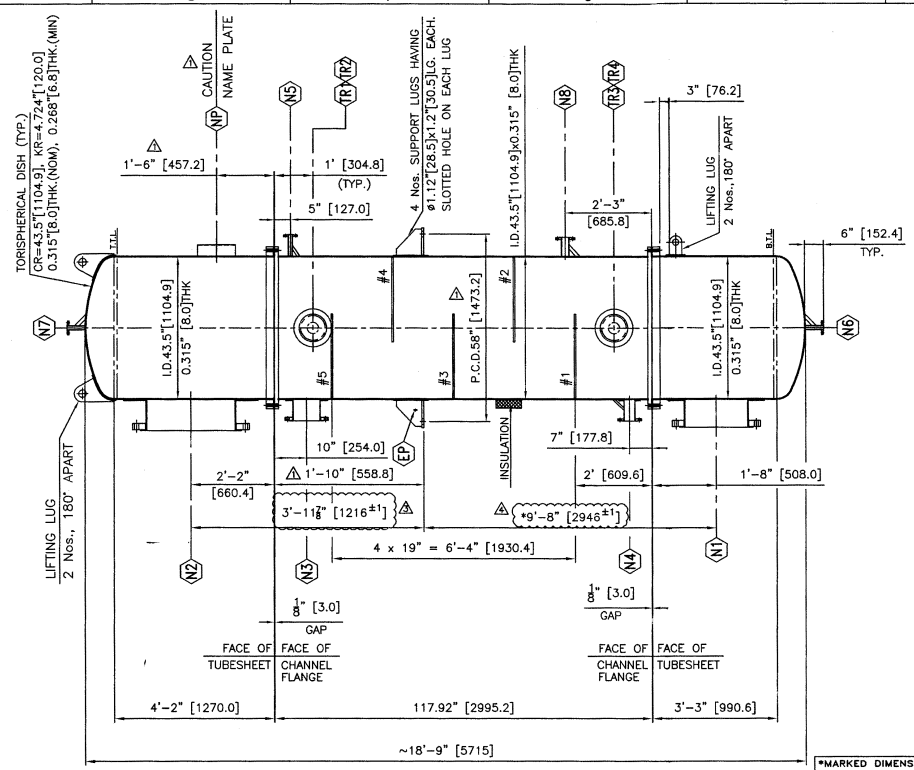
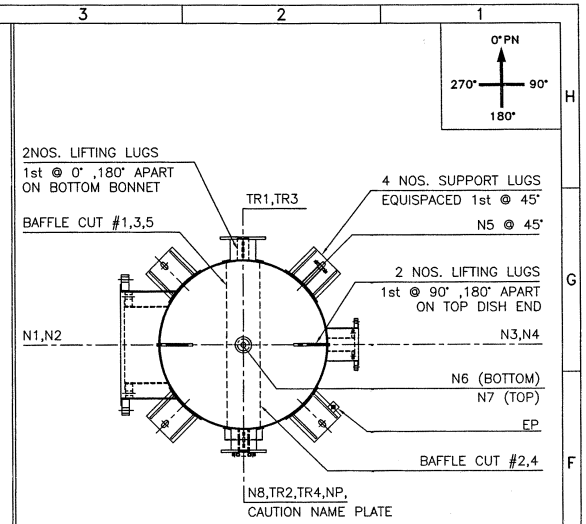


ELEVATION

*MARKED DIMENSIONS SHALL BE STRICTLY AS PER TOLERANCE SHOWN TO MATCH WITH COMPANION EQUIPMENT NOZZLES.



⚠ NOZZLE ORIENTATION PLAN

[SPACE FOR 'ASME' STAMPS]

198.00	187.00	198.00	187.00	198.00	186.00
SHELL SIDE	TUBE SIDE	SHELL SIDE	TUBE SIDE	SHELL SIDE	TUBE SIDE
STARTUP		NORMAL OPERATION		UPSET	

TABLE NO.1 : MEAN METAL TEMPERATURE (°F)

SR.NO.	DESCRIPTION	MATERIAL	SIZE
07	TUBE	SA 249 TP 304	0.063"THK. (REF.DRG.NO.: 06D058-1-WFD408)
06	TUBESHEET	SA 240 TYPE 304L	1.259"THK. (REF.DRG.NO.: 06D058-2-TSL408)
05	CHANNEL FLANGE	SA 266 GR.2 ⚠	2.283"THK. (REF.DRG.NO.: 06D058-1-WFD408)
04	CHANNEL SHELL F.S.	SA 240 TYPE 304L	0.315"THK. (REF.DRG.NO.: 06D058-1-WFD408)
03	CHANNEL SHELL R.S.	SA 240 TYPE 304L	0.315"THK. (REF.DRG.NO.: 06D058-1-WFD408)
02	TORISPHERICAL DISHED END	SA 240 TYPE 304L	0.315"THK. (REF.DRG.NO.: 06D058-1-WFD408)
01	SHELL	SA 240 TYPE 304L	0.315"THK. (REF.DRG.NO.: 06D058-1-WFD408)

PART DETAILS

AS BUILT

REV. NO.	DESCRIPTION	DRAWN	CHKD.	APPD.	DATE
4	AS BUILT ⚠	A.S.J.	Y.S.G.	K.B.	27-DEC-2008
3	AS BUILT ⚠	A.S.J.	Y.S.G.	K.B.	15-DEC-2008
2	REVISED AS MARKED ⚠	P.S.Z.	Y.S.G.	K.B.	28-May-2008
1	REVISED AS MARKED ⚠	P.S.Z.	Y.S.G.	K.B.	24/01/2008
0	FOR FABRICATION	P.S.Z.	Y.S.G.	K.B.	19/10/2007

CLIENT : LOUISIANA GREEN FUELS LLC.
PLANT : 22.45 MGPY DEHYDRATED ETHANOL (UNDENATURED)
LOCATION : LA CASSINE, LOUISIANA, USA

PRAJ INDUSTRIES
THIS DWG. IS THE PROPERTY OF PRAJ INDUSTRIES LTD. AND SHOULD NOT BE REPRODUCED WITHOUT WRITTEN CONSENT FROM
PRAJ INDUSTRIES LTD.
"PRAJ HOUSE", Bavdhan, Pune-411 021. (INDIA)

TITLE : G.A. DRAWING FOR SIDE STRIPPER REBOILER DE VAPOR HEATED (H 1463B)	I.D. NO. H 1463B	PIL JOB CODE 06D058
	SCALE N.T.S.	CAD FILE NAME 06D058-2-GAD408
DWG. NO. 06D058-2-GAD408	SHEET 1 OF 1	REV. 4

NOZZLE SCHEDULE

NOZZLE NO.	SIZE NPS	SCH./ THK.	TYPE	RATING	PROJ. FROM CENTER LINE	SERVICE
NP	--	AS PER DETAILS			--	NAME PLATE (ASME)
EP	--	AS PER DETAILS			--	EARTHING PLATE
TR1-TR4	6	SCH.80	--		2'-4"	TRUNNION ON SHELL
N8	2	SCH.80	SORF	150#	2'-5"	VAPORS OUT
N7	1	SCH.80	SORF	150#	SEE DRG.	TUBE SIDE VENT
N6	1	SCH.80	SORF	150#	SEE DRG.	TUBE SIDE DRAIN
N5 ⚠	1	SCH.80	SORF	150#	2'-5"	SHELL SIDE VENT
N4	3	SCH.80	SORF	150#	2'-5"	CONDENSATE OUT
N3	8	SCH.40	SOFF	150#	2'-6"	MSDH VAPORS IN
N2	28	0.315"	REF.NOTE 9 & 27		2'-8"	SPENT LEES VAPOR OUT
N1	20	0.315"	SOFF	150#	2'-7"	SPENT LEES IN
			END FLG.CONN. ASME B-16.5			

DESIGN DATA

GENERAL NOTES (CONT.)				
FULL OF WATER WEIGHT		lbm / [kg]	24,250.0 / [11,000.0]	
EMPTY WEIGHT		lbm / [kg]	13,230.0 / [6,000.0]	
WEIGHTS				
PAINTING			REFER PAINTING SPECIFICATIONS	
INSULATION	THICKNESS	inch / [mm]	3" / [76.2]	3" / [76.2]
	TYPE	HOT / COLD	HOT	HOT
SEISMIC	IMPORTANCE FACTOR		1.0	
	SITE CLASS		'D' ⚠	
	ACC. BASED FACTOR (Fv)		2.0	
	ACC. BASED FACTOR (Fa)		1.6	
	DESIGN CODE		IBC-2006 ⚠	
WIND	IMPORTANCE FACTOR		1.0	
	EXPOSURE CONSTANT		EXPOSURE-'C'	
	SPEED	mph / [kmph]	150 / [241.4]	
	DESIGN CODE		IBC-2006	
IMPACT TESTING			REFER NOTE 5	
HEAT TREATMENT/PWHT			REFER NOTE 4	
TUBE PITCH		inch / [mm]	1.25" / [31.75]	
TUBE SIZE	O.D.x THK.	inch / [mm]	1" x 0.063" / [25.4 x 1.6]	
	LENGTH	ft-in / [mm]	9'-10" / [2997.2]	
NUMBER OF TUBES			978	
NUMBER OF PASS			ONE	ONE
HEAT TRANSFER AREA		ft^2 / [m^2]	2520 / [234.11]	
PROCESS FLUID DENSITY		lb/ft^3 / [kg/m^3]	57.43 / [919.94]	59 / [945.09]
PROCESS FLUID			MSDH VAPORS	SPENT LEES
JOINT EFFICIENCY		SHELL/HEAD	0.85 / -- ⚠	0.85 / 0.85
NDT	RADIOGRAPHY (REF. NOTE 26)	SHELL/HEAD	SPOT / --	SPOT / FULL
	DPT/LPT		AS PER PRAJ QA PLAN	
CORROSION ALLOWANCE		inch / [mm]	NIL	NIL
TEST FLUID			WATER (REFER NOTE 18 & 21)	
HYDRO TEST PRESSURE (HORIZONTAL)		psi(g) / [kg/cm^2(g)]	36.98/[2.6]	22.75/[1.6]
HYDRO TEST PRESSURE (VERTICAL)		psi(g) / [kg/cm^2(g)]	32.71/[2.3]	14.22/[1.0]
MEAN METAL TEMPERATURE		°F / [°C]	REFER TABLE NO.1	
MDMT AT MAWP		°F / [°C]	32 / [0]	32 / [0]
DESIGN TEMPERATURE		°F / [°C]	239 / [115]	212 / [100]
EXTERNAL MAP AT DESIGN TEMP.		psi(g) / [MPa(g)]	N.A.	15 / [0.1]
MAWP AT DESIGN TEMPERATURE		psi(g) / [MPa(g)]	25 / [0.172]	10 / [0.07]
DESCRIPTION		UNITS	SHELL SIDE	TUBE SIDE
DESIGN CODE : ASME SEC.VIII DIV.1, EDITION 2004 UPTO & INCLUDING ADDENDA 2006 (ASME 'U' STAMP & NATIONAL BOARD REGISTRATION IS REQD.)				

GENERAL NOTES

22) ALL NOZZLE FLANGES SHALL BE CLOSED WITH 3 mm THK. NACF GASKET & 1.6 mm THK. AISI 304 SHEET, DULY TIED WITH ø1.6 AISI 304 WIRE TO AVOID ENTRY OF FOREIGN MATERIALS DURING TRANSPORTATION/STORAGE.
21) CHLORIDE CONTENT OF WATER USED FOR HYDROTEST SHALL NOT EXCEED 25 PPM.
20) CARBON STEEL BLIND FLANGES ALONG WITH RING GASKET (1/8" THK.) TO BE USED DURING HYDROTEST.
19) HYDROSTATIC TEST AT SHOP SHALL BE CARRIED OUT IN HORIZONTAL POSITION.
18) MINIMUM METAL TEMP. OF EQUIPMENT DURING HYDROTEST SHALL BE MAINTAINED BETWEEN 62°F TO 104°F
17) R.F. PAD VENT HOLES SHALL BE PNEUMATICALLY TESTED @15 psi (g) & CHECKED WITH SOAP SOLUTION.
16) ATTACHMENT WELDS OF ANY PERMANENT ATTACHMENT TO SHELL/DISH SHALL BE PENETRANT TESTED.
15) THE ROOT & FINAL PASS OF ALL CLOSING SEAMS OR INACCESSIBLE BUTT WELDS SHALL BE PENETRANT TESTED.
14) ALL WELD OVERLAYS SHALL BE EXAMINED BY PENETRANT TEST AFTER MACHINING.
13) PROPER CARE SHOULD BE TAKEN BY SHOP TO PROTECT THREADING OF NIPPLE OR SOCKET.
12) INSIDE EDGES OF TUBE SHEET & BAFFLES SHALL BE CAREFULLY DEBURRED TO AVOID DAMAGE TO TUBES.
11) NOZZLE N2, LARGE OPENING IN VESSEL SHALL BE FABRICATED AS PER RECOMMENDATIONS OF APPENDIX 1-7(c) OF ASME SEC. VIII DIV I AND WELDS SHALL BE GROUND TO CONCAVE CONTOUR & INSIDE CORNER OF OPENING ROUNDED TO GENEROUS RADIUS TO REDUCE STRESS CONCENTRATION & SHALL BE LIQUID PENETRANT TESTED.
10) ALL INSIDE WELDS TO BE FLUSHED AND OUTSIDE WELD JOINTS TO BE GROUND SMOOTH.
9) BOLTING DIMENSIONS OF NOZZLE FLANGES UPTO NPS 24 SHALL BE AS PER ASME B16.5-2003 AND FOR NPS 26 & ABOVE ARE AS PER ASME B16.47-1996, #150, SERIES A, ALSO HALF COUPLINGS WITH PLUG SHALL BE AS PER ASME B16.11-2001.
8) GASKET SEATING SURFACE OF TUBESHEET & FLANGE SHALL HAVE SERRATED CONCENTRIC FINISH OF 125 TO 250 MICRO INCH AND AVERAGE CONCENTRIC SERRATIONS 44 TO 55 PER INCH AS PER ASME B16.5-8.4.4.3.
7) ALL MATERIALS SHALL CONFIRM TO ASME SEC.II PART A EDITION 2004 ADDENDA 06. MATERIAL TEST REPORTS ARE REQUIRED FOR ALL PRESSURE PARTS.
6) EQUIPMENT IS FOR NON-LETHAL SERVICE. CYCLIC LOADING/IMPACT SHOCK LOADING ARE NOT APPLICABLE.
5) STAINLESS STEEL MATERIAL IS EXEMPTED FROM IMPACT TESTING AS PER UHA-51(d) & UHA-51(e) FOR THE REQUIRED MINIMUM DESIGEN METAL TEMPARATURE, BUT FLANGES OF SA 516 GR.70 (NORMALIZED) OVER 5" (127 mm) THK. SHALL BE IMPACT TESTED AT MDMT.
4) PWHT IS NOT REQUIRED FOR COMPLETE EQUIPMENT, EXEMPTED AS PER UHA-32. IF CARBON STEEL FLANGES OVER 38 mm THK. ARE WELDED IN SEGMENTS THEN PWHT SHALL BE CARRIED OUT AFTER COMPLETE WELDING OF FLANGES ONLY.
3) ALL BOLT HOLES TO STRADDLE WITH PRINCIPLE CENTER LINE.
2) NOZZLE PROJECTIONS ARE MEASURED FROM CENTER LINE OF EQUIPMENT OR FIXED REFERENCE LINE UPTO THE GASKET SEATING SURFACE.
1) ALL DIMENSIONS ARE IN US CUSTOMERY UNITS & THOSE IN BRACKET ARE IN "mm" UNLESS OTHERWISE SPECIFIED.
27) FOR DETAILS OF NOZZLE FLANGES NPS 26 & ABOVE, REFER DRG. NO. : 06D058-4-WFD453.
26) WELD JOINTS OF BODY FLANGES/NOZZLE FLANGES (OVER NPS 24) & TUBE SHEETS MADE IN SEGMENTS SHALL BE FULLY RADIOGRAPHED TO MEET UW-11 REQUIREMENTS.
25) NOZZLE UPTO NPS 3 SHALL BE PROVIDED 2 Nos. GUSSET OF SIZE 1" W x 0.196" THK. AT 90° APART.
24) ALL STAINLESS STEEL PARTS SHALL BE PICKLED & PASSIVATED AS PER ASTM A-380 CODE-B AND CARBON STEEL PARTS SHALL BE SAND BLAST CLEANED TO SA 2 1/2 & PAINTED WITH MINIMUM ONE COAT OF EPOXY PRIMER & TWO COATES OF EPOXY FINAL PAINT.
23) AFTER HYDROTEST EQUIPMENT SHALL BE DRIED THOROUGHLY.

MATERIAL OF CONSTRUCTION

11	NOZZLE FLANGE DETAILS (ABOVE DN600)	06D058-4-WFD453
10	RECOMMENDED TORQUE VALUES FOR BOLT/STUDS	STJ-4-M-2801
09	NOZZLE LOAD DATA	06D058-NLD-401
08	WELD PLAN	06D058-3-WEL408
07	STAMPING DETAILS OF CAUTION PLATE	06D058-4-NPD430
06	DETAILS OF ASME NAME PLATE	06D058-3-NPD408
05	DESIGN CALCULATIONS	06D058-CAL-H1463B
04	PICKLING & PASSIVATION FOR (SS)	MFG-P-219
03	FABRICATION TOLERANCES	06D058-FABTOL-401
02	TUBESHEET & BAFFLE DETAILS	06D058-2-TSL408
01	FABRICATION DETAILS	06D058-1-WFD408

LIST OF REFERENCE DRAWINGS

NAME PLATE	AISI 304
INSULATION CLADDING	SS 304
C TYPE GASKET	EPDM
PASS PARTITION PLATE	SA 240 TYPE 304L
STIFFENER	SA 240 TYPE 304L
REINFORCEMENT PAD	SA 240 TYPE 304L
SUPPORT PLATE ⚠	IS 2062 GR.B
SUPPORT PAD PLATE	SA 240 TYPE 304L
STUD/NUTS/WASHER (EXT.) (FOR BODY FLANGES & NOZZLE FLANGES FROM NPS 26 & ABOVE)	SA193 Gr.B7 & SA194 Gr.2H (GREEN PASSIVATED)
BOLT/NUTS/WASHER (EXT.) (FOR NOZZLE FLANGES FROM NPS 6 TO NPS 24)	SA193 Gr.B7 & SA194 Gr.2H (GREEN PASSIVATED)
BOLT/NUTS/WASHER (EXT.) (FOR NOZZLE FLANGES UPTO NPS 4)	SA193 Gr.B8 & SA194 Gr.8
GASKET	NACF (AF#154)
NOZZLE FLANGE (FROM NPS 26 & ABOVE) ⚠	SA 516 GR.70 (NORMALIZED) (WITH SS304L WELD OVERLAY)
NOZZLE FLANGE (NPS 6 TO NPS 24)	SA 105 (SS304L WELD OVERLAY)
NOZZLE FLANGE (UPTO NPS 4)	SA 182 F 304L
NOZZLE PIPE (NPS 14 & ABOVE)	SA 240 TYPE 304L
NOZZLE PIPE (UPTO NPS 12)	SA 312 TP304L (WELDED)
BOLT/NUTS (INT.)	AISI 304L
SPACER TUBE	AISI 304L
TIE ROD	AISI 304L
BAFFLE	SA 240 TYPE 304L
CHANNEL FLANGE ⚠	SA 266 Gr.2 (WITH SS304L WELD OVERLAY)
DISHEND	SA 240 TYPE 304L
TUBE SHEET ⚠	SA 240 TYPE 304L
TUBE	SA 249 TP 304
CHANNEL SHELL	SA 240 TYPE 304L
SHELL	SA 240 TYPE 304L