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Heavy Plates & Vessels Plant
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INVITATION TO TENDER

Ref : OS/20-21/Mach/05/012

Date : 12.06.2020

Sub : Fabrication & Machining of CS, LAS & SS Components for various boiler projects

Dear Sir,

Sealed tenders are invited for the subject work in **two part bid** system from **Vendors** who are experienced in execution of similar jobs. Bidders shall enclose documents in support of their experience in execution of similar jobs.

1. VENDOR'S SCOPE OF WORK:

- Total Quantity of work to be carried out by the vendors is about 7.4 MT and the details of components to be fabricated are given in Annexure ñ II.
- Complete Fabrication & Machining of CS, LAS and SS Components as per annexure ñ II, which involves various operations like Marking, Cutting / Shearing, Profile / Shape Cutting, Bending / Rolling, Edge Preparation / Chamfering, Drilling / Punching, Boring / Turning, Assembly, Welding etc. as per the applicable Drawings, GMS, Shipping List, QAP and WPS etc.
- NDT like LPI, MPI, RT etc., wherever applicable, shall be carried out as per approved QAP.
- Surface Cleaning and Painting of CS & LAS Components as per the applicable Painting Schedule.
- Collection of raw materials from HPVP stores and transportation to Vendor's works, Transportation & handing over of finished items to HPVP Logistics dept.
- Though not mentioned specifically, any activity which is required for completion of the work as per the drawings and QAP is deemed to be included in the scope of work of vendor. Any modification work due to revision of drawings during fabrication is to be carried out by the vendor without any extra cost.

2. BHEL's SCOPE :

BHEL shall supply the following as free issue :

- Plates and Sheets in full size / off-cuts
- Rolled Sections, Pipes / Tubes, Rounds in Running Metres
- Paints and other items as per GMS
- Drawings, GMS, Shipping List, QAP, WPS and Painting Schedule etc.

3. LOCATION OF WORK SPOT :

The fabrication work is to be carried out **at Vendor's works.**

4. INSPECTION :

Inspection shall be carried out by M/s. BHEL / BHEL Authorized Inspection Agency as per approved QAP. All the documentation related to inspection such as BHEL / TPI / Customer Clearance, Generation of Inspection Reports, Preparation of Final Documents as per BHEL standard formats etc., is in the scope of vendor and soft copy as well as hard copy of the same are to be submitted to BHEL-QA.

5. DELIVERY :

Finished items along with inspection documents and all other relevant certificates are to be handed over to Logistics dept. within **4 weeks** from the date of issue of raw materials.

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6. VALIDITY OF OFFER :

The offer shall be valid for a period of **3 months** from the last date for tender submission.

7. PRICE :

The prices shall be quoted for the detailed scope of work in the Schedule of Rates enclosed at Annexure ñ I & II. The prices shall be fixed & firm without any escalation during the entire period of contract and till completion of the work.

The quoted price shall be **inclusive of all applicable taxes & duties except GST and** GST shall be reimbursable to the vendor as detailed in Clause ñ 8. Income tax shall be deducted at applicable rates from the vendor's bills.

8. GOODS & SERVICES TAX (GST) :

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

- Vendors registered under GST Act shall have to mention their GSTIN no. (15 Digits) in their Technical Bid. If any specific exemption is available, a declaration with due supporting documents need to be furnished for considering the offer.
- Semi-finished goods are to be delivered by the Vendors in BHEL, HPVP premises within a maximum period of one year from the date of issue of the material, failing which the whole transaction will be considered as Supply and Sale and GST is required to be paid along with interest (calculated @ SBI Base Rate + 6%) along with penalty, if any, from the date of Challan on the whole value of materials. Hence vendors shall have to ensure that materials issued to them are returned within 365 days.
- After fabrication, the vendors shall have to deliver the Semi-finished Goods by fulfilling the following formalities :

GST invoice should be raised by the vendors by paying GST on job work charges at applicable rates and by incorporating the HPVP GSTIN no. in the invoice for availing the reimbursement of GST from HPVP.

The vendor shall also have to enter in their GST Return -1 (GSTR-1) the details of invoice raised for payment of GST so as to enable HPVP to avail input tax credit.

9. REVERSE AUCTION :

BHEL shall be resorting to Reverse Auction (RA) (guidelines as available on **www.bhel.com**) for this tender. RA shall be conducted among all the techno-commercially qualified bidders.

The bidders are advised to give their acceptance for participation in the RA and those bidders who give their acceptance will be allowed to participate in the RA. The bidders intended to participate in the Reverse Auction will have to necessarily submit '**Process Compliance Form**' (PCF) to the designated Service Provider.

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

10. RISK PURCHASE :

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

- 11.** Other Terms & Conditions shall be as per Annexure ñIII enclosed.

12. GENERAL :

- a) The bidders shall study the Tender documents, Drawings, Quality Documents and all other relevant documents in detail for understanding the scope of work and the processes involved before submission of offer. One complete set of drawings & other relevant documents shall be made available in the office of DGM (Outsourcing) and the same shall be referred during working hours.

For any clarifications required on this tender document, scope of work etc., the bidders shall depute their authorized representatives to BHEL, Visakhapatnam with prior intimation to get clarifications from concerned authorities between 09:00 AM and 04:00 PM on any working day but before the due date & time for tender submission.

- b) **Bidders shall confirm their acceptance to all the terms & conditions of the tender enquiry. Any deviations to the tender terms & conditions are not acceptable** and BHEL reserves the right to reject such offers without further correspondence.
- c) BHEL reserves the right to modify in part or full or cancel the tender enquiry at any stage without assigning any reasons thereof.

13. The following documents shall form part of the tender enquiry :

- | | |
|---|------------------|
| i) Schedule of Rates | : Annexure - I |
| ii) Details of DUs to be fabricated & applicable drawings | : Annexure - II |
| iii) General Terms & Conditions | : Annexure - III |
| iv) Acceptance to tender terms & conditions | : Annexure - IV |
| v) GST Compliance for Indigenous Suppliers | : Annexure - GST |

14. TENDER SUBMISSION :

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

Both the bids completed in all respects along with the supporting documents shall be sent through an e-mail only latest by **14.00 Hrs. on or before 22.06.2020** duly mentioning the Name of Work, Tender Ref. No. & Date and Technical Bid / Price Bid in the subject of the e-mail.

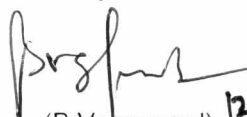
TENDERS RECEIVED AFTER THE DUE DATE & TIME ARE NOT ACCEPTABLE.

Note : Offers sent in any other form will be treated as invalid and will be summarily rejected.

15. TENDER OPENING :

Techno-commercial Bids will be opened on **22.06.2020 at 14.00 Hrs.** The date & time of opening of price bids of techno-commercially qualified bidders will be intimated later at appropriate time. The bidders may depute their representatives at the time of opening of Technical or Price bids. Intimation regarding Reverse Auction shall be given to the qualified bidders through an e-mail in advance at appropriate time.

For Bharat Heavy Electricals Limited,


(B. Vehugopal) 12/6/2020
Manager (OS)

Schedule of Rates

Sub : Fabrication & Machining of CS, LAS & SS Components for various boiler projects

Ref : OS/20-21/Bal Mach Items/05/012, dt. 12.06.2020

SOR Item No.	S.O. No.	Description of Item	Unit	Quantity in KG (A)	Unit Rate (in ₹) (B)	Amount (in ₹) (AxB)
		Fabrication of the following CS, LAS & SS Items as detailed in annexure - II, which involve major operations like Marking, Cutting / Shearing, Profile / Shape Cutting, Bending, Edge Preparation / Chamfering, Drilling / Punching, Boring / Turning, Machining, Threading, Assembly, Welding etc. as per applicable drawings, QAP & Specifications and as per detailed scope of work mentioned in the tender document.				
1	7789 7790 7842 7843 7848 7849 7850 7851 7870	CS Items (Plate / Sheet / Pipe / Rolled Section) - Cut to Size	KG	250		
2		CS Items - Fabrication	KG	860		
3		Eye Hanger (CS)	KG	35		
4		Lifting Eye (CS)	KG	50		
5		Retainer (CS)	KG	80		
6		Rocker Washer (CS)	KG	160		
7		Pipe Clamps Rod Type (CS)	KG	140		
8		Peep Hole Assly. (CS)	KG	1650		
9		Screwed Piece, Screwed Plug, SW Coupling etc. (CS / LAS)	KG	10		
10		Flanges, Blind End Covers, Threaded End Covers etc. (CS / LAS)	KG	265		
		Total - CS / LAS Items		3500		
11		SS Plate / Sheet - Cut to Size	KG	50		
12		SS Items - Fabrication	KG	1200		
13		SS Guide Vanes	KG	2600		
		Total - SS Items		3850		
Total Amount in Words :						

Notes :

- 1) L1 Status will be evaluated itemwise i.e. based on the Total Quoted Value for CS / LAS Items (Sl. No. 1 to 10) & SS Items (Sl. No. 11 to 13) .
- 2) The quantity and weights indicated above are tentative and may vary upto ±15% depending upon the requirement at the time of ordering / execution or due to revision of drawings / Engg. details. However, payment shall be made for the actual quantities / weights only.
- 3) The quoted price shall be inclusive of all applicable taxes & duties except GST GST shall be reimbursable to the vendor as detailed in Clause – 8. Income tax shall be deducted at applicable rates from the vendor's bills.
- 4) The prices shall be fixed & firm without any escalation during the entire period of contract and till completion of the work.
- 5) The bidders are advised to go through all the drawings & documents before quoting the tender.
- 6) BHEL reserves the right to go for Reverse auction as per the applicable guidelines instead of opening price bids.
- 7) Tenderer should quote the amount in figures & words. It may be noted that corrections, overwriting etc. are not allowed. If there is a discrepancy between amount in figures & words, the amount in words shall prevail unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail. If there is an error in the total corresponding to the addition or subtraction of sub-totals, the sub-totals shall prevail and total shall be corrected accordingly.
In case of any mismatch between quoted rate and amount in figures, rate in figures shall be taken into consideration for further evaluation and processing.

Signature of the Bidder with Stamp

ANNEXURE - II**Details of DUs to be fabricated & Relevant Drawings**

Ref : OS/20-21/Mach/05/012, dt. 12.06.2020

Sl. No.	SO	PGMA	DU NO	DU_DESCRIPTION	UNIT	QTY	WEIGHT (KG)	DRG_NUMBER	REV	Matl. Spec.
1	<u>CS Items (Plate / Sheet / Pipe / Rolled Section) - Cut to Size</u>									
1.1	7851	42002	017	2" SCH 40 PIPE 1000L	NO	1	5.437			SA106GRB
1.2	7851	42002	018	0.5" SCH 40 PIPE 2000L	NO	1	2.540			SA106GRB
1.3	7870	35410	021	ISMB 200 _S5 ROW LATERAL BEAM	NO	2	196.040	1-35-410-U0353	01	IS2062
2	<u>CS Items - Fabrication</u>									
2.1	7842	80366	017	IBD TANK MANIFOLD	NO	1	63.205	2-80-366-U9016	00	CS ASSLY.
2.2	7789	42010	001	FRAME as per Drg.	NO	1	644.803	1-42-010-U6025	00	IS2062
2.3	7870	35410	022	S5 ROW BRACKETS - CS PLATE 12 & 16 THK	NO	4	74.168	1-35-410-U0353	01	IS2062
3	<u>Eye Hangers (CS)</u>									
3.1	7842	21700	007	EYE HANGER NB 50-80, RND D10 MM	NO	26	2.080	7740-1830	07	IS2062
3.2	7842	24700	022	EYE HANGER NB200-250, D22 x 245 LG	NO	5	3.655	7740-1830	07	SA105
3.3	7843	21601	003	EYE HANGER NB50-80; L=131, RND D10	NO	112	8.960	7740-1830	07	IS2062
3.4	7843	24401	049	EYE HANGER NB50-80; L=131, RND D10	NO	50	4.000	7740-1830	07	IS2062
3.5	7843	80600	010	EYE-HANGER NB50-80; RND BAR D10, L=131	NO	20	1.600	7740-1830	07	IS2062
3.6	7850	80600	010	EYE HANGER NB 50-80, D10 MM, L=131	NO	20	1.600	7740-1830	07	IS2062
3.7	7851	21700	007	EYE HANGER NB 50-80 D10 MM, L=131	NO	10	0.800	7740-1830	07	IS2062
3.8	7851	24700	022	EYE HANGER NB200-250, D22 x 245 LG	NO	5	3.655	7740-1830	07	SA105
4	<u>Lifting Eyes (CS)</u>									
4.1	7843	42076	034	LIFTING EYE PL 12x125x150	NO	4	7.064	4-42-152-U6017	00	IS2062
4.2	7843	42152	013	LIFTING EYE PL 12x125x150	NO	8	10.000	4-42-152-U6017	00	IS2062

Sl. No.	SO	PGMA	DU NO	DU_DESCRIPTION	UNIT	QTY	WEIGHT (KG)	DRG_NUMBER	REV	Matl. Spec.
4.3	7850	42076	056	LIFTING EYE (PL 16 TK & FLAT 50x6)	NO	4	10.668	3-42-076-U6086	00	IS2062
4.4	7850	42076	065	LIFTING EYE - PL 12 TKx200x200	NO	4	5.000	4-42-076-U6020	00	IS2062
5 Retainers (CS)										
5.1	7842	30215	013	RETAINER TYPE 'A' SH.1.6x70x70	NO	450	27.450	4-32-010-01053	04	IS513D
5.2	7851	30215	013	RETAINER TYPE 'A' SH.1.6x70x70	NO	450	27.450	4-32-010-01053	04	IS513D
5.3	7789	42010	040	TRAY	NO	2	7.118	3-42-010-U6037	00	IS1079, IS2062
6 Rocker Washers (CS)										
6.1	7843	12913	011	ROCKER WASHER; PLATE 40	NO	8	54.800	4-12-913-U8220	00	IS2062
6.2	7870	19911	005	PLATE 32.0 MM - ROCKER WASHER	NO	14	84.000	4-19-911-U8272	00	IS2062
7 Pipe Clamps - Rod Type (CS)										
7.1	7848	42-076	031	PIPE CLAMP ROD TYPE CS OD114.3 TDC:015.0	NO	20	21.760	6124-0233	03	IS2062
7.2	7848	42-076	032	PIPE CLAMP ROD TYPE CS NB80	NO	2	0.900	7740-0630	08	IS2062
7.3	7848	42-076	033	PIPE CLAMP ROD TYPE CS OD60.3	NO	4	0.756	6124-0233	03	IS2062
7.4	7848	42-076	035	PIPE CLMP ROD TYPE CS NB25	NO	20	16.000	7740-0630	08	IS2062
7.5	7848	42-076	036	PIPE CLMP ROD TYPE CS NB25 (FOR 3/4"PIPE)	NO	15	12.000	7740-0630	08	IS2062
7.6	7848	42-076	067	PIPE CLAMP ROD TYPE CS NB80	NO	18	8.100	7740-0630	08	IS2062
7.7	7848	42-076	073	PIPE CLAMP ROD TYPE CS NB15	NO	6	0.330	7740-0630	08	IS2062
7.8	7849	42-076	031	PIPE CLAMP ROD TYPECS OD114.3 TDC:015.0	NO	20	21.760	6124-0233	03	IS2062
7.9	7849	42-076	032	PIPE CLAMP ROD TYPECS NB80	NO	2	0.900	7740-0630	08	IS2062
7.10	7849	42-076	033	PIPE CLAMP ROD TYPECS OD60.3	NO	4	0.756	6124-0233	03	IS2062
7.11	7849	42-076	035	PIPE CLAMP ROD TYPE CNB25 IS2062FE410W	NO	20	16.000	7740-0630	08	IS2062
7.12	7849	42-076	036	PIPE CLAMP ROD TYPE C (FOR 3/4" PIPE)	NO	15	12.000	7740-0630	08	IS2062
7.13	7849	42-076	067	PIPE CLAMP ROD TYPE S NB80	NO	18	8.100	7740-0630	08	IS2062

Sl. No.	SO	PGMA	DU NO	DU_DESCRIPTION	UNIT	QTY	WEIGHT (KG)	DRG_NUMBER	REV	Matl. Spec.
7.14	7849	42-076	073	PIPE CLAMP ROD TYPE S NB15 IS2062E250A	NO	6	0.330	7740-0630	08	IS2062
8	Peep Hole Assly. (CS)									
8.1	7843	48200	016	PEEP HOLE ASSEMBLY	NO	32	1187.424	1-48-200-U0055	00	CS
8.2	7850	48200	013	PEEP HOLE ASSEMBLY	NO	8	298.040	1-48-425-U0008	00	CS
9	Screwed Piece, Screwed Plug, SW Coupling, etc. (CS / LAS)									
9.1	7848	42155	011	SCREWED PIECE 3/4"NPT(M) x 1/2"SW	NO	4	0.600	3-42-156-U6016	00	SA182F22CL3
9.2	7849	42155	011	SCREWED PIECE 3/4"NPT(M) x 1/2"SW	NO	4	0.600	3-42-156-U6016	00	SA182F22CL3
9.3	7848	43200	022	SCR. PLUG 1/2"NPT ROD D 34.6; 35L	NO	1	0.140	3-43-200-U0006	00	SA105
9.4	7849	43200	022	SCR. PLUG 1/2"NPT ROD D 34.6; 35L	NO	1	0.140	3-43-200-U0006	00	SA105
9.5	7848	43200	024	2" SW COUPLING ROD D80, 50L	NO	3	3.600	4-43-200-U0003	01	SA105
9.6	7849	43200	024	2" SW COUPLING ROD D80, 50L	NO	3	3.600	4-43-200-U0003	01	SA105
10	Flanges, Blind End Covers, Threaded End Covers etc. (CS / LAS)									
10.1	7842	80366	013	CS SOW FLANGE NB 200 CL 150 PL 32THK	NO	2	23.000	3-80-999-99059	01	IS2062
10.2	7843	24420	003	CS SO FLANGE-4"x150#, PL 50 THK	NO	2	11.800	4-24-420-U0156	00	SA515GR70
10.3	7843	24420	018	CS SO FLANGE-3"x300#, PL 50 THK	NO	1	6.000	4-24-420-U0157	00	SA515GR70
10.4	7843	24420	020	CS SO FLANGE-6"x300#, PL 55 THK	NO	1	17.500	4-24-420-U0158	00	SA515GR70
10.5	7843	24420	038	SO FLANGE - 4"x300#, PL 50 THK	NO	1	10.130	4-24-420-U0155	00	SA515GR70
10.6	7843	24420	060	CS FLANGE 6"-300#, PL 16 THK	NO	1	17.500	4-24-420-U0158	00	SA515GR70
10.7	7850	24420	027	CS SOW FLANGE 6.0"-150#, ASME B16.5	NO	1	12.000	4-24-420-80813	01	SA515GR70
10.8	7850	24420	050	CS SOW FLANGE 6.0"-150#,ASME B16.5	NO	1	12.000	4-24-420-80813	01	SA515GR70
10.9	7850	24420	073	CS SOW FLANGE 4.0" - 150#	NO	1	7.000	4-24-420-84346	00	SA515GR70
10.10	7850	24420	083	CS SOW FLANGE 4.0" - 150#	NO	2	14.000	4-24-420-84346	00	SA515GR70
10.11	7850	42076	015	SOW FLANGE, NB 80 CL150	NO	16	57.600	0-42-076-U6030	00	SA105

Sl. No.	SO	PGMA	DU NO	DU_DESCRIPTION	UNIT	QTY	WEIGHT (KG)	DRG_NUMBER	REV	Matl. Spec.
10.12	7851	80366	013	CS SOW FLANGE NB 200 CL 150 PL 32THK	NO	2	23.000	3-80-999-99059	01	IS2062
10.13	7848	43200	018	CS BLD FLG 100NBx150	NO	1	6.800	1-43-200-U0009	00	SA105
10.14	7849	43200	018	CS BLD FLG 100NBx150 - SA105	NO	1	6.800	1-43-200-U0011	00	SA105
10.15	7843	24420	082	AS SO FLANGE 4"-300#	NO	1	10.100	4-24-420-U0159	00	SA387GR22CL2
10.16	7848	42156	006	SW BLIND END COVER PL10 x D100 (PL12TK)	NO	1	0.390	3-42-156-U6073	00	SA515GR70
10.17	7849	42156	006	SW BLIND END COVER PL10 x D100 (PL12TK)	NO	1	0.390	3-42-156-U6073	00	SA515GR70
10.18	7850	42155	010	SW BLIND END COVER PL6xD40	NO	1	0.060	1-42-155-U6028	00	IS2062
10.19	7848	43200	023	THREADED END COVER PL20 x D70	NO	1	0.600	4-43-202-U0040	00	IS2062
10.20	7849	43200	023	THREADED END COVER PL20 x D70	NO	1	0.600	4-43-202-U0040	00	IS2062
11	SS Plate / Sheet - Cut to Size									
11.1	7790	80473	017	SS Plate 10 Tk x 500 x 500	NO	1	20.175	1-80-473-U9030	00	SA240TY304
12	SS Items - Fabrication									
12.1	7850	35595	003	LATB - 3 (PL 10 & 12 THK)	NO	6	930.000	2-35-595-U0096	00	SA240TY304
13	SS Guide Vanes									
13.1	7843	48012	089	Guide Vane (PL 10 & 12 THK) 2-48-012-U0068	NO	1	1329.515	2-00-260-U4014	00	SA240TY304
13.2	7843	48012	090	Guide Vane (PL 10 & 12 THK) 2-48-012-U0070	NO	1	661.228	2-00-260-U4014	00	SA240TY304
13.3	7843	48012	091	Guide Vane (PL 10 & 12 THK) 2-48-012-U0087	NO	1	558.552	2-00-260-U4014	00	SA240TY304

NOTE : DUs and Quantities indicated above are tentative and may vary depending on the actual requirement at the time of ordering.

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

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

2. PARTY'S SCOPE :

The scope of the party shall be as follows: -

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

Note : Electrodes of specification mentioned in the drawings / WPS and of BHEL approved brands only shall be used.

3. REVISION OF DRAWINGS :

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

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

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

6. RECTIFICATIONS / REJECTIONS :

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

7. SECURITY DEPOSIT :

Vendors shall have to submit a Bank Guarantee for **10%** of the order value in case of **HPVP ADM site** or **25%** of the material cost in case of Vendor works towards Security Deposit and safe custody of materials within one week from the date of issue of Order. The BG shall be valid for the contract period with a claim period of 3 months. This Bank Guarantee shall be released to the contractor after completion of work and on acceptance of the same by BHEL / Owner and on submission of Performance BG for 10 % of the order value covering for the defects liability period. If PBG is not submitted, 10% of the order value shall be deducted towards PBG from final bill.

8. RAW MATERIALS ISSUE :

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

9. TRANSFER / RETURN OF LEFT OVER MATERIALS :

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

10. MATERIAL RECONCILIATION :

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

Maximum of 0.5 % on the requirement of materials (**Plates, Sections and Pipes**) is admitted towards **process allowance and invisible wastage**.

Scrap quantity is permissible up to a **maximum of 1% on Structural (Beams, Channels, Angles, Rods, Pipes etc.), 2% on Sheets, 3% for Plates** on the theoretical requirement of materials.

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

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

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

11. SCRAP & OFFCUT NORMS :

SI. No.	Description	Scrap Size (in mm)	Off-Cut (in MM)
1.	CS/AS Sheets & Plates	Below 500 × 250	500 × 250 & above
2.	Rolled sections Rod, angles etc. (other than -tubes, pipes)	Below 1000	1000 & above
3.	Tubes & Pipes	Below 500	500 & above
4.	Universal column	Below 1000	1000 & Above
5.	SS Sheets & Plates	Below 500 × 250	500 × 250 & above
6.	SS Structural, Rods, Tubes, Pipes	Below 250	250 & above
7.	Non – ferrous: sheets & plates, rods & tubes	Below 500 × 250 (S & PL), Below 250 (Rods & Tubes)	500 × 250 & above, 250 & above
8.	Big size Scrap	(2500 & above) × (150 to 249)	-

12. INSPECTION :

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

13. WORKMANSHIP GUARANTEE :

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

14. WORK PROGRESS :

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

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

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

15. DELIVERY :

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

16. PENALTY :

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

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

17. PAYMENT TERMS :

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

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

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

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

18. SECRECY :

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

19. SUB-LETTING :

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

20. FACTORY RULES AND REGULATIONS :

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

21. SAFETY :

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

22. HOUSE KEEPING :

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

23. ACCIDENT / DAMAGE / CONDUCT ETC. :

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

24. TERMINATION OF CONTRACT :

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

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

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

25. DISPUTES :

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

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

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

Signature of Bidder with Stamp

Acceptance to Tender Terms & Conditions

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

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

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

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

Signature of the Bidder with Stamp

GST COMPLIANCE FOR INDIGENOUS SUPPLIERS

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

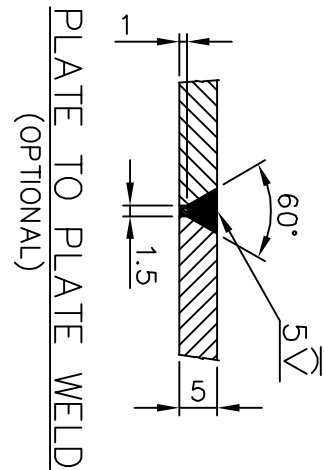
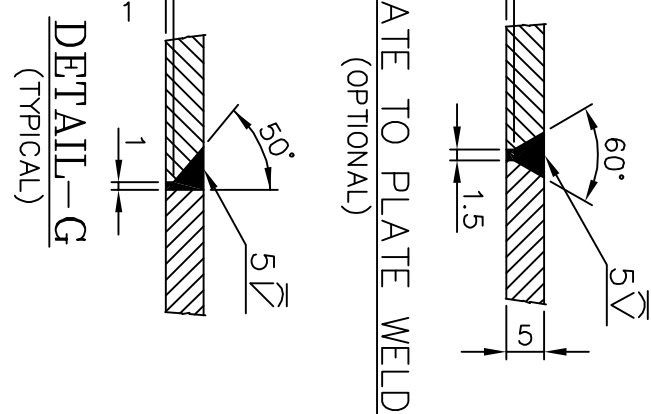
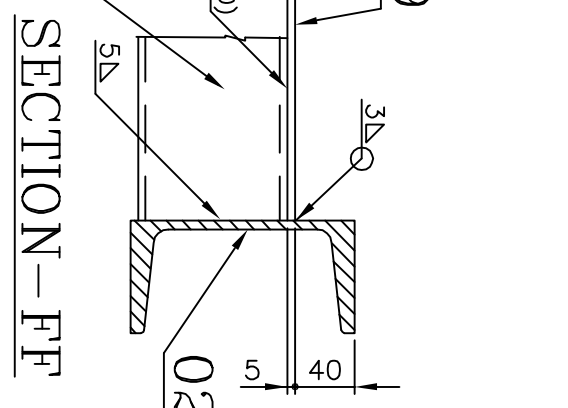
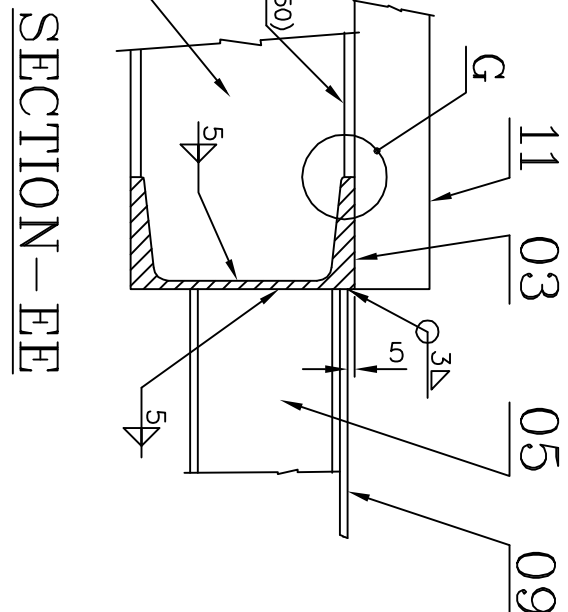
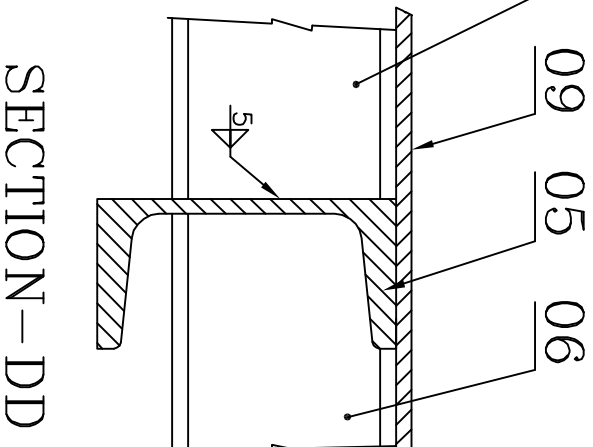
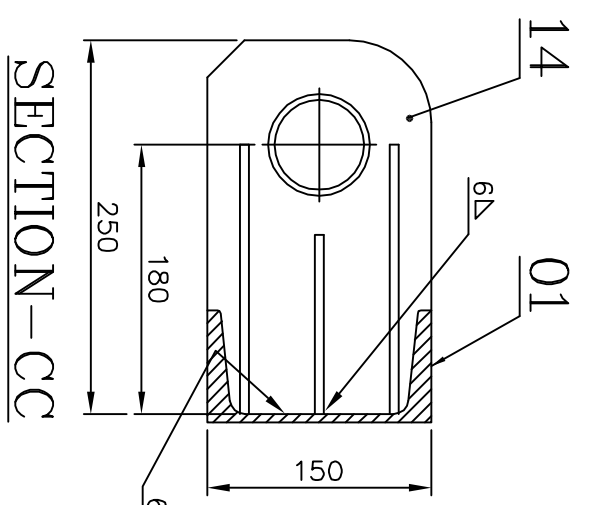
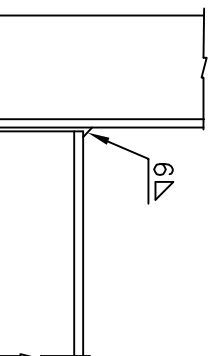
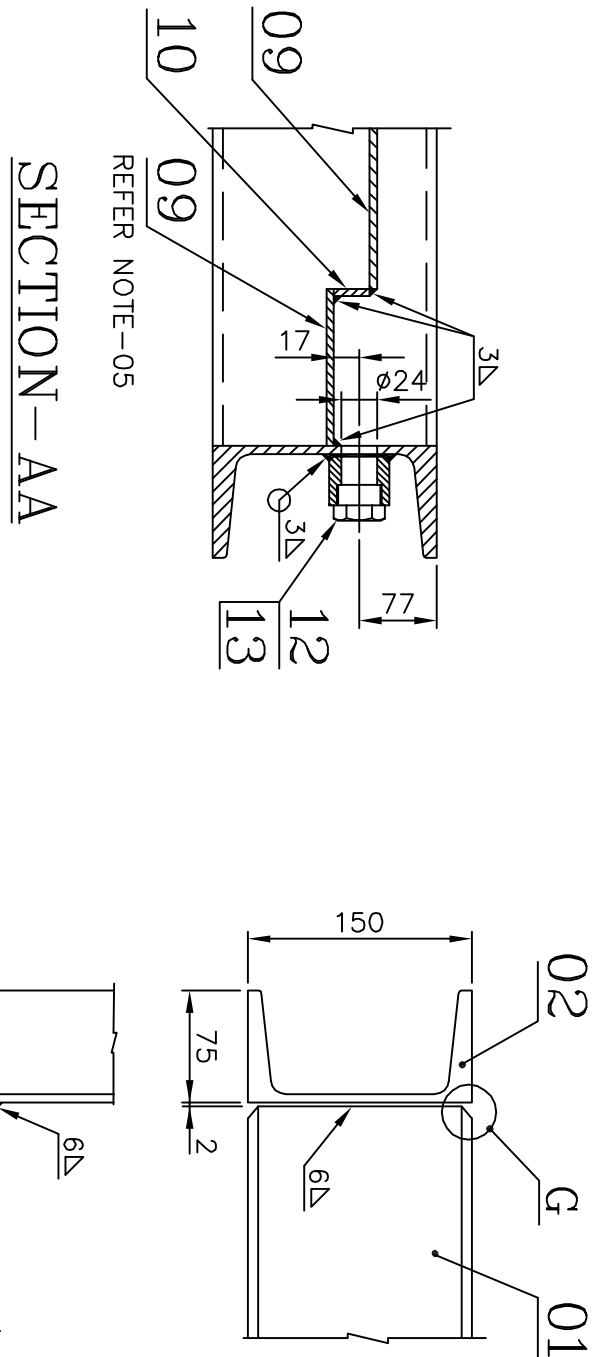
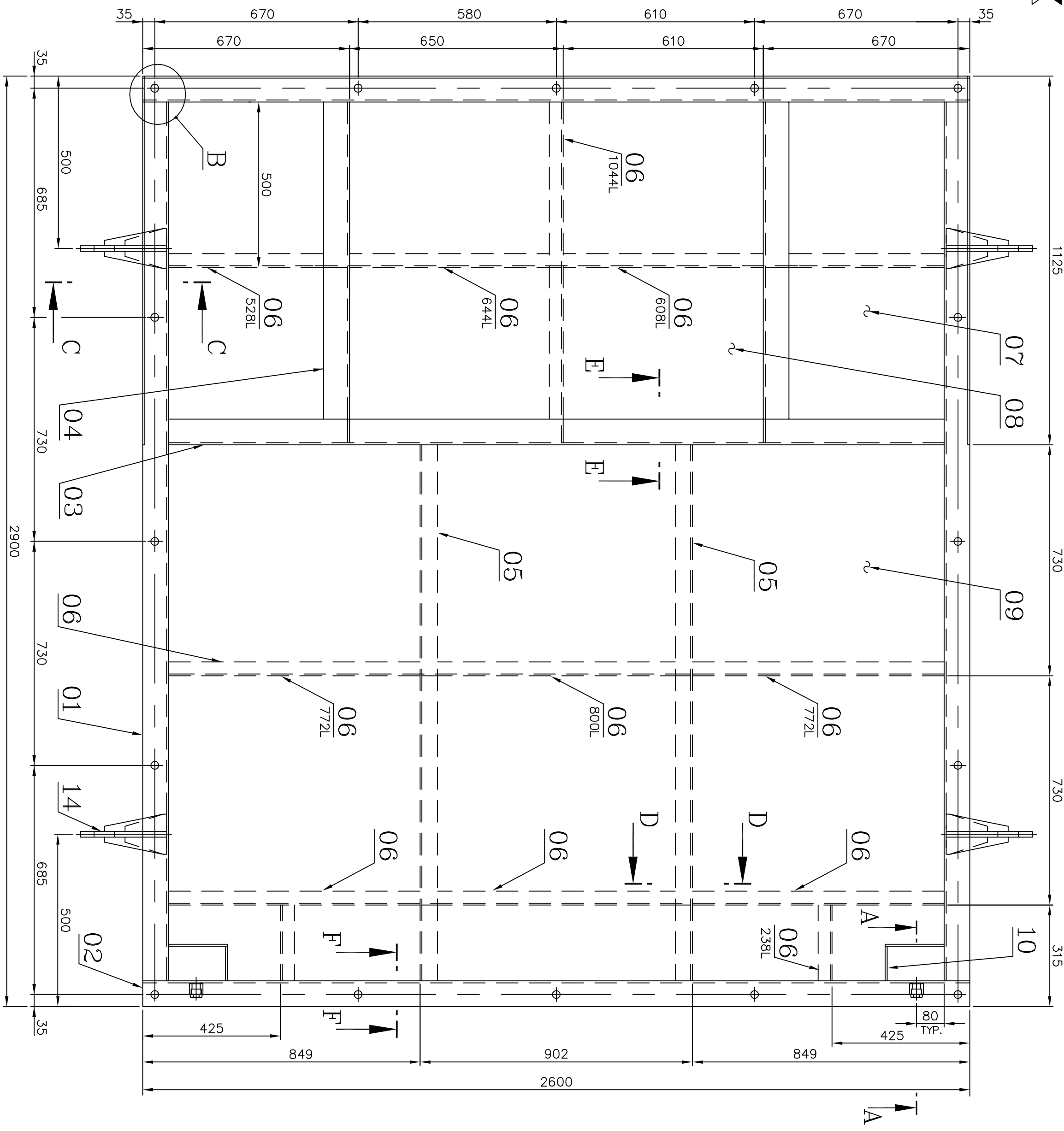
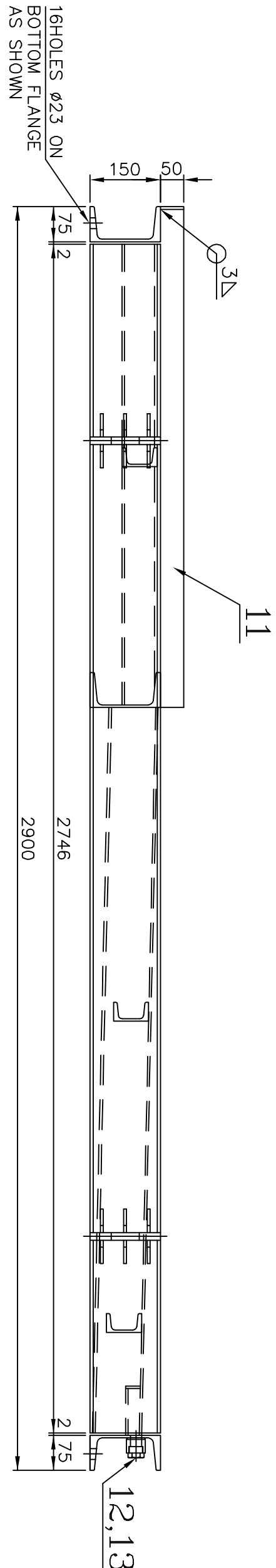
Note : The above will be followed strictly for processing vendor payments to ensure GST Compliance.

Signature of the Bidder with Stamp

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

52091-010-24-1 ON .DRG



WELD TABLE			
TYPE OF WELD	TYPE OF ELECTRODE	LENGTH OF WELD (M)	REMARKS
3 L	E 7018	8	SUPPORTING
5 L	E 7018	8	SUPPORTING
6 L	E 7018	4	SUPPORTING
5 1/2 V	E 7018	3	FLAT GRIND
6 1/2 V	E 7018	2	

NOTE:

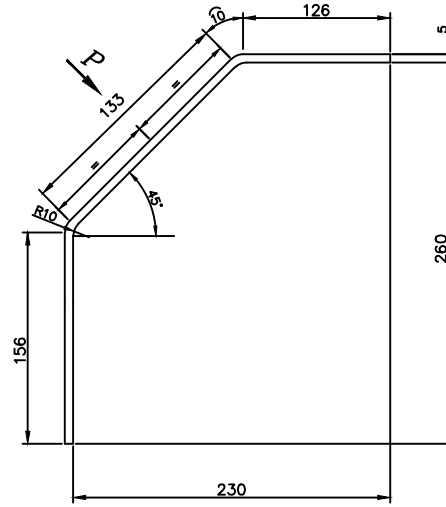
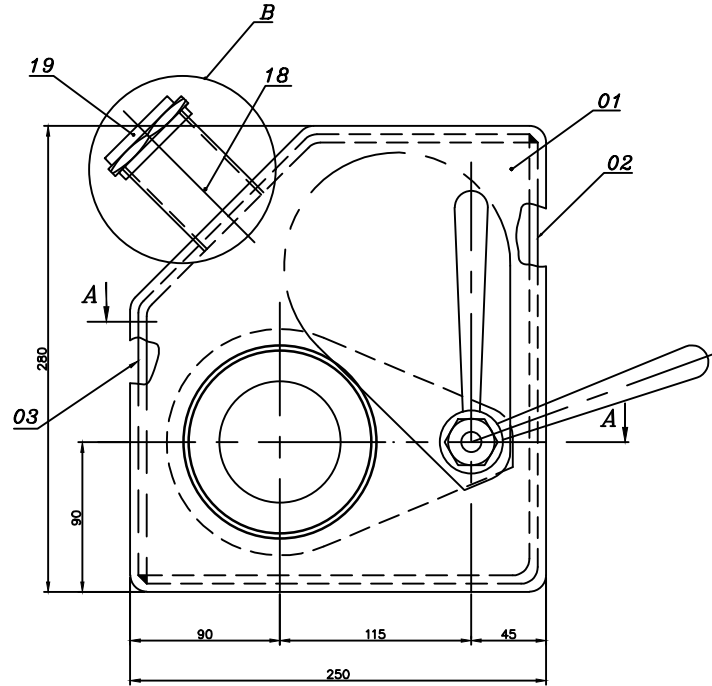
01. FLAT GRIND THE WELDS ON THE TOP & BOTTOM SURFACES OF THE FRAME FOR PLACING THE PLATE (ITEM No.-09) AND TO ENSURE PROPER SLOPE TOWARDS DRAIN.
02. ITEM NOS. 06,10 &11 SHALL BE CUT ACCORDING TO THE REQUIREMENT.
03. WELD ITEM No.-09 WITH 05 INTERMITTENT (3X 50(150)).
04. PREPARE THE ENDS OF THE CHANNEL TO SUIT THE PROFILE OF THE CHANNEL TO WHICH IT IS CONNECTED. FOR TYPICAL DETAIL REFER SECTION-DD& EE.
05. FOR DRAIN POCKET OF THE MAIN FRAME USE THE CUT PIECE OF ITEM No.-09.
06. PUMP BASE PLATE HOLES UNDER HOLD AND SHALL BE MATCH DRILLED WITH PUMP & MOTOR.
07. FUEL OIL PUMP NOT FINALIZED. BASED ON PUMP DRG. MINOR CHANGES IN PIPING NEED TO BE DONE/WELD.

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL	MATERIAL SPECN	UNIT	WEIGHT	QTY	ZONE
	14	LIFTING EYE		3-42-010-U6032	01	WELDMENT	SA 105	NO	7.100	4	
	13	THREADED PIECE		4-42-010-U6006		SA 105		NO	0.300	2	
	12	PLUG 3/4" FP		BPS 41224		41224 11075		NO	0.190	2	
	11	FLAT 50x6: 4950L				15 008 011		NO	11.682	1	
	10	FLAT 50x6: 600L				15 008 011		NO	1.420	1	
	09	PL 5x1698x2448				IS2062 FE410A		NO	163.162	1	
	08	PL 5x973x1258				IS2062 FE410A		NO	48.042	1	
	07	PL 5x518x973				15 011 029		NO	19.783	2	
	06	ISMC 75x40				IS2062 FE410A		NO	63.546	1	
	05	ISMC 100x50				15 010 036		NO	16.233	2	
	04	ISMC 150x75				IS2062 FE410A		NO	17.539	2	
	03	ISMC 150x75				15 010 035		NO	41.126	1	
	02	ISMC 150x75				15 010 035		NO	43.680	2	
	01	ISMC 150x75				IS2062 FE410A		NO	46.133	2	
						IS2062 FE410A					

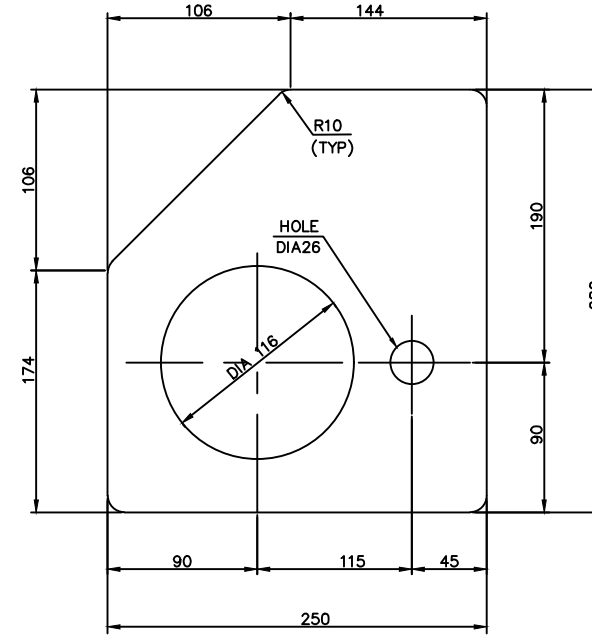
S.O. 7789

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TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT	
Bharat Heavy Electricoids Ltd	
UNIT: HEAVY PLATES & VESSELS PLANT	
VISAKHAPATNAM - 530012	
S.V. SIVAY	
APPROVED BY: PRASANNAKUMAR	
DATE: 24.08.2018	
SCALE: N.T.S	
WEIGHT (KGS): 635.473	
DRAWING NO: 1-42-010-02306	
REV: 00	

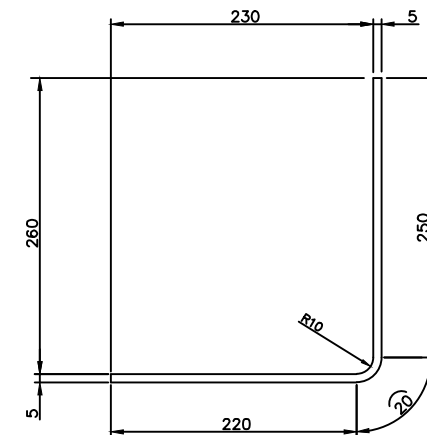
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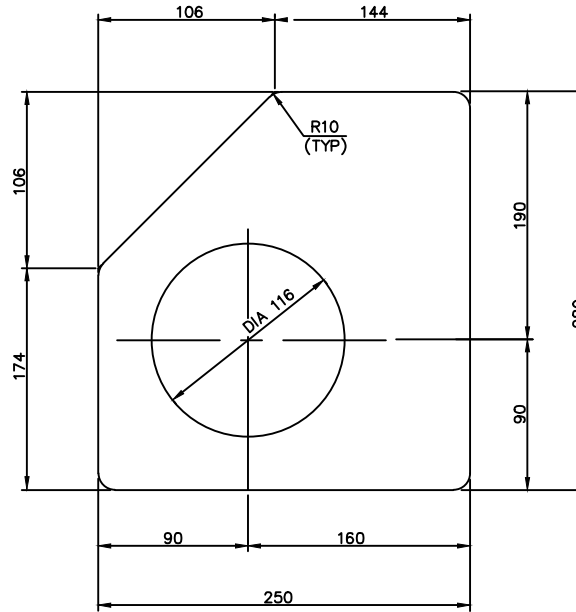
ITEM NO.03



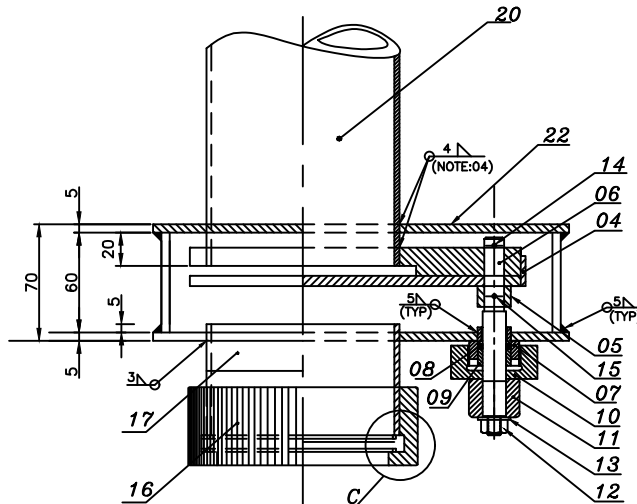
ITEM NO.01



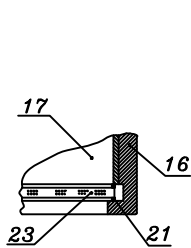
ITEM NO.02



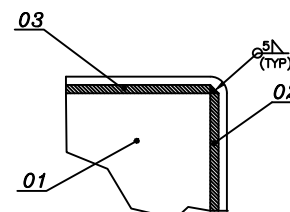
ITEM NO.22



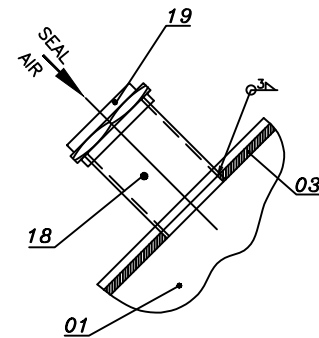
SECTION AA



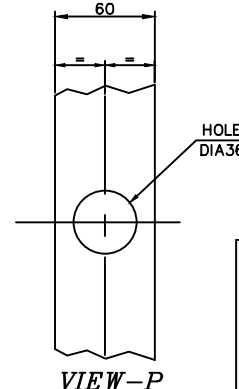
DETAIL-C



CORNER WELDING DETAIL



DETAIL-B



VIEW-P

NOTES:

01. ALL WELDS SHOULD BE AIR TIGHT.
02. ITEM NO.02 TO BE WELDED AFTER ENSURING PROPER ALIGNMENT AND FREE MOVEMENT OF DOOR.
03. ITEM NO.23 TO BE SENT AS A SEPARATE DU.
04. USE ELECTRODE E 309 FOR WELDING ITEM NO.20.WITH ITEM NO.04 & 22.
05. OPEN THE STRANDS OF THE ITEM NO.08 AND USE AS GLAND PACKING.

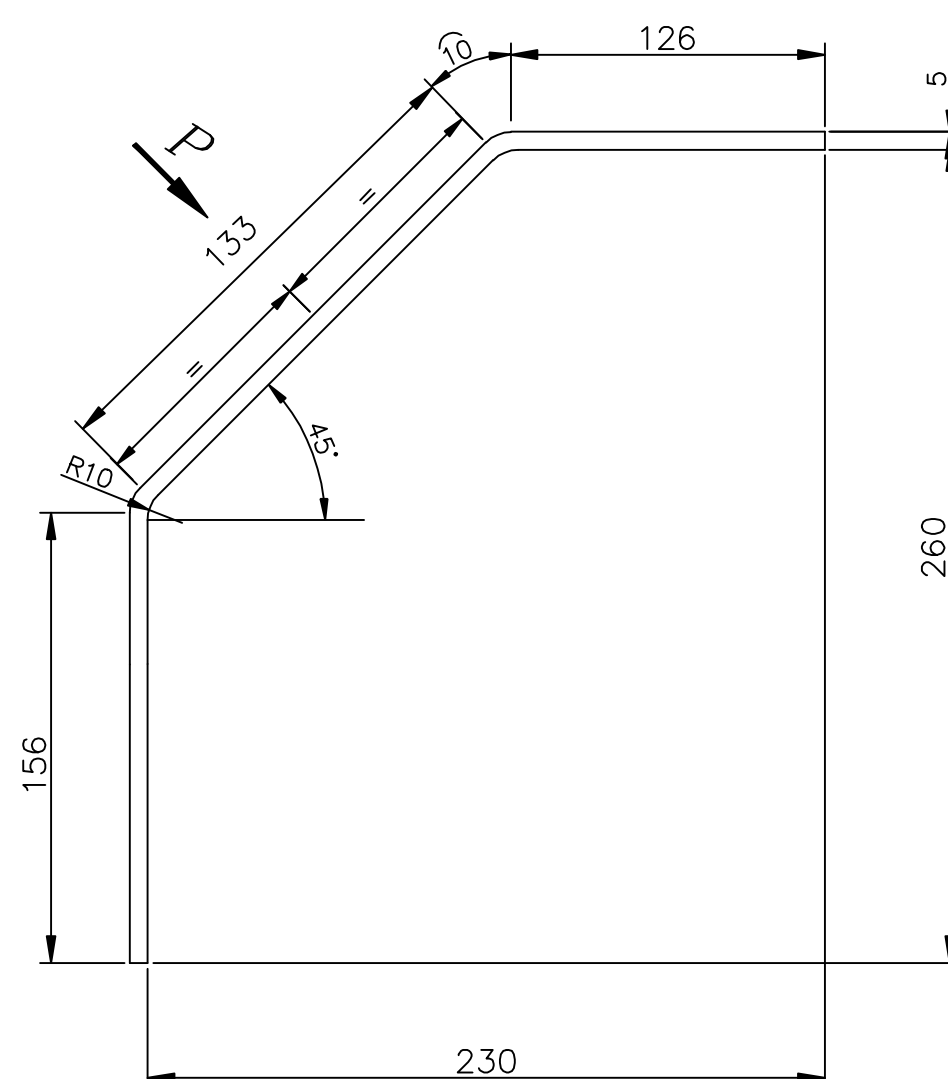
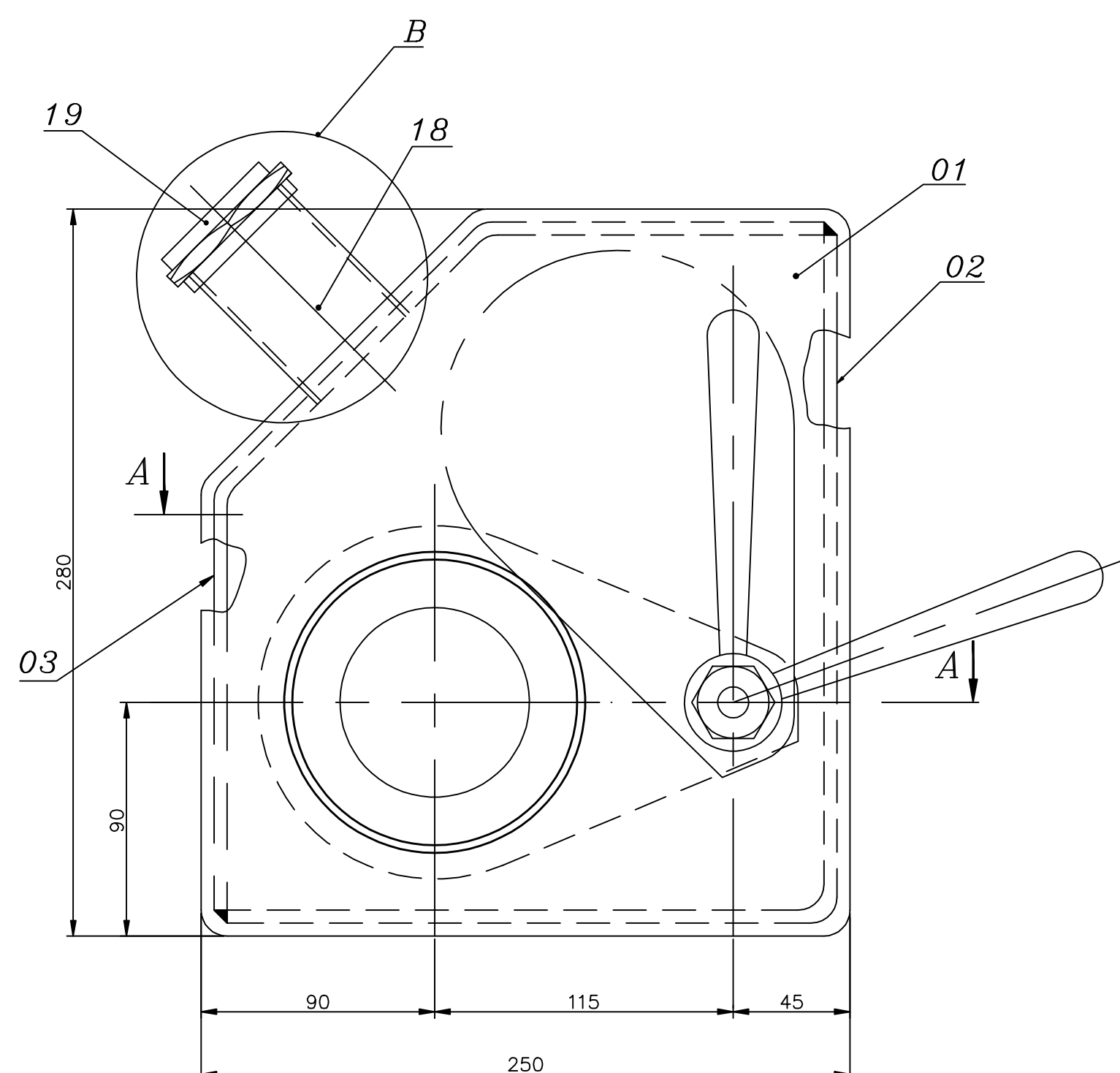
ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT WEIGHT
23	HEAT RESISTANT GLASS DIA 109x5 THK	NO	0.200	
22	PL 5x250x280	NO	2.112	
21	CAF JOINTING GR 0/1 3xDIA 111/105	NO	0.006	
20	PIPE DIA114.3x4.5; 1000 L	NO	12.190	
19	UNION 1"	NO	0.348	
18	ERW TUBE Nb25x3.2; L=55	NO	0.131	
17	PIPE Nb 100x3.6; L=60	NO	0.583	
16	CAP-II PL 50xDIA140	NO	1.620	
15	SPLIT PIN 4x45	NO	0.005	
14	SPLIT PIN 4x25	NO	0.003	
13	WASHER PUNCHED A8	NO	0.002	
12	NUT M8	NO	0.005	
11	SPHERICAL HANDLE	NO	0.570	
10	CAP-II PL 25x50x58	NO	0.194	
09	BUSH ROD DIA 25; 10L	NO	0.023	
08	PACKING ROPE DA SQ6mm; L=100	NO	0.035	
07	GLAND; ROD #36; 24L	NO	0.192	
06	SHAFT; ROD #16; L=118	NO	0.120	
05	COVER	NO	1.201	
04	SUPPORT	NO	3.291	
03	PL 5x60x435	NO	0.980	
02	PL 5x60x490	NO	1.150	
01	PL 5x250x280	NO	2.090	

REV NO.	ZONE	BRIEF RECORD OF REVISIONS	PPD.	CHD.	APPD.
0					

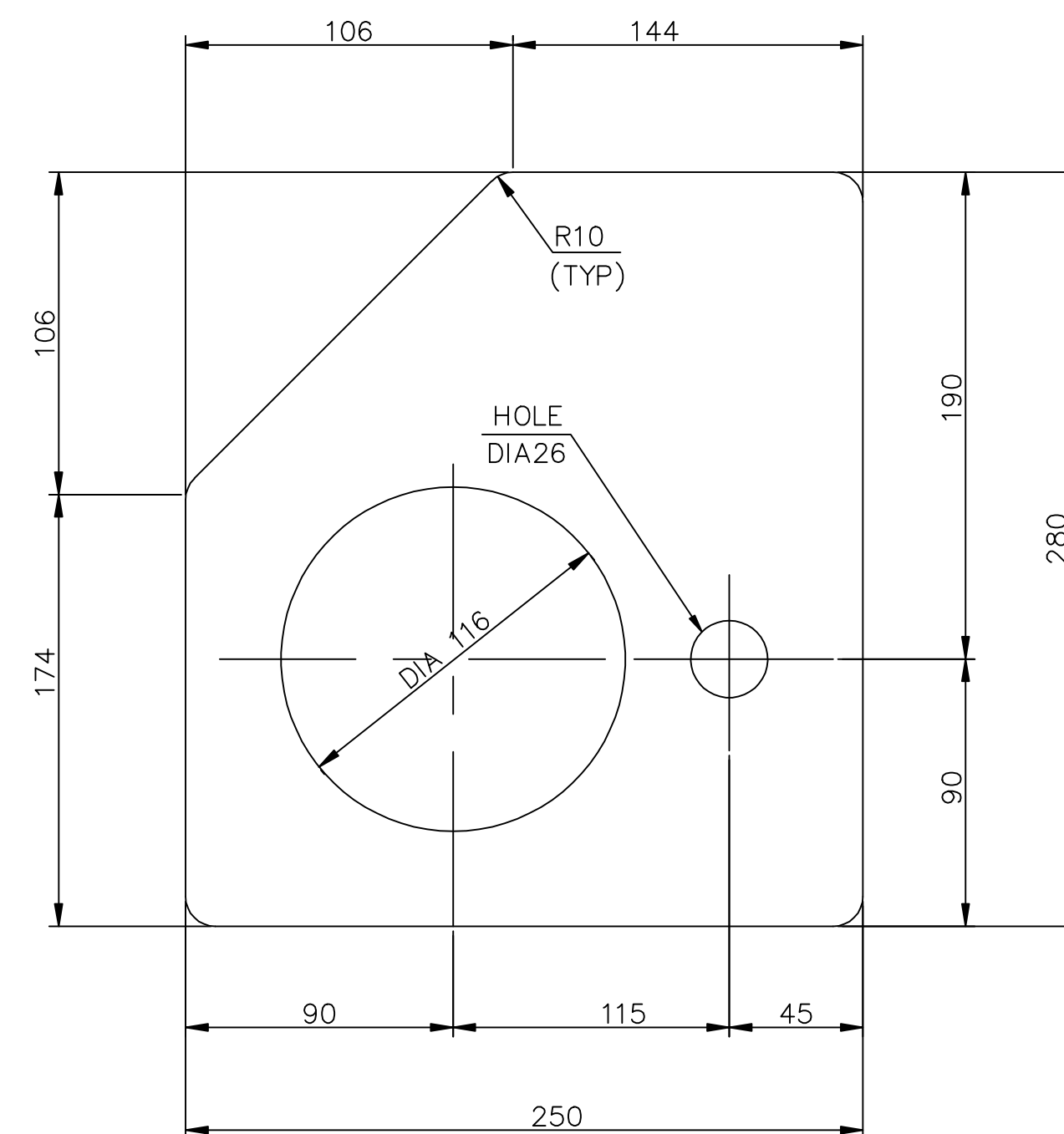
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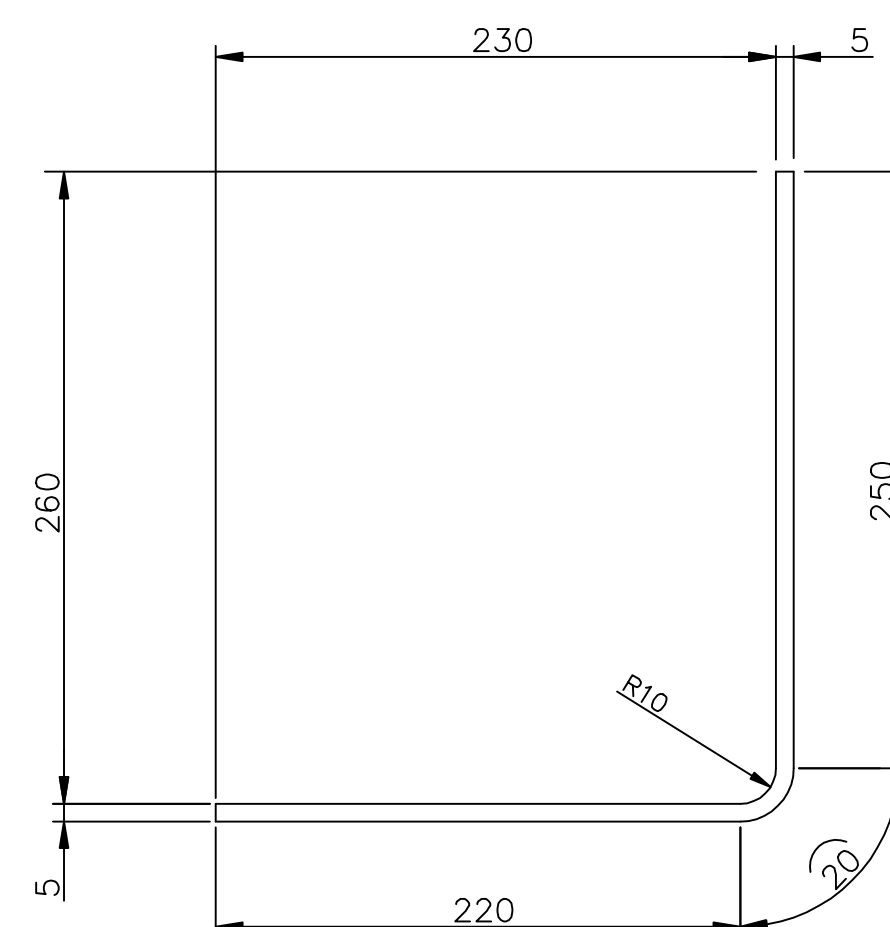
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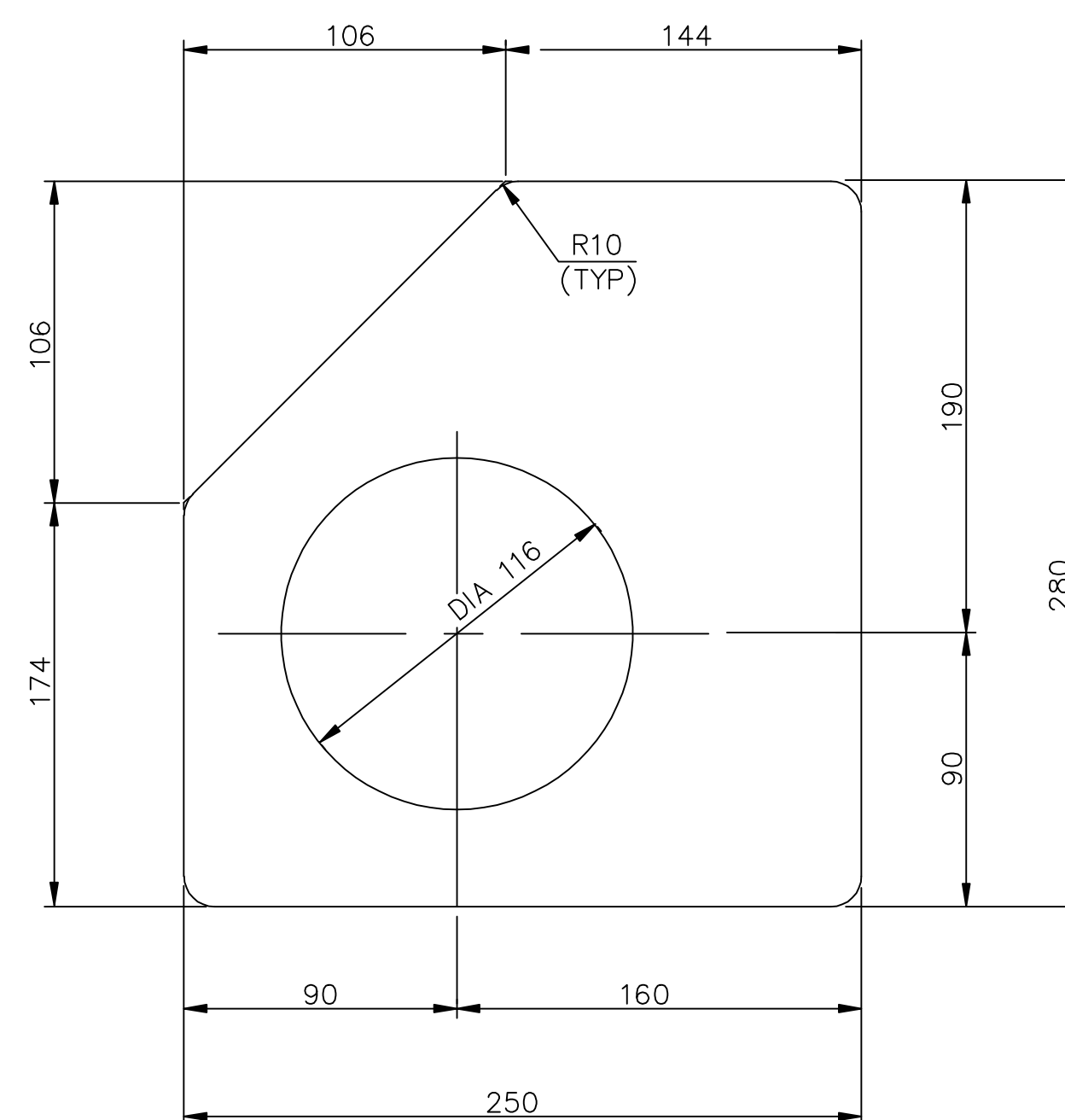
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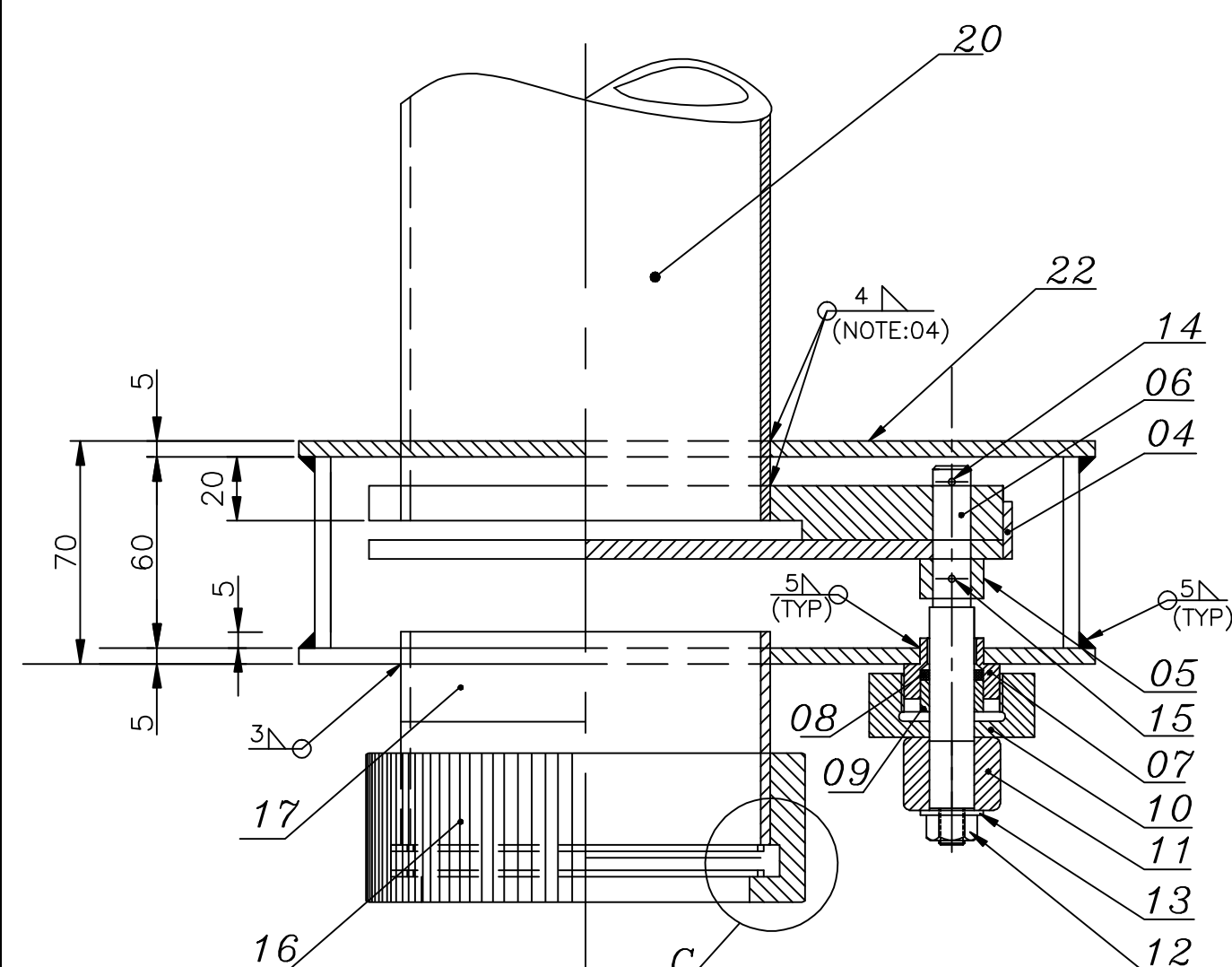
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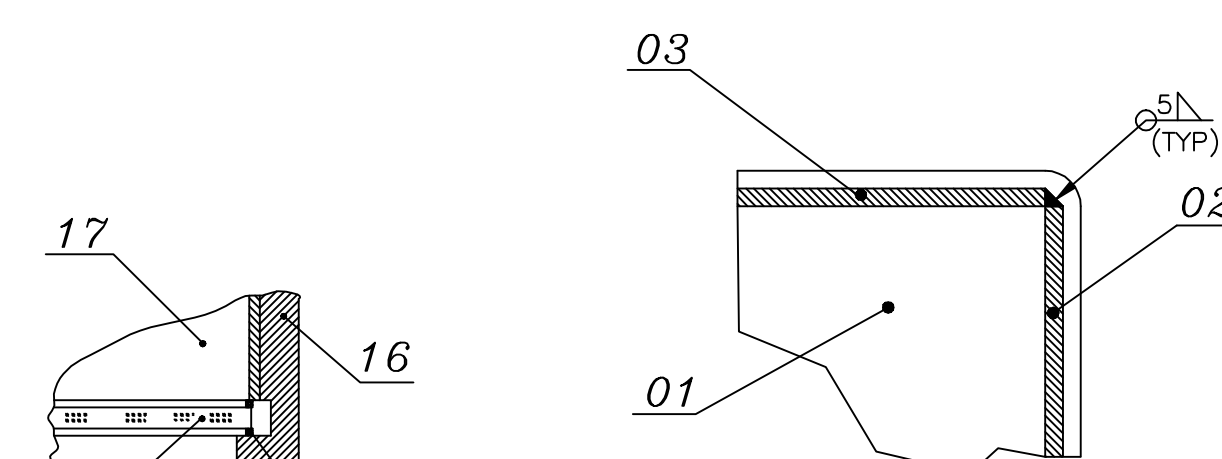
ITEM NO.02



ITEM NO.22

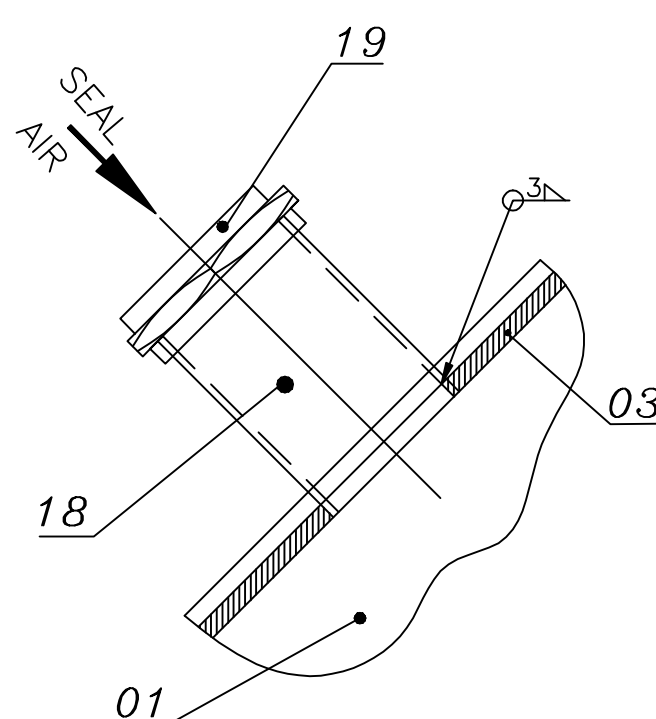


SECTION AA

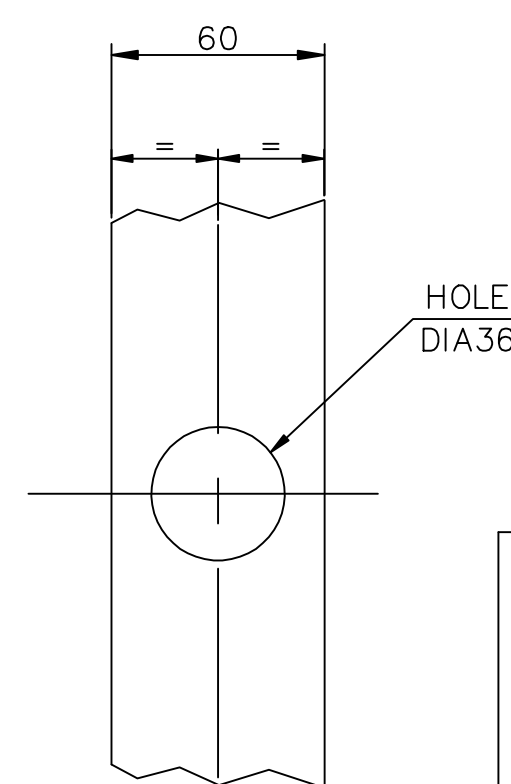


DETAIL-C

CORNER WELDING DETAIL



DETAIL-B



VIEW-P

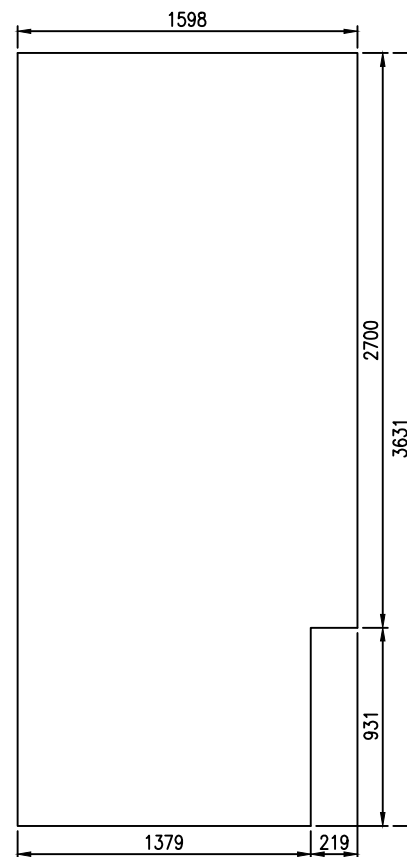
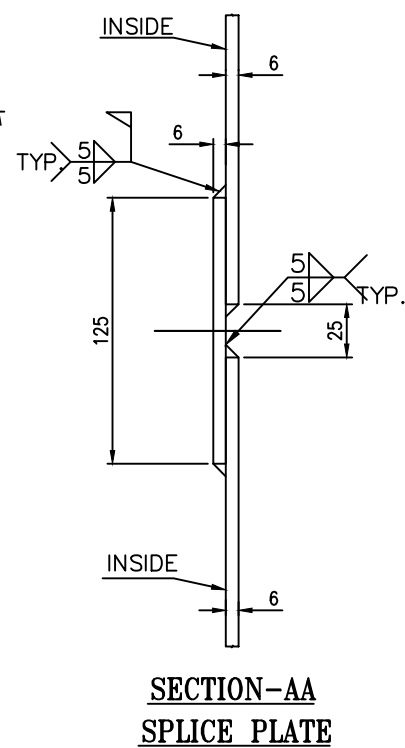
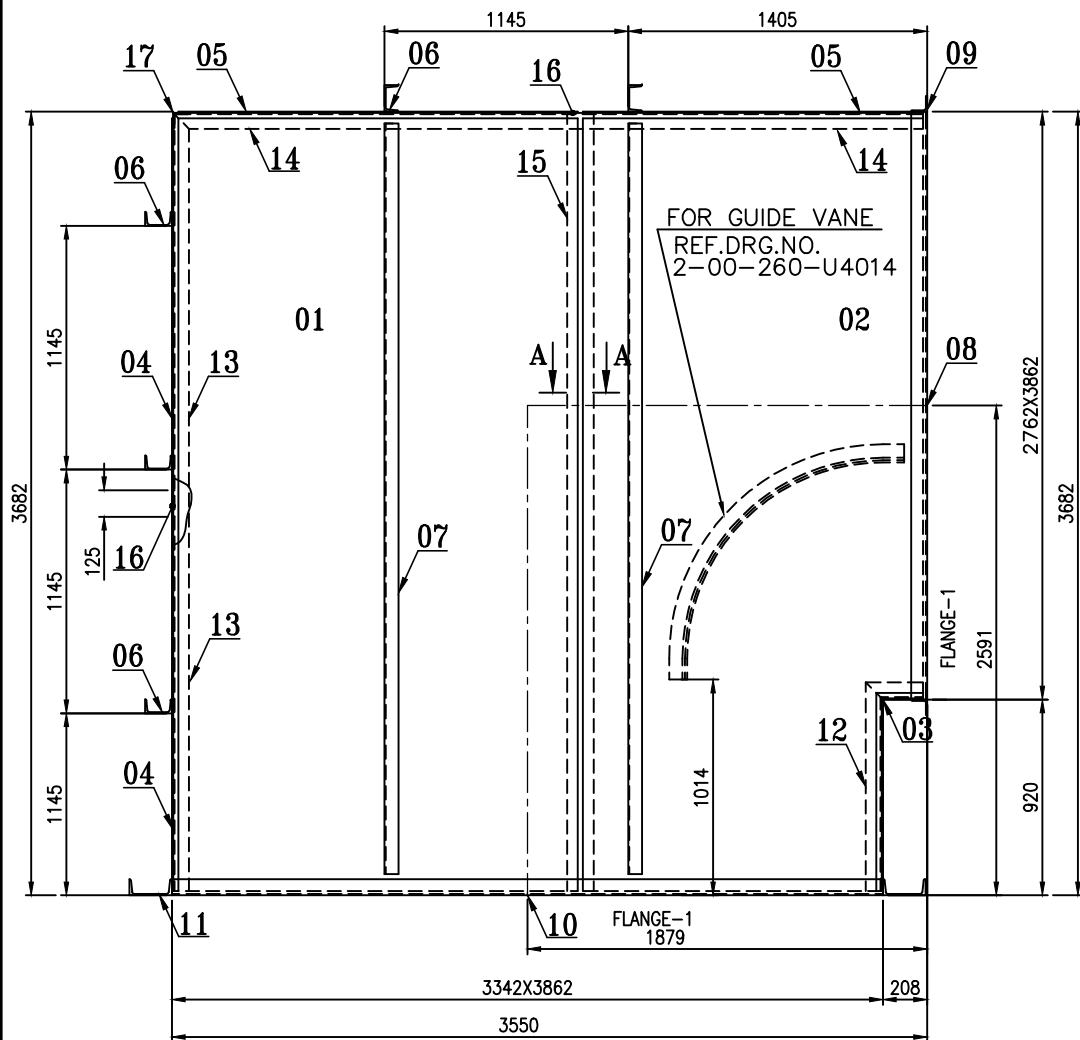
NOTES:

01. ALL WELDS SHOULD BE AIR TIGHT.
02. ITEM NO.02 TO BE WELDED AFTER ENSURING PROPER ALIGNMENT AND FREE MOVEMENT OF DOOR.
03. ITEM NO.23 TO BE SENT AS A SEPARATE DU.
04. USE ELECTRODE E 309 FOR WELDING ITEM NO.20.WITH ITEM NO.04 & 22.
05. OPEN THE STRANDS OF THE ITEM NO.08 AND USE AS GLAND PACKING.

	23	HEAT RESISTANT GLASS DIA 109x5 THK			591541800000 SUB-DELY	NO L	0.200 1		
	22	PL 5x250x280			150110290000 IS2062FE410A	NO	2.112 1		
	21	CAF JOINTING GR O/1 3xDIA 111/105			220204610000	NO	0.006 2		
	20	PIPE DIA114.3x4.5; 1000 L			159510490000 SA213TP 304H	C NO	12.190 1		
	19	UNION 1"			170340250000 U-1"-15-871-61	NO	0.348 1		
	18	ERW TUBE Nb25x3.2; L=55	4-48-200-U0020		150386230000 IS1239	NO	0.131 1		
	17	PIPE Nb 100x3.6; L=60	4-48-200-U0019		150386190000 IS1239	NO	0.583 1		
	16	CAP-I PL 50xDIA140	4-48-425-U0025		150111060000 IS2062FE410B	NO	1.620 1		
	15	SPLIT PIN 4x45			417044004500		0.005 1		
	14	SPLIT PIN 4x25			417040402500	NO	0.003 1		
	13	WASHER PUNCHED A8			414080000800	NO	0.002 1		
	12	NUT M8			413040000800	NO	0.005 1		
	11	SPHERICAL HANDLE	3-48-425-U0035		WELDMNT	NO	0.570 1		
	10	CAP-II PL 25x50x58	4-48-425-U0023		150110810000 IS2062FE410B	NO	0.194 1		
	09	BUSH ROD DIA 25; 10L	4-48-425-U0022		153391390000 SA105	NO	0.023 1		
	08	PACKING ROPE DA SQ6mm; L=100			220203330000	NO	0.035 1		
	07	GLAND; ROD ø36; 24L	4-48-425-U0021		153392800000 SA105	NO	0.192 1		
	06	SHAFT; ROD ø16; L=118	4-48-425-U0024		150041060000 IS2062FE410A	NO	0.120 1		
	05	COVER	3-48-425-U0034		WELDMNT	NO	1.201 1		
	04	SUPPORT	3-48-200-U0036		WELDMNT	NO	3.291 1		
	03	PL 5x60x435			150110290000 IS2062FE410A	NO	0.980 1		
	02	PL 5x60x490			150110290000 IS2062FE410A	NO	1.150 1		
	01	PL 5x250x280			150110290000 IS2062FE410A	NO	2.090 1		
VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	S.D	DRAWING NUMBER	ITEM NO VAR NO	MATERIAL CODE MATERIAL SPECN	A/C/P D1	UNIT WEIGHT QUANTITY	CS ZONE

FORM NO. 0425/2

[illegible]



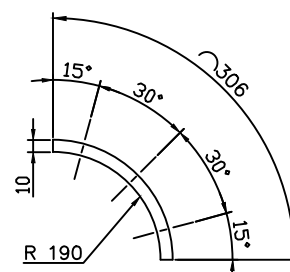
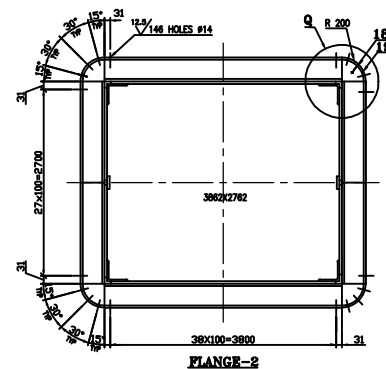
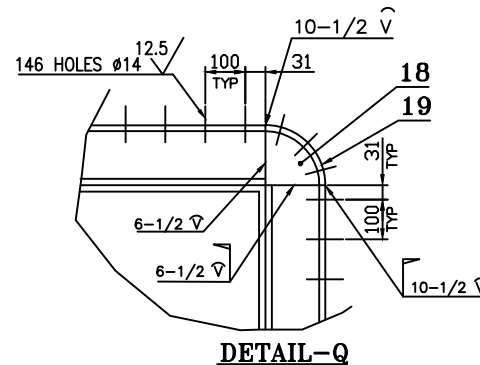
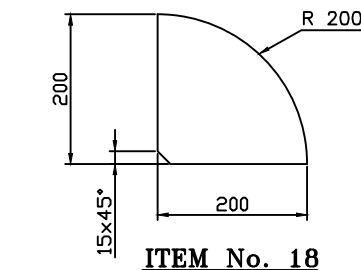
NOTE:

01. NTPC, DS CORNER, SHOP ASSEMBLED DUCT.
02. QTY GIVEN IN BOM IS FOR ONE ASSEMBLY ONLY. NO OF ASSEMBLIES=1.

FLANGE DETAILS										
FLANGE NO.	REF	D	X	A	B	W	S	E	F	N
FLANGE-1	110	3342	761	0.83	761	3862	1188	1.3	1188	18

	19	PLATE 10 70X306			152110980000		1.681			
					IS2062Fe410A		8			
	18	PLATE 6 200X200			152110920000		1.884			
					IS2062Fe410A		8			
	17	CORNER ANGLE ISA 75X75X6–3850			150130050000		25.160			
					IS2062Fe410A		1			
	16	PLATE 6 125X3800			152110920000		22.373			
					IS2062Fe410A		2			
	15	PLATE 6 125X3656			152110920000		21.378			
					IS2062Fe410A		2			
	14	ISA 75X75X6 1762			150130050000		11.893			
					IS2062Fe410A		4			
	13	ISA 75X75X6 1918			150130050000		12.961			
					IS2062Fe410A		4			
	12	ISA 75X75X6 1250			150130050000		8.085			
					IS2062Fe410A		2			
	11	ISM 200 4262			150100380000		95.043			
					IS2062Fe410A		2			
	10	ISM 200 3342			150100380000		74.527			
					IS2062Fe410A		2			
	09	ISM 200X76 4012			150100380000		86.123			
					IS2062Fe410A		4			
	08	ISM 200X76 2762			150100380000		61.593			
					IS2062Fe410A		4			
	07	ISM 125 3526			150100020000		47.304			
					IS2062Fe410A		4			
	06	ISM 125 3750			150100020000		49.518			
					IS2062Fe410A		5			
	05	PLATE 6 1737X3800			152110920000		309.814			
					IS2062Fe410A		2			
	04	PLATE 6 1803X3800			152110920000		322.701			
					IS2062Fe410A		2			
	03	PLATE 6 1089X3800			152110920000		194.909			
					IS2062Fe410A		1			
	02	PLATE 6 1598X3631			152110920000		273.290			
					IS2062Fe410A		2			
	01	PLATE 6 1877x3631			152110920000		321.005			
					IS2062Fe410A		2			
VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT	3
					VAR NO	MATERIAL SPECN		DI	QUANTITY	

DESPATCH TABLE										
S.NO.	DESCRIPTION	DU. NO.	NO. OFF	ITEM NOS.						
				NO. OFF						
01	BEND DUCT WALL	079	2	01	07	15				
				1	1	1				
02	BEND DUCT WALL	080	2	02	07					
				1	1					
03	BEND DUCT WALL	081	1	03	11	12				
				1	1	2				
04	BEND DUCT WALL	082	1	04	06	11	13	16		
				1	1	1	2	1		
05	BEND DUCT WALL	083	1	04	06	13	17			
				1	2	2	1			
06	BEND DUCT WALL	084	1	05	06	14	16			
				1	1	2	1			
07	BEND DUCT WALL	085	1	05	06	14				
				1	1	2				
08	FLANGE – 2/1	086	2	08	09	18	19			
				1	1	2	2			
09	FLANGE – 2/1	087	2	08	09	18	19			
				1	1	2	2			
10	BEND DUCT WALL	088	2	10						
				1						



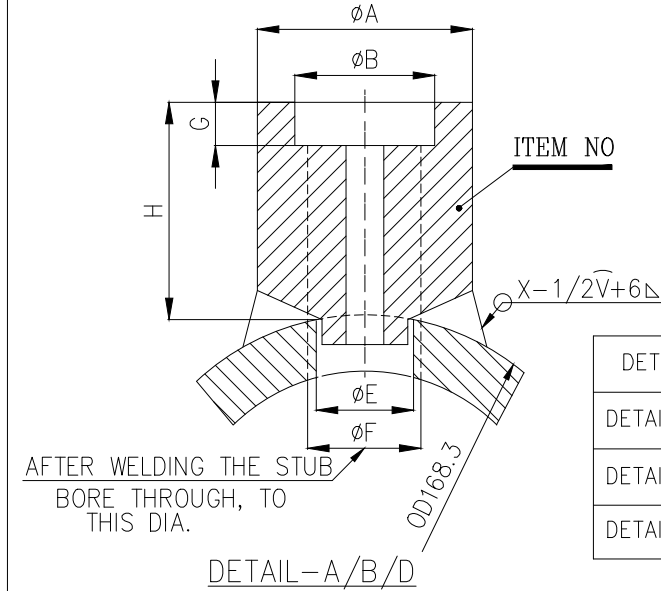
IMPORTANT NOTE :

SS PLATE GUIDE VANES SHALL BE FIXED TO THE CS SUPPORT ANGLES, WHICH WILL BE AN "ADD-ON" TO THE ABOVE DETAILED DUCT. THE DRAWING FOR THIS "ADD-ON" SHALL BE ISSUED SEPERATELY AFTER FINALISATION "CFD-ANALYSIS" BY BURNER VENDOR. THE SAME ARE TO BE INSTALLED IN THE DUCT BEFORE DISPATCH OF THE DUCT AS "DU".

REV NO.	ZONE	BRIEF RECORD OF REVISIONS	PPD.	CHD.	APPD.

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		Bharat Heavy Electricals Ltd UNIT: HEAVY PLATES & VESSELS PLANT VISAKHAPATNAM-530012			DRN	NAME <i>Prikanth P</i>	DATE 09.05.18
					CHD	M.S. KUMAR	09.05.18
					APPD	P.K. SAHOO	09.05.18
DEPT	ALL DIMENSIONS ARE IN MM		SCALE	WEIGHT (Kg) 4272.107	REF TO ASSY / OLD DWG		
CODE							
TITLE BEND DUCT- 4					DRAWING NO : 2-48-012-U0087		REV 0



DETAIL	SIZE	ØA	ØB	ØE	ØF	G	H	X	ITEM NO
DETAIL-A	NB50	76	61.3	47	53	16	60	15	04
DETAIL-B	NB40	62	48.9	36	41	13	48	14	05
DETAIL-D	NB25	46	34	23	27	13	44	12	06

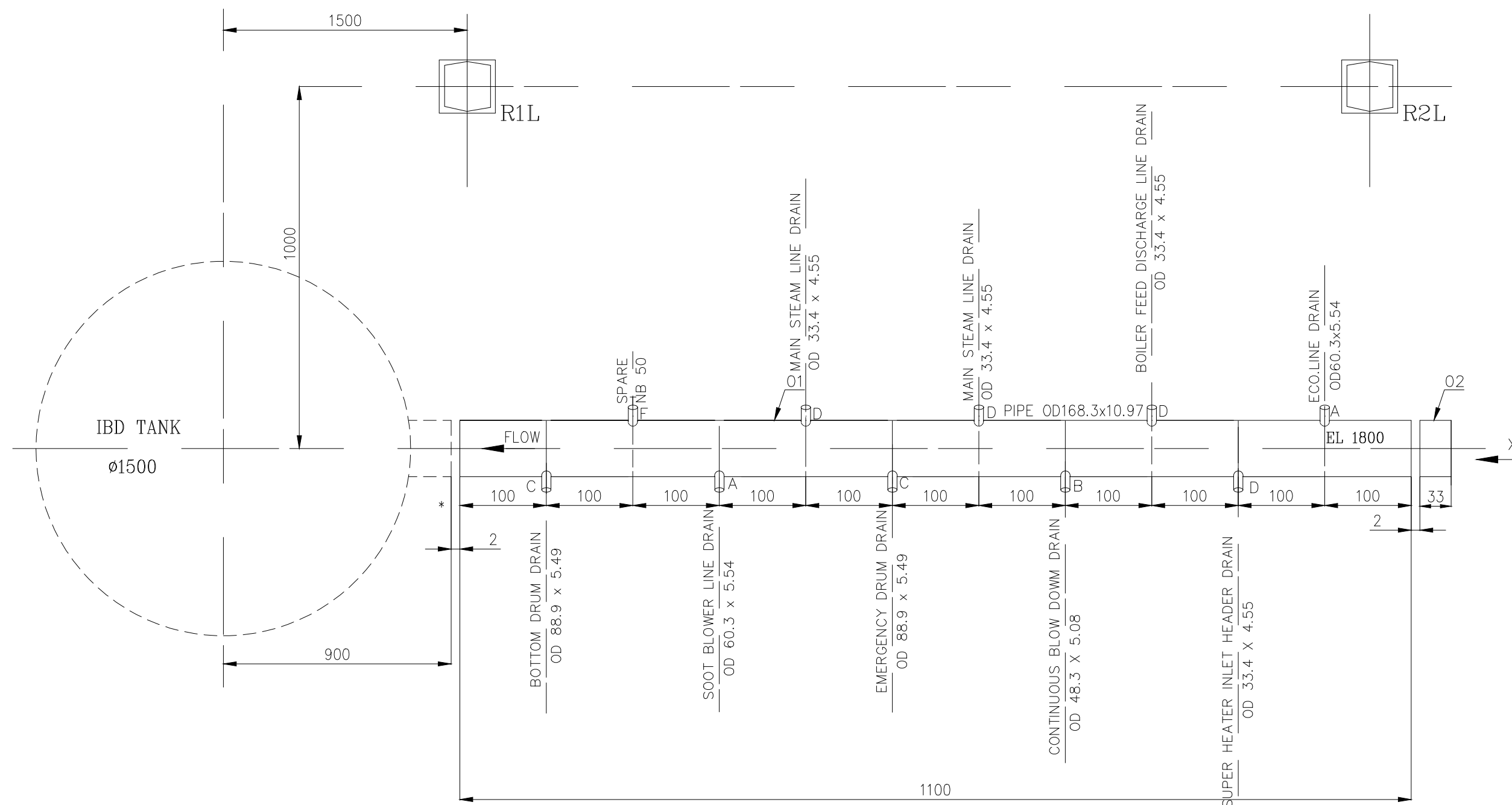
NOTES: —

ALL DIMENSIONS ARE IN MILLIMETRES

- 01 DESIGN PRESSURE : 7 Kg/Cm² (g)
02 DESIGN TEMPERATURE : 110°C
03 WORKING MEDIUM : WATER
04 HYDRAULIC TEST NEED NOT BE DONE IN THE SHOP
05 FOR STANDARD NOTES OF PRODUCTION & ERECTION OF PIPES AND TOLERANCE ON
FITTINGS REFER DRG.No.4-80-001-37654 & 4-80-301-26192 RESPECTIVELY
06 FOR ERECTION WELDING SCHEDULE REFER DRG No. 4-80-366-U9117.
07 COMPONENTS FOR HANGERS & SUPPORTS ARE ISSUED IN PGMA 80-921
08 FOLLOW APPLICABLE QCP
09 * INDICATES 2 mm WELD GAP, WELD AT SITE
10 PIPE EDGE PREPARATION & ELECTRODE DETAILS ARE AS FOLLOWS UNLESS
OTHERWISE INDICATED.

[illegible]

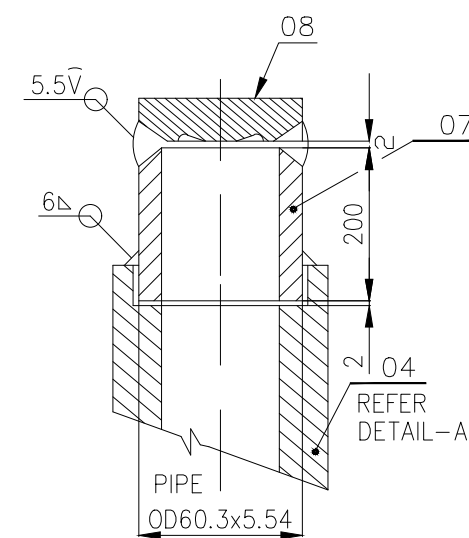
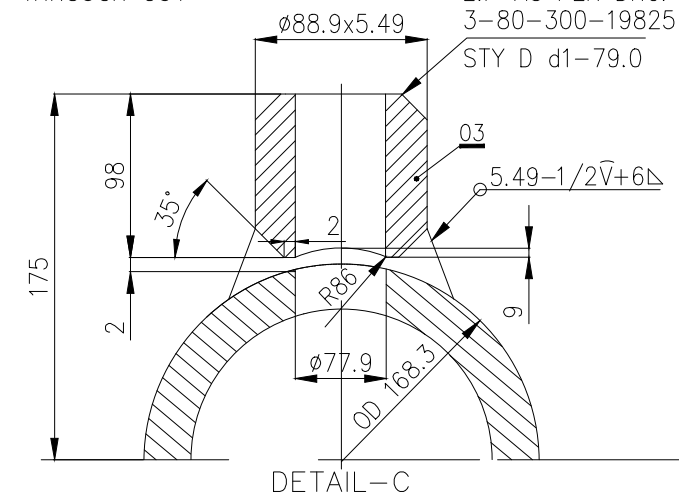
10 FOR ITEM NO:02&08 PLATE OF SA516GR70 SPEC IS ALSO ACCEPTABLE



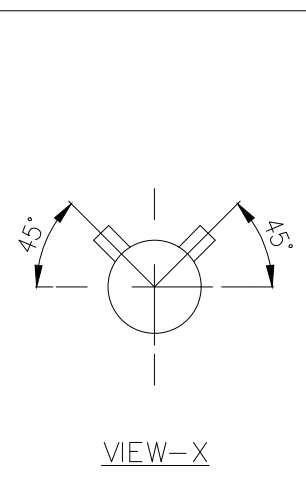
PLAN VIEW

**BRANCH PIPE SHALL BE CUT TO SUIT THE
OUTER SURFACE OF THE MAIN PIPE SUCH THAT
A UNIFORM GAP OF 2mm IS MAINTAINED
THROUGH OUT E.P AS PER DRG.

E.P AS PER DRG.
3-80-300-19825
STY D d1-79.0



DETAIL-F



VIEW-X

REV NO.	ZONE	BRIEF RECORD OF REVISIONS	PPD.	CHD.

IN NO WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY, MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED.IT CAUTION: THE INFORMATION ON THIS DOCUMENT IS THE

PROJECT:		60 TPH AUXILIARY BOILER, 19Kg/cm ² (g) AND 290 ^o c		
	BHARAT HEAVY ELECTRICALS LTD. UNIT : HEAVY PLATES & VESSELS PLANT VISAKHAPATNAM - 530012 (A.P)		NAME	DATE
		DRAWN	AVR	25.01.2019
		CHECKED	A VENKATA RAO	25.01.2019
		APPROVED	K TARAKESH	25.01.2019
TITLE : IBD TANK MANIFOLD				
UNIT : VISAKHAPATNAM	SCALE : NTS	DWG. NO. : 2-80-366-U9016		REV. 0

INVENTORY NO

SIGN. AND DATE

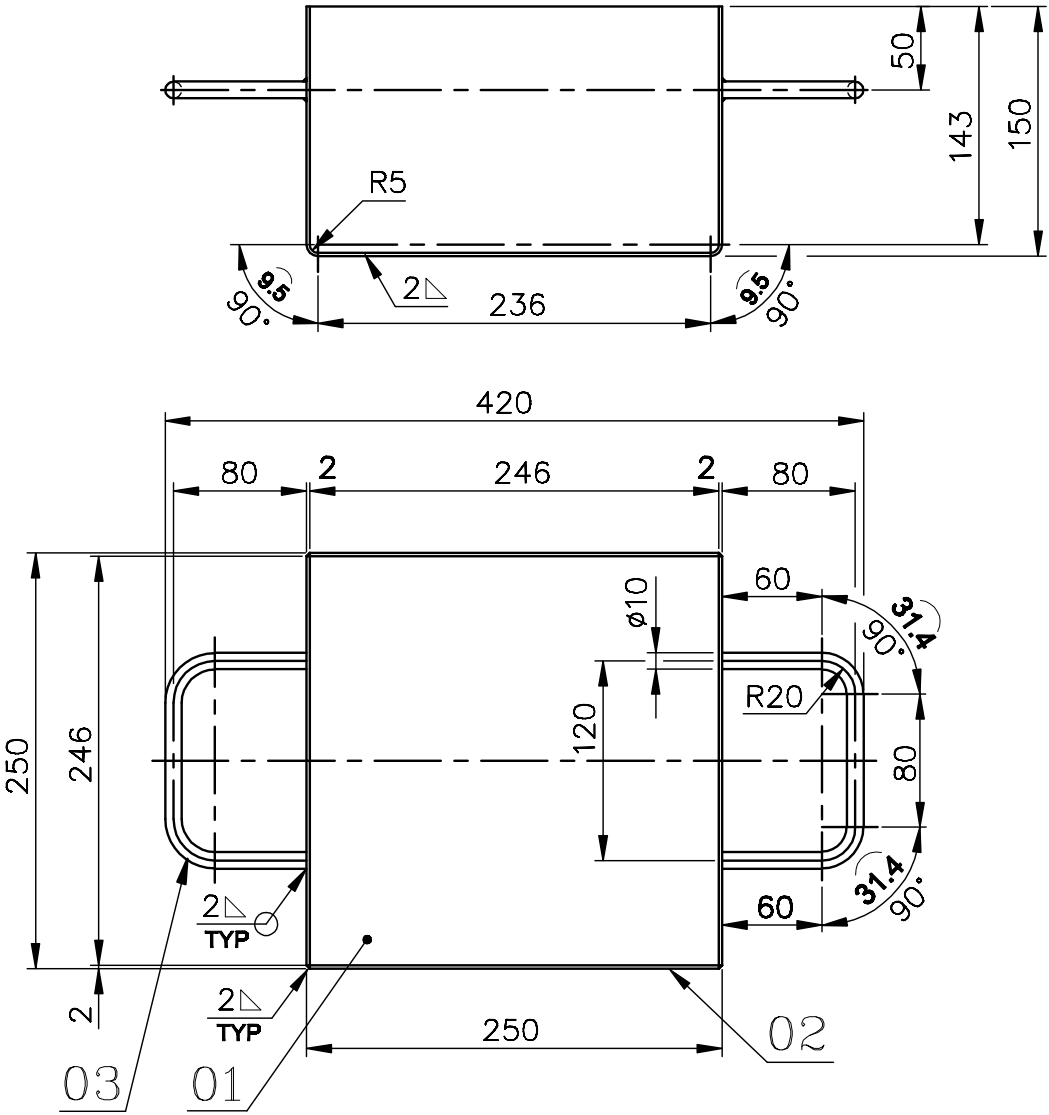
REF. DRG. NO.

COMPUTER FILE NAME

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FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)



DRG. NO.
3-42-010-U6037

NOTE:
01. WELD LIQUID TIGHT.

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT	CS
					VAR NO	MATERIAL SPECN			QUANTITY	
	03	ROD D10 ; 263L				15 004 042			0.163	
						IS2062FE410A			2	
	02	SHEET 2x148x246				15 011 104			0.572	
						IS513D			2	
	01	SHEET 2x246x541				15 011 104			2.089	
						IS513D			1	

S.O. 7779

REV	DATE	ALTERED :
01		CHD & APPD :
ZONE		

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TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT



Bharat Heavy Electricals Ltd
UNIT: HEAVY PLATES & VESSELS PLANT
VISAKHAPATNAM - 530012

DRN	NAME	DATE
	T.S.S.RAO	22.12.2017
CHD	S.SANKARA RAO	22.12.2017
APPD	S.VIJAY	22.12.2017

DEPT	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	WEIGHT (Kg)
HTE			N.T.S.	3.559
CODE	320			

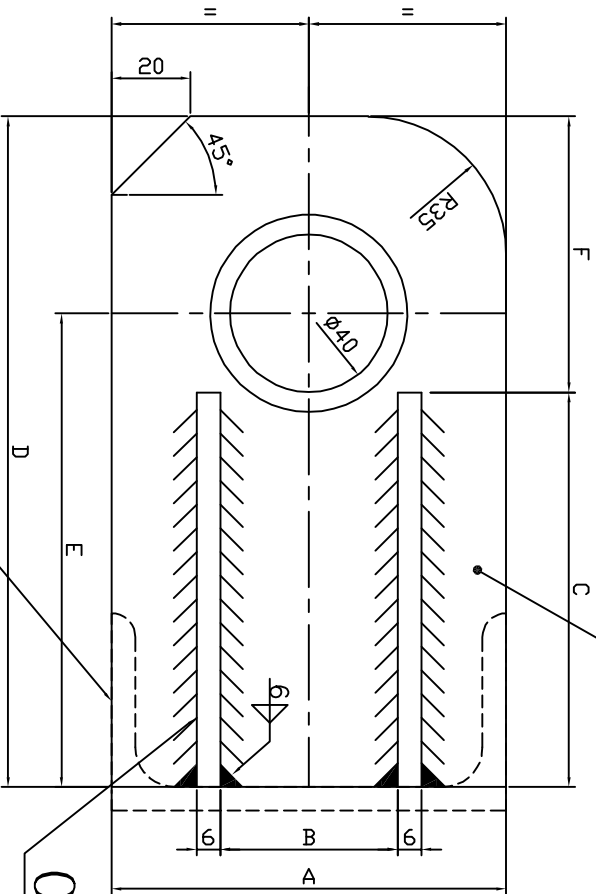
REF TO ASSY / OLD DWG
3-42-010-00298

TITLE
TRAY
(250x250x150)

DRAWING NO :
3-42-010-U6037

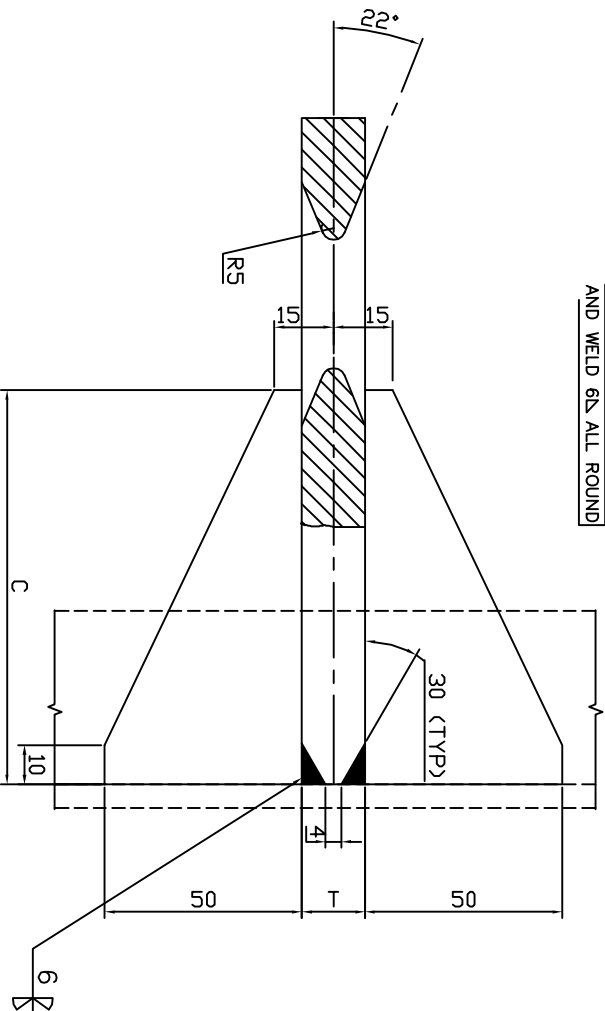
REV
00

01



FLAME CUT ITEM NO.1 TO
SUIT THE FRAME CHANNEL
AND WELD 6% ALL ROUND

02



NOTE:

CUT ITEM 02 ACCORDING TO THE REQUIREMENT.

STYLE.NO	A	B	C	D	E	F	T	TOTAL WT
01	100	45	100	170	120	50	16	2.667
02	75	30	100	170	120	50	16	2.495

TYPE OF WELD	TYPE OF ELECTRODE	WELD LENGTH
6V	E7018	0.50
6L	E7018	2.50

FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER PLANT STD.NO TP 023 0299

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	DRAWING NUMBER	ITEM NO	MATERIAL CODE	UNIT WEIGHT
02	02	FLAT 50 X 6;			15 008 011	1.180
		500L			IS2062FE410A	1
02	01	PLATE 16X75X169			15 011 026	1.315
					IS2062FE410A	1
01	02	FLAT 50 X 6;			15 008 011	1.180
		500L			IS2062FE410A	1
01	01	PLATE 16X100X170			15 011 026	1.487
					IS2062FE410A	1

REV	DATE	ALTERED :
01		CHD & APPD:
ZONE		

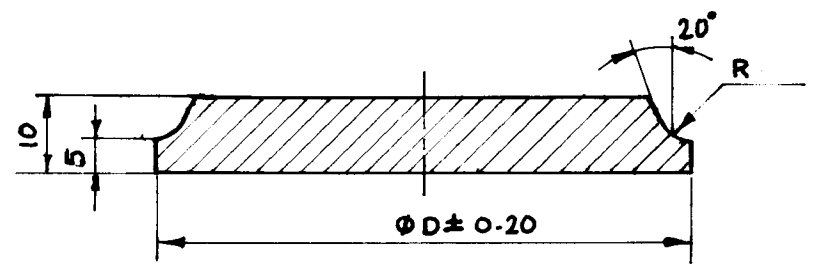
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT				NAME				DATE
 Bharat Heavy Electricals Ltd UNIT: HEAVY PLATES AND VESSELS PLANT VISAKHAPATNAM - 530012				DRN	T.S.RAO	SIGNATURE		08.05.19
				CHD	S.S.RAO			08.05.19
				APPD	S.VIJAY			08.05.19
DEPT	HTE	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	N.T.S	WEIGHT (Kg)	REF. TABLE	REF TO ASSY / OLD DWG
CODE	320							
TITLE								DRAWING NO :
LIFTING EYE								3-42-076-U608600
								REV

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3-42-156-U6073
DRAWING NO.

ALL DIMENSIONS ARE IN MILLIMETRES

12.5



VAR NO.	PIPE SIZE	D ± 0.20	R
01.	1/2 (21.3 x 2.77)	13.50	2
02.	1 (33.4 x 3.38)	24.20	2
03.	1 1/2 (48.3 x 4.6)	38.75	2
04.	2 (60.3 x 5.91)	50.00	2
05.	3 (88.9 x 7.4)	77.00	5
06.	4 (114.3 x 9.02)	100.00	5
07.	6 (168.3 x 11)	152.00	5

07.		PL 10 X Ø152				15-042-110	C		0	590
						SA 515 GR. 70				
06.		PL 10 X Ø100				15-042-110	C		0	390
						SA 515 GR. 70				
05.		PL 10 X Ø77				15-042-110	C		0	300
						SA 515 GR. 70				
04.		PL 10 X Ø50				15-042-110	C		0	155
						SA 515 GR. 70				
03.		PL 10 X Ø38.75				15-042-110	C		0	092
						SA 515 GR. 70				
02.		PL 10 X Ø24.20				15-042-110	C		0	036
						SA 515 GR. 70				
01.		PL 10 X Ø13.50				15-042-110	C		0	012
						SA 515 GR. 70				
VAR NO.	ITEM NO.	DESCRIPTION	STD	DRAWING NO.	ITEM NO.	MATL CODE	A	UNIT	UNIT WT.	
					VAR NO.	MATL SPECN	C	DI	QTY.	

REV	DATE	ALTERED
		CHECKED

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TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

Bharat Heavy Electricals Ltd

UNIT: HEAVY PLATES & VESSELS PLANT

VISAKHAPATNAM - 530012

DEPT ENGG.

CODE 320

GRADE OF UNTOLED DIM

Ø / M / F

SCALE

N.T.S

WEIGHT (KG).

-

NAME

T.S.S.RAO

DATE

28.09.2018

NO. OF VAR.

CHD

G.PAVANI LATHA/S.SANKARA RAO

DATE

28.09.2018

APPD

S.VIJAY

DATE

28.09.2018

REF. TO ASSY/OLD DRG.

3-42-156-80096

ITEM NO.

NO. OF ITEMS

TITLE

SW BLIND END COVER

CARD CODE

U 01

DRAWING NO.

3-42-156-U6073

REV

00

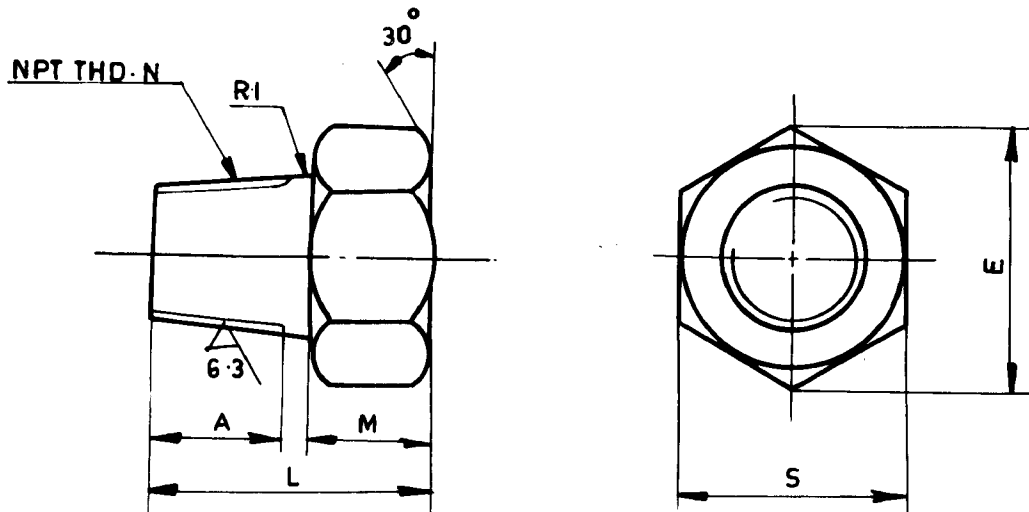
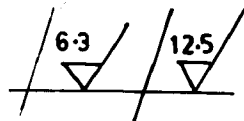
Size A3

TP-DG-3-42-156-80096
CORPORATE DRG ID

FIRST ANGLE PROJECTION (ALL DIMENSIONS IN MILLIMETRES)

3-43-200-U0006

DRAWING NO.



STYLE	NPT THD. N	A	M	L	E	S
01	1/8"	10	12	25	22	19
02	1/4"	15	12	30	22	19
03	3/8"	15	12	30	27.7	24
04	1/2"	20	12	35	34.6	30
05	3/4"	20	15	40	41.6	36
06	1"	25	15	45	47.3	41

06		SCREW PLUG 1" NPT ROD D 47.3 ; 45 L				15 - 339 - 142	A		0.370	
						SA 105				
05		SCREW PLUG 3/4" NPT ROD D 41.6 ; 40 L				15 - 339 - 142	A		0.240	
						SA 105				
04		SCREW PLUG 1/2" NPT ROD D 34.6 ; 35 L				15 - 339 - 141	A		0.140	
						SA 105				
03		SCREW PLUG 3/8" NPT ROD D 27.7 ; 30 L				15 - 339 - 140	A		0.080	
						SA 105				
02		SCREW PLUG 1/4" NPT ROD D 22 ; 30 L				15 - 339 - 139	A		0.050	
						SA 105				
01		SCREW PLUG 1/8" NPT ROD D 22 ; 25 L				15 - 339 - 139	A		0.040	
						SA 105				
VARIANT NO.	ITEM NO.	DESCRIPTION	STD	DRAWING NO.	ITEM NO.	MATL. CODE	A/C	UNIT	UNIT WT.	CS
					VAR NO.	MATL. SPEC.			QTY.	

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

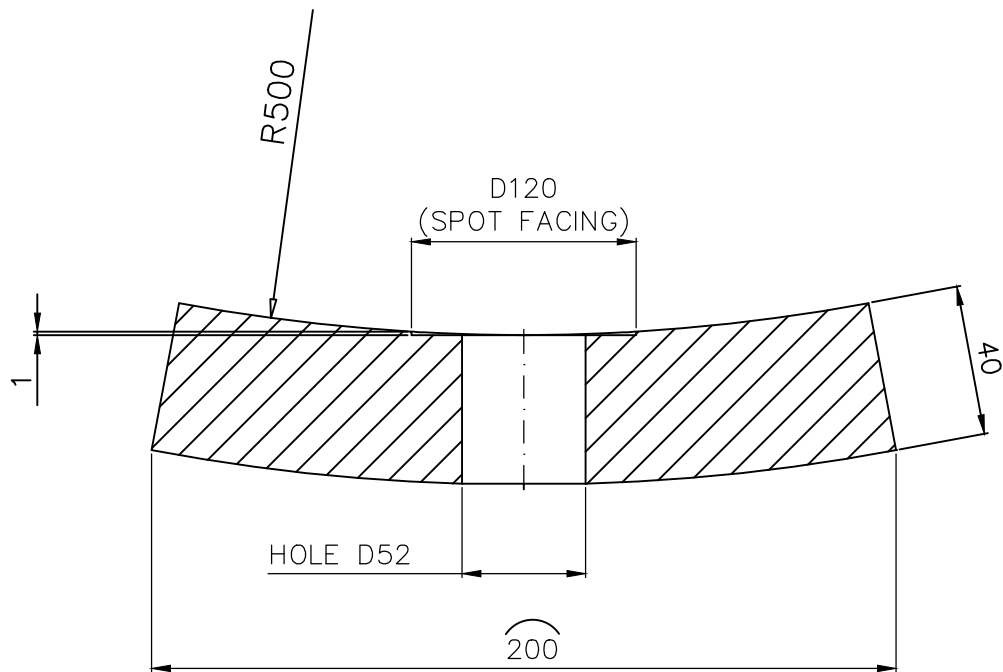


Bharat Heavy Electricals Ltd
UNIT : HPVP PLANT
VISAKHAPATNAM - 530012

DRN.	NAME	DATE	NO. OF VAR
	M. Velandi	31/5/85	
CHD.	M. J. S	5/6/85	
APPD.	Jaffar	5/6/85	

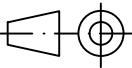
REV 01	DATE	ALTERED CHECKED	DEPT ENGG.	GRADE OF UNTO L DIM E/M/F	SCALE N.T.S.	WEIGHT (kg)	REF TO ASSY / OLD DRG 3-42-000-01071-00	ITEM NO.
			CODE 320					
			TITLE NPT PLUGS	CARD CODE U 01	DRAWING NO. 3-43-200-U0006	REV. 00		

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VARIANT NUMBER	PL. 40 X 120 X 200	STD	150111840000	N		6.850	
			IS 2062 Gr.B				
	DESCRIPTION		MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT	
			MATERIAL SPECN			QUANTITY	

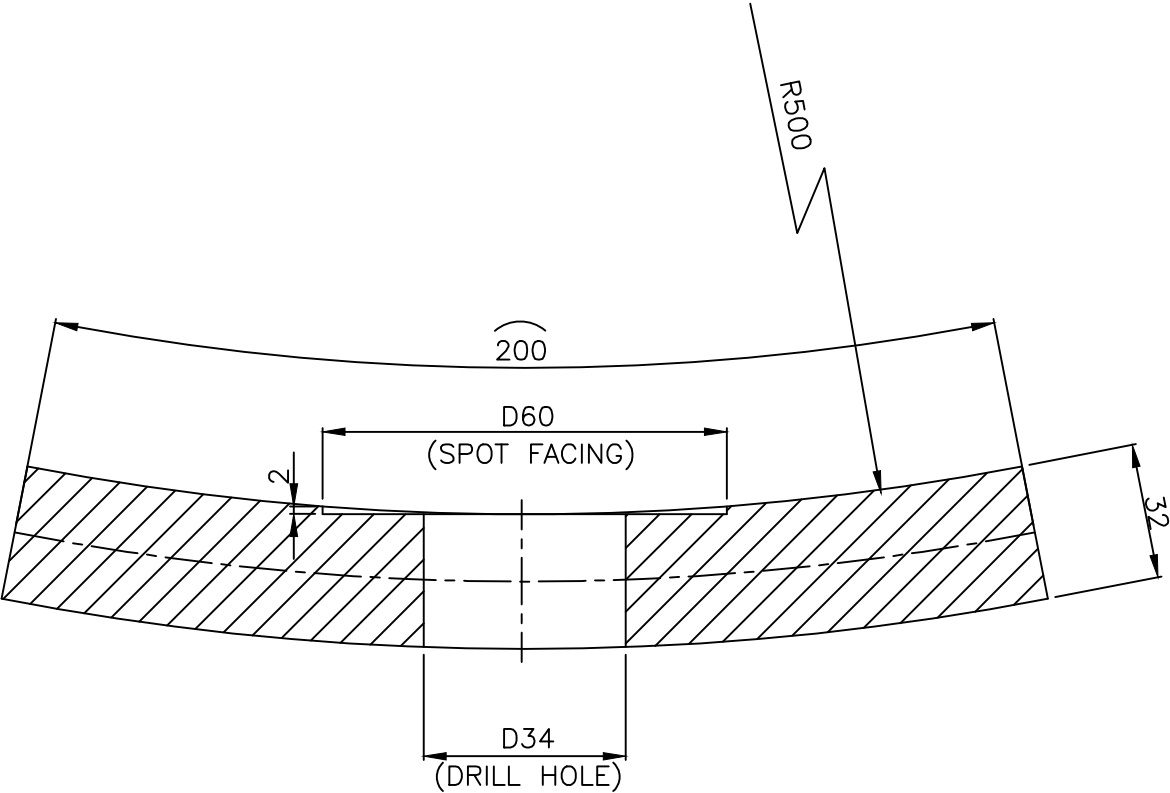
FORM NO. 0420/2

		Bharat Heavy Electricals Ltd UNIT: HEAVY PLATES & VESSELS PLANT VISAKHAPATNAM-530012		DRN	NAME R.A.RAJU	SIGNATURE	DATE 21.08.19	
				CHD	M.IJAZ		21.08.19	
				APPD	A.N.V.K.KISHORE		21.08.09	
				REF TO ASSY / OLD DWG ----				
DEPT PP.ENG	ALL DIMENSIONS ARE IN MM	PROJECTION 	SCALE N.T.S	WEIGHT (Kg) 6.850	DRAWING NO : 4-12-913-U8220			REV 00
CODE 031								
TITLE ROCKER WASHER								

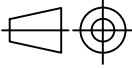
CAUTION : The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

REV	DATE	ALTERED
		CHD & APPD

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING
MANUFACTURE REFER RELEVANT Q.C.P\Q.P
MANUFACTURING AS PER RELEVANT Q.C.P\S.Q.P



	PL.32X120X200		150111300000	C	6.000
			IS2062GRB		
VARIANT NUMBER	DESCRIPTION	STD	MATERIAL CODE	A/C/P	UNIT WEIGHT
			MATERIAL SPECN	UNIT	QUANTITY

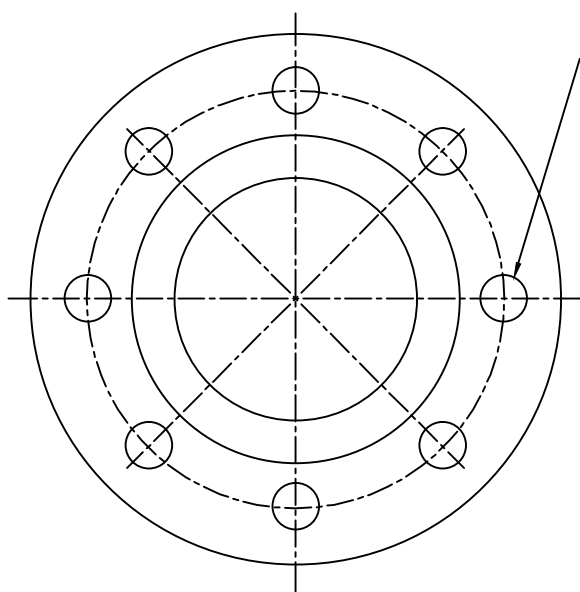
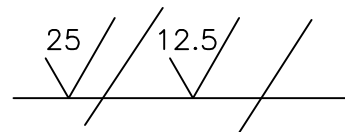
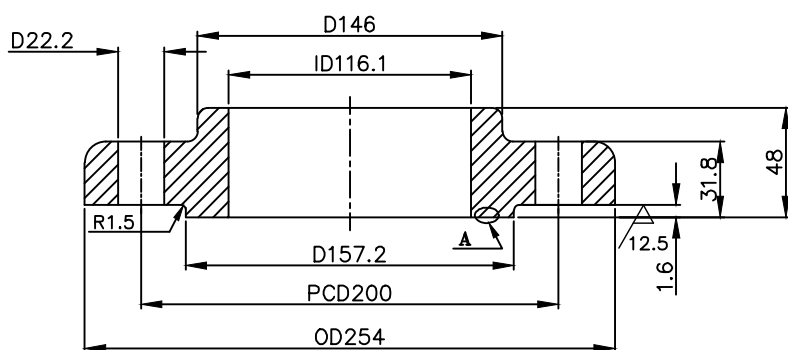
		Bharat Heavy Electricals Ltd		DRN	V.RAMESH	DATE	06.07.19
		UNIT: HEAVY PLATES AND VESSELS PLANT		CHD	M.V.R.PRASAD		06.07.19
		VISAKHAPATNAM - 530012		APPD	Y.PRASANNA KUMAR		06.07.19
DEPT	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	WEIGHT (Kg)	REF TO ASSY / OLD DWG		
HT ENGG			N.T.S	6.000	4-19-911-85211		
CODE							
320							
TITLE					DRAWING NO :		REV
ROCKER WASHER					4-19-911-U8272		00

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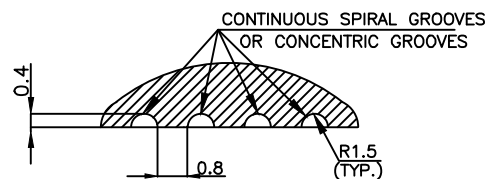
REV	DATE	ALTERED
		CHD & APPD

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING

MANUFACTURE REFER RELEVANT Q.C.P\Q.P
MANUFACTURING AS PER RELEVANT Q.C.P\S.Q.P



8-HOLE D22.2
EQUALLY SPACED



DETAIL-A

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT	CS	ZONE
	01	OD254/ID116.1-50TK.PL			159421190000	SA 515 GR. 70	C		10.1		
					VAR NO	MATERIAL SPECN	A/C/P	D1			
									TOTAL WEIGHT (kg.)		



Bharat Heavy Electricals Ltd
UNIT: HEAVY PLATES & VESSELS PLANT
VISAKHAPATNAM - 530012

DRN	NAME	SIGNATURE	DATE
CHD	MURALI	Sd./-xxx	05.09.18
APPD	AVR/TARAKASH	Sd./-xxx	05.09.18
	AC MOHANTHY	Sd./-xxx	06.09.18

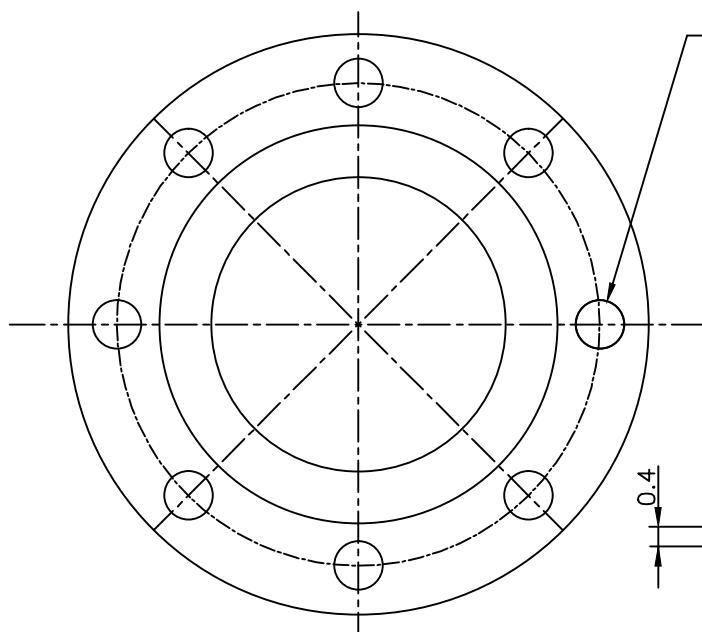
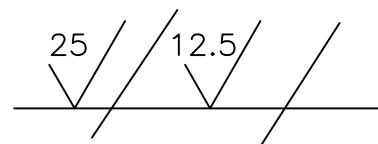
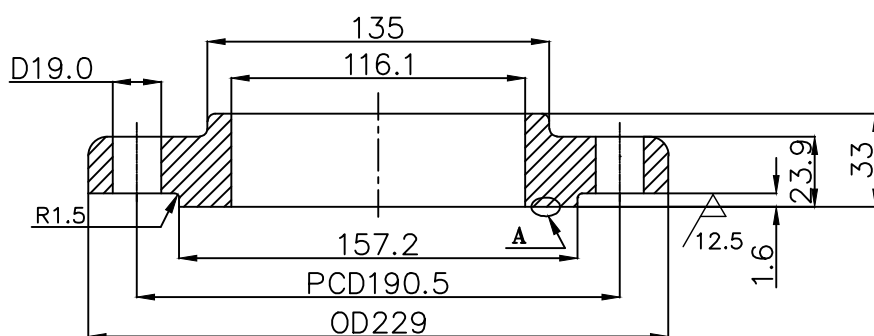
DEPT	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	WEIGHT (Kg)	REF/OLD DWG	REV
CODE			N.T.S.	10.1	ASME B16.5	
TITLE					DRAWING NO :	
CS S.O FLANGE - 4"x300#					4-24-420-U0155	00

A4 SIZE

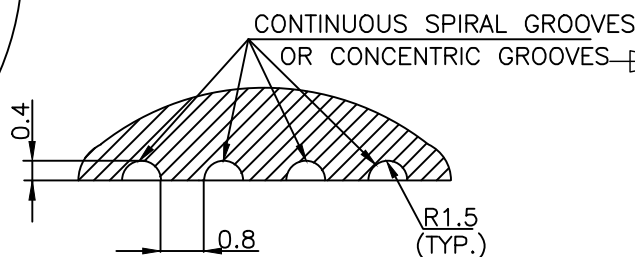
CAUTION : The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

REV	DATE	ALTERED
		CHD & APPD

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING
MANUFACTURE REFER RELEVANT Q.C.P\Q.P
MANUFACTURING AS PER RELEVANT Q.C.P\S.Q.P



8-HOLE D19
EQUALLY SPACED



DETAIL-A

	01	D229/D116.1 PL.50Tk			159421190000	C		5.9	
					SA 515 GR. 70				
VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT
					VAR NO	MATERIAL SPECN		D1	
									CS
									ZONE
									TOTAL WEIGHT (kg.)



Bharat Heavy Electricals Ltd
UNIT: HEAVY PLATES & VESSELS PLANT
VISAKHAPATNAM - 530012

DRN	NAME	SIGNATURE	DATE
	MURALI	Sd./-xxx	05.09.18
CHD	AVR/TARAKASH	Sd./-xxx	05.09.18
APPD	AC MOHANTHY	Sd./-xxx	06.09.18

DEPT	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	WEIGHT (Kg)
CODE			N.T.S.	5.9

REF. ASME B16.5

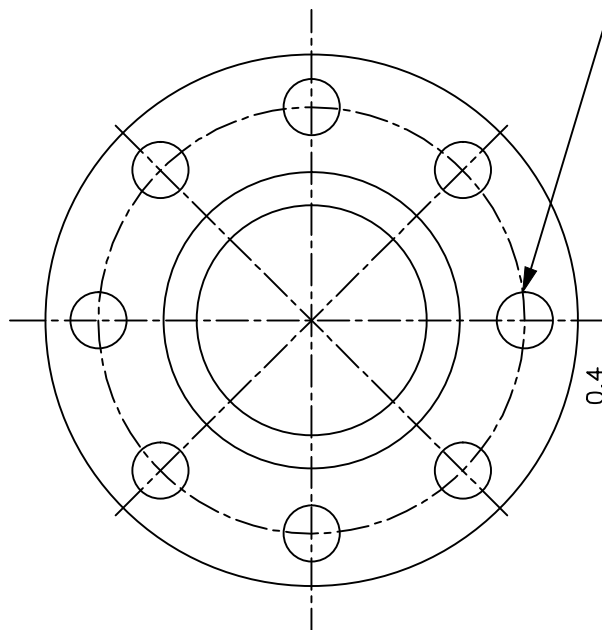
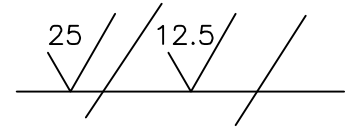
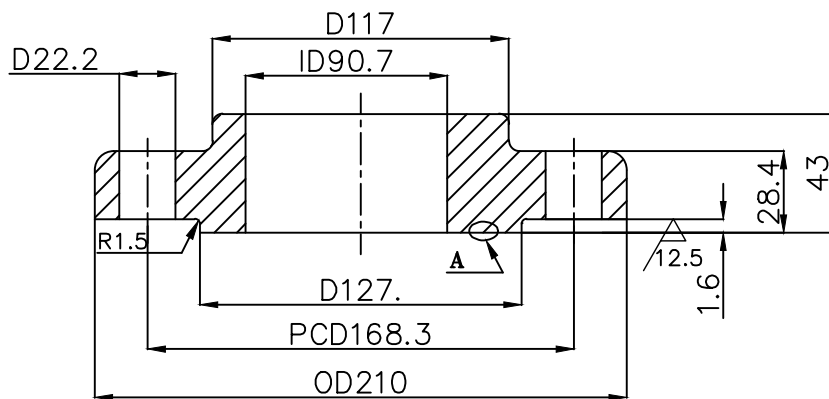
TITLE	DRAWING NO :	REV
CS S.O FLANGE-4"x150#	4-24-420-U0156	00

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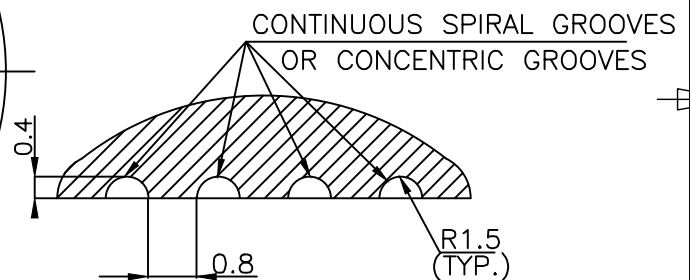
REV	DATE	ALTERED
		CHD & APPD

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING

MANUFACTURE REFER RELEVANT Q.C.P\Q.P
MANUFACTURING AS PER RELEVANT Q.C.P\S.Q.P



8-HOLES- D22.2
EQUALLY SPACED



DETAIL-A

	01	OD210 / ID90.7 PL.50Tk			159421190000	C		6.0	
					SA 515 GR. 70				
VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT
					VAR NO	MATERIAL SPECN	D1		
									CS
									ZONE
									TOTAL WEIGHT (kg.)



Bharat Heavy Electricals Ltd

UNIT: HEAVY PLATES & VESSELS PLANT
VISAKHAPATNAM - 530012

DRN	NAME	SIGNATURE	DATE
	MURALI	Sd./-xxx	05.09.18
CHD	AVR/TARAKASH	Sd./-xxx	05.09.18
APPD	AC MOHANTHY	Sd./-xxx	06.09.18

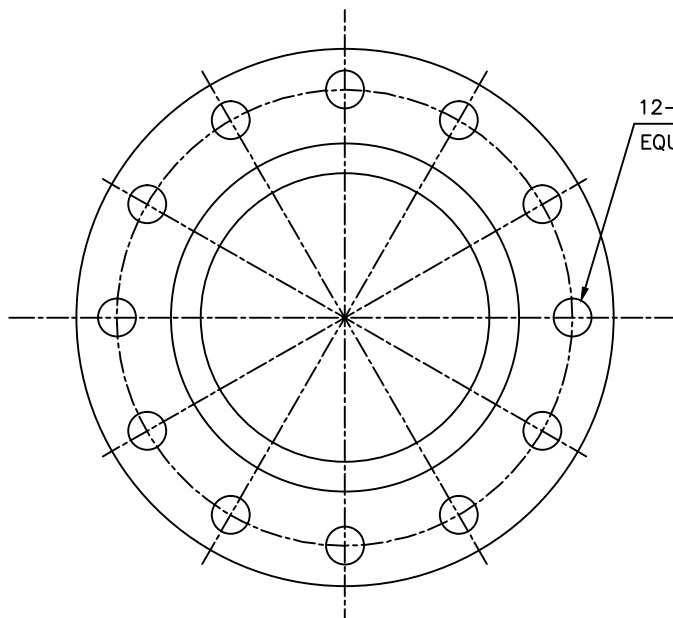
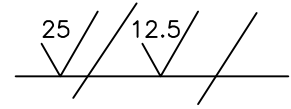
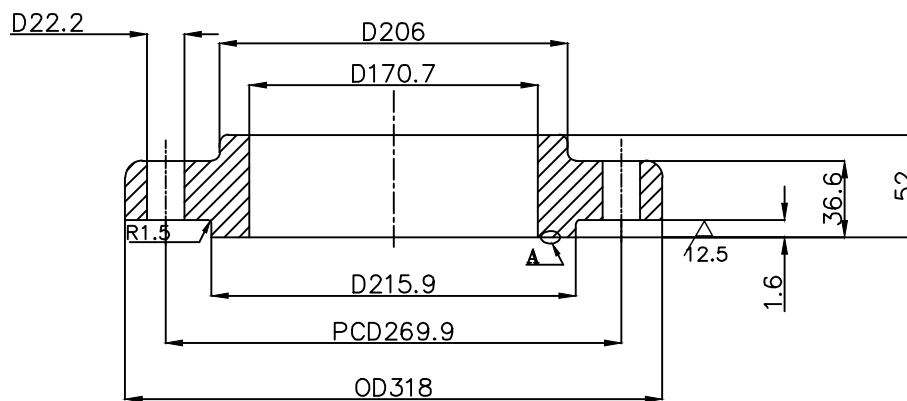
DEPT	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	WEIGHT (Kg)	REF.
CODE			N.T.S.	6.0	ASME B16.5
TITLE					DRAWING NO :
CS S.O FLANGE-3"x300#					4-24-420-U0157
					REV
					00

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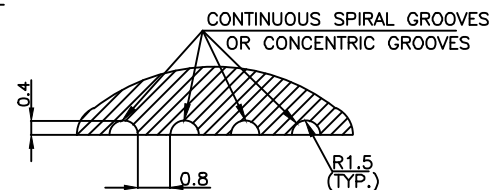
REV	DATE	ALTERED
		CHD & APPD

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING

MANUFACTURE REFER RELEVANT Q.C.P\Q.P
MANUFACTURING AS PER RELEVANT Q.C.P\S.Q.P



12-HOLES D22.2
EQUALLY SPACED



DETAIL-A

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT	CS	ZONE
	01	D318 / D170.7 PL.55Tk			159421200000	SA 515 GR. 70	C		17.5		
					VAR NO	MATERIAL SPECN	A/C/P	D1			
									TOTAL WEIGHT (kg.)		



Bharat Heavy Electricals Ltd

UNIT: HEAVY PLATES & VESSELS PLANT
VISAKHAPATNAM - 530012

DRN	NAME	SIGNATURE	DATE
CHD	MURALI	Sd./-xxx	05.09.18
APPD	AVR/TARAKASH	Sd./-xxx	05.09.18
	AC MOHANTHY	Sd./-xxx	06.09.18

DEPT	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	WEIGHT (Kg)	REF.
CODE			N.T.S.	17.5	ASME B16.5
TITLE					REF.
CS S.O FLANGE - 6"x300#					ASME B16.5
DRAWING NO :					REV
4-24-420-U0158					00

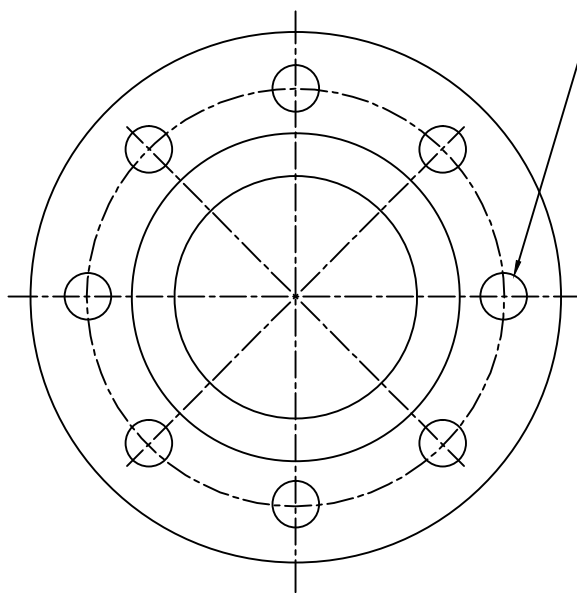
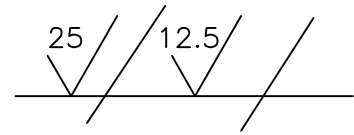
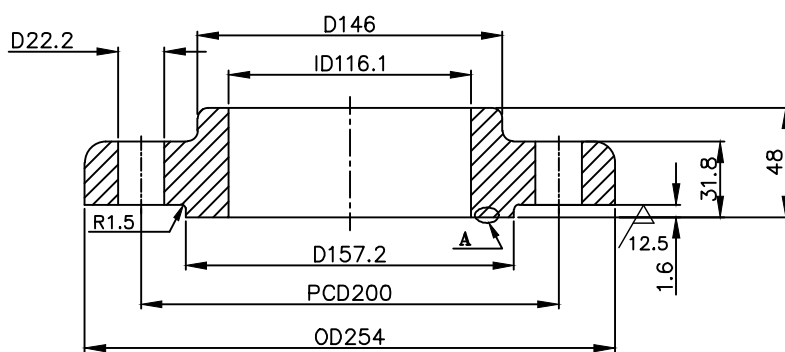
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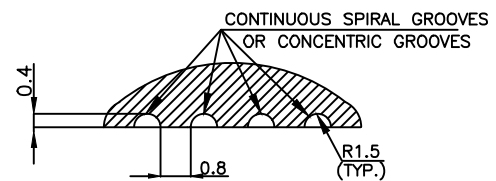
REV	DATE	ALTERED
		CHD & APPD

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING

MANUFACTURE REFER RELEVANT Q.C.P\Q.P
MANUFACTURING AS PER RELEVANT Q.C.P\S.Q.P



8-HOLE D22.2
EQUALLY SPACED



DETAIL-A

	01	OD254/ID116.1-50TK.PL			159422730000			10.1	
					SA387GR.22CL2	C			
VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT
					VAR NO	MATERIAL SPECN	D1		
									TOTAL WEIGHT (kg.)



Bharat Heavy Electricals Ltd
UNIT: HEAVY PLATES & VESSELS PLANT
VISAKHAPATNAM - 530012

DRN	NAME	SIGNATURE	DATE
	MURALI	Sd./-xxx	05.09.18
CHD	AVR/TARAKASH	Sd./-xxx	05.09.18
APPD	AC MOHANTHY	Sd./-xxx	06.09.18

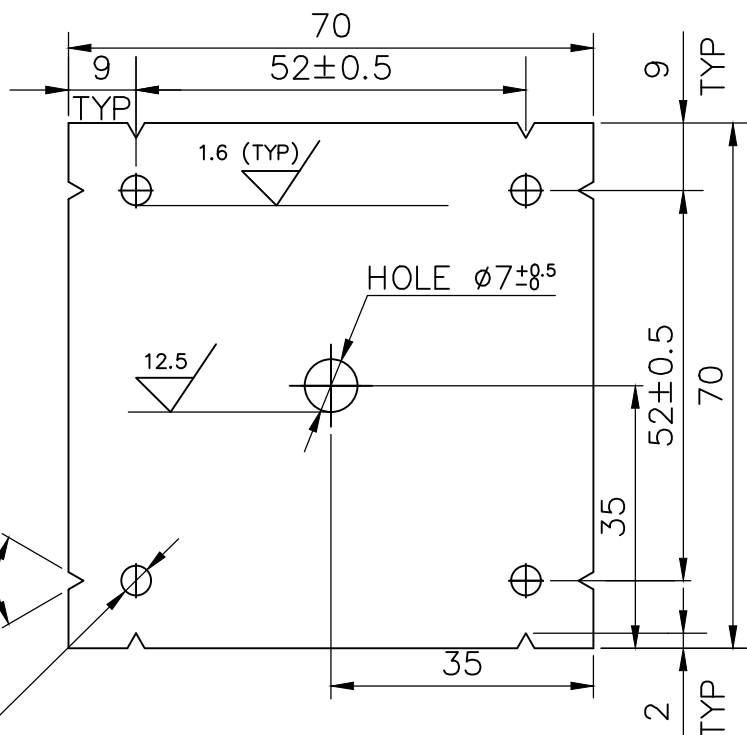
DEPT	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	WEIGHT (Kg)	REF/OLD DWG	REV
CODE			N.T.S.	10.1	ASME B16.5	
TITLE					DRAWING NO :	
AS S.O FLANGE - 4"x300#					4-24-420-U0159	00

CAUTION:

REV 01	DATE 21.01.04	ALTERED : A.R.J CHD & APPD : C.G.S
SHEET THICKNESS ALTERED		
REV 02	DATE 29.02.12	ALTERED : R.M CHD & APPD : C.G.S
HOLES $\phi 3.95$ TOLERANCE ALTERED		
REV 04	DATE 31.08.17	ALTERED : GOKUL CHD & APPD : N.S.R
TABLE-1 ADDED		

REV 03	DATE 03.03.15	ALTERED : S.S CHD & APPD : K.S
HOLES $\phi 3.95$ TOLERANCE ALTERED		

FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER PLANT STD. NO TP 023 0299



NOTE:

1.ALL HOLES SHOULD BE FREE OF BURRS.

TABLE-1

CUSTOMER NUMBER	ORIGINAL MATERIAL	USED MATERIAL
1806, 1809	1.6mm THK, IS 513 D	2mm THK, IS 1079 D
0684, 1255, 1256, 1257	1.6mm THK, IS 513 D	2mm THK, IS 5986 GR FE 330

	SHEET 1.6		15 011 076		0.061
			IS:513 D		
VARIANT NUMBER	DESCRIPTION	BPS CODE	MATERIAL CODE	A/C/P	UNIT WEIGHT
			MATERIAL SPECN	UNIT	QUANTITY



355-056

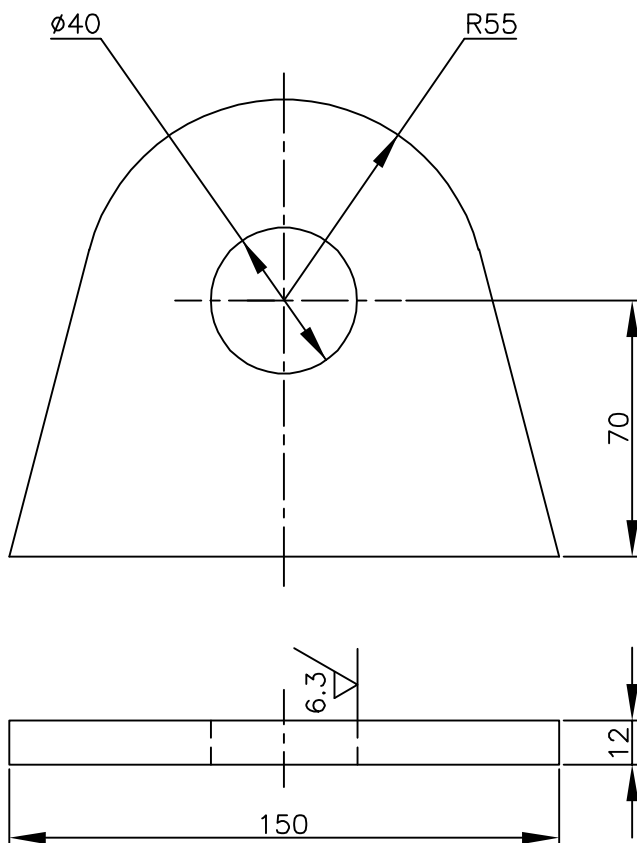
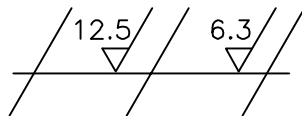
Bharat Heavy Electricals Ltd
UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014

DRN	NAME A.R.J.	SIGNATURE	DATE 17.12.03
CHD	C.G.S		
APPD	C.G.S		

DEPT L&I	ALL DIMENSIONS ARE IN MM	PROJECTION 	SCALE NTS	WEIGHT (Kg)	REF TO ASSY / OLD DWG 61600145 21
CODE 123					
TITLE RETAINER TYPE-A					DRAWING NO : 4-32-010-01053 04
					REV 04

REV	DATE	ALTERED :
01		CHECKED :

ALL DIMENSIONS ARE IN MILLIMETERS
FOR TOLERANCES OF UNTOLERANCED DIMENSIONS
DURING MANUFACTURE REFER RELEVANT SQP/QP.



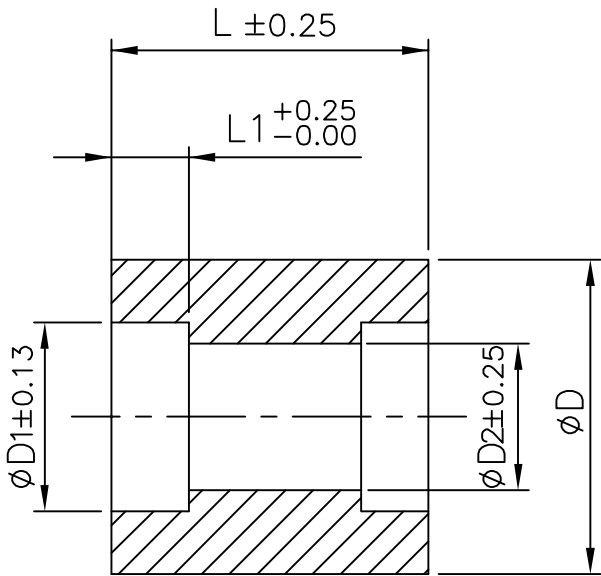
VARIANT NUMBER	PL 12X125X150	STD	15 011 132	A/C	UNIT	1.250
			IS 2062 FE410A			
	DESCRIPTION		MATERIAL CODE			UNIT WEIGHT
	MATERIAL SPECN		QUANTITY			

 Bharat Heavy Electricals Ltd UNIT: HEAVY PLATES & VESSELS PLANT VISAKHAPATNAM – 530012				DRN	NAME T.S.S.RAO.	DATE 11-09-2017	NO. OF VAR
				CHD	S.SANKARA RAO	11-09-2017	
				APPD	S.VIJAY	11-09-2017	
DEPT HT ENGG.	GRADE OF UNTOL. DIM C/M/F		SCALE NTS	WEIGHT (Kg) 1.250	REF TO ASSY / OLD DWG	ITEM NO	No OF ITEMS
CODE 320							
TITLE LIFTING EYE					DRAWING NO : 4-42-152-U6017		REV 00

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REV	DATE	ALTERED	G.P.LATHA
01	20.06.18	CHD & APPD	S.VIJAY

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING
MANUFACTURE REFER RELEVANT Q.C.P\Q.P
MANUFACTURING AS PER RELEVANT Q.C.P\S.Q.P



VAR NO.	NBS	D	D1	D2	L	L1
01	1/2"	32	21.84	15.75	30	9.65
02	1"	50	33.91	26.65	40	12.70
03	1 1/2"	63	48.77	40.95	40	12.70
04	2"	80	61.21	52.50	50	15.75
05	1"	50	33.91	26.65	40	12.70
06	1/2"	32	21.84	15.75	30	9.65

NOTE:

01. DIMENSIONS D1,D2 & L1 ARE AS PER ANSI B16.11
02. RATING 3000 LBS

06	1/2" SW COUPLING ROD D32; 30L		15 324 194	C		1.200
			SA 182 F304			1
05	1" SW COUPLING ROD D50; 40L		15 324 424	C		0.586
			SA 182 F304			1
04	2" SW COUPLING ROD D80; 50L		15 339 144	C		1.200
			SA 105			1
03	1 1/2" SW COUPLING ROD D63; 40L		15 339 143	C		0.586
			SA 105			1
02	1" SW COUPLING ROD D50; 40L		15 339 142	C		0.456
			SA 105			1
01	1/2" SW COUPLING ROD D32; 30L		15 339 140	C		0.140
			SA 105			1
VARIANT NUMBER	DESCRIPTION	STD	MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT
			MATERIAL SPECN			QUANTITY



361-321

Bharat Heavy Electricals Ltd

UNIT: HEAVY PLATES & VESSELS PLANT

VISAKHAPATNAM - 530012

NAME	SIGNATURE	DATE
DRN P.AYYAKKANNU		29.9.08
CHD T.K.RAMAKRISHNAN		29.9.08
APPD T.K.RAMAKRISHNAN		29.9.08

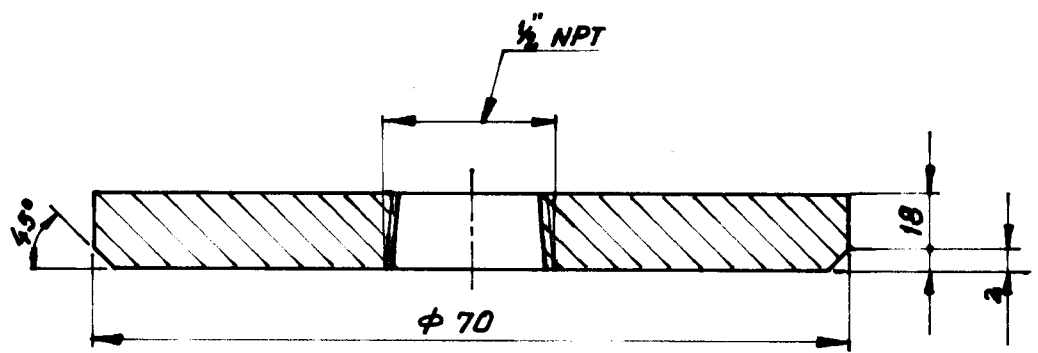
DEPT HT-ENGG	ALL DIMENSIONS ARE IN MM		SCALE N.T.S	WEIGHT (Kg) \	REF TO ASSY / OLD DWG 4-42-156-80271	
CODE 320						
TITLE SW COUPLING					DRAWING NO : 4-43-200-U0003	REV 01

05-249/C

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FIRST ANGLE PROJECTION (ALL DIMENSIONS IN MILLIMETRES)

REV 01	DATE	ALTERED	REV 02	DATE	ALTERED
		CHECKED			CHECKED



MF

1047356

	PL 20 x φ 70		15-011-150		0.600
			BM-C 20		
VARIANT NO.	DESCRIPTION	STD	MATL CODE	A	UNIT WT
			MATL SPEC	C	QTY



Bharat Heavy Electricals Ltd.,
BOILER PLANT UNIT
TIRUCHIRAPALLI-620 014

DRN	NAME	SIGN	DATE
CHD	17. K. P. Suresh		14/08/87
APPD			

DEPT. IPP	GRADE OF UNTOL DIM C/M/F		SCALE I	WEIGHT (kg) I	REF TO ASSY / OLD DRG 4-43-000-80004	ITEM NO.
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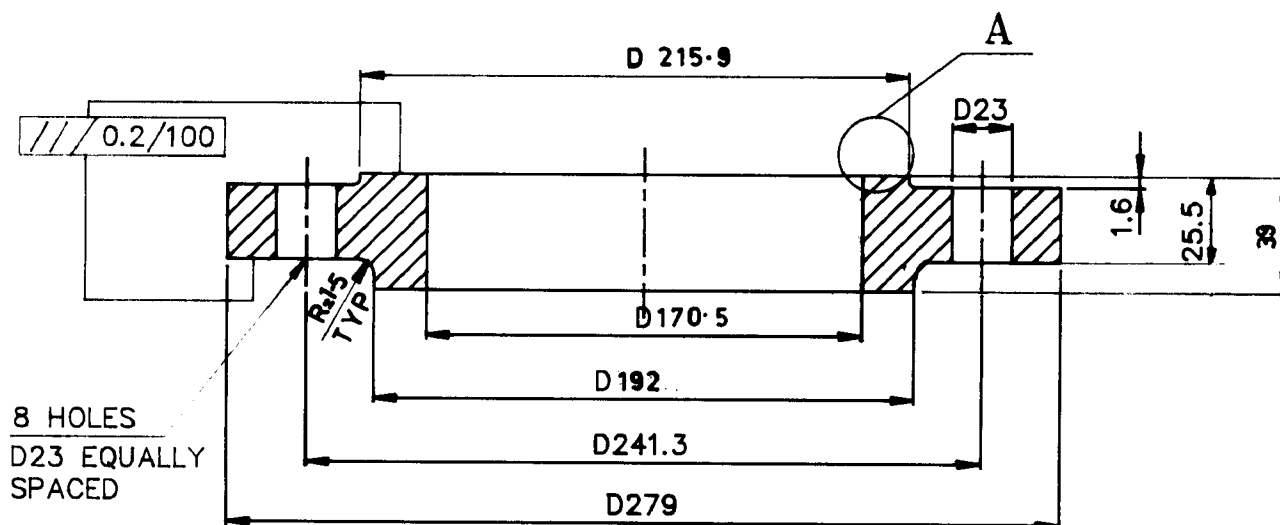
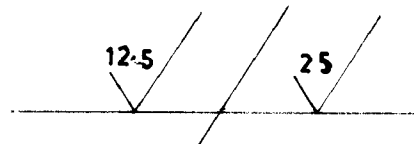
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Size A4

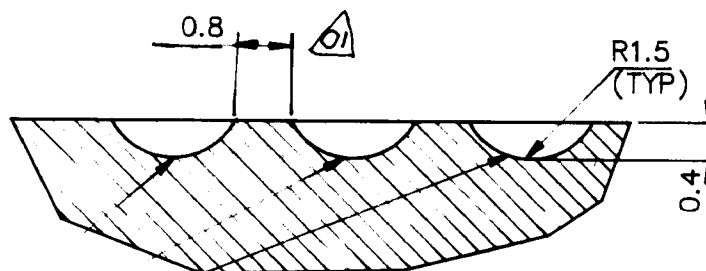
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IT MUST NOT BE USED DIRECTLY OR INDIRECTLY
IN ANY WAY DETRIMENTAL TO THE INTEREST OF BHEL

CAUTION:

REV	DATE	ALTERED :
01	9-3-95	CHECKED : <i>K. Chandra</i>
CORRECTED AS INDICATED		



8 HOLES
D23 EQUALLY
SPACED



DETAIL-A

CONTINUOUS
SPIRAL GROOVES
OR CONCENTRIC
GROOVES



PL.40 D279		15 042 117	P	12-000
		SA 515 GR.70		
VARIANT NUMBER	DESCRIPTION	MATERIAL CODE	A/C	UNIT WEIGHT
		MATERIAL SPECN		QUANTITY

1296040



Bharat Heavy Electricals Ltd
UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014

DRN	NAME A.RAJENDRAN	SIGNATURE <i>A. Rajendran</i>	DATE	NO. OF VAR
CHD	M.VELCHAMY	<i>M. Velchamy</i>		
APPD	K.R.MUKUNDAN	<i>K. R. Mukundan</i>	16/10/91	

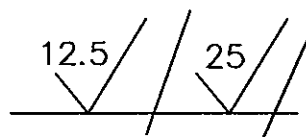
DEPT IPP.BM	GRADE OF UNTOL. DIM C/M/F	SCALE 	WEIGHT (Kg) 12-000	REF TO ASSY / OLD DWG	ITEM NO	No OF ITEMS
CODE 1322						
TITLE FLANGE-6"				CARD CODE U 01	DRAWING NO : 4-24-420-80813	
					REV 01	

CAUTION : The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

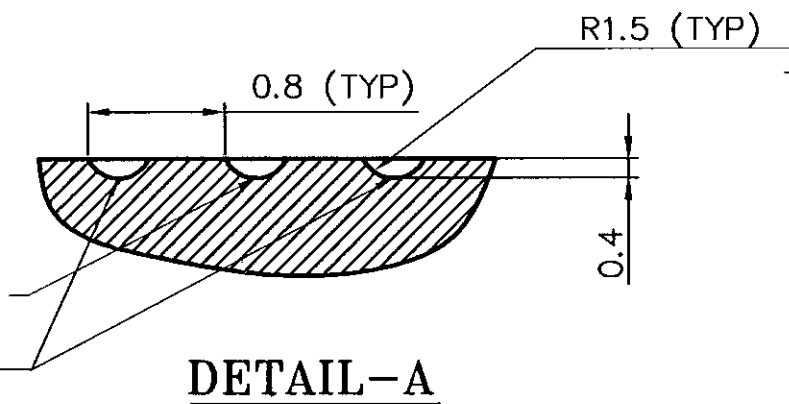
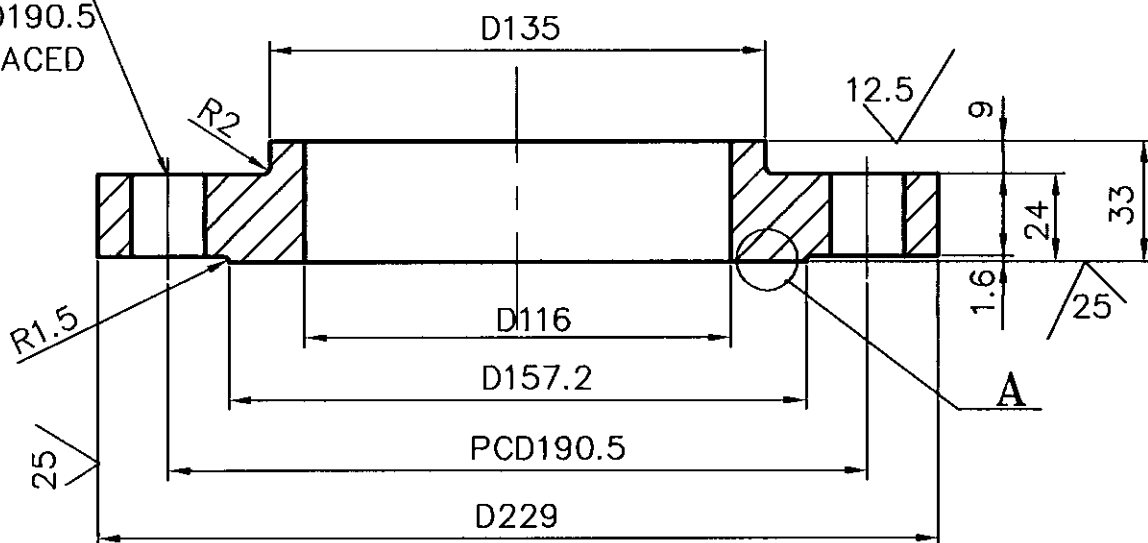
REV	DATE	ALTERED
		CHD & APPD

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING

MANUFACTURE REFER RELEVANT Q.C.P\Q.P
MANUFACTURING AS PER RELEVANT Q.C.P\S.Q.P



8 HOLES OF
D22 ON PCD190.5
EQUALLY SPACED



VARIANT NUMBER	DESCRIPTION	STD	PL.35; D229		A/C/P	UNIT	15 042 116	7.000
							SA515 GR.70	
							MATERIAL CODE	
							MATERIAL SPECN	



Bharat Heavy Electricals Ltd

UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014

DRN	NAME	SIGNATURE	DATE
CHD	M.CHELLA	<i>M. Chellam</i>	01/04/05
APPD	R.K.N	<i>R. Kannan</i>	
	V.K.N	<i>V. Kannan</i>	

DEPT FBC/HRSG CODE 1322	ALL DIMENSIONS ARE IN MM	PROJECTION 	SCALE N.T.S	WEIGHT (Kg) 7.000	REF TO ASSY / OLD DWG
TITLE FLANGE 4" - (CS)_150#					DRAWING NO : 4-24-420-84346 00

1. THREAD: METRIC THREAD ACCORDING TO TOLERANCE CLASS 8g OF AA 023 0403 - IS:14962 (PART-3)-2001

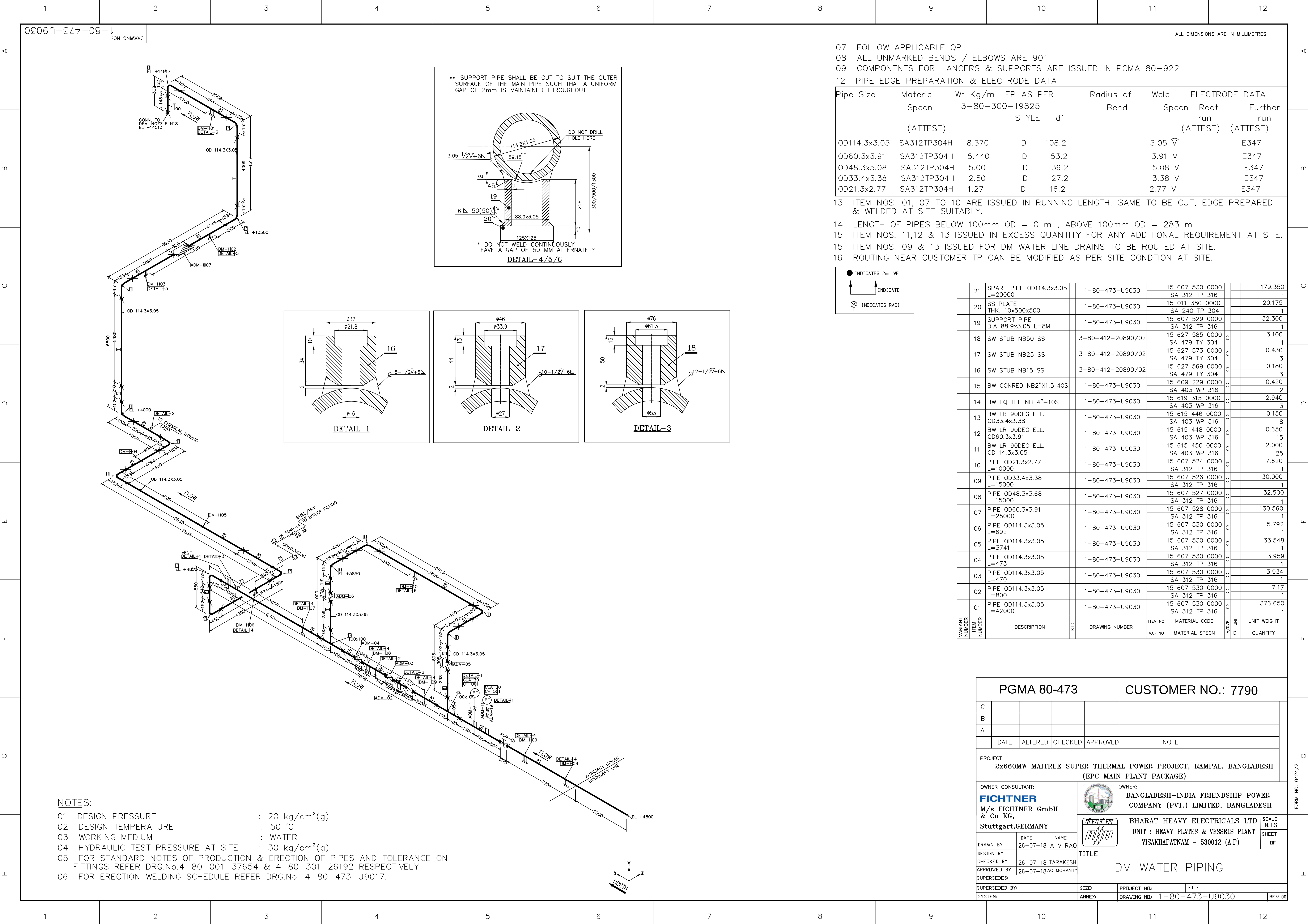
06		PIPE CLAMP ROD TYPE CS OD 168.3		6124 0233 26		94 221 011		1.571
05		PIPE CLAMP ROD TYPE CS OD 114.3		6124 0233 25		94 221 010		1.088
04		PIPE CLAMP ROD TYPE CS OD 73.0		6124 0233 24		94 221 009		0.400
03		PIPE CLAMP ROD TYPE CS OD 60.3		6124 0233 23		94 221 008		0.189
02		PIPE CLAMP ROD TYPE CS OD 48.3		6124 0233 22		94 221 007		0.108
01		PIPE CLAMP ROD TYPE CS OD 33.4		6124 0233 21		94 221 006		0.083
VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/P	UNIT WEIGHT
					VAR NO	MATERIAL SPECN	DI	QUANTITY

06		PIPE CLAMP ROD TYPE CS OD 168.3		6124 0233 26		94 221 011		1.571
05		PIPE CLAMP ROD TYPE CS OD 114.3		6124 0233 25		94 221 010		1.088
04		PIPE CLAMP ROD TYPE CS OD 73.0		6124 0233 24		94 221 009		0.400
03		PIPE CLAMP ROD TYPE CS OD 60.3		6124 0233 23		94 221 008		0.189
02		PIPE CLAMP ROD TYPE CS OD 48.3		6124 0233 22		94 221 007		0.108
01		PIPE CLAMP ROD TYPE CS OD 33.4		6124 0233 21		94 221 006		0.083
VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/P	UNIT WEIGHT
					VAR NO	MATERIAL SPECN	DI	QUANTITY

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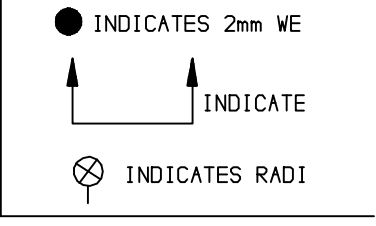
REV	DATE	ALTERED :	G.S.VASAN	REV	DATE	ALTERED :	S.SATHIS
03	03.05.13	CHD & APPDNK.V.		02	03.08.10	CHD & APPDN.KIRUBAKARAN	
ZONE	NOTE NO.1 CORRECTED.						ZONE
	MATERIAL SPECIFICATION						
	ALTERED						
	CONVERTED TO AUTOCAD DWG						

CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.					
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT					
		Bharat Heavy Electricals Ltd UNIT: HIGH PRESSURE BOILER PLANT TRUCHIRAPALLI - 620014			
DEPT	SS	ALL DIMENSIONS ARE IN MM		SCALE N.T.S	WEIGHT (Kg) REFER UNIT WT
CODE	850				
TITLE	PIPE CLAMP (CARBON STEEL ROD TYPE)				
DRAWING NO :	7740-0630				
	REF TO ASSY / OLD DWG				
	SKALIBULLA		NAME	SIGNATURE	DATE
			TRISHNAN		16.08.82
			TRISHNAN		16.08.82
					16.08.82
REV	160				
03	6124-0233				



- NOTES: -
- 01 DESIGN PRESSURE : 20 kg/cm²(g)
 - 02 DESIGN TEMPERATURE : 50 °C
 - 03 WORKING MEDIUM : WATER
 - 04 HYDRAULIC TEST PRESSURE AT SITE : 30 kg/cm²(g)
 - 05 FOR STANDARD NOTES OF PRODUCTION & ERECTION OF PIPES AND TOLERANCE ON FITTINGS REFER DRG.No.4-80-001-37654 & 4-80-301-26192 RESPECTIVELY.
 - 06 FOR ERECTION WELDING SCHEDULE REFER DRG.No. 4-80-473-U9017.

- 07 FOLLOW APPLICABLE QP
- 08 ALL UNMARKED BENDS / ELBOWS ARE 90°
- 09 COMPONENTS FOR HANGERS & SUPPORTS ARE ISSUED IN PGMA 80-922
- 12 PIPE EDGE PREPARATION & ELECTRODE DATA
- | Pipe Size | Material Specn | Wt Kg/m | EP AS PER | Radius of Bend | Weld Specn | ELECTRODE DATA |
|--------------|----------------|----------------|-----------|----------------|-------------------|----------------------|
| (ATTEST) | | 3-80-300-19825 | STYLE d1 | | Root run (ATTEST) | Further run (ATTEST) |
| OD114.3x3.05 | SA312TP304H | 8.370 | D 108.2 | | 3.05 ∇ | E347 |
| OD60.3x3.91 | SA312TP304H | 5.440 | D 53.2 | | 3.91 V | E347 |
| OD48.3x5.08 | SA312TP304H | 5.00 | D 39.2 | | 5.08 V | E347 |
| OD33.4x3.38 | SA312TP304H | 2.50 | D 27.2 | | 3.38 V | E347 |
| OD21.3x2.77 | SA312TP304H | 1.27 | D 16.2 | | 2.77 V | E347 |
- 13 ITEM NOS. 01, 07 TO 10 ARE ISSUED IN RUNNING LENGTH. SAME TO BE CUT, EDGE PREPARED & WELDED AT SITE SUITABLY.
- 14 LENGTH OF PIPES BELOW 100mm OD = 0 m , ABOVE 100mm OD = 28.3 m
- 15 ITEM NOS. 11,12 & 13 ISSUED IN EXCESS QUANTITY FOR ANY ADDITIONAL REQUIREMENT AT SITE.
- 16 ITEM NOS. 09 & 13 ISSUED FOR DM WATER LINE DRAINS TO BE ROUTED AT SITE.
- 16 ROUTING NEAR CUSTOMER TP CAN BE MODIFIED AS PER SITE CONDION AT SITE.



21	SPARE PIPE OD114.3x3.05 L=20000	1-80-473-U9030	15 607 530 0000	SA 312 TP 316	179.350
20	SS PLATE THK. 10x500x500	1-80-473-U9030	15 011 380 0000	SA 240 TP 304	20.175
19	SUPPORT PIPE DIA 88.9x3.05 L=8M	1-80-473-U9030	15 607 529 0000	SA 312 TP 316	32.300
18	SW STUB NB50 SS	3-80-412-20890/02	15 627 585 0000	SA 479 TY 304	3.100
17	SW STUB NB25 SS	3-80-412-20890/02	15 627 573 0000	SA 479 TY 304	0.430
16	SW STUB NB15 SS	3-80-412-20890/02	15 627 569 0000	SA 479 TY 304	0.180
15	BW CONRED NB2"X1.5"40S	1-80-473-U9030	15 609 229 0000	SA 403 WP 316	0.420
14	BW EQ TEE NB 4"-10S	1-80-473-U9030	15 619 315 0000	SA 403 WP 316	2.940
13	BW LR 90DEG ELL. OD33.4x3.38	1-80-473-U9030	15 615 446 0000	SA 403 WP 316	0.150
12	BW LR 90DEG ELL. OD60.3x3.91	1-80-473-U9030	15 615 448 0000	SA 403 WP 316	0.650
11	BW LR 90DEG ELL. OD114.3x3.05	1-80-473-U9030	15 615 450 0000	SA 403 WP 316	2.000
10	PIPE OD21.3x2.77 L=10000	1-80-473-U9030	15 607 524 0000	SA 312 TP 316	7.620
09	PIPE OD33.4x3.38 L=15000	1-80-473-U9030	15 607 526 0000	SA 312 TP 316	30.000
08	PIPE OD48.3x3.68 L=15000	1-80-473-U9030	15 607 527 0000	SA 312 TP 316	32.500
07	PIPE OD60.3x3.91 L=25000	1-80-473-U9030	15 607 528 0000	SA 312 TP 316	130.560
06	PIPE OD114.3x3.05 L=692	1-80-473-U9030	15 607 530 0000	SA 312 TP 316	5.792
05	PIPE OD114.3x3.05 L=3741	1-80-473-U9030	15 607 530 0000	SA 312 TP 316	33.548
04	PIPE OD114.3x3.05 L=473	1-80-473-U9030	15 607 530 0000	SA 312 TP 316	3.959
03	PIPE OD114.3x3.05 L=470	1-80-473-U9030	15 607 530 0000	SA 312 TP 316	3.934
02	PIPE OD114.3x3.05 L=800	1-80-473-U9030	15 607 530 0000	SA 312 TP 316	7.17
01	PIPE OD114.3x3.05 L=42000	1-80-473-U9030	15 607 530 0000	SA 312 TP 316	376.650

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO VAR NO	MATERIAL CODE MATERIAL SPECN	X/Z/P DI	UNIT	UNIT WEIGHT QUANTITY
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PGMA 80-473				CUSTOMER NO.: 7790			
C							
B							
A							
DATE				ALTERED	CHECKED	APPROVED	NOTE
PROJECT 2x660MW MAITREE SUPER THERMAL POWER PROJECT, RAMPAL, BANGLADESH (EPC MAIN PLANT PACKAGE)							
OWNER CONSULTANT: FICHTNER M/s FICHTNER GmbH & Co KG, Stuttgart,GERMANY				OWNER:  BANGLADESH-INDIA FRIENDSHIP POWER COMPANY (PVT.) LIMITED, BANGLADESH			
DRAWN BY				DATE	NAME	SCALE	SHEET
DESIGN BY				26-07-18	TARAKESH	N.T.S	OF
CHECKED BY				26-07-18	TARAKESH		
APPROVED BY				26-07-18	AC MOHANTY		
SUPERSEDES:							
SUPERSEDED BY:				SIZE:	PROJECT NO.:	FILE:	
SYSTEM:				ANNEX:	DRAWING NO.:	1-80-473-U9030	REV 00

TITLE
DM WATER PIPING

FORM NO. 0424/2

A1 SIZE