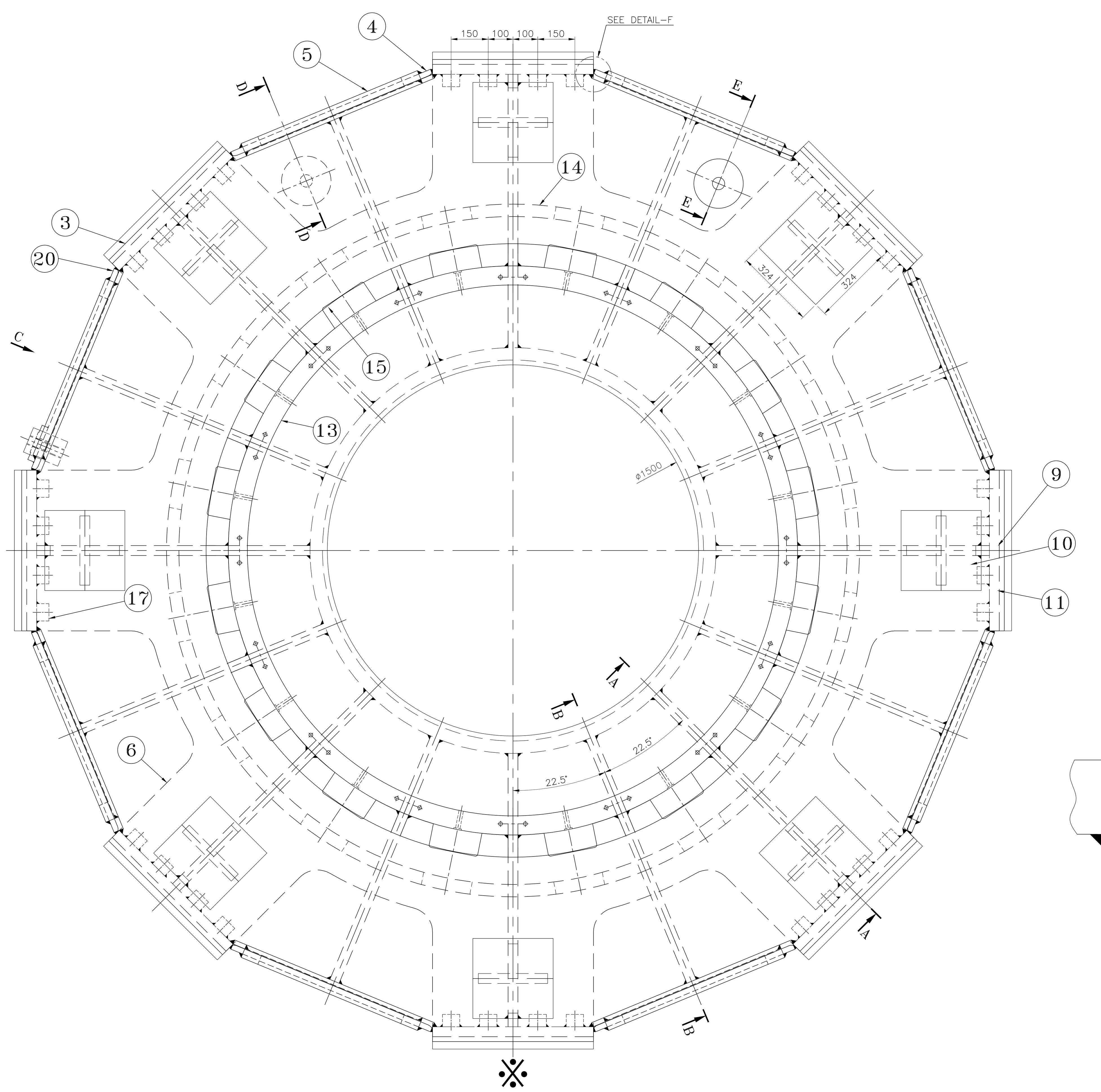
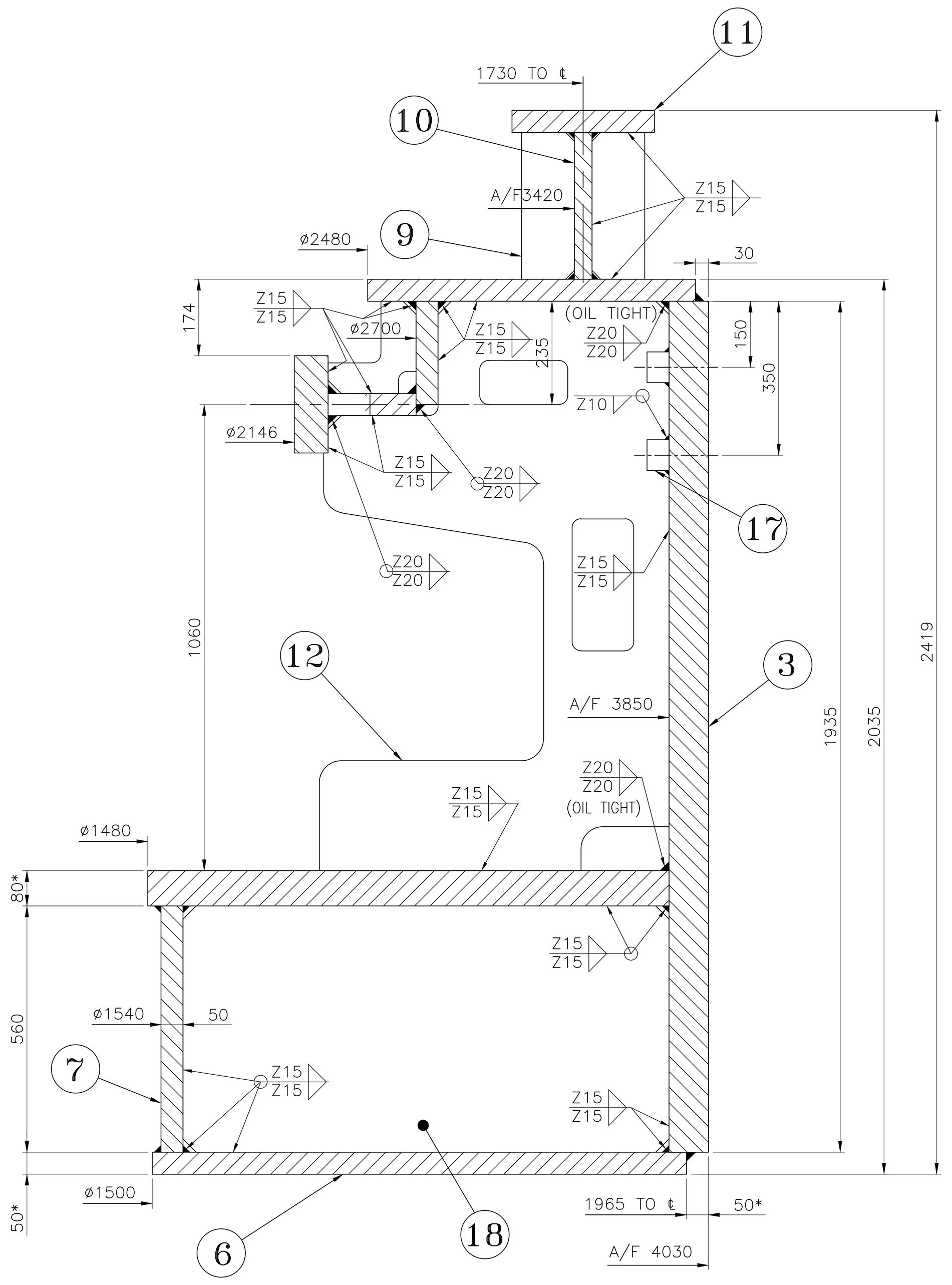
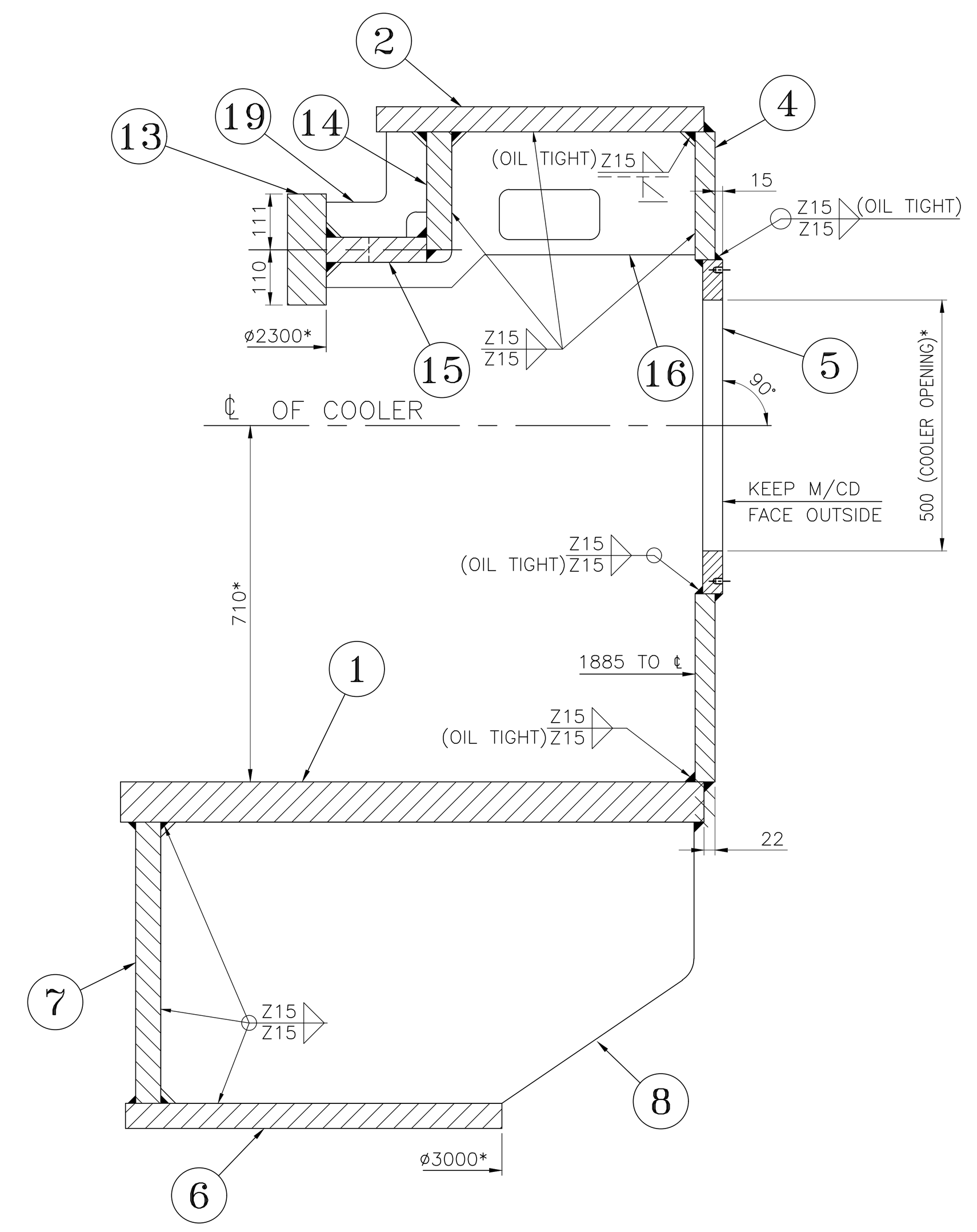


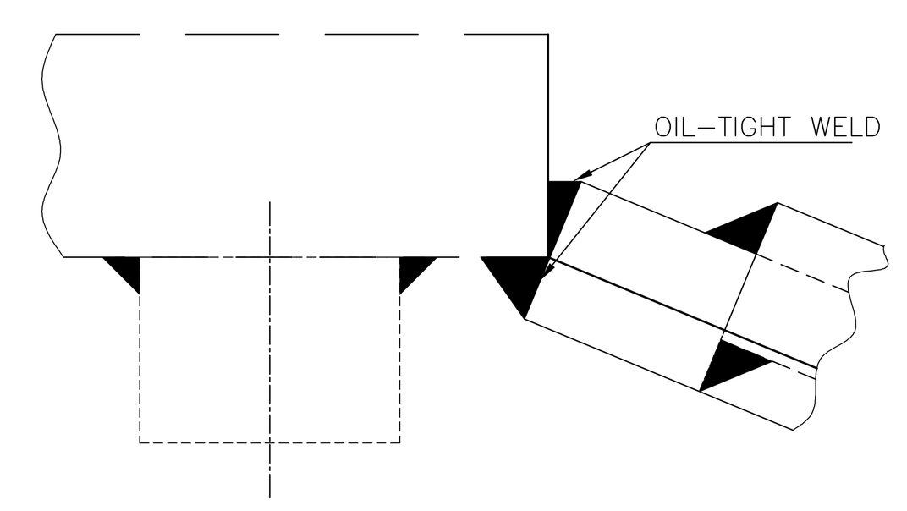
SUCTION END ASSEMBLY



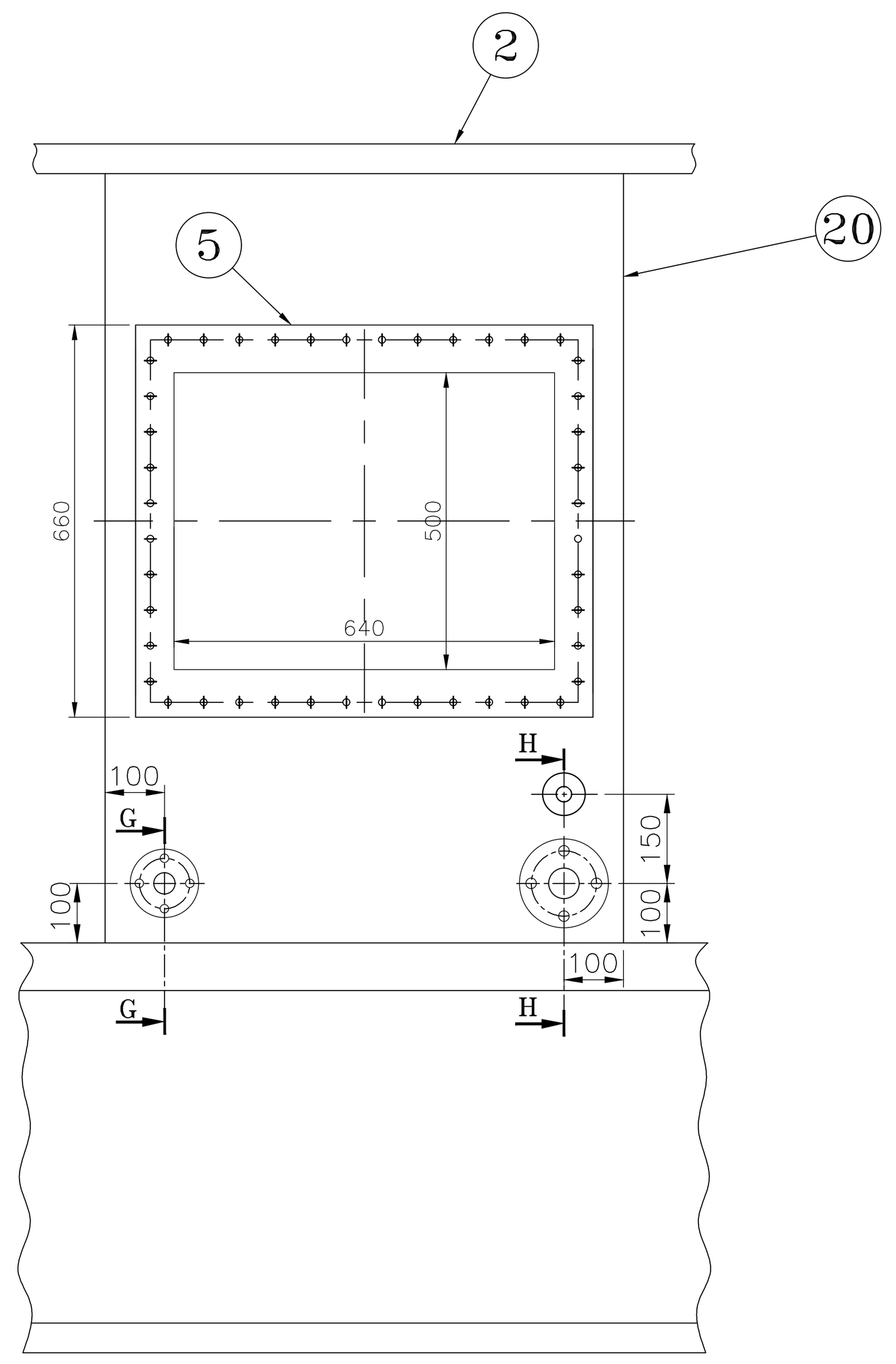
SECTION-AA



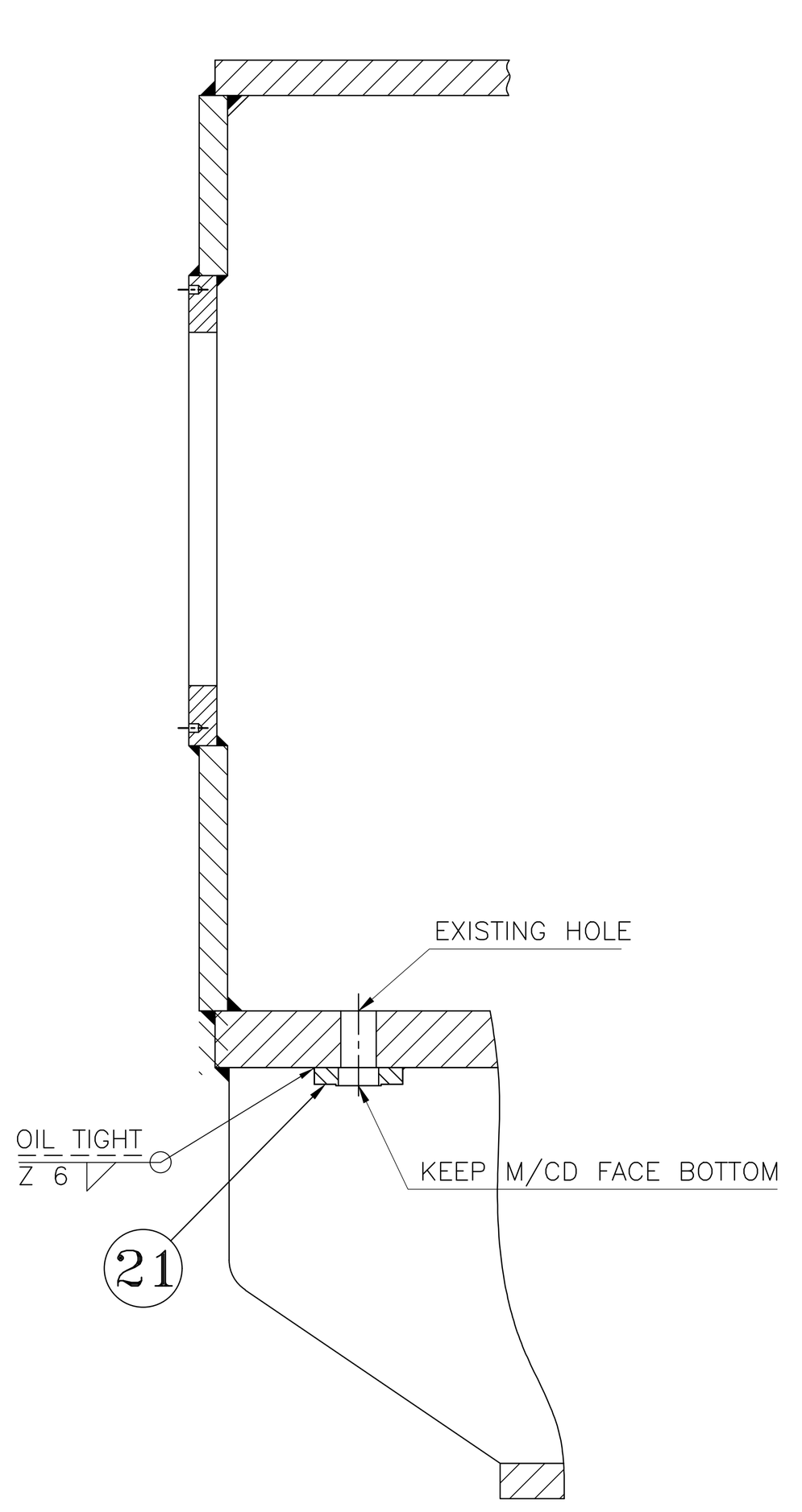
SECTION-BB



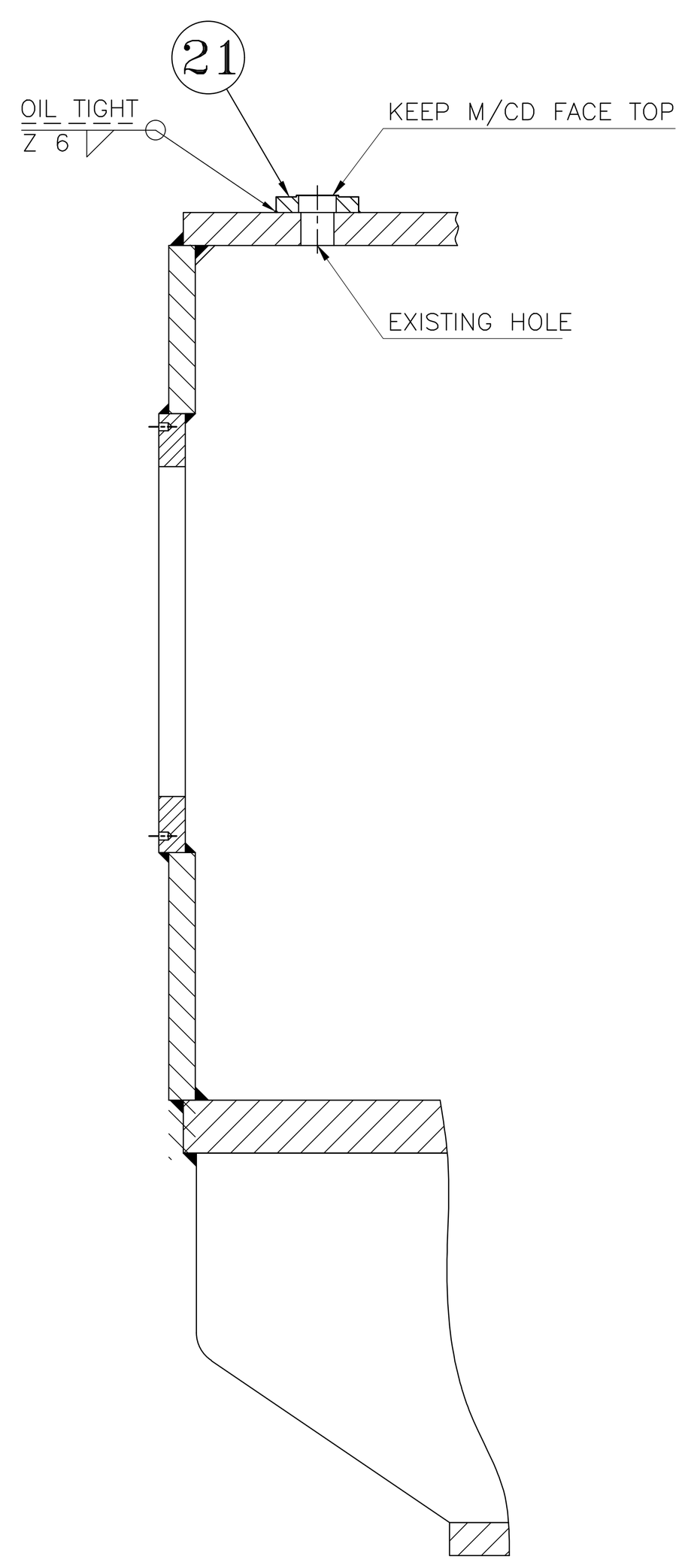
ENLARGED DETAIL-F



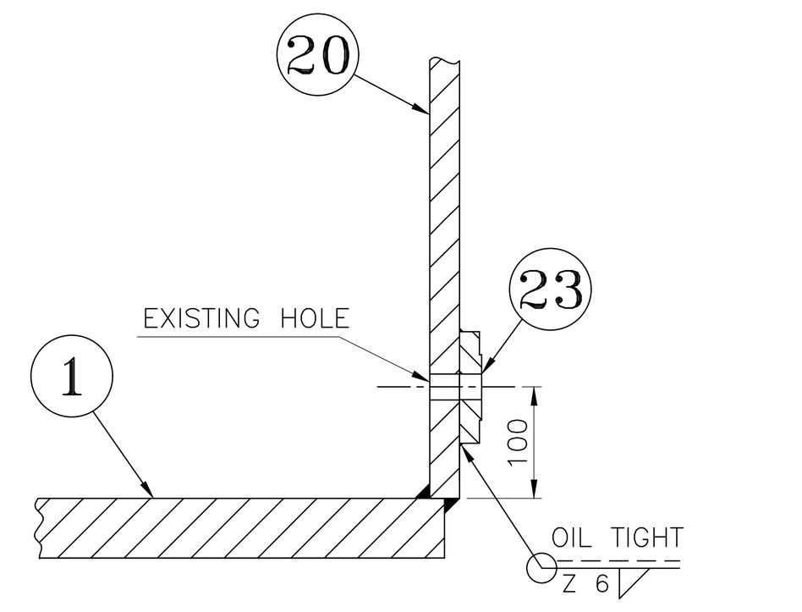
VIEW AS ARROW-C



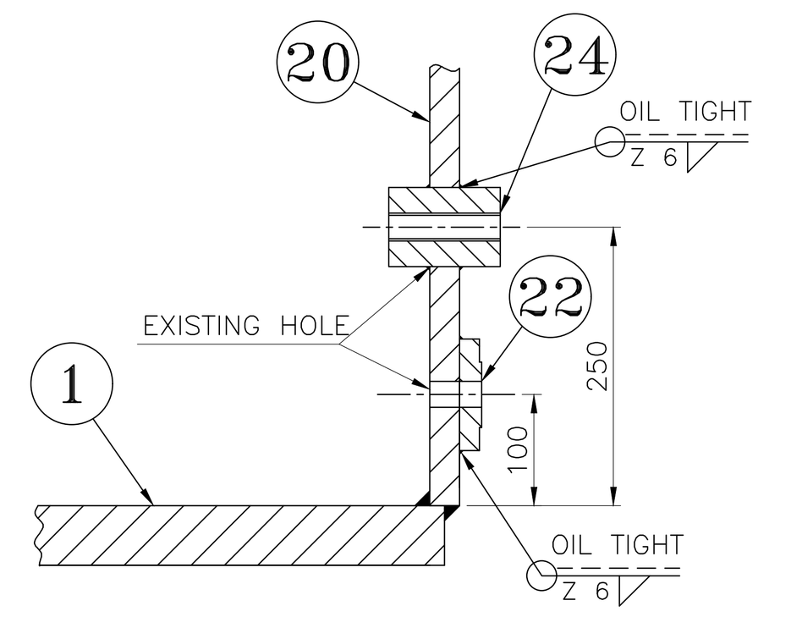
SECTION-DD (FOR OIL DRAIN)



SECTION-EE (FOR OIL FILLING)



SECTION-GG (FOR OIL LEVEL INDICATOR)



SECTION-HH (FOR H.S. LUB.)

TECHNICAL REQUIREMENTS:

1. ALL WELDS ARE CONTINUOUS AND 15 MM FILLET UNLESS OTHERWISE STATED.
2. ALL WELDS SHALL BE AS PER GR-III OF AA0622101 UNLESS OTHERWISE STATED.
3. ALL OIL-TIGHT WELDS SHALL UNDERGO D.P. TESTING AS PER BP0850199 AFTER FIRST ROOT RUN AND AFTER COMPLETE WELDING. THE OIL-TIGHT WELDS SHALL BE PROTECTED WITH TRP BHARAT TC PF 4 AS PER BP55188. THE OIL-TIGHT WELDS SHALL BE PAINTED ONLY AFTER THE COMPLETION OF GRAVITY TESTING AS PER BP0850095.
4. WATER REQUIRED FOR GRAVITY TEST = 14900 LITRES (APPROX.)
5. THE MACHINED FACES OF ITEM 5 ARE TO BE KEPT PARALLEL TO THE BRACKET AXIS DURING WELDING (VERTICALLY WITHIN 2 MM).
6. THE PRE-MACHINED FACES OF ITEM 13 ARE TO BE LEVELLED USING A WATER LEVEL AND TACK WELDS. RE-CHECK THE LEVELLING BEFORE FINAL WELDING.
7. BEFORE WELDING ITEMS 5, 21, 22, 23, & 24, STRESS RELIEVE THE ASSEMBLY AS PER BP0640299. ALL TAPPED HOLES AND MACHINED SURFACES ARE TO BE PROTECTED DURING STRESS RELIEVING.
8. AFTER STRESS RELIEVEING, RE-APPLY TRP ON MACHINED SURFACES TO BP0690084.
9. DIMENSIONS MARK THUS * ARE FOR D.O. REFERENCE ONLY.
10. APPLY TRP ON MACHINED SURFACES TO BP 0690084.
11. ALL PLATES (40 MM AND ABOVE) TO BE ULTRASONICALLY TESTED TO AA0850120 BEFORE WELDING.
12. PAINTING SHALL BE CARRIED OUT AS PER HG12007.

FABRICATED WEIGHT INCLUDING WELDING = 30660 KG.

VAR00	REMARKS	VAR. NO.	ITEM NO.	DESCRIPTION	STD	DRAWING NO.	IT.NO. / VAR.	MATL. CODE / MATL. SPCN.	C	UNIT	QTY.	ZONE
001	SEE TR-7		024	INSERT		1 257 01 89603	012		NA	NO	2.52	
001	SEE TR-7		023	FLANGE 25 NB		3 299 88 01008	001		NA	NO	2.02	
001	SEE TR-7		022	FLANGE 40 NB		3 299 88 01008	003		NA	NO	4.33	
002	SEE TR-7		021	FLANGE 50 NB		3 299 88 01008	004		NA	NO	4.97	
001			020	SIDE PLATE		1 257 01 89603	009		NA	NO	193.26	
016			019	RIB		1 257 01 89603	005		NA	NO	7.06	
008			018	STIFFENER		1 257 01 89603	004		NA	NO	193.74	
064			017	BOSS		1 257 01 89603	011		NA	NO	1.97	
008			016	STIFFENER		1 257 01 89603	003		NA	NO	35.33	
001			015	FLANGE		1 257 01 89602	003		NA	NO	494.97	
001			014	TOP RING		1 257 01 89602	004		NA	NO	639.5	
001			013	GUIDE BEARING SUPPORT RING		2 257 01 89602	001		NA	NO	925.52	
008			012	RIB		1 257 01 89603	001		NA	NO	189.53	
008			011	PLATE 50TKx324x324 LG. STEEL PLATE				AA1011808218 / AA10108	NA	NO	41.20	
008			010	PLATE 40TKx280x334 LG. STEEL PLATE				AA1011808196 / AA10108	NA	NO	21.22	
016			009	STIFFNER		1 257 01 89603	006		NA	NO	12.46	
008			008	STIFFENER		1 257 01 89603	002		NA	NO	171.00	
001			007	CYLINDER		1 257 01 89603	008		NA	NO	1097.93	
001			006	BOTTOM PLATE		1 257 01 89602	005		NA	NO	3061.26	
008	SEE TR-7		005	COOLER SUPPORT PLATE		1 257 01 89603	007		NA	NO	58.55	
007			004	SIDE PLATE		1 257 01 89603	010		NA	NO	195.00	
008			003	JOINT PLATE 90TKx650x1935 LG. S.S.S.Q. PLATE	1			AA10108	NA	NO	888.60	
001			002	TOP PLATE		1 257 01 89602	002		NA	NO	2797.96	
001			001	INTERMEDIATE PLATE		1 257 01 89602	001		NA	NO	6233.50	

28 → CARD TYPE-3 | 28 → CARD TYPE-1 | 28 → CARD TYPE-2

ADDITIONAL INFORMATION
W.O. 36201 TO 09 A 23157 STAGE-2
W.O. 36210 TO 18 A 23157 STAGE-3

STATUS OF DRAWING: U

DISTRIBUTION OF PRINTS
HGE – 2 TEX – 1
HGM – 2 FWM – 2

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT:
HMS-713/170-24K
PALAMURU RANGAREDDY LIS STAGE-2&3
(MEIL/TSGENCO)

BHARAT HEAVY ELECTRICALS LTD.
BHOPAL

	NAME	SIGN	DATE
DRN	RKP		
CKD	NS/BKS		
APPD	RG		

NO. OF VAR: 00

DEPT	CODE	UNTOL.DIMS. GR.	SCALE	WEIGHT (K.G.)	REF. TO ASSY. DRG.	ITEM NO.	NO. OF ITEM
HGE	403	3 250 00 01 404	1:10	30660	1 257 01 89605	001	024

TITLE: BOTTOM BRACKET CENTRE ASSEMBLY (FABRICATION)

DRAWING NO. 0 257 01 89601

REV: DRAFT

SHT. No. 1 NO. OF SHT. 1

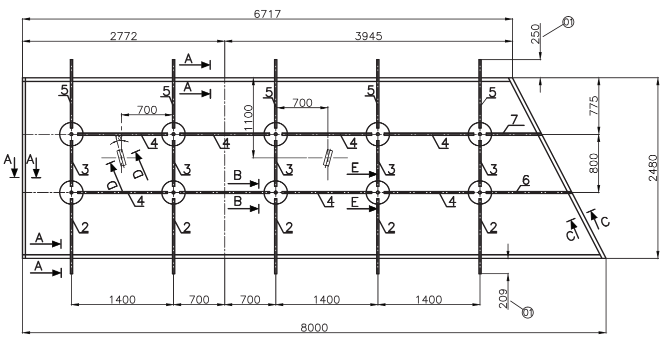
A0

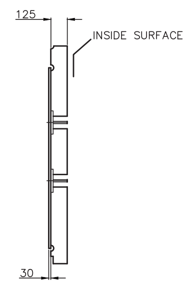
FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm)

FORM: DG 45(B)

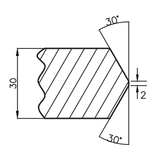
DRAWING NO. 21601370075

50/ THE REST

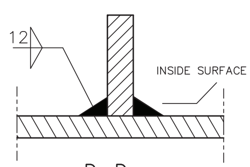




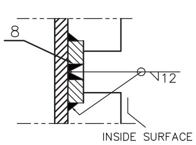
A–A



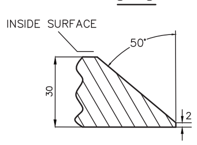
B–B



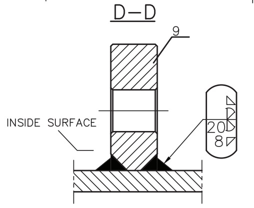
E-E



C–C



D–D



TECHNICAL REQUIREMENTS:–

1. WELDING CLASSIFICATION GROUPS ACCORDING TO HW 0620099 CS/BK.
   TEST SCOPE ACCORDING TO HW0850199 PART 10.
3. EDGE PREPARATIONS FOR THE WELDING OF INCLINED CONNECTIONS ARE TO BE MADE DURING ASSY AS INDICATED IN SECTIONS.
4. PAINTING IS TO BE DONE AS PER HXE PRODUCT STD. HE 77001
5. NON DESTRUCTIVE EXAMINATION OF WELD SEAM TO BE DONE AS PER HW 0850199 PART 10.
6. THE GENERAL TOLERANCE ON STRAIGHTNESS, FLATNESS AND PARALLELISM SHALL BE MAINTAINED AS PER AA0621105 GRADE–F.
7. FOR LIFTING THE ASSEMBLY, ALL LIFTING LUGS SHALL BE USED SIMULTANEOUSLY WITH D–SHACKLES AS PER CORP. STD NO. AA7248105.
8. UNLESS OTHERWISE STATED EDGE PREPARATION OF WELD JOINTS SHALL BE AS PER AA0620502.
9. THIS INDICATES CRITICAL TO QUALITY (CTQ).

20	12	12	8	SIZE & SYMBOL OF SEAM
.96	17.8	10.7	.96	WELD LENGTH (M)
1.53	27.3	7.5	.33	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

CBOM NO.			STATUS OF DRG.
01601370077			U
AGREED DEPT.	NAME	SIGN	DATE
WT.	B.L.MEENA	Sd.	14.07.18

REV.	DATE	ALTERED	CHECKED
01	27.8.20	AJAY KUMAR	SHAVEZ KHAN

HXE–20–F0034
CHANGE AS MARKED 01

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT: 660 MW MAITREE

BHARAT HEAVY ELECTRICALS LTD.
HARDWAR

	NAME	SIGN	DATE
DRN	M.S.	Sd.	01.01.18
CHD	SHAVEZ	Sd.	13.07.18
APD	NAVEEN	Sd.	16.07.18

NO.OF VAR. –

DEPT.	SCALE	WEIGHT(Kg.)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
HXE	1:1	5272.34	01601370077	–	–

CODE 4222

TITLE: DOME WALL–III

DRAWING NO. 21601370075 — REV 01

SHEET NO. 01 — NO.OF SHEETS 01

SIZE A2

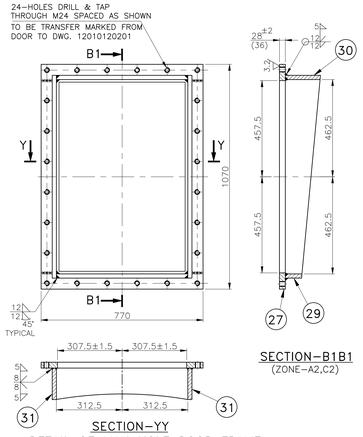
INVENTORY NO. | SIGN & DATE | REF. DRG. NO.

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

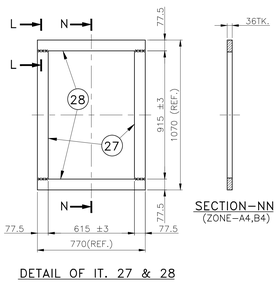
DRG. NO. 0 201 02 202 02

24-HOLES DRILL & TAP THROUGH M24 SPACED AS SHOWN TO BE TRANSFER MARKED FROM DOOR TO DWG. 12010120201

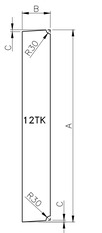


SECTION–B1B1
(ZONE–A2,C2)

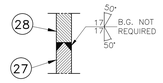
SECTION–YY
DETAIL OF MAN HOLE DOOR FRAME
(SCALE 1:10) (ZONE–B1,2)



DETAIL OF IT. 27 & 28



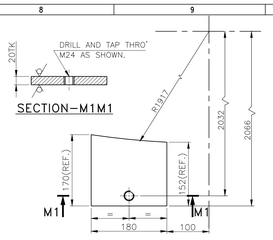
SECTION–NN
(ZONE–A4,B4)



SECTION–LL (TYP.)
(ZONE–A4)

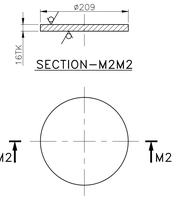
IT. NO.	DESC.	A	B	C
15	LONGITUDINAL RIB–1	3224	80	7
16	LONGITUDINAL RIB–2	3553	100	9
42	LONGITUDINAL RIB–3	1594	80	7
43	LONGITUDINAL RIB–4	660	80	7
44	LONGITUDINAL RIB–5	329	100	9

DETAIL OF IT.15,16,42,43 & 44



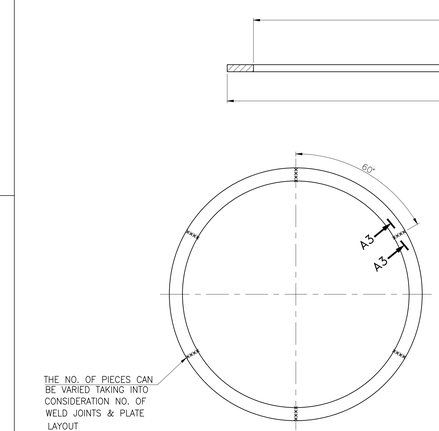
SECTION–M1M1

DETAIL OF IT. 05



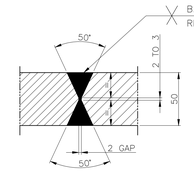
SECTION–M2M2

DETAIL OF IT. 13
(SCALE 1:5)

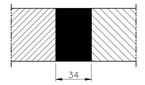


IN SIX PARTS

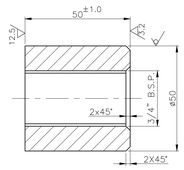
DETAIL OF ITEM NO. 1



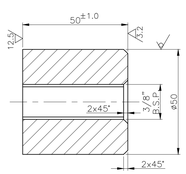
SECTION–A3A3
ALTERNATIVE–I
(SCALE 1:2)
(ZONE–C12)



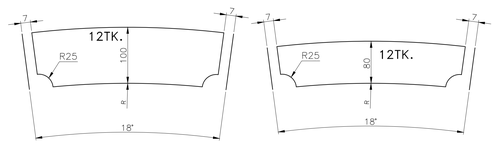
SECTION–A3A3
ALTERNATIVE–II
(SCALE 1:2) (ZONE–C12)
(DETAIL OF ELECTRO SLAG WELDING)



DETAIL OF TEST COCK BOSS IT.25
(SCALE 1:1)



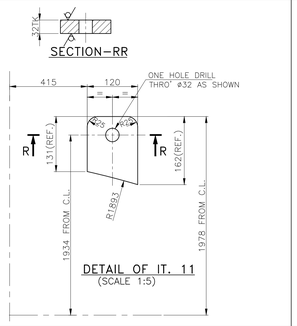
DETAIL OF PRESSURE GAUGE BOSS IT.26
(SCALE 1:1)



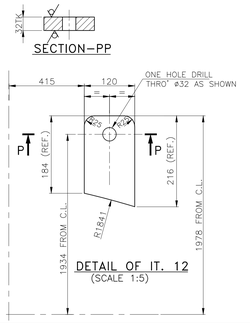
DETAIL OF IT. 32,33,34,35,36,45&47

DETAIL OF IT. 17,18,19,20,21,22,23&24

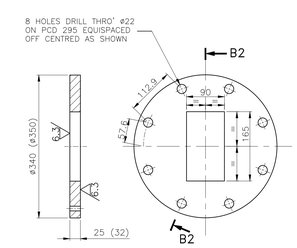
IT.NO.	DESC.	R
17	CIRCUMF. RIB–1	1973
18	CIRCUMF. RIB–2	1939
19	CIRCUMF. RIB–3	1891
20	CIRCUMF. RIB–4	1844
21	CIRCUMF. RIB–5	1797
22	CIRCUMF. RIB–6	1750
23	CIRCUMF. RIB–7	1702
24	CIRCUMF. RIB–8	1669
32	CIRCUMF. RIB–9	1864
33	CIRCUMF. RIB–10	1817
34	CIRCUMF. RIB–11	1770
35	CIRCUMF. RIB–12	1722
36	CIRCUMF. RIB–13	1689
45	CIRCUMF. RIB–14	1912
47	CIRCUMF. RIB–15	1959



DETAIL OF IT. 11
(SCALE 1:5)

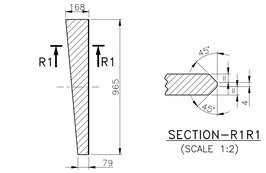


DETAIL OF IT. 12
(SCALE 1:5)



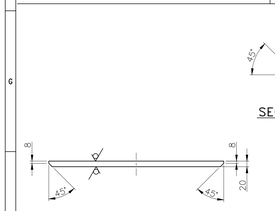
SECTION–B2B2

DETAIL OF FLANGE IT.08
(SCALE 1:5)

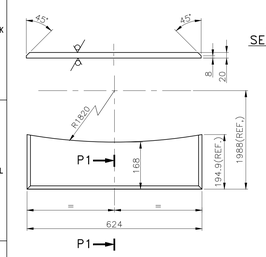


SECTION–R1R1
(SCALE 1:2)

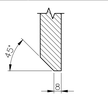
DETAIL OF IT. 31



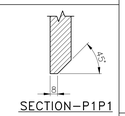
DETAIL OF IT. 29
(SCALE 1:7.5)



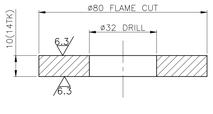
DETAIL OF IT. 30
(SCALE 1:7.5)



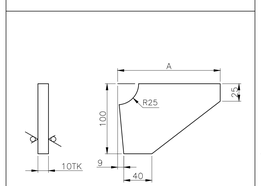
SECTION–Q1Q1



SECTION–P1P1

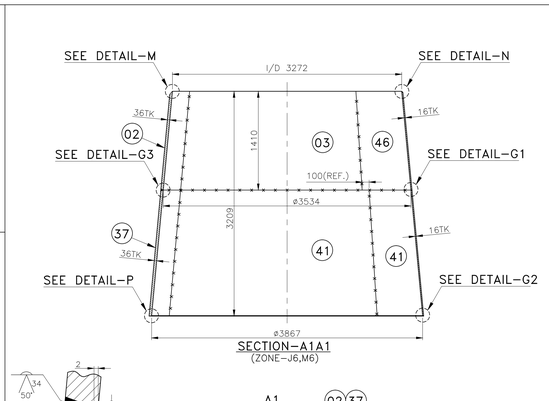


DETAIL OF IT. 10
(SCALE 1:1)

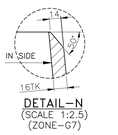


IT. NO.	A
06	153
07	170

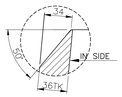
DETAIL OF IT. 06 & 07



SECTION–A1A1
(ZONE–J6,M6)

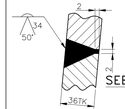


DETAIL–N
(SCALE 1:2.5)
(ZONE–G7)

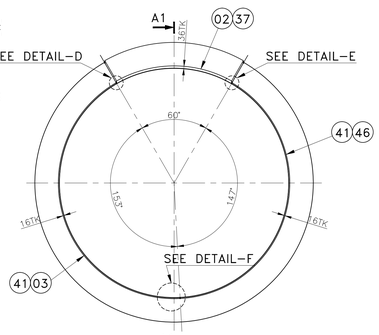


DETAIL–M
(SCALE 1:2.5)
(ZONE–G6)

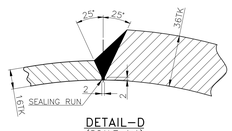
DETAIL–G2
(SCALE 1:1.5)
(ZONE–J7)



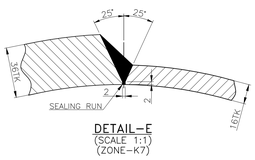
DETAIL–G3
(SCALE 1:1)
(ZONE–H5)



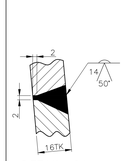
UPPER CONE
(SCALE 1:30)



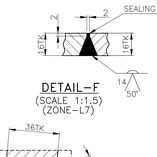
DETAIL–D
(SCALE 1:1)
(ZONE–K6)



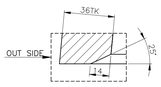
DETAIL–E
(SCALE 1:1)
(ZONE–K7)



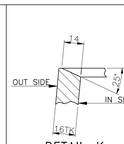
DETAIL–G1
(SCALE 1:1)
(ZONE–H7)



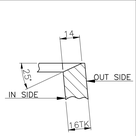
DETAIL–F
(SCALE 1:1.5)
(ZONE–L7)



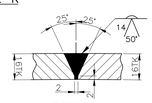
DETAIL–P
(SCALE 1:1.5)
(ZONE–J5)



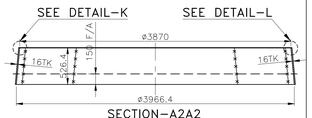
DETAIL–K



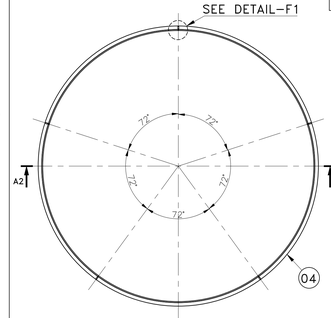
DETAIL–L



DETAIL–F1



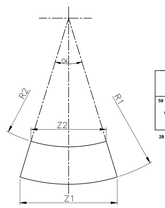
SECTION–A2A2



LOWER CONE
(SCALE 1:30)

TK.	IT.NO	NO.OF SEG	R1	R2	Z1	Z2	∝
36TK	02	01	19289	17873	1869	1731	5.55
16TK	03	01	19181	17764	4728	4379	14.16
16TK	04	05	21520	20990	2501	2439	6.66
16TK	41	02	20988	19180	5072	4635	13.88
16TK	46	01	19181	17764	4543	4208	13.60
36TK	37	01	21096	19288	2044	1868	5.55

DEVLOPMENT DETAIL OF IT. NO.2,3,4,41,46&37



STAGE–2
(SCALE 1:30)
(MACHINING OF TOP FLANGE) REFER DETAIL–'R' SHEET–1

STAGE–1
(SCALE 1:30)
(WELDING OF TOP FLANGE,UPPER CONE & MIDDLE CONE)
REFER DETAIL–'R' & 'R1' (SHEET–1)

STAGE–3
(WELDING OF MIDDLE AND LOWER CONE)
REFER DETAIL–Y & DETAIL–S, SHEET–1 (ZONE–L8 & L9)

REV.	DATE	ALTERED	CHECKED	APPROVED

VAR.COD	REMARKS	ITEM NO.	DRAWING NO.	IT.NO.	MATL. CODE	UNIT WT.	QTY.
					MATL. SPCN.		

CARD TYPE–3 — CARD TYPE–1 — CARD TYPE–2

ADDITIONAL INFORMATION

STATUS OF DRAWING: U

DISTRIBUTION OF PRINTS: HTE–2, WTM(P)–5, WTM(S)–4, FBM – 7, THX – 1

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: PALAMURU RANGAREDDY LIS STAGE–III (9x145 MW)

BHARAT HEAVY ELECTRICALS LTD. BHOPAL

	NAME	SIGN	DATE
DRN	NEERAJ		05.11.16
CHD	OND		05.11.16
APPD	S.K.		05.11.16

DEPT: HTE
CODE: 402
UNTOL.DIMS. OR. AS PER DRG. 3000004914
SCALE: 1 : 15
WEIGHT (K.G.): SEE SHT.01
REF. TO ASSY. DRG.: 0 201 02 20201
ITEM NO.: —
NO. OF SETS: —

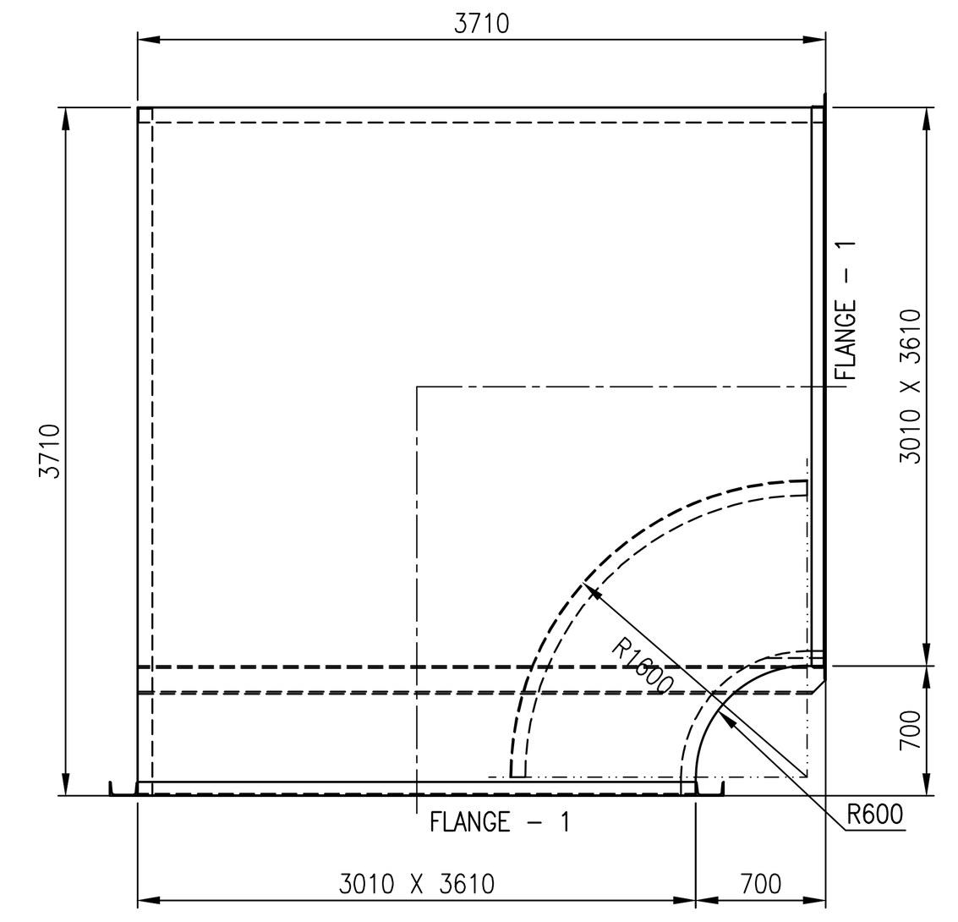
TITLE: DRAFT TUBE CONE (PART DRAWING)

DRAWING NO.: 0 201 01 202 02
REV: 00
SHT. No. 2 NO. OF SHT. 2

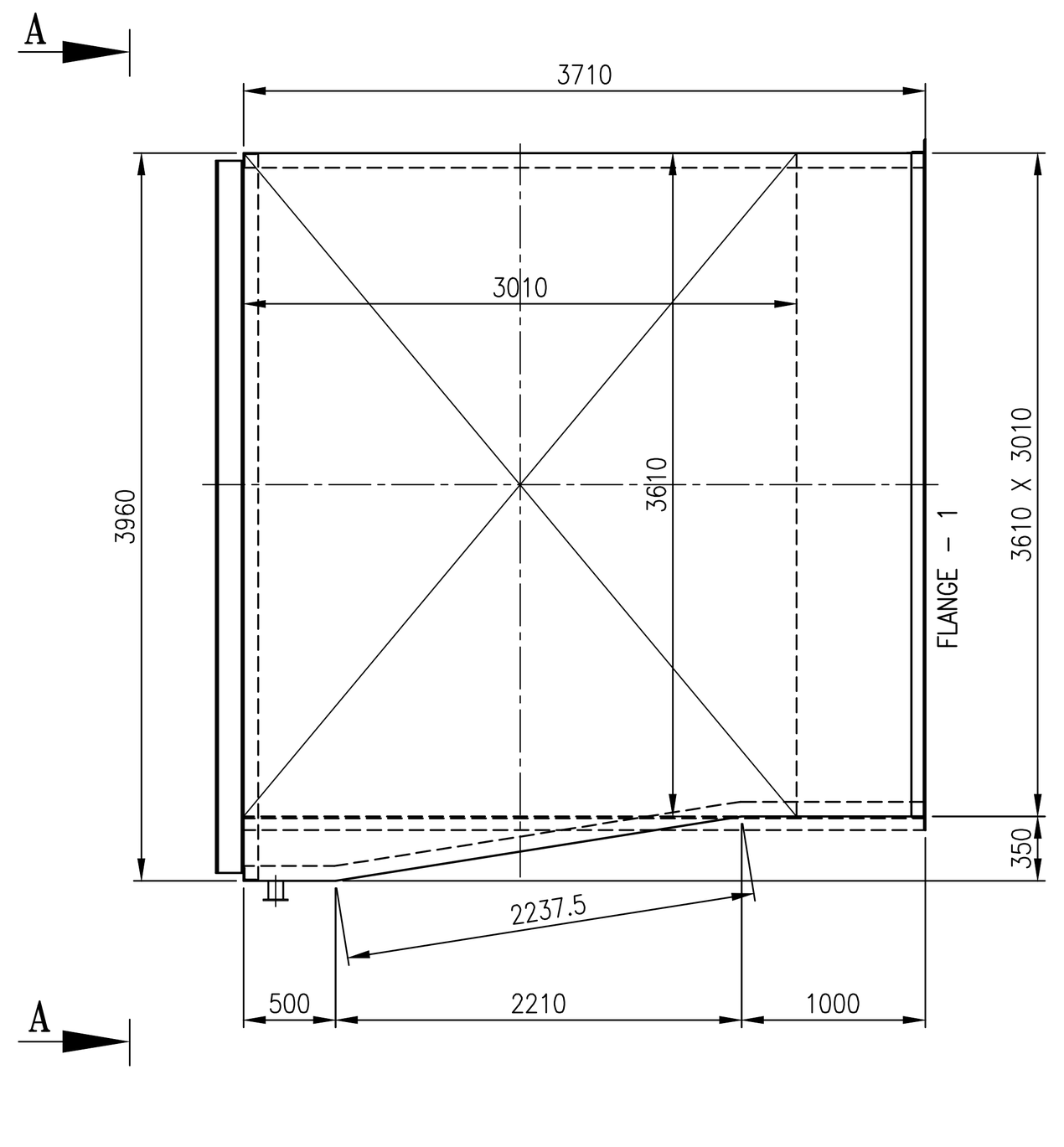
REF. DRG. NO. 0 201 02 18402
SIGN. & DATE
INVENTORY NO.

AO SIZE

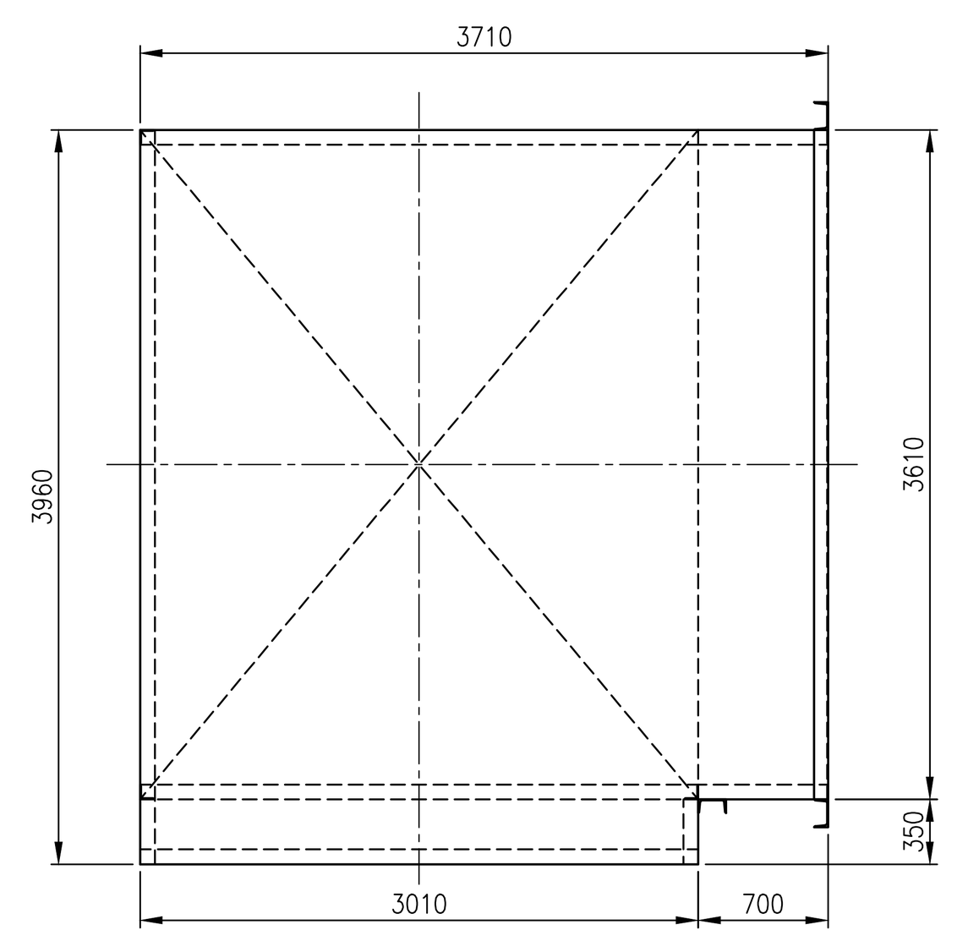
FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER PLANT STD. NO TP 023 0299



PLAN



ELEVATION



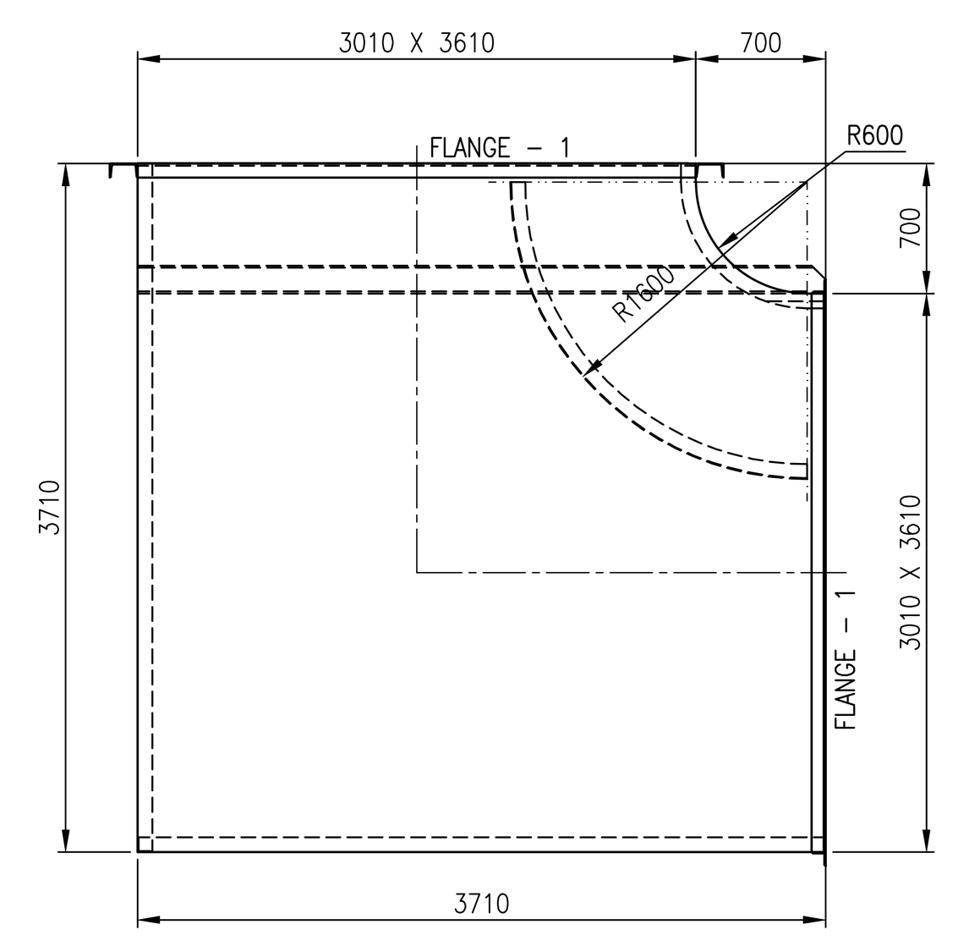
VIEW - AA

NOTES:

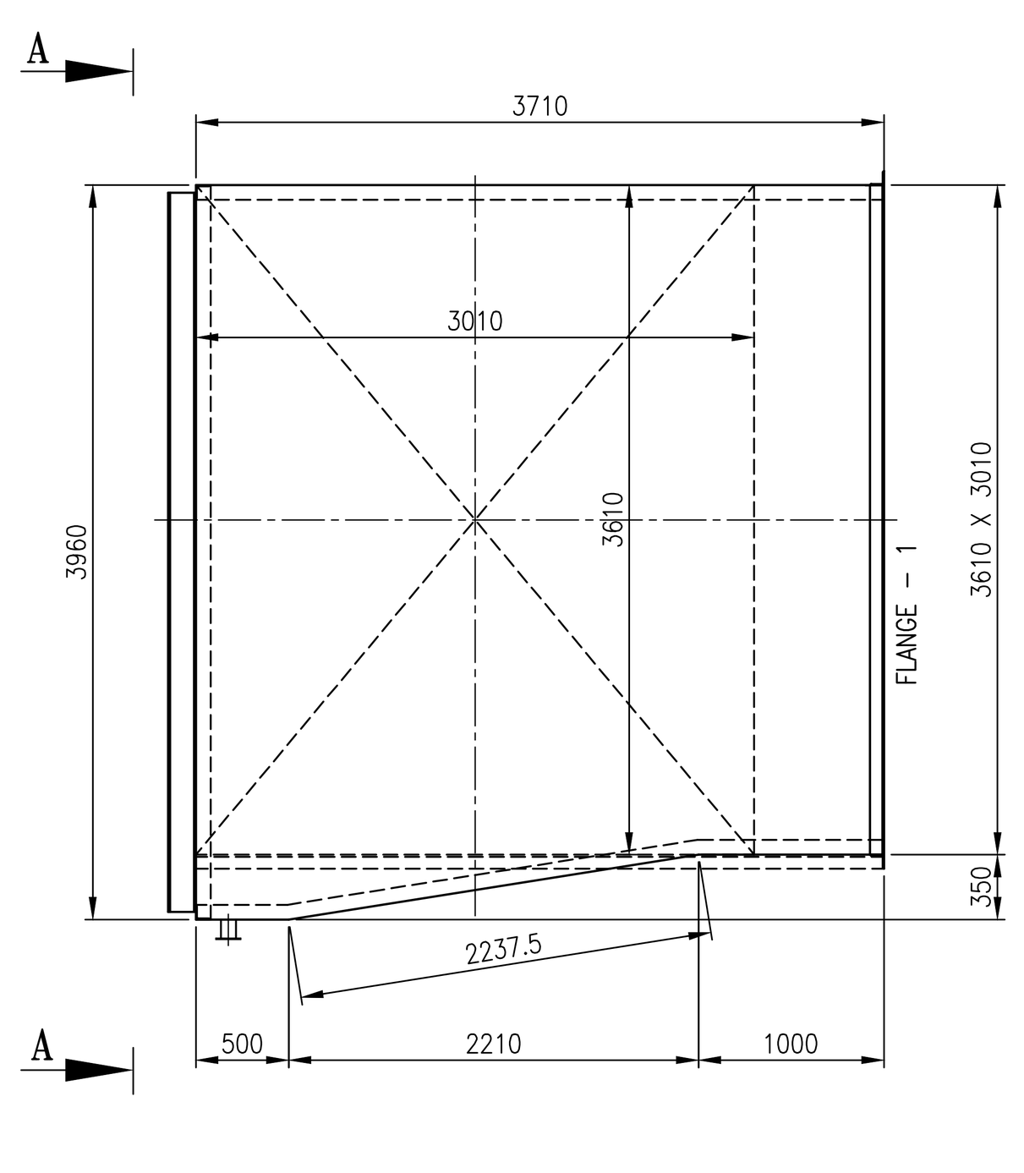
01. FOR GENERAL NOTES REFER PAGE NO. 41 (REF. 41) OF DUCT CONSTRUCTION MANUAL. REF. 121 FOR CONSTRUCTION DETAIL.
02. THIS DRAWING ALONG WITH 1-48-112-44946
1-48-112-44947
03. BOTH ARE TO BE TRAIL ASSEMBLED AT THE SAME WORKS TO ENSURE THE MIRROR ASSEMBLY.

L.H.S. SIDE
THIS IS NOT IDENTICAL TO R.H.S. SIDE
REF. DRG. NO; 1-48-112-44947

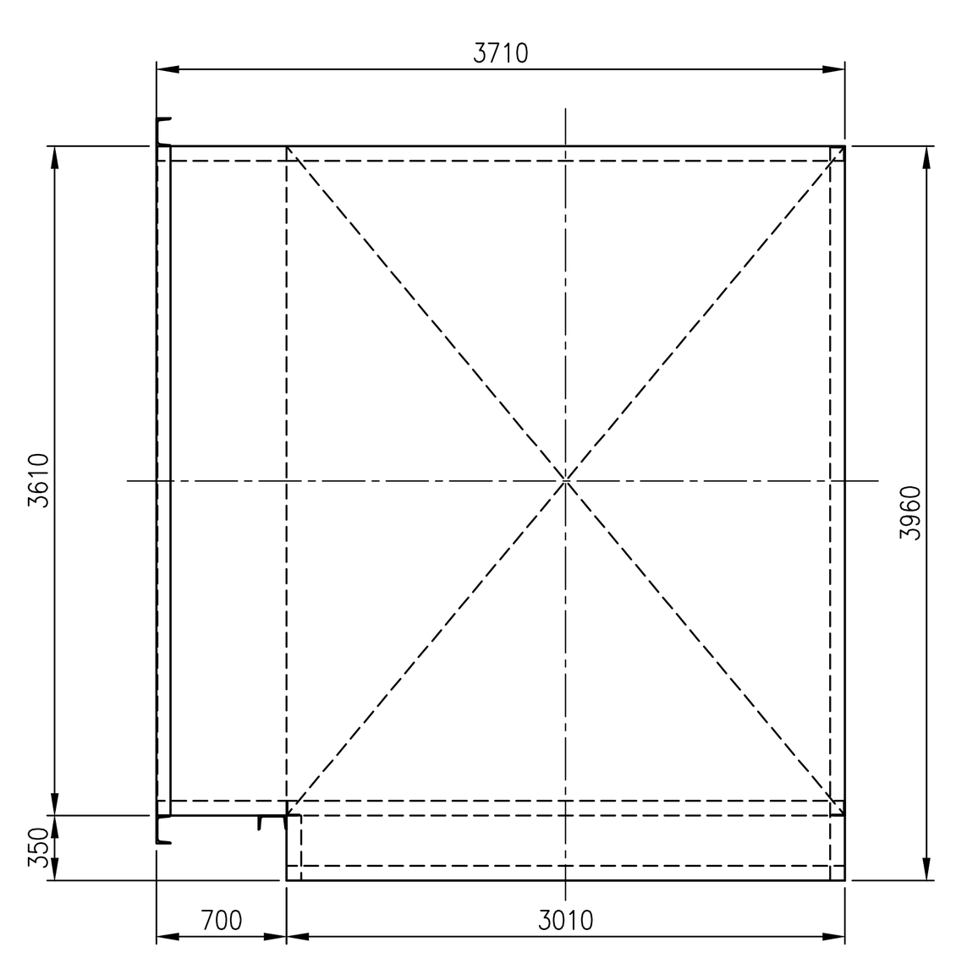
BOILER AXIS



PLAN



ELEVATION



VIEW - AA

R.H.S. SIDE
THIS IS NOT IDENTICAL TO R.H.S. SIDE
REF. DRG. NO; 1-48-112-44946

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO / VAR NO	MATERIAL CODE / MATERIAL SPECN	A/C/P / DI	UNIT	UNIT WEIGHT / QUANTITY	GS
02	43	ISA 75X75X6 2473				150130050000 IS2062 E250A			16.810 2	
02	42	PLATE 5 2509x3550				150110290000 IS2062 E250A			349.590 1	
02	41	ISA 75X75X6 3938				150130050000 IS2062 E250A			26.770 1	
02	40	ISA 75X75X6 319				150130050000 IS2062 E250A			2.160 1	
02	39	ISA 75X75X6 660				150130050000 IS2062 E250A			4.480 1	
02	38	ISA 75X75X6 C.T.S. 1576				150130050000 IS2062 E250A			10.710 1	
02	37	ISA 75X75X6 2261				150130050000 IS2062 E250A			15.370 1	
02	36	ISA 75X75X6 1421				150130050000 IS2062 E250A			9.660 2	
02	35	ISA 75X75X6 C.T.S. 1998.5				150130050000 IS2062 E250A			13.590 1	
02	34	ISA 75X75X6 2171				150130050000 IS2062 E250A			14.760 1	
02	33	ISA 75X75X6 1711				150130050000 IS2062 E250A			11.630 1	
02	32	ISA 75X75X6 1511				150130050000 IS2062 E250A			10.270 1	
02	31	ISA 75X75X6 1143				150130050000 IS2062 E250A			7.770 2	
02	30	ISA 75X75X6 3760				150130050000 IS2062 E250A			25.560 1	
02	29	ISA 75X75X6 3010				150130050000 IS2062 E250A			20.460 2	
02	28	ISMC 150 3910				150100350000 IS2062 E250A			65.680 2	
02	27	ISMC 150 3010				150100350000 IS2062 E250A			50.560 2	
02	26	ISMC 150 C.T.S. 3710				150100350000 IS2062 E250A			62.320 1	
02	25	ISMC 150 3876				150100350000 IS2062 E250A			65.110 4	
02	24	ISMC 150 C.T.S. 3876				150100350000 IS2062 E250A			65.110 1	
02	23	ISMC 150 C.T.S. 3848				150100350000 IS2062 E250A			64.640 1	
02	22	ISMC 150 C.T.S. 3779				150100350000 IS2062 E250A			63.480 1	
02	21	ISMC 150 C.T.S. 3676				150100350000 IS2062 E250A			61.750 1	
02	20	ISMC 150 C.T.S. 3573				150100350000 IS2062 E250A			60.020 1	
(1) 02	19	ISMC 150 C.T.S. 3526				150100350000 IS2062 E250A			59.230 3	
02	18	ISMC 150 C.T.S. 3657				150100350000 IS2062 E250A			61.430 4	
(1) 02	17	ISMC 150 2926				150100350000 IS2062 E250A			49.150 6	
02	16	ISMC 150 C.T.S. 3237				150100350000 IS2062 E250A			54.380 1	
02	15	PLATE 5 125x3900				150110290000 IS2062 E250A			19.130 1	
02	14	PLATE 5 125x3755				150110290000 IS2062 E250A			18.420 1	
02	13	PLATE 5 125x2950				150110290000 IS2062 E250A			14.470 1	

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO / VAR NO	MATERIAL CODE / MATERIAL SPECN	A/C/P / DI	UNIT	UNIT WEIGHT / QUANTITY	GS
02	12	PLATE 5 C.T.S. 125x3669				150110290000 IS2062 E250A			18.000 1	
02	11	PLATE 5 300x2362				150110290000 IS2062 E250A			16.660 1	
02	10	PLATE 5 2250x3900				150110290000 IS2062 E250A			334.660 1	
02	09	PLATE 5 1385x3900				150110290000 IS2062 E250A			212.000 1	
02	08	PLATE 5 1385x3900				150110290000 IS2062 E250A			209.390 1	
02	07	PLATE 5 2250x3751				150110290000 IS2062 E250A			318.500 1	
02	06	PLATE 5 1106x3550				150110290000 IS2062 E250A			154.100 1	
02	05	PLATE 5 660x3334				150110290000 IS2062 E250A			78.850 1	
02	04	PLATE 5 1962.5x2950				150110290000 IS2062 E250A			227.230 1	
02	03	PLATE 5 2135x3660				150110290000 IS2062 E250A			306.700 1	
02	02	PLATE 5 1700x2950				150110290000 IS2062 E250A			196.830 1	
02	01	PLATE 5 1500x3660				150110290000 IS2062 E250A			199.040 1	
01	43	ISA 75X75X6 2473				150130050000 IS2062 E250A			16.810 2	
01	42	PLATE 5 2509x3550				150110290000 IS2062 E250A			349.590 1	
01	41	ISA 75X75X6 3938				150130050000 IS2062 E250A			26.770 1	
01	40	ISA 75X75X6 319				150130050000 IS2062 E250A			2.160 1	
01	39	ISA 75X75X6 660				150130050000 IS2062 E250A			4.480 1	
01	38	ISA 75X75X6 C.T.S. 1576				150130050000 IS2062 E250A			10.710 1	
01	37	ISA 75X75X6 2261				150130050000 IS2062 E250A			15.370 1	
01	36	ISA 75X75X6 1421				150130050000 IS2062 E250A			9.660 2	
01	35	ISA 75X75X6 C.T.S. 1998.5				150130050000 IS2062 E250A			13.590 1	
01	34	ISA 75X75X6 2171				150130050000 IS2062 E250A			14.760 1	
01	33	ISA 75X75X6 1711				150130050000 IS2062 E250A			11.630 1	
01	32	ISA 75X75X6 1511				150130050000 IS2062 E250A			10.270 1	
01	31	ISA 75X75X6 1143				150130050000 IS2062 E250A			7.770 2	
01	30	ISA 75X75X6 3760				150130050000 IS2062 E250A			25.560 1	
01	29	ISA 75X75X6 3010				150130050000 IS2062 E250A			20.460 2	
01	28	ISMC 150 3910				150100350000 IS2062 E250A			65.680 2	
01	27	ISMC 150 3010				150100350000 IS2062 E250A			50.560 2	
01	26	ISMC 150 C.T.S. 3710				150100350000 IS2062 E250A			62.320 1	
01	25	ISMC 150 3876				150100350000 IS2062 E250A			65.110 4	
01	24	ISMC 150 C.T.S. 3876				150100350000 IS2062 E250A			65.110 1	
01	23	ISMC 150 C.T.S. 3848				150100350000 IS2062 E250A			64.640 1	
01	22	ISMC 150 C.T.S. 3779				150100350000 IS2062 E250A			63.480 1	
01	21	ISMC 150 C.T.S. 3676				150100350000 IS2062 E250A			61.750 1	
01	20	ISMC 150 C.T.S. 3573				150100350000 IS2062 E250A			60.020 1	
(1) 01	19	ISMC 150 C.T.S. 3526				150100350000 IS2062 E250A			59.230 3	
01	18	ISMC 150 C.T.S. 3657				150100350000 IS2062 E250A			61.430 4	
(1) 01	17	ISMC 150 2926				150100350000 IS2062 E250A			49.150 6	
01	16	ISMC 150 C.T.S. 3237				150100350000 IS2062 E250A			54.380 1	
01	15	PLATE 5 125x3900				150110290000 IS2062 E250A			19.130 1	
01	14	PLATE 5 125x3755				150110290000 IS2062 E250A			18.420 1	
01	13	PLATE 5 125x2950				150110290000 IS2062 E250A			14.470 1	
01	12	PLATE 5 C.T.S. 125x3669				150110290000 IS2062 E250A			18.000 1	
01	11	PLATE 5 300x2362				150110290000 IS2062 E250A			16.660 1	
01	10	PLATE 5 2250x3900				150110290000 IS2062 E250A			334.660 1	
01	09	PLATE 5 1385x3900				150110290000 IS2062 E250A			212.000 1	
01	08	PLATE 5 1385x3900				150110290000 IS2062 E250A			209.390 1	
01	07	PLATE 5 2250x3751				150110290000 IS2062 E250A			318.500 1	
01	06	PLATE 5 1106x3550				150110290000 IS2062 E250A			154.100 1	
01	05	PLATE 5 660x3334				150110290000 IS2062 E250A			78.850 1	
01	04	PLATE 5 1962.5x2950				150110290000 IS2062 E250A			227.230 1	
01	03	PLATE 5 2135x3660				150110290000 IS2062 E250A			306.700 1	
01	02	PLATE 5 1700x2950				150110290000 IS2062 E250A			196.830 1	
01	01	PLATE 5 1500x3660				150110290000 IS2062 E250A			199.040 1	

REV	DATE	ALTERED : ABHISHEK / CHD & APPD : MRS
01	04.07.20	ZONE (1) ITEM NO: 17 AND 19 QTY UPDATED.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

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

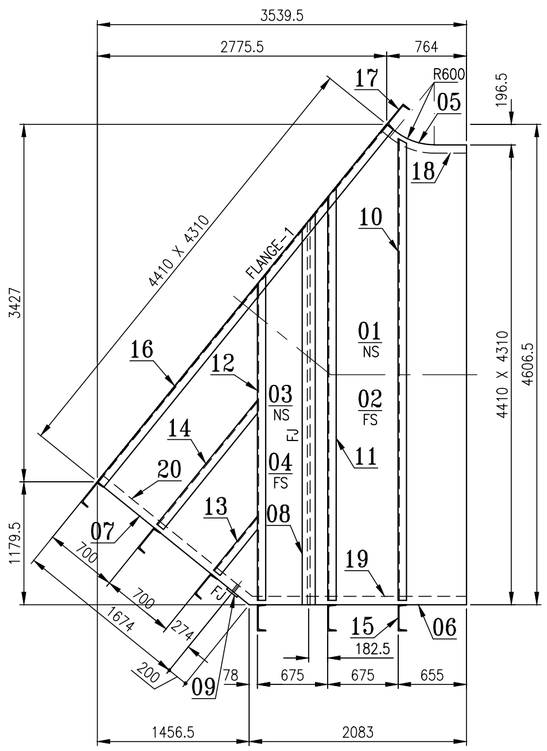
	NAME	SIGNATURE	DATE
DRN	S.S.MANIAN		17.01.2019
CHD	ABHISHEK		18.01.2019
APPD	B.M.KUMAR		19.01.2019

DEPT DU | CODE 124 | ALL DIMENSIONS ARE IN MM | PROJECTION | SCALE 1 : 40 | WEIGHT (Kg) 9122.4 | REF TO ASSY / OLD DWG

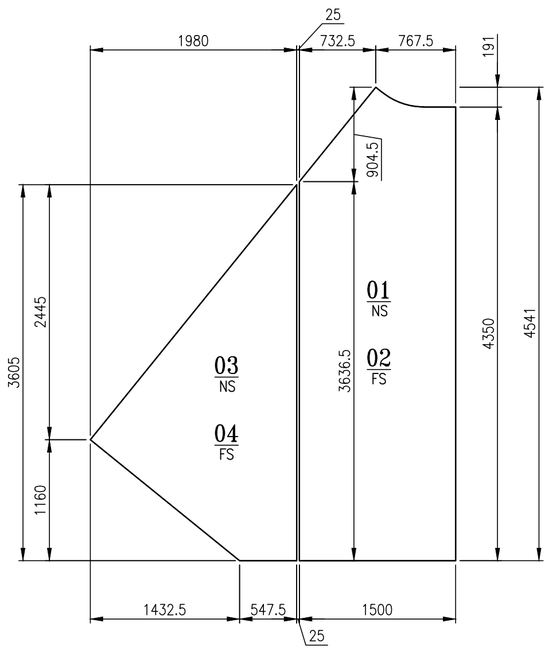
TITLE: ELBOW DUCT (R.H.S. + L.H.S.)

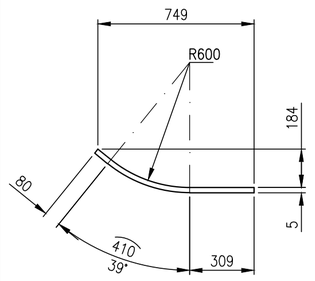
DRAWING NO : 0-48-112-37156 (SH. 03 OF 03) REV 01

DRAWING NO: 2-48-012-62942

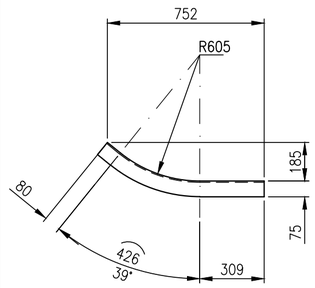


ITEM NOS. 01 TO 04

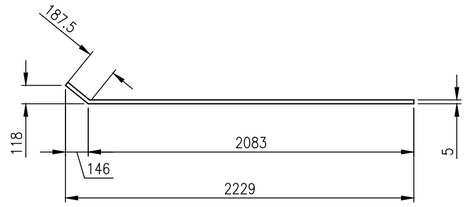




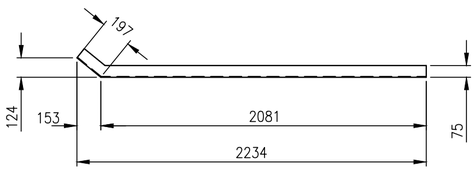
ITEM NO. 05



ITEM NO. 18



ITEM NO. 06



ITEM NO. 19

DESPATCH TABLE

S.NO.	DESCRIPTION	DU. NO.	NO. OFF	ITEM NOS.				
				NO. OFF				
01	BEND DUCT WALL	007	1	01	08	10	11	
				1	1	1	1	
02	BEND DUCT WALL	008	1	02	08	10	11	
				1	1	1	1	
03	BEND DUCT WALL	009	1	03	12	13	14	
				1	1	1	1	
04	BEND DUCT WALL	010	1	04	12	13	14	
				1	1	1	1	
05	BEND DUCT WALL	011	1	05	17	18		
				1	1	2		
06	BEND DUCT WALL	012	1	06	09	15	19	
				1	1	3	2	
07	BEND DUCT WALL	013	1	07	15	17	20	
				1	2	1	2	
08	COLLECTOR FLANGE	014	2	16				
				1				

NOTE:

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

01. FOR GENERAL NOTES REFER PAGE NO. 41 (REF. 41) OF DUCT CONSTRUCTION MANUAL. REF. 121 FOR CONSTRUCTION DETAIL.

FLANGE DETAILS

FLANGE NO.	REF	D	X	A	B	W	S	E	F	N
FLANGE-1	REF 108	4310	356	2	1828	4410	456	2	1828	24

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO / VAR NO	MATERIAL CODE / MATERIAL SPECN	A/C/P	UNIT / DI	UNIT WEIGHT / QUANTITY	GS
	20	ISA 75X75X6 1652.5			150130050000 IS2062 E250A				11.230 2	
	19	ISA 75X75X6 2278			150130050000 IS2062 E250A				15.490 2	
	18	ISA 75X75X6 815			150130050000 IS2062 E250A				5.540 2	
	17	ISMC 250 4810			150100340000 IS2062 E250A				164.500 2	
	16	ISMC 250 4410			150100340000 IS2062 E250A				150.820 2	
	15	ISMC 250 4226			150100340000 IS2062 E250A				144.520 5	
	14	ISMC 250 1532			150100340000 IS2062 E250A				52.390 2	
	13	ISMC 250 667			150100340000 IS2062 E250A				22.810 2	
	12	ISMC 250 3114			150100340000 IS2062 E250A				106.490 2	
	11	ISMC 250 3947			150100340000 IS2062 E250A				134.980 2	
	10	ISMC 250 4427			150100340000 IS2062 E250A				151.400 2	
	09	PLATE 5 125X4250			150110290000 IS2062 E250A				20.850 1	
	08	PLATE 5 C.T.S 125X3650			150110290000 IS2062 E250A				17.910 2	
	07	PLATE 5 1641.5X4250			150110290000 IS2062 E250A				273.820 1	
	06	PLATE 5 2270.5X4250			150110290000 IS2062 E250A				378.740 1	
	05	PLATE 5 799X4250			150110290000 IS2062 E250A				133.280 1	
	04	PLATE 5 1980X3605			150110290000 IS2062 E250A				152.560 1	
	03	PLATE 5 1980X3605			150110290000 IS2062 E250A				152.560 1	
	02	PLATE 5 1500X4541			150110290000 IS2062 E250A				249.680 1	
	01	PLATE 5 1500X4541			150110290000 IS2062 E250A				249.680 1	

REV	DATE	ALTERED :
01		CHD & APPD :
ZONE		

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
TIRUCHIRAPALLI – 620014
355-054

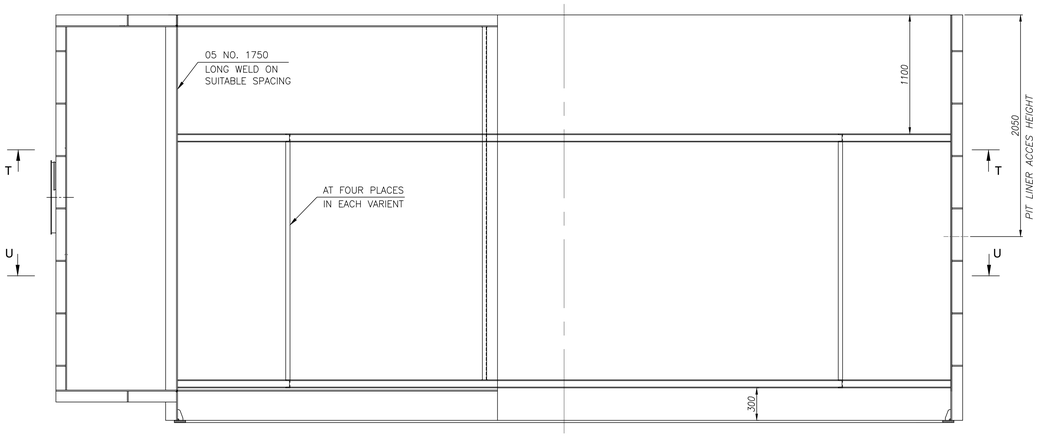
	NAME	SIGNATURE	DATE
DRN	EOL/VAD		30.11.2018
CHD	VVEL		30.11.2018
APPD	B.M.KUMAR		30.11.2018

DEPT	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	WEIGHT (Kg)	REF TO ASSY / OLD DWG
DU			1 : 40	4000.890	
CODE 124					

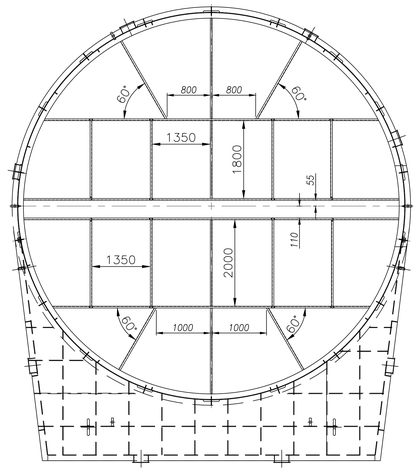
TITLE: BEND DUCT

DRAWING NO : 2-48-012-62942

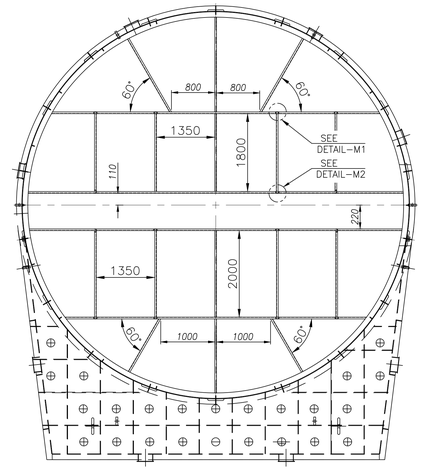
REV 00



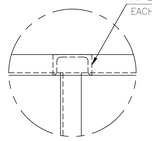
SECTION-AA
(SCHEME FOR TRANSPORT STAY)
(ZONE-H,L,8-FROM SHEET-1)



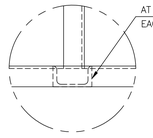
TOP VIEW & SECTION-TT
(SCHEME FOR TRANSPORT STAY)
(TYPICAL)
(SCALE 1:50)
(ZONE-C,1,7,)



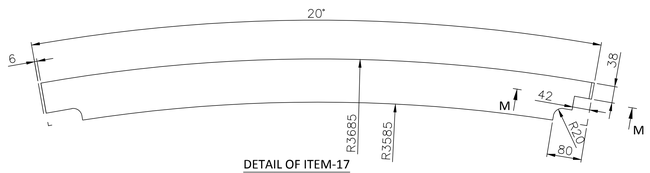
SECTION-UU
(SCHEME FOR TRANSPORT STAY)
(TYPICAL)
(SCALE 1:50)
(ZONE-D,1,7,)



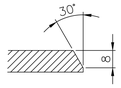
DETAIL-M1
(ZONE-C14)



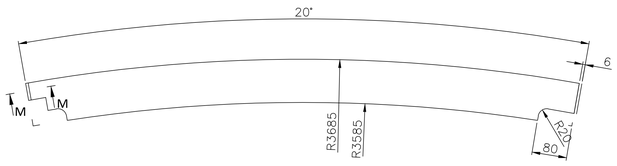
DETAIL-M2
(ZONE-C14)



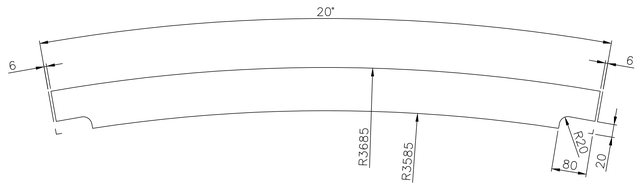
DETAIL OF ITEM-17
(TYPICAL)
(SCALE 1:5)



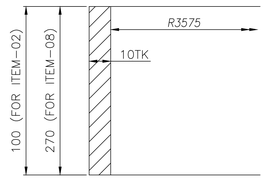
SECTION-MM



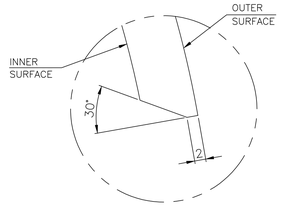
DETAIL OF ITEM-18
(TYPICAL)
(SCALE 1:5)



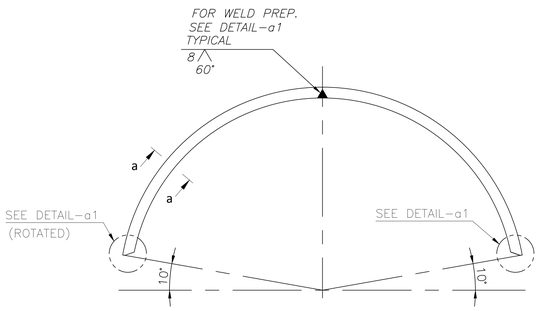
DETAIL OF ITEM-11
(TYPICAL)
(SCALE 1:5)



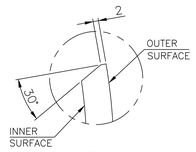
SECTION-aa
NTS



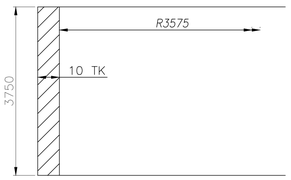
DETAIL-a1
(TYPICAL) NTS



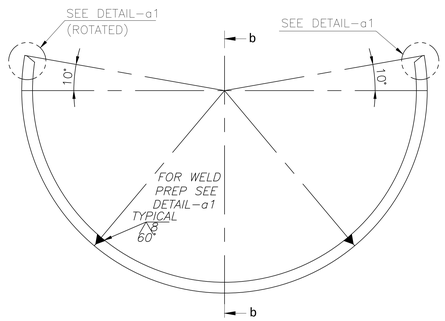
DETAIL OF ITEM-02 & 08
NTS



DETAIL-a1
(TYPICAL) NTS



SECTION-bb
NTS



DETAIL OF ITEM-03
NTS

VAR.01	VAR.OO	REMARKS	VAR NO.	ITEM NO.	DESCRIPTION	STD.	DRAWING NO.	ITEM NO.	MATL CODE	A/P	UNIT	UNIT WT.	ZONE
								VAR.	MATL SPCN.			TM QTY.	
CARD TYPE- 3					CARD TYPE- 1			CARD TYPE- 2					

REV.	DATE	ALTERED / CHECKED / APPD.	ZONE

ADDITIONAL INFORMATION: –

STATUS OF DRAWING: U

DISTRIBUTION OF PRINTS: HTE-2, WTM(P)-1, WTM(S)-4, FGM-7, THX-1

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: PALAMURU RANGAREDDY-1 (L.I.S.)

BHARAT HEAVY ELECTRICALS LTD. BHOPAL

	NAME	SIGN	DATE	
DRN	T.R.Dhadse		08.01.21	NO. OF VAR.
CKD	P.K./V.P.		08.01.21	–
APPD	A.K.Bharti	–sd.–	08.01.21	

DEPT. H.T.E. CODE 402 | UNTOL. DIMS. GR. | REF.DRG.NO. 32000049014 | SCALE 1:20 | WEIGHT(K.G.) – | REF.TO ASSY.DRG. 0 20207 21201 | ITEM NO. – | NO.OF ITEM ––

TITLE: WELDED ASSY. OF PIT LINER

DRAWING NO. 0 20207 21202 | REV. 00

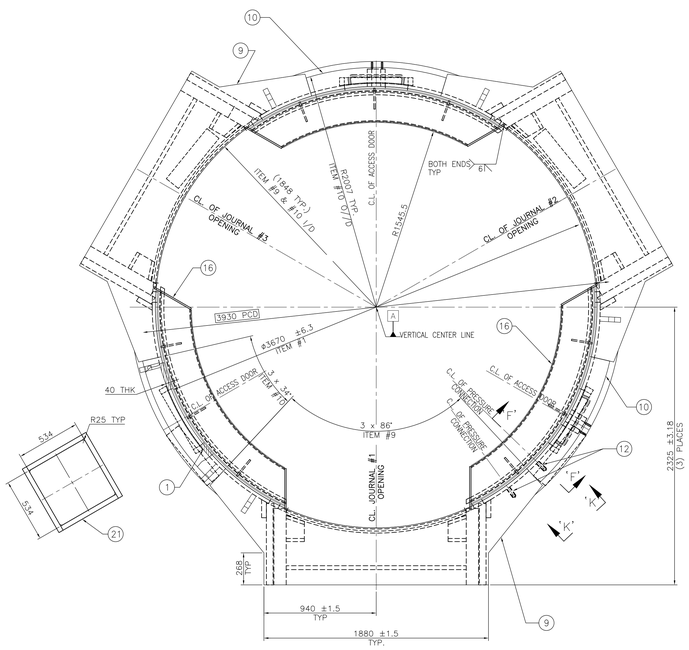
SHT. NO. 02 | NO. OF SHT. 03

A0 SIZE

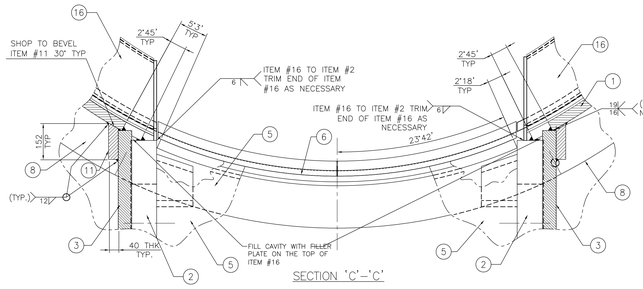
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

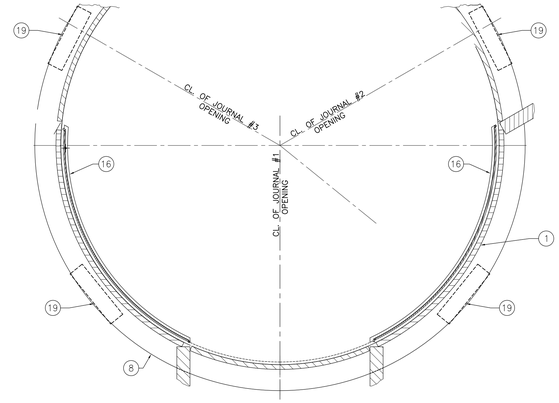
DRG. NO 0-61-310-01552



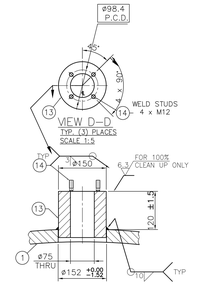
PLAN VIEW

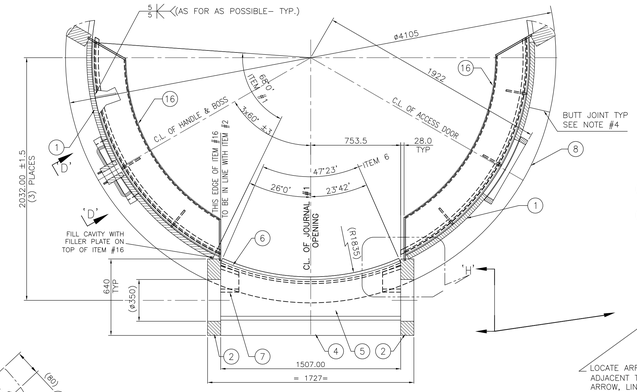


SECTION 'C'–'C'

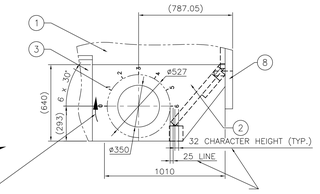


SECTION 'G'–'G'

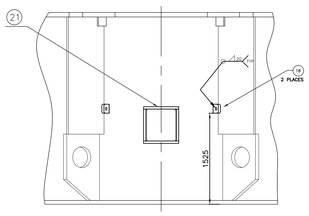




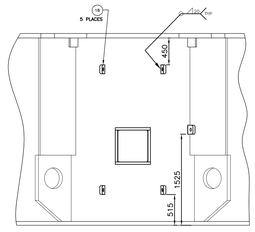
SECTION 'A'–'A'



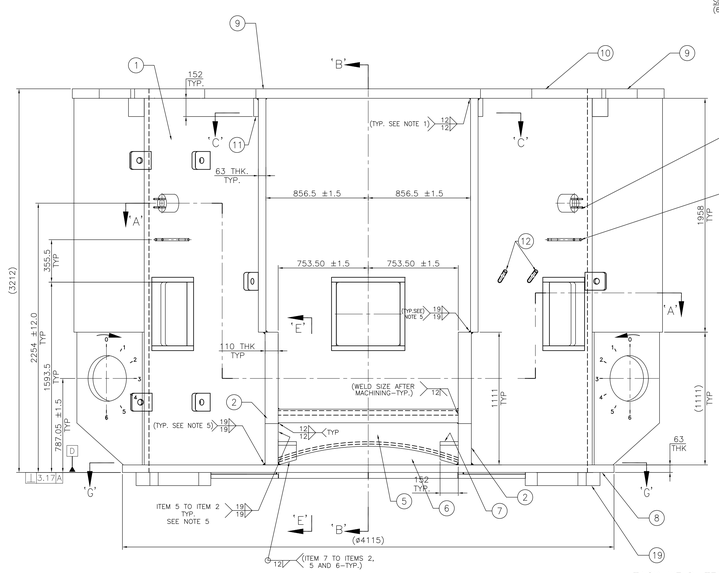
LOCATE ARROW & CHARACTER 0 THRU 6 AS CLOSE AS PRACTICAL, ADJACENT TO THE LINE IT REPRESENTS (AS SHOWN). ARROW, LINES & CHARACTER TO BE PAINTED IN BLACK TYP. REFER TO ELEVATION VIEW FOR PROPER NUMBERING POSITION.



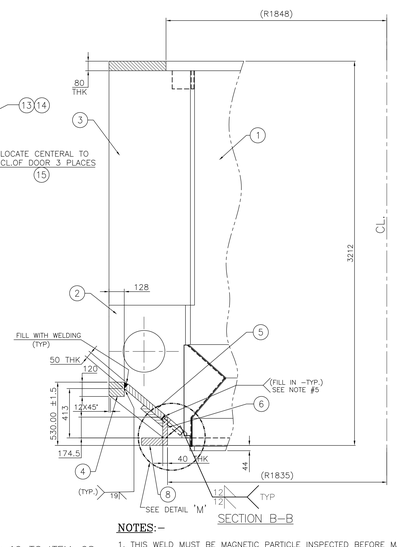
VIEW–N
(LUG POSITIONING)



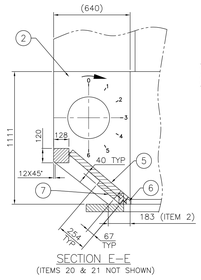
VIEW–L
(LUG POSITIONING)



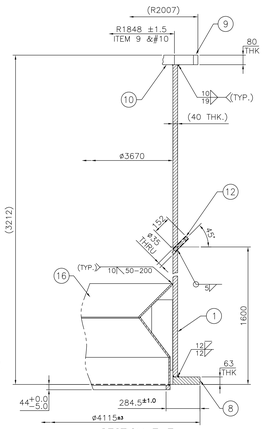
ELEVATION



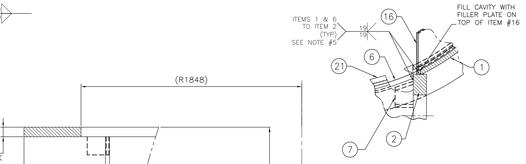
SECTION B–B



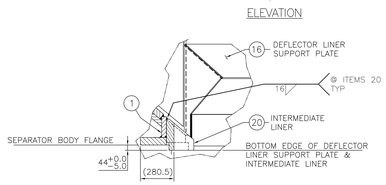
SECTION E–E
(ITEMS 20 & 21 NOT SHOWN)



SECTION F–F

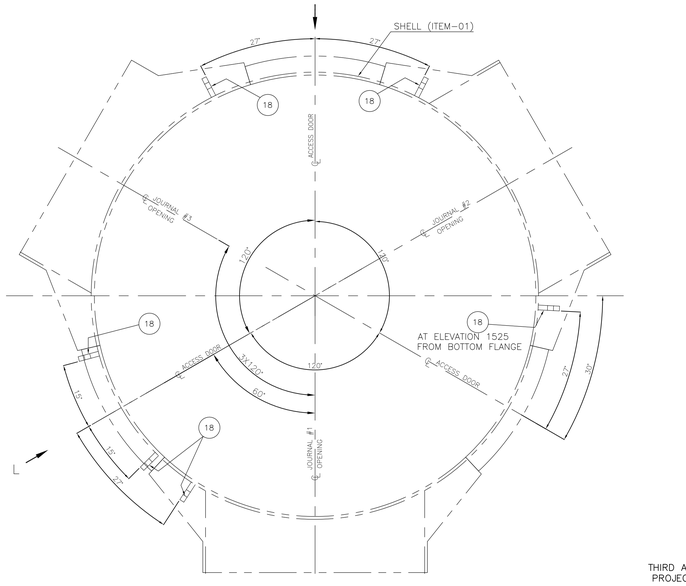


DETAIL 'H'



DETAIL 'M'

TACK WELD ITEM–19 TO ITEM–08 (TYP – 4 PLACES)



ITEM–18 (LUG) POSITIONING DETAILS

THIRD ANGLE PROJECTION

NOTES:–

1. THIS WELD MUST BE MAGNETIC PARTICLE INSPECTED BEFORE MACHINING (TYP 12 PLACES).
2. USE DOOR FRAME (ITEM 4) AS A TEMPLATE FOR THE CUTTING OF DOOR FRAME OPENING
3. THIS WELD TO BE MADE WITH GAS SHIELDED FLUX CORE WELDING
4. ALL FILLET WELD TO BE 12㎜ UNLESS OTHERWISE NOTED
5. ALL "V" WELDS TO BE FULL PENETRATION WELDS UNLESS OTHERWISE NOTED
6. ALL BUTT WELDS TO BE
   A) FULL PENETRATION ' X ' WELDS.
   B) LPI TESTED AFTER BACK CHIPPING AS PER AA0850131 ACCEPTANCE AS PER AA0850129
   C) 100% MINIMUM RADIOGRAPHY TESTED (100% FOR ALL KNOT WELDS) AS PER HY0850170.
7. LPI OF ALL FINISHED WELDS ASPER AA0850131 AND ACCEPTANCE AS PER AA0850129 .
8. REFER TO 0-61-310-00902 FOR MACHINING DRAWING.
9. NOTES 4 TO 7 ARE ALSO APPLICABLE FOR PART DRAWINGS REFERRED TO IN THIS DRAWING
10. ABOVE ARE MINIMUM NDT REQUIREMENTS. CUSTOMER APPROVED QUALITY PLAN MAY REQUIRE ADDITIONAL NDT REQUIREMENT / PERCENTAGE
11. FOR LOCATION OF ITEM 16 SEE SECTIONS A–A, C–C AND F–F.
12. WELD ITEMS #1 THRU #15 AS SHOWN.
13. REFER 06131000935 DRAWING FOR CUTTING PLANS
14. LIFTING LUGS TO BE FIXED AS PER DRG NO. 26131003585.

REV.	DATE	ALTERED	CHECKED	APPROVED
ZONE				

THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED.

1. REF. TO HY0230261 FOR UNSPECIFIED TOLERANCES.
2. CHAMFER M/CD. SHARP EDGES AT 45°.
3. INTERNAL M/CD. CORNER RADII 1 TO 0.7
4. THE SURFACE ROUGHNESS WHERE-EVER NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWN OUT SIDE THE BACK SLASH GIVEN OR THE TOP MOST RIGHT CORNER OF THE DRG.

RELEASED EDAS

TYPE OF PRODUCT
NAME OF CUSTOMER/PROJECT HP 1103 BOWL MILL

BHARAT HEAVY ELECTRICALS LIMITED HYDERABAD

RESTRICTED USE

	NAME	DATE	NO.OF VAR.
DRN.	SHARIFF	04.05.18	
CHD.	AMAN	04.05.18	
APPD.	S.GHATGE	04.05.18	

CODE	SCALE	WEIGHT (KG)	REF. TO ASSY DRG.	ITEM NO.	NO.OF ITEMS
4460	1:18	19261	0-61-310-01520		

TITLE SEPARATOR BODY FABRICATION

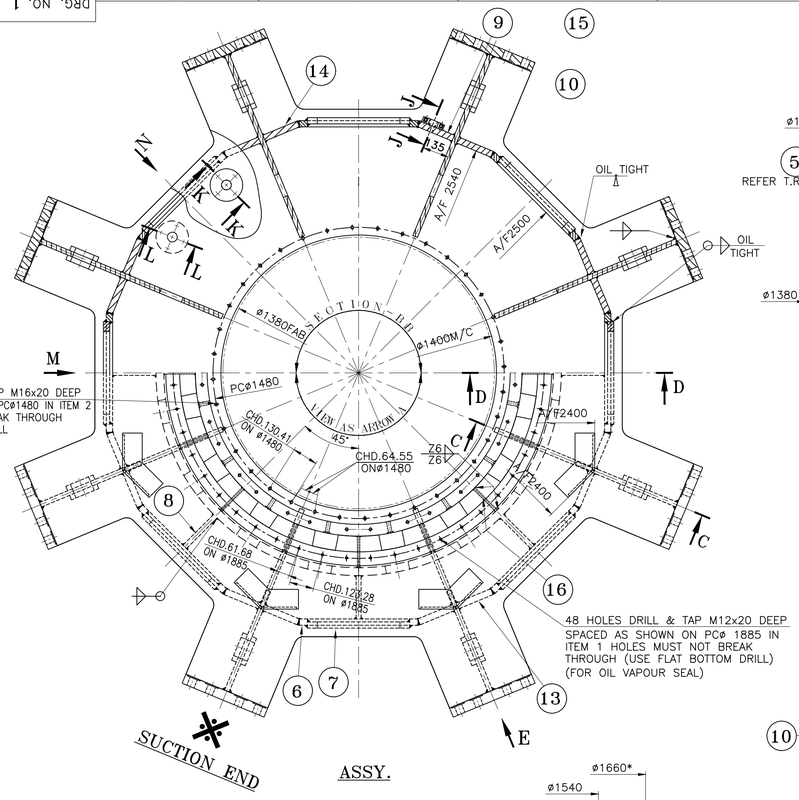
DRAWING NO. 0-61-310-01552 REV. 00

SHEET NO. NO OF SHEETS

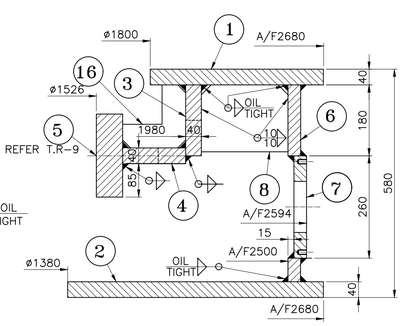
INVENTORY NO | COMP. FILE NAME 0-61-310-00934-13 | REF. DRG. NO.

FIRST ANGLE PROJECTION

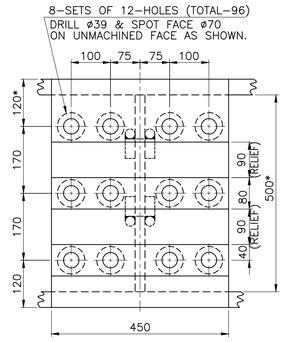
DRG. NO. 1 256 01 89601



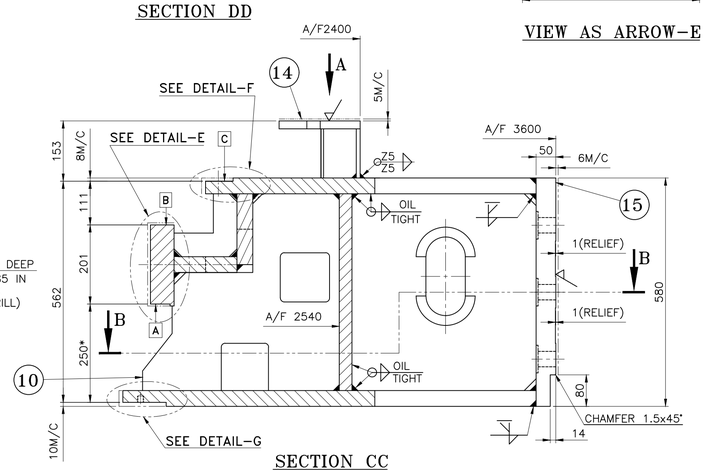
ASSY.



SECTION DD



VIEW AS ARROW-E

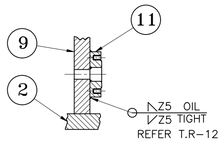


SECTION CC

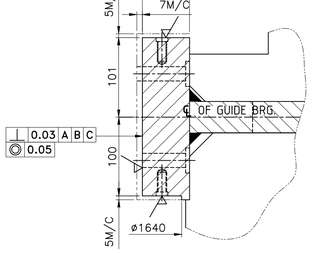
TECHNICAL REQUIREMENTS:-

1. WELDING INSTRUCTION :-
   - A. ALL WELDS ARE 15 MM FILLET OF GR.-III TO AA0622101 UNLESS OTHERWISE STATED.
   - B. ALL WELDS TO BE CRACK DETECTED BY D.P/MCD. TO BP 0850199.
   - C. STRESS RELIEVE ASSY. TO BP 0640299 BEFORE MACHINING. THREADS OF IT.5,11&12 TO BE PROTECTED DURING S.R.
   - D. ALL WELDS SHOWN THUS 'LEAK TIGHT' TO BE D.P. TESTED AFTER FIRST ROOT RUN AND ALSO AFTER COMPLETE WELDING.
   - E. ALL WELDS ARE CONTINUOUS EXCEPT WHERE OTHERWISE STATED,
2. PAINTING SHALL BE CARRIED OUT AS PER HG12007.
3. DIMENSIONS MARKED THUS * ARE FOR D.O. REF. ONLY.
4. SURFACE FINISH OF MACHINED SURFACE SHALL BE 3.2 MICRONS OR BETTER
5. ITEM 7 TO BE WELDED TO HOUSING AFTER THE BRACKET HAS BEEN STRESS RELIEVED.
6. MACHINED FACES OF COOLER FLANGE ITEM 7 TO BE KEPT PARALLEL TO THE BRACKET AXIS DURING WELDING (VERTICALITY WITH IN 2 mm.)
7. ALL MACHINED SURFACES TO BE COATED WITH T.R.P. TO BP 0690084.
8. ALL WELDS, WHICH REQUIRE LEAK PROOF TIGHTNESS, SHOULD BE PAINTED ONLY AFTER OIL LEAKAGE TEST BY GRAVITY TO BP 0850095. REFER DRG. TO 22635289601 FOR GRAVITY TEST.
9. PRE MACHINED FACES OF GUIDE BEARING SUPPORT RING ITEM 5 TO BE LEVELLED WITH WATER LEVEL & TACK WELD. RECHECK BEFORE FINAL WELDING WITH RESPECT TO SUCTION END MARK.
10. DP TEST TO BP0850199 OF THE COMPLETE LENGTH OF EACH WELD SHALL BE CARRIED OUT AFTER S.R.
11. THE VOLUME OF WATER REQUIRED FOR GRAVITY TESTING IS 1600 LTRS. (APPROX.)
12. ALL FLANGES TO BE WELDED IN ACCORDANCE WITH DRG. 3 263 03 01005.

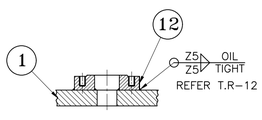
FABRICATED WEIGHT FOR ORDERING PURPOSES IS 7062 Kg. WHICH INCLUDES WELDING WEIGHT.



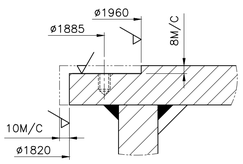
SECTION-JJ
(FOR OIL LEVEL INDICATOR)



ENLARGED DETAIL-E

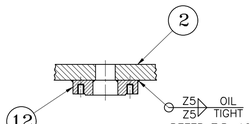


SECTION-KK
(FOR OIL FILLING)

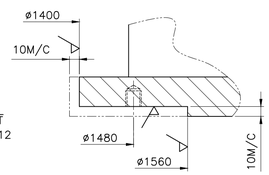


ENLARGED DETAIL-F

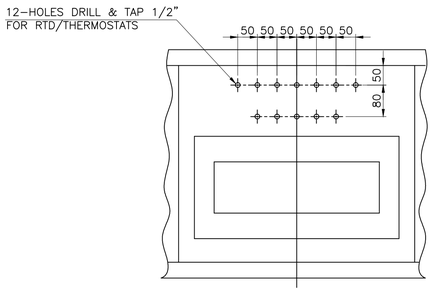
TOOL LIST		
IT. NO.	TOOL NO.	DESCRIPTION



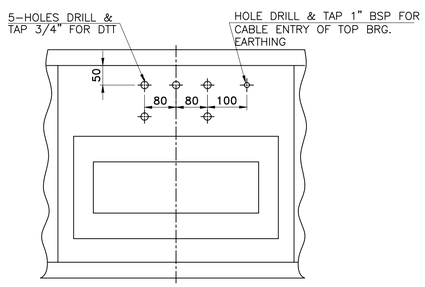
SECTION-LL
(FOR OIL DRAIN)



ENLARGED DETAIL-G



VIEW AS ARROW-M



VIEW AS ARROW-N

QTY VAR00	REMARKS	VAR. NO.	ITEM NO.	DESCRIPTION	STD	DRAWING NO.	IT.NO.	MATL. CODE	UNIT	UNIT WT.	GS	ZONE
							32 33 VAR.	46 54 MATL. SPCN.		68 71 QTY.		
016			016	RIB		1 256 01 89602	008		NA	NO		1.41
008			015	JOINT PLATE 56TKx450x580LG. S.S.S.Q. PLATE	1			AA1011808226 AA10108	NA	NO		114.74
008			014	SUPPORT ASSY.		3 256 01 89604	00		NA	NO		11.50
015			013	SIDE PLATE 32TKx188x500LG. S.S.S.Q. PLATE	1			AA1011808196 AA10108	NA	NO		23.60
002			012	TAPPED FLANGE 50 NB		3 299 88 01008	004		NA	NO		5.00
001			011	TAPPED FLANGE 25 NB		3 299 88 01008	001		NA	NO		2.00
008			010	RIB ASSY.		3 256 01 89601	00		NA	NO		77.50
001			009	SIDE PLATE		1 256 01 89602	007		NA	NO		23.52
008			008	RIB		1 256 01 89602	006		NA	NO		7.22
008			007	COOLER FLANGE		3 256 01 89603	001		NA	NO		19.84
008			006	SIDE PLATE		1 256 01 89602	005		NA	NO		41.14
001			005	GUIDE BRG. SUPPORT RING		2 256 01 89603	001		NA	NO		548.90
001			004	SUPPORT FLANGE		1 256 01 89602	004		NA	NO		239.00
001			003	RING		1 256 01 89602	003		NA	NO		304.50
001			002	BOTTOM PLATE		1 256 01 89602	002		NA	NO		1787.0
001			001	TOP PLATE		1 256 01 89602	001		NA	NO		1456.0

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

ADDITIONAL INFORMATION
W.O. 36201 TO 09 A 23157 STAGE-2
W.O. 36210 TO 18 A 23157 STAGE-3

STATUS OF DRAWING

DISTRIBUTION OF PRINTS
HGE - 2 HGM - 4
FWM - 4 TEX - 1

mRikn dk i-dkj ;k xk-gd@ifj;kstuk dk uke — TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

HMS-713/170-24K
PALAMURU RANGAREDDY LIS STAGE-2&3 (MEIL/TSGENCO)

BHARAT HEAVY ELECTRICALS LTD. BHOPAL

DRN.	BKS
CKD.	NS/AS
APPD.	RG/AD

SCALE 1:15 | WEIGHT (KG) 6700.0 (M/C) | REF. TO ASSY. DRG. NA | ITEM NO. NA | NO. OF ITEM 016

DEPT. HGE | CODE 403 | UNTOL. DIMS. GR. 3 250 00 01404

TITLE: TOP BRACKET CENTRE ASSY. (FAB. & M/C)

DRAWING NO. 1 256 01 89601 | DRAFT | SHT. NO. 01 | NO. OF SHT. 01

REV.	DATE	ALTERED / CHECKED / APPROVED	ZONE

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED.
IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

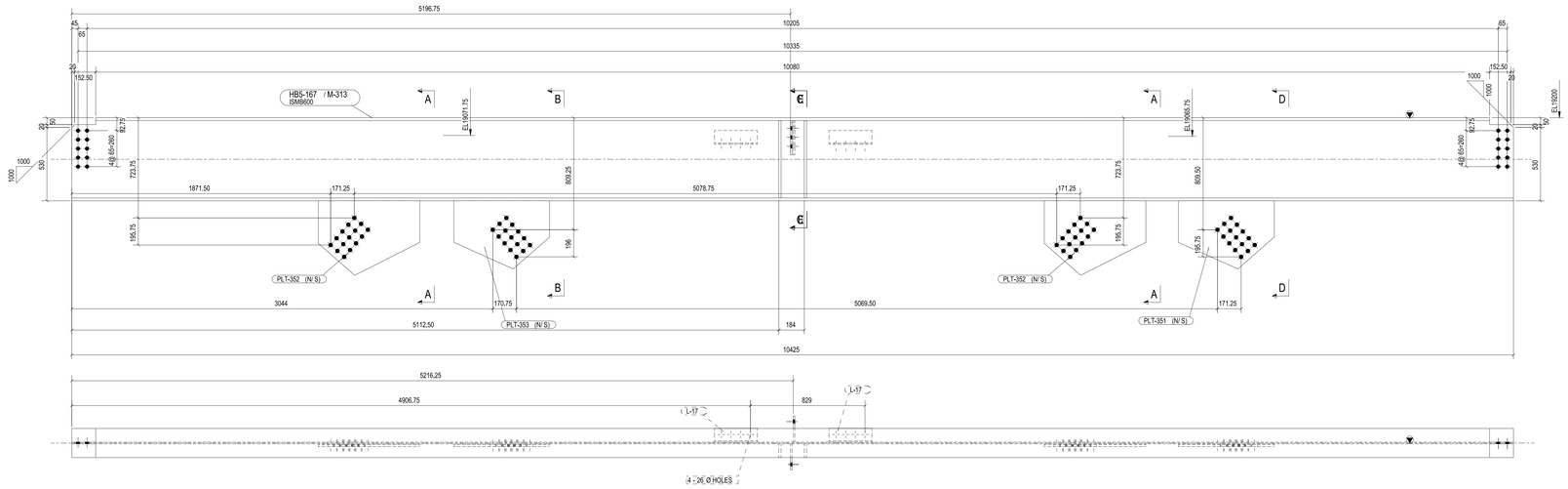
REF. DRG. NO. | SIGN. & DATE | INVENTORY NO.

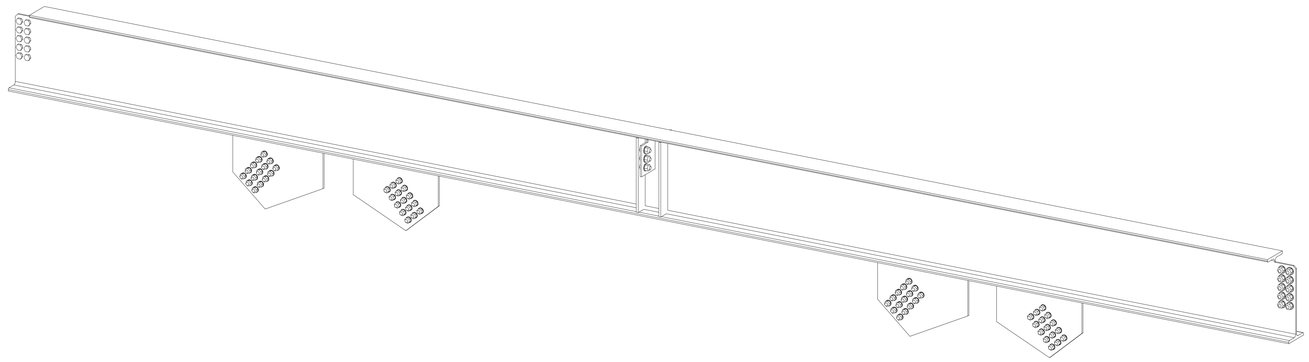
A1

0-FW-287-04139

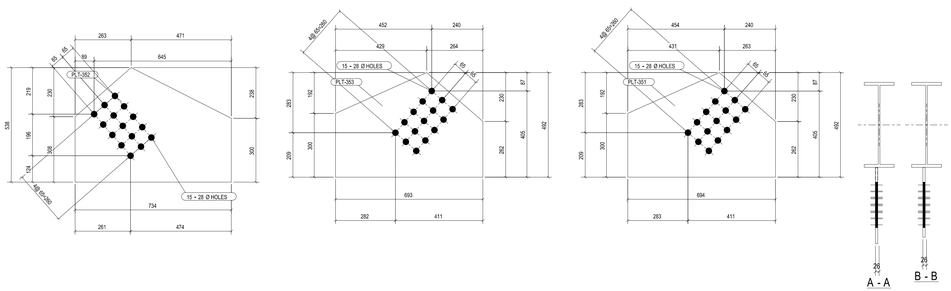
ON DWARVIS

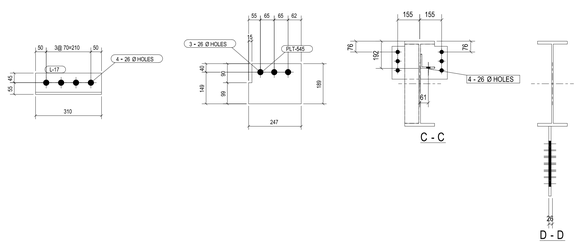
FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER PLANT STD. NO:PR-QA-500
FOR PAINTING, REFER PR-QA-590





CEILING
1:15





NOTES:-

FOR ASSEMBLY, REFER PRINCIPAL DRAWING MENTIONED IN GMS
FOR WELDING DETAILS, REFER 0-FW-260-02493 (LATEST).
FOR FABRICATION NOTES, REFER 4-00-000-32487 (LATEST).
FOR PRODUCTION NOTES, REFER 2-FW-220-00686 (LATEST).
DIMENSIONS IN DECIMAL, ROUND OFF TO NEAREST INTEGER

WMWP NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER		ITEM NO / VAR NO	MATERIAL CODE / MATERIAL SPECN	AS/P	UNIT / DI	UNIT WEIGHT / QUANTITY	CO	ZONE
	7	PLATE-12 189.0x247.0		PLT-545		AA101808099 IS2062E250A(Fe410W)	No 2	4.272				
	6	PLATE-16 99.0x558.0		PLT-406		AA101808110 IS2062E250A(Fe410W)	No 2	6.943				
	5	PLATE-16 492.0x693.0		PLT-353		AA101808110 IS2062E250A(Fe410W)	No 2	33.836				
	4	PLATE-16 535.0x734.0		PLT-352		AA101808110 IS2062E250A(Fe410W)	No 2	30.786				
	3	PLATE-16 492.0x694.0		PLT-351		AA101808110 IS2062E250A(Fe410W)	No 2	33.891				
	2	ISMB600 10425		M-313		15-009-014 IS2062E250A(Fe410W)	No 1	1282.275				
	1	ISA100X100X10 310		L-17		15-013-018 IS2062E250A(Fe410W)	No 2	4.619				

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

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

Bharat Heavy Electricals Ltd
UNIT:BOILER AUXILIARIES PLANT
RANIPET-632406

	NAME	SIGNATURE	DATE
DRN	RAGHAVAN		05.01.2021
CHD	MAHEN		05.01.2021
APPD	KBADHI		07.01.2021

SIZE	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	WEIGHT (Kg)	REF TO ASSY / OLD DWG
A CODE 862 AQCS			NTS	1459.242	

TITLE: HB5-167 # 1

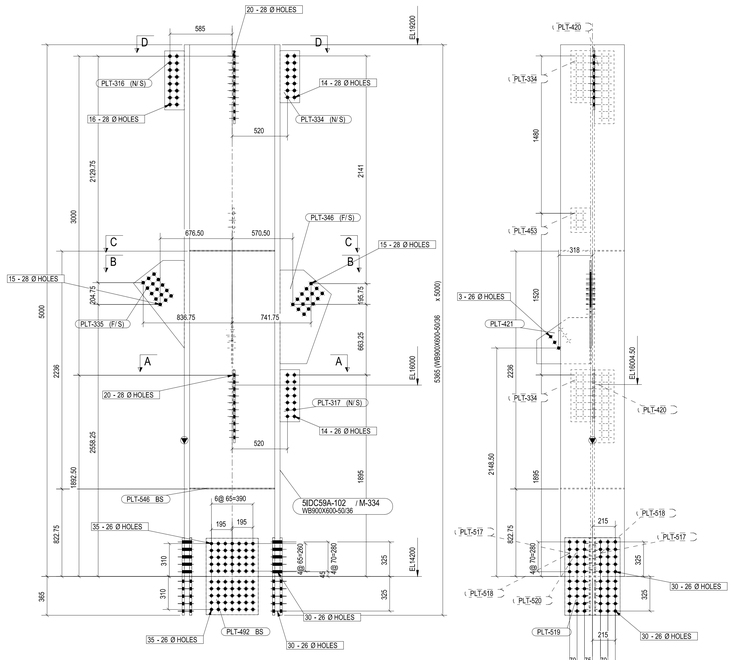
DRAWING NO: 0-FW-287-04139

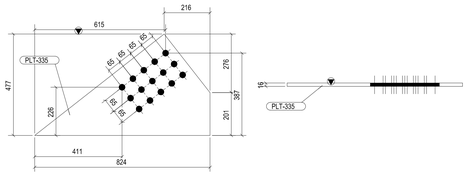
REV

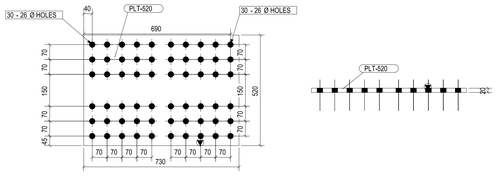
0-FW-287-04109

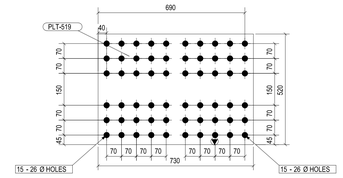
DRAWING NO

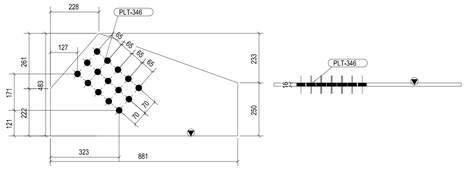
FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER PLANT STD, NO:PR-QA-500
FOR PAINTING, REFER PR-QA-590

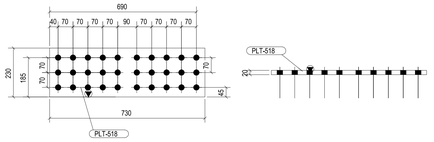


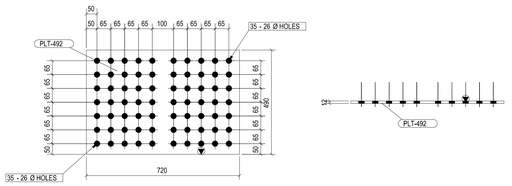


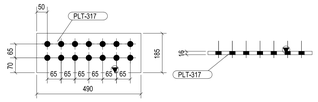


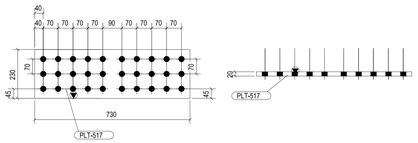


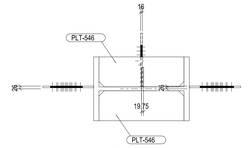




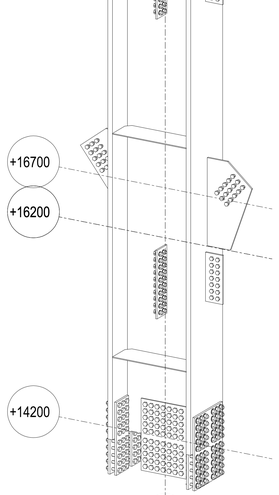


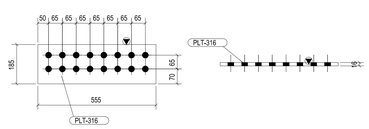


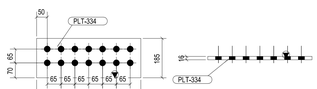


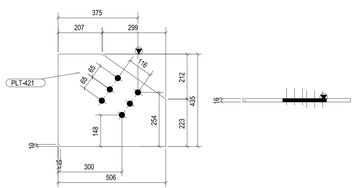


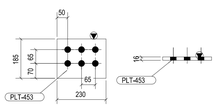
B - B

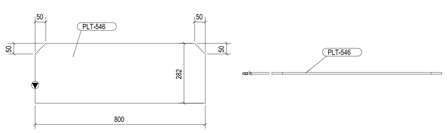


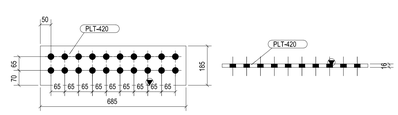


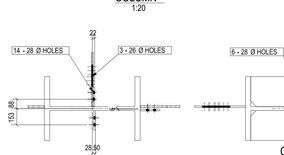




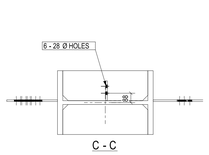




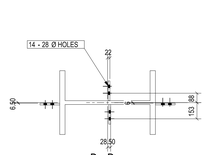




A - A



C - C



D - D

NOTES:-

FOR ASSEMBLY, REFER PRINCIPAL DRAWING MENTIONED IN GMS
FOR WELDING DETAILS, REFER 0-FW-260-02493 (LATEST).
FOR FABRICATION NOTES, REFER 4-00-000-32487 (LATEST).
FOR PRODUCTION NOTES, REFER 2-FW-220-00686 (LATEST).
DIMENSIONS IN DECIMAL, ROUND OFF TO NEAREST INTEGER

DRAWING NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO / VAR NO	MATERIAL CODE / MATERIAL SPECN	KG/P	UNIT	UNIT WEIGHT / QUANTITY	QC	ZONE
	19	NUT HEX Gr.C M24				413040002400		No	0.110		
	18	BOLT HEX Gr.C M24x80.0				412212408000		No	0.384		
	17	PLATE-8 260.0x800.0		PLT-546		AA01118308056 IS2062:E250(Fe410W)		No	13.997		
	16	PLATE-20 520.0x730.0		PLT-520		AA01118308137 IS2062:E250(Fe410W)		No	59.597		
	15	PLATE-20 520.0x730.0		PLT-519		AA01118308137 IS2062:E250(Fe410W)		No	59.597		
	14	PLATE-20 230.0x730.0		PLT-518		AA01118308137 IS2062:E250(Fe410W)		No	26.360		
	13	PLATE-20 230.0x730.0		PLT-517		AA01118308137 IS2062:E250(Fe410W)		No	26.360		
	12	PLATE-12 490.0x720.0		PLT-492		AA01118308099 IS2062:E250(Fe410W)		No	33.234		
	11	PLATE-10 185.0x230.0		PLT-453		AA01118308110 IS2062:E250(Fe410W)		No	5.344		
	10	PLATE-10 435.0x606.0		PLT-421		AA01118308110 IS2062:E250(Fe410W)		No	23.642		
	9	PLATE-10 185.0x885.0		PLT-420		AA01118308110 IS2062:E250(Fe410W)		No	15.917		
	8	PLATE-10 483.0x881.0		PLT-346		AA01118308110 IS2062:E250(Fe410W)		No	40.128		
	7	PLATE-10 477.0x824.0		PLT-335		AA01118308110 IS2062:E250(Fe410W)		No	27.404		
	6	PLATE-10 185.0x490.0		PLT-334		AA01118308110 IS2062:E250(Fe410W)		No	11.386		
	5	PLATE-10 185.0x490.0		PLT-317		AA01118308110 IS2062:E250(Fe410W)		No	11.386		
	4	PLATE-16 185.0x555.0		PLT-316		AA01118308110 IS2062:E250(Fe410W)		No	12.896		
	3	PLATE-36 800x5000		M-334xWEB		AA01181918O		No	1130.400		
	2	PLATE-50 600X5000		M-334xTFL		AA01181921O IS2062:E250B/Fe410W		No	1177.500		
	1	PLATE-50 600X5000		M-334xBFL		AA-101-181-9210 IS2062:E250B/Fe410W		No	1177.500		

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

Bharat Heavy Electricals Ltd
UNIT:BOILER AUXILIARIES PLANT
RANIPET-632406

	NAME	SIGNATURE	DATE
DRN	RAGHAVAN		05.01.2021
CHD	MAHEN		05.01.2021
APPD	KBPADHI		07.01.2021

DRG CODE: AQCS 862 | ALL DIMENSIONS ARE IN MM | PROJECTION | SCALE: NTS | WEIGHT (Kg): 4022.246 | REF TO ASSY / OLD DWG:

TITLE: 5IDC59A-102 # 1

DRAWING NO: 0-FW-287-04109 | REV

PAINTING OF BHEL LARGE AND MEDIUM RANGE MOTORS AND COMPONENTS

1. GENERAL

This standard details the process to be followed to provide a chemical resistant paint finish on Siemen's design large and medium range motors and components. The dried paint film shall be smooth, glossy and scratch resistant. The painted surface shall be resistant to chlorine, contaminated atmosphere as well as corrosive alkaline, ammonia, acidic and salty atmospheres.

2. MATERIAL

2.1.	Etch Primer	AA 56103
2.2.	Chemical Resistant Epoxide finishing paint (Light grey Shade No. 631 of IS:5 unless otherwise specified in OGA/GA Drawing).	AA 56131
2.3	Chemical Resistant Epoxide priming paint	AA 56105
2.4.	Thinner for AA 56131	AA 56708
2.5.	Thinner for AA 56105	AA 56708
2.6.	White Spirit	AA 56701

3. PREPARATION OF THE PAINTS

3.1. Mixing of the constituents of epoxide paints

These paints as supplied consist of two separate ingredients, namely base and accelerator. Shortly before mixing and use, these shall be thoroughly stirred. The base and the accelerator shall be accuratly mixed together in the proportions as per the recommendations of the supplier detailed in Annexure–1.

Accelerator should be added to the base and not the base to the accelerator. The paints shall be mixed with continuous stirring until a uniform consistency is obtained.

3.1.1. Consistencies of the paints AA 56131 and AA 56105:

The paints mixed as per clause 3.1 shall be used at the consistencies as given below:-

Paint Specification	Flow time of the paint in IS cup No. B-4 (IS:3944)
	For spraying
1. AA 56105 2. AA 56131	30 ± 2 Sec. 30 ± 2 Sec.

The above consistencies shall be adjusted using thinners for epoxy paints AA 56131/AA 56105 and these flow times shall be maintained independent of normal temp. variations within shopfloor painting area.

IMPORTANT NOTE:

After mixing, the paint shall be allowed to mature for 1/2 hour. The mixed paint shall be used within 8 hours.

3.2. Safety Precautions:

AA 56131 and AA 56101 Epoxy paints are liable to cause irritation to the skin. This may transpire into inflammation, swelling, rash or postules on the hands, arms and occassionally on whole of the body.

Following precautions should be observed while handling these materials:

i) Work place and storage, rooms should be adequately ventilated.

ii) Before starting the work, hands should be washed with soap and water and good barrier cream applied.

iii) Maximum care should be taken to avoid splashes on the skin.

iv) Splashings on the skin should be immediately washed with soap and water.

v) After the work, hands, arms and face should be washed with soap and water followed by thorough drying with a clean cloth.

vi) Spray painting:
Same shall be done in a specially designed painting booth.

In case painting is required to be done by spraying in open area then the operators should be provided with safety masks and place of painting should be sufficiently away from source of fire e. g. welding, hand grinding etc.

4. SURFACE PREPARATION:
It is necessary that surface to be painted is free from loose dust, mill scale, rust, grease, oil, old paint etc. For this the surface preparation shall be as per AA 067 41 01.
Any loose swarf or shot shall be removed with a dry brush or air blast and first primer coat applied before on set of rusting. The time should however not exeed 24 hours.
NOTE : In ideal condition first coat of priming paint sholud be applied over "virgin" i.e. just shot blasted surface.

5. APPLICATION OF PAINT : Painting shall be done by spraying process only. Brush painting is not allowed.

5.1. Application of first coat of AA 56105 (Primer paint).
Priming paint AA 56105 as prepared in Clause 3.1.1 shall be applied over the surface by spraying.

5.1.1. Drying of paint
The painted surfaces shall be allowed to air dry for a minimum period of 12 hours.

5.2. Application of second coat of Epoxide primer AA 56105
Surface shall be degreased where necessary. Second coat of epoxide to AA 56105 shall be applied in accordance with Clause 5.1. Refer Clause 6.2 for coating thickness (DFT).

5.2.1. Drying of the paint

The painted surfaces shall be allowed to air dry for a minimum period of 12 hours.

5.3. Application of first coat of AA 56131 (finishing paint)
Immediately before painting the surface shall be cleaned with white spirit where necessary. Any damage which has been caused to the previous coat shall be repaired depending upon the serverity of the damage. After the repairs, the surface shall be painted with AA 56131 paint as prepared in clause 3.1.1 by spraying.

5.3.1. Drying of the paint

The painted surface shall be allowed to air dry for minimum period of 12 hours.

5.4. Application of second coat of AA 56131 (Finishing paint)

Surface shall be cleaned with white spirit where necessary. Another coat of AA 56131 paint shall be applied in accordance with clause 5.3 above.

5.4.1. Drying of the paint

The pinted surfaces shall be allowed to air dry for minimum period of 12 hours. At this stage it is suitable for handling, writing stc.

Note: 1. The time gap between any two successive coats shall not be more than 7 days.

2. The final painted surface develops optimum mechanical, chemical properties after 7 days of drying.

6. INSPECTION FOR PROCESS CONTROL.

6.1. Quality control inspector shall visually inspect the finished components for various paint film defects such as gloss, uniformity of shade, wrinkles, orange peel effects, blistering etc.

6.2. Thickness

The dried film thickness(DFT) after Etch Primer coat if any & 2 coats of primer shall be 40 to 50 microns, when measured by using a suitable instrument for the non—destructive measure—ment of the coats as detailed in IS 6012:1970. Similarly DFT shall be 100 to 140 microns (0.1 to 0.14 mm) after 4 coats (2 primer+2 finish coats). Additional finishing coats may be given to acheive the thickness for a specific application. It can be achieved by giving further finishing coats.

6.3. Adhesion by tape test

This test is carried out by applying & removing pressure sensi—tive adhesive tape over cuts made in the paint film to ensure that adhesion of paint film to matallic substrate is adequate.

The test shall be carried out generally in line with ASTM D 3359 except that transparent pressure sensitive Adhesive tape of 25 mm width, shall conform to IS: 13262 or should bear ISI mark.

Method A of ASTM D 3359 shall be followed in case thickness of film is greater than 125 microns and acceptance criterion shall be "4A" Viz trace peeling or removal along incisions, and method B of ASTM D 3359 shall be followed when thickness of paint film is between 50 to 125 microns and acceptance criterion shall be "4B", Viz small flakes of the coating are detached at intersections, less than 5% of the area is affected.

7. REPAIR OF DAMAGED PAINT WORK:

7.1. Local damage unrusted:
Where local damage to the paint work has occured without subsequent rusting, the damaged area shall be cleaned with white spirit. The number of paint coates shall be applied sufficient to provide a dry film thickness, not less than that of the surrounding paint.

7.2. Local damage rusted:
Where local damage to the paint work with subsequent rusting has occured, the rust shall be removed by mechanical procedure as per clause 4 and followed by subsequent procedure laid down in clause 7.1.

7.3. Extensive damage:
In case of extensive damage entire old film shall be removed and surface prepared as per clause 4 and repainted.

8. Checklist for painting of Equipments as per Annexture II.

Note : 1. This standard is being issued by AME, in line with the decision taken to issue painting Spec. by all Engineering Divisions. The contents of the Spec. are maintained exactly same as given in TSD Spec. No. BP 067 41 77.

ANNEXTURE – I

1. Mixing Ratio of Chemical Resistant Epoxide Priming Paint to AA 56105.
(Stocked in factory Main Stores).

TABLE – I

Supplier's Name	Mixing Ratio in Parts by Volume
	Base : Accelerator
Jenson Nicholson, Asian, Goodlass	3 : 1
Garware	5 : 1
Alkali Chemicals	6 : 1

2. Mixing Ratio of Chemical Resistant Epoxide Finishing Paint to AA 56131.

TABLE – II

Supplier's Name	Mixing Ratio in Parts by Volume
	Base : Accelerator
Shalimar, Goodlass	3 : 1
Asian Paints, Alkali Chemicals	4 : 1
Garware	3 : 2

ANNEXTURE – II

CHECKLIST FOR PAINTING PROCESS FOR ELECTRICAL MACHINE GROUP

(To be filled by shop)

1. DATE : .....
2. W. O. NO & SL. NO. : .....
3. SURFACE PREPARATION : .....SOLVENT.
   ..... MECHANICAL CLEANING
4. DATE OF EXPIRY : .....
5. VISCOSITY : .....
6. MIXING RATIO : .....
   (For 2 pack system)
7. NAME OF PAINTER : .....

INSPECTION AND QUALITY CHECKS.

(To be filled by QC Personnel)

1. VISUAL OBSERVATION

SHADE	OK	NOT OK
FINISH	SMOOTH	NOT UNIFORM
GLASS	GLOSSY	MATT.
SAGGING	PRESENT	ABSENT

2. THICKNESS (DFT) : .....Microns.
3. ADHESION BY TAPE TEST : (If felt necessary)

OK	NOT OK

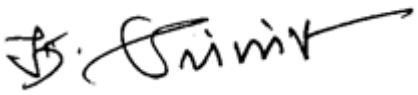
SIGNATURE : .....

NAME : .....

DESIGNATION : .....

BHARAT HEAVY ELECTRICALS LIMITED
Tiruchirappalli - 620 014

BHUSAWAL THERMAL POWER PLANT, 1 X 660 MW
M/s. MAHAGENCO, JALGOAN DIST., MAHARASHTRA
CUSTOMER NO. U6/1727, UNIT-6
PAINTING SCHEDULE

Prepared by	**K. Srinivasan** **Senior Engineer/ Plant Lab**		**Document No: PL: C3 - PS / 1727**
Reviewed by	**D. Vijayakumar** **SM /PE/FB**		**Revision No: 00 Dated: 11-06-2018**
Approved by	**A. Santha kumari** **AGM / Plant Lab**		**Sheet No. 01 of 11**

m:\ chem. \ contracts 11\MAHAGENCO-BHUSAWAL 1X660 MW TPP\psword_00.doc

RECORD OF REVISIONS

Rev. No	Date	Details of revision	Remarks
00	11-06-2018	New	Prepared in line with MAHAGENCO Bid Specification. No. DG/BSL U-6/2011/ T-1 & clarifications to Bidding Documents.

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
1 PS1AC	Collector & Separator Vessels (Except Internals), Supports 04 –147,321,547;	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744 DFT= 30µm per coat	1	--	--	Synthetic enamel paint (Long Oil Alkyd) to IS2932 (DFT = 20µm/ coat)	2	International orange Shade No: 592 of IS 5	70
2 PS5B	Collector & Separator Vessels Internals & foundation materials 04-347; Machined components and threaded surfaces (Dd items): 07-302,303,309,331,360,361,362,393;09-303,304; 12-306,314,317,324,327,328,344,348,354,393; 17-304,306,319;19-304,306,307;21-602,605; 24-352,803,818,823,827,842;28-700; 32-700; 35-010,190,700; 39-012,700; 41-710;42-700,710; 43-710;45-710;47-710;48-019;65-710;67-710;	SSPC-SP1/ or SSPC – SP3 Solvent / Power Tool Cleaning	Rust Preventive Fluid to PR: CHEM: 09 – 04 DFT=20µm per coat	2	--	--	--	--	--	40
3 PS 1JT	Buck stays 08-001,003,006,007,111,501,503,901, 08-910;34-100,200,300; Boiler supporting structures, Columns, Girders, Bracings 35-211,212,213,214,221,222,231,232; 35-311,312,321,322,331,332,341,342,351; 35-352,361,362, 381,382; 35-383, 390,441,442; 35-443, 451,452,453; 35-511,512,513;35-521,522,523; 35-531,532,533,993,995;	Blast cleaning to SA2 ½ or SSPC-SP10 (Near white metal) with surface profile 35µ	Red Oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744 DFT= 35µm per coat	2	--	--	#Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 25µm per coat # Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20µm per coat	2* 1	Light Grey Shade No: 631 of IS5	140

 # Out of 3 coats of finish paint, *first coat of synthetic enamel finish paint to 25 microns shall be given at shop / subcontracting works. Second coat of synthetic enamel finish to 25 microns and third coat of synthetic enamel paint to 20 microns shall be applied at site.

S. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
3 PS 1JT (continuation)	36-110,150,311,312,313,314; 36-315,316,321,322,323,324,325, 36-326,331,613,993; <u>Galleries, Stair-ways & inter connecting Walkways</u> 36-332,333,334,335, 341,342; 36-343,344,345,351,352,353,354,355; 36-361,362,363; 36-391,392,393,394; 36-395,610,620,740; 38-210,299,310; 38-381,410,510,610,710,993; 39-101,102, 39-141,142,150, 300,301,304,305,306,993; 48-015,115,225,265,385,435,465,485,495; 48-665,911,912;	Blast cleaning to SA2 ½ or SSPC-SP10 (Near white metal) with surface profile 35µ	Red Oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744 DFT= 35µm per coat	2	--	--	#Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 25µm per coat # Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20µm per coat	2* 1	Light Grey Shade No: 631 of IS5	140
4 PS3	Components >95° C Insulated other than components in Sl.No.6 &8 Ring Headers, Down Comers, Hot air Headers outside the gas path etc. 05-155,227,231,251,327,330,350; 07-110,125,223,231,232; 10-174,178,191,274,278,283,284, 10-285,291;12-178,900; 15-136,178;15-236,278;17-504,807,900; 18-001,010;19-701,702,753,903;21-600; 24-800,805,806,807,808,809,811,815; 32-010,210,810; 33-970; 37-010; 42-020,030,128,150,158; <u>Hot Air:</u> 48-202, 207,208,212,214, 48-222,224,232,234,262,264,267,662,664,667. <u>Flue Gas:</u> 48-372,382,384,386,432,434 48-462,464,482, 484,492,494;	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744 DFT= 30µm per coat	2	--	--	No paint	No paint	Red oxide	60

 # Out of 3 coats of finish paint, *first coat of synthetic enamel finish paint to 25 microns shall be given at shop / subcontracting works. Second coat of synthetic enamel finish to 25 microns and third coat of synthetic enamel paint to 20 microns shall be applied at site.

Sl. No.	- PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate Coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
5 PS9	Components >95° C and <400ºC uninsulated other than components coming in gas path. 20-511; 24-820,824,835,860,865,867; 42-200,300,358;48-200,915;	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr. II DFT 20 µm per coat	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr. II DFT 20 µm per coat	1	Aluminum	40
6 PS10	**Components uninsulated other than components coming in gas path.** **Temp: >400°C & <600°C** 09-003,004,005,503; 28-220;	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr. I DFT 20 µm per coat	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr. I DFT 20 µm per coat	1	Aluminum	40
7 PS2	Loose tubes, SH, RH & Eco. coils, 11-074,078,374,378,406,416,467, 11-487,606,608,684,694,716,718, 11-767; 11-769,787,791,916,918,967,969,987,991; 12-184,187,368,405,514,515; 12-524,544,554,803,805;12-852,903,914,917; 12-924,927,928,944,948,954,968; 16-079,201,202,203,270,379; 19-402,802,814,824,884; 19-914,924,984;	SSPC – SP2 or SSPC – SP3 Hand tool / Power tool cleaning	Red Oxide Zinc Phosphate Dip coat primer to PR: CHEM: 09 – 03 DFT=35µm per coat	1*	--	--	No paint	No paint	Red Oxide	35

*-In lieu of dip painting, 2 coats of brush painting of Red oxide Zinc Phosphate primer to a coating thickness of 60µ is also permitted in line with Sr.No.9.

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate Coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
8 PS1A	Miscellaneous casing sheets, fuel piping, duct plates, expansion joints and coal handling items 07-409,431,460,461,462,502,503,531,560; 12-906,907;21-601,604,700; 24-350,700,804; 24-817,822,825,826,836,837,840; 24-841,855,950,955,960; 30-219,233,234,235; 36-611, 621; 38-611; 39-302; 41-350,390,500; 42-001,002,005,010,046,065,070; 42-120,152,154; 42-157;43-004,005,104,105,200;45-200,801; 45-802,804,805,858;47-261,263,858; <u>Cold Air</u> 48-012,014,018,112,114,141; <u>Tempering Air:</u> 48-142,144,145,204,205; 65-736;67-204,272,276,283,801,802,803; 95-088,089,091,485;96-186;97-585,591,592; Handling equipments: 99-099,100,300,400,600;	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744 DFT= 30µm per coat	1	--	--	Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20µm per coat	2	Smoke Grey Shade No: 692 of IS5	70

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
9 PS3	Components >95° C coming in the gas path, Headers, Commissioning Spares &erection Materials, Miscellaneous materials etc., 05-137,147;06-400,401, 434,437; 06-451,453,455,500,501,731,732; 06-734, 737,741,744, 747,751,752; 06-753,755;07-315,316,318,423,993; 10-182,183,184,185;11-408,491; 12-850,993; 17-506;19-763,783,793,850,851,852,853; 20-998;24-993; 30-215; 30-103,223,224; 31-010,104; 34-390,400,500; 35-111,112,121,122,130,140,150; 36-130,327;42-858; 48-993;65-200;67-200;97-282,590; 20-988;21-987,988;24-987,988; 24-989;41-988;42-988;	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744 DFT= 30µm per coat	2	--	--	No paint	No paint	Red oxide	60
10 PS6	Hand rails and posts, ladders / rungs 34 - 820,850; 35 - 821,822, 823,851; 36 -820,851,852,853; 38 - 820,850;39 - 820,850; Floor Grills, Guard plates 34-810;35 -811;36-811,812,813,814; 38 -810;39 – 810;	Acid pickling to SSPC-SP8	Hot dip Galvanizing to a coating weight of 610 g/m^2 (minimum) Refer Notes given below **							

Notes **: Guard plates, Hood Ladders, Stringer channels, angles and plates shall be painted as per painting scheme prescribed in Sl. No: 03

PAINTING SCHEME FOR VALVES

Sl. No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
11 PS 10	Cast carbon steel valves (Conventional) Cast alloy steel valves (Conventional) All API valves, QCNRV, SV & SRV <u>Silencers,</u> 24-885; 21-800,825; <u>Safety valves & ERV</u> 21-850; 24-880,881;	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr. I/DFT 20µm per coat	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr. I/DFT 20µm per coat	1	Aluminium	40
--	Forged valves	Chemical cleaning	Phosphating to a coating weight of 1500 mg per sq.ft.	--	--	--	--	--	--	--
12 PS 1AS	Soot Blower components (Outside surface – shell) 20-051,054,201,204,794,962;	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744 DFT= 30µm per coat	2	--	--	Syn. Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20µm per coat	2	Verdigris Green Shade No. 280 of IS5	100
	HP / LP system	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr.I 20µm per coat	2	--	--	--	--	--	40

Sl.No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
13 PS15	For CLH & VLH* PGs 07,08,12,17,19,21,24,47,48 &80 07-402,403,405,505;12-506; 17-904,906,919; 19-506,507,904,905,906,907; 24-351,353,810; 48-206,395;	Abrasive blast cleaning to Sa2½ 35- 50 µm	Epoxy zinc rich Primer to IS 14589 Gr II %VS = 35(min)	1 DFT =40 µm Per coat	--	--	Aliphatic acrylic poly-urethane paint %VS = 35(min)	1 DFT= 30µm Per coat	Phirozi blue Shade No. 176 of IS 5	70
14 PS8A	Components >95 C & < 150 C, un-insulated Fuel pipes 47-269;	SSPC-SP3/ Power Tool Cleaning	General purpose Aluminium paint to IS 2339 DFT= 20µm per coat	1	--	--	General purpose Aluminium paint to IS 2339 DFT= 20µm per coat	1	Aluminum	40
15 PS 5B	All Columns below '0' level (embedded in concrete) PGs 34, 35,36,38 39	SSPC-SP1/ or SSPC – SP3 Solvent / Power Tool Cleaning	Rust Preventive Fluid to PR: CHEM: 09 – 04 DFT=20µm per coat	2	--	--	--	--	--	40

*- For components other than CLH & VLH, Painting scheme shall be as given in Sl. No. 8.

NOTES:

1. **Rust Preventive Coating should be given on HSFG Bolt and nut threads.**
2. **All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, Sleeves, machined surfaces and retainers shall be coated with Temporary Rust Preventive Fluid and during execution of civil works; the dried film of coating shall be removed using organic solvents.**
3. **Ground shade/ colour of Finish paints & identification tag/Band for equipments, pipings pipe service, boiler supporting structures and other boiler components shall be followed.**
4. **Refer respective engineering document for all sub-vendor items not covered under this document.**
5. **No painting is required for Stainless Steel, non-ferrous & galvanized components. Abrasive blast cleaning to SSPC-SP6 (Sa2) shall be done to prepare the surfaces of hot worked pipes prior to application of primer.**
6. **Wherever inside surfaces of components under PGMA 48 – XXX & others, need protection till erection, two coats of Red-oxide zinc phosphate primer paint to IS12744 to a DFT of 60 microns followed by 1 coat of synthetic enamel paint to IS 2932 – shade smoke grey shall be applied, after blast cleaning. For items meant for spares and subcontracting where no further processing is involved, the painting scheme selected shall be the same as that of similar product configuration/ description.**
7. **The Temporary Rust Preventive coating that already been applied on any components, tubes, pipes etc., shall be visually inspected for good adherence. If the coating is intact, direct coating of alkyd based red oxide paints over the coating is permitted. In case the coating has peeled off over a large area, the coating is to be removed by suitable solvents / heating to 350 –400 °C for an hour before primer paint application –but, in this case, it should be ensured that the minimum surface cleanliness required for primer paint application shall be SSPC – SP2 (equivalent – Hand Tool cleaning).**
8. **In components, wherever plates / sheets of thickness less than or equal to 5 mm and rods of <25mm/tubes/drain pipes are used, power tool / hand tool cleaning to SSPC – SP3 shall be followed and the painting shall be done as described in Sl.No.8.**
9. **For all commissioning components-erection materials (xx-993) two coats of Redoxide Zinc Phosphate Primer shall be applied to meet the temporary protection till erection, after power tool cleaning. This painting Schedule is valid for only Customer No: U6/1727- 1X660 MW BOILER for MAHAGENCO BHUSAWAL TPP.**
10. **Touch-up painting of damaged areas shall be carried out as per clause no. 15.1 of Page. No. 80 of 555 of Section – 4, Volume – II, master specifications of bid specification no. DG/BSL U-6/2011/ T-1.**
11. **All components covered under different PGMA's are to be painted in case any component is left out, the same shall be deemed to be included under the relevant section based on paint logic approved.**
12. **For very small components like clamps etc. Sl.no.8 shall be followed with power tool cleaning.**
13. **Only weldable primer 2 coats to a DFT of 50µ (2x25µ) shall be applied on both external and internal surfaces within 50mm from the end of the component to be welded subsequently at site. At those locations no other paint shall be applied. All small components (less than 300x300 mm in dimension) shall be given only weldable primer.**
14. **DUs coming under Constant Load Hangers (CLH)/ Variable Load Hangers (VLH) shall be painted as per the system - PS 15 indicated in Sl. No. 13 of the table. However, for DUs other than CLH/VLH, the painting shall be as per Painting Scheme PS 1A indicated in Sl. No. 8 of the table.**
15. **For internal protection of Pipes, tubes, headers and other pressure parts, Volatile Corrosion Inhibitor (VCI) pellets shall be put (after sponge testing/ draining/ or drying) and subsequently end capped. The dosage of VCI pellets shall be approximately 100 g/ Cu.m. For tubes typically 4 – 5 tablets per end are to be put. For C & I items the dosage of self-indicating Silica Gel (colourless) shall be 250 g/ cu.m. (About 2 to 3 bags weighing approximately 100 grams each). VCI pellets shall not be used for stainless steel components and its composite associates.**
16. **All threaded components of spring assemblies and turnbuckles shall be galvanized and achromatized to 15 microns minimum thickness.**
17. **Soot blower components i.e Valve head assembly having high surface temperature (> 200 and <600 deg. C) shall be applied with HR aluminium IS13183 Gr.II paint (up to 400 deg.C) and Gr.I paint (up to 600 deg.C)**
18. **Handrails of PGMA under Sl. No. 3 need to be galvanized in line with scheme for handrails (i.e. Sl .No. 10). For chequered plates having thickness <=5mm, surface preparation can be power tool cleaning to St3 and painting shall be in line with Sl. No. 8.**
19. **It is mandatory that for finish coat each layer shall have a permanent DFT and free from any paint defects like sags, wrinkles etc. Total DFT of a component correspond to respective painting scheme has to be ensured.**
20. **Inside surfaces of fabricated structure (e.g. Box type column) shall be painted with two coats of red oxide primer paint during fit up stage.**
21. **Painting of bunker structures to be in line with painting scheme of supporting structures (Sl. No. 3).**

Details for paint procurement & application purposes

Sl.No.	Generic nature of paint	Theoretical Covering Capacity Sq.m per Litre.	No. of pack	Volume solids, % (min)**	DFT in microns per coat (approx.)	Shade	Shade No. to IS5	Mode of appln.	Over coating interval, Hrs.
1	Epoxy Zinc rich primer to IS14589 Gr.II	8	2	35	40	Grey	--	Spray	24
2	Aliphatic acrylic polyurethane paint to IS 13213	12	2	40	30	Phirozi – Blue.	176	Spray	24
3	Heat resistant Aluminium paint to IS 13183 Grade I/II	10	1	-	20	--	--	Brush / Spray	24
4	Red oxide zinc phosphate primer paint to IS 12744	10	1	--	30	-	--	Brush / Spray	12
5	Red oxide Zinc Phosphate Dip coat primer paint to PR: CHEM: 09-03	10	1	--	35	--	---	Dip	12
6	Long oil alkyd synthetic enamel finish paint to IS2932	10	1	--	20	Reqd. shade	Corrpdg. Shade no.	Brush / Spray	12
7	Temporary Rust preventive fluid to PR: CHE: 09 – 04	10	1	--	20	--	--	--	12
8	General purpose Aluminium paint to IS 2339	10	2	--	20	Aluminum	--	Brush	12

Brush painting is accepted, if recommended by the Paint suppliers. The covering capacity of paints specified is only approximate.
The paints and Rust Preventive fluid shall be procured from BHEL's approved suppliers. ** Values are indicative.