BHARAT HEAVY ELECTRICALS LIMITED
HEEP HARIDWAR INDIA-PIN 249403
PHONE NO: 0091 1334 285120

Sub: Procurement of ACC STEAM DUCT
Projects: Patratu-2

A. SCOPE OF ENQUIRY:

The Heavy Electricals Equipment Plant (HEEP) located in Haridwar, India is one of the major manufacturing plants of Bharat Heavy Electricals Ltd. The core business of HEEP includes design and manufacture of large steam turbines, turbo generators and so on.

Bids are invited from Indian indigenous suppliers for following items through GeM Portalhttps://gem.gov.in
Scope of Work: - **PRE-FAB. M/C & FAB. ONLY** as per Drawing/Standard & QP requirements.

SLNO	MATERIAL CODE	DESCRIPTION	TOTAL QTY	UNIT	DELIVERY IN DAYS
1	0170997002300	D LIASIONING 8000~2800 UNIT-2	1	NO.	150

(Total qty in numbers= 1 nos. of 0170997002300 **& Fab. Weight= 105350 kg. /pc)**

TOTAL LOAD = 105350 KG. (TOLERANCE IN TOTAL LOAD MAY BE (+/-) 25%)

B. Buyers Specific Additional Terms & Conditions in addition to GTC:

Sl. No.	Terms	Description	Bidder's Confirmation
1.	**Confirmation to compliance of General terms and conditions on GeM**	In addition to the terms & conditions mentioned in below table, latest General terms and conditions on GeM or subsequent rules/policies issued by GeM shall be applicable against this enquiry. **Kindly confirm** same is acceptable to you.	
2.	**Documents Checklist:**	**Kindly confirm** that the following documents have been submitted along with your offer: 1. Requisite EMD 2. Pre-Qualification Requirements 3. Quality Requirements & Plan 4. Drawings & CBOM 5. make in india (Self-certification) 6. Integrity pact 7. Vendor credentials in NTPC formats (SUB-VENDOR QUESTIONNAIRE &MAIN CONTRACTOR attached) 8. Any other document as specified in "**Buyers Specific Additional Terms & Conditions in addition to GTC**"	

3.	**Pre-Qualification Requirements**	The Pre-Qualification Requirements are attached. All the bidders should ensure submission of duly-filled and signed with complete details and documents as called for in these requirements.	
4.	**Special Instruction of Technical requirement**	1. Items to be supplied directly to Patratu Site. **DELIVERY TERM: F.O.R. PATRATU SITE** **Patratu site address:** GENERAL MANAGER (PROJECTS) , PATRATU STPP (3X800 MW), PATRATU VIDYUT UTPADAN NIGAM LIMITED, PO – PTPS, DIST – RAMGARH, JHARKHAND – 829119. **Please confirm.**	
		4.All ACC STEAM DUCT are required as per NIT document and specification only. **Please confirm.**	
5.	**Prices**	Prices shall remain firm and fixed during entire tender process and execution of the contract. **Kindly confirm** that Quoted prices on GEM against the GEM bid for each schedule is F.O.R. Patratu site on firm basis & inclusive of all cost components (Packing & Forwarding, Freight, GST, Insurance etc.). **Also inform the percentage of GST considered by you in your FOR prices.**	
6.	**MDCC clause**	Material shall be dispatched only after issue of material dispatch clearance certificate (MDCC) by BHEL. All test certificates, applicable TPIA verified documents, Quality Plan and relevant documents are to be sent to BHEL before dispatch of material for issue of MDCC, which will be issued after review of test certificates, applicable TPIA verified documents, Quality Plan and all relevant documents. MDCC will be issued within 07 days of receipt of these documents once found complete in all respects. In case of any delay on account of BHEL in issuing MDCC, delivery shall be extended by no. of days in excess of 7 days taken by BHEL in issuing MDCC and delays shall be dealt on merit basis. This period of 7 days is included in the delivery period. Material is to dispatched within 07 days of receipt of MDCC from BHEL without waiting for PO amendment.	
7.	**Quality Requirements**	Quality Requirements are attached with this tender document. All the bidders should ensure submission of duly filled and signed the attached QP with complete details and documents as called for in these requirements.	

<table>
<tr><td>8.</td><td>Delivery Period</td><td>Bidders are requested to quote their best possible delivery period in terms of days from date of PO.</td><td></td></tr>
<tr><td rowspan="2">9.</td><td rowspan="2">Penalty / LD Clause :</td><td>LD/Penalty for delayed supplies shall be as per latest General terms and conditions on GeM.</td><td></td></tr>
<tr><td>The date of LR (Lorry receipt) would be treated as the date of delivery for penalty purposes.</td><td></td></tr>
<tr><td>10.</td><td>Payment Terms</td><td>100% payment will be made after receipt and acceptance of material at site and after issue of consignee receipt-cum acceptance certificate (CRAC) as per the below details:
<table>
<tr><th>Type of Bidder</th><th>Payment Terms (Number of Days)</th></tr>
<tr><td>Micro & Small Enterprises (MSEs)</td><td>45 days</td></tr>
<tr><td>Medium Enterprises</td><td>60 days</td></tr>
<tr><td>Non MSME</td><td>90 days</td></tr>
</table>
Subject to submission of 8 sets of non-discrepant documents along with original MDCC & LR as per terms & conditions of GEM contract.</td><td></td></tr>
<tr><td>11.</td><td>Quantity Variation</td><td>BHEL reserves the right to cancel tender or reject any or all the quotations without assigning any reasons thereof. BHEL also reserves the right to Increase or decrease the tendered quantities. Vendors should be prepared to accept order for reduced Quantity without any extra charges. Vendor should also be prepared for giving discount in case of Increase in Quantity.
Vendor has to take dispatch clearance from BHEL before starting supplies of item. In case ordered quantity is reduced, then payment shall be made accordingly, as per decreased quantity.
Kindly confirm.</td><td></td></tr>
<tr><td>12.</td><td>Bid to RA</td><td>Opening of Price bid & RA shall be conducted for only those bidders who qualifies PQR, Quality requirements and whose techno-commercial bid is acceptable to BHEL & customer PVUNL.RA will be conducted as per GeM rules & guidelines.</td><td></td></tr>
<tr><td>13.</td><td>Risk Purchase</td><td>In case of abnormal delays (beyond the maximum late delivery period as per LD clause) in supplies / defective supplies or non-fulfilment of any other terms and conditions given in Purchase Order, BHEL may cancel the Purchase Order in full or part
thereof, and may also make the purchase of such material from elsewhere / alternative source at the risk and cost of the supplier. BHEL will take all reasonable steps to get the material from alternate source at optimum cost. If bidder does not agree to the above Risk Purchase Clause, BHEL reserves the right to reject the offer. In case for compelling reasons BHEL accepts the offer without acceptance of this clause by the bidder and in the eventuality of Risk Purchase, appropriate action will be taken as per BHEL</td><td></td></tr>
</table>

		extant rules. This will be without prejudice to any other right of BHEL under the contract or under General Law. **Kindly confirm.**	
14.	**Action against Bidders / vendor / supplier / contractor in case of default**	In order to protect the commercial interests of BHEL, BHEL shall take action against supplies / contractors by way of suspension of business dealings, who either fail to perform or are in default without any reasonable cause, cause loss of business/ money/ reputation, indulge in malpractices, cheating, bribery, fraud or any other misconduct or formation of cartels so as to influence the bidding process or influence the price etc. Suspension of Business Dealings could be in the form of "Hold" or "Banning" a supplier/ contractor or a bidder and shall be as per "Guidelines for Suspension of Business Dealings with Suppliers/ Contractors" available at BHEL's website https://www.bhel.com/guidelines suspensionbusiness- dealings-supplierscontractors	
15.	**Conflict of Interest**	A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. **The bidder found to have a conflict of interest shall be disqualified**. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if: a) they have controlling partner (s) in common;· or b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; or c) they have the same legal representative/agent for purposes of this bid; or d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder,· or e) Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from. One bidding manufacturer in more than one bid; or f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a	

		particular tender enquiry. One manufacturer can also authorise only one agent/dealer. There can be only one bid from the following: 1. The principal manufacturer directly or through one Indian agent on his behalf; and 2. Indian/foreign agent on behalf of only one principal,· or g) A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid,· or h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business. "	
16.	**EMD Applicability**	EMD will be applicable as per GEM bid, however EMD is waived in following cases- a. Central/ State – PSUs b. *MSE suppliers are exempted for submission of EMD (Valid Documentary proof against MSE must be submitted along with offer to avail the benefits). c. BHEL-HEEP registered vendors (if applicable) are exempted from submission of EMD. d. Other exemptions on EMD will be as per GeM Terms and conditions. ***Benefits of MSE (such as EMD Waiver, Tender fee exemption, Price preference, Payment preference etc.) will be given only to those MSE Vendors who are manufacturers of offered items against the NIT. No MSE benefits shall be provided to Agents / Stockiest / Dealers / Traders etc. for the items offered but not manufactured by themselves.**	
17.	**In course of evaluation, if more than one bidder happens to occupy L-1 status**	In course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discount from respective L-1 bidders. In case more than one bidder happens to occupy the L-1 status even after soliciting discounts, the L-1 bidder shall be decided by a toss/draw of lots, in the presence of respective L-1 bidders or their representatives.”	

18.	**GUARANTEE CERTIFICATE: -**	The vendor shall warrant that the supplied fabricated assemblies comply fully with the drawings and other technical conditions. If the fabrications/items are found defective owing to faulty workmanship/incomplete work within a period of eighteen (18) months from Supply completion date. Supply completion date shall be reckoned from the actual date of last supply made by the vendor (date of LR) for the quantities awarded (in terms of number(s)). During guarantee period, the vendor shall make good of items/replace the same free of cost. Alternatively, the rework/replacement charges may be recovered.	
19.	**RECTIFICATION: -**	Any defect (noticed at SITE) arising out of the fabrication/machining done by the Sub-Contractor, will have to be rectified or items replaced by the sub-contractor within 10 days of intimation of same at their own cost. Otherwise BHEL will be free to take necessary action as deemed fit and consequence/cost of the same will be to subcontractors' account.	

SPECIAL REMARKS FOR BIDDERS:

Following documents are an integral part of this tender enquiry and endorsed copies of these documents (duly signed and stamped on each page, as a token of acceptance) are to be uploaded along with offer on e-procurement portal.

1. Please submit signed & Stamped copy (each page) of duly filled of confirmation column of "Buyers Specific Terms & Conditions" and supporting documents where required.

2.Please submit signed & stamped copy (each page) of PQR documents with proper filled information and related supporting documents as mentioned in PQR.

3.Vendor scope includes complete manufacturing of item as per drawing including all NDT requirements, painting & preseravtion as per drg.

4.Vendor scope also includes any mock up of assemblies required in drg

5. Transportation of items as per shipping list/packing list provided by BHEL to Patratu site is also in the scope of vendor.

6. MDCC is required before dispatch of items & MDCC is required for all items.

7. Patratu site address is:
General Manager (projects), 3x800 mw Patratu stpp
Patratu vidyut utpadan nigam limited
po-ptps, Dist-Ramgarh, jharkhand-829119.

8.Tolerance in total load may be (+/-) 25%

9. Guarantee period will be 18 months from the date of last supply by the vendor.

10.Vendors to confirm, endorse and return back MQP no- PAT/ACC/DUCT U-2 rev00 (attached).

11.Inspection by NTPC / PVUNL and BHEL / BHEL nominated inspection agency as per finally NTPC / PVUNL approved QP.

12.Offers that are found suitable techno-commercially & approved by customer PVUNL will be considered for further process.

13. Notes available in drawing to be fulfilled by the vendor for manufacturing.

14. All items to be manufactured with party material only. No further subcontracting is permissible, without prior approval.

15. Supplier must furnish material test certificates for all the items.

16.Guarantee Certificate will be required.

17. Aesthetic appearance shall also be ensured and inspected before delivery to SITE.

18.Cleaning of parts, removal of mill scale from components prior to assembly will be in scope of vendor.

19.CHP Clearance may be obtained from NTPC/LLOYD/RITES/NPC at party's end.

20.Final Assembly shall undergo cleaning to ensure that all parts are free from dents, mills, spatters.

21.Customer's seal (if Any on supplied Material) to be transferred.

22. Copies of the relevant certificates to be supplied to the receiving shop.

23.All special tests viz., UT, RT, HYDRAULIC & KEROSENE etc. are to be performed as per drg. requirements.

24. Rest all terms and conditions shall be as per general terms and conditions of **GeM.**

Raw material

Raw material shall be procured from following PVUNL enlisted main steel producers only: -

SAIL, JSW Steel Limited, Jindal Steel & Power, Tata Steel Ltd (for reinforcement steel / TMT bars), RINL (for long products/ rolled sections and Reinforcement steel / TMT bars), Essar Steel India Ltd (for flat products/ Steel plates), Electrosteel Steel Ltd (for Reinforcement steel / TMT bars) and Monnet Ispat and Energy Ltd (for long products/ rolled sections and Reinforcement steel / TMT bars).

In addition to above, the approved sources of plates are:
"*SAIL, JSW Steel Limited, Jindal Steel & Power, Tata Steel Ltd, RINL, Essar Steel India Ltd), and Monnet Ispat and Energy Ltd"*

PQR

Item :ACC Duct Elbow TEE dia.8000, ACC Steam duct, Acc Steam duct Riser, D Liasioning 8000mm-2800mm, Y piece, Blank Plate for ground duct (Partatu: drg: 01709970009-01, 01709970017-01, 01709970022-00, 01709970023-00, 01709970025-00, 11709970121-00, 11709970172-00)

PRE-QUALIFICATION REQUIREMENT

01.00	TECHNICAL REQUIREMENT	Required	Vendor's Offer
01.01	**Experience:** Vendors should have experience of fabricating (cutting/bending/assembly/welding/pre-fabrication machining) and supplying of atleast 1 no. **ACC Duct Elbow TEE dia.8000, ACC Steam duct, Acc Steam duct Riser, D Liasioning 8000mm-2800mm, Y piece, Blank Plate for ground duct or equivalent** components in last 7 years from the date of enquiry as per following details: i) Dimensions of job: Diameter=4000 mm and Length= 3000 mm and above. (ii) Weight: 4 Tons and above	Vendor to Comply & submit suitable evidence including technical specifications, drawings etc.	
01.02	**Facility:** i) Lifting facility and capacity at vendor works should EOT crane 10 Tons and above. ii) Vendor must have levelled bed plate having size : Length/height= 4000mm, Dia./Breadth=8600mm and above to fabricate the job ((Either machined bed plate or bed plate constructed by steel plates is allowed but concrete floor not allowed). iii) Vendor must have rolling/bending facility to bend/roll cylinder of thickness 20mm or above with width 2500mm or above. (iv) Vendor must have suitable WPS/PQR and qualified welders for welding approved by third party and submit documentary evidence with offer. (v) Vendor must have cutting facility to cut plate of thickness 50mm and above.	Vendor to Comply & submit suitable evidence including technical specifications, technical brochure, photographs etc. of the facilities.	
01.03	Vendor to furnish certificate or documentary evidence against clause 01.01 from the customer / company or end user duly confirming that fabricated **ACC Duct Elbow TEE dia.8000, ACC Steam duct, Acc Steam duct Riser, D Liasioning 8000mm-2800mm, Y piece, Blank Plate for ground duct or equivalent** job was supplied and used for Hydro Pump or turbine/power plant/capital goods/infrastructure application OR Vendor to submit documentary evidence as per clause 1.04.	Vendor to Comply & submit suitable documents	
01.04	Vendor to furnish name of customer/company with complete contact details and month /year of previous supply along with copy of PO, type of manufacturing facility used for fabrication (assembly/welding/pre-fabrication machining), supply documents, Payment details(invoice copy) and inspection documents of supplied **ACC Duct Elbow TEE dia.8000, ACC Steam duct, Acc Steam duct Riser, D Liasioning 8000mm-2800mm, Y piece, Blank Plate for ground duct or equivalent**.	Vendor to Comply & submit suitable documents	
01.05	All PQR documents are to be stamped and signed in original by Vendor. In case documents and official stamp is in language other than English, documents and details of official stamp are to be translated in English and duly certified by Government agency/approved agency of Government/Embassy.	Vendor to Comply & submit suitable documents	
01.06	BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, their offers shall be rejected.	Vendor to agree	
NOTE: PQR is not restrictive			

[Engineer-WTT]

20/06/2023
[Ravi Deshwal
Manager(WTT)]

21.6.2023
(BS Arya) AGM-WTT

complete name and address of manufacturing works of vendor

MANUFACTURING QUALITY PLAN

ITEM: **FABRICATION OF DUCTS AND MANIFOLDS**

QP. No: **PAT/ACC/DUCT** U-2 **REV 00,**

Page No. 1of1

SUB SYSTEM :- **AS PER PO**

PROJECT: **PATRATU 3 X 800MW**
PACKAGE: **EPC(TG/ACC)**
CONTRACT No: **9585-001**
CONTRACTOR : **BHEL HARIDWAR**

S. No.	COMPONENTS/OPERATION	CHARACTERISTICS/CHEK	CLASS	TYPE / METHOD OF CHEK	QUANTUM OF CHEK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
1	2	3	4	5	M	C/N	7	8	9	D*	M	C	N	11
					6						10			
A	**RAW MATERIAL**													
A.1	Structural Steel, Section, Bars etc.	Dimension	Major	Meas.	100%		Approved Drg./Tech. Spec.	Approved Drg./Tech. Spec.	IR		P	V	V	Co-related Mill TC to be submitted for review. Refer note 1 and 2. Direct procurement from NTPC approved sources.
		Chemical Composition	Major	Lab. Test	1/Heat				TC	√	P	V	V	
		Mechanical Properties	Major	Lab. Test	1/Heat				TC	√	P	V	V	
		Internal Flaw	Major	UT Report	100%		ASTM A578 Level B-S2		UT Report	√	P	V	V	
		(UT on Plate > 40mm Thk)												
B	**INSPECTION - IN PROCESS**													
B.1	Marking, Cutting and Preparation	Completeness	Major	Visual & Measurement	100%		Apporaved Drg. / Tech. Spec.	Apporaved Drg. / Tech. Spec.	IR		P	V		
		Dimension	Major	Measurement	Random				IR		P	V		
B.2	Rolling & Fit-up	Rolling Process	Major	Visual & Dimensional	100%				IR		P	V		
		Edge Preparation	Major	Visual	100%				IR		P	V		
		Fit-up	Major	Visual	100%				IR		P	V		
		Dimensions	Major	Meas.	100%				IR		P	V		
B.3	Welding	WPS, PQR, WPQ	Major	Review	100%		ASME Sec. IX		Record	√	P	V	V	WPS shall be approved by BHEL & welders qualified by BHEL or BHEL appointed TPIA like BVQI, Lloyds, TUV shall be deployed for welding. If lifting lugs are to be welded to ducts and manifold for site erection, 100% DPT will be carried out for even fillet weld and witnessed by BHEL
		Size	Major	Meas.	100%		Approved Drg. / Tech. Spec.		IR	√	P	V	V	
		Weld Defects												
		i) Butt Weld	Major	RT/UT	10%	10%	ASME Sec VIII Div. 1 Appendix 12		RT/UT Report	√	P	W	V	
			Major	DPT	100%	10%	ASME Sec VIII Div. 1 Appendix 8		PT Report	√	P	W	V	
		ii) Fillet Weld	Major	DPT	10%	10%	ASME Sec VIII Div. 1 Appendix 8		PT Report	√	P	W	V	
		iii) Heat Treatment	If Applicable	HEAT Treatment chart	100%	100%	ASME Sec VIII Div. 1 Appendix 8		SR Report	√	P	R	R	
C	**FINAL INSPECTION**	Completeness	Major	Visual	100%	10% Randomly from offered lot	Approved Drg. / Tech. Spec.		IR	√	P	W	V	
		Dimensions	Major	Meas.			Approved Drg. / Tech. Spec.		IR	√	P	W	W	
		Match Marking	Major	Visual			Approved Drg. / Tech. Spec.		IR	√	P	W	W	
		Identification	Major	Visual			Approved Drg. / Tech. Spec.		IR	√	P	W	V	
D	**TRIAL ASSEMBLY FOR LARGE SIZE DUCTS REDUCER, Y-PIECE, BRANCH, TRANSITION DUCTS**	Orientation	Major	Visual & Measurement	100%	10% from offered lot	Approved Drg. / Tech. Spec.		IR	√	P	W	W	Large size ducts shall be sent to site in parts after rolling and fit-up shall be done at site. Weld edges for L & C seams shall be prepared at shop random 10% witness for trail assembly at shop accordingly. Guide vanes, if any, shall be dispatched to site in welded condition.
		Dimensions	Major											
		Match Marking	Major											
E	**SUEFACE PREP. & PAINTING**	Visual & Measurement	Major	Random	100%		Approved Drg. / Tech. Spec.		IR & Paint Report		P	V	V	
F	**PACKING AND TRANSPORTATION**	Visual & Measurement	Major	Random	100%		Approved Drg. / Tech. Spec.		Packing List		P	W	V	Refer to Note 3

LEGEND:- *RECORDS, IDENTIFICATION WITH "TICK"(√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. **M:- MANUFACTURER/SUB-SUPPLIER, C:- MAIN SUPPLIER, N:- NTPC, P: PERFORM, W:-WITNESS AND V:- VERIFICATION AS APPROPRIATE, CHP: NTPC SHALL IDENTIFY IN COLUMN "N" AS "W"

DOC. NO. :

MFD. SUB SUPPLIER	MAIN SUPPLIER				
SIGNATURE	SIGNATURE	FOR NTPC USE	REVIEWED BY	APPROVED BY	APPROVAL SEAL

Note-1 : Rolled sections shall be of grade desiganation E250 Quality A/BR semi killed / killed conforming to IS 2062. All steel plated shall be of grade designation E250, Quality BR (fully killed), conforming to IS 2062 and shall be tested for impact test value at room temperature. Plates beyond 12mm thickness and upto 40mm thickness shall be normalized rolled.

Plates beyond 40mm thickness shall be vacuum degassed furnace normalized and shall also be 100% ultrasonically tested as per ASTM-A578 level B-S2. (FOR MILD STEEL)

Note-2:- Rolled sections shall be of grade designation E350 or higher Quality BO (Fully Killed) conforming to IS 2062. Plates beyond 12mm thickness and upto 40mm thickness shall be normalized rolled.

Plates beyond 40mm thickness shall be vacuum degassed furnace normalized and shall also be ultrasonically tested as per ASTM-578 level B-S2. (FOR MEDIUM AND HIGH TENSILE STEEL)

Note-3:- Proper lockingof circular duct parts shall beensuredin such a way that site weld edgesand circularduct curvature is intact during transportation and handling at site

Note-4:- All material of construction shall be as per NTPC/PVUN approved drawing/ data sheet.

Self-certification

As per Government Public procurement order no. P-45021/2/2017-BE-II dt.15.06.2017 & P-45021/2/2017-PP(BE-II) dated 28.05.2018,29.5.2019 & 04.6.2020, it is hereby certifying that we

……

(supplier name) are ……..(Class-I/Class-II) local supplier and will meet the requirement of minimum local content of …….. (50%/20%) as defined in public procurement order dated 04.6.2020 for material against Enquiry no.

…….

Details of location at which local value addition will be made is as follows: -

……..

……

We also understand, false declarations will be in breach of the code of integrity under Rule

175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the general financial rules along with such other actions as may be permissible under law.

Seal & Signature of Supplier

CORPORATE QUALITY ASSURANCE

MAIN CONTRACTOR'S PROPOSAL CUM EVALUATION REPORT

Ref No:			**Date:**		
i.	**Main Contractor**				
ii.	**Project**				
iii.	**Package Name**		**Package No**		
iv.	**Proposed Item/Scope of Sub-contracting**				
v.	**Item covered under**	**Schedule-1**	☐	**As per contract clause No-**	
		Schedule-2	☐		
vi.	**If item is Schedule-1 and proposed sub-vendor is indigenous, Main Contractor to explain how the contractual provisions will be fulfilled**				
vii.	**Name and Address of the proposed Sub-vendor's works**				
viii.	**PO placement date/ Start of manufacturing (if self-manufactured) as per L2 network**				

ix.	**Item Description (Type/Size/Rating/Scope of Sub-Contracting)**	**Total quantity of proposed item envisaged in this package (Nos/ Running Meters/ Kgs/ Tons etc)**	**Quantity proposed to be procured from proposed sub-vendor (Nos/ Running Meters /Kgs /Tons etc)**	**Timeline for quantity requirements as per project schedule & whether the proposed Sub-vendor equipped with adequate capacity to supply proposed order quantity in time**

x. **Supply experience of the proposed sub-vendor (including supplies to Main Contractor, if any) for similar item/scope of sub-contracting, for last 3 years (*Note:- Only relevant experience details w.r.t. proposed item/scope of subcontracting to be brought out here)***

Project/Package	**Customer Name**	**Supplied Item (Type/Rating/Model /Capacity/Size etc)**	**PO ref no/date**	**Supplied Quantity**	**Date of Supply**

We confirm that as per our assessment, the proposed sub-vendor has requisite capabilities & supply experience and is suitable for supplying the proposed item/scope of sub-contracting.

Name:		**Desig:**		**Sign:**		**Date:**	

Company's Seal/Stamp:-

CORPORATE QUALITY ASSURANCE

SUB-VENDOR QUESTIONNAIRE

i.	**Item/Scope of Sub-contracting**			
ii.	**Address of the registered office**	**Details of Contact Person (Name, Designation, Mobile, Email)**		
iii.	**Name and Address of the proposed Sub-vendor's works where item is being manufactured**	**Details of Contact Person: (Name, Designation, Mobile, Email)**		
iv.	**Annual Production Capacity for proposed item/scope of sub-contracting**			
v.	**Annual production for last 3 years for proposed item/scope of sub-contracting**			
vi.	**Details of proposed works**			
1.	**Year of establishment of present works**			
2.	**Year of commencement of manufacturing at above works**			
3.	**Details of change in Works address in past (if any)**			
4.	**Total Area**			
	Covered Area			
5.	**Factory Registration Certificate**	**Details attached at Annexure – F2.1**		
6.	**Design/ Research & development set-up (No. of manpower, their qualification, machines & tools employed etc.)**	**Applicable / Not applicable if manufacturing is as per Main Contractor/purchaser design) Details attached at Annexure – F2.2 (if applicable)**		
7.	**Overall organization Chart with Manpower Details (Design/Manufacturing/Quality etc)**	**Details attached at Annexure – F2.3**		
8.	**After sales service set up in India, in case of foreign sub-vendor (Location, Contact Person, Contact details etc.)**	**Applicable / Not applicable Details attached at Annexure – F2.4**		
9.	**Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any**	**Details attached at Annexure – F2.5**		
10.	**Sources of Raw Material/Major Bought Out Item**	**Details attached at Annexure – F2.6**		

11.	**Quality Control exercised during receipt of raw material/BOI, in-process , Final Testing, packing**	**Details attached at Annexure – F2.7**
12.	**Manufacturing facilities** **(List of machines, special process facilities, material handling etc.)**	**Details attached at Annexure – F2.8**
13.	**Testing facilities** **(List of testing equipment)**	**Details attached at Annexure – F2.9**
14.	**If manufacturing process involves fabrication then-** **List of qualified Welders** **List of qualified NDT personnel with area of specialization**	**Applicable / Not applicable** **Details attached at Annexure – F2.10** **(if applicable)**
15.	**List of out-sourced manufacturing processes with Sub-Vendors' names & addresses**	**Applicable / Not applicable** **Details attached at Annexure. –F2.11** **(if applicable)**
16.	**Supply reference list including recent supplies**	**Details attached at Annexure – F2.12** **(as per format given below)**

Project/ package	*Customer Name*	*Supplied Item (Type/Rating/Model /Capacity/Size etc)*	*PO ref no/date*	*Supplied Quantity*	*Date of Supply*

17.	**Product satisfactory performance feedback letter/certificates/End User Feedback**	**Attached at annexure - F2.13**
18.	**Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product (similar or higher rating)** **Note:- Reports need not to be submitted**	**Applicable / Not applicable** **Details attached at Annexure – F2.14** **(if applicable)**
19.	**Statutory / mandatory certification for the proposed product**	**Applicable / Not applicable** **Details attached at Annexure – F2.15** **(if applicable)**
20.	**Copy of ISO 9001 certificate** **(if available)**	**Attached at Annexure – F2.16**
21.	**Product technical catalogues for proposed item (if available)**	**Details attached at Annexure – F2.17**

Name:		**Desig:**		**Sign:**		**Date:**	

Company's Seal/Stamp:-

COMBINED BILL OF MATERIAL

Printed On:13.07.2023
Printed By:

CBOM No: 01709970023 **CBOM Var:** 00 **Revno:** 1 **Rev Date:** 08.07.2023
Description: D LIASIONING 8000~2800 UNIT-2 **Total weight:** 105350.0

R E C O R D OF C H A N G E S

Drawing No	Var	Revno	Rev Date	Description
01709970023	00	1	12.06.2023	Item No.13 Replace. it no 26 & 27 added

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

COMBINED BILL OF MATERIAL

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CBOM No: 01709970023 **CBOM Var:** 00 **Revno:** 1 **Rev Date:** 08.07.2023
Description: D LIASIONING 8000~2800 UNIT-2 **Total weight:** 105350.0

Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / ENGG SIZE/GRP	Weight / Inclusion? / Fab Wt	Blank Sizes / Mat Shape / Route	Nos	Qty	Norm/pc / Remarks	Extra Norm / Spare Code	Total Norm / Unit
0	01709970023 00			105350.0						
1(1)	D LIASIONING 8000~2800 UNIT-2			Y						
MF CD			Y	104606.0	SITE					
1	11709970173 00			2277.8						
2(2)	DUCT LIASIONING TEE 5600X2800			Y						
MF CD			N	2268.0	0306-0314-000D					
1-1		AA1011819090	AA10119	852.5	2920.0X4580.0	1	2	1324.0	0.0	2648.0
1(2)	DUCT PLATE			Y	PL 12			-Make in Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
1-2		AA1011819139	AA10119	125.7	1562.0X535.0	1	2	137.88	0.0	275.76
1(2)	STIFFENER PLATE			Y	PL 20			-Make in 2 Eq Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
1-3		AA1011819139	AA10119	130.1	2111.0X570.0	1	2	198.54	0.0	397.08
1(2)	STIFFENER PLATE			Y	PL 20					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
1-4		AA1011819139	AA10119	93.3	2345.0X1000.0	1	2	386.5	0.0	773.0
1(2)	STIFFENER PLATE			Y	PL 20			-Make in 2 Eq Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
1-5		AA1011819090	AA10119	481.0	1573.0X4373.0	1	2	681.0	0.0	1362.0
1(2)	NOZZLE PLATE			Y	PL 12					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
1-6		AA1011819090	AA10119	303.4	3619.0X2375.0	1	2	851.0	0.0	1702.0
1(2)	NOZZLE PLATE			Y	PL 12					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
1-7		AA1011819104	AA10119	18.4	795.0X250.0	1	4	22.96	0.0	91.84
2(4)	STIFFENER PLATE			Y	PL 14					
MF DR	STRUCTURAL STEEL WELDABLE				0072-0301-0306					KG
1-8		AA1011819139	AA10119	215.3	300.0X4570.0	1	2	226.2	0.0	452.4
1(2)	STIFFENER PLATE		4570X300	Y	PL 20					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

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Description: D LIASIONING 8000~2800 UNIT-2 **Total weight:** 105350.0

Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / ENGG SIZE/GRP	Weight / Inclusion? / Fab Wt	Blank Sizes / Mat Shape / Route	Nos	Qty	Norm/pc / Remarks	Extra Norm / Spare Code	Total Norm / Unit
1-9		AA1011819139	AA10119	30.0	805.0X280.0	1	2	37.19	0.0	74.38
1(2)	STIFFENER PLATE			Y	PL 20					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
2	11709970174 00			2277.8						
2(2)	DUCT LIASIONING TEE 5600X2800			Y						
MF CD			N	2268.0	0306-0314-000D					
2-1		AA1011819090	AA10119	852.5	2926.0X4580.0	1	2	1326.7	0.0	2653.4
1(2)	DUCT PLATE			Y	PL 12			-Make in Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
2-2		AA1011819139	AA10119	125.7	1560.0X550.0	1	2	141.57	0.0	283.14
1(2)	STIFFENER PLATE			Y	PL 20			-Make in 2 Eq Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
2-3		AA1011819139	AA10119	130.1	2111.0X570.0	1	2	198.54	0.0	397.08
1(2)	STIFFENER PLATE			Y	PL 20					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
2-4		AA1011819139	AA10119	93.3	2345.0X1000.0	1	2	386.5	0.0	773.0
1(2)	STIFFENER PLATE			Y	PL 20			-Make in 2 Eq Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
2-5		AA1011819090	AA10119	481.0	1573.0X4373.0	1	2	681.0	0.0	1362.0
1(2)	NOZZLE PLATE			Y	PL 12					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
2-6		AA1011819090	AA10119	303.4	3619.0X2375.0	1	2	851.0	0.0	1702.0
1(2)	NOZZLE PLATE			Y	PL 12					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
2-7		AA1011819104	AA10119	18.4	1252.0X262.0	1	4	37.88	0.0	151.52
2(4)	STIFFENER PLATE			Y	PL 14					
MF DR	STRUCTURAL STEEL WELDABLE				0072-0301-0306					KG
2-8		AA1011819139	AA10119	215.3	4570.0X300.0	1	2	226.2	0.0	452.4
1(2)	STIFFENER PLATE		4570X300	Y	PL 20					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

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Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / ENGG SIZE/GRP	Weight / Inclusion? / Fab Wt	Blank Sizes / Mat Shape / Route	Nos	Qty	Norm/pc / Remarks	Extra Norm / Spare Code	Total Norm / Unit
2-9		AA1011819139	AA10119	30.0	805.0X280.0	1	2	37.19	0.0	74.38
1(2)	STIFFENER PLATE			Y	PL 20					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
3	21709970206 00			1576.0						
8(8)	DUCT LIASIONING TEE 5600X2800			Y						
MF CD			N	1577.0	0306-0314-000D					
3-1		AA1011819090	AA10119	1262.4	4580.0X2926.0	1	8	1326.7	0.0	10613.6
1(8)	DUCT PLATE			Y	PL 12			-Make in Parts		
MF DR	ST-FE410 WB-PLATE		2926.0X4580.0		0072-0301-0306					KG
3-2		AA1011819139	AA10119	125.7	655.0X1588.0	1	32	171.6	0.0	5491.2
4(32)	STIFFENER PLATE			Y	PL 20			-Make in 2 Eq Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
3-3		AA1011819104	AA10119	73.7	570.0X1572.0	1	16	103.5	0.0	1656.0
2(16)	STIFFENER PLATE			Y	PL 14			-Make in 2 Eq Parts		
MF DR	STRUCTURAL STEEL WELDABLE				0072-0301-0306					KG
3-4		AA1011819139	AA10119	105.2	570.0X1572.0	1	8	147.8	0.0	1182.4
1(8)	STIFFENER PLATE			Y	PL 20			-Make in 2 Eq Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
4	21709970182 00			2672.7						
1(1)	ECCNTRIC REDUCER(5600X4900)-01			Y						
MF CD			N	2666.2	0072-0306-000D					
4-1		AA1011819090	AA10119	1942.8	3456.0X8628.0	1	1	2949.3	0.0	2949.3
1(1)	DUCT PLATE			Y	PL 12			-Make in Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
4-2		AA1011819104	AA10119	207.7	1110.0X2854.0	1	1	365.56	0.0	365.56
1(1)	STIFFENER PLATE			Y	PL 14			-Make in 3 Eq Parts		
MF DR	STRUCTURAL STEEL WELDABLE				0072-0301-0306					KG
4-3		HW1041055684	AA10455	256.05	5580.0	1	1	5.58	0.0	5.58
1(1)	TECHNOLOGICAL SUPPORT		L=5580	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

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Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / ENGG SIZE/GRP	Weight / Inclusion? / Fab Wt	Blank Sizes / Mat Shape / Route	Nos	Qty	Norm/pc / Remarks	Extra Norm / Spare Code	Total Norm / Unit
4-4		HW1041055684	AA10455	41.8	2600.0	1	1	2.6	0.0	2.6
1(1)	TECHNOLOGICAL SUPPORT		L=2600	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
4-5		HW1041055684	AA10455	78.5	4880.0	1	1	4.88	0.0	4.88
1(1)	TECHNOLOGICAL SUPPORT		L=4880	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
4-6		HW1041055684	AA10455	36.2	2250.0	1	1	2.25	0.0	2.25
1(1)	TECHNOLOGICAL SUPPORT		L=2250	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
5	21709970183 00			2772.2						
1(1)	ECCNTRIC REDUCER(5600X4900)-02			Y						
MF CD			N	2666.2	0306-0314-000D					
5-1		AA1011819090	AA10119	1942.8	3457.0X8628.0	1	1	2949.3	0.0	2949.3
1(1)	DUCT PLATE			Y	PL 12			-Make in Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
5-2		AA1011819104	AA10119	207.7	1110.0X2854.0	1	1	365.56	0.0	365.56
1(1)	STIFFENER PLATE			Y	PL 14			-Make in 3 Eq Parts		
MF DR	STRUCTURAL STEEL WELDABLE				0072-0301-0306					KG
5-3		HW1041055684	AA10455	256.05	5580.0	1	1	5.58	0.0	5.58
1(1)	TECHNOLOGICAL SUPPORT		L=5580	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
5-4		HW1041055684	AA10455	41.8	2600.0	1	1	2.6	0.0	2.6
1(1)	TECHNOLOGICAL SUPPORT		L=2600	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
5-5		HW1041055684	AA10455	78.5	4880.0	1	1	4.88	0.0	4.88
1(1)	TECHNOLOGICAL SUPPORT		L=4880	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
5-6		HW1041055684	AA10455	36.2	2250.0	1	1	2.25	0.0	2.25
1(1)	TECHNOLOGICAL SUPPORT		L=2250	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

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Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / ENGG SIZE/GRP	Weight / Inclusion? / Fab Wt	Blank Sizes / Mat Shape / Route	Nos	Qty	Norm/pc / Remarks	Extra Norm / Spare Code	Total Norm / Unit
6	21709970184 00			0.0						
1(1)	PROFILE COORDINT(5600X4900)			Y						
MF CD			N		0306					
7	21709970185 00			2804.5						
2(2)	DUCT LIASIONING DIA 4900			Y						
MF CD			N	2798.0	0306-0314-000D					
7-1		AA1011819090	AA10119	1997.5	7697.0X2755.0	1	2	2097.4	0.0	4194.8
1(2)	DUCT PLATE			Y	PL 12			-Make in Parts		
MF DR	ST-FE410 WB-PLATE		7697.0X2755.0		0072-0301-0306					KG
7-2		AA1011819104	AA10119	151.0	1024.0X2660.0	1	2	314.3	0.0	628.6
1(2)	STIFFENER PLATE			Y	PL 14			-Make in 3 Eq Parts		
MF DR	STRUCTURAL STEEL WELDABLE				0072-0301-0306					KG
7-3		HW1041055684	AA10455	224.4	4890.0	1	4	4.89	0.0	19.56
2(4)	TECH SUPPORT		L=4890	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
7-4		HW1041055684	AA10455	100.6	2192.0	1	4	2.192	0.0	8.768
2(4)	TECH SUPPORT		L=2192	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
8	21709970186 00			2982.2						
2(2)	DUCT LIASIONING DIA 4900			Y						
MF CD			N	2976.0	0306-0314-000D					
8-1		AA1011819090	AA10119	2175.2	7697.0X2755.0	1	2	2097.4	0.0	4194.8
1(2)	DUCT PLATE			Y	PL 12			-Make in Parts		
MF DR	ST-FE410 WB-PLATE		7697.0X3000.0		0072-0315-0306					KG
8-2		AA1011819104	AA10119	151.0	1024.0X2660.0	1	2	314.3	0.0	628.6
1(2)	STIFFENER PLATE			Y	PL 14			-Make in 3 Eq Parts		
MF DR	STRUCTURAL STEEL WELDABLE				0072-0301-0306					KG
8-3		HW1041055684	AA10455	224.4	4890.0	1	4	4.89	0.0	19.56
2(4)	TECH SUPPORT		L=4890	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

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8-4		HW1041055684	AA10455	100.6	2192.0	1	4	2.192	0.0	8.768
2(4)	TECH SUPPORT		L=2192	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
9	11709970139 00			3291.7						
1(1)	DUCT LIASIONING TEE 4900X2800			Y						
MF CD			N	3248.9	0306-0314-000D					
9-1		AA1011819090	AA10119	1389.0	4935.0X3830.0	1	1	1869.5	0.0	1869.5
1(1)	DUCT PLATE			Y	PL 12			-Make in Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
9-2		AA1011819139	AA10119	169.6	780.0X2076.0	1	2	266.9	0.0	533.8
2(2)	STIFFENER PLATE			Y	PL 20			-Make in 2 Eq Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
9-3		AA1011819139	AA10119	160.8	2343.0X700.0	1	1	270.0	0.0	270.0
1(1)	STIFFENER PLATE			Y	PL 20					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
9-4		AA1011819139	AA10119	1880.0	1272.0X630.0	1	1	132.1	0.0	132.1
1(1)	STIFFENER PLATE			Y	PL 20			-Make in 2 Eq Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
9-5		AA1011819090	AA10119	481.0	4373.0X1573.0	1	1	680.0	0.0	680.0
1(1)	NOZZLE PLATE			Y	PL 12					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
9-6		AA1011819090	AA10119	303.4	3619.0X2375.0	1	1	850.14	0.0	850.14
1(1)	NOZZLE PLATE			Y	PL 12					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
9-7		AA1011819090	AA10119	42.3	1855.0X405.0	1	2	74.3	0.0	148.6
2(2)	STIFFENER PLATE			Y	PL 12					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
9-8		AA1011819139	AA10119	232.4	4935.0X300.0	1	1	244.06	0.0	244.06
1(1)	STIFFENER PLATE			Y	PL 20					
MF DR	ST-FE410 WB-PLATE		4935.0X300.0		0072-0301-0306					KG

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

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Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / ENGG SIZE/GRP	Weight / Inclusion? / Fab Wt	Blank Sizes / Mat Shape / Route	Nos	Qty	Norm/pc / Remarks	Extra Norm / Spare Code	Total Norm / Unit
9-9		AA1011819139	AA10119	70.6	1855.0X400.0	1	1	122.31	0.0	122.31
1(1)	STIFFENER PLATE			Y	PL 20					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
10	11709970140 00			3291.7						
1(1)	DUCT LIASIONING TEE 4900X2800			Y						
MF CD			N	3248.9	0306-0314-000D					
10-1		AA1011819090	AA10119	1389.0	4935.0X3830.0	1	1	1869.5	0.0	1869.5
1(1)	DUCT PLATE			Y	PL 12			-Make in Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
10-2		AA1011819139	AA10119	169.6	780.0X2076.0	1	2	266.9	0.0	533.8
2(2)	STIFFENER PLATE			Y	PL 20			-Make in 2 Eq Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
10-3		AA1011819139	AA10119	160.8	700.0X2343.0	1	1	270.37	0.0	270.37
1(1)	STIFFENER PLATE			Y	PL 20					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
10-4		AA1011819139	AA10119	1880.0	1272.0X630.0	1	1	132.1	0.0	132.1
1(1)	STIFFENER PLATE			Y	PL 20			-Make in 2 Eq Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
10-5		AA1011819090	AA10119	481.0	4373.0X1573.0	1	1	680.37	0.0	680.37
1(1)	NOZZLE PLATE			Y	PL 12					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
10-6		AA1011819090	AA10119	303.4	3619.0X2375.0	1	1	850.14	0.0	850.14
1(1)	NOZZLE PLATE			Y	PL 12					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
10-7		AA1011819090	AA10119	42.3	1855.0X400.0	1	2	73.39	0.0	146.78
2(2)	STIFFENER PLATE			Y	PL 12					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
10-8		AA1011819139	AA10119	232.4	4935.0X300.0	1	1	244.6	0.0	244.6
1(1)	STIFFENER PLATE			Y	PL 20					
MF DR	ST-FE410 WB-PLATE		4935.0X300.0		0072-0301-0306					KG

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

COMBINED BILL OF MATERIAL

Printed On:13.07.2023
Printed By:

CBOM No: 01709970023 **CBOM Var:** 00 **Revno:** 1 **Rev Date:** 08.07.2023
Description: D LIASIONING 8000~2800 UNIT-2 **Total weight:** 105350.0

Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / ENGG SIZE/GRP	Weight / Inclusion? / Fab Wt	Blank Sizes / Mat Shape / Route	Nos	Qty	Norm/pc / Remarks	Extra Norm / Spare Code	Total Norm / Unit
10-9		AA1011819139	AA10119	70.6	1855.0X400.0	1	1	122.31	0.0	122.31
1(1)	STIFFENER PLATE			Y	PL 20					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
11	21709970174 00			2514.7						
2(2)	DUCT LIASIONING TEE 4900X2800			Y						
MF CD			N	2501.0	0306-0314-000D					
11-1		AA1011819090	AA10119	1780.479	4935.0X3830.0	1	2	1869.5	0.0	3739.0
1(2)	DUCT PLATE			Y	PL 12			-Make in parts		
MF DR	ST-FE410 WB-PLATE		4935.0X3830.0		0072-0301-0306					KG
11-2		AA1011819139	AA10119	169.6	780.0X2076.0	1	2	160.16	0.0	320.32
1(2)	STIFFENER PLATE			Y	PL 20			-Make in 2 Eq Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
11-3		AA1011819090	AA10119	111.2	728.0X2076.0	1	4	149.4	0.0	597.6
2(4)	STIFFENER PLATE			Y	PL 12			-Make in 2 Eq Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
11-4		AA1011819139	AA10119	158.8	728.0X2076.0	1	2	249.14	0.0	498.28
1(2)	TECHNOLOGICAL SUPPORT			Y	PL 20			-Make in 2 Eq Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
12	31709970037 00			2416.3						
1(1)	ECCNTRIC REDUCER(4900X4000)-1			Y						
MF CD			N		0306-0314-000D					
12-1		AA1011819090	AA10119	1986.7	7529.0X3825.0	1	1	2848.45	0.0	2848.45
1(1)	DUCT PLATE			Y	PL 12			-Make in Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
12-2		AA1011819090	AA10119	137.5	1010.0X2435.0	1	1	243.25	0.0	243.25
1(1)	STIFFENER PLATE			Y	PL 12			-Make in 3 Eq Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
12-3		HW1041055684	AA10455	64.6	4020.0	1	1	4.02	0.0	4.02
1(1)	TECHNOLOGICAL SUPPORT		L=4020	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

COMBINED BILL OF MATERIAL

Printed On:13.07.2023
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CBOM No: 01709970023 **CBOM Var:** 00 **Revno:** 1 **Rev Date:** 08.07.2023
Description: D LIASIONING 8000~2800 UNIT-2 **Total weight:** 105350.0

Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / ENGG SIZE/GRP	Weight / Inclusion? / Fab Wt	Blank Sizes / Mat Shape / Route	Nos	Qty	Norm/pc / Remarks	Extra Norm / Spare Code	Total Norm / Unit
12-4		HW1041055684	AA10455	29.0	1804.0	1	1	1.804	0.0	1.804
1(1)	TECHNOLOGICAL SUPPORT		L=1804	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
12-5		HW1041055684	AA10455	77.5	4824.0	1	1	4.824	0.0	4.824
1(1)	TECHNOLOGICAL SUPPORT		L=4824	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
12-6		HW1041055676	AA10455	35.4	2205.0	1	1	2.205	0.0	2.205
1(1)	TECHNOLOGICAL SUPPORT		L=2205	Y	PI 114.3X13.49					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
12-7		AA1011819074	AA10119	85.6	800.0X2160.0	1	1	142.43	0.0	142.43
1(1)	STIFFENER PLATE			Y	PL 10			-Make in 3 Eq Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
13	31709970038 00			2416.3						
1(1)	ECCNTRIC REDUCER(4900X4000)-2			Y						
MF CD			N		0306-0314-000D					
13-1		AA1011819090	AA10119	1986.7	3825.0X7529.0	1	1	2848.45	0.0	2848.45
1(1)	DUCT PLATE			Y	PL 12			-Make in Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
13-2		AA1011819090	AA10119	137.5	1010.0X2435.0	1	1	243.25	0.0	243.25
1(1)	STIFFENER PLATE			Y	PL 12			-Make in 3 Eq Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
13-3		HW1041055684	AA10455	64.6	4020.0	1	1	4.02	0.0	4.02
1(1)	TECHNOLOGICAL SUPPORT		L=4020	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
13-4		HW1041055684	AA10455	29.0	1804.0	1	1	1.804	0.0	1.804
1(1)	TECHNOLOGICAL SUPPORT		L=1804	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
13-5		HW1041055684	AA10455	77.5	4824.0	1	1	4.824	0.0	4.824
1(1)	TECHNOLOGICAL SUPPORT		L=4824	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

COMBINED BILL OF MATERIAL

Printed On:13.07.2023
Printed By:

CBOM No: 01709970023 **CBOM Var:** 00 **Revno:** 1 **Rev Date:** 08.07.2023
Description: D LIASIONING 8000~2800 UNIT-2 **Total weight:** 105350.0

Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / ENGG SIZE/GRP	Weight / Inclusion? / Fab Wt	Blank Sizes / Mat Shape / Route	Nos	Qty	Norm/pc / Remarks	Extra Norm / Spare Code	Total Norm / Unit
13-6		HW1041055676	AA10455	35.4	2205.0	1	1	2.205	0.0	2.205
1(1)	TECHNOLOGICAL SUPPORT		L=2205	Y	PI 114.3X13.49					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
13-7		AA1011819074	AA10119	85.6	800.0X2150.0	1	1	141.7	0.0	141.7
1(1)	STIFFENER PLATE			Y	PL 10					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
14	31709970047 00			0.0						
1(1)	PROFILE COORDINATE 4900X4000			Y						
MF CD			N		0306					
15	31709970039 00			1493.2						
8(8)	DUCT LIASIONING DIA 4000			Y						
MF CD			N		0306-0314-000D					
15-1		AA1011819074	AA10119	1324.4	2692.0X6267.0	1	8	1390.57	0.0	11124.56
1(8)	DUCT PLATE			Y	PL 10			-to make in parts		
MF DR	ST-FE410 WB-PLATE		5864.3X2460.0		0072-0301-0306					KG
15-2		AA1011819074	AA10119	76.8	1115.0X2160.0	1	8	142.43	0.0	1139.44
1(8)	STIFFENER PLATE			Y	PL 10			-to make in 3 Eq parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
15-3		HW1041055684	AA10455	63.4	3950.0	1	16	3.95	0.0	63.2
2(16)	TECH SUPPORT		L=3950	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
15-4		HW1041055684	AA10455	28.6	1783.0	1	16	1.783	0.0	28.528
2(16)	TECH SUPPORT		L=1783	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
16	11709970142 00			2906.5						
2(2)	DUCT LIASIONING TEE 4000X2800			Y						
MF CD			N		0306-0314-000D					
16-1		AA1011819074	AA10119	1181.4	4790.0X3142.0	1	2	1240.5	0.0	2481.0
1(2)	DUCT PLATE		4790X3142	Y	PL 10			-to make in parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

COMBINED BILL OF MATERIAL

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CBOM No: 01709970023 **CBOM Var:** 00 **Revno:** 1 **Rev Date:** 08.07.2023
Description: D LIASIONING 8000~2800 UNIT-2 **Total weight:** 105350.0

Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / ENGG SIZE/GRP	Weight / Inclusion? / Fab Wt	Blank Sizes / Mat Shape / Route	Nos	Qty	Norm/pc / Remarks	Extra Norm / Spare Code	Total Norm / Unit
16-2		AA1011819139	AA10119	138.9	1732.0X740.0	1	4	211.28	0.0	845.12
2(4)	STIFFENER PLATE			Y	PL 20			-to make in 2 Eq parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
16-3		AA1011819139	AA10119	155.8	592.0X2460.0	1	2	240.07	0.0	480.14
1(2)	STIFFENER PLATE			Y	PL 20					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
16-4		AA1011819139	AA10119	179.72	2345.0X1000.0	1	2	386.57	0.0	773.14
1(2)	STIFFENER PLATE			Y	PL 20			-to make in 2 Eq parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
16-5		AA1011819090	AA10119	481.0	4373.0X1573.0	1	2	1134.0	0.0	2268.0
1(2)	NOZZLE PLATE			Y	PL 12					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
16-6		AA1011819090	AA10119	303.4	3660.0X2383.0	1	2	862.67	0.0	1725.34
1(2)	NOZZLE PLATE			Y	PL 12					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
16-7		AA1011819074	AA10119	21.8	1545.0X380.0	1	4	48.39	0.0	193.56
2(4)	STIFFENER PLATE			Y	PL 10					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
16-8		AA1011819139	AA10119	256.6	4790.0X300.0	1	2	236.88	0.0	473.76
1(2)	STIFFENER PLATE			Y	PL 20					
MF DR	ST-FE410 WB-PLATE		4935.0X300.0		0072-0301-0306					KG
16-9		AA1011819139	AA10119	43.7	1545.0X380.0	1	2	96.78	0.0	193.56
1(2)	STIFFENER PLATE			Y	PL 20					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
17	11709970143 00			2906.5						
1(1)	DUCT LIASIONING TEE 4000X2800			Y						
MF CD			N		0306-0314-000D					
17-1		AA1011819074	AA10119	1181.4	4790.0X3142.0	1	1	1240.5	0.0	1240.5
1(1)	DUCT PLATE		4790X3142	Y	PL 10			-to make in parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

COMBINED BILL OF MATERIAL

Printed On:13.07.2023
Printed By:

CBOM No: 01709970023 **CBOM Var:** 00 **Revno:** 1 **Rev Date:** 08.07.2023
Description: D LIASIONING 8000~2800 UNIT-2 **Total weight:** 105350.0

Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / ENGG SIZE/GRP	Weight / Inclusion? / Fab Wt	Blank Sizes / Mat Shape / Route	Nos	Qty	Norm/pc / Remarks	Extra Norm / Spare Code	Total Norm / Unit
17-2		AA1011819139	AA10119	138.9	1732.0X740.0	1	2	211.28	0.0	422.56
2(2)	STIFFENER PLATE			Y	PL 20			-to make in 2 Eq parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
17-3		AA1011819139	AA10119	155.8	2460.0X592.0	1	1	240.0	0.0	240.0
1(1)	STIFFENER PLATE			Y	PL 20					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
17-4		AA1011819139	AA10119	179.72	2345.0X1000.0	1	1	386.57	0.0	386.57
1(1)	STIFFENER PLATE			Y	PL 20			-to make in 2 Eq parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
17-5		AA1011819090	AA10119	481.0	1573.0X4373.0	1	1	680.37	0.0	680.37
1(1)	NOZZLE PLATE			Y	PL 12					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
17-6		AA1011819090	AA10119	303.4	3660.0X2383.0	1	1	862.67	0.0	862.67
1(1)	NOZZLE PLATE			Y	PL 12					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
17-7		AA1011819074	AA10119	21.8	1545.0X380.0	1	2	48.39	0.0	96.78
2(2)	STIFFENER PLATE			Y	PL 10					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
17-8		AA1011819139	AA10119	256.6	4790.0X300.0	1	1	236.88	0.0	236.88
1(1)	STIFFENER PLATE			Y	PL 20					
MF DR	ST-FE410 WB-PLATE		4935.0X300.0		0072-0301-0306					KG
17-9		AA1011819139	AA10119	43.7	1545.0X380.0	1	1	96.78	0.0	96.78
1(1)	STIFFENER PLATE			Y	PL 20					
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
18	31709970051 00			2200.2						
2(2)	DUCT LIASIONING TEE 4000X2800			Y						
MF CD			N		0306-0314-000D					
18-1		AA1011819090	AA10119	1175.42	4790.0X3126.0	1	2	1481.03	0.0	2962.06
1(2)	DUCT PLATE			Y	PL 12			-to make in parts		
MF DR	ST-FE410 WB-PLATE		4790.0X3126.0		0072-0301-0306					KG

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

COMBINED BILL OF MATERIAL

Printed On:13.07.2023
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CBOM No: 01709970023 **CBOM Var:** 00 **Revno:** 1 **Rev Date:** 08.07.2023
Description: D LIASIONING 8000~2800 UNIT-2 **Total weight:** 105350.0

Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / ENGG SIZE/GRP	Weight / Inclusion? / Fab Wt	Blank Sizes / Mat Shape / Route	Nos	Qty	Norm/pc / Remarks	Extra Norm / Spare Code	Total Norm / Unit
18-2		AA1011819139	AA10119	260.3	1732.0X740.0	1	4	211.28	0.0	845.12
2(4)	STIFFENER PLATE			Y	PL 20			-to make in 2 Eq parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
18-3		AA1011819090	AA10119	123.3	700.0X1732.0	1	4	119.9	0.0	479.6
2(4)	STIFFENER PLATE			Y	PL 12			-to make in 2 Eq parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
18-4		AA1011819139	AA10119	246.6	700.0X1732.0	1	2	199.86	0.0	399.72
1(2)	STIFFENER PLATE			Y	PL 20			-to make in 2 Eq parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
19	31709970040 00			1462.1						
2(2)	ECCNTRIC REDUCER(4000X2800)-1			Y						
MF DR			N		0306-0314-000D					
19-1		AA1011819074	AA10119	1239.9	7540.0X6055.0	1	2	3763.0	0.0	7526.0
1(2)	DUCT PLATE			Y	PL 10			-Make in parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
19-2		AA1011819074	AA10119	65.1	780.0X1852.0	1	2	119.06	0.0	238.12
1(2)	STIFFENER PLATE			Y	PL 10			-to make in 3 Eq parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
19-3		HW1041055684	AA10455	44.8	2790.0	1	2	2.79	0.0	5.58
1(2)	TECHNOLOGICAL SUPPORT		L=2790	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
19-4		HW1041055684	AA10455	20.4	1270.0	1	2	1.27	0.0	2.54
1(2)	TECHNOLOGICAL SUPPORT		L=1270	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
19-5		HW1041055684	AA10455	62.5	3890.0	1	2	3.89	0.0	7.78
1(2)	TECHNOLOGICAL SUPPORT		L=3890	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
19-6		HW1041055676	AA10455	29.4	1830.0	1	2	1.83	0.0	3.66
1(2)	TECHNOLOGICAL SUPPORT		L=1830	Y	PI 114.3X13.49					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

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Printed On:13.07.2023
Printed By:

CBOM No: 01709970023 **CBOM Var:** 00 **Revno:** 1 **Rev Date:** 08.07.2023
Description: D LIASIONING 8000~2800 UNIT-2 **Total weight:** 105350.0

Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / ENGG SIZE/GRP	Weight / Inclusion? / Fab Wt	Blank Sizes / Mat Shape / Route	Nos	Qty	Norm/pc / Remarks	Extra Norm / Spare Code	Total Norm / Unit
20	31709970041 00			1462.1						
2(2)	ECCNTRIC REDUCER(4000X2800)-2			Y						
MF CD			N		0306-0314-000D					
20-1		AA1011819074	AA10119	1239.9	7540.0X6055.0	1	2	3763.0	0.0	7526.0
1(2)	DUCT PLATE			Y	PL 10			-Make in parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
20-2		AA1011819074	AA10119	65.1	1852.0X780.0	1	2	119.06	0.0	238.12
1(2)	STIFFENER PLATE			Y	PL 10			-to make in 3 Eq parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
20-3		HW1041055684	AA10455	44.8	2790.0	1	2	2.79	0.0	5.58
1(2)	TECHNOLOGICAL SUPPORT		L=2790	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
20-4		HW1041055684	AA10455	20.4	1270.0	1	2	1.27	0.0	2.54
1(2)	TECHNOLOGICAL SUPPORT		L=1270	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
20-5		HW1041055684	AA10455	62.5	3890.0	1	2	3.89	0.0	7.78
1(2)	TECHNOLOGICAL SUPPORT		L=3890	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
20-6		HW1041055676	AA10455	29.4	1830.0	1	2	1.83	0.0	3.66
1(2)	TECHNOLOGICAL SUPPORT		L=1830	Y	PI 114.3X13.49					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
21	31709970048 00			0.0						
1(1)	PROFILE CO-ORDINATE 4000X2800			Y						
MF CD			N		0306					
22	31709970050 00			5206.3						
2(2)	DUCT LIASIONING DIA 2800			Y						
MF CD			N		0306-0314-000D					
22-1		AA1011819058	AA10119	4516.7	8771.0X8200.0	1	2	4742.5	0.0	9485.0
1(2)	DUCT PLATE			Y	PL 8			-to make in parts		
MF DR	ST-FE410 WB-PLATE		8771.0X8200.0		0072-0301-0306					KG

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

COMBINED BILL OF MATERIAL

Printed On:13.07.2023
Printed By:

CBOM No: 01709970023 **CBOM Var:** 00 **Revno:** 1 **Rev Date:** 08.07.2023
Description: D LIASIONING 8000~2800 UNIT-2 **Total weight:** 105350.0

Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / ENGG SIZE/GRP	Weight / Inclusion? / Fab Wt	Blank Sizes / Mat Shape / Route	Nos	Qty	Norm/pc / Remarks	Extra Norm / Spare Code	Total Norm / Unit
22-2		AA1011819074	AA10119	165.72	1075.0X2160.0	1	8	191.39	0.0	1531.12
4(8)	STIFFENER PLATE			Y	PL 10			-to make in 4 Eq parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
23	21709970201 00			2641.0						
1(1)	ECCENTRIC REDUCER(5600X4000)-1			Y						
MF CD			N	2634.0	0306-0314-000D					
23-1		AA1011819090	AA10119	2226.7	4410.0X8296.0	1	1	3621.95	0.0	3621.95
1(1)	DUCT PLATE			Y	PL 12			-Make in Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG
23-2		AA1011819104	AA10119	190.7	1100.0X2635.0	1	1	334.77	0.0	334.77
1(1)	STIFFENER PLATE			Y	PL 14			-Make in 3 Eq Parts		
MF DR	STRUCTURAL STEEL WELDABLE				0072-0301-0306					KG
23-3		HW1041055684	AA10455	89.7	5580.0	1	1	5.58	0.0	5.58
1(1)	TECHNOLOGICAL SUPPORT		L=5580	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
23-4		HW1041055684	AA10455	40.9	2543.0	1	1	2.543	0.0	2.543
1(1)	TECHNOLOGICAL SUPPORT		L=2543	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
23-5		HW1041055684	AA10455	63.8	3966.0	1	1	3.966	0.0	3.966
1(1)	TECHNOLOGICAL SUPPORT		L=3966	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
23-6		HW1041055684	AA10455	22.0	1743.0	1	1	1.743	0.0	1.743
1(1)	TECHNOLOGICAL SUPPORT		L=1743	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
24	21709970202 00			2641.0						
1(1)	ECCENTRIC REDUCER(5600X4000)-2			Y						
MF CD			N	2634.0	0306-0314-000D					
24-1		AA1011819090	AA10119	2226.7	4410.0X8296.0	1	1	3621.95	0.0	3621.95
1(1)	DUCT PLATE			Y	PL 12			-Make in Parts		
MF DR	ST-FE410 WB-PLATE				0072-0301-0306					KG

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

COMBINED BILL OF MATERIAL

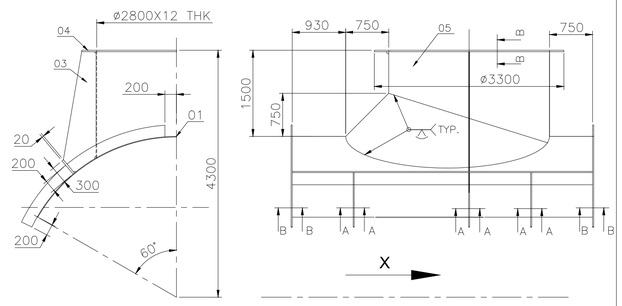
Printed On:13.07.2023
Printed By:

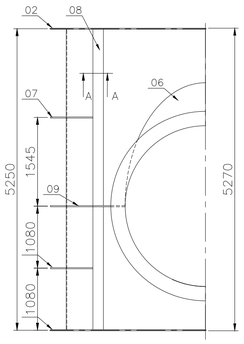
CBOM No: 01709970023 **CBOM Var:** 00 **Revno:** 1 **Rev Date:** 08.07.2023
Description: D LIASIONING 8000~2800 UNIT-2 **Total weight:** 105350.0

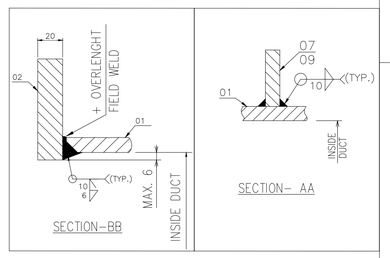
Item No / Qty(Total) / Typ Cat Zone	Drawingno Var Mvar / Description / Var/Matl. Description	Mat Code	Mat Spec / Assy. Remarks / ENGG SIZE/GRP	Weight / Inclusion? / Fab Wt	Blank Sizes / Mat Shape / Route	Nos	Qty	Norm/pc / Remarks	Extra Norm / Spare Code	Total Norm / Unit
24-2		AA1011819104	AA10119	190.7	1100.0X2635.0	1	1	334.77	0.0	334.77
1(1)	STIFFENER PLATE			Y	PL 14			-Make in 3 Eq Parts		
MF DR	STRUCTURAL STEEL WELDABLE				0072-0301-0306					KG
24-3		HW1041055684	AA10455	89.7	5580.0	1	1	5.58	0.0	5.58
1(1)	TECHNOLOGICAL SUPPORT		L=5580	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
24-4		HW1041055684	AA10455	40.9	2543.0	1	1	2.543	0.0	2.543
1(1)	TECHNOLOGICAL SUPPORT		L=2543	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
24-5		HW1041055684	AA10455	63.8	3966.0	1	1	3.966	0.0	3.966
1(1)	TECHNOLOGICAL SUPPORT		L=3966	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
24-6		HW1041055684	AA10455	22.0	1743.0	1	1	1.743	0.0	1.743
1(1)	TECHNOLOGICAL SUPPORT		L=1743	Y	PI 114.3X6.02					
MF DR	ST-B-HFS-PIPES				0072-0315-0306					MR
25	21709970203 00			0.0						
1(1)	PROFILE COORDINATE(5600X4000)			Y						
MF DR			N		0306					
26		AA1011819139	AA10119	125.4	0.0	0	0	0.0	0.0	0.0
5(5)	STIFFENER PLATE			Y	PL 20					
MF CD	ST-FE410 WB-PLATE									KG
27		AA1011819139	AA10119	201.6	0.0	0	0	0.0	0.0	0.0
5(5)				Y	PL 20					
MF CD	ST-FE410 WB-PLATE									KG

	ENGG		WTX	
	Initial	Date	Initial	Date
Worked By	hxenkj	26.04.2023	wtxman	24.05.2023
Checked By	hxeaxk	28.04.2023	bk2rd	24.05.2023
Approved By	hxenp	24.05.2023	wtxskg	24.05.2023

DRAWING NO. 11709970123

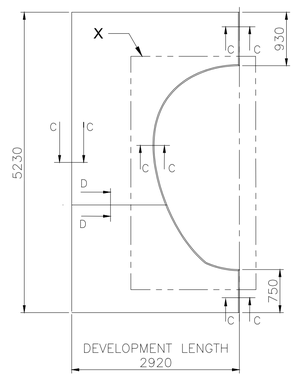




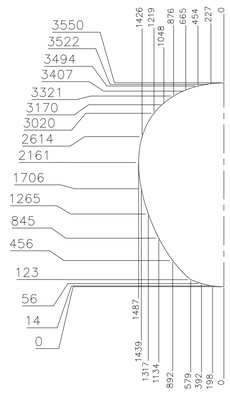


SECTION–BB

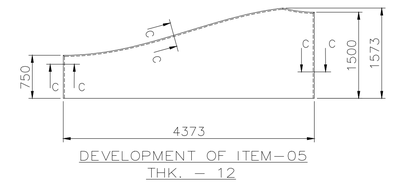
SECTION– AA



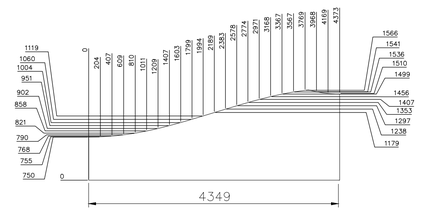
ITEM NO –01



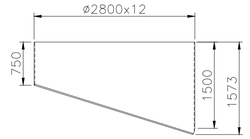
DETAIL VIEW – X



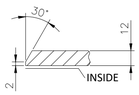
DEVELOPMENT OF ITEM–05
THK. – 12



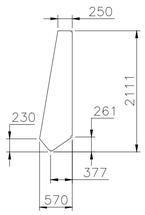
DETAILS OF ITEM–05
THK. – 12



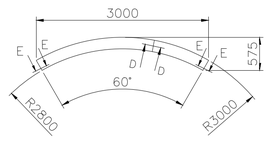
ITEM–05



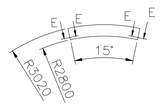
SECTION– CC



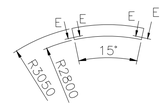
THK–20
ITEM NO –03



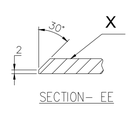
THK–20
ITEM NO –02



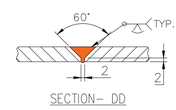
THK–14
ITEM NO –07



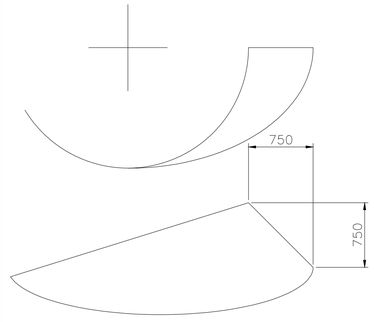
THK–20
ITEM NO –09



SECTION– EE

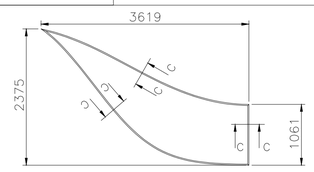


SECTION– DD

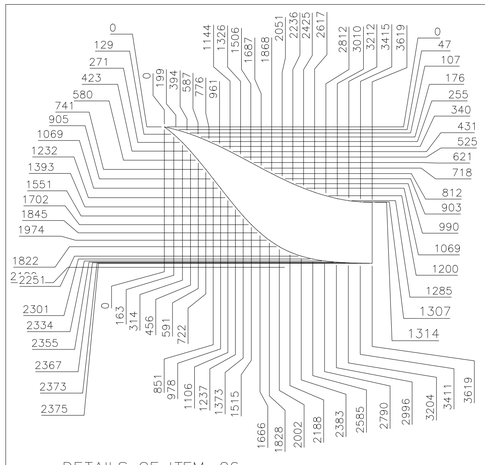


ITEM NO–6

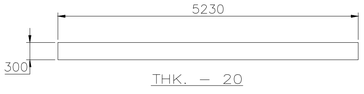
DETAIL VIEW – P



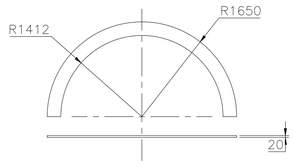
DEVELOPMENT OF –06
THK. – 12



DETAILS OF ITEM–06



THK. – 20
ITEM NO –08



ITEM NO –04

TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm

   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. ITEM NO 1,6 & 5 ARE TO BE MATCHED MAINTAINING DIM. AS PER VIEW–P.

(10) △	(10) ▽	(6) ▽	SIZE & SYMBOL OF SEAM
5.8	17.4	1.3	WELD LENGTH (M).
2.8	6.8	0.2	WT. OF WELD METAL (Kg).
E–7018			TYPE OF ELECTRODE

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

CBOM NO. 01709970017 -03 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE

REV.	DATE	ALTERED / CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-- SD --	14.12.2022	
CHD	AXAY KUMAR	-- SD --	14.12.2022	~~
APD	N PRAKASH	-- SD --	14.12.2022	73 , 74

DEPT.	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
HXE	1:50	2613	01709970017	01	~~ (75 , 77)

CODE 4222

TITLE: DUCT LIASIONING TEE Ø5600xØ2800

CARD CODE: X

DRAWING NO. 11709970123 (7 , 22) REV. 00 (23 , 24)

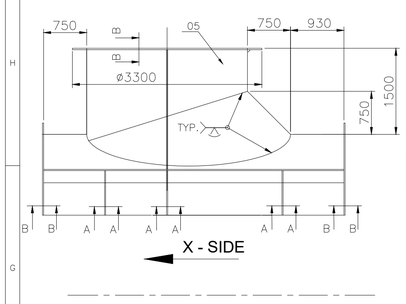
SHEET NO. | NO.OF SHEETS

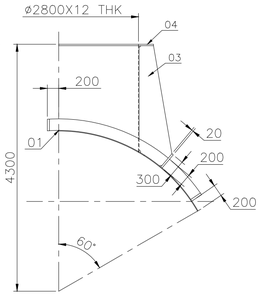
SIZE A1

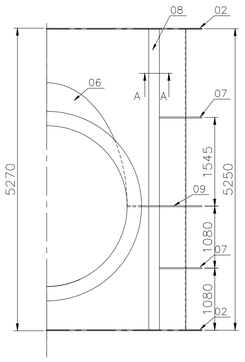
FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm)

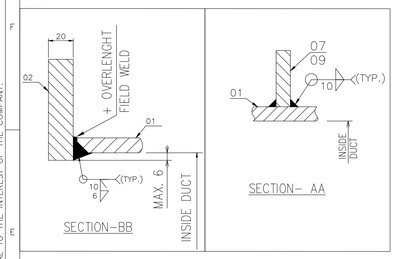
FORM: DG 45(B)

DRAWING NO. 11709970124



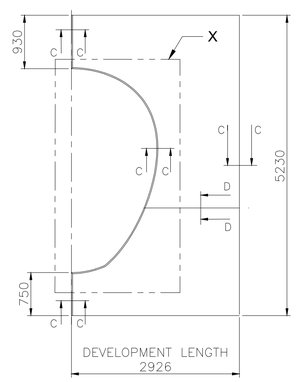




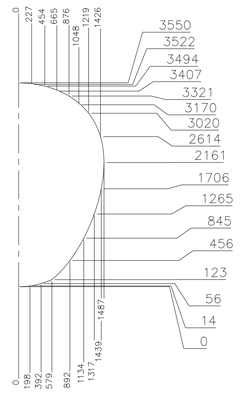


SECTION–BB

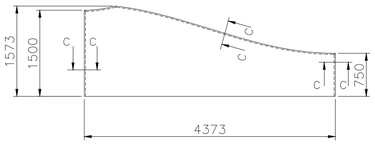
SECTION– AA



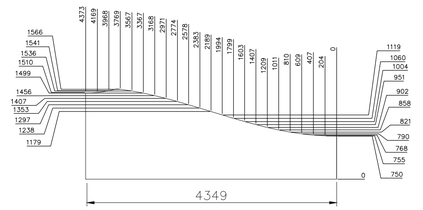
ITEM NO –01



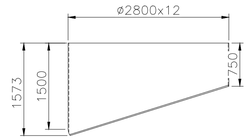
DETAIL VIEW – X



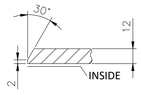
DEVELOPMENT OF ITEM–05
THK. – 12



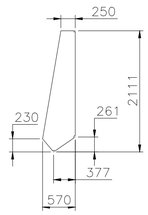
DETAILS OF ITEM–05
THK. – 12



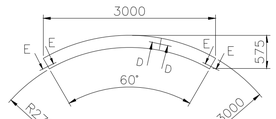
ITEM–05



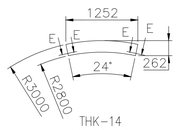
SECTION– CC



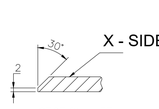
ITEM NO –03



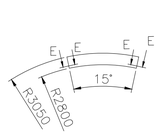
THK–20
ITEM NO –02



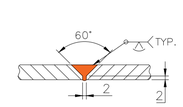
THK–14
ITEM NO –07



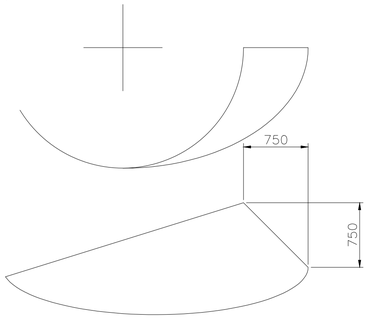
SECTION– EE



THK–20
ITEM NO –09

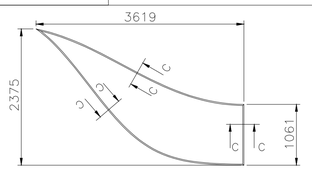


SECTION– DD

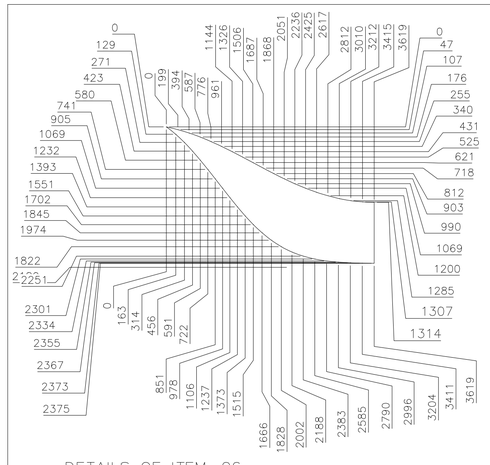


ITEM NO–6

DETAIL VIEW – P



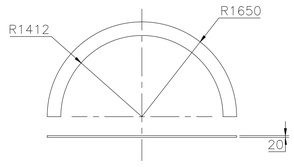
DEVELOPMENT OF –06
THK. – 12



DETAILS OF ITEM–06

THK. – 20

ITEM NO –08



ITEM NO –04

TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm

   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. ITEM NO 1,6 & 5 ARE TO BE MATCHED MAINTAINING DIM. AS PER VIEW–P.

(10) △	(10)▽	(6) ▽	SIZE & SYMBOL OF SEAM
5.8	17.4	1.3	WELD LENGTH (M).
2.8	6.8	0.2	WT. OF WELD METAL (Kg).
E–7018			TYPE OF ELECTRODE

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

CBOM NO. 01709970017 -03 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE

REV.	DATE	ALTERED / CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	--	SD -- 14.12.2022	
CHD	AXAY KUMAR	--	SD -- 14.12.2022	~~
APD	N PRAKASH	--	SD -- 14.12.2022	73 , 74

DEPT.	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
HXE	1:50	2613	01709970017	23	~~ (75 , 77)
CODE 4222					

TITLE: DUCT LIASIONING TEE Ø5600xØ2800

CARD CODE: X

DRAWING NO. 11709970124 (7 , 22) | REV. 00 (23 , 24)

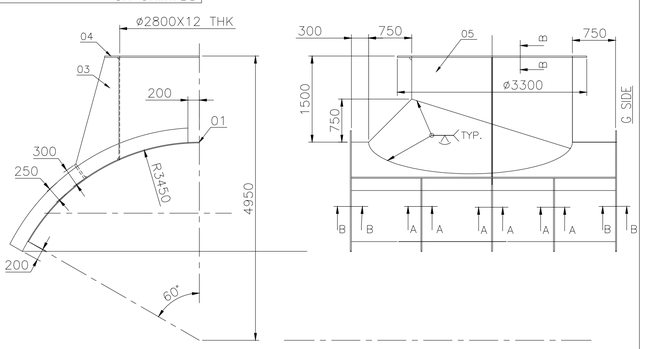
SHEET NO. | NO.OF SHEETS

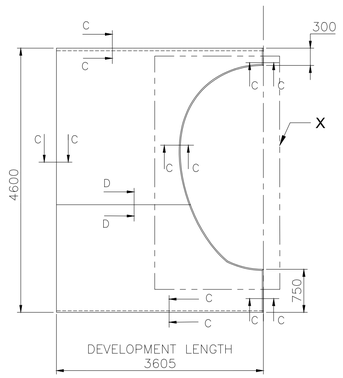
SIZE A1

FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm)

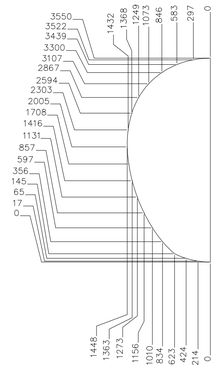
FORM: DG 45(B)

DRAWING NO. 11709970128

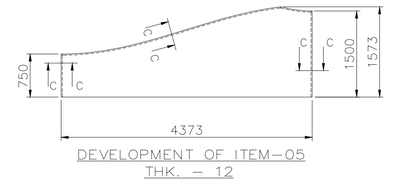




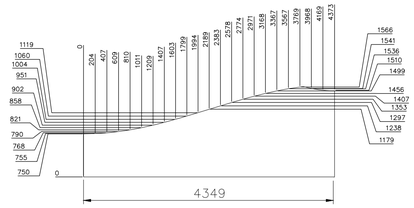
ITEM NO –01



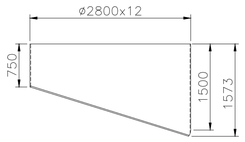
DETAIL VIEW – X



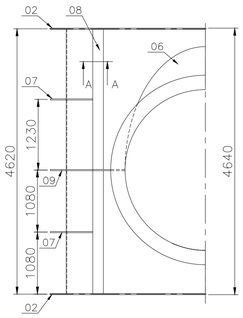
DEVELOPMENT OF ITEM–05
THK. – 12

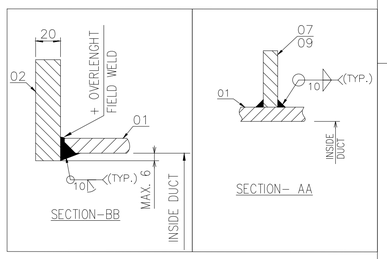


DETAILS OF ITEM–05
THK. – 12



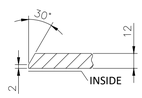
ITEM–05



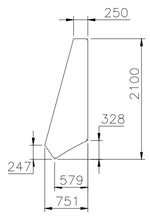


SECTION–BB

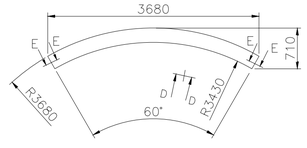
SECTION– AA



SECTION– CC

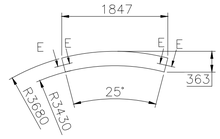


ITEM NO –03



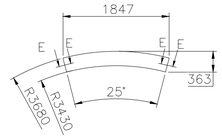
ITEM NO –02

20 THK



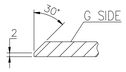
ITEM NO –07

14 THK

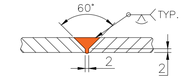


ITEM NO –09

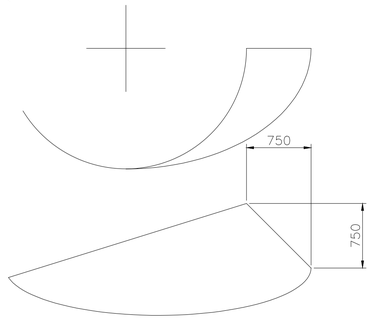
20 THK



SECTION– EE

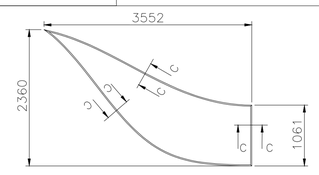


SECTION– DD

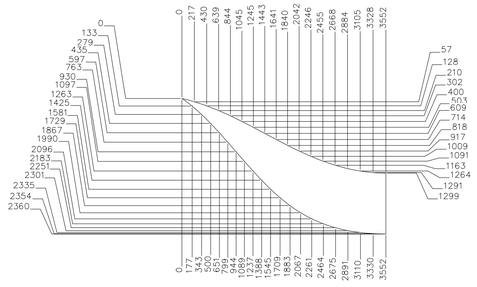


ITEM NO–6

DETAIL VIEW – P



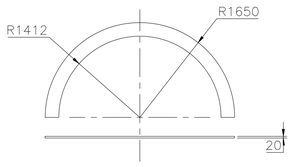
DEVELOPMENT OF –06
THK. – 12



DETAILS OF ITEM–06

THK. – 20

ITEM NO –08



ITEM NO –04

TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm

   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. ITEM NO 1,6 & 5 ARE TO BE MATCHED MAINTAINING DIM. AS PER VIEW–P.

(10)▽	(10)△	SIZE & SYMBOL OF SEAM
21.9	7.3	WELD LENGTH (M).
8.6	3.4	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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

CBOM NO. 01709970017 Var. 03 — STATUS OF DRG. LI

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

REV.	DATE	ALTERED / CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-- SD --	14.12.2022	~~
CHD	AXAY KUMAR	-- SD --	14.12.2022	
APD	N PRAKASH	-- SD --	14.12.2022	73 , 74

DEPT. HXE | CODE 4222 | SCALE 1:50 | WEIGHT(Kg.) 3151 | REF. TO ASSY. DRG. 01709970017 | ITEM NO. 05 | NO.OF ITEMS ~~ (75 , 77)

TITLE: DUCT LIASIONING TEE Ø6900xØ2800

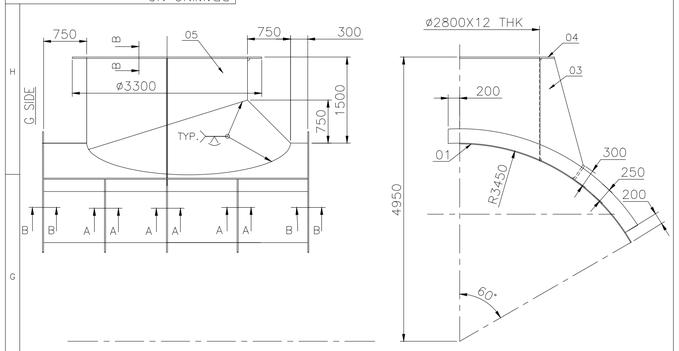
CARD CODE X | DRAWING NO. 11709970128 (7 , 22 , 23 , 24) | REV. 00 | SHEET NO. | NO.OF SHEETS

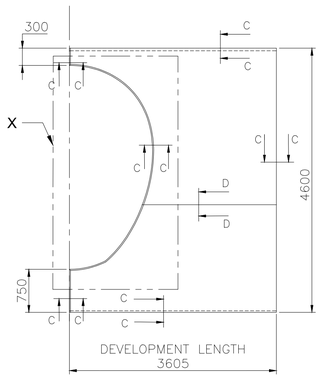
SIZE A1

FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm)

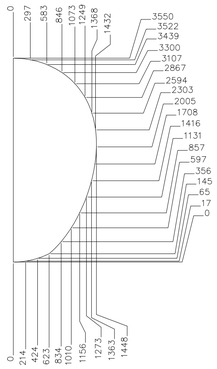
FORM: DG 45(B)

DRAWING NO. 11709970129

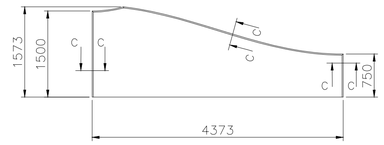




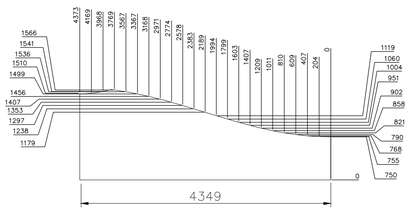
ITEM NO –01



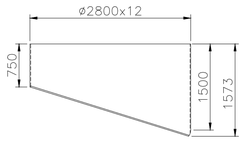
DETAIL VIEW – X



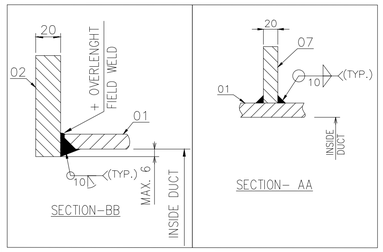
DEVELOPMENT OF ITEM–05
THK. – 12



DETAILS OF ITEM–05
THK. – 12

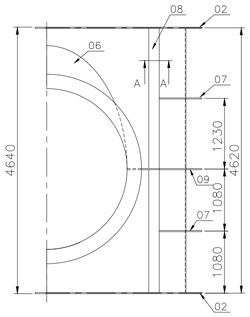


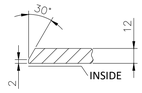
ITEM–05



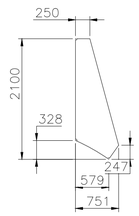
SECTION–BB

SECTION– AA

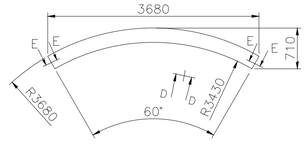




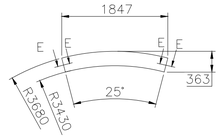
SECTION– CC



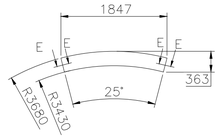
ITEM NO –03



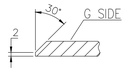
ITEM NO –02
20 THK



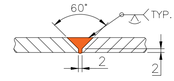
ITEM NO –07
14 THK



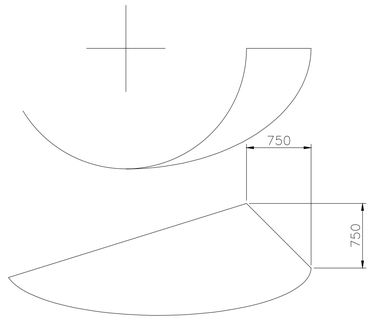
ITEM NO –07
20 THK



SECTION– EE

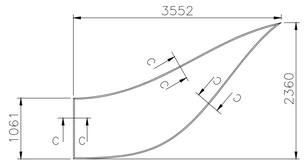


SECTION– DD

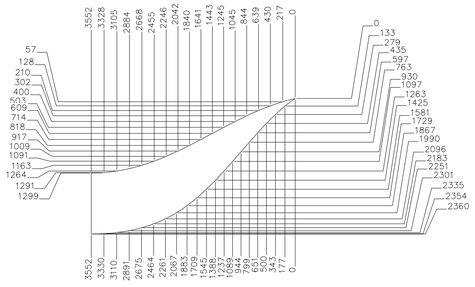


ITEM NO–6

DETAIL VIEW – P



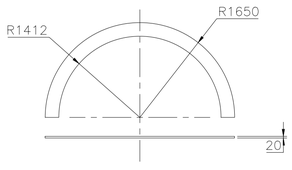
DEVELOPMENT OF –06
THK. – 12



DETAILS OF ITEM–06

THK. – 20

ITEM NO –08



ITEM NO –04

TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – I COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – I COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm

   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. ITEM NO 1,6 & 5 ARE TO BE MATCHED MAINTAINING DIM. AS PER VIEW–P.

(10)▽	(10)△	SIZE & SYMBOL OF SEAM
21.9	7.3	WELD LENGTH (M).
8.6	3.4	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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

CBOM NO. 01709970017 Var. 03 — STATUS OF DRG. LI

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

REV.	DATE	ALTERED / CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-- SD --	14.12.2022	~~
CHD	AXAY KUMAR	-- SD --	14.12.2022	~~
APD	N PRAKASH	-- SD --	14.12.2022	73 , 74

DEPT. HXE | CODE 4222 | SCALE 1:50 | WEIGHT(Kg.) 3151 | REF. TO ASSY. DRG. 01709970017 | ITEM NO. 05 | NO.OF ITEMS ~~ (75 , 77)

TITLE: DUCT LIASIONING TEE Ø6900xØ2800

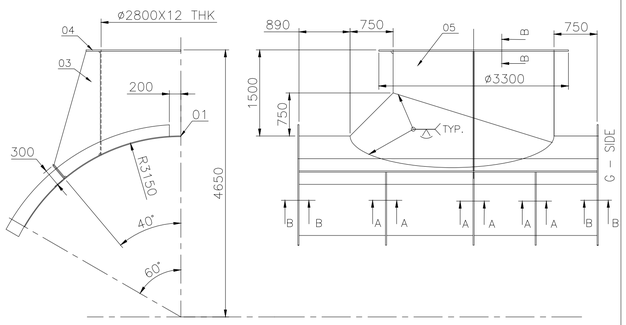
CARD CODE X | DRAWING NO. 11709970129 | REV. 00 | SHEET NO. | NO.OF SHEETS (22 , 23 , 24)

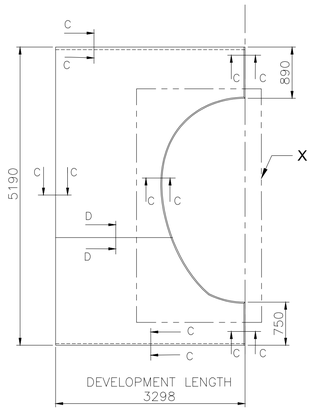
SIZE A1

FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm)

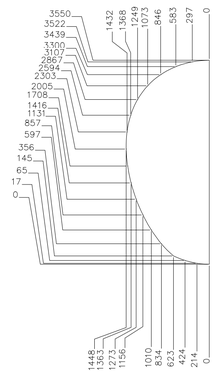
FORM: DG 45(B)

DRAWING NO. 11709970130

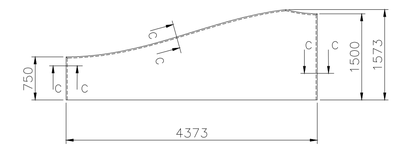




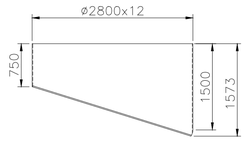
ITEM NO -01



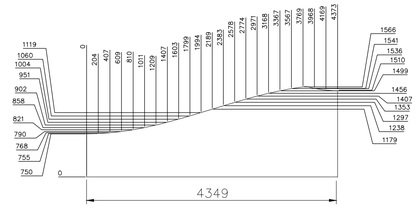
DETAIL VIEW – X



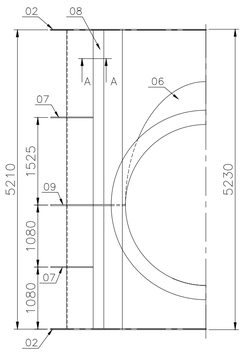
DEVELOPMENT OF ITEM–05
THK. – 12

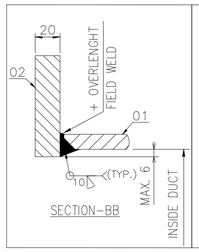


ITEM–05

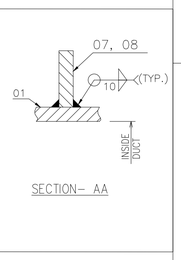


DETAILS OF ITEM–05
THK. – 12

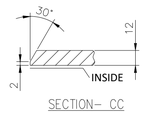




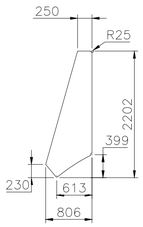
SECTION–BB



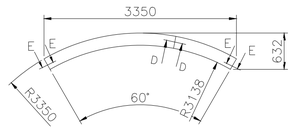
SECTION– AA



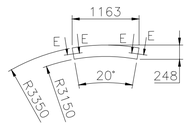
SECTION– CC



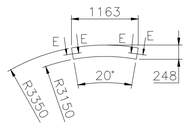
ITEM NO -03



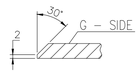
ITEM NO -02
20 THK



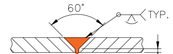
ITEM NO -07
14 THK



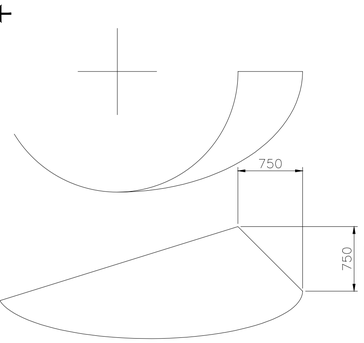
ITEM NO -09
20 THK



SECTION– EE

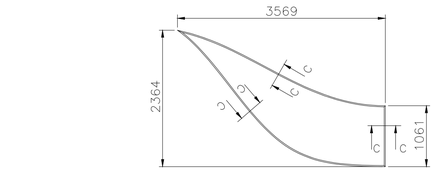


SECTION– DD

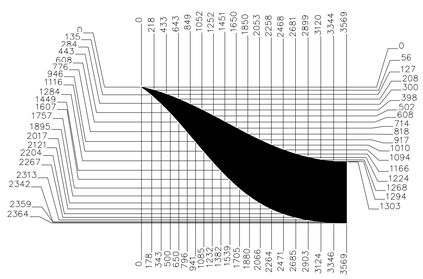


ITEM NO–6

DETAIL VIEW – P



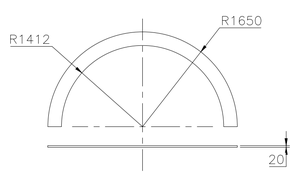
DEVELOPMENT OF –06
THK. – 12



DETAILS OF ITEM–06

THK. – 20

ITEM NO –08



ITEM NO –04

TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

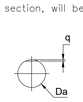
   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm

   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm



7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. ITEM NO 1,6 & 5 ARE TO BE MATCHED MAINTAINING DIM. AS PER VIEW–P.

(10)▽	(10)△	SIZE & SYMBOL OF SEAM
21.9	7.3	WELD LENGTH (M).
8.6	3.4	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970017 Var. 03 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-- SD --	21.12.2022	~~
CHD	AXAY KUMAR	-- SD --	21.12.2022	~~
APD	N PRAKASH	-- SD --	21.12.2022	73 , 74

DEPT.	CODE	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
HXE	4222	1:50	2900.5	01709970017	14	~~ 75 , 77

TITLE: DUCT LIASIONING TEE Ø6300xØ2800

CARD CODE: X

DRAWING NO.: 11709970130 | REV.: 00 (7 , 22 , 23 , 24)

SHEET NO. | NO.OF SHEETS

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

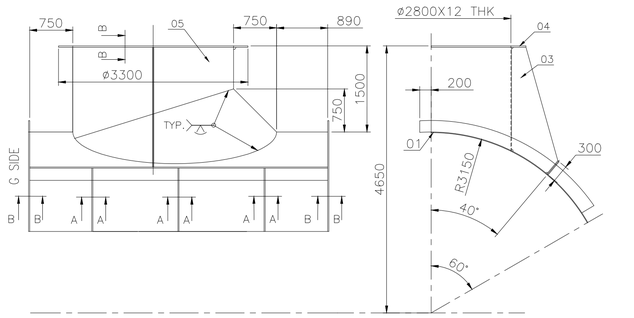
SIZE A1

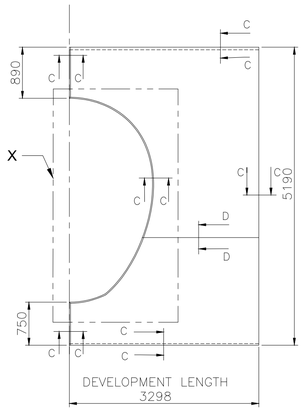
FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm)

FORM: DG 45(B)

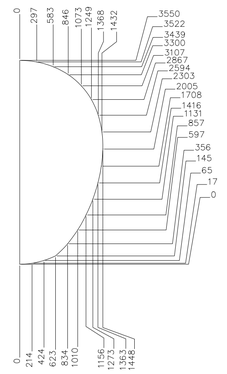
DRAWING NO. 11709970135

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

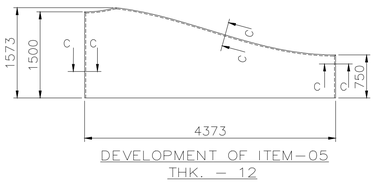




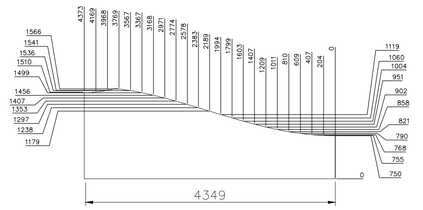
ITEM NO -01



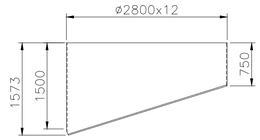
DETAIL VIEW – X



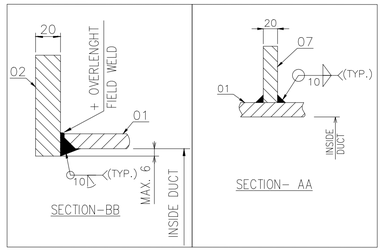
DEVELOPMENT OF ITEM–05
THK. – 12



DETAILS OF ITEM–05
THK. – 12

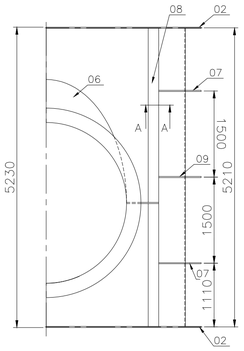


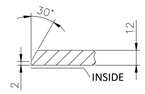
ITEM–05



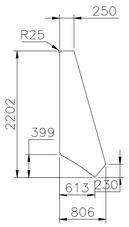
SECTION–BB

SECTION– AA

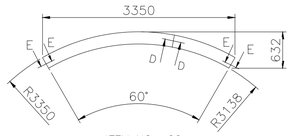




SECTION– CC

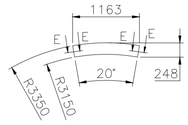


ITEM NO –03



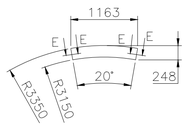
ITEM NO –02

20 THK



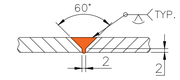
ITEM NO –07

14 THK

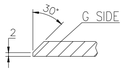


ITEM NO –09

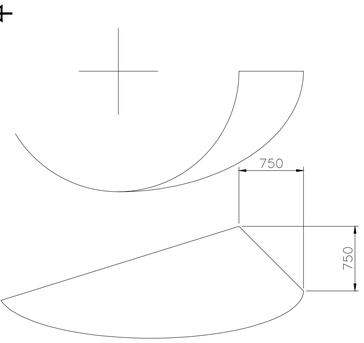
20 THK



SECTION– DD

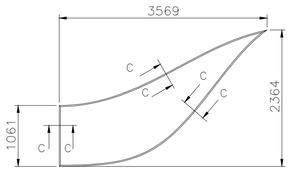


SECTION– EE

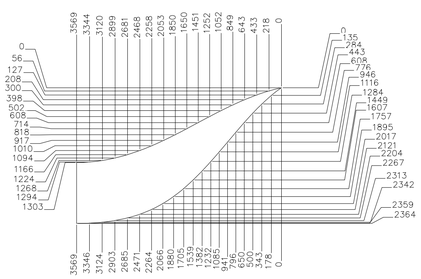


ITEM NO–6

DETAIL VIEW – P



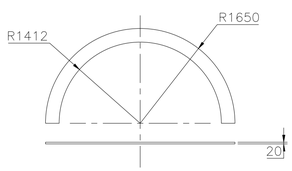
DEVELOPMENT OF –06
THK. – 12



DETAILS OF ITEM–06

THK. – 20

ITEM NO –08



ITEM NO –04

TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

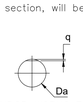
   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm

   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm



7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. ITEM NO 1,6 & 5 ARE TO BE MATCHED MAINTAINING DIM. AS PER VIEW–P.

(10)▽	(10)△	SIZE & SYMBOL OF SEAM
21.9	7.3	WELD LENGTH (M).
8.6	3.4	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970017 Var. 03 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-- SD --	21.12.2022	~~
CHD	AXAY KUMAR	-- SD --	21.12.2022	~~
APD	N PRAKASH	-- SD --	21.12.2022	73 , 74

DEPT. HXE | CODE 4222 | SCALE 1:50 | WEIGHT(Kg.) 2900.5 | REF. TO ASSY. DRG. 01709970017 | ITEM NO. 15 | NO.OF ITEMS ~~ 75 , 77

TITLE: DUCT LIASIONING TEE Ø6300xØ2800

CARD CODE X

DRAWING NO. 11709970135 | REV. 00 | 7 , 22 , 23 , 24

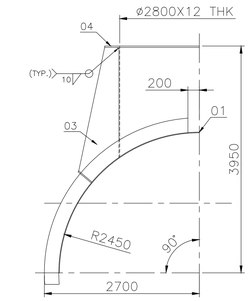
SHEET NO. | NO.OF SHEETS

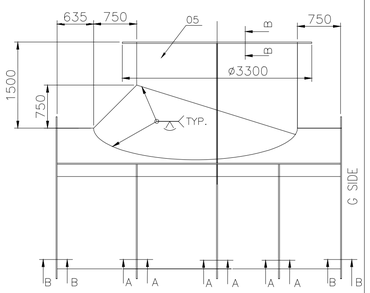
SIZE A1

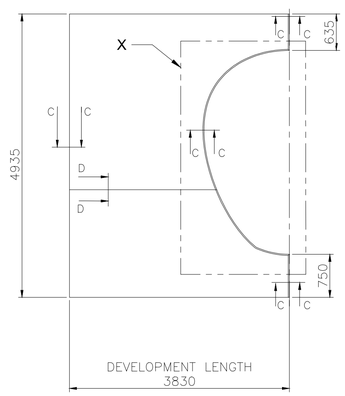
FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm)

FORM: DG 45(B)

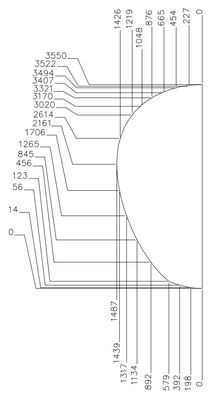
DRAWING NO. 1170997013 9



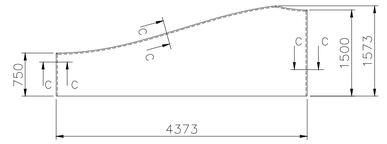




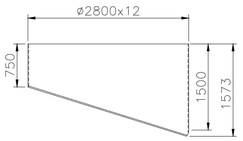
ITEM NO –01



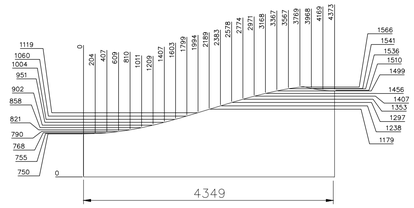
DETAIL VIEW – X



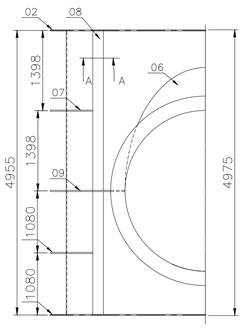
DEVELOPMENT OF ITEM–05
THK. – 12

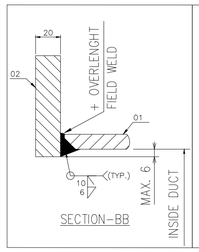


ITEM–05

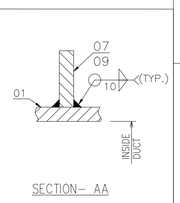


DETAILS OF ITEM–05
THK. – 12

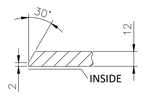




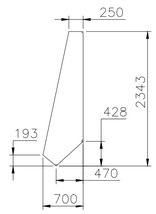
SECTION–BB



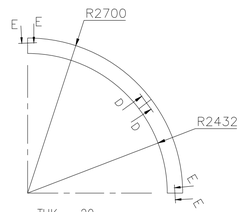
SECTION– AA



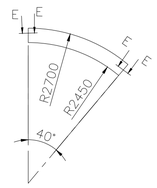
SECTION– CC



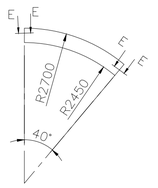
ITEM NO –03



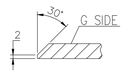
THK – 20
ITEM NO –02



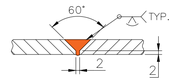
THK – 12
ITEM NO –07



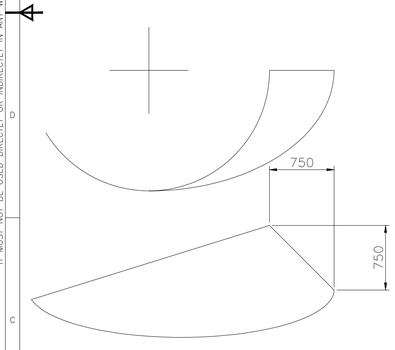
THK – 20
ITEM NO –09



SECTION– EE

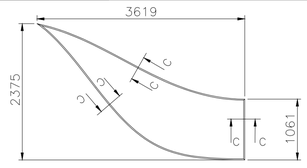


SECTION– DD

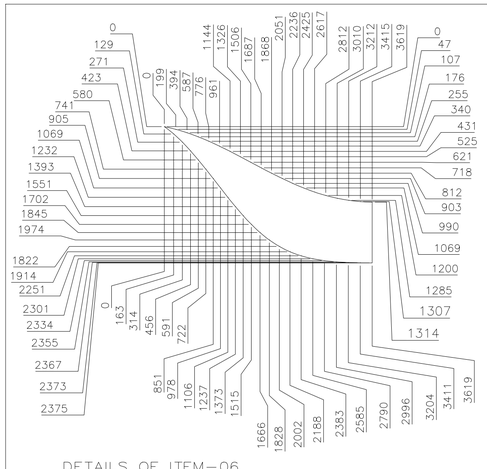


ITEM NO–6

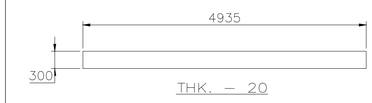
DETAIL VIEW – P



DEVELOPMENT OF –06
THK. – 12

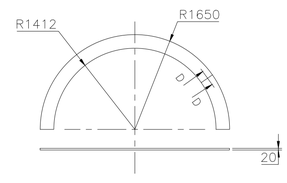


DETAILS OF ITEM–06



THK. – 20

ITEM NO –08



ITEM NO –04

TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – I COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – I COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm

   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. ITEM NO 1,6 & 5 ARE TO BE MATCHED MAINTAINING DIM. AS PER VIEW–P.

(10) △	(10) ▽	(6) ▽	SIZE & SYMBOL OF SEAM
30.8	51.2	30.8	WELD LENGTH (M).
14.4	24.0	4.4	WT. OF WELD METAL (Kg).
E–7018			TYPE OF ELECTRODE

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

CBOM NO. 01709970017 Var. 03 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

REV.	DATE	ALTERED
		CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-- SD --	26.12.2022	
CHD	AXAY KUMAR	-- SD --	26.12.2022	~~
APD	N PRAKASH	-- SD --	26.12.2022	73 , 74

DEPT. HXE | CODE 4222 | SCALE 1:50 | WEIGHT(Kg.) 3291.7 | REF. TO ASSY. DRG. 01709970017 | ITEM NO. 31 | NO.OF ITEMS ~~ 75 , 77

TITLE: DUCT LIASIONING TEE Ø4900xØ2800

CARD CODE X | DRAWING NO. 11709970139 | REV. 00

SHEET NO. | NO.OF SHEETS

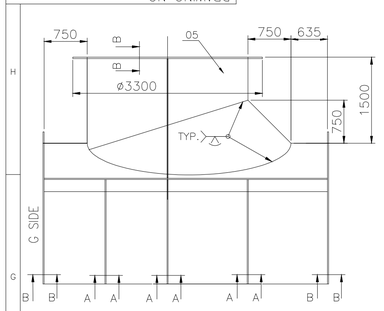
SIZE A1

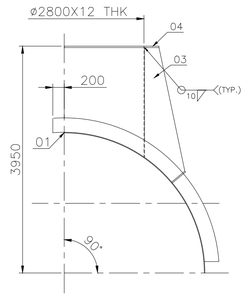
REF. DRG NO. | SIGN & DATE | INVENTORY NO.

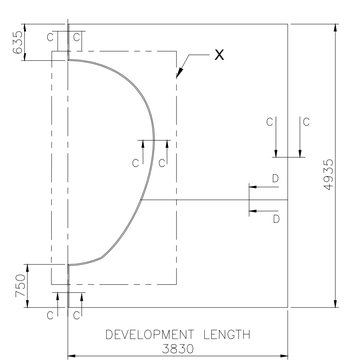
FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm)

FORM: DG 45(B)

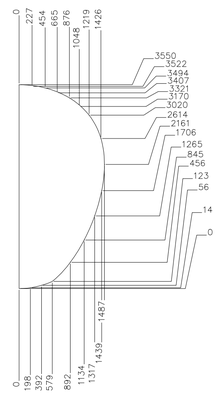
DRAWING NO. 11709970140



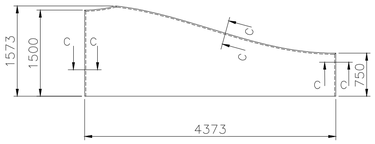




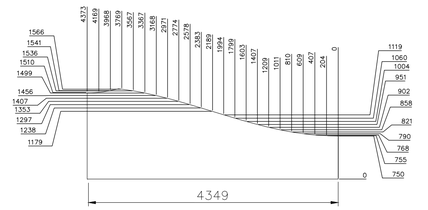
ITEM NO -01



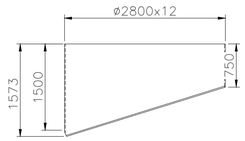
DETAIL VIEW – X



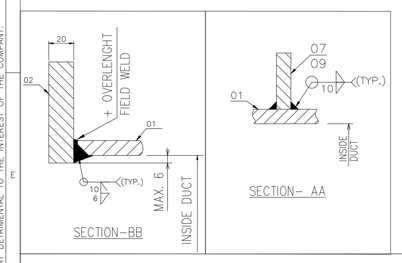
DEVELOPMENT OF ITEM–05
THK. – 12



DETAILS OF ITEM–05
THK. – 12

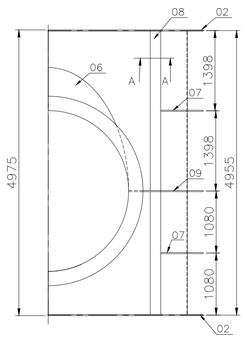


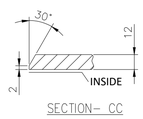
ITEM–05



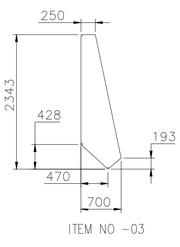
SECTION–BB

SECTION– AA

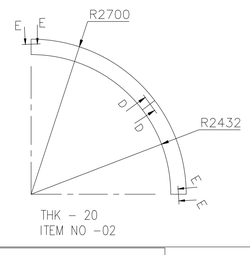




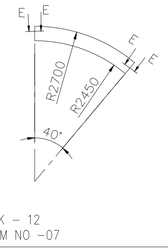
SECTION– CC



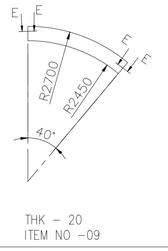
ITEM NO –03



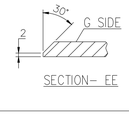
THK – 20
ITEM NO –02



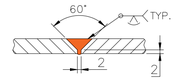
THK – 12
ITEM NO –07



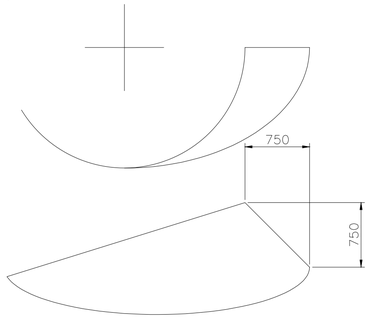
THK – 20
ITEM NO –09



SECTION– EE

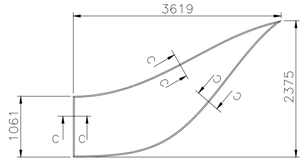


SECTION– DD

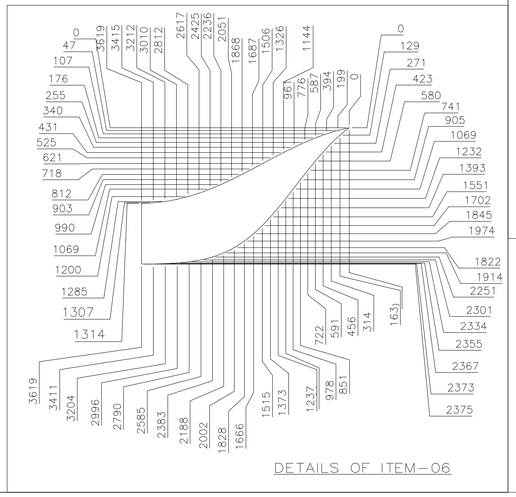


ITEM NO–6

DETAIL VIEW – P



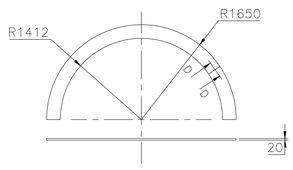
DEVELOPMENT OF –06
THK. – 12



DETAILS OF ITEM–06

THK. – 20

ITEM NO –08



ITEM NO –04

TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – I COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – I COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm

   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. ITEM NO 1,6 & 5 ARE TO BE MATCHED MAINTAINING DIM. AS PER VIEW–P.

(10)△	(10)▽	(6)▽	SIZE & SYMBOL OF SEAM
30.8	51.2	30.8	WELD LENGTH (M).
14.4	24.0	4.4	WT. OF WELD METAL (Kg).
E–7018			TYPE OF ELECTRODE

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

CBOM NO. 01709970017 Var. 03 — STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

REV.	DATE	ALTERED / CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	--	SD -- 26.12.2022	~~
CHD	AXAY KUMAR	--	SD -- 26.12.2022	~~
APD	N PRAKASH	--	SD -- 26.12.2022	73, 74

DEPT.	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
HXE	1:50	3291.7	01709970017	32	~~ 75, 77

CODE 4222

TITLE: DUCT LIASIONING TEE Ø4900xØ2800

CARD CODE X

DRAWING NO. 11709970140 — REV. 00 (23, 24)

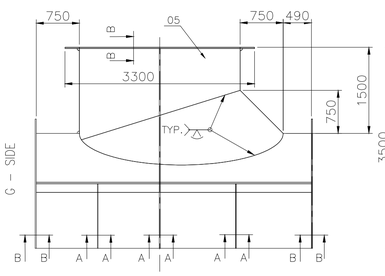
SHEET NO. — NO.OF SHEETS

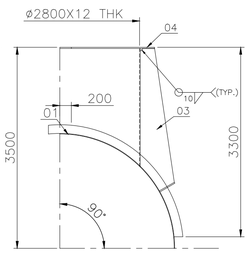
SIZE A1

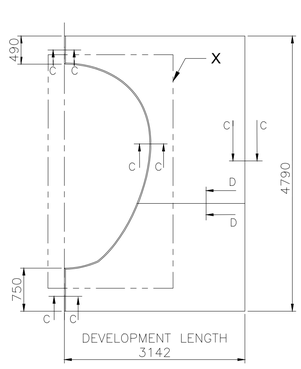
FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm)

FORM: DG 45(B)

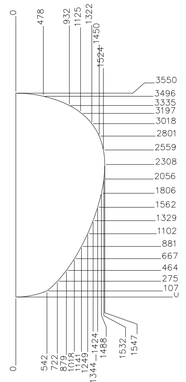
DRAWING NO. 11709970142



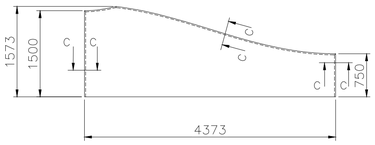




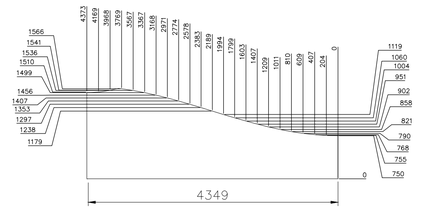
ITEM NO -01 (THK.10)



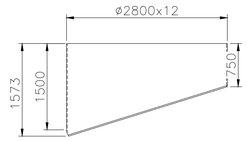
DETAIL VIEW – X



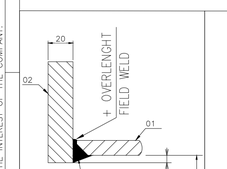
DEVELOPMENT OF ITEM–05
THK. – 12



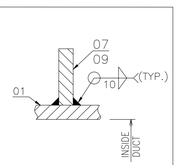
DETAILS OF ITEM–05
THK. – 12



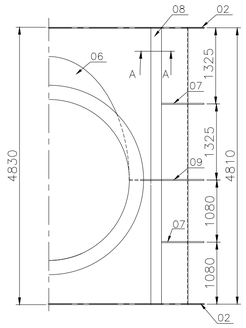
ITEM–05

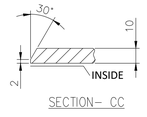


SECTION–BB

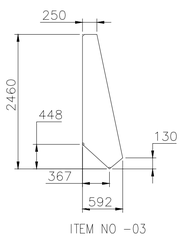


SECTION– AA

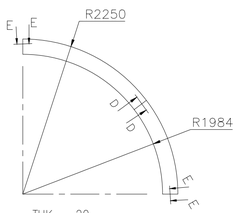




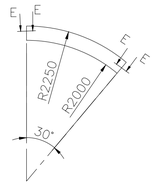
SECTION– CC



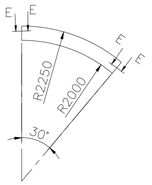
ITEM NO -03



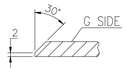
THK – 20
ITEM NO –02



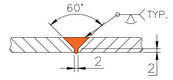
THK – 12
ITEM NO –07



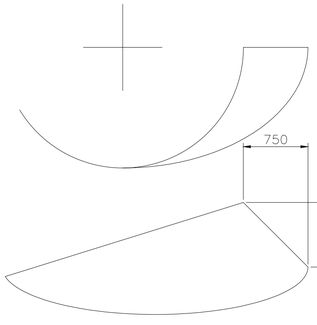
THK – 20
ITEM NO –09



SECTION– EE

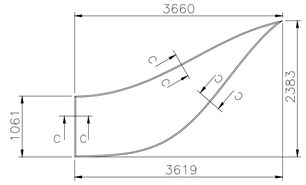


SECTION– DD

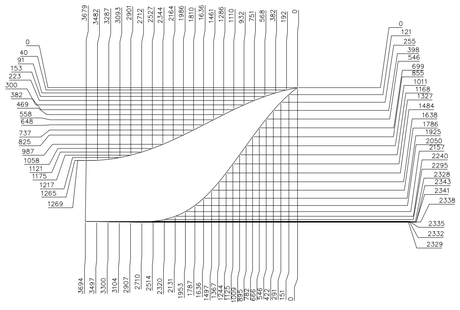


ITEM NO–6

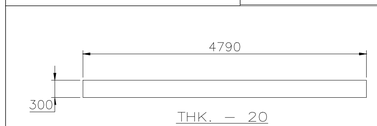
DETAIL VIEW – P



DEVELOPMENT OF –06
THK. – 12

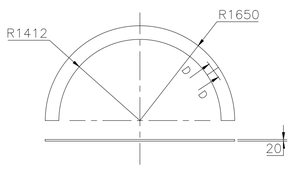


DETAILS OF ITEM–06



THK. – 20

ITEM NO –08



ITEM NO –04

TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm

   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. ITEM NO 1,6 & 5 ARE TO BE MATCHED MAINTAINING DIM. AS PER VIEW–P.

(10)△	(10)▽	(6)▽	SIZE & SYMBOL OF SEAM
30.8	51.2	30.8	WELD LENGTH (M).
14.4	24.0	4.4	WT. OF WELD METAL (Kg).
E–7018			TYPE OF ELECTRODE
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
		CHECKED

CBOM NO. 01709970017 Var. 03 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-- SD --	26.12.2022	
CHD	AXAY KUMAR	-- SD --	26.12.2022	~~
APD	N PRAKASH	-- SD --	26.12.2022	73, 74

DEPT. HXE | CODE 4222 | SCALE 1:50 | WEIGHT(Kg.) 2906.5 | REF. TO ASSY. DRG. 01709970017 | ITEM NO. 38 | NO.OF ITEMS ~~ (75, 77)

TITLE: DUCT LIASIONING TEE Ø4000xØ2800

CARD CODE: X | DRAWING NO. 11709970142 | REV. 00 (7, 22, 23, 24)

SHEET NO. 01 | NO.OF SHEETS 01

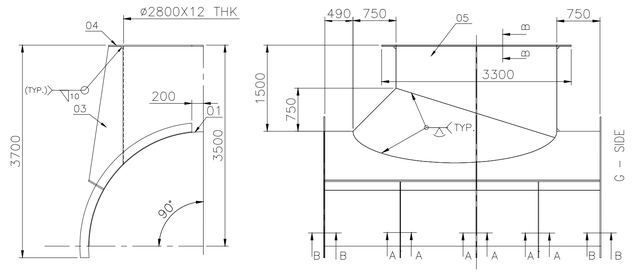
SIZE A1

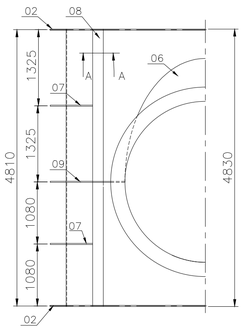
REF. DRG NO. | SIGN & DATE | INVENTORY NO.

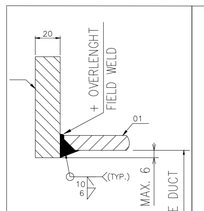
FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm)

FORM: DG 45(B)

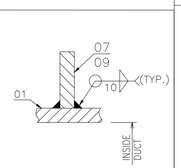
DRAWING NO. 11709970143



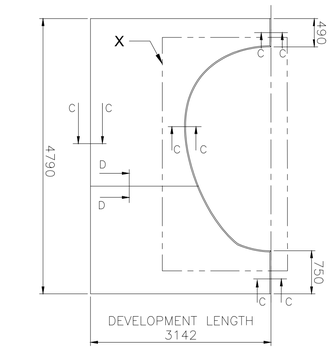




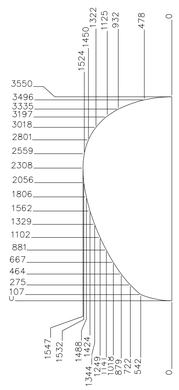
SECTION–BB



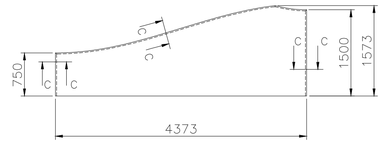
SECTION– AA



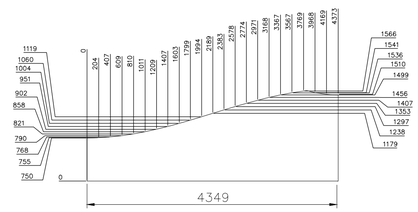
ITEM NO –01 (THK.10)



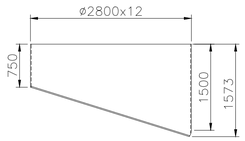
DETAIL VIEW – X



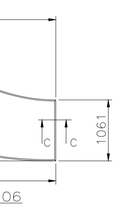
DEVELOPMENT OF ITEM–05
THK. – 12



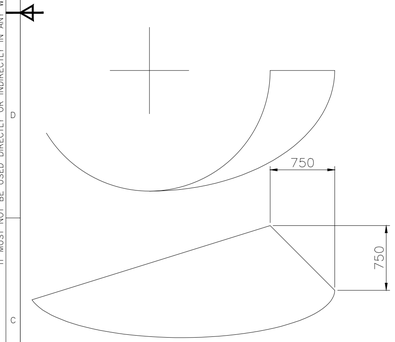
DETAILS OF ITEM–05
THK. – 12



ITEM–05

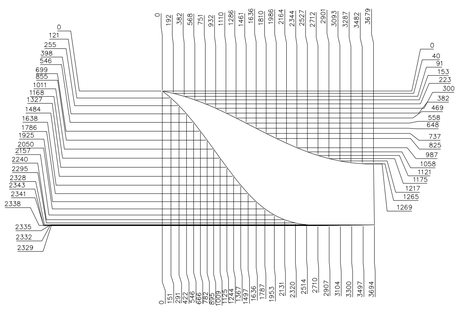


DEVELOPMENT OF –06
THK. – 12

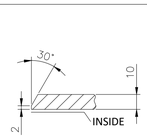


ITEM NO–6

DETAIL VIEW – P

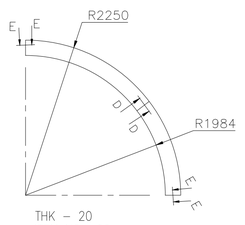


DETAILS OF ITEM–06

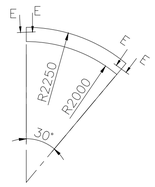


ITEM NO –03

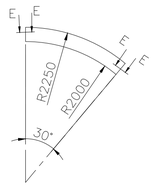
SECTION– CC



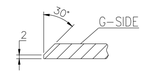
THK – 20
ITEM NO –02



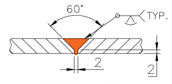
THK – 12
ITEM NO –07



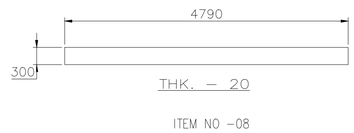
THK – 20
ITEM NO –09



SECTION– EE

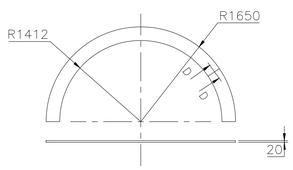


SECTION– DD



THK. – 20

ITEM NO –08



ITEM NO –04

TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm

   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. ITEM NO 1,6 & 5 ARE TO BE MATCHED MAINTAINING DIM. AS PER VIEW–P.

(10)△	(10)▽	(6)▽	SIZE & SYMBOL OF SEAM
30.8	51.2	30.8	WELD LENGTH (M).
14.4	24.0	4.4	WT. OF WELD METAL (Kg).
E–7018			TYPE OF ELECTRODE

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

CBOM NO. 01709970017 Var. 03 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

REV.	DATE	ALTERED / CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-- SD --	26.12.2022	~~
CHD	AXAY KUMAR	-- SD --	26.12.2022	~~
APD	N PRAKASH	-- SD --	26.12.2022	73, 74

DEPT. HXE | CODE 4222 | SCALE 1:50 | WEIGHT(Kg.) 2906.5 | REF. TO ASSY. DRG. 01709970017 | ITEM NO. 39 | NO.OF ITEMS ~~ 75, 77

TITLE: DUCT LIASIONING TEE Ø4000xØ2800

1 CARD 3 CODE X | DRAWING NO. 11709970143 | REV. 00 | 7, 22, 23, 24

SHEET NO. 01 | NO.OF SHEETS 01

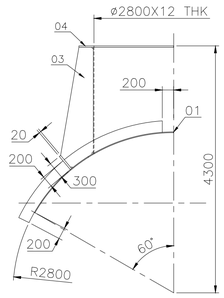
SIZE A1

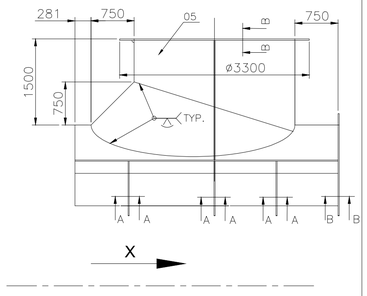
REF. DRG NO. | SIGN & DATE | INVENTORY NO.

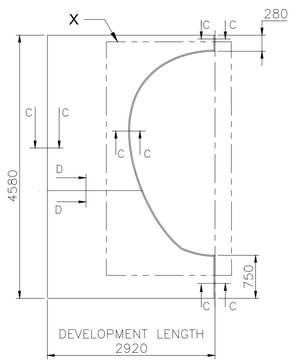
FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm)

FORM: DG 45(B)

DRAWING NO. 11709970173

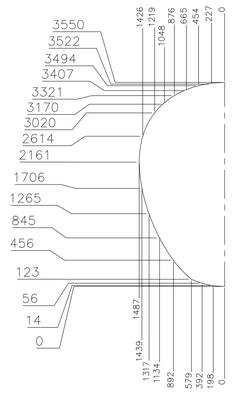




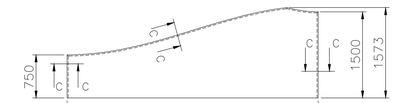


DEVELOPMENT LENGTH
2920

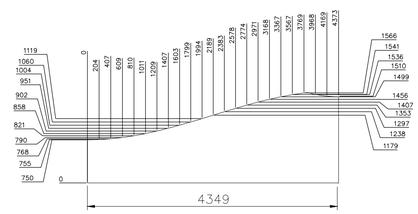
ITEM NO -01



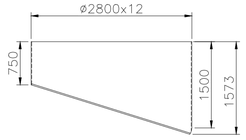
DETAIL VIEW – X



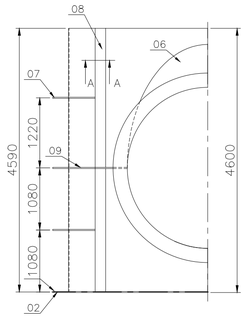
DEVELOPMENT OF ITEM–05
THK. – 12

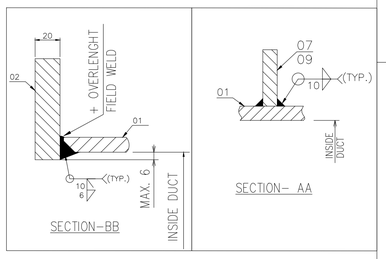


DETAILS OF ITEM–05
THK. – 12



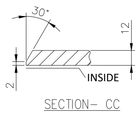
ITEM–05



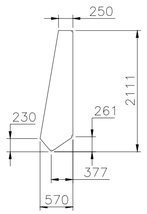


SECTION–BB

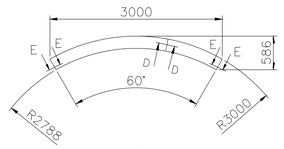
SECTION– AA



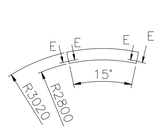
SECTION– CC



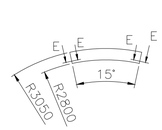
THK–20
ITEM NO –03



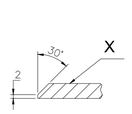
THK–20
ITEM NO –02



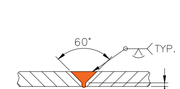
THK–14
ITEM NO –07



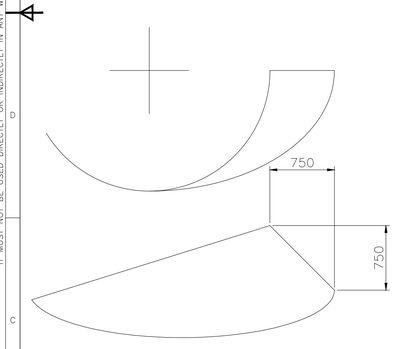
THK–20
ITEM NO –09



SECTION– EE

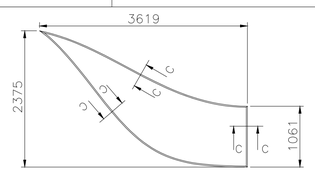


SECTION– DD

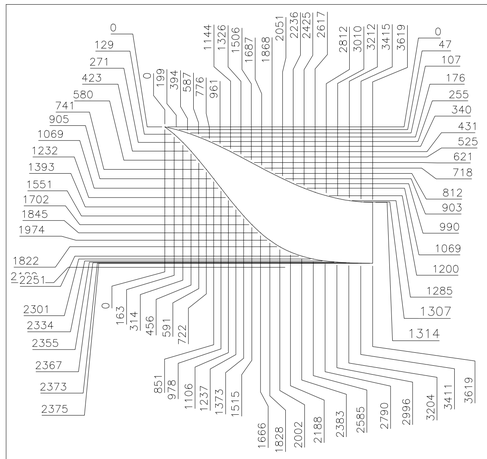


ITEM NO–6

DETAIL VIEW – P



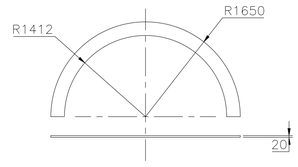
DEVELOPMENT OF –06
THK. – 12



DETAILS OF ITEM–06

THK. – 20

ITEM NO –08



ITEM NO –04

TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm

   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. ITEM NO 1,6 & 5 ARE TO BE MATCHED MAINTAINING DIM. AS PER VIEW–P.

(10) △	(10) ▽	(6) ▽	SIZE & SYMBOL OF SEAM
5.8	17.4	1.3	WELD LENGTH (M).
2.8	6.8	0.2	WT. OF WELD METAL (Kg).
E–7018			TYPE OF ELECTRODE

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

CBOM NO. 01709970023 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-sd-	24.05.23

REV.	DATE	ALTERED / CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-- SD --	26.04.2023	
CHD	AXAY KUMAR	-- SD --	26.04.2023	~~
APD	N PRAKASH	-- SD --	26.04.2023	73, 74

DEPT. HXE | CODE 4222 | SCALE 1:50 | WEIGHT(Kg.) 2277.8 | REF. TO ASSY. DRG. 01709970023 | ITEM NO. 01 | NO.OF ITEMS ~~ (75, 77)

TITLE: DUCT LIASIONING TEE Ø5600xØ2800

CARD CODE X | DRAWING NO. 11709970173 | REV. 00 (7, 22, 23, 24)

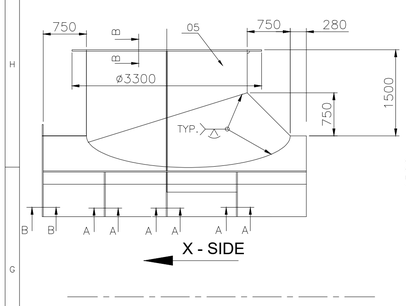
SHEET NO. 01 | NO.OF SHEETS 01

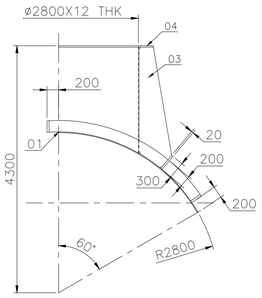
SIZE A1

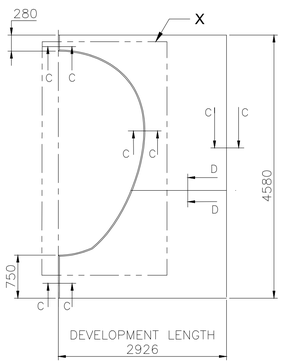
FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm)

FORM: DG 45(B)

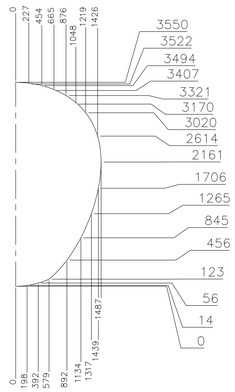
DRAWING NO. 11709970174



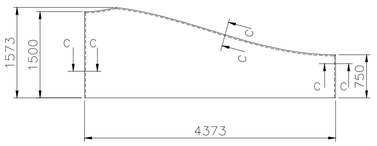




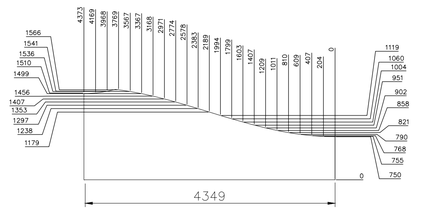
ITEM NO –01



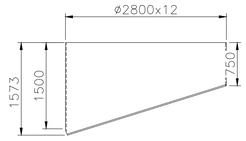
DETAIL VIEW – X



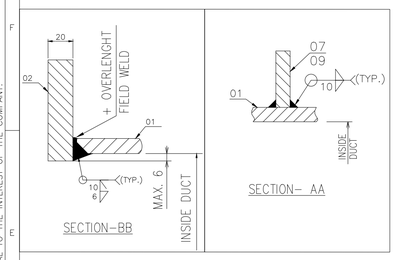
DEVELOPMENT OF ITEM–05
THK. – 12



DETAILS OF ITEM–05
THK. – 12

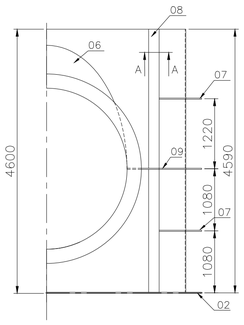


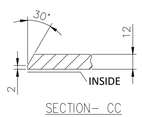
ITEM–05



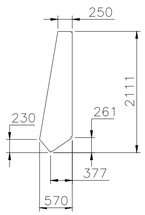
SECTION–BB

SECTION– AA

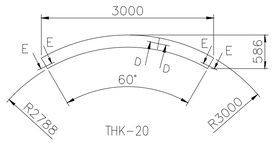




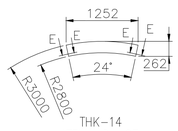
SECTION– CC



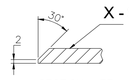
ITEM NO –03



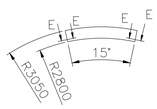
THK–20
ITEM NO –02



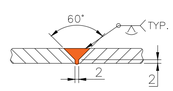
THK–14
ITEM NO –07



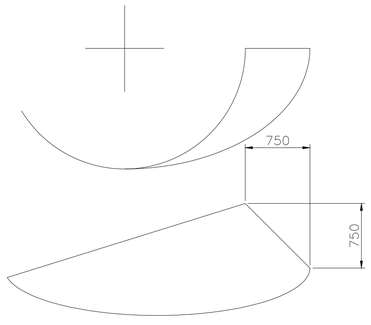
SECTION– EE



THK–20
ITEM NO –09

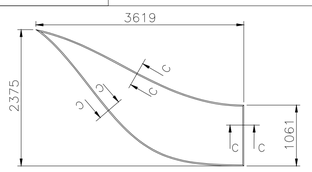


SECTION– DD

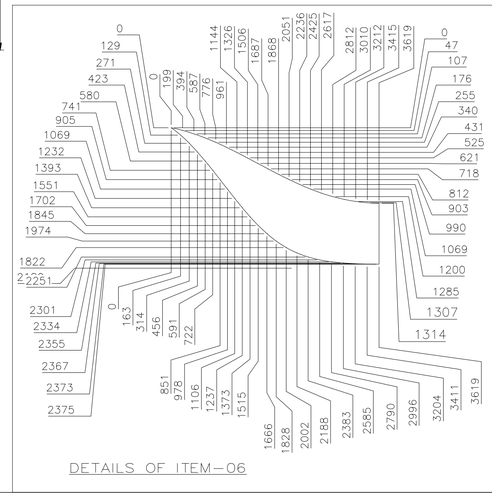


ITEM NO–6

DETAIL VIEW – P



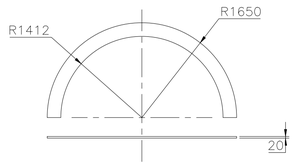
DEVELOPMENT OF –06
THK. – 12



DETAILS OF ITEM–06

THK. – 20

ITEM NO –08



ITEM NO –04

TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm

   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. ITEM NO 1,6 & 5 ARE TO BE MATCHED MAINTAINING DIM. AS PER VIEW–P.

(10) △	(10)▽	(6) ▽	SIZE & SYMBOL OF SEAM
5.8	17.4	1.3	WELD LENGTH (M).
2.8	6.8	0.2	WT. OF WELD METAL (Kg).
E–7018			TYPE OF ELECTRODE

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

CBOM NO. 01709970023 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-sd-	24.05.23

REV.	DATE	ALTERED
		CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	--	SD -- 26.04.2023	~~
CHD	AXAY KUMAR	--	SD -- 26.04.2023	73 , 74
APD	N PRAKASH	--	SD -- 26.04.2023	

DEPT. HXE | SCALE 1:50 | WEIGHT(Kg.) 2277.8 | REF. TO ASSY. DRG. 01709970023 | ITEM NO. 02 | NO.OF ITEMS ~~ (75 , 77)

CODE 4222

TITLE: DUCT LIASIONING TEE Ø5600xØ2800

CARD CODE X

DRAWING NO. 11709970174 | REV. 00 (7 , 22 , 23 , 24)

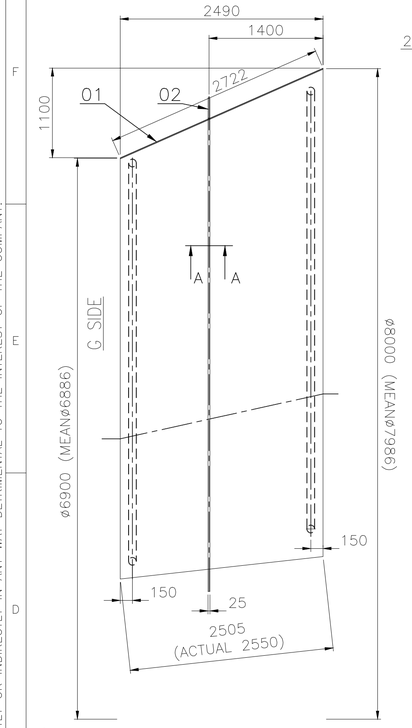
SHEET NO. 01 | NO.OF SHEETS 01

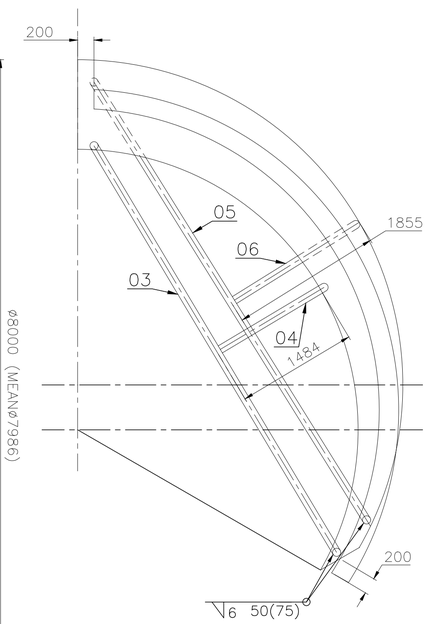
SIZE A1

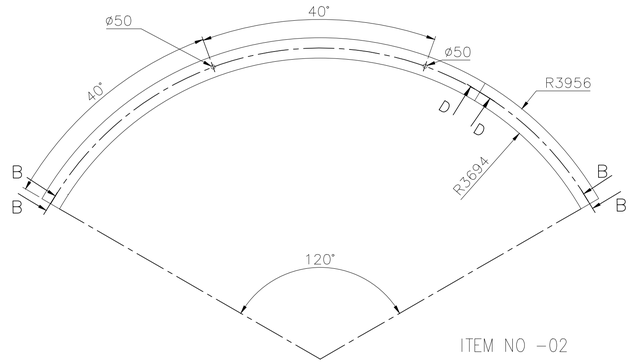
FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

FORM: DG 44(B)

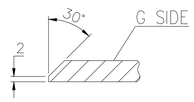
DRAWING NO. 21709970106







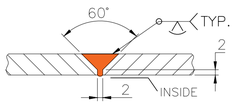
ITEM NO –02



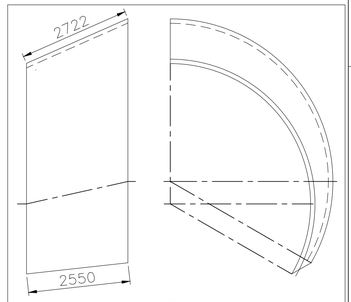
SECTION– BB

ITEM NO	L
03	5815
04	1484
05	6425
06	1855

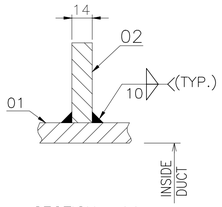
TECHNOLOGICAL SUPPORT



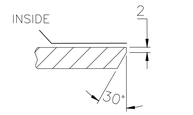
SECTION– DD



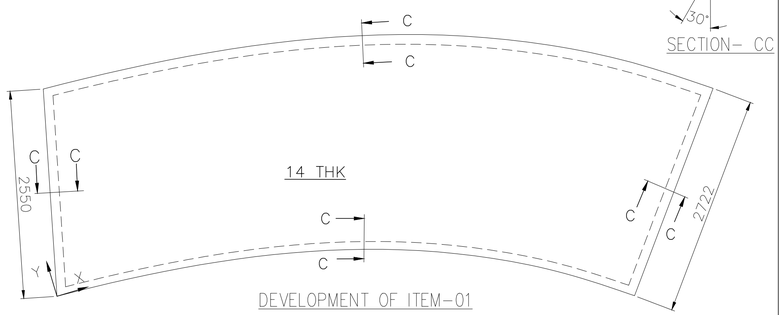
ITEM–01



SECTION– AA



SECTION– CC



DEVELOPMENT OF ITEM–01

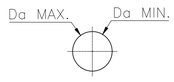
TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm



   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG NO 21709970110.

(10)▽	(6)▽	SIZE & SYMBOL OF SEAM
16.7	1.3	WELD LENGTH (M).
6.6	0.2	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970117–03 STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	–SD–	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	–Sd–	23.11.2022
CHD	AXAY KUMAR	–Sd–	23.11.2022
APD	N PRAKASH	–Sd–	23.11.2022

NO.OF VAR. – – (73, 74)

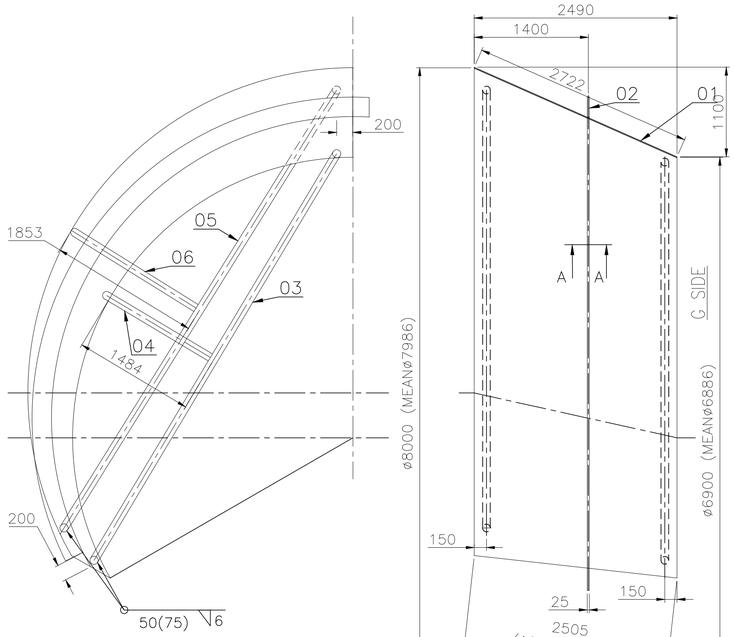
DEPT. HXE
CODE 2444
SCALE 1:40
WEIGHT(Kg.) 2715
REF. TO ASSY. DRG. 01709970117
ITEM NO. 01
NO.OF ITEMS – – (75, 77)

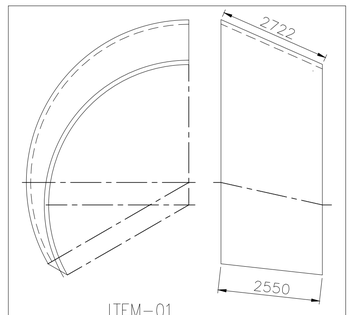
TITLE: ECCENTRIC REDUCER–1
CARD CODE X
DRAWING NO. 21709970106 (7, 22)
REV. 00 (23, 24)
SHEET NO. | NO.OF SHEETS

SIZE A2

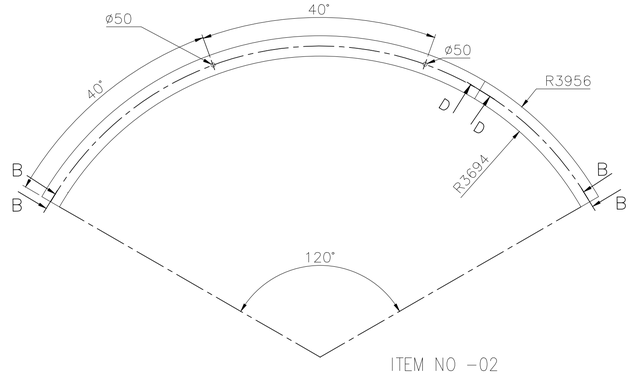
REF. DRG NO. | SIGN & DATE | INVENTORY NO.

DRAWING NO. 21709970107

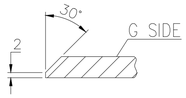




ITEM–01



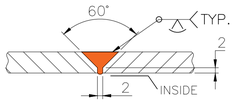
ITEM NO –02



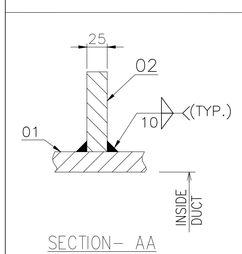
SECTION– BB

ITEM NO	L
03	5815
04	1484
05	6425
06	1855

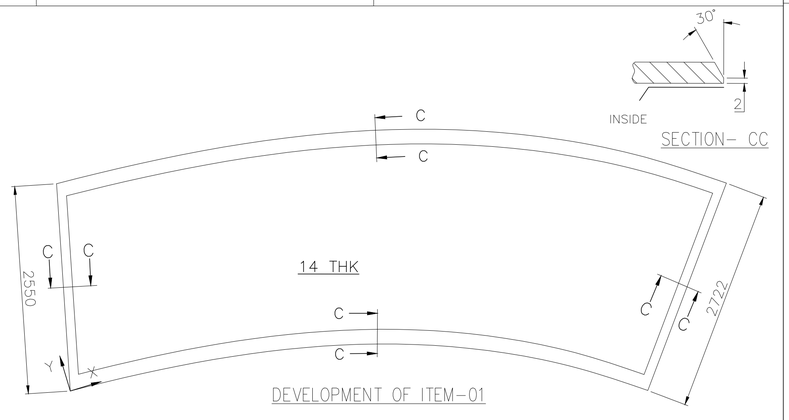
TECHNOLOGICAL SUPPORT



SECTION– DD



SECTION– AA



SECTION– CC

DEVELOPMENT OF ITEM–01

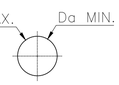
TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm



   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG NO 21709970110.

(10)◸	(6)◸	SIZE & SYMBOL OF SEAM
16.7	1.3	WELD LENGTH (M).
6.6	0.2	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO.	STATUS OF DRG.
01709970117–03	U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	–SD–	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD.
HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	–Sd–	23.11.2022
CHD	AXAY KUMAR	–Sd–	23.11.2022
APD	N PRAKASH	–Sd–	23.11.2022

NO.OF VAR. –– (73, 74)

DEPT.	CODE	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS (75, 77)
HXE	2444	1:40	2715	01709970017	02	––

TITLE: ECCENTRIC REDUCER–2 8000x6900

CARD CODE: X

DRAWING NO. 21709970107 (7, 22, 23, 24)

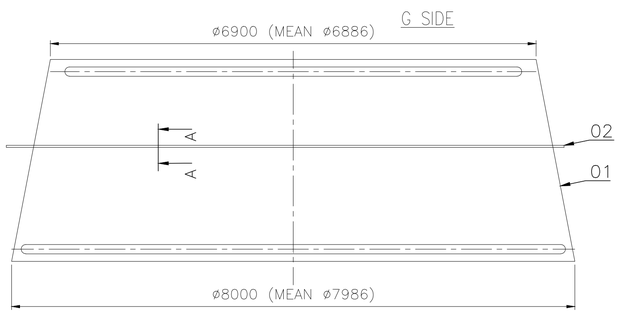
REV. 00

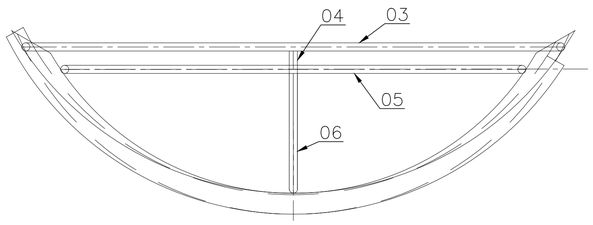
SHEET NO. | NO.OF SHEETS

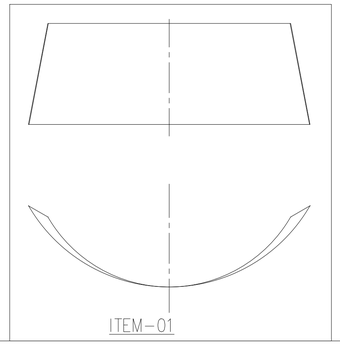
SIZE A2

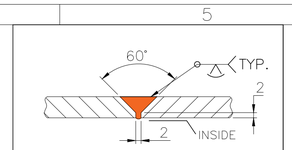
REF. DRG NO. | SIGN & DATE | INVENTORY NO.

DRAWING NO. 21709970108

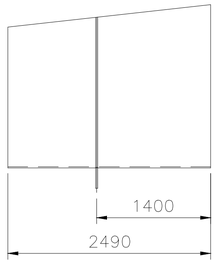


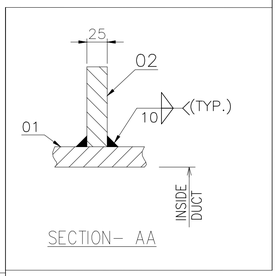




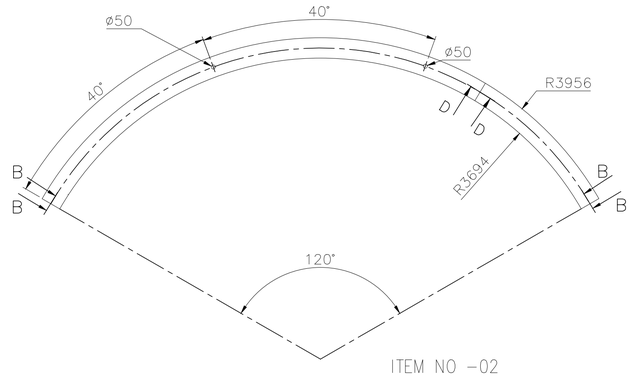


SECTION- DD

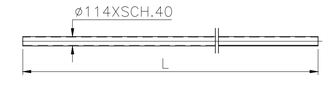




SECTION- AA

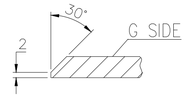


ITEM NO -02

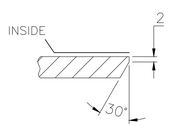


ITEM NO	L
03	6570
04	1745
05	5495
06	1472

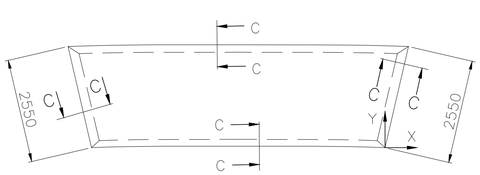
TECHNOLOGICAL SUPPORT



SECTION- BB



SECTION- CC



DEVELOPMENT OF ITEM NO 01

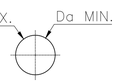
TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm



   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG. NO 21709970110.

(10)▽	(6)▽	SIZE & SYMBOL OF SEAM
16.7	1.3	WELD LENGTH (M).
6.6	0.2	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970117–03 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	–SD–	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	–Sd–	07.12.2022
CHD	AXAY KUMAR	–Sd–	07.12.2022
APD	N PRAKASH	–Sd–	07.12.2022

NO.OF VAR. –– (73, 74)

DEPT. HXE | CODE 2444 | SCALE 1:40 | WEIGHT(Kg.) 2705.6 | REF. TO ASSY. DRG. 01709970117 | ITEM NO. 03 | NO.OF ITEMS –– (75, 77)

TITLE: ECCENTRIC REDUCER ø8000Xø6900 –3

CARD CODE X

DRAWING NO. 21709970108 | REV. 00 (7, 22, 23, 24)

SHEET NO. | NO.OF SHEETS

SIZE A2

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

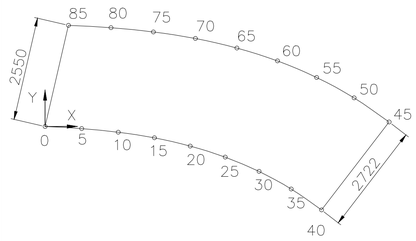
FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

FORM: DG 44(B)

DRAWING NO. 21709970110

PROFILE CO ORDINATE -01		
POINT	X	Y
0	0.000	0.000
1	180.109	-7.726
2	360.167	-16.582
3	540.160	-26.662
4	720.074	-38.065
5	899.892	-50.889
6	1079.596	-65.234
7	1259.162	-81.200
8	1438.568	-98.887
9	1617.784	-118.396
10	1796.781	-139.827
11	1975.524	-163.277
12	2153.977	-188.845
13	2332.099	-216.625
14	2509.845	-246.711
15	2687.170	-279.193
16	2864.021	-314.159
17	3040.346	-351.693
18	3216.086	-391.876
19	3391.180	-434.784
20	3565.565	-480.490
21	3739.173	-529.061
22	3911.936	-580.560
23	4083.781	-635.044
24	4254.632	-692.566
25	4424.414	-753.173
26	4593.048	-816.906
27	4760.452	-883.800
28	4926.547	-953.883
29	5091.249	-1027.180
30	5254.474	-1103.707
31	5416.141	-1183.476
32	5576.165	-1266.490
33	5734.464	-1352.748
34	5890.956	-1442.243
35	6045.561	-1534.961
36	6198.198	-1630.883
37	6348.791	-1729.983
38	6497.265	-1832.231
39	6643.548	-1937.589
40	6787.571	-2046.017
41	X	X
42	X	X

43	X	X
44	X	X
45	8447.739	111.283
46	8280.709	237.032
47	8111.058	359.220
48	7938.866	477.801
49	7764.217	592.732
50	7587.197	703.977
51	7407.895	811.506
52	7226.405	915.298
53	7042.818	1015.335
54	6857.231	1111.610
55	6669.739	1204.121
56	6480.439	1292.873
57	6289.427	1377.879
58	6096.799	1459.158
59	5902.653	1536.737
60	5707.081	1610.651
61	5510.177	1680.940
62	5312.033	1747.651
63	5112.738	1810.839
64	4912.377	1870.564
65	4711.035	1926.894
66	4508.793	1979.901
67	4305.729	2029.663
68	4101.916	2076.265
69	3897.424	2119.795
70	3692.322	2160.347
71	3486.671	2198.018
72	3280.530	2232.910
73	3073.954	2265.128
74	2866.994	2294.780
75	2659.698	2321.976
76	2452.107	2346.830
77	2244.262	2369.456
78	2036.198	2389.969
79	1827.947	2408.485
80	1619.537	2425.121
81	1410.993	2439.993
82	1202.339	2453.218
83	993.593	2464.909
84	784.772	2475.179
85	575.892	2484.139



ECCENTRIC REDUCER PLATE

PROFILE CO ORDINATE -02		
POINT	X	Y
0	0.000	0.000
1	-180.151	6.691
2	-360.334	12.437
3	-540.543	17.328
4	-720.771	21.448
5	-901.013	24.880
6	-1081.266	27.703
7	-1261.527	29.991
8	-1441.793	31.814
9	-1622.062	33.239
10	-1802.334	34.327
11	-1982.607	35.136
12	-2162.881	35.717
13	-2343.156	36.118
14	-2523.431	36.379
15	-2703.706	36.538
16	-2883.981	36.626
17	-3064.256	36.668
18	-3244.531	36.683
19	-3424.806	36.687
20	-3605.081	36.687
21	-3785.356	36.687
22	-3965.631	36.683
23	-4145.906	36.668
24	-4326.181	36.626
25	-4506.456	36.538
26	-4686.731	36.379
27	-4867.006	36.118
28	-5047.281	35.717
29	-5227.555	35.136
30	-5407.828	34.327
31	-5588.100	33.239
32	-5768.369	31.814
33	-5948.635	29.991
34	-6128.896	27.703
35	-6309.149	24.880
36	-6489.391	21.448
37	-6669.619	17.328
38	-6849.828	12.437
39	-7030.011	6.691
40	-7210.162	0.000
41	NA	NA
42	NA	NA

43	NA	NA
44	NA	NA
45	-7786.054	2484.139
46	-7577.125	2491.899
47	-7368.158	2498.564
48	-7159.162	2504.235
49	-6950.143	2509.014
50	-6741.108	2512.994
51	-6532.061	2516.268
52	-6323.005	2518.921
53	-6113.943	2521.035
54	-5904.876	2522.688
55	-5695.807	2523.950
56	-5486.736	2524.888
57	-5277.664	2525.562
58	-5068.592	2526.027
59	-4859.519	2526.330
60	-4650.446	2526.515
61	-4441.373	2526.616
62	-4232.300	2526.665
63	-4023.227	2526.682
64	-3814.154	2526.687
65	-3605.081	2526.687
66	-3396.008	2526.687
67	-3186.935	2526.682
68	-2977.862	2526.665
69	-2768.789	2526.616
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75	-1514.355	2523.950
76	-1305.286	2522.688
77	-1096.219	2521.035
78	-887.157	2518.921
79	-678.101	2516.268
80	-469.054	2512.994
81	-260.019	2509.014
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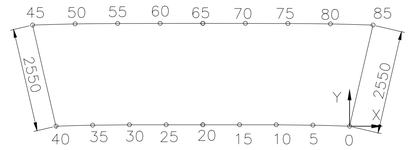
83	157.996	2498.564
84	366.963	2491.899
85	575.892	2484.139



ECCENTRIC REDUCER PLATE

REF. DRG NO.

SIGN & DATE

INVENTORY NO.

CBOM NO. 01709970117-03			STATUS OF DRG. U
AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

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

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	-Sd-	07.12.2022
CHD	AXAY KUMAR	-Sd-	07.12.2022
APD	N PRAKASH	-Sd-	07.12.2022

NO.OF VAR. --

DEPT. HXE
CODE 2444
SCALE -
WEIGHT(Kg.) ——
REF. TO ASSY. DRG. 21709970109
ITEM NO. --
NO.OF ITEMS --

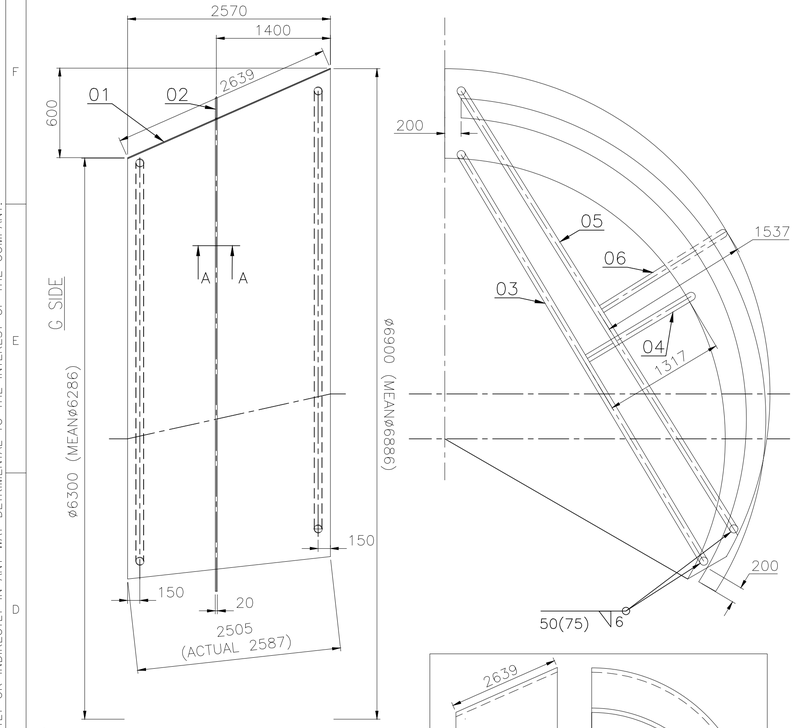
TITLE: ECCENTRIC REDUCER 8000X6900 PROFILE CO ORDINATE
CARD CODE X
DRAWING NO. 21709970110
REV. 00
SHEET NO.
NO.OF SHEETS

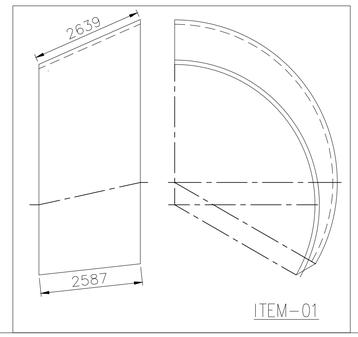
SIZE A2

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

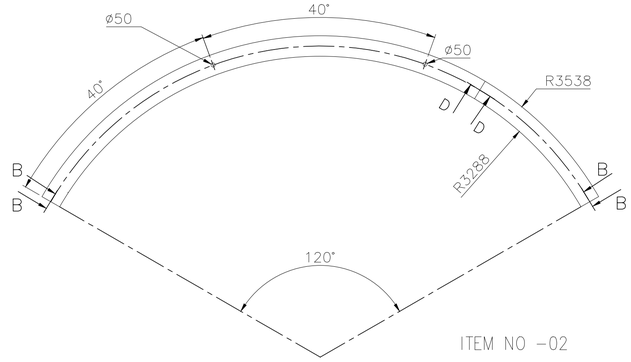
FORM: DG 44(B)

DRAWING NO. 21709970140

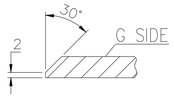




ITEM-01



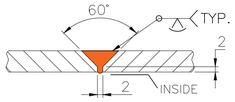
ITEM NO -02



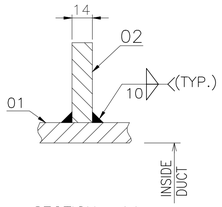
SECTION- BB

ITEM NO	L
03	5234
04	1317
05	5694
06	1537

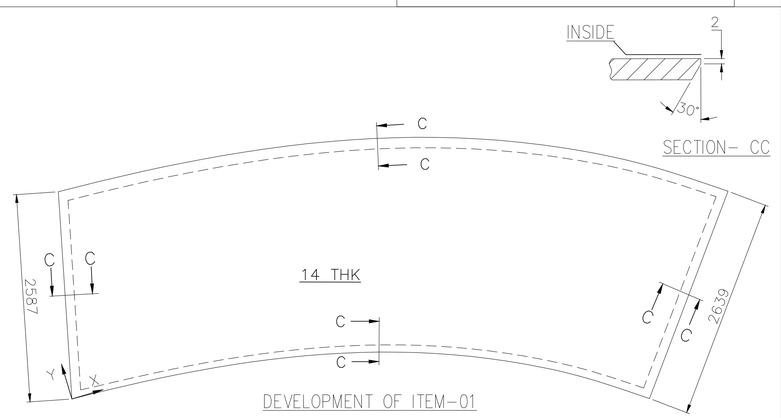
TECHNOLOGICAL SUPPORT



SECTION- DD



SECTION- AA



SECTION- CC

DEVELOPMENT OF ITEM-01

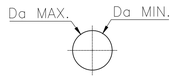
TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

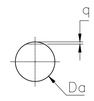
   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm



   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm



7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG NO 21709970143.

(10)◸	(6)◸	SIZE & SYMBOL OF SEAM
7.5	1.3	WELD LENGTH (M).
3.0	0.2	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO.	STATUS OF DRG.
01709970017 Var. 03	U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	–SD–	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD.
HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	–Sd–	16.12.2022	––
CHD	AXAY KUMAR	–Sd–	16.12.2022	
APD	N PRAKASH	–Sd–	16.12.2022	73 , 74

DEPT. HXE
CODE 2444
SCALE 1:40
WEIGHT(Kg.) 2398.5
REF. TO ASSY. DRG. 21709970109
ITEM NO. –
NO.OF ITEMS –– 75 , 77

TITLE: ECCENTRIC REDUCER ø6900Xø6300 –1
CARD CODE X
DRAWING NO. 21709970140
REV. 00
7 , 22 , 23 , 24
SHEET NO. | NO.OF SHEETS

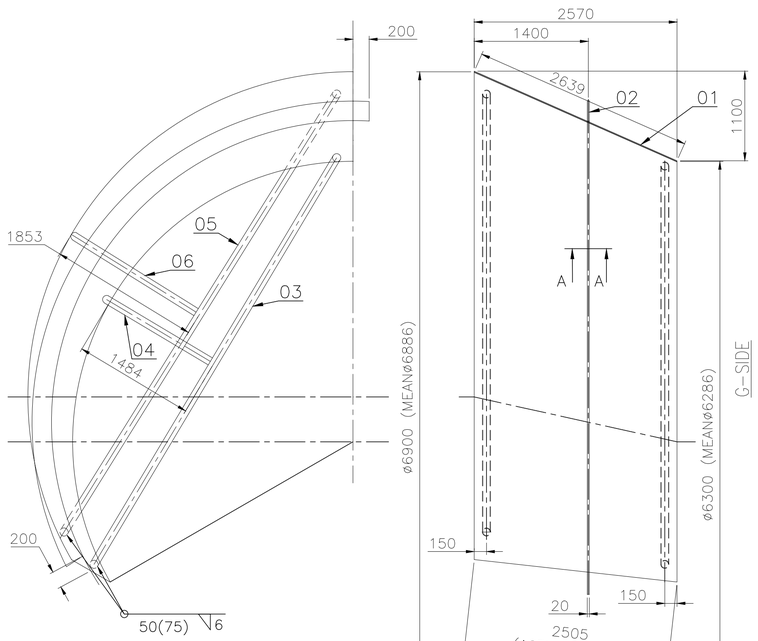
SIZE A2

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

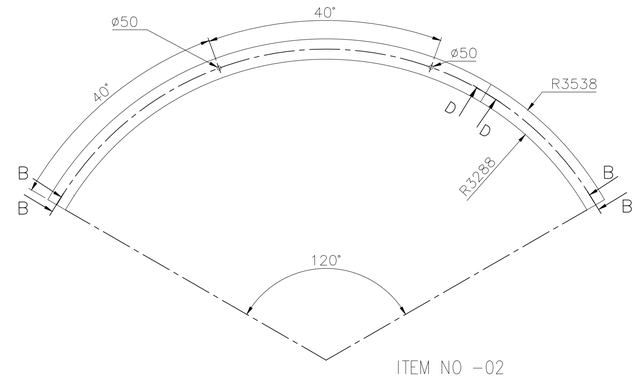
FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

FORM: DG 44(B)

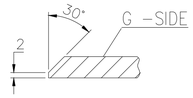
DRAWING NO. 21709970141



ITEM-01



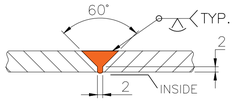
ITEM NO -02



SECTION- BB

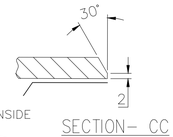
ITEM NO	L
03	5234
04	1317
05	5694
06	1537

TECHNOLOGICAL SUPPORT

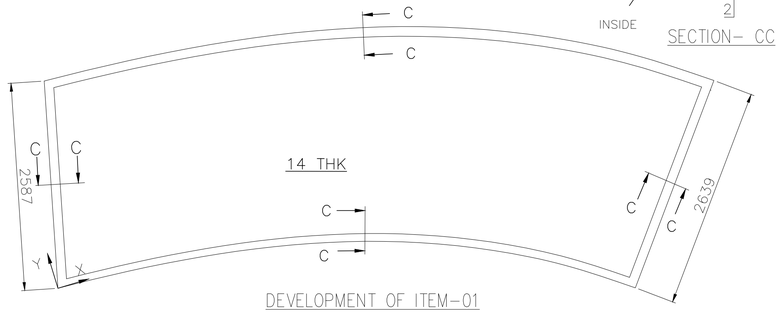


SECTION- DD

SECTION- AA



SECTION- CC



DEVELOPMENT OF ITEM-01

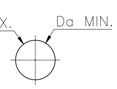
TECHNICAL REQUIREMENTS: -

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER - 1 COAT - DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT - 1 COAT - 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE-F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm - 4900 mm = ±7 mm
   Da 4900 mm - 6300 mm = ±8 mm
   Da 6300 mm - 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm - 4900 mm x = 14 mm
   Da 4900 mm - 6300 mm x = 16 mm
   Da 6300 mm - 8100 mm x = 20 mm



   Permissible ovality at any cross-section, other than ends of section, will be as per ASME Section VIII Div 1 UG-80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D-D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG NO 21709970143.

(10)◸	(6)◸	SIZE & SYMBOL OF SEAM
7.5	1.3	WELD LENGTH (M).
3.0	0.2	WT. OF WELD METAL (Kg).
E-7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970017 Var. 03 — STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD.
HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	-Sd-	16.12.2022
CHD	AXAY KUMAR	-Sd-	16.12.2022
APD	N PRAKASH	-Sd-	16.12.2022

NO.OF VAR. --

DEPT. HXE
CODE 2444
SCALE 1:40
WEIGHT(Kg.) 2398.5
REF. TO ASSY. DRG. 21709970109
ITEM NO. -
NO.OF ITEMS --

TITLE: ECCENTRIC REDUCER ø6900Xø6300 -2
CARD CODE X
DRAWING NO. 21709970141
REV. 00
SHEET NO.
NO.OF SHEETS

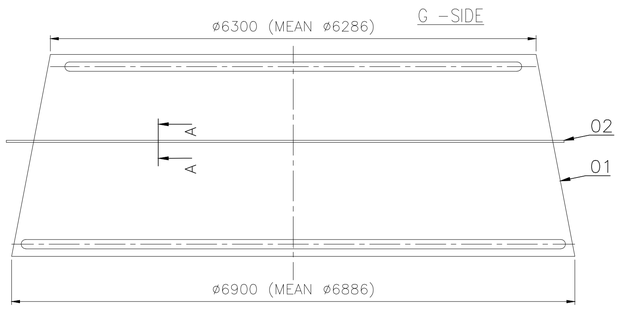
SIZE A2

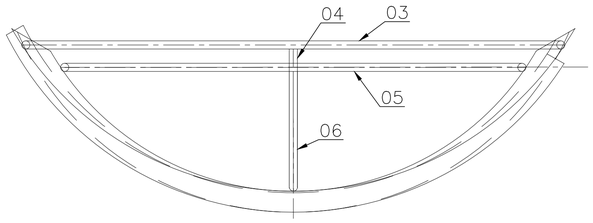
REF. DRG NO. | SIGN & DATE | INVENTORY NO.

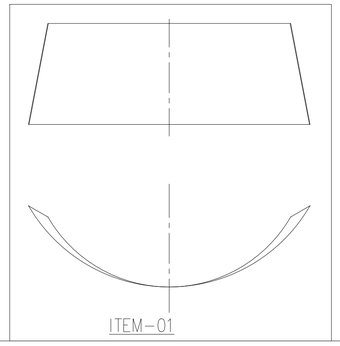
FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

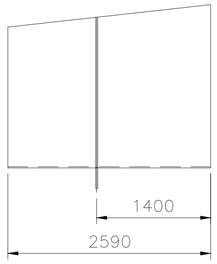
FORM: DG 44(B)

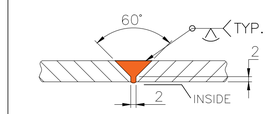
DRAWING NO. 21709970142



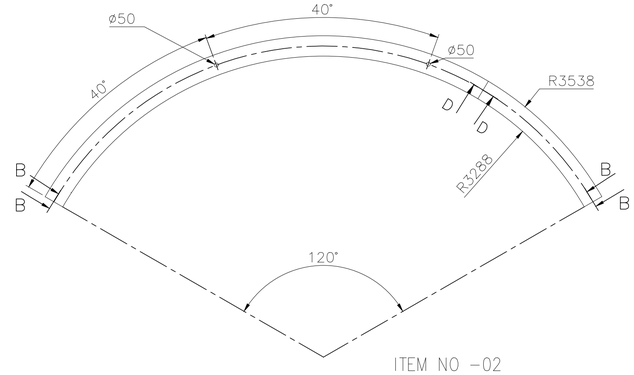








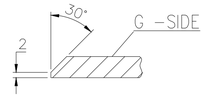
SECTION– DD



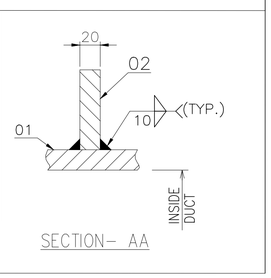
ITEM NO –02

ITEM NO	L
03	5694
04	1537
05	5234
06	1317

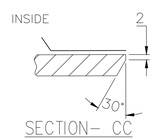
TECHNOLOGICAL SUPPORT



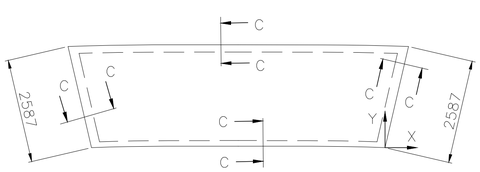
SECTION– BB



SECTION– AA



SECTION– CC



DEVELOPMENT OF ITEM NO 01

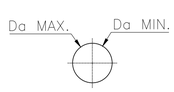
TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

(b) ADMISSIBLE OVALITY

At ends: Da 2800 mm – 4900 mm x = 14 mm
Da 4900 mm – 6300 mm x = 16 mm
Da 6300 mm – 8100 mm x = 20 mm



Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

(c) ADMISSIBLE OBLATENESS

Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG. NO 21709970143.

(10)	(6)	SIZE & SYMBOL OF SEAM
7.5	1.3	WELD LENGTH (M).
3.0	0.2	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970017 Var. 03 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	–SD–	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	–Sd–	07.12.2022
CHD	AXAY KUMAR	–Sd–	07.12.2022
APD	N PRAKASH	–Sd–	07.12.2022

NO.OF VAR. –– (73, 74)

DEPT. HXE | CODE 2444 | SCALE 1:40 | WEIGHT(Kg.) 2370 | REF. TO ASSY. DRG. 21709970109 | ITEM NO. 10 | NO.OF ITEMS –– (75, 77)

TITLE: ECCENTRIC REDUCER ø8000Xø6900 –3

CARD CODE X

DRAWING NO. 21709970142 | REV. 00 (7, 22, 23, 24)

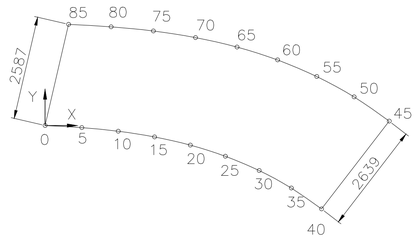
SHEET NO. | NO.OF SHEETS

SIZE A2

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

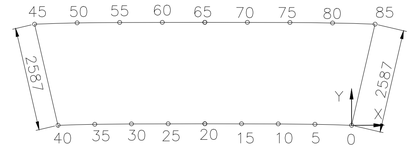
DRAWING NO. 21709970143

PROFILE CO ORDINATE -01		
POINT	X	Y
0	0.000	0.000
1	164.525	-3.736
2	329.036	-8.020
3	493.531	-12.899
4	658.005	-18.422
5	822.455	-24.637
6	986.875	-31.594
7	1151.259	-39.344
8	1315.602	-47.937
9	1479.895	-57.425
10	1644.131	-67.858
11	1808.301	-79.288
12	1972.394	-91.766
13	2136.400	-105.343
14	2300.307	-120.068
15	2464.102	-135.990
16	2627.772	-153.159
17	2791.300	-171.622
18	2954.671	-191.425
19	3117.868	-212.613
20	3280.874	-235.230
21	3443.668	-259.318
22	3606.232	-284.918
23	3768.544	-312.067
24	3930.583	-340.803
25	4092.326	-371.160
26	4253.750	-403.170
27	4414.831	-436.863
28	4575.545	-472.268
29	4735.866	-509.409
30	4895.769	-548.309
31	5055.229	-588.988
32	5214.220	-631.464
33	5372.716	-675.752
34	5530.691	-721.864
35	5688.119	-769.810
36	5844.975	-819.595
37	6001.233	-871.225
38	6156.870	-924.700
39	6311.860	-980.019
40	6466.182	-1037.178
41	NA	NA
42	NA	NA
43	NA	NA
44	NA	NA
45	7397.529	1432.132
46	7228.478	1494.747
47	7058.693	1555.346
48	6888.201	1613.925
49	6717.028	1670.483
50	6545.200	1725.021
51	6372.745	1777.543
52	6199.692	1828.056
53	6026.068	1876.571
54	5851.901	1923.102
55	5677.221	1967.664
56	5502.054	2010.277
57	5326.430	2050.963
58	5150.377	2089.747
59	4973.921	2126.656
60	4797.089	2161.722
61	4619.907	2194.976
62	4442.402	2226.455
63	4264.597	2256.196
64	4086.516	2284.239
65	3908.183	2310.626
66	3729.619	2335.402
67	3550.844	2358.613
68	3371.879	2380.306
69	3192.742	2400.531
70	3013.451	2419.338
71	2834.021	2436.781
72	2654.469	2452.911
73	2474.809	2467.783
74	2295.053	2481.452
75	2115.213	2493.974
76	1935.301	2505.403
77	1755.325	2515.796
78	1575.296	2525.209
79	1395.221	2533.699
80	1215.107	2541.320
81	1034.961	2548.128
82	854.787	2554.178
83	674.592	2559.523
84	494.378	2564.216
85	314.149	2568.309



ECCENTRIC REDUCER PLATE

PROFILE CO ORDINATE -02		
POINT	X	Y
0	0.000	0.000
1	-164.535	3.234
2	-329.079	6.011
3	-493.629	8.373
4	-658.184	10.363
5	-822.743	12.020
6	-987.304	13.382
7	-1151.868	14.486
8	-1316.433	15.366
9	-1480.998	16.054
10	-1645.564	16.579
11	-1810.131	16.969
12	-1974.698	17.250
13	-2139.265	17.443
14	-2303.832	17.569
15	-2468.399	17.646
16	-2632.966	17.688
17	-2797.533	17.708
18	-2962.100	17.716
19	-3126.667	17.717
20	-3291.235	17.718
21	-3455.802	17.717
22	-3620.369	17.716
23	-3784.936	17.708
24	-3949.503	17.688
25	-4114.070	17.646
26	-4278.637	17.569
27	-4443.204	17.443
28	-4607.771	17.250
29	-4772.338	16.969
30	-4936.905	16.579
31	-5101.471	16.054
32	-5266.036	15.366
33	-5430.601	14.486
34	-5595.165	13.382
35	-5759.726	12.020
36	-5924.285	10.363
37	-6088.840	8.373
38	-6253.390	6.011
39	-6417.934	3.234
40	-6582.469	0.000
41	NA	NA
42	NA	NA
43	NA	NA
44	NA	NA
45	-6896.618	2568.309
46	-6716.378	2571.852
47	-6536.128	2574.893
48	-6355.872	2577.481
49	-6175.610	2579.661
50	-5995.344	2581.476
51	-5815.075	2582.969
52	-5634.804	2584.178
53	-5454.532	2585.142
54	-5274.258	2585.895
55	-5093.984	2586.470
56	-4913.710	2586.898
57	-4733.435	2587.205
58	-4553.160	2587.417
59	-4372.885	2587.555
60	-4192.610	2587.639
61	-4012.335	2587.685
62	-3832.060	2587.707
63	-3651.785	2587.716
64	-3471.510	2587.717
65	-3291.235	2587.718
66	-3110.959	2587.717
67	-2930.684	2587.716
68	-2750.409	2587.707
69	-2570.134	2587.685
70	-2389.859	2587.639
71	-2209.584	2587.555
72	-2029.309	2587.417
73	-1849.034	2587.205
74	-1668.759	2586.898
75	-1488.485	2586.470
76	-1308.211	2585.895
77	-1127.937	2585.142
78	-947.665	2584.178
79	-767.394	2582.969
80	-587.125	2581.476
81	-406.859	2579.661
82	-226.597	2577.481
83	-46.341	2574.893
84	133.909	2571.852
85	314.149	2568.309



ECCENTRIC REDUCER PLATE

REF. DRG NO.

SIGN & DATE

INVENTORY NO.

CBOM NO. 01709970017 Var. 03			STATUS OF DRG. U
AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

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

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	-Sd-	16.12.2022
CHD	AXAY KUMAR	-Sd-	16.12.2022
APD	N PRAKASH	-Sd-	16.12.2022

NO.OF VAR. -- (73, 74)

DEPT. HXE
CODE 2444
SCALE -
WEIGHT(Kg.) ——
REF. TO ASSY. DRG. 21709970109
ITEM NO. 11
NO.OF ITEMS -- (75, 77)

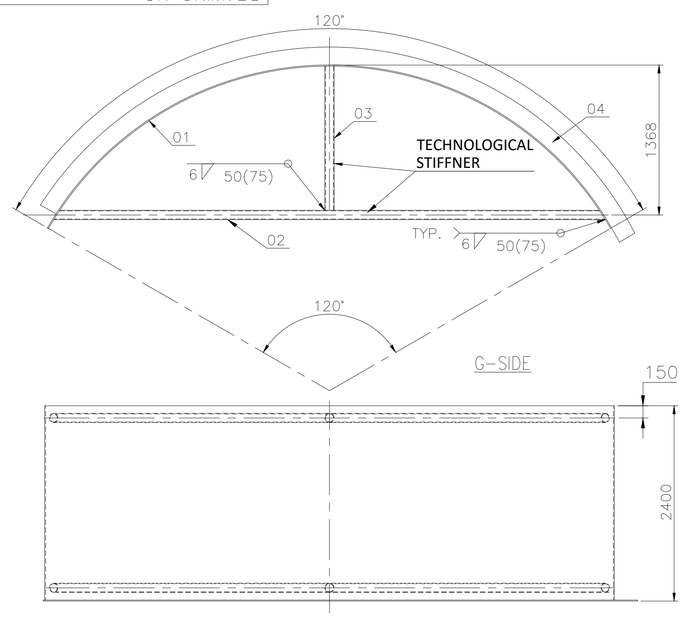
TITLE: ECCENTRIC REDUCER 6900X6300 PROFILE CO ORDINATE
CARD CODE X (1, 3)
DRAWING NO. 21709970143 (7, 22, 23, 24)
REV. 00
SHEET NO.
NO.OF SHEETS

SIZE A2

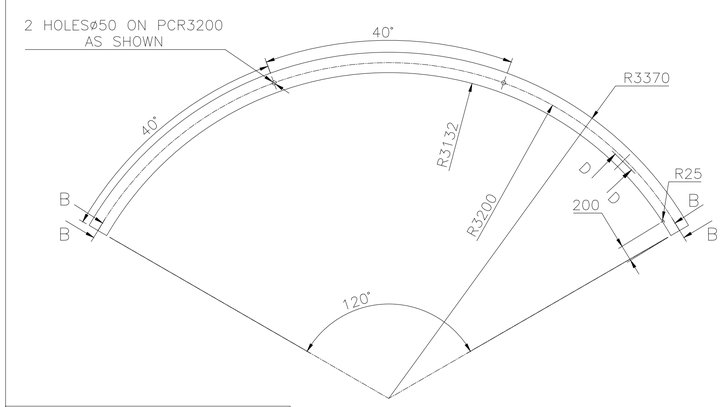
FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

FORM: DG 44(B)

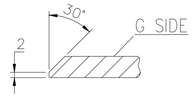
DRAWING NO. 21709970144



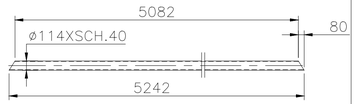
ITEM NO –01



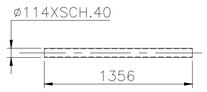
ITEM NO –04



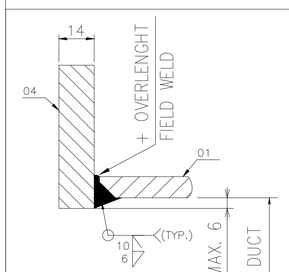
SECTION– BB



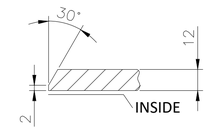
ITEM NO –02



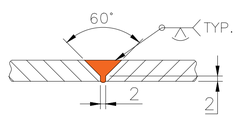
ITEM NO –03



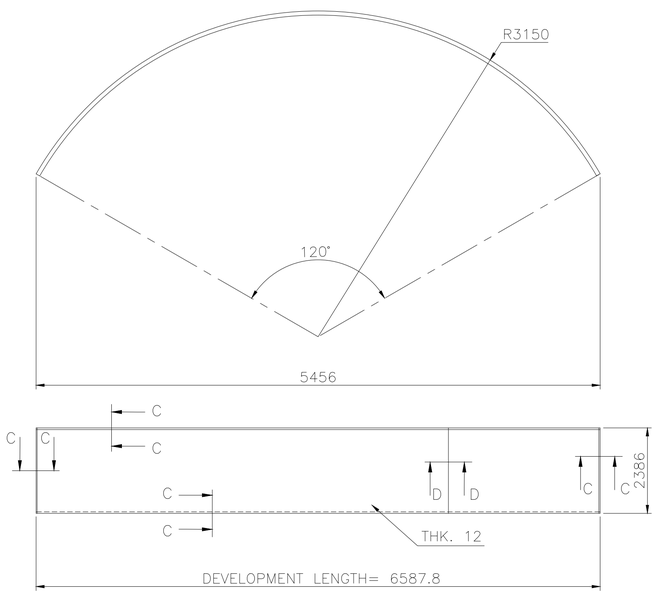
SECTION–BB



SECTION– CC



SECTION– DD



ITEM NO –01

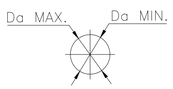
TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

(b) ADMISSIBLE OVALITY

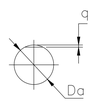
At ends: Da 2800 mm – 4900 mm x = 14 mm
Da 4900 mm – 6300 mm x = 16 mm
Da 6300 mm – 8100 mm x = 20 mm



Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

(c) ADMISSIBLE OBLATENESS

Da ≤ 9220 mm q = 6 mm



7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.4) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.

(10)△	(6)▽	SIZE & SYMBOL OF SEAM
6.6	1.3	WELD LENGTH (M).
3.1	0.2	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970017 Var. 03 — STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	–Sd–	06.12.2022
CHD	AXAY KUMAR	–Sd–	06.12.2022
APD	N PRAKASH	–Sd–	06.12.2022

NO.OF VAR. – – (73 , 74)

DEPT. HXE | CODE 2444 | SCALE 1:40 | WEIGHT(Kg.) 1874.3 | REF. TO ASSY. DRG. 01709970017–03 | ITEM NO. 12 | NO.OF ITEMS – – (75 , 77)

TITLE: DUCT LIAISONING ø6300

CARD CODE (1 3) X

DRAWING NO. 21709970144 (7 , 22) | REV. 00 (23 , 24)

SHEET NO. | NO.OF SHEETS

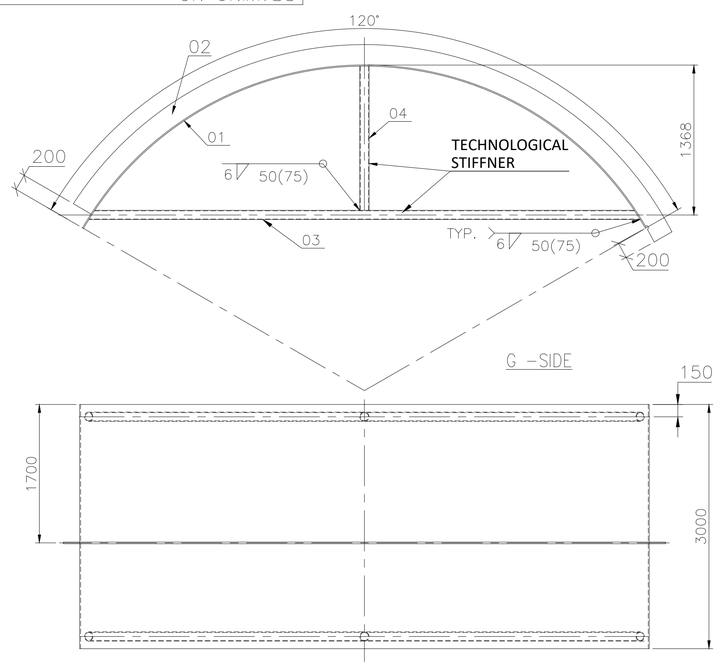
SIZE A2

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

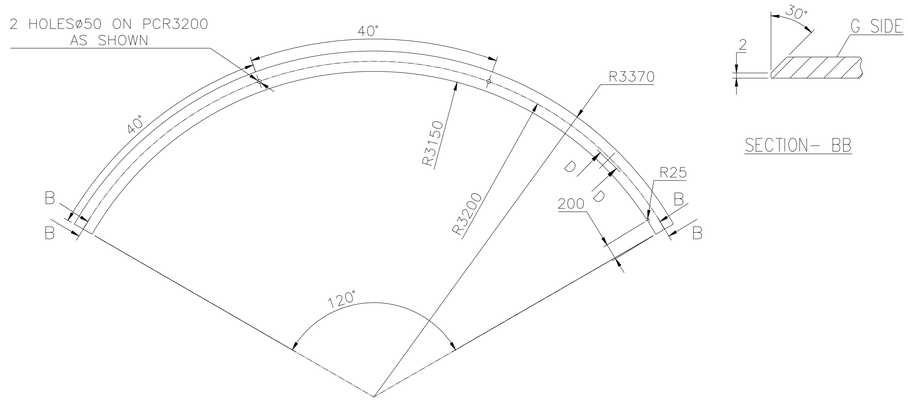
FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

FORM: DG 44(B)

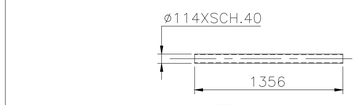
DRAWING NO. 217099701 45



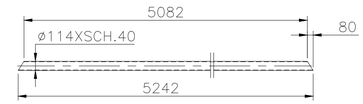
ITEM NO –01



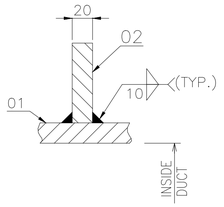
ITEM NO –02



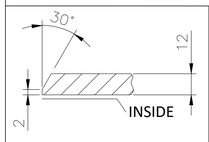
ITEM NO –04



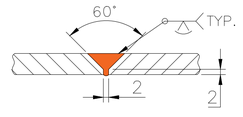
ITEM NO –03



SECTION– AA



SECTION– CC



SECTION– DD

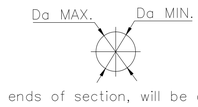
TECHNICAL REQUIREMENTS:–

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

(b) ADMISSIBLE OVALITY

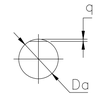
At ends: Da 2800 mm – 4900 mm x = 14 mm
Da 4900 mm – 6300 mm x = 16 mm
Da 6300 mm – 8100 mm x = 20 mm



Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

(c) ADMISSIBLE OBLATENESS

Da ≤ 9220 mm q = 6 mm



7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.

(10) △	(6) ▽	SIZE & SYMBOL OF SEAM
6.6	1.3	WELD LENGTH (M).
3.1	0.2	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970017 Var. 03 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	–SD–	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	–Sd–	06.12.2022
CHD	AXAY KUMAR	–Sd–	06.12.2022
APD	N PRAKASH	–Sd–	06.12.2022

NO.OF VAR. –– (73, 74)

DEPT.	CODE	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
HXE	2444	1:40	2242.2	01709970017–03	13	–– (75, 77)

TITLE: DUCT LIAISONING ø6300

CARD CODE: X

DRAWING NO. 21709970145 REV. 00 (7, 22, 23, 24)

SHEET NO. | NO.OF SHEETS

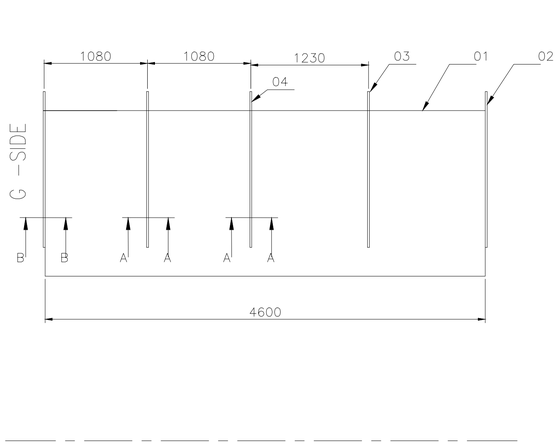
SIZE A2

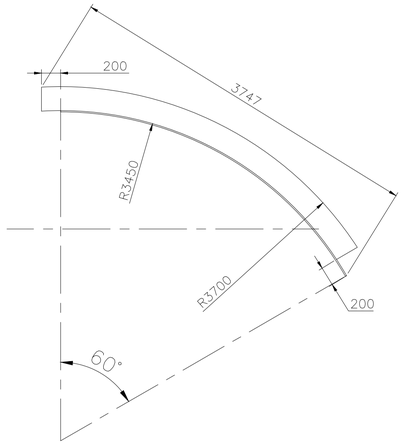
REF. DRG NO. | SIGN & DATE | INVENTORY NO.

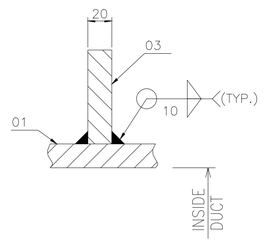
FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm)

FORM: DG 45(B)

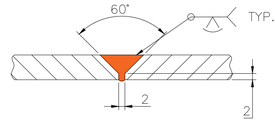
DRAWING NO. 21709970167



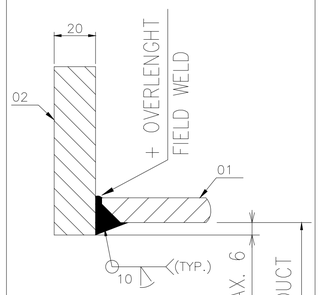




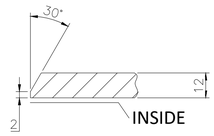
SECTION– AA



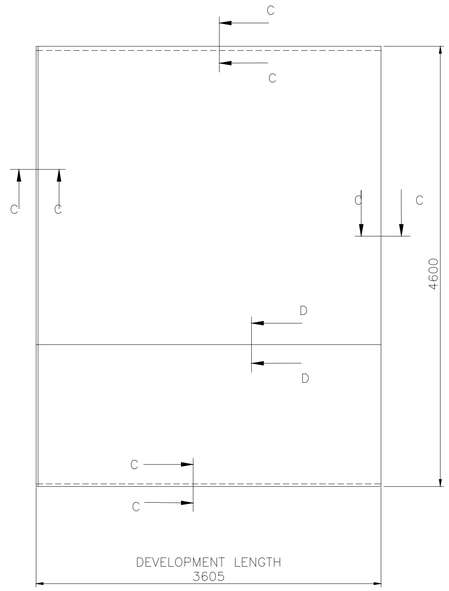
SECTION– DD



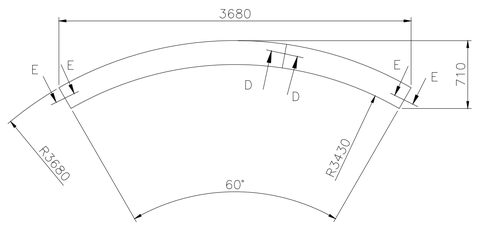
SECTION–BB



SECTION– CC

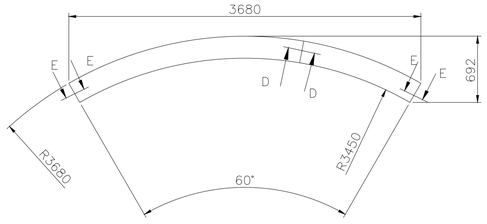


ITEM NO –01



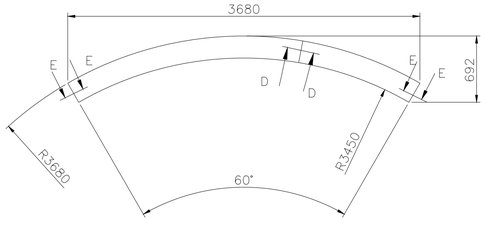
ITEM NO –02

20 THK



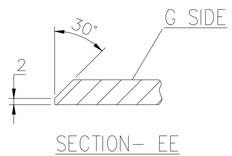
ITEM NO –03

14 THK



ITEM NO –04

20 THK



SECTION– EE

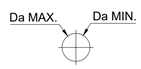
TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm



   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.

(10)▽	(10)▷	SIZE & SYMBOL OF SEAM
21.9	7.3	WELD LENGTH (M).
8.6	3.4	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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

CBOM NO. 01709970017 Var. 03			STATUS OF DRG. U
AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

REV.	DATE	ALTERED	CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	--	SD -- 19.12.2022	~
CHD	AXAY KUMAR	--	SD -- 19.12.2022	
APD	N PRAKASH	--	SD -- 19.12.2022	73, 74

DEPT.	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
HXE	1:30	2095.8	01709970017	07	~ (75, 77)
CODE 4222					

TITLE: DUCT LIASIONING TEE Ø6900xØ2800

CARD CODE: X

DRAWING NO. 21709970167 (7, 22) REV. 00 (23, 24)

SHEET NO. | NO.OF SHEETS

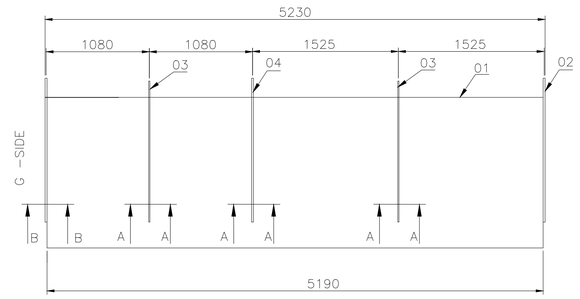
SIZE A2

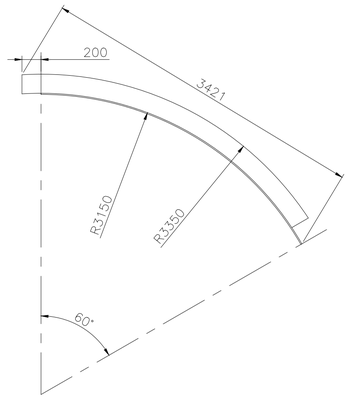
INVENTORY NO. | SIGN & DATE | REF. DRG NO.

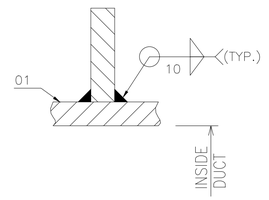
FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm)

FORM: DG 45(B)

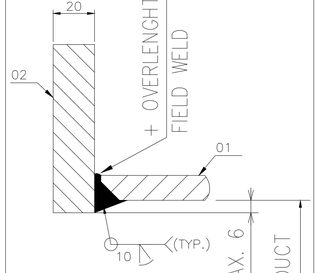
DRAWING NO. 21709970168



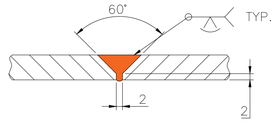




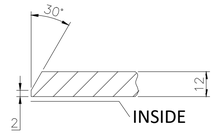
SECTION– AA



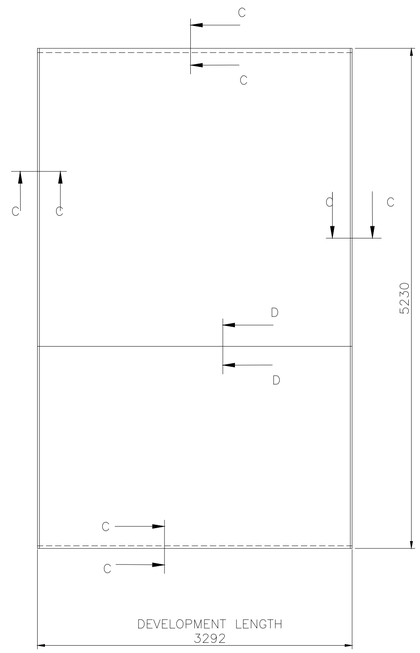
SECTION–BB



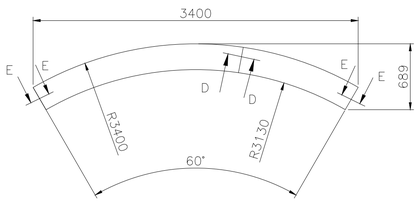
SECTION– DD



SECTION– CC

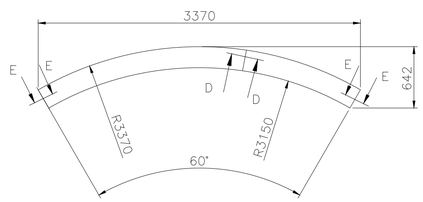


ITEM NO –01



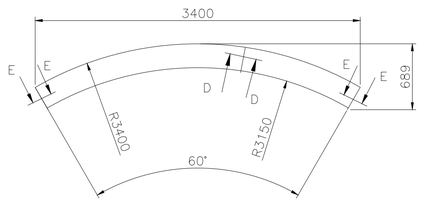
ITEM NO –02

20 THK



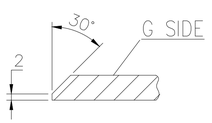
ITEM NO –03

14 THK



ITEM NO –04

20 THK



SECTION– EE

TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

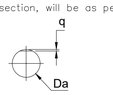
   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm

   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm



7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.

(10)	(10)	SIZE & SYMBOL OF SEAM
21.9	7.3	WELD LENGTH (M).
8.6	3.4	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

GRADE OF UNTOL. DIM.:–
M/CG– V/C/M/F AA 0230208
WELDING–A/B/C/D–AA621104
GAS CUTTING–'T.3'AA0621101

REV.	DATE	ALTERED
		CHECKED

CBOM NO. 01709970017 Var. 03 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

REV.	DATE	ALTERED
		CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	-- SD --	19.12.2022
CHD	AXAY KUMAR	-- SD --	19.12.2022
APD	N PRAKASH	-- SD --	19.12.2022

NO.OF VAR. ~~ (73, 74)

DEPT. HXE | CODE 4222 | SCALE 1:30 | WEIGHT(Kg.) 2116 | REF. TO ASSY. DRG. 01709970017 | ITEM NO. 16 (75, 77) | NO.OF ITEMS ~~

TITLE: DUCT LIASIONING TEE Ø6300xØ2800

CARD CODE X

DRAWING NO. 21709970168 (7, 22, 23, 24) | REV. 00

SHEET NO. | NO.OF SHEETS

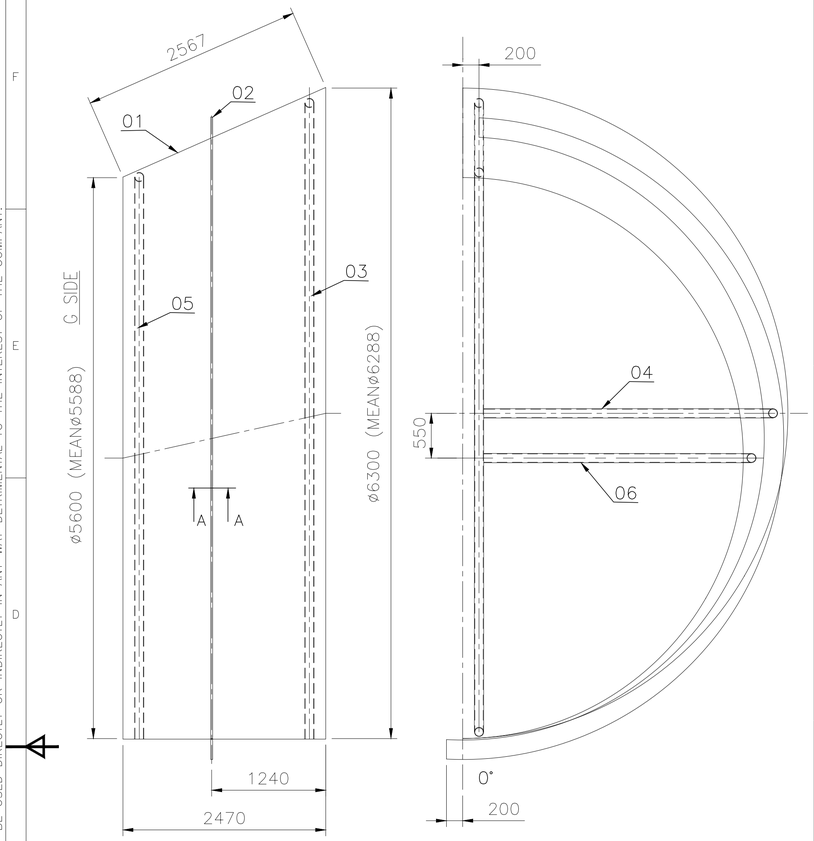
SIZE A2

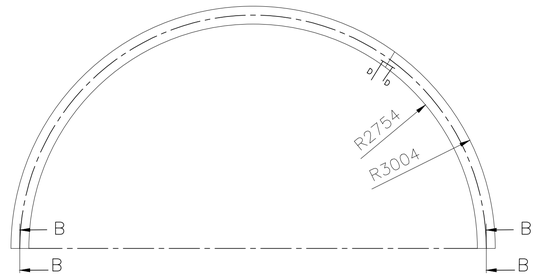
REF. DRG. NO. | SIGN & DATE | INVENTORY NO.

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

FORM: DG 44(B)

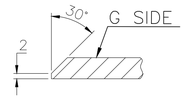
DRAWING NO. 21709970172





ITEM NO –02

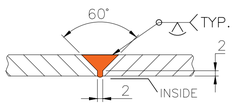
THK–14



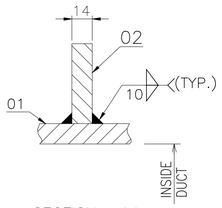
SECTION– BB

ITEM NO	L
03	4240
04	2950
05	5650
06	2600

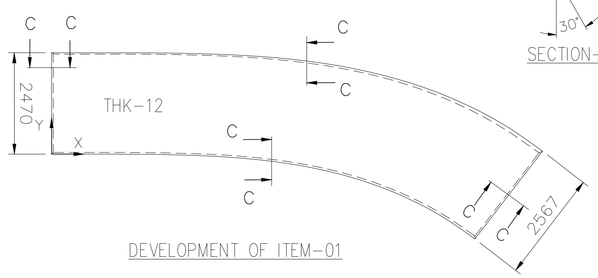
TECHNOLOGICAL SUPPORT



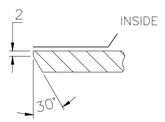
SECTION– DD



SECTION– AA



DEVELOPMENT OF ITEM–01



SECTION– CC

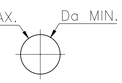
TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

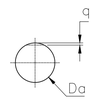
   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm



   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm



7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG NO 21709970175

(10)▽	(6)▽	SIZE & SYMBOL OF SEAM
17.3	1.3	WELD LENGTH (M).
6.8	0.2	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970017 Var. 03 — STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	–SD–	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	–Sd–	16.12.2022
CHD	AXAY KUMAR	–Sd–	16.12.2022
APD	N PRAKASH	–Sd–	16.12.2022

NO.OF VAR. ––

DEPT. HXE
CODE 2444

SCALE 1:40

WEIGHT(Kg.) 2674.5

REF. TO ASSY. DRG. 0170997017

ITEM NO. 17

NO.OF ITEMS ––

TITLE: ECCENTRIC REDUCER ø6300Xø5600 –1

CARD CODE X

DRAWING NO. 21709970172

REV. 00

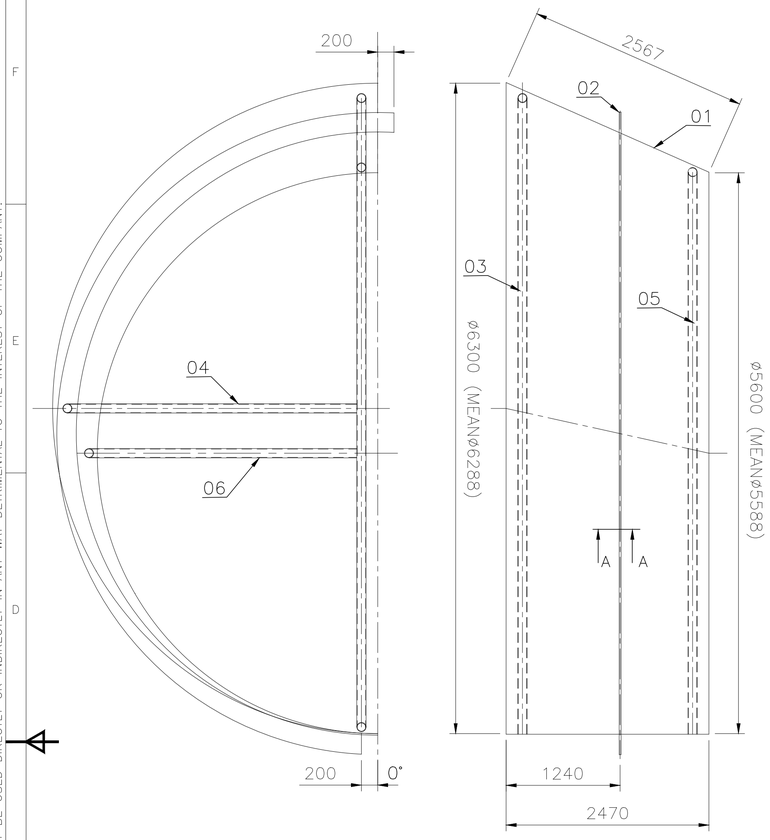
SHEET NO. | NO.OF SHEETS

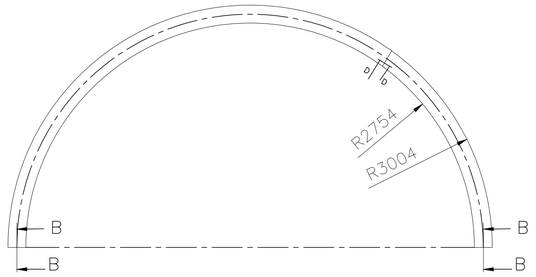
SIZE A2

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

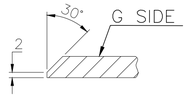
FORM: DG 44(B)

DRAWING NO. 21709970173





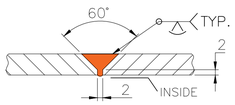
ITEM NO –02
THK – 14



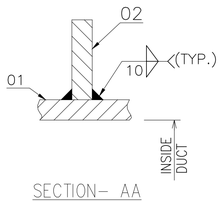
SECTION– BB

ITEM NO	L
03	4240
04	2950
05	5650
06	2600

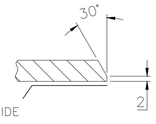
TECHNOLOGICAL SUPPORT



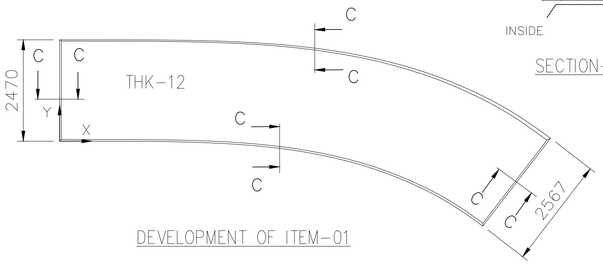
SECTION– DD



SECTION– AA



SECTION– CC



DEVELOPMENT OF ITEM–01

TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm

   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG NO 21709970175.

(10)◸	(6)◸	SIZE & SYMBOL OF SEAM
17.3	1.3	WELD LENGTH (M).
6.8	0.2	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970017–03 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	–SD–	31.01.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	–Sd–	16.12.2022
CHD	AXAY KUMAR	–Sd–	16.12.2022
APD	N PRAKASH	–Sd–	16.12.2022

NO.OF VAR. ––

DEPT. HXE | CODE 2444 | SCALE 1:40 | WEIGHT(Kg.) 2674.5 | REF. TO ASSY. DRG. 0170997017 | ITEM NO. 18 | NO.OF ITEMS ––

TITLE: ECCENTRIC REDUCER ø6300Xø5600 –2

CARD CODE X

DRAWING NO. 21709970173 | REV. 00

SHEET NO. | NO.OF SHEETS

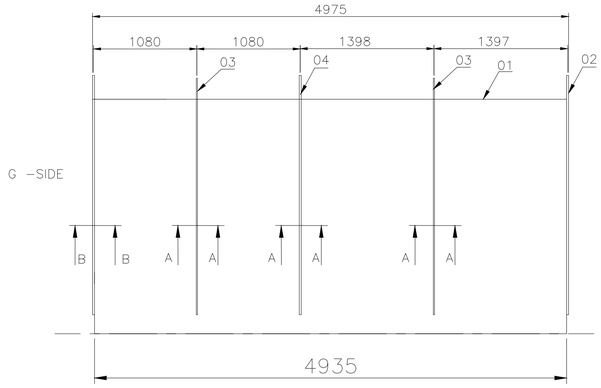
SIZE A2

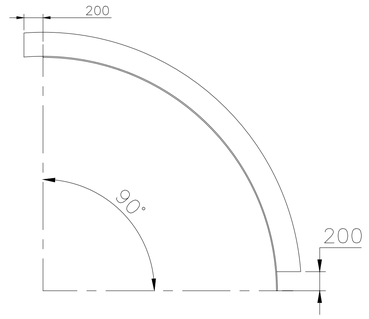
REF. DRG NO. | SIGN & DATE | INVENTORY NO.

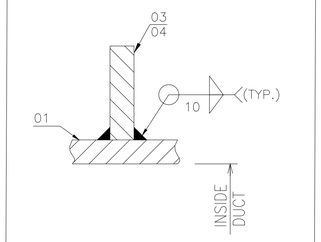
FIRST ANGLE PROJECTION | (ALL DIMENSIONS ARE IN mm)

FORM: DG 45(B)

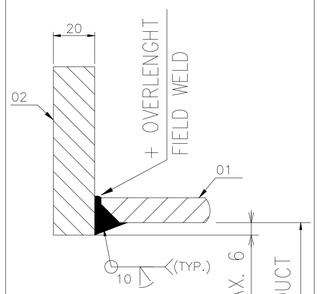
DRAWING NO. 21709970174



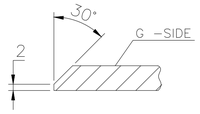




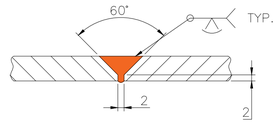
SECTION– AA



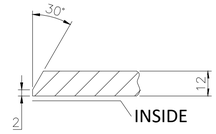
SECTION–BB



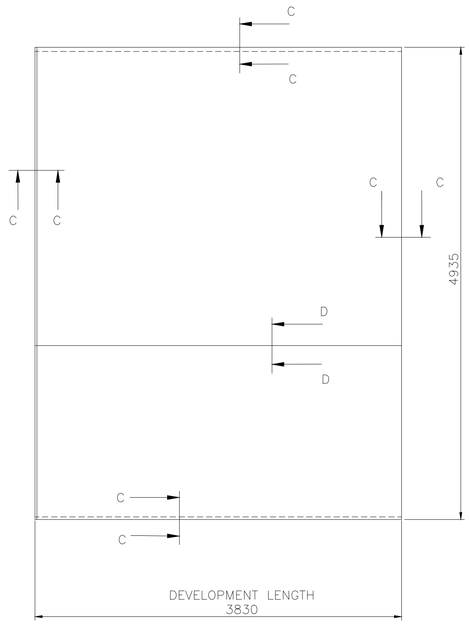
SECTION– EE



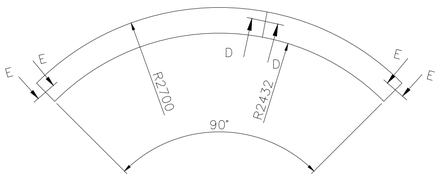
SECTION– DD



SECTION– CC

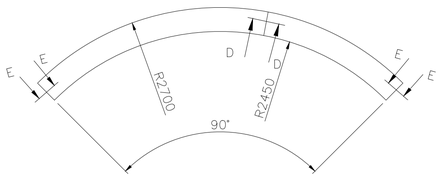


ITEM NO –01

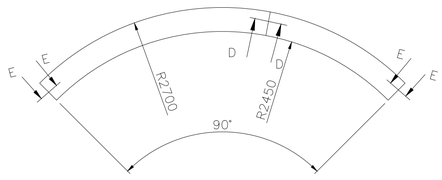


ITEM NO –02

20 THK



ITEM NO –03
12 THK



ITEM NO –04
20 THK

TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm

   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.

(10)△	(10)◸	(6)◸	SIZE & SYMBOL OF SEAM
22.8	7.6	7.6	WELD LENGTH (M).
8.9	3.6	1.3	WT. OF WELD METAL (Kg).
E–7018			TYPE OF ELECTRODE

REF. DRG NO.

SIGN & DATE

INVENTORY NO.

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

CBOM NO. 01709970017 Var. 03 | STATUS OF DRG. LI

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-sd-	02.02.23

REV.	DATE	ALTERED / CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-- SD --	26.12.2022	~~
CHD	AXAY KUMAR	-- SD --	26.12.2022	~~
APD	N PRAKASH	-- SD --	26.12.2022	73 , 74

DEPT.	HXE	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
CODE	4222	1:30	2514.7	01709970017	33	~~ 75 , 77

TITLE: DUCT LIASIONING TEE Ø4900xØ2800

CARD CODE: X

DRAWING NO. 21709970174 (2 , 22 , 23 , 24) | REV. 00

SHEET NO. | NO.OF SHEETS

SIZE A2

DRAWING NO. 21709970175

PROFILE CO ORDINATE -01		
POINT	X	Y
0	0.000	0.000
1	146.293	0.000
2	292.587	-0.002
3	438.880	-0.010
4	585.174	-0.032
5	731.467	-0.077
6	877.761	-0.160
7	1024.054	-0.296
8	1170.348	-0.505
9	1316.641	-0.807
10	1462.934	-1.229
11	1609.226	-1.795
12	1755.518	-2.537
13	1901.808	-3.487
14	2048.097	-4.678
15	2194.383	-6.148
16	2340.666	-7.936
17	2486.943	-10.083
18	2633.215	-12.631
19	2779.477	-15.627
20	2925.729	-19.115
21	3071.967	-23.145
22	3218.188	-27.766
23	3364.387	-33.028
24	3510.559	-38.983
25	3656.699	-45.684
26	3802.800	-53.184
27	3948.855	-61.538
28	4094.855	-70.799
29	4240.791	-81.022
30	4386.652	-92.261
31	4532.426	-104.572
32	4678.102	-118.008
33	4823.663	-132.624
34	4969.096	-148.471
35	5114.383	-165.602
36	5259.506	-184.068
37	5404.447	-203.919
38	5549.184	-225.203
39	5693.695	-247.968
40	5837.958	-272.258
41	5981.948	-298.117
42	6125.639	-325.586
43	6269.006	-354.704
44	6412.019	-385.509
45	6554.651	-418.036
46	6696.871	-452.315
47	6838.651	-488.377
48	6979.957	-526.249
49	7120.759	-565.954
50	7261.025	-607.515
51	7400.722	-650.949
52	7539.818	-696.272
53	7678.279	-743.497
54	7816.075	-792.632
55	7953.171	-843.685
56	8089.536	-896.659
57	8225.140	-951.555
58	8359.950	-1008.369
59	8493.938	-1067.098
60	8627.075	-1127.732
61	x	x
62	x	x
63	x	x
64	x	x
65	9707.775	1200.999
66	9557.960	1269.229
67	9407.188	1335.314
68	9255.490	1399.246
69	9102.900	1461.018
70	8949.452	1520.628
71	8795.182	1578.076
72	8640.125	1633.367
73	8484.319	1686.507
74	8327.799	1737.508
75	8170.602	1786.383
76	8012.766	1833.149
77	7854.325	1877.829
78	7695.318	1920.445
79	7535.778	1961.024
80	7375.742	1999.598
81	7215.243	2036.198
82	7054.314	2070.862
83	6892.989	2103.629
84	6731.297	2134.539
85	6569.270	2163.637
86	6406.935	2190.970
87	6244.321	2216.586
88	6081.453	2240.537
89	5918.356	2262.874
90	5755.054	2283.654
91	5591.567	2302.931
92	5427.916	2320.763
93	5264.120	2337.209
94	5100.196	2352.328
95	4936.161	2366.181
96	4772.028	2378.829
97	4607.811	2390.333
98	4443.522	2400.754
99	4279.171	2410.153
100	4114.768	2418.593
101	3950.321	2426.133
102	3785.838	2432.835
103	3621.325	2438.756
104	3456.788	2443.955
105	3292.231	2448.490
106	3127.658	2452.416
107	2963.073	2455.786
108	2798.479	2458.654
109	2633.877	2461.070
110	2469.270	2463.082
111	2304.659	2464.736
112	2140.045	2466.077
113	1975.429	2467.145
114	1810.811	2467.980
115	1646.193	2468.618
116	1481.574	2469.091
117	1316.955	2469.432
118	1152.336	2469.667
119	987.717	2469.820
120	823.097	2469.913
121	658.478	2469.964
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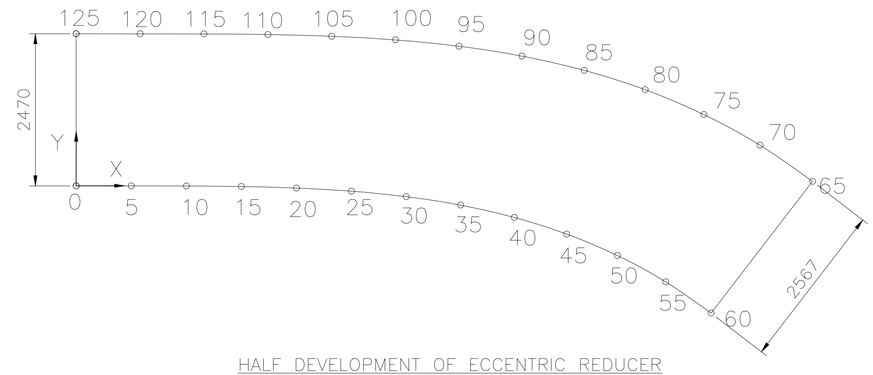
123	329.239	2469.998
124	164.619	2470.000
125	0.000	2470.000



HALF DEVELOPMENT OF ECCENTRIC REDUCER

REF. DRG NO.

SIGN & DATE

INVENTORY NO.

CBOM NO.			STATUS OF DRG.
01709970117 Var.03			U
AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

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

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD.
HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	-Sd-	23.12.2022
CHD	AXAY KUMAR	-Sd-	23.12.2022
APD	N PRAKASH	-Sd-	23.12.2022

NO.OF VAR. --

DEPT. HXE
CODE 2444
SCALE -
WEIGHT(Kg.) ——
REF. TO ASSY. DRG. 01709970017
ITEM NO. 20
NO.OF ITEMS --

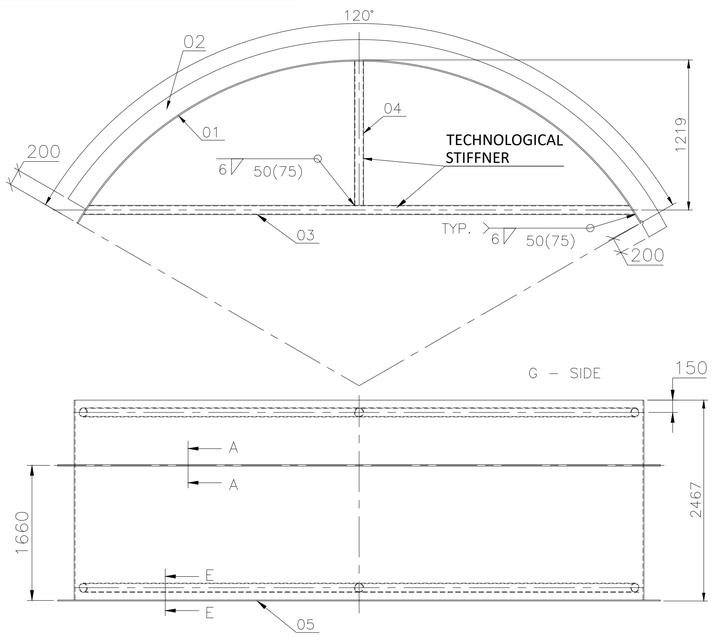
TITLE: ECCENTRIC REDUCER 6300X5600 PROFILE CO ORDINATE
CARD CODE X
DRAWING NO. 21709970175
REV. 00
SHEET NO.
NO.OF SHEETS

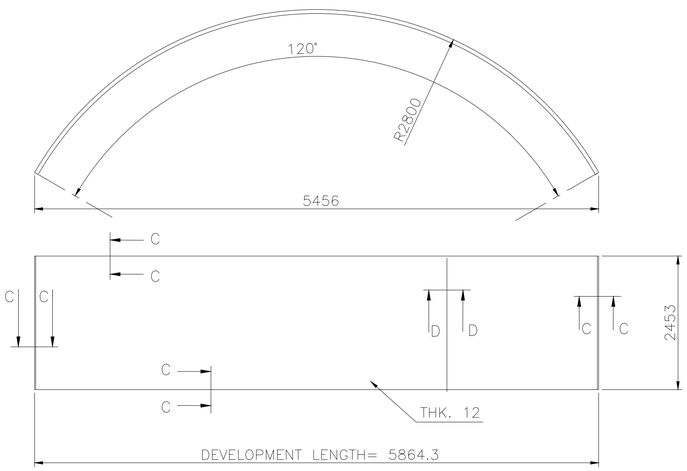
SIZE A2

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

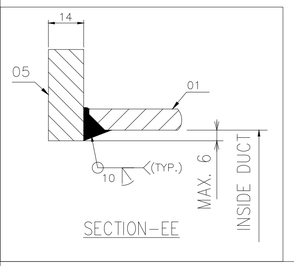
FORM: DG 44(B)

DRAWING NO. 21709970176

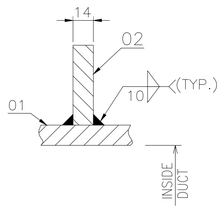




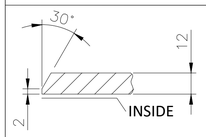
ITEM NO –01



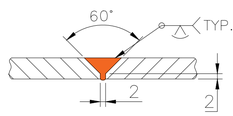
SECTION–EE



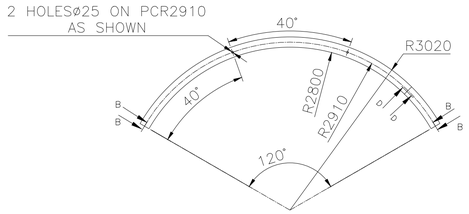
SECTION– AA



SECTION– CC

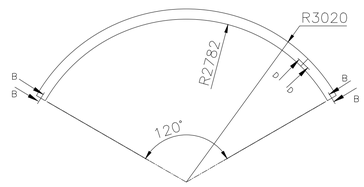


SECTION– DD

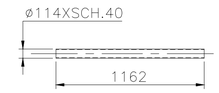


ITEM NO –02

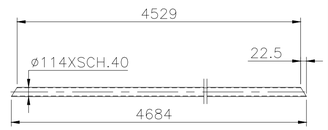
SECTION– BB



ITEM NO –05



ITEM NO –04



ITEM NO –03

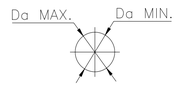
TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

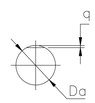
   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm



   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm



7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.

(10) △	(10) ◸	(6) ◸	SIZE & SYMBOL OF SEAM
5.9	11.73	1.3	WELD LENGTH (M).
2.3	4.6	0.2	WT. OF WELD METAL (Kg).
E–7018			TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970017 Var.03 — STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	–SD–	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	–Sd–	06.12.2022
CHD	AXAY KUMAR	–Sd–	06.12.2022
APD	N PRAKASH	–Sd–	06.12.2022

NO.OF VAR. ––

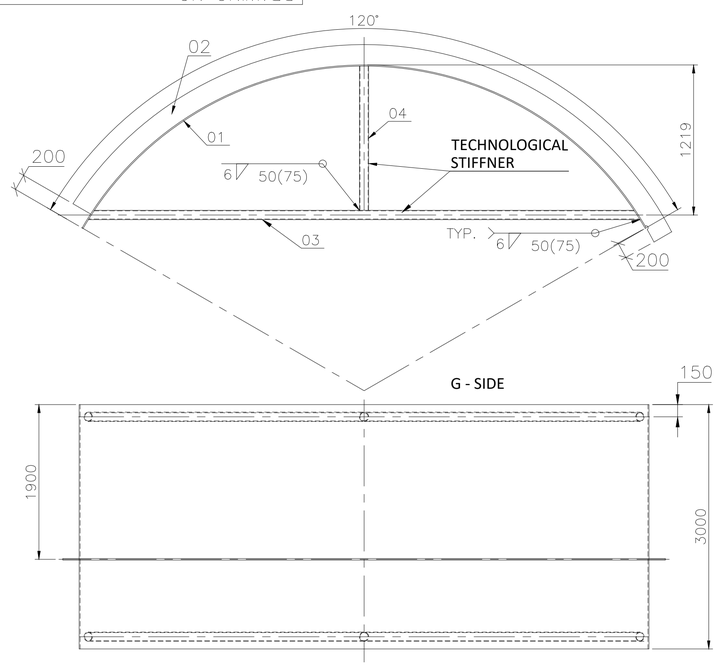
DEPT. HXE
CODE 2444
SCALE 1:40
WEIGHT(Kg.) 1860.4
REF. TO ASSY. DRG. 01709970017–03
ITEM NO. 21
NO.OF ITEMS ––

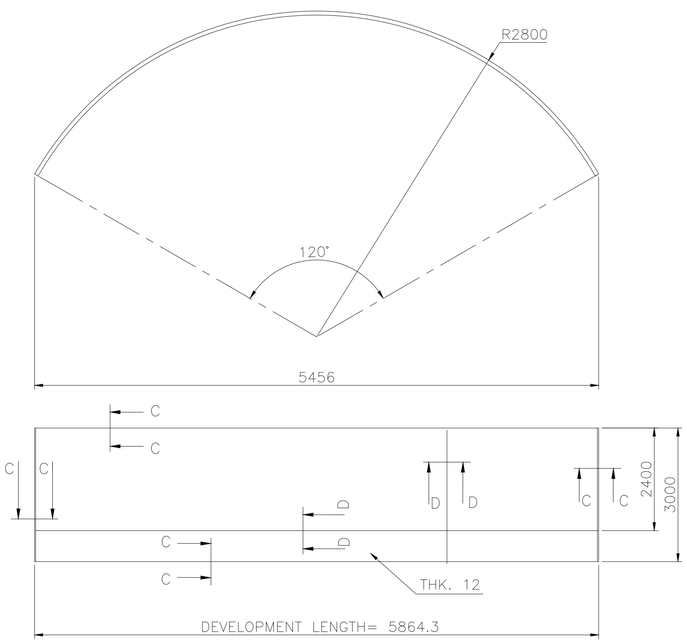
TITLE: DUCT LIAISONING ø5600
CARD CODE X
DRAWING NO. 21709970176
REV. 00
SHEET NO.
NO.OF SHEETS

SIZE A2

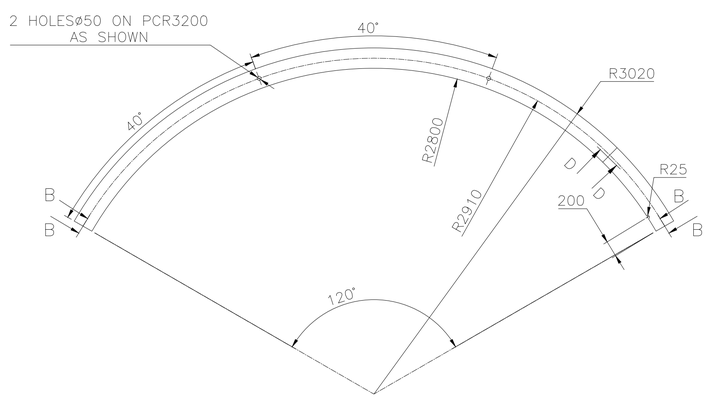
REF. DRG NO. | SIGN & DATE | INVENTORY NO.

DRAWING NO. 21709970177

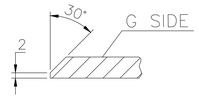




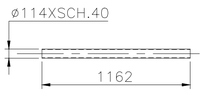
ITEM NO –01



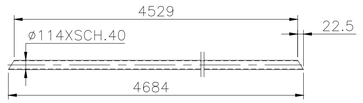
ITEM NO –02



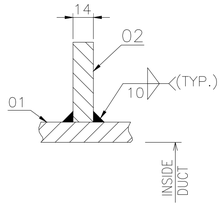
SECTION– BB



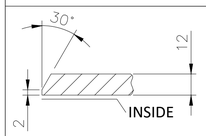
ITEM NO –04



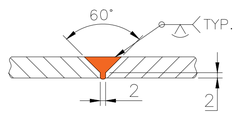
ITEM NO –03



SECTION– AA



SECTION– CC



SECTION– DD

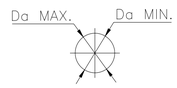
TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

(b) ADMISSIBLE OVALITY

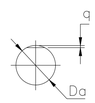
At ends: Da 2800 mm – 4900 mm x = 14 mm
Da 4900 mm – 6300 mm x = 16 mm
Da 6300 mm – 8100 mm x = 20 mm



Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

(c) ADMISSIBLE OBLATENESS

Da ≤ 9220 mm q = 6 mm



7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.

(10)◸	(6)◸	SIZE & SYMBOL OF SEAM
11.73	1.3	WELD LENGTH (M).
4.6	0.2	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970017 Var. 03 — STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	–SD–	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO. OF VAR.
DRN	NK JANGRA	–Sd–	06.12.2022	––
CHD	AXAY KUMAR	–Sd–	06.12.2022	
APD	N PRAKASH	–Sd–	06.12.2022	73, 74

DEPT. HXE | CODE 2444 | SCALE 1:40 | WEIGHT(Kg.) 1897.4 | REF. TO ASSY. DRG. 01709970017–03 | ITEM NO. 22 | NO. OF ITEMS –– (75, 77)

TITLE: DUCT LIAISONING ø5600

CARD CODE X

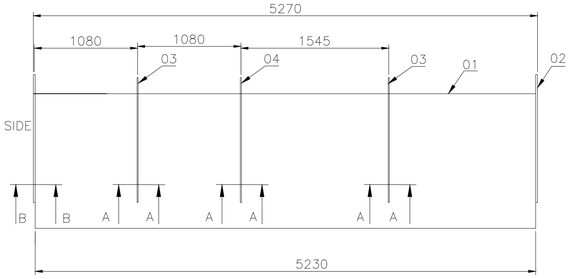
DRAWING NO. 21709970177 | REV. 00 (23, 24)

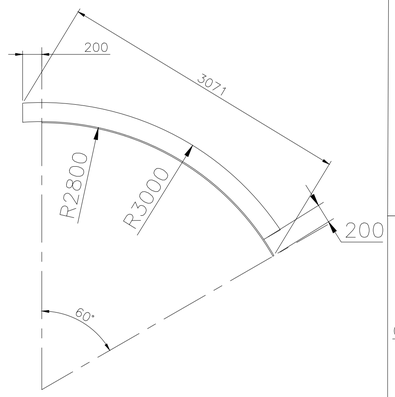
SHEET NO. | NO. OF SHEETS

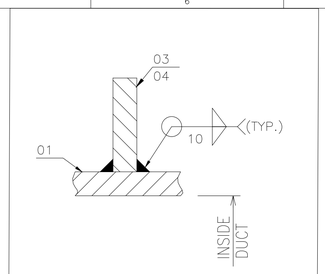
SIZE A2

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

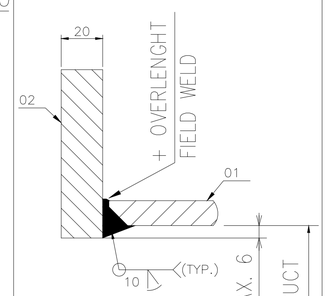
DRAWING NO. 217099701 81



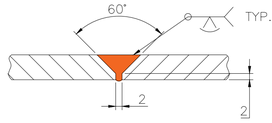




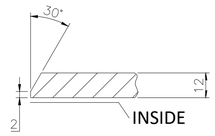
SECTION– AA



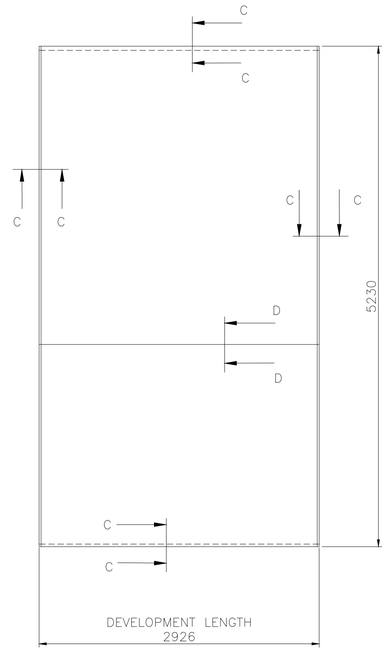
SECTION–BB



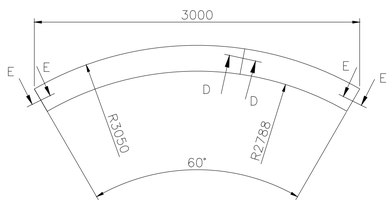
SECTION– DD



SECTION– CC

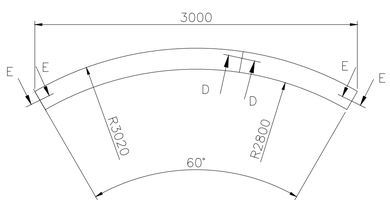


ITEM NO –01



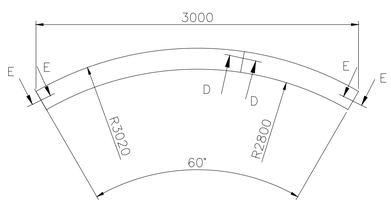
ITEM NO –02

20 THK



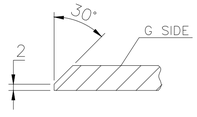
ITEM NO –03

14 THK



ITEM NO –04

20 THK



SECTION– EE

TECHNICAL REQUIREMENTS:–

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm

   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.

(10) △	(10) ◸	SIZE & SYMBOL OF SEAM
5.8	17.4	WELD LENGTH (M).
4.0	6.8	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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

CBOM NO. 01709970017 Var. 03 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-sd-	02.02.23

REV.	DATE	ALTERED / CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-- SD --	23.12.2022	--
CHD	AXAY KUMAR	-- SD --	23.12.2022	
APD	N PRAKASH	-- SD --	23.12.2022	73 , 74

DEPT.	HXE	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
CODE	4222	1:30	1882	01709970017	25	75 , 77

TITLE: DUCT LIASIONING TEE Ø5600xØ2800

[1]CARD[2] CODE: X

DRAWING NO. 21709970181 (7 , 22) REV. 00 (23 , 24)

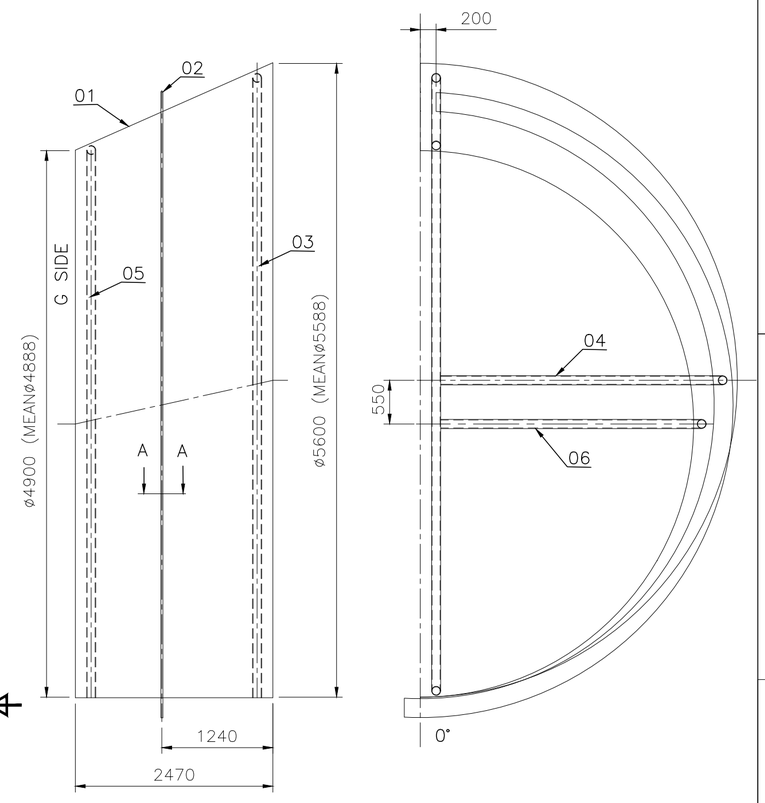
SHEET NO. | NO.OF SHEETS

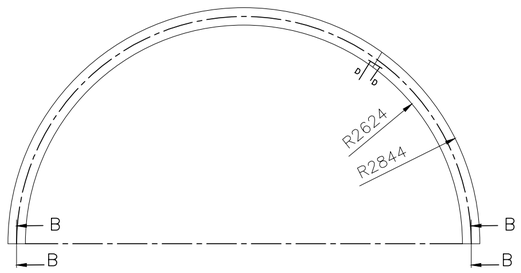
SIZE A2

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

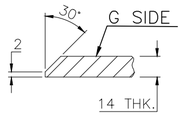
FORM: DG 44(B)

DRAWING NO. 21709970182

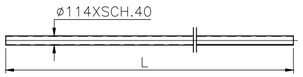




ITEM NO –02

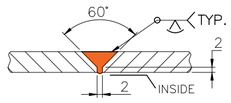


SECTION– BB

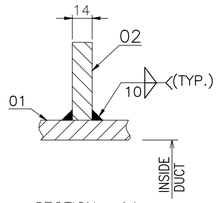


ITEM NO	L
03	5580
04	2600
05	4800
06	2250

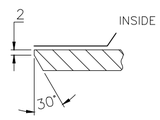
TECHNOLOGICAL SUPPORT



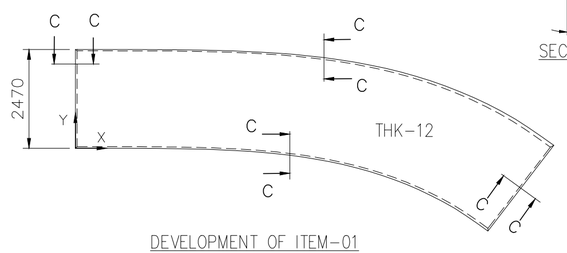
SECTION– DD



SECTION– AA



SECTION– CC



DEVELOPMENT OF ITEM–01

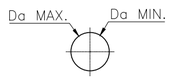
TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

(b) ADMISSIBLE OVALITY

At ends: Da 2800 mm – 4900 mm x = 14 mm
Da 4900 mm – 6300 mm x = 16 mm
Da 6300 mm – 8100 mm x = 20 mm



Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

(c) ADMISSIBLE OBLATENESS

Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG NO 21709970184.

(10)▽	(6)▽	SIZE & SYMBOL OF SEAM
16.5	1.3	WELD LENGTH (M).
6.5	0.2	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970017 Var. 03 — STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	–SD–	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	–Sd–	16.12.2022
CHD	AXAY KUMAR	–Sd–	16.12.2022
APD	N PRAKASH	–Sd–	16.12.2022

NO.OF VAR. – –

DEPT. HXE
CODE 2444
SCALE 1:40
WEIGHT(Kg.) 2859.6
REF. TO ASSY. DRG. 0170997017
ITEM NO. 26
NO.OF ITEMS – – 73, 74, 75, 77

TITLE: ECCENTRIC REDUCER ø5600Xø4900 –1
CARD CODE X
DRAWING NO. 21709970182
REV. 00
SHEET NO. NO.OF SHEETS

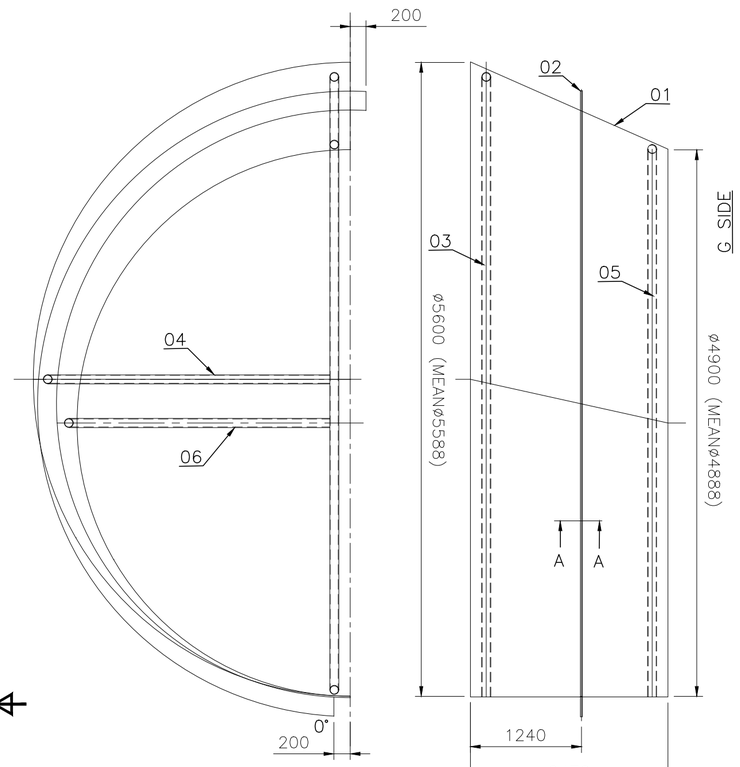
SIZE A2

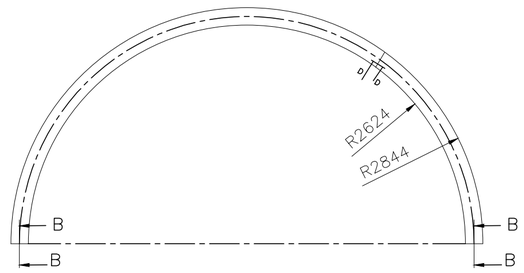
REF. DRG NO. | SIGN & DATE | INVENTORY NO.

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

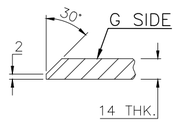
FORM: DG 44(B)

DRAWING NO. 21709970183

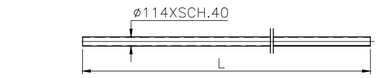




ITEM NO –02

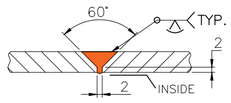


SECTION– BB

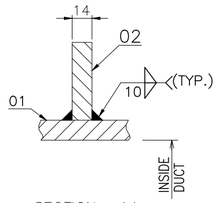


ITEM NO	L
03	5580
04	2600
05	4880
06	2250

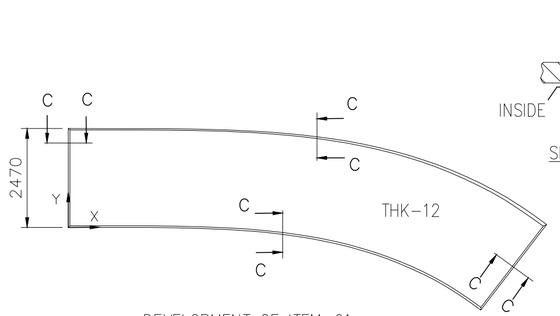
TECHNOLOGICAL SUPPORT



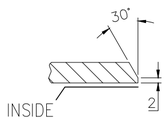
SECTION– DD



SECTION– AA



DEVELOPMENT OF ITEM–01



SECTION– CC

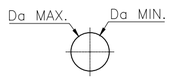
TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

(b) ADMISSIBLE OVALITY

At ends: Da 2800 mm – 4900 mm x = 14 mm
Da 4900 mm – 6300 mm x = 16 mm
Da 6300 mm – 8100 mm x = 20 mm



Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

(c) ADMISSIBLE OBLATENESS

Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG NO 21709970184.

(10)▽	(6)▽	SIZE & SYMBOL OF SEAM
16.5	1.3	WELD LENGTH (M).
6.5	0.2	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970017 Var. 03 — STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	–SD–	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	–Sd–	16.12.2022
CHD	AXAY KUMAR	–Sd–	16.12.2022
APD	N PRAKASH	–Sd–	16.12.2022

NO.OF VAR. – –

DEPT. HXE
CODE 2444
SCALE 1:40
WEIGHT(Kg.) 2859.6
REF. TO ASSY. DRG. 0170997017
ITEM NO. 27
NO.OF ITEMS – –
73 , 74 / 75 , 77

TITLE: ECCENTRIC REDUCER ø5600Xø4900 –2
CARD CODE X
DRAWING NO. 21709970183
REV. 00
SHEET NO. / NO.OF SHEETS
7 , 22 , 23 , 24

SIZE A2

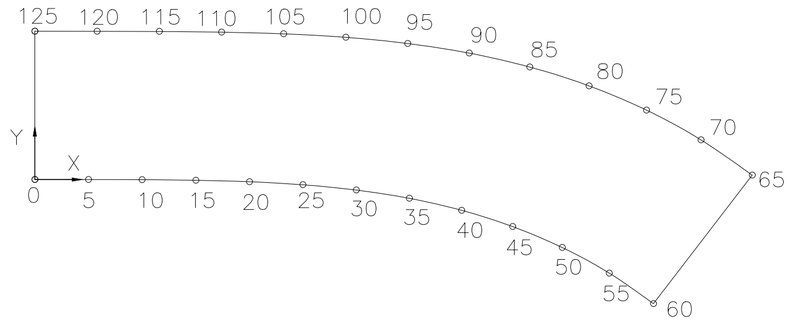
REF. DRG NO. | SIGN & DATE | INVENTORY NO.

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

FORM: DG 44(B)

DRAWING NO. 21709970184

PROFILE CO ORDINATE -01		
POINT	X	Y
0	0.000	0.000
1	127.968	0.000
2	255.935	-0.002
3	383.903	-0.009
4	511.870	-0.028
5	639.838	-0.068
6	767.805	-0.140
7	895.773	-0.259
8	1023.740	-0.442
9	1151.707	-0.706
10	1279.674	-1.075
11	1407.641	-1.570
12	1535.607	-2.219
13	1663.572	-3.050
14	1791.535	-4.092
15	1919.496	-5.378
16	2047.454	-6.942
17	2175.408	-8.820
18	2303.356	-11.049
19	2431.297	-13.669
20	2559.228	-16.721
21	2687.147	-20.246
22	2815.050	-24.288
23	2942.935	-28.891
24	3070.797	-34.100
25	3198.630	-39.961
26	3326.429	-46.522
27	3454.188	-53.829
28	3581.899	-61.930
29	3709.554	-70.872
30	3837.143	-80.704
31	3964.656	-91.473
32	4092.083	-103.226
33	4219.410	-116.010
34	4346.625	-129.872
35	4473.712	-144.857
36	4600.656	-161.010
37	4727.440	-178.374
38	4854.046	-196.992
39	4980.455	-216.905
40	5106.646	-238.152
41	5232.599	-260.772
42	5358.290	-284.800
43	5483.697	-310.271
44	5608.795	-337.217
45	5733.560	-365.669
46	5857.965	-395.654
47	5981.984	-427.199
48	6105.589	-460.326
49	6228.753	-495.058
50	6351.448	-531.413
51	6473.645	-569.406
52	6595.317	-609.051
53	6716.433	-650.360
54	6836.967	-693.340
55	6956.890	-737.998
56	7076.173	-784.336
57	7194.789	-832.355
58	7312.712	-882.052
59	7429.916	-933.424
60	7546.374	-986.462
61	x	x
62	x	x
63	x	x
64	x	x
65	8627.075	1342.268
66	8493.938	1402.902
67	8359.950	1461.631
68	8225.140	1518.445
69	8089.536	1573.341
70	7953.171	1626.315
71	7816.075	1677.368
72	7678.279	1726.503
73	7539.818	1773.728
74	7400.722	1819.051
75	7261.025	1862.485
76	7120.759	1904.046
77	6979.957	1943.751
78	6838.651	1981.623
79	6696.871	2017.685
80	6554.651	2051.964
81	6412.019	2084.491
82	6269.006	2115.296
83	6125.639	2144.414
84	5981.948	2171.883
85	5837.958	2197.742
86	5693.695	2222.032
87	5549.184	2244.797
88	5404.447	2266.081
89	5259.506	2285.932
90	5114.383	2304.398
91	4969.096	2321.529
92	4823.663	2337.376
93	4678.102	2351.992
94	4532.426	2365.428
95	4386.652	2377.739
96	4240.791	2388.978
97	4094.855	2399.201
98	3948.855	2408.462
99	3802.800	2416.816
100	3656.699	2424.316
101	3510.559	2431.017
102	3364.387	2436.972
103	3218.188	2442.234
104	3071.967	2446.855
105	2925.729	2450.885
106	2779.477	2454.373
107	2633.215	2457.369
108	2486.943	2459.917
109	2340.666	2462.064
110	2194.383	2463.852
111	2048.097	2465.322
112	1901.808	2466.513
113	1755.518	2467.463
114	1609.226	2468.205
115	1462.934	2468.771
116	1316.641	2469.193
117	1170.348	2469.495
118	1024.054	2469.704
119	877.761	2469.840
120	731.467	2469.923
121	585.174	2469.968
122	438.880	2469.990
123	292.587	2469.998
124	146.293	2470.000
125	0.000	2470.000



DEVELOPMENT OF ECCENTRIC REDUCER

REF. DRG NO.

SIGN & DATE

INVENTORY NO.

CBOM NO. 01709970017 Var. 03			STATUS OF DRG. U
AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

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 / CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	-Sd-	23.12.2022
CHD	AXAY KUMAR	-Sd-	23.12.2022
APD	N PRAKASH	-Sd-	23.12.2022

NO.OF VAR. --

DEPT. HXE
CODE 2444
SCALE -
WEIGHT(Kg.) ——
REF. TO ASSY. DRG. 01709970017
ITEM NO. 28
NO.OF ITEMS ---

TITLE: ECCENTRIC REDUCER 5600X4900 PROFILE CO ORDINATE
CARD CODE X
DRAWING NO. 21709970184
REV. 00
SHEET NO.
NO.OF SHEETS

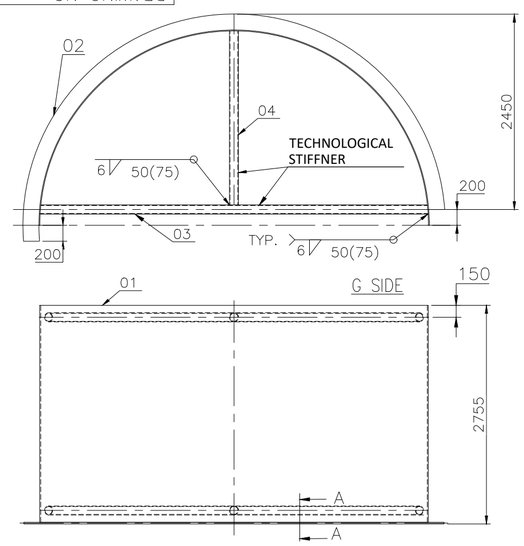
73, 74
75, 77
7, 22, 23, 24

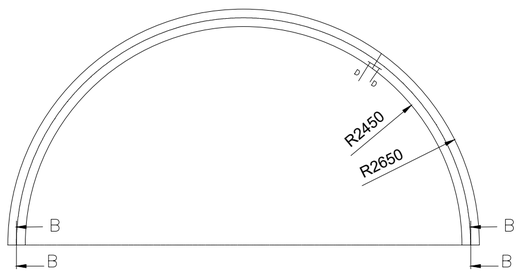
SIZE A2

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

FORM: DG 44(B)

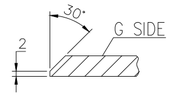
DRAWING NO. 217099701 85



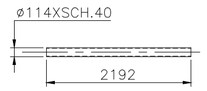


THK–14

ITEM NO –02

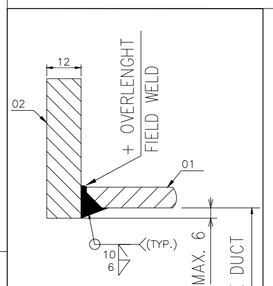


SECTION– BB



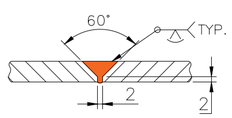
ITEM NO –04

ITEM NO –03

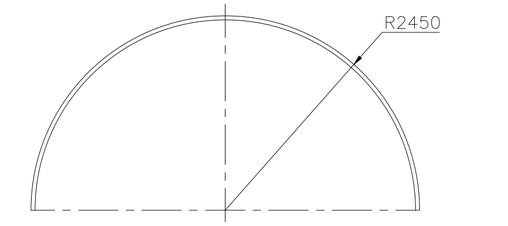


SECTION– AA

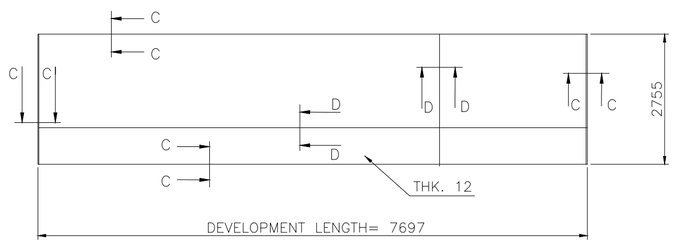
SECTION– CC



SECTION– DD



ITEM NO –01



ITEM NO –01

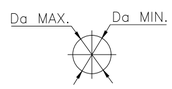
TECHNICAL REQUIREMENTS:–

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – I COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – I COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

(b) ADMISSIBLE OVALITY

At ends: Da 2800 mm – 4900 mm x = 14 mm
Da 4900 mm – 6300 mm x = 16 mm
Da 6300 mm – 8100 mm x = 20 mm



Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

(c) ADMISSIBLE OBLATENESS

Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.

(6) ▽	(10)▷	SIZE & SYMBOL OF SEAM
15.4	15.0	WELD LENGTH (M).
1.3	6.0	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970017 Var.03 — STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	–SD–	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	–Sd–	23.12.2022
CHD	AXAY KUMAR	–Sd–	23.12.2022
APD	N PRAKASH	–Sd–	23.12.2022

NO.OF VAR. ––

DEPT. HXE | CODE 2444 | SCALE 1:40 | WEIGHT(Kg.) 2804.5

REF. TO ASSY. DRG. 01709970017–03 | ITEM NO. 29 | NO.OF ITEMS ––

TITLE: DUCT LIAISONING ø4900

CARD CODE X

DRAWING NO. 21709970185 | REV. 00

SHEET NO. | NO.OF SHEETS

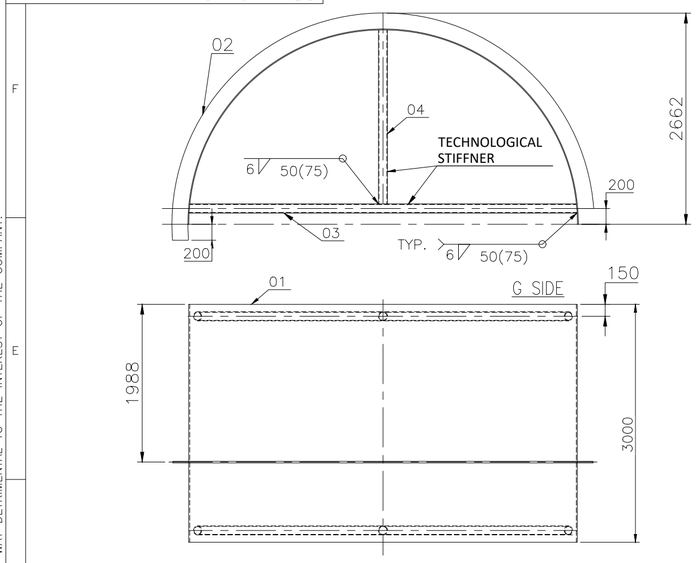
SIZE A2

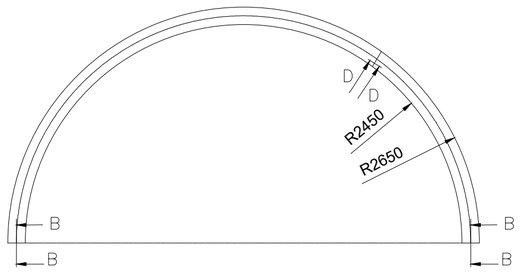
REF. DRG NO. | SIGN & DATE | INVENTORY NO.

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

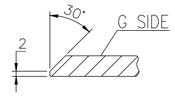
FORM: DG 44(B)

DRAWING NO. 217099701 86

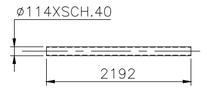




ITEM NO –02

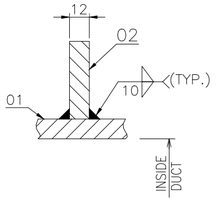


SECTION– BB

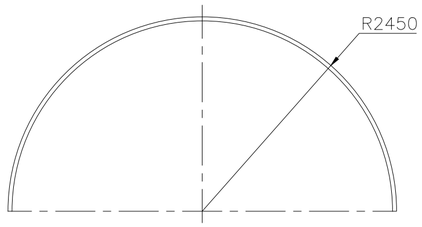


ITEM NO –04

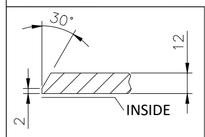
ITEM NO –03



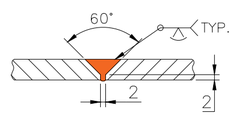
SECTION– AA



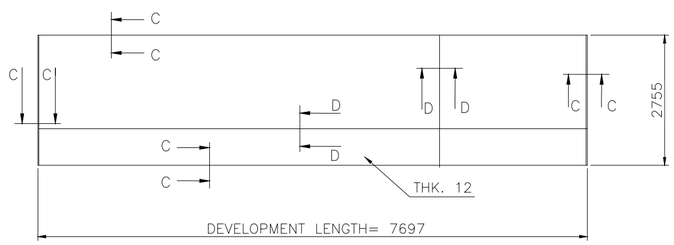
ITEM NO –01



SECTION– CC



SECTION– DD



ITEM NO –01

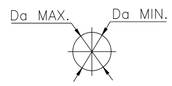
TECHNICAL REQUIREMENTS:–

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – I COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – I COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

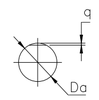
   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm



   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm



7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.

(12)△	(6)▽	SIZE & SYMBOL OF SEAM
15.0	15.4	WELD LENGTH (M).
6.0	1.3	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970017 Var. 03 — STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	–SD–	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	–Sd–	23.12.2022
CHD	AXAY KUMAR	–Sd–	23.12.2022
APD	N PRAKASH	–Sd–	23.12.2022

NO.OF VAR. –– (73, 74)

DEPT. HXE
CODE 2444
SCALE 1:40
WEIGHT(Kg.) 2982.2
REF. TO ASSY. DRG. 01709970017–03
ITEM NO. 30
NO.OF ITEMS –– (75, 77)

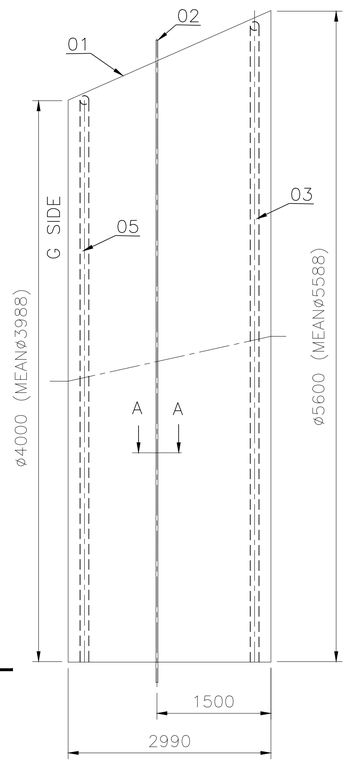
TITLE: DUCT LIAISONING ø4900
CARD CODE X
DRAWING NO. 21709970186
REV. 00 (23, 24)
SHEET NO. | NO.OF SHEETS

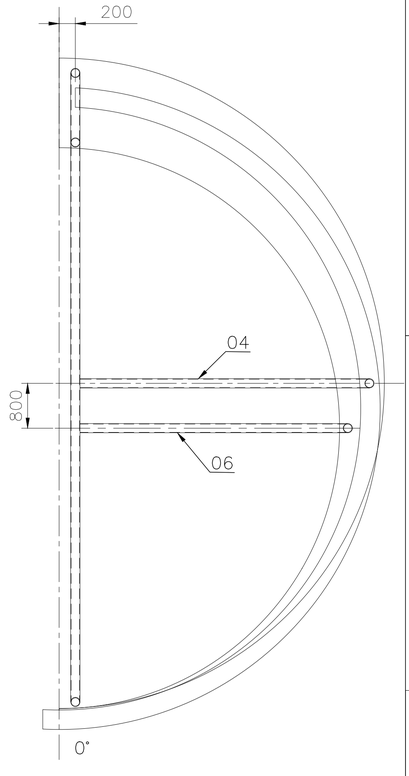
SIZE A2

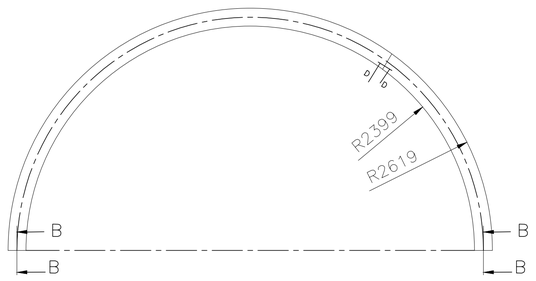
FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

FORM: DG 44(B)

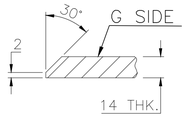
DRAWING NO. 21709970201







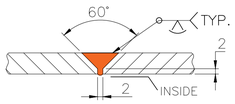
ITEM NO –02



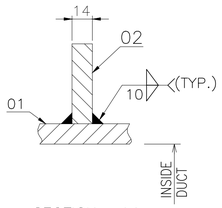
SECTION– BB

ITEM NO	L
03	5580
04	2543
05	3966
06	1743

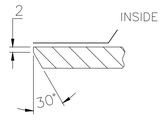
TECHNOLOGICAL SUPPORT



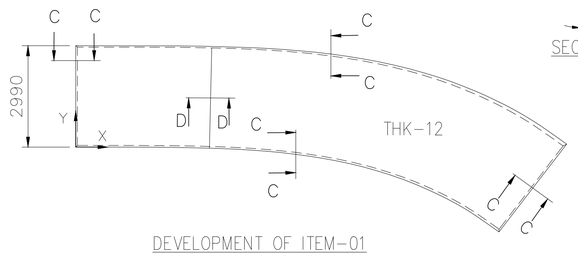
SECTION– DD



SECTION– AA



SECTION– CC



DEVELOPMENT OF ITEM–01

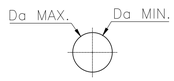
TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

(b) ADMISSIBLE OVALITY

At ends: Da 2800 mm – 4900 mm x = 14 mm
Da 4900 mm – 6300 mm x = 16 mm
Da 6300 mm – 8100 mm x = 20 mm



Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

(c) ADMISSIBLE OBLATENESS

Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE MAY BE MADE IN 4 PARTS, WELDED AS PER DETAIL D–D & STIFFENER (IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT, WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG NO 21709970203.

(10)◸	(6)◸	SIZE & SYMBOL OF SEAM
16.5	1.3	WELD LENGTH (M).
6.5	0.2	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970023 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	24.05.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	-Sd-	25.04.2023
CHD	AXAY KUMAR	-Sd-	25.04.2023
APD	N PRAKASH	-Sd-	25.04.2023

NO.OF VAR. – –

DEPT. HXE | CODE 2444 | SCALE 1:40 | WEIGHT(Kg.) 2641

REF. TO ASSY. DRG. 01709970023 | ITEM NO. 23 | NO.OF ITEMS – –

TITLE: ECCENTRIC REDUCER ø5600Xø4000 –1

CARD CODE X

DRAWING NO. 21709970201 | REV. 00

SHEET NO. 01 | NO.OF SHEETS 01

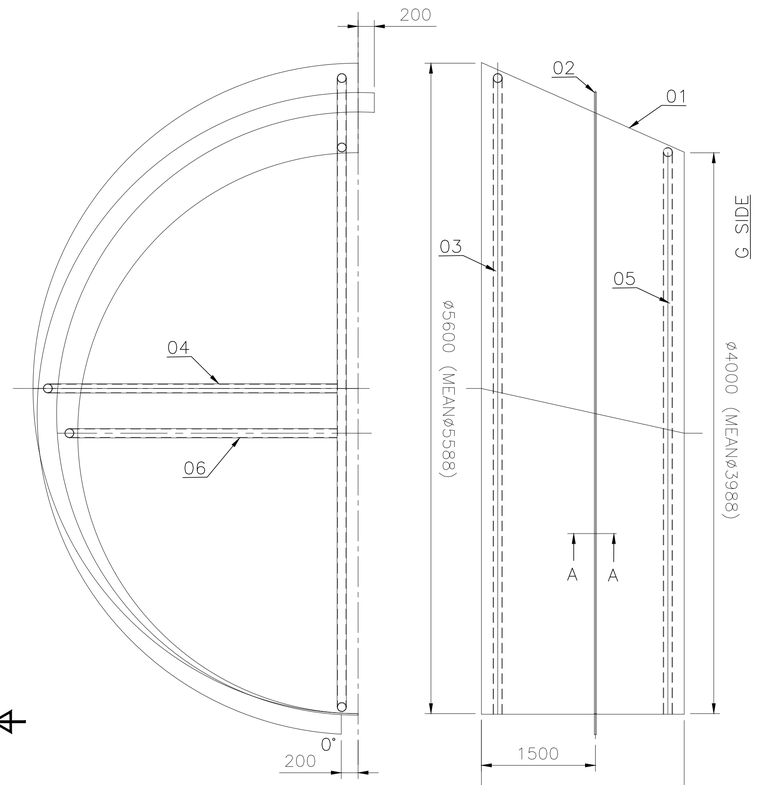
SIZE A2

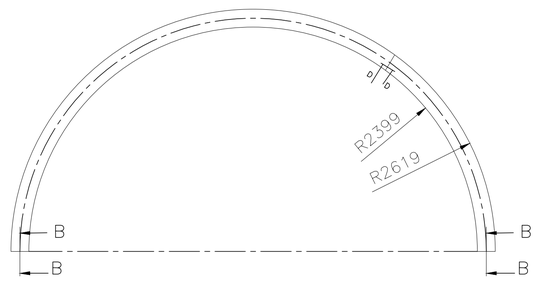
REF. DRG NO. | SIGN & DATE | INVENTORY NO.

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

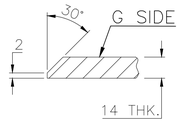
FORM: DG 44(B)

DRAWING NO. 21709970202





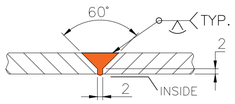
ITEM NO –02



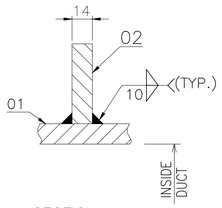
SECTION– BB

ITEM NO	L
03	5580
04	2543
05	3966
06	1743

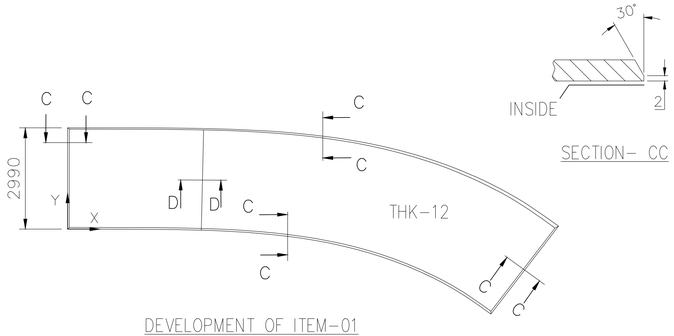
TECHNOLOGICAL SUPPORT



SECTION– DD



SECTION– AA



DEVELOPMENT OF ITEM–01

SECTION– CC

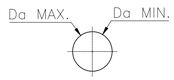
TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm



   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE MAY BE MADE IN 4 PARTS, WELDED AS PER DETAIL D–D & STIFFENER (IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT, WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG NO 21709970203.

(10)◸	(6)◸	SIZE & SYMBOL OF SEAM
16.5	1.3	WELD LENGTH (M).
6.5	0.2	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970023 — STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	24.05.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD.
HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	-Sd-	25.04.2023
CHD	AXAY KUMAR	-Sd-	25.04.2023
APD	N PRAKASH	-Sd-	25.04.2023

NO.OF VAR. --

DEPT.	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
HXE	1:40	2641	01709970023	24	--
CODE 2444					

TITLE: ECCENTRIC REDUCER ø5600Xø4000 –2

CARD CODE: X

DRAWING NO. 21709970202 — REV. 00

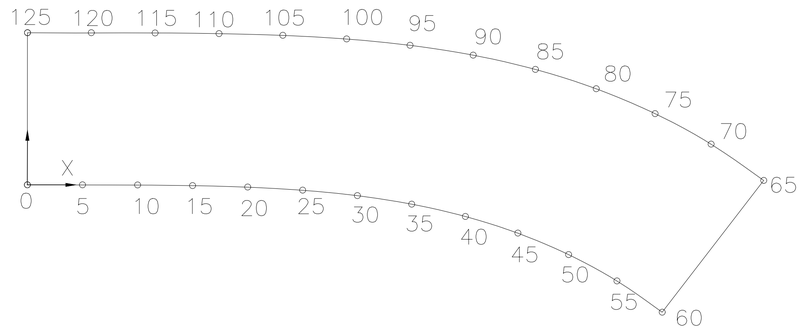
SHEET NO. 01 — NO.OF SHEETS 01

SIZE A2

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

DRAWING NO. 21709970203

PROFILE CO ORDINATE		
POINT	X	Y
0	0.0	0.0
1	104.4	0.0
2	208.8	0.0
3	313.2	0.0
4	417.6	0.0
5	522.0	-0.1
6	626.4	-0.2
7	730.8	-0.4
8	835.2	-0.7
9	939.6	-1.1
10	1044.1	-1.7
11	1148.5	-2.4
12	1252.9	-3.4
13	1357.3	-4.7
14	1461.6	-6.3
15	1566.0	-8.3
16	1670.4	-10.7
17	1774.8	-13.6
18	1879.1	-17.0
19	1983.5	-21.0
20	2087.8	-25.7
21	2192.0	-31.1
22	2296.2	-37.3
23	2400.4	-44.4
24	2504.5	-52.4
25	2608.5	-61.3
26	2712.5	-71.4
27	2816.3	-82.5
28	2919.9	-94.9
29	3023.4	-108.5
30	3126.8	-123.4
31	3229.9	-139.8
32	3332.8	-157.6
33	3435.4	-176.9
34	3537.7	-197.8
35	3639.6	-220.4
36	3741.1	-244.7
37	3842.3	-270.7
38	3942.9	-298.5
39	4043.0	-328.2
40	4142.5	-359.7
41	4241.4	-393.2
42	4339.6	-428.7
43	4437.0	-466.2
44	4533.7	-505.7
45	4629.5	-547.2
46	4724.3	-590.8
47	4818.2	-636.6
48	4911.0	-684.4
49	5002.7	-734.3
50	5093.2	-786.3
51	5182.5	-840.5
52	5270.5	-896.7
53	5357.1	-955.0
54	5442.3	-1015.4
55	5525.9	-1077.8
56	5608.1	-1142.2
57	5688.6	-1208.7
58	5767.5	-1277.0
59	5844.7	-1347.4
60	5920.1	-1419.6
61	x	x
62	x	x
63	x	x
64	x	x
65	8295.3	1000.9
66	8189.6	1102.1
67	8081.5	1200.6
68	7970.9	1296.4
69	7858.1	1389.5
70	7743.0	1479.8
71	7625.7	1567.3
72	7506.3	1651.9
73	7385.0	1733.6
74	7261.7	1812.3
75	7136.6	1888.2
76	7009.8	1961.1
77	6881.3	2031.0
78	6751.3	2098.0
79	6619.7	2162.1
80	6486.8	2223.2
81	6352.6	2281.5
82	6217.2	2336.8
83	6080.7	2389.3
84	5943.1	2439.0
85	5804.5	2486.0
86	5665.1	2530.2
87	5524.8	2571.8
88	5383.8	2610.7
89	5242.1	2647.2
90	5099.8	2681.2
91	4957.0	2712.8
92	4813.7	2742.1
93	4669.9	2769.2
94	4525.7	2794.1
95	4381.2	2817.0
96	4236.5	2838.0
97	4091.4	2857.1
98	3946.2	2874.4
99	3800.7	2890.0
100	3655.1	2904.1
101	3509.3	2916.6
102	3363.5	2927.8
103	3217.5	2937.7
104	3071.5	2946.4
105	2925.4	2954.0
106	2779.2	2960.5
107	2633.0	2966.2
108	2486.8	2971.0
109	2340.6	2975.0
110	2194.3	2978.4
111	2048.1	2981.2
112	1901.8	2983.4
113	1755.5	2985.2
114	1609.2	2986.6
115	1462.9	2987.7
116	1316.6	2988.5
117	1170.3	2989.0
118	1024.1	2989.4
119	877.8	2989.7
120	731.5	2989.9
121	585.2	2989.9
122	438.9	2990.0
123	292.6	2990.0
124	146.3	2990.0
125	0.0	2990.0



DEVELOPMENT OF ECCENTRIC REDUCER

REF. DRG NO.

SIGN & DATE

INVENTORY NO.

CBOM NO. 01709970023			STATUS OF DRG. U
AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	01.05.23

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

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE
DRN	NK JANGRA	-Sd-	25.04.2023
CHD	AXAY KUMAR	-Sd-	25.04.2023
APD	N PRAKASH	-Sd-	25.04.2023

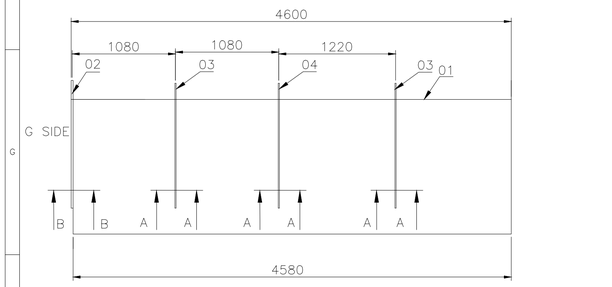
NO.OF VAR. --

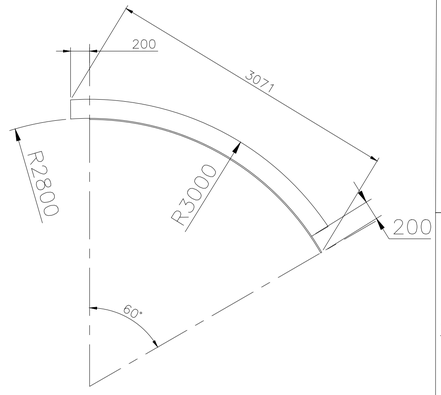
DEPT. HXE
CODE 2444
SCALE -
WEIGHT(Kg.) ——
REF. TO ASSY. DRG. 01709970023
ITEM NO. 25
NO.OF ITEMS --

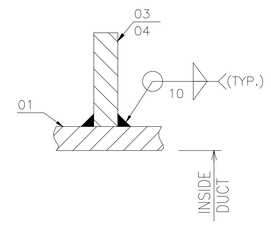
TITLE: ECCENTRIC REDUCER 5600X4000 PROFILE CO ORDINATE
CARD CODE X
DRAWING NO. 21709970203
REV. 00
SHEET NO. 01 NO.OF SHEETS 01

SIZE A2

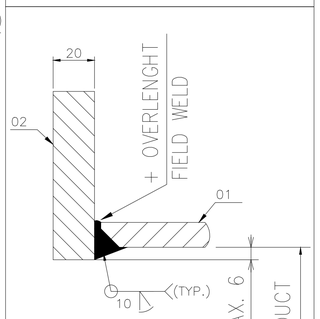
DRAWING NO. 2170997020 6



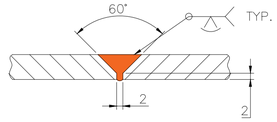




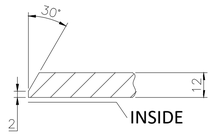
SECTION– AA



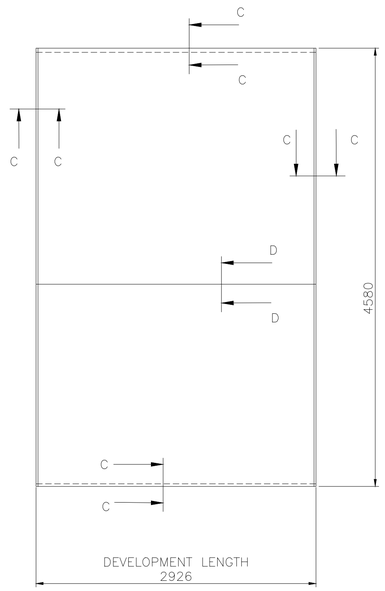
SECTION–BB



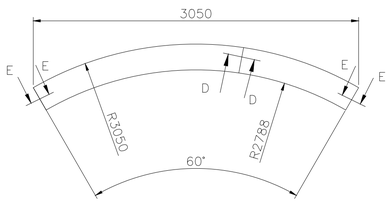
SECTION– DD



SECTION– CC

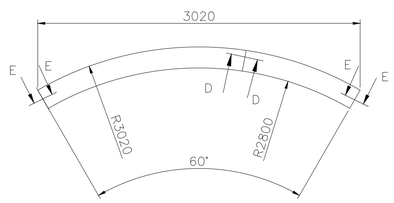


ITEM NO –01



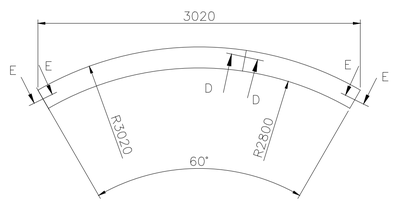
ITEM NO –02

20 THK



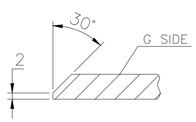
ITEM NO –03

14 THK



ITEM NO –04

20 THK



SECTION– EE

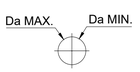
TECHNICAL REQUIREMENTS: –

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

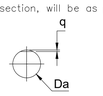
   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm



   Permissible ovality at any cross–section, other than ends of section, will be as per ASME Section VIII Div 1 UG–80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm



7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORKS FOR 10% OF COMPONENTS FOR LARGE ITEMS (NO. 1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D–D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.

(10) △	(10) ◸	SIZE & SYMBOL OF SEAM
5.8	17.4	WELD LENGTH (M).
4.0	6.8	WT. OF WELD METAL (Kg).
E–7018		TYPE OF ELECTRODE

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 / CHECKED

CBOM NO. 01709970023 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-sd-	24.05.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-- SD --	26.04.2023	~
CHD	AXAY KUMAR	-- SD --	26.04.2023	~
APD	N PRAKASH	-- SD --	26.04.2023	73 , 74

DEPT. HXE | CODE 4222 | SCALE 1:30 | WEIGHT(Kg.) 1577 | ITEM NO. 03 | NO.OF ITEMS ~ 75 , 77

REF. DRG. NO. 01709970023

TITLE: DUCT LIASIONING TEE Ø5600xØ2800

CARD CODE X

DRAWING NO. 2170997020 6 | REV. 00

SHEET NO. | NO.OF SHEETS

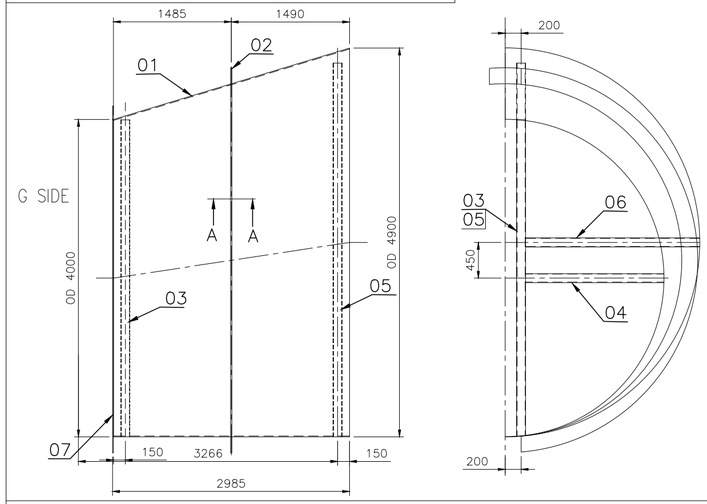
SIZE A2

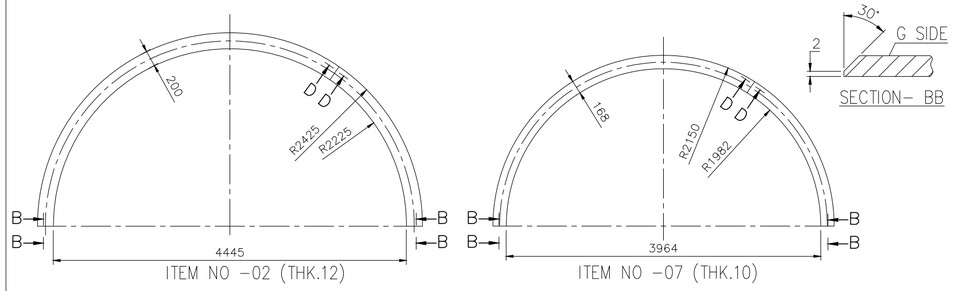
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)

DRAWING NO. 31709970037

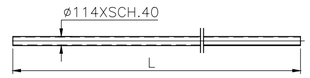




ITEM NO -02 (THK.12)

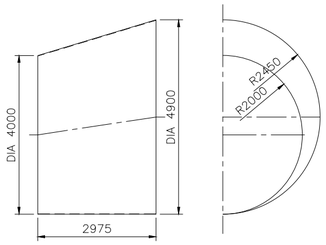
ITEM NO -07 (THK.10)

SECTION- BB

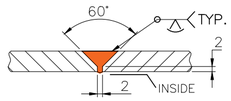


ITEM NO	L
03	4020
04	1804
05	4824
06	2205

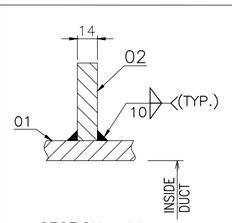
TECHNOLOGICAL SUPPORT



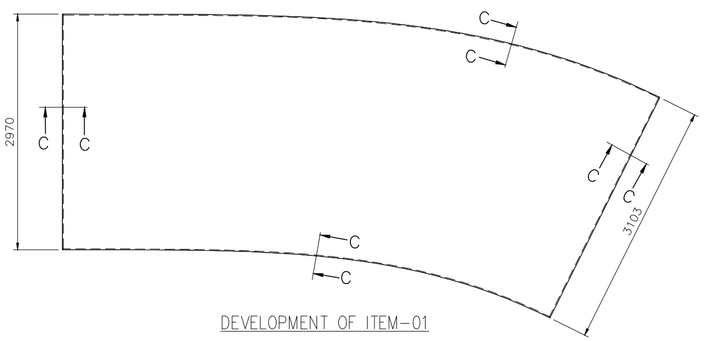
ITEM NO -01 (TK.12)



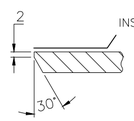
SECTION- DD



SECTION- AA



DEVELOPMENT OF ITEM-01



SECTION- CC

(12)△	(10)▽	(6)▽	SIZE & SYMBOL OF SEAM
1.9	16.7	1.3	WELD LENGTH (M).
1.8	6.6	0.2	WT. OF WELD METAL (Kg).
E-7018			TYPE OF ELECTRODE

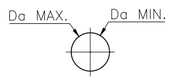
TECHNICAL REQUIREMENTS: -

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE-F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

(b) ADMISSIBLE OVALITY

At ends: Da 2800 mm – 4900 mm x = 14 mm
Da 4900 mm – 6300 mm x = 16 mm
Da 6300 mm – 8100 mm x = 20 mm



Permissible ovality at any cross-section, other than ends of section, will be as per ASME Section VIII Div 1 UG-80

(c) ADMISSIBLE OBLATENESS

Da ≤ 9220 mm q = 6 mm

7. TRIAL / MOCK-UP ASSEMBLY OF ECCENTRIC REDUCER.
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D-D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG NO 31709970047.
12. ANY DEVIATION FROM DIMENSION GIVEN IN THE DRAWING SHALL BE RECTIFIED AT SITE BY THE VENDOR.

GRADE OF UNTOL. DIM.:-
M/CG- V/C/M/F – AA0230208
WELDING- A/B/C/D – AA621104
GAS CUTTING- 'T3'AA0621101

REV.	DATE	ALTERED / CHECKED

REV.	DATE	ALTERED / CHECKED

CBOM NO.	STATUS OF DRG.
01709970017 Var.03	U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD.
HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-Sd-	28.12.2022	--
CHD	AXAY KUMAR	-Sd-	28.12.2022	
APD	N PRAKASH	-Sd-	28.12.2022	73 | 74

DEPT.	CODE	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
H.X.E.	4222	N.T.S.	2416.3	0170997017	34	- (75 | 77)

TITLE: ECCENTRIC REDUCER-01 ø4900Xø4000

1 CARD CODE 3: X

DRAWING NO. 31709970037 (7 \| 22) REV. 00 (23 \| 24)

SHEET NO. 01 NO.OF SHEETS 01

SIZE A3

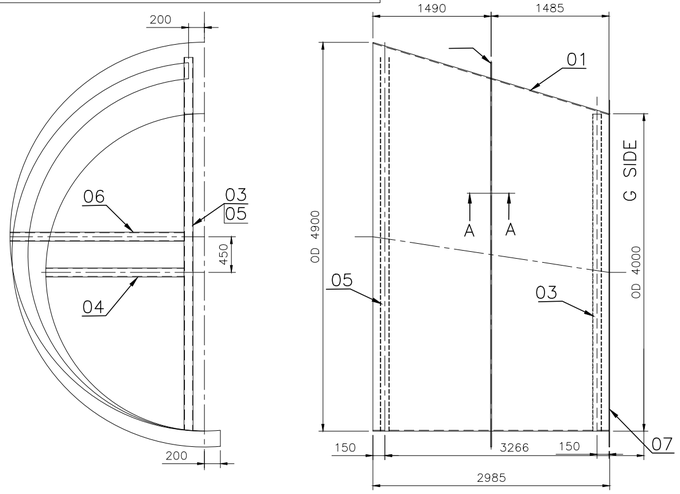
INVENTORY NO. | SIGN & DATE | REF. DRG NO.

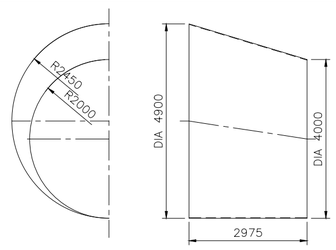
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

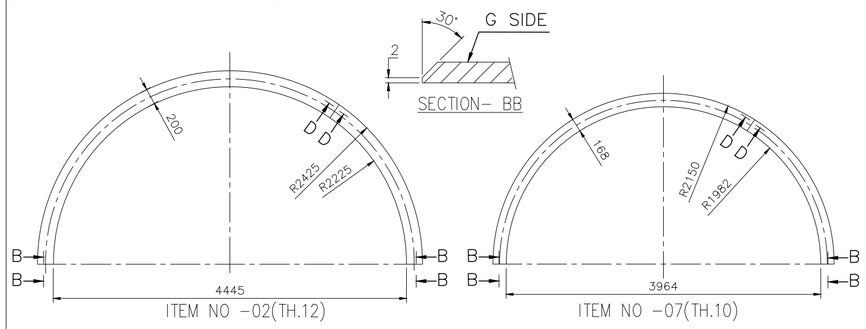
FORM: DG-38(B)

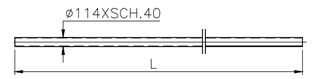
DRAWING NO. 31709970038





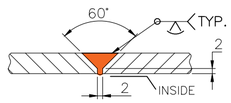
ITEM NO -01 (TK.12)



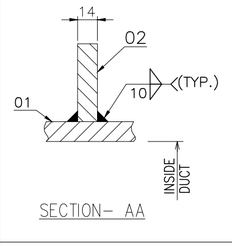


ITEM NO	L
03	4020
04	1804
05	4824
06	2205

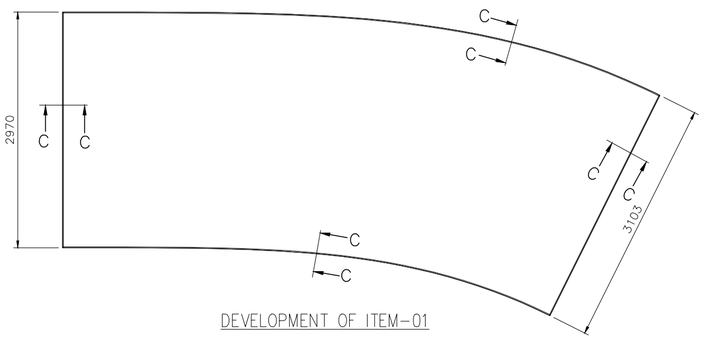
TECHNOLOGICAL SUPPORT



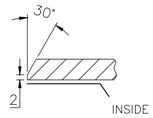
SECTION- DD



SECTION- AA



DEVELOPMENT OF ITEM-01



SECTION- CC

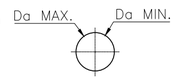
TECHNICAL REQUIREMENTS: -

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE-F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

(b) ADMISSIBLE OVALITY

At ends: Da 2800 mm – 4900 mm x = 14 mm
Da 4900 mm – 6300 mm x = 16 mm
Da 6300 mm – 8100 mm x = 20 mm



Permissible ovality at any cross-section, other than ends of section, will be as per ASME Section VIII Div 1 UG-80

(c) ADMISSIBLE OBLATENESS

Da ≤ 9220 mm q = 6 mm

7. TRIAL / MOCK-UP ASSEMBLY OF ECCENTRIC REDUCER.
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D-D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG NO 31709970047.
12. ANY DEVIATION FROM DIMENSION GIVEN IN THE DRAWING SHALL BE RECTIFIED AT SITE BY THE VENDOR.

(12) Δ	(10) ▽	(6) ▽	SIZE & SYMBOL OF SEAM
1.9	16.7	1.3	WELD LENGTH (M).
1.8	6.6	0.2	WT. OF WELD METAL (Kg).
E-7018			TYPE OF ELECTRODE

GRADE OF UNTOL. DIM.:-
M/CG- V/C/M/F – AA0230208
WELDING- A/B/C/D – AA621104
GAS CUTTING- 'T3'AA0621101

REV.	DATE	ALTERED / CHECKED

REV.	DATE	ALTERED / CHECKED

CBOM NO. 01709970017 Var. 03 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-Sd-	28.12.2022	--
CHD	AXAY KUMAR	-Sd-	28.12.2022	
APD	N PRAKASH	-Sd-	28.12.2022	73 | 74

DEPT. H.X.E.		SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
CODE 4222		N.T.S.	2416.3	0170997017	35	-- (75 | 77)

TITLE: ECCENTRIC REDUCER -02 ø4900Xø4000

1 CARD CODE 3: X

DRAWING NO. 31709970038 (7 \| 22) REV. 00 (23 \| 24)

SHEET NO. 01 | NO.OF SHEETS 01

SIZE A3

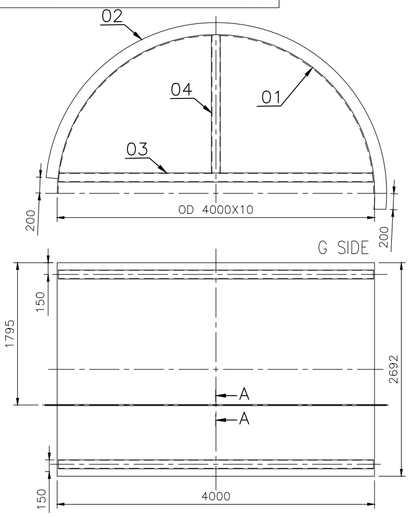
REF. DRG NO. | SIGN & DATE | INVENTORY NO.

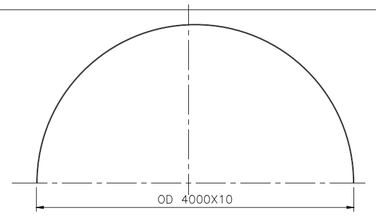
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

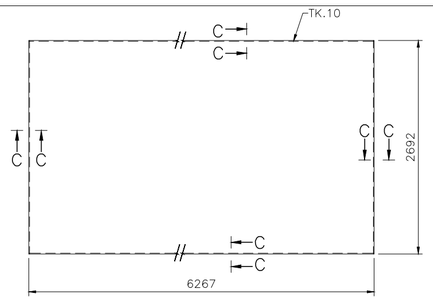
FORM: DG-38(B)

DRAWING NO. 31709970039

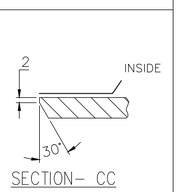




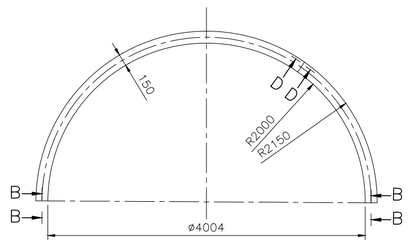
ITEM NO -01 (TK.10)



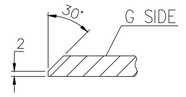
DEVELOPMENT OF ITEM-01



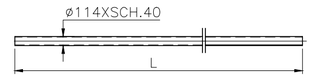
SECTION- CC



ITEM NO -02(TH.10)

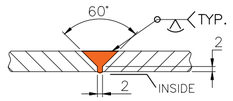


SECTION- BB

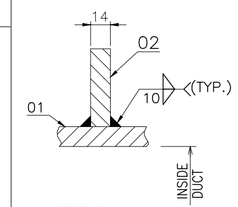


ITEM NO	L
03	3950
04	1783

TECHNOLOGICAL SUPPORT



SECTION- DD



SECTION- AA

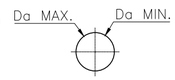
TECHNICAL REQUIREMENTS: -

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE-F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

(b) ADMISSIBLE OVALITY

At ends: Da 2800 mm – 4900 mm x = 14 mm
Da 4900 mm – 6300 mm x = 16 mm
Da 6300 mm – 8100 mm x = 20 mm



Permissible ovality at any cross-section, other than ends of section, will be as per ASME Section VIII Div 1 UG-80

(c) ADMISSIBLE OBLATENESS

Da ≤ 9220 mm q = 6 mm

7. TRIAL / MOCK-UP ASSEMBLY OF ECCENTRIC REDUCER.
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D-D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG NO 21709970143.
12. ANY DEVIATION FROM DIMENSION GIVEN IN THE DRAWING SHALL BE RECTIFIED AT SITE BY THE VENDOR.

(12)△	(10)▽	(6)▽	SIZE & SYMBOL OF SEAM
1.9	16.7	1.3	WELD LENGTH (M).
1.8	6.6	0.2	WT. OF WELD METAL (Kg).
E-7018			TYPE OF ELECTRODE

CBOM NO.	STATUS OF DRG.
01709970017 Var. 03	U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

GRADE OF UNTOL. DIM.:-
M/CG- V/C/M/F – AA0230208
WELDING- A/B/C/D – AA621104
GAS CUTTING- 'T3'AA0621101

REV.	DATE	ALTERED / CHECKED

REV.	DATE	ALTERED / CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD.
HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-Sd-	28.12.2022	--
CHD	AXAY KUMAR	-Sd-	28.12.2022	
APD	N PRAKASH	-Sd-	28.12.2022	73 | 74

DEPT.	CODE	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
H.X.E.	4222	N.T.S.	1493.2	0170997017	37	-- (75 | 77)

TITLE: DUCT LIASIONING ø4000

1 CARD CODE 3: X

DRAWING NO. 31709970039 (7 ... 22) REV. 00 (23 | 24)

SHEET NO. 01 | NO.OF SHEETS 01

SIZE A3

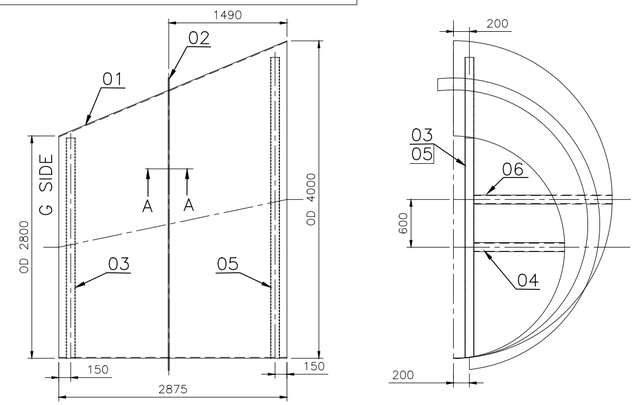
REF. DRG NO. | SIGN & DATE | INVENTORY NO.

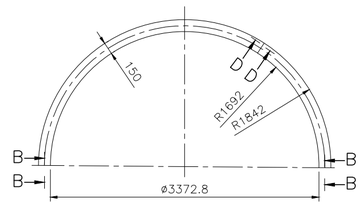
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

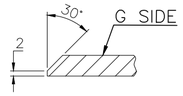
FORM: DG-38(B)

DRAWING NO. 31709970040





ITEM NO -02(TH.10)

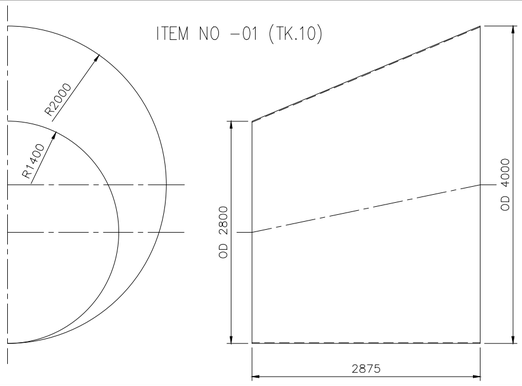


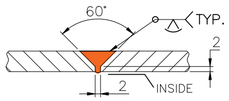
SECTION- BB

ITEM NO	L
03	2790
04	1270
05	3890
06	1830

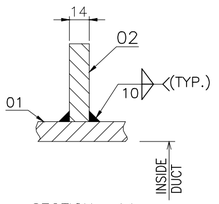
TECHNOLOGICAL SUPPORT

ITEM NO -01 (TK.10)

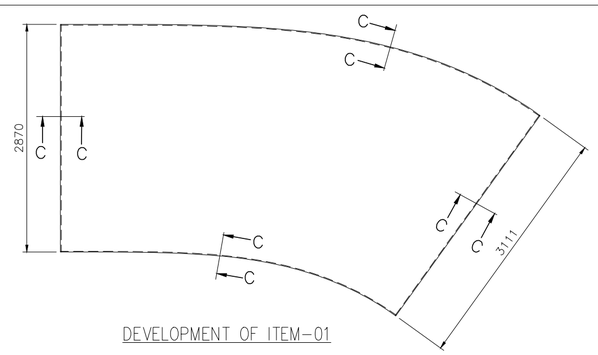




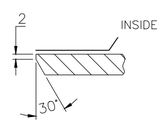
SECTION- DD



SECTION- AA



DEVELOPMENT OF ITEM-01



SECTION- CC

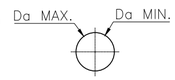
TECHNICAL REQUIREMENTS: -

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE-F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

(b) ADMISSIBLE OVALITY

At ends: Da 2800 mm – 4900 mm x = 14 mm
Da 4900 mm – 6300 mm x = 16 mm
Da 6300 mm – 8100 mm x = 20 mm



Permissible ovality at any cross-section, other than ends of section, will be as per ASME Section VIII Div 1 UG-80

(c) ADMISSIBLE OBLATENESS

Da ≤ 9220 mm q = 6 mm

7. TRIAL / MOCK-UP ASSEMBLY OF ECCENTRIC REDUCER.
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D-D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG NO 31709970048.
12. ANY DEVIATION FROM DIMENSION GIVEN IN THE DRAWING SHALL BE RECTIFIED AT SITE BY THE VENDOR.

(12)△	(10)▽	(6)▽	SIZE & SYMBOL OF SEAM
1.9	16.7	1.3	WELD LENGTH (M).
1.8	6.6	0.2	WT. OF WELD METAL (Kg).
E-7018			TYPE OF ELECTRODE

GRADE OF UNTOL. DIM.:-
M/CG- V/C/M/F – AA0230208
WELDING- A/B/C/D – AA621104
GAS CUTTING- 'T3'AA0621101

REV.	DATE	ALTERED / CHECKED

REV.	DATE	ALTERED / CHECKED

CBOM NO. 01709970017 Var. 03 | STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-Sd-	28.12.2022	--
CHD	AXAY KUMAR	-Sd-	28.12.2022	
APD	N PRAKASH	-Sd-	28.12.2022	73 | 74

DEPT.	CODE	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
H.X.E.	4222	N.T.S.	1462.1	01709970017	41	-- (75 | 77)

TITLE: ECCENTRIC REDUCER ø4000Xø2800

1 CARD CODE 3: X

DRAWING NO. 31709970040 (7 ... 22) REV. 00 (23 | 24)

SHEET NO. 01 | NO.OF SHEETS 01

SIZE A3

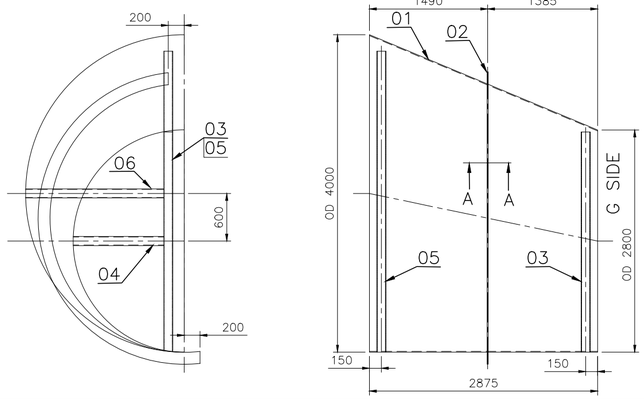
REF. DRG NO. | SIGN & DATE | INVENTORY NO.

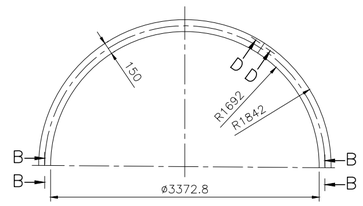
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

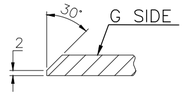
FORM: DG-38(B)

DRAWING NO. 31709970041

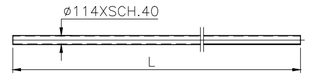




ITEM NO -02(TH.10)



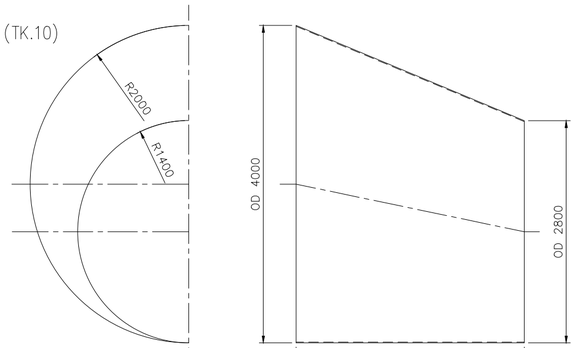
SECTION- BB

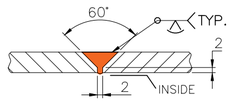


ITEM NO	L
03	2790
04	1270
05	3890
06	1830

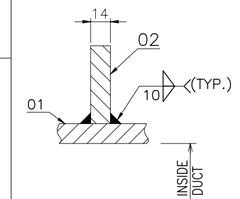
TECHNOLOGICAL SUPPORT

ITEM NO -01 (TK.10)

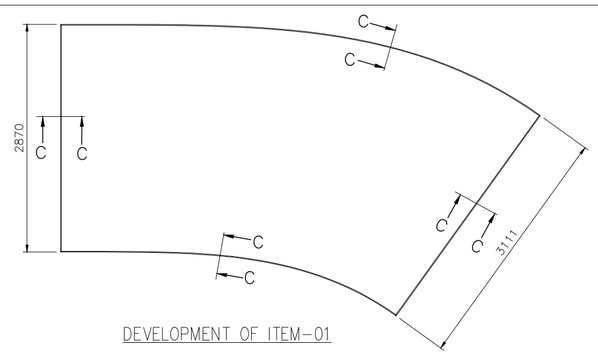




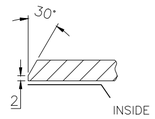
SECTION- DD



SECTION- AA



DEVELOPMENT OF ITEM-01



SECTION- CC

(12)△	(10)▽	(6)▽	SIZE & SYMBOL OF SEAM
1.9	16.7	1.3	WELD LENGTH (M).
1.8	6.6	0.2	WT. OF WELD METAL (Kg).
E-7018			TYPE OF ELECTRODE

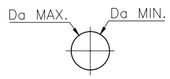
TECHNICAL REQUIREMENTS: -

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE-F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

(b) ADMISSIBLE OVALITY

At ends: Da 2800 mm – 4900 mm x = 14 mm
Da 4900 mm – 6300 mm x = 16 mm
Da 6300 mm – 8100 mm x = 20 mm



Permissible ovality at any cross-section, other than ends of section, will be as per ASME Section VIII Div 1 UG-80

(c) ADMISSIBLE OBLATENESS

Da ≤ 9220 mm q = 6 mm

7. TRIAL / MOCK-UP ASSEMBLY OF ECCENTRIC REDUCER.
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D-D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. FOR DEVELOPMENT OF ITEM NO 01 , REFER DRG NO 31709970048.
12. ANY DEVIATION FROM DIMENSION GIVEN IN THE DRAWING SHALL BE RECTIFIED AT SITE BY THE VENDOR.

CBOM NO. 01709970017 Var. 03			STATUS OF DRG. U
AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

GRADE OF UNTOL. DIM.:-
M/CG- V/C/M/F – AA0230208
WELDING- A/B/C/D – AA621104
GAS CUTTING- 'T3'AA0621101

REV.	DATE	ALTERED / CHECKED

REV.	DATE	ALTERED / CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD.
HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-Sd-	28.12.2022	--
CHD	AXAY KUMAR	-Sd-	28.12.2022	
APD	N PRAKASH	-Sd-	28.12.2022	73 | 74

DEPT. H.X.E.		SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
CODE 4222		N.T.S.	1462.1	01709970017	42	-- (75 | 77)

TITLE: ECCENTRIC REDUCER ø4000Xø2800

1 CARD CODE 3: X

DRAWING NO. 31709970041 (7 ... 22) REV. 00 (23 | 24)

SHEET NO. 01 | NO.OF SHEETS 01

SIZE A3

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

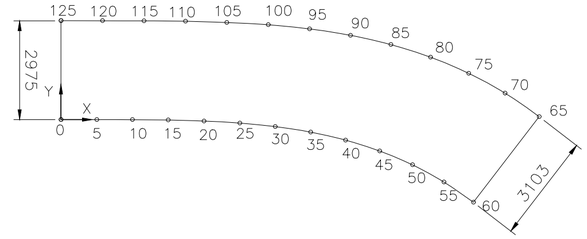
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)

DRAWING NO. 31709970047

PROFILE CO ORDINATE -01		
POINT	X	Y
0	0.000	0.000
1	104.458	0.000
2	208.916	-0.002
3	313.374	-0.008
4	417.832	-0.024
5	522.290	-0.059
6	626.748	-0.122
7	731.206	-0.226
8	835.663	-0.385
9	940.121	-0.615
10	1044.579	-0.936
11	1149.036	-1.368
12	1253.492	-1.934
13	1357.948	-2.657
14	1462.402	-3.565
15	1566.854	-4.686
16	1671.303	-6.049
17	1775.748	-7.685
18	1880.188	-9.627
19	1984.621	-11.910
20	2089.045	-14.569
21	2193.458	-17.640
22	2297.856	-21.161
23	2402.237	-25.170
24	2506.596	-29.708
25	2610.930	-34.814
26	2715.231	-40.528
27	2819.495	-46.892
28	2923.714	-53.946
29	3027.882	-61.733
30	3131.988	-70.294
31	3236.025	-79.670
32	3339.980	-89.901
33	3443.844	-101.030
34	3547.603	-113.094
35	3651.244	-126.135
36	3754.752	-140.190
37	3858.111	-155.297
38	3961.306	-171.492
39	4064.319	-188.810
40	4167.130	-207.286
41	4269.720	-226.952
42	4372.068	-247.838
43	4474.154	-269.974
44	4575.954	-293.387
45	4677.446	-318.103
46	4778.605	-344.146
47	4879.408	-371.536
48	4979.830	-400.293
49	5079.844	-430.436
50	5179.426	-461.979
51	5278.549	-494.934
52	5377.188	-529.313
53	5475.315	-565.125
54	5572.906	-602.374
55	5669.934	-641.066
56	5766.374	-681.201
57	5862.200	-722.779
58	5957.389	-765.797
59	6051.917	-810.249
60	6145.760	-856.128
61	x	x
62	x	x
63	x	x
64	x	x
65	7532.022	1925.761
66	7417.011	1981.989
67	7301.161	2036.467
68	7184.501	2089.188
69	7067.059	2140.145
70	6948.866	2189.333
71	6829.952	2236.752
72	6710.349	2282.404
73	6590.087	2326.293
74	6469.199	2368.427
75	6347.718	2408.816
76	6225.674	2447.473
77	6103.100	2484.415
78	5980.027	2519.659
79	5856.486	2553.228
80	5732.509	2585.144
81	5608.124	2615.435
82	5483.361	2644.129
83	5358.249	2671.259
84	5232.814	2696.856
85	5107.084	2720.958
86	4981.082	2743.601
87	4854.834	2764.826
88	4728.362	2784.674
89	4601.688	2803.188
90	4474.832	2820.414
91	4347.814	2836.396
92	4220.651	2851.182
93	4093.359	2864.820
94	3965.955	2877.360
95	3838.452	2888.850
96	3710.863	2899.342
97	3583.199	2908.885
98	3455.471	2917.531
99	3327.689	2925.330
100	3199.861	2932.334
101	3071.994	2938.591
102	2944.095	2944.152
103	2816.170	2949.066
104	2688.222	2953.381
105	2560.258	2957.145
106	2432.279	2960.404
107	2304.290	2963.201
108	2176.292	2965.582
109	2048.288	2967.587
110	1920.279	2969.257
111	1792.267	2970.630
112	1664.252	2971.743
113	1536.235	2972.630
114	1408.217	2973.323
115	1280.198	2973.852
116	1152.179	2974.246
117	1024.159	2974.528
118	896.139	2974.723
119	768.119	2974.850
120	640.099	2974.928
121	512.080	2974.970
122	384.060	2974.991
123	256.040	2974.998
124	128.020	2975.000
125	0.000	2975.000



DEVELOPMENT OF ECCENTRIC REDUCER

REF. DRG NO.

SIGN & DATE

INVENTORY NO.

CBOM NO. 01709970017-03			STATUS OF DRG. U
AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	....01.23

GRADE OF UNTOL. DIM.:-

M/CG- V/C/M/F - AA0230208

WELDING- A/B/C/D - AA621104

GAS CUTTING- 'T3'AA0621101

REV.	DATE	ALTERED / CHECKED
REV.	DATE	ALTERED / CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-Sd-	28.12.2022	--
CHD	AXAY KUMAR	-Sd-	28.12.2022	
APD	N PRAKASH	-Sd-	28.12.2022	73, 74

DEPT. H.X.E.		SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
CODE 4222		--	--	01709970017	36	-- (75, 77)

TITLE: ECCENTRIC REDUCER 4900X4000 PROFILE CO ORDINATE

[1]CARD[3] CODE: X

DRAWING NO. 31709970047 (7 ... 22) REV. 00 (23, 24)

SHEET NO. 01 | NO.OF SHEETS 01

SIZE A3

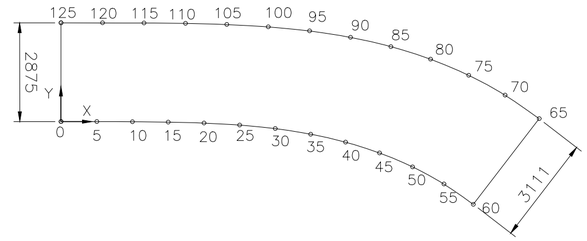
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)

DRAWING NO. 31709970048

PROFILE CO ORDINATE -01		
POINT	X	Y
0	0.000	0.000
1	73.042	0.000
2	146.084	-0.001
3	219.126	-0.007
4	292.168	-0.023
5	365.210	-0.057
6	438.252	-0.118
7	511.294	-0.218
8	584.336	-0.371
9	657.378	-0.594
10	730.419	-0.903
11	803.460	-1.320
12	876.500	-1.866
13	949.539	-2.564
14	1022.575	-3.439
15	1095.609	-4.520
16	1168.640	-5.834
17	1241.665	-7.411
18	1314.683	-9.284
19	1387.691	-11.484
20	1460.689	-14.046
21	1533.671	-17.005
22	1606.634	-20.397
23	1679.574	-24.258
24	1752.485	-28.625
25	1825.362	-33.538
26	1898.197	-39.033
27	1970.982	-45.151
28	2043.709	-51.929
29	2116.367	-59.406
30	2188.946	-67.621
31	2261.433	-76.612
32	2333.814	-86.416
33	2406.074	-97.071
34	2478.199	-108.612
35	2550.169	-121.076
36	2621.968	-134.496
37	2693.575	-148.906
38	2764.968	-164.336
39	2836.126	-180.818
40	2907.026	-198.379
41	2977.642	-217.047
42	3047.949	-236.847
43	3117.921	-257.802
44	3187.529	-279.934
45	3256.746	-303.261
46	3325.543	-327.800
47	3393.889	-353.567
48	3461.755	-380.574
49	3529.110	-408.831
50	3595.923	-438.346
51	3662.163	-469.126
52	3727.799	-501.172
53	3792.801	-534.487
54	3857.138	-569.069
55	3920.780	-604.915
56	3983.696	-642.018
57	4045.859	-680.370
58	4107.240	-719.962
59	4167.812	-760.780
60	4227.550	-802.811
61	x	x
62	x	x
63	x	x
64	x	x
65	6045.851	1726.894
66	5960.420	1787.002
67	5873.795	1845.377
68	5786.014	1901.998
69	5697.114	1956.846
70	5607.137	2009.907
71	5516.122	2061.170
72	5424.114	2110.626
73	5331.154	2158.270
74	5237.287	2204.100
75	5142.556	2248.118
76	5047.006	2290.328
77	4950.682	2330.738
78	4853.626	2369.361
79	4755.884	2406.210
80	4657.497	2441.304
81	4558.510	2474.664
82	4458.962	2506.315
83	4358.895	2536.283
84	4258.348	2564.599
85	4157.360	2591.297
86	4055.966	2616.411
87	3954.202	2639.982
88	3852.101	2662.049
89	3749.696	2682.656
90	3647.017	2701.848
91	3544.091	2719.673
92	3440.945	2736.178
93	3337.604	2751.416
94	3234.092	2765.437
95	3130.428	2778.295
96	3026.633	2790.043
97	2922.724	2800.736
98	2818.716	2810.429
99	2714.625	2819.178
100	2610.464	2827.037
101	2506.242	2834.063
102	2401.971	2840.309
103	2297.659	2845.831
104	2193.314	2850.681
105	2088.942	2854.912
106	1984.548	2858.576
107	1880.137	2861.723
108	1775.714	2864.401
109	1671.280	2866.657
110	1566.839	2868.536
111	1462.393	2870.081
112	1357.942	2871.334
113	1253.489	2872.332
114	1149.034	2873.112
115	1044.578	2873.708
116	940.121	2874.151
117	835.663	2874.469
118	731.206	2874.688
119	626.748	2874.832
120	522.290	2874.919
121	417.832	2874.967
122	313.374	2874.989
123	208.916	2874.998
124	104.458	2875.000
125	0.000	2875.000



DEVELOPMENT OF ECCENTRIC REDUCER

REF. DRG NO.

SIGN & DATE

INVENTORY NO.

GRADE OF UNTOL. DIM.:-

M/CG- V/C/M/F - AA0230208

WELDING- A/B/C/D - AA621104

GAS CUTTING- 'T3'AA0621101

REV.	DATE	ALTERED / CHECKED

REV.	DATE	ALTERED / CHECKED

CBOM NO.	STATUS OF DRG.
01709970017 Var. 03	U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD.
HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-Sd-	28.12.2022	--
CHD	AXAY KUMAR	-Sd-	28.12.2022	
APD	N PRAKASH	-Sd-	28.12.2022	73 74

DEPT.	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
H.X.E.	--	--	01709970017	43	--
CODE 4222					75 77

TITLE: ECCENTRIC REDUCER 4000X2800 PROFILE CO ORDINATE

1 CARD CODE 3: X

DRAWING NO. 31709970048 (7 22) REV. 00 (23 24)

SHEET NO. 01 | NO.OF SHEETS 01

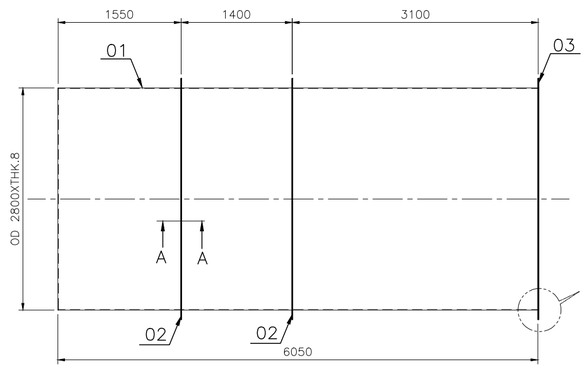
SIZE A3

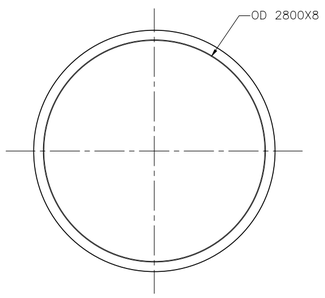
FIRST ANGLE PROJECTION

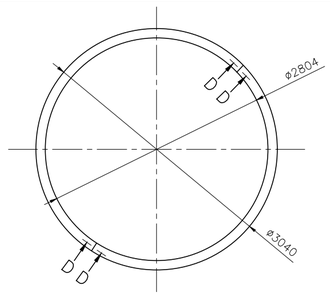
(ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)

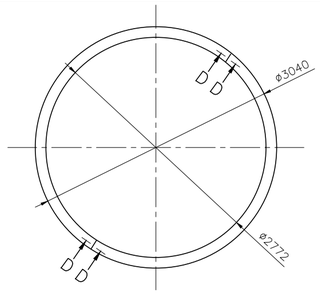
DRAWING NO. 31709970049



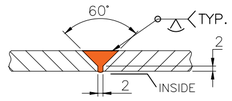




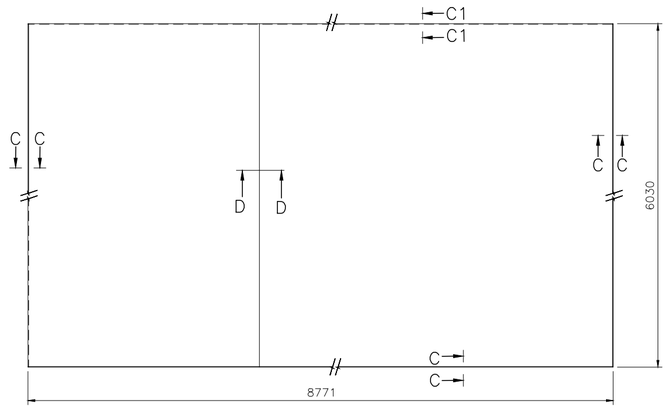
ITEM NO -02 (TK.10)



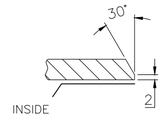
ITEM NO -03 (TK.10)



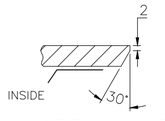
SECTION- DD



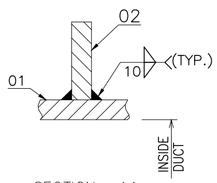
DEVELOPMENT OF ITEM-01 (TH.8)



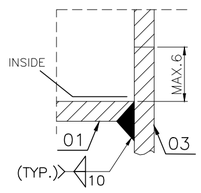
SECTION- CC



SECTION- C1-C1



SECTION- AA



VIEW-B

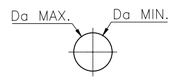
TECHNICAL REQUIREMENTS: -

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE-F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

(b) ADMISSIBLE OVALITY

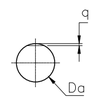
At ends: Da 2800 mm – 4900 mm x = 14 mm
Da 4900 mm – 6300 mm x = 16 mm
Da 6300 mm – 8100 mm x = 20 mm



Permissible ovality at any cross-section, other than ends of section, will be as per ASME Section VIII Div 1 UG-80

(c) ADMISSIBLE OBLATENESS

Da ≤ 9220 mm q = 6 mm



7. TRIAL / MOCK-UP ASSEMBLY OF ECCENTRIC REDUCER.
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D-D & STIFFENERS MAY BE MADE IN MAXIMUM FOUR PARTS, WELDED AS PER DETAIL D-D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM AND SIZE (MIN. DIM) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. ANY DEVIATION FROM DIMENSION GIVEN IN THE DRAWING SHALL BE RECTIFIED AT SITE BY THE VENDOR.

(12)△	(10)▽	(6)▽	SIZE & SYMBOL OF SEAM
1.9	16.7	1.3	WELD LENGTH (M).
1.8	6.6	0.2	WT. OF WELD METAL (Kg).
E-7018			TYPE OF ELECTRODE

REF. DRG NO.

SIGN & DATE

INVENTORY NO.

GRADE OF UNTOL. DIM.:-
M/CG- V/C/M/F – AA0230208
WELDING- A/B/C/D – AA621104
GAS CUTTING- 'T3'AA0621101

REV.	DATE	ALTERED / CHECKED

REV.	DATE	ALTERED / CHECKED

CBOM NO. 01709970017 Var. 03 — STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-Sd-	28.12.2022	--
CHD	AXAY KUMAR	-Sd-	28.12.2022	
APD	N PRAKASH	-Sd-	28.12.2022	

DEPT.	CODE	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
H.X.E.	4222	N.T.S.	3948.5	01709970017	45	--

TITLE: DUCT LIASIONING ø2800

CARD CODE: X

DRAWING NO. 31709970049 — REV. 00

SHEET NO. 01 — NO.OF SHEETS 01

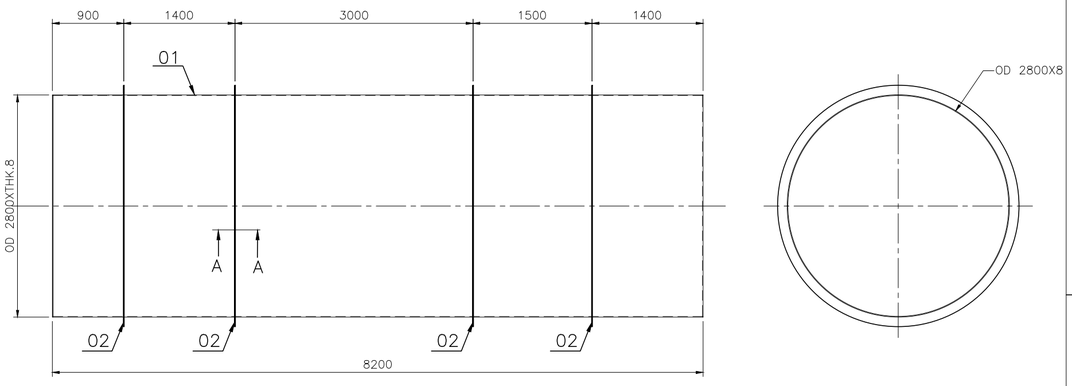
SIZE A3

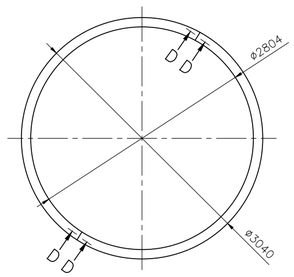
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

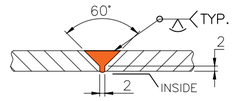
FORM: DG-38(B)

DRAWING NO. 31709970050

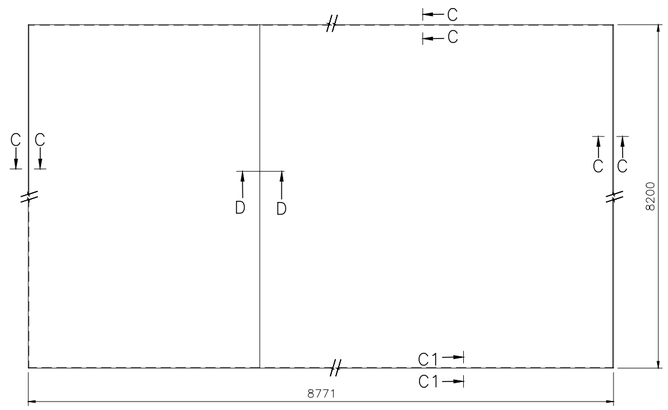




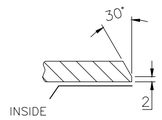
ITEM NO -02 (TK.10)



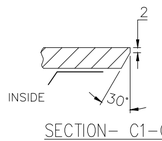
SECTION- DD



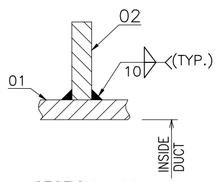
DEVELOPMENT OF ITEM-01 (TH.8)



SECTION- CC



SECTION- C1-C1



SECTION- AA

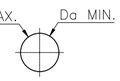
TECHNICAL REQUIREMENTS: -

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – 1 COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – 1 COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE-F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

   (b) ADMISSIBLE OVALITY

   At ends: Da 2800 mm – 4900 mm x = 14 mm
   Da 4900 mm – 6300 mm x = 16 mm
   Da 6300 mm – 8100 mm x = 20 mm



   Permissible ovality at any cross-section, other than ends of section, will be as per ASME Section VIII Div 1 UG-80

   (c) ADMISSIBLE OBLATENESS

   Da ≤ 9220 mm q = 6 mm

7. TRIAL / MOCK-UP ASSEMBLY OF ECCENTRIC REDUCER.
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D-D & STIFFENERS MAY BE MADE IN MAXIMUM FOUR PARTS, WELDED AS PER DETAIL D-D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM AND SIZE (MIN. DIM) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.
11. ANY DEVIATION FROM DIMENSION GIVEN IN THE DRAWING SHALL BE RECTIFIED AT SITE BY THE VENDOR.

(12) △	(10) ▽	(6) ▽	SIZE & SYMBOL OF SEAM
1.9	16.7	1.3	WELD LENGTH (M).
1.8	6.6	0.2	WT. OF WELD METAL (Kg).
E-7018			TYPE OF ELECTRODE

REF. DRG NO.

SIGN & DATE

INVENTORY NO.

GRADE OF UNTOL. DIM.:-
M/CG- V/C/M/F – AA0230208
WELDING- A/B/C/D – AA621104
GAS CUTTING- 'T3'AA0621101

REV.	DATE	ALTERED / CHECKED

REV.	DATE	ALTERED / CHECKED

CBOM NO. 01709970017 Var. 03 — STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD. HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-Sd-	28.12.2022	--
CHD	AXAY KUMAR	-Sd-	28.12.2022	
APD	N PRAKASH	-Sd-	28.12.2022	73 74

DEPT. H.X.E.		SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
CODE 4222		N.T.S.	5386.3	01709970017	44	-- (75 77)

TITLE: DUCT LIASIONING ø2800

CARD CODE (1 3): X

DRAWING NO. 31709970050 (7 22) — REV. 00 (23 24)

SHEET NO. 01 — NO.OF SHEETS 01

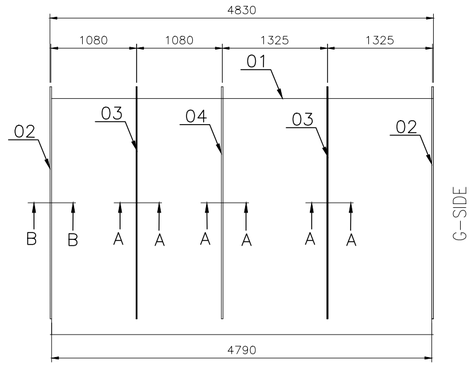
SIZE A3

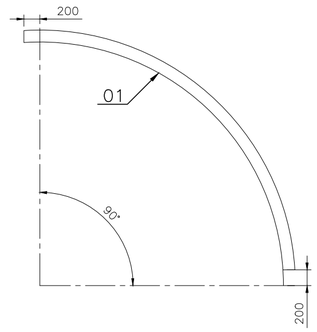
FIRST ANGLE PROJECTION

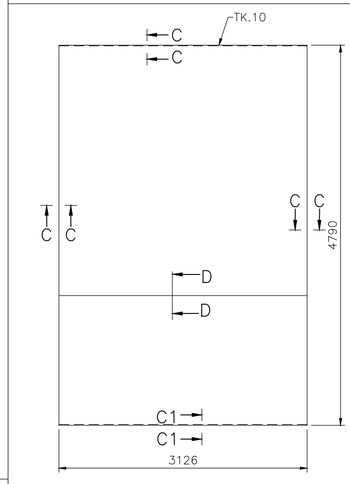
(ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)

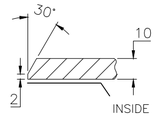
DRAWING NO. 31709970051



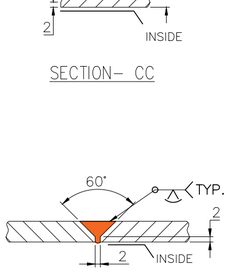




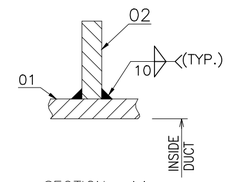
DEVELOPMENT OF ITEM-01 (TH.10)



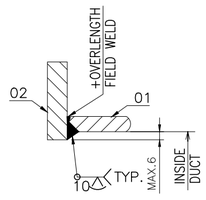
SECTION- CC



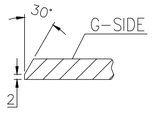
SECTION- DD



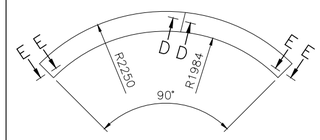
SECTION- AA



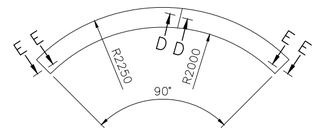
SECTION- BB



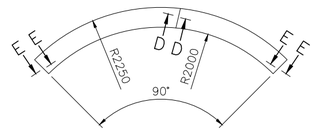
SECTION- EE



ITEM NO -02 (TK.20)



ITEM NO -03 (TK.10)



ITEM NO -04 (TK.20)

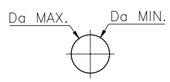
TECHNICAL REQUIREMENTS: -

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
2. PAINTING ON OUTSIDE SURFACES:
   (i) PRIMER PAINT: EPOXY BASED ZINC RICH PRIMER – I COAT – DFT 50 MICRON.
   (ii) INTERMEDIATE PAINT: EPOXY TIO PIGMENTED POLYAMIDE CURED PAINT – I COAT – 50 MICRON.
3. BUTT WELDS SHALL BE SUBJECTED TO 100% DPT AND 10% UT/RT. FILLET WELDS SHALL BE SUBJECTED TO 10% DPT.
4. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE-F.
5. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
6. (a) DIAMETER TOLERANCES

   At ends: Da 2800 mm – 4900 mm = ±7 mm
   Da 4900 mm – 6300 mm = ±8 mm
   Da 6300 mm – 8100 mm = ±10 mm

(b) ADMISSIBLE OVALITY

At ends: Da 2800 mm – 4900 mm x = 14 mm
Da 4900 mm – 6300 mm x = 16 mm
Da 6300 mm – 8100 mm x = 20 mm



Permissible ovality at any cross-section, other than ends of section, will be as per ASME Section VIII Div 1 UG-80

(c) ADMISSIBLE OBLATENESS

Da ≤ 9220 mm q = 6 mm

7. TRIAL ASSEMBLY OF INTER FACING PARTS TO BE DONE AT VENDOR WORK FOR 10% OF COMPONENTS FOR LARGE ITEM(NO.1,2,3)
8. PROPER LOCKING OF CIRCULAR DUCT PARTS SHALL BE ENSURED IN SUCH A WAY THAT CURVATURE IS INTACT DURING TRANSPORTATION AND HANDLING AT SITE. TECHNOLOGICAL SUPPORTS / STIFFENERS TO BE PROVIDED FOR THIS.
9. IF REQUIRED, PLATE & STIFFENER (IT.1 & IT.2) MAY BE MADE IN TWO PARTS WITH ONE JOINT AND WELDED AS PER DETAIL D-D SO THAT JOINT DOES NOT FOUL WITH AND IS AT LEAST 300 MM AWAY FROM ANY OTHER WELD SEAM/HOLE/ NOZZLE/ PAD AND SIZE (MIN. DIM.) OF ANY ONE PLATE IS AT LEAST 1000 MM. WELDED CLASSIFICATION GROUPS AND TEST SCOPE AS PER T.R.1
10. A SEMI CIRCULAR GROOVE OF RADIUS 25mm MAY BE PROVIDED IN THE STIFFENER AT THE LOCATION WHERE STIFFENER CROSSES A WELD SEAM TO MAINTAIN CONTACT BETWEEN PLATE (IT. 1) AND STIFFENER.

(10)△	(10)▽	(6)▽	SIZE & SYMBOL OF SEAM
22.8	7.6	7.6	WELD LENGTH (M).
8.9	3.6	1.3	WT. OF WELD METAL (Kg).
E-7018			TYPE OF ELECTRODE

REF. DRG NO.

SIGN & DATE

INVENTORY NO.

GRADE OF UNTOL. DIM.:-
M/CG- V/C/M/F – AA0230208
WELDING- A/B/C/D – AA621104
GAS CUTTING- 'T3'AA0621101

REV.	DATE	ALTERED / CHECKED

REV.	DATE	ALTERED / CHECKED

CBOM NO. 01709970017Var. 03 — STATUS OF DRG. U

AGREED DEPT.	NAME	SIGN	DATE
WT	MANISH	-SD-	02.02.23

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 3X800 MW ACC (PATRATU)

BHARAT HEAVY ELECTRICALS LTD.
HARDWAR

	NAME	SIGN	DATE	NO.OF VAR.
DRN	NK JANGRA	-Sd-	28.12.2022	--
CHD	AXAY KUMAR	-Sd-	28.12.2022	
APD	N PRAKASH	-Sd-	28.12.2022	73 74

DEPT. H.X.E.		SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
CODE 4222		N.T.S.	2200.2	0170997017	40	-- (75 77)

TITLE: LIASIONING DUCT TEE ø4000X2800

CARD CODE [1] [3]: X

DRAWING NO. 31709970051 (7 ... 22) — REV. 00 (23 24)

SHEET NO. 01 — NO.OF SHEETS 01

SIZE A3