARP EDGES TO R0.2/0.2X45° RESPECTIVELY.
2. MARK PART NO. & INSPECTION STAMP ON TAG.
3. CARRY OUT NDT 006 AND 015.
4. FINISH: ANODISE AS PER HPS 201 TYPE I FINISH II.

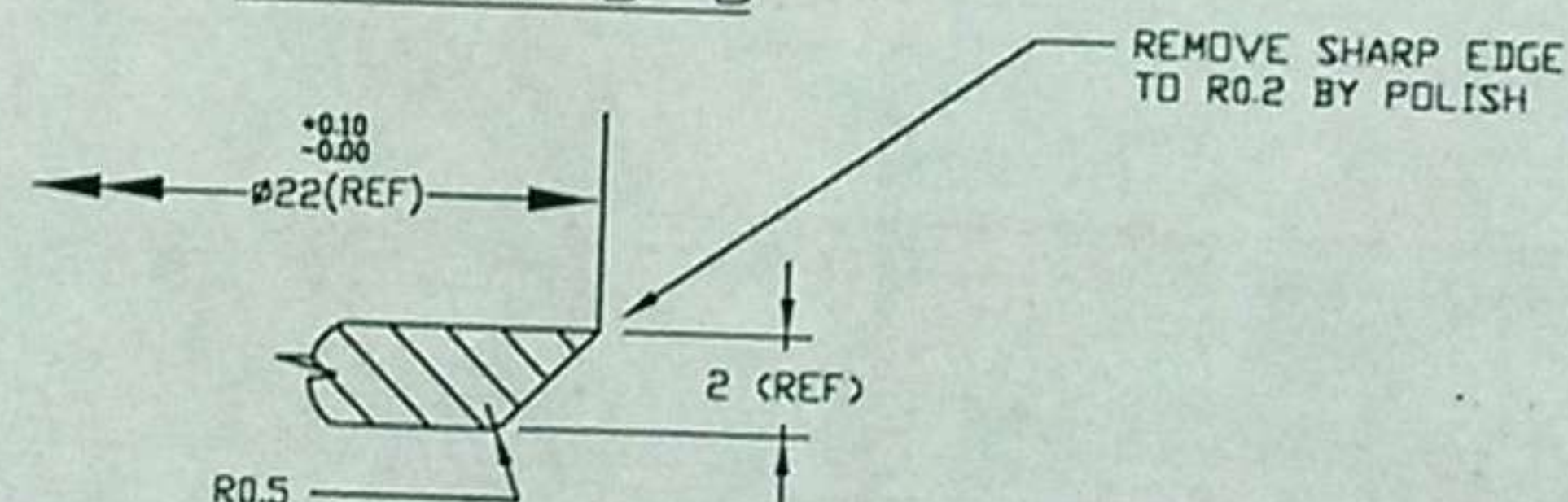
SCALE:	1:1	ADA AERONAUTICAL DEVELOPMENT AGENCY (MIN.OF.DEFENCE) BANGALORE-17,INDIA	DEC-99	NAME	DATE
MATERIAL	AL ALLOY	SPECN: HE15A-ST-T6	DRAWN	Battaya	29/12/99
UNSPECIFIED TOLERANCE	GENERAL ±0.3 mm MACHINED ±0.15 mm ANGULAR ±1/2°	HEAT TREAT(kg/Sq.mm) 82L ≥ 43	CHECKED	Manoj	29/12/99
SURFACE ROUGHNESS (CLA)	AS PRODUCED ROUGH ▽ 3.2 μm MEDIUM ▽ 1.6 μm FINE ▽ 0.8 μm SPECIAL	DIMENSIONS IN MM EXCEPT NOTED FINISH: REF. NOTE CAL. WT ≤ 0.03kg NO. REQD. 1 NEXT ASSEMBLY A1K-I4-4085-000-000 A1K-I4-5005-000-000	STRESS/WT CONTROL		
		IDENTIFIABLE PART: YES / NO KEY: YES / NO	ENGINEER	P. K. Kaul	29/12/99
			APPROVED	Luvs	29/12/99
			DWG. NO.		
			SHEET 1 OF 1		
			A1K-I4-4085-002-000		

SEAT

A1K-14-4085-003-000

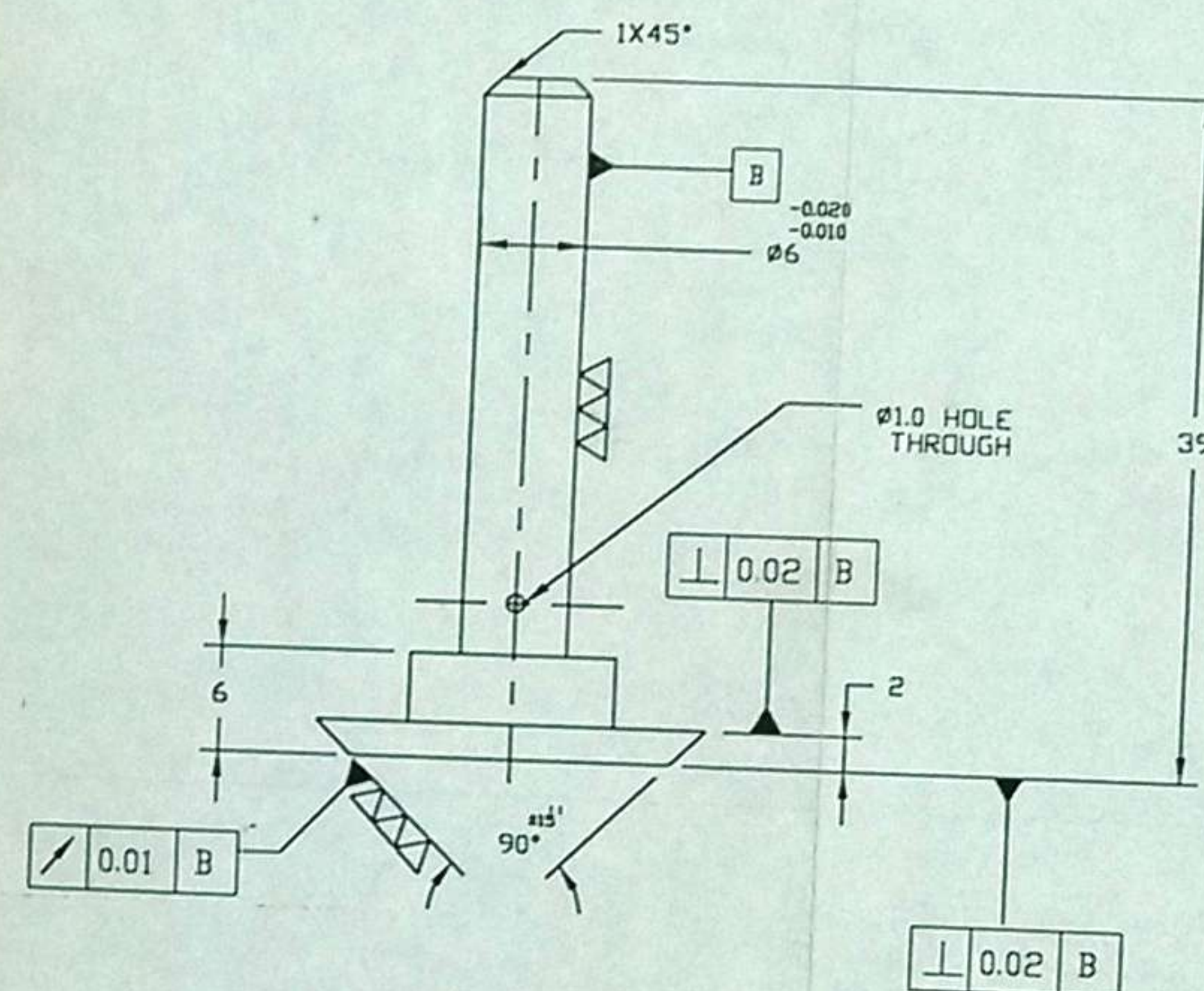


SECTION B-B

DETAIL-X
SCALE 4:1

NOTE:

1. BREAK CORNERS & SHARP EDGES TO R0.2/0.2X45° RESPECTIVELY.
2. MARK PART NO. & INSPECTION STAMP ON TAG.
3. CARRY OUT NDT AS PER 006 & FLUORESCENT DYE PENETRANT AS PER NDT015.



SCALE:

2:1

ADA AERONAUTICAL DEVELOPMENT AGENCY
(MIN.OF.DEFENCE) BANGALORE-17,INDIA

MATERIAL

STAINLESS STEEL

UNSPECIFIED TOLERANCE

 GENERAL ±0.3 mm
 MACHINED ±0.15 mm
 ANGULAR ±1/2°

SURFACE ROUGHNESS (CLA)

 AS PRODUCED
 ROUGH ▽ 3.2 μm
 MEDIUM ▽ 1.6 μm
 FINE ▽ 0.8 μm
 SPECIAL

SPECN: MDN 321A

HEAT TREAT(kg/Sq.mm) 6u ≥ 52

FINISH: REF. NOTE

NO. REQD. 1

NEXT ASSEMBLY

IDENTIFIABLE PART: YES / NO

ICY: YES / NO

DEC-99

NAME

DATE

DRAWN

Sattiyar

29/12/99

CHECKED

Sattiyar

29/12/99

STRESS/WT

CONTROL

ENGINEER

J. K. Kaur

28/12/99

APPROVED

Linda

28/12/99

DWG. NO.

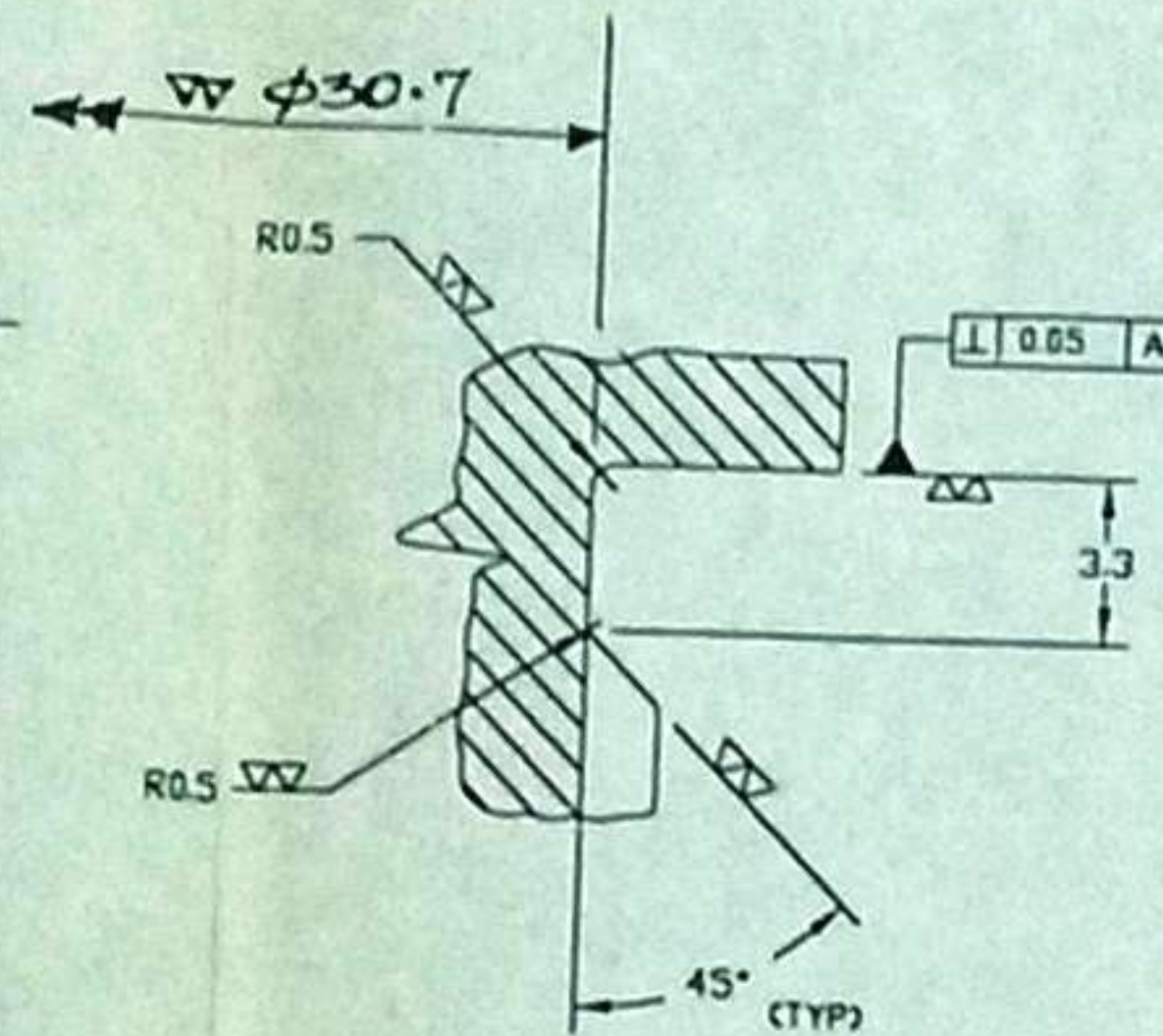
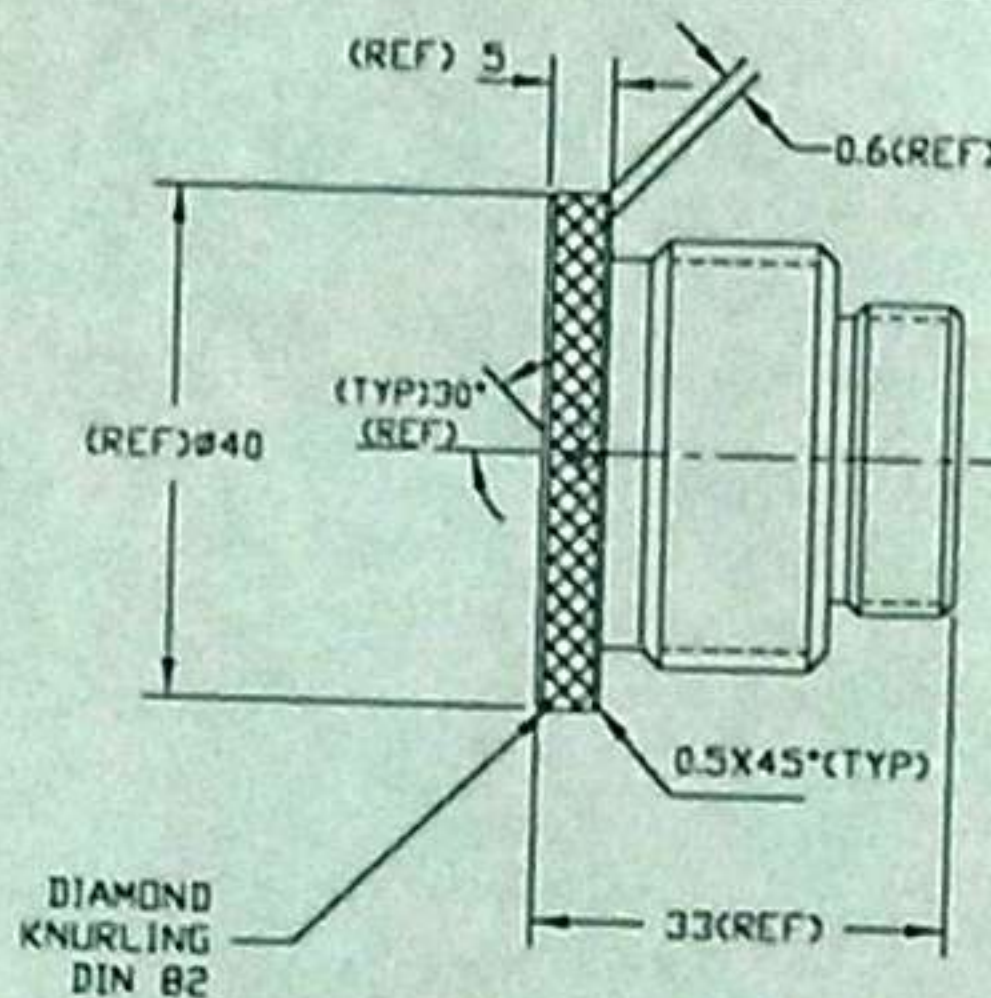
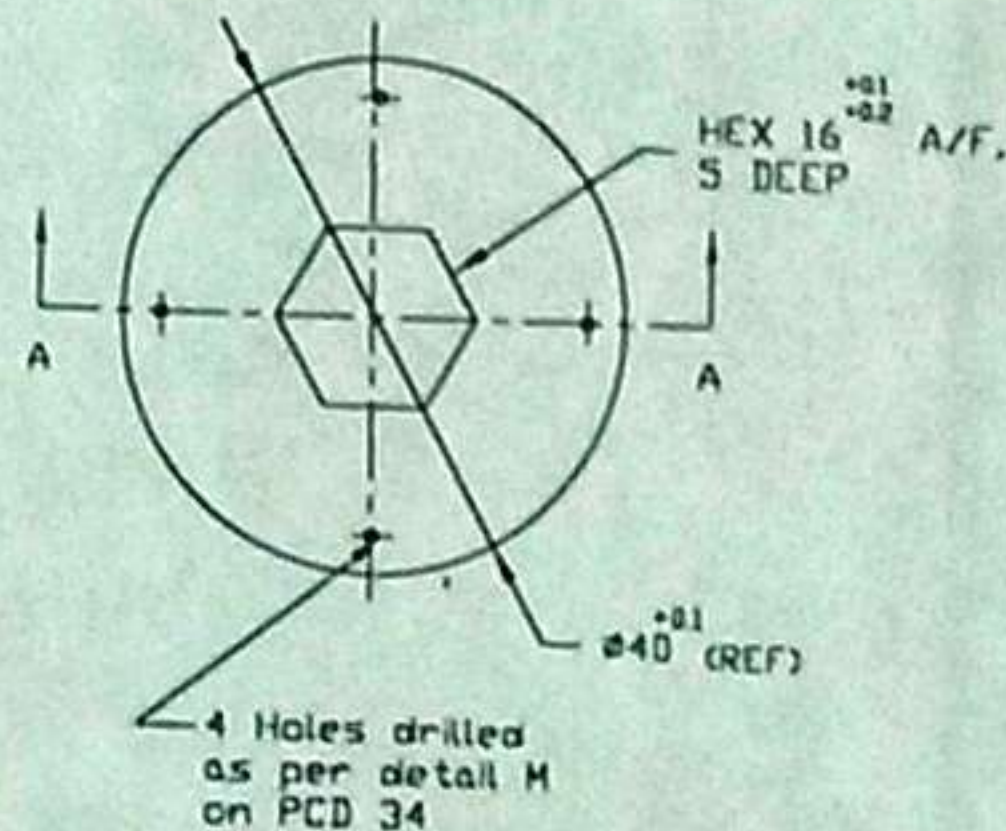
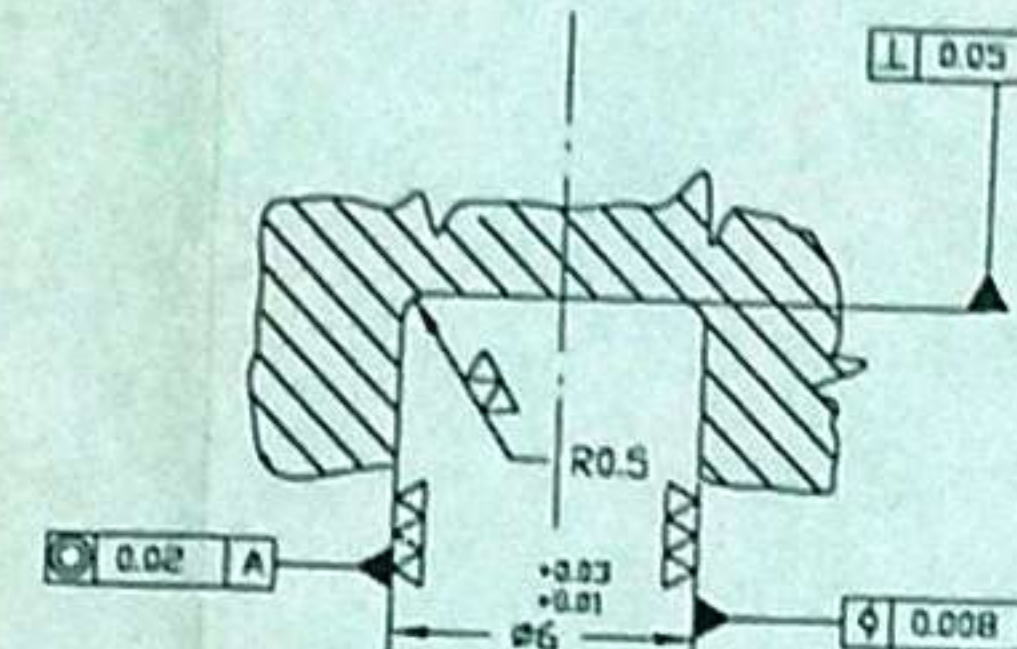
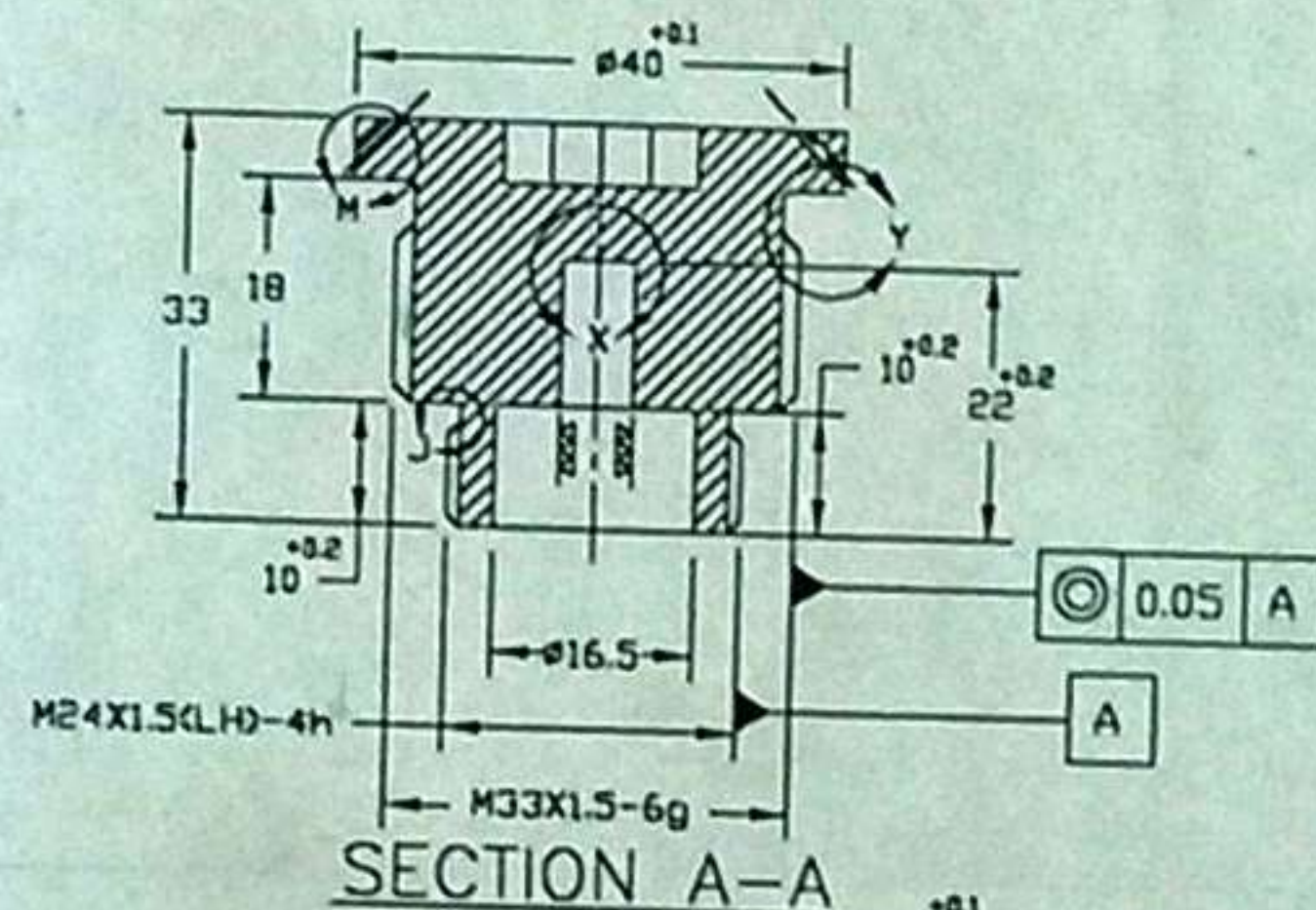
SHEET 1 OF 1

A1K-14-4085-003-000

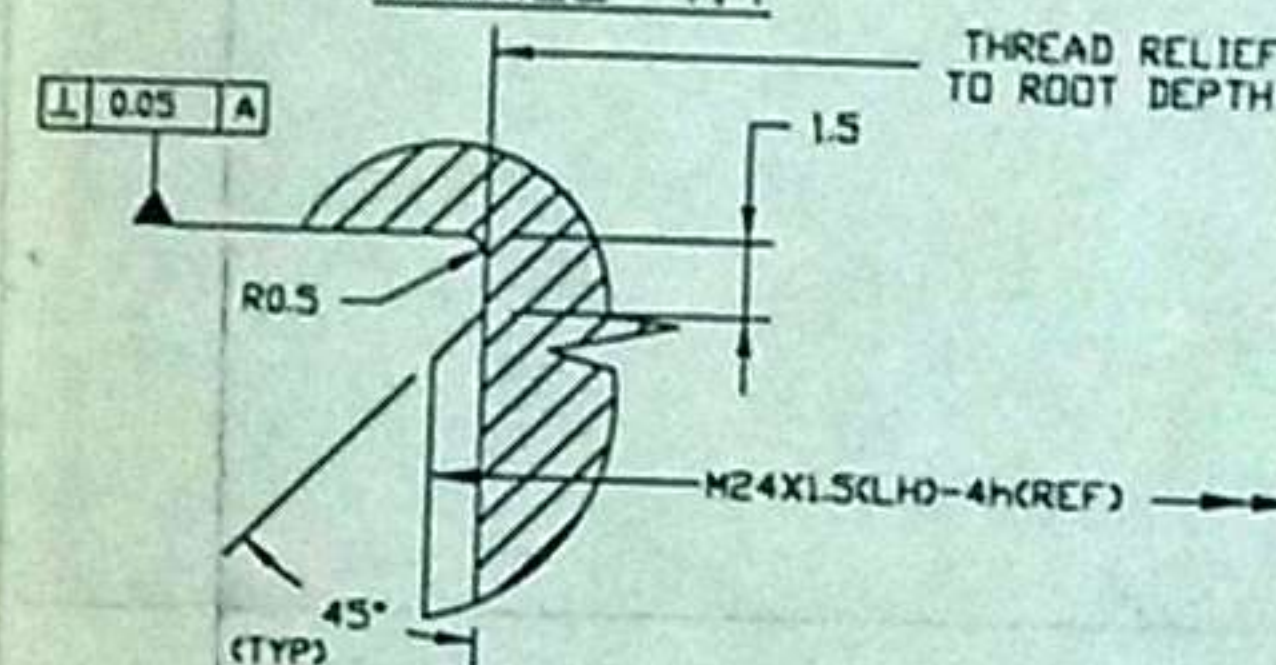
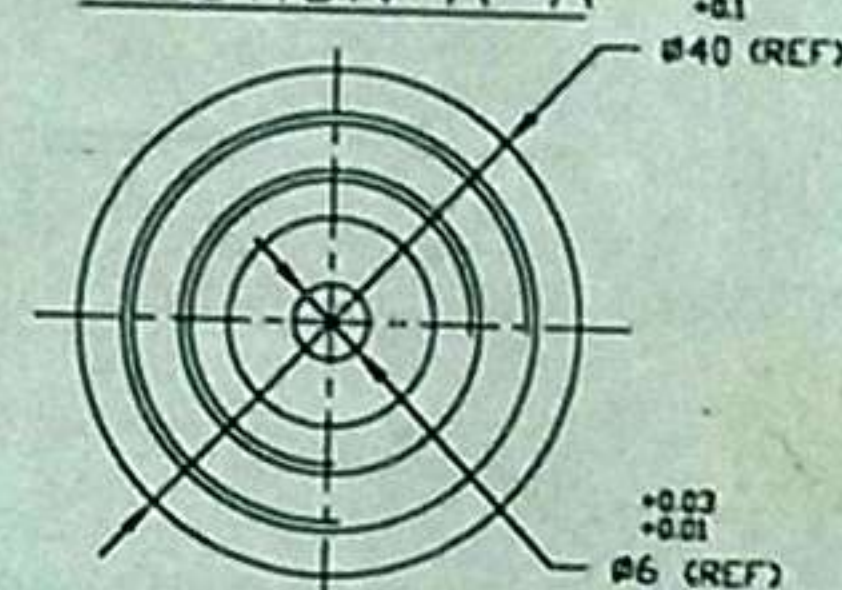
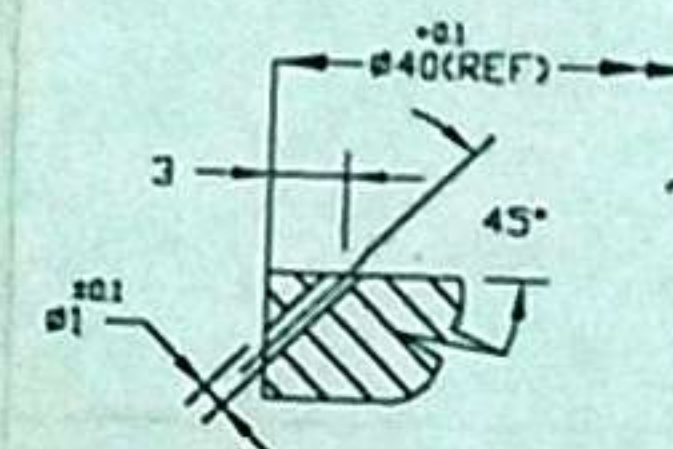
TITLE:

POPPET

A1K-14-4085-004-000

DETAIL-Y
SCALE 4:1DETAIL-X
SCALE 4:1

SECTION A-A

DETAIL-J
SCALE 4:1DETAIL-M(TYP)
SCALE 2:1

NOTE:

1. BREAK CORNER & SHARP EDGES TO R0.2/0.2X45° RESPECTIVELY.
2. MARK PART NO. & INSPECTION STAMP ON TAG.
3. CARRY OUT NDT 006 AND 015.
4. FINISH: ANODISE AS PER HPS 201 TYPE 1 FINISH II.
5. ALLOWED TO USE AL ALLOY BSL 168.

SCALE:
1:1ADA AERONAUTICAL DEVELOPMENT AGENCY
(MIN.OF.DEFENCE) BANGALORE-17,INDIA

DEC-99 NAME DATE

MATERIAL	AL. ALLOY	SPECN: HE15A-ST-T6	HEAT TREAT(kg/Sq.mm) $\delta U \geq 43$
UNSPECIFIED TOLERANCE	GENERAL ± 0.3 mm MACHINED ± 0.15 mm ANGULAR $\pm 1/2^\circ$	DIMENSIONS IN MM EXCEPT NOTED	
SURFACE ROUGHNESS (CL)	AS PRODUCED ROUGH $\nabla 3.2 \mu m$ MEDIUM $\nabla 1.6 \mu m$ FINE $\nabla 0.8 \mu m$ SPECIAL	FINISH: REF. NOTE NO. REQD. 1	CAL. WT. 0.070 Kg NEXT ASSEMBLY A1K-14-4085-000-000 A1K-14-5005-000-000
		IDENTIFIABLE PART: YES / NO ICY: YES / NO	

DRAWN	G.2.12	
CHECKED	G.2.12	
STRESS/WT CONTROL		
ENGINEER	G.2.12	
APPROVED	W.2.2	

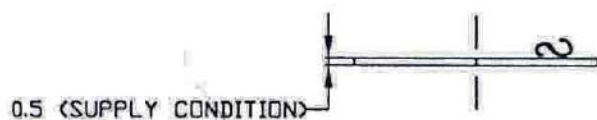
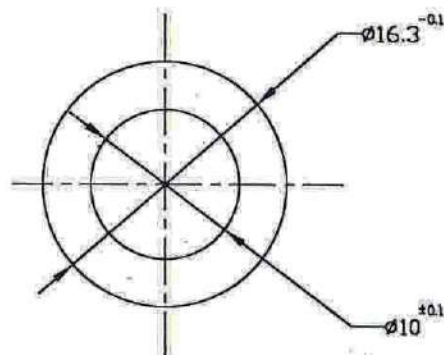


TITLE:

RETAINER

DWG. NO. SHEET 1 OF 1

A1K-14-4085-004-000

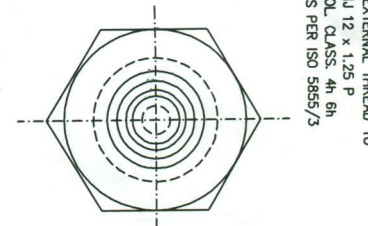
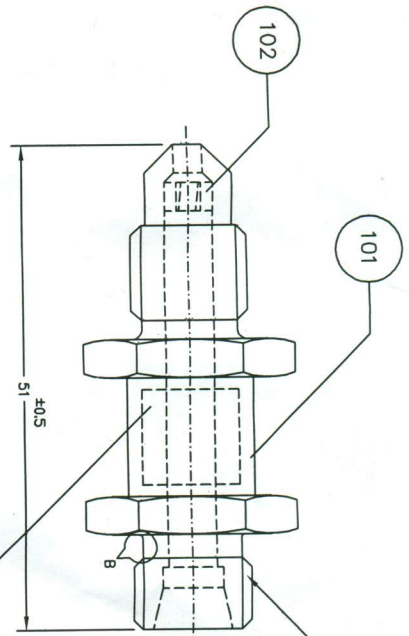


12KH18N10T EQ: SS321
 e17.
 Cr 12%
 Ni 10%
 Ti Stabilized.

NOTE: REMOVE ALL BURRS AND SHARP EDGES.

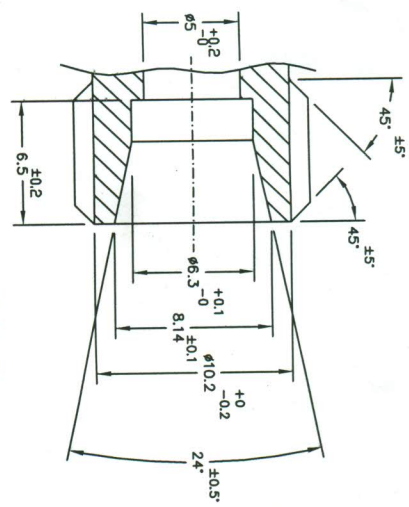
MDN321 - 1st pm project Slip
 4085/004

SCALE: 2:1	ADA AERONAUTICAL DEVELOPMENT AGENCY (MIN.OF.DEFENCE) BANGALORE-17,INDIA		APR-00	NAME	DATE
MATERIAL	SS SHEET 0.5 TH	SPECN: 12KH18N10T MDN321 -	HEAT TREAT(kg/Sq.mm)	DRAWN	Sallya
UNSPECIFIED TOLERANCE	GENERAL ±0.3 mm	DIMENSIONS IN MM EXCEPT NOTED		CHECKED	P.L. kurl
	MACHINED ±0.15 mm	FINISH: -	CAL. WT. 0.001Kg	STRESS/WT CONTROL	
	ANGULAR ±1/2°	NO. REQD.	NEXT ASSEMBLY	ENGINEER	P.L. kurl
SURFACE ROUGHNESS (CLA)	AS PRODUCED	1	A1K-I4-4085-000-000	APPROVED	hvels. 17/4
	ROUGH ▽ 3.2 μm		A1K-I4-5005-000-000		
	MEDIUM ▽▽ 1.6 μm				
	FINE ▽▽▽ 0.8 μm				
	SPECIAL	IDENTIFIABLE PART: YES / NO			
		ICY : YES / NO		DWG. NO.	SHEET 1 OF 1
TITLE: SPACER		A1K-I4-4085-008-000			



SEE NOTE 3

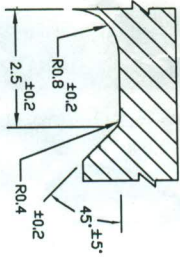
VIEW-AA



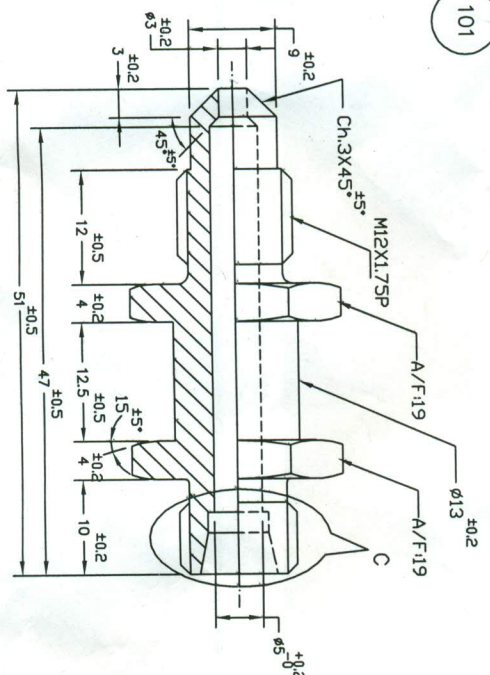
DETAIL-C

SCALE : 4:1

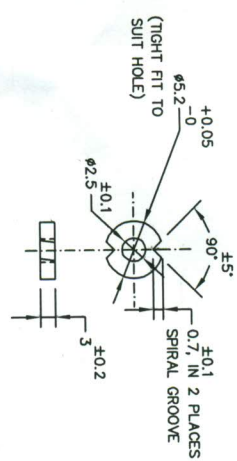
TOTAL WT: 0.025 KG



DETAIL-B



BODY



DISC

P.No.	DESCRIPTION	QTY.	MATERIAL	WT(KG)
102	DISC	1	AA 5086	0.001
101	BODY	1	AA 5086	0.024

BHARAT HEAVY PLATE & VESSELS LTD.
(A Subsidiary of Bharat Yantro Nigam Limited)
VISAKHAPATNAM - 530 012 (A.P.)

RESEARCH & DEVELOPMENT

CUSTOMER : M/S HAL, BANGALORE

WATER INJECTOR

DRN	SYS srinivas	08.03.13
CHD	KSR	08.03.13
APPROVED	A.Ponigrahi	08.03.13
SCALE	2:1	
ALL PROJECTIONS ARE FIRST ANGLE UNLESS OTHERWISE SPECIFIED		
WORK ORDER NO :		NO OFF:
YEAR OF ORDER	2012	SIZE
RD-41015701-A-100		DRAWING No.
		REV
		0

NOTES:
1. TOLERANCES INDICATED ARE NOT CUMULATIVE
2. ALL SHARP CORNERS SHALL BE ROUNDED OFF
3. THE FOLLOWING INFORMATION SHALL BE INDICATED IN THE APPROXIMATE AREA SHOWN AFTER COMPLETION OF ASSEMBLY.
P/N 41015701
S/N XX
MFR BHPV
MFD XX-XXXX
CSTM HAL
4. SURFACE TREATMENT :
AS PER BHPV ANODPROCEDURE-001

REF. DRG. ADA SPEC ADA/CA/EC/S/W/000/05,
ISSUE:NI, DTD 27-03-2013.

REV NO	ZONE	BRIEF RECORD	PPD	CHD	APD