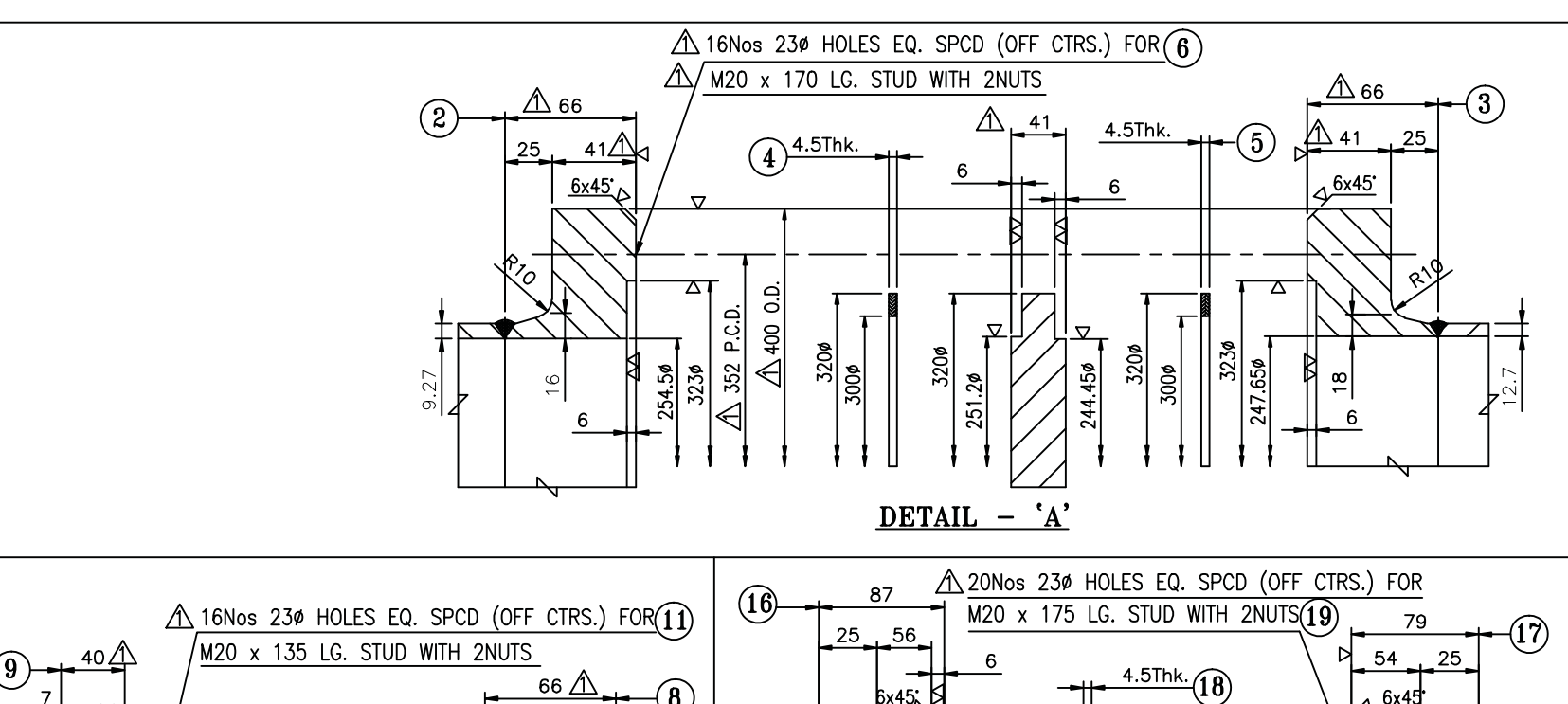
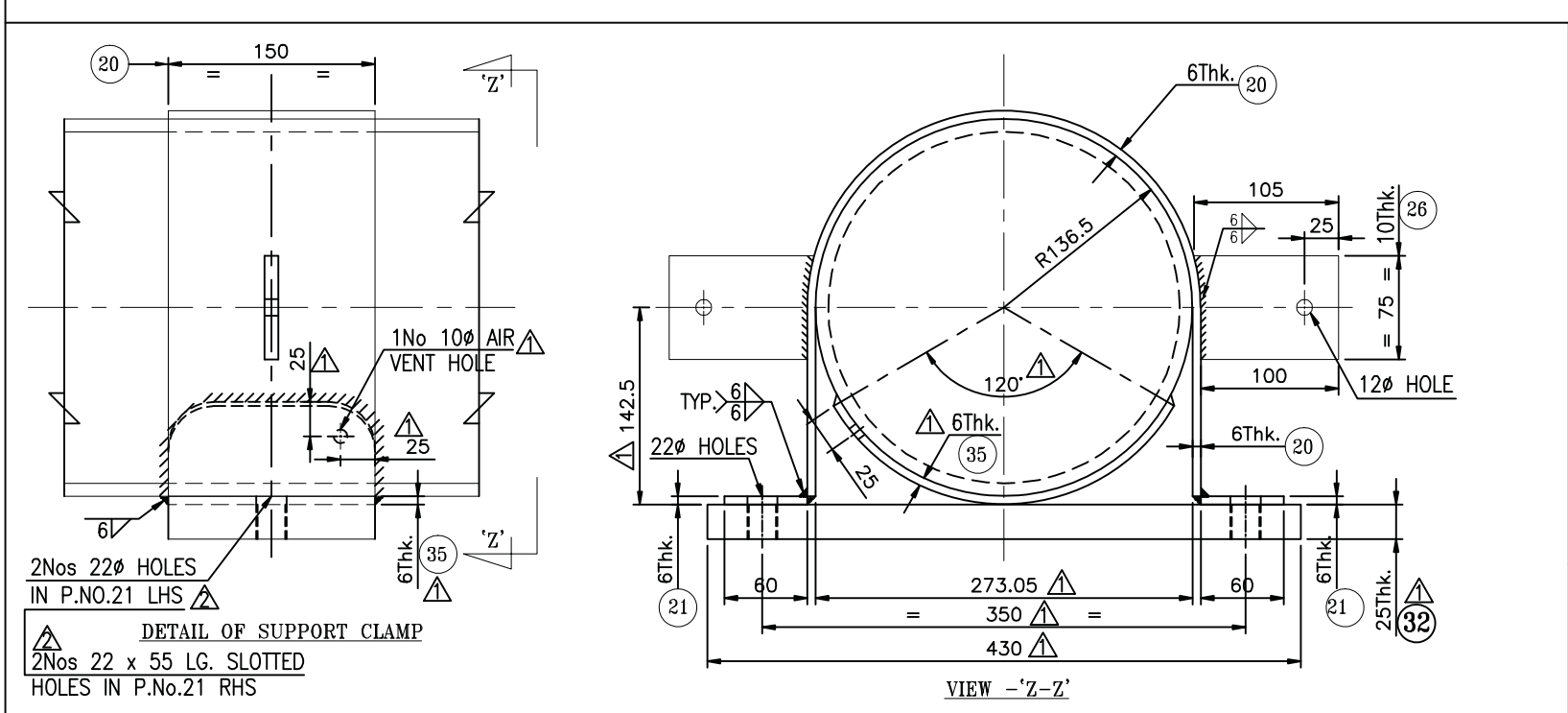
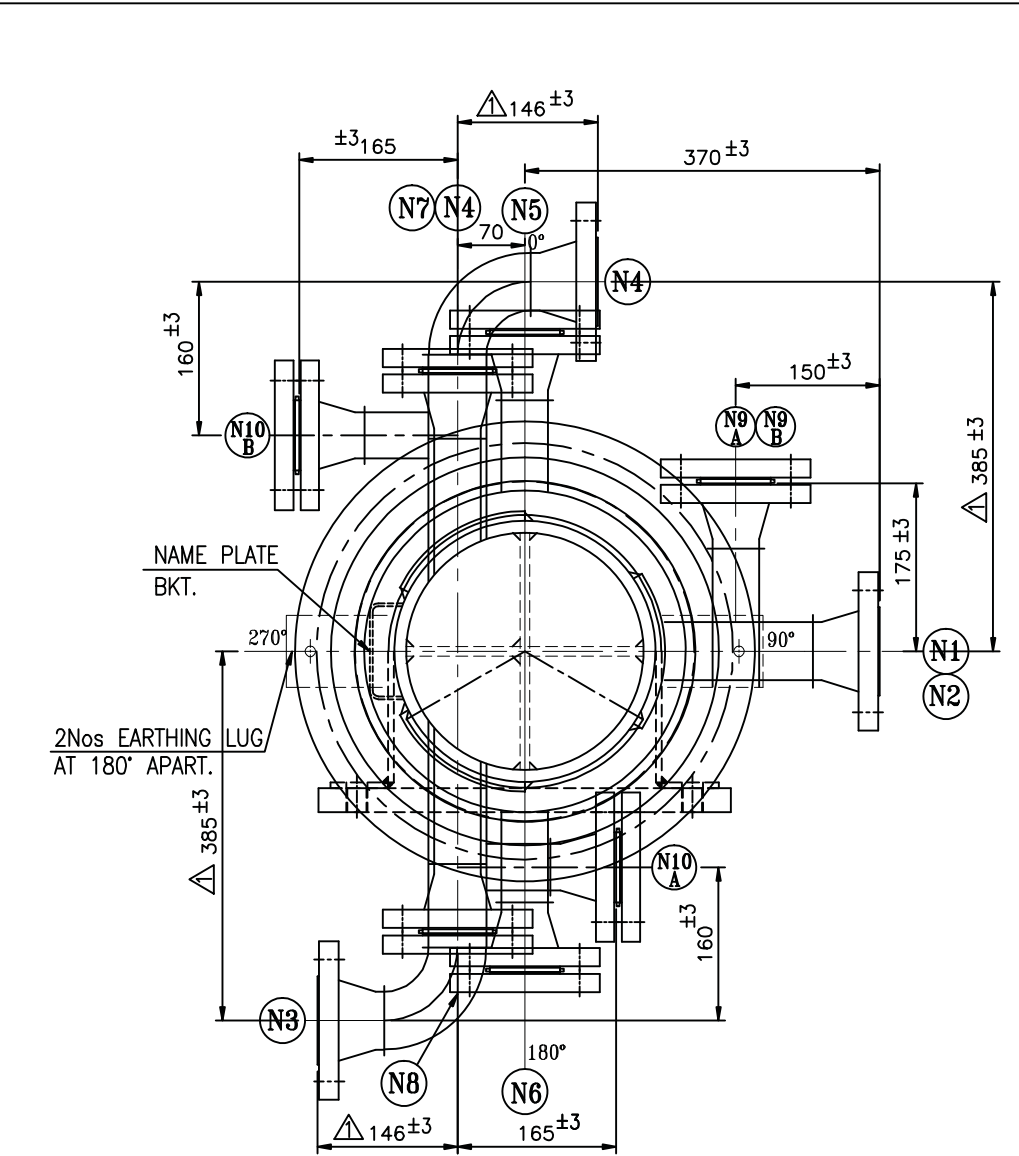
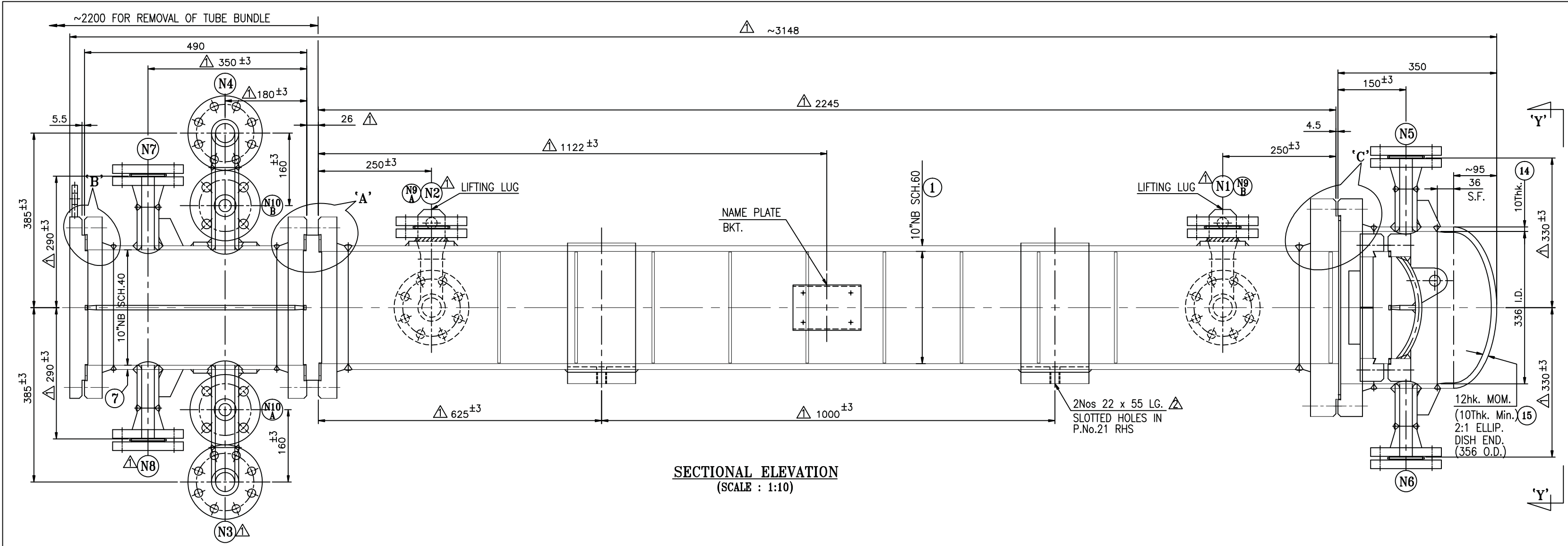
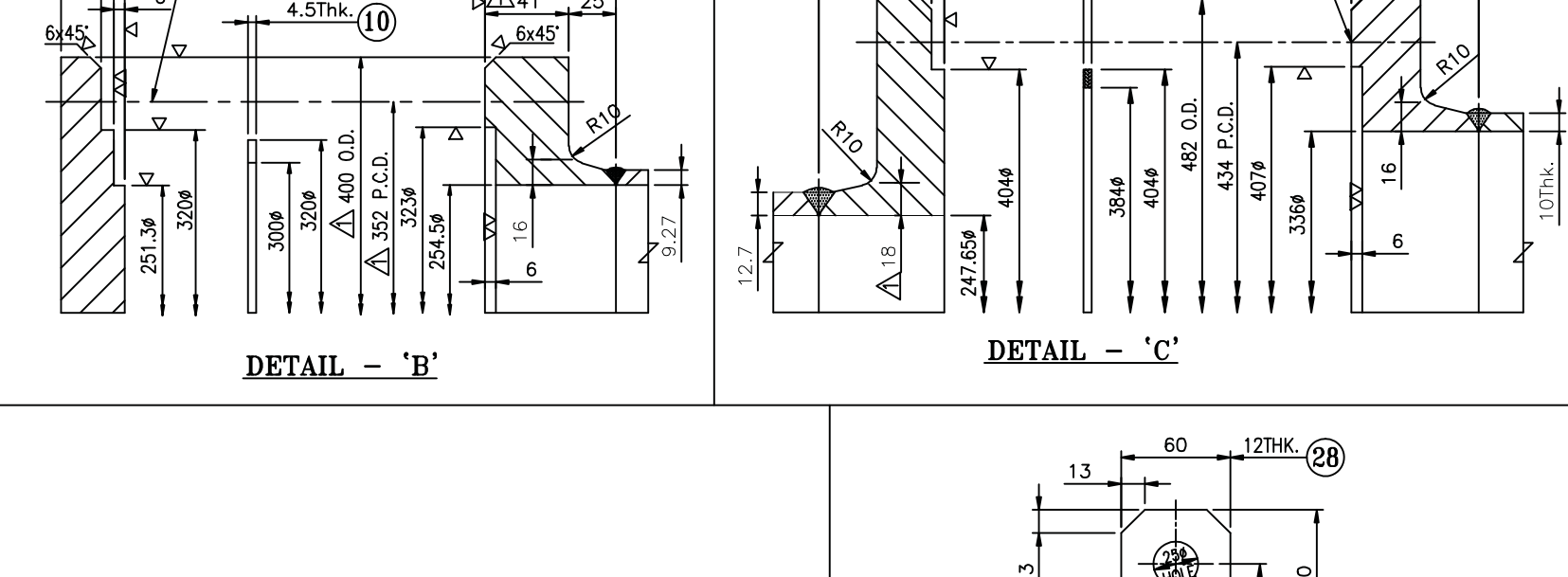
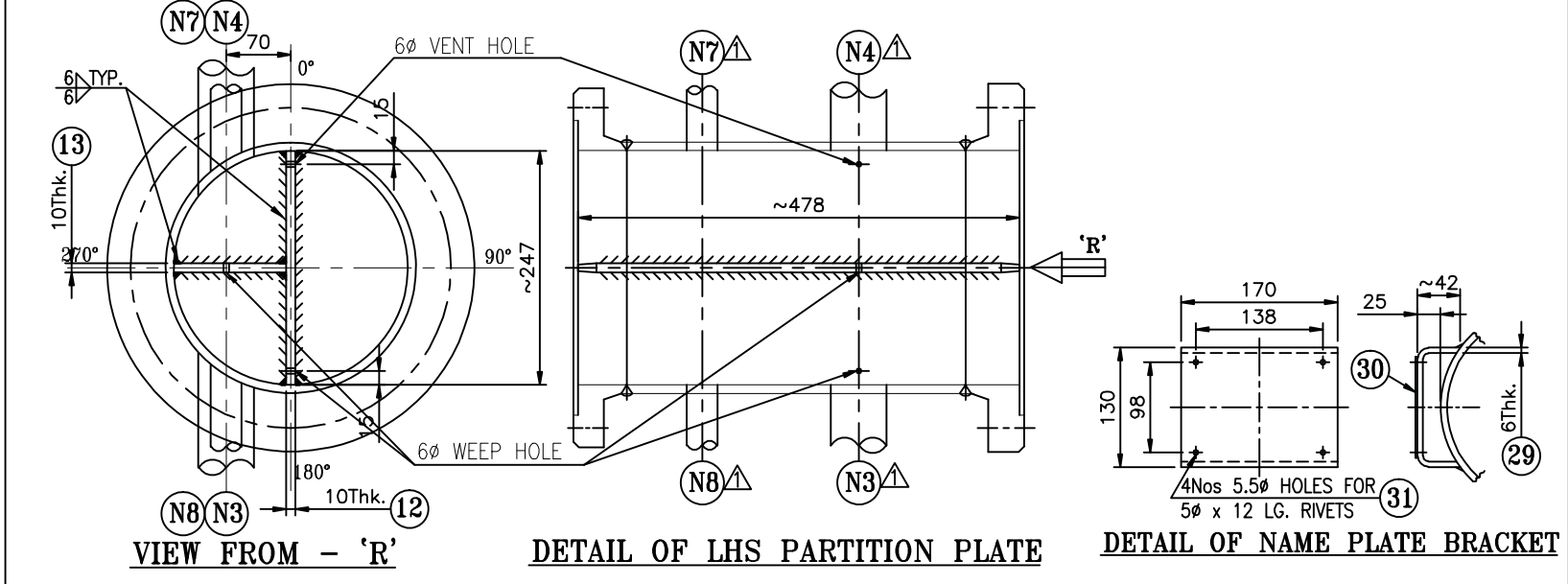
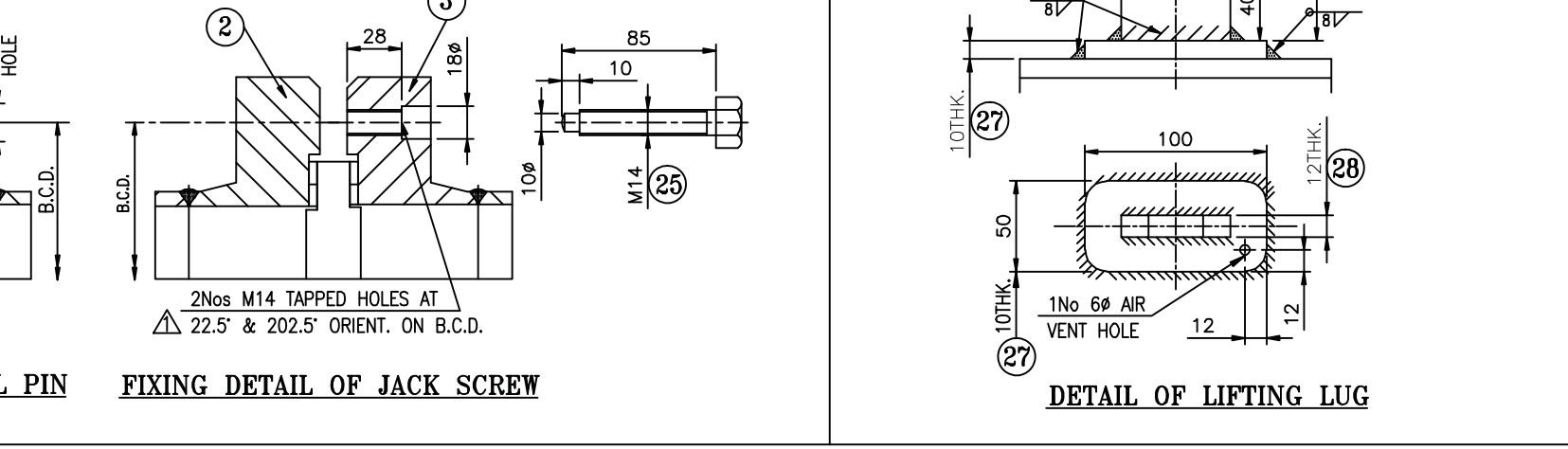
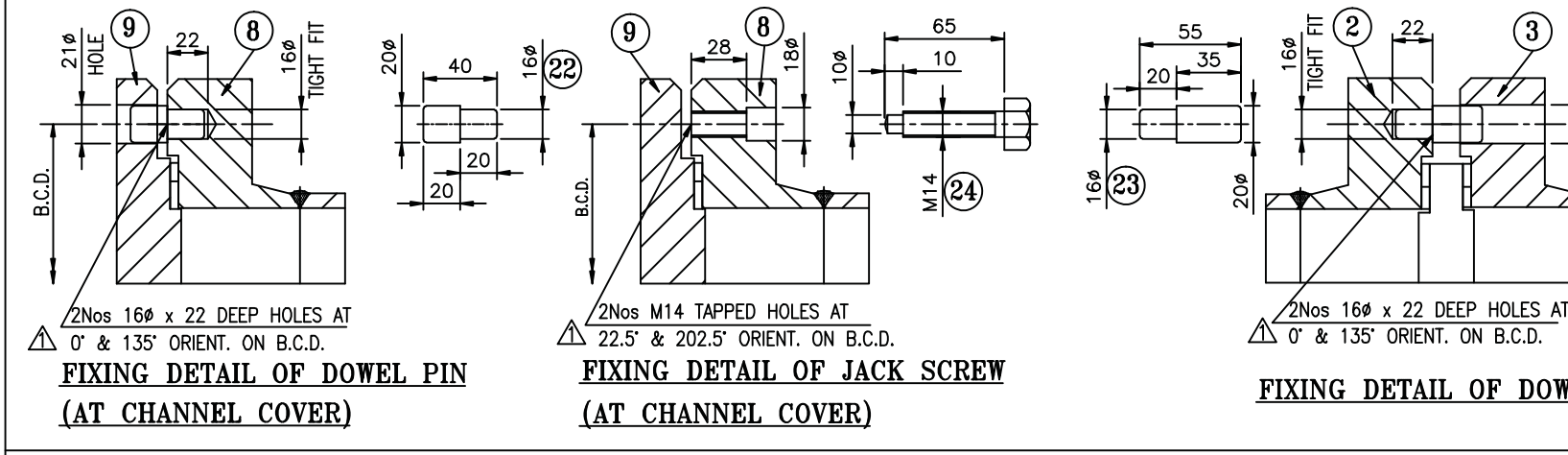




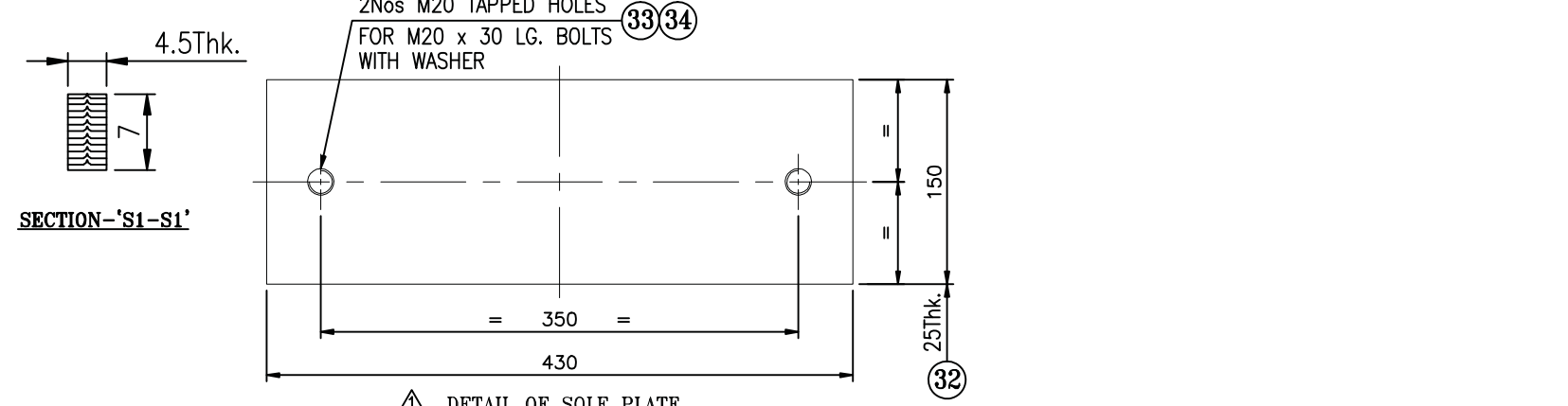
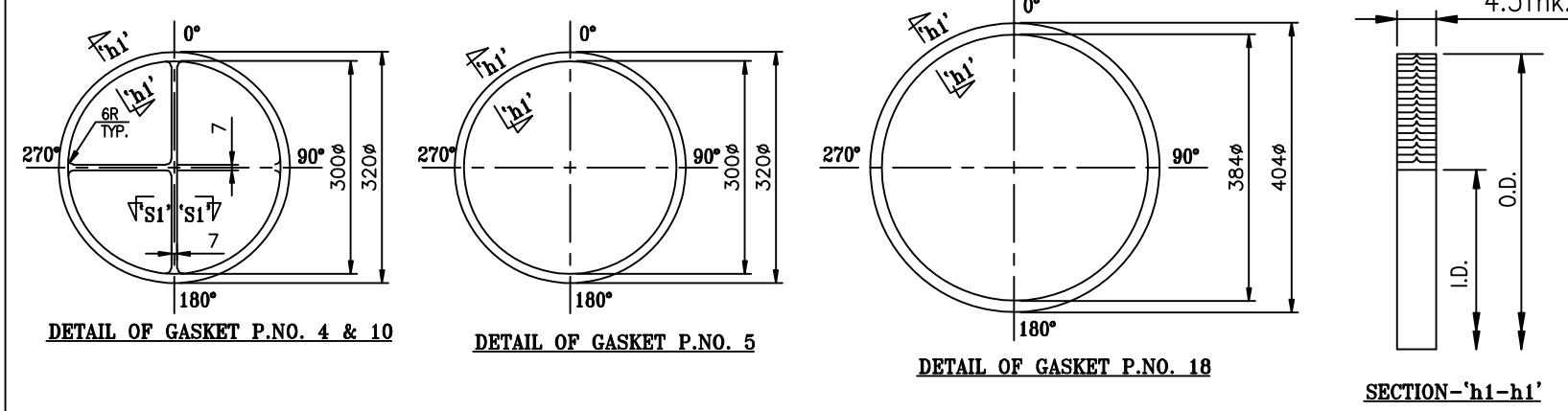
STANDARD/SPECIFICATION		
SR. NO.	STD./SPEC.	DESCRIPTION
1	WIN 51310WV	SPECIFICATION FOR 3rd STAGE AFTER COOLER SHT. 1 TO 13 REV.0
2	GENERAL NOTES RIN 41111A001	REV.3
3	INTERNAL PAINTING SPEC. W131334A	REV.1
4	SPECIFICATION FOR VENDOR DOCUMENTATION	WIN521730B, REV.0
5	JOB SPECIFICATION (STATIC EQUIPMENT) FOR N2 COMPRESSOR	(6907-117-16-46-SP-0003 REV.A)
6	STANDARD SPECIFICATION FOR PRESSURE VESSEL FOR PACKAGE ITEMS	(6-12-0030 REV.7)
7	STANDARD SPECIFICATION FOR BOCS	(6-12-0011 REV.6)
8	SPECIFICATION FOR HARDNESS REQUIREMENT	(6-15-0091 REV.2)
9	SITE & UTILITY DATA	(6907-117-KA-SU-5210 REV.A)
10	SPECIFICATION FOR VENDOR DESIGNED SHELL & TUBE HEAT EXCHANGERS	(6-15-0021 REV.3)
11	SPECIFICATION FOR WELDED TUBE TO TUBE-SHEET JOINT	(6-15-0003 REV.3)



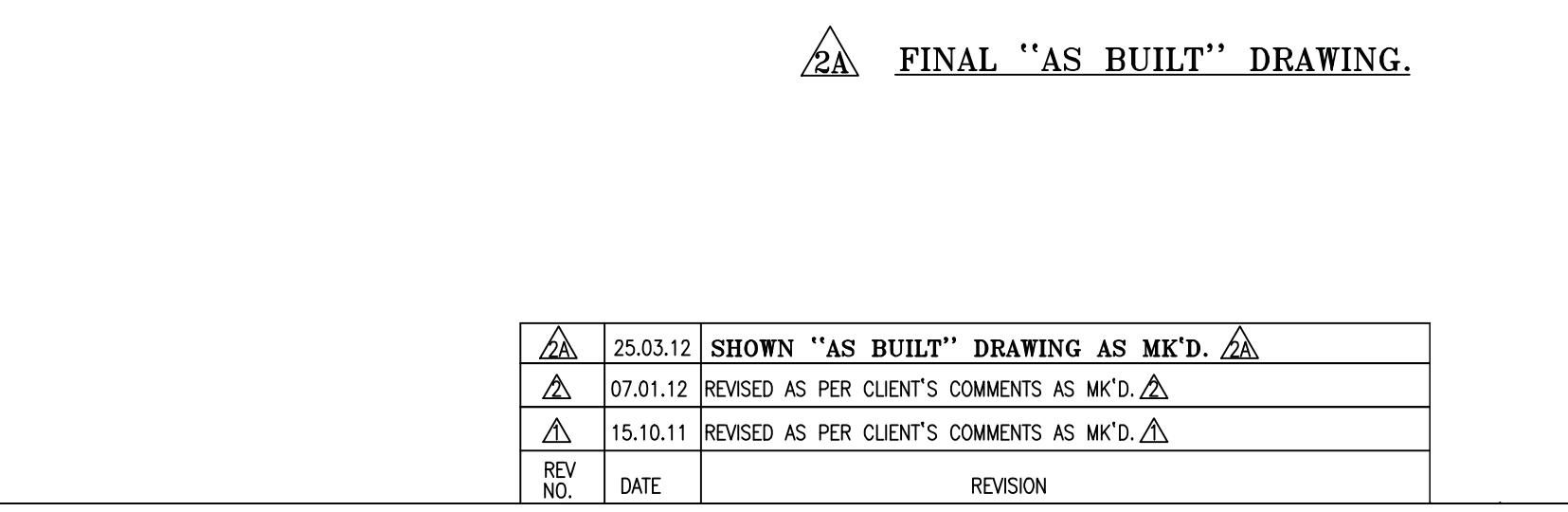
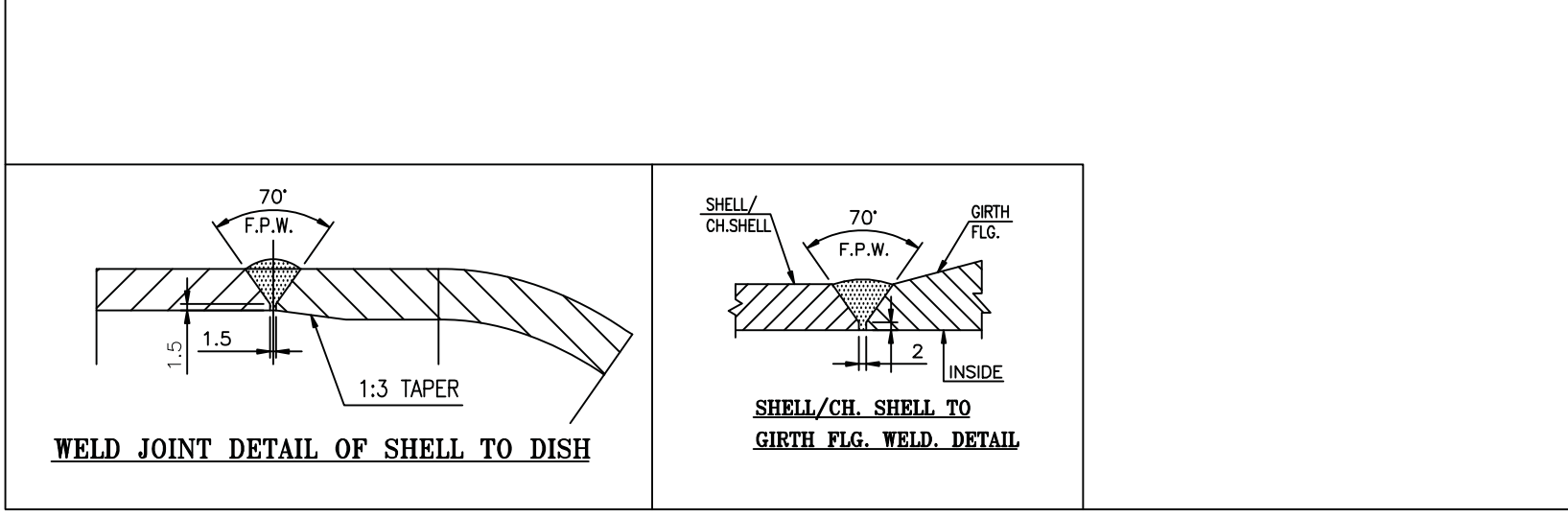
LIST OF SPARES		
P. NO.	DESCRIPTION	QTY.
4	GASKET FOR T/S TO CHANNEL FLG.	4
5	GASKET FOR T/S TO SHELL FLG.	4
10	GASKET FOR CH. FLG. TO CH. COVER	4
18	GASKET FOR COVER SHELL FLG.	4
81	GASKET FOR FLOATING HD. FLG.	4
57	GASKET FOR N2/NB	8
65	GASKET FOR N2/NB	8
70	GASKET FOR N2/NB	8
76	GASKET FOR N2/NB	8



SPARE FASTENERS WINS1310WV3 SP1 (PER EQUIPMENT) Δ		
P. NO.	DESCRIPTION	QTY.
6	STUD WITH 2 NUTS FOR SHELL FLG. TO CH. FLG.	4
11	STUD WITH 2 NUTS FOR CH. FLG. TO CH. COVER	4
19	STUD WITH 2 NUTS FOR COVER SHELL FLG.	4
82	STUD WITH 2 NUTS FOR FLOATING HD. FLG.	4
84	STUD WITH 1 NUT FOR CONNECTING PIECE	4
58	STUD WITH 2 NUTS FOR N2A, N9B	4
66	STUD WITH 2 NUTS FOR N2A, N9B	4
71	STUD WITH 2 NUTS FOR N5, N6	4
77	STUD WITH 2 NUTS FOR N7, N8	4



NOZZLE LOAD DATA		
NOZZLE MARK NO.	SIZE (NPS)	P.Kg.
N1,N2	2"	139
N3,N4	2"	139



CLIENT CONSULTANT PROJECT		
CLIENT NO.	117-KA-570 A/B	
CLIENT REF.	DOI-45410	
D-R COMPRESSOR MODEL :	6.75" & 6.75" & 6.5" & 4.5" x 9" 4HSE-3 N12 @ 320 RPM	
PACKAGE QTY.	TWO	

NOZZLE SCHEDULE		
MARK NO.	QTY.	SIZE
N10B	1	1 1/2" NB XXS.
N10A	1	1 1/2" NB XXS.
N9B	1	1 1/2" NB XXS.
N9A	1	1 1/2" NB XXS.
N8	1	1 1/2" NB XXS.
N7	1	1 1/2" NB XXS.
N6	1	1 1/2" NB XXS.
N5	1	1 1/2" NB XXS.
N4	1	2" NB 160
N3	1	2" NB 160
N2	1	2" NB 160
N1	1	2" NB 160

DESIGN DATA		
1. DESIGN CODE :- ASME SEC. VIII, DIV. 1, EDI.2010, & TEMA CL. 'R'		
2. TYPE OF EXCHANGER - AES (HORIZONTAL)		
3. SIZE : 247.65 x 2400		
4. OPERATING FLUID	NITROGEN	COOLING WATER
5. CAPACITY \ FLOW RATE	1196.8 Kg / hr.	1083.8 Kg / hr.
6. DESIGN PRESSURE Kg/cm2 g	40	31
7. DESIGN TEMPERATURE °C	177	100
8. WORKING PRESSURE Kg/cm2 g	35	4.3
9. WORKING TEMPERATURE °C IN/OUT	123 / 43	33 / 35.22
10. HYDRO TEST PRESSURE Kg/cm2 g	52	40.3
11. CORROSION ALLOWANCE MM	3.2	3.2 (EXCEPT TUBES)
12. JOINT EFFICIENCY	0.85	0.85
13. RADIOGRAPHY	10 % SPOT + ALL 'T' JOINTS	10 % SPOT + ALL 'T' JOINTS
14. HEAT TREATMENT	NIL. DISH END TO BE S.R. AFTER FORMING	NIL
15. NUMBER OF PASSES	ONE	FOUR
16. PRESSURE DROP Kg/cm2 All. / cal.	0.100 / 0.025	0.350 / 0.326
17. MDMT °C	-1	-1
18. FOULING FACTOR hm2 °C / Kcal.	0.0002	0.0004
19. INSULATION THK. MM	NIL	NIL
20. HEAT DUTY Kcal/Hr.	24035.1	NIL
21. INSPECTION BY	D.R. / CLIENT / EIL	
22. WEIGHT EMPTY Kgs	~ 711	
23. WEIGHT FULL OF WATER Kgs	~ 858	
24. WEIGHT OF TUBE BUNDLE Kgs	~ 124	

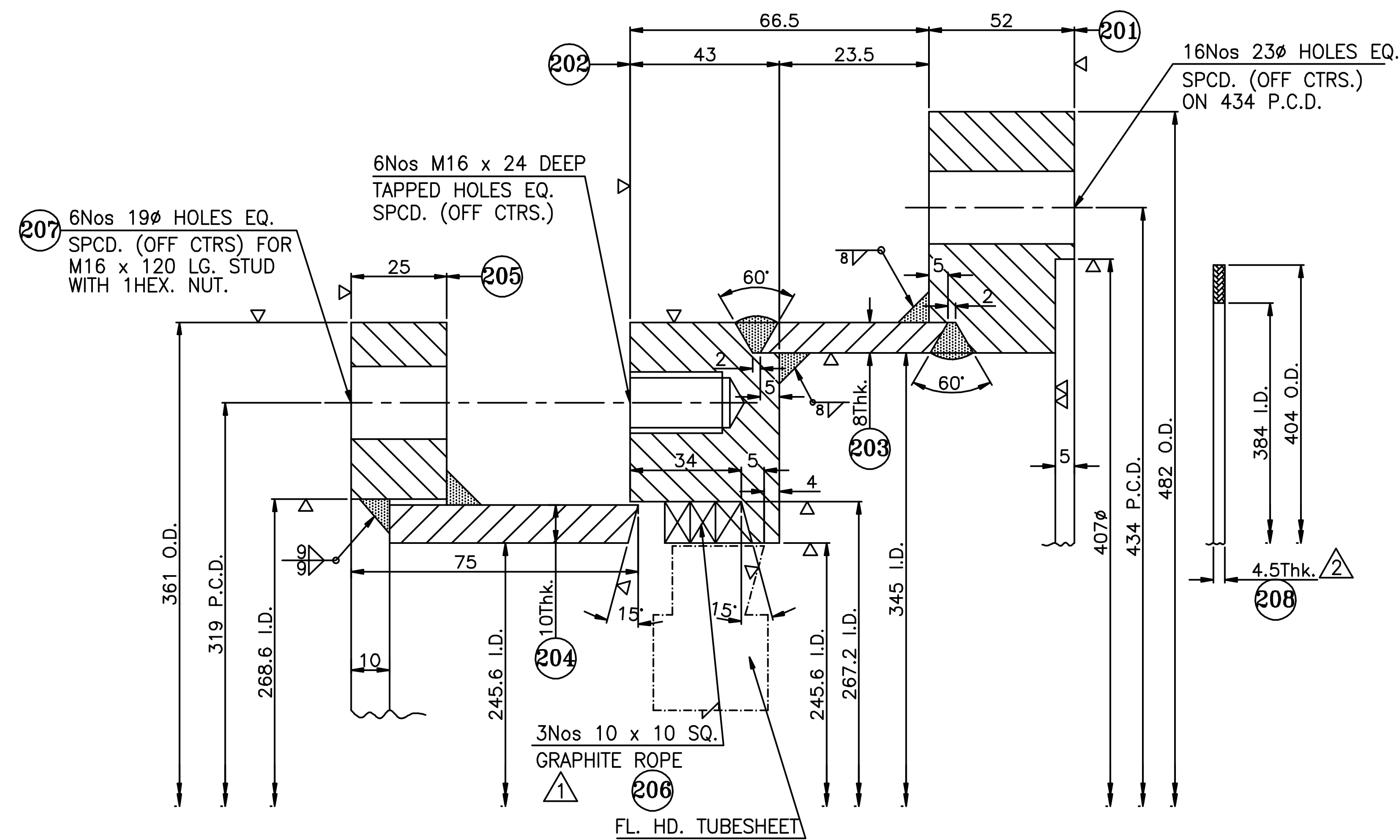
GENERAL NOTES :-

- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
- 2) ALL FLG. BOLT HOLES TO BE STRADDLE TO THE MAIN CENTER LINE.
- 3) EQUIPMENT TO BE DRIED THOROUGHLY AND CLEANED AFTER HYDRO TEST BY BLOWING DRY AIR.
- 4) ALL NOZZLE FLG. FACES SHALL HAVE 125-250 AARH FINISH UNLESS OTHERWISE SPECIFIED.
- 5) NOZZLES UP TO 50NB SIZE SHALL BE STIFFENED WITH 2 Nos 40w x 6thk. STIFFENERS WELDED AT 90° APART AT SUITABLE ORIENT.
- 6) ALL FLANGE OPENINGS SHALL BE PROTECTED WITH 3mm THICK BOLTED METALLIC CLOSURES.
- 7) ALL CS PLATES SHALL CONFORM TO LATEST ISSUE OF SPECIFICATION SA-20.
- 8) ONLY NORMALIZED PLATES FREE FROM INJURIOUS DEFECT WITH WORKMAN LIKE FINISH SHALL BE USED. RECONDITIONING/REPAIR OF PLATES BY ANY MEANS SHALL NOT BE PERMITTED.
- 9) ALL FORGINGS TO BE NORMALIZED.
- 10) ALL DISHED ENDS SHALL BE MADE OF SINGLE PIECE CONSTRUCTION.
- 11) ROLLING DIRECTION OF PLATE FOR SHELL SHALL BE LENGTHWISE.
- 12) ALL NOZZLES TO SHELL WELDS (ROOT AND FINAL RUN) SHALL BE CRACK DETECTED EXAMINED BY DP EXAMINATION.
- 13) ALL NOZZLES SHALL BE FLUSHED WITH INSIDE PROFILE OF SHELL AND SHALL BE ROUNDED OFF (RADIUS LESSER OF 1/4T OR 3/4")
- 14) RF PAD SHALL BE PROVIDED WITH 2 Nos 1/4" NPT TAPPED TALE HOLE FOR AIR SOAP SOLUTION TEST, AT 180° APART.
- 15) TEST PRESSURE SHALL BE 1.25 Kg/cm2 g.
- 16) GASKET USED FOR HYDROTEST SHALL BE SAME TYPE AS SERVICE. SAME SHALL NOT BE REUSED.
- 17) TOLERANCES ON GIRTH FLANGES (BODY FLANGES) CHANNEL COVER, FLOATING HEAD FLANGE, BOKING RING AND TUBESHEET SHALL BE AS PER TEMA. NO NEGATIVE TOLERANCE ALLOWED ON DESIGN THICKNESSES FOR THE SAME.
- 18) TOLERANCE ON DIMENSIONS TO BE +/-0.125 inches FOR COOLERS UP TO 10" DIA. ABOVE 10" DIA. +/-0.187 INCHES UNLESS TOLERANCED OTHERWISE.
- 19) ALL SHARP CORNERS SHALL BE ROUNDED OFF.
- 20) IN ADDITION TO HYDROTEST, ALL TUBES SHALL BE EDDY CURRENT TESTED IN THEIR FINAL ANNEALED CONDITION.
- 21) ALL TUBES SHALL BE SEAMLESS ONLY.
- 22) ALL FLANGES SHALL BE AS PER ASME B-16.5, FLANGES NOT COVERED BY ASME B-16.5 SHALL BE TO ASME B-16.47 (SERIES B).
- 23) PAINTING :-
 - a) INTERNAL SURFACE : AS PER D-R SPEC. NO. W131334A REV.1.
 - b) EXTERNAL SURFACE : SAND VESSEL SURFACE TO SA 2-1/2 TO ACHIVE SURFACE FINISH OF 75 MICRONS.
 - c) PRIMER COAT WITH INORGANIC ZINC SILICATE PRIMER (75 MICRONS Min. DFT)
 - d) INTERMEDIATE COAT WITH HIGH BUILT EPOXY MDO COAT 100 MICRONS DFT.
 - e) FINISH COAT - 2 FINISH COATS OF POLYURETHANE (DOL 7035)-40 MICRONS DFT PER COAT.
 - f) Baffle holes shall be deburred. All edges & corners shall be deburred.
 - g) All T/T & VENT HOLES SHALL BE FILLED WITH HARD GREASE BEFORE DESPATCH.
 - h) S.R. CYCLE FOR DISH ENDS :-
 - i) LOADING TEMPERATURE : LESS THAN 426 °C
 - ii) ABOVE 426 °C H.R. SHALL NOT EXCEED 222 °C/hr & NEED NOT BE LESS THAN 56 °C/hr.
 - iii) SOAKING TEMPERATURE : 620±10 °C
 - iv) SOAKING PERIOD : 30 MINUTES MINIMUM.
 - v) ABOVE 426 °C COOLING RATE SHALL NOT EXCEED 280 °C/hr. AND NEED NOT BE LESS THAN 56 °C/hr.
 - vi) FROM 426 °C THE DISHED ENDS MAY BE COOLED IN STILL AIR.

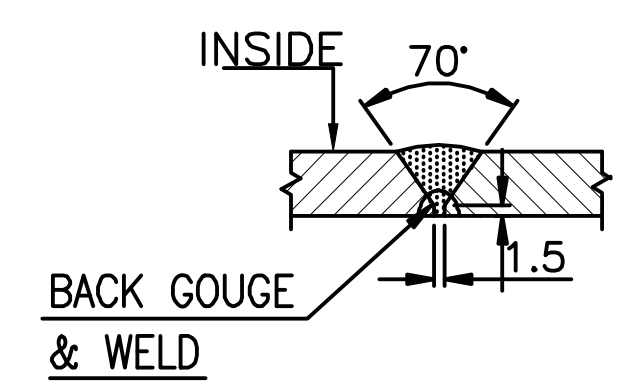
TORQUE VALUE FOR TIGHTENING		
FLANGE JOINT	TIGHTENING TORQUE	
FLANGE 2 TO 3 (M20)	282.9 N-m	
FLANGE 16 TO 17 (M20)	282.9 N-m	
FLANGE 8 TO CHANNEL COVER (M20)	282.9 N-m	
FLANGE 16 TO 17 (M20)	282.9 N-m	

BILL OF MATERIAL		
P.NO.	NAME	REMARK
35	PAD PLATE FOR SUPPORT	2 SA 516 GR. 70 6THk. x 150 x ~300 LG.
34	WASHER FOR SOLE PLATE	4 IS 2062 6THk. x 150 x ~70 LG.
33	BOLTS	4 SA 193 GR. B7 M20 x 30 LG.
32	SOLE PLATE	2 IS 2062 GR. A 25THk. x 150 x 430 LG.
31	RIVETS	4 S.S. 304 50 x 12 LG.
30	NAME PLATE	1 S.S. 304 REFER SK-AEH-11027/001
29	NAME PLATE BRACKET	1 SA 516 GR. 70 6THk. x 170 x ~275 LG.
28	LIFTING LUG	2 IS 2062 GR. A 12THk. x 60 x ~70 LG.
27	PAD PLATE FOR LIFTING LUG	2 SA 516 GR. 70 10THk. x 50 x 100 LG.
26	EARTHING LUG	2 IS 2062 GR. A 10THk. x 75 x 105 LG.
25	JACK SCREW	2 SA 193 GR. B7 M14 x 85 LG.
24	JACK SCREW	2 SA 193 GR. B7 M14 x 85 LG.
23	DOWEL PIN	2 IS 2062 GR. A 200 x 55 LG.
22	DOWEL PIN	2 IS 2062 GR. A 200 x 40 LG.
21	CLAMP PLATE	4 IS 2062 GR. A 6THk. x 150 x 60 LG.
20	CLAMP PLATE	2 IS 2062 GR. A 6THk. x 150 x ~721 DEV. LG.
19	STUD WITH 2HEX. NUTS	20 SA 193 GR. B7 M20 x 175 LG.
18	GASKET	1 4.5THk. x 404 / 3844
17	BODY FLANGE	1 SA 266 GR. 4 54THk. x AS PER DETAIL
16	BODY FLANGE	1 SA 266 GR. 4 62THk. x AS PER DETAIL
15	DISH END RHS	1 SA 516 GR. 70 12THk. x 520 BLANK DIA.
14	COVER SHELL RHS	1 SA 516 GR. 70 10THk. x 140 x 1087 DEV. LG.
13	PARTITION PLATE	1 SA 516 GR. 70 10THk. x ~121 x ~478 LG.
12	PARTITION PLATE	1 SA 516 GR. 70 10THk. x ~251.5 x ~478 LG.
11	STUD WITH 2HEX. NUTS	16 SA 193 GR. B7 M20 x 135 LG.
10	GASKET	1 4.5THk. x AS PER DETAIL
9	CHANNEL COVER	1 SA 266 GR. 4 40THk. x 4000 (AS PER DETAIL)
8	BODY FLANGE CH.	1 SA 266 GR. 4 41THk. x AS PER DETAIL
7	CHANNEL SHELL LHS	1 SA 106 GR. B 10NB SCH.40 x 358 LG.
6	STUD WITH 2HEX. NUTS	16 SA 193 GR. B7 M20 x 170 LG.
5	GASKET	1 4.5THk. x 320 / 3000
4	GASKET	1 4.5THk. x AS PER DETAIL
3	BODY FLANGE (SHELL)	1 SA 266 GR. 4 41THk. x AS PER DETAIL
2	BODY FLANGE (CHANNEL)	1 SA 266 GR. 4 41THk. x AS PER DETAIL
1	MAIN SHELL	1 SA 106 GR. B 10NB SCH.60 x 2098 LG.

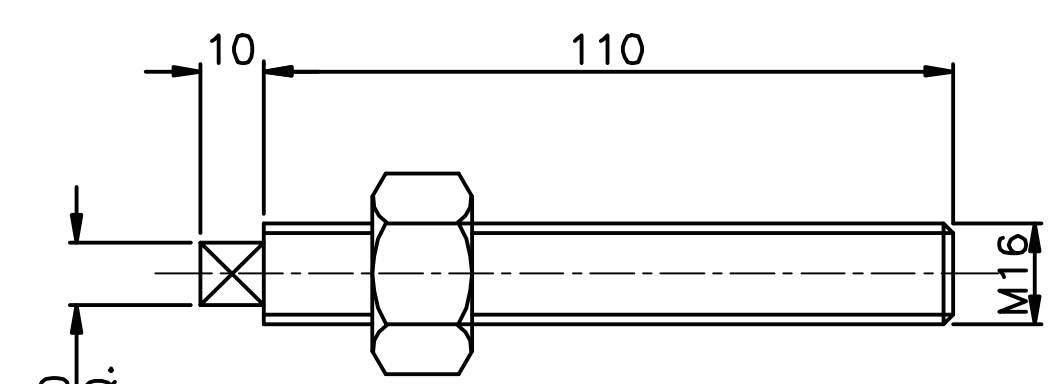
TITLE:		
ASSI.Y. AND PART DETAIL FOR 3rd. STAGE AFTER COOLER 117-EE-578A/B		
P.R. NO. :-	DRN BY	10.06.11
PROJECT :-	CHD BY	10.06.11
ITEM NO. :-	APPD BY	10.06.11
PURCHASER :-	JOB NO. :-	
DRESSER RAND IND. PVT. LTD. NARODA, AHMEDABAD.		
P.O.NO.	DRG. NO. :-	AEH-11027
REF. DRG. NO. :-	QTY. :-	2Nos.
	REV. :-	1 OF 3



DETAIL OF TEST RING



L/S DETAIL OF
P.NO.203,204



DETAIL OF P.NO. 207

REV NO.	DATE	REVISION
1	03.10.11	REVISED AS PER CLIENT'S COMMENTS AS MK'D. 1
2	07.01.12	REVISED AS PER CLIENT'S COMMENTS AS MK'D. 2
2A	25.03.12	SHOWN "AS BUILT" DRAWING AS MK'D. 2A

2A FINAL "AS BUILT" DRAWING.

2 * * 4.5Thk. S.S. 304 SPIRAL WOUND GASKET GRAPHITE FILLED.

P.NO.	NAME	QTY.	MATERIAL	SIZE	REMARK
208	GASKET	1	* *	4.5Thk. x 404 / 384ø	
207	STUD WITH 1HEX. NUTS	6	SA 193 GR. B7 SA 194 GR. 2H	M16 x 120 LG. (AS PER DET.)	
206	SQ. ASBESTOS ROPE	1	GRAPHITE ROPE	10 x 10 SQ. x AS REQD.	
205	GLAND FLANGE	1	IS 2062 GR. B	25Thk. x 361 / 268.6ø	
204	GLAND SHELL RING	1	IS 2062 GR. B	10Thk. x 65 x ~803 DEV. LG.	
203	RING SHELL	1	IS 2062 GR. B	8Thk. x 33.5 x ~1109 DEV. LG.	
202	INNER RING	1	IS 2062 GR. B	43Thk. x 361 / 245.6ø	
201	TEST RING FLANGE	1	IS 2062 GR. B	52Thk. x 482 / 345ø	

BILL OF MATERIAL

TITLE: TEST RING DETAIL FOR 3rd. STAGE AFTER COOLER (117-EE-578A/B)

P.R.NO.		DRN BY		10.09.11	SCALE
PROJECT	BRAHMAPUTRA PETROCHEMICAL COMPLEX PROJECT	CHD BY		10.09.11	NTS
ITEM NO.	WIN 51310WV3 TF	APPD BY		10.09.11	

PURCHASER: DRESSER RAND IND. PVT. LTD. Naroda, Ahmedabad. JOB NO.:

P.O.NO. DRG. NO. : AEH-11027 SHEET NO. 3 OF 3

REF. DRG. NO.: WIN51310WV. 1 OF 13 TO 13 OF 13. REV. 0 QTY : 1No. REV. 2A