



MANUFACTURER'S NAME AND ADDRESS				STANDARD QUALITY PLAN				TO BE FILLED BY BHEL		TO BE FILLED BY BHEL				
BHEL		VENDOR'S NAME		ITEM		GENERATOR INTEGRAL PIPING & HYDROGEN COOLER PIPING		QP NO.	QA/BI/QP/021					
				DRG. NO.		AS PER PO								
				SPEC.-		TG60682								
				REV.-		02								
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE CRITERIA	FORMAT OF RECORDS	AGENCY		REMARKS			
1	2	3	4	5	6	7	8	9	D	M	B	N	10	11


1.0	MATERIAL	Co-relation & verification of Mill TCs for	Major	Verify	100%	Standard as per BOM	Standard as per BOM	Mill TCs	✓	P	V	-	
1.1	Seamless C.S. pipes as per A106 Gr. B & SS Seamless pipe	a) Chem. Composition	Major	Chem. Analysis	1/Heat	-DO-	-DO-	-DO-		P	V	-	
		b) Mech. Properties	Major	Mech. Test	1/Lot	-DO-	-DO-	-DO-		P	V	-	
		c) Flattening or bending test (as applicable as per ASTM)	Major	Mech. Test	1/Lot	-DO-	-DO-	-DO-		P	V	-	
		d) Hydraulic test	Major	Pressure Test	100%	-DO-	-DO-	-DO-		P	V	-	
		e) Heat Treatment (As applicable)	Major	Time/Temp	100%	-DO-	-DO-	-DO-		P	V	-	
		f) Surface finish	Major	Visual	100%	-DO-	-DO-	-DO-		P	V	-	
		g) Dimensions/OD, ID & wall Thickness	Major	Measurement	10%	-DO-	-DO-	-DO-		P	V	-	
		h) NDT (UT/ECT)	Major	UT/ECT	100%	SA 106	-DO-	-DO-		P	V	-	
1.2	Pipe fitting	Co-relation & verification of MTCs For	Major	Verify	100%	Standard as per BOM	Standard as per BOM	MILL TCs	✓	P	V	-	
		a) Chem. Composition	Major	Chem. Analysis	1/Heat	-DO-	-DO-	TCs		P	V	-	
		b) Mech. Properties	Major	Mech. Test	1/Heat batch	-DO-	-DO-	-DO-		P	V	-	

MANUFACTURER/SUBCONTRACTOR	 20.07.2020		LEGEND: RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM, INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		FOR CUSTOMER USE		APPROVED BY	
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		DRG. NO.	AS PER PO		REV.	02					
		SPEC. -	TG60682								
		REV. -	02	Page 2 of 7							
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1.3	FLANGES	c)Dimensions , Finish	Major	Measurement	100%	ANSI B16.9	ANSI B16.9	-DO-	P	V	-	
		d)Wall thickness of bend by UT Gauge	Major	-DO-	100%	ASTM A234	ASTM A234	TC	P	V	-	
		e)Heat Treatment (as applicable)	Major	Time / Temp	10%	Standard as per BOM	Standard as per BOM	-DO-	P	V	-	
		g)Hardness of fitting	Major	Measurement	10% (random)	Standard as per BOM	Standard as per BOM	TC	P	V	-	
		h)Surface defects	Major	DPT/MP	100%	ASME SEC-V art-6	ASME Sec-VIII-div-1 APPENDIX-8	-DO-	P	V	-	
		Co-relation & verification of Mill TCs For	Major	verify	100%	Standard as per BOM	Standard as per BOM	TC	P	V	-	
		a) Chemical Composition	Major	Chem. test	1/Heat	-DO-	-DO-	-DO-	P	V	-	
		b)mechanical properties	Major	Mech. Test	1/HT Batch	-DO-	-DO-	-DO-	P	V	-	
		c)Heat Treatment	Major	Time/Temp	100%	-DO-	-DO-	-DO-	P	V	-	
		d)Dimension	Major	Measurement	10%	As per Drawing in BOM	As per Drawing in BOM	TCs	P	V	-	
		e)surface defects	Major	DPT	10%	E165/A275	ASME Sec-VIII Div-I Appendix 8	TC/IR				

MANUFACTURER/SUBCONTRACTOR		LEGEND:		FOR CUSTOMER USE	
<div>   20/06/2020 </div>		RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORMANCE 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED COLUMN 'N' SHALL BE 'CP' OF CUSTOMER		APPROVED BY	



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		DRG. NO.	AS PER PO											
		SPEC.-	TG60682											
		REV.-	02			Page 3 of 7								
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1.4	Fasteners	a) Verification of trade mark & prop. Class	Major	Verify	10%	Standard as per BOM	Standard as per BOM	TC	✓	P	V	-	
		b) Dimension	-DO-	Measurment	10%	Standard as per BOM	Standard as per BOM	IR	✓	P	V	-	
		c) Marking & Packing	-DO-	Visual	100%	TG60682	TG60682	IR	✓	P	W		
		a) Review of Test certificates	Major	Review	100%	Standard as per BOM	Standard as per BOM	TC	✓	P	V		
1.5	Gaskets	b) Dimension	Major	Measurment	100%	As per BOM	As per BOM	TC	✓	P	W		Gaskets procured by the vendor shall be from BHEL approved sources only.
		c) Marking & Packing	Major	Visual	100%	TG60682	TG60682	TC	✓	P	W		
1.6	Rods, Round, Flanges	Co-relation & verification of Mill TC	-DO-	Chem. & Mech. Measurment	1/ Heat	Drawing & Standard as per BOM	Drawing & Standard as per BOM	TC	✓	P	V		
		a) Chemical composition, Mechanical b) Dimension, finish c) H.T. if applicable d) DPT/UT		Time/Temp.	10% 100% 100%								
1.7	Angle, Beam, Channel, Tee Bar, Beam attachment, AS plate/Flat	a)Visual b)Dimensional c)Chemical d)Mechanical	-DO-	Measurment & Visual	100%	Drawing & Standard as per BOM	Drawing & Standard as per BOM	TC	✓	P	V	-	
1.8	Forging, Turn buckle, Pipe clamp	a)Chemical & Mech. properties	-DO-	Analysis/ Mechanical	1/Heat	Drawing & Standard as per BOM	Drawing & Standard as per BOM	TC	✓	P	V	-	Inform vendor name
		b)Heat treatment	-DO-	Verify	100%								
		c)Hardness	-DO-	Hardness	20%								
		d)Surface defect	-DO-	DPT	20% of each item								

MANUFACTURER/SUBCONTRACTOR	 20.01.2020	LEGEND: ! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	FOR CUSTOMER USE	
			APPROVED BY 	

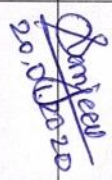







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				DRG. NO.		AS PER PO					
				SPEC. -		TG60682					
				REV. -		02					
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1.16	H2 vent Star	Material TC's Visual Dimensional	-DO-	Measurement & Visual	100%	Drawing & Standard as per BOM	Drawing & Standard as per BOM	TC	✓	P	V	-	
2.00	INSPECTION PROCESS												
2.1	Preparation	a) Marking & identification Check	Major	Visual	100%	As per Drawing	As per Drawing	IR		P	V	-	
		b) Cutting & Edge preparation	-DO-	-DO	100%	As per Drawing	As per Drawing	-		P	V	-	
		c) Dimensions	-DO-	-DO	10%	As per Drawing	As per Drawing	IR		P	V	-	
		d) Surface defects on edge preparation on Alloy steel pipes	-DO-	DPT	10%	ASME Sec. V Art-6	ASME Sec. V VIII Div-I Appendix 8	-	✓	P	V	-	
2.2	Bending	a) Dimensions	Major	Measurement	100%	As per Drawing	As per Drawing	IR	✓	P	V	-	
		b) Ovality	-DO-	Measurement	100%	As per Drawing	Max. 10%	-		P	V	-	
		c) Wrinkles	-DO-	Measurement	100%	As per Drawing	As per Drawing	-		P	V	-	
		d) Thinning	-DO-	Measurement	100%	By UT thickness meter	Max. 12.5%	-	✓	P	W*	-	
		e) Surface defects (On bend portion only)	-DO-	DPT	10%	ASME Sec. V Art-6	ASME Sec. VIII Div-I Appendix 8	-	✓	P	V	-	

MANUFACTURER/SUBCONTRACTOR	 20.08.2020	LEGEND: I RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	FOR CUSTOMER USE	APPROVED BY	
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		DRG. NO.	AS PER PO		REV.	02						
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2.3	WPS & PQR	f) Bend radius / angle of bend	-DO-	Measurement	10%	As per Drawing	ANSI-B 31.1	-	✓	P	V	-	
		g) Out of Squareness	-DO-	Measurement	10%	As per drawing	ANSI-B 31.1	-		P	V	-	
2.4	Welding	Record for each weld combination & welder	-DO-	Verify	100%	ASME Sec. IX	ASME Sec. IX	-	✓	P	W	-	WPS, PQR shall be approved by BHEL
		a) Fit-up	-DO-	Visual	100%	HW0620599	HW0620599	-		P	-	-	
		b) Pre-heating	-DO-	TEMP.	As applicable	Relevant WPS	Relevant WPS	-		P	-	-	
		c) Root run	-DO-	Visual & DPT	10%	HW0850199	HW0850199	IR	✓	P	V	-	
		d) Inter pass cleaning	Minor	Visual	100%	-----	WPS	-		P	-	-	
		e) Dimensions & Visual examination of welds	Major	Measurement & Visual	10%	HW0620099	HW0620099	-	✓	P	V	-	
		f) Surface defects for fillet welds	Critical	DPT	10%	HW0620099	HW0620099	IR	✓	P	W	-	
		g) P.W.H.T. (if Applicable)	Major	TIME/TEMP	As per applicable	ANSI-B 31.1	ANSI-B 31.1	Report	✓	P	-	-	
3.00	FINAL INSPECTION	h) Internal Defects (for butt welds only)	Critical	RT /UT	As per applicable	HW0850199	HW0850199	I.R.	✓	P	W	-	
3.1	Complete Fabricated Piping	a) Visual examination	Major	Visual	100%	As Per Drawing	HW0620099	-	✓	P	V	-	
		b) Dimensions	-DO-	Measurement	100%	-DO-	As per Drawing	-	✓	P	W	-	*RANDOM (10%) WITNESS BY BHEL

MANUFACTURER/SUBCONTRACTOR		LEGEND:		FOR CUSTOMER USE	
MANUFACTURER/SUBCONTRACTOR INTRACTOR <i>[Signature]</i> 20/04/2020		RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORMANCE 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED COLUMN 'N' SHALL BE 'CP' OF CUSTOMER		APPROVED BY  	



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BHEL		DRG. NO.	AS PER PO								
		SPEC. REV.	TG60682								
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		c) Marking	-DO-	Visual	100%	-DO-	-DO-	-	P	V	-
		d) Cleaning (small bore pipes up to 3" NB by acid pickling)	-DO-	-DO-	100%	TG60682	ST34001 clause-8	-	P	W	-
		e) Preservation & Painting	-DO-	-DO-	100%	TG60682	TG60682	-	P	V	-
		f) End protection & packing	-DO-	-DO-	100%	TG60682	TG60682	-	P	W	-
		g) D.P site wedge edges	-DO-	DPT	Random	HW0850199	HW0850199		V	P	W

**NOTES:-**

- 1 All edge preparation shall be done by machining only.
2. For small bore piping, where the individual stamping & stencilling may not be possible metal tags or plastic tags may be used for identification.
- 3 i) Small items like small reducers, elbows, tees, stubs, flanges etc. and other machines components duly preserved shall be packed in wooden boxes.
- ii) Each item either individually or jointly will be segregated system wise for dispatch.
4. Inside protection by VPI tablets/powder shall be ensured before end capping.
- 5 the raw material used shall be procured from BHEL agreed vendors.
6. The pipe with requirement for UT shall be UT/Hydro tested at mill and shall indicate in certificates only.
- 7 All material of construction shall be as per approved Drawing / pipe schedule / BHEL plant Std.
8. Electrodes used shall be procured from BHEL agreed vendors.
9. Gaskets procured by the vendor shall be from BHEL approved sources only.

MANUFACTURER/SUBCO	20.01.2020	LEGEND:	FOR CUSTOMER USE	
TRACTOR		1 RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.	APPROVED BY	
		M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER		
		INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION		
		ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		

14





**PPX-BOI DEPARTMENT**  
**BHARAT HEAVY ELECTRICALS LIMITED**  
**HEEP: HARDWAR-249 403 (Uttarakhand)**  
**FAX: +91 1334 226084/226462**  
**TEL: +91 1334 28 1660/1753**  
**PRE-QUALIFICATION REQUIREMENT**

**Enquiry No.:**  
**B/4133/2018/2835V/1**

### Annexure-A

Sl. No.	Pre-Qualification Requirements (Annexure-A)								Vendor's Response
1.	TG integral piping is used for connection of various equipment to Generator and its auxiliaries.								
2.	The material of construction of pipe & fittings (CS & SS) and dimensions shall be as per ASME B36.19/B16.9 or equivalent. Water Header (fabricated), Flanges, Neck, Hangers & Supports shall be in line with IS-2062.								
3.	Vendor should have experience of supplying pipe and fittings in thermal power- plant/ process industries.								
4.	Vendor to confirm that all the items specified at Point no.2.0 shall be quoted and offer with part supply shall not be considered.								
5.	<b>Mandatory Requirement of utilities/testing facilities -</b> <ol style="list-style-type: none"> <li><u>Mandatory In-House Facilities</u> - Vendors should have capability for Pickling &amp; passivation (only for CS items), Dye penetrant Testing and Hydraulic testing.</li> <li><u>Mandatory Outsourced or In-House Facilities</u> - Ultrasonic Testing, Radiography Testing, chemical analysis facility shall be either in house or outsourced.</li> <li>Particulars for testing facilities (at point a and b) along with details to be furnished. Photographs of pickling &amp; passivation facility (tanks) will be provided.</li> <li>Vendor to submit third party approved WPS/PQR for welding requirement</li> </ol>								
6.	The vendor should be a regular supplier/fabricator of such items mentioned at clause 1.0. Vendor should have executed Purchase Order (having date of delivery not earlier than 8 years at the time of bid submission) for CS & SS items. Total supply of each PO should be min. 5 tons and 1.5 tons for CS items & SS Items respectively. In support of above, vendor shall furnish details in following format along with their credential lists for the past 8 years.								
	Sl. No.	Application	Name & address of customer	Contact details of customer (email and phone number etc.)	Purchase order Reference no.	Purchase order issue date	Total weight of quantity of piping item (kg.)	Brief technical details of Material of Construction	Details of test carried out
	1.	Thermal power-plant/ process industries Only							
	2.								
	3.								
	4.								





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**PRE-QUALIFICATION REQUIREMENT**


**Enquiry No.:**  
**B/4133/2018/2835V/1**

**Annexure-A**




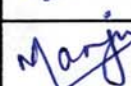
7.	In support of year of supply, vendor shall furnish copy of Purchase Order along with Bill of material executed in past along with test certificates (for the relevant PO's executed & indicated by vendor at point no. 6.0 above and qualifies the criteria at point 6.0 above).	
8.	Vendor to furnish the acceptance certificates or accepted test certificate from customer for complete supplies of for the relevant PO's executed & indicated by vendor at point no. 6.0 above and qualifies the criteria at point 6.0 above.	
9.	Vendor to submit each documents with marked-up Annexure no. clearly and also indicating "title" as mentioned in table at point 6.0 for co-relation of documents. In Case co-relation of documents is not mentioned by vendor & further non-receipt of details as per point no. 6.0, the vendor offer shall not be reviewed.	
10.	BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false / incorrect, the offer shall be rejected.	
11.	Vendors to furnish point wise compliance of all the above mentioned points else offers will not be considered.	

(Sign & Stamp of Bidder)



दिनांक एवं हस्ताक्षर SIGN & DATE		<b>उत्पाद क्रय विनिर्देश (हीप : हरिद्वार)</b> <b>PRODUCT PURCHASE SPECIFICATION</b> <b>(HEEP: HARIDWAR)</b>		<b>TG 60682</b>	
				पृष्ठ 6 का 1 Page 1 Of 6	
समय सीमा संख्या को अधिकृतित करने हे	SUPERSEDES INVENTORY NO.	BASED ON OWN EXPERIENCE <b>SPECIFICATION FOR FABRICATION AND SUPPLY OF GENERATOR INTEGRAL PIPING</b>			
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company		<b>1.0 PROJECT INFORMATION</b>  The piping covered under this specification are to be used in association with mechanical auxiliaries for generator piping at power station for carrying oil, water and gas.			
		<b>2.0 SCOPE OF WORK</b>  The scope of work for piping vendor shall be to completely supply the total Piping to site, which includes materials, fabrication, testing, cleaning, painting, packing and dispatch, as mentioned in the order.  All pipes shall be seamless and supplied in approximately 6.0 meter length. Tees, Bends, Reducers and flanges etc as per Bill of Material (BOM) shall be supplied loose.			
स्वतंत्राधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी एलेक्ट्रिकल लिमिटेड की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग जो कि कंपनी के हित में हानिकारक हो न किया जाय।		<b>3.0 MATERIAL SPECIFICATION</b>  <b>3.1</b> The material to be used for fabrication of piping is specified in the BOM.  <b>3.2</b> The vendor shall furnish the correlated mill test certificate for the material used.  <b>3.3</b> Plates to be used for flanges > 25mm shall be checked for laminations by UT as per ASME-435.  <b>3.4</b> Gaskets procured by the vendor shall be from BHEL Approved sources only.			
		<b>4.0 FABRICATION</b>  <b>4.1</b> All Pipes, Bend/Elbows, Tee, Reducer, Flange, Gasket, Fasteners etc shall be in accordance with the respective Bill of material.  <b>4.2</b> All fitting shall be clean finished and reasonably free from scales. They shall be totally free from cracks, porosity, surface flaws, laminations, informal surface and other harmful defects.			
दिनांक एवं हस्ताक्षर SIGN & DATE	TSX	Lalit Kumar	Latit Kumar	नाम NAME	दिनांक एवं हस्ताक्षर SIGNATURE & DATE
	PSC MEMBER	R.K. Sharma	R.K. Sharma	अनुवादक TRANSLATED BY	
	QAX	S.K. BHARDWAJ	S.K. BHARDWAJ	निर्माणकर्ता WORKED BY	KUNAL MISHRA
				जांचकर्ता CHECKED BY	MANJU AZAD
	सहमत विभाग AGREED DEPTT.	नाम NAME	दिनांक एवं हस्ताक्षर DATE & SIGNATURE	पर्यवेक्षणकर्ता SUPERVISED BY	R. L. VYAS
	EME	Jagdish	Jagdish	स्वीकृति APPROVED :	Gr. NO.
	EME	R. L. VYAS	R. L. VYAS	RAKSH KUMAR (AGM - EME)	2.11
समय सीमा संख्या INVENTORY NO.	REV. NO.	02		निर्माण PREPARED : EME	जारी ISSUED : TSX
	DATE	23.08.2017			दिनांक DATE : 29.03.2010
	Change Advice No.	TGE-17-39	21-08-17		



SIGN & DATE सामग्री सूची संख्या को अधिष्ठापित करता है		<b>उत्पाद क्रय विनिर्देश (हीप : हरिद्वार)</b> <b>PRODUCT PURCHASE SPECIFICATION</b> <b>(HEEP: HARIDWAR)</b>		<b>TG 60682</b>	
				पृष्ठ 6 का 2 Page 2 Of 6	
SUPERSEDES INVENTORY सामग्री सूची संख्या को अधिष्ठापित करता है	COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	<p>4.3 All elbows shall be of long radius type with R= 1.5 NB or as specified in the Bill of Material.</p> <p>4.4 The final drg of H2 Cooler header shall be issued after placement of order. However tentative drg shall be furnished for the same along with enquiry BOM.</p> <p><b>5.0 TESTING AND CERTIFICATION</b></p> <p><b>5.1 HYDRAULIC TESTING</b>          Hydraulic test certificate of mother pipe shall be supplied by the fabricator. In the event of mill test certificate not being available, the pipelines shall be hydraulically tested by the vendor in his shop as per ANSI B31.1 before induction.</p> <p>5.2 In case of standard fitting like elbows, tees, reducers etc hydraulic test certificate of mother pipe shall be furnished.</p> <p>5.3 Material test certificates of individual item as per BOM shall be furnished.</p> <p>5.4 DPT/MPI shall be carried out on all fittings for surface crack as per applicable ASME/ASTM.</p> <p><b>6.0 CLEANING &amp; PAINTING</b></p> <p><b>6.1 STAINLESS STEEL PIPING</b>          All hot bent, forged, fabricated and straight section of piping shall be thoroughly cleaned, wire brushed and purged with an air blast to remove water, sand and scale from inner surface. The out side surface of all pipes shall also be free of cleaning slag. Vendor shall not leave any material on the inner or outer surface that will affect the serviceability of the pipe.</p> <p><b>6.2 CARBON STEEL PIPING</b>          All CS pipes shall be treated by pickling with acid neutralised before dispatch. All pipes which are cleaned by acid pickling shall be conserved in accordance with the procedure detailed below. Any alternative method used by the supplier shall have to be got approved from BHEL for which the supplier shall furnish all the details along with the acceptance norms etc. with his offer.</p>			
		स्वतंत्रता और गोपनीयता इन प्रलेख में दी गई सूचना भारत हेवी एलेक्ट्रिकल्स लिमिटेड की सम्पत्ति है इसका प्रयोग एवं प्रकाशन केवल से किसी भी तरह उपयोग जो कि कम्पनी के हित में होना चाहिए			
SIGN & DATE 	REV. NO. 02	निर्माणकर्ता WORKED BY	KUNAL MISHRA		11/07/17
INVENTORY NO. 20395		जांचकर्ता CHECKED BY	MANJU AZAD		11/7/17




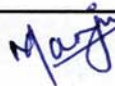

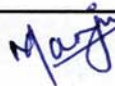

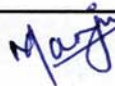


नमः एवं हरिवार <small>Haridwar</small>		<b>उत्पाद क्रय विनिर्देश (हीप : हरिद्वार)</b> <b>PRODUCT PURCHASE SPECIFICATION</b> <b>(HEEP: HARIDWAR)</b>				<b>TG 60682</b>																																	
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SUPERSEDES INVENTORY समूची सूची संख्या को अधिकारित करता है	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><b>STEP</b></p> <p><b>DEGREASING</b></p> <p><b>TEMPERATURE</b></p> <p><b>DURATION</b></p> </div> <div style="width: 50%;"> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">1</td> <td style="width: 55%;">Degreasing by Hydroxide Sodium &gt; ~10%</td> <td style="width: 20%;">60-70 °C</td> <td style="width: 20%;">2 Hours</td> </tr> <tr> <td>2</td> <td>Rising by tap water</td> <td>Room Temperature</td> <td>-----</td> </tr> <tr> <td>3</td> <td>Descaling with Hydrochloric acid Solution with inhibitor 10-15%</td> <td>Room Temperature</td> <td>50-60 minutes</td> </tr> <tr> <td>4</td> <td>Rising by tap water</td> <td>Room Temperature</td> <td>-----</td> </tr> <tr> <td>5</td> <td>Phosphate treatment with Phosphate Solution 8%</td> <td>50-60 °C</td> <td>50 MINUTES</td> </tr> <tr> <td>6</td> <td>Rising by hot tap water above 50 °C</td> <td></td> <td>-----</td> </tr> <tr> <td>7</td> <td>All pipes should be dried with the help of Hot air</td> <td></td> <td></td> </tr> <tr> <td>8</td> <td>Antirust treatment**</td> <td></td> <td></td> </tr> </table> </div> </div>							1	Degreasing by Hydroxide Sodium > ~10%	60-70 °C	2 Hours	2	Rising by tap water	Room Temperature	-----	3	Descaling with Hydrochloric acid Solution with inhibitor 10-15%	Room Temperature	50-60 minutes	4	Rising by tap water	Room Temperature	-----	5	Phosphate treatment with Phosphate Solution 8%	50-60 °C	50 MINUTES	6	Rising by hot tap water above 50 °C		-----	7	All pipes should be dried with the help of Hot air			8	Antirust treatment**		
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							<p><b>स्वत्वाधिकार एवं गोपनीय</b>          इस दस्तावेज में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स लिमिटेड की सम्पत्ति है। इसका प्रयोग एवं प्रसारण केवल उसी उद्देश्य के लिए किया जा सकता है जो कि कंपनी के हित में होना चाहिए।</p>																																
<p><b>** Vapour phase inhibitor shall be used for protecting the inner surface of the pipes after cleaning by pickling or otherwise as the case may be. The recommended quantity is 60gm/m<sup>2</sup> (min.) The vapour phase inhibitor used by the supplier shall be such that it is effective for the purpose for which it is used and does not leave any residue after vaporization.</b></p> <p>After cleaning, the pipes shall be coated with one coat of anti-corrosive chromated primer paint and two additional coats of light colored semi matt paint. The inner surface of the pipe shall be protected with the help of vapour phase inhibitors put inside the pipe with ends sealed with plastic caps with suitable adhesives.</p>																																							
<p><b>Tentative painting schedule - After cleaning, pipe shall be painted as per details given below-</b></p>																																							
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समूची सूची संख्या INVENTORY NO. P-6395	दिनांक एवं हस्ताक्षर SIGN & DATE 	REV. NO. 01		निर्माणकर्ता WORKED BY	KUNAL MISHRA		11/07/17																																
				जांचकर्ता CHECKED BY	MANJU AZAD		11/7/17																																



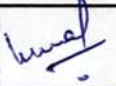



दिनांक एवं हस्ताक्षर SIGN & DATE		<b>उत्पाद क्रय विनिर्देश (हीप : हरिद्वार)</b> <b>PRODUCT PURCHASE SPECIFICATION</b> (HEEP: HARIDWAR)		TG 60682	
				पृष्ठ 6 का 4 Page 4 Of 6	
SUPERSEDES INVENTORY	<b>7.0 PACKING &amp; MARKING</b>				
सामग्री सूची संख्या को अधिकृतित करता है	<p>7.1 Item no. of BOM shall be clearly marked on each item with punch and paint.</p> <p>7.2 All straight pipes of a particular system shall be packed in separate Box/Boxes. System name, BOM no. and item name shall be clearly mentioned on the Box.</p> <p>7.3 All flanges, Tees, Reducers etc. of a particular system shall packed in separate box. System name, BOM no. and item name shall be clearly mentioned on the Box.</p> <p>7.4 All fasteners of a particular system shall packed in separate box. System name, BOM no. and item name shall be clearly mentioned on the Box.</p> <p>7.5 All Gaskets of a particular system shall be packed in separate box. System name shall be clearly mentioned on the Box. On each Gasket, Gasket size (as indicated in BOM), BOM sl. no. make &amp; grade shall be clearly marked with suitable paint or marker for easy identification.</p> <p>7.6 Vendor to ensure that the procurement of gaskets (or gasket material used for manufacturing) shall be done just before dispatch of the entire material so as to maintain the shelf life of the gasket for a min period of 2 years (from the date of dispatch).</p> <p>7.7 All the parts shall be carefully packed for transport in such a manner that these are protected against all damage and the climatic conditions including saline atmosphere to which it may be subjected in transit and one year of storage.</p> <p>7.8 Pipe ends, flange and other similar open ends shall be protected from both external damage (by provision of plastic caps) and ingress of dirt or moisture during transit and storage. All machined surface shall be protected by means of wooden protecting pieces bolted to such surfaces.</p> <p>7.9 Small bore items are to be bundled or bagged and fitted with wired metal tags stamped with item number &amp; BOM number, make &amp; grade.</p> <p>7.10 Water Proof paper &amp; felt lining of the packages shall overlap seams at least up to 15mm and seams shall also be sealed.</p>				
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company					
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दिनांक एवं हस्ताक्षर SIGN & DATE					
सामग्री सूची संख्या INVENTORY NO. P-6595	REV. NO. 02	(SUPERSEDES)	निर्माणकर्ता WORKED BY Jagdeesh Chauhan		23.08.17
			जांचकर्ता CHECKED BY R. L. Vyas		23/8/17



नाम एवं हस्ताक्षर _____		<b>उत्पाद क्रय विनिर्देश (हीप : हरिद्वार)</b> <b>PRODUCT PURCHASE SPECIFICATION</b> <b>(HEEP: HARIDWAR)</b>		<b>TG 60682</b> पृष्ठ 6 का 5 Page 5 Of 6																			
सामग्री सूची संख्या को अधिकृतित करता है _____	SUPERSEDES INVENTORY _____	<p><b>7.11</b> Vendor to ensure to take receipt from site for boxes for every dispatch against GR verification of items sent inside box. GR Verification should be done in presence of supplier's representative at site. Supplier is required to depute their representative to site (one visit per set) on demand from site for verification of items sent inside the box and ensure receipt of all items. Any shortage found during verification is to be replenished free of cost by supplier. However, payment will be released against dispatch documents as per present practice.</p> <p><b>7.12</b> Each straight pipe and pipe fitting belonging to the different systems shall be color coded by making one color band on each free end of the component for identification of material at site as mentioned below: -</p>																					
<b>COPYRIGHT AND CONFIDENTIAL</b> The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.		<table border="1"> <thead> <tr> <th>S. No.</th> <th>DESCRIPTION</th> <th>COLOUR CODE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Seal oil system and Liquid Detector Rack System</td> <td>Light brown (ISC 410)</td> </tr> <tr> <td>2</td> <td>Primary water system</td> <td>Sea Green (ISC 217)</td> </tr> <tr> <td>3</td> <td>Gas system</td> <td>Canary yellow (ISC 309)</td> </tr> <tr> <td>4</td> <td>Waste gas and waste Fluid system</td> <td>Black (ISC 632)</td> </tr> <tr> <td>5</td> <td>H2 Cooler Piping system</td> <td>Sea Green (ISC 217)</td> </tr> </tbody> </table>				S. No.	DESCRIPTION	COLOUR CODE	1	Seal oil system and Liquid Detector Rack System	Light brown (ISC 410)	2	Primary water system	Sea Green (ISC 217)	3	Gas system	Canary yellow (ISC 309)	4	Waste gas and waste Fluid system	Black (ISC 632)	5	H2 Cooler Piping system	Sea Green (ISC 217)
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दिनांक एवं SIGN & DATE 	REV. NO. 02	<table border="1"> <tr> <td>निर्माणकर्ता WORKED BY</td> <td>KUNAL MISHRA</td> <td></td> <td>11/07/17</td> </tr> <tr> <td>जांचकर्ता CHECKED BY</td> <td>MANJU AZAD</td> <td></td> <td>11/21/17</td> </tr> </table>				निर्माणकर्ता WORKED BY	KUNAL MISHRA		11/07/17	जांचकर्ता CHECKED BY	MANJU AZAD		11/21/17										
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सामग्री सूची संख्या INVENTORY NO 2-6395																							



नाम एवं हस्ताक्षर		<b>उत्पाद क्रय विनिर्देश (हीप : हरिद्वार)</b> <b>PRODUCT PURCHASE SPECIFICATION</b> <b>(HEEP: HARIDWAR)</b>		<b>TG 60682</b> पृष्ठ 6 का 6 Page 6 Of 6	
समयी सूची संख्या को अपडेट कर रहा है	SUPERSEDES INVENTORY	<b>10.0 INSTRUCTION FOR BID PREPERATION</b>  <b>10.1</b> The supplier shall furnish a quality plan on BHEL's format detailing all the tests/ checks conducted by supplier at various stages including receipt of raw material, fabrication, packing and dispatch etc. BHEL shall identify hold points in this quality plan beyond which work shall not proceed without the approval of BHEL. The quality plan will form a pre-approval document.  <b>10.2</b> The supplier shall furnish a list of deviations with respect to this purchase specification, if any, otherwise mention No DEVIATIONS.  <b>10.3</b> The pipes and fittings shall be as per detailed B.O.M.  <b>10.4</b> The material of the pipes and fittings shall be as per list of referred standards & drawings.  <b>11.0 CROSS REFERRED STANDARDS</b>  ASME SA 106, ASME A182, ASME A 435, ASTM A234, ASTM A403, ASME B16.9, IS 2062, ANSI B31.1, HW 59870, HW0620599, HW0850199.			
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स्वत्वधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत की भारती लिमिटेड की सम्पत्ति है। इसका प्रयोग एवं प्रकाशक रूप से किसी भी तरह प्रयोग जो कि कंपनी के हित में हानिकारक					
दिनांक एवं हस्ताक्षर	SIGN & DATE				
समयी सूची संख्या	INVENTORY NO.	REV. NO. 02	निर्माणकर्ता WORKED BY	KUNAL MISHRA	 11/07/17
			जांचकर्ता CHECKED BY	MANJU AZAD	 11/07/17



Generator Pippings for 660 MW sets  
(CARBON STEEL)  
MATERIAL CODE-W90415002028

TGE-3702  
REV02  
DATE-12.10.2019

PIPING FOR GAS SYSTEM								
ITEM NO.	PART NO.	DESCRIPTION OF SUB-ASSEMBLY	DRG. NO./SIZE	VAR.	QTY.	UNIT	MAT.SPEC.	WT.(KG)
1		PIPE ASSEMBLY FROM TERM.94(GU) TO TERM.95 (H2 DIST.)						
	1.1	PIPE	D33.4X3.38		38	Mtr.	ASTM SA106 GR.B	95.00
2		PIPE ASSEMBLY FROM TERM.90(GU) TO TERM.16 (GEN.)						
	2.1	PIPE	D60.3X3.91		35	Mtr.	ASTM SA106 GR.B	190.40
	2.2	ELBOW LR 90°	D60.3X3.91		10	No.	ASTM A234 WPB,ASME B16.9	6.80
	2.3	FLANGE, 50NB (GU END)	31492501055	00	1	No.	IS:2062 E250 BR	2.50
	2.4	O-RING	41492501071	00	1	No.	HW59870	0.04
	2.5	SCREW HEX	A-8.8 M16X60		4	No.	IS:1364PART-2,1367PART-3	0.50
	2.6	NUT HEX	A-8.8 M16		4	No.	IS:1364PART-3,1367PART-3	0.14
	2.7	WASHER MCD-ST17.0			8	No.	IS:2016-1967, IS:2062 E250 BR	0.09
	2.8	FLANGE, 50NB (GEN END)	31492501005	00	1	No.	IS:2062 E250 BR	2.50
	2.9	O-RING	41492501071	00	1	No.	HW59870	0.04
	2.10	SCREW HEX	A-8.8 M16X65		4	No.	IS:1364PART-2,1367PART-3	0.53
	2.11	NUT HEX	A-8.8 M16		4	No.	IS:1364PART-3,1367PART-3	0.14
	2.12	WASHER MCD-ST17.0			8	No.	IS:2016-1967, IS:2062 E250 BR	0.09
3		PIPE ASSEMBLY FROM TERM.97(CO2 DIST.) TO TERM.96(GU)						
	3.1	PIPE	D60.3X3.91		30	Mtr.	ASTM SA106 GR.B	163.20
	3.2	ELBOW LR 90°	D60.3X3.91		10	No.	ASTM A234 WPB,ASME B16.9	6.80
	3.3	FLANGE, 50NB (GU END)	31492501055	00	1	No.	IS:2062 E250 BR	2.50
	3.4	O-RING	41492501071	00	1	No.	HW59870	0.04
	3.5	SCREW HEX	A-8.8 M16X60		4	No.	IS:1364PART-2,1367PART-3	0.50
	3.6	NUT HEX	A-8.8 M16		4	No.	IS:1364PART-3,1367PART-3	0.14
	3.7	WASHER MCD-ST17.0			8	No.	IS:2016-1967, IS:2062 E250 BR	0.09
	3.8	FLANGE, 50NB (CO2 DIST. END)	31492501005	00	1	No.	IS:2062 E250 BR	2.50
	3.9	O-RING	41492501071	00	1	No.	HW59870	0.04
	3.10	SCREW HEX	A-8.8 M16X60		4	No.	IS:1364PART-2,1367PART-3	0.50
	3.11	NUT HEX	A-8.8 M16		4	No.	IS:1364PART-3,1367PART-3	0.14
	3.12	WASHER MCD-ST17.0			8	No.	IS:2016-1967, IS:2062 E250 BR	0.09
4		PIPE ASSEMBLY FROM TERM.91(GU) TO TERM.15 (GEN.)						
	4.1	PIPE	D60.3X3.91		35	Mtr.	ASTM SA106 GR.B	190.40
	4.2	ELBOW LR 90°	D60.3X3.91		10	No.	ASTM A234 WPB,ASME B16.9	6.80
	4.3	FLANGE, 50NB (GU END)	31492501055	00	1	No.	IS:2062 E250 BR	2.50
	4.4	O-RING	41492501071	00	1	No.	HW59870	0.04
	4.5	SCREW HEX	A-8.8 M16X60		4	No.	IS:1364PART-2,1367PART-3	0.50
	4.6	NUT HEX	A-8.8 M16		4	No.	IS:1364PART-3,1367PART-3	0.14
	4.7	WASHER MCD-ST17.0			8	No.	IS:2016-1967, IS:2062 E250 BR	0.09
	4.8	FLANGE, 50NB (FOR GEN END)	31492501005	00	1	No.	IS:2062 E250 BR	2.50
	4.9	O-RING	41492501071	00	1	No.	HW59870	0.04
	4.10	SCREW HEX	A-8.8 M16X65		4	No.	IS:1364PART-2,1367PART-3	0.53
	4.11	NUT HEX	A-8.8 M16		4	No.	IS:1364PART-3,1367PART-3	0.14
	4.12	WASHER MCD-ST17.0			8	No.	IS:2016-1967, IS:2062 E250 BR	0.09

*Kunal Mishra*

Prepared by KUNAL MISHRA  
Checked by MANJU AZAD  
Approved by R.L.VYAS



Generator Pippings for 660 MW sets  
(CARBON STEEL)  
MATERIAL CODE-W90415002028

TGE-3702  
REV02  
DATE-12.10.2019

PIPING FOR GAS SYSTEM								
ITEM NO.	PART NO.	DESCRIPTION OF SUB-ASSEMBLY	DRG. NO./SIZE	VAR.	QTY.	UNIT	MAT.SPEC.	WT.(KG)
5		PIPE ASSEMBLY FROM TERM.19(GEN) TO TERM.110/112 (GAS DRIER INLET)						
	5.1	PIPE	D60.3X3.91		35	Mtr.	ASTM SA106 GR.B	190.40
	5.2	ELBOW LR 90°	D60.3X3.91		12	No.	ASTM A234 WPB,ASME B16.9	8.16
	5.3	TEE	60.3x60.3x3.91		1	No.	ASTM A234 WPB,ASME B16.9	1.59
	5.4	FLANGE, 50NB (FOR VLV, GAS DRIER,OIL TRAP,GEN END)	31492501005	00	11	No.	IS:2062 E250 BR	27.50
	5.5	O-RING	41492501071	00	11	No.	HW59870	0.39
	5.6	SCREW HEX	A-8.8 M16X65		44	No.	IS:1364PART-2,1367PART-3	5.81
	5.7	NUT HEX	A-8.8 M16		44	No.	IS:1364PART-3,1367PART-3	1.50
	5.8	WASHER MCD-ST17.0			88	No.	IS:2016-1967, IS:2062 E250 BR	0.97
	5.9	CONNECTION, 8NB	31500001190	06	1	No.	IS:2062 E250 BR	0.06
6		PIPE ASSEMBLY FROM TERM.111/113 (GAS DRIER OUTLET) TO TERM.20(GEN)						
	6.1	PIPE	D60.3X3.91		35	Mtr.	ASTM SA106 GR.B	190.40
	6.2	ELBOW LR 90°	D60.3X3.91		12	No.	ASTM A234 WPB,ASME B16.9	8.16
	6.3	TEE	60.3x60.3x3.91		1	No.	ASTM A234 WPB,ASME B16.9	1.59
	6.4	FLANGE,50NB (FOR VLV,GAS DRIER, GEN END)	31492501005	00	9	No.	IS:2062 E250 BR	22.50
	6.5	O-RING	41492501071	00	9	No.	HW59870	0.32
	6.6	SCREW HEX	A-8.8 M16X65		36	No.	IS:1364PART-2,1367PART-3	4.75
	6.7	NUT HEX	A-8.8 M16		36	No.	IS:1364PART-3,1367PART-3	1.22
	6.8	WASHER MCD-ST17.0			72	No.	IS:2016-1967, IS:2062 E250 BR	0.79
	6.9	CONNECTION, 8NB	31500001190	06	1	No.	IS:2062 E250 BR	0.06
7		PIPE ASSEMBLY FROM TERM.107(GU) TO 313A/313B(GAC)						
	7.1	PIPE	D13.7X2.24		20	Mtr.	ASTM SA106 GR.B	12.60
							TOTAL WT.	1157.75

TOTAL WEIGHT OF PIPING FOR GAS SYSTEM = 1158 KG KG

*Kunal Mishra*



Generator Pipings for 660 MW sets  
(CARBON STEEL)  
MATERIAL CODE-W90415002028

TGE-3702  
REV02  
DATE-12.10.2019

PIPING FOR SEAL OIL SYSTEM								
ITEM NO.	PART NO.	DESCRIPTION OF SUB-ASSEMBLY	DRG. NO. / SIZE	VAR.	QTY.	UNIT	MAT. SPEC.	WT.(KG)
101	PIPE ASSEMBLY FROM TERM.445A (SOU) TO 5A, 5C (GEN)							
	101.6	GASKET VITON	102X60X3		12	No.	HW59870	0.42
	101.7	SCREW HEX	A-8.8 M16X65		48	No.	IS:1364PART-2,1367PART-3	6.34
	101.8	NUT HEX	A-8.8 M16		48	No.	IS:1364PART-3,1367PART-3	1.63
	101.9	WASHER MCD-ST17.0			96	No.	IS:2016-1967, IS:2062 E250 BR	1.06
	101.12	GASKET VITON	88X48X3		2	No.	HW59870	0.06
	101.13	SCREW HEX	A-8.8 M16X40		8	No.	IS:1364PART-2,1367PART-3	0.74
	101.14	NUT HEX	A-8.8 M16		8	No.	IS:1364PART-3,1367PART-3	0.27
	101.15	WASHER MCD-ST17.0			16	No.	IS:2016-1967, IS:2062 E250 BR	0.18
102	PIPE ASSEMBLY FROM TERM.445B (SOU) TO 5B, 5D (GEN)							
	102.6	GASKET VITON	102X60X3		9	No.	HW59870	0.32
	102.7	SCREW HEX	A-8.8 M16X65		36	No.	IS:1364PART-2,1367PART-3	4.75
	102.8	NUT HEX	A-8.8 M16		36	No.	IS:1364PART-3,1367PART-3	1.22
	102.9	WASHER MCD-ST17.0			72	No.	IS:2016-1967, IS:2062 E250 BR	0.79
	102.12	GASKET VITON	88X48X3		2	No.	HW59870	0.06
	102.13	SCREW HEX	A-8.8 M16X40		8	No.	IS:1364PART-2,1367PART-3	0.74
	102.14	NUT HEX	A-8.8 M16		8	No.	IS:1364PART-3,1367PART-3	0.27
	102.15	WASHER MCD-ST17.0			16	No.	IS:2016-1967, IS:2062 E250 BR	0.18
103	PIPE ASSEMBLY FROM TERM. 285A (SOU) TO TERM.6A, 6C (GEN)							
	103.5	GASKET VITON	68X34X3		9	No.	HW59870	0.27
	103.6	SCREW HEX	A-8.8 M12X50		36	No.	IS:1364PART-2,1367PART-3	2.27
	103.7	NUT HEX	A-8.8 M12		36	No.	IS:1364PART-3,1367PART-3	0.61
	103.8	WASHER MCD-ST 13			72	No.	IS:2016-1967, IS:2062 E250 BR	0.45
	103.10	GASKET VITON	88X48X3		2	No.	HW59870	0.06
	103.11	SCREW HEX	A-8.8 M16X40		8	No.	IS:1364PART-2,1367PART-3	0.74
	103.12	NUT HEX	A-8.8 M16		8	No.	IS:1364PART-3,1367PART-3	0.27
	103.13	WASHER MCD-ST17.0			16	No.	IS:2016-1967, IS:2062 E250 BR	0.18
104	PIPE ASSEMBLY FROM TERM. 285B (SOU) TO TERM.6B, 6D (GEN)							
	104.5	GASKET VITON	68X34X3		9	No.	HW59870	0.27
	104.6	SCREW HEX	A-8.8 M12X50		36	No.	IS:1364PART-2,1367PART-3	2.27
	104.7	NUT HEX	A-8.8 M12		36	No.	IS:1364PART-3,1367PART-3	0.61
	104.8	WASHER MCD-ST 13			72	No.	IS:2016-1967, IS:2062 E250 BR	0.45
	104.10	GASKET VITON	88X48X3		2	No.	HW59870	0.06
	104.11	SCREW HEX	A-8.8 M16X40		8	No.	IS:1364PART-2,1367PART-3	0.74
	104.12	NUT HEX	A-8.8 M16		8	No.	IS:1364PART-3,1367PART-3	0.27
	104.13	WASHER MCD-ST17.0			16	No.	IS:2016-1967, IS:2062 E250 BR	0.18
105	PIPE ASSEMBLY FROM TERM 80 (SOU) TO OUTLET OF SOST							
	105.4	GASKET VITON	122X76X3		10	No.	HW59870	0.45
	105.5	SCREW HEX	A-8.8 M16X65		40	No.	IS:1364PART-2,1367PART-3	5.28
	105.6	NUT HEX	A-8.8 M16		40	No.	IS:1364PART-3,1367PART-3	1.36
	105.7	WASHER MCD-ST17.0			80	No.	IS:2016-1967, IS:2062 E250 BR	0.88
107	PIPE ASSEMBLY FROM TERM.294 (SOST) TO 79 (SOU)							
	107.6	GASKET VITON	158X115X3		10	No.	HW59870	0.60
	107.7	SCREW HEX	A-8.8 M16X65		80	No.	IS:1364PART-2,1367PART-3	10.56
	107.8	NUT HEX	A-8.8 M16		80	No.	IS:1364PART-3,1367PART-3	2.72
	107.9	WASHER MCD-ST17.0			160	No.	IS:2016-1967, IS:2062 E250 BR	1.76
	107.11	GASKET VITON	158X122X3		2	No.	HW59870	0.10
	107.12	SCREW HEX	A-8.8 M20X70		16	No.	IS:1364PART-2,1367PART-3	3.57
	107.13	NUT HEX	A-8.8 M20		16	No.	IS:1364PART-3,1367PART-3	0.80
	107.14	WASHER MCD-ST21.0			32	No.	IS:2016-1967, IS:2062 E250 BR	0.54
108	PIPE ASSEMBLY FROM TERM 283(SOU) TO TEE OF PIPE 294 (SOST) TO 79(SOU)							
	108.4	GASKET VITON	122X76X3		2	No.	HW59870	0.09
	108.5	SCREW HEX	A-8.8 M16X65		8	No.	IS:1364PART-2,1367PART-3	1.06
	108.6	NUT HEX	A-8.8 M16		8	No.	IS:1364PART-3,1367PART-3	0.27
	108.7	WASHER MCD-ST17.0			16	No.	IS:2016-1967, IS:2062 E250 BR	0.18

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Approved by R.L.VYAS



Generator Pippings for 660 MW sets  
(CARBON STEEL)  
MATERIAL CODE-W90415002028

TGE-3702  
REV02  
DATE-12.10.2019

PIPING FOR SEAL OIL SYSTEM							
ITEM NO.	PART NO.	DESCRIPTION OF SUB-ASSEMBLY	DRG. NO. / SIZE	VAR.	QTY.	UNIT	WT.(KG)
109		PIPE ASSEMBLY FROM TERM.7A/7B (GEN) TO 78 (SOU)					
	109.6	O-RING	41492501071	01	15	No.	0.53
	109.7	SCREW HEX	A-8.8 M16X65		8	No.	1.06
	109.8	NUT HEX	A-8.8 M16		120	No.	4.08
	109.9	WASHER MCD-ST17.0			240	No.	2.64
	109.14	O-RING	41492501071	01	2	No.	0.07
	109.15	SCREW HEX	A-8.8 M16X65		8	No.	1.06
	109.16	NUT HEX	A-8.8 M16		16	No.	0.54
	109.17	WASHER MCD-ST17.0			16	No.	0.18
111		PIPE ASSEMBLY FROM CONN.480 (SOST) TO TERM. 481 (SOU)					
	111.4	GASKET VITON	158X115X3		8	No.	0.48
	111.5	SCREW HEX	A-8.8 M16X65		8	No.	1.06
	111.6	NUT HEX	A-8.8 M16		64	No.	2.18
	111.7	WASHER MCD-ST17.0			128	No.	1.41
	111.9	GASKET VITON	158X122X3		2	No.	0.10
	111.10	SCREW HEX	A-8.8 M20X70		16	No.	3.57
	111.11	NUT HEX	A-8.8 M20		16	No.	0.80
	111.12	WASHER MCD-ST21.0			32	No.	0.54
112		PIPE ASSEMBLY OF ACW SUPPLY/RETURN FROM TERM 921/922 TO 927/928					
	112.1	PIPE CS	D114.3X3.05		20	Mtr.	321.60
	112.2	ELBOW LR 90°	D114.3X6.02		8	No.	31.60
	112.3	TEE	114.3X114.3X3.05		2	No.	10.00
	112.4	FLANGE, 100NB	31500001239	10	3	No.	10.86
	112.5	GASKET VITON	158X115X3		3	No.	0.18
	112.6	SCREW HEX	A-8.8 M16X65		24	No.	3.17
	112.7	NUT HEX	A-8.8 M16		24	No.	0.82
	112.8	WASHER MCD-ST17.0			48	No.	0.53
	112.9	FLANGE, 100NB (SEAL OIL CLR END)	31500001239	10	4	No.	14.48
	112.10	GASKET VITON	158X115X3		4	No.	0.24
	112.11	SCREW HEX	A-8.8 M16X65		32	No.	4.22
	112.12	NUT HEX	A-8.8 M16		32	No.	1.09
	112.13	WASHER MCD-ST17.0			64	No.	0.70
	112.14	FLANGE, 100NB (FOR VLV)	31493201065	08	8	No.	40.00
	112.15	GASKET VITON	158X122X3		8	No.	0.40
	112.16	SCREW HEX	A-8.8 M20X70		64	No.	14.27
	112.17	NUT HEX	A-8.8 M20		64	No.	3.20
	112.18	WASHER MCD-ST21.0			128	No.	2.18
	112.19	FLANGE, 100NB (FOR PEM TP)	31500001239	10	4	No.	14.48
	112.20	GASKET VITON	158X115X3		2	No.	0.12
	112.21	SCREW HEX	A-8.8 M16X65		16	No.	2.11
	112.22	NUT HEX	A-8.8 M16		16	No.	0.54
	112.23	WASHER MCD-ST21.0			32	No.	0.54
						TOTAL WT	556.53

TOTAL WEIGHT OF PIPING FOR SEAL OIL SYSTEM = 557 KG

REMARKS : ITEM NOS. TO BE READ IN CONJUNCTION WITH BOM TGE-3703.

*Kunal Mishra*

Prepared by KUNAL MISHRA  
Checked by MANJU AZAD  
Approved by R.L.VYAS



**Generator Pippings for 660 MW sets  
(CARBON STEEL)  
MATERIAL CODE-W90415002028**

TGE-3702  
REV02  
DATE-12.10.2019

PIPING FOR LIQUID DETECTOR RACK								
ITEM NO.	PART NO.	DESCRIPTION OF SUB-ASSEMBLY	DRG. NO./SIZE	VAR.	QTY.	UNIT	MAT.SPEC.	WT.(KG)
200		PIPE ASSEMBLY FROM TERM. 21A/B/C(GEN) TO 61A/B/C(LDR)						
	200.1	PIPE	D33.4X3.38		65	Mtr.	ASTM SA106 GR.B	162.50
	200.2	REDUCER CONC.	60.3X33.4X3.91X3.38		3	No.	ASTM A234 WPB,ASME B16.9	1.11
	200.3	FLANGE, 25NB	31500001239	04	30	No.	IS:2062 E250 BR	30.60
	200.4	GASKET VITON	68X34X3		30	No.	HW59870	0.90
	200.5	SCREW HEX	A-8.8 M12X50		120	No.	IS:1364PART-2,1367PART-3	7.56
	200.6	NUT HEX	A-8.8 M12		120	No.	IS:1364PART-3,1367PART-3	2.04
	200.7	WASHER MCD-ST 13			240	No.	IS:2016-1967, IS:2062 E250 BR	1.49
	200.8	FLANGE, 50NB (FOR 21A/B/C TP GEN END)	31500001239	07	3	No.	IS:2062 E250 BR	6.30
	200.9	GASKET VITON	102X60X3		3	No.	HW59870	0.11
	200.10	SCREW HEX	A-8.8 M16X65		12	No.	IS:1364PART-2,1367PART-3	1.58
	200.11	NUT HEX	A-8.8 M16		12	No.	IS:1364PART-3,1367PART-3	0.41
	200.12	WASHER MCD-ST17.0			24	No.	IS:2016-1967, IS:2062 E250 BR	0.26
	200.13	FLANGE, 25NB (FOR VLV)	31493201125	00	6	No.	IS:2062 E250 BR	6.78
	200.14	O-RING	41492501071	02	6	No.	HW59870	0.21
	200.15	SCREW HEX	A-8.8 M12X50		24	No.	IS:1364PART-2,1367PART-3	1.512
	200.16	NUT HEX	A-8.8 M12		24	No.	IS:1364PART-3,1367PART-3	0.408
	200.17	WASHER MCD-ST 13			48	No.	IS:2016-1967, IS:2062 E250 BR	0.2976
201		PIPE ASSEMBLY FROM TERM.22(GEN) TO 62(LDR)						
	201.1	PIPE	D33.4X3.38		25	Mtr.	ASTM SA106 GR.B	62.50
	201.2	REDUCER CONC.	60.3X33.4X3.91X3.38		1	No.	ASTM A234 WPB,ASME B16.9	0.37
	201.3	FLANGE, 25NB	31500001239	04	10	No.	IS:2062 E250 BR	10.20
	201.4	GASKET VITON	68X34X3		5	No.	HW59870	0.15
	201.5	SCREW HEX	A-8.8 M12X50		20	No.	IS:1364PART-2,1367PART-3	1.26
	201.6	NUT HEX	A-8.8 M12		20	No.	IS:1364PART-3,1367PART-3	0.34
	201.7	WASHER MCD-ST 13			40	No.	IS:2016-1967, IS:2062 E250 BR	0.25
	201.8	FLANGE, 50NB (FOR 22 TP GEN END)	31500001239	07	1	No.	IS:2062 E250 BR	2.10
	201.9	GASKET VITON	102X60X3		1	No.	HW59870	0.04
	201.10	SCREW HEX	A-8.8 M16X60		4	No.	IS:1364PART-2,1367PART-3	0.50
	201.11	NUT HEX	A-8.8 M16		4	No.	IS:1364PART-3,1367PART-3	0.14
	201.12	WASHER MCD-ST17.0			8	No.	IS:2016-1967, IS:2062 E250 BR	0.09
202		PIPE ASSEMBLY FROM TERM. 25(GEN) TO 64(LDR)						
	202.1	PIPE	D33.4X3.38		25	Mtr.	ASTM SA106 GR.B	62.50
	202.2	REDUCER CONC.	60.3X33.4X3.91X3.38		1	No.	ASTM A234 WPB,ASME B16.9	0.37
	202.3	FLANGE, 25NB	31500001239	04	10	No.	IS:2062 E250 BR	10.20
	202.4	GASKET VITON	68X34X3		5	No.	HW59870	0.15
	202.5	SCREW HEX	A-8.8 M12X50		20	No.	IS:1364PART-2,1367PART-3	1.26
	202.6	NUT HEX	A-8.8 M12		20	No.	IS:1364PART-3,1367PART-3	0.34
	202.7	WASHER MCD-ST 13			40	No.	IS:2016-1967, IS:2062 E250 BR	0.25
203		PIPE ASSEMBLY FROM TERM. 23(GEN) TO 63(LDR)						
	203.1	PIPE	D33.4X3.38		25	Mtr.	ASTM SA106 GR.B	62.50
	203.2	REDUCER CONC.	60.3X33.4X3.91X3.38		1	No.	ASTM A234 WPB,ASME B16.9	0.37
	203.3	FLANGE, 25NB	31500001239	04	10	No.	IS:2062 E250 BR	10.20
	203.4	GASKET VITON	68X34X3		5	No.	HW59870	0.15
	203.5	SCREW HEX	A-8.8 M12X50		20	No.	IS:1364PART-2,1367PART-3	1.26
	203.6	NUT HEX	A-8.8 M12		20	No.	IS:1364PART-3,1367PART-3	0.34
	203.7	WASHER MCD-ST 13			40	No.	IS:2016-1967, IS:2062 E250 BR	0.25
							<b>TOTAL WT.</b>	<b>452.13</b>

TOTAL WEIGHT OF PIPING FOR LDR = 452 KG

Prepared by KUNAL MISHRA  
Checked by MANJU AZAD  
Approved by R.L.VYAS



Generator Pippings for 660 MW sets  
(CARBON STEEL)  
MATERIAL CODE-W90415002028

TGE-3702  
REV02  
DATE-12.10.2019

PIPING FOR PRIMARY WATER SYSTEM								
ITEM NO.	PART NO.	DESCRIPTION OF SUB-ASSEMBLY	DRG. NO. / SIZE	VAR.	QTY.	UNIT	MAT. SPEC.	WT.(KG)
301		PIPE ASSEMBLY FROM TERM.190 (PW TANK PIPE LINE) TO (PW PUMP INLET)						
	301.6	GASKET VITON	212X169X3		9	No.	HW59870	0.54
	301.7	SCREW HEX	A-8.8 M20X80		72	No.	IS:1364PART-2,1367PART-3	18.58
	301.8	NUT HEX	A-8.8 M20		72	No.	IS:1364PART-3,1367PART-3	3.60
	301.9	WASHER MCD-ST 21			144	No.	IS:2016-1967, IS:2062 E250 BR	2.45
	301.11	GASKET VITON	218X159X3		4	No.	HW59870	0.24
	301.12	SCREW HEX	A-8.8 M24X130		32	No.	IS:1364PART-2,1367PART-3	20.00
	301.13	NUT HEX	A-8.8 M24		32	No.	IS:1364PART-3,1367PART-3	2.24
	301.14	WASHER MCD-ST 25			64	No.	IS:2016-1967, IS:2062 E250 BR	1.92
	301.16	GASKET VITON	188X140X3		2	No.	HW59870	0.12
	301.17	SCREW HEX	A-8.8 M16X120		16	No.	IS:1364PART-2,1367PART-3	2.74
	301.18	NUT HEX	A-8.8 M16		16	No.	IS:1364PART-3,1367PART-3	0.54
	301.19	WASHER MCD-ST 17			32	No.	IS:2016-1967, IS:2062 E250 BR	0.35
	301.21	FLANGE, 125NB (190 GEN END)	31530201018	00	1	No.	IS:2062 E250 BR	6.90
	301.22	GASKET VITON	188X131X3		1	No.	HW59870	0.06
	301.23	SCREW HEX	A-8.8 M24X130		8	No.	IS:1364PART-2,1367PART-3	5.00
	301.24	NUT HEX	A-8.8 M24		8	No.	IS:1364PART-3,1367PART-3	0.56
	301.25	WASHER MCD-ST 25			16	No.	IS:2016-1967, IS:2062 E250 BR	0.48
302		PIPE ASSEMBLY FROM TERM.188 (PW TANK PIPE LINE) TO TERM. 195 ( PW UNIT)						
	302.5	GASKET VITON	212X169X3		9	No.	HW59870	0.54
	302.6	SCREW HEX	A-8.8 M20X80		72	No.	IS:1364PART-2,1367PART-3	18.58
	302.7	NUT HEX	A-8.8 M20		72	No.	IS:1364PART-3,1367PART-3	3.60
	302.8	WASHER MCD-ST 21			144	No.	IS:2016-1967, IS:2062 E250 BR	2.45
	302.10	FLANGE, 150NB (PWU 195 END)	31531401089	01	1	No.	IS:2062 E250 BR	7.59
	302.11	GASKET VITON	218X159X3		1	No.	HW59870	0.06
	302.12	SCREW HEX	A-8.8 M24X130		8	No.	IS:1364PART-2,1367PART-3	5.00
	302.13	NUT HEX	A-8.8 M24		8	No.	IS:1364PART-3,1367PART-3	0.56
	302.14	WASHER MCD-ST 25			16	No.	IS:2016-1967, IS:2062 E250 BR	0.48
	302.16	FLANGE, 125NB (188 GEN END)	31530201018	00	1	No.	IS:2062 E250 BR	6.90
	302.17	GASKET VITON	188X131X3		1	No.	HW59870	0.06
	302.18	SCREW HEX	A-8.8 M24X130		8	No.	IS:1364PART-2,1367PART-3	5.00
	302.19	NUT HEX	A-8.8 M24		8	No.	IS:1364PART-3,1367PART-3	0.56
	302.20	WASHER MCD-ST 25			16	No.	IS:2016-1967, IS:2062 E250 BR	0.48

Prepared by KUNAL MISHRA  
Checked by MANJU AZAD  
Approved by R.L.VYAS



23

**Generator Pippings for 660 MW sets  
(CARBON STEEL)  
MATERIAL CODE-W90415002028**

TGE-3702  
REV02  
DATE-12.10.2019

PIPING FOR PRIMARY WATER SYSTEM								
ITEM NO.	PART NO.	DESCRIPTION OF SUB-ASSEMBLY	DRG. NO. / SIZE	VAR.	QTY.	UNIT	MAT. SPEC.	WT.(KG)
303		PIPE ASSEMBLY FROM OUTLET OF PW PUMP TO PW FILTER UNIT (206)						
	303.6	GASKET VITON	212X169X3		2	No.	HW59870	0.12
	303.7	SCREW HEX	A-8.8 M20X70		16	No.	IS:1364PART-2,1367PART-3	3.57
	303.8	NUT HEX	A-8.8 M20		16	No.	IS:1364PART-3,1367PART-3	0.80
	303.9	WASHER MCD-ST 21			32	No.	IS:2016-1967, IS:2062 E250 BR	0.54
	303.12	GASKET VITON	138X85X3		2	No.	HW59870	0.10
	303.13	SCREW HEX	A-8.8 M16X75		16	No.	IS:1364PART-2,1367PART-3	2.24
	303.14	NUT HEX	A-8.8 M16		16	No.	IS:1364PART-3,1367PART-3	0.54
	303.15	WASHER MCD-ST 17			32	No.	IS:2016-1967, IS:2062 E250 BR	0.35
	303.17	GASKET VITON	218X159X3		2	No.	HW59870	0.12
	303.18	SCREW HEX	A-8.8 M24X130		16	No.	IS:1364PART-2,1367PART-3	10.00
	303.19	NUT HEX	A-8.8 M24		16	No.	IS:1364PART-3,1367PART-3	1.12
	303.20	WASHER MCD-ST 25			32	No.	IS:2016-1967, IS:2062 E250 BR	0.96
	303.21	STUDS-MILD STEEL DOUBLE ENDED (FOR NRV)	C-20 M24X250		16	No.	HW7141199	13.60
	303.22	NUT HEX (FOR NRV)	M24-B6		16	No.	AA7151112	1.12
	303.23	WASHER MCD-ST25.0			16	No.	IS:2016-1967, IS:2062 E250 BR	0.48
	303.25	FLANGE 150NB (PW FILTER UNIT END)	31531401089	01	1	No.	IS-2062 E250BR	7.59
	303.26	GASKET VITON	218X159X3		1	No.	HW59870	0.06
	303.27	SCREW HEX	A-8.8 M24X130		8	No.	IS:1364PART-2,1367PART-3	5.00
	303.28	NUT HEX	A-8.8 M24		8	No.	IS:1364PART-3,1367PART-3	0.56
	303.29	WASHER MCD-ST 25			16	No.	IS:2016-1967, IS:2062 E250 BR	0.48
304		PIPE ASSEMBLY FROM PW UNIT (207) TO PW PUMP SUCTION LINE 198						
	304.3	GASKET VITON	68X34X3		1	No.	HW59870	0.03
	304.4	SCREW HEX	A-8.8 M12X100		4	No.	IS:1364PART-2,1367PART-3	0.25
	304.5	NUT HEX	A-8.8 M12		4	No.	IS:1364PART-3,1367PART-3	0.07
	304.6	WASHER MCD-ST 13			8	No.	IS:2016-1967, IS:2062 E250 BR	0.05
	304.8	GASKET VITON	68X34X3		1	No.	HW59870	0.03
	304.9	SCREW HEX	A-8.8 M12X50		4	No.	IS:1364PART-2,1367PART-3	0.25
	304.10	NUT HEX	A-8.8 M12		4	No.	IS:1364PART-3,1367PART-3	0.07
	304.11	WASHER MCD-ST 13			8	No.	IS:2016-1967, IS:2062 E250 BR	0.05
305		PIPE ASSEMBLY FROM PW UNIT (394) TO TERMINAL BUSHING INLET (132A/B/C)						
	305.6	GASKET VITON	88X48X3		10	No.	HW59870	0.30
	305.7	SCREW HEX	A-8.8 M16X55		40	No.	IS:1364PART-2,1367PART-3	4.64
	305.8	NUT HEX	A-8.8 M16		40	No.	IS:1364PART-3,1367PART-3	1.36
	305.9	WASHER MCD-ST 17			80	No.	IS:2016-1967, IS:2062 E250 BR	0.88

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Approved by R.L.VYAS



Generator Pippings for 660 MW sets  
(CARBON STEEL)  
MATERIAL CODE-W90415002028

TGE-3702  
REV02  
DATE-12.10.2019

PIPING FOR PRIMARY WATER SYSTEM								
ITEM NO.	PART NO.	DESCRIPTION OF SUB-ASSEMBLY	DRG. NO. / SIZE	VAR.	QTY.	UNIT	MAT. SPEC.	WT.(KG)
	305.11	GASKET VITON	68X34X3		3	No.	HW59870	0.09
	305.12	SCREW HEX	A-8.8 M12X50		12	No.	IS:1364PART-2,1367PART-3	0.76
	305.13	NUT HEX	A-8.8 M12		12	No.	IS:1364PART-3,1367PART-3	0.20
	305.14	WASHER MCD-ST 13			24	No.	IS:2016-1967, IS:2062 E250 BR	0.15
	305.16	FLANGE, 40NB (PWU 394 END)	31500001044	00	1	No.	IS:2062 E250 BR	1.19
	305.17	GASKET VITON	71X48X3		1	No.	HW59870	0.03
	305.18	SCREW HEX	A-8.8 M12X100		4	No.	IS:1364PART-2,1367PART-3	0.41
	305.19	NUT HEX	A-8.8 M12		4	No.	IS:1364PART-3,1367PART-3	0.07
	305.20	WASHER MCD-ST 13			8	No.	IS:2016-1967, IS:2062 E250 BR	0.05
306		PIPE ASEMBLY FROM PW BUSHING OUTLET(133A/B/C) TO CONNECTION AT (PIPE TERM 190 TO TERM 199).						
	306.10	GASKET VITON	88X48X3		2	No.	HW59870	0.06
	306.11	SCREW HEX	A-8.8 M16X55		8	No.	IS:1364PART-2,1367PART-3	0.93
	306.12	NUT HEX	A-8.8 M16		8	No.	IS:1364PART-3,1367PART-3	0.27
	306.13	WASHER MCD-ST 17			16	No.	IS:2016-1967, IS:2062 E250 BR	0.18
	306.15	GASKET VITON	68X34X3		7	No.	HW59870	0.21
	306.16	SCREW HEX	A-8.8 M12X50		28	No.	IS:1364PART-2,1367PART-3	1.76
	306.17	NUT HEX	A-8.8 M12		28	No.	IS:1364PART-3,1367PART-3	0.48
	306.18	WASHER MCD-ST 13			56	No.	IS:2016-1967, IS:2062 E250 BR	0.35
	306.20	GASKET VITON	88X48X3		2	No.	HW59870	0.06
	306.21	SCREW HEX	A-8.8 M16X55		8	No.	IS:1364PART-2,1367PART-3	0.93
	306.22	NUT HEX	A-8.8 M16		8	No.	IS:1364PART-3,1367PART-3	0.27
	306.23	WASHER MCD-ST 17			16	No.	IS:2016-1967, IS:2062 E250 BR	0.18
	306.29	GASKET VITON	45X22X3		18	No.	HW59870	0.54
	306.30	SCREW HEX	A-8.8 M12X55		72	No.	IS:1364PART-2,1367PART-3	5.18
	306.31	NUT HEX	A-8.8 M12		72	No.	IS:1364PART-3,1367PART-3	1.22
	306.32	WASHER MCD-ST 13			144	No.	IS:2016-1967, IS:2062 E250 BR	0.89
	306.34	GASKET VITON	68X34X3		6	No.	HW59870	0.18
	306.35	SCREW HEX	A-8.8 M12X50		24	No.	IS:1364PART-2,1367PART-3	1.51
	306.36	NUT HEX	A-8.8 M12		24	No.	IS:1364PART-3,1367PART-3	0.41
	306.37	WASHER MCD-ST 13			48	No.	IS:2016-1967, IS:2062 E250 BR	0.30
							TOTAL WT. (KG)	194.36

TOTAL WEIGHT OF PIPING FOR PW SYSTEM = 194 KG

REMARKS : ITEM NOS. TO BE READ IN CONJUNCTION WITH BOM TGE-3703.

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Checked by MANJU AZAD  
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Generator Piping for 660 MW sets  
(CARBON STEEL)  
MATERIAL CODE-W90415002028

TGE-3702  
REV02  
DATE-12.10.2019

PIPING FOR WASTE GAS SYSTEM								
ITEM NO.	PART NO.	DESCRIPTION	DRG.NO./SIZE	VAR.	QTY.	UNIT	MAT. SPEC./ DIMENSION STD.	WT.(KG)
400		FROM TERM. 105(GU) TO ATM						
	400.1	PIPE	D168.3X7.11		70	Mtr.	ASTM SA106 GR.B	1978.2
	400.2	ELBOW LR 90°	D168.3X7.11		10	No.	ASTM A234 WPB,ASME B16.9	104
	400.3	H2 VENT STAR	TGE-2774		1	No.	TGE-2774	80.74
	400.4	PIPE	D26.7X2.87		10	Mtr.	ASTM SA106 GR.B	16.9
	400.5	CONNECTION, 20NB	31500001190	03	1	No.	IS:2062 E250 BR	0.115
	400.6	FLANGE, 20NB (FOR SIGHT GLASS)	31500001239	03	1	No.	IS:2062 E250 BR	0.73
	400.7	GASKET VITON	58X27X3		1	No.	HW59870	0.03
	400.8	SCREW HEX	A-8.8 M12X60		4	No.	IS:1364PART-2,1367PART-3	0.288
	400.9	NUT HEX	A-8.8 M12		4	No.	IS:1364PART-3,1367PART-3	0.068
	400.10	WASHER MCD-ST13.0			8	No.	IS:2016-1967, IS:2062 E250 BR	0.0496
	400.11	FLANGE, 20NB (FOR VALVE)	31500001239	03	1	No.	IS:2062 E250 BR	0.73
	400.12	GASKET VITON	58X27X3		1	No.	HW59870	0.03
	400.13	SCREW HEX	A-8.8 M12X60		4	No.	IS:1364PART-2,1367PART-3	0.288
	400.14	NUT HEX	A-8.8 M12		4	No.	IS:1364PART-3,1367PART-3	0.068
	400.15	WASHER MCD-ST13.0			8	No.	IS:2016-1967, IS:2062 E250 BR	0.0496
401		FROM TERM. CO2 DIST.(968) TO WGS CONNECTION						
	401.1	PIPE	D60.3X3.91		25	Mtr.	ASTM SA106 GR.B	136
	401.2	ELBOW LR 90°	D60.3X3.91		8	No.	ASTM A234 WPB,ASME B16.9	5.44
	401.3	TEE	60.3x60.3x3.91		1	No.	ASTM A234 WPB,ASME B16.9	1.59
	401.4	TEE UNEQUAL	D168.3x114.3x3.40		1	No.	ASTM A234 WPB,ASME B16.9	13.5
	401.5	REDUCER CONC.	114.3X60.3X6.02X3.91		1	No.	ASTM A234 WPB,ASME B16.9	1.44
402		FROM TERM. H2 DIST.(106) TO WGS CONNECTION						
	402.1	PIPE	D60.3X3.91		10	Mtr.	ASTM SA106 GR.B	54.4
	402.2	ELBOW LR 90°	D60.3X3.91		4	No.	ASTM A234 WPB,ASME B16.9	2.72
	402.3	TEE UNEQUAL	D168.3x114.3x3.40		1	No.	ASTM A234 WPB,ASME B16.9	13.5
	402.4	REDUCER CONC.	114.3X60.3X6.02X3.91		1	No.	ASTM A234 WPB,ASME B16.9	1.44
403		FROM TERM. GAC 315 A/B TO WGS CONNECTION(COMMON HEADER OF 50/100NB)						
	403.1	PIPE	D33.4X3.38		15	Mtr.	ASTM SA106 GR.B	37.5
	403.2	TEE	33.4X33.4X2.90		1	No.	ASTM A234 WPB,ASME B16.9	0.34
	403.3	PIPE	D60.3X3.91		10	Mtr.	ASTM SA106 GR.B	54.4
	403.4	ELBOW LR 90°	D60.3X3.91		4	No.	ASTM A234 WPB,ASME B16.9	2.72
	403.5	TEE UNEQUAL	60.3X33.4X3.91		1	No.	ASTM A234 WPB,ASME B16.9	1.49
	403.6	REDUCER CONC.	60.3X33.4X3.91X3.38		1	No.	ASTM A234 WPB,ASME B16.9	0.37
404		FROM TERM. 87 (SOU) TO WGS CONNECTION(COMMON HEADER OF 50NB)						
	404.1	PIPE	D33.4X3.38		30	Mtr.	ASTM SA106 GR.B	75
405		COMMON HEADER 100NB TO ATM						
	405.1	PIPE	D114.3X6.02		45	Mtr.	ASTM SA106 GR.B	723.6
	405.2	ELBOW LR 90°	D114.3X6.02		8	No.	ASTM A234 WPB,ASME B16.9	31.6
	405.3	REDUCER CONC.	114.3X60.3X6.02X3.91		1	No.	ASTM A234 WPB,ASME B16.9	1.44
	405.4	CONNECTION, 20NB	31500001190	03	1	No.	IS:2062 E250 BR	0.115
	405.5	FLANGE, 20NB (FOR SIGHT GLASS)	31500001239	03	1	No.	IS:2062 E250 BR	0.73
	405.6	GASKET VITON	58X27X3		2	No.	HW59870	0.06
	405.7	SCREW HEX	A-8.8 M12X60		8	No.	IS:1364PART-2,1367PART-3	0.576
	405.8	NUT HEX	A-8.8 M12		8	No.	IS:1364PART-3,1367PART-3	0.136
	405.9	WASHER MCD-ST13.0			16	No.	IS:2016-1967, IS:2062 E250 BR	0.0992
	405.10	FLANGE, 20NB (FOR VALVE)	31500001239	03	1	No.	IS:2062 E250 BR	0.73
	405.11	GASKET VITON	58X27X3		1	No.	HW59870	0.03
	405.12	SCREW HEX	A-8.8 M12X60		4	No.	IS:1364PART-2,1367PART-3	0.288
	405.13	NUT HEX	A-8.8 M12		4	No.	IS:1364PART-3,1367PART-3	0.068
	405.14	WASHER MCD-ST13.0			8	No.	IS:2016-1967, IS:2062 E250 BR	0.0496

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Generator PIPINGS for 660 MW sets  
(CARBON STEEL)  
MATERIAL CODE-W90415002028

TGE-3702  
REV02  
DATE-12.10.2019

PIPING FOR WASTE GAS SYSTEM								
ITEM NO.	PART NO.	DESCRIPTION	DRG.NO./SIZE	VAR.	QTY.	UNIT	MAT. SPEC./ DIMENSION STD.	WT.(KG)
406		FROM TERM. 9A/9B TO VAPOUR EXHAUSTER (COMMON HEADER 80NB) UPTO 100NB COMMON OUTLET HEADER						
	406.1	PIPE	D88.9X5.49		50	Mtr.	ASTM SA106 GR.B	564.5
	406.2	ELBOW LR 90°	D88.9X5.49		20	No.	ASTM A234 WPB,ASME B16.9	41.6
	406.3	TEE	88.9X88.9X3.05		5	No.	ASTM A234 WPB,ASME B16.9	15
	406.4	FLANGE, SORF, 80NB	31500001239	09	20	No.	IS:2062 E250 BR	65.6
	406.5	GASKET VITON	138X89X3		10	No.	HW59870	0.5
	406.6	SCREW HEX	A-8.8 M16X70		80	No.	IS:1364PART-2,1367PART-3	11.2
	406.7	NUT HEX	A-8.8 M16		80	No.	IS:1364PART-3,1367PART-3	2.72
	406.8	WASHER MCD-ST17.0			160	No.	IS:2016-1967, IS:2062 E250 BR	1.76
	406.9	FLANGE, 80NB (VAP EXHST END)	41500001011	00	4	No.	IS:2062 E250 BR	15.632
	406.10	GASKET VITON	90X108X3		4	No.	HW59870	0.14
	406.11	SCREW HEX	A-8.8 M8X70		16	No.	IS:1364PART-2,1367PART-3	2.88
	406.12	NUT HEX	A-8.8 M8		16	No.	IS:1364PART-3,1367PART-3	0.08
	406.13	WASHER MCD-ST9.0			32	No.	IS:2016-1967, IS:2062 E250 BR	0.1984
	406.14	FLANGE, 80NB (9A/9B GEN END, VALVE)	31500001239	09	10	No.	IS:2062 E250 BR	32.8
	406.15	GASKET VITON	138X89X3		10	No.	HW59870	0.5
	406.16	SCREW HEX	A-8.8 M16X70		48	No.	IS:1364PART-2,1367PART-3	6.72
	406.16	SCREW HEX FOR NRV						
	406.16	FLANGE	A-8.8 M16X100		32	No.	IS:1364PART-2,1367PART-3	5.472
	406.17	NUT HEX	A-8.8 M16		80	No.	IS:1364PART-3,1367PART-3	2.72
	406.18	WASHER MCD-ST17.0			160	No.	IS:2016-1967, IS:2062 E250 BR	1.76
	406.19	FLANGE, 80NB (BLIND)	AA7244703		1	No.	IS:2062 E250 BR	4.77
	406.20	CONNECTION, 15NB	31500001190	02	3	No.	IS:2062 E250 BR	0.3
407		FROM COMMON HEADER 100NB TO ATM						
	407.1	PIPE	D114.3X6.02		80	Mtr.	ASME SA106 GR.B	1286.40
	407.2	ELBOW LR 90°	D114.3X6.02		20	No.	ASTM A234 WPB,ASME B16.9	79.00
	407.3	TEE	114.3X88.9X3.05		2	No.	ASTM A234 WPB,ASME B16.9	10.00
	407.4	FLANGE, SORF, 100NB	31500001239	10	32	No.	IS:2062 E250 BR	115.84
	407.5	GASKET VITON	158X115X3		16	No.	HW59870	0.96
	407.6	SCREW HEX	A-8.8 M16X65		128	No.	IS:1364PART-2,1367PART-3	16.90
	407.7	NUT HEX	A-8.8 M16		128	No.	IS:1364PART-3,1367PART-3	4.35
	407.8	WASHER MCD-ST17.0			128	No.	IS:2016-1967	1.41
	407.9	FLANGE, 100NB (BLIND)	AA7244703		1	No.	IS:2062 E250 BR	5.65
	407.10	CONNECTION, 20NB	31500001190	03	1	No.	IS:2062 E250 BR	0.115
408		FROM TERM. 296 (SOST VENT) TO VAP. EXHAUSTER						
	408.1	PIPE	D88.9X5.49		15	Mtr.	ASTM SA106 GR.B	169.35
	408.2	ELBOW LR 90°	D88.9X5.49		6	No.	ASTM A234 WPB,ASME B16.9	12.48
	408.3	FLANGE, SORF, 80NB	31500001239	09	4	No.	IS:2062 E250 BR	13.12
	408.4	GASKET VITON	138X89X3		2	No.	HW59870	0.10
	408.5	SCREW HEX	A-8.8 M16X70		16	No.	IS:1364PART-2,1367PART-3	2.24
	408.6	NUT HEX	A-8.8 M16		16	No.	IS:1364PART-3,1367PART-3	0.54
	408.7	WASHER MCD-ST17.0			32	No.	IS:2016-1967, IS:2062 E250 BR	0.35
	408.8	FLANGE, SORF, 80NB (SOST END)	31500001239	09	1	No.	IS:2062 E250 BR	3.28
	408.9	GASKET VITON	138X89X3		1	No.	HW59870	0.05
	408.10	SCREW HEX	A-8.8 M16X70		8	No.	IS:1364PART-2,1367PART-3	1.12
	408.11	NUT HEX	A-8.8 M16		8	No.	IS:1364PART-3,1367PART-3	0.272
	408.12	WASHER MCD-ST17.0			16	No.	IS:2016-1967, IS:2062 E250 BR	0.176

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Generator PIPings for 660 MW sets  
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TGE-3702  
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DATE-12.10.2019

PIPING FOR WASTE GAS SYSTEM								
ITEM NO.	PART NO.	DESCRIPTION	DRG.NO./SIZE	VAR.	QTY.	UNIT	MAT. SPEC./ DIMENSION STD.	WT.(KG)
409		FROM TERM 189 (PW TANK) TO WGS (VAP EXHAUSTER)						
	409.1	PIPE	D26.7X2.87		10	Mtr.	ASTM SA106 GR.B	16.9
	409.2	PIPE	D21.3X2.77		6	Mtr.	ASTM SA106 GR.B	7.62
	409.3	REDUCER CONC. (FOR VALVE)	26.7X21.3X2.87X2.77		2	No.	ASTM A234 WPB,ASME B16.9	0.16
	409.4	REDUCER CONC. (FOR VALVE)	26.7X17.1X2.87X2.31		2	No.	ASTM A234 WPB,ASME B16.9	0.14
	409.5	TEE	26.7X21.3X2.87		3	No.	ASTM A234 WPB,ASME B16.9	0.45
	409.6	REDUCER CONC. (FOR SIGHT GLASS)	33.4X21.3X3.38X2.77		2	No.	ASTM A234 WPB,ASME B16.9	0.28
	409.7	FLANGE, 25NB(FOR SIGHT GLASS)	31500001239	04	2	No.	IS:2062 E250 BR	2.04
	409.8	GASKET VITON	68X34X3		2	No.	HW59870	0.06
	409.9	SCREW HEX	A-8.8 M12X50		8	No.	IS:1364PART-2,1367PART-3	0.504
	409.10	NUT HEX	A-8.8 M12		8	No.	IS:1364PART-3,1367PART-3	0.136
	409.11	WASHER MCD-ST13.0			16	No.	IS:2016-1967, IS:2062 E250 BR	0.0992
410		FROM TERM 114/115 (GAS DRIER) TO WGS (VAP EXHAUSTER)						
	410.1	PIPE	D60.3X3.91		20	Mtr.	ASTM SA106 GR.B	108.8
	410.2	ELBOW LR 90°	D60.3X3.91		4	No.	ASTM A234 WPB,ASME B16.9	2.72
	410.3	REDUCER CONC.	88.9X60.3X5.49X3.91		1	No.	ASTM A234 WPB,ASME B16.9	0.91
	410.4	TEE	60.3x60.3x3.91		1	No.	ASTM A234 WPB,ASME B16.9	1.59
	410.5	FLANGE, 50NB (FOR GAS DRIER)	31500001239	07	2	No.	IS:2062 E250 BR	4.2
	410.6	GASKET VITON	102X60X3		2	No.	HW59870	0.07
	410.7	SCREW HEX	A-8.8 M16X65		8	No.	IS:1364PART-2,1367PART-3	1.056
	410.8	NUT HEX	A-8.8 M16		8	No.	IS:1364PART-3,1367PART-3	0.272
	410.9	WASHER MCD-ST17.0			16	No.	IS:2016-1967, IS:2062 E250 BR	0.176
TOTAL WT.								5992.40

TOTAL WEIGHT OF PIPING FOR WASTE GAS SYSTEM =

5992 KG

*Kunal Mishra*

Prepared by KUNAL MISHRA  
Checked by MANJU AZAD  
Approved by R.L.VYAS



PIPING FOR WASTE FLUID SYSTEM								
ITEM NO.	PART NO.	DESCRIPTION	DRG.NO./SIZE	VAR.	QTY.	UNIT	MAT. SPEC./ DIMENSION STD.	WT.(KG)
500		FROM WASTE GAS SYSTEM TO COMMON HEADER OF 50 NB						
	500.1	PIPE	D26.7X2.87		20	Mtr.	ASTM SA106 GR.B	33.80
	500.2	CONNECTION, 20NB	31500001190	03	2	No.	ASTM SA106 GR.B	0.23
501		FROM GIS(LDR) TO COMMON HEADER OF 50 NB						
	501.1	PIPE	D17.1X2.31		20	Mtr.	ASTM SA106 GR.B	16.80
	501.2	CONNECTION, 10NB	31500001190	00	1	No.	ASTM SA106 GR.B	0.08
502		FROM SOS(U-LOOP DRAIN) & GS(OIL TRAP) TO COMMON HEADER OF 50 NB						
	502.1	PIPE	D21.3X2.77		40	Mtr.	ASTM SA106 GR.B	50.80
	502.2	CONNECTION, 15NB	31500001190	02	2	No.	ASTM SA106 GR.B	0.20
503		FROM SOU TO COMMON HEADER OF 50 NB						
	503.1	PIPE	D33.4X3.38		35	Mtr.	ASTM SA106 GR.B	87.50
	503.2	CONNECTION, 25NB	31500001190	08	1	No.	ASTM SA106 GR.B	0.14
504		COMMON HEADER OF 50 NB TO DRAIN OIL COLLECTOR						
	504.1	PIPE	D60.3X3.91		20	Mtr.	ASTM SA106 GR.B	108.80
	504.2	ELBOW 90° LR	D60.3X3.91		5	No.	ASTM A234 WPB, ASME B16.9	3.40
505		FROM DRAIN OIL COLLECTOR TO WASTE DISPOSAL PIT						
	505.1	PIPE	D33.4X3.38		20	Mtr.	ASTM SA106 GR.B	50.00
TOTAL WT.								351.75

TOTAL WEIGHT OF PIPING FOR WASTE FLUID SYSTEM =

352 KG

*Kunal Mishra*



29

Generator Pipings for 660 MW sets  
(CARBON STEEL)  
MATERIAL CODE-W90415002028

TGE-3702  
REV02  
DATE-12.10.2019

SUPPORTS FOR GENERATOR PIPING								
ITEM NO.	PART NO.	DESCRIPTION OF SUB-ASSEMBLY	DRG NO. / SIZE	VAR.	QTY.	QTY.	MAT. SPEC.	WT.(KG)
600	600.1	STRIP	3.16X20		60	Mtr.	IS:5986	30
	600.2	FLAT	6X40		100	Mtr.	IS:2062 E250 BR	180
	600.3	FLAT	16X30		70	Mtr.	IS:2062 E250 BR	264
	600.4	ANGLE	50X50X5		100	Mtr.	IS:2062 E250 BR	380
	600.5	ANGLE	75X75X6		100	Mtr.	IS:2062 E250 BR	680
	600.6	CHANNEL ISMC 100			20	Mtr.	IS:2062 E250 BR	185
	600.7	CHANNEL ISMC 75			20	Mtr.	IS:2062 E250 BR	138
	600.8	PIPE CS	D60.3X3.91		10	Mtr.	ASTM SA106 GR.B	54.4
	600.9	TEE BAR ISNT-50			24	Mtr.	IS:2062 E250 BR	106
	600.10	TEE BAR ISNT-75			24	Mtr.	IS:2062 E250 BR	245
	600.11	PIPE CLAMP NB8	2-150-00-01023	1	40	No.	IS:2062 E250 BR	4.8
	600.12	PIPE CLAMP NB10	2-150-00-01023	2	25	No.	IS:2062 E250 BR	3
	600.13	PIPE CLAMP NB15	2-150-00-01023	3	80	No.	IS:2062 E250 BR	10.4
	600.14	PIPE CLAMP NB20	2-150-00-01023	4	6	No.	IS:2062 E250 BR	0.96
	600.15	PIPE CLAMP NB25	2-150-00-01023	5	100	No.	IS:2062 E250 BR	22.5
	600.16	PIPE CLAMP NB40	2-150-00-01023	7	20	No.	IS:2062 E250 BR	5.5
	600.17	PIPE CLAMP NB50	2-150-00-01024	8	100	No.	IS:2062 E250 BR	131.2
	600.18	PIPE CLAMP NB65	2-150-00-01026	6	15	No.	IS:2062 E250 BR	12
	600.19	PIPE CLAMP NB80	2-150-00-01026	7	20	No.	IS:2062 E250 BR	18
	600.20	PIPE CLAMP NB100	2-150-00-01026	8	60	No.	IS:2062 E250 BR	120
	600.21	PIPE CLAMP NB 150	31500001237	01	55	No.	IS:2062 E250 BR	132
	600.22	BEAM ATTACHMENT M12	4-150-00-01101	2	40	No.	IS:2062 E250 BR	1.25
	600.23	TURN BUCKLE M12	4-150-00-01103	2	50	No.	IS:2062 E250 BR	52
	600.24	TIE ROD M12	4-150-00-01130	0	50	No.	IS:2062 E250 BR	12
	600.25	THREADED ROD M12	4-150-00-01131	0	100	No.	IS:2062 E250 BR	72
	600.26	WELDING EYE	4-150-00-01132	0	80	No.	IS:2062 E250 BR	90
	600.27	EYE BOLT M12	4-150-00-01099	2	50	No.	IS:2062 E250 BR	8
TOTAL WT. (KG)								2958

TOTAL WEIGHT OF PIPING FOR HANGERS & SUPPORTS =

2958 KG

COMBINED WEIGHT OF THE  
SYSTEM(GS+SOS+LDR+PWS+WGS+WFS+H&S)=

11663 KG

TOTAL WEIGHT OF CARBON STEEL MATERIAL =

11663 KG

*Kunal Mishra*  
KUNAL MISHRA  
Dy. Mg. BH&E (EME)

Prepared by KUNAL MISHRA  
Checked by MANJU AZAD  
Approved by R.L.VYAS



28

Generator Pippings for 660 MW Sets  
(STAINLESS STEEL)  
MATERIAL CODE - W90415001994

TGE-3703  
REV02  
DATE-12.10.2019

PIPING FOR SEAL OIL SYSTEM								
ITEM NO.	PART NO.	DESCRIPTION OF SUB-ASSEMBLY	DRG. NO. / SIZE	VAR.	QTY.	UNIT	MAT. SPEC.	WT.(KG)
101		PIPE ASSEMBLY FROM TERM.445A (SOU) TO 5A, 5C (GEN)						
	101.1	PIPE SS	D60.3X3.91		65	Mtr.	ASTM A312 TP321	353.60
	101.2	ELBOW LR 90°	D60.3X3.91		22	No.	ASTM A403 WP321,ASME B16.9	14.96
	101.3	TEE	60.3X60.3X3.91		1	No.	ASTM A403 WP321,ASME B16.9	1.59
	101.4	REDUCER CONC.	60.3X48.3X3.91X3.68		2	No.	ASTM A403 WP321,ASME B16.9	0.82
	101.5	FLANGE, 50NB	31500001240	07	24	No.	ASTM A182 F321	50.40
	101.10	PIPE SS	D48.3X3.68		3	Mtr.	ASTM A312 TP321	12.15
	101.11	FLANGE,40NB (FOR GEN END)	31500001240	06	2	No.	ASTM A182 F321	2.34
	101.16	CONNECTION, 15NB	31500001190	02	1	No.	ASTM A182 F321	0.10
102		PIPE ASSEMBLY FROM TERM.445B (SOU) TO 5B, 5D (GEN)						
	102.1	PIPE SS	D60.3X3.91		50	Mtr.	ASTM A312 TP321	272.00
	102.2	ELBOW LR 90°	D60.3X3.91		16	No.	ASTM A403 WP321,ASME B16.9	10.88
	102.3	TEE	60.3X60.3X3.91		1	No.	ASTM A403 WP321,ASME B16.9	1.59
	102.4	REDUCER CONC.	60.3X48.3X3.91X3.68		2	No.	ASTM A403 WP321,ASME B16.9	0.82
	102.5	FLANGE, 50NB	31500001240	07	18	No.	ASTM A182 F321	37.80
	102.10	PIPE SS	D48.3X3.68		3	Mtr.	ASTM A312 TP321	12.15
	102.11	FLANGE,40NB (FOR GEN END)	31500001240	06	2	No.	ASTM A182 F321	2.34
	102.16	CONNECTION, 15NB	31500001190	02	1	No.	ASTM A182 F321	0.10
103		PIPE ASSEMBLY FROM TERM. 285A (SOU) TO TERM.6A, 6C (GEN)						
	103.1	PIPE SS	D33.4X3.38		60	Mtr.	ASTM A312 TP321	150.00
	103.2	TEE	33.4X33.4X3.38		1	No.	ASTM A403 WP321,ASME B16.9	0.34
	103.3	REDUCER CONC.	D48.3X33.4X3.68X3.38		2	No.	ASTM A403 WP321,ASME B16.9	0.48
	103.4	FLANGE, 25NB	31500001240	04	18	No.	ASTM A182 F321	18.36
	103.9	FLANGE,40NB (FOR GEN END)	31500001240	06	2	No.	ASTM A182 F321	2.34
104		PIPE ASSEMBLY FROM TERM. 285B (SOU) TO TERM.6B, 6D (GEN)						
	104.1	PIPE SS	D33.4X3.38		50	Mtr.	ASTM A312 TP321	125.00
	104.2	TEE	33.4X33.4X3.38		1	No.	ASTM A403 WP321,ASME B16.9	0.34
	104.3	REDUCER CONC.	D48.3X33.4X3.68X3.38		2	No.	ASTM A403 WP321,ASME B16.9	0.48
	104.4	FLANGE, 25NB	31500001240	04	18	No.	ASTM A182 F321	18.36
	104.9	FLANGE,40NB (FOR GEN END)	31500001240	06	2	No.	ASTM A182 F321	2.34
105		PIPE ASSEMBLY FROM TERM 80 (SOU) TO OUTLET OF SOST						
	105.1	PIPE SS	D73X5.16		50	Mtr.	ASTM A312 TP321	431.50
	105.2	ELBOW LR 90°	D73X5.16		10	No.	ASTM A403 WP321,ASME B16.9	13.00
	105.3	FLANGE, 65NB	31500001240	08	20	No.	ASTM A182 F321	53.40
107		PIPE ASSEMBLY FROM TERM.294 (SOST) TO 79 (SOU)						
	107.1	PIPE SS	D114.3X6.02		55	Mtr.	ASTM A312 TP321	884.40
	107.2	ELBOW LR 90°	D114.3X6.02		12	No.	ASTM A403 WP321,ASME B16.9	47.40
	107.3	TEE	114.3X114.3X6.02		1	No.	ASTM A403 WP321,ASME B16.9	5.00
	107.4	REDUCER CONC.	114.3X73X6.02X5.16		1	No.	ASTM A403 WP321,ASME B16.9	1.52
	107.5	FLANGE, 100NB	31500001240	10	20	No.	ASTM A182 F321	72.40
	107.10	FLANGE,100NB (FOR VLV)	31493201065	08	2	No.	ASTM A182 F321	10.00
108		PIPE ASSEMBLY FROM TERM 283(SOU) TO TEE OF PIPE 294 (SOST) TO 79(SOU)						
	108.1	PIPE SS	D73X5.16		15	Mtr.	ASTM A312 TP321	129.45
	108.2	ELBOW LR 90°	D73X5.16		6	No.	ASTM A403 WP321,ASME B16.9	7.80
	108.3	FLANGE, 65NB	31500001240	08	4	No.	ASTM A182 F321	10.68

*Kunal Mishra*

Prepared by KUNAL MISHRA  
Checked by MANJU AZAD  
Approved by R.L.VYAS



Generator Pipings for 660 MW Sets  
(STAINLESS STEEL)  
MATERIAL CODE - W90415001994

TGE-3703  
REV02  
DATE-12.10.2019

PIPING FOR SEAL OIL SYSTEM								
ITEM NO.	PART NO.	DESCRIPTION OF SUB-ASSEMBLY	DRG. NO. / SIZE	VAR.	QTY.	UNIT	MAT. SPEC.	WT.(KG)
109		PIPE ASSEMBLY FROM TERM.7A/7B (GEN) TO 78 (SOU)						
	109.1	PIPE SS	D114.3X6.02		80	Mtr.	ASTM A312 TP321	1286.40
	109.2	ELBOW LR 90°	D114.3X6.02		26	No.	ASTM A403 WP321,ASME B16.9	102.70
	109.3	TEE	114.3X114.3X6.02		1	No.	ASTM A403 WP321,ASME B16.9	5.00
	*109.4	FLANGE, 100NB	31500001027	02	15	No.	ASTM A182 F321	54.3
	*109.5	FLANGE, 100NB	31500001000	06	15	No.	ASTM A182 F321	88.2
	109.10	CONNECTION FOR RTD	4150000111	00	2	No.	ASTM A182 F321	1.00
	109.11	THERMOWELL	41531401027	00	2	No.	ASTM A182 F321	0.80
	109.12	CONNECTION, 15NB	31500001190	02	2	No.	ASTM A182 F321	0.20
	109.13	FLANGE, 100NB (FOR GEN END)	31500001027	02	2	No.	ASTM A182 F321	7.24
* REMARKS FOR PROJECT SITE - ITEM NO. 109.4 & 109.5 SHALL BE USED IN COMBINATION i.e. ONE FLAT FLANGE ALONG WITH GROOVED FLANGE WITH O-RING COVERED IN BOM TGE-3702 (ITEM NO. 109.14).								
110		PIPE ASSEMBLY FROM U LOOP TO TERM.81(DPR LINE)						
	110.1	PIPE SS	D21.3X2.77		45	Mtr.	ASTM A312 TP321	57.15
111		PIPE ASSEMBLY FROM CONN.480 (SOST)TO TERM. 481 (SOU)						
	111.1	PIPE SS	D114.3X6.02		45	Mtr.	ASTM A312 TP321	723.60
	111.2	ELBOW LR 90°	D114.3X6.02		10	No.	ASTM A403 WP321,ASME B16.9	39.50
	111.3	FLANGE, 100NB	31500001240	10	16	No.	ASTM A182 F321	57.92
	111.8	FLANGE,100NB (FOR VLV)	31493201065	08	2	No.	ASTM A182 F321	10.00
113		SPARE ITEMS FOR SEAL OIL SYSTEM PIPING						
	113.1	PIPE SS	D13.7X2.24		3	Mtr.	ASTM A312 TP321	1.89
	113.2	FLANGE, 100NB (SOST END TERM 448)	31490701004	00	1	No.	ASTM A182 F321	4.58
							TOTAL WT	5198.71

TOTAL WEIGHT OF PIPING FOR SEAL OIL SYSTEM = 5199 KG

REMARKS FOR SITE: ITEM NOS. TO BE READ IN CONJUNCTION WITH BOM TGE-3702.

Prepared by KUNAL MISHRA  
Checked by MANJU AZAD  
Approved by R.L.VYAS



Generator Piping for 660 MW Sets  
(STAINLESS STEEL)  
MATERIAL CODE - W90415001994

TGE-3703  
REV02  
DATE-12.10.2019

26

PIPING FOR PRIMARY WATER SYSTEM								
ITEM NO.	PART NO.	DESCRIPTION OF SUB-ASSEMBLY	DRG. NO. / SIZE	VAR.	QTY.	UNIT	MAT. SPEC.	WT.(KG)
301		PIPE ASSEMBLY FROM TERM.190 (PW TANK PIPE LINE) TO (PW PUMP INLET)						
	301.1	PIPE SS	D168.3X7.11		48	Mtr.	ASTM A312 TP321	1356.48
	301.2	ELBOW LR 90°	D168.3X7.11		11	No.	ASTM A403 WP321,ASME B16.9	114.40
	301.3	TEE	D168.3X168.3X7.11		1	No.	ASTM A403 WP321,ASME B16.9	15.00
	301.4	REDUCER CONC.	D168.3X141.3X7.11X6.55		3	No.	ASTM A403 WP321,ASME B16.9	11.79
	301.5	FLANGE, 150NB	31500001240	12	18	No.	ASTM A182 F321	108.00
	301.10	FLANGE 150NB (VALVE END)	31500001240	20	4	No.	ASTM A182 F321	24.00
	301.15	FLANGE, 125NB (PW PUMP END)	31500001240	11	2	No.	ASTM A182 F321	9.98
	301.20	NECK, 125NB (190 GEN END)	31500601115	00	1	No.	ASTM A182 F321	2.40
	301.26	CONNECTION, 25NB	31500001190	08	1	No.	ASTM A182 F321	0.14
302		PIPE ASSEMBLY FROM TERM.188 (PW TANK PIPE LINE) TO TERM. 195 ( PW UNIT)						
	302.1	PIPE SS	D168.3X7.11		45	Mtr.	ASTM A312 TP321	1271.70
	302.2	ELBOW LR 90°	D168.3X7.11		8	No.	ASTM A403 WP321,ASME B16.9	83.20
	302.3	REDUCER CONC.	D168.3X141.3X7.11X6.55		1	No.	ASTM A403 WP321,ASME B16.9	3.93
	302.4	FLANGE, 150NB	31500001240	12	18	No.	ASTM A182 F321	108.00
	302.9	NECK, 150NB (PWU 195 END)	31531401088	01	1	No.	ASTM A182 F321	3.26
	302.15	NECK, 125NB (188 GEN END)	31500601115	00	1	No.	ASTM A182 F321	2.40
303		PIPE ASSEMBLY FROM OUTLET OF PW PUMP TO PW FILTER UNIT (206)						
	303.1	PIPE SS	D168.3X7.11		12	Mtr.	ASTM A312 TP321	339.12
	303.2	ELBOW LR 90°	D168.3X7.11		5	No.	ASTM A403 WP321,ASME B16.9	52.00
	303.3	TEE	D168.3X168.3X7.11		1	No.	ASTM A403 WP321,ASME B16.9	15.00
	303.4	REDUCER CONC.	D168.3x88.9x7.11X5.49		2	No.	ASTM A403 WP321,ASME B16.9	7.26
	303.5	FLANGE, 150NB	31500001240	12	4	No.	ASTM A182 F321	24.00
	303.10	CONNECTION, 8NB	31500001190	06	2	No.	ASTM A182 F321	0.23
	303.11	FLANGE 80NB (PW PUMP END)	31500001240	09	2	No.	ASTM A182 F321	6.56
	303.16	FLANGE 150NB (VALVE END)	31500001240	20	2	No.	ASTM A182 F321	12.00
	303.24	NECK 150NB (PW FILTER UNIT END)	31531401088	01	1	No.	ASTM A182 F321	3.26
	303.30	PIPE SS (FOR PG PT)	D21.3X2.77		16	Mtr.	ASTM A312 TP321	20.32
	303.31	CONNECTION, 15NB	31500001190	02	2	No.	ASTM A182 F321	2.54
304		PIPE ASSEMBLY FROM PW UNIT (207) TO PW PUMP SUCTION LINE 198						
	304.1	PIPE SS	D33.4X3.38		10	Mtr.	ASTM A312 TP321	25.00
	304.2	NECK,25NB (PWU 198 END)	31531401021	01	1	No.	ASTM A182 F321	0.47
	304.7	FLANGE, 25NB	31500001240	04	2	No.	ASTM A182 F321	2.04

*Kunal Mishra*

Prepared by KUNAL MISHRA  
Checked by MANJU AZAD  
Approved by R.L.VYAS



Generator Pippings for 660 MW Sets  
(STAINLESS STEEL)  
MATERIAL CODE - W90415001994

TGE-3703  
REV02  
DATE-12.10.2019

PIPING FOR PRIMARY WATER SYSTEM								
ITEM NO.	PART NO.	DESCRIPTION OF SUB-ASSEMBLY	DRG. NO. / SIZE	VAR.	QTY.	UNIT	MAT. SPEC.	WT.(KG)
305		PIPE ASSEMBLY FROM PW UNIT (394) TO TERMINAL BUSHING INLET (132A/B/C)						
	305.1	PIPE SS	D48.3X3.68		50	Mtr.	ASTM A312 TP321	202.50
	305.2	PIPE SS	D33.4X3.38		6	Mtr.	ASTM A312 TP321	15.00
	305.3	REDUCER CONC.	D48.3X33.4X3.68X3.38		1	No.	ASTM A403 WP321,ASME B16.9	0.24
	305.4	TEE	D48.3X33.4X3.68X3.38		2	No.	ASTM A403 WP321,ASME B16.9	1.84
	305.5	FLANGE, 40NB	31500001240	06	20	No.	ASTM A182 F321	23.40
	305.10	FLANGE, 25NB	31500001240	04	6	No.	ASTM A182 F321	6.12
		NECK, 40NB						
	305.15	(PWU 394 END)	31531401021	03	1	No.	ASTM A182 F321	0.74
306		PIPE ASSEMBLY FROM PW BUSHING OUTLET(133A/B/C) TO CONNECTION AT (PIPE TERM 190 TO TERM 199).						
	306.1	PIPE SS	D21.3X2.77		10	Mtr.	ASTM A312 TP321	12.70
	306.2	PIPE SS	D33.4X3.38		35	Mtr.	ASTM A312 TP321	87.50
	306.3	PIPE SS	D48.3X3.68		12	Mtr.	ASTM A312 TP321	48.60
	306.4	PIPE SS	D114.3X6.02		1	Mtr.	ASTM A312 TP321	16.08
	306.5	REDUCER CONC.	114.3X48.3X6.02X3.68		2	No.	ASTM A403 WP321,ASME B16.9	2.48
	306.6	REDUCER CONC.	D48.3X21.3X3.68X2.77		3	No.	ASTM A403 WP321,ASME B16.9	0.60
	306.7	REDUCER CONC.	D33.4X21.3X3.38X2.77		3	No.	ASTM A403 WP321,ASME B16.9	0.42
	306.8	TEE	48.3X48.3X3.68		2	No.	ASTM A403 WP321,ASME B16.9	2.40
	306.9	FLANGE, 40NB	31500001240	06	4	No.	ASTM A182 F321	4.68
	306.14	FLANGE, 25NB	31500001240	04	14	No.	ASTM A182 F321	14.28
		FLANGE, 40NB						
	306.19	(FOR VALVE)	31500001240	06	2	No.	ASTM A182 F321	2.34
	306.24	CONNECTION, 40NB	31531401139	05	1	No.	ASTM A182 F321	1.27
	306.25	CONNECTION	31531401020	03	2	No.	ASTM A182 F321	2.54
	306.26	THERMOWELL	41531401027	00	2	No.	ASTM A182 F321	0.80
		FLANGE, 15NB						
	306.27	(FOR FLOW METER)	31500001240	02	18	No.	ASTM A182 F321	22.86
		FLANGE, 25NB						
	306.33	(FOR SIGHT GLASS)	31500001240	04	6	No.	ASTM A182 F321	6.12
307		PIPE ASSEMBLY FROM TERM.136/582A/581A to PW SKID & PW PUMP DISCHARGE TO PW UNIT						
	307.1	PIPE SS	D21.3X2.77		170	Mtr.	ASTM A312 TP321	215.90
	307.2	TEE	D21.3X21.3X2.77		1	No.	ASTM A403 WP321,ASME B16.9	0.20
308		FROM N2 DIST(312) TO PW TANK						
	308.1	PIPE SS	D13.7X2.24		60	Mtr.	ASTM A312 TP321	37.80
	308.2	REDUCER CONC.	D26.7X13.7X2.87X2.24		1	No.	ASTM A403 WP321,ASME B16.9	0.07
309		PIPE ASSEMBLY FOR DRAIN PIPING FROM PU PUMP LINE TO PW UNIT DRAIN						
	309.1	PIPE SS	D13.7X2.24		10	Mtr.	ASTM A312 TP321	6.30
							TOTAL WT. (KG)	4360.26

TOTAL WEIGHT OF PIPING FOR PW SYSTEM (STAINLES STEEL) = 4360 KG  
COMBINED WEIGHT OF THE SYSTEM (SOS+PWS) = 9559 KG  
TOTAL WEIGHT OF STAINLES STEEL MATERIAL = 9559 KG

REMARKS FOR SITE: ITEM NOS. TO BE READ IN CONJUCTION WITH BOM TGE-3702.

*Kunal Mishra*  
KUNAL MISHRA  
By Mgr/BHEL-HWR(EME)

Prepared by KUNAL MISHRA  
Checked by MANJU AZAD  
Approved by R.L.VYAS



**Piping for Hydrogen Cooler-660 MW  
(CARBON STEEL)  
(MATERIAL CODE-W90415002036)**

TGE-3805  
REV00  
DATE-20.05.2019

H2 COOLER PIPING								
ITEM NO.	PART NO.	DESCRIPTION OF SUB-ASSEMBLY	DRAWING NO. / SIZE	VAR.	QTY.	QTY.	MAT. SPEC.	WT.(KG)
1	1.1	INLET HEADER	21500001125	00	1	No.	ASTM SA106 GR.B	536
2	2.1	OUTLET HEADER	21500001126	00	1	No.	ASTM SA106 GR.B	536
3	3.1	PIPE	D168.3X7.11		200	Mtr.	ASTM SA106 GR.B	5652
	3.2	PIPE	D33.4X3.38		40	Mtr.	ASTM SA106 GR.B	100
	3.3	PIPE	D21.3X2.77		100	Mtr.	ASTM SA106 GR.B	127
	3.5	PIPE	D13.7X2.24		20	Mtr.	ASTM SA106 GR.B	12.6
	3.6	ELBOW 90 °	D168.3X7.11		64	No.	ASTM A234 WPB,ASME B16.9	665.6
	3.7	ELBOW 45 °	D168.3X7.11		16	No.	ASTM A234 WPB,ASME B16.9	83.2
	3.8	CONNECTION	41500001118	00	16	No.	IS:2062 E250 BR	8
	3.9	CONNECTION	41500001182	00	16	No.	IS:2062 E250 BR	8
	3.10	CONNECTION, 8NB	31500001190	06	10	No.	IS:2062 E250 BR	0.6
	3.11	CONNECTION, 10NB	31500001190	00	15	No.	IS:2062 E250 BR	2.13
	3.12	THERMOWELL	41531401027	00	10	No.	IS:2062 E250 BR	4
	3.13	FLANGE NB150	31500001239	12	80	No.	IS:2062 E250 BR	480
	3.14	GASKET VITON	212X170X3TK		40	No.	HW59870	3.2
	3.15	SCREW HEX A-8.8	M20X80		320	No.	IS:1364PART-2,1367PART-3	82.56
	3.16	NUT HEX A-8.8	M20		320	No.	IS:1364PART-3,1367PART-3	16
	3.17	WASHER MCD-ST 21			640	No.	IS:2016-1967, IS:2062 E250 BR	10.88
	3.18	FLANGE NB150 (C.F. OF VALVES)	31500001239	12	16	No.	IS:2062 E250 BR	96
	3.19	GASKET VITON	212X170X3TK		16	No.	HW59870	1.28
	3.20	SCREW HEX A-8.8	M20X80		128	No.	IS:1364PART-2,1367PART-3	33.024
	3.21	NUT HEX A-8.8	M20		256	No.	IS:1364PART-3,1367PART-3	12.8
	3.22	WASHER MCD-ST 21			128	No.	IS:2016-1967, IS:2062 E250 BR	2.176
4	4.1	SUPPORT	21500001041	00	1	SET	IS:2062 E250 BR	322
	4.2	SUPPROT U3,U4	21500001042	00	1	No.	IS:2062 E250 BR	330
	4.3	HANGER ASSEMBLY F1,F2,F3,F4	11500001019		1	SET		192
	4.3.1	PARALLEL BEAM IPB 100	L=3000		1	No.	IS:2062 E250 BR	
	4.3.2	CHANNEL ISMC 150X75	L=1200		2	No.	IS:2062 E250 BR	
	4.3.3	PIPE CLAMP	21500001026	10	8	No.	IS:2062 E250 BR	
	4.3.4	BEAM ATTACHEMENT M20	4-150-00-01101	04	8	No.	IS:2062 E250 BR	
	4.3.5	EYE BOLT M20	4-150-00-01099	04	8	No.	IS:2062 E250 BR	
	4.3.6	THREADED ROD M20X1.5	4-150-00-01131	02	8	No.	IS:2062 E250 BR	
	4.3.7	TURN BUCKLE M20	4-150-00-01103	04	8	No.	IS:2062 E250 BR	
	4.3.8	TIE ROD M20X2000	41500001176	00	2	No.	IS:2062 E250 BR	
	4.3.9	SPRING HANGER	41500001198	00	2	No.	IS:2062 E250 BR	
	4.3.10	SPRING HANGER	41500001199	00	2	No.	IS:2062 E250 BR	
	4.4	HANGER ASSEMBLY F5	21500001043		1	No.		65
	4.4.1	PARALLEL BEAM IPB 100	L=1800		2	No.	IS:2062 E250 BR	
	4.4.2	BEAM ATTACHEMENT M20	4-150-00-01101	04	1	No.	IS:2062 E250 BR	
	4.4.3	EYE BOLT M20	4-150-00-01099	04	2	No.	IS:2062 E250 BR	
	4.4.4	PIPE CLAMP	21500001026	11	1	No.	IS:2062 E250 BR	
	4.4.5	THREADED ROD M20X1.5	4-150-00-01131	02	1	No.	IS:2062 E250 BR	
	4.4.6	TIE ROD M20X2000	41500001176	00	1	No.	IS:2062 E250 BR	
	4.4.7	SPRING HANGER	41500001199	00	1	No.	IS:2062 E250 BR	
	4.4.8	TURN BUCKLE M20	4-150-00-01103	04	2	No.	IS:2062 E250 BR	
	4.5	HANGER ASSEMBLY F6	21500001044		1	No.		63
	4.5.1	PARALLEL BEAM IPB 100	L=1800		1	No.	IS:2062 E250 BR	
	4.5.2	PLATE	41500001177	00	1	No.	IS:2062 E250 BR	
	4.5.3	BEAM ATTACHEMENT M20	4-150-00-01101	04	2	No.	IS:2062 E250 BR	
	4.5.4	EYE BOLT M20	4-150-00-01099	04	1	No.	IS:2062 E250 BR	
	4.5.5	THREADED ROD M20X1.5	4-150-00-01131	02	1	No.	IS:2062 E250 BR	
	4.5.6	TIE ROD M20X2000	41500001176	00	1	No.	IS:2062 E250 BR	
	4.5.7	SPRING HANGER	41500001199	00	1	No.	IS:2062 E250 BR	
	4.6	HANGER ASSEMBLY F7	21500001045		1	No.		60
	4.6.1	PARALLEL BEAM IPB 100	L=1800		1	No.	IS:2062 E250 BR	
	4.6.2	BEAM ATTACHEMENT M20	4-150-00-01101	04	1	No.	IS:2062 E250 BR	
	4.6.3	EYE BOLT M20	4-150-00-01099	04	2	No.	IS:2062 E250 BR	

*Kunal Mishra*

Prepared by KUNAL MISHRA  
Checked by MANJU AZAD  
Approved by R.L.VYAS



**Piping for Hydrogen Cooler-660 MW**  
**(CARBON STEEL)**  
**(MATERIAL CODE-W90415002036)**

TGE-3805  
REV00  
DATE-20.05.2019

H2 COOLER PIPING							
ITEM NO.	PART NO.	DESCRIPTION OF SUB-ASSEMBLY	DRAWING NO. / SIZE	VAR.	QTY.	QTY.	MAT. SPEC.
	4.6.4	PIPE CLAMP	21500001026	11	1	No.	IS:2062 E250 BR
	4.6.5	THREADED ROD M20X2000	41500001178	00	1	No.	IS:2062 E250 BR
	4.6.6	SPRING HANGER	41500001199	00	1	No.	IS:2062 E250 BR
	4.7	HANGER ASSEMBLY F8	21500001046		1	No.	
	4.7.1	PARALLEL BEAM IPB 100	L=1800		1	No.	IS:2062 E250 BR
	4.7.2	PLATE	41500001177	00	1	No.	IS:2062 E250 BR
	4.7.3	BEAM ATTACHEMENT M20	4-150-00-01101	04	2	No.	IS:2062 E250 BR
	4.7.4	EYE BOLT M20	4-150-00-01099	04	1	No.	IS:2062 E250 BR
	4.7.5	THREADED ROD M20X2000	41500001178	00	1	No.	IS:2062 E250 BR
	4.7.6	SPRING HANGER	41500001199	00	1	No.	IS:2062 E250 BR
	4.8	PIPE CLAMP NB150	21500001026	10	30	No.	IS:2062 E250 BR
	4.9	FLAT	5X40		6	Mtr.	IS:2062 E250 BR
	4.10	ANGLE	75X75X6		10	Mtr.	IS:2062 E250 BR
	4.11	CHANNEL ISMC 75			6	Mtr.	IS:2062 E250 BR
TOTAL WT. (KG)							9757

TOTAL WEIGHT CARBON STEEL PIPING FOR H2 COOLER SYSTEM = 9757 KG

*Kunal Mishra*  
**KUNAL MISHRA**  
Dy. Mg. BH&L-HWR (ENE)

Prepared by KUNAL MISHRA  
Checked by MANJU AZAD  
Approved by R.L.VYAS

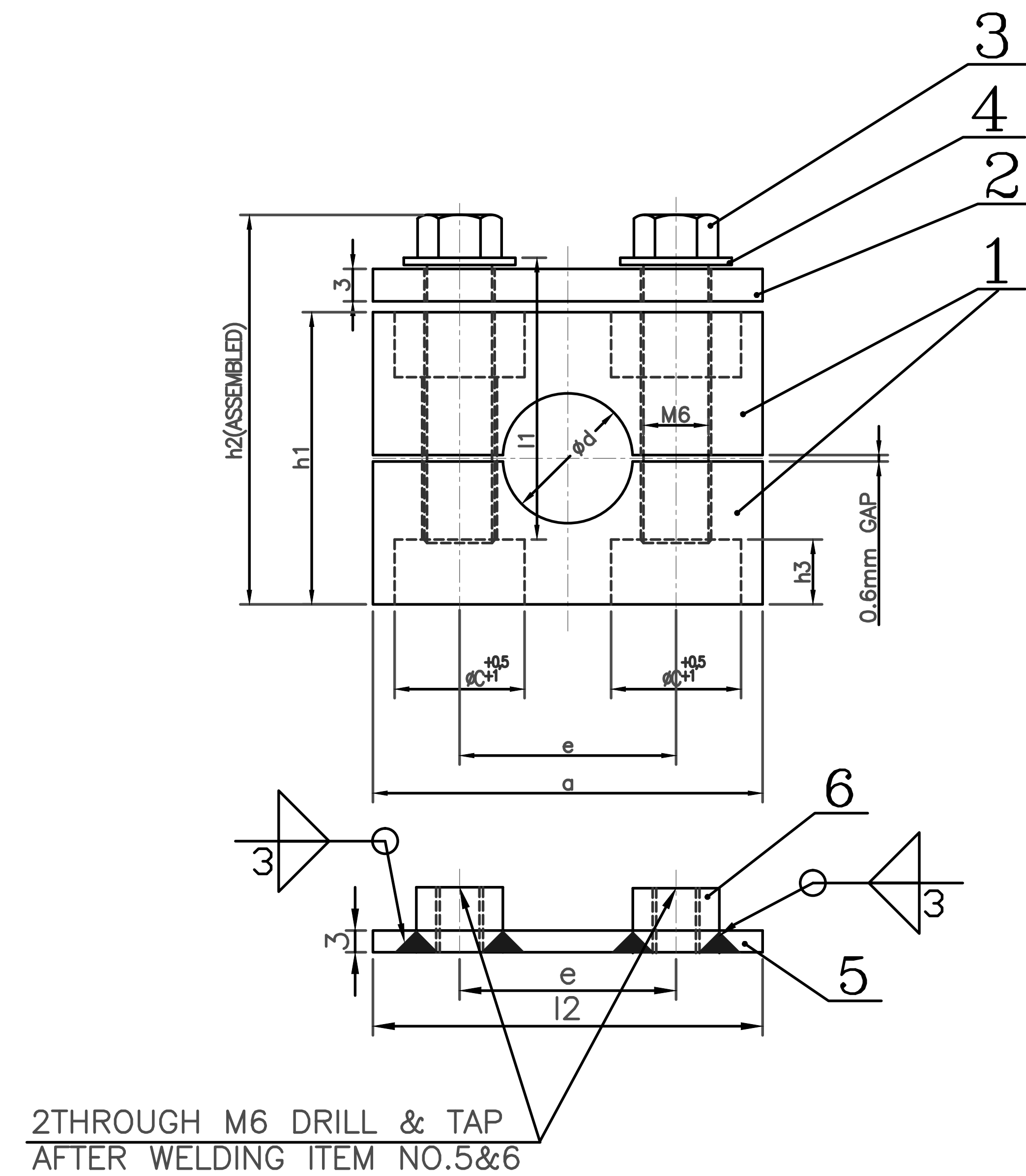


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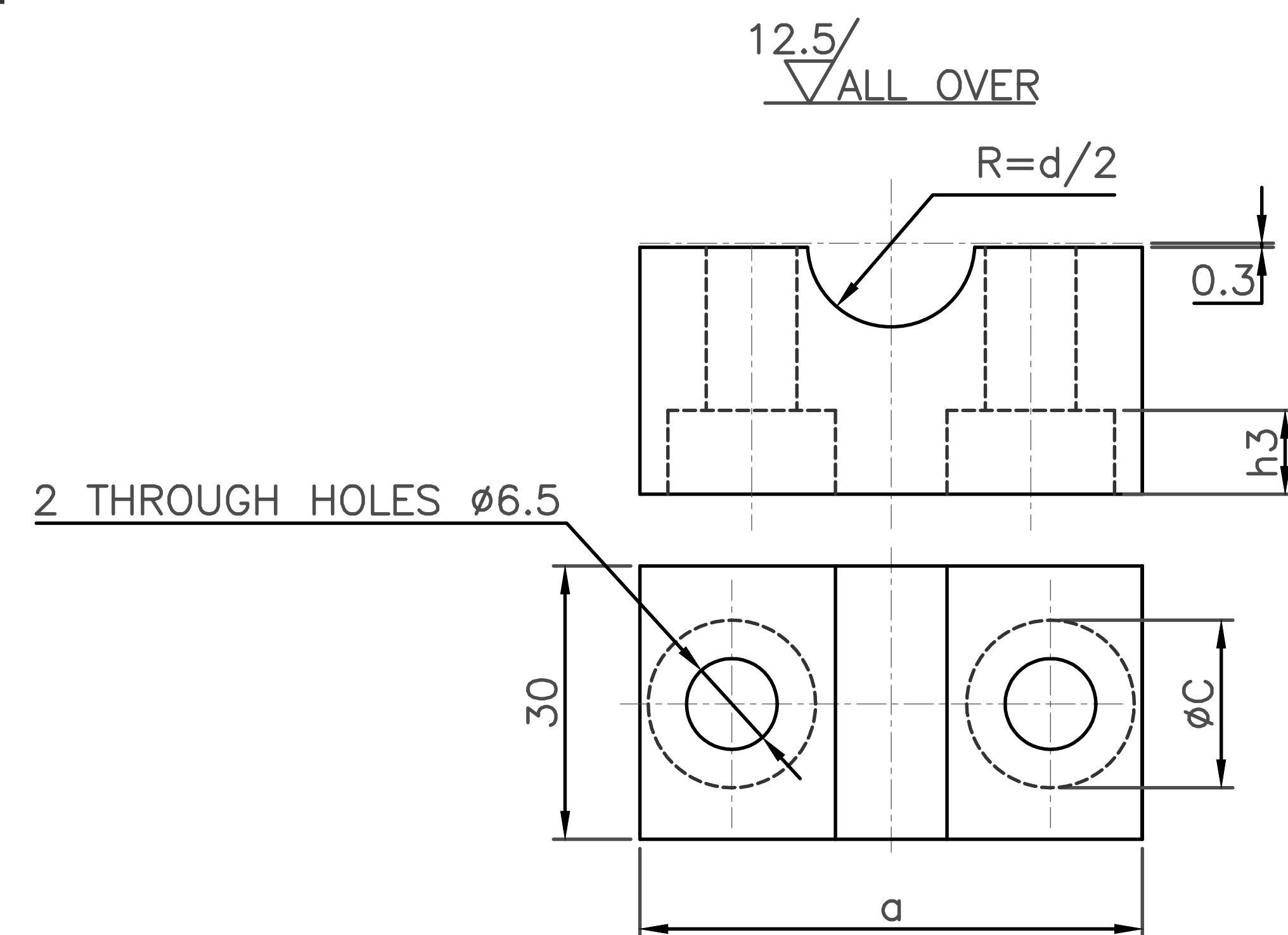
Et1-16322 INVENTORY NO.	22/8/92 SIGN & DATE	REF. DRG NO.
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22/8/92  
SIGN & DATE

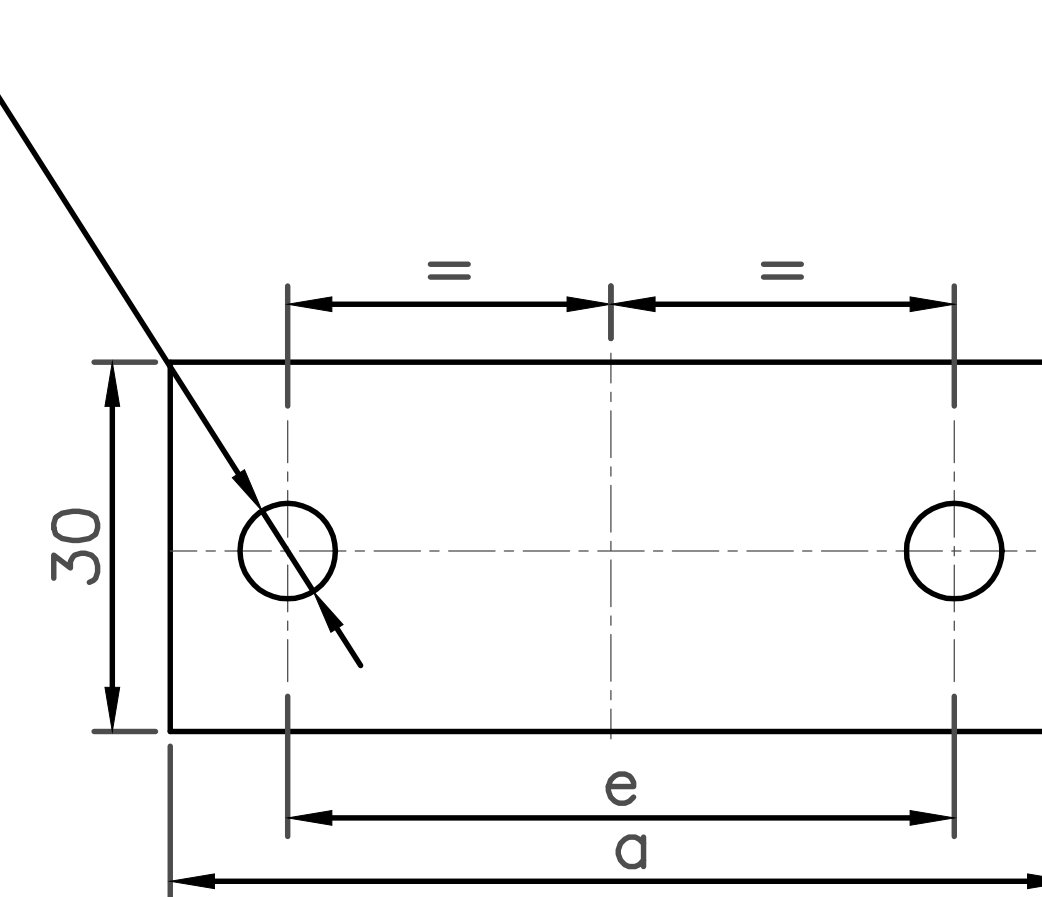
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INVENTORY NO.



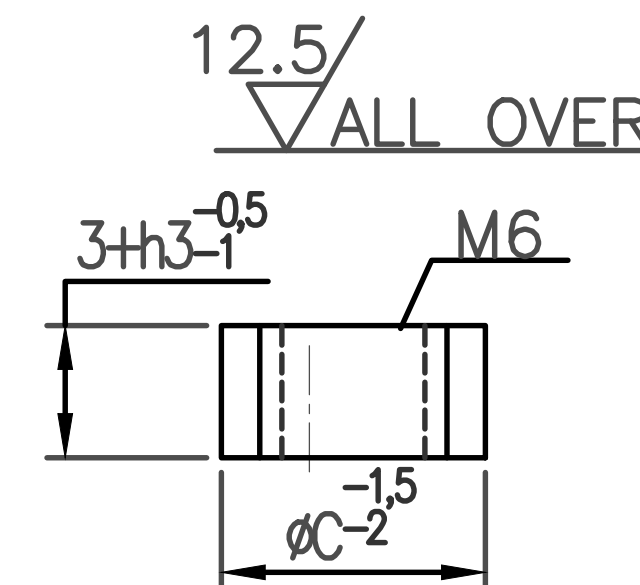
### DETAILS OF ITEM NO.-1



### DETAILS OF ITEM NO.-2








### DETAILS OF ITEM NO.-6



VAR	d	NB	a	e	h1	h2	l1	l2	c	h3	Wt. Kg.	MATERIAL CODE
00	12	6	36	20	27	36	30	54	12	5	0.10	W96415001701
01	13.5	8	42	26	33	43	35	62	12	8	0.12	W96415001710
02	17.2	10	42	26	33	43	35	62	12	8	0.12	W96415001728
03	21.3	12	50	33	35	45	40	69	12	8	0.13	W96415001736
04	26.9	15	59	40	42	52	45	76	15	12	0.16	W96415001744
05	33.7	25	72	52	58	68	60	88	15	12	0.22	W96415001752
06	42.4	32	72	52	58	68	60	88	15	12	0.22	W96415001760
07	48.3	40	86	66	66	82	60	110	15	12	0.26	W96415001779

1. PIPE CLAMPS SHALL BE SUPPLIED IN ASSEMBLED CONDITION.
2. IDENTIFICATION SHALL BE DONE BY ATTACHING A TAG.
3. FOR MATERIAL CODE REFER VARIANT TABLE.
4. MATERIAL OF CLIP ITEM NO.1 SHALL BE POLYAMIDE.

006	NUT	SEE DETAIL			STEEL A8.8			--
005	SUPPORT PLATE L2X30	-			CS-IS2062E250BR			--
004	WASHER M6	-			CS-IS2062E250BR			--
003	BOLT HEX.M6XL1	SEE DETAIL			STEEL A8.8			--
002	COVER PLATE	SEE DETAIL			CS-IS2062E250BR			--
001	CLIP	SEE DETAIL			POLYAMIDE			--
ITEM NO.	DESCRIPTION	DRAWING	SLT	VAR	MATERIAL CODE	MATERIAL SPEC.	C	UNIT WEIGHT

[illegible]



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KUN 633.03  
REF. DRG NO.

22/8/92  
SIGN & DATE

Et1-16321  
INVENTORY NO.

2-150-00-01024  
DRAWING NO.

F  
E  
D  
C  
B  
A

8 7 6 5 4 3

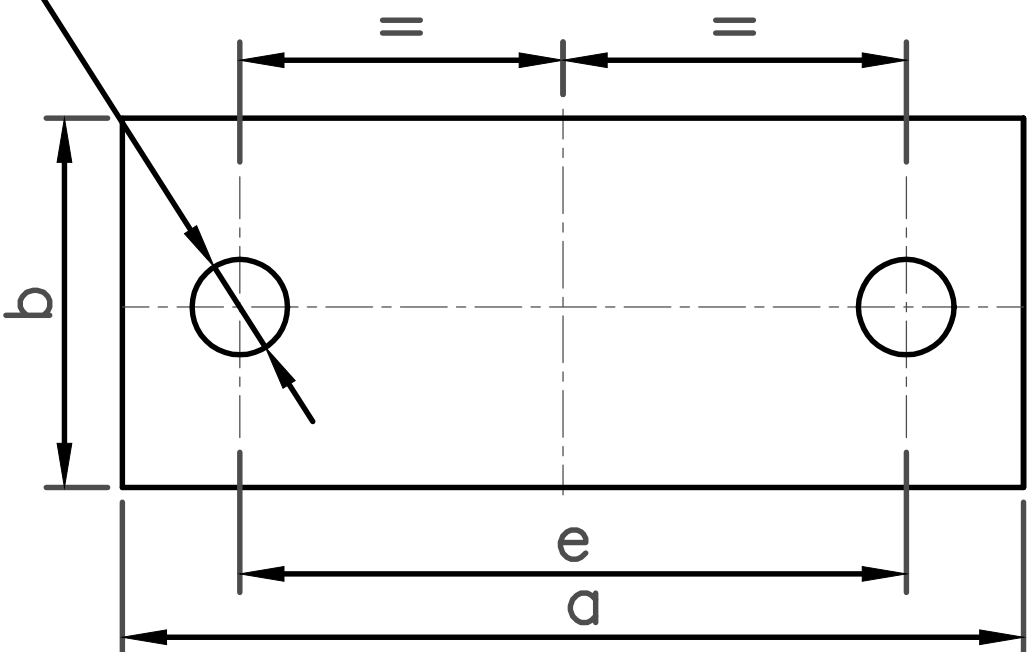
FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

FORM: DG 44(B)

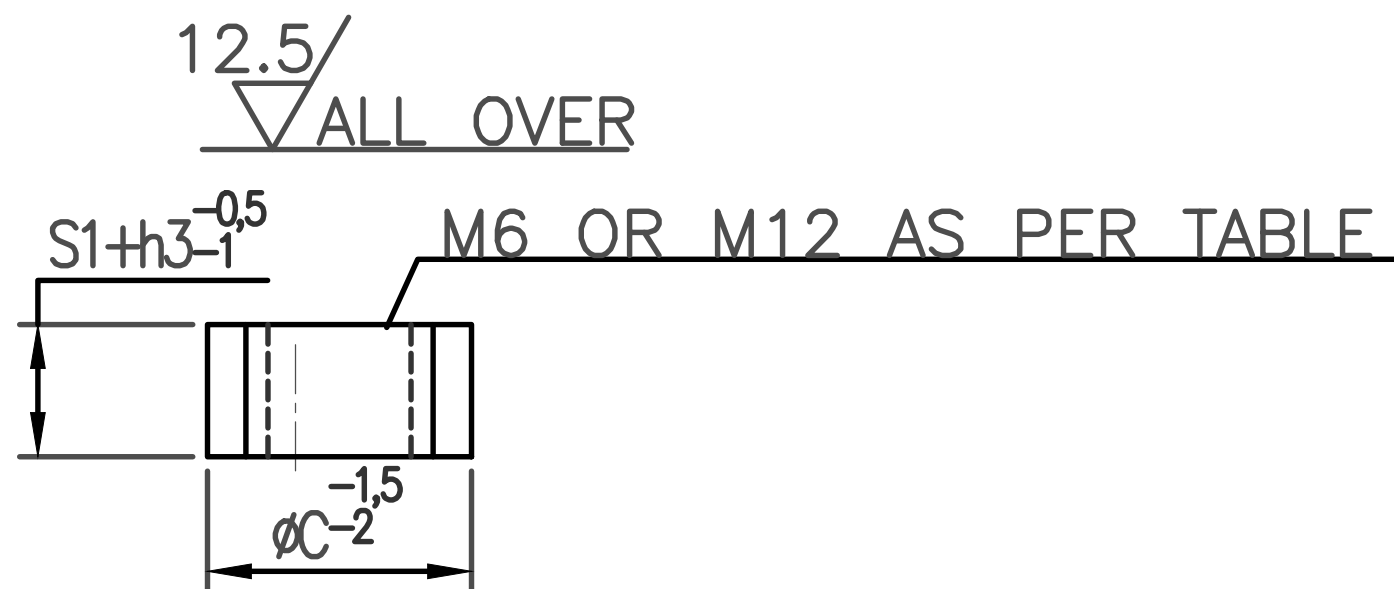
### VARIANT TABLE

VAR	b	d	PIPE NB	a	e	h1	h2	d1	l	c	h3	Wt. Kg.	MATERIAL CODE	S1	S2	BOLT SIZE
00	30	12	6	55	33	32	48	10.5	73	18	12	0.34	W96415001617	8	8	M10X45
01	30	13.5	8	55	33	32	48	10.5	73	18	12	0.34	W96415001625	8	8	"
02	30	17.2	10	55	33	32	48	10.5	73	18	12	0.34	W96415001633	8	8	"
03	30	21.3	15	70	45	48	64	10.5	85	20	15	0.44	W96415001641	8	8	M10X60
04	30	26.9	20	70	45	48	64	10.5	85	20	15	0.44	W96415001655	8	8	"
05	30	33.7	25	84	60	60	76	10.5	100	20	15	0.54	W96415001663	8	8	M10X70
06	30	42.4	32	84	60	60	76	10.5	100	20	15	0.54	W96415001671	8	8	"
07	45	48.3	40	115	90.5	90	111	13	140	25	20	1.36	W96415001680	10	10	M12X100
08	45	60.3	50	115	90.5	90	111	13	140	25	20	1.31	W96415001698	10	10	"

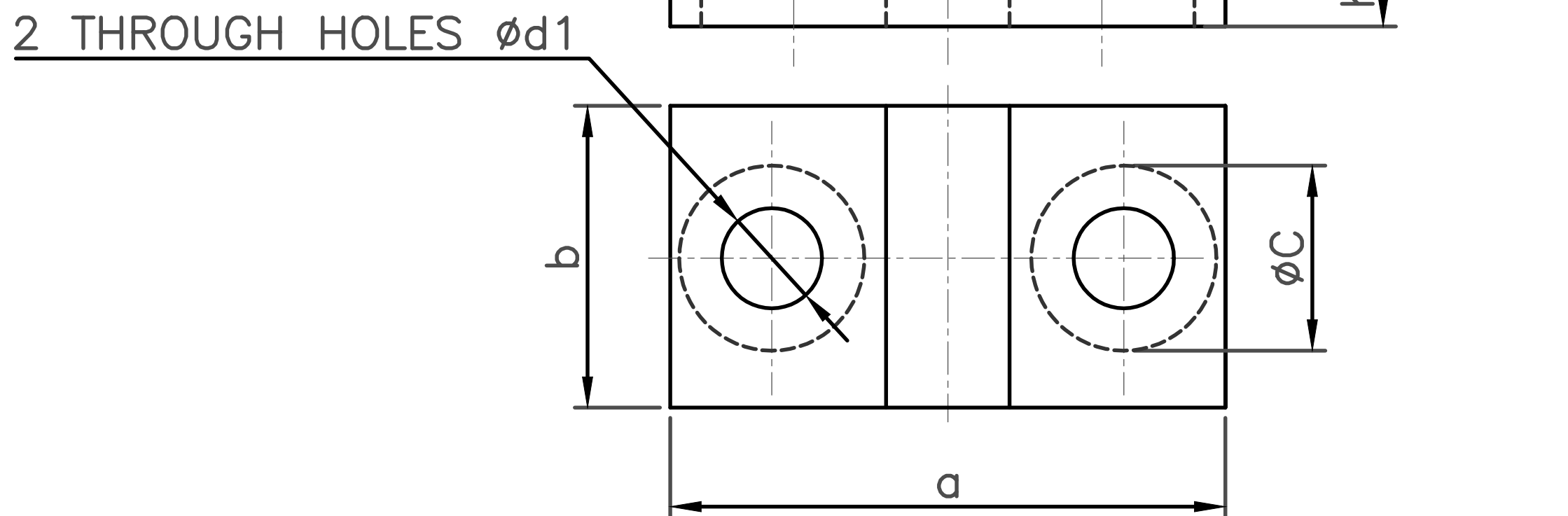
### DETAILS OF ITEM NO.-2



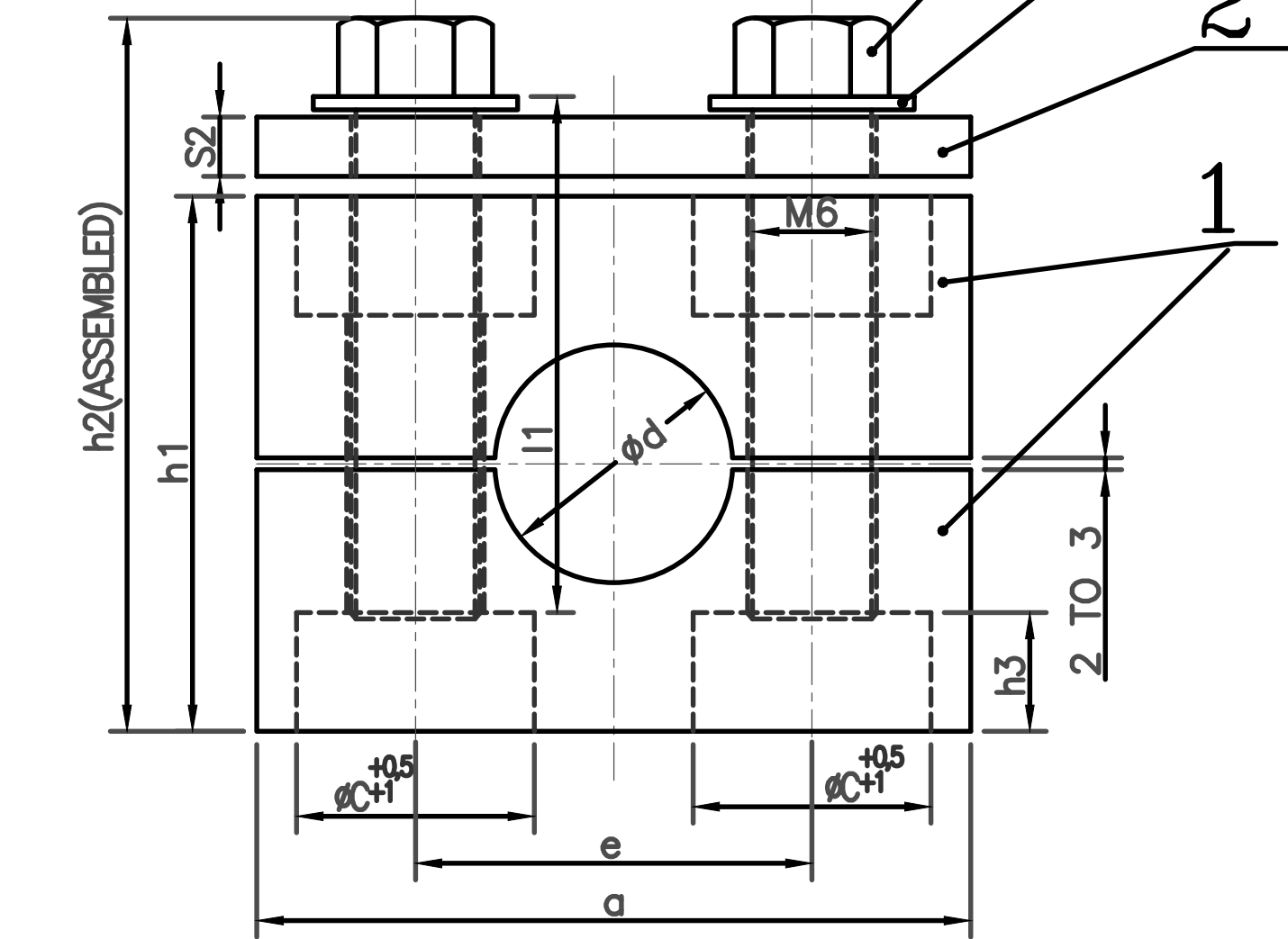
### DETAILS OF ITEM NO.-6



### DETAILS OF ITEM NO.-1



2THROUGH M10 OR M5 AS PER TABLE  
AND TAP AFTER WELDING ITEM NO.5&6



### TECHNICAL REQUIREMENTS

- PIPE CLAMPS SHALL BE SUPPLIED IN ASSEMBLED CONDITION.
- IDENTIFICATION SHALL BE DONE BY ATTACHING A TAG.
- FOR MATERIAL CODE REFER VARIANT TABLE.
- MATERIAL OF CLIP ITEM NO.1 SHALL BE POLYAMIDE.

006	NUT	SEE DETAIL			STEEL A8.8			
005	SUPPORT PLATE	-			CS-IS2062E250BR			
004	WASHER	-			CS-IS2062E250BR			
003	BOLT HEX.M6XL1	SEE DETAIL			STEEL A8.8			
002	COVER PLATE	SEE DETAIL			CS-IS2062E250BR			
001	CLIP	SEE DETAIL			POLYAMIDE			
ITEM NO.	DECEIPTION	DRAWING	1/2	VAR	MATERIAL CODE	A	UNIT WEIGHT	

GRADE OF UNTOL. DIM.:--  
M/CG- ~~4~~/C/~~M~~/~~F~~ AA 0230208  
WELDING-~~A~~/B/C/~~D~~-AA621104  
GAS CUTTING-~~T3~~/AA0621101

REV. DATE ALTERED  
CHECKED

CBOM NO.  
0-150-00-01125  
STATUS OF DRG.  
AGREED DEPT. NAME SIGN DATE  
WTK SC GOYAL sd/- 23.7.92

REV. DATE ALTERED KM  
01 04.06.18 CHECKED MA  
REVISION MARKED

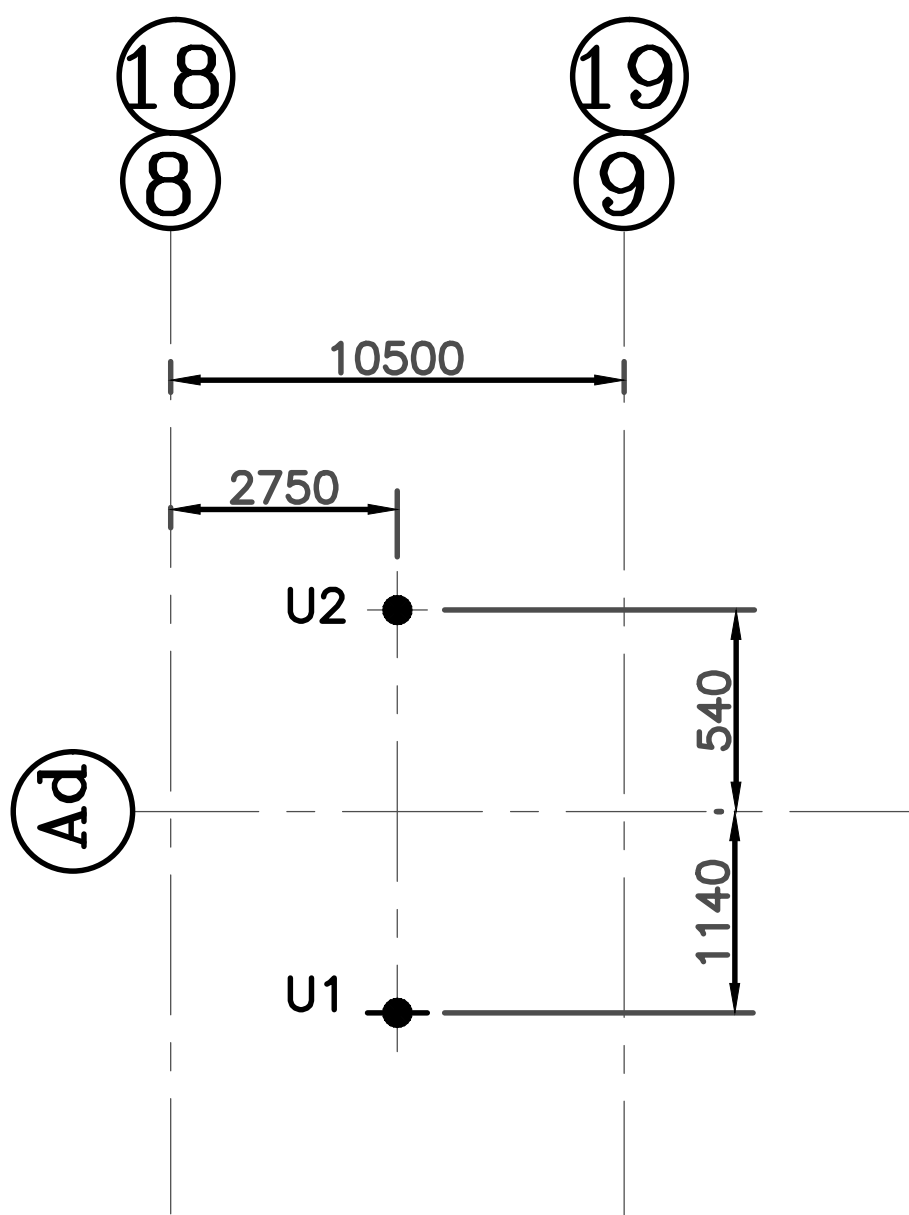
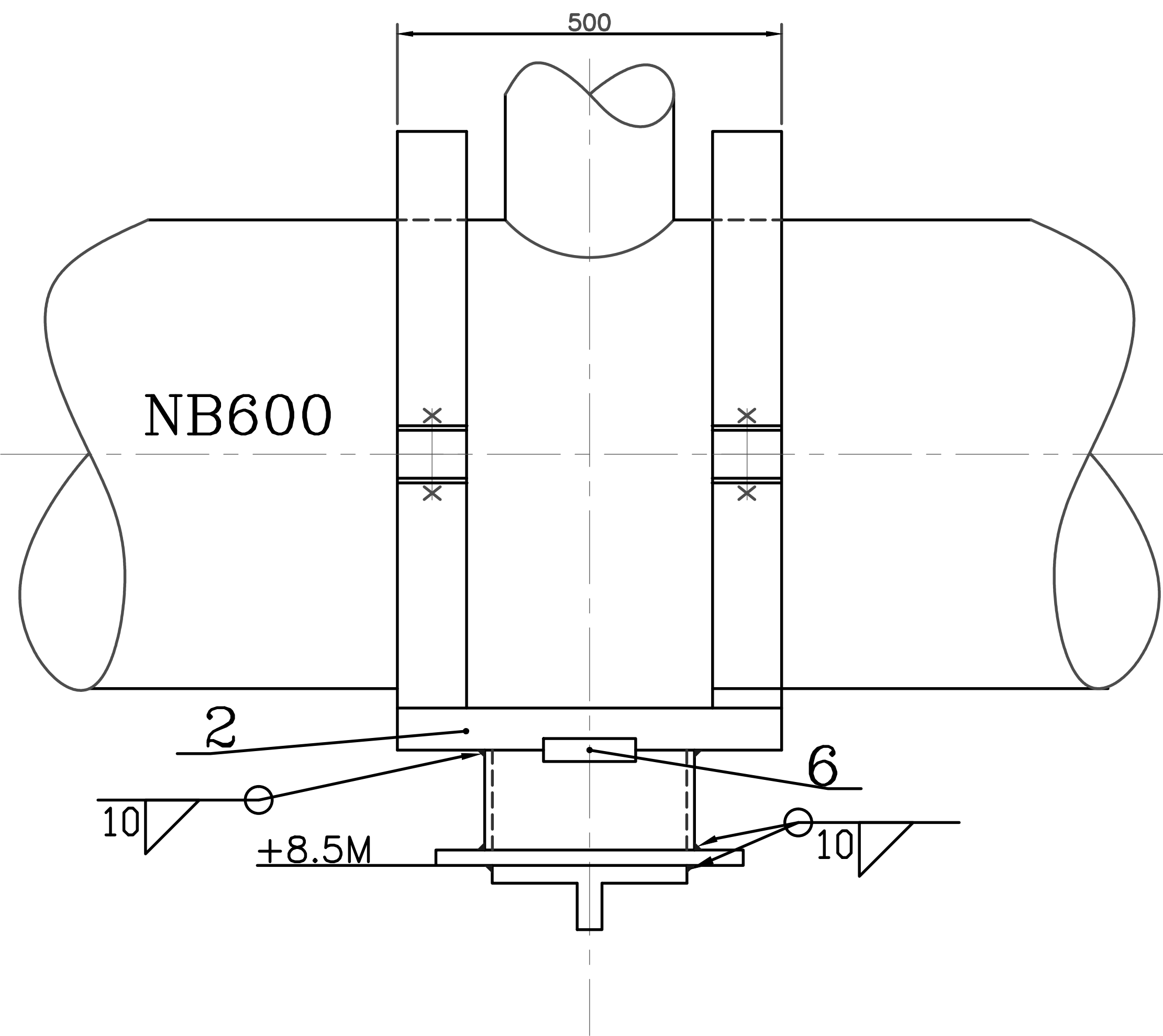
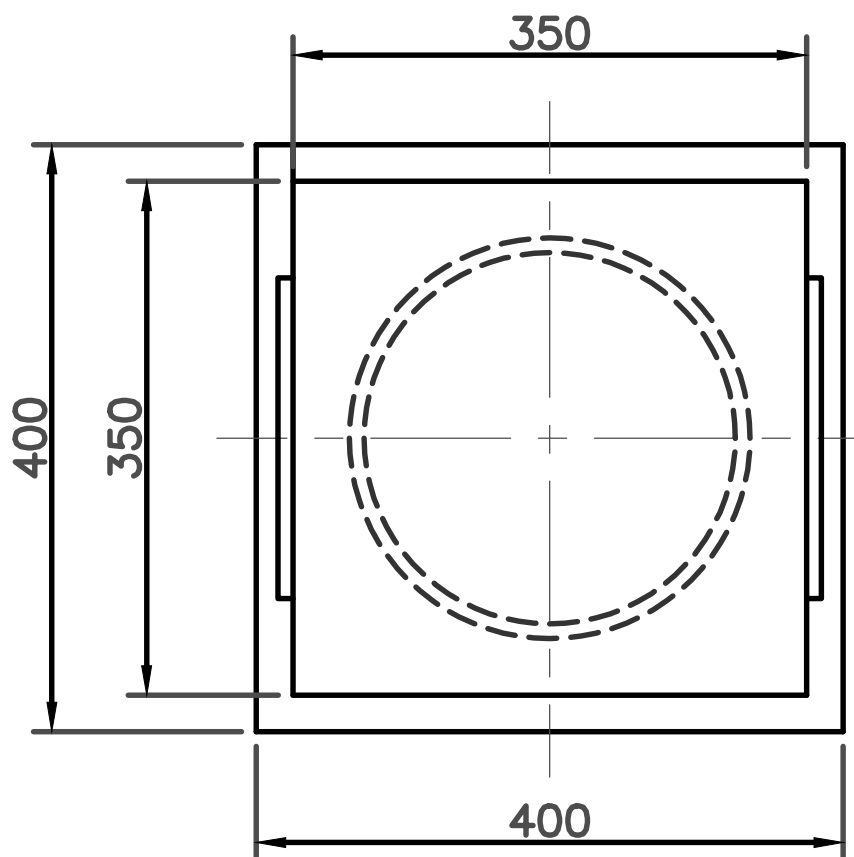
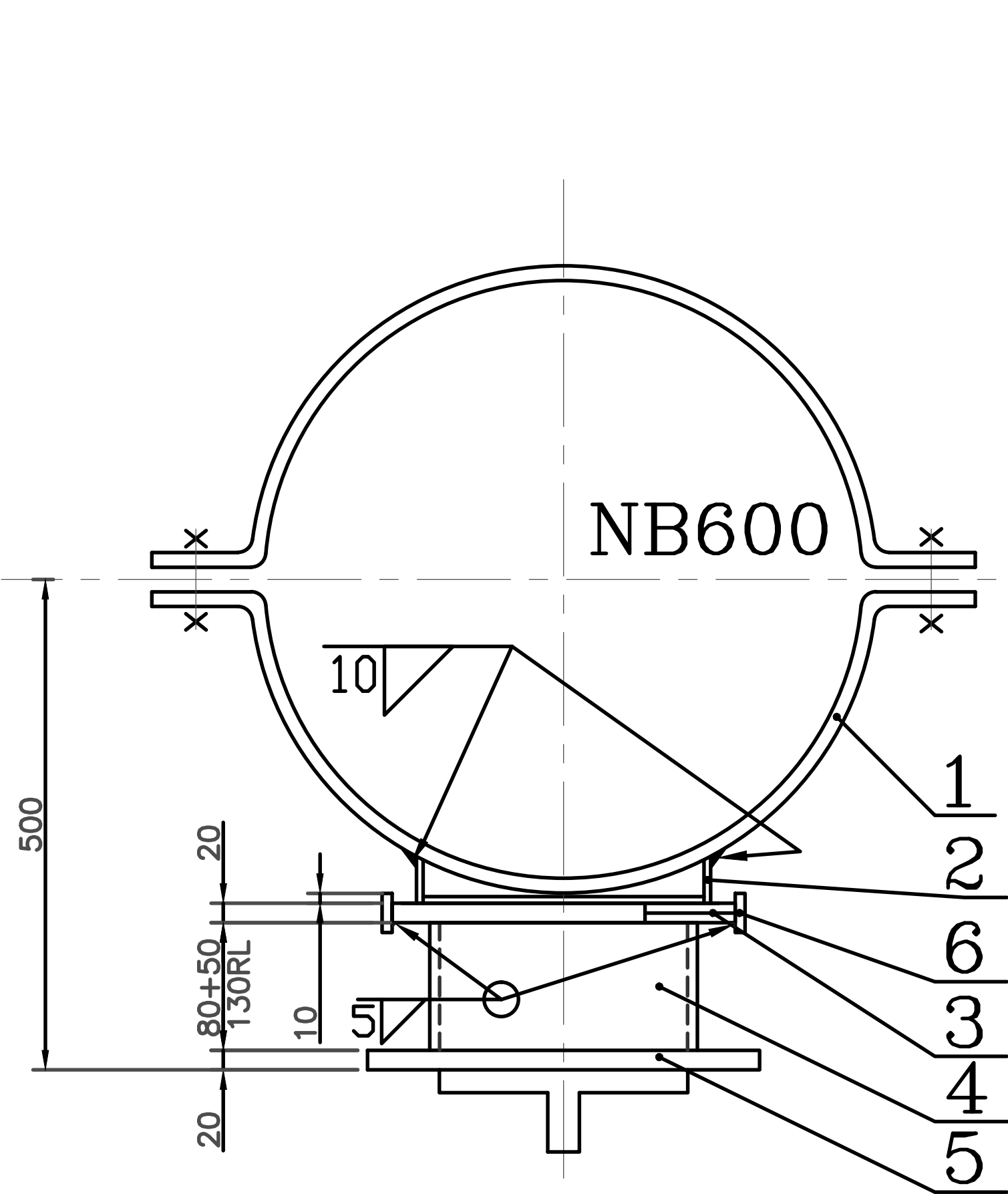
TYPE OF PRODUCT  
OR  
NAME OF CUSTOMER/ PROJECT

DEPT. EME	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
CODE 4133	N.T.S	SEE TABLE	0-150-00-01125		
TITLE			DRAWING NO.		
PIPE CLAMP			2-150-00-01024		
			SHEET NO. 01		
			NO.OF SHEETS 01		

SIZE A2



DRAWING NO. 2-150-00-01041



TECHNICAL REQUIREMENTS

1. ALL THE WELD JOINT TO BE AS PER HW 0620.599.
2. QUALITY OF WELD SEAM TO BE AS PER 0620.099 BS/BK.
3. TEST SCOPE AS PER HW 0850.199 EXAMINATION GR.4.
4. IDENTIFICATION AS PER HW 0400.397.
5. ITEMS AS PER BILL OF MATERIAL ARE TO BE SUPPLIED LOOSE ALL ASSEMBLY & WELDING WORK TO BE DONE AT SITE.
6. DESIGN OF THE SUPPORT IS FOR THE GUIDANCE OF SITE. MODIFICATIONS CAN BE DONE TO SUIT SITE CONVENIENCE.

001		006	FLAT40X10, L=1350	-		AA1010308580	IS2062E250BR	4	240
002		005	PLATE 400X400X20	-		AA1011808137	IS2062E250BR	25	120
001		004	PIPE Ø273X10,L=300	-		AA1041155409	IS2062E250BR	19	470
004		003	PLATE 350X350X20	-		AA1011808137	IS2062E250BR	19	200
001		002	CHANNEL ISMC 300X90,L=1000	-		AA1012708179	IS2062E250BR	36	300
004	VAR	001	PIPE CLAMP NB600	2-150-00-01026	13	W96415001914		26	000
VAR		PURCHASED	ITEM NO.	DESCRIPTION	DRAWING	VAR	MATERIAL CODE	A	UNIT WEIGHT
							MATERIAL SPEC.	C	

TYPE OF PRODUCT NATIONAL THERMAL POWER LTD VINDHYACHAL  
OR SUPER THERMAL POWER PROJECT  
NAME OF CUSTOMER/ PROJECT STAGE -II (2X500MW)-UNIT-7&8

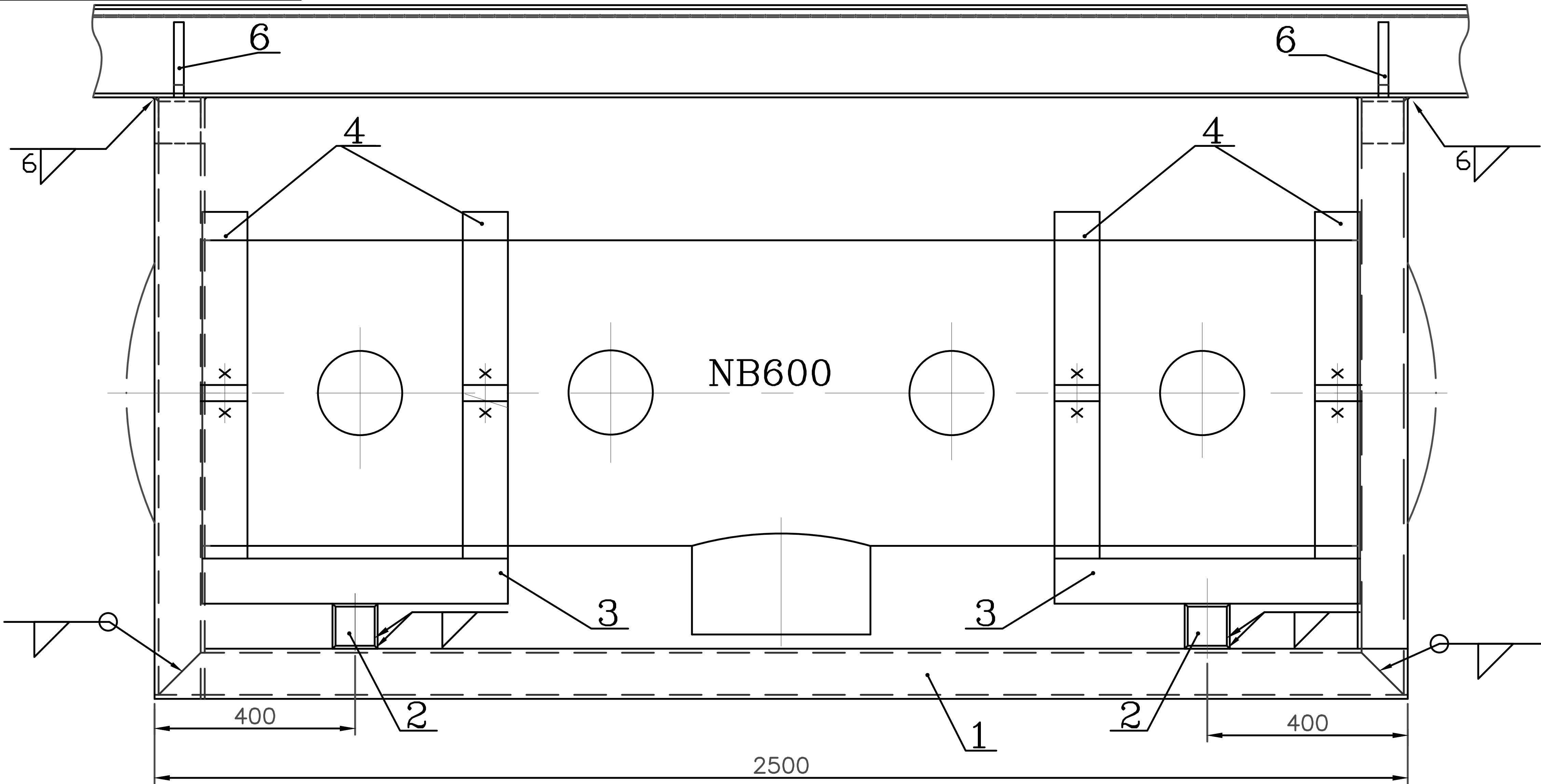
DRN	NAME	SIGN	DATE	NO.OF VAR.
CHD	K.R.G	sd/-	19.1.97	
APD	G.GUPTA	sd/-	05.2.97	73, 74

DEPT. EME	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
CODE 4133	1:10	321.950	0-150-00-01212	051	75, 77

TITLE	DRAWING NO.	SHEET NO. 01	NO.OF SHEETS 01
SUPPORT U1, U2	2-150-00-01041		

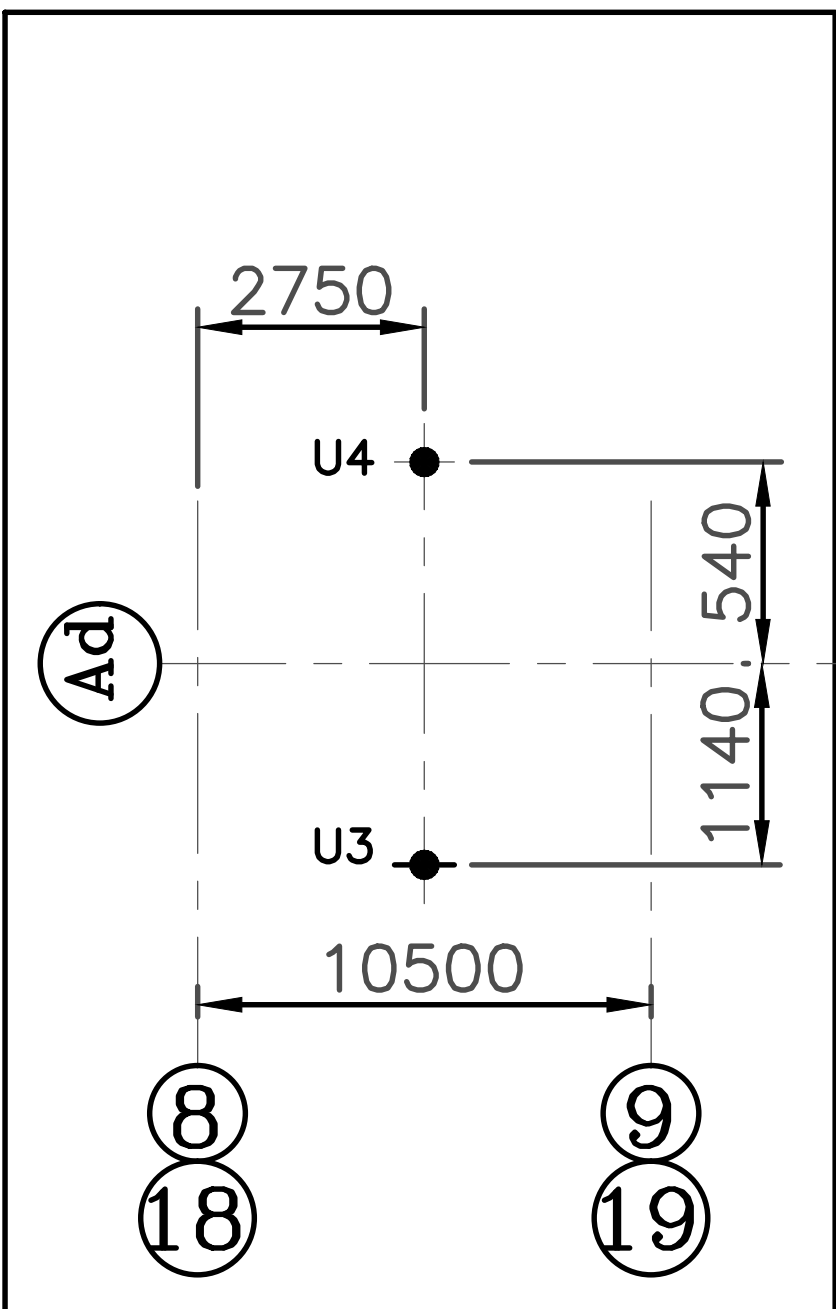
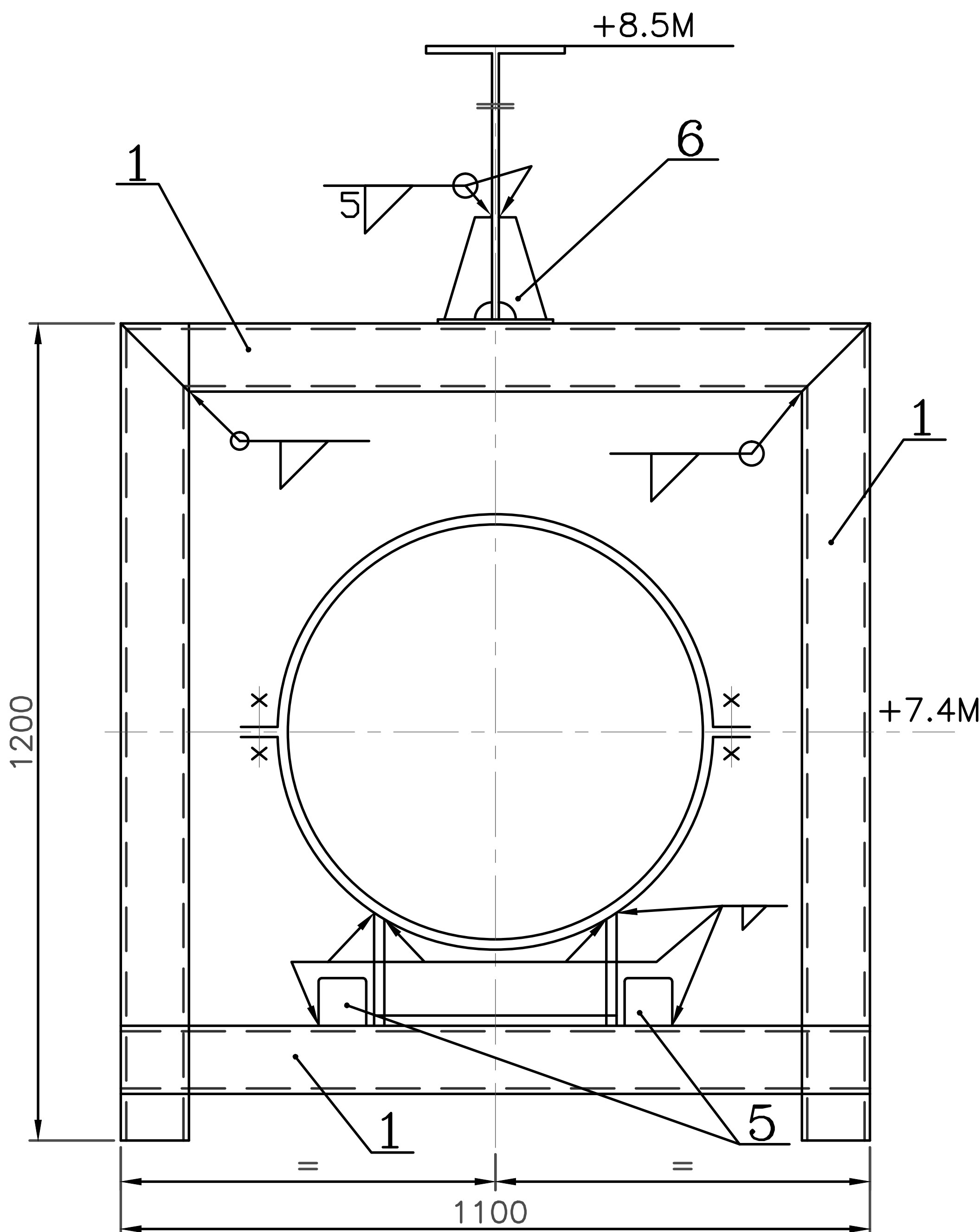


2-150-00-01042  
DRAWING NO.



TECHNICAL REQUIREMENTS

1. ALL THE BUTT JOINT TO BE AS PER HW 0620.599.
2. QUALITY OF WELD SEAM TO BE AS PER 0620.099 BS/BK.
3. TEST SCOPE AS PER HW 0850.199 EXAMINATION GR.4.
4. IDENTIFICATION AS PER HW 0400.397.
5. ITEMS AS PER BILL OF MATERIAL ARE TO BE SUPPLIED LOOSE ALL ASSEMBLY & WELDING WORK TO BE DONE AT SITE.
6. DESIGN OF THE SUPPORT IS FOR THE GUIDANCE OF SITE. MODIFICATIONS CAN BE DONE TO SUIT SITE CONVENIENCE.



004	BOR01500001205	006	RIB	4-150-00-01175		AA1011808137	1	100
	MS					IS2062E250BR		
004		005	PLATE 70X70X20	-		AA1011808137	0	770
						IS2062E250BR		
004	BOR01500001125	004	PIPE CLAMP NB600	2-150-00-01026		W96415001914	26	000
	MS				13			
001		003	CHANNEL ISMC 300X90,L=1000	-		AA1012708179	36	300
						IS2062E250BR		
004		002	PLATE 90X90X6	-		AA1011808030	0	380
						IS2062E250BR		
001		001	ANGLE 100X100X8 L=15000	-		AA1012508226	181	500
						IS2062E250BR		
VAR	PURCHASED	ITEM NO.	DESCRIPTION	DRAWING	IS	MATERIAL CODE	UNIT	WEIGHT
						MATERIAL SPEC.		

TYPE OF PRODUCT NATIONAL THERMAL POWER LTD VINDHYACHAL  
OR SUPER THERMAL POWER PROJECT  
NAME OF CUSTOMER/ PROJECT STAGE -II (2X500MW)-UNIT-7&8

DRN	NAME	SIGN	DATE	NO.OF VAR.
CHD	K.R.G	sd/-	19.1.97	
APD	G.GUPTA	sd/-	05.2.97	73, 74

DEPT. EME	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
CODE 4133	1:10	330.800	0-150-00-01212	052	75, 77

TITLE	DRAWING NO.	SHEET NO. 01	NO.OF SHEETS 01
SUPPORT U3 U4	2-150-00-01042		

GRADE OF UNTOL. DIM.:--  
M/CG- X/C/M/F AA 0230208  
WELDING-X/B/C/D-AA621104  
GAS CUTTING-T3'AA0621101

REV.	DATE	ALTERED	CHECKED
01	04.06.18		MA

CBOM NO.	STATUS OF DRG.
0-150-00-01212	
AGREED DEPT.	NAME SIGN DATE

REV.	DATE	ALTERED	KM
01	04.06.18		MA

REVISION	MARKED

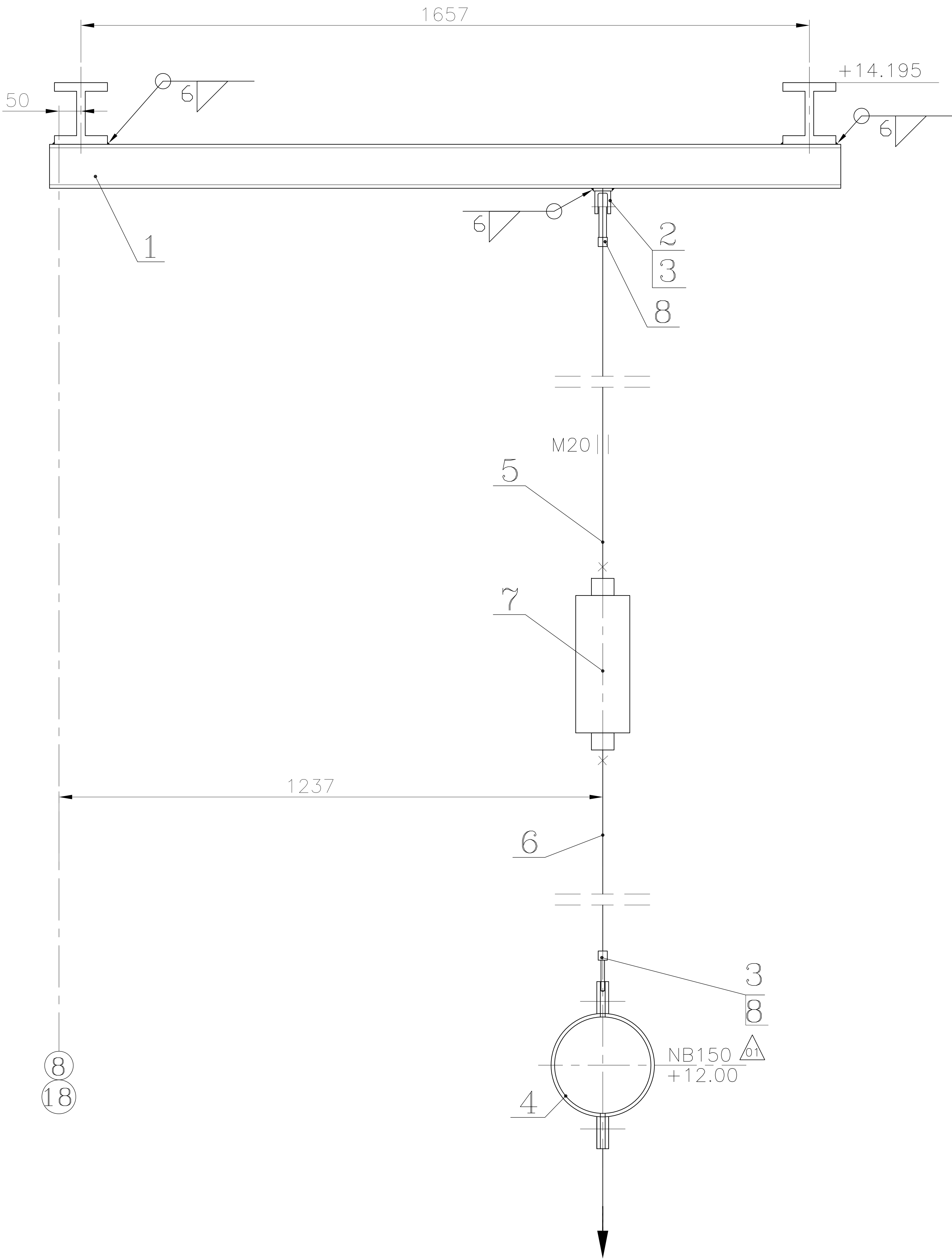
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10/2/97  
SIGN & DATE

E11-19254  
INVENTORY NO.



DRAWING NO. 2-150-00-01043



TECHNICAL REQUIREMENTS

1. ALL THE BUTT JOINTS TO BE AS PER HW 0620.599.
2. QUALITY OF WELD SEAM TO BE AS PER 0620.099 BS/BK.
3. TEST SCOPE AS PER HW 0850.199 EXAMINATION GR.4.
4. IDENTIFICATION AS PER HW 0400.397.
5. ITEMS AS PER BILL OF MATERIAL ARE TO BE SUPPLIED LOOSE
6. DESIGN OF HANGER ASSEMBLY IS FOR THE GUIDANCE OF SITE MODIFICATIONS CAN BE DONE TO SUIT SITE CONVENIENCE.

002	BOR.01500001205 GMS	008	TURN BUCKLE M20	4-150-00-01103	3	04	W96415001434			0.800
001		007	SPRING HANGER	4-150-00-01199	3		W96415002341			12.800
001	BOR.01500001205 GMS	006	TIE ROD M20X2000	4-150-00-01176	3		W96415002325			5.600
001	BOR.01500001125 GMS	005	THREADED ROD M20X1.5	4-150-00-01131	3	02	W96415001973			2.080
001	BOR.01500001125 GMS	004	PIPE CLAMP NB150	2-150-00-01026	3	10	W96415001892			2.400
002	BOR.01500001151 GMS	003	EYE BOLT M20	4-150-00-01099	3	04	W97415000099			0.300
001	BOR.01500001151 GMS	002	BEAM ATTACHMENT M20	4-150-00-01101	3	04	W96415001469			1.800
001		001	PARALLEL BEAM IPB100,L=1800	-	3		HW1013360897 AA10108			36.720
VAR	PURCHASED	ITEM NO.	DECRPTION	DRAWING	3	05	VAR	MATERIAL CODE A	MATERIAL SPEC. C	UNIT WEIGHT

TYPE OF PRODUCT NATIONAL THERMAL POWER LTD VINDHYACHAL  
OR SUPER THERMAL POWER PROJECT  
NAME OF CUSTOMER/ PROJECT STAGE -II (2X500MW)-UNIT-7&8

DEPT. EME		SCALE 1:10	WEIGHT(Kg.) 64.160	NAME	SIGN	DATE	NO.OF VAR.
				DRN AEDD	sd/-	19.1.97	
				CHD K.R.G	sd/-	19.1.97	
CODE 4133				APD G.GUPTA	sd/-	05.2.97	73, 74
TITLE HANGER ASSEMBLY F-5				REF. TO ASSY. DRG. 0-150-00-01212		ITEM NO.	NO.OF ITEMS
				DRAWING NO. 2-150-00-01043		054	008
				SHEET NO. 01		NO.OF SHEETS 01	

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REF. DRG NO.

10/2/97  
SIGN & DATE

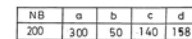
Et1-19255  
INVENTORY NO.

GRADE OF UNTOL. DIM.:-			
M/CG- X/C/M/F AA 0230208			
WELDING-A/B/C/D-AA621104			
GAS CUTTING-T3'AA0621101			
REV.	DATE	ALTERED	
		CHECKED	
REVISION MARKED			

CBOM NO. 0-150-00-01212			STATUS OF DRG.
AGREED DEPT.	NAME	SIGN	DATE

REV.	DATE	ALTERED KM
01	04.06.18	CHECKED MA

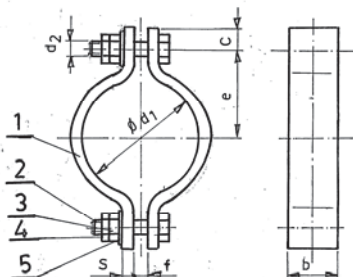




GRADE OF UNTOL. DIM. ....		SIGNATURE		DATE		NAME OF		STAGE-II (2X 500 MW) UNIT-748	
M/CG-C/M/F AA 0320208								NAME	
WELDING : M/C/F AA021104								SIGNATURE	
GAS CUTTING : M/C/A 021101								DATE	
REV DATE : 11/05/2008								NO OF SHEETS	
REVISION : CHECKED								NO OF SHEETS	
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13	600	609.6	90	45	375	25	15	M 30 X 120	26-00	W9615001914
12	300	323.9	60	30	205	14	8	M 20 X 75	5.04	W9615001906
11	200	219.1	50	24	145	11	8	M16 X 65	2.96	W 96415001892
10	150	168.3	50	24	120	11	8	M16 X 65	2.40	W96415001884
09	125	139.7	50	24	105	11	8	M 16 X 65	2.15	W96415001876
08	100	114.3	50	24	90	11	8	M 16 X 65	1.95	W96415001868
07	80	88.9	40	18	70	9	6	M12 X 50	0.88	W96415001850
06	65	76.1	40	18	60	9	6	M12 X 50	0.79	W96415001841
05	50	60.3	40	18	55	9	6	M12 X 50	0.71	W96415001833
04	40	48.3	30	15	45	7	5	M10 X 40	0.31	W96415001825
03	32	42.4	30	15	41	7	5	M10 X 40	0.28	W96415001817
02	25	33.7	30	15	36	7	5	M10 X 40	0.25	W96415001809
01	20	26.9	30	15	33	7	5	M10 X 40	0.23	W96415001795
00	15	21.3	30	15	30	7	5	M10 X 40	0.21	W96415001787
VAR00	NB	d <sub>1</sub>	b	c	e	f	s	d <sub>2</sub>	WT. IN Kgs.	MATERIAL CODE

1. PIPE CLAMPS SHALL BE SUPPLIED IN ASSEMBLED CONDITION.
2. IDENTIFICATION SHALL BE DONE BY ATTACHING A TAG.
3. MATERIAL CODE REFER VARIAT TABLE.
4. FOR MATERIAL CODE REFER VARIANT TABLE.

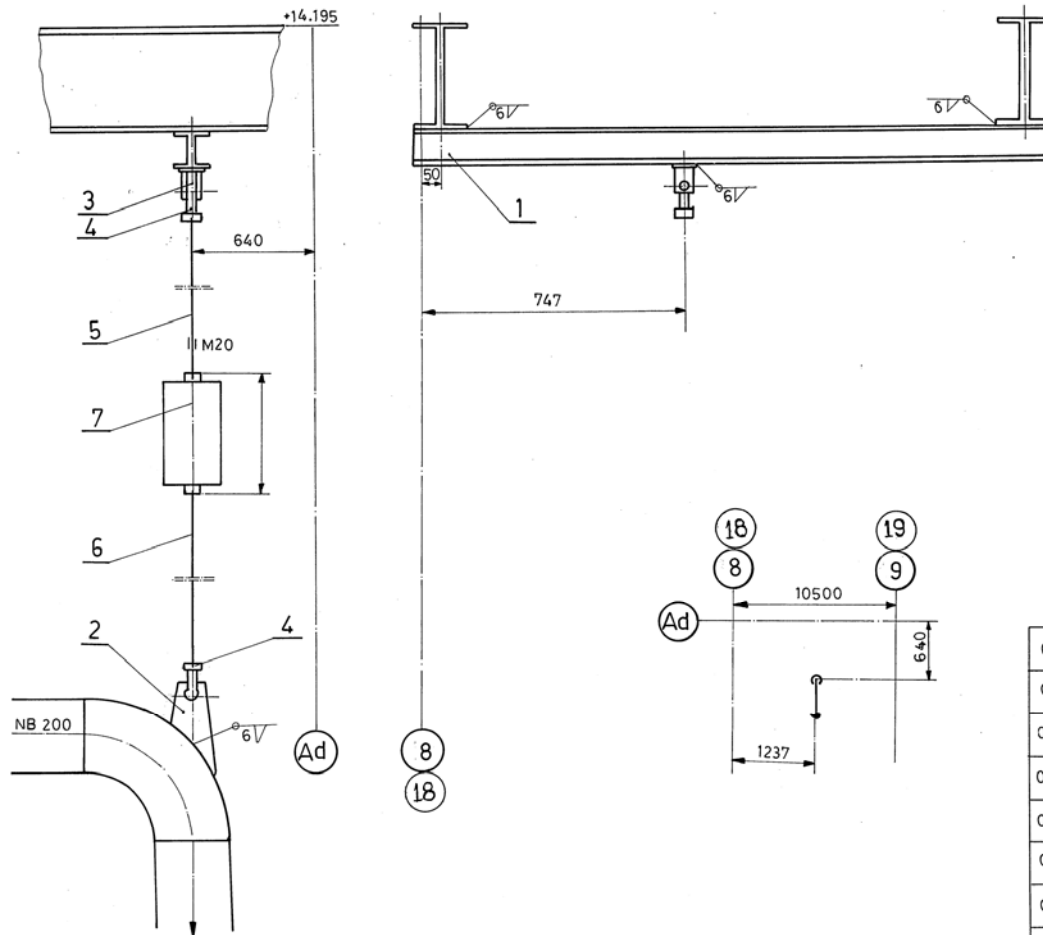
0 0 2		0 0 5	WASHER	—		CS-IS2062E250BR			—	
0 0 2		0 0 4	LOCK NUT	—		STEEL A8.8			—	
0 0 2		0 0 3	NUT	—		STEEL A8.8			—	
0 0 2		0 0 2	BLOT HEX.	—		STEEL A8.8			—	
0 0 2		0 0 1	CLAMP	—		CS-IS2062E250BR			—	
VAR 00	REMARKS	ITEM No.	DESCRIPTION	S/D	DRAWING No.	MATERIAL CODE	UNIT	UNIT WEIGHT	GS	ZONE
59	64 65	75 25 27 29	28	58 59 60	77	32 33 34	54	55	66	71 72
CARD TYPE-3				CARD TYPE-1		CARD TYPE-2				

GMS No. / GR-SP- No. 0150 0001125				STATUS OF DRG. U		CARD TYPE-1													
AGREED DEPT		NAME		SIGN		DATE		TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT											
GTY		SC GUVAL		SS-3		23/9/92													
						BHARAT HEAVY ELECTRICALS LTD.				NAME KAPoor		SIGN <i>[Signature]</i>		DATE		No. of V.			
						HARDWAR				CHD		K.R.G		<i>[Signature]</i>		13192		73	
										APPD		G.M.K		<i>[Signature]</i>		10/9/92		73	
REV		DATE		ALTERED		DEPT				SCALE N.T.S		WEIGHT (KG)		REF. TO ASSY. DRG. 0-150-00-0125				ITEM No. 75	
				TGE															
				CHECKED		CODE 4033													
ZONE						TITLE :		PIPE CLAMP				CARD CODE		DRAWING No. 2-150-00-01026				RE	
4														1 3 122:23					
														SHEET No. 01		NO. OF SHEETS 01			



27010-00-051-2  
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INVENTORY NO. SIGN &amp; DATE REF. DRG. NO.



## TECHNICAL REQUIREMENTS :-

1. ALL THE BUTT JOINTS TO BE AS PER HW 0620.599.
2. QUALITY OF WELD SEAM TO BE AS PER HW 0620.099 BS/BK
3. TEST SCOPE AS PER HW 0850.199 EXAMINATION GR.4
4. IDENTIFICATION AS PER HW 0400.397.
5. ITEMS AS PER BILL OF MATERIAL ARE SUPPLIED LOOSE ALL ASSEMBLY & WELDING WORK TO BE DONE AT SITE.
6. DESIGN OF HANGER ASSEMBLY IS FOR THE GUIDANCE OF SITE MODIFICATIONS CAN BE DONE TO SUIT SITE CONVENIENCE.



001		007	SPRING HANGER	3	41500001199	W96415002341	NO	12	800	
001	BORROWED 01500001205 GMS	006	TIE ROD M20X2000	3	4-150-00-01176	W96415002325	NO	5	600	
001	BORROWED 01500001125 GMS	005	THREADED ROD M20X1.5	3	4-150-00-01131	W96415001973	NO	2	080	
001	- DO -	004	EYE BOLT M20	3	4-150-00-01099	W97475000099	NO	0	300	
002	BORROWED 01500001151 GMS	003	BEAM ATTACHMENT M20	3	4-150-00-01101	W96415001469	NO	1	800	
001	BORROWED 01500001205 GMS	002	PLATE		4-150-00-01177	AA1011808137 AA10108	NO	1	500	
001		001	PARALLEL BEAM IPB 100, L=1800			HW1013608917 AA10108	NO	36	700	
VAR.00	REMARKS	ITEM NO.	DESCRIPTION	STATUS	DRAWING NO.	MATERIAL CODE	UNIT WEIGHT	NO. OF	CONC.	
59	64	65	75	25	27	29	31	33	35	
58	59	60	77	79	81	83	85	87	89	
CARD TYPE - 3 → 28			28 → CARD TYPE - 1			28 → CARD TYPE - 2				
GMS NO. / GR. SP. NO. 0-150-00-01212			STATUS OF DRG.			TYPE OF PRODUCT NATIONAL THERMAL POWER CORPORATION LTD. OR VINDHYACHAL SUPER THERMAL POWER PROJECT NAME OF CUSTOMER / PROJECT STAGE - II ( 2 X 500 MW ) - UNIT 5 - 748				
AGREED DEPT			NAME			SIGN			DATE	
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NAME			SIGN			DATE			NO. OF VAR.	
SIGN			DATE			NAME			SIGN	
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NAME			SIGN			DATE			NO. OF VAR.	
SIGN			DATE			NAME			SIGN	
DATE			NAME			SIGN			DATE	
NAME			SIGN			DATE			NO. OF VAR.	
SIGN			DATE			NAME			SIGN	
DATE			NAME			SIGN</				



**DRAWING NO.**

1. ALL THE BUTT JOINTS TO BE AS PER HW 0620.599.
2. QUALITY OF WELD SEAM TO BE AS PER HW 0620.099 BS/BK
3. TEST SCOPE AS PER HW 0850.199 EXAMINATION GR 4.
4. IDENTIFICATION AS PER HW 0400.397.
5. ITEMS AS PER BILL OF MATERIAL ARE SUPPLIED LOOSE ALL ASSEMBLY & WELDING WORK TO BE DONE AT SITE.
6. DESIGN OF HANGER ASSEMBLY IS FOR THE GUIDANCE OF SITE. MODIFICATIONS CAN BE DONE TO SUIT SITE CONVENIENCE.

001		006	SPRING HANGER	3	41500001199		W96415002341	NC	12 800		C
	BORROWED 01500001205 GMS	005	THREADED ROD M 20X2000	3	4-150-00-01178		W96415002333	NC	4 160		
001	BORROWED 01500001125 GMS	004	PIPE CLAMP NB 200	3	2-150-00-01026	11	W96415001892	NC	2 960		
002	BORROWED 01500001151 GMS	003	EYE BOLT M20	3	4-150-00-01099	04	W97415000099	NC	0 300		
001	BORROWED 01500001151 GMS	002	BEAM ATTACHMENT M20	3	4-150-00-01101	04	W96415001469	NC	1 800		
001		001	PARALLEL BEAM IPB 100, L=1800		-		HV1013608917 AA1Q108	NO	36 720		B
VAR.00	REMARKS	ITEM NO.	DESCRIPTION	DWG NO.	DRAWING NO.	MATERIAL SPECN.	A UNIT WEIGHT	GMS	ZONE.		
59	64	65	75	25	27	29	31	32	33	34	35
CARD TYPE - 3 → 28			28 → CARD TYPE - 1			28 → CARD TYPE - 2					

GMS NO. / GR. SP. NO. 0-150-00-01212				STATUS OF Dwg. 0	TYPE OF PRODUCT NATIONAL THERMAL POWER CORPORATION LTD. OR VINDHYACHAL SUPER THERMAL POWER PROJECT NAME OF CUSTOMER / PROJECT STAGE II ( 2 X 500 MW ) - UNITS - 748									
AGREED DEPT	NAME		SIGN	DATE	 BHARAT HEAVY ELECTRICALS LTD. HARDWAR				DRN	NAME		SIGN	DATE	NO. OF VAR.
									CHD	K.R. GUPTA		R.P. SINGH	13/17	
									APD	G. GUPTA		5/2/97	73/74	
REV.	DATE	ALTERED		DEPT. TGE		SCALE	WEIGHT (kg.)	REF. TO ASSY. DRG.				ITEM NO.	NO OF ITEM	
		CHECKED		CODE 4033		NTS	59.040	0-150-00-01212				056	006	
				TITLE				DRAWING NO.						
				HANGER ASSEMBLY F-7				2-150-00-01045						
								1 3 SHEET NO. 01				NO OF SHEET	22/23/24	

SIZE A 2

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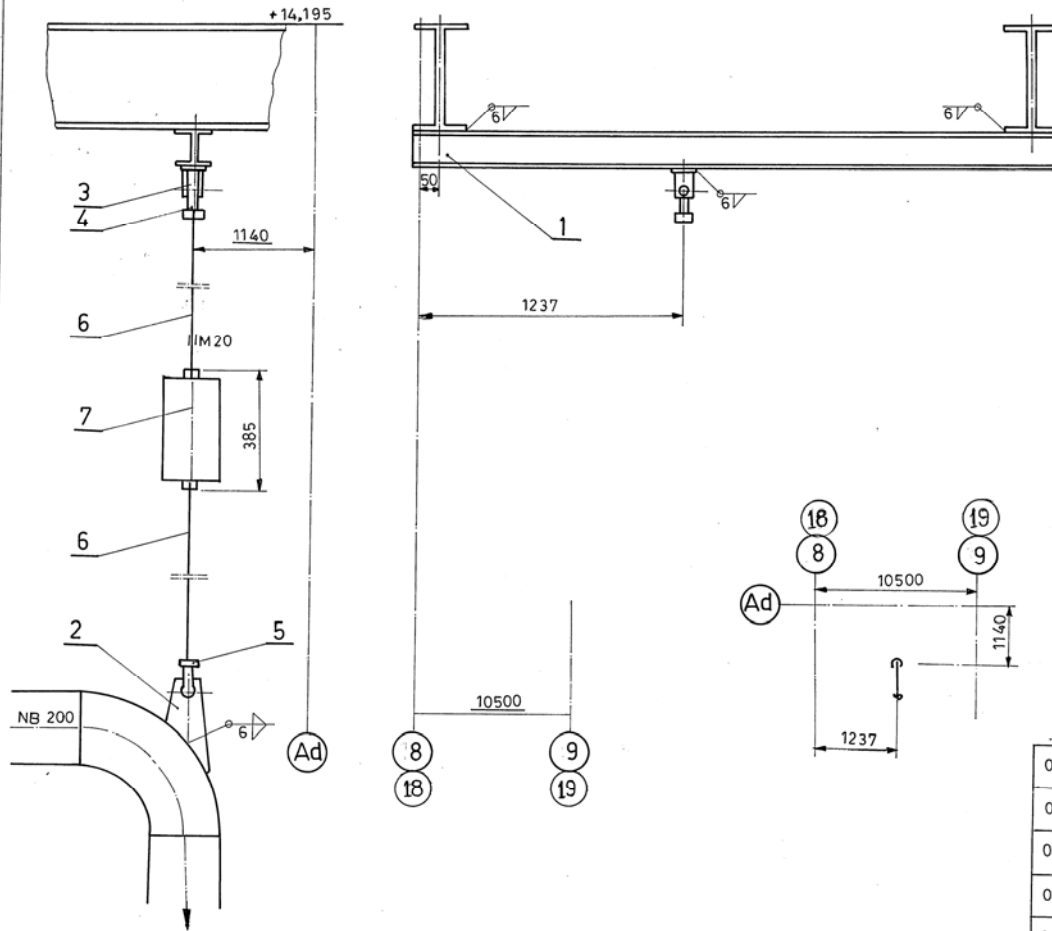
6-1-19253	16/4/52	
INVENTORY NO.	SIGN. & DATE	REF. DRG. NO.



97010-00-091-2

DRAWING NO.

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## TECHNICAL REQUIREMENTS :-

1. ALL THE BUTT JOINTS TO BE AS PER HW 0620.599.
2. QUALITY OF WELD SEAM TO BE AS PER HW 0620 099 BS/BK
3. TEST SCOPE AS PER HW 0850 199 EX GR.4
4. IDENTIFICATION AS PER HW 0400 397.
5. ITEMS AS PER BILL OF MATERIAL ARE SUPPLIED LOOSE ALL ASSEMBLY & WELDING WORK TO BE DONE AT SITE.
6. DESIGN OF HANGER ASSEMBLY IS FOR THE GUIDANCE OF SITE. MODIFICATIONS CAN BE DONE TO SUIT SITE CONVENIENCE.

001		006	SPRING HANGER	3	41500001199	W96415002341	NO	12	800	
001	BORROWED 01500001205	005	THREADED ROD M 20x 200	3	4-150-00-01178	W96415002333	NO	4	160	
001	- 00 -	004	EYE BOLT M20	3	4-150-00-01099	W97415000099	NO	0	300	
002	BORROWED 01500001151 GMS	003	BEAM ATTACHMENT M20	3	4-150-00-01101	W96415001469	NO	1	800	
001		002	PLATE		4-150-00-01177	AA1011808137 AA10108	NO	1	500	
001		001	PARALLEL BEAM IPB 100, L= 1800			HW1013608977 AA10108	NO	36	720	
VAR.00	REMARKS	ITEM	DESCRIPTION	STD	DRAWING NO.	29,31	MATERIAL CODE	UNIT	WEIGHT	ZONE
59	64 65	75 25 27	29	58 59 60	77	VAR. 32,33 46	MATERIAL SPEC.	UNIT	WEIGHT	ZONE
CARD TYPE - 3 → 28					28 → CARD TYPE - 1					
GMS NO. / GR. SP. NO. 0-150-00-01212					STATUS OF DRG.					
AGREED DEPT					NAME SIGN DATE					

GRADE OF UNTOL. DIM. :-  
 M / CG / L / M / P AA 0230208  
 WELDING-A/B/C/D-AA 0621104  
 GAS CUTTING-T3-AA 0621101

REV. DATE ALTERED CHECKED

ZONE

TYPE OF PRODUCT NATIONAL THERMAL POWER CORPORATION LTD.  
 OR  
 VINDHYACHAL SUPER THERMAL POWER PROJECT  
 NAME OF CUSTOMER / PROJECT STAGE II ( 2X 500 MW )-UNITS-7 & 8

BHARAT HEAVY ELECTRICALS LTD.  
 HARDWAR

DEPT. TGE SCALE N.T.S. WEIGHT (kg.) 59.080 REF. TO ASSY. DRG. 0-150-00-01212

CODE 4033 TITLE HANGER ASSEMBLY F8

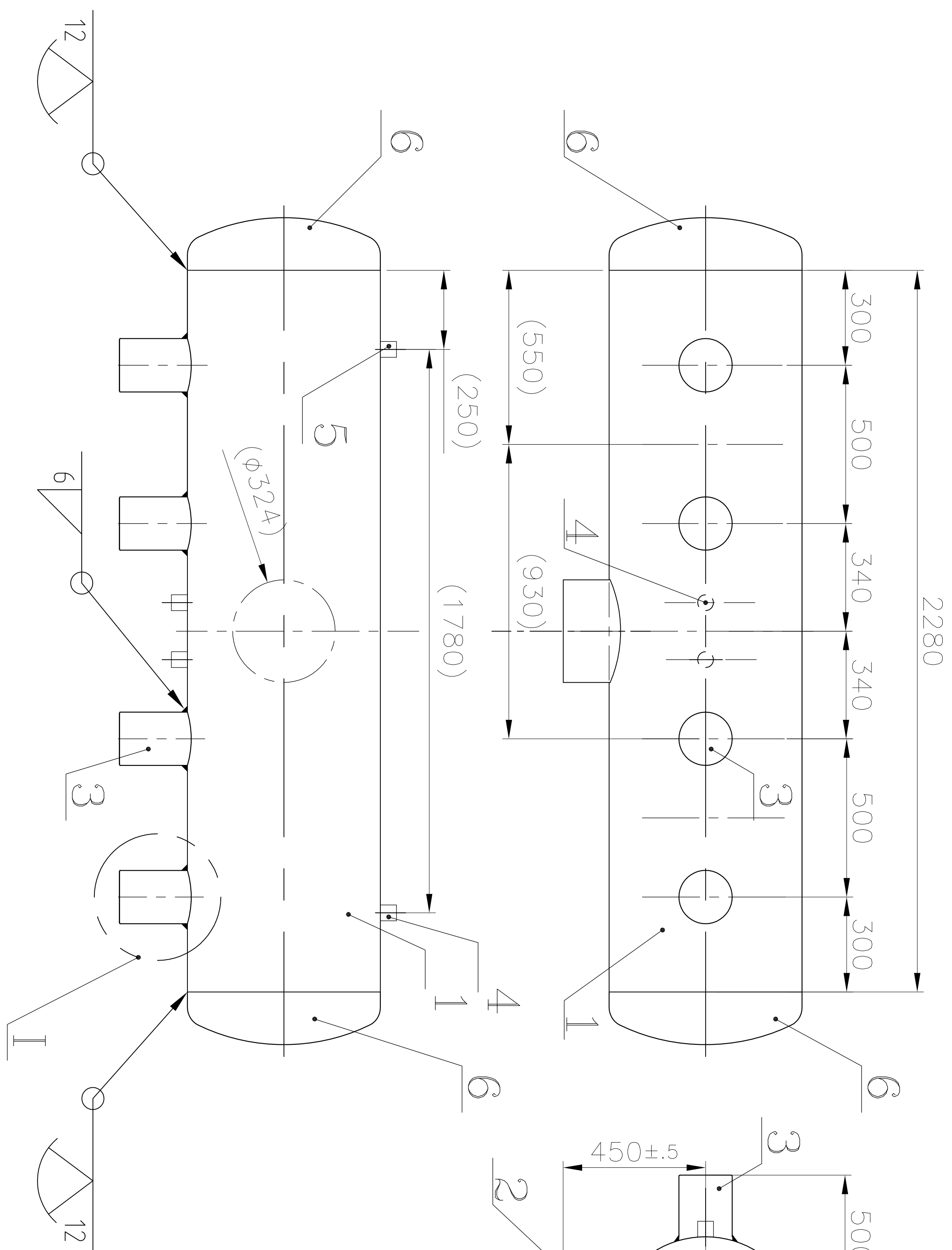
DRAWING NO. 2-150-00-01046

1 3 SHEET NO. NO. OF SHEET

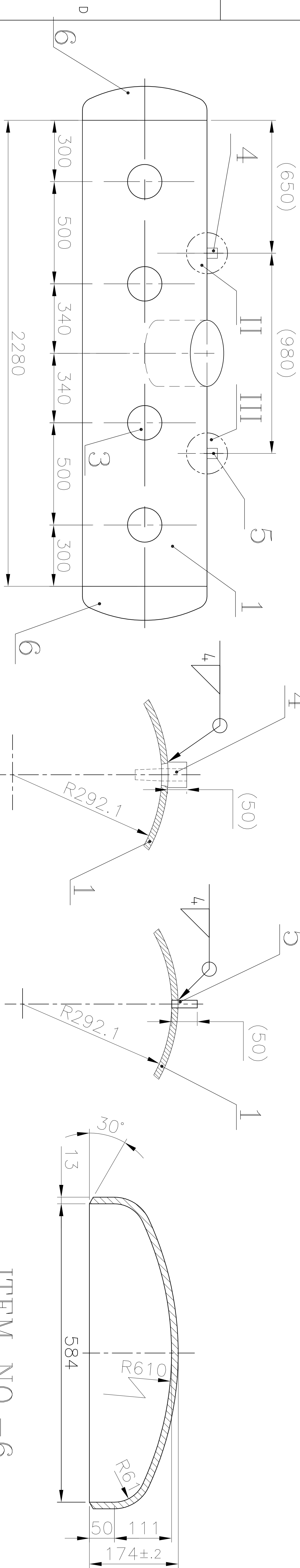


DRAWING NO. 21500001125

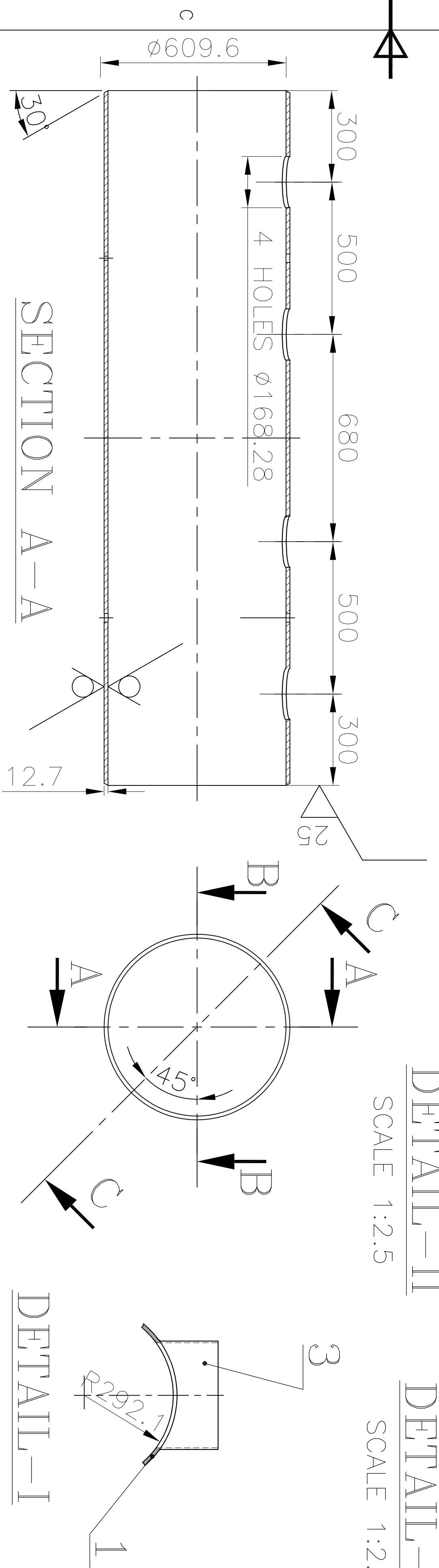
DRAWING NO.





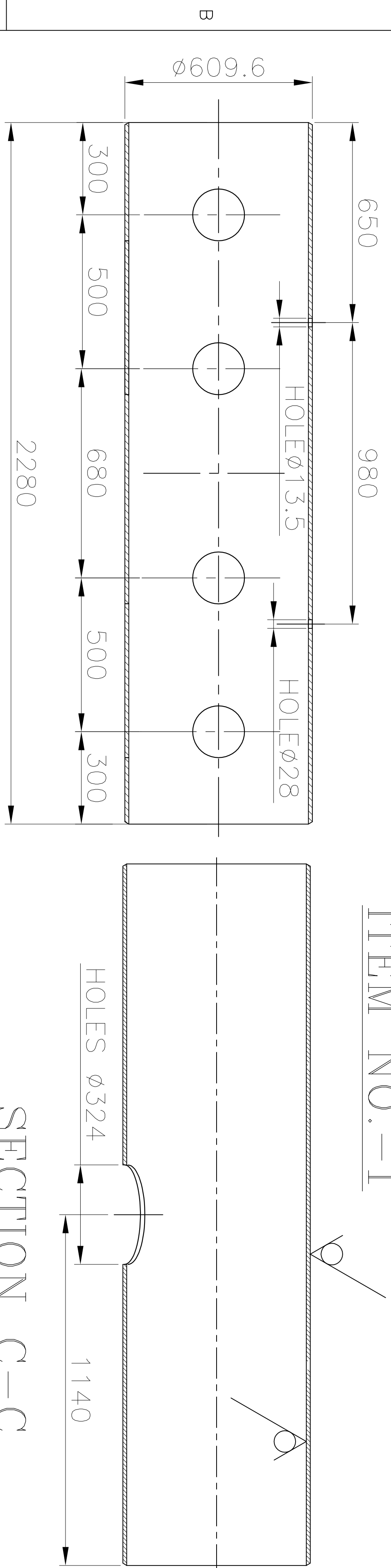


1. MATERIAL OF CONSTRUCTION IS AS PER TABLE-1
2. WELDING & EDGE PREPARATION AS PER HW 0620.599.
3. QUALITY OF WELD SEAM TO BE AS PER HW 0620.099. BS/BK.
4. DPT OF 100% WELD JOINTS & RT OF 10% BUTT JOINTS TO BE DONE AS PER HW050199.
5. IDENTIFICATION AS PER HW0400397.
6. DIMENSION WITH IN BRACKET ARE FOR REFERENCE ONLY.
7. DURING ASSY. OF ITEM 2 PROPER MATCHING TO BE DONE BY GAS CUTTING & GRINDING THE PROFILE.
8. EXT COATING OF RED OXIDE PRIMER TO BE DONE AS PER HW 0912.015.
9. ITEM NO. 6 TO BE NORMALISED IF NOT FORMED IN NORMALISING RANGE.
10. ITEM NO. 6 TO BE MANUFACTURED AS PER ASME SECTION-VIII DIV-1 REQUIREMENTS.
11. FOR ITEM NO. 6, MAXIMUM PERMISSIBLE THINNING IS 25% OF CAP THICKNESS.
12. DPT TO BE DONE ON KNUCKLE PORTION AND SF AFTER HEAT TREATMENT (BOTH INSIDE & OUTSIDE).
13. PHYSICAL TESTS ON TEST COUPONS TO BE CARRIED OUT AS PER UCS-85 OF ASME SECTION-VIII DIV-1. IMPACT TEST NOT REQUIRED.
14. ITEM NO. 6 TO BE CONSTRUCTED IN SINGLE PIECE. CENTRAL HOLE IF REQUIRED FROM MANUFACTURING POINT OF VIEW SHOULD BE PLUGGED & FULLY RADIOGRAPHED.
15. HYDRO TEST TO BE PERFORMED AT 15 KG/CM2 FOR 30 MIN. AND NO LEAKAGE ALLOWED.





ITEM NO.	ITEM DETAIL	UNIT WT.(KG)	QTY.	MOC
1	CYLINDER	390	1	ASME 106GrB
2	CONNECTION	14.2	1	ASME 106GrB
3	CONNECTION	6.08	4	ASME 106GrB
4	CONNECTION	0.08	1	ASME 106GrB
5	CONNECTION	0.5	1	ASTM A105
6	CAP	50	2	IS-2062 E250BR

ITEM NO.	ITEM DETAIL	UNIT WT. (KG)	QTY.	MOC
1	CYLINDER	390	1	ASME 106GrB
2	CONNECTION	14.2	1	ASME 106GrB
3	CONNECTION	6.08	4	ASME 106GrB
4	CONNECTION	0.08	1	ASME 106GrB
5	CONNECTION	0.5	1	ASTM A105
6	CAP	50	2	IS-2062 E250BR



---

## SECTION B-B

GRADE OF UNTOL. DIM.:-	CBOM NO.			STATUS OF DRG.	TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT  THDF 115/67
	AGREED DEPT.	NAME	SIGN	DATE	
M/CG- V/C/M/F AA 0230208					<div><div><div>भारत भारती</div><div></div></div><div><div>BHARAT HEAVY ELECTRICALS LTD.</div><div>HARDWAR</div></div></div>
WELDING-A/B/C/D-AA621104					
GAS CUTTING-T3'AA0621101					
<div><div><div>भारत भारती</div><div></div></div><div><div>BHARAT HEAVY ELECTRICALS LTD.</div><div>HARDWAR</div></div></div>					NAME
DRN	KUNAL MISHRA	sd/-	22.04.19	NO.OF VAR.	
CHD	MANJU AZAD	sd/-	22.04.19		
APD	R.L.VYAS	sd/-	22.04.19	75, 74	

REV	DATE	ALTERED	K-M	REV	DATE	ALTERED	K-M
04	30.07.18	CHECKED	MA	03	11.06.18	CHECKED	M
NOZZLE ORIENTATION				REVISION MARKED AS			
UPDATED AS PER LATEST				0.3			
PDMS MODEL							

INVENTORY NO.

SIGN &amp; DATE

REF. DRG NO.

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10

REV.	DATE	ALTERED	K/M	REV.	DATE	ALTERED	K/M	REV.	DATE	ALTERED	K/M
O4	30.07.18	CHECKED	M/A	O3	11.06.18	CHECKED	M/A	O2	12.01.16	CHECKED	R/LV
NOZZLE ORIENTATION UPDATED AS PER LATEST PDMS MODEL				REVISION MARKED AS $\Delta$ 3							

ITEM NO.-1

SECTION C-C

2	CON
3	CON
4	CON
5	CON
6	

Technical drawing of a circular structure with four holes. The drawing includes the following details:

- SECTION A-A:** A cross-section view showing the outer diameter  $\varnothing 609.6$  and the hole diameter  $\varnothing 168.28$ . The section is labeled "SECTION A-A" and shows a 30° angle and a 12.7 mm dimension.
- DETAIL-I:** A close-up view of the hole edge, showing a 45° angle and a 12.7 mm dimension. The detail is labeled "DETAIL-I".
- DETAIL-II:** A close-up view of the hole edge, showing a 45° angle and a 12.7 mm dimension. The detail is labeled "DETAIL-II".
- DETAIL-III:** A close-up view of the hole edge, showing a 45° angle and a 12.7 mm dimension. The detail is labeled "DETAIL-III".

Technical drawing of a vehicle chassis showing a top view and two side views.

**Top View:**

- Overall width: 2280
- Overall length: 2280
- Dimensions from left to right: 300, 500, 340, 340, 500, 300
- Dimensions from top to bottom: 300, 500, 340, 340, 500, 300
- Labels: 1 (Wheels), 2 (Front suspension), 3 (Rear suspension), 4 (Suspension points), 5 (Front suspension), 6 (Rear suspension)
- Section lines: I, II, III

**Side Views:**

- Height: 50
- Radius: R292.1
- Angle: 30°
- Dimension: 13
- Labels: 1 (Chassis), 2 (Front suspension), 3 (Rear suspension), 4 (Suspension points)

ITEM NO. —  
SCALE 1:2.5

5	9	7
---	---	---

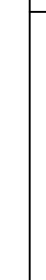
DRAWING NO. 21500001126

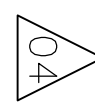
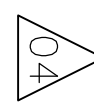
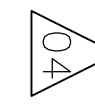
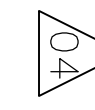
REV: O1	DATE 28.07.15	ALTERED	K/M
		CHECKED	RLV


NECTION	14.2	1
NECTION	6.08	4
NECTION	0.08	1
NECTION	0.5	1
CAP	50	2
CBOM NO.		STATUS OF DRG

SCALE 1:2.5			
SIZE OF SEAM	4"	6"	
3TH(M)	0.28	3.75	
SISTED METAL(Kg)	0.03	0.35	
ELECTRODE	E 7018/ER		

4	
---	--

DEPT. EME		SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO. OF ITEMS
CODE 4 1 3 3		1:20	536.0		75 77
TITLE			DRAWING NO.		
OUTLET HEADER			21500001126		
			R04 22 23 24		

ASME 106GrB	
ASME 106GrB	
ASME 106GrB	
ASTM A105	
IS-2062 E250BR	

INSIDE & OUTSIDE).	
13. PHYSICAL TESTS ON TEST COUPONS TO BE CARRIED OUT AS PER UCS-85 OF ASME SECTION-VIII DIV-1, IMPACT TEST NOT REQUIRED.	
14. ITEM NO. 6 TO BE CONSTRUCTED IN SINGLE PIECE. CENTRAL HOLE IF REQUIRED FROM MANUFACTURING POINT OF VIEW SHOULD BE PLUGGED & FULLY RADIOGRAPHED.	
15.  HYDRO TEST TO BE PERFORMED AT 15 KG/CM2 FOR 30 MIN. AND NO LEAKAGE ALLOWED.	
70SC	
Y.	MOC

**TECH. REQUIREMENTS:—**

1. MATERIAL OF CONSTRUCTION IS AS PER TABLE-1
2. WELDING & EDGE PREPARATION AS PER HW 0620.599.
3. QUALITY OF WELD SEAM TO BE AS PER HW 0620.099. BS/BK.  
DPT OF 100% WELD JOINTS & RT OF 10% BUTT JOINTS TO BE DONE AS PER  
HW0850199.
4. IDENTIFICATION AS PER HW0400397.
5. DIMENSION WITH IN BRACKET ARE FOR REFERENCE ONLY.
6. DURING ASSY. OF ITEM 2 PROPER MATCHING TO BE DONE BY GAS CUTTING &  
GRINDING THE PROFILE.
7. EXT COATING OF RED OXIDE PRIMER TO BE DONE AS PER HW 0912.015.
8. ITEM NO. 6 TO BE NORMALISED IF NOT FORMED IN NORMALISING RANGE.
9. ITEM NO. 6 TO BE MANUFACTURED AS PER ASME SECTION-VIII DIV-1
10. REQUIREMENTS.
11. FOR ITEM NO. 6, MAXIMUM PERMISSIBLE THINNING IS 25% OF CAP THICKNESS.

ITEM NO.-3  
1:2.5

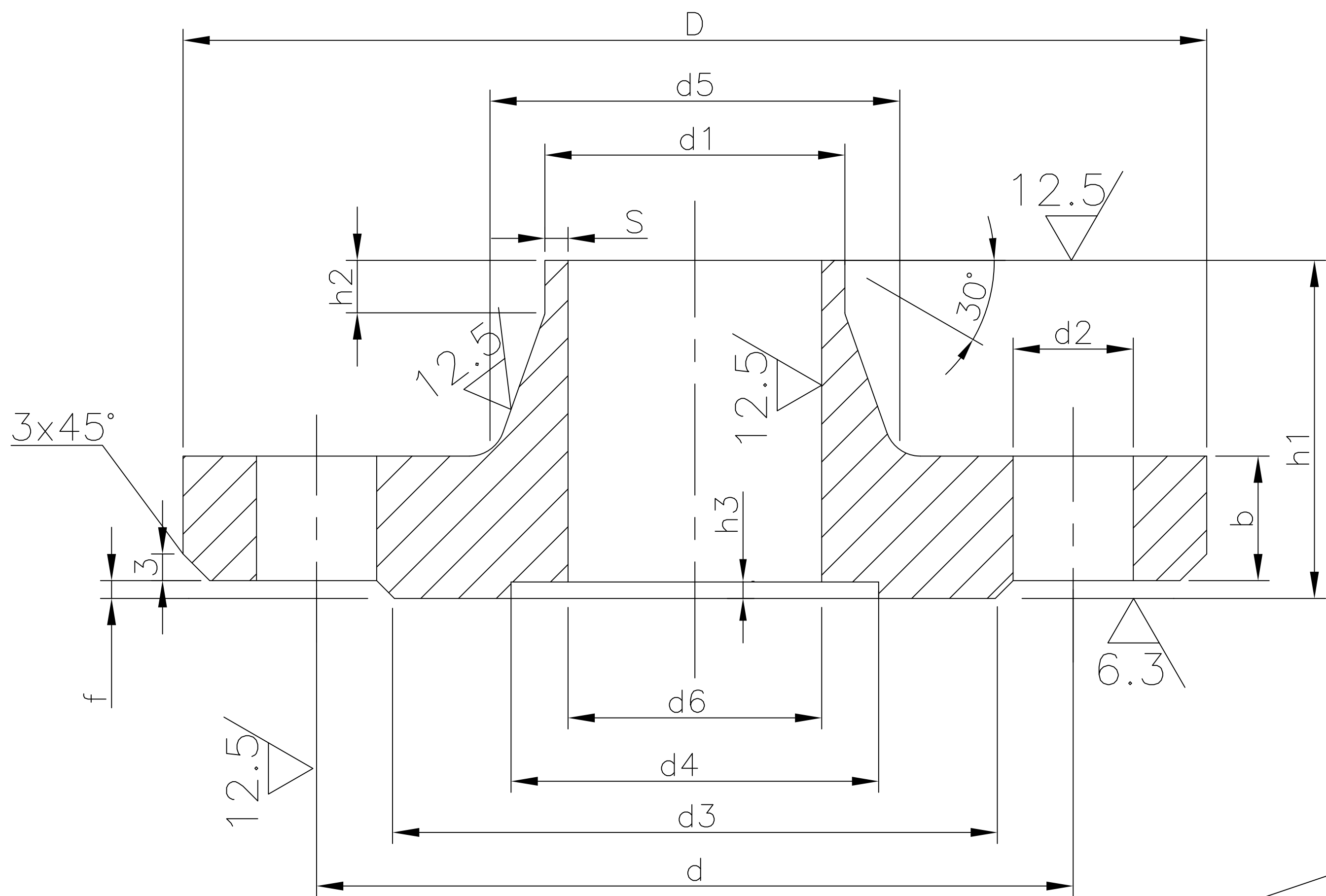
ITEM NO.-4  
SCALE 10:1

ITEM NO.-5  
SCALE 10:1

[illegible]



DRAWING NO. 3-149-07-01004



VAR	NB	D	d1	d	d2	d3	d4	d5	d6	h2	h1	h3	f	b	N HOLE	s
00	100	220	114.3	180	18	158	122.5	131	107.1	12	52	3.2	3	20	8	3.6
01	65	185	76.1	145	18	122	79.5	90	68.1	10	45	2.4	3	18	4	4.0
02	40	150	48.3	110	18	88	55.5	64	43.1	7	42	2.4	3	16	4	2.6

SERRATION ON FLANGE FACE – FLANGES SHALL HAVE A CONTINUOUS SPIRAL GROOVE PRODUCED BY A 1.5 MM RADIUS ROUND-NOSED TOOL AT A FEED OF APPROXIMATELY 0.8MM PER REVOLUTION.


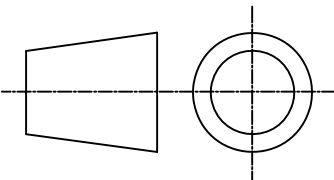
THIS DRAWING SUPERSEDES THE OLD DRAWING UNDER THE SAME NUMBER

		003	V FLANGENb=40	3-149-07-01005	02	MATERIAL AS PER BOM	CNO	1	840	
		002	V FLANGENb=65	3-149-07-01005	01		CNO	3	020	
		001	V FLANGENb=100	3-149-07-01004	00		CNO	4	580	
VAR.00	REMARKS	KYE NO.	DESCRIPTION			MATERIAL			UNIT WT.(kg.)	

CARD TYPE-3 28 CARD TYPE-1 28 CARD TYPE-2 28

KUN 673.42  
REF. DRG NO.  
SIGN & DATE  
INVENTORY NO.

CBOM NO. 0-149-07-01000				STATUS OF DRG.	
AGREED DEPT.	NAME	SIGN	DATE		
GRADE OF UNTOL. DIM.:-					
M/CG- X/C/M/F AA 0230208					
WELDING A/B/C/D AA621104					
GAS CUTTING-T3'AA0621101					
REV.	DATE	ALTERED CHECKED	REV.	DATE	ALTERED K.B.M. CHECKED K.N.
02	29.08.07				
DRAWING SUPERSEDES CHANGE ADVICE NO. TGE-07-F0179					

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT				TG-HW-500-2				
<div>BHARAT HEAVY ELECTRICALS LTD. HARDWAR</div>					NAME	SIGN	DATE	NO.OF VAR.
				DRN	BDS/KBM	sd/-	18.11.81	
				CHD	S.N./G.G	sd/-	13.05.82	
				APD	D.R.C./N.P.C	sd/-	22.07.82	
DEPT. EME		SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.		ITEM NO.	73   74	
CODE 4133		N.T.S	SEE TABLE	3-149-07-01012		001	NO.OF ITEMS - 75   77	
TITLE  V FLANGE				1  001	DRAWING NO. 3-149-07-01004			7   22   23   24
					SHEET NO.			
					NO.OF SHEETS			



FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)

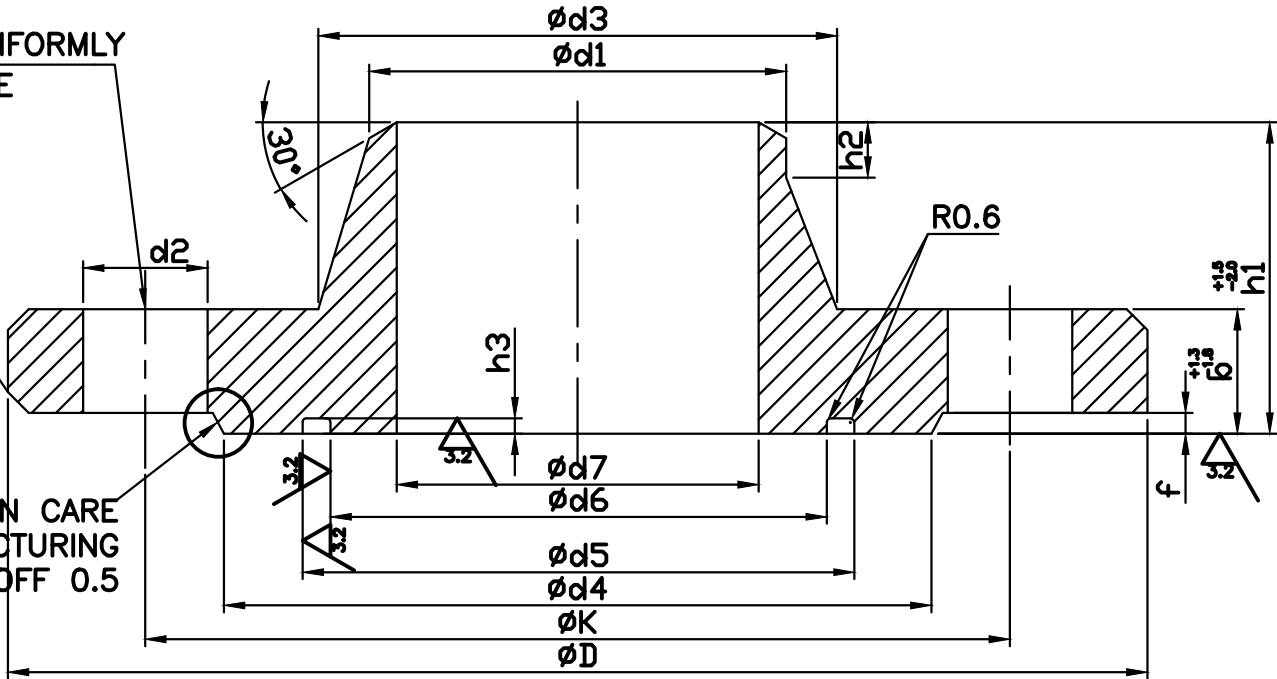
31492501005  
DRAWING NO.

VAR NO.	d1	D	k	h1	d3	h2	d4	$\pm 2.0$ d2	$\pm 2.0$ d5	$\pm 2.0$ d6	$+0.05$ h3	$+0.2$ $f_{0.7}$	b	d7
00	60.3	165	125	45	75	8	102	18	79.5	71.5	2.2	3	18	52.3
01	26.9	105	75	38	40	6	58	14	39.5	31.5	2.2	2	16	22.3
02	33.7	115	85	38	45	6	68	14	45.5	37.5	2.2	2	16	28.5
03	60.3	152.4	120.6	45	75	8	92.1	19	79.5	71.5	2.2	3	15.9	52.3
04	48.3	150	110	42	64	7	88	18	60	52	2.2	3	16	43.1

12.5  
THE REST

4 HOLES PLACED UNIFORMLY  
ON CIRCUMFERENCE

EDGES TO BE TAKEN CARE  
DURING MANUFACTURING  
ROUND OFF 0.5



SUPERSEEDS OLD DRAWING  
UNDER THE SAME NUMBER

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

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REF. DRG NO.

SIGN & DATE

INVENTORY NO.

CBOM NO. 0-149-25-01000		STATUS OF DRG.	
AGREED DEPT.	NAME	SIGN	DATE
EMT	S.CHANDRA	SD/-	15/1/82
WT	S.CHANDRA	SD/-	14/6/82

GRADE OF UNTOL. DIM:-	
M/CG V/C/M/F AA 0230208	
WELDING-A/B/C/D-AA621104	
GAS CUTTING-T3-AA0621101	

REV.	DATE	ALTERED
		CHECKED

REV.	DATE	ALTERED
05	19.09.18	CHECKED

CHANGES DONE AS PER  
CA NO. TGE-18-F0205.

TYPE OF PRODUCT  
OR  
NAME OF CUSTOMER/ PROJECT

TG-HW-0500-2

BHARAT HEAVY ELECTRICALS LTD.  
HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	KB MUKHERJEE	SD/-	19.02.81	
CHD	G.GUPTA/D.R.C	SD/-	2.11.81	
APD	N.P.GUPTA	SD/-	24.6.82	73, 74

DEPT. TGE	SCALE NTS	WEIGHT(Kg) SEE TABLE
CODE 42/33		

TITLE  
FLANGE

DRAWING NO.  
31492501005

SHEET NO. 1 NO.OF SHEETS 1

SIZE A3



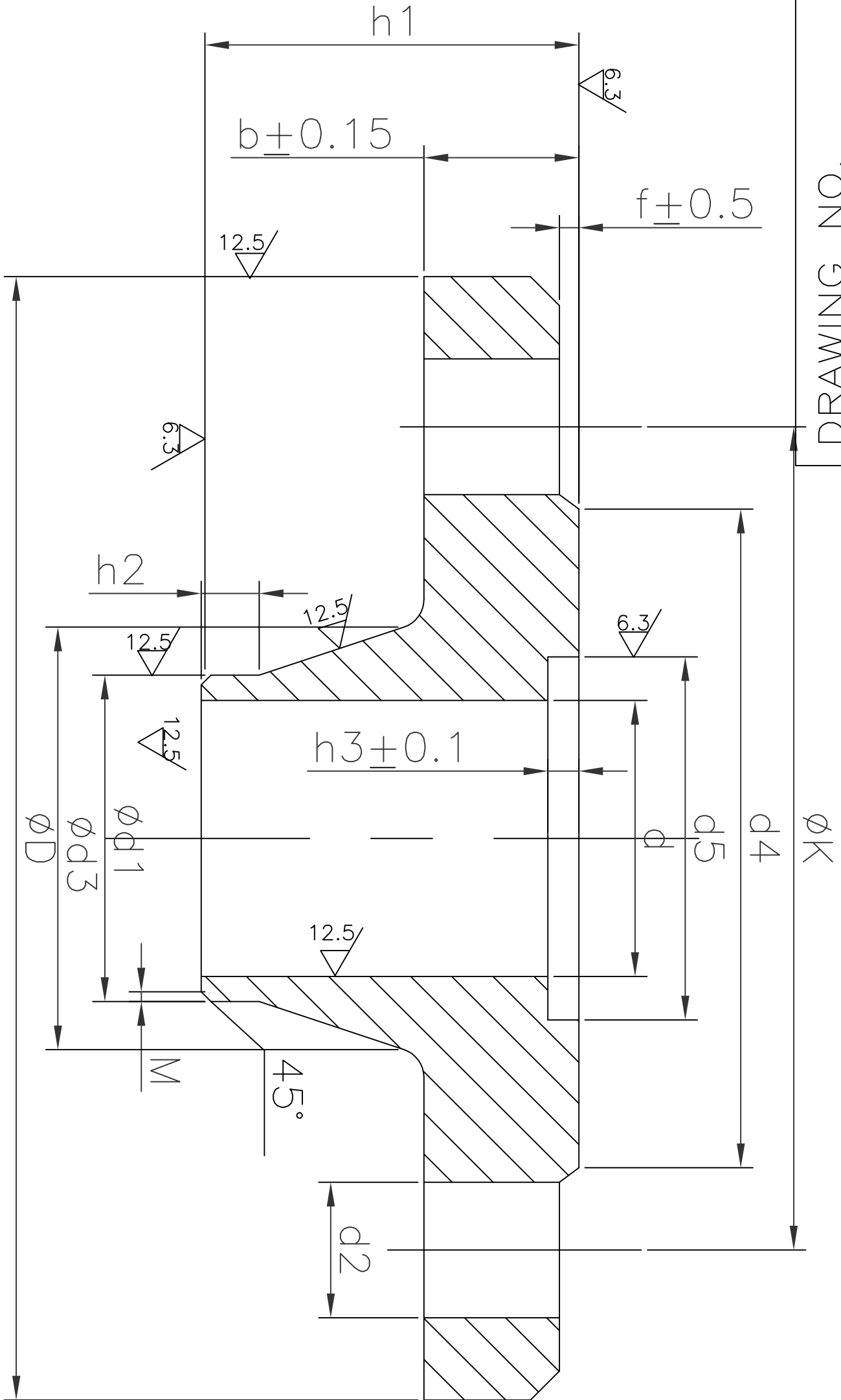




FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)




SERRATION ON FLANGE FACE - FLANGES SHALL HAVE A CONTINUOUS SPIRAL GROOVE PRODUCED BY A 1.5 MM RADIUS ROUND-NOSED TOOL AT A FEED OF APPROXIMATELY 0.8MM PER REVOLUTION.

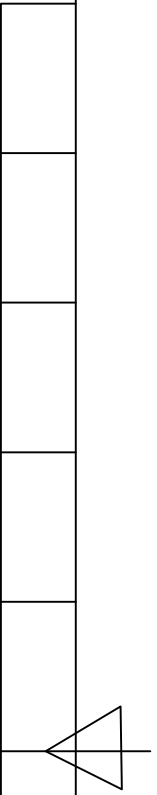
VAR	D	K	d	d1	d2	d3	d4	d5	h1	h2	h3	f	M	b	N	WEIGHT
															HOLE	(KG)
00	90	60	13.6	17.2	14	28	40	23.5	35	6	2.4	2	2	14	4	0.58
01	165	125	52.3	60.3	18	75	102	65.5	45	8	2.4	3	4	18	4	2.50
02	185	145	68.1	76.1	18	90	122	79.5	45	10	2.4	3	4	18	4	3.02
03	200	160	80.9	88.9	18	105	138	97.5	50	10	3.2	3	4	20	8	3.66
04	220	180	105.3	114.3	18	131	158	122.5	52	12	3.2	3	5	20	8	4.58
05	115	85	28.5	33.7	14	45	68	39.5	38	6	2.4	2	3	16	4	1.13
06	150	110	43.1	48.3	18	64	88	55.5	42	7	2.4	3	-	16	4	1.84
07	235	190	105.3	114.3	18	131	158	122.5	52	12	3.2	3	5	20	8	5.00
08	235	190	105.3	114.3	22	131	158	122.5	52	12	3.2	3	5	20	8	5.00
09	185	145	68.1	76.1	18	90	122	79.5	45	10	2.4	3	4	18	8	3.02
10	270	220	130.7	139.7	26	158	184	138.7	68	14	4	3	5	22	8	9.8
11	285	240	167.4	168.3	22	188	208	175.4	75	14	4	3	5	22	8	11.59

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REF. DRG NO.	SIGN & DATE	INVENTORY NO.
--------------	-------------	---------------

CBOM NO. 01493201014		STATUS OF DRG.	
AGREED DEPT.	NAME	SIGN	DATE
EMT	S. CHANDRA	SD/-	11/07/2007
WT	CHHABRA	SD/-	17/07/2007
GRADE OF UNTOL. DIM:--			
M/CG- M/C/M/F AA 0230208			
WELDING- A/B/Ø/Ø-AA621104			
GAS CUTTING- T3/AA0621101			

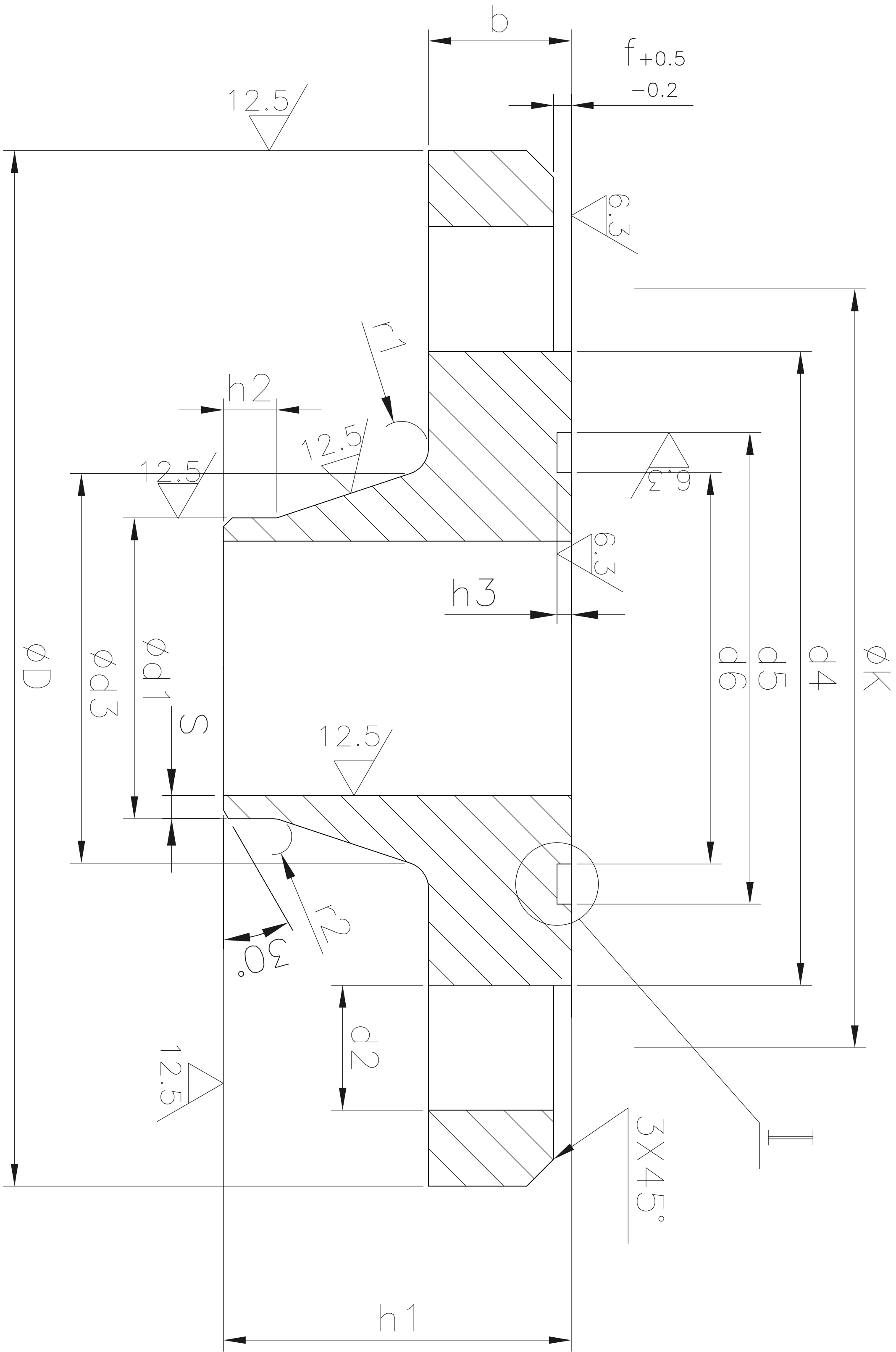
TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT		TG-HW-0500-2	
		BHARAT HEAVY ELECTRICALS LTD. HARDWAR	
DEPT. TGE	SCALE	WEIGHT(Kg.)	APD
CODE 4133	NTS	-	A.K.M.
TITLE FLANGE		DRAWING NO. 31493201065	
CH.AD. NO. TGE-12-F0174		REF. TO ASSY. DRG. 01493201014	
SHEET NO. 1		NO.OF SHEETS 1	



SIZE A3



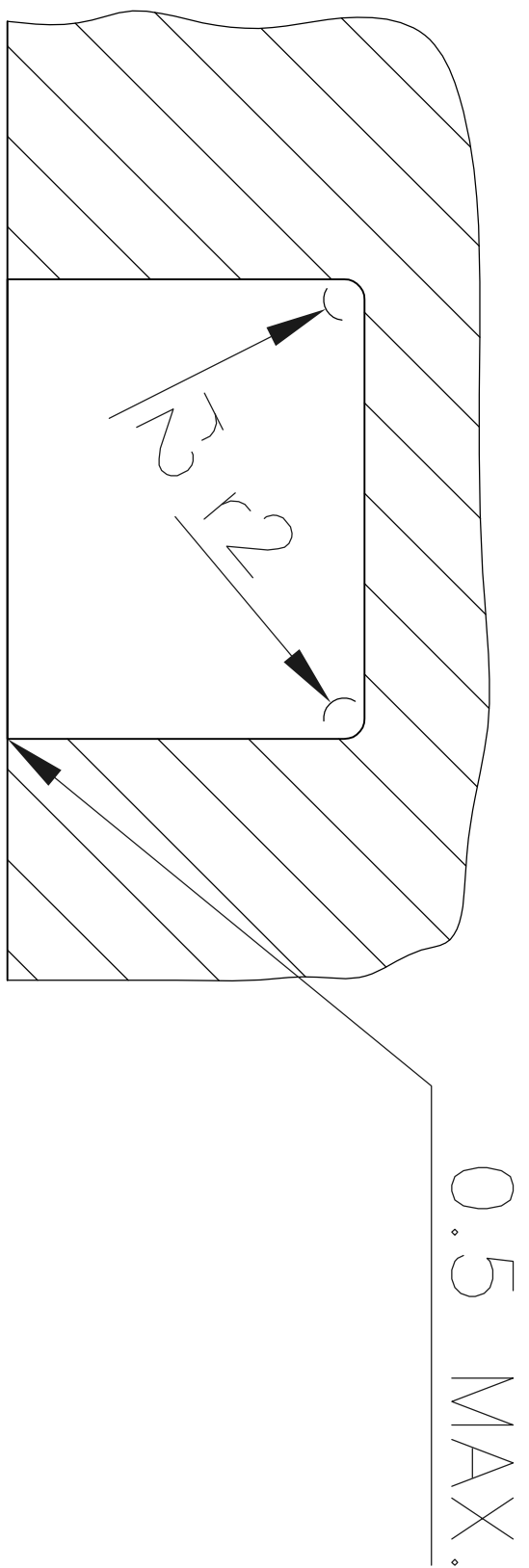
52110-32-641-3  
DRAWING NO



VAR	NB	d1	D	b	K	h1	d3	s	r1	h2	d4	f+0.2 -0.7	N HOLE	d2	d5 <sup>+0.3</sup> -0.4	d6	h3	r2
00	25	33.7	115	16 <sup>+1.3</sup> -1.8	85	38	45	2.6	4	6	68	2	4	13.5	41.3	33.3	1.85 <sup>+0.1</sup> 0.6	
01	40	48.3	150	16 <sup>+1.3</sup> -1.8	110	42	64	2.6	6	7	88	3	4	17.5	59.6	49.6	2.5 <sup>+0.2</sup> 1.2	
02	50	60.3	165	18 <sup>+1.3</sup> -1.8	125	45	75	4	6	8	102	3	4	17.5	69.6	59.6	2.5 <sup>+0.2</sup> 1.2	
03	65	76.1	185	18 <sup>+1.3</sup> -1.8	145	45	90	4	6	10	122	3	4	17.5	86.6	76.6	2.5 <sup>+0.2</sup> 1.2	
04	80	88.9	200	20 <sup>+1.3</sup> -1.8	160	50	105	4	8	10	138	3	8	17.5	96.6	86.6	2.5 <sup>+0.2</sup> 1.2	
05	20	26.9	105	16 <sup>+1.3</sup> -1.8	75	38	40	2.3	4	6	58	2	4	13.5	34.8	26.9	1.85 <sup>+0.1</sup> 0.6	
06	25	33.7	115	16 <sup>+1.3</sup> -1.8	85	38	45	2.6	4	6	68	2	4	13.5	59.1	49.1	2.5 <sup>+0.2</sup> 0.6	
07	50	60.3	165	18 <sup>+1.3</sup> -1.8	125	45	75	4	6	6	102	3	4	18	86.1	76.1	2.5 <sup>+0.2</sup> 0.6	

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DETAIL-I

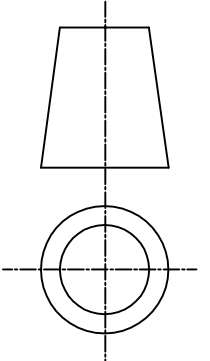


TECHNICAL REQUIREMENTS

IDENTIFICATION AS PER HW0400.397

Et1-12219 INVENTORY NO.	19/11/87 SIGN & DATE	KUN673.42(PART-2) REF. DRG NO.
----------------------------	-------------------------	-----------------------------------

CBOM NO. 0-149-32-01003				STATUS OF DRG.	
AGREED DEPT.	NAME	SIGN	DATE		
GTX	S.C.GOYAL	sd/-	10.11.87		
WT				B.CHOUHDHARY	sd/-
GRADE OF UNTOL. DIM.:-				31.11.87	
M/CG- V/C/M/F AA 0230208					
WELDING-A/B/C/D-AA621104					
GAS CUTTING-T3'AA0621101					
REV.	DATE	ALTERED	CHECKED		

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT				TG-HH-210MW					
<div><div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div></div><div><div></div><div></div><div></div><div></div><div></div></div></div> <div>BHARAT HEAVY ELECTRICALS LTD. HARDWAR</div>									
				DRN	KB. MUKHERJEE	sd/-	07.03.87	NO.OF VAR.	
				CHD	K.R.G/G.GUPTA	sd/-	06.07.87		
				APD	A.C.C	sd/-	13.11.87	73, 74	
DEPT. TGE			SCALE	N.T.S.	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS	
CODE 4233					SEE TABLE				
TITLE		1		3		DRAWING NO.			
FLANGE		3-149-32-01125						01	
		7						22	
		SHEET NO.						23	
		NO.OF SHEETS						24	



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KUN673.41  
REF. DRG NO.

25/11/86  
SIGN & DATE

Et1-11527  
INVENTORY NO.

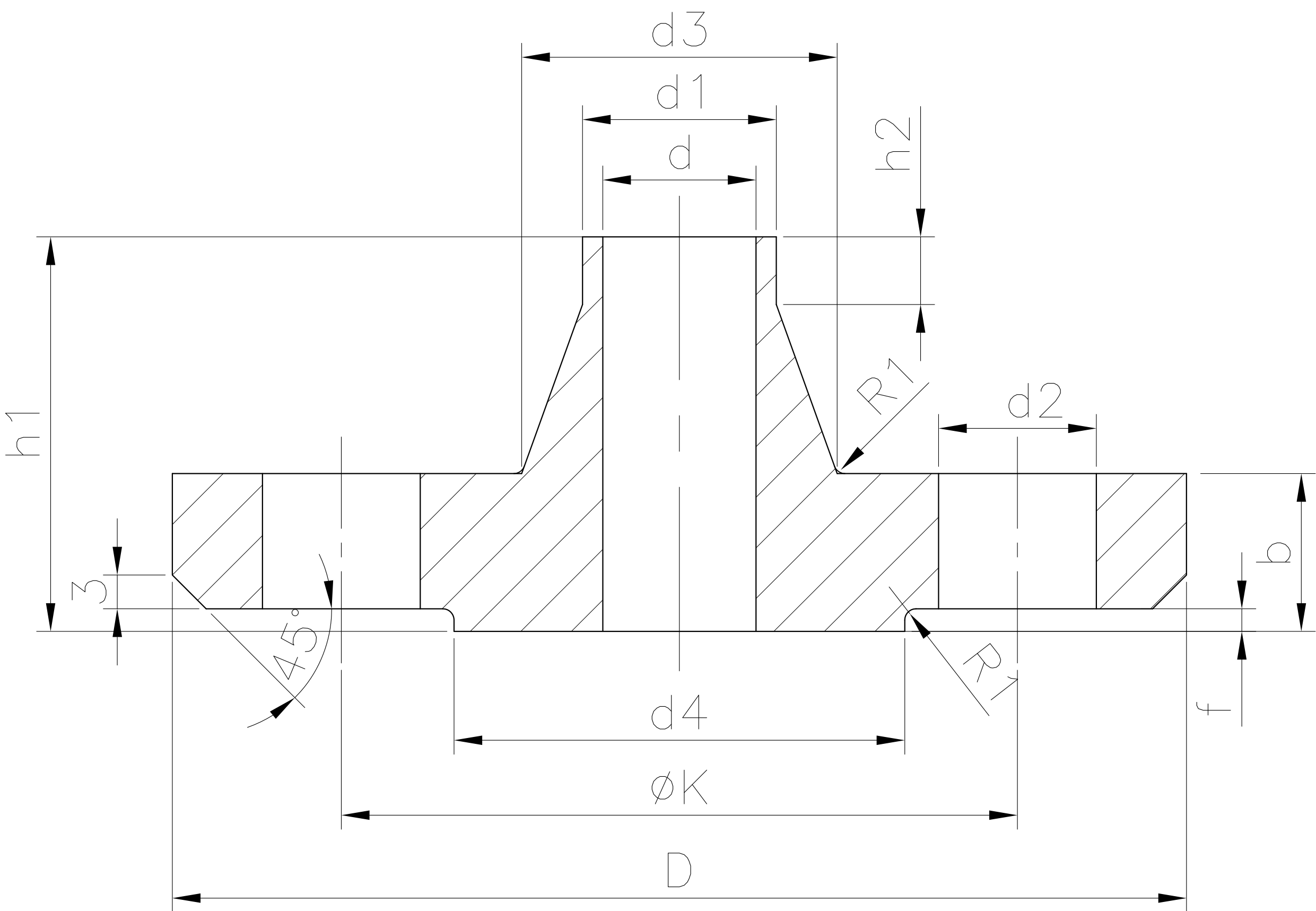
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)

00010-00-0913  
DRAWING NO.

12.5/  
ALL OVER



SERRATION ON FLANGE FACE – FLANGES SHALL HAVE A CONTINUOUS SPIRAL GROOVE PRODUCED BY A 1.5 MM RADIUS ROUND-NOSED TOOL AT A FEED OF APPROXIMATELY 0.8MM PER REVOLUTION.

VAR	D	K	d	d1	d2	d3	d4	h1	h2	f	b	N HOLES
00	90	60	13.6	17.2	14	28	40	35	6	2	14	4
01	95	65	19.3	21.3	14	32	45	35	6	2	14	4
02	115	85	28.5	33.7	14	45	68	38	6	2	16	4
03	150	110	43.1	48.3	18	64	88	42	7	3	16	4
04	165	125	52.3	60.3	18	75	102	45	8	3	18	4
05	200	160	80.9	88.9	18	105	138	50	10	3	20	8
06	220	180	106.3	114.3	18	131	158	52	12	3	20	8
07	185	145	68.1	76.1	18	90	122	45	10	3	18	4
08	340	295	206.5	219.1	23	235	268	62	16	3	24	12

		009	FLANGE	3-150-00-01000		08	MATERIAL AS PER BOM			6.200
		008	FLANGE	3-150-00-01000		07				3.060
		007	FLANGE	3-150-00-01000		06				5.880
		006	FLANGE	3-150-00-01000		05				3.700
		005	FLANGE	3-150-00-01000		04				2.530
		004	FLANGE	3-150-00-01000		03				1.840
		003	FLANGE	3-150-00-01000		02				1.130
		002	FLANGE	3-150-00-01000		01				0.630
		001	FLANGE	3-150-00-01000		00				0.580
VAR	REMARKS	ITEM NO.	DECRPTION	DRAWING	STD	VAR	MATERIAL CODE	A	UNIT WEIGHT	
							MATERIAL SPEC.	C		

CBOM NO.  
0-150-00-01090

STATUS  
OF DRG.

TYPE OF PRODUCT  
OR

NAME OF CUSTOMER/ PROJECT

TG-HW-0500-2

AGREED DEPT.	NAME	SIGN	DATE
GTX	S.C.GOYAL	sd/-	29.10.86
W.T	S.C.C	sd/-	29.11.86

GRADE OF UNTOL. DIM.:—

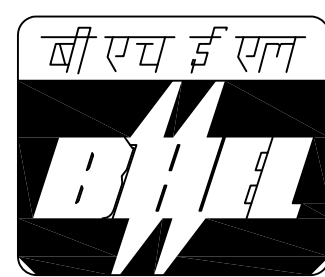
M/CG- X/C/M/F AA 0230208

WELDING-A/B/C/D-AA621104

GAS CUTTING-'T3'AA0621101

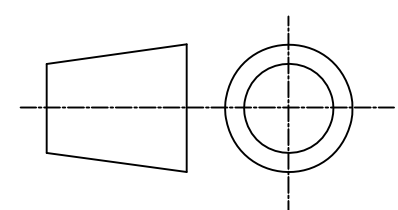
REV.	DATE	ALTERED CHECKED
------	------	--------------------

REV.	DATE	ALTERED CHECKED
------	------	--------------------



BHARAT HEAVY ELECTRICALS LTD.  
HARDWAR

DEPT. EME  
CODE 4133



SCALE  
N.T.S

WEIGHT(Kg.)  
SEE TABLE

DRN	NAME	SIGN	DATE	NO.OF VAR.
K B MUKHER JEE	sd/-	17.7.86		
KRG/G.G	sd/-	17.7.86		
A.C.C.	sd/-	17.11.86		

REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
--------------------	-------------	----------------

TITLE

FLANGE

DRAWING NO.  
3-150-00-01000

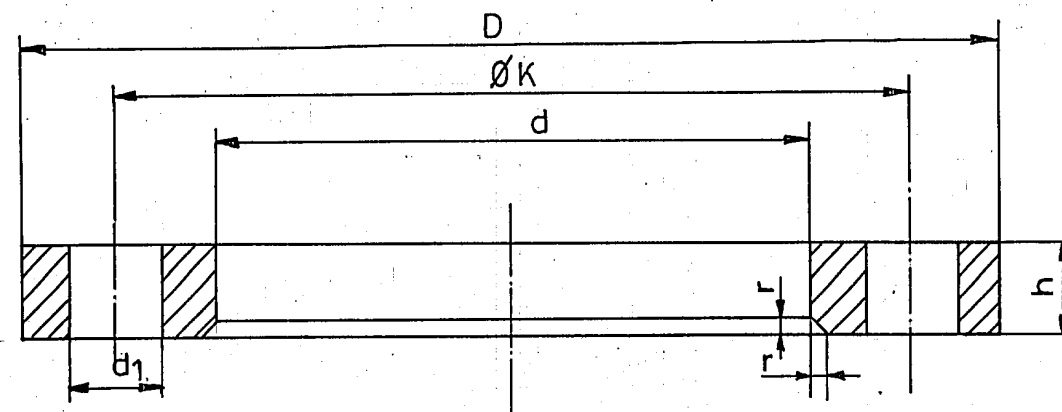
SHEET NO. 1 NO.OF SHEETS 1

SIZE A3



3-150-00-01044

DRAWING NO.

12.5/  
ALL OVER

VAR.	D	ØK	d	d <sub>1</sub>	r	NO. OF HOLES	h	Nb
00	115	85	48	14	3	4	18	25
01	150	110	66	18	3	4	18	40
02	235	190	135	22	3	8	22	100
03	270	220	164	26	4	8	26	125
04	165	125	78	18	3	4	20	50
05	95	65	34	14	3	4	16	15

		006	FLANGE	3-150-00-01044	05	AA1041801122		0.960
		005	FLANGE	3-150-00-01044	04	AA1041801149		2.580
		004	FLANGE	3-150-00-01044	03	AA1041801165		6.450
		003	FLANGE	3-150-00-01044	02	AA1041801157		4.770
		002	FLANGE	3-150-00-01044	01	AA1041801130		1.970
		001	FLANGE	3-150-00-01044	00	AA1041801130		1.190
VAR. 00	REMARKS	KEY NO.	DESCRIPTION	NO.	29 31	MATERIAL CODE	55 57	UNIT WT. (Kg.)
59	64 65	75 25 27 29	58	60	77	32 33 46	54	66 71
CARD TYPE-3			CARD TYPE-1			CARD TYPE-2		

GMS/GR. SP. NO. <b>0-150-00-01090</b>		STATUS OF DRG.		TYPE OF PRODUCT <b>TG-HW-0500-2</b>				M F	
AGREED DEPT.	NAME	SIGN.	DATE	OR NAME OF CUSTOMER/PROJECT					
GTX	S.C. GOYAL	[Signature]	29/11/86						
w.T. she				[Signature]		29/11/86			
Bharat Heavy Electricals Ltd. RANIPUR - HARDWAR.				DRN.	NAME KB MUKHERJEE	SIGN.	DATE 17.7.86	NO. OF VAR.	
				CHD.	G. GUPTA	[Signature]	17.7.86		
				APPD.	A.C.C. WLA	[Signature]	17.11.86	73 74	
REV	DATE	ALTERED	DEPT. TGE	GRADE OF UNTO DIM	SCALE	WEIGHT (Kg)	REF. TO ASSY. DRG	ITEM NO.	NO. OF ITEMS
		CHECKED	CODE 4233	C/M/F	N.T.S.	SEE TABLE			75 77
				TITLE <b>FLANGE</b>		CARD CODE	DRAWING NO. <b>3-150-00-01044</b>		REV.
						SHEET NO. 1		NO. OF SHEETS:- 1	

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DIN2676  
Ref. Drg. No.

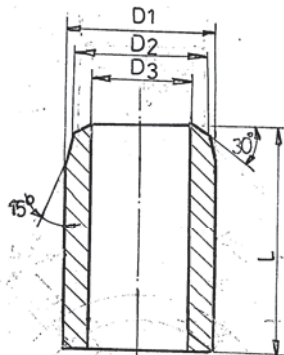
Sign &amp; Date

Inventory No.  
441-11670



06110-00-051-3

DRAWING NO.

12.5/  
ALL OVER  
EXCEPT OTHER  
WISE STATED

03	50	25	012	36.5	33.7	28.5	011	MATERIAL	-0142
03	100	50	011	60.3	52.3	10	01	AS PER BOM	-0560
03	50	15	010	25.3	21.3	16.7	09		0100
04	50	25	009	36.5	33.7	28.5	08		0142
03	50	20	008	30.5	26.9	21.7	07		0115
	50	8	007	17.5	13.5	8.3	06		0060
03	50	15	006	25.3	21.3	16.7	05		-0100
03	50	20	005	30.5	26.9	21.7	04		-0115
	50	20	004	30.5	26.9	21.7	03		0115
	50	15	003	25.3	21.3	16.7	02		0100
	100	50	002	60.3	52.3	01	01		0560
	50	10	001	21.2	17.2	13.6	00		0080
L	N B	SL No.		Ø D1	Ø D2	Ø D3			
59	64	65	75	25	27	29	58		
CARD TYPE-3				CARD TYPE-1				CARD TYPE-2	
29	31	34	45	55	58	65	71	72	
VAR	MATERIAL SPECN.	54	56	57	66	71	72		
29	31	34	45	55	58	65	71	72	

MATERIAL  
AS PER  
BOM

NOTE:

WELDING TO BE DONE AT SITE

REV	DATE	ALTERED P.A.B.
05	4.9.99	CHECKED R.L.V.

CH. ADVICE No.
TGE-99-327

GMS No./GR-SP. No.
01500001125

STATUS OF DRG
23179

TYPE OF PRODUCT OR  
③-NUCLEAR POWER CORPORATION  
(500 MW)

NAME OF CUSTOMER/PROJECT TARAPUR ATOMIC POWER PROJECT-4

**BHARAT HEAVY ELECTRICALS LTD.**  
HARDWARE

DRN.	NAME	SIGN	DATE	No. OF VAR
CHD	K.R.G.		13.1.92	
APPD	G.M.K.		10.9.92	73, 74

DEPT	TGE
CODE	2033

SCALE  
N.T.SWEIGHT (KG)  
SEE TABLEREF. TO ASSY. DRG.  
0-150-00-01125

ITEM No.	No. OF ITEMS
75	77

TITLE :  
CONNECTION

CARD CODE
3

DRAWING No.	REV
3-150-00-01190	22, 23, 24

SHEET No. 01 No. OF SHEETS 01

REV	DATE	ALTERED KBM
04	10.1.97	CHECKED KRG
VAR. 08 ADDED		
CH. AD. NO. TGE-97-04		

GRADE OF UNTOL. DIM:-
MCG. :- C/M/F/ AA 023 0208
WELDING :- 'T1' O 610.003
GAS CUTTING :- 'T3' AA 0621101

REV	DATE	ALTERED P.A.B.
03	11.9.96	CHECKED KRG
CH. AD. NO. TGE-96-325		

REV	DATE	ALTERED KBM
02	30.5.96	CHECKED R.L.V.
CH. AD. NO. TGE-96-161		

REV	DATE	ALTERED KBM
01	18.11.95	CHECKED KRG
CH. AD. NO. TGE-95-445		



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REF. DRG NO.

SIGN & DATE

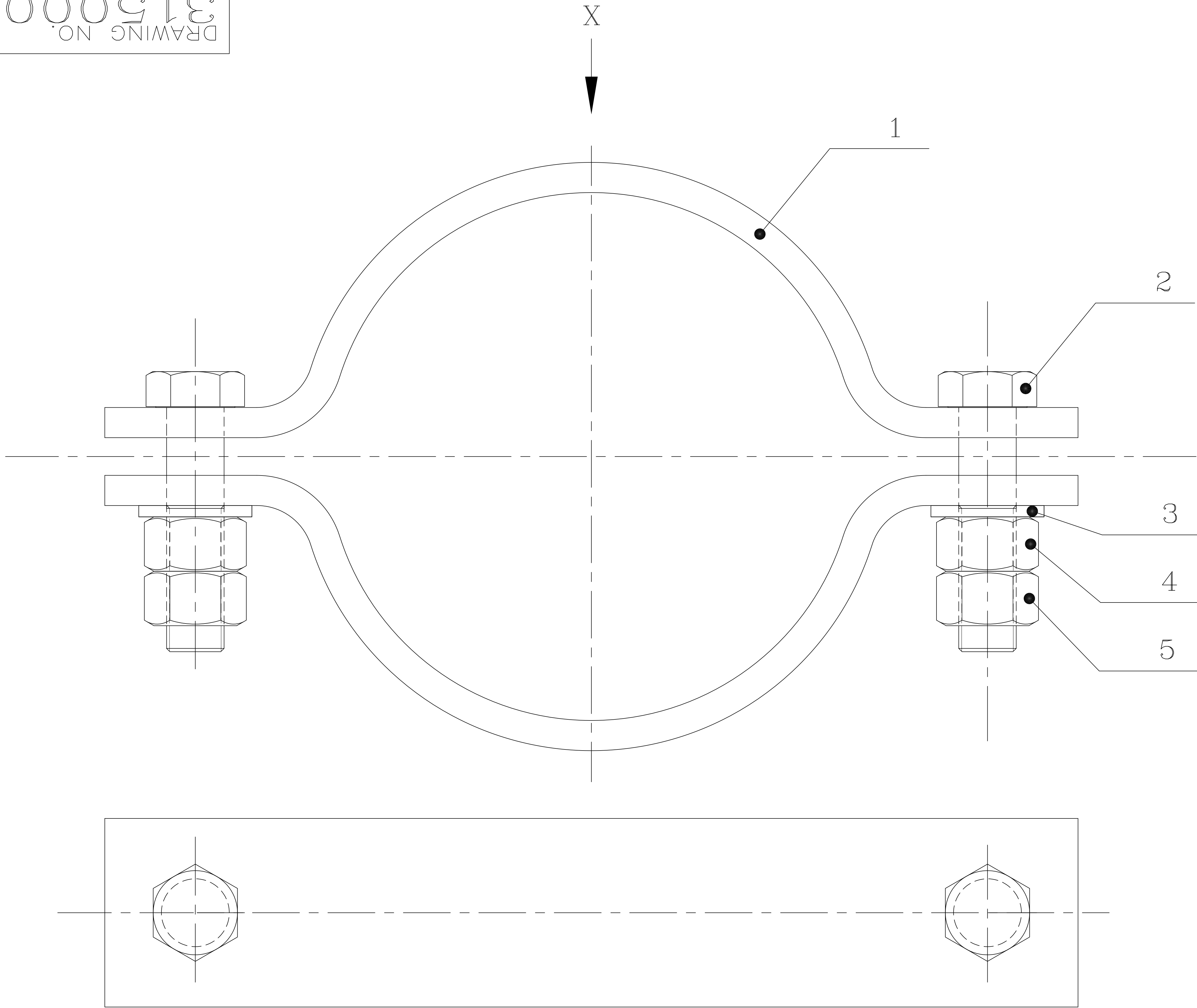
INVENTORY NO.

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)

31500001237  
DRAWING NO.



VAR	SIZE(NB)	WT.(Kg)	PART DRG FOR ITEM NO.1
00	125	2.15	31500001238,VAR00
01	150	2.40	31500001238,VAR01

VIEW-X

GRADE OF UNTOL. DIM.:—			CBOM NO. 31500001237		STATUS OF DRG.		TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT						THDF 115/67										
M/CG— V/C/M/F AA 0230208—			AGREED DEPT.		NAME		SIGN		DATE		DRN		NAME		SIGN		DATE		NO.OF VAR.				
WELDING—A/B/C/D—AA621104—			EMT		AEMTAKG		AEMTAKG		30-10-2013				CHD		STGEPG		STGEPG		26-10-2013				
GAS CUTTING—'T3'AA0621101—													APD		ATGEAKM		ATGEAKM		27-12-2013				
REV.		DATE		ALTERED CHECKED		REV.		DATE		ALTERED CHECKED		DEPT. TGE		SCALE		WEIGHT(Kg.)		REF. TO ASSY. DRG.		ITEM NO.		NO.OF ITEMS	
												CODE 4133		05-01		8251400001009		21		75, 77			
												TITLE PIPE CLAMP ASSEMBLY						DRAWING NO. 31500001237					
																		SHEET NO.1		NO.OF SHEETS 1			

SIZE A3



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REF. DRG NO.

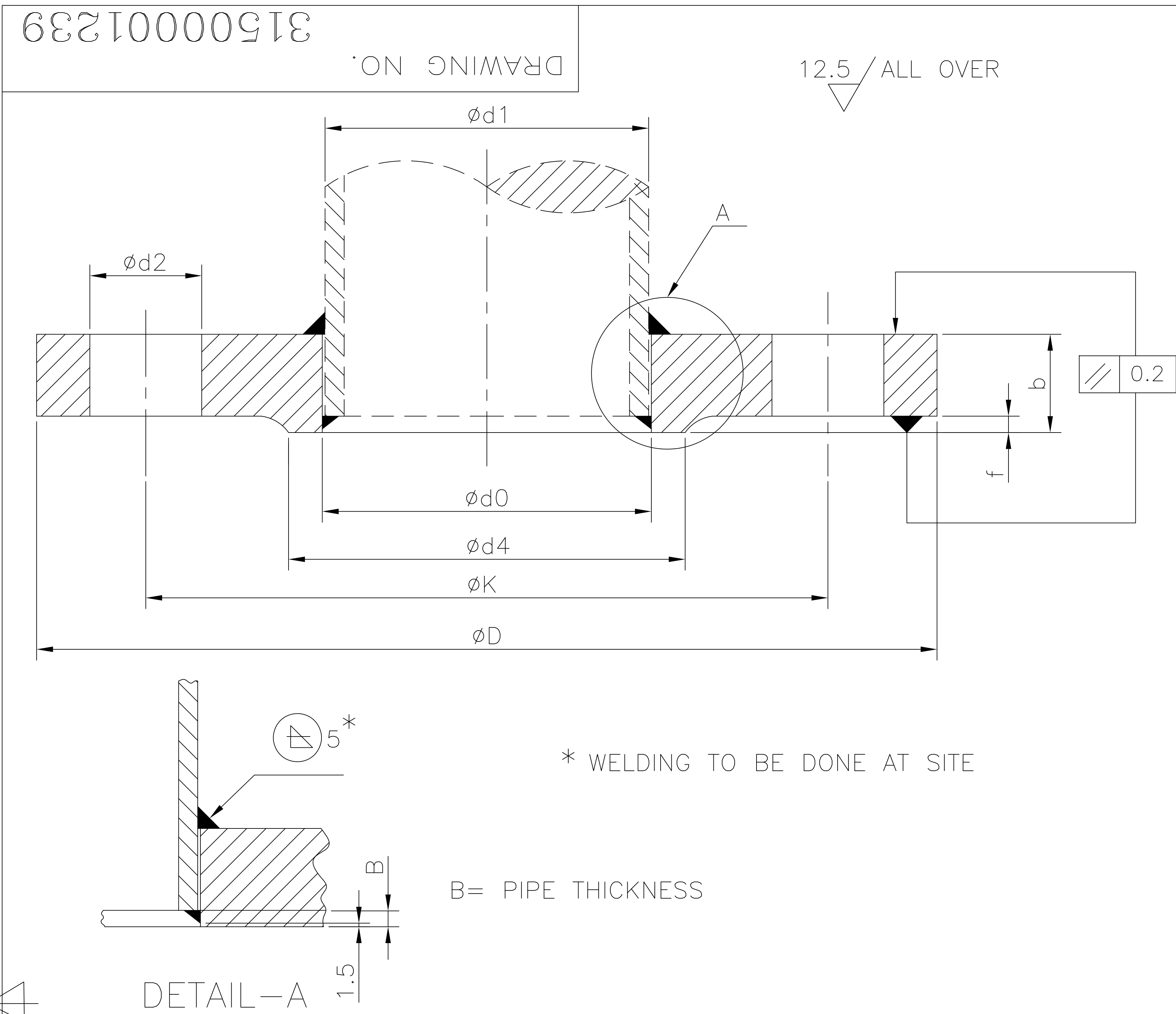
SIGN & DATE

INVENTORY NO.

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)



TECHNICAL REQUIREMENTS

1. RIMS SHALL BE TURNED OR BURRS SHALL BE REMOVED ALONG WITH MACHINING OF CENTER HOLE. ALL BOLT HOLES SHALL BE DRILLED, EQUALLY SPACED ON THE PITCH CIRCLE DIAMETER AND SPOT FACED.
2. MATERIAL : CARBON STEEL AS PER IS-2062E250BR.
3. PRESERVATION : BEFORE DESPATCH, THE FLANGES SHALL BE DRIED AND CLEANED, AND THE ENTIRE SURFACE SHALL BE WELL COVERED WITH GOOD QUALITY RUST PREVENTIVE MATERIAL THAT WILL NOT BECOME FLUID AND RUN OFF AT 65 °C.
4. SERRATION ON FLANGE FACE – FLANGES SHALL HAVE A CONTINUOUS SPIRAL GROOVE PRODUCED BY A 1.5 MM RADIUS ROUND-NOSED TOOL AT A FEED OF APPROXIMATELY 0.8MM PER REVOLUTION.

VARIANT	NOM. SIZE (NB)	CONNEC- TING PIPE O.D.	FLANGE DIMENSIONS									BOLTING DETAILS					Wt/ PIECE IN kg	
			d0		D		b		RAISED FACE			BOLT SIZE	HOLES		K			
			NOM.	TOL.	NOM.	TOL.	NOM.	TOL.	d4		f							
									NOM.	TOL.			NO	d2				
01	10	17.2	17.7	+0.5 +0.0	90	±1	14	+3 -0	40	+0.0 -1.0	2	M12	4	14	60	0.53		
02	15	21.3	21.8		95		14		45		2	M12	4	14	65	0.59		
03	20	26.9	27.4		105		16		58		2	M12	4	14	75	0.73		
04	25	33.7	34.2		115		16		68		2	M12	4	14	85	1.02		
05	32	42.4	42.9		140		16		78		2	M16	4	18	100	1.47		
06	40	48.3	48.8		150		16		88		3	M16	4	18	110	1.77		
07	50	60.3	60.8		165		18		102		3	M16	4	18	125	2.18		
08	65	76.1	76.6		185		18		122		3	M16	4	18	145	2.67		
09	80	88.9	89.9		200		20		138		3	M16	8	18	160	3.28		
10	100	114.3	115.3	+1.0 +0.0	220	±1.5	20	+3 -0	158	+0.0 -2.0	3	M16	8	18	180	3.62		
11	125	139.7	140.7		250		22		188		3	M16	8	18	210	4.99		
12	150	168.3	169.3		285		22		212		3	M20	8	22	240	6		
13	175	193.7	194.7		315		24		242		3	M20	8	22	270	7.82		
14	200	219.1	221.1		340	±2.0	24		268		3	M20	12	22	295	8.31		
15	250	273	275		405		26		320		3	M24	12	26	355	11.9		
16	300	323.9	325.9		460		28		378		4	M24	12	26	410	14.7		
17	350	355.6	357.6		520		32		438	4	M24	16	26	470	24.3			
18	125	139.7	140.7		+1.5	270	±1.5		22	+0.0 -2.0	188	+0.0 -2.0	3	M24	8	26	220	5.0
19	100	114.3	115.3			235			24		162		3	M20	8	22	190	3.8

PURCHASED

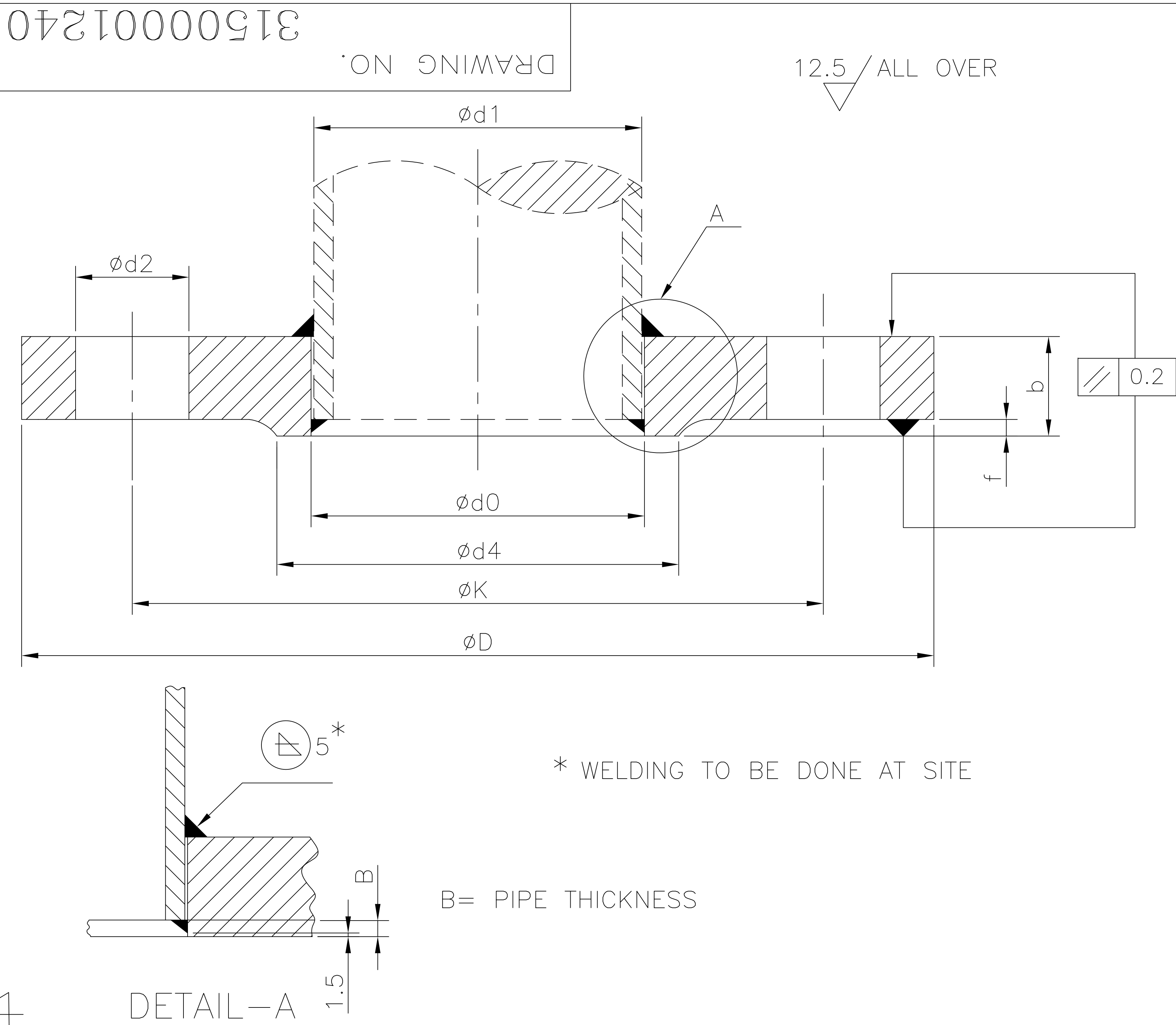
GRADE OF UNTOL. DIM.:—			CBOM NO.		STATUS OF DRG.		TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT						THDF 115/67					
M/CG- X/Ø/M/Ø AA 0230208			AGREED DEPT.	NAME	SIGN	DATE	<div><div><div>बी एच ई एल</div><div>BHARAT HEAVY ELECTRICALS LTD. HARDWAR</div></div><div><div>DEPT. TGE</div><div>CODE 4133</div></div><div><div>SCALE NTS</div><div>WEIGHT(Kg.) SEE TABLE</div></div></div>						DRN		NAME	SIGN	DATE	NO.OF VAR.
WELDING A/B/C/D AA621104													CHD	KUNAL MISHRA	SD/—	25.03.14		
GAS CUTTING-’T3’AA0621101													APD	RAKESH KUMAR	SD/—	25.03.14	73, 74	
REV.	DATE	ALTERED CHECKED	REV. 01	DATE 15.12.17	ALTERED KM CHECKED MA								REF. TO ASSY. DRG.		ITEM NO.		NO.OF ITEMS	
			1. VARIANT 19 IS ADDED. 2. TR NO. 4 IS ADDED.				TITLE				DRAWING NO.		71, 72, 23, 24					
							FLANGE PN16 (CARBON STEEL)				315000001239							
							SHEET NO. 1				NO.OF SHEETS 1							



FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)



VARIANT	NOM. SIZE (NB)	CONNEC- TING PIPE O.D.	FLANGE DIMENSIONS								BOLTING DETAILS						Wt/ PIECE IN kg
			d0		D		b		RAISED FACE			BOLT SIZE	HOLES		K		
			NOM.	TOL.	NOM.	TOL.	NOM.	TOL.	d4		f						
									NOM.	TOL.			NO	d2			
01	10	17.2	17.7	+0.5 +0.0	90	±1	14	+3 -0	40	+0.0 -1.0	2	M12	4	14	60	0.53	
02	15	21.3	21.8		95		14		45		2	M12	4	14	65	0.59	
03	20	26.9	27.4		105		16		58		2	M12	4	14	75	0.73	
04	25	33.7	34.2		115		16		68		2	M12	4	14	85	1.02	
05	32	42.4	42.9		140		16		78		2	M16	4	18	100	1.47	
06	40	48.3	48.8		150		16		88		3	M16	4	18	110	1.77	
07	50	60.3	60.8		165		18		102		3	M16	4	18	125	2.18	
08	65	76.1	76.6		185		18		122		3	M16	4	18	145	2.67	
09	80	88.9	89.9		200		20	138	3	M16	8	18	160	3.28			
10	100	114.3	115.3	+1.0 +0.0	220	±1.5	20	158	3	M16	8	18	180	3.62			
11	125	139.7	140.7		250		22	188	3	M16	8	18	210	4.99			
12	150	168.3	169.3		285		22	212	3	M20	8	22	240	6			
13	175	193.7	194.7		315	24	242	3	M20	8	22	270	7.82				
14	200	219.1	221.1		340	±2.0	24	268	+0.0 -2.0	3	M20	12	22	295	8.31		
15	250	273	275		405	26	320	3	M24	12	26	355	11.9				
16	300	323.9	325.9		460	28	378	4	M24	12	26	410	14.7				
17	350	355.6	357.6		520	32	438	+0.0 -3.0	4	M24	16	26	470	24.3			
18	125	139.7	140.7		270	±1.5	22	188	+0.0 -2.0	3	M24	8	26	220	5.0		
19	100	114.3	115.3		235	±1.5	24	162	+0.0 -2.0	3	M20	8	22	190	3.8		

TECHNICAL REQUIREMENTS

1. RIMS SHALL BE TURNED OR BURRS SHALL BE REMOVED ALONG WITH MACHINING OF CENTER HOLE. ALL BOLT HOLES SHALL BE DRILLED, EQUALLY SPACED ON THE PITCH CIRCLE DIAMETER AND SPOT FACED.
2. MATERIAL : STAINLESS STEEL AS PER ASTM A182 F321.
3. PRESERVATION : BEFORE DESPATCH, THE FLANGES SHALL BE DRIED AND CLEANED, AND THE ENTIRE SURFACE SHALL BE WELL COVERED WITH GOOD QUALITY RUST PREVENTIVE MATERIAL THAT WILL NOT BECOME FLUID AND RUN OFF AT 65 °C.
4. SERRATION ON FLANGE FACE – FLANGES SHALL HAVE A CONTINUOUS SPIRAL GROOVE PRODUCED BY A 1.5 MM RADIUS ROUND-NOSED TOOL AT A FEED OF APPROXIMATELY 0.8MM PER REVOLUTION.

CBOM NO.				STATUS OF DRG.	
AGREED DEPT.	NAME	SIGN	DATE		
GRADE OF UNTOL. DIM.:—					
M/CG- X/Ø/M/Ø AA 0230208					
WELDING A/B/C/D AA621104-					
GAS CUTTING-’T3’AA0621101					
REV.	DATE	ALTERED	REV.	DATE	ALTERED KM
		CHECKED	01	15.12.17	CHECKED MA
			1. VARIANT 19 IS ADDED. 2. TR NO. 4 IS ADDED.		

TYPE OF PRODUCT  
OR  
NAME OF CUSTOMER/ PROJECT

THDF 115/67

DRN

CHD

APD

BHARAT HEAVY ELECTRICALS LTD.

HARDWAR

NAME

SIGN

DATE

ALOK AGARWAL

SD/-

25.03.14

KUNAL MISHRA

SD/-

25.03.14

RAKESH KUMAR

SD/-

25.03.14

DEPT. TGE

CODE 4133

TITLE  
FLANGE  
(STAINLESS STEEL)

SCALE  
NTS

WEIGHT(Kg.)  
SEE TABLE

REF. TO ASSY. DRG.  
—

NO.OF VAR.  
73, 74

ITEM NO.  
—

NO.OF ITEMS  
75, 77

DRAWING NO.  
31500001240

SHEET NO. 1

NO.OF SHEETS 1

SIZE A3



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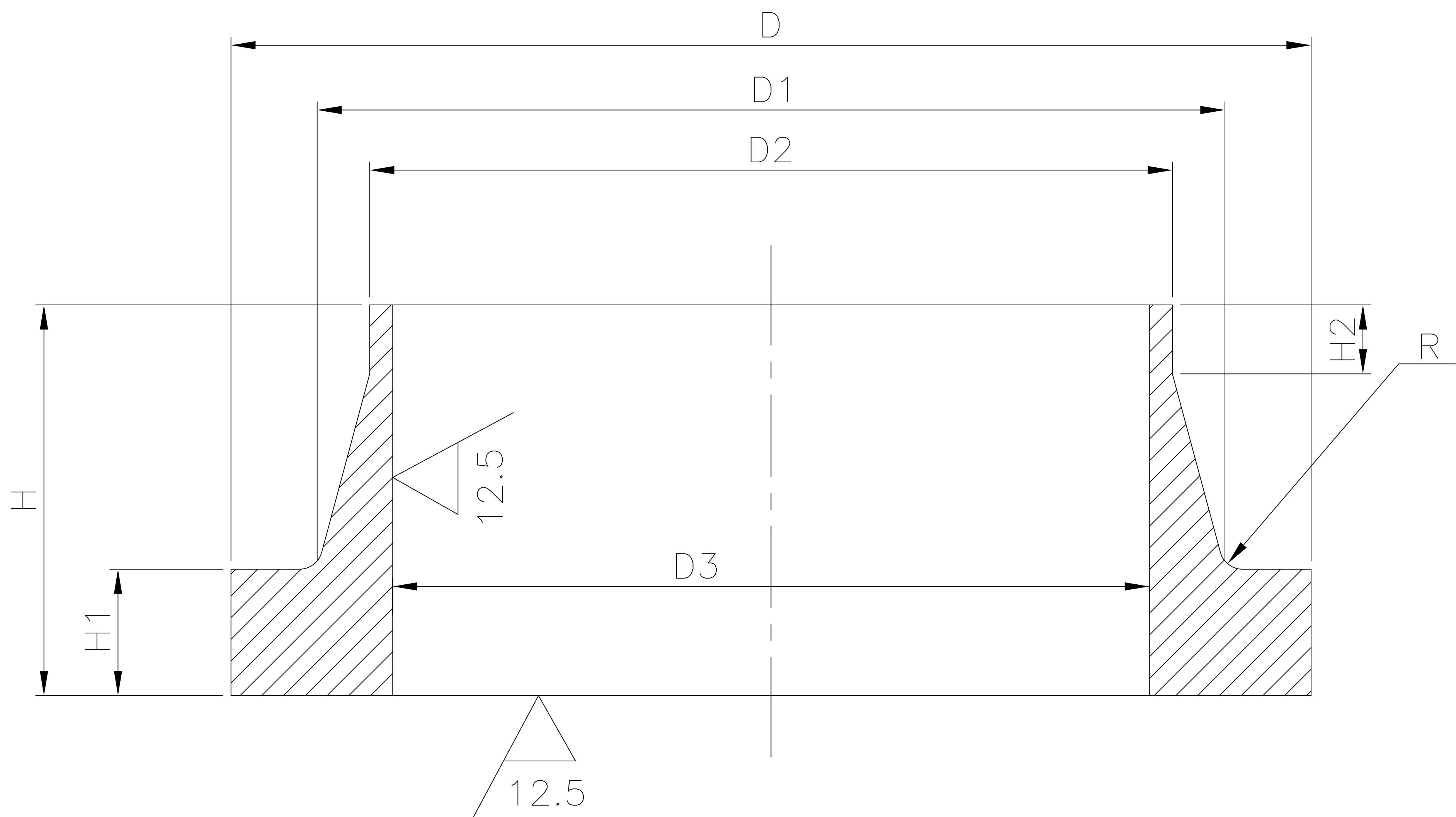
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)

31500601115  
DRAWING NO.

25/  
THE REST


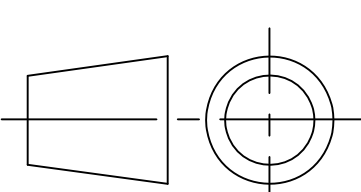


VAR	DN	DIMENSIONS								REF. TO ASSEMBLY	
		D	D1	D2	H	H1	H2	R	D3	ITEM NO.	DRAWING NO.
00	125	188	158	139.7	68	22	12	4	131.7	001	3-150-06-01094

TECHNICAL REQUIREMENTS

- MARK IDENTIFICATION ACCORDING TO HW 0400.397
- EDGE PREPARATION AND WELDING TO BE DONE AS PER HW 0620.599
- SERRATION ON NECK FACE – FLANGES SHALL HAVE A CONTINUOUS SPIRAL GROOVE PRODUCED BY A 1.5 MM RADIUS ROUND-NOSED TOOL AT A FEED OF APPROXIMATELY 0.8MM PER REVOLUTION.

CBOM NO.			STATUS OF DRG.	
01500601006				
AGREED DEPT.	NAME	SIGN	DATE	
GRADE OF UNTOL. DIM.:—				
M/CG- V/C/M/F AA 0230208				
WELDING-A/B/C/D-AA621104				
GAS CUTTING-'T3'AA0621101				
REV.	DATE	ALTERED CHECKED	REV.	DATE

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT					THDF 115/67				
<div><div><div>बी एच ई एल</div><div></div></div><div>BHARAT HEAVY ELECTRICALS LTD. HARDWAR</div></div>						NAME	SIGN	DATE	NO.OF VAR.
					DRN	STGEKBM	STGEKBM	06/03/2010	
					CHD	STGENV	STGENV	06/03/2010	
					APD				
DEPT. TGE			SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.		ITEM NO.	NO.OF ITEMS	
CODE 4133			1:1	2.4	SEE TABLE		SEE TABLE		
TITLE				1	3	DRAWING NO.		NO.OF SHEETS	
NECK PN25						31500601115			
				SHEET NO.1		NO.OF SHEETS 1			

SIZE A3



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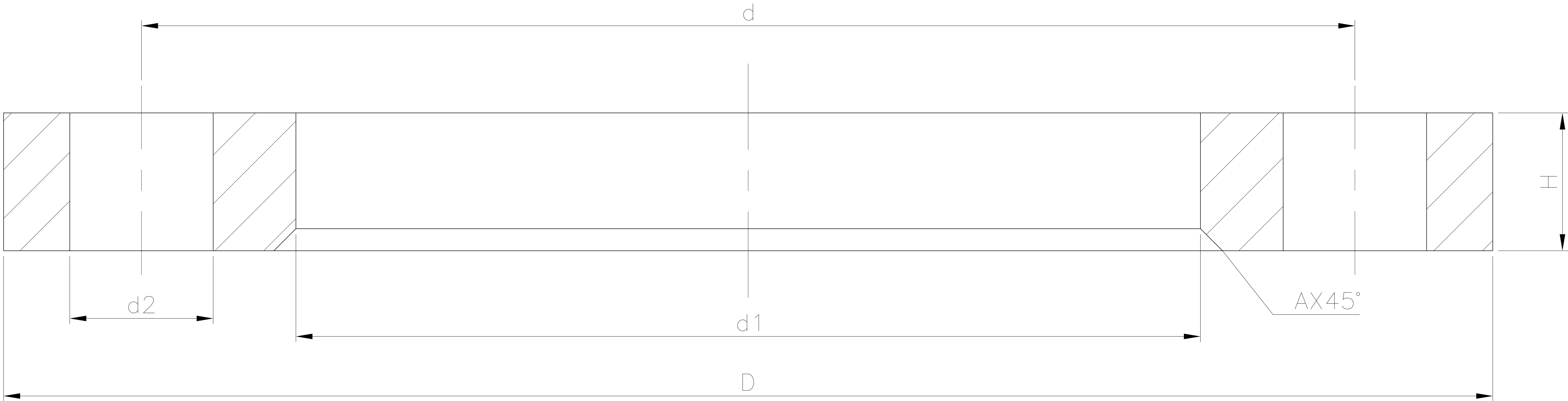
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)

DRAWING NO. 31530201018

6.3 ALL OVER



VAR	DIN	DIMENSIONS						NO.OF HOLES	REF.TO ASSY.	
		D	d	d1	d2	H	A		ITEM NO.	DRAWING NO
00	125	270	220	164	26	25	4	8	005	11530201002

TECHNICAL REQUIREMENTS

- MARK IDENTIFICATION ACCORDING TO HW 0400.397.
- THERE SHOULD BE NO TOOL MARK OR PITTING (PARTICULARLY I.D) ON THESE FLANGES. ALSO AT ALL CORNERS A CHAMFER OF 1X45° TO BE SHOWN.

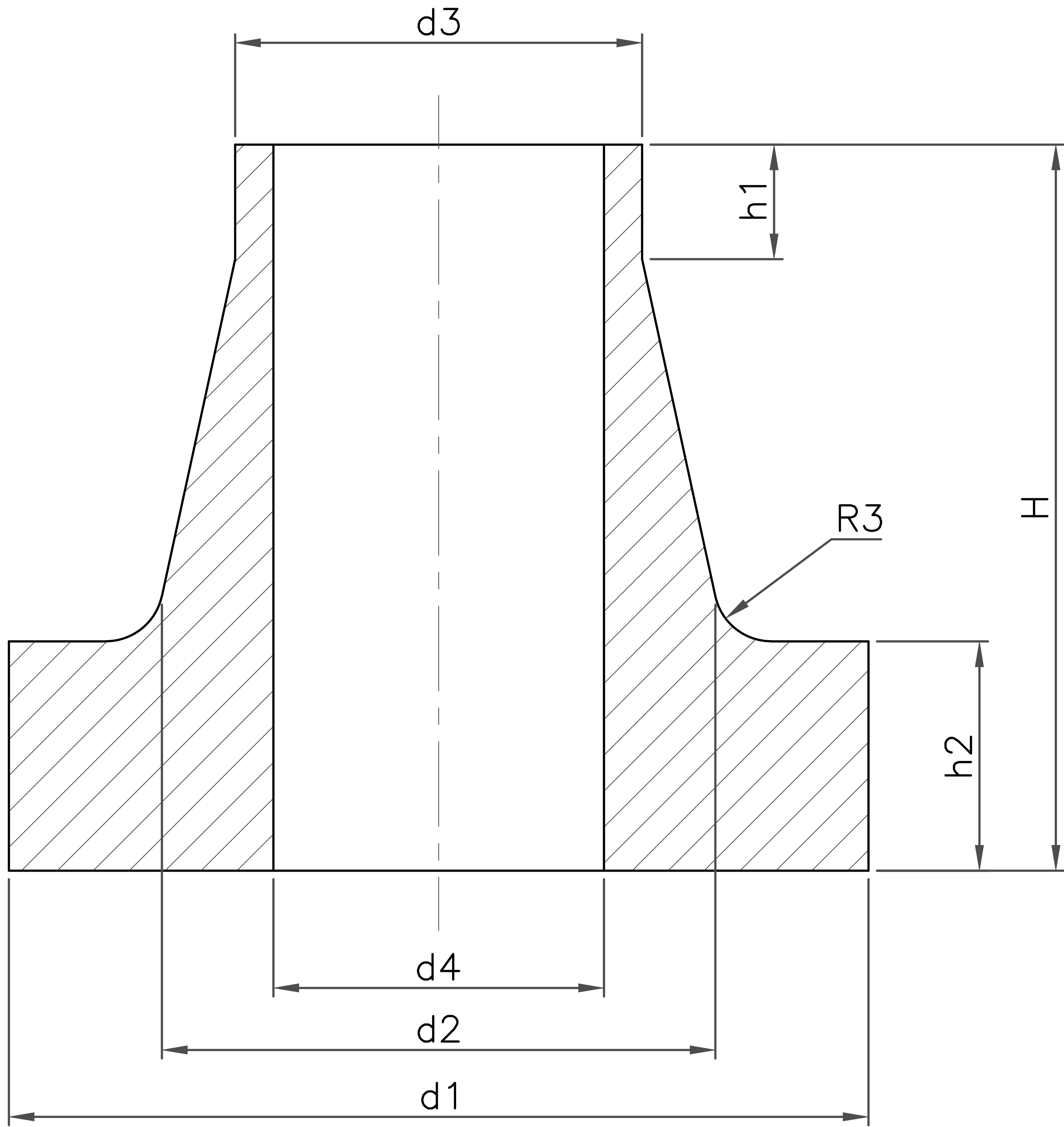
INVENTORY NO.	SIGN & DATE	REF. DRG NO.	CBOM NO. 01530201000				STATUS OF DRG.		TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT										
			AGREED DEPT.	NAME	SIGN	DATE	GRADE OF UNTOL. DIM.:— M/CG— <del>X/C/M/F</del> AA 0230208 WELDING— <del>A/B/C/D</del> AA621104— GAS CUTTING—'T3'AA0621101			<div><div><div>बी एच ई एल</div><div>BH</div></div><div>BHARAT HEAVY ELECTRICALS LTD. HARDWAR</div></div>	DRN	NAME	SIGN	DATE	NO.OF VAR.				
			WT	CHHABRA	Sd/—	4/4					CHD	MAH/PCC	sd/—	20.12.80					
			REV.	DATE	ALTERED	REV.	DATE	ALTERED JC	sd/—		APD	KNW/N.P.G	sd/—	15.4.81					
			CHANGE DONE AS PER CHANGE ADVICE NO. TGE-16-F0344.				DEPT. 4133				SCALE 1:1	WEIGHT(Kg.) —	REF. TO ASSY. DRG. SEE TABLE		ITEM NO. SEE TABLE	NO.OF ITEMS			
			CHECKED				05	14.10.16	CHECKED										
							TITLE FLANGE PN25				1 3		DRAWING NO. 31530201018						
													SHEET NO. 01		NO.OF SHEETS 01				

SIZE A3



DRAWING NO.  
3-153-14-01021

12.5/  
ALL OVER



VAR.	NB	d1	d2	d3	d4	h1	h2	H
00	15	45	30	21.3	17.3	6	12	38
01	25	68	43	33.7	28.5	6	14	40
02	65	122	90	76.1	70.3	10	16	52
03	40	88	62	48.3	43.1	7	14	45
04	50	102	78	60.3	54.5	8	16	48
05	80	138	110	88.9	82.5	12	18	58

TECH. REQUIREMENTS

- EDGE PREPARATION AS PER PS 0620.599
- MATERIAL OF THE NECK SHALL BE STAINLESS STEEL  
AS PER BHEL CORPORATE STD. NO. AA10725
- MATERIAL TEST CERTIFICATES SHALL BE SUPPLIED.
- SERRATION ON NECK FACE – FLANGES SHALL HAVE A  
CONTINUOUS SPIRAL GROOVE PRODUCED BY A 1.5 MM RADIUS  
ROUND-NOSED TOOL AT A FEED OF APPROXIMATELY  
0.8MM PER REVOLUTION

SUPERSEDES OLD DRAWING UNDER  
THE SAME NUMBER.

GRADE OF UNTOL. DIM.:—			CBOM NO. 0-153-14-01001		STATUS OF DRG. U		TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT											
M/CG- V/C/M/F AA 0230208			AGREED DEPT.		NAME		SIGN		DATE		NAME		SIGN		DATE		NO.OF VAR.	
WELDING-A/B/C/D-AA0621104			EMT		S.C. GOYAL		sd/-		22.2.83		BHEL		KB MUKHERJEE		sd/-		15.02.83	
GAS CUTTING-'T3'AA0621101											BHARAT HEAVY ELECTRICALS LTD.		CHD		S.N./G.G		sd/-	
REV. DATE ALTERED AKA2 sd/-											HARDWAR		APD		D.R.C/N.P.G		sd/-	
06 17.05.16 CHECKED AJ sd/-			REV. DATE ALTERED K.B.M. sd/-		05 27.08.09 CHECKED R.L.V. sd/-		DEPT. EME		SCALE		WEIGHT(Kg.)		REF. TO ASSY. DRG.		ITEM NO.		NO.OF ITEMS	
							CODE 4233		N.T.S.		-		0-153-14-01001		053		73, 74	
CHANGE ADVICE NO. TGE-16-F0177.			SUPERSEDES OLD DRAWING UNDER THE THE SAME NUMBER		CHANGE ADVICE NO. TGE-09-F0228		TITLE		NECK PN40		1 3		DRAWING NO. 3-153-14-01021		7 22 23 24		75, 77	
													SHEET NO. 1		NO.OF SHEETS 1			

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REF. DRG NO.

SIGN & DATE

INVENTORY NO.

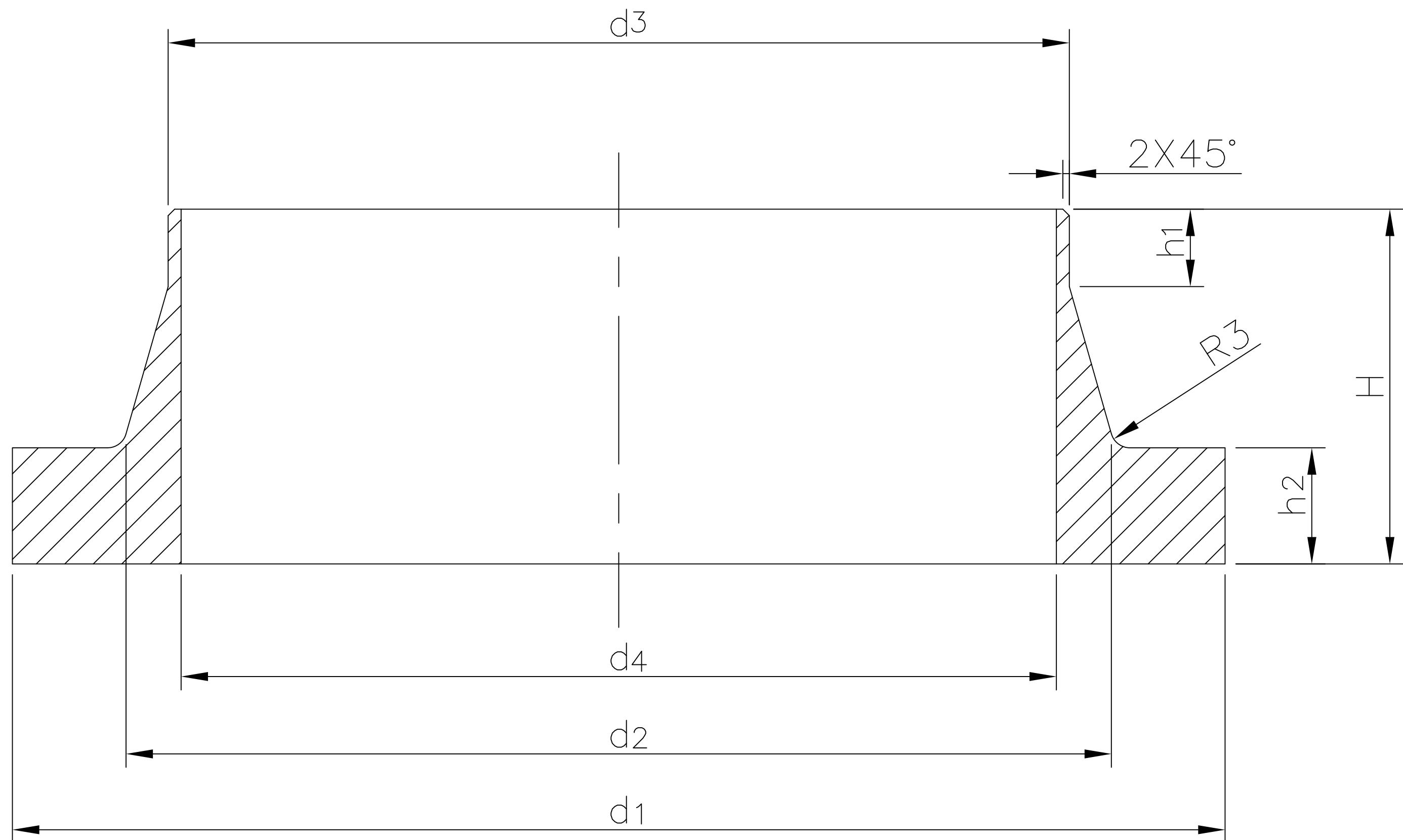
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)

31531401088  
DRAWING NO.

12.5/  
ALL OVER

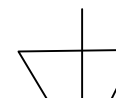


REF.ASSLY	ITEM	VAR.	NB	d1	d2	d3	d4	h1	h2	H	WT.
31531401076	01	00	125	188	158	139.7	131.7	12	22	68	3.95
31531401071	01	01	150	218	188	168.3	159.3	12	22	75	5.20

## TECHNICAL REQUIREMENTS

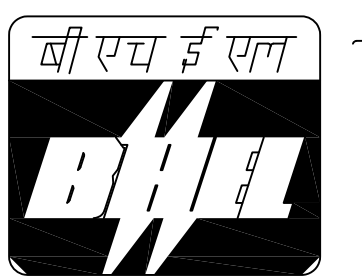
- EDGE PREPARATION AS PER HW0620.599.
- MATERIAL OF THE NECK SHALL BE STAINLESS STEEL AS PER BHEL CORPORATE STD NO.AA10725.
- MATERIAL TEST CERTIFICATES SHALL BE SUPPLIED.
- SERRATION ON NECK FACE – FLANGES SHALL HAVE A CONTINUOUS SPIRAL GROOVE PRODUCED BY A 1.5 MM RADIUS ROUND-NOSED TOOL AT A FEED OF APPROXIMATELY 0.8MM PER REVOLUTION.

PURCHASED

				CBOM NO. 01531401007			STATUS OF DRG.	
				AGREED DEPT.	NAME		SIGN	DATE
GRADE OF UNTOL. DIM.:—				EMT	AEMTNCG		AEMTNCG	18/05/2007
M/CG— <del>X</del> /C/ <del>M</del> / <del>F</del> AA 0230208								
WELDING—A/B/C/D—AA621104—								
GAS CUTTING—'T3'AA0621101								
REV. 03	DATE 17.05.16	ALTERED AKA2 SD/—		REV. 02	DATE 01.08.14	ALTERED PKM SD/—		
		CHECKED AJ SD/—				CHECKED PG SD/—		
CHANGES ARE DONE AS PER C/A NO.— TGE—16—F0176				CHANGES ARE DONE AS PER C/A NO.— TGE—14—F0234				
								

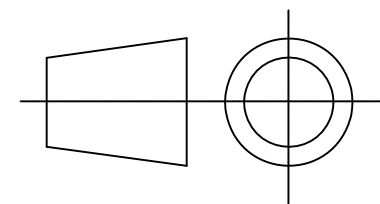
TYPE OF PRODUCT  
OR  
NAME OF CUSTOMER/ PROJECT

THDF 125/67



BHARAT HEAVY ELECTRICALS LTD.  
HARDWAR

DEPT. TGE



SCALE

1:5

WEIGHT(Kg.)

3.26

TITLE

NECK PN25

DRN	NAME	SIGN	DATE	NO.OF VAR.
CHD	STGEKN	STGEKN	27/04/2007	
APD	ATGEKRG	ATGEKRG	12/05/2007	
			24/07/2007	73, 74

REF. TO ASSY. DRG.

31531401071

ITEM NO.

01

NO.OF ITEMS

75, 77

DRAWING NO.

31531401088

SHEET NO.1

NO.OF SHEETS 1

22 23 24

SIZE A3



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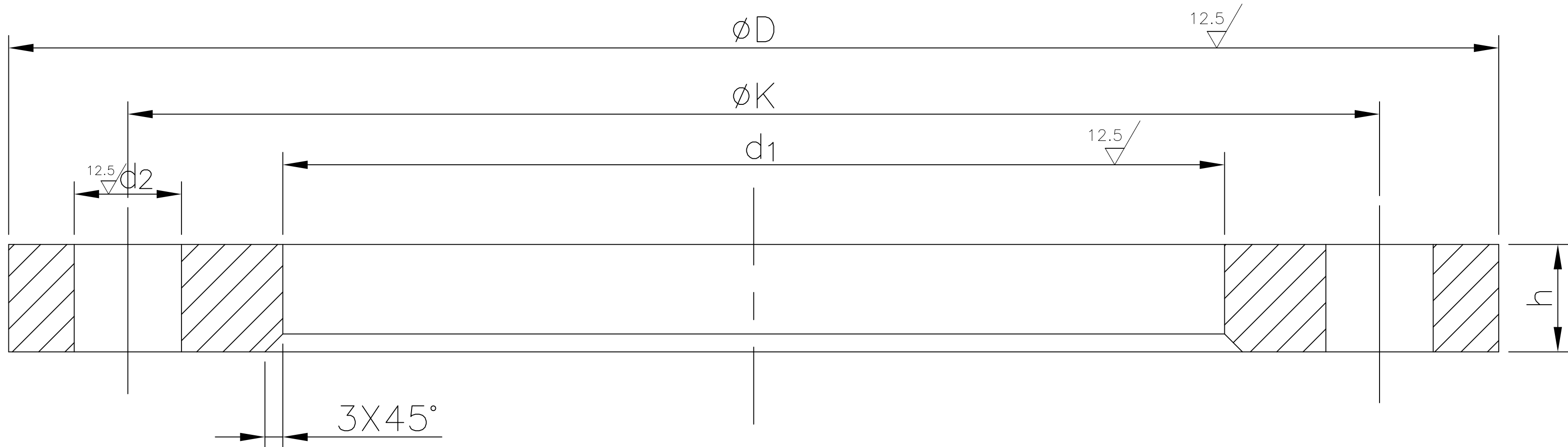
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FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)

31531401089  
DRAWING NO.




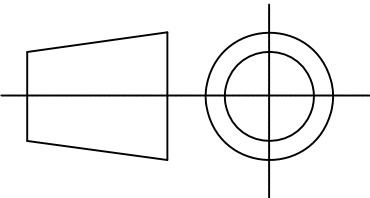
VAR.	NB	D	d1	d2	K	NO.OF HOLES	h	WT.
00	125	270	164	22	220	8	24	6.45
01	150	300	194	26	250	8	24	7.59
02	125	250	164	18	210	8	24	6.45
03	125	270	164	26	220	8	24	7.00

FOR COOLER

TECHNICAL REQUIREMENTS

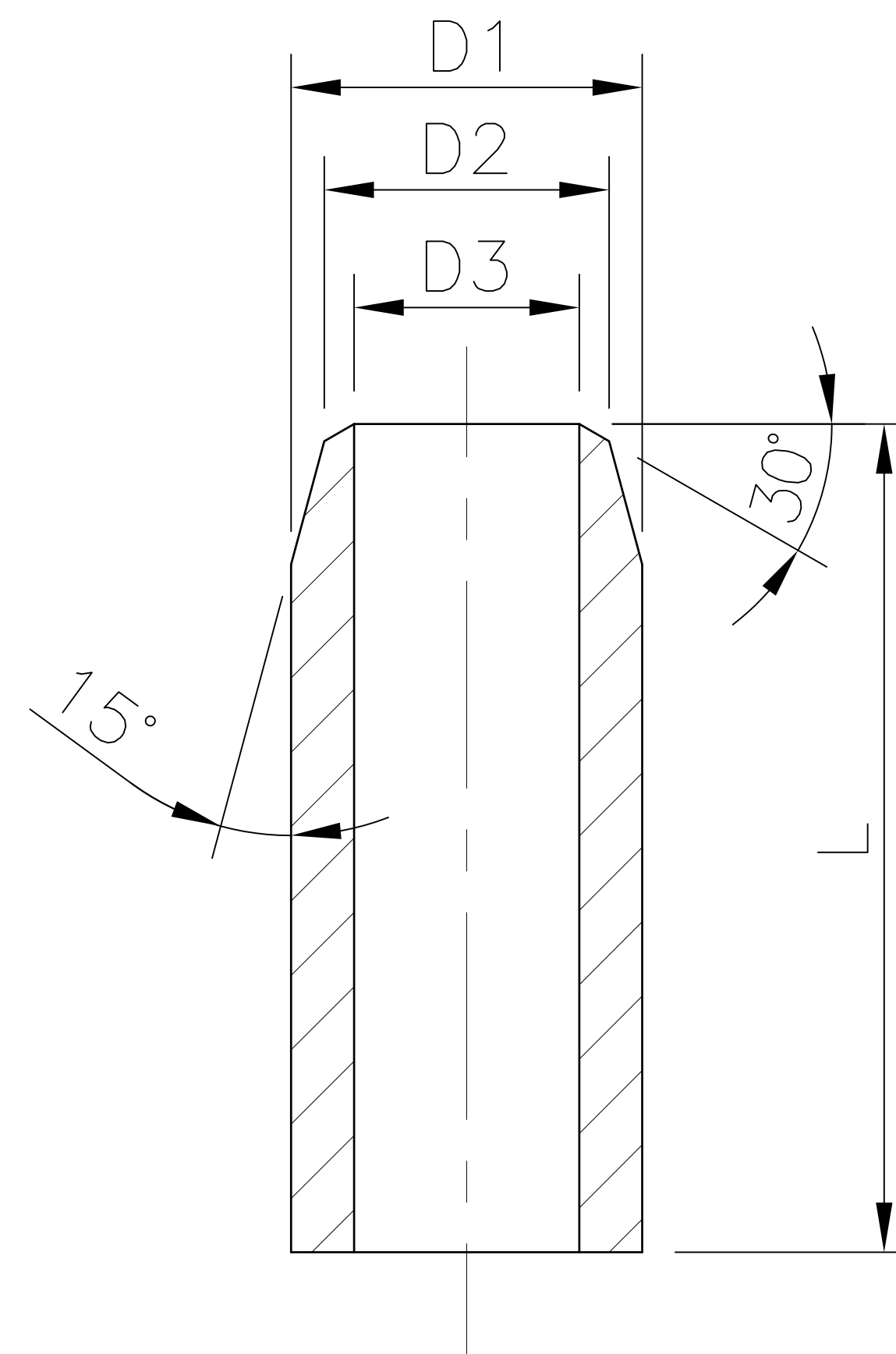
1. EDGE PREPARATION AS PER HW0620.599.

SUPERSEEDS OLD DRAWING  
UNDER THE SAME NUMBER

GRADE OF UNTOL. DIM.:—			CBOM NO. 01531401007		STATUS OF DRG.		TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT								
			AGREED DEPT.	NAME	SIGN	DATE	THDF 125/67								
M/CG— V/C/M/F AA 0230208							 <b>BHARAT HEAVY ELECTRICALS LTD.</b> <b>HARDWAR</b>		DRN	NAME STGEKBM	SIGN STGEPNM	DATE 27/04/2007	NO.OF VAR. 73, 74		
WELDING—A/B/C/D—AA621104									CHD	STGERLV	STGEKN	12/05/2007			
GAS CUTTING—'T3'AA0621101									APD	ATGEKRG	ATGEKRG	24/07/2007			
REV.	DATE	ALTERED CHECKED	REV. 06	DATE 22.02.18	ALTERED AKA2 CHECKED PG		sd/— sd/—	DEPT. TGE		SCALE 1:5	WEIGHT(Kg.) 4.64	REF. TO ASSY. DRG. 31531401071		ITEM NO. 06	NO.OF ITEMS 75, 77
			CHANGES DONE AS PER CHANGE NO. TGE-18-F0034.				TITLE FLANGE PN40			DRAWING NO. 31531401089					
										SHEET NO.1		NO.OF SHEETS 1			

SIZE A3

12.5 ALL OVER



06	100	50	68.1	60.3	52.3	0.560
05	100	40	55.6	48.3	40.94	0.40
04	50	25	36.5	33.7	28.5	0.142
03	50	20	30.5	26.9	21.7	0.115
02	50	15	25.3	21.3	16.7	0.100
01	50	10	21.2	17.2	13.6	0.080
00	50	8	17.5	13.5	8.3	0.060
VAR.	L	NB	∅D1	∅D2	∅D3	WEIGHT (KG)

NOTE: ♦ ♦

MATERIAL : STAINLESS STEEL AS PER ASTM A182F321.

[illegible]

SIZE A3

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REV	DATE	ALTERED	KM	REV	DATE	ALTERED	KM	CBOM No.			STATUS
02	29.12.17	CHECKED	MA	01	17.05.17	CHECKED	MA	—			OF DRG
VARIANT TABLE ADDED.				DIMENSION CORRECTED.				AGREED DEPT.	NAME	SIGN	DATE
GRADE OF UNTOL.DIM.M/CG-✓/C/M/F.AA0230208					<del>WELDING A/B/C/D AA0621104</del>			<del>GAS CUTTING-T3 AA0621104</del>			



VARIANT TABLE

VARIANT	D1 (MM)	D2 (MM)
00	74.0	3.0
01	123	4.0
02	34	3.0

TECHNICAL REQUIREMENT

1. THE 'O' RING MATERIAL SHOULD CONFORM TO SPEC. HW59870.



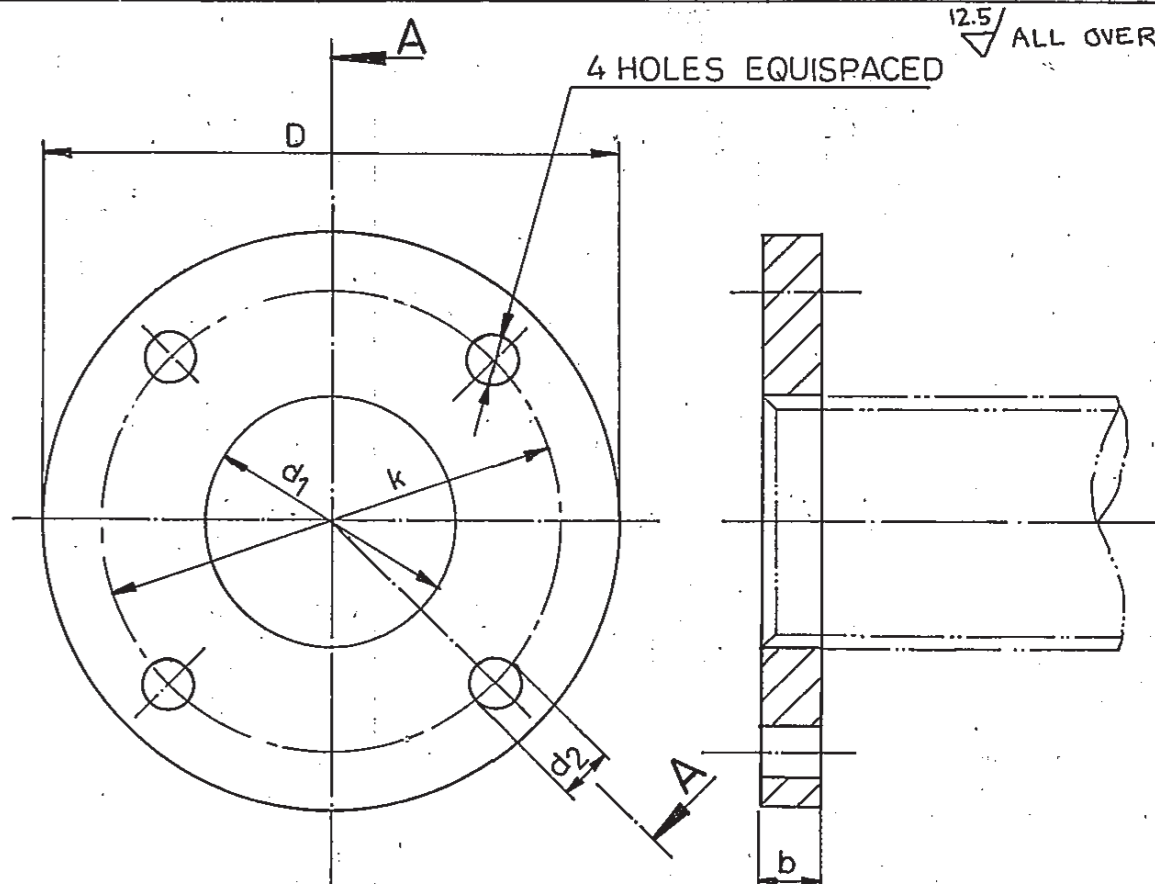
BHARAT HEAVY ELECTRICALS LTD  
HARDWAR

	NAME	SIGN	DATE	NO. OF VAR
DRN	KM	—SD—	30/04/2014	
CHD	KM	—SD—	30/04/2014	
APD	RLV	—SD—	30/04/2014	

DEPT.TGE		SCALE	WEIGHT(Kg)	REF.TO ASSY.DRG.	ITEM No.	No OF ITEMS
CODE 4133		1:1	0.01	_____		—
TITLE				DRAWING No.		
O—RING				41492501071		
				SHEET No.1	No.OF SHEETS 1	

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REV	DATE	ALTERED	REV	DATE	ALTERED	GMS NO./GR. SP. NO.		STATUS OF DRG.	
		CHECKED			CHECKED	0-150-00-01090			
						AGREED DEPT.	NAME	SIGN	DATE
						GTY	S.C. GOYAL	<i>[Signature]</i>	29.10.86
						W.T.	S.K.C.	<i>[Signature]</i>	29.10.86



SECTION A-A

VAR	D	d <sub>1</sub>	k	b	d <sub>2</sub>
00	144	90	118	20	9.5
01	200	90	160	20	18



	002	FLANGE		01	CS-IS2062E250BR		3908
	001	FLANGE		00	CS-IS2062E250BR		1548
REMARKS	KEY NO.	DESCRIPTION	STD	29 31	MATERIAL CODE	45 A	UNIT WEIGHT
65	75 25 27	29	58 59	32 33 46	VAR. MATERIAL SPECN	54 55 56 57 66	71

CARD TYPE-3

28

28

CARD TYPE-1

28

CARD TYPE-2



**BHARAT HEAVY ELECTRICALS LTD.**  
HARDWAR

DRN.	NAME	SIGN	DATE	NO. OF VAR.
CHD.	KB. MUKHERJEE	<i>[Signature]</i>	17.7.86	
APPD.	G. GUPTA	<i>[Signature]</i>	17.7.86	
	A.C.C.	<i>[Signature]</i>	17.11.86	73 74

DEPT. TGE	GRADE OF UNTOLODIM.	SCALE	WEIGHT (KG)	REF. TO ASSY DRG.	ITEM NO.	NO. OF ITEMS
CODE 4233	C/M/F	N.T.S.	SEE TABLE	3-150-00-01037	4 5	-
TITLE			CARD CODE	DRAWING NO.	REV.	
FLANGE			3	4-150-00-01011		
			7	SHEET NO. 1	NO. OF SHEETS. 1	



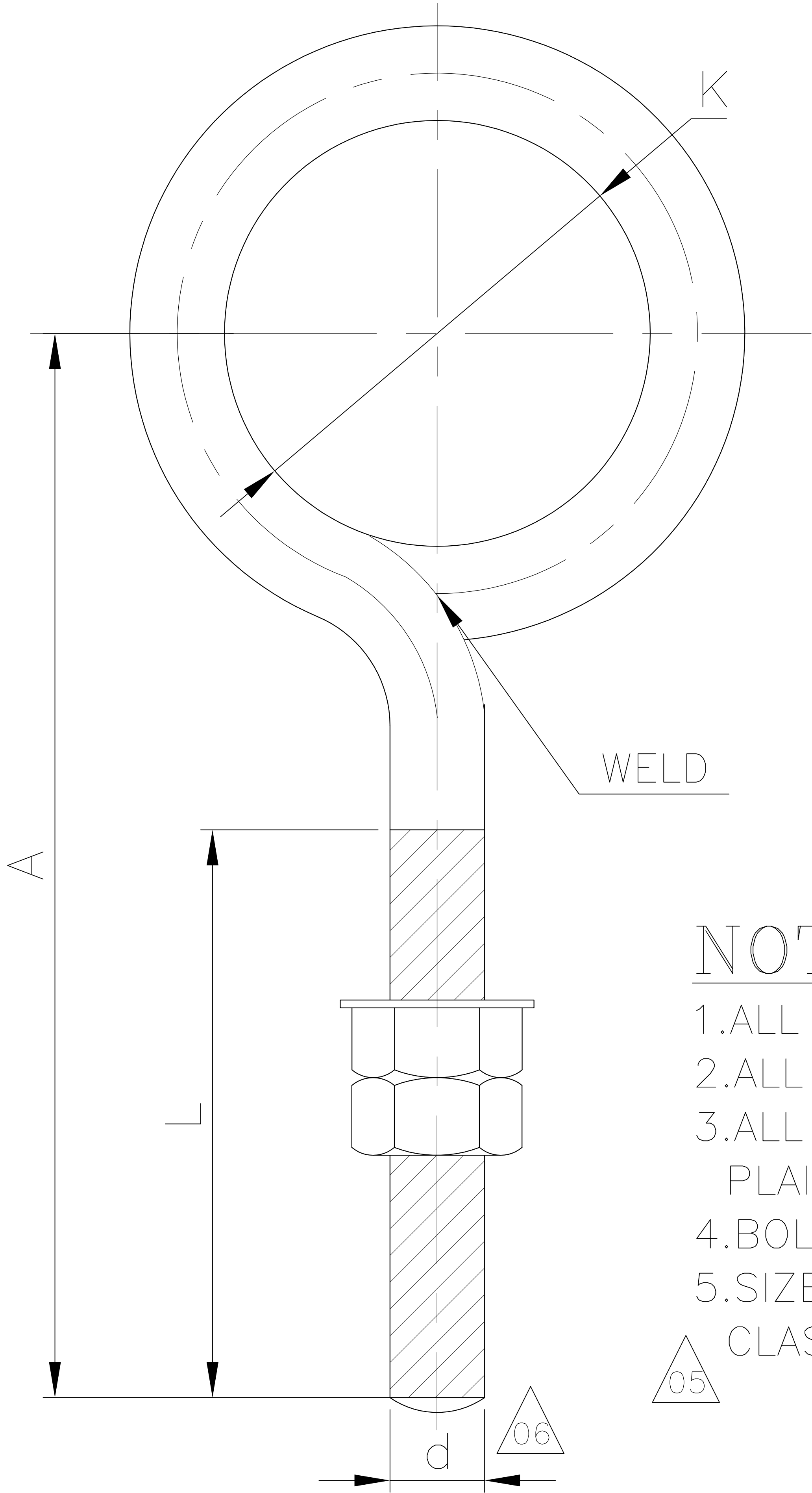
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FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

REV	DATE	ALTERED	KM	REV	DATE	ALTERED	KM	CBOM No.			STATUS OF DRG
06	08.11.19	CHECKED	MA	05	04.06.18	CHECKED	MA	0-150-00-01151			
REVISION MARKED				REVISION MARKED				AGREED DEPT.	NAME	SIGN	DATE
GRADE OF UN				TOL.DIM.M/CG-V/C/M/F.AA0230208				WELDING A/B/C/D AA0621104			
								GAS CUTTING-T3 AA0621101			




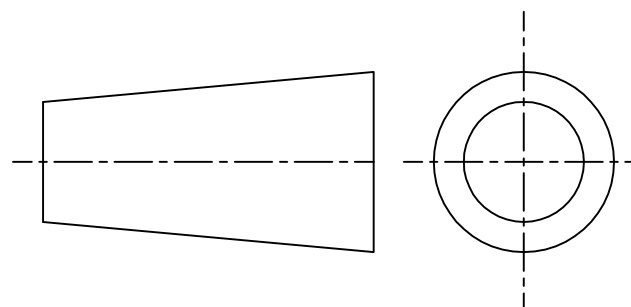
TESTING:—

VAR.	A	L	K	d	F
01	100	60	18	M10	5
02	120	65	22	M12	8
03	130	65	26	M16	12.5
04	145	75	31	M20	20

F—AXIAL PROOF FORCE (KN)

NOTE:—

- 1.ALL DIMENSIONS ARE IN mm.
- 2.ALL STEEL MATERIAL SHALL BE AS PER IS:2062E250BR.
- 3.ALL BOLTS SHALL HAVE NUTS, LOCK NUTS & PLAIN WASHER AS SHOWN.
- 4.BOLT & NUT SHALL CONFORM TO IS : 1363.
- 5.SIZE TOLERANCE AS PER AA0230208 CLASS—COARSE.

REF.DRG.No.		004	EYE BOLT		04	W97415000013			0.30	
		003	EYE BOLT		03	W97415000056			0.20	
		002	EYE BOLT		02	W97415000048			0.15	
		001	EYE BOLT		01	W97415000030			0.10	
SIGN & DATE	REMARKS	ITEM NO.	DECRPTION	STD	VAR	MATERIAL CODE	A	UNIT WEIGHT		
						MATERIAL SPEC.	C			
	<div>BHARAT HEAVY ELECTRICALS LTD HARDWAR</div>						NAME	SIGN	DATE	NO. OF VAR
						DRN	BEDD	sd/-	15.6.93	
						CHD	K.R.GUPTA	sd/-	19.6.93	
						APD	G.GUPTA	sd/-	19.6.93	
INVENTORY No.	DEPT. EME		SCALE	WEIGHT(Kg)		REF.TO ASSY.DRG.			ITEM	No OF ITEMS
	CODE 4133		1:1	SEE TABLE		0-150-00-01151			No. —	
	TITLE						DRAWING No.			
EYE BOLT				4-150-00-01099						
RAPP 3,4 : KAIGA1,2						SHEET No. 1		No.OF SHEETS 1		

VAR.	ROD J SIZE	A	B	H	t	h	d	BOLT SIZE DXL
01	M-10	30	75	53	10	22	14	M12X75
02	M-12	30	75	53	10	22	18	M16X80
03	M-16	32	75	53	10	25	22	M20X85
04	M-20	40	75	53	10	30	24	M22X90

MATERIAL:- IS-2062 E250BR

NOTE:-

1.BEAM ATTACHMENT SHALL BE SUPPLIED COMPLETE WITH BOLT, NUT & PLANE WASHERS (2NOS)

	004	BEAM ATTACHMENT		04	W96415001469			1.80
	003	BEAM ATTACHMENT		03	W96415000969			1.41
	002	BEAM ATTACHMENT		02	W96415000950			1.25
	001	BEAM ATTACHMENT		01	W96415000942			1.15
REMARKS	ITEM NO.	DECRPTION	STD	VAR	MATERIAL CODE	A		UNIT WEIGHT
					MATERIAL SPEC.	C		

BHARAT HEAVY ELECTRICALS LTD  
HARDWAR

	NAME	SIGN	DATE	NO. OF VAR
DRN	AEDD	sd/-	09.04.91	
CHD	K.R.GUPTA	sd/-	09.04.91	
APD	G.GUPTA	sd/-	12.04.91	

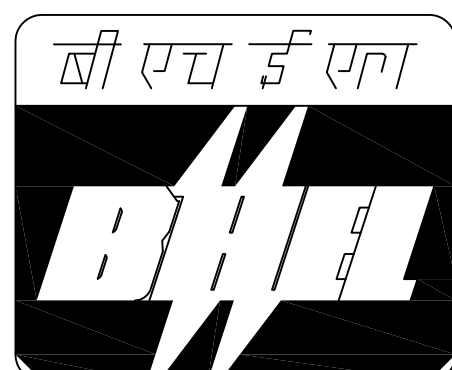
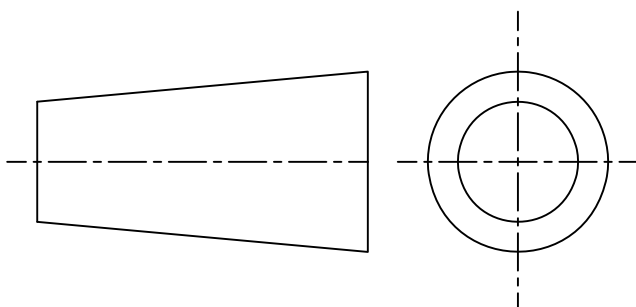
DEPT. EME		SCALE	WEIGHT(Kg)	REF.TO ASSY.DRG.	ITEM No.	No OF ITEMS
CODE 4133		N.T.S	SEE TABLE	0-150-00-01151	-	

TITLE	BEAM ATTACHMENT	DRAWING No.	4-150-00-01101
	RAPP 3,4 : KAIGA1,2	SHEET No. 1	No.OF SHEETS 1

MATERIAL:- IS-2062 E250BR

NOTE: —

1.BEAM ATTACHMENT SHALL BE SUPPLIED COMPLETE WITH BOLT, NUT & PLANE WASHERS (2NOS)

REF.DRG.No.		004	BEAM ATTACHMENT		04	W96415001469			1.80
		003	BEAM ATTACHMENT		03	W96415000969			1.41
		002	BEAM ATTACHMENT		02	W96415000950			1.25
		001	BEAM ATTACHMENT		01	W96415000942			1.15
		000	BEAM ATTACHMENT		00	W96415000940			1.10
SIGN & DATE	REMARKS	ITEM NO.	DESCRIPTION	STD	VAR	MATERIAL CODE	A	UNIT WEIGHT	
						MATERIAL SPEC.	C		
	<div>BHARAT HEAVY ELECTRICALS LTD HARDWAR</div>					NAME	SIGN	DATE	NO. OF VAR
						DRN	AEDD	sd/-	
CHD						K.R.GUPTA	sd/-	09.04.91	
					APD	G.GUPTA	sd/-	12.04.91	
INVENTORY No.	DEPT. EME		SCALE	WEIGHT(Kg)	REF.TO ASSY.DRG.			ITEM No.	No OF ITEMS
	CODE 4133		N.T.S	SEE TABLE	0-150-00-01151			-	
	TITLE BEAM ATTACHMENT RAPP 3,4 : KAIGA1,2					DRAWING No. 4-150-00-01101			
					SHEET No. 1		No.OF SHEETS 1		



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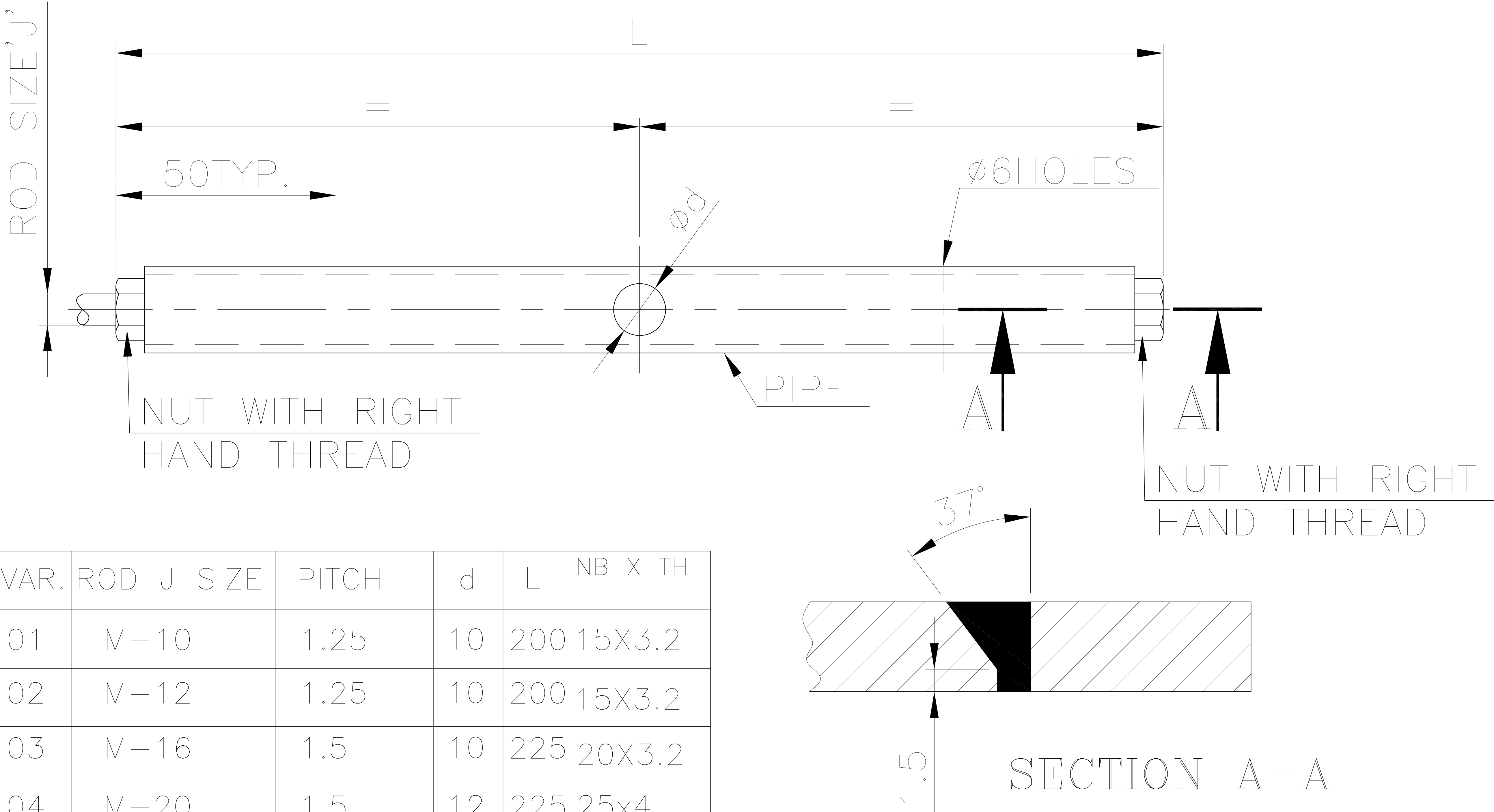
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FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

REV	DATE	ALTERED	REV	DATE	ALTERED	PAB	CBOM No.			STATUS OF DRG	
		CHECKED	01	17.11.99	CHECKED	KRG	0-150-00-01151				
							AGREED DEPT.	NAME	SIGN		DATE

GRADE OF UN			TOL.DIM.V/C/M/F.AA0230208			WELDING A/B/C/D AA0621104			GAS CUTTING T3 AA0621104	
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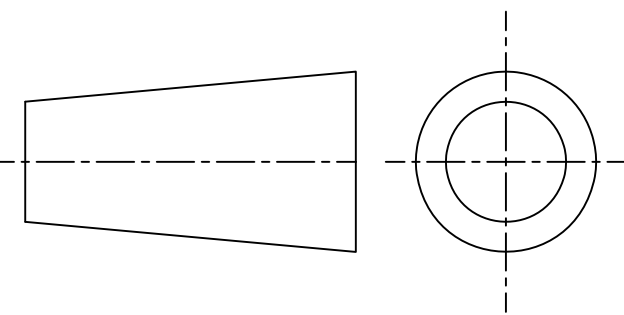


VAR.	ROD J SIZE	PITCH	d	L	NB X TH
01	M-10	1.25	10	200	15X3.2
02	M-12	1.25	10	200	15X3.2
03	M-16	1.5	10	225	20X3.2
04	M-20	1.5	12	225	25x4

MATERIAL:- PIPE C.S AS PER IS:1239 PART 1  
NUT C.S TO IS 1364 CLASS 8.8

NOTE:-

- 1.TO BE GALVANISED AS PER IS:1367 (PART XIII), THICKNESS OF COATING 15μ.
2. WELD TO BE D.P. TESTED AS PER ASME SECTION VIII

24.04.91 SIGN & DATE	REF.DRG.No.		004	TURN BUCKLE		04	W96415001434			0.80	
			003	TURN BUCKLE		03	W96415000934			0.60	
			002	TURN BUCKLE		02	W96415000926			0.50	
			001	TURN BUCKLE		01	W96415000918			0.50	
Et1-15373 INVENTORY No.	REMARKS	ITEM NO.	DECRPTION	STD	VAR	MATERIAL CODE		A	UNIT WEIGHT		
						MATERIAL SPEC.		C			
<div>BHARAT HEAVY ELECTRICALS LTD HARDWAR</div>						DRN	AEDD	sd/-	09.04.91	NO. OF VAR	
CHD	K.R.GUPTA	sd/-	09.04.91								
APD	G.M.K	sd/-	12.04.91								
DEPT. EME			SCALE	WEIGHT(Kg)		REF.TO ASSY.DRG.			ITEM No.	No OF ITEMS	
CODE 4133			N.T.S	SEE TABLE		0-150-00-01151					
TITLE				TURN BUCKLE				DRAWING No.			
				RAPP 3,4 : KAIGA1,2				4-150-00-01103			
								SHEET No. 1		No.OF SHEETS	1

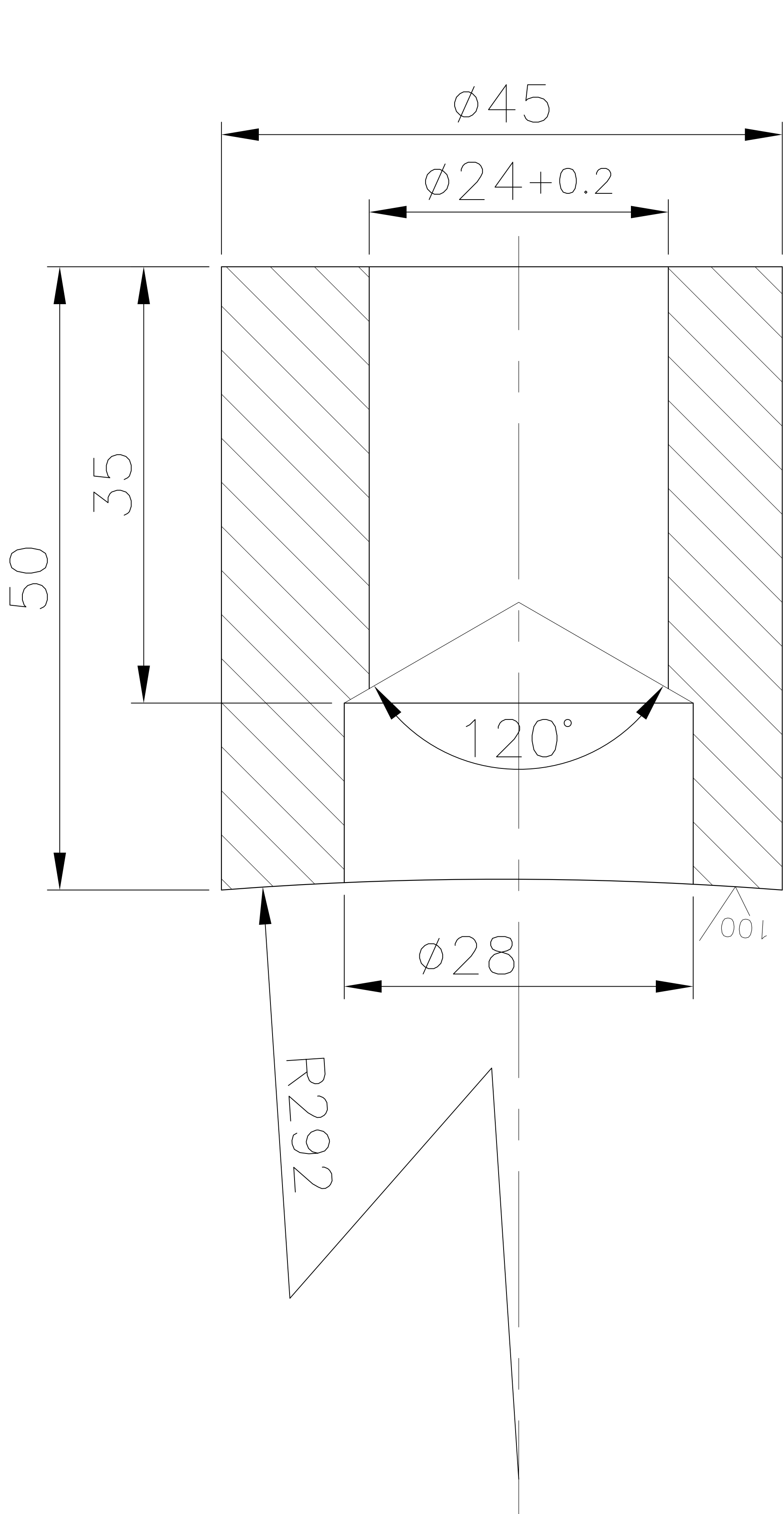
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FIRST ANGLE PROJECTION

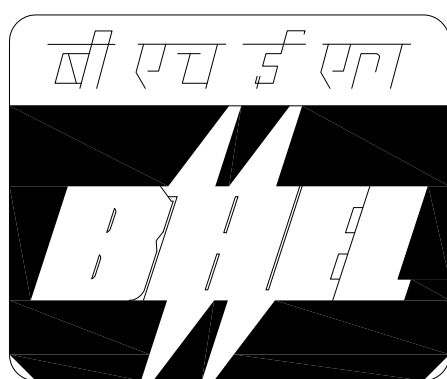
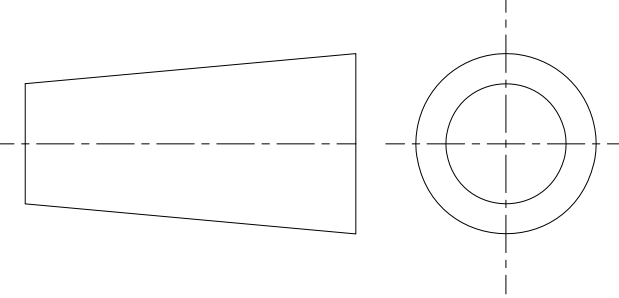
(ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

REVDATE	ALTERED	REVDATE	ALTERED	KBM	CBOM No.			STATUS OF DRG
	CHECKED	02	13.12.08	CHECKED NV	9-150-00-01002			
		CH.AD.NO.TGE-08-F0330			AGREED DEPT.	NAME	SIGN	DATE
					W.T	ROY	sd/-	3.2.92
GRADE OF UNTOL.DIM.M/CG- <del>V</del> /C/ <del>X</del> / <del>F</del> .AA0230208		WELDING A/B/C/D AA0621104			GAS CUTTING-T3 AA0621101			



T.R

1. IDENTIFICATION AS PER HW0400397.
2. RADIUS R-292 SHOULD BE MADE DURING ASSLY. MATCHING WITH THE JOB.

28/04/92 SIGN & DATE	REF.DRG.No.										
	T.R										
	1. IDENTIFICATION AS PER HW0400397.										
	2. RADIUS R-292 SHOULD BE MADE DURING ASSLY. MATCHING WITH THE JOB.										
28/04/92 SIGN & DATE	PURCHASED	001	CONNECTION			MATERIAL AS PER BOM				0.500	
					00						
	REMARKS	ITEM NO.	DECRPTION	STD	VAR	MATERIAL CODE		A		UNIT WEIGHT	
						MATERIAL SPEC.		C			
	<div>BHARAT HEAVY ELECTRICALS LTD HARDWAR</div>						NAME	SIGN	DATE	NO. OF VAR	
						DRN	KAPOOR	sd/-	12.08.91		
						CHD	K.R.GUPTA	sd/-	12.08.91		
						APD	G.M.K	sd/-	16.04.92		
	Et1-16068 INVENTORY No.	DEPT. EME		SCALE	WEIGHT(Kg)		REF.TO ASSY.DRG.			ITEM	No OF ITEMS
		CODE 4133		1:1	0.500		3-150-00-01185			No. 006	
TITLE					DRAWING No.						
CONNECTION					4-150-00-01118						
					SHEET No. 1					No.OF SHEETS	1



RIGHT HAND THREAD

LEFT HAND THREAD

12.5/▽ ALL OVER

d1

d2

l1

l2

l3

VAR	d1	d2	PITCH	l1	l2	l3	wt.in Kg	MATERIAL CODE
00	M12	M12	1.25	250	80	130	0.200	W96415001922
01	M16	M16	1.5	250	80	130	0.300	W96415001930
02	M20	M20	1.5	250	80	130	0.500	W96415001949

1.TIE ROD TO BE GALVANISED WITH MIN. THICKNESS 15 MICRONS.

SUPER SEEDS OLD DRAWING  
UNDER SAME NUMBER

[illegible]

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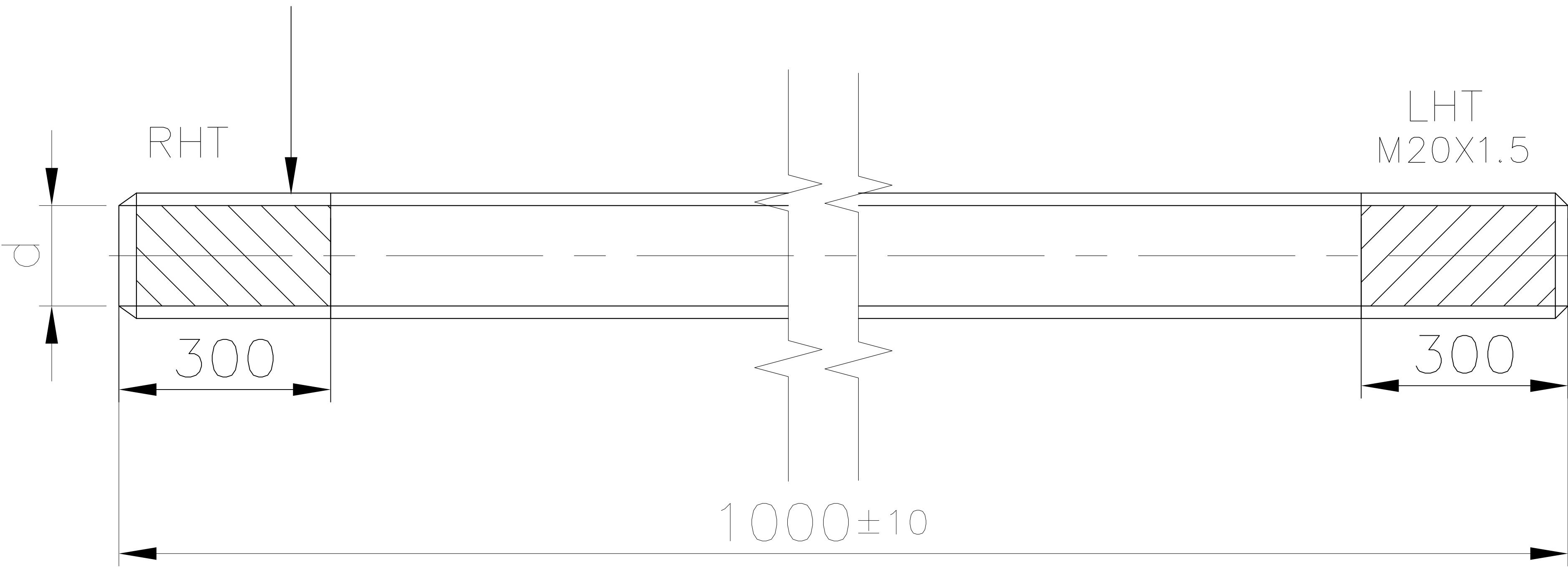
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

REV	DATE	ALTERED	REV	DATE	ALTERED	PAB	CBOM No.			STATUS OF DRG
		CHECKED	03	20.11.01	CHECKED	RLV	0-150-00-01125			
			CH.AD.NO.TGE-01-529				AGREED DEPT.	NAME	SIGN	DATE
							GTX	SCGOYAL	sd/-	23/7/92
GRADE OF UNTOL.DIM.V/C/M/F.AA0230208				WELDING A/B/C/D-AA0621104			GAS CUTTING-T3 AA0621101			

12.5 / THE REST

THIS END IS OF M16X1.5 WHILE ASSEMBLY WITH HANGER WITH DRG NO.41500001198 AND OF M20X1.5 WHILE ASSEMBLY WITH HANGER WITH DRG NO. 41500001199.  
FOR ASSEMBLY DRG. PLEASE REFER DRG NO. 11500001019, 21500001043, 21500001044, 21500001045, 21500001046


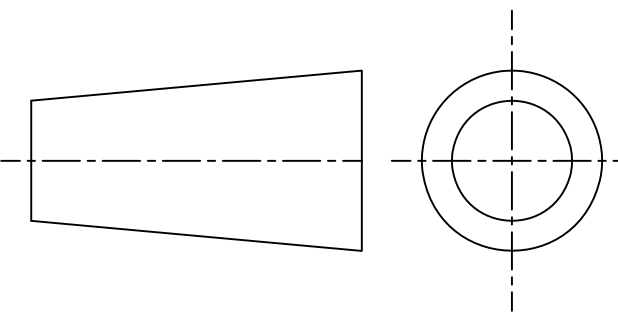


VARIANT TABLE

VAR.	SIZE d	WEIGHT (KG)	MATERIAL CODE
00	M12X1.25	0.725	W96415001957
01	M16X1.5	1.330	W96415001965
02	M20X1.5	2.080	W96415001973

TECH. REQ.

1. THREADED ROD TO BE GALVANISED AS PER IS: 1367 (PART XIII), THICKNESS OF COATING 15μ

	001	THREADED ROD			CS-IS2062E250BR		SEE	TABLE	
				01					
REMARKS	ITEM NO.	DECRPTION	STD	VAR	MATERIAL CODE	A	UNIT WEIGHT		
					MATERIAL SPEC.	C			
<div></div> <div>BHARAT HEAVY ELECTRICALS LTD HARDWAR</div>					NAME	SIGN	DATE	NO. OF VAR	
				DRN	KAPOOR	sd/-	13.04.92		
				CHD	K.R.GUPTA	sd/-	13.04.92		
				APD	G.M.K	sd/-	10.04.92		
DEPT. EME		SCALE	WEIGHT(Kg)	REF.TO ASSY.DRG.			ITEM	No OF ITEMS	
CODE 4133		N.T.S	SEE TABLE	0-150-00-01125			No. -		
TITLE					DRAWING No.				
THREADED ROD					4-150-00-01131				
					SHEET No. 1		No.OF SHEETS		1



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KUN 664.51  
REF.DRG.No.

SIGN & DATE

Et1-16337  
INVENTORY No.

FIRST ANGLE PROJECTION

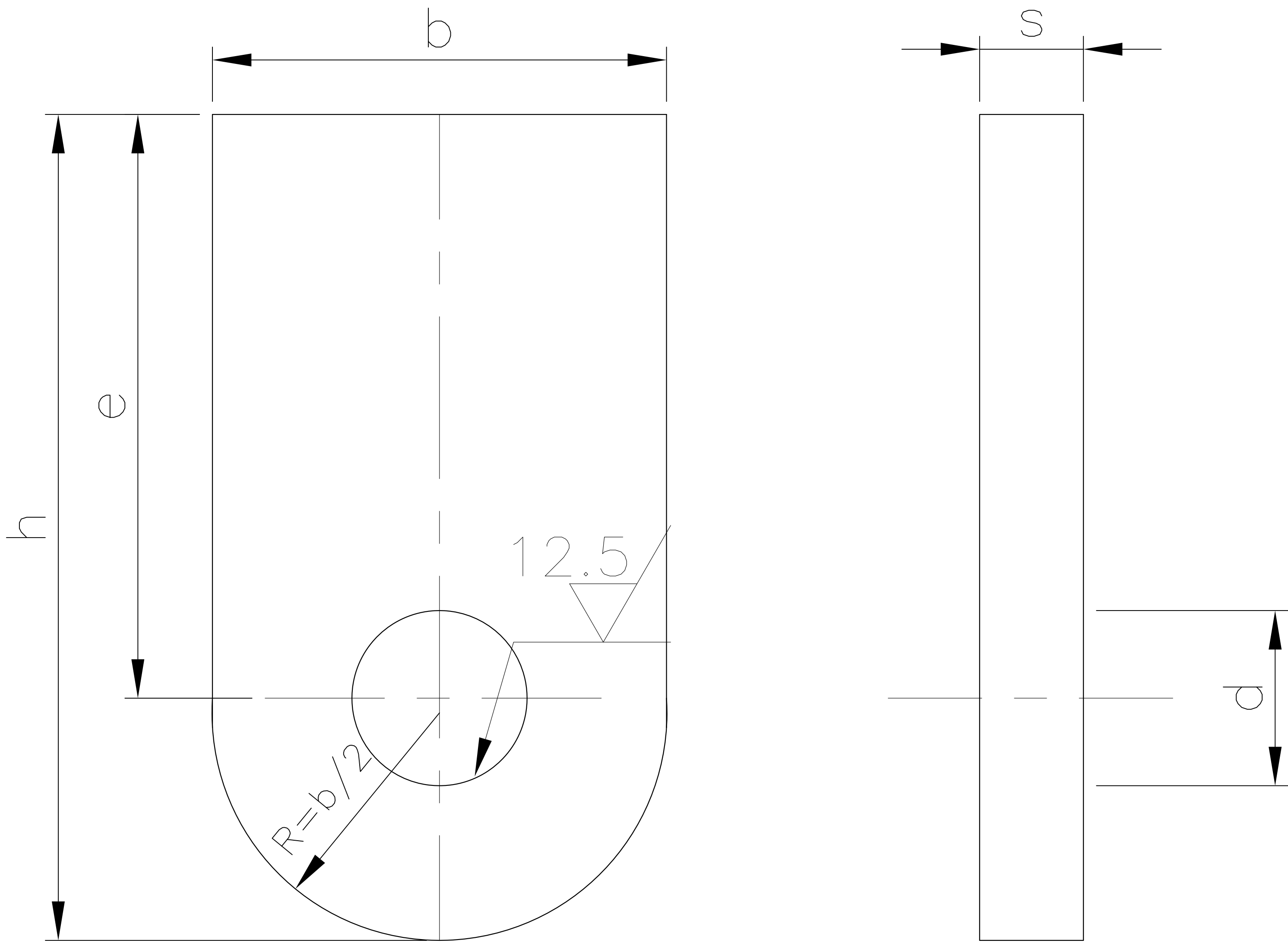
(ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

REV	DATE	ALTERED	REV	DATE	ALTERED	PNM	SD/-	CBOM No.			STATUS OF DRG
		CHECKED	01	1.03.07	CHECKED	KN	SD/-	0-150-00-01125			
			CHANGE ADVICE NO. TGE-07-F0043					AGREED DEPT.	NAME	SIGN	DATE
GRADE OF UNTOL.DIM.M/CG- <del>V</del> /C/ <del>M</del> /F.AA0230208			<del>WELDING A/B/C/D AA0621104</del>					GAS CUTTING-T3 AA0621101			

GRADE OF UNTOL.DIM.M/CG-V/C/M/F.AA0230208

WELDING A/B/C/D AA0621104

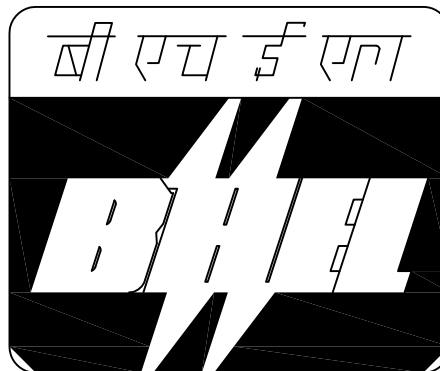
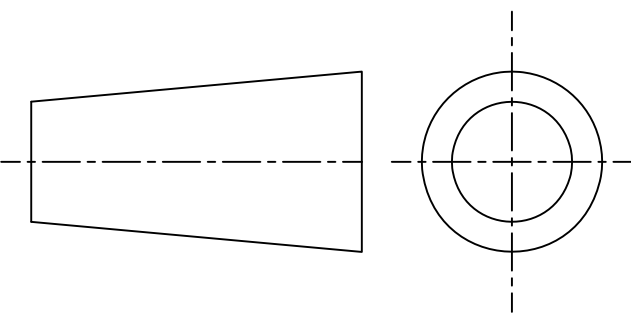
GAS CUTTING-T3 AA0621101



50  
THE REST

VARIANT TABLE

VAR.	SIZE	d	b	h	e	s	WT.IN Kg.	MATERIAL CODE
00	12	13.5	35	67	45	8	0.11	W96415001981
01	16	17.5	45	78	50	10	0.19	W96415001990
02	20	21.5	60	92	55	12	0.35	W96415002007

	001	WELDING EYE			CS-IS2062E250BR				
				01					
REMARKS	ITEM NO.	DECRPTION	STD	VAR	MATERIAL CODE	A	UNIT WEIGHT		
					MATERIAL SPEC.	C			
 BHARAT HEAVY ELECTRICALS LTD HARDWAR					NAME	SIGN	DATE	NO. OF VAR	
				DRN	KAPOOR	sd/-			
				CHD	K.R.GUPTA	sd/-	13.01.92		
				APD	G.M.K	sd/-	10.08.92		
DEPT. EME		SCALE	WEIGHT(Kg)		REF.TO ASSY.DRG.			ITEM No.	No OF ITEMS
CODE 4133		1:1	SEE TABLE		0-150-00-01125				
TITLE						DRAWING No.			
WELDING EYE						4-150-00-01132			
				SHEET No. 1		No.OF SHEETS 1			

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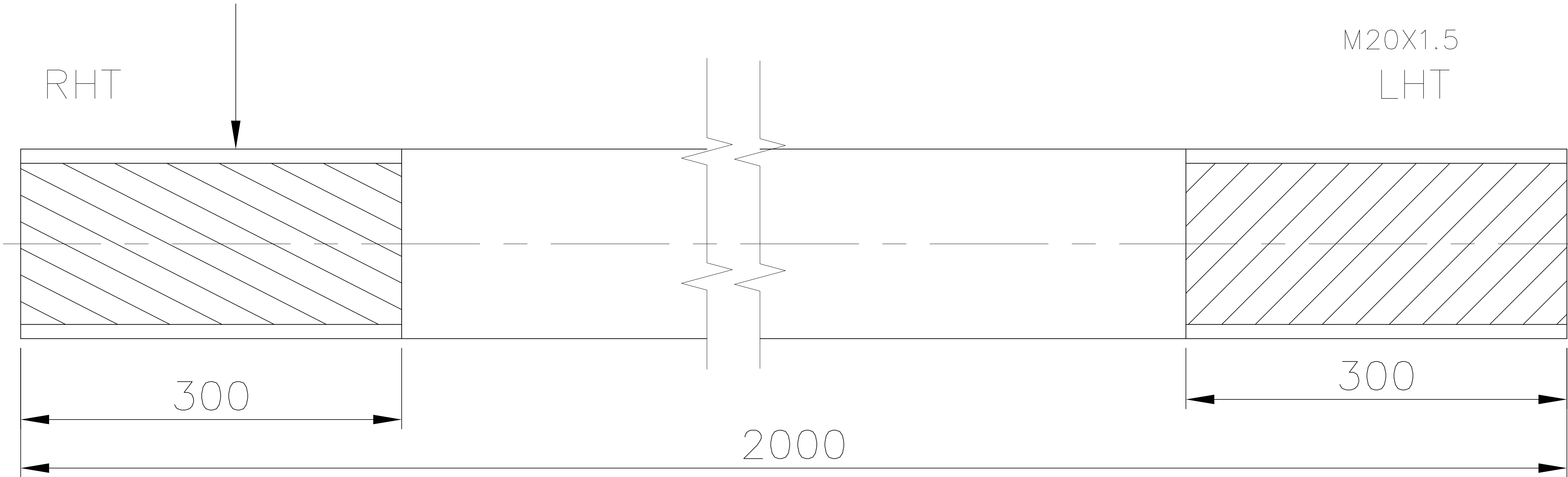
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FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

REVDATE ALTERED KM	REVDATE ALTERED PAB	CBOM No.			STATUS OF DRG
02 06.04.18 CHECKED MA	01 17.11.91 CHECKED KRG	0-150-00-01205			
REVISION MARKED	CH.AD.NO.TGE-99-415	AGREED DEPT.	NAME	SIGN	DATE
GRADE OF UNTOL.DIM.M/CG-X/C/M/F.AA0230208		WELDING A/B/C/D AA0621104		GAS CUTTING-T3 AA0621104	

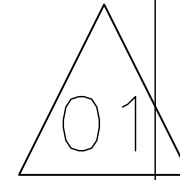

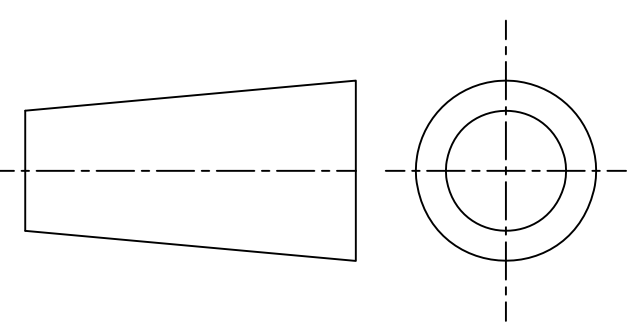
THIS END IS OF M16X1.5 WHILE ASSEMBLY WITH HANGER WITH DRG NO.41500001198 AND OF M20X1.5 WHILE ASSEMBLY WITH HANGER WITH DRG NO. 41500001199.  
FOR ASSEMBLY DRG. PLEASE REFER DRG NO. 11500001019, 21500001043, 21500001044, 21500001045, 21500001046



TECH. REQ.

1. IDENTIFICATION AS PER HW 0400.397.  
2. TO BE GALVANISED AS PER IS :1367 (PART XIII), THICKNESS OF COATING 15μ

PURCHASED

PURCHASED	001	ROD (M20X2000)			W96415002325			5.600	
				01	CS:IS2062E250BR				
REMARKS	ITEM NO.	DECRPTION	STD	VAR	MATERIAL CODE	A		UNIT WEIGHT	
					MATERIAL SPEC.	C			
 BHARAT HEAVY ELECTRICALS LTD HARDWAR						NAME	SIGN	DATE	NO. OF VAR
					DRN	EDC	sd/-	24.08.95	
					CHD	K.R.G/G.G	sd/-	14.09.95	
					APD	G.GUPTA	sd/-	18.10.95	
DEPT. EME		SCALE	WEIGHT(Kg)		REF.TO ASSY.DRG.			ITEM No. 052 08	No OF ITEMS
CODE 4133		N.T.S	5.600		0-150-00-01205				
TITLE					DRAWING No.				
TIE ROD (M20X2000)					4-150-00-01176				
TG-HW-0500-2					SHEET No. 1		No.OF SHEETS		



Technical drawing of a mechanical part, showing front and side views with dimensions and annotations.

**Front View (Left):**

- Overall height:  $\sim 120$
- Top width:  $75$
- Bottom width:  $150$
- Bottom right corner radius:  $R415$
- Bottom right corner thickness:  $15$
- Central circular hole:  $\phi 25$
- Top left corner chamfer:  $1.2.5$
- Bottom left corner chamfer:  $100$

**Side View (Right):**

- Overall height:  $150$
- Top width:  $20$
- Bottom width:  $20$
- Central circular hole:  $\phi 25$
- Top right corner chamfer:  $100$

**Annotations:**

- HOLES  $\phi 25$
- ALL REST

1. IDENTIFICATION AS PER HW 0400.397

[illegible]

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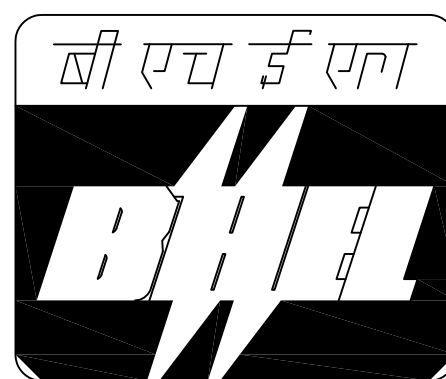
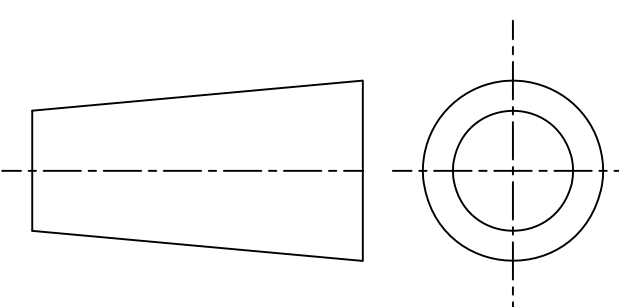
Technical drawing of a long cylindrical part with a break in the middle. The drawing shows a side view of a cylinder with a dashed centerline. A break symbol (two zig-zag lines) is used to indicate that the part is longer than shown. Dimension lines indicate a total length of  $2000 \pm 10$  and a diameter of M20. Below the drawing, the text "THREAD TYPE — RHT M20X1.5" is written.

THREAD TYPE — RHT M20X1.5

TECH. REQ.

1. IDENTIFICATION AS PER HW 0400.397.
2. TO BE GALVANISED AS PER IS :1367 (PART XIII), THICKNESS OF COATING 15μ

PURCHASED

PURCHASED	001	ROD (M20X2000)			W96415002333			4.160	
				01	CS:IS2062E250BR				
REMARKS	ITEM NO.	DECRPTION	STD	VAR	MATERIAL CODE	A	UNIT WEIGHT		
					MATERIAL SPEC.	C			
<div>BHARAT HEAVY ELECTRICALS LTD HARDWAR</div>						NAME	SIGN	DATE	NO. OF VAR
					DRN	EDC	sd/-	22.08.95	
					CHD	K.R.G/G.G	sd/-	14.09.95	
					APD	G.GUPTA	sd/-	18.10.95	
DEPT. EME		SCALE	WEIGHT(Kg)		REF.TO ASSY.DRG.			ITEM	No OF ITEMS
CODE 4133		1:1	4.160		0-150-00-01205			No. 056 05	
TITLE THREADED ROD (M20X2000)						DRAWING No. 4-150-00-01178			
TG-HW-0500-2						SHEET No. 1		No.OF SHEETS	1



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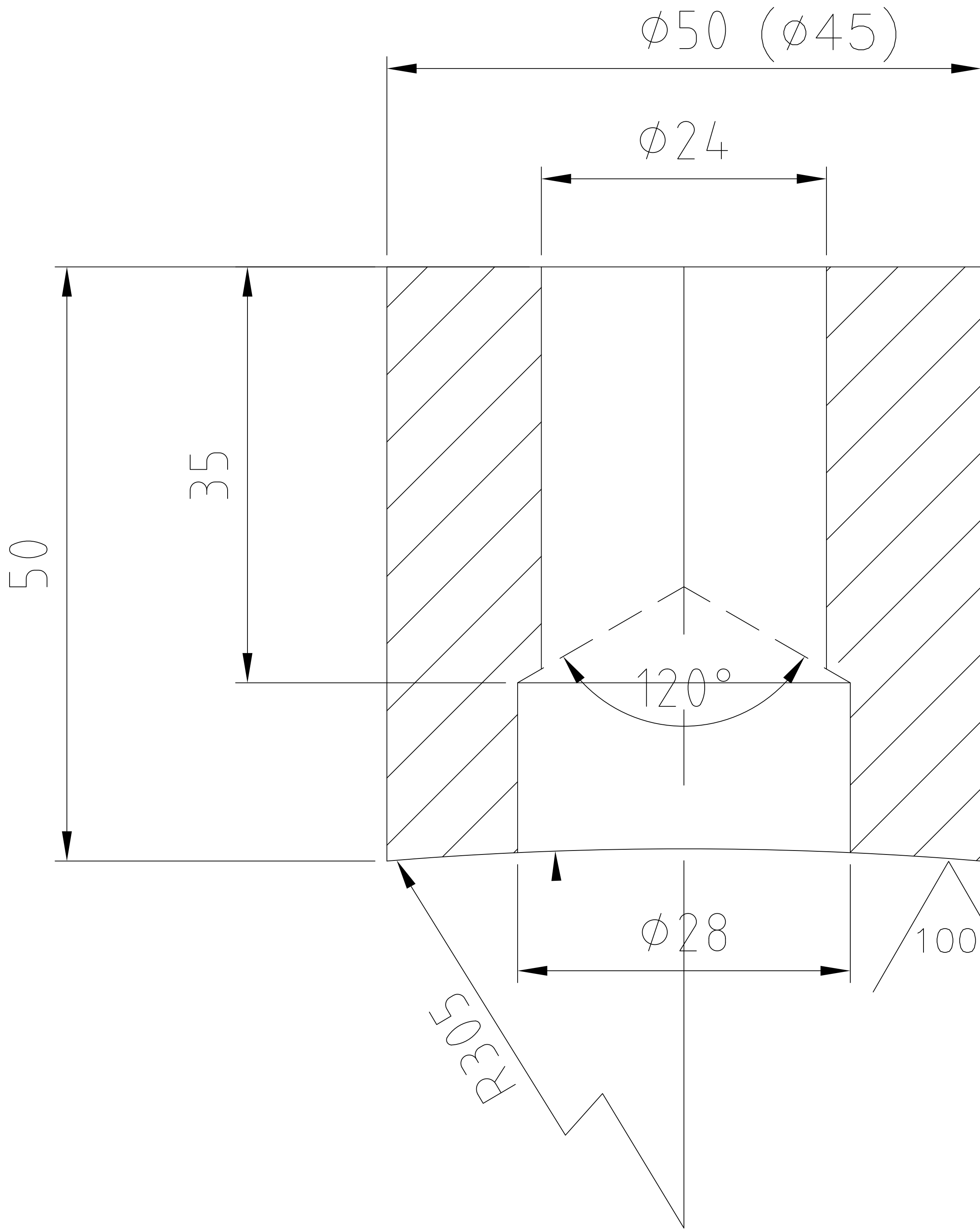
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FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

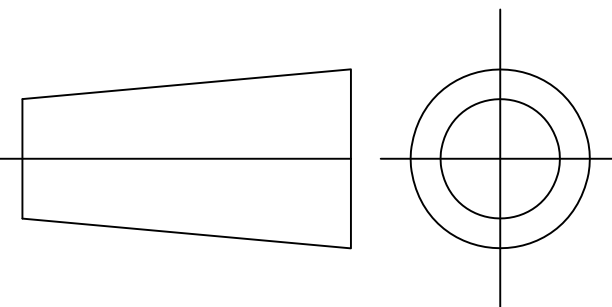
REV	DATE	ALTERED	REV	DATE	ALTERED	PNM	SD/-	CBOM No. 01500001212		STATUS OF DRG	
		CHECKED			CHECKED						
			02	19.05.07		KN	SD/-				
			CHANGE AD.NO.TGE-07-F0107					AGREED DEPT.	NAME	SIGN	DATE
								WT	RSC	SD/-	28.01.97
GRADE OF UNTOL.DIM.M/CG- <del>V</del> /C/ <del>M</del> /F.AA0230208				<del>WELDING A/B/C/D</del> AA0621104				GAS CUTTING-T3 AA0621101			

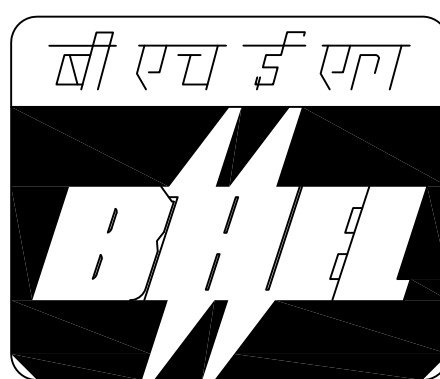
12.5  
ALL OVER



TECH.REQI.

- 1. IDENTIFICATION ACCORDING TO HW 0400.397
- 2. DIM. IN BRACKET ARE AFTER MACHINING.

INVENTORY No.	DEPT. EME			SCALE	WEIGHT(Kg)	REF.TO ASSY.DRG.		ITEM No.	No OF ITEMS	
	CODE 4133			1:1		0.500	21500001039			003
	TITLE						DRAWING No.			
	CONNECTION						415000001182			
						SHEET No		No.OF SHEETS		

SIGN & DATE		BHARAT HEAVY ELECTRICALS LTD HARDWAR		NAME	SIGN	DATE	NO. OF VAR
			DRN	P.N.MOURYA	Sd/-	28.04.07	
			CHD	K.N	Sd/-	28.04.07	
			APD	A.K.M	Sd/-	19.05.07	

REF.DRG.No.

TECH.REQI.

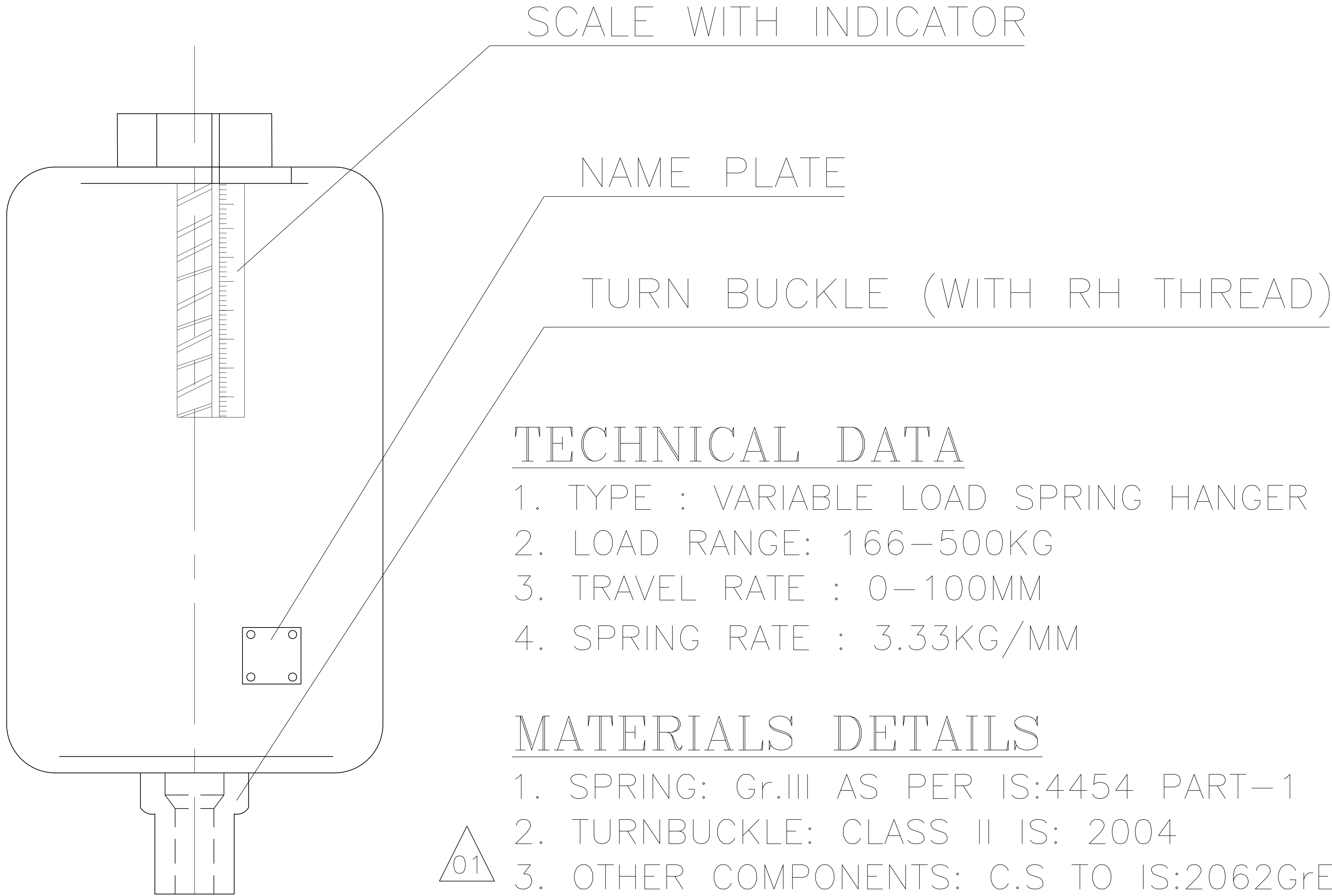
1. IDENTIFICATION ACCORDING TO HW 0400.397  
2. DIM. IN BRACKET ARE AFTER MACHINING.

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FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

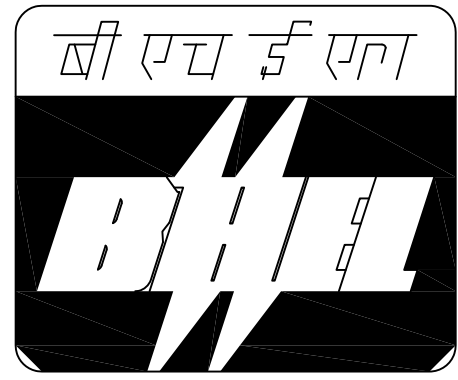
REV	DATE	ALTERED		REV	DATE	ALTERED		CBOM No.		STATUS OF DRG			
		CHECKED		01	06.04.18	CHECKED		—					
				REVISION				MARKED	AGREED DEPT.	NAME	SIGN	DATE	
GRADE OF UN					TOL.DIM.M/CG—V/C/M/F.AA0230208					WELDING A/B/C/D AA0621104			GAS CUTTING—T3 AA0621101



NOTE:—  
THE DIMENSION 300 CORRESPONDS TO ZERO COMPRESSION OF THE SPRING.  
THIS DIMENSION SHALL GET EXTENDED ACCORDING TO THE LOAD ON THE SPRING CAGE

- TESTING REQUIREMENTS
- 1. STATIC LOAD TESTING OF SPRING AS PER IS:7906 PART–II
  - 2. SPRING RATE CHECKING
  - 3. MATERIAL TEST (CHEMICAL COMP.) OF SPRING
  - 4. MATERIAL TEST FOR TURNBUCKLE
  - 5. TEST CERTIFICATES FOR 1,2,3,4 TO BE FURNISHED
- PAINTING REQUIREMENTS
- 1. ALL PARTS EXCEPT SPRING SHALL BE COATED WITH RED OXIDE PRIMER
  - 2. THE COMPLETE SPRING HANGER TO BE COATED WITH 2COATS OF DARK ADMIRALTY GREY PAINT
  - 3. SPRING SURFACE TO BE MANGANESE PHOSPHATED AND OIL DIPPED

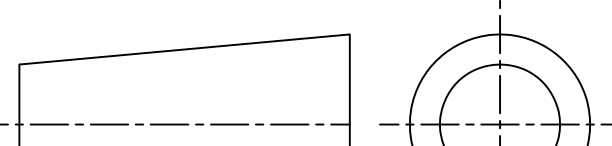
PURCHASED W96415002481



BHARAT HEAVY ELECTRICALS LTD  
HARDWAR

	NAME	SIGN	DATE	NO. OF VAR
DRN	KB MUKHERJEE	sd/—	16.11.99	
CHD	K.R.GUPTA	sd/—	16.11.99	
APD	G.GUPTA	sd/—	16.11.99	

INVENTORY No.

DEPT. EME		SCALE	WEIGHT(Kg)	REF.TO ASSY.DRG.	ITEM No.	No OF ITEMS
CODE 4133		N.T.S	6.5		—	
TITLE				DRAWING No.		
SPRING HANGER				4—150—00—01198		
500MW				SHEET No. 1		No.OF SHEETS 1

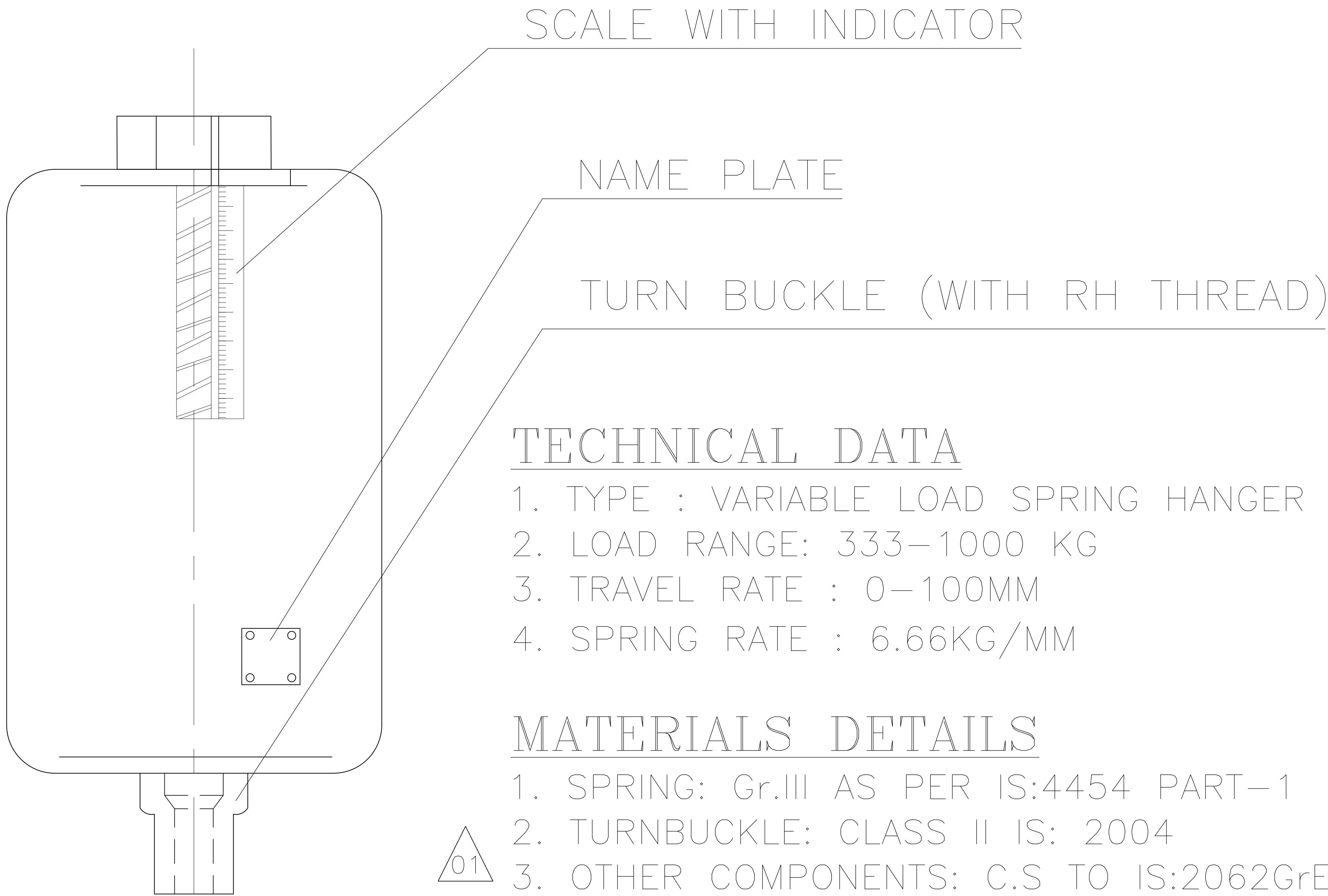


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FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

REV	DATE	ALTERED		REV	DATE	ALTERED		CBOM No.		STATUS OF DRG	
		CHECKED		01	06.04.18	CHECKED		—			
				REVISION MARKED				AGREED DEPT.	NAME	SIGN	DATE
GRADE OF UN					TOL.DIM.M/CG—V/C/M/F.AA0230208			WELDING A/B/C/D AA0621104		GAS CUTTING—T3 AA0621101	



TECHNICAL DATA

- 1. TYPE : VARIABLE LOAD SPRING HANGER
- 2. LOAD RANGE: 333–1000 KG
- 3. TRAVEL RATE : 0–100MM
- 4. SPRING RATE : 6.66KG/MM

MATERIALS DETAILS

- 1. SPRING: Gr.III AS PER IS:4454 PART–1
- 2. TURNBUCKLE: CLASS II IS: 2004
- 3. OTHER COMPONENTS: C.S TO IS:2062GrE250BR

TESTING REQUIREMENTS

- 1. STATIC LOAD TESTING OF SPRING AS PER IS:7906 PART–II
- 2. SPRING RATE CHECKING
- 3. MATERIAL TEST (CHEMICAL COMP.) OF SPRING
- 4. MATERIAL TEST FOR TURNBUCKLE
- 5. TEST CERTIFICATES FOR 1,2,3,4 TO BE FURNISHED

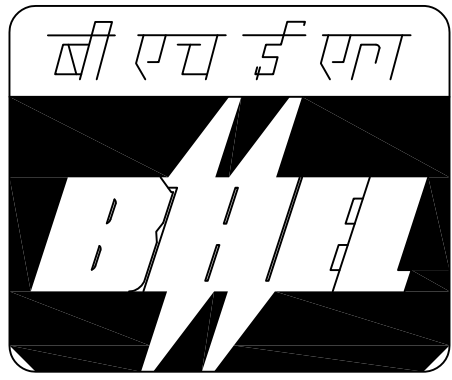
PAINTING REQUIREMENTS

- 1. ALL PARTS EXCEPT SPRING SHALL BE COATED WITH RED OXIDE PRIMER
- 2. THE COMPLETE SPRING HANGER TO BE COATED WITH 2COATS OF DARK ADMIRALTY GREY PAINT
- 3. SPRING SURFACE TO BE MANGANESE PHOSPHATED AND OIL DIPPED

NOTE:—

THE DIMENSION 300 CORRESPONDS TO ZERO COMPRESSION OF THE SPRING.  
THIS DIMENSION SHALL GET EXTENDED ACCORDING TO THE LOAD ON THE SPRING CAGE

PURCHASED W96415002490

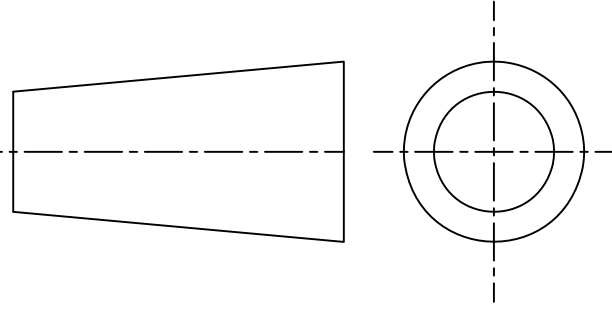


BHARAT HEAVY ELECTRICALS LTD  
HARDWAR

	NAME	SIGN	DATE	NO. OF VAR
DRN	KB MUKHERJEE	sd/—	16.11.99	
CHD	K.R.GUPTA	sd/—	16.11.99	
APD	G.GUPTA	sd/—	16.11.99	

INVENTORY No.

DEPT. EME  
CODE 4133



SCALE  
N.T.S

WEIGHT(Kg)  
13.5

REF.TO ASSY.DRG.

ITEM No.  
—  
No OF ITEMS

TITLE  
SPRING HANGER

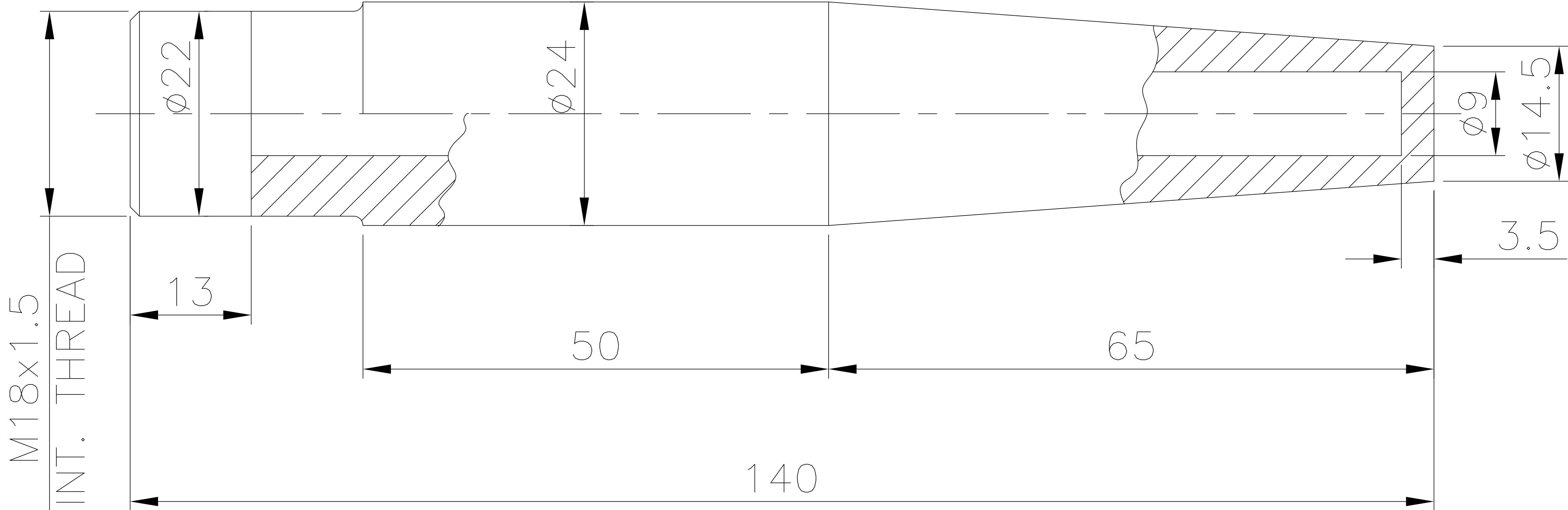
DRAWING No.  
4–150–00–01199

SHEET No. 1 | No.OF SHEETS 1

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FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

REV	DATE	ALTERED	AKA2	sd/-	REV	DATE	ALTERED	K.B.M.	sd/-	CBOM No.			STATUS OF DRG
06	17.03.15	CHECKED	GC	sd/-	05	24.11.10	CHECKED	N.V.	sd/-	0-153-14-01001			
CHANGE ADVICE DONE AS PER CHANGE ADVICE NO. TGE-15-F0080.					CHANGE ADVICE DONE AS PER CHANGE ADVICE NO. TGE-10-F0304					AGREED DEPT.	NAME	SIGN	DATE
										EMT	SC GOYAL	sd/-	06.04.83
GRADE OF UNTO L.DIM.M/CG-V/C/M/F.AA0230208						WELDING A/B/C/D AA0621104				GAS CUTTING-T3 AA0621101			



NOTE;

1. HYDRAULIC TEST AND MATERIAL TEST CERTIFICATES SHALL BE SUPPLIED
2. VENDOR TO ENGRAVE MATERIAL CODE & DRAWING NO. WITH REV. NO. ON THE THERMOWELL

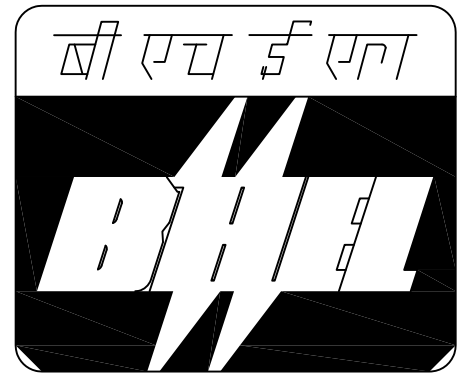
MATERIAL: AS PER BOM

TEST PRESSURE: 15 Kg/cm2, DURATION: 2 MIN.

MATERIAL CODE: W96415300814

SUPERSEDES OLD DRAWING UNDER  
THE SAME NUMBER

PURCHASED



BHARAT HEAVY ELECTRICALS LTD  
HARDWAR

	NAME	SIGN	DATE	NO. OF VAR
DRN	B.D. SINGH	sd/-	09.04.81	
CHD	G. GUPTA	sd/-	15.02.83	
APD	D.R.C./N.P.G.	sd/-	12.05.83	

INVENTORY No.	DEPT. TGE		SCALE	WEIGHT(Kg)	REF.TO ASSY.DRG.	ITEM No.	No OF ITEMS	
	CODE 4233		1:1	0.400	2-153-14-01012	008	001	
	TITLE THERMOWELL				DRAWING No.			
					4-153-14-01027			
				SHEET No.1	No.OF SHEETS 1			





# CORPORATE STANDARD

AA7151112

Rev. No. 05

PAGE 1 of 3

## NUTS HEXAGON, PRODUCT Gr.B, COARSE PITCH, STEEL, PROPERTY CLASS 6 (M20-M36)

### 1.0 DESIGNATION

A Product Gr.B hexagon, steel nut, thread M24, coarse pitch and conforming to property class 6 shall be designated as:

#### 1.1 On drawings

- i) Material specification column : AA7151112
- ii) Description column : NUT HEX B M24 – 6

#### 1.2 On indents

Nut Hex B M24 – 6; AA7151112

#### 1.3 For issuing enquiries and on purchase orders

While issuing enquiries and purchase orders, delete BHEL standard number from above description and add the information given under clause 2.0

### 2.0 COMPLIANCE WITH STANDARDS

#### 2.1 Dimensions, Tolerances and General Requirements

As per IS: 1364, Part 3–2002, Reaffirmed 2007

#### 2.2 Mechanical properties

To conform to property class 6, as specified in Table-5&6 of IS: 1367, Part 6

#### 2.3 Threads

- Pitch - Coarse to IS: 4218, Part 2
- Tolerance quality - Medium
- Tolerance class - 6H

#### 2.4 Identification Marking

As stated in clause 9 of IS: 1367, Part 6

#### 2.5 Finish

As specified in BHEL order.

Revisions:  
As per clause 32.2 of MOM of MRC-F

**APPROVED:**  
INTERPLANT MATERIAL RATIONALISATION  
COMMITTEE – MRC (F)

Rev. No. 05	Amd. No.	Reaffirmed	Prepared	Issued	Dt. of 1 <sup>st</sup> Issue
Dt: 06-09-2014	Dt:	Year:	HPEP, Hyderabad	Corp. R&D	01-01-1977

**3.0 NOTE**

- 3.1 For nut, hexagon, brass product Gr.A, coarse pitch, (M1.6-M16) refer BHEL standard AA7151113
- 3.2 For screw threads, general (Metric) refer to BHEL standard AA0231800
- 3.3 For tolerance grade, position and class refer to BHEL standard AA0230201
- 3.4 Nuts to this standard would be unplated, divisions wishing to have plated screws would have to get them plated.
- 3.5 Weights given in this standard are for general reference only and are not meant for commercial transactions.
- 3.6 When fasteners are to be tested with in BHEL, the sampling and acceptance plan shall be as per IS: 1367, Part 17

**4.0 REFERRED STANDARDS (Latest Publications including Amendments)**

- 1) IS: 1367, Part 6 & 17
- 2) IS: 4218, Part 2
- 3) AA7151113
- 4) AA0231800
- 5) AA0230201

**EXPLANATORY NOTE**

The following changes have been made in the revision:

- Clause 2.1, Reaffirmed 2007 added to IS: 1364 Part 3
- Clause 2.2, Reference year removed for IS: 1367 Part 6
- Clause 2.3, Reference year removed for IS: 4218 Part 2
- Clause 4.0 changed



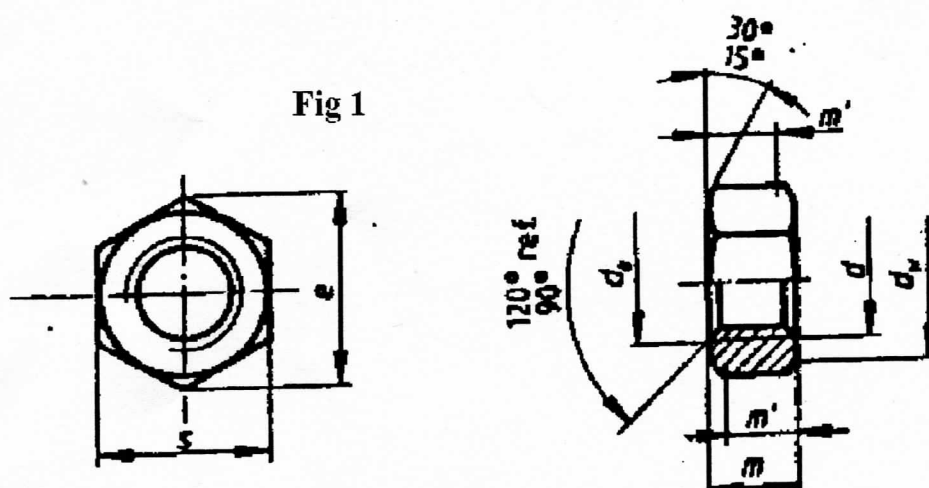


Table-1

All dimensions are in mm


Size	Flats		Coreners	Thickness		Wrench Height	Dia	Dia		Sub Code
d	s		e	m		m'	d <sub>w</sub>	d <sub>a</sub>		
Nom.	Max.	Min.	Min.	Max.	Min.	Min.	Min.	Min.	Max.	Weight
M20	30	29.16	32.95	18.0	16.9	13.5	27.7	20	21.6	017 64.59
M24	36	35	39.55	21.5	20.2	16.2	33.3	24	25.9	025 110.40
M30	46	45	50.85	25.6	24.3	19.4	42.8	30	32.4	033 237.40
M36	55	53.8	60.79	31.0	29.4	23.5	51.1	36	38.9	041 396.80

NOTE:



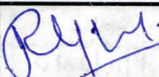
- 1) Corporate sub code numbers are shown above.
- 2) Weights have been shown in kg/1000 Nos.

24/09/14


CS-804

दिनांक एवं हस्ताक्षर SIGN & DATE	सामग्री सूची संख्या को अधिकृतित करता है	SUPERSEDES INVENTORY NO.		<b>संस्थान क्रय विनिर्देश</b>  (हीप - हार्डवयर)  <b>PLANT PURCHASE SPECIFICATION</b> (HEEP - HARDWAR)	<b>HW-59870</b>  पृष्ठ 11 का 1  Page 1 of 11																																																
			<b>FLOUROCARBON /VITON RUBBER SHEETS, GASKETS CORDS, PROFILES, MOULDINGS ETC</b>			Supersedes old standard no. TG-60101, TG-60108, TG60154, TG60158, TG-60413 partially, TG-60414, TG-60415																																															
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p><b>1. GENERAL :</b></p> <p>This specification governs the quality of fluorocarbon/viton rubber sheets, gaskets, cords, profiles &amp; mouldings of different grades..</p> <p><b>2. APPLICATION :</b></p> <p>Used as gaskets, mouldings &amp; seals in DC &amp; AC machines, water turbines, shunt reactors and generators.</p> <p><b>3. COMPLIANCE WITH NATIONAL STANDARD :</b></p> <p>There is no Indian standard covering this specification.</p> <p><b>4. DIMENSIONS AND TOLERANCES</b></p> </div> <div style="width: 65%;"> <p><b>4.1 SIZES</b></p> <ul style="list-style-type: none"> <li>- Length x Width x Thickness of sheet shall be stated on the order.</li> <li>- Gaskets, mouldings, cords, profiles shall be supplied as per our drawings.</li> <li>- Preferred thickness of sheets &amp; gaskets shall be 2,3,4,5,6,8,10,12 &amp; 16 mm.</li> </ul> <p><b>4.2 TOLERANCES</b></p> <p>Variation in individual piece not to increase more than 50% of given tolerance. Unless otherwise stated on the order/drawing tolerance on length, width and thickness shall be as follows:-</p> </div> </div>																																																					
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p><b>स्वत्वाधिकार एवं गोपनीय</b></p> <p>इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए</p> </div> <div style="width: 65%;"> <p><b>1.1.10</b></p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">TSX</td> <td style="width:15%;">V.K. Singh</td> <td style="width:15%;">31/11/18</td> <td style="width:15%;">अनुवादक TRANSLATED BY</td> <td style="width:15%;">-</td> <td style="width:20%;"></td> </tr> <tr> <td>QAX</td> <td>S.K. Chauhan</td> <td>31/11/18</td> <td>निर्माणकर्ता WORKED BY</td> <td>Amit</td> <td>27/11/18</td> </tr> <tr> <td>सहमत विभाग AGREED DEPTT.</td> <td>नाम NAME</td> <td>दिनांक एवं हस्ताक्षर DATE &amp; SIGNATURE</td> <td>जांचकर्ता CHECKED BY</td> <td>Rakesh Kumar</td> <td>27/11/18</td> </tr> <tr> <td>WORKED BY</td> <td>PRASHANT</td> <td>31/11/18</td> <td>पर्यवेक्षणकर्ता SUPERVISED BY</td> <td>R.C. Bajpai</td> <td>27.11.18</td> </tr> <tr> <td>CHECKED BY</td> <td>AMIT</td> <td>31/11/18</td> <td colspan="3">           स्वीकृति :            APPROVED : AGM (EME) 27.11.18            संस्थान मानक समिति PLANT STANDARDS COMMITTEE         </td> </tr> <tr> <td>Rev. No. 02</td> <td></td> <td></td> <td colspan="3">           निमाण : मानक विभाग            PREPARED : EME ISSUED : STANDARDS DIVISION         </td> </tr> <tr> <td>31/8/18</td> <td></td> <td></td> <td colspan="3">           दिनांक :            DATE : 10.11.80         </td> </tr> <tr> <td>C/A NO.</td> <td>TSX(EME)18-98</td> <td>31/8/18</td> <td colspan="3"></td> </tr> </table> </div> </div>						TSX	V.K. Singh	31/11/18	अनुवादक TRANSLATED BY	-		QAX	S.K. Chauhan	31/11/18	निर्माणकर्ता WORKED BY	Amit	27/11/18	सहमत विभाग AGREED DEPTT.	नाम NAME	दिनांक एवं हस्ताक्षर DATE & SIGNATURE	जांचकर्ता CHECKED BY	Rakesh Kumar	27/11/18	WORKED BY	PRASHANT	31/11/18	पर्यवेक्षणकर्ता SUPERVISED BY	R.C. Bajpai	27.11.18	CHECKED BY	AMIT	31/11/18	स्वीकृति : APPROVED : AGM (EME) 27.11.18 संस्थान मानक समिति PLANT STANDARDS COMMITTEE			Rev. No. 02			निमाण : मानक विभाग PREPARED : EME ISSUED : STANDARDS DIVISION			31/8/18			दिनांक : DATE : 10.11.80			C/A NO.	TSX(EME)18-98	31/8/18			
TSX	V.K. Singh	31/11/18	अनुवादक TRANSLATED BY	-																																																	
QAX	S.K. Chauhan	31/11/18	निर्माणकर्ता WORKED BY	Amit	27/11/18																																																
सहमत विभाग AGREED DEPTT.	नाम NAME	दिनांक एवं हस्ताक्षर DATE & SIGNATURE	जांचकर्ता CHECKED BY	Rakesh Kumar	27/11/18																																																
WORKED BY	PRASHANT	31/11/18	पर्यवेक्षणकर्ता SUPERVISED BY	R.C. Bajpai	27.11.18																																																
CHECKED BY	AMIT	31/11/18	स्वीकृति : APPROVED : AGM (EME) 27.11.18 संस्थान मानक समिति PLANT STANDARDS COMMITTEE																																																		
Rev. No. 02			निमाण : मानक विभाग PREPARED : EME ISSUED : STANDARDS DIVISION																																																		
31/8/18			दिनांक : DATE : 10.11.80																																																		
C/A NO.	TSX(EME)18-98	31/8/18																																																			




दिनांक एवं हस्ताक्षर SIGN & DATE		<b>संस्थान क्रय विनिर्देश</b> <b>(हीप - हार्डवयर)</b> <b>PLANT PURCHASE SPECIFICATION</b> <b>(HEEP - HARDWAR)</b>		<b>HW-59870</b>	
				पृष्ठ 11 का 2 Page 2 of 11	
SUPERSEDES INVENTORY NO. सामग्री सूची संख्या को अधिकृतित करता है	4.2.1 On Length & width: $\pm 3\%$ (Max.3mm) 4.2.2 On Thickness: $+10\%$ upto 4mm thickness $+0.40$ from 05 to 08 mm $+0.60$ from 09 to 12 mm. $+0.80$ from 13 to 16 mm. 4.2.3 On Cord dia: $+0.20$ mm upto dia. 06 mm. $+0.25$ mm from dia. 07 to 12mm. $+0.30$ mm from dia. 13 to 20mm. $+0.35$ mm from dia. 21 to 30mm. $+0.40$ mm from dia. 31 to 40mm.				
<b>5. FINISH &amp; FREEDOM FROM DEFECTS :</b> <p>Material shall have a smooth finish when seen with a magnifying glass (1X10). All ingredients of the mix shall be free from grit and extraneous matter. The selection and processing of the ingredients shall be such that the vulcanizate is free from surface imperfections, blisters, porosity, voids, inclusions, flow marks, inadequate joint of moulding blank, cracks, twists and other defects which could impair the satisfactory performance.</p>					
<b>6. CHEMICAL COMPOSITION :</b> <p>Sheets, gaskets, mouldings shall be made out of fluorocarbon rubber.</p>					
<b>7. IDENTIFICATION :</b> <p>The material when identified by infrared spectrometer or by infrared spectrometer or by other convenient method shall be of fluoro-elastomer rubber. It is inert to 80% H<sub>2</sub>SO<sub>4</sub> or concentrated HNO<sub>3</sub>. Burns brightly in flame but extinguishes immediately on removal from flame.</p>					
<b>8. TEST SAMPLES :</b> <p>The test certificates in respect of tests at sl. No. 9 &amp; 10 shall be supplied alongwith test samples. The samples shall have the same composition and shall be made by the same process as the original product. Supplier shall not change the composition/ process after type approval. In case of any change, the same shall be revalidated from BHEL.</p>					
<b>8.1 SAMPLE FOR ROUTINE TESTING</b> Solid cylinder dia. $29 \pm 0.5$ x $12.5 \pm 0.5$ ----- 3 nos.					
हस्ताक्षर एवं दिनांक SIGN & DATE P-3721 2/11/10	REV.NO. 02	निर्माणकर्ता WORKED BY Amit	जांचकर्ता CHECKED BY Rakesh Kr.		27/11/10 







<div>दिनांक एवं हस्ताक्षर SIGN &amp; DATE</div>		<div>संस्थान क्रय विनिर्देश</div> <div>(हीप - हार्डवयर)</div> <div>PLANT PURCHASE SPECIFICATION</div> <div>(HEEP - HARDWAR)</div>		<div>HW-59870</div>	
				<div>पृष्ठ 11 का 3</div> <div>Page 3 of 11</div>	
<div>सामग्री सूची संख्या को अधिकृत करता है</div>	<div>SUPERSEDES INVENTORY NO.</div>	<div>Extra component in case 'O' ring</div> <div>Or if otherwise mentioned in P.O. ----- 1 No.</div>			
<div>सामग्री सूची संख्या को अधिकृत करता है</div>		<p>The samples for routine testing shall be supplied alongwith the consignment. The compression test &amp; any other test to the extent possible shall be carried out on the original supplies to ascertain the reliability of the supplies material. In case of gaskets &amp; moulded articles the testing may be done on 5% pieces selected at random. In case of cords the required length for testing may be taken from each roll supplied.</p>			
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<div>स्वत्वाधिकार एवं गोपनीय</div> <div>इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।</div>		<div>9 <u>ROUTINE TESTS :</u></div> <div>9.1. <u>DIMENSIONS AND TOLERANCES:</u></div> <div>To be checked as per clause no. 4.</div> <div>9.2 <u>FINISH &amp; FREEDOM FROM DEFECTS :</u></div> <div>To be checked as per clause no. 5.</div> <div>9.3 <u>HARDNESS (B.S. 903: PART A 26: METHOD N) :</u></div> <div>Unless otherwise stated on drawing/purchase order, hardness shall be 80±5 IRHD.</div> <div>9.4. <u>COMPRESSION SET AT 200°C FOR 22 HRS. (IS:3400, PART X) :</u></div> <div>14% max.</div> <div>9.5. <u>IDENTIFICATION :</u> As per clause no.7.</div>			
<div>हस्ताक्षर एवं दिनांक SIGN &amp; DATE</div>	<div>REV.NO.</div> <div>02</div>	<div>निर्माणकर्ता WORKED BY</div> <div>Amit</div>	<div>जांचकर्ता CHECKED BY</div> <div>Rakesh Kr.</div>	<div>27/11/10</div>	<div>27/11/10</div>
<div>सामग्री सूची संख्या INVENTOR YNO.</div> <div>P-3721</div>					




दिनांक एवं हस्ताक्षर SIGN & DATE		संस्थान क्रय विनिर्देश (हीप - हरिद्वार) <b>PLANT PURCHASE SPECIFICATION</b> (HEEP - HARDWAR)		<b>HW-59870</b>	
				पृष्ठ 11 का 4 Page 4 of 11	
SUPERSEDES INVENTORY NO.					
सामग्री सूची संख्या को अधिकृतित करता है					
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company					
<b>10. TYPE TESTs :</b>					
<b>10.1 TENSILE STRENGTH (IS:3400. PART I. DUMB BELL) :</b>					
10 N/mm <sup>2</sup> Min.					
<b>10.2 ELONGATION AT BREAK (IS:3400. PART I. DUMB BELL) :</b>					
150%Min.					
<b>10.3 COMPRESSION SET AT 200° C FOR 22 HRS. (IS : 3400. PART X) :</b>					
14% Max.					
<b>10.4 COMPRESSION SET AT 200° C FOR 70 HRS. (IS : 3400. PART X) :</b>					
25% Max.					
<b>10.5 ADHESION TO &amp; CORROSION OF METALS (BS: 2751. APPENDIX-A) :</b>					
There shall be no corrosion or pitting of the metals and the material shall not adhere to the metal surface or show any sign of liquid exudation.					
<b>10.6 ACCELERATED AGING. (IS : 3400. PART IV) :</b>					
<b>10.6.1 AGEING IN AIR :</b>					
The specimen shall be aged in air for 168 hours at 200±5° C. Following shall be the changes over the values obtained at clause 09.3, 10.1, 10.2.					
Change in Hardness    Not more than +5 IRHD Change in T.S.        ±2.5 N/mm <sup>2</sup> Elongation                125 % Min.					
<b>10.6.2 AGEING IN OIL :</b>					
The specimen shall be aged in insulating oil, confirming to IS : 335, for 168 hrs. at 100 °C. After oil is wiped by blotting paper, the specimen shall show the following properties.					
<b>10.6.2.1 OIL ABSORPTION :</b>					
The original weight of the specimen shall not increase by more than 1.5%					
सामग्री सूची संख्या INVENTORY NO.	REV.NO. 02	निर्माणकर्ता WORKED BY		Amit	
		जांचकर्ता CHECKED BY		Rakesh Kr.	
P-3721				27/11/10	


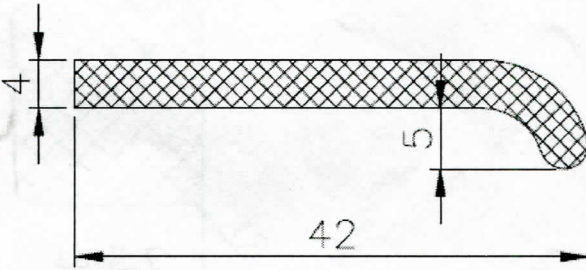


दिनांक एवं हस्ताक्षर SIGN & DATE			संस्थान क्रय विनिर्देश (हीप : हरिद्वार)  <b>PLANT PURCHASE SPECIFICATION</b> (HEEP: HARIDWAR)		<b>HW-59870</b>  पृष्ठ 11 का 5 Page 5 of 11	
सामग्री सूची संख्या INVENTORY NO.		SUPERSEDES INVENTORY NO.	<p><b>10.6.2.2 CHANGE IN VOLUME:</b> <math>\pm 5\%</math> Max.</p> <p><b>10.7 RESISTANCE TO SOLVENTS, LUBRICANTS ETC:</b></p> <p>The material shall have long wearing characteristics, resistance to oil, fuels, grease, lubricants, and solvents etc., coupled with excellent resistance to atmospheric oxidation.</p> <p><b>11 STORAGE:</b></p> <p>The finished rubber items shall be stored at ambient temperature not exceeding 30°C &amp; not below 15°C. Condensation, moist conditions should be avoided and humidity generally should not exceed 80%. Exposure to direct sunlight, strong artificial light, and ultra-violet light should be avoided. Contact with liquid or semi-solid material should be avoided. Under the recommended storage conditions, the maximum shelf life is 12 years.</p> <p><b>12 TRACEABILITY OF MATERIAL:</b></p> <p>The supplier shall print the name of his organization, monogram, month &amp; year of manufacture on each and every item. In case of chord, the same shall be done on every meter length. The printing so done should not damage the surface of rubber component and no way affect its quality.</p> <p><b>13 TEST CERTIFICATES:</b></p> <p>Unless otherwise stated, three copies of test certificates shall be supplied along with each consignment giving the following information:</p> <ul style="list-style-type: none"> <li>- Fluorocarbon/Viton Rubber to BHEL Purchase specification No. :</li> <li>- BHEL Purchase Order No. :</li> <li>- Drawing No. &amp; Item No. if any :</li> <li>- Supplier's Name :</li> <li>- Batch No. and Month &amp; Year of manufacture :</li> <li>- Size &amp; Quantity supplied :</li> </ul>			
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company						
स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत भारती एलेक्ट्रिकल लिमिटेड की सम्पत्ति है इसका प्रयोग एवं आश्रय के बिना या किसी भी तृतीय पक्ष को किसी भी रूप में उपयोग के बिना न होना चाहिए।						
दिनांक एवं हस्ताक्षर SIGN & DATE						
सामग्री सूची संख्या INVENTORY	REV. NO. 02	(SUPERSEDES)	निर्माणकर्ता WORKED BY	PRASHANT		31/8/18
			जांचकर्ता CHECKED BY	AMIT MITTAL		4/9/18



दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश PRODUCT PURCHASE SPECIFICATION		HW-59870	
				पृष्ठ 11 का 6 Page 6 of 11	
सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES INVENTORY	- Test result of routine tests as per clause no.09 :  - Reference & copy of test Report as per clause no. 10. : (not older than 2 years on the date of supply)			
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company		<b>14 INSPECTION AT SUPPLIERS WORK :</b>  All facilities shall be provided by the supplier for carrying out the inspection at supplier's works. BHEL shall have the right to check at manufacturing stage of the product ordered.			
स्वत्वधिकार एवं गोपनीय इस प्रवेश में दी गई सूचना भारत हेवी एलेक्ट्रिकल्स की सम्पत्ति है इसका प्रयोग एवं प्रकाशन अन्य किसी भी तरह प्रयोग को कि कम्पनी के हित में हानिकारक हो न किया जाय।		<b>15 PACKING &amp; MARKING :</b>  The material shall be preserved with French-chalk powder, packed to prevent damage from contamination and handling during transit and storage.  The moulded articles should be packed individually in a sealed transparent plastic cover packing which should be further kept in a carton having max. gross wt. of 10 Kgs.  The "O" rings may be packed in a similar way as above. The cords should be rolled over wooden/plastic drums of dia. 250mm with max. gross wt. of 10 Kgs and the drum should be sealed air tight. The drum flange size should be such that the cord when rolled does not project over the flange. The minimum length of the cord required in a single piece shall be mentioned in the PO.  Each package shall be legibly marked with following information :-			
दिनांक एवं हस्ताक्षर SIGN & DATE	- Fluorocarbon/Viton Rubber to BHEL Purchase specification No. :  - BHEL Purchase Order No. :  - Drawing No. & Item No. if any :  - Supplier's Name :  - Batch No. and Month & Year of manufacture :  - Size & Quantity supplied :				
सामग्री सूची संख्या INVENTORY NO.	REV. NO.	(SUPERSEDES)	निर्माणकर्ता WORKED BY	PRASHANT	31/8/18
P-3721	02		जांचकर्ता CHECKED BY	AMIT MITTAL	4/9/18



दिनांक एवं हस्ताक्षर SIGN & DATE		संस्थान क्रय विनिर्देश (हीप - हार्डवयर) <b>PLANT PURCHASE SPECIFICATION</b> (HEEP - HARDWAR)		<b>HW-59870</b> पृष्ठ 11 का 7 Page 7 of 11	
सामग्री सूची संख्या को अधिकृतित करता है SUPERSEDES INVENTORY NO.	<b>16 ACCEPTANCE CRITERIA :</b>  The items shall be accepted by BHEL on the basis of the following:- -Compliance certificate furnished by the supplier. -Test certificate furnished by the supplier as per cl. No. 13 -Testing carried out by BHEL on furnished products or otherwise.				
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	<b>17 REJECTION :</b>  BHEL reserves the right to reject the entire lot of material, if found not confirming to stipulations of this specification. Parts of the lot not subjected to testing but found to be defective and those with hidden defects can also be rejected later on.				
स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।	<div style="text-align: center;"> <b>PROFILE VITON</b>  <b>TYPE 107.001</b> </div> 				
दिनांक एवं हस्ताक्षर SIGN & DATE 2-11/2010					
सामग्री सूची संख्या INVENTORY NO. P-3721	REV.NO. 02		निर्माणकर्ता WORKED BY Amit	जांचकर्ता CHECKED BY Rakesh Kr.	27/11/10 27/11/10



# संस्थान क्रय विनिर्देश

(हीप - हरिद्वार)

## PLANT PURCHASE SPECIFICATION (HEEP - HARDWAR)

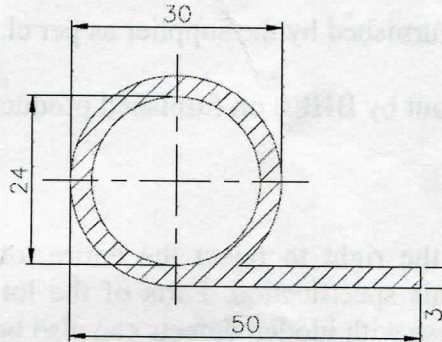
HW-59870

पृष्ठ 11 का 8

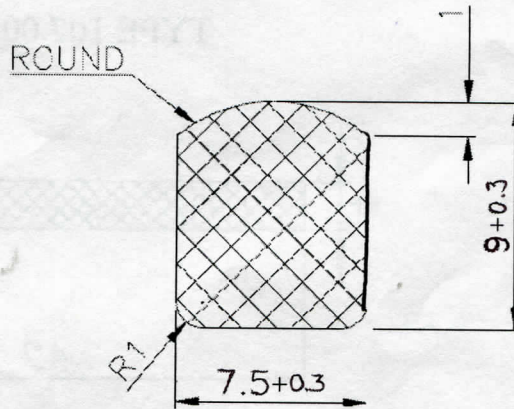
Page 8 of 11



### TYPE 502.003 FLUOR-KAUKSCHOK



### SKETCH PROFILE RUBBER VITON HW5984588013



दिनांक एवं हस्ताक्षर  
SIGN & DATE

SUPERSEDES  
INVENTORY NO.

सामग्री सूची संख्या को  
अधिकृतित करता है

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स्वत्वाधिकार एवं गोपनीय

इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में होनिकाएक हो न किया जाए ।

हस्ताक्षर एवं दिनांक  
SIGN & DATE

सामग्री सूची संख्या  
INVENTORY NO.

REV.NO.  
02

निर्माणकर्ता  
WORKED BY

Amit

जांचकर्ता  
CHECKED BY

Rakesh Kr.

27/11/10

27/11/10

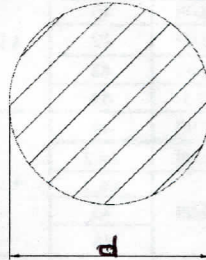




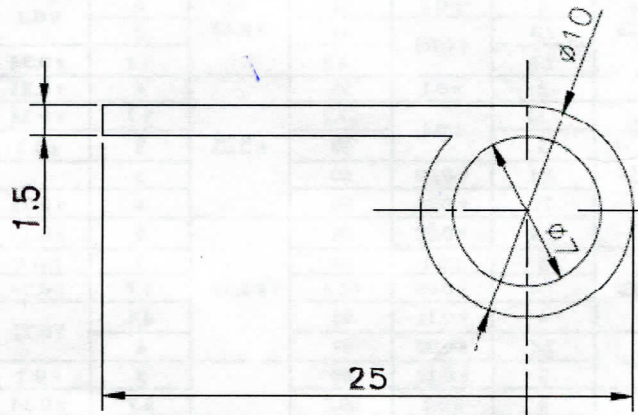
(हीप - हरिद्वार)

## PLANT PURCHASE SPECIFICATION (HEEP - HARDWAR)

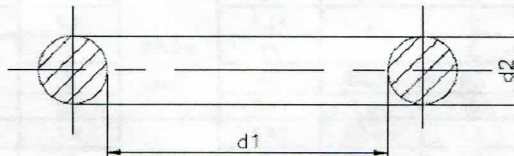
Profile NO. 501-026 d=10±0.3 Mat.Code =HW5983681010



PROFILE NO. 502.004



## O-RING



DIMENSIONAL DETAILS AS PER TABLE-1

NOTE :LENGTH OF ALL PROFILES AS PER PURCHASE ORDER

स्वत्वाधिकार एवं गोपनीय

इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।

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SUPERSEDES  
INVENTORY NO.

सामग्री सूची संख्या बढ़ो  
अधिकमित करता है

दिनांक एवं हस्ताक्षर  
SIGN & DATE

हस्ताक्षर एवं दिनांक  
SIGN & DATE

सामग्री सूची संख्या  
INVENTORY NO.

REV.NO.  
02

निर्माणकर्ता  
WORKED BY

Amit

जांचकर्ता  
CHECKED BY

Rakesh Kr.

27/11/10

27/11/13





# संस्थान क्रय विनिर्देश

(हीप - हार्डवार)

HW-59870

पृष्ठ 11 का 10

## PLANT PURCHASE SPECIFICATION (HEEP - HARDWAR)

Page 10 of 11

TABLE-1

d1	d2	d1	d2	d1	d2
ALL.TOL	ALL.TOL	ALL.TOL	ALL.TOL	ALL.TOL	ALL.TOL
4	1.5 ±0.07	40	3 ±0.1	89	3 ±0.1
5	2.5 ±0.08	40	3.5 ±0.11	89.2	5.7 ±0.14
6	1.5 ±0.07	42	3 ±0.1	90	3 ±0.1
6	2 ±0.08	43	3 ±0.1	90	4 ±0.11
6	3 ±0.1	43	4 ±0.11	90	5 ±0.12
7.3	2.4 ±0.09	44	3 ±0.1	91	8 ±0.16
8	2 ±0.08	44.2	3 ±0.1	92	8.5 ±0.18
8.3	2.4 ±0.09	44.2	5.7 ±0.14	94	3 ±0.1
9	2.5 ±0.09	45	3 ±0.1	94.2	5.7 ±0.14
9.5	2.4 ±0.09	45	3.5 ±0.11	97	5 ±0.12
10	2.5 ±0.09	46	3 ±0.1	99.2	5.7 ±0.14
10.3	2.4 ±0.09	47	3.5 ±0.11	100	4 ±0.11
11	2.5 ±0.09	47	3 ±0.1	102	4 ±0.11
11.3	2.4 ±0.07	48	6 ±0.14	104.2	5.7 ±0.14
12	1.5 ±0.07	49	3 ±0.1	108	3 ±0.1
12	3 ±0.1	50	3 ±0.1	109.2	5.7 ±0.14
12.3	2.4 ±0.09	50	4 ±0.11	112	3 ±0.1
14	3 ±0.1	52	3 ±0.1	112	4 ±0.11
14.3	2.4 ±0.09	54	3 ±0.1	115	4 ±0.11
15	2.5 ±0.1	54.2	5.7 ±0.14	118	4 ±0.1
15	3 ±0.1	55	4 ±0.11	120	3 ±0.1
15.54	2.62 ±0.1	57.2	5.7 ±0.14	120	4 ±0.11
16	3 ±0.1	59	3 ±0.1	122	4 ±0.11
16.3	2.4 ±0.09	60	3 ±0.11	123	4 ±0.1
17	11 ±0.24	60	4 ±0.11	124	3 ±0.1
17.3	2.4 ±0.08	60	8 ±0.16	124.2	5.7 ±0.14
18	3 ±0.1	64	3 ±0.1	125	4 ±0.11
18.3	2.4 ±0.09	64.2	5.7 ±0.14	128	6 ±0.14
18	4 ±0.11	65	3.5 ±0.11	129	4 ±0.11
19.3	2.4 ±0.09	67	4 ±0.11	132	3 ±0.1
20	5 ±0.12	69	3 ±0.1	132	4 ±0.11
20.2	3 ±0.1	69.2	5.7 ±0.14	135	4 ±0.1
20.3	2.4 ±0.09	70	3 ±0.1	138	3 ±0.1
21.2	2.5 ±0.09	70	5 ±0.12	140	3 ±0.11
21.3	2.4 ±0.07	71	3 ±0.11	142	4 ±0.11
22	1.5 ±0.07	71	4 ±0.11	145	4 ±0.11
22	3 ±0.1	71.2	5.7 ±0.14	146	8 ±0.16
22.2	3 ±0.1	73	3 ±0.1	150	4 ±0.11
22.3	2.4 ±0.09	74	3 ±0.1	153	6 ±0.14
25	3 ±0.1	74.2	5.2 ±0.14	154	3 ±0.1
25.3	2.4 ±0.09	74.2	5.7 ±0.14	155	4 ±0.11
25.3	2.4 ±0.09	75	4 ±0.11	159	6 ±0.14
28	3 ±0.1	78	3 ±0.11	160	3 ±0.1
30	3 ±0.1	78	5 ±0.12	160	4 ±0.11
32	3 ±0.1	79	3 ±0.1	164	4 ±0.11
33	3.5 ±0.11	79.2	5.7 ±0.14	165	4 ±0.11
34	3 ±0.1	80	3 ±0.1	166	6 ±0.14
34	4 ±0.11	80	4 ±0.11	170	4 ±0.11
35	3 ±0.1	81	6 ±0.14	171	11 ±0.24
35.2	3 ±0.1	84.2	6.7 ±0.14	175	5 ±0.12

REV.NO.  
02

निर्माणकर्ता  
WORKED BY

Amit

जांचकर्ता  
CHECKED BY

Rakesh Kr.

27/11/10

27/11/10



दिनांक एवं हस्ताक्षर  
SIGN & DATE



# संस्थान क्रय विनिर्देश

(हीप - हरिद्वार)

## PLANT PURCHASE SPECIFICATION (HEEP - HARDWAR)

HW-59870

पृष्ठ 11 का 11

Page 11 of 11

SUPERSEDES  
INVENTORY NO.

सामग्री सूची संख्या को  
अधिकतम करना है

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स्वत्वधिकार एवं गोपनीय

इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रलेख एवं अप्रलेख रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए।

हस्ताक्षर एवं दिनांक  
SIGN & DATE

सामग्री सूची संख्या  
INVENTORY NO.

REV.NO.  
02

निर्माणकर्ता  
WORKED BY

Amit

जांचकर्ता  
CHECKED BY

Rakesh Kr.

d1	ALL.TOL.	d2	ALL.TOL.	d1	ALL.TOL.	d2	ALL.TOL.	d1	ALL.TOL.	d2	ALL.TOL.
180	± 1.25	6	± 0.14	355	± 2.5	5	± 0.12	760		12	± 0.24
184.2		5.7	± 0.14	360		4	± 0.11	770	± 6.3	4	± 0.11
185	± 1.6	4	± 0.11	367		3.5	± 0.11	785		8	± 0.16
185		5	± 0.12	370		10	± 0.18	800		12	± 0.24
190		4	± 0.11	375	± 2.5	10		820	± 9	12	
193		6	± 0.14	380		4	± 0.11	837		4	± 0.11
195	± 1.6	4	± 0.11	380		10	± 0.18	870		12	± 0.24
200		3	± 0.1	385		12	± 0.24	920	± 9	12	
200		4	± 0.11	395	± 2.5	5	± 0.12	902		4	± 0.11
203		3	± 0.1	400		4	± 0.11	955		10	± 0.18
204		4	± 0.11	415	± 3.15	5	± 0.12	968		10	± 0.18
205	± 1.6	5	± 0.12	420		5		970		12	± 0.24
212		4	± 0.11	424		5	± 0.12	980	± 9	10	± 0.18
215		8	± 0.16	425		4	± 0.11	992		8	± 0.16
220		3	± 0.1	435	± 3.15	12	± 0.24	1002		4	± 0.11
220		5	± 0.12	438		4	± 0.11	1015		8	± 0.16
221	± 1.6	6	± 0.14	445		5	± 0.12	1022		6	± 0.14
228		4	± 0.11	450		5	± 0.12	1025	± 9	12	± 0.24
235		5	± 0.12	455		5		1070		12	
238		5	± 0.12	473		7.5	± 0.16	1100		12	
242		6	± 0.14	475	± 3.15	5	± 0.12	1185		8	± 0.16
243	± 1.6	4	± 0.11	485		5		1240	± 11	12	± 0.24
244		7	± 0.16	495	± 3.15	4	± 0.11	1246		8	± 0.16
245		5	± 0.12	500		5	± 0.12				
247		6	± 0.14	510		6	± 0.14				
250		4	± 0.11	530	± 4	4	± 0.11				
250	± 1.6	7	± 0.16	530		5	± 0.12				
250		8	± 0.16	530		12	± 0.24				
255	± 2	4	± 0.11	540		3	± 0.1				
260		5	± 0.12	540	± 4	4	± 0.11				
265		3	± 0.1	540		5	± 0.12				
265	± 2	5	± 0.12	550		8	± 0.16				
265		8	± 0.16	560		5	± 0.12				
275		5	± 0.12	580		10	± 0.18				
280		4	± 0.11	580	± 4	12	± 0.24				
280	± 2	5	± 0.12	585		4	± 0.11				
280		8	± 0.16	590		5	± 0.12				
280		10	± 0.18	598		8	± 0.16				
285		4	± 0.11	600		4	± 0.11				
285		6	± 0.14	600	± 4	10	± 0.18				
290	± 2	5	± 0.12	612		8	± 0.16				
290		8	± 0.16	621	± 4	8	± 0.16				
297		4	± 0.11	640		8					
300		4	± 0.11	655		4	± 0.11				
300		5	± 0.12	660	± 5.3	12	± 0.24				
315	± 2.5	4	± 0.11	680		12					
315		5	± 0.12	700		10	± 0.18				
330		4	± 0.11	730		4	± 0.11				
330		10	± 0.18	730		10	± 0.18				
345		5	± 0.12	745	± 5.3	7	± 0.16				
350	± 2.5	4	± 0.11	750		6	± 0.14				
355		4		750		10	± 0.18				

2-11-2010

P-3721

*Amit*

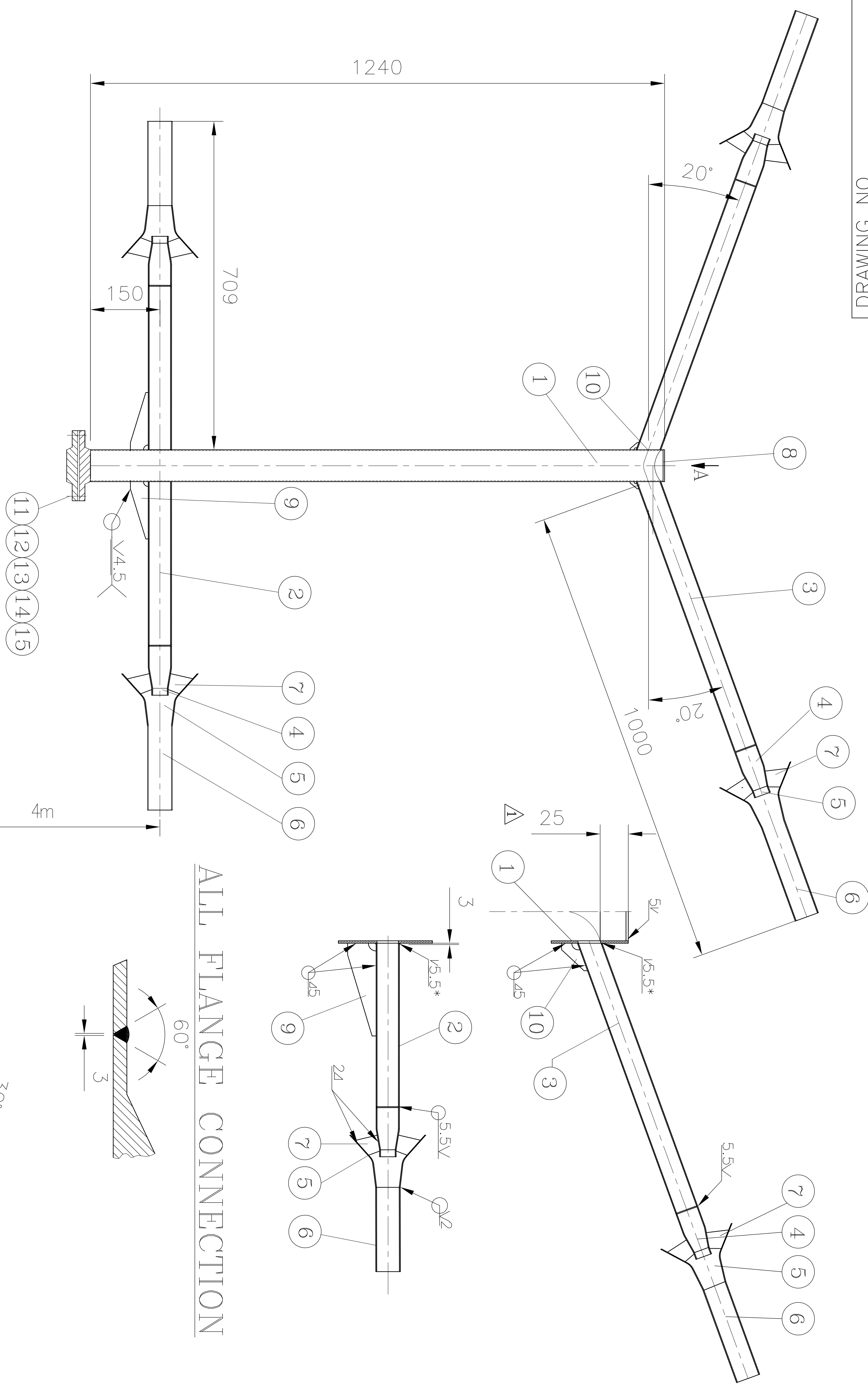
27/11/10

*Rakesh Kr.*

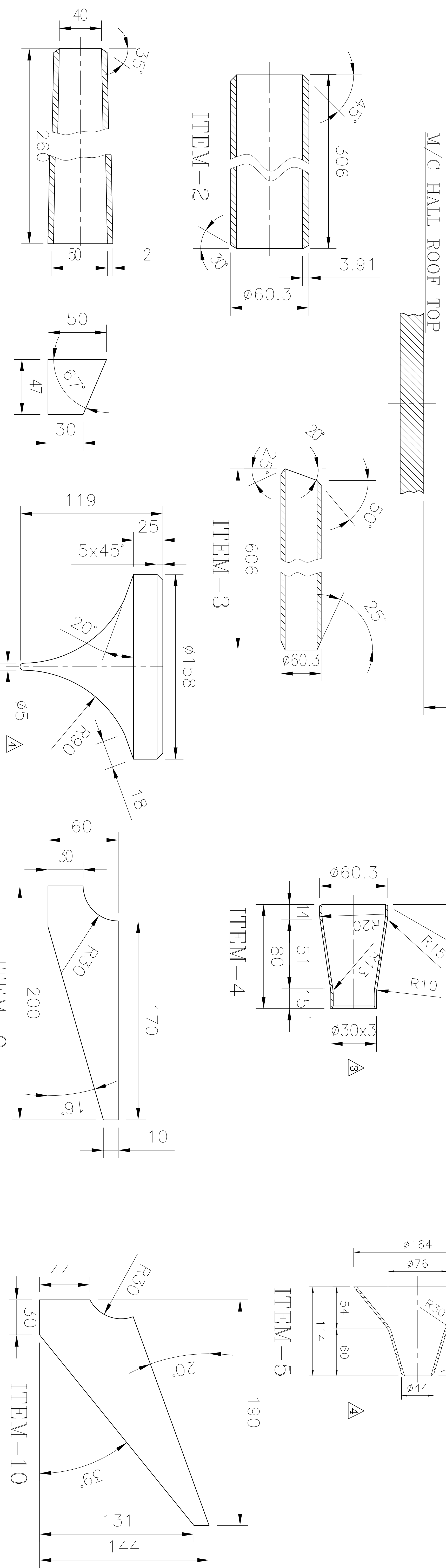
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7222-EGL  
ON GINWARD

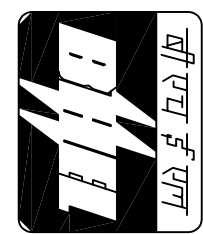


VIEW-A



ITEM NO.	QTY.	DESCRIPTION	MATERIAL SPEC	UNIT	WEIGHT
015	16	WASHER MCD-ST12.10	IS:2016-1967 IS:2062E250BR	NO	0.01
014	08	NUT M20	IS-1364 PART-3 IS-1367 PART-3	NO	0.02
013	08	BOLT M20X80	IS-1364 PART-2 IS-1367 PART-3	NO	0.02
012	01	GASKET 210X168X3TK	HW59870 VITON	NO	0.01
		FLANGE NB150	IS:2062E250BR DIMENSION AS PER AA/244303	NO	6.00
011	02	SUPPORT (THK=8MM)	IS:2062 E250BR	NO	0.5
010	04	SUPPORT (THK=8MM)	IS:2062 E250BR	NO	0.5
009	04	SUPPORT (THK=8MM)	IS:2062 E250BR	NO	0.5
008	01	FLOW GUIDE	IS:2062 E250BR	NO	1.00
007	024	SUPPORT (THK=4MM)	IS:2062 E250BR	NO	0.05
006	08	PIPE ASSY	ASTM A105	NO	1.5
005	08	VENT COWL	ASTM A105	NO	1.2
004	08	REDUCER 60.3X30X3	ASTM A105	NO	0.4
003	04	C.S PIPE ASSY 60.3X3.91	ASME SA106GRB	NO	3.29
002	04	C.S PIPE ASSY 60.3X3.91	ASME SA106GRB	NO	1.66
001	01	C.S PIPE 6168.3X3.4 L=1240	ASME SA106GRB	NO	17.15

THDF 115/67



**BHARAT HEAVY ELECTRICALS LTD.**  
**HARDWAR**

NAME	SIGN	DATE	NO.OF
RAVINDRA	SD/-	16.01.10	VAR.
RLV	SD/-	16.01.10	
AKM	SD/-	16.01.10	73, 74

TOLERANCES ON DIMENSIONS SHALL BE AS PER COARSE "C" GRADE OF STANDARRD AA0230208

REV.	DATE	ALTERED	KM	REV.	DATE	ALTERED	KM	REV.	DATE	ALTERED	KM	REV.	DATE	ALTERED	KM
04	09.01.2020	CHECKED	MA	03	14.08.19	CHECKED	MA	02	02.08.19	CHECKED	MA	01	29.05.18	CHECKED	MA
DETAILS UPDATED FOR ITEM NO. 5 & 8.															
REVISION MARKED AS A															

INVENTORY NO. SIGN & DATE REF. DRG NO.

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