

ANNEXURE-I
PR NO:0135905479

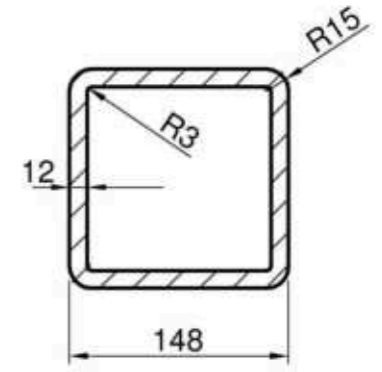
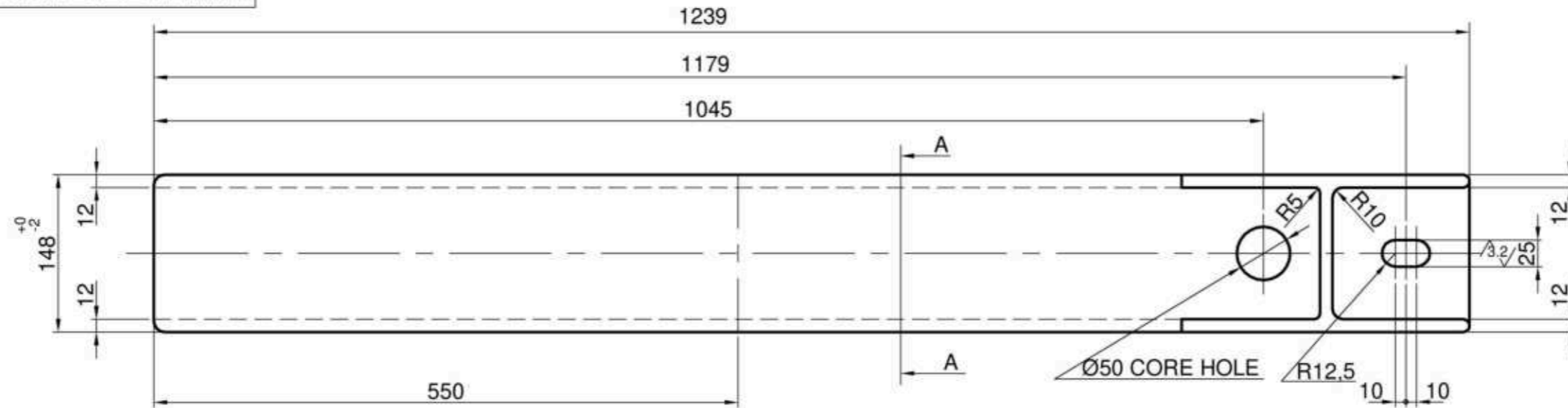
SL NO	PRE QUALIFICATION REQUIREMENT	VENDOR'S COMMENTS
1	Vendor must have experience in manufacturing of Iron and Steel castings. The bidder shall submit previous Purchase Order supplied to Central/State Govt./PSU company/Private organization during the last Seven years from the date of tender. The proof of such supply (Executed Purchase Order Copy along with TDS (Tax Deducted at Source) certificate issued by the organization or Form 26 AS or Bank statement for transaction of payment for completion of supply or Performamce certificate duly signed) shall be submitted with the offer.	

ANNEXURE -II

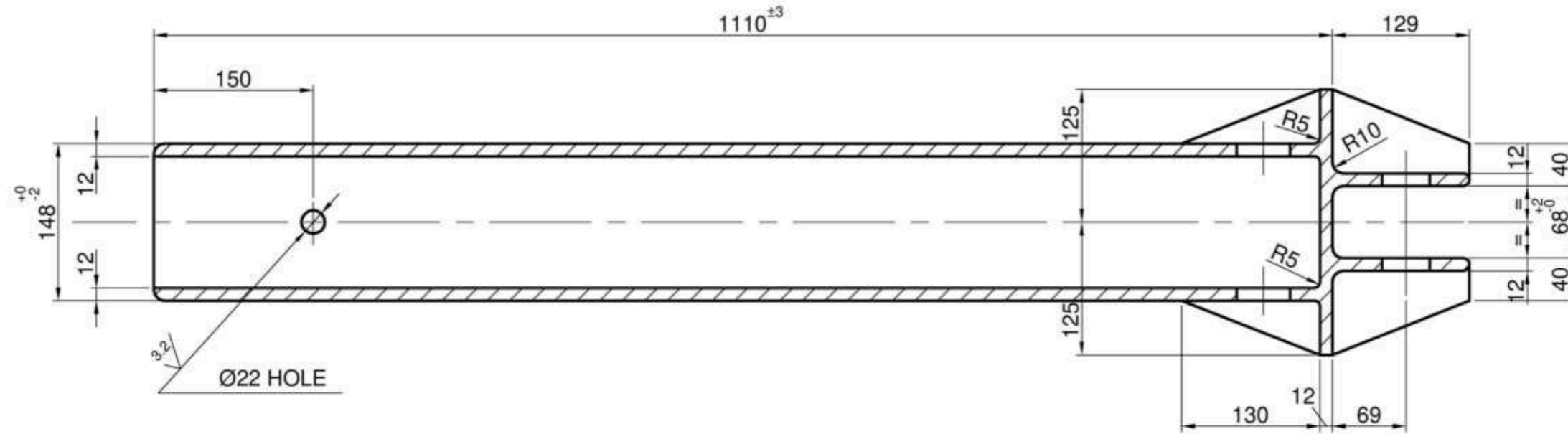
SL NO	Documents requirements	VENDOR'S COMMENTS
1	Signed copy of technical specification with organisation seal/stamp	
2	Executed Purchase Order Copy along with TDS (Tax Deducted at Source) certificate issued by the organization or Form 26 AS or Bank statement for transaction of payment for completion of supply or Performamce certificate duly signed to meet the requirements in Annexure I Sl No 1. Kindly avoid sending multiple purchase orders.	
3	Filled in & signed copy of Annexure I - PQR details with organisation seal /stamp	
4	Filled in & signed copy of Annexure B & C (BHEL Technical Cum Commercial Terms And Conditions)for Indigenous Vendors)with organisation seal /stamp	

ALL DIMENSIONS ARE IN MILLIMETRES

DRAWING NO: 3-7-1150-04-02844



MAINTAIN TOLERANCE-2mm ON 148SQ FOR LENGTH OF 550 mm.



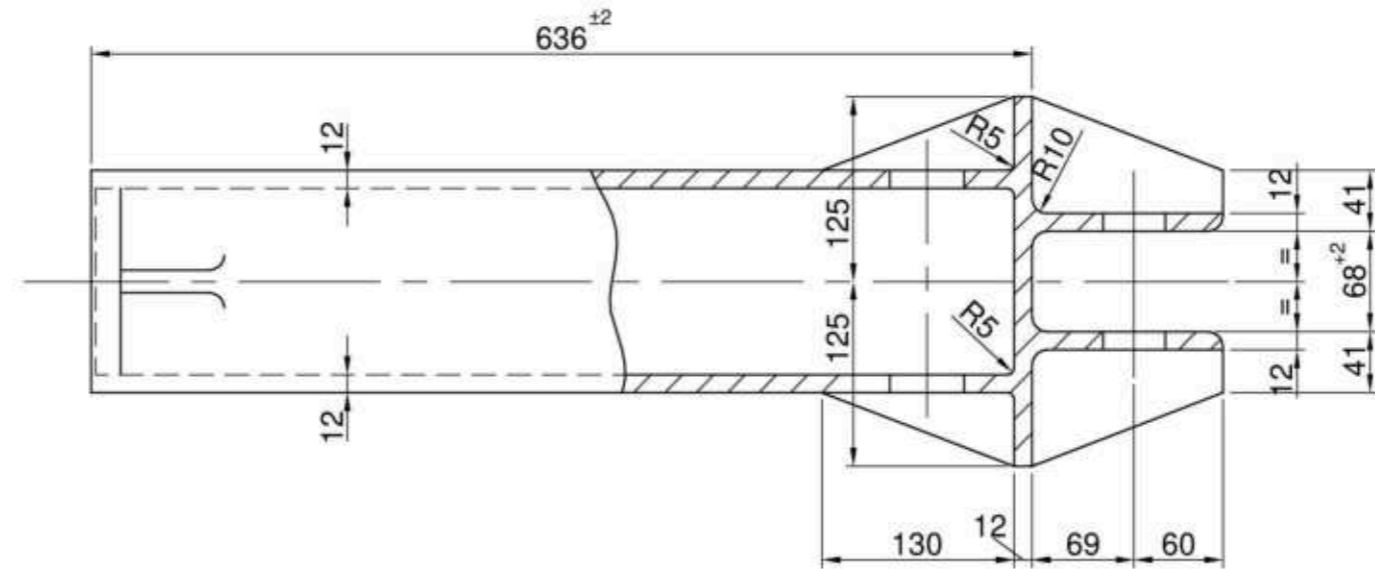
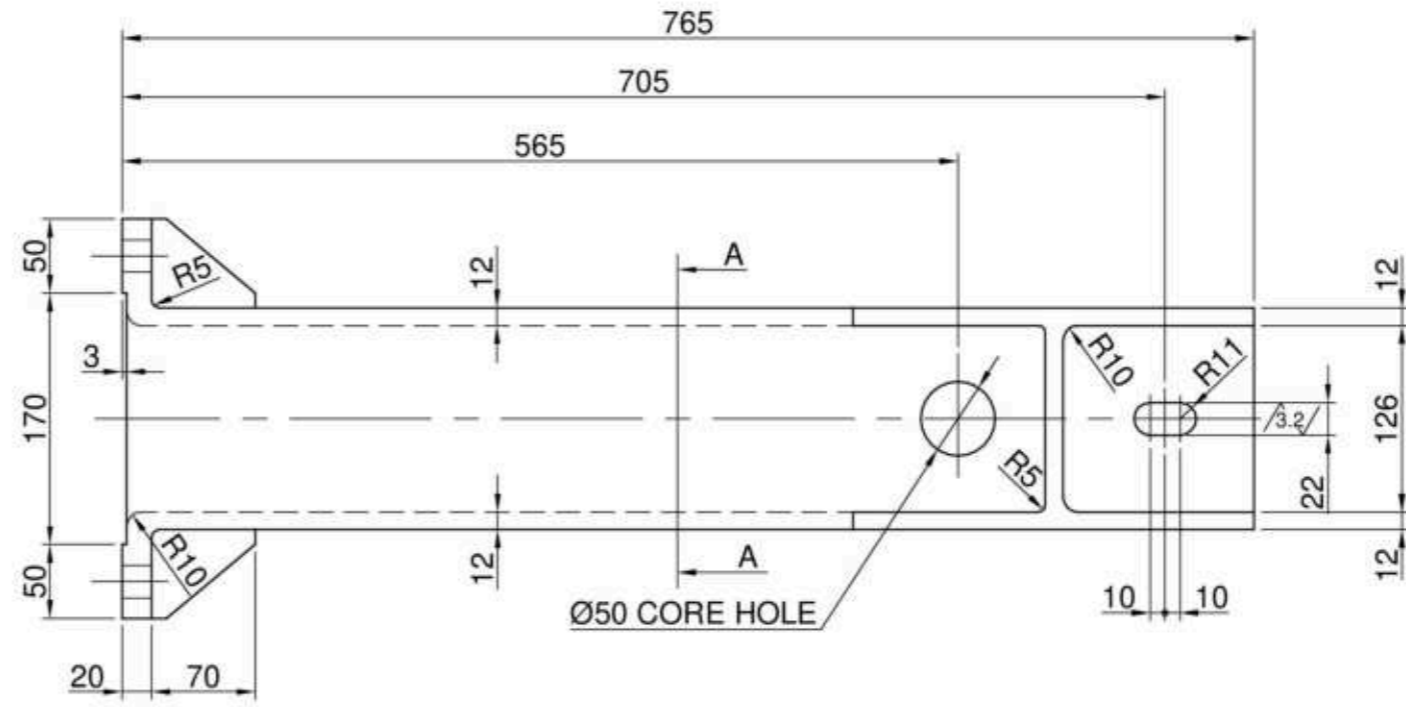
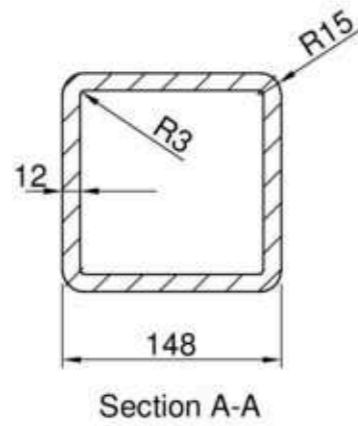
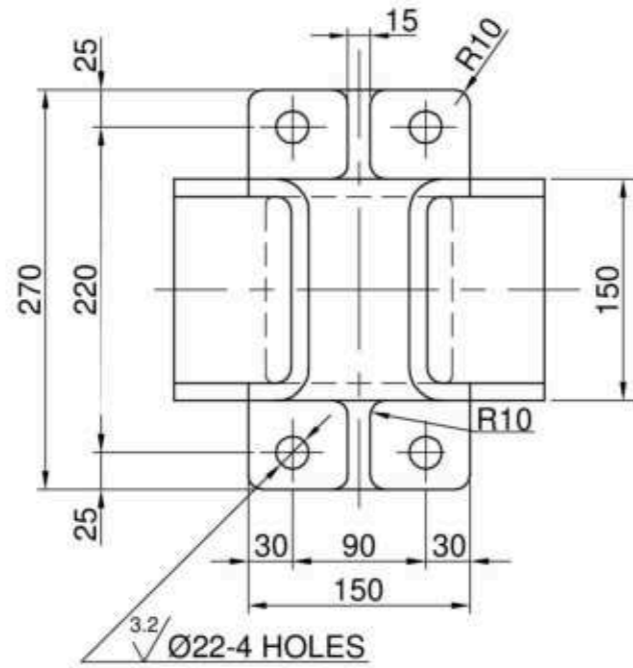
NOTES:

- WEIGHT VARIATION ± 5 %
- WARPAGE NOT TO EXCEED 4mm LENGTH.
- ALL SHARP CORNERS TO BE ROUNDED BY R3.UNLESS OTHERWISE STATED FOR ORIGINAL DESIGN REF DRG No.3-7-1150-04-01361

REV 02	DATE 01.02.12	ALTERED P. Mathavan CHECKED SSN Kumar APPROVED R. Raghunvar	REV 01	DATE 08.12.89	ALTERED CHECKED APPROVED
Section A introduced showing Radius			125,130 WERE 150 AND 200 RESPECTIVELY, IN THE RIB.		

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ITEM NO		DESCRIPTION	DRAWING NO	AS PER INDENT AND TDC	
				ALLOY STEEL CASTING	
				MATL CODE	UNIT WT
				MATL SPEC	QTY
EQPT: WALKING BEAM FURNACE					
DEPT S5TP		GRADE OF UNTOL DIM	SCALE	WEIGHT (Kg)	REF TO ASSY DWG NO
CODE 456		φ/M/F IS: 2102	1:5	73.67	REF TO OLD DWG NO 7621 / 408-3
TITLE			CARD CODE	DRAWING NO :	REV
WBF - MOVABLE BEAM SUPPORT			U 01	3-7-1150-04-02844	02



NOTES:

- 1.WEIGHT VARIATION 5%
- 2.WARPAGE NOT TO EXCEED 3mm IN LENGTH
- 3.ALL SHARP CORNERS TO ROUNDED BY R3 UNLESS OTHERWISE STATED
- 4.FOR ORIGINAL DESIGN REF DRG No.3-7-1150-05-01362

REV 02	DATE 01.02.12	ALTERED P. Mathavan
		CHECKED SSN Kumar
		APPROVED R. Raghunagar

REV 01	DATE 08.12.89	ALTERED
		CHECKED
		APPROVED

SECTION AA added showing Radius 125,130 WERE 150 AND 200 RESPECTIVELY IN THE RIB.

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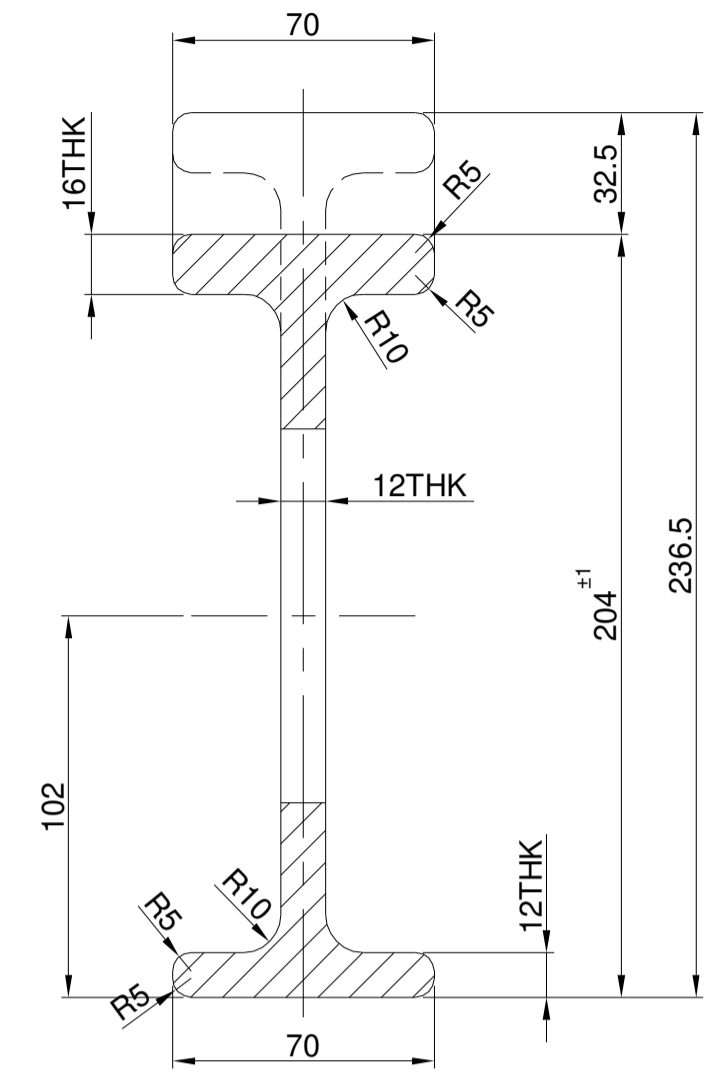
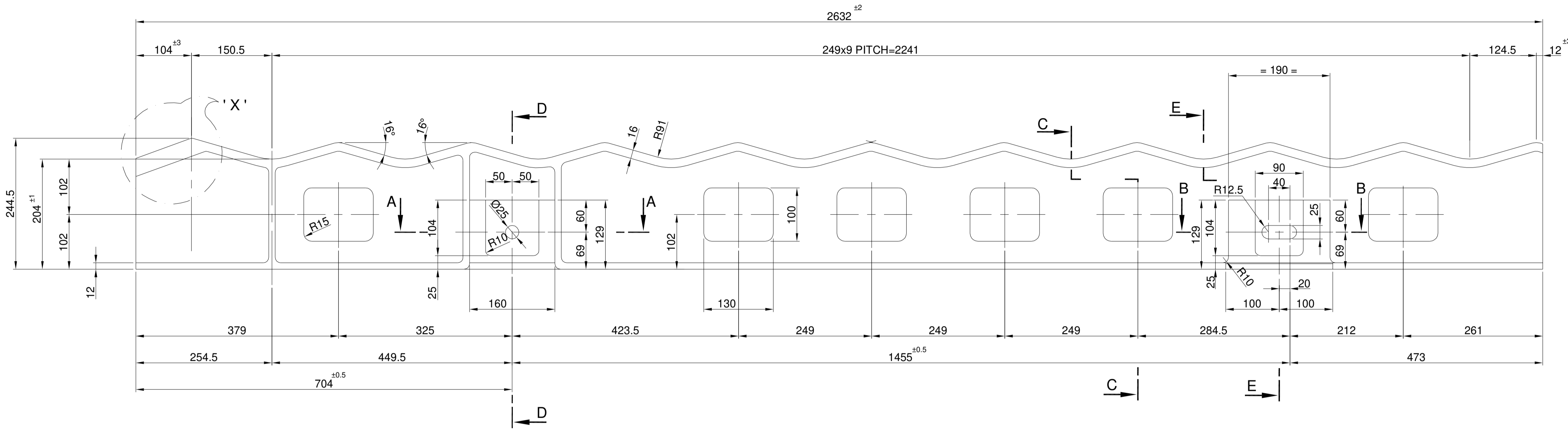
ITEM NO		DESCRIPTION	DRAWING NO	AS PER INDENT AND TDC	
				ALLOY STEEL CASTING	
				MATL CODE	UNIT WT
				MATL SPEC	QTY
EQPT: WALKING BEAM FURNACE.					
DEPT S5TP		GRADE OF UNTOL. DIM	SCALE	WEIGHT (Kg)	REF TO ASSY DWG NO
CODE 456		φ/M/F IS: 2102	1:5	51.67	REF TO OLD DWG NO 7621 / 409-3
TITLE			CARD CODE	DRAWING NO :	REV
WBF - FIXED BEAM SUPPORT			U 01	3-7-1150-05-02845	02



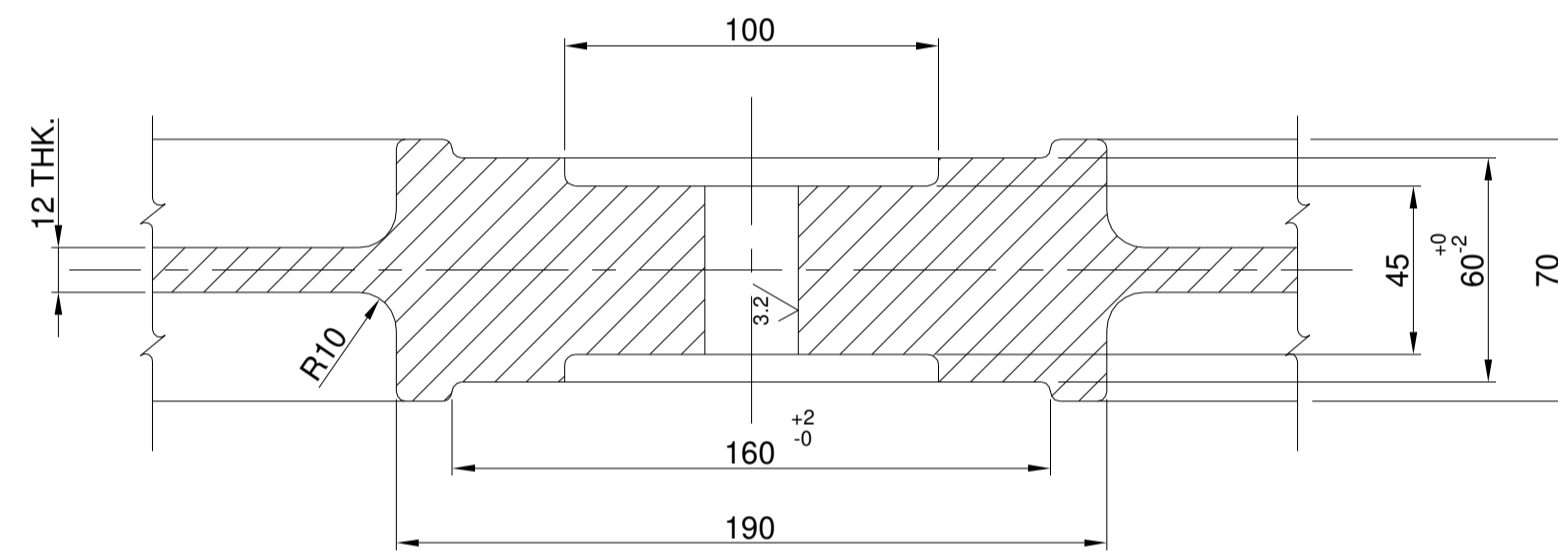
Bharat Heavy Electricals Ltd
SEAMLESS STEEL TUBE PLANT
TIRUCHIRAPALLI - 620014

DRN	NAME B.ASHOKKUMAR	SIGNATURE	DATE 23.05.02
CHD	SSN.KUMAR		
APPD	SHANMUGASUNDARAM.S		

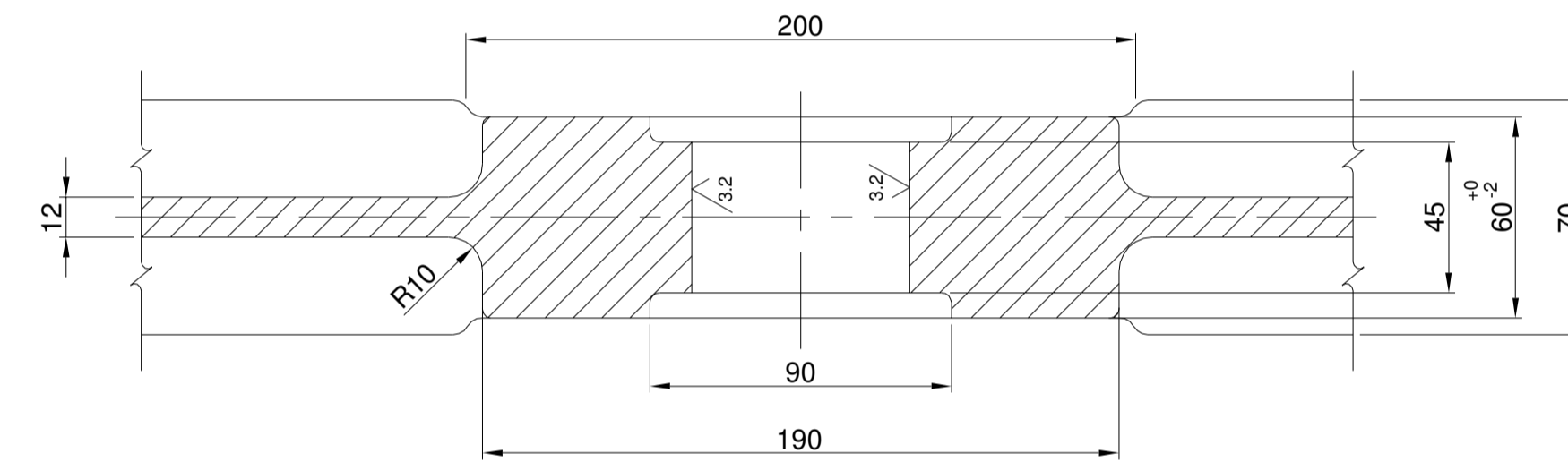
~ 32/



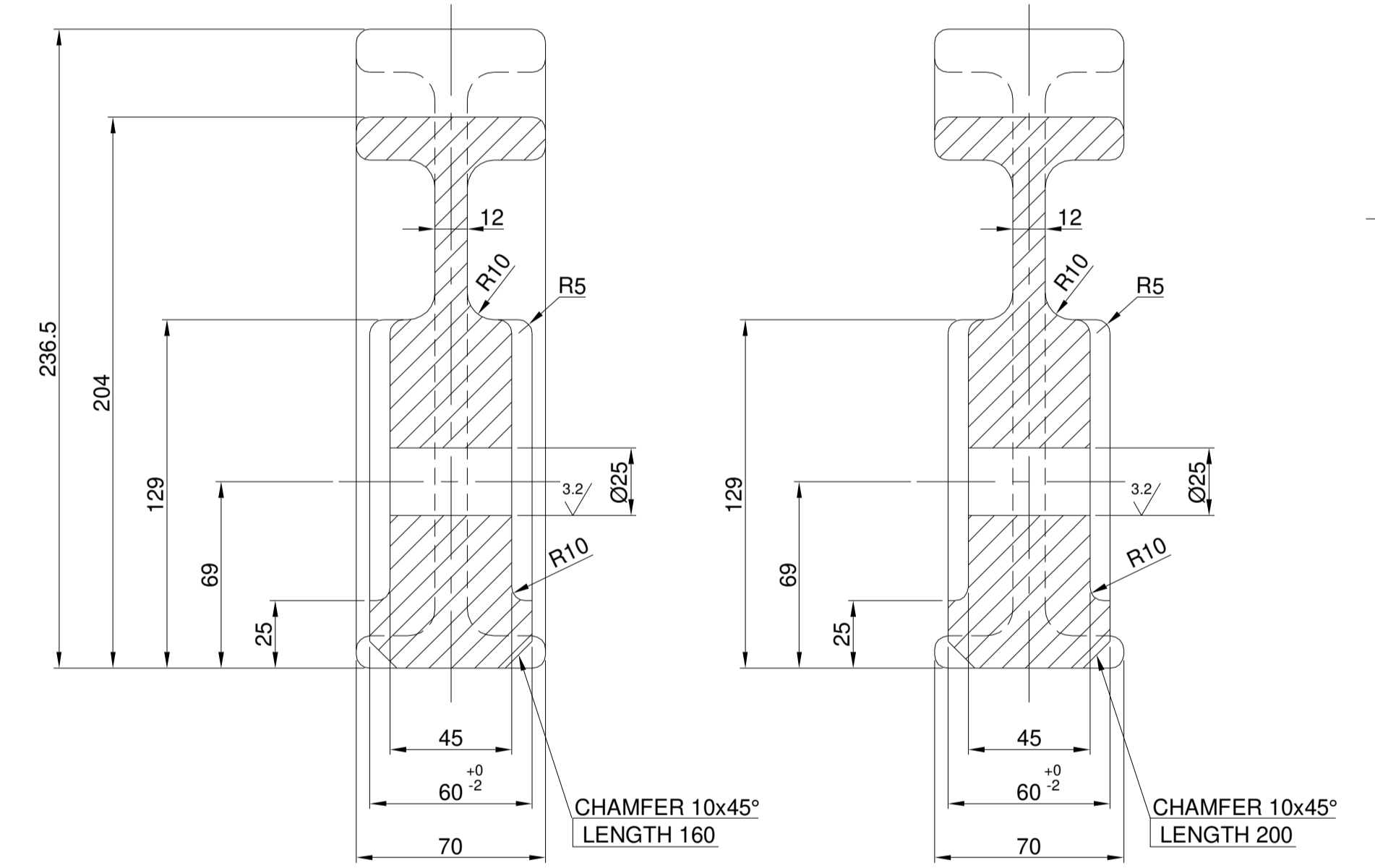
SECTION-CC



SECTION-AA

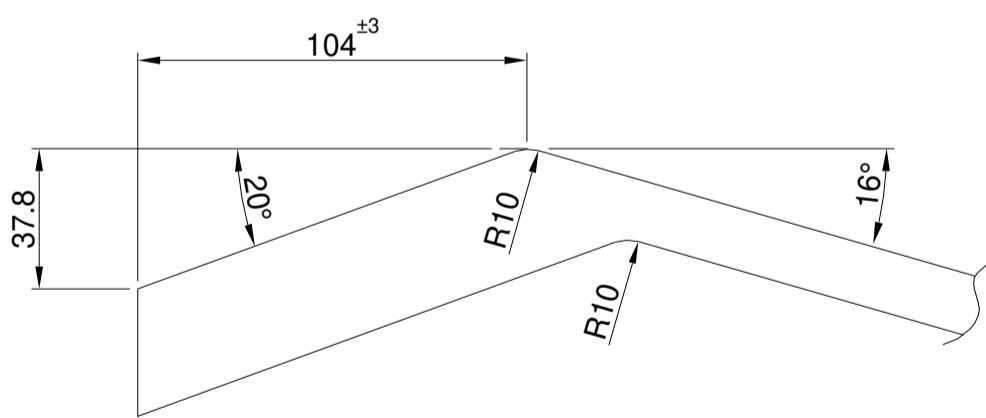


SECTION-BB

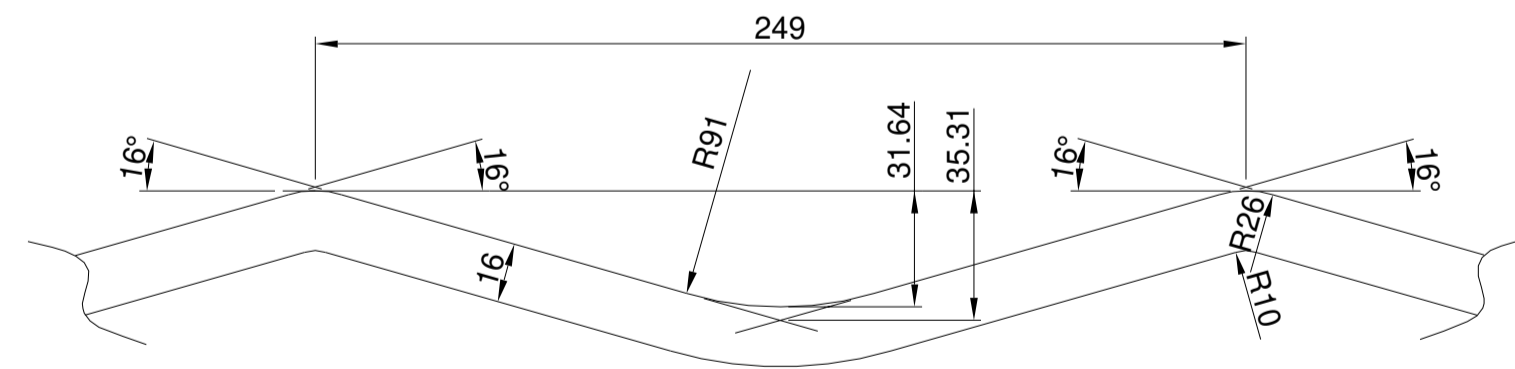


SECTION-DD

SECTION-EE



DETAIL-X



DETAIL-Y

NOTES:

1. ALL SHARP CORNERS ARE TO BE ROUNDED R3. WHERE NOT SPECIFIED.
2. WEIGHT VARIATION ±5%
3. WARPAGE NOT TO EXCEED 3 TO 5 IN ANY DIRECTION
4. UNIT WT: 104Kg, REQD. QTY: 8 Nos. MATL: AS PER INDENT AND TDC

REV	DATE	ALTERED :	REV	DATE	ALTERED :	REV	DATE	ALTERED :	REV	DATE	ALTERED :
04		CHECKED :	03	16.12.89	CHECKED :	02	09.01.89	CHECKED :	01	08.05.85	CHECKED :
		APPROVED:			APPROVED:			APPROVED:			APPROVED:

ENTRI SIDE ALTERED TO HAVE FREE TRANSFER OF HOLLOWES DURING REVERSE CYCLE.

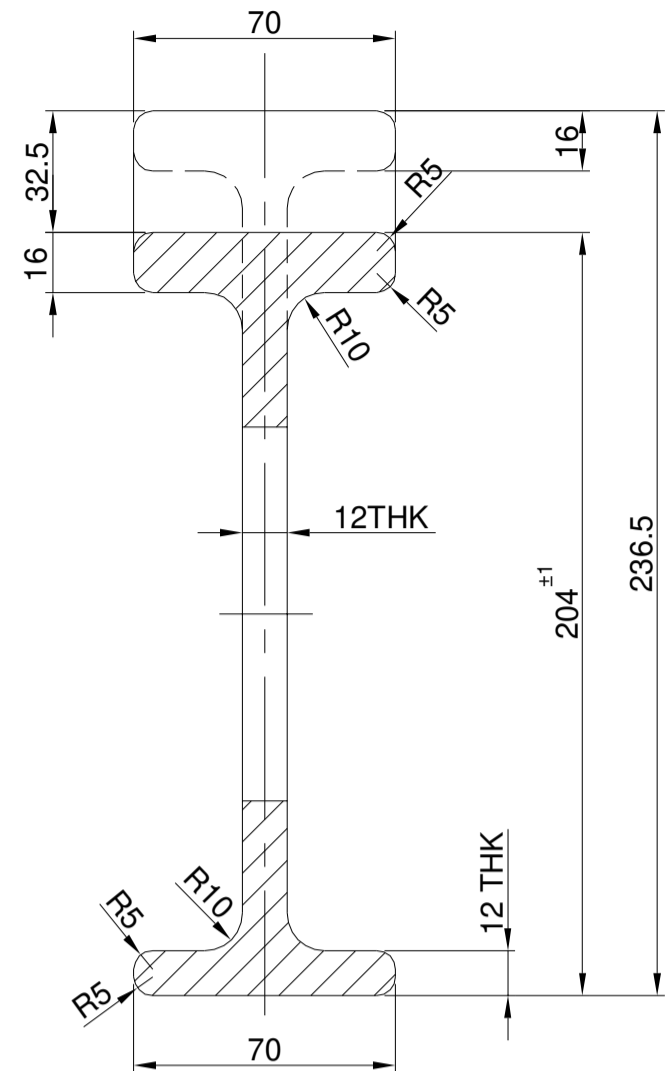
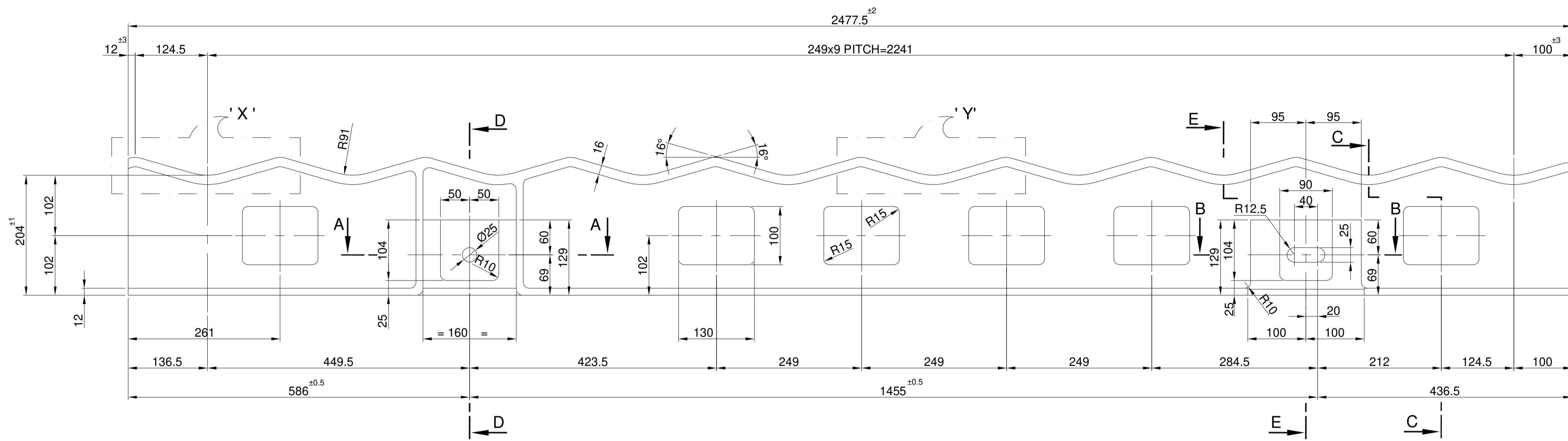
DIMENSIONS 9 ALTERED.

DIMENSIONS ALTERED 17 AND TOLARANCE ADDED.

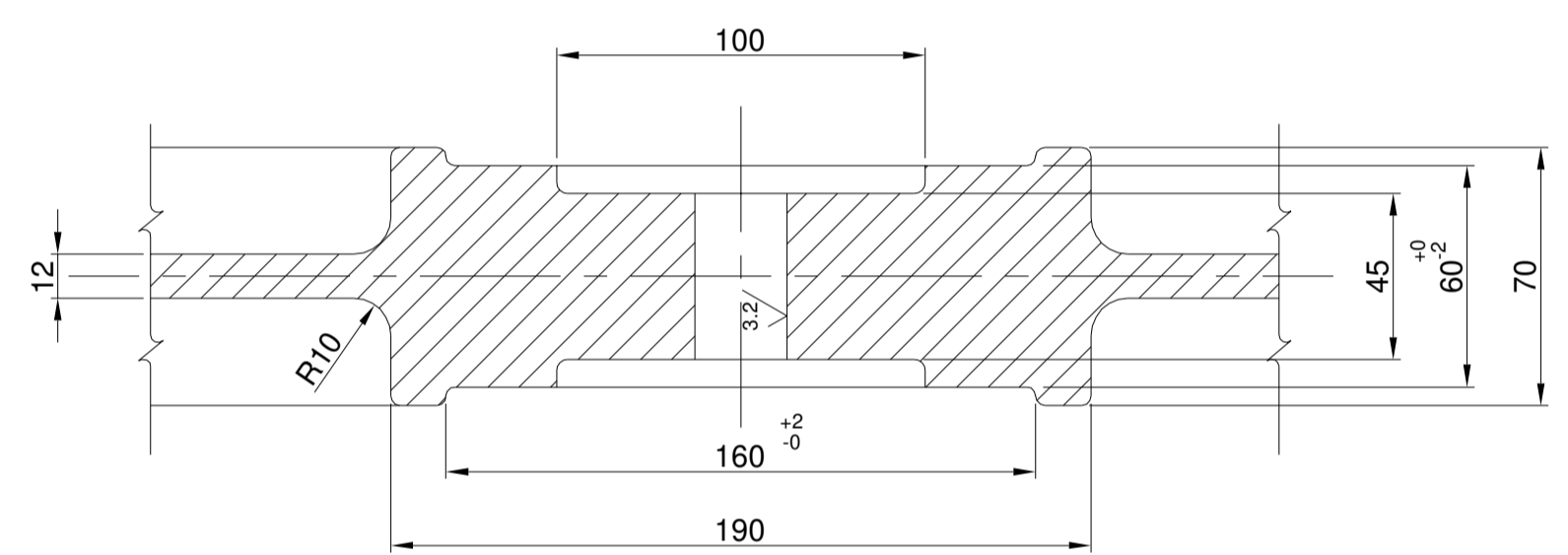
ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	UNIT WT
EQUIP: WALKING BEAM FURNACE				
Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014			DRN CHD APPD	NAME SIGNATURE DATE
			MPG GRADE OF UNIT, DM S/M/F	SCALE WEIGHT (Kg)
			REF TO ASSY DWG NO	ITEM NO
			REF TO OLD DWG NO	
TITLE WALKING BEAM CASTING DISCHARGING END			CARD CODE U 01	DRAWING NO : 1-7-1150-05-02073 03

~ / 3.2 /

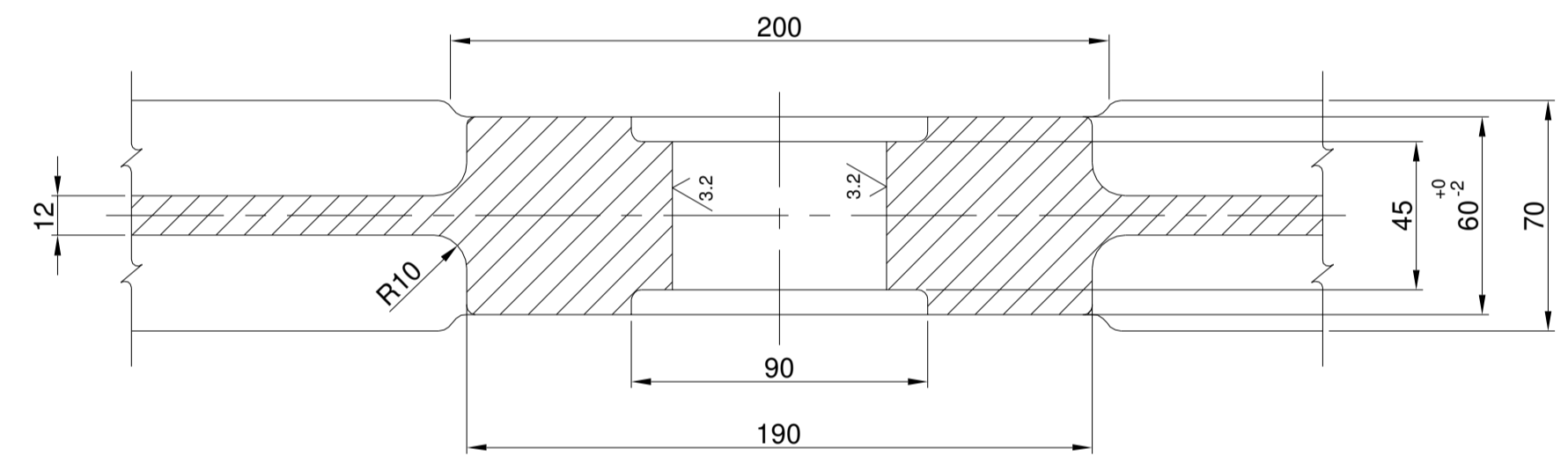
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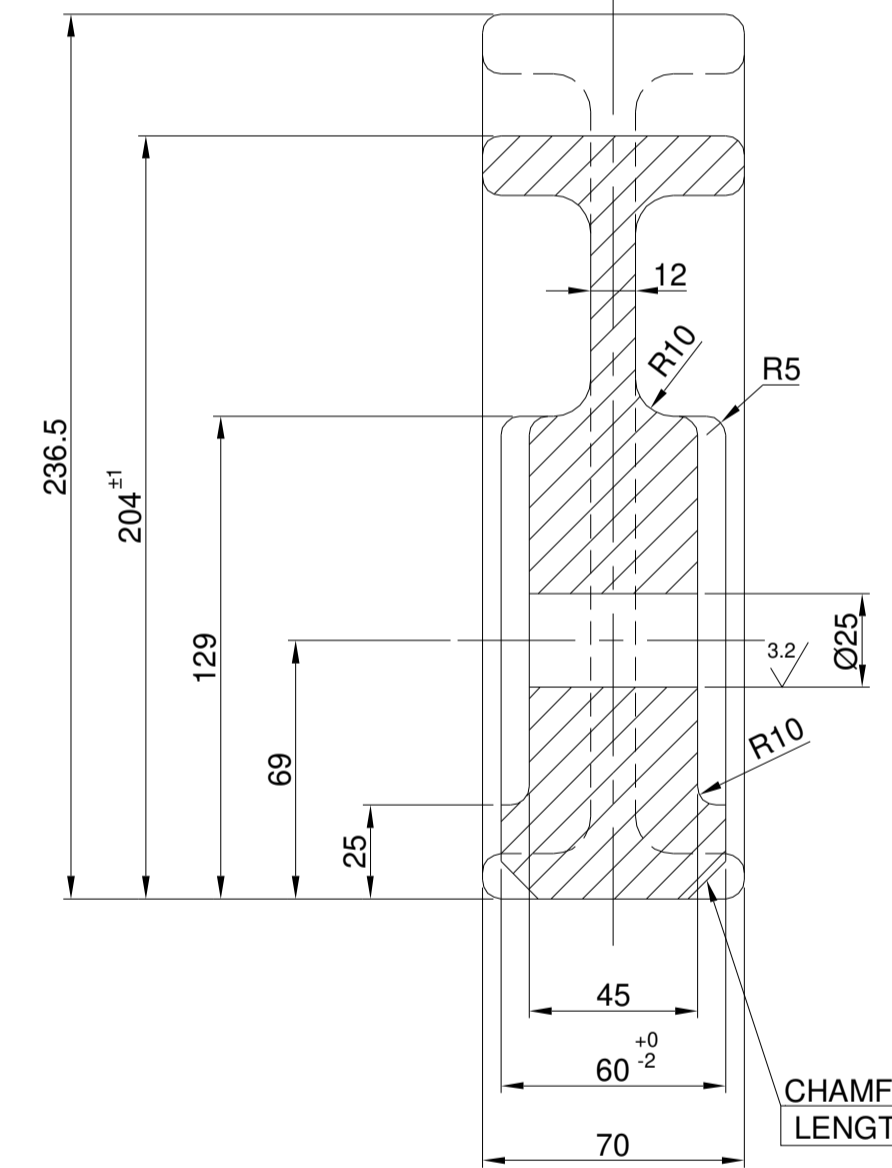
SECTION-CC



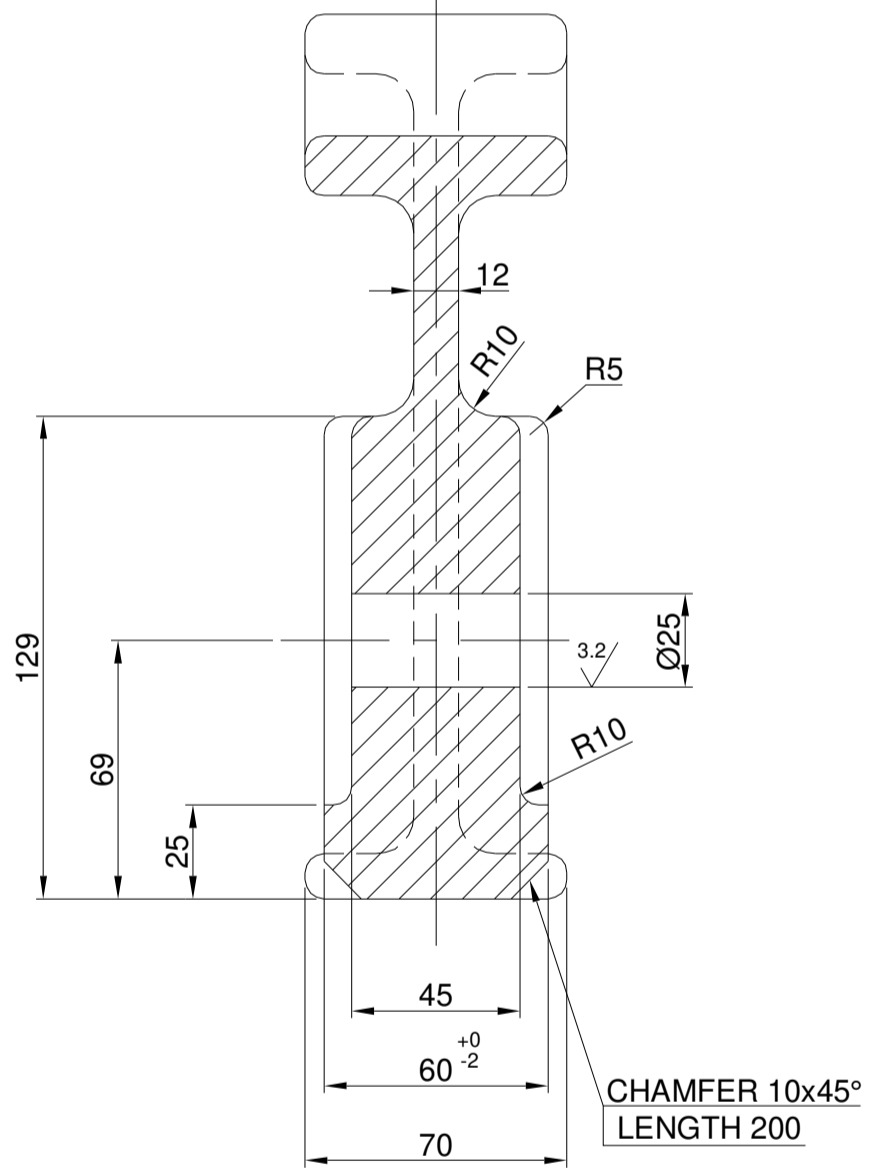
SECTION-AA



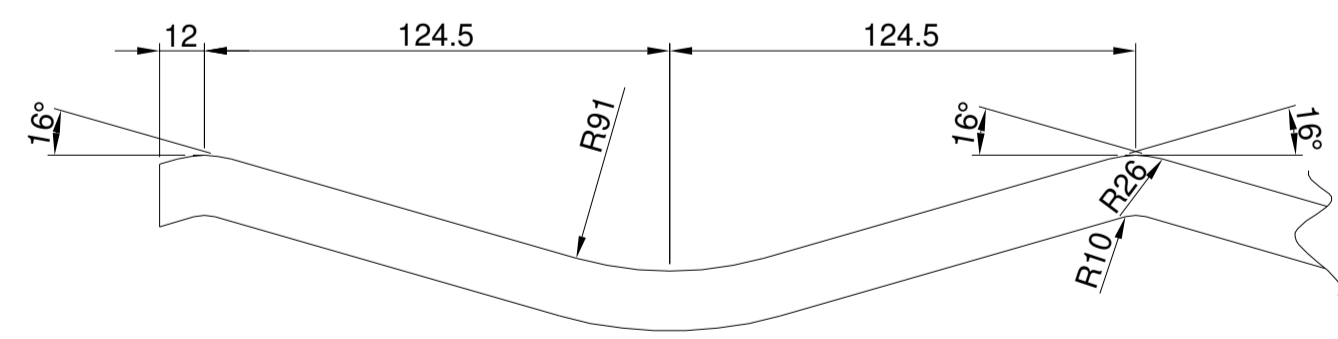
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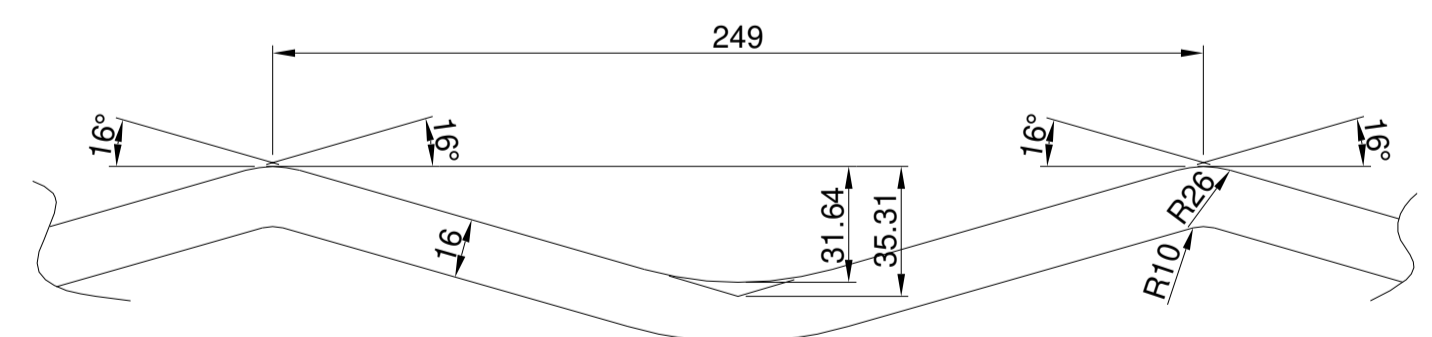
SECTION-DD



SECTION-EE



DETAIL-X



DETAIL-Y

NOTES:

1. ALL SHARP CORNERS ARE TO BE ROUNDED R3. WHERE NOT SPECIFIED.
2. WEIGHT VARIATION ±5%.
3. WARPAGE NOT TO EXCEED 3 TO 5 IN ANY DIRECTION.
4. REQD QTY : 8Nos.

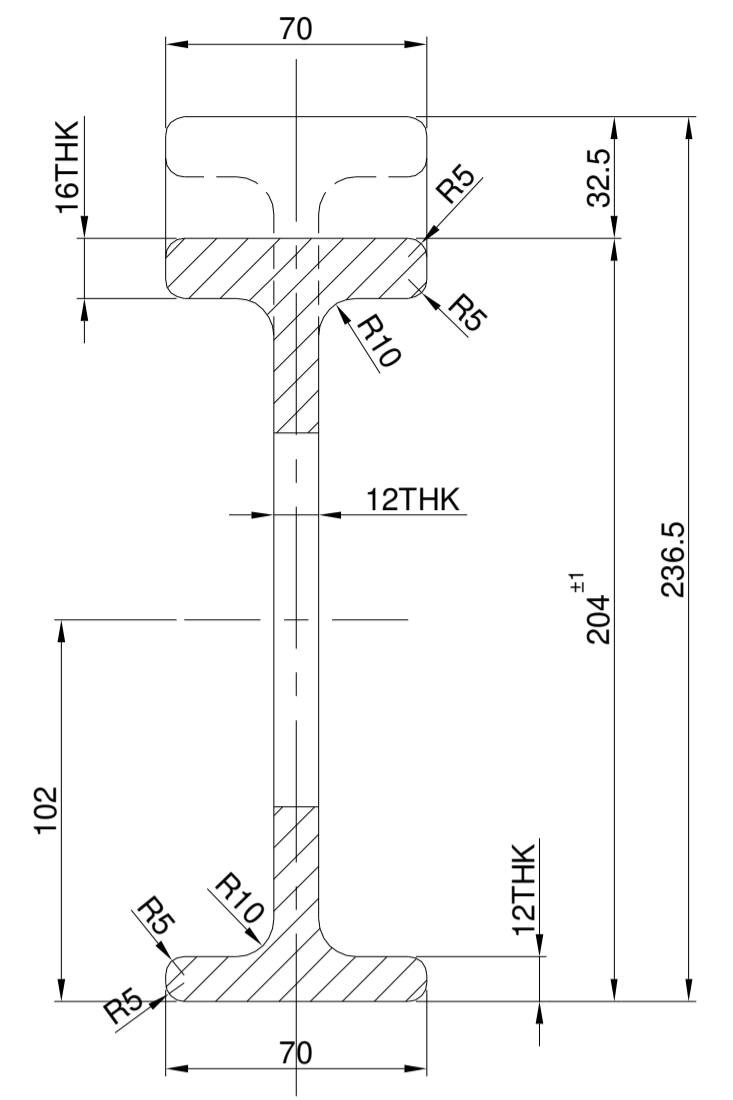
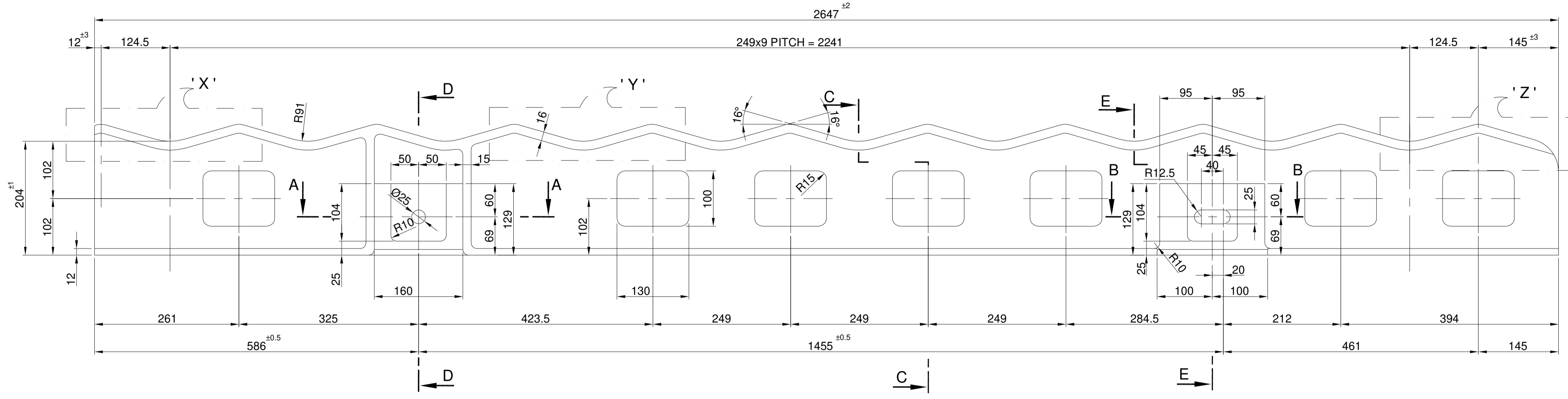
REV 06	DATE	ALTERED :	REV 05	DATE	ALTERED :	REV 04	DATE	ALTERED :	REV 03	DATE	ALTERED :	REV 02	DATE	ALTERED :	REV 01	DATE	ALTERED :
ZONE		CHECKED :	ZONE		CHECKED :	ZONE		CHECKED :	ZONE		CHECKED :	ZONE		CHECKED :	ZONE		CHECKED :
		APPROVED:			APPROVED:			APPROVED:			APPROVED:			APPROVED:			APPROVED:

DIMENSIONS ALTERED.

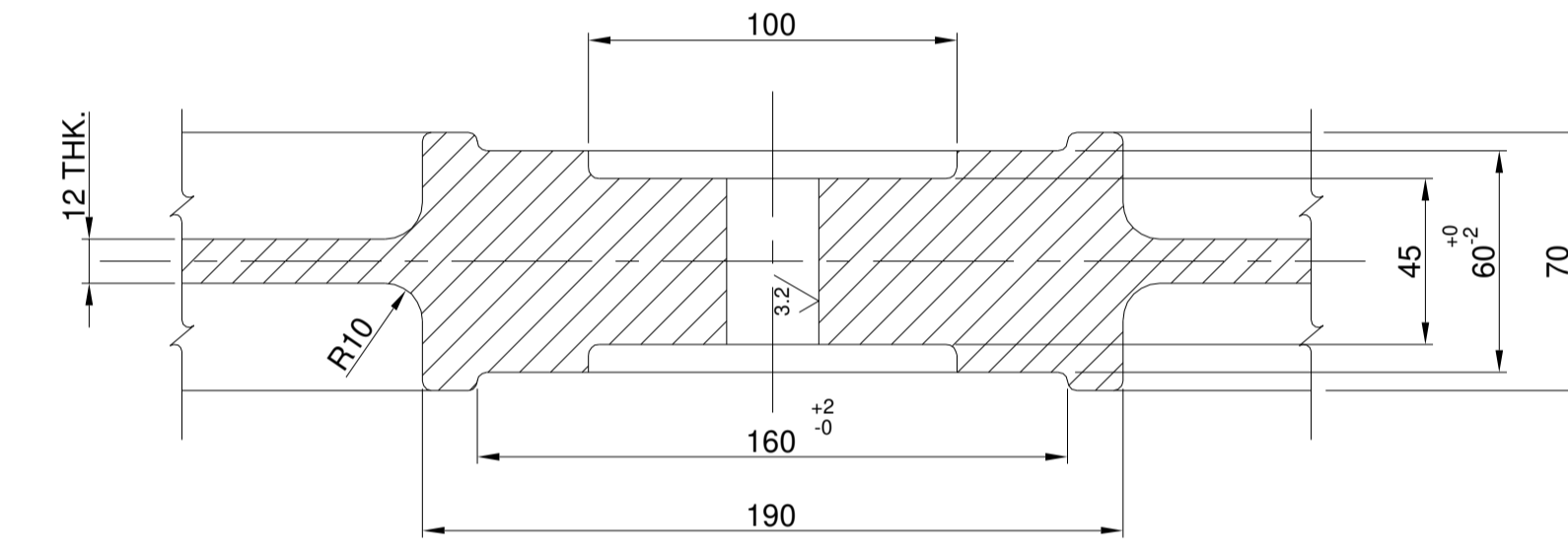
DIMENSIONS ALTERED 16 AND TOL. ADDED.

AS PER INDENT AND TDC		MATERIAL CODE		UNIT WT	
ITEM NO	DESCRIPTION	DRAWING NO	MATERIAL SPEC	QTY	
EQUIPMENT: WALKING BEAM FURNACE					
Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014			DRN	NAME	SIGNATURE
			CHD	SSN KUMAR	DATE
			APPD	S SHANMUGASUNDARAM	03.06.02
DEPT	MPG	GRADE OF UNIT	SCALE	WEIGHT (Kg)	REF TO ASSY DWG NO
		U 01	1:5 (1:2)	99	REF TO OLD DWG NO
DRAWING NO :			7621 / 401-1		
MOVABLE HEARTH CASTING CHARGING END			1-7-1150-04-02074		

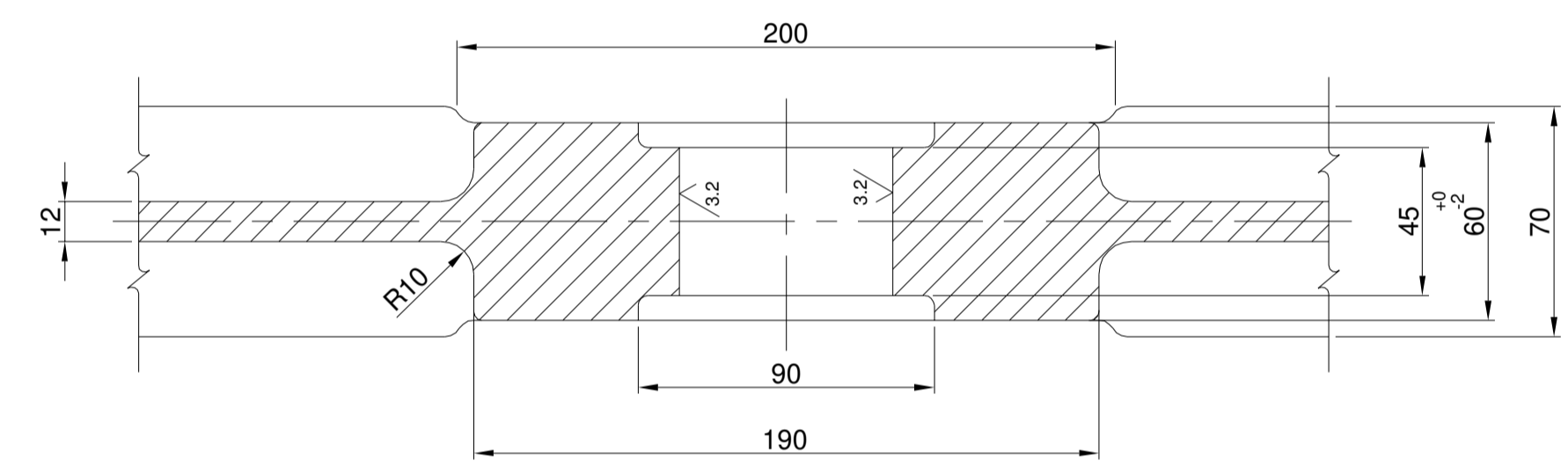
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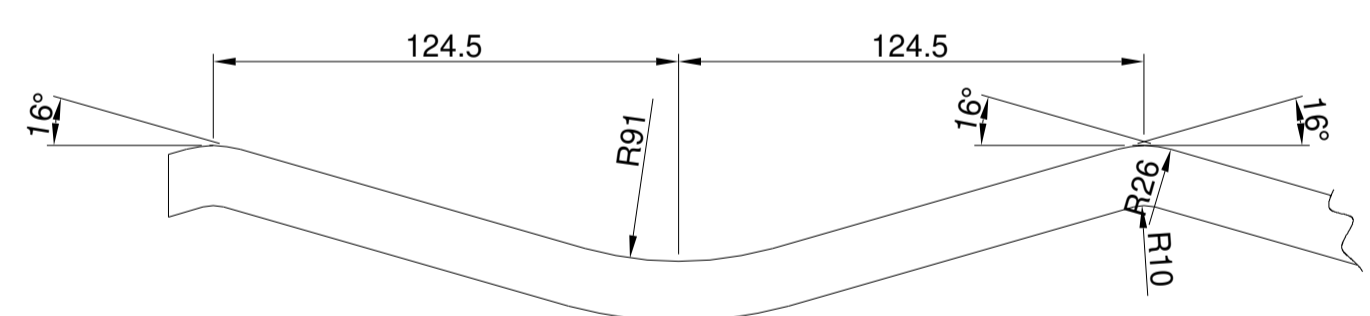
SECTION-CC



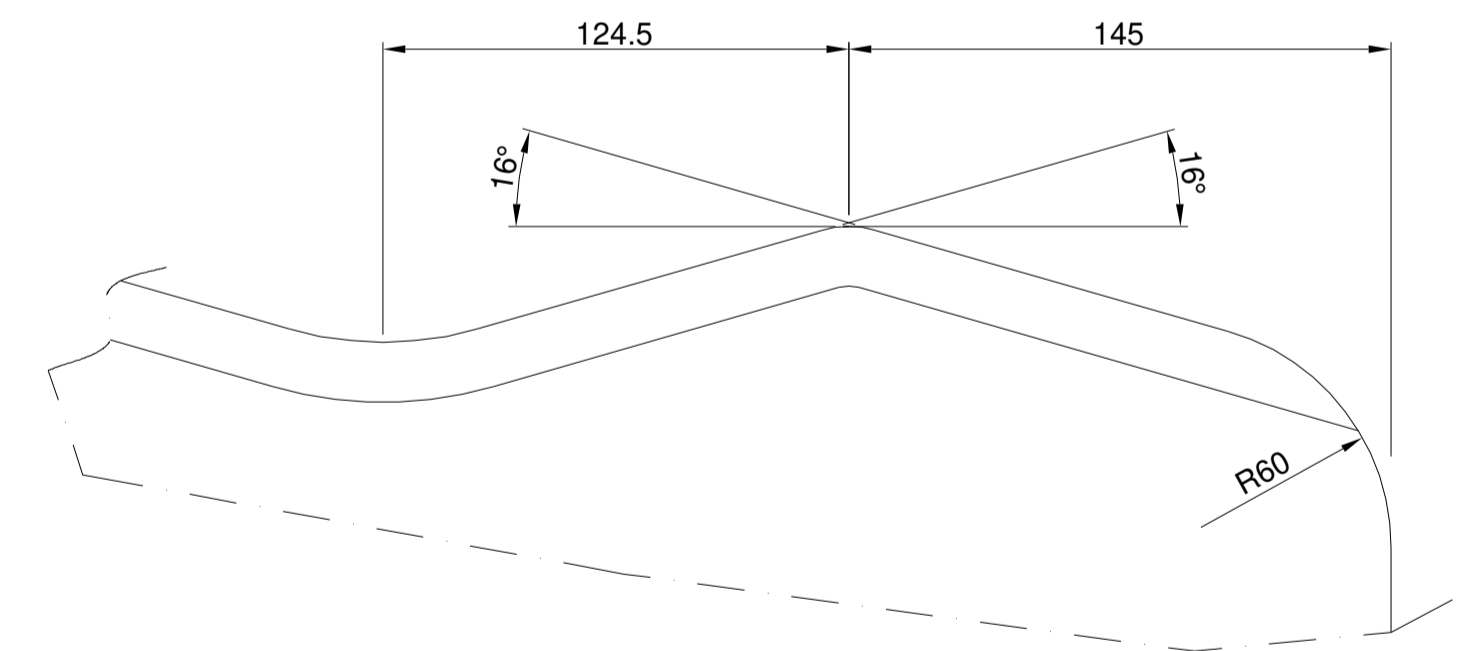
SECTION-AA



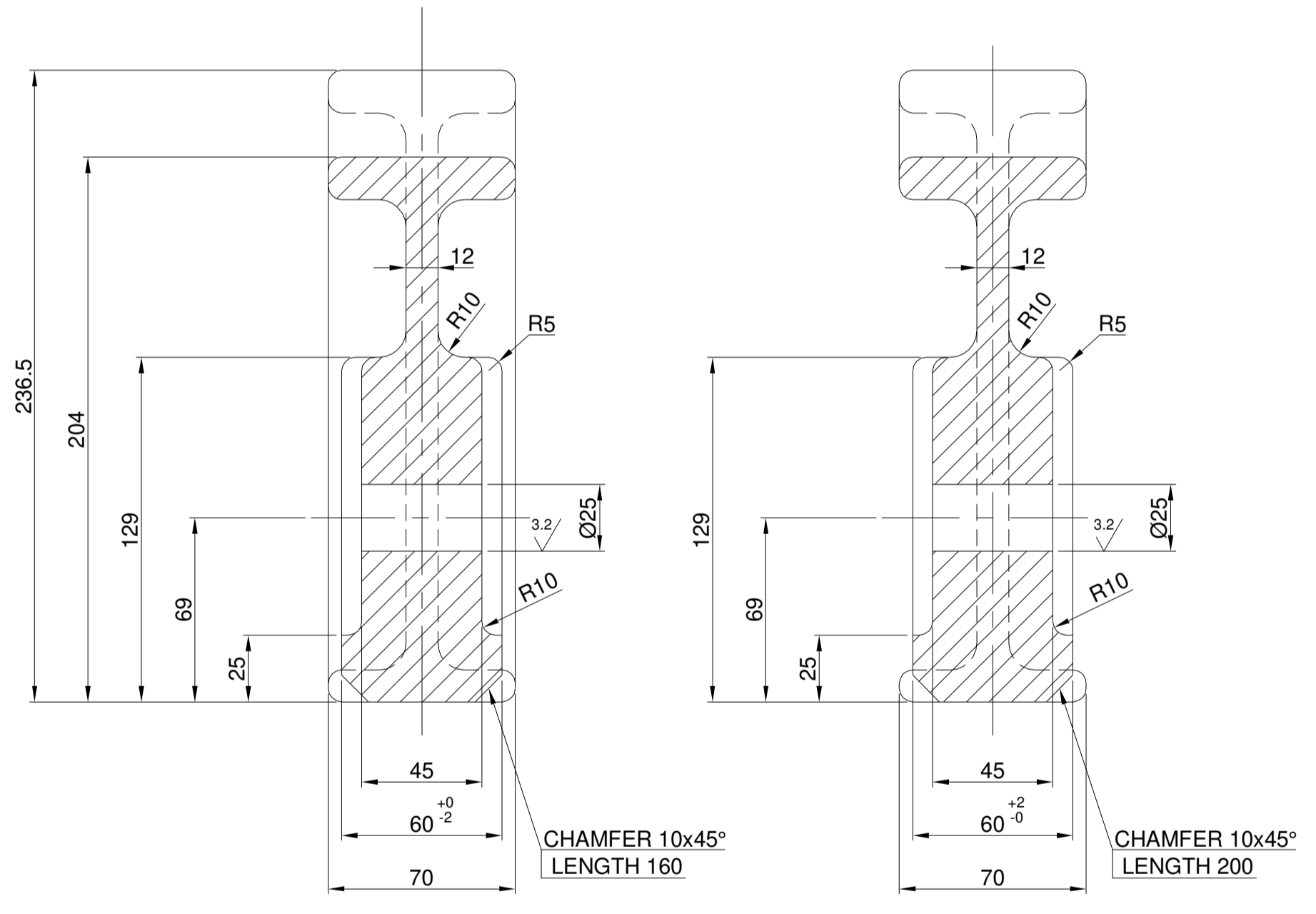
SECTION-BB



DETAIL-X

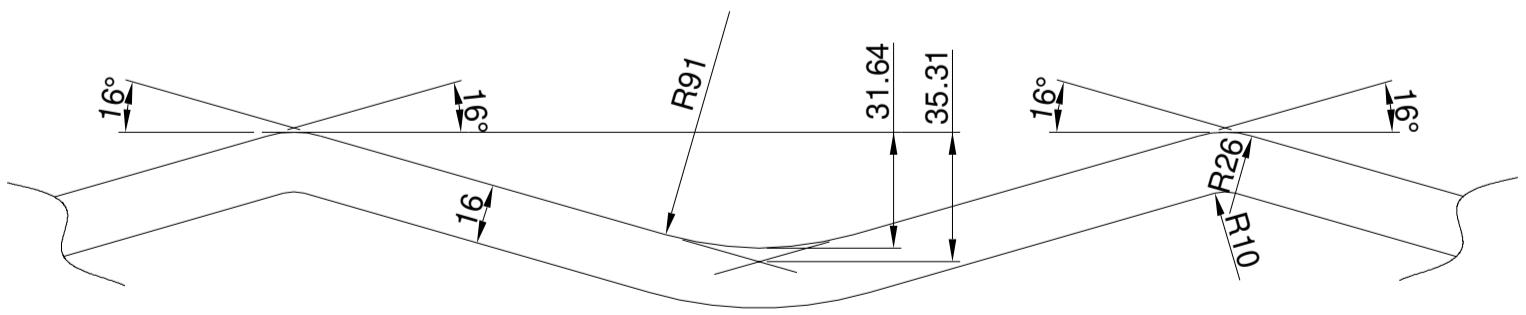


DETAIL-Z



SECTION-DD

SECTION-EE



DETAIL-Y

- NOTES:**
1. ALL SHARP CORNERS ARE TO BE ROUNDED R3. WHERE NOT SPECIFIED.
 2. WEIGHT VARIATION ±5%
 3. WARPAGE NOT TO EXCEED 3 TO 5 IN ANY DIRECTION
 4. MATL AS PER INDENT AND TDC. UNIT WT: 106 Kg, QTY REQ: 8 Nos.

REV	DATE	ALTERED :	REV	DATE	ALTERED :	REV	DATE	ALTERED :	REV	DATE	ALTERED :
04		CHECKED :	03		CHECKED :	02	09.01.89	CHECKED :	01	08.05.85	CHECKED :
		APPROVED:			APPROVED:			APPROVED:			APPROVED:

ITEM NO	DESCRIPTION	DRAWING NO	MATL CODE	UNIT WT
EQUIP: WALKING BEAM FURNACE				
Bharat Heavy Electricals Ltd SEAMLESS STEEL TUBE PLANT TIRUCHIRAPALLI - 620014			DRN	DATE
			CHD	31.05.02
			APPO	31.05.02
			REF TO ASSY DWG NO	
			REF TO OLD DWG NO	
TITLE			CARD CODE	REV
FIXED HEARTH CASTING DISCHARGING END			U 01	02

DRAWING NO : 1-7-1150-05-02072

TECHNICAL DELIVERY CONDITION

Product : **WBF Charging roller assy castings/WBF beam & Kick off casting/WBF support casting**

Document No: TDC:HMM1003 Rev No : 03

Effective Date: 27.09.22

Page- 1 of 2

1.0 MATERIAL:

Specification: Heat resistant alloy steel casting Grade 11 as per IS 4522

Equivalent ASTM standard: A 297 HN.

Size, Qty, Grade/Class: As per Purchase order & Drawing

2.0 CHEMICAL COMPOSITION:

Melting: As per the Specification, Fully Killed

Chemical Specification:

C	Mn	Si	P	S	Cr	Ni	Mo
0.2- 0.5	1.5 Max	1.2 – 1.8	0.025 Max	0.015 Max	19.0 – 23.0	23.0 – 27.0	0.5

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

3.0 DIMENSION & TOLERANCES

Tolerances as per the Drawing

4.0 HEAT TREATMENT :(HT)

No Heat treatment required, to be supplied in as cast condition.

5.0 MECHANICAL TESTS:

Test bars to be cast integral with the casting. Test bar size shall be 30mm X 30mm. Test bar will be detached from the casting at SSTP/STORES for our reference. Following tests to be conducted by vendor as per ASTM A370.

S. NO	TEST	Material specification
		SA/ASTM A297 HN
1	Tension Test	As per the Specification
2	Hardness Test	170 BHN
3	Bend Test Specimen 1"x ¼"	Not applicable
4	Charpy- U Impact	Not applicable
5	Charpy- V Impact	Not applicable

6.0 FETTLING, DRESSING & CLEANING:

Dressing of castings- Free from risers, in gates, notches, undercuts and deep marks etc.

- Fused wires, parting line fins, chills etc. shall be removed by grinding.
- Castings shall be blast cleaned both inside and outside for the removal of fused sand, scales etc.
- Visual inspection of castings for surface quality.
- Paint/Rust preventive oil should not be applied over the surface of casting

7.0 NON DESTRUCTIVE TESTING (NDT) AFTER HEAT TREATMENT:

Castings shall be free from visual surface defects like cracks and porosity. Internal defects like porosity, inclusion shall be within Level II, shrinkage CA within Level-I and other type shrinkage with level –II cracks, Hot tear, inserts not acceptable. All castings shall be of Radiographic Quality.

Radiographic Testing Procedure: As per ASTM E 94

Acceptance standard: ASTM E 446

1 No. random sample shall be selected by BHEL from the supply lot, which shall be subjected to RT for acceptance of the lot. RT will be carried out by the casting supplier.

TECHNICAL DELIVERY CONDITION

Product : **WBF Charging roller assy castings/WBF beam & Kick off casting/WBF support casting**

Document No: TDC:HMM1003 Rev No : 03

Effective Date: 27.09.22

Page- 2 of 2

8.0 REPAIR:

Castings with unacceptable cracks, hot tears, shrinkage, etc. to be rectified by grinding & if required by Welding. Welding to be done by qualified welder and qualified procedure as per ASME Section IX. Acceptance standard for retest by radiography after heat treatment – ASME Sec 8 Div -1 UW 51

9.0 SURFACE TREATMENT:

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

10.0 MARKING AND PACKING:

Following details to be stamped on each casting raised from the surface. The purpose of marking is to identify the castings after using in the furnace at 1000 Deg. So the marking should be permanent unaffected by service temperature of furnace.

- Last 5 digits of drawing number.

Castings shall be suitably packed to avoid damage during transit.

11.0 INSPECTION AND CERTIFICATION:

Test certificates shall contain the following details.

- Purchase Order No. (BHEL), TDC No. & Test certificate number
- Specification and Grade with applicable year of code, Heat Number, Quantity & Size
- Steel making process, Chemistry including incidental elements - Heat wise.
- Mechanical test results, NDT test results with reference & acceptance standard.
- Repair details, Cleaning & Surface treatment details.
- Any other information like clearance of sample casting.
- Dimensional Inspection Report
- Chemical Composition test certificate only from NABL approved lab.

<u>Record of Revision</u>	<u>Revision Note</u>
Rev -01 Date: 04/03/2017 Rev -02 Date: 04/09/2018 Rev - 03 Date: 27/09/2022	Heat Treatment clause and NDT clause modified. NDT acceptance standard included WBF support castings included

M. Moorthy
27/09/22

M. Ashok Raja Kumar
27/09/22

Approved By M.Moorthy DGM/Maintenance	Approved BY M.Ashok Raja Kumar Deputy Manager /Hot Mill Maintenance
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