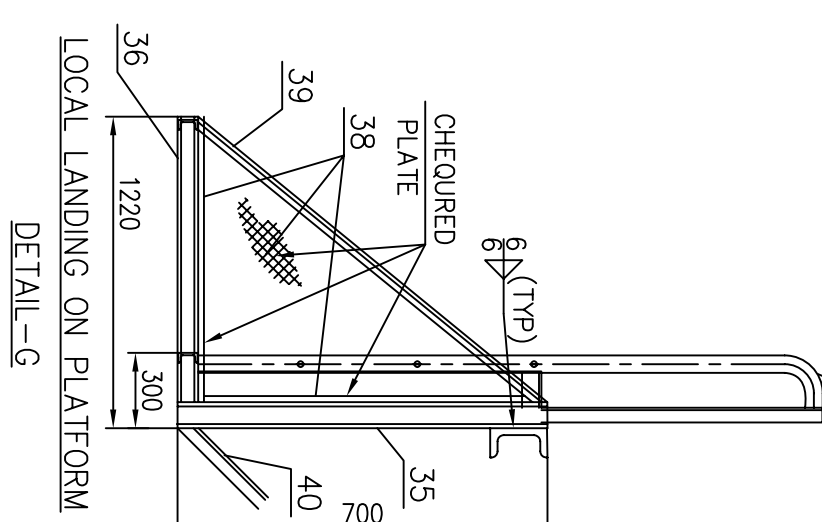
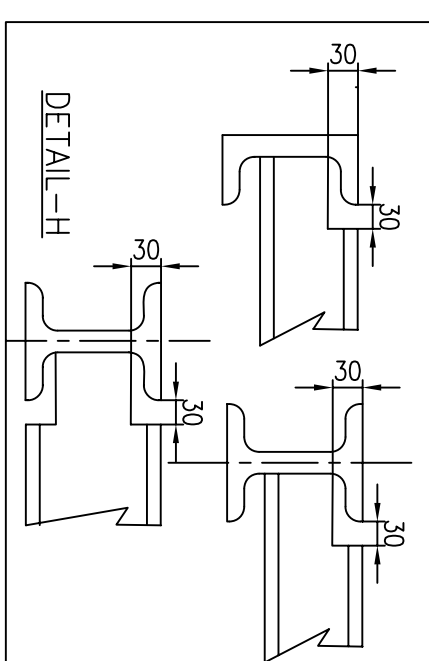
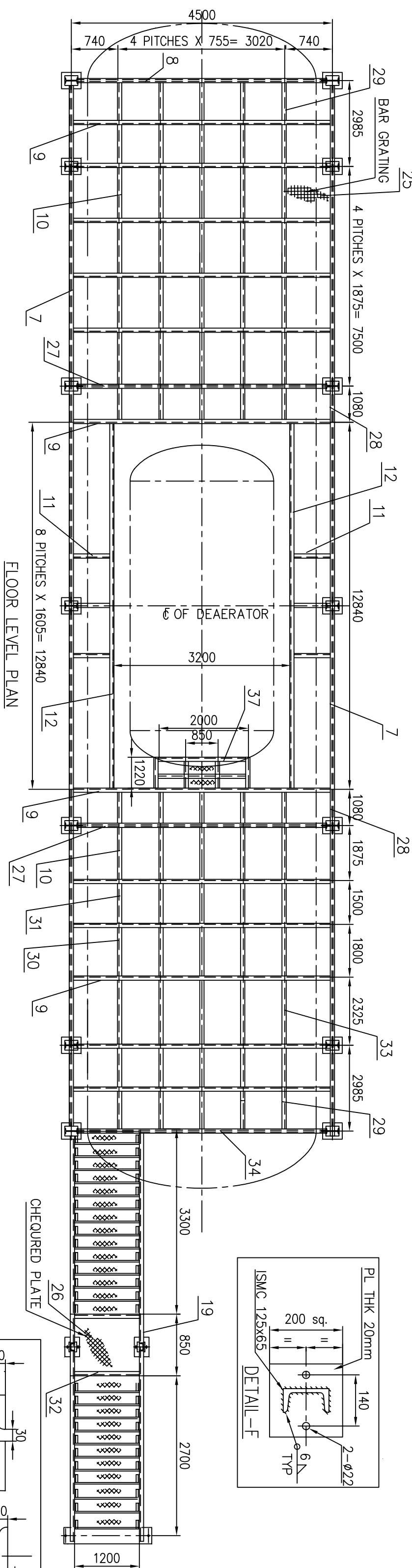
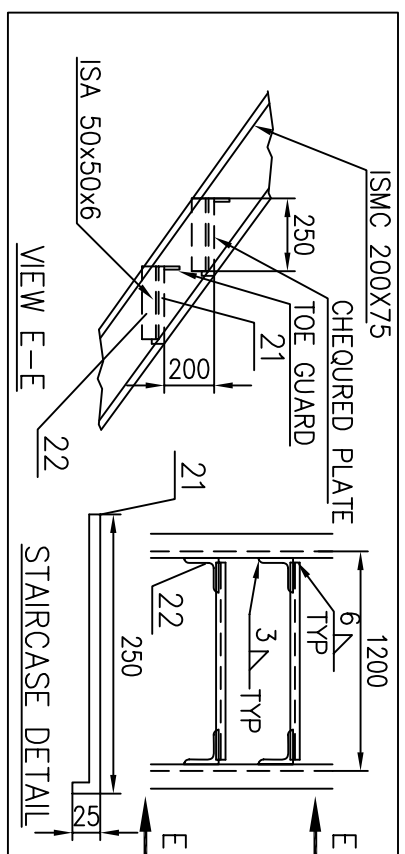
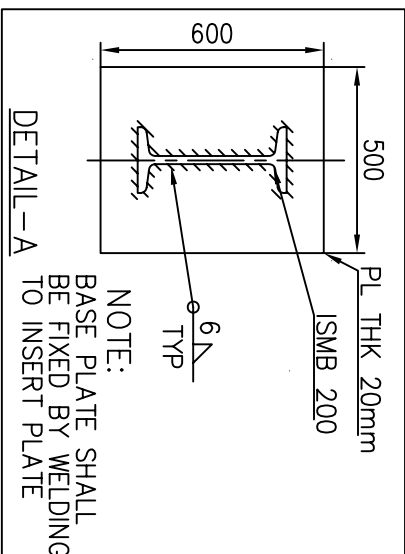






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1) CUTTING OF RAW MATERIAL AS INDICATED IN THE BOM AND DRILLING OF HOLES IN BASE PLATES IS IN VENDORS SCOPE.

5) HEADER MATERIAL: T21633511515-00.



TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT										600MW PROJECT																							
<div><div><div><div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div></div><div>BHARAT HEAVY ELECTRICALS LTD. HYDERABAD</div></div> <td colspan="2">DEPT^T HEE CODE 405</td> <td colspan="2">GRADE OF TOL/DIM. C/M/F</td> <td colspan="2"></td> <td colspan="2">SCALE</td> <td colspan="2">WEIGHT (Kg)</td> <td colspan="2">CARD CODE</td> <td colspan="10">DRAWING NO. 2-163-35-11515</td> <td colspan="2">REV. 00</td>										DEPT ^T HEE CODE 405		GRADE OF TOL/DIM. C/M/F				SCALE		WEIGHT (Kg)		CARD CODE		DRAWING NO. 2-163-35-11515										REV. 00	
								REF. TO ASSY DRG.						NAME A.L.RAJAM		SIGN.		DATE 21.02.11		NO.OF VAR.													
														CHD.		UMESH MENON				21.02.11													
														APPO.		TSN BHARGAV				21.02.11													
																				ITEM NO.		NO.OF ITEMS											
SHEET No. 01										NO OF SHEETS 01																							

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

INVENTORY NO. SIGN. AND DATE REF. DRG. NO. COMPUTER FILE NAME

GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261

FIRST ANGLE PROJECTION

DRG. NO. 2-163-19-11570

SH. OF 2

3

4

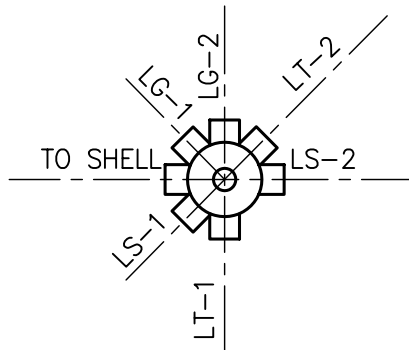
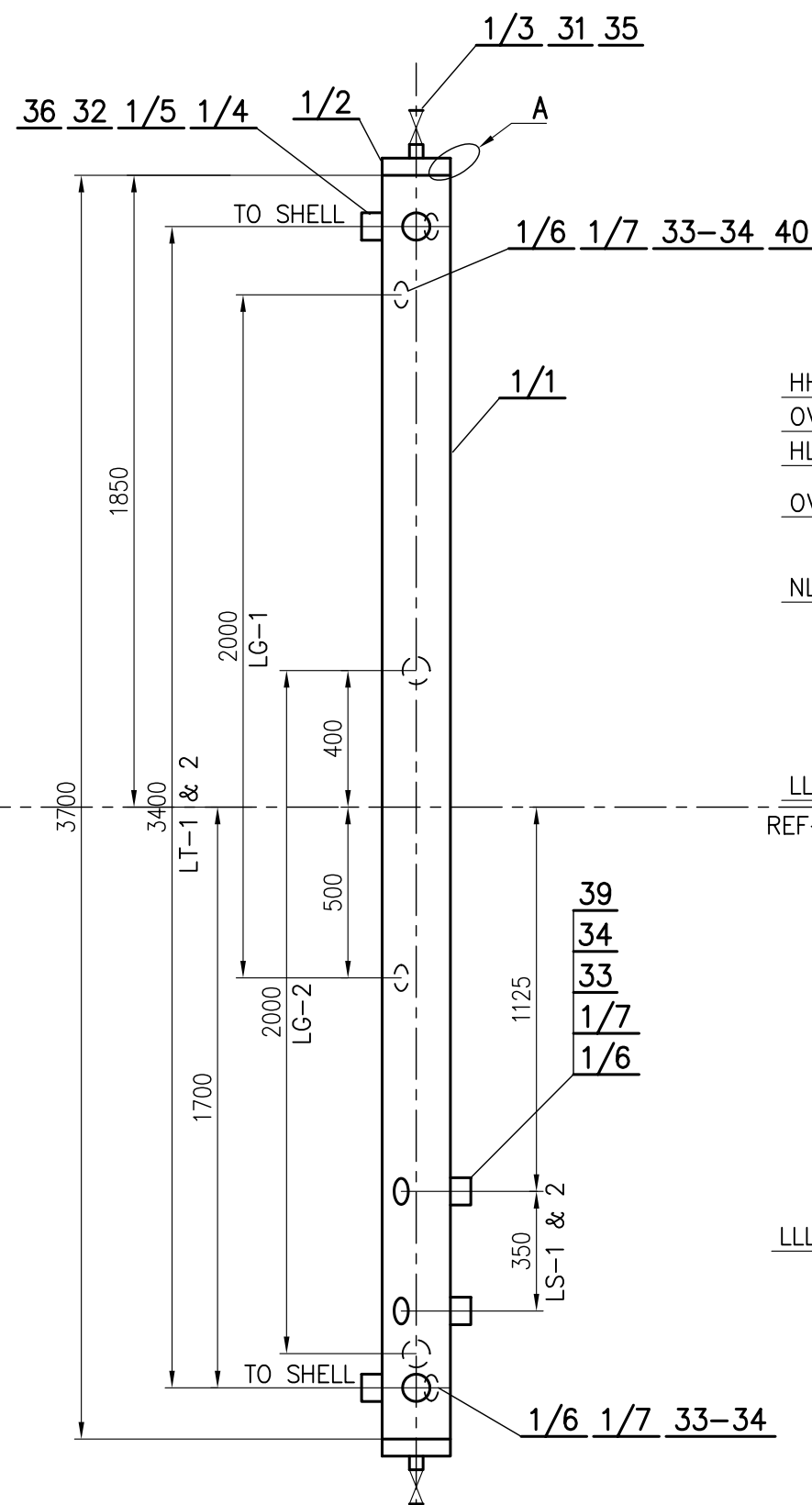
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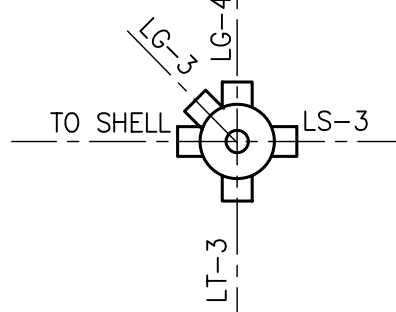
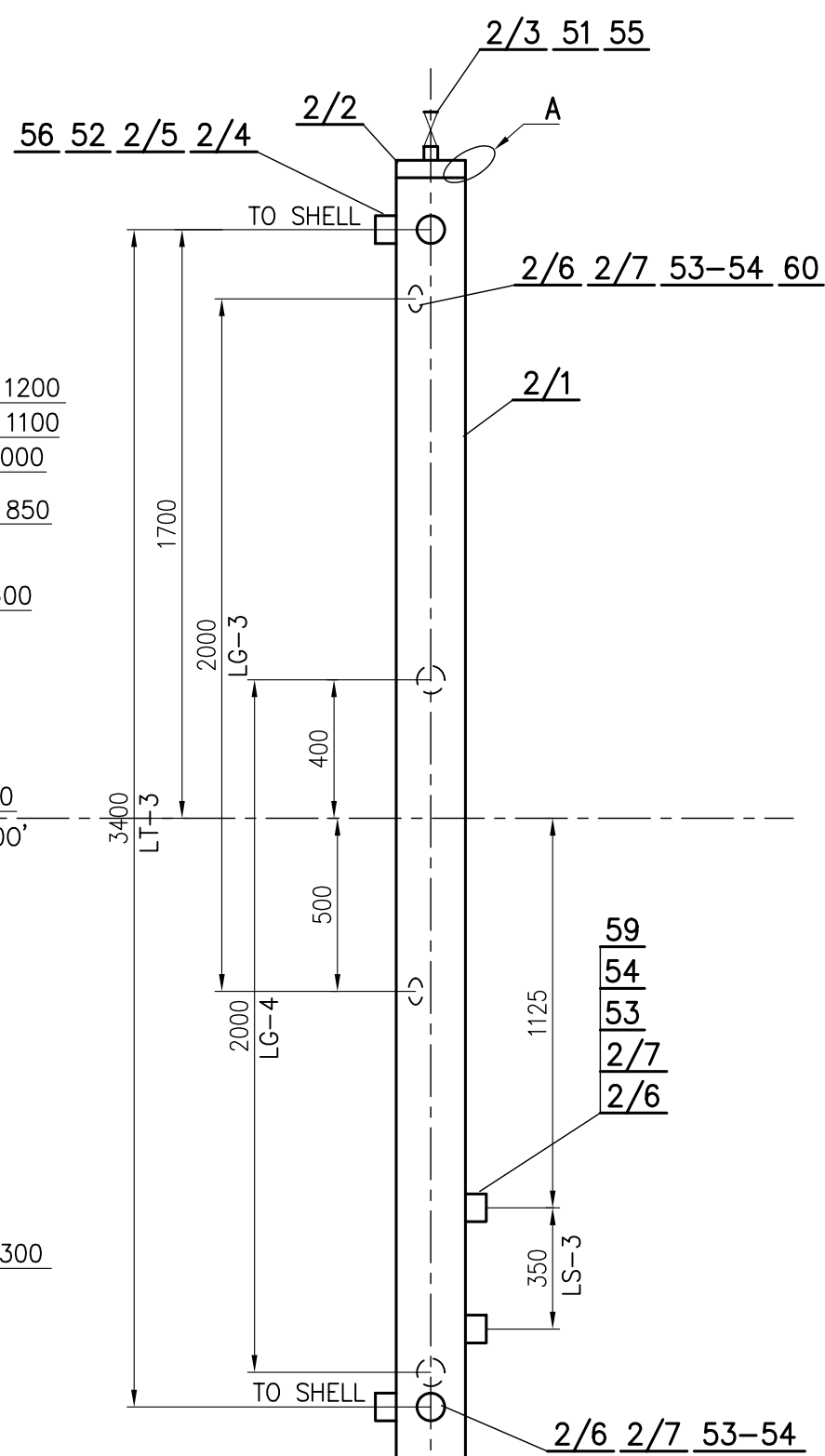
8

(ALL DIMENSIONS ARE IN mm)



ORIENTATION OF CONN.

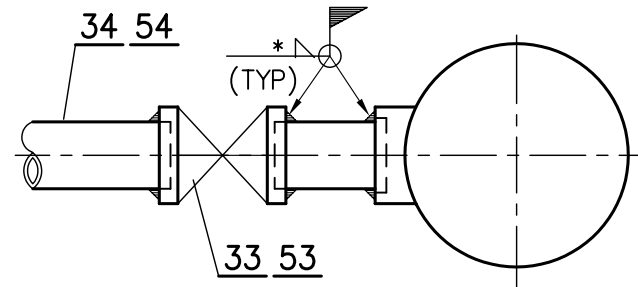
STAND PIPE-1



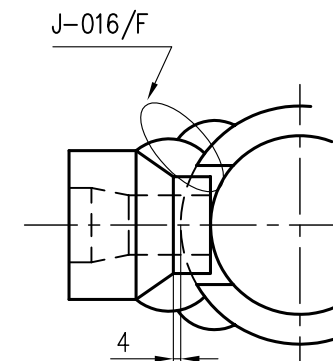
ORIENTATION OF CONN.

STAND PIPE-2

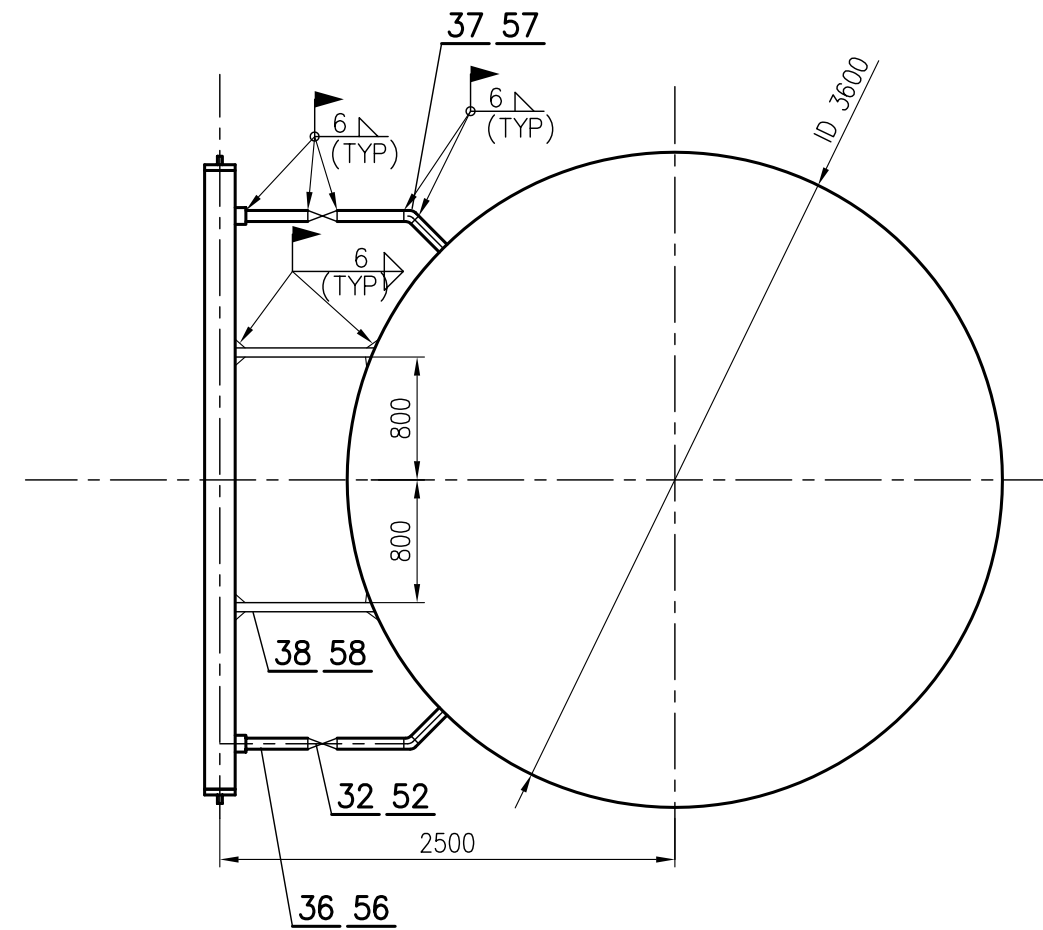
*=0.7 X CONNECTION PIPE THICKNESS.



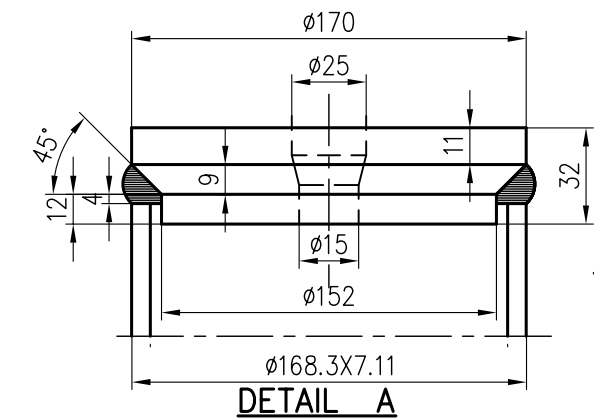
SW CONN. WELDING DETAIL
(FOR LS, LG & LT)



PIPE TO COUPLING WELDING



STAND PIPE TO SHELL CONNECTION DETAIL



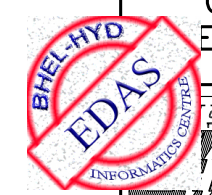
INSTRUMENT DETAILS

SL.No.	DESCRIPTION	C/C	END CONN.	QTY ON	
				SP1	SP2
1	LEVEL GUAGE (LG)	2000	1" SW	2	2
2	LEVEL TRANSMITTER (LT)	3400	1" SW	2	1
3	LEVEL SWITCH (LS)	350	1" SW	2	1

NOTES :-

- HYDRAULIC TEST WILL BE DONE IN SHOP BEFORE DESPATCH AS PER HY0852061.
- REPRESENTS SITE WELDING

TYPE OF PRODUCT
OR
E OF CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.
HYDERABAD

DRN.	NAME A.L. RAJAM	SIGN.	DATE 03.01.11	NO. OF VAR.
CHD.	UMESH M. RAO		03.01.11	NA
APPD.	TSN BHARGAV		03.01.11	NA
DEPT.	HEE	GRADE OF TOL. DIM. C/M/F	SCALE	WEIGHT (KG)
CODE	405		NTS	NA
TITLE DEAERATOR STANDPIPE ASSEMBLY. (FOR STAND PIPE I & II)			CARD CODE N.A.	DRAWING NO. 2-163-19-11570 SHEET No. NO OF SHEETS
				REV. 00

DRG. NO. 1-163-16-11459

OF 1

HS

7

6

5

4

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2

1

F

E

D

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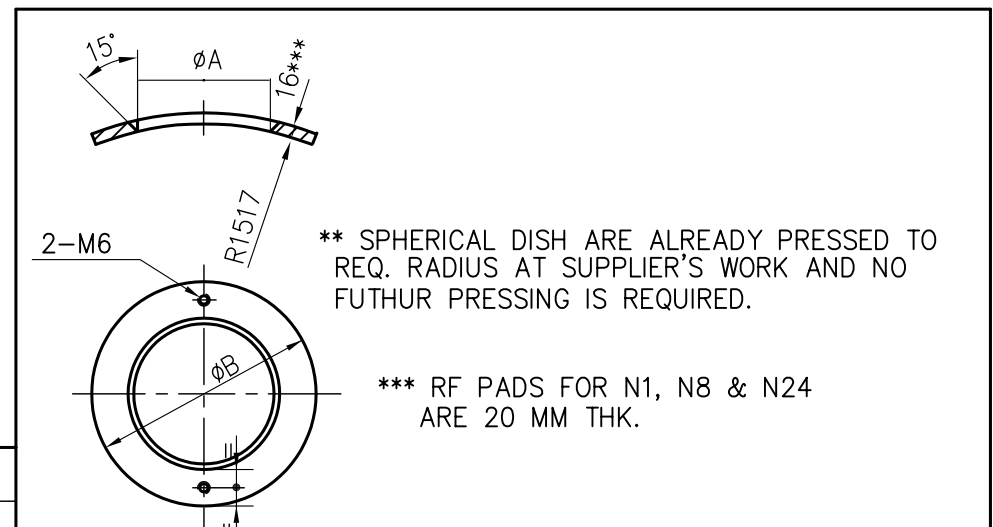
LIST OF NOZZLE CONNECTIONS

REF.	DESCRIPTION	SIZE	OD x THK	QTY	WELDING DETAILS			RATING	TYPE	ØA	ØB	REMARKS	REF.	VAR NO.
					SHELL TO NOZZLE*	AT WORKS*	NOZZLE END CONNECTION AT SITE*							
N1	STEAM INLET	34"	864 x 16	1	DET-D1	DET-D1	DET-D5			880	1400		N1	01
N2A,N2B	CONDENSATE INLET	16"	406 x 16	2	DET-D1	DET-D1	DET-D5			422	650		N2A,B	02
N8	TRAY REMOVAL DOOR	20"	508 x 16	1	J-007/F	J-015/F	-	300#	SORF	524	800		N8	03
N9A,B	SAFETY RELIEF VALVE	8"	219.1 x 12.7	2	DET-D8	DET-D8	DET-D8	300#	SORF	235	400		N9A,B	04
N12	VENT CONN	2"	COUPLING 6000#	4	DET-F	DET-F	DET-G	300#	SW			REFER NOTE-12	N12	05
N17	TEMP. GAUGE CONN	M33X2	COUPLING	2	J-008/F	***	SCREW THERMOWELL		SCREWED			SPECIAL COUPLING	N17	06
N19	PRESSURE GAUGE CONN	1/2"	COUPLING 6000#	1	DET-D6	DET-D6	DET-D31		SW			**	N19	07
N20	PRESSURE TRANSMITTER CONN	1/2"	COUPLING 6000#	2	DET-D6	DET-D6	DET-D31		SW			**	N20	07
N21	CBD VENT	12"	323.6 x 17.48	1	DET-D1	DET-D1	DET-D5			340	500		N21	08
N24	HP-5 DRAIN INLET	8"	219.1 x 12.7	2	DET-D10	DET-D10	DET-D5			235	500		N24	09
N28	PG TEST PRESSURE TAP POINT CONN.	1/2"	COUPLING 6000#	1	DET-D6	DET-D6	DET-D31		SW			**	N28	07
N29	DOWN COMMER	36"	914 x 16	2	DET-D2	DET-D2	DET-D5 & DET-C			930	1400		N29	10
N30	EQUALIZER	36"	914 x 16	2	DET-D1	DET-D1	DET-D5 & DET-C			930	1400		N30	11

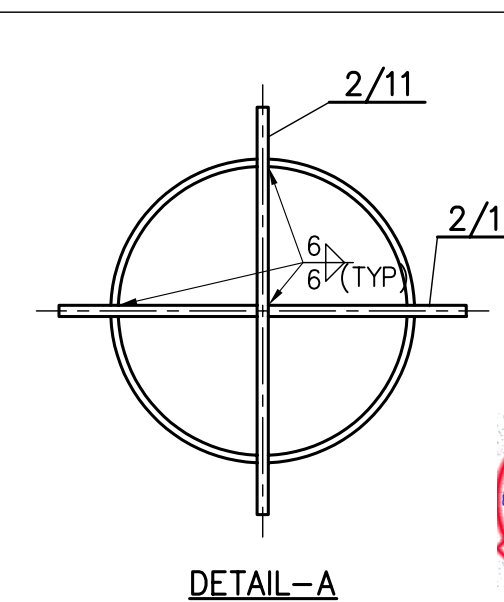
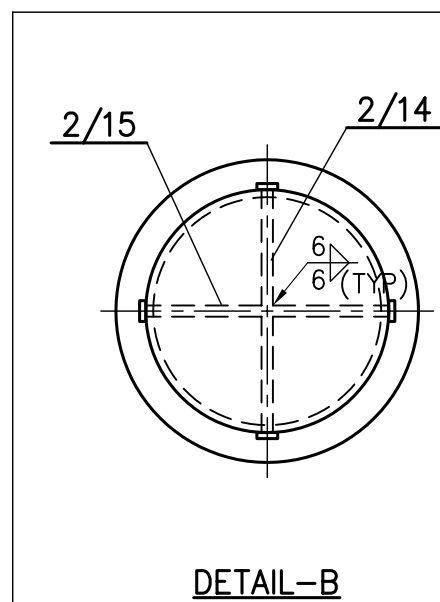
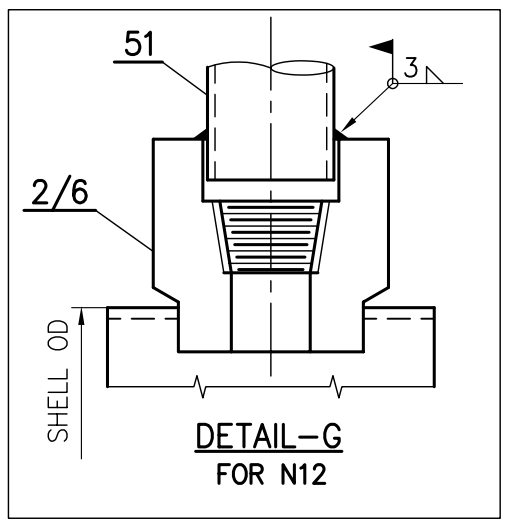
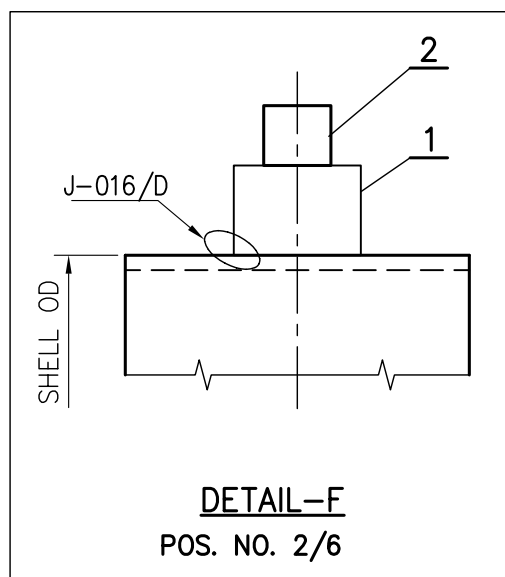
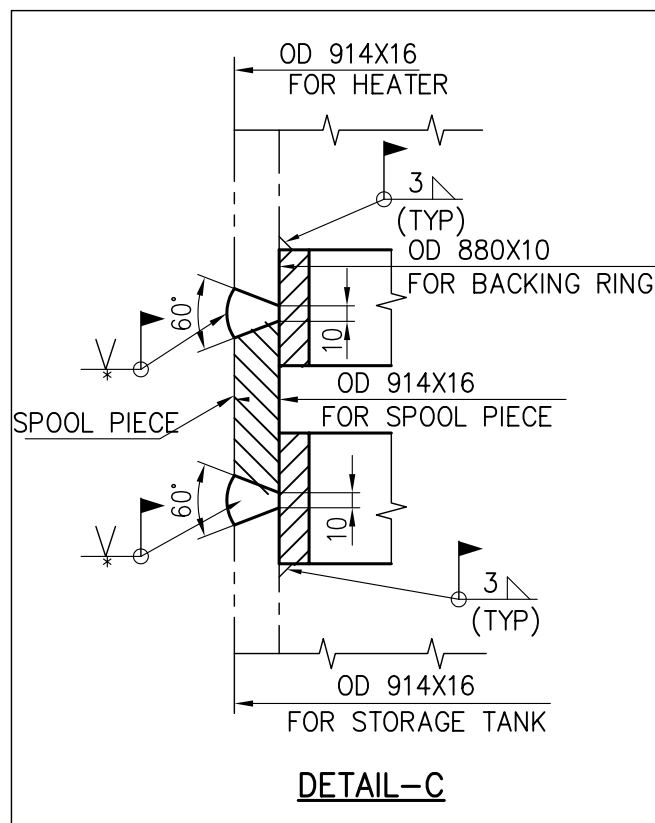
** SW PIPE TO COUPLING AFTER REMOVING PLUG
*** SCREW PLUG WITH WASHER

* NOTES FOR LIST OF NOZZLE CONN. TABLE

- FOR DETAILS D1 TO D31 REFER DRG. 1-163-10-11267.
- FOR DETAILS J-001/F, J-002/F, J-007/F, J-008/F, J-015/F, J-014/D & J-016/D REFER DRG. 2-16310-00014.
- FOR DET-A, B, C, F & G REFER THIS DRG.



PREFIX 1/ TO ALL POS. NOs., EXCEPT POS. NOs. 51 TO 61.



NOTES:-

- ALL FLANGE BOLT HOLES SHALL STRADDLE NORMAL CENTRE LINES OF VESSEL.
- ALL FABRICATED NOZZLES TO BE FULLY RADIOGRAPHED.
- HYDROTEST BLANKING PLATES SHALL BE REMOVED ONLY AT SITE.
- WPS FOR FILLET WELDS ON SHELL SHALL BE AS PER J-002/F.
- ALL LONGITUDINAL AND CIRCUMFERENTIAL WELDS ARE TO BE BACK-GOUGED TO SOUND METAL.
- MAGNETIC PARTICLE TEST REQUIRED ONLY AT NOZZLE TO HEAD WELDS AND NOZZLE TO SHELL WELDS.
- VESSEL WILL BE DESPATCHED IN SINGLE PIECE.
- INSIDE EDGES OF ALL PROJECTED NOZZLES SHALL BE ROUNDED OFF.
- NOZZLES WHICH OVERLAP C-SEAMS SHALL MEET THE REQUIREMENTS OF UW-14
- BOLTING TO SECURE HEATER TO STORAGE TANK IS 8 No'S OF M27x120
- HYDROSTATIC TEST AS PER HY0852061.
- NOZZLE N12 SHALL BE PLUGGED AT WORKS FOR HYDROTEST PURPOSE. WHICH SHALL THEN BE REMOVED AT SITE AND VENT ORIFICE ASSLY (POS. NO. 51) AS PER RELEVANT DRG. SHALL BE WELDED AS PER DET-G FOR N12.
- INDICATES SITE WELDING.

IMPORTANT NOTES ON DEAERATOR VENT PIPING

- NO SHARP BENDS AND TRAPS ARE ALLOWED IN VENT PIPING.
- VENT PIPE SHALL RISE VERTICALLY FROM DEAERATOR HEATER IN A SHORT LENGTH OF PIPE
- AVIDOE LONG LINES WITH GREAT NUMBERS OF TURNS
- HORIZONTAL RUNS SHALL BE AVOIDED IN VENT PIPING.
- DO'NT JOIN INDIVIDUAL VENT LINES WITH A COMMON HEADER.

TYPE OF PRODUCT
OR
OF CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.
HYDERABAD

DRN.	NAME	DATE	NO. OF
CHD.	UMESH MENON	10.05.10	VAR.
APPD.	B. SRINIVAS	10.05.10	N.A.

DEPT. HEE
CODE 405



SCALE
NTS

WEIGHT (KG)
NA

REF. TO ASSY DRG.
NA

ITEM NO.
N.A.

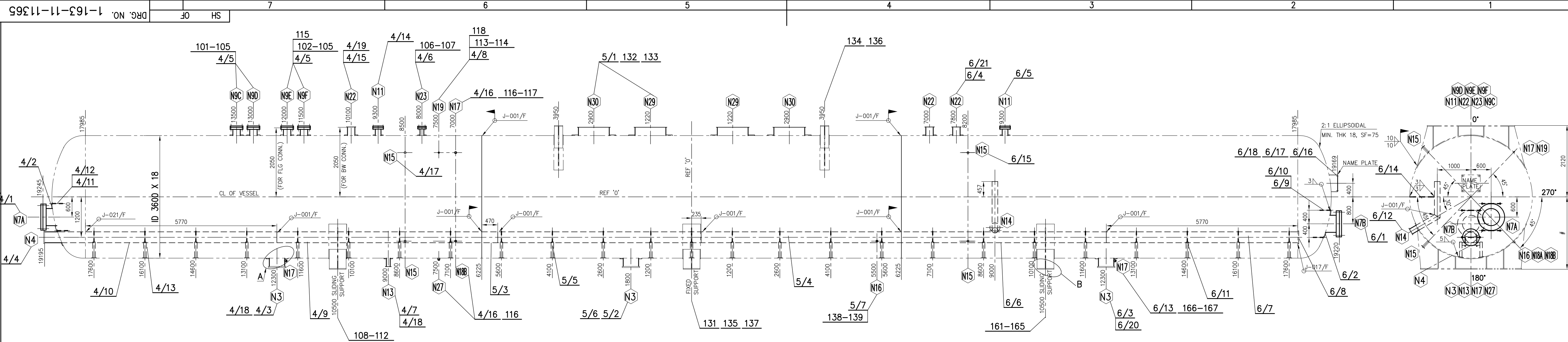
NO. OF
ITEMS
N.A.

TITLE
NOZZLE ASSEMBLY
(FOR DEAERATOR HEATER)

CARD
CODE

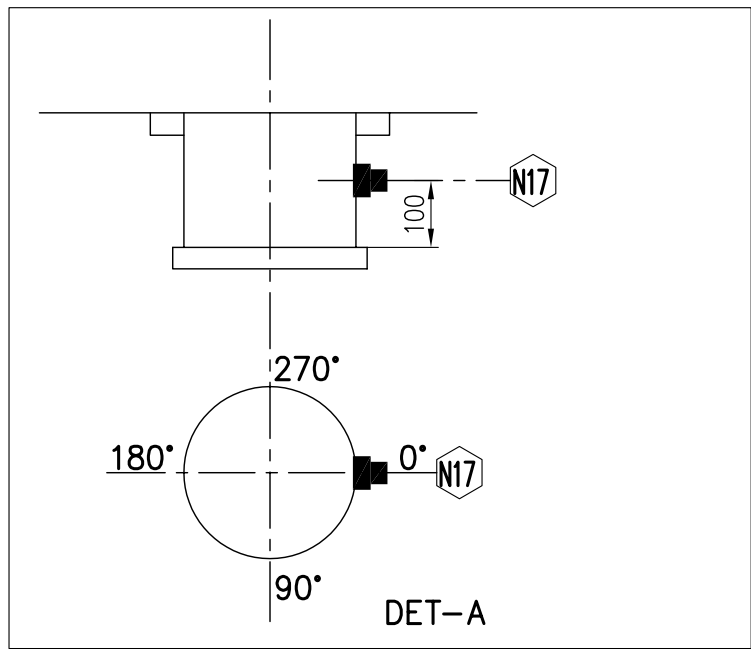
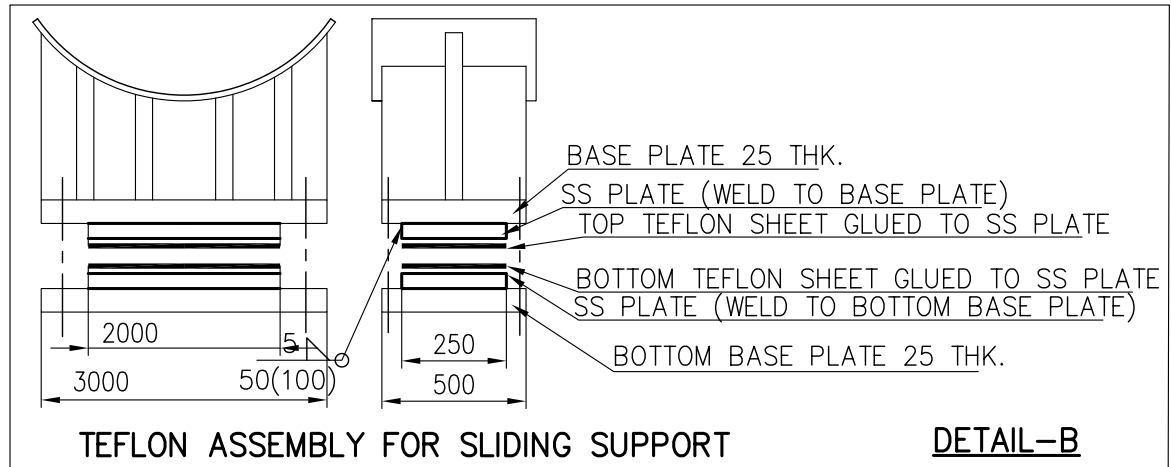
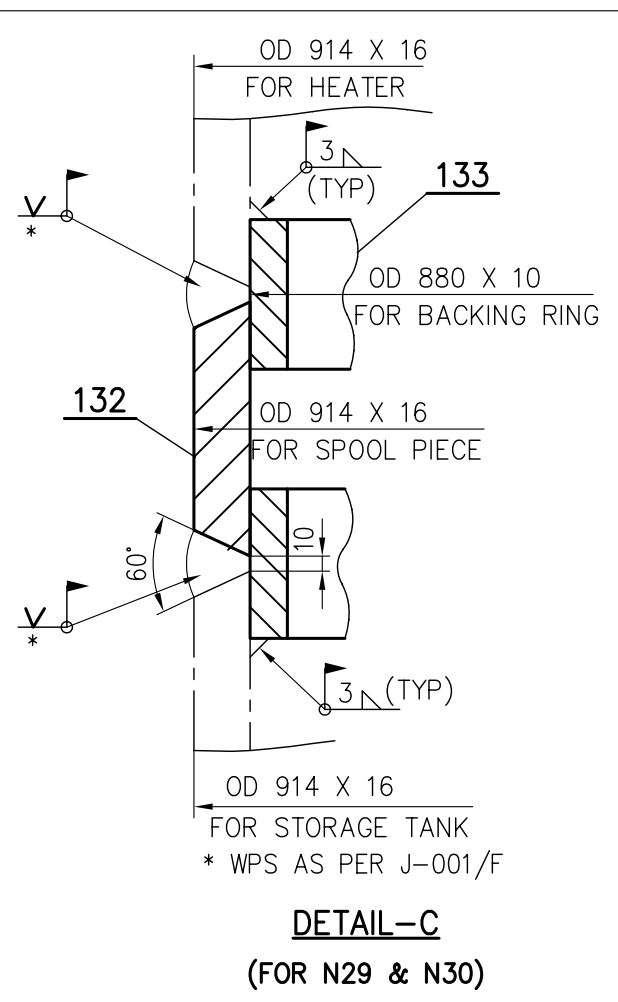
DRAWING NO.
1-163-16-11459

REV.
00




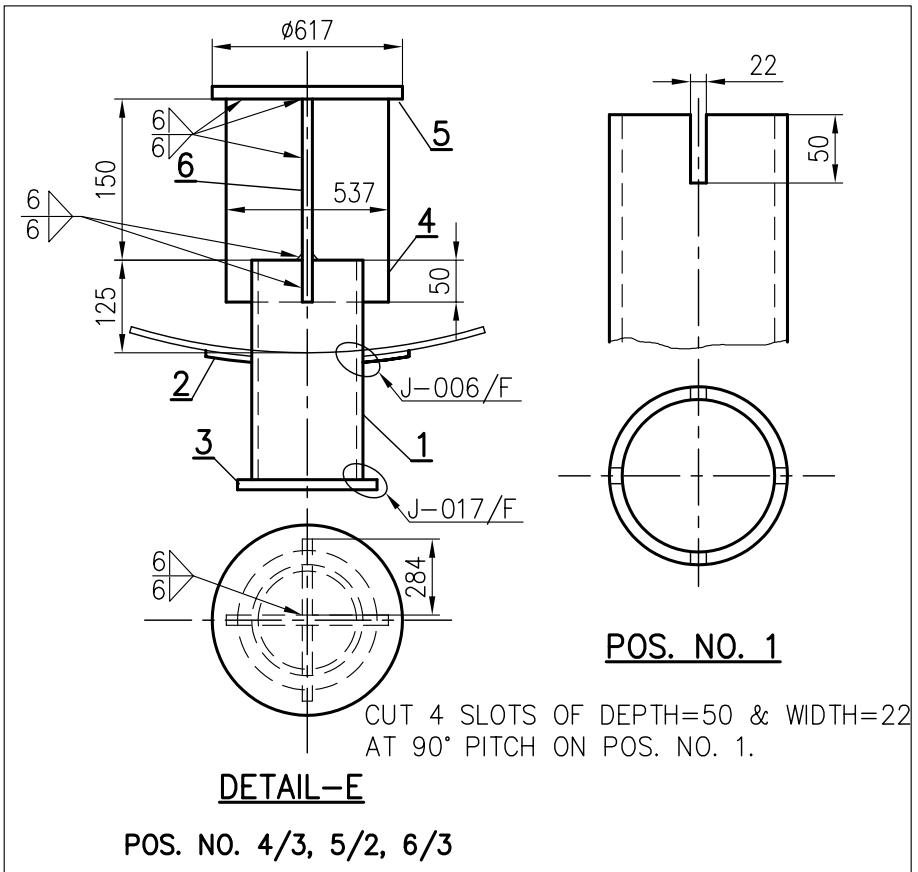
#= 2150 (FOR FIXED SUPPORT) & 2135 (FOR SLIDING SUPPORT), 15mm
DIFFERENCE IN HEIGHT IS COMPENSATED BY TEFLON SHEET ASSLY. (REFER DET-B)

PREFIX 1/, 2/ & 3/ FOR POS. NOS. FOR SEC-I, II & III RESPECTIVELY, EXCEPT POS. NOS. 101-118, 131-139, 161-167.



IMPORTANT:-
SUBCONTRACTOR SHALL TAKE CONCURRENCE FROM HE ENGG. DEPARTMENT,
BEFORE MAKING ANY OPENINGS FOR NOZZLES ON THE SHELL & DISH ENDS.

- NOTES:-
1. ALL NOZZLE BOLT HOLES SHALL STRADDLE NORMAL CENTRE LINES OF VESSEL.
 2. ALL FABRICATED NOZZLES TO BE FULLY RADIOGRAPHED.
 3. BUTT WELD CONNECTIONS TO HAVE HYDROTEST BLANK - OFF PLATES LEFT
 4. IN PLACE (TO BE REMOVED AFTER HYDRAULIC TEST AT SITE)
 5. WPS FOR FILLET WELDS ON SHELL ARE AS PER J-002/F & FILLET DIMENSION SHOWN SHOWN IS THROAT DIMENSION
 6. ALL LONGITUDINAL AND CIRCUMFERENTIAL WELDS ARE TO BE BACK-GOUGED TO SOUND METAL.
 7. M.P TEST REQUIRED ONLY AT NOZZLE TO HEAD WELDS AND NOZZLE TO SHELL WELDS
 8. TANK WILL BE DESPATCHED IN THREE SECTIONS.
 9. INSIDE EDGES OF ALL PROJECTED NOZZLES SHALL BE ROUNDED OFF.
 10. NOZZLES WHICH OVERLAP C-SEAMS SHALL MEET THE REQUIREMENTS OF UW-14
 11. FOUNDATION BOLTS: M42x300 STUD WITH TWO NUTS 16 No'S PER SET ALONG WITH WASHER SHALL BE SUPPLIED.
 12. HYDROSTATIC TEST AS PER HY0852061
 13. SPOOL PIECE CONSTRUCTED OF SA 516/70 WILL BE SUPPLIED TO AID IN PROPER FIT UP OF THE DOWN COMMERS AND EQUALIZERS. TWO BACKING RINGS WILL BE SUPPLIED WITH EACH SPOOL PIECE (REFER DET-C).
 14. STORAGE TANK TO HEADER CONNECTION SHALL BE AS PER DET-C AT SITE. (DOWN COMMERS & EQUALISERS)
 15. VENTILATOR IS A FLANGED CONN. BLANKED WITH A BLIND FLANGE. THIS CAN BE USED FOR VENTILATION INSIDE THE STORAGE TANK DURING ANY MAINTENANCE OPERATION. THIS IS POSSIBLE BY OPENING THE BLIND FLANGE OF THE VENTILATOR NOZZLE.
 16. SPOOL PIECE ARE EDGE PREPARED ONLY ON ONE SIDE AT WORKS. CUTTING SPOOL PIECE TO EXACT LENGTH AS PER SITE REQUIREMENT AND EDGE PREPARATION ON THE OTHER SIDE IS IN SITE SCOPE OF WORK.
 17. BOLTING TO SECURE HEATER TO STORAGE TANK IS OF M27x120 IN SIZE AND 8 No'S IN QTY.
 18. SYMBOL  INDICATES SITE WELDING
 19. SADDLE SUPPORTS FOR SUPPORTING DEAEARATOR HEATER SHALL BE DESPATCHED IN TACK WELDED CONDITION FROM WORKS. FINAL WELDIND SHALL BE AT SITE.
 20. FOR NAME PLATE (POS. NO. 6/17) DRG. NO. REFER ST.TANK ASSLY. DRG.



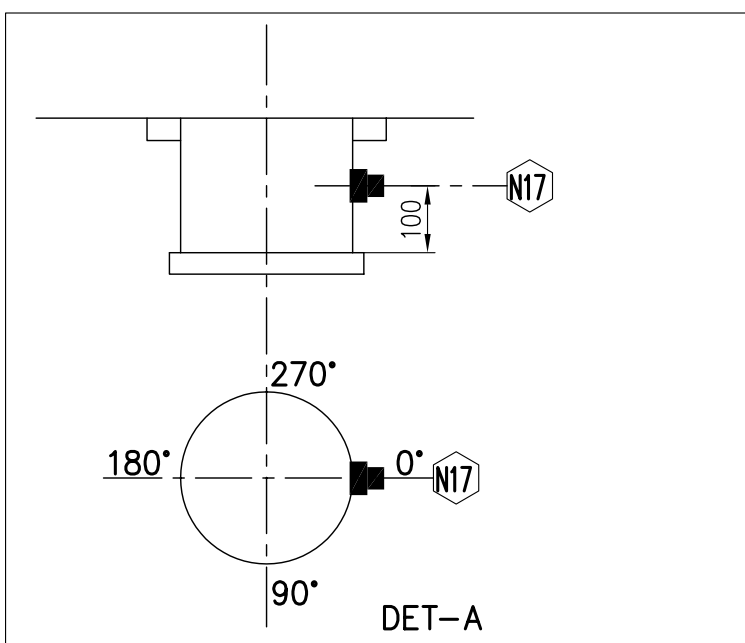
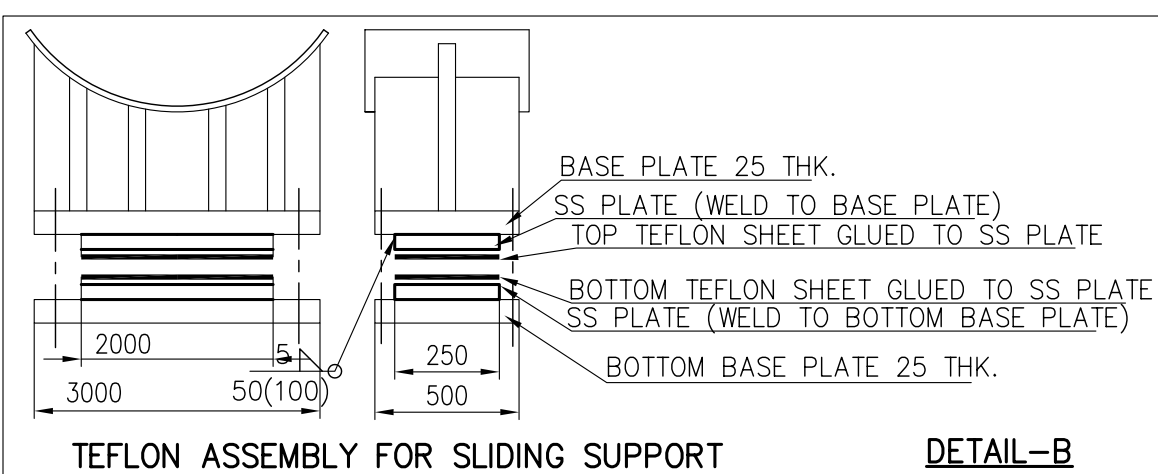
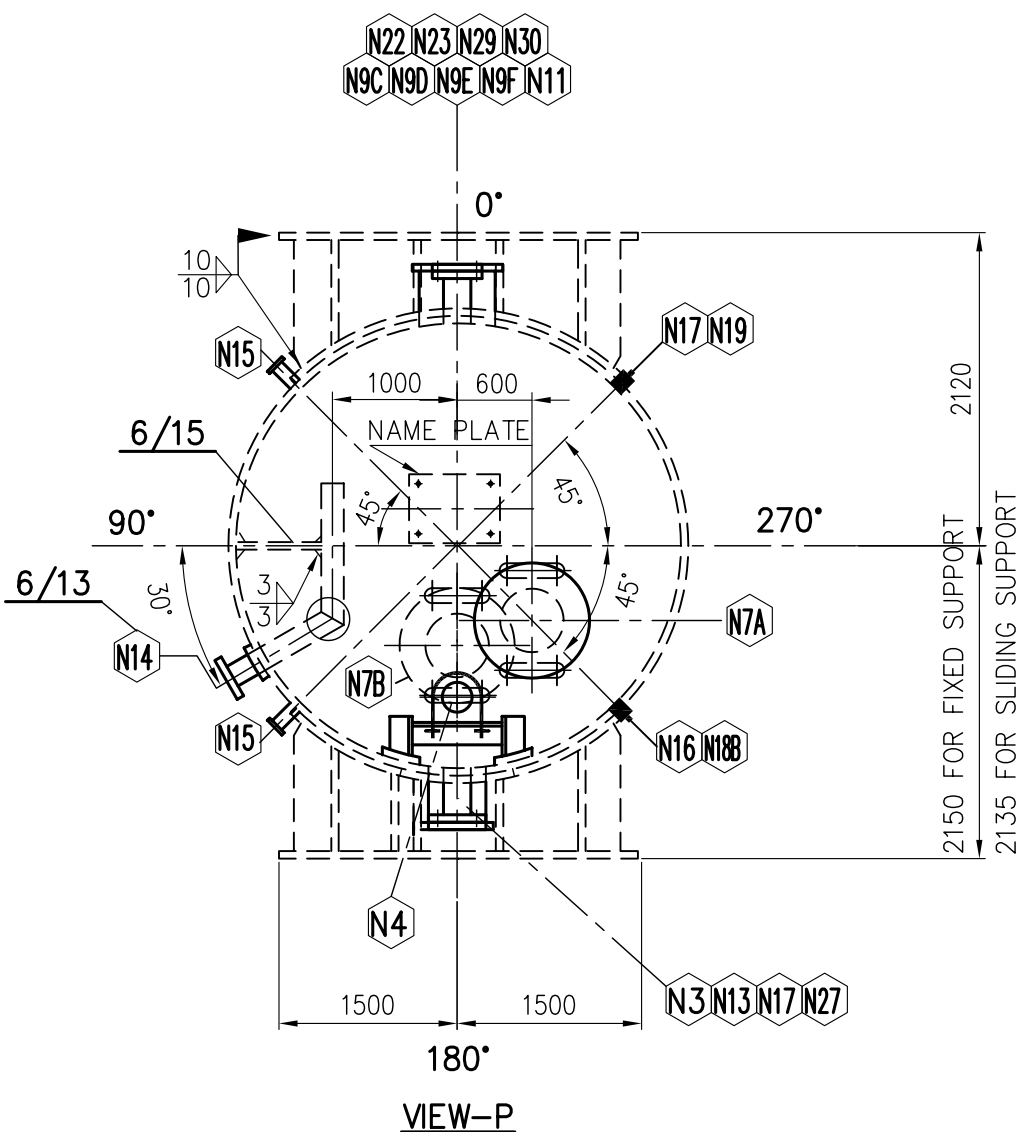
LIST OF NOZZLE CONNECTIONS		WELDING DETAILS										REF.		VAR NO.
		SHELL TO	NOZZLE	NOZZLE END CONNECTION	AT WORKS	AT SITE	RATING	TYPE	ØA	ØB	REMARKS			
N3A-C	FEED WATER OUTLET	18"	457 X 16	3	DET-E	DET-E	DET-D5	-	BW	473	650	WITH VORTEX BREAKER	N3A-C	01
N4	STARTUP HEATING STEAM INLET CONN.	12"	323.9 X 17.48	1	DET-D1	DET-D1	DET-D5	-	BW	340	500		N4	02
N7A	MANHOLE	20"	508 X 16	1	J-007/F	J-015/F	-	300#	SORF	524	850		N7A	03
N7B	MANHOLE	20"	508 X 16	1	J-007/F	J-015/F	-	300#	SORF	524	850		N7B	03
N9C TO F	SAFETY RELIEF VALVE CONN.	8"	219.1 X 12.7	4	DET-D8	DET-D8	DET-D8	300#	SORF	235	400		N9C TO F	04
N11	VENTILATOR	6"	168.3 X 10.97	2	DET-D4	DET-D4	-	300#	SORF	184	300	REFER NOTE-15	N11	05
N13	DRAIN	4"	114.3 X 11.13	1	DET-D2	DET-D2	DET-D5	-	BW	130	250		N13	06
N14	OVER FLOW CONN.	6"	168.3 X 10.97	1	DET-D1	DET-D1	DET-D5	-	BW	184	300		N14	07
N15	STAND PIPE	2"	60.3 X 8.74	4	DET-D17	DET-D17	DET-D21	-	BW	-	-		N15	08
N16	SAMPLING CONNECTION	1"	COUPLING 6000#	1	DET-D6	DET-D6	DET-D31	-	-	-	-	**	N16	09
N17	THERMOMETER CONN.	M33X2	COUPLING	3	J-008/F	***	SCREW THERMOWELL	-	SCREWED	-	-	SPECIAL COUPLING	N17	10
N18B	CONN. FOR RTD	M33X2	COUPLING	1	J-008/F	***	SCREW THERMOWELL	-	SCREWED	-	-	SPECIAL COUPLING	N18B	10
N19	PRESSURE GAUGE CONN.	1/2"	COUPLING 6000#	1	DET-D6	DET-D6	DET-D31	-	SCREWED	-	-	**	N19	11
N22A-C	RECIRCULATION CONN. (BFP)	8"	219.1 X 12.7	3	DET-D10	DET-D10	DET-D5	-	BW	235	400	WITH DISPERSER	N22A-C	12
N23	INITIAL FILLING CONN.	4"	114.3 X 11.13	1	DET-D3	DET-D3	DET-D3	300#	SORF	130	250		N23	13
N27	PG TEST THEMOWELL CONN.	M33X2	COUPLING	1	J-008/F	***	-	-	SCREWED	-	-		N27	10
N29	DOWN COMER	36"	914 X 16	2	DET-D1	DET-D1	DET-D5 & DET-C	-	BW	930	1300		N29	14
N30	EQUALIZER	36"	914 X 16	2	DET-D1	DET-D1	DET-D5 & DET-C	-	BW	930	1300		N30	14

** SW PIPE TO COUPLING AFTER REMOVING PLUG.
*** SCREW PLUG WITH WASHER.

* NOTES (LIST OF NOZZLE CONN.):


- 1) FOR DETAILS J-001/F, J-002/F, J-007/F, J-008/F, J-011/F, J-015/F, J-017/F REFER DRG. NO. 2-163-10-00014.
- 2) FOR DETAILS D1 TO D32 REFER DRG. NO. 1-163-10-11267
- 3) FOR DETAIL -A, 'C' & 'E' REFER THIS DRG.

TYPE OF PRODUCT OR OF CUSTOMER/PROJECT		Bharat Heavy Electricals Ltd. HYDERABAD		DRN. A.L. RAJAM CHD. UMESH MENON APPD. B. SRINIVAS	NAME A.L. RAJAM UMESH MENON B. SRINIVAS	DATE 11.05.10 11.05.10 11.05.10	NO. OF VAR.
DEPT. HEE CODE 405	GRADE OF TOLDIM C/M/F	SCALE NTS	WEIGHT (KG) NA	REF. TO ASSY DRG. NA	ITEM NO. NA	NO. OF ITEMS NA	
TITLE NOZZLE ASSLY. DETAILS (DEAEARATOR STORAGE TANK)				CARD CODE	DRAWING NO. 1-163-11-11365 SHEET No. 00		



PREFIX 1/, 2/ & 3/ FOR POS. NOs. FOR SEC-I, II & III RESPECTIVELY, EXCEPT POS. NOs. 101-118, 131-137, 161-169.

NOTES: –

3. ALL NOZZLE BOLT HOLES SHALL STRADDLE NORMAL CENTRE LINES OF VESSEL.
2. ALL FABRICATED NOZZLES TO BE FULLY RADIOGRAPHED.
3. BUTT WELD CONNECTIONS TO HAVE HYDROTEST BLANK – OFF PLATES LEFT
4. IN PLACE (TO BE REMOVED AFTER HYDRAULIC TEST AT SITE)
5. WPS FOR FILLET WELDS ON SHELL ARE AS PER J-002/F & FILLET DIMENSION SHOWN IS THROAT DIMENSION
6. ALL LONGITUDINAL AND CIRCUMFERENTIAL WELDS ARE TO BE BACK-GROUGED TO SOUND METAL.
7. M.P TEST REQUIRED ONLY AT NOZZLE TO HEAD WELDS AND NOZZLE TO SHELL WELDS
8. TANK WILL BE DESPATCHED IN THREE SECTIONS.
9. INSIDE EDGES OF ALL PROJECTED NOZZLES SHALL BE ROUNDED OFF.
10. NOZZLES WHICH OVERLAP C-SEAMS SHALL MEET THE REQUIREMENTS OF UW-14
11. FOUNDATION BOLTS:
M42x300 STUD WITH TWO NUTS 16 No'S PER SET ALONG WITH WASHER SHALL BE SUPPLIED.
12. HYDROSTATIC TEST AS PER HY0852061
13. SPOOL PIECE CONSTRUCTED OF SA 516/70 WILL BE SUPPLIED TO AID IN PROPER FIT UP OF THE DOWN COMERS AND EQUALIZERS. TWO BACKING RINGS WILL BE SUPPLIED WITH EACH SPOOL PIECE (REFER DET-C).
14. STORAGE TANK TO HEADER CONNECTION SHALL BE AS PER DET-C AT SITE. (DOWN COMERS & EQUALISERS)
15. VENTILATOR IS A FLANGED CONN. BLANKED WITH A BLIND FLANGE. THIS CAN BE USED FOR VENTILATION INSIDE THE STORAGE TANK DURING ANY MAINTENANCE OPERATION. THIS IS POSSIBLE BY OPENING THE BLIND FLANGE OF THE VENTILATOR NOZZLE.
16. SPOOL PIECE ARE EDGE PREPARED ONLY ON ONE SIDE AT WORKS. CUTTING SPOOL PIECE TO EXACT LENGTH AS PER SITE REQUIREMENT AND EDGE PREPARATION ON THE OTHER SIDE IS IN SITE SCOPE OF WORK.
17. BOLTING TO SECURE HEATER TO STORAGE TANK IS OF M27x120 IN SIZE AND 8 No'S IN QTY.
18. SYMBOL  INDICATES SITE WELDING
19. SADDLE SUPPORTS FOR SUPPORTING DEAERATOR HEATER SHALL BE DESPATCHED IN TACK WELDED CONDITION FROM WORKS. FINAL WELDING SHALL BE AT SITE.
20. FOR NAME PLATE (POS. NO. 6/18) DRG. NO. REFER ST.TANK ASS'LY. DRG.

Technical drawing of a mechanical part, likely a valve or plug, showing a side view, a top view, and a cross-section.

Side View Dimensions:

- Top flange diameter: $\phi 65.80$
- Total height: 195
- Bottom flange height: 125
- Central shaft diameter: 51.0
- Bottom flange diameter: 74.5
- Bottom flange thickness: 50

Top View Dimensions:

- Bottom flange diameter: 74.5
- Central shaft diameter: 51.0

Cross-section Dimensions:

- Slot width: 22
- Slot depth: 50

Detail View:

- Detail 1: J-006/F
- Detail 2: J-017/F
- Detail 3: J-006/F
- Detail 4: J-017/F

Annotations:


- CUT 4 SLOTS OF DEPTH=50 & WIDTH=22 AT 90° PITCH ON POS. NO. 1.
- POS. NO. 1
- DETAIL-F
- POS. NO. 4/3, 5/2, 6/3

** SW PIPE TO COUPLING AFTER REMOVING PLUG.
*** SCREW PLUG WITH WASHER.

* NOTES (LIST OF NOZZLE CONN.):—

- 1) FOR DETAILS J-001/F, J-002/F, J-007/F, J-008/F, J-015/F, J-017/F, J-021/F REFER DRG. NO. 2-163-10-00014.
2) FOR DETAILS D1 TO D32 REFER DRG. NO. 1-163-10-11267
3) FOR DETAIL -'A', 'C' & 'E' REFER THIS DRG.

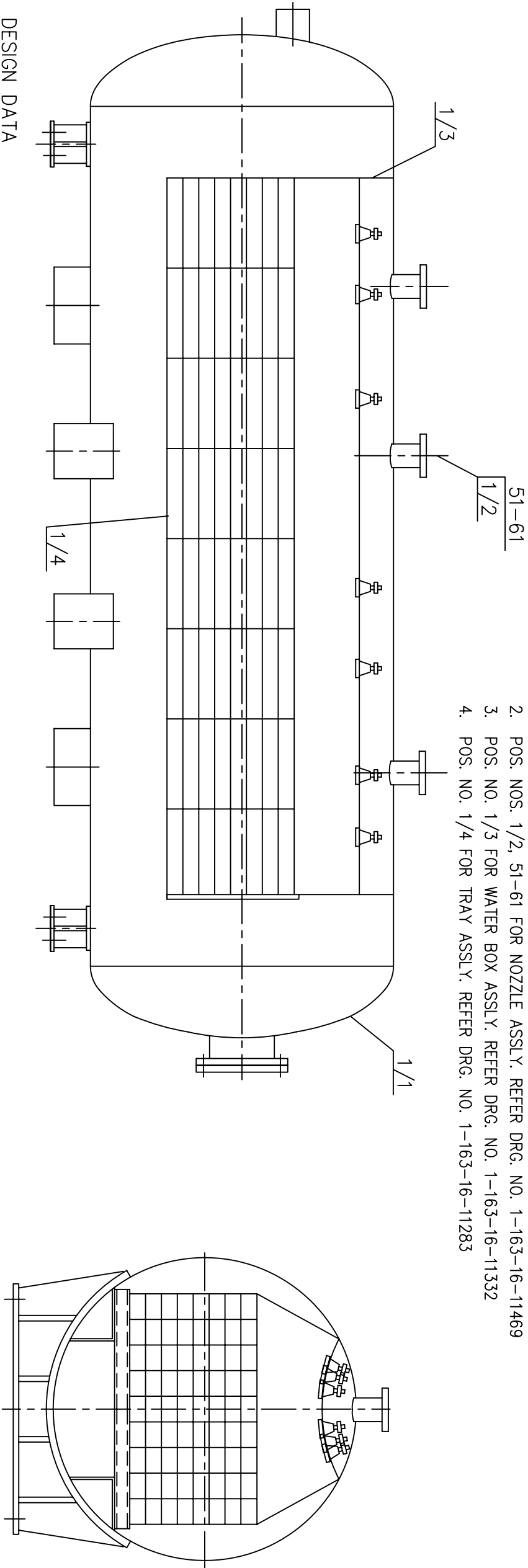
[illegible]

TYPE OF PRODUCT OR OF CUSTOMER/PROJECT		BHRAT HEAVY ELECTRICALS LTD. HYDERABAD		DRN. CHD.	A.L. RAJAM UMESH MENON	DATE 22.03.10	NO OF VAR.
DEPT. HEE GRADE OF TOL.DIM. C/M/F		SCALE NTS		WEIGHT (KG) NA	REF. TO ASSY DRG. NA	ITEM NO. NA	NO OF ITEMS NA
CODE 405				CARD CODE	DRAWING NO. 1-163-11-11357		REV. 00
TITLE NOZZLE ASSLY. DETAILS (DEACERATOR STORAGE TANK)				SHEET No. _____		NO OF SHEETS _____	

Є8911-91-Є91-Є ON DRG.

NOTES:

- 1. POS. NO. 1/1 FOR SHELL ASSLY. REFER DRG NO. 3-163-16-11638
- 2. POS. NOS. 1/2, 51-61 FOR NOZZLE ASSLY. REFER DRG. NO. 1-163-16-11469
- 3. POS. NO. 1/3 FOR WATER BOX ASSLY. REFER DRG. NO. 1-163-16-11332
- 4. POS. NO. 1/4 FOR TRAY ASSLY. REFER DRG. NO. 1-163-16-11283



DESIGN DATA




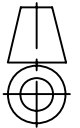
DESCRIPTION		
DESIGN PRESSURE	Kg/sq.cm (g)	9 & FULL VACUUM
TEST PRESSURE	Kg/sq.cm (g)	11.7
DESIGN TEMP. MAX/MIN	°C	360/0
TEST TEMP. MAX/MIN	°C	AMBIENT/17
CORROSION ALLOW.	SHELL / HEADS	3.2
IN mm	RF PADS / NOZZLES / FLANGES mm	1.6
RADIO GRAPHY		100%
JOINT EFFICIENCY		1.0
INSPECTION		BHEL & LLOYDS & *
DESPATCH WT. (A)	KG	29437
LOOSE ITEMS WT. IN FABRICATOR SCOPE (B)	KG	259
LOOSE ITEMS WT. IN BHEL SCOPE (C)	KG	576
TOTAL WT. (A+B+C)	KG	30272
PWHT		NOT REQUIRED

* CUSTOMER APPOINTED TPI (OPTIONAL), FOR APPLICABILITY REFER QP.

NOTE:-

- 1) PAINTING INSIDE: NIL
OUTSIDE: TWO COATS OF HEAT RESISTANT ALUMINIUM
PAINT AS PER AA56134.
- 2) QUALITY PLAN NO. IS INDICATED IN ANNEXURE TO P.O.

REV.	DATE	ALTERED	CHECKED	APPD
ZONE				

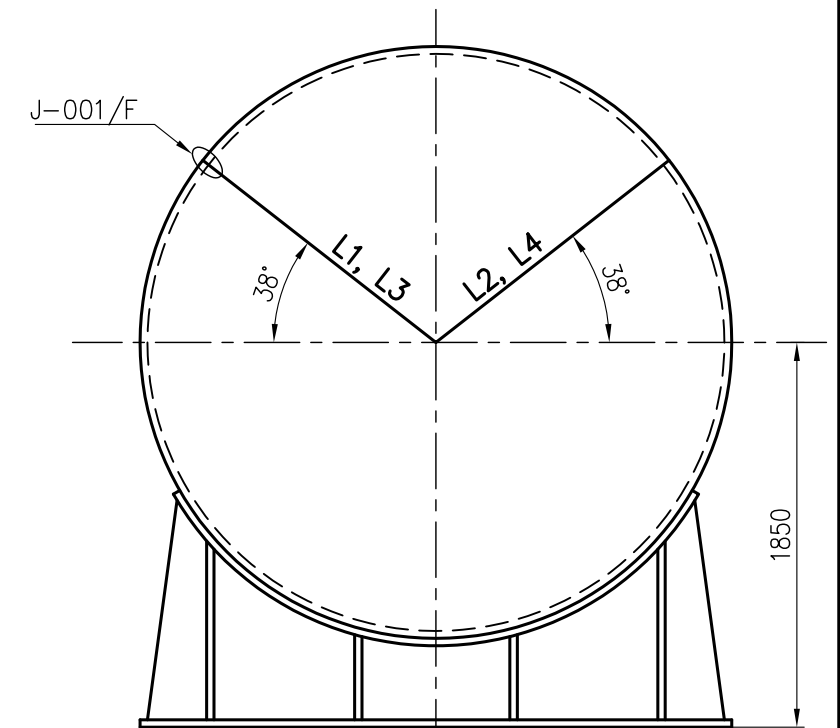
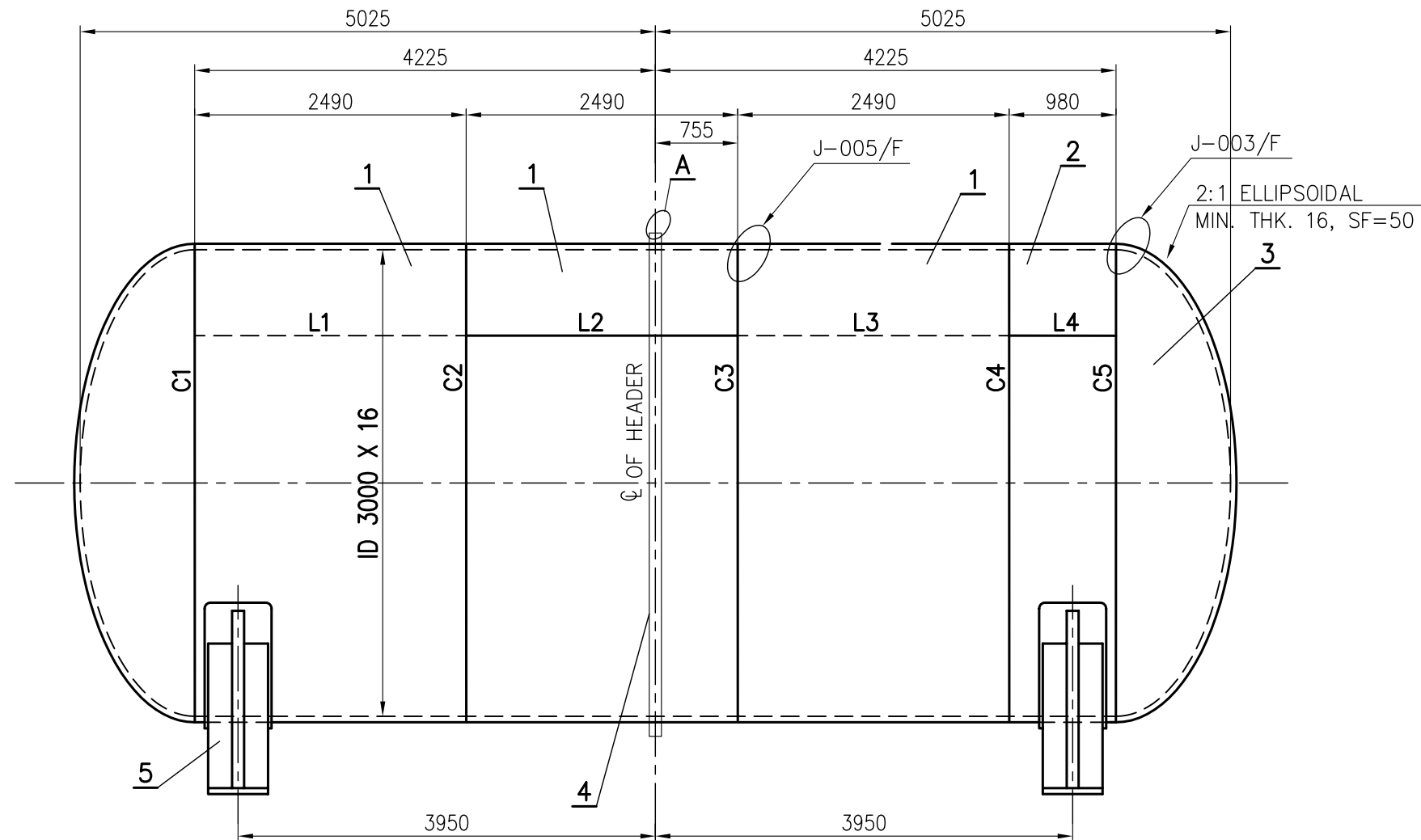
DESIGN, FABRICATION & TESTING CODE		ASME SEC VIII DIV.1, YEAR AND ADDENDA LATEST						
WORK ORDER No.		REFER ANNEXURE TO P.O						
VESSEL No.		REFER ANNEXURE TO P.O						
WELD DET. & WPS DRG. No.		2 163 10 00014						
NOZZLE DETAIL DRG. No.		1 163 10 11267						
HEADER MATERIAL/ DRG. LIST.		T31631611683-00						
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		500MW DEAERATOR						
BHARAT HEAVY ELECTRICALS LTD. HYDERABAD		DRN.	AL RAJAM	SIGN.	DATE	NO.OF VAR.		
		CHD.	UMESH MENON		14.02.11	NA		
		APPD.	TSN BHARGAV		14.02.11			
DEPT. HEE	GRADE OF TOL.DIM. C/M/F			SCALE NTS	WEIGHT (Kg) NA	REF. TO ASSY DRG. NA	ITEM NO. NA	NO.OF ITEMS NA
CODE 405	TITLE HEATER ASSLY. (DEAERATOR)		CARD CODE		DRAWING NO. 3-163-16-11683		REV. 00	
		SHEET No.				NO OF SHEETS		

INVENTORY NO. SIGN. AND DATE REF. DRG. NO. 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

FIRST ANGLE PROJECTION

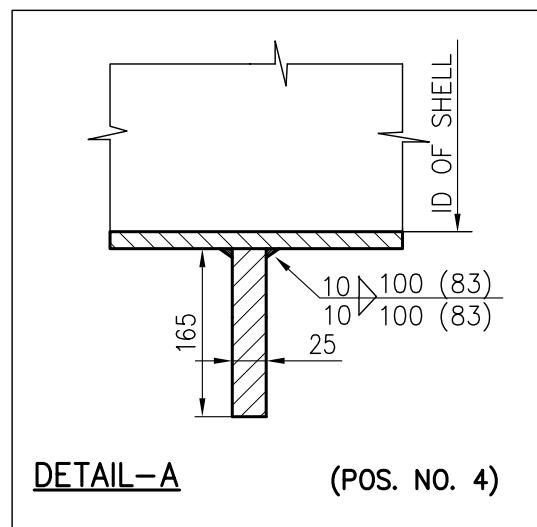
(ALL DIMENSIONS ARE IN mm)

DRG. NO. 3-163-16-11638

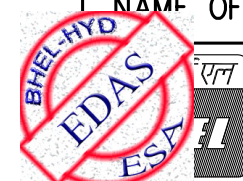


NOTE: -

1. DETAIL OF WELDS & WPS. NOS. REF. DRG. NO. 2-163-10-00014
2. RADIO GRAPHY ----- 100 %.
3. ALL LOGITUDINAL & CIRCUMFERENTIAL WELDS ARE TO BE BACK GOUGED TO SOUND METAL.
4. DURING THE FIT UP OF DISHD END TO SHELL A REFERENCE LINE SHALL BE MARKED ON THE SHELL AT A DISTANCE OF 100MM FROM THE END OF THE SHELL , WHICH SHALL BE TRANSFERED BACK AFTER WELDING, TO IDENTIFY WELD LINE.
5. DEVELOPED LENGTH OF POS. NO. 1, 2= 9475



TYPE OF PRODUCT
OR
NAME OF CUSTOMER/PROJECT

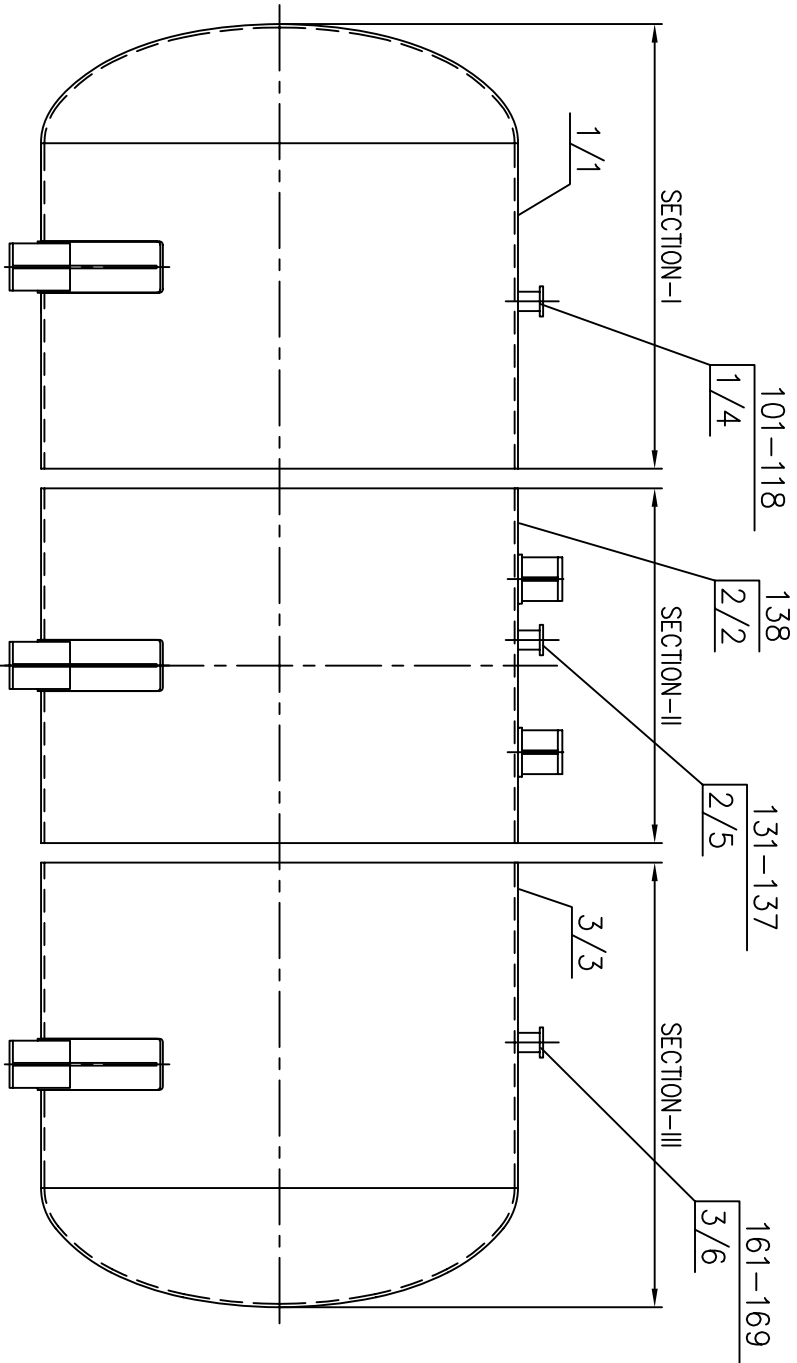


BHARAT HEAVY ELECTRICALS LTD.
HYDERABAD

DRN.	NAME A.L.RAJAM	DATE 10.03.10	NO.OF VAR.
CHD.	UMESH MENON	10.03.10	NA
APPD.	B SRINIVAS	10.03.10	NA

REV.	DATE	ALTERED	CHECKED	APPD	REV.	DATE	ALTERED	CHECKED	APPD
ZONE					ZONE				

DEPT. HEE	GRADE OF TOL.DIM. C/M/F	SCALE NTS	WEIGHT (KG) NA	REF. TO ASSY DRG. NA	ITEM NO. NA	NO.OF ITEMS NA
CODE 405						
TITLE SHELL ASSLY. (FOR DEAERATOR HEATER)			CARD CODE	DRAWING NO. 3-163-16-11638		REV. 00
SHEET No. 1			NO OF SHEETS 1			



1. POS. NO. 1/1 FOR SHELL ASSLY. SEC-I, REFER DRG NO. 3-163-11-11912
2. POS. NOS. 2/2, 138 FOR SHELL ASSLY. SEC-II, REFER DRG NO. 3-163-11-11912
3. POS. NO. 3/3 FOR SHELL ASSLY. SEC-III, REFER DRG NO. 3-163-11-11912
4. POS. NOS. 1/4, 101-118 FOR NOZZLE ASSLY. SEC-I, REFER DRG NO. 1-163-11-11357
5. POS. NOS. 2/5, 131-137 FOR NOZZLE ASSLY. SEC-II, REFER DRG NO. 1-163-11-11357
6. POS. NOS. 3/6, 161-169 FOR NOZZLE ASSLY. SEC-III, REFER DRG NO. 1-163-11-11357

TABLE-1

STORAGE TANK SECTION. NO.	DES. WT. IN (kg) (A)	# IN (kg) (B)	## IN (kg) (C)	TOTAL WT. IN (kg) (A+B+C)	HEADER MATL. No./ DRG. LIST
SECTION-I	23482	470	1174	25126	T31631111961-00A
SECTION-II	22303	615	0	23918	T31631111961-00B
SECTION-III	23046	365	2	23413	T31631111961-00C

LOOSE ITEMS WT. IN FABRICATOR SCOPE
LOOSE ITEMS WT. IN BHEL SCOPE

DESIGN DATA

DESCRIPTION	
DESIGN PRESSURE	Kg/sq.cm (g)
TEST PRESSURE	Kg/sq.cm (g)
DESIGN TEMP. MAX/MIN	°C
TEST TEMP. MAX/MIN	°C
CORROSION ALLOW.	
IN mm	SHELL/ HEADS
	RF PADS/ NOZZLES/ FLANGES mm
RADIO GRAPHY	
JOINT EFFICIENCY	
INSPECTION	
TOTAL WEIGHT OF ST.TANK	KG
DESPATCH WEIGHT	KG
PWMT	

* CUSTOMER APPOINTED TPI (OPTIONAL), FOR APPLICABILITY REFER QP.
* 360° C TEMPERATURE APPLICABLE ONLY FOR NLC-TUTICORIN 500MW PROJECT

NOTE:—

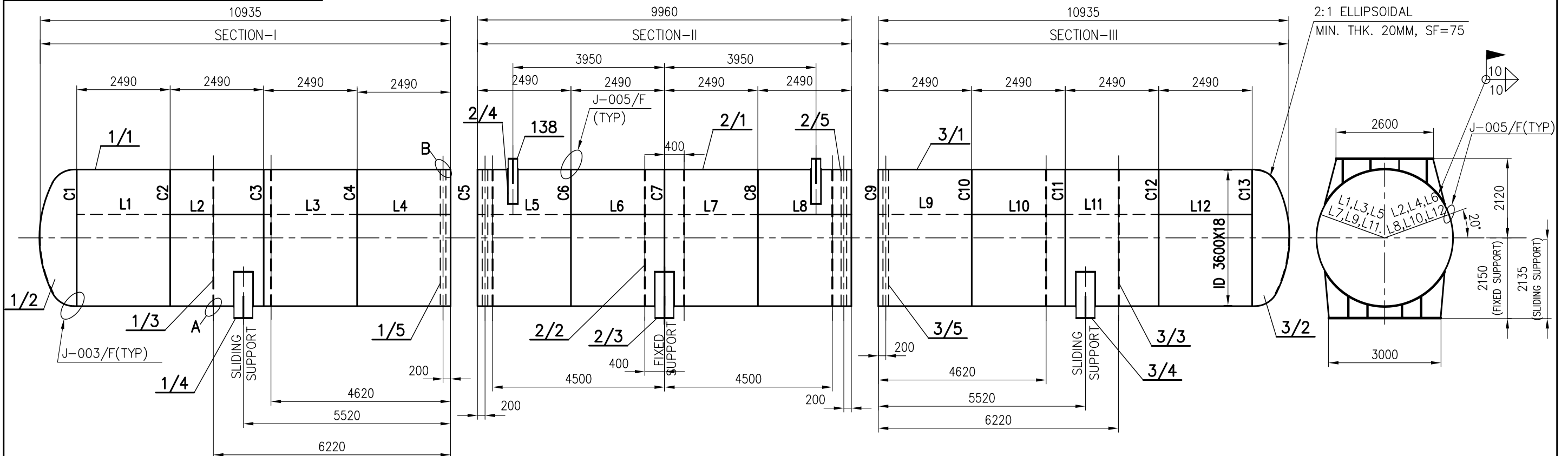
- 1) PAINTING INSIDE: STEAM WASHABLE PAINT AS PER AA55151.
- 2) FOR NAME PLATE DRG. NO. DETAILS, REFER ANNEXURE TO P.O.
- 3) QUALITY PLAN NO. IS INDICATED IN ANNEXURE TO P.O.

REV.	DATE	ALTERED	CHECKED	APPD

ZONE	

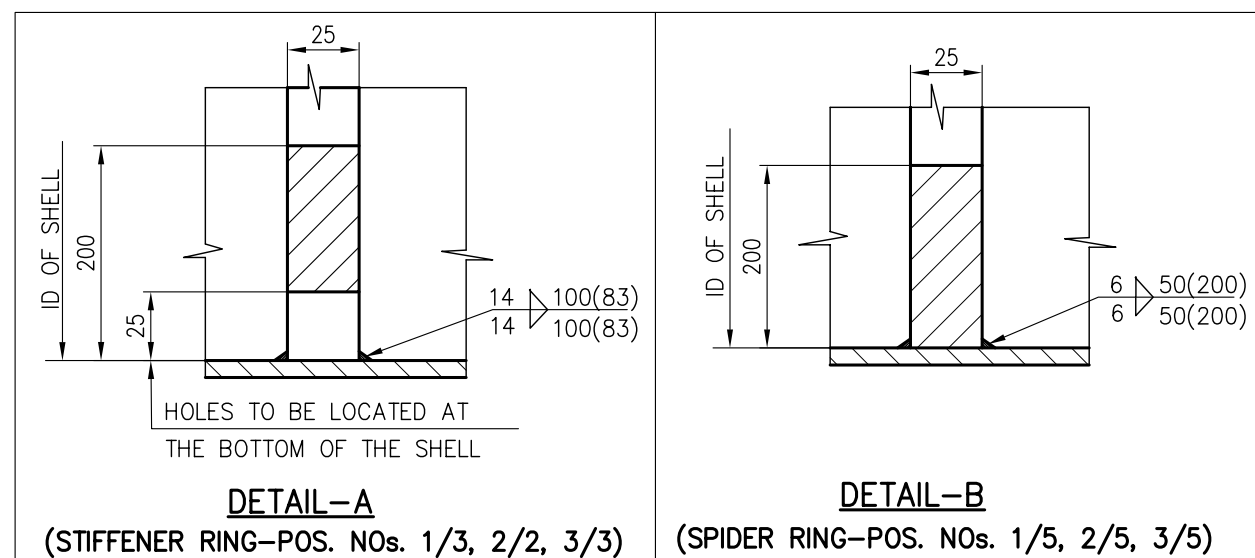
DESIGN, FABRICATION & TESTING CODE	ASME SEC VIII DIV.1, YEAR AND ADDENDA LATEST									
WORK ORDER No.	REFER ANNEXURE TO P.O									
VESSEL No.	REFER ANNEXURE TO P.O									
WELD DET. & WPS DRG. No.	2 163 10 00014									
NOZZLE DETAIL DRG. No.	1 163 10 11267									
HEADER MATERIAL/ DRG. LIST.	REFER TABLE-1									
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT										
500MW DEAERATOR										
BHARAT HEAVY ELECTRICALS LTD.										
HYDERABAD										
DEPT. HEE										
GRADE OF TOL.DIM. C/M/F										
SCALE NTS										
WEIGHT (KG) NA										
REF. TO ASSY DRG. NA										
ITEM NO. NA										
NO.OF ITEMS NA										
TITLE										
ST.TANK ASSLY. (DEAERATOR)										
CARD CODE										
DRAWING NO.										
3-163-11-11961										
REV.										
00										
SHEET No.										
NO OF SHEETS										


DRG. NO. 3-163-11-11912



1. ALL LONGITUDINAL AND CIRCUMFERENTIAL WELDS ARE TO BACK GOUGED TO SOUND METAL
2. ALL BUTT WELD JOINTS TO BE 100 % RADIOGRAPHED.
3. FOR WELD DETAILS & WPS. NOS. REFER DRG. NO. 2-163-10-00014
4. POS. NOS. 1/5, 2/5 & 3/5 ARE REQUIRED TO PREVENT DISTORTION OF SHELL SEGMENTS DURING TRANSPORTATION, TO BE REMOVED AFTER WELDING THE SECTIONS AT SITE.
5. DURING THE FIT UP OF DISHED END TO SHELL A REFERENCE LINE SHALL BE MARKED ON THE SHELL AT A DISTANCE OF 100MM FROM THE END OF THE SHELL , WHICH SHALL BE TRANSFERED BACK AFTER WELDING, TO IDENTIFY WELD LINE.

PREFIX 1/, 2/ & 3/ FOR POS. NOS. FOR SEC-I, II & III RESPECTIVELY, EXCEPT POS. NO. 138.



REV.	DATE	ALTERED	CHECKED	APPD	DEPT. HEE	GRADE OF TOL.DIM. C/M/F		SCALE NTS	WEIGHT (KG)	REF. TO ASSY DRG. NA	ITEM NO. NA	NO.OF ITEMS NA	
					CODE 405								
ZONE					TITLE SHELL ASSLY (FOR STORAGE TANK SHELL)					CARD CODE	DRAWING NO. 3-163-11-11912		REV. 00
											SHEET No. 1	NO OF SHEETS 1	

91511-5C-391-2

ON GRD

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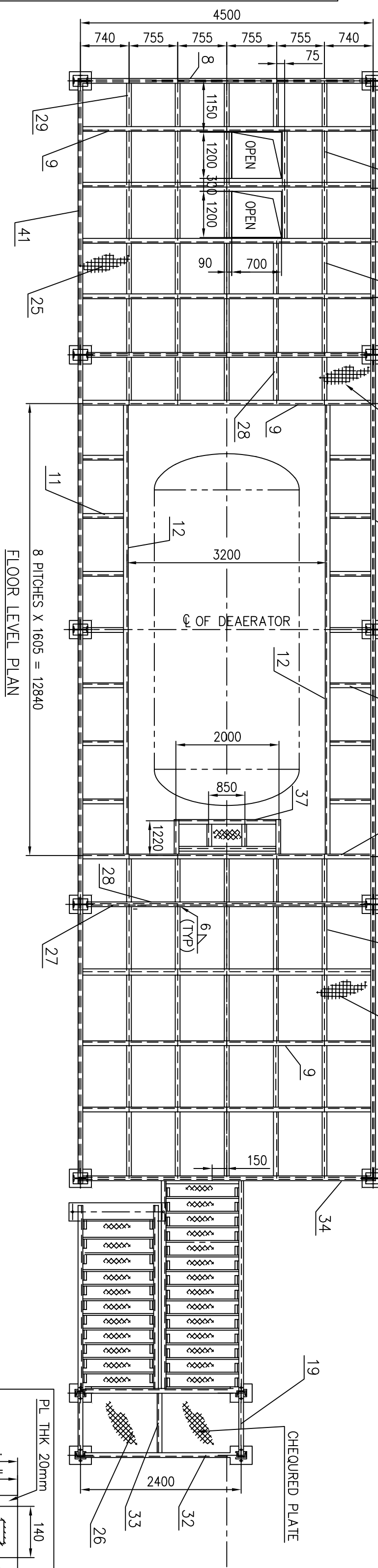
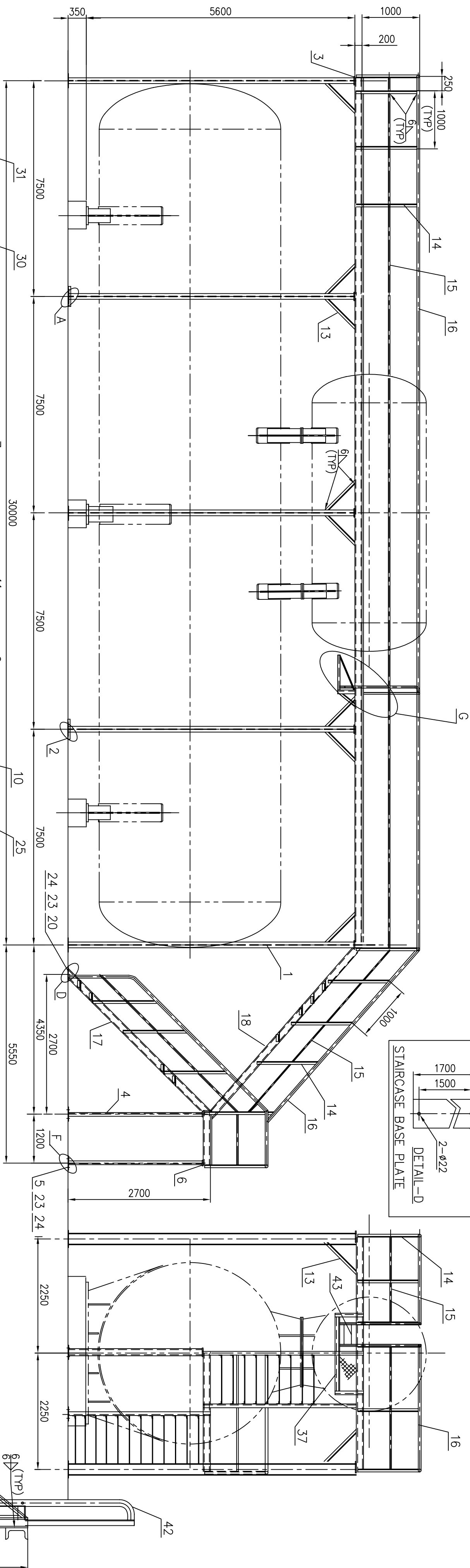
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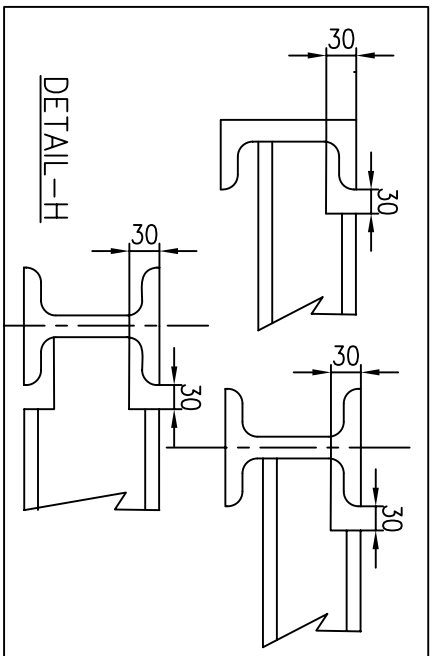
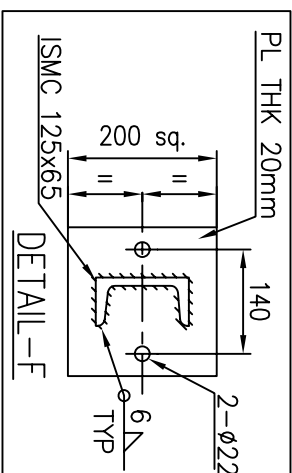
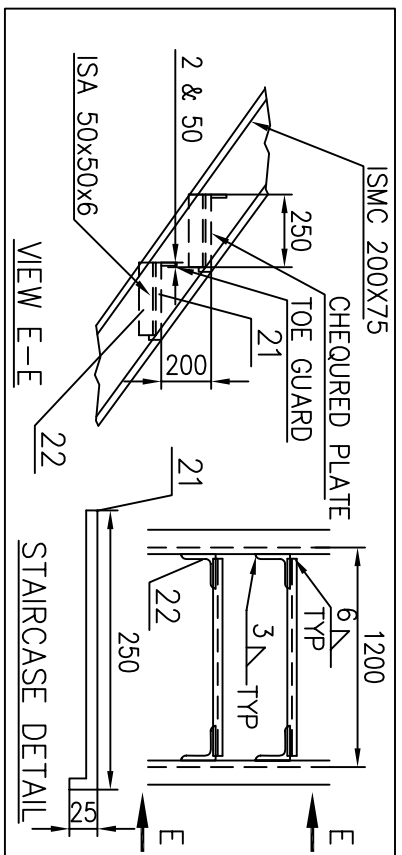
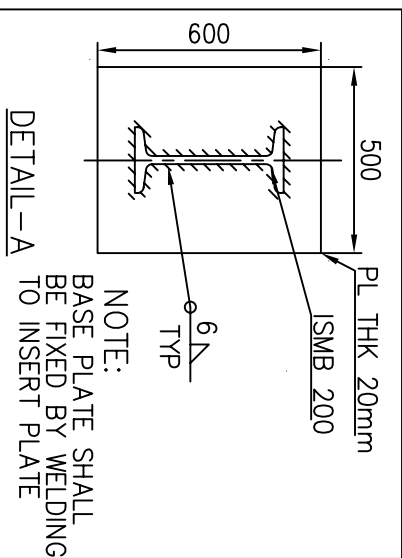


FLOOR LEVEL PLAN

NOTE:-

- 1) CUTTING OF RAW MATERIAL AS INDICATED IN THE BOM AND DRILLING OF HOLES IN BASE PLATES IS IN VENDORS SCOPE.
- 5) HEADER MATERIAL: T21633511516-00.

GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261

LOCAL LANDING ON PLATFORM
DETAIL-G

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		500MW DEAERATOR	
DEPT. HEE		BHARAT HEAVY ELECTRICALS LTD.	
GRADE OF C/M/F		HYDERABAD	
SCALE		NTS	
WEIGHT (KG)		NA	
CARD CODE		DRAWING NO. 2-163-35-11516	
TITLE		DEAERATOR PLATFORM ASSLY	
DRN. AL RAJAM		SIGN. [Signature]	
CHD. UMESH MENON		DATE 21.01.11	
APPD. TSN BHARGAV		NO. OF VARS. 00	
REF. TO ASSY DRG.		ITEM NO. NA	
NO. OF SHEETS 01		NO. OF ITEMS NA	

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

INVENTORY NO. SIGN. AND DATE REF. DRG. NO. COMPUTER FILE NAME

GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261

FIRST ANGLE PROJECTION

DRG. NO. 2-163-19-11570

SH. OF 2

3

4

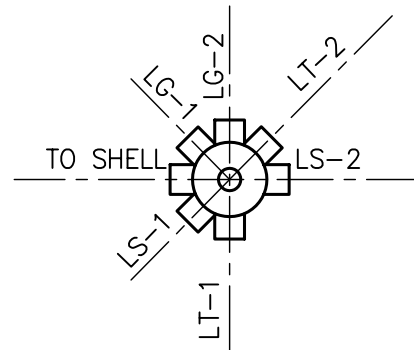
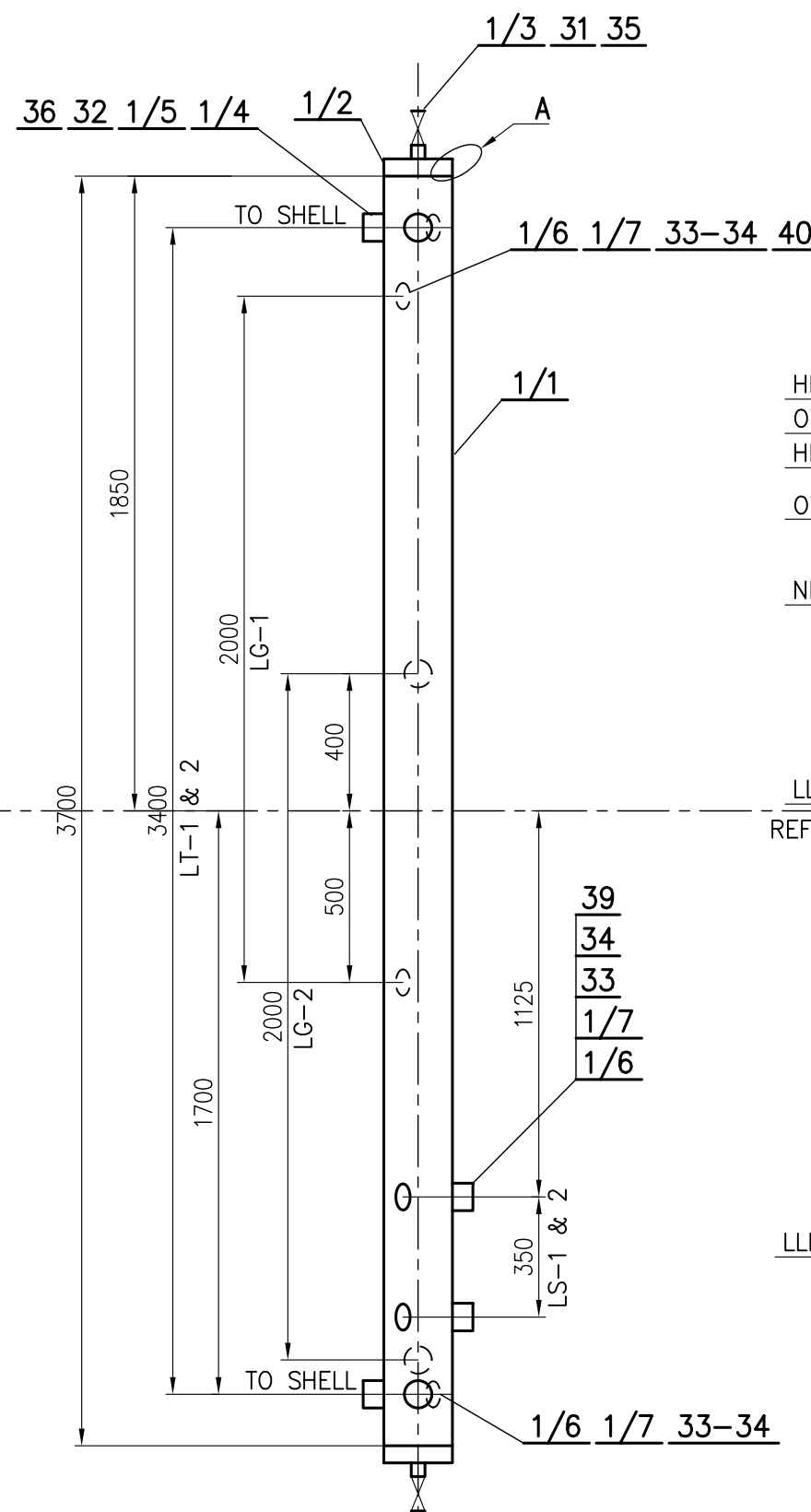
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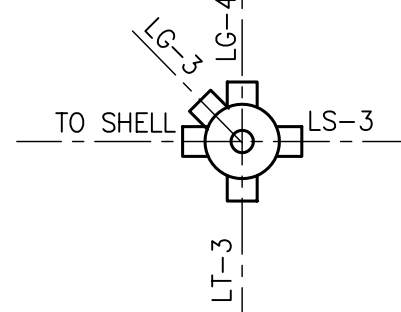
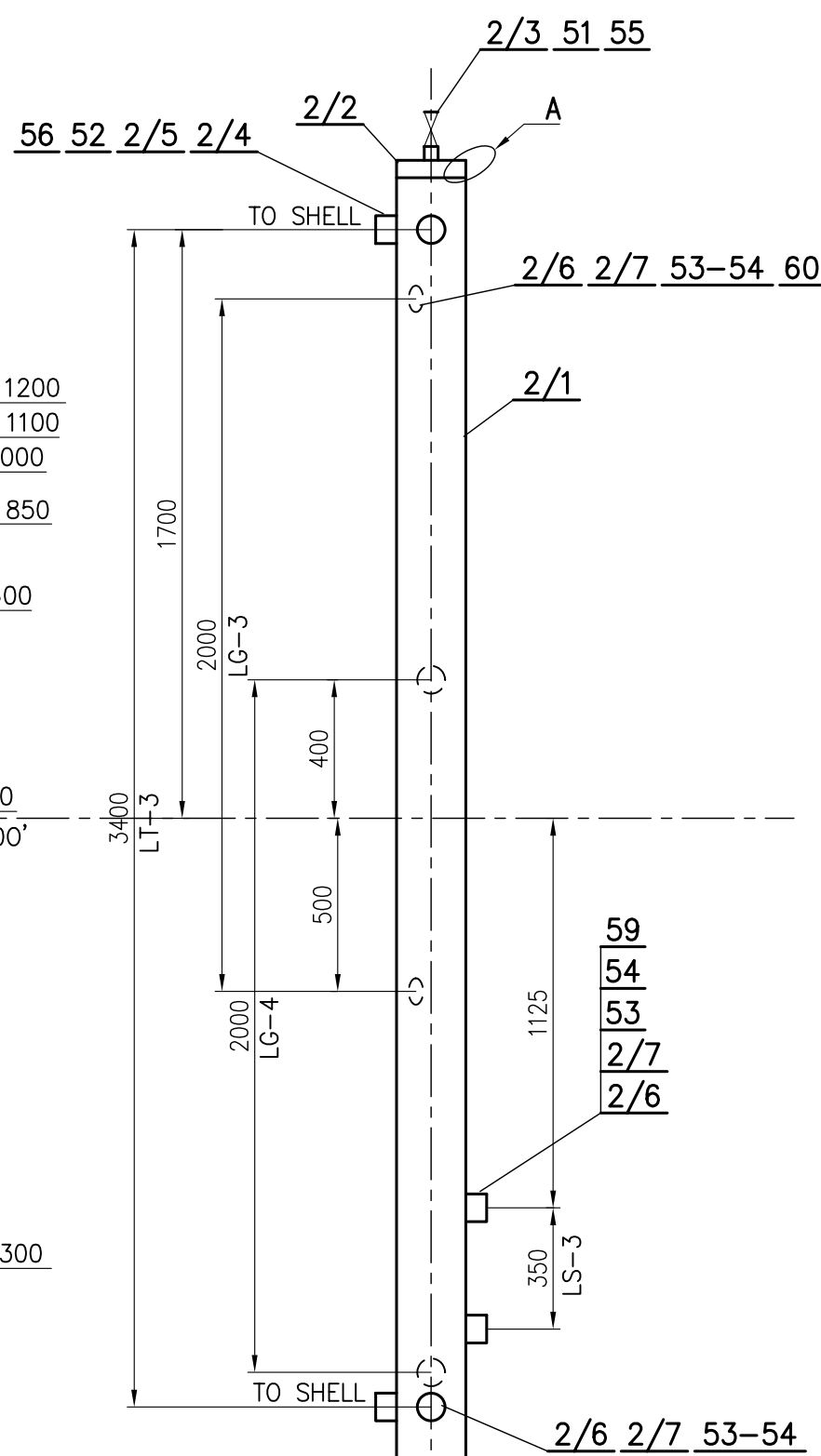
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(ALL DIMENSIONS ARE IN mm)



ORIENTATION OF CONN.

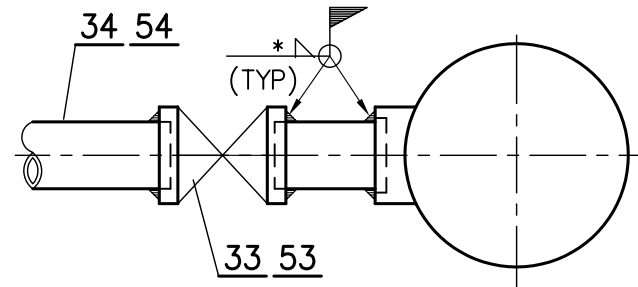
STAND PIPE-1



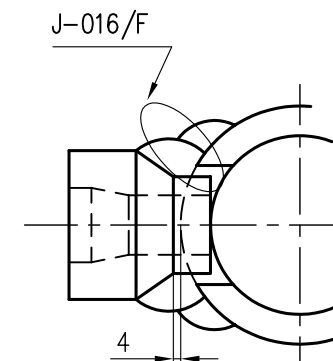
ORIENTATION OF CONN.

STAND PIPE-2

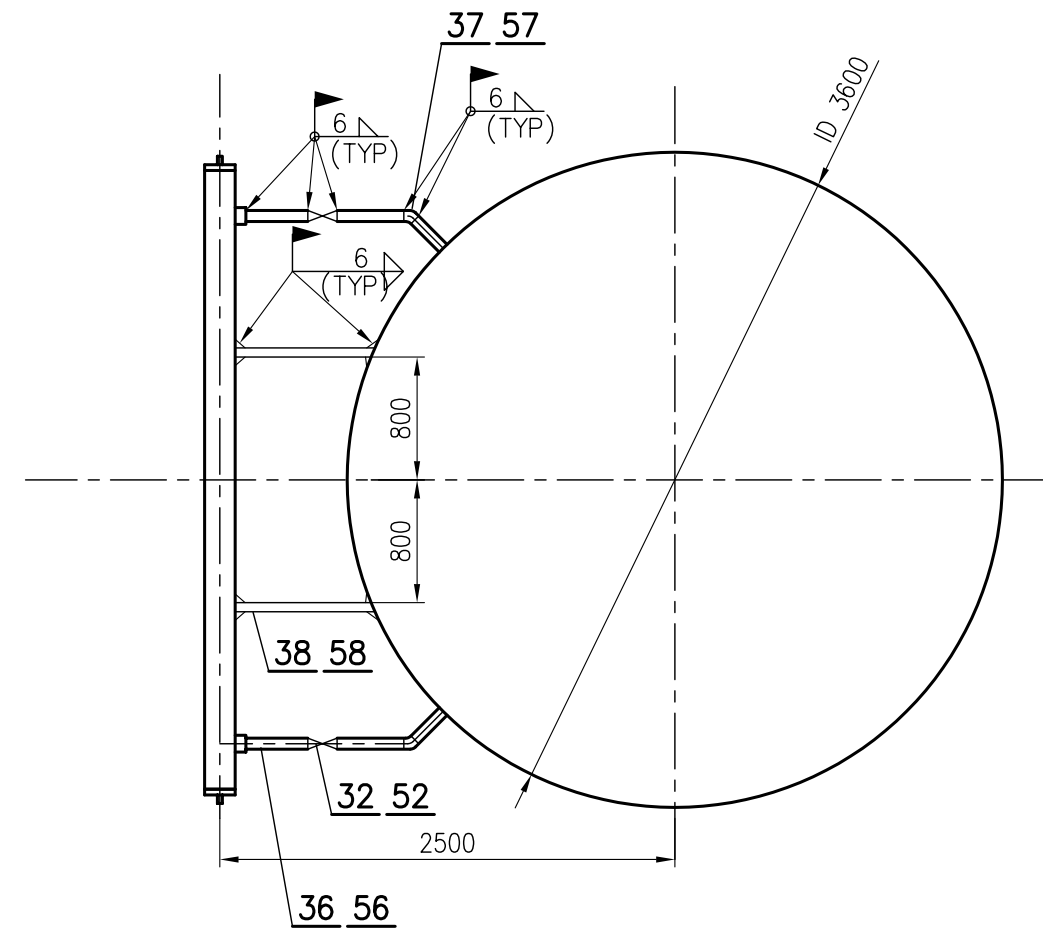
*=0.7 X CONNECTION PIPE THICKNESS.



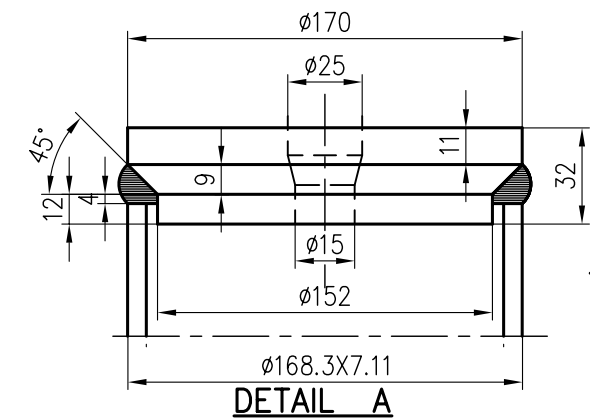
SW CONN. WELDING DETAIL
(FOR LS, LG & LT)



PIPE TO COUPLING WELDING



STAND PIPE TO SHELL CONNECTION DETAIL



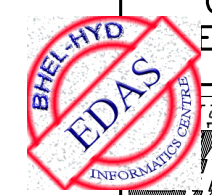
INSTRUMENT DETAILS

SL.No.	DESCRIPTION	C/C	END CONN.	QTY ON	
				SP1	SP2
1	LEVEL GUAGE (LG)	2000	1" SW	2	2
2	LEVEL TRANSMITTER (LT)	3400	1" SW	2	1
3	LEVEL SWITCH (LS)	350	1" SW	2	1

NOTES :-

- HYDRAULIC TEST WILL BE DONE IN SHOP BEFORE DESPATCH AS PER HY0852061.
- REPRESENTS SITE WELDING

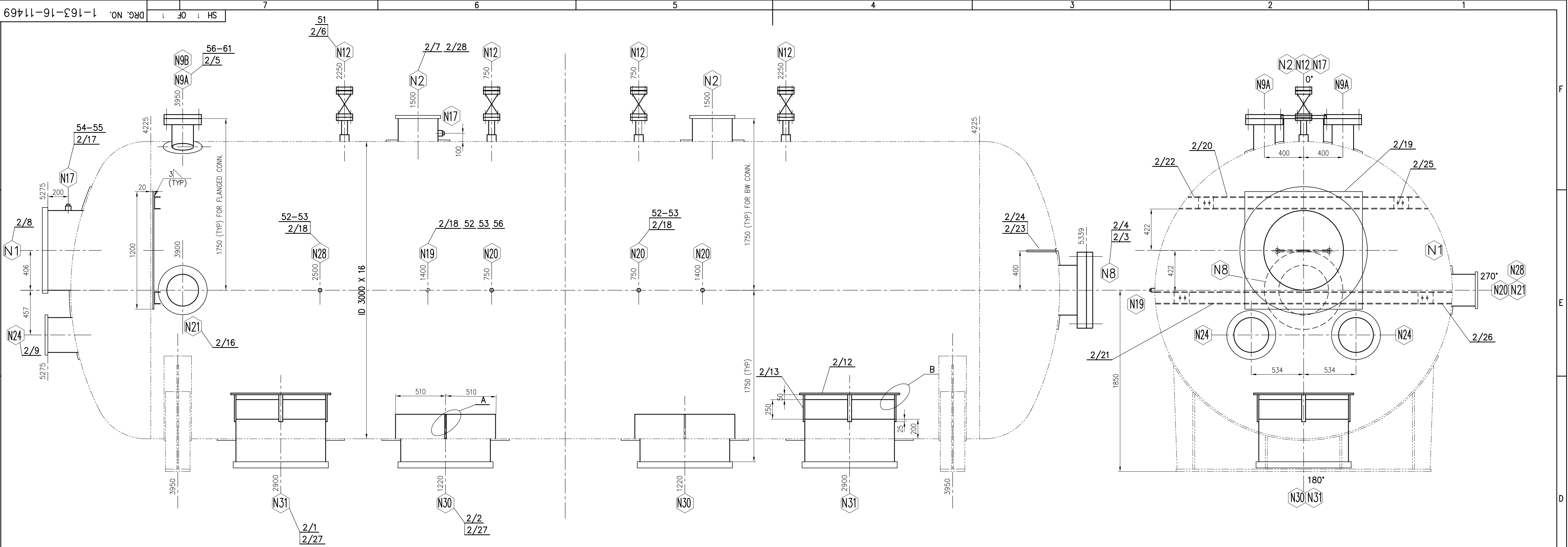
TYPE OF PRODUCT
OR
E OF CUSTOMER/PROJECT



BHARAT HEAVY ELECTRICALS LTD.
HYDERABAD

DRN.	NAME A.L. RAJAM	SIGN.	DATE 03.01.11	NO. OF VAR.
CHD.	UMESH M. RAO		03.01.11	NA
APPD.	TSN BHARGAV		03.01.11	

DEPT. HEE	GRADE OF TOL. DIM. C/M/F	SCALE NTS	WEIGHT (KG) NA	REF. TO ASSY DRG. NA	ITEM NO. NA	NO. OF ITEMS NA
CODE 405						
TITLE DEAERATOR STANDPIPE ASSEMBLY. (FOR STAND PIPE I & II)				CARD CODE N.A.	DRAWING NO. 2-163-19-11570	REV. 00
				SHEET No.	NO OF SHEETS	



PREFIX 1/ TO ALL POS. NOS., EXCEPT POS. NOS. 51 TO 61.

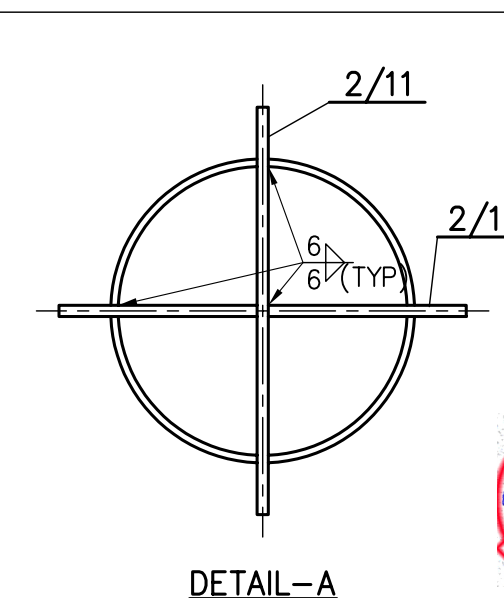
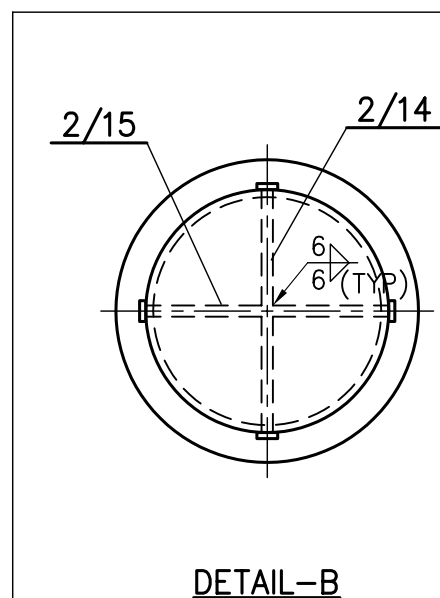
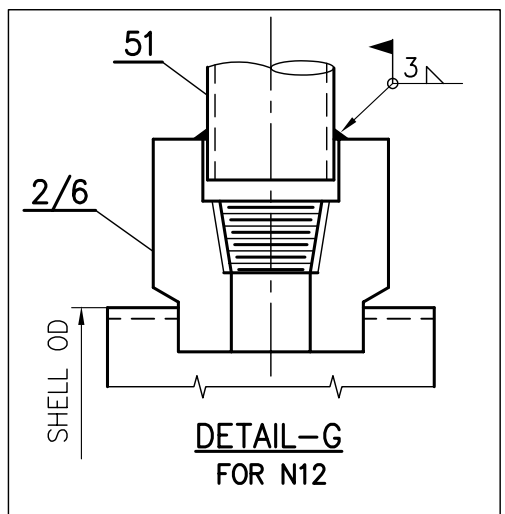
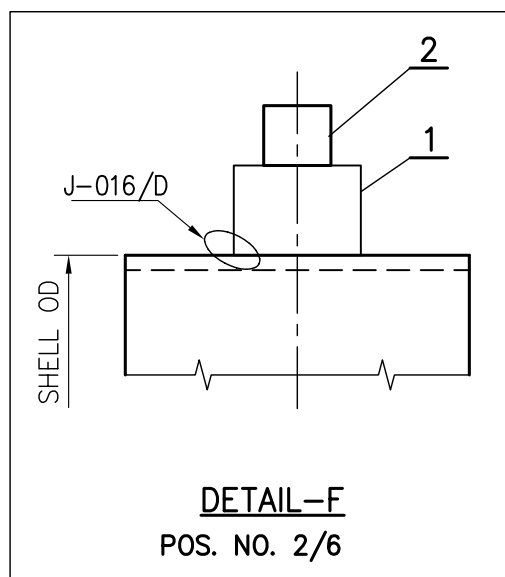
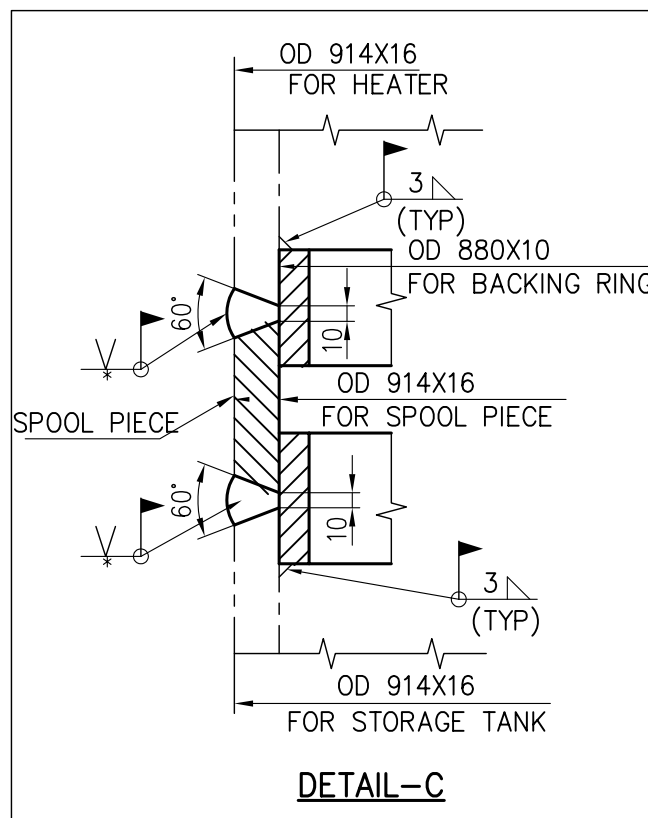
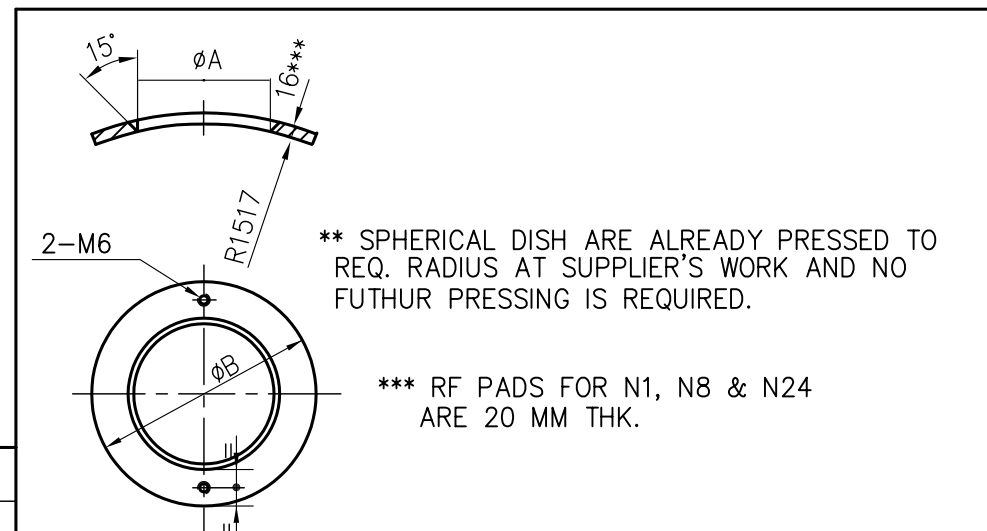
LIST OF NOZZLE CONNECTIONS

REF.	DESCRIPTION	SIZE	OD x THK	QTY	WELDING DETAILS			RATING	TYPE	ØA	ØB	REMARKS	REF.	VAR NO.
					SHELL TO NOZZLE*	AT WORKS*	NOZZLE END CONNECTION AT SITE*							
N1	STEAM INLET	32"	813 x 20	1	DET-D1	DET-D1	DET-D5			829	1400		N1	01
N2A,N2B	CONDENSATE INLET	16"	406 x 16	2	DET-D1	DET-D1	DET-D5			422	650		N2A,B	02
N8	TRAY REMOVAL DOOR	20"	508 x 16	1	J-007/F	J-015/F	-	300#	SORF	524	800		N8	03
N9A,B	SAFETY RELIEF VALVE	8"	219.1 x 12.7	2	DET-D8	DET-D8	DET-D8	300#	SORF	235	400		N9A,B	04
N12	VENT CONN	2"	COUPLING 6000#	4	DET-F	DET-F	DET-G	300#	SW			REFER NOTE-12	N12	05
N17	TEMP. GAUGE CONN	M33X2	COUPLING	2	J-008/F	***	SCREW THERMOWELL		SCREWED			SPECIAL COUPLING	N17	06
N19	PRESSURE GAUGE CONN	1/2"	COUPLING 6000#	1	DET-D6	DET-D6	DET-D31		SW			**	N19	07
N20	PRESSURE TRANSMITTER CONN	1/2"	COUPLING 6000#	3	DET-D6	DET-D6	DET-D31		SW			**	N20	07
N21	CBD VENT	12"	323.6 x 17.48	1	DET-D1	DET-D1	DET-D5			340	500		N21	08
N24	HP-5 DRAIN INLET	8"	219.1 x 12.7	2	DET-D10	DET-D10	DET-D5			235	500		N24	09
N28	PG TEST PRESSURE TAP POINT CONN.	1/2"	COUPLING 6000#	1	DET-D6	DET-D6	DET-D31		SW			**	N28	07
N29	DOWN COMMER	36"	914 x 16	2	DET-D2	DET-D2	DET-D5 & DET-C			930	1400		N29	10
N30	EQUALIZER	36"	914 x 16	2	DET-D1	DET-D1	DET-D5 & DET-C			930	1400		N30	11

** SW PIPE TO COUPLING AFTER REMOVING PLUG
*** SCREW PLUG WITH WASHER

* NOTES FOR LIST OF NOZZLE CONN. TABLE

- FOR DETAILS D1 TO D31 REFER DRG. 1-163-10-11267.
- FOR DETAILS J-001/F, J-002/F, J-007/F, J-008/F, J-015/F, J-014/D & J-016/D REFER DRG. 2-16310-00014.
- FOR DET-A, B, C, F & G REFER THIS DRG.



NOTES:-

- ALL FLANGE BOLT HOLES SHALL STRADDLE NORMAL CENTRE LINES OF VESSEL.
- ALL FABRICATED NOZZLES TO BE FULLY RADIOGRAPHED.
- HYDROTEST BLANKING PLATES SHALL BE REMOVED ONLY AT SITE.
- WPS FOR FILLET WELDS ON SHELL SHALL BE AS PER J-002/F.
- ALL LONGITUDINAL AND CIRCUMFERENTIAL WELDS ARE TO BE BACK-GOUGED TO SOUND METAL.
- MAGNETIC PARTICLE TEST REQUIRED ONLY AT NOZZLE TO HEAD WELDS AND NOZZLE TO SHELL WELDS.
- VESSEL WILL BE DESPATCHED IN SINGLE PIECE.
- INSIDE EDGES OF ALL PROJECTED NOZZLES SHALL BE ROUNDED OFF.
- NOZZLES WHICH OVERLAP C-SEAMS SHALL MEET THE REQUIREMENTS OF UW-14
- BOLTING TO SECURE HEATER TO STORAGE TANK IS 8 No'S OF M27x120
- HYDROSTATIC TEST AS PER HY0852061.
- NOZZLE N12 SHALL BE PLUGGED AT WORKS FOR HYDROTEST PURPOSE. WHICH SHALL THEN BE REMOVED AT SITE AND VENT ORIFICE ASSLY (POS. NO. 51) AS PER RELEVANT DRG. SHALL BE WELDED AS PER DET-G FOR N12.
- INDICATES SITE WELDING.

IMPORTANT NOTES ON DEAERATOR VENT PIPING

- NO SHARP BENDS AND TRAPS ARE ALLOWED IN VENT PIPING.
- VENT PIPE SHALL RISE VERTICALLY FROM DEAERATOR HEATER IN A SHORT LENGTH OF PIPE
- AVIDOE LONG LINES WITH GREAT NUMBERS OF TURNS
- HORIZONTAL RUNS SHALL BE AVOIDED IN VENT PIPING.
- DO'NT JOIN INDIVIDUAL VENT LINES WITH A COMMON HEADER.

TYPE OF PRODUCT OR OF CUSTOMER/PROJECT		BHARAT HEAVY ELECTRICALS LTD. HYDERABAD		DRN. A.L. RAJAM	NAME	DATE 03.02.11	NO. OF VAR.
CHD. UMESH MENON		APPD. TSN BHARGAV		NAME	DATE 03.02.11	N.A.	N.A.
DEPT. HEE		GRADE OF TOLDIM. C/M/F		SCALE NTS		WEIGHT (KG) NA	
CODE 405		REF. TO ASSY DRG. NA		ITEM NO. N.A.		NO. OF ITEMS N.A.	
TITLE NOZZLE ASSEMBLY (FOR DEAERATOR HEATER)		CARD CODE		DRAWING NO. 1-163-16-11469		REV. 00	
SHEET No. 1		NO OF SHEETS 1					