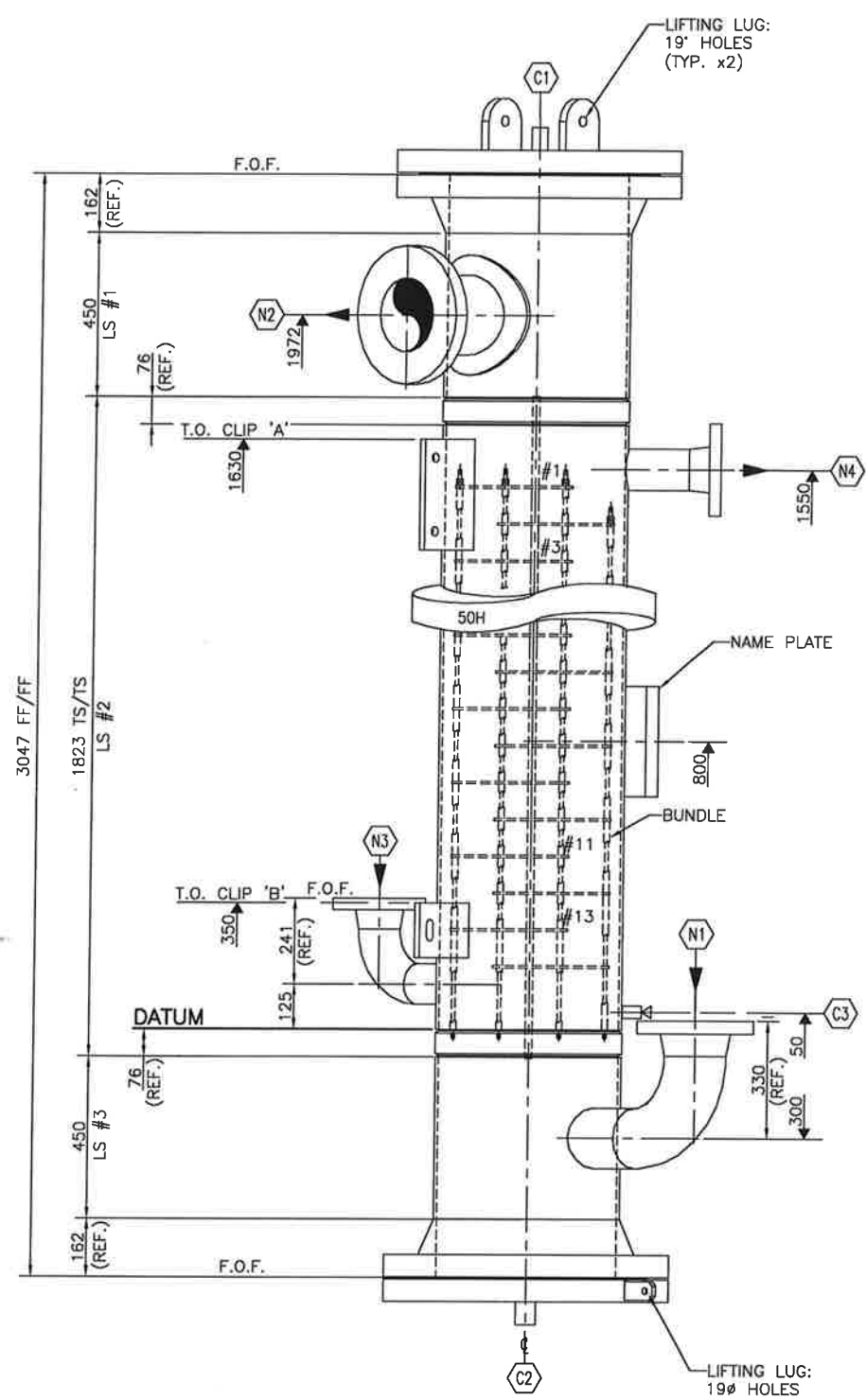


### Heat Exchanger Specification Sheet

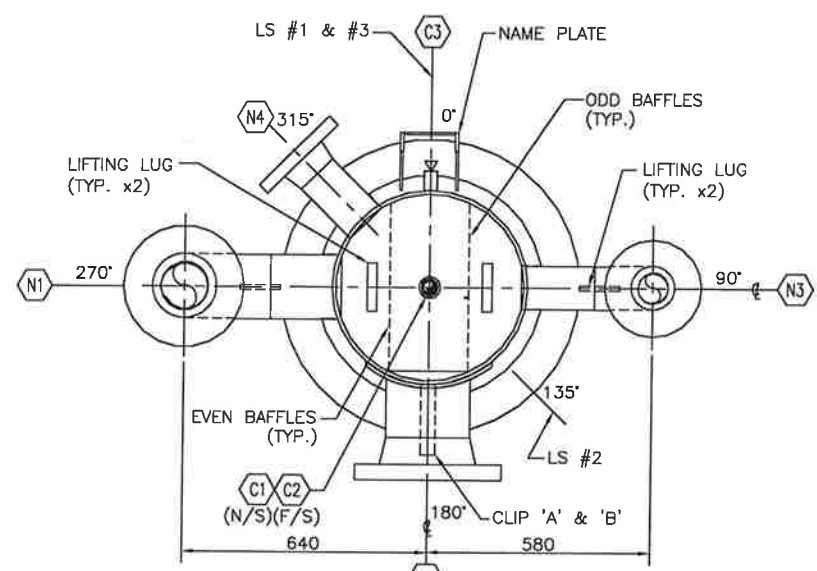
1	Company: Leucrotta Energy									
2	Location: Doe Creek Sour Gas Plant									
3	Service: Deethanizer Reboiler					Our Reference: Q14-0262 Rev #5				
4	Item No: E-3026					Your Reference:				
5	Date: 12/05/14		Rev No:		Job No: J145165					
6	Size	19--72	in	Type	NEN	Ver	Connected in	1 parallel	1 series	
7	Surf/unit (eff.)	371.2	ft <sup>2</sup>	Shells/unit	1		Surf/shell (eff.)	371.2	ft <sup>2</sup>	
8	<b>PERFORMANCE OF ONE UNIT</b>									
9	Fluid allocation			Shell Side			Tube Side			
10	Fluid name			Therminol 55			C3 plus Liquids			
11	Fluid quantity, Total			60039			20361			
12	Vapor (In/Out)			0			0			
13	Liquid			60039			20361			
14	Noncondensable			0			0			
15										
16	Temperature (In/Out)			380			339.98			
17	Dew / Bubble point						169.8			
18	Density Vapor/Liquid			/ 47.921			/ 48.891			
19	Viscosity			/ 0.8403			/ 1.0677			
20	Molecular wt, Vap						51.14			
21	Molecular wt, NC									
22	Specific heat			/ 0.6215			/ 0.6014			
23	Thermal conductivity			/ 0.061			/ 0.063			
24	Latent heat						110.8			
25	Pressure (abs)			63.54			62.48			
26	Velocity			3.39			2.07			
27	Pressure drop, allow./calc.			5			1.06			
28	Fouling resist. (min)			ft <sup>2</sup> h F/ BTU			0.002			
29	Heat exchanged			1469288			BTU/h			
30	Transfer rate, Service			22.09			Dirty 59.78			
31							Clean 82.24			
32							MTD corrected			
33							179.18 °F			
34							BTU/(h ft <sup>2</sup> F)			
35	<b>CONSTRUCTION OF ONE SHELL</b>									
36				Shell Side			Tube Side			
37	Design/vac/test pressure:g			psi			550/ /			
38	Design temperature			°F			500			
39	Number passes per shell			1			1			
40	Corrosion allowance			in			0.0625			
41	Connections			In			in			
42	Size/rating			Out			1			
43	Nominal			Intermediate			/ 300 ANSI			
44	Tube No.			330			OD 0.75			
45	Tube type			Plain			#in			
46	Shell			SA-515 70			ID 19.125			
47	Channel or bonnet			SA-515 70			OD 20			
48	Tubesheet-stationary			SA-516 70			in			
49	Floating head cover			-			Shell cover			
50	Baffle-crossing			SA-36 K02600			Channel cover			
51	Baffle-long			-			Tubesheet-floating			
52	Supports-tube			U-bend			Impingement protection			
53	Bypass seal						None			
54	Expansion joint			-			Type			
55	RhoV2-Inlet nozzle			743			Type			
56	Gaskets - Shell side			Flat Metal Jacket Fibe			Tube-tubesheet joint			
57	Floating head			-			Exp.			
58	Code requirements			ASME Code Sec VIII Div 1			Type			
59	Weight/Shell			3610.7			Type			
60	Remarks			Inlet Pressure 850 psig - DeC2 250 psig and 2 Deg F LTS Temperature			Type			
61										
62										



THE DESIGN IT COVERS ARE CONFIDENTIAL AND THE PROPERTY OF PROPAK SYSTEMS LTD., AND SHALL NOT BE DISCLOSED TO OTHERS OR REPRODUCED IN ANY MANNER OR USED FOR ANY PURPOSE WHATSOEVER EXCEPT BY WRITTEN CONSENT OF PROPAK

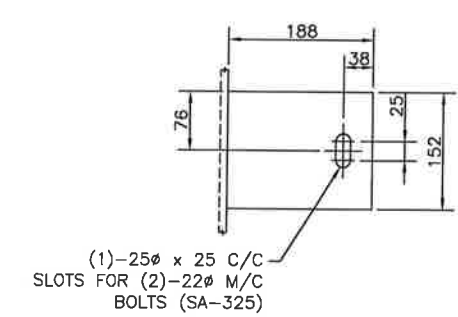


**ELEVATION**  
SCALE: 1:10



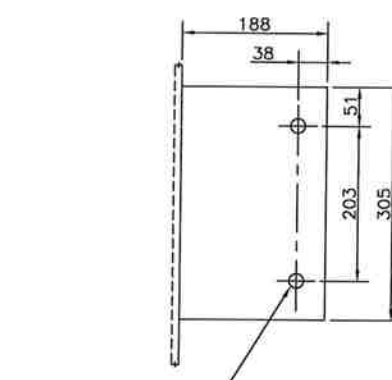
**ORIENTATION**  
SCALE: 1:10

NOZZLE SCHEDULE						
MK	SIZE	RATING	FACING	SCH	SERVICE	EXT. PROJ WELD
N1	6 NPS	300#	RFWN	XXH	TUBESIDE INLET	SPEC. -
N2	8 NPS	300#	RFWN	XH	TUBESIDE OUTLET	250 -
N3	4 NPS	300#	RFWN	XXH	SHELLSIDE INLET	SPEC. -
N4	4 NPS	300#	RFWN	XXH	SHELLSIDE OUTLET	250 -
C1	1 NPS	3000#	CPLG	-	VENT	- -
C2	1 NPS	3000#	CPLG	-	DRAIN	- -
C3	3/4 NPS	3000#	CPLG	-	SHELLSIDE DRAIN C/W PLUG	- -



(1)-25ø x 25 C/C  
SLOTS FOR (2)-22ø M/C  
BOLTS (SA-325)

**CLIP 'B'**  
SCALE: 1:5



(2)-25ø HOLES  
FOR (2)-22ø M/C  
BOLTS (SA-325)

**CLIP 'A'**  
SCALE: 1:5

**SERVICE:** TS: STAB. LIQUID  
SS: HOT OIL  
**LOADINGS PER UG-22(e) CONSIDERED GOVERNS:** NO  
**PRODUCTION IMPACT TEST REQ'D:** NO  
**IMPACT TESTING:**  
 VESSEL: NO-PER UG-20(f)(1-5)  
 TUBESHEET: NO-PER UCS-66(a)(1)(c) & UG-20(f)  
**CAPACITY:** 0.572 m<sup>3</sup>  
**SURFACE AREA OF TUBES:** 32.97 m<sup>2</sup>  
**WEIGHT EMPTY:** 2464 kg (INCL. BUNDLE & INSUL.)  
**WEIGHT FULL OF WATER:** 3035 kg  
**APPROX. TUBE BUNDLE WEIGHT:** 775 kg  
**PAINT SPEC:** PNT-12  
**INSULATION:** 51 THK CALCIUM SILICATE C/W ALUMINUM JACKET  
**SHIP LOOSE:** YES

SERIAL NO: 145165-111		CRN: W5053.2
YEAR BUILT: 2015		
LSD #: 13-24-80-15 W6M		
CODE:		ADDENDA: -
ASME SECT. VIII DIV I, '13,		
	SHELLSIDE	TUBESIDE
DESIGN PRESSURE	3792 kPag	3792 kPag
	NOTE: DES. PRESS. IS MAWP	NOTE: DES. PRESS. IS MAWP
DESIGN TEMPERATURE	232.2° C	232.2° C
M.D.M.T.	-28.8° C @ 3792 kPag	-28.8° C @ 3792 kPag
HYDROTEST PRESSURE	4930 kPag	4930 kPag
MATERIAL:	HEAD: SA-516-70N	SA-516-70N/SA-105N
	SHELL: SA-516-70N	SA-516-70N
RADIOGRAPHY:	LONG: FULL UW-11(a)	FULL UW-11(a)
	CIRC: FULL UW-11(a)	FULL UW-11(a)
P.W.H.T.	NO	NO
MIN TEMP / TIME	-	-
CORR. ALLOWANCE	1.59 mm	1.59 mm

TAG NO: E-3026

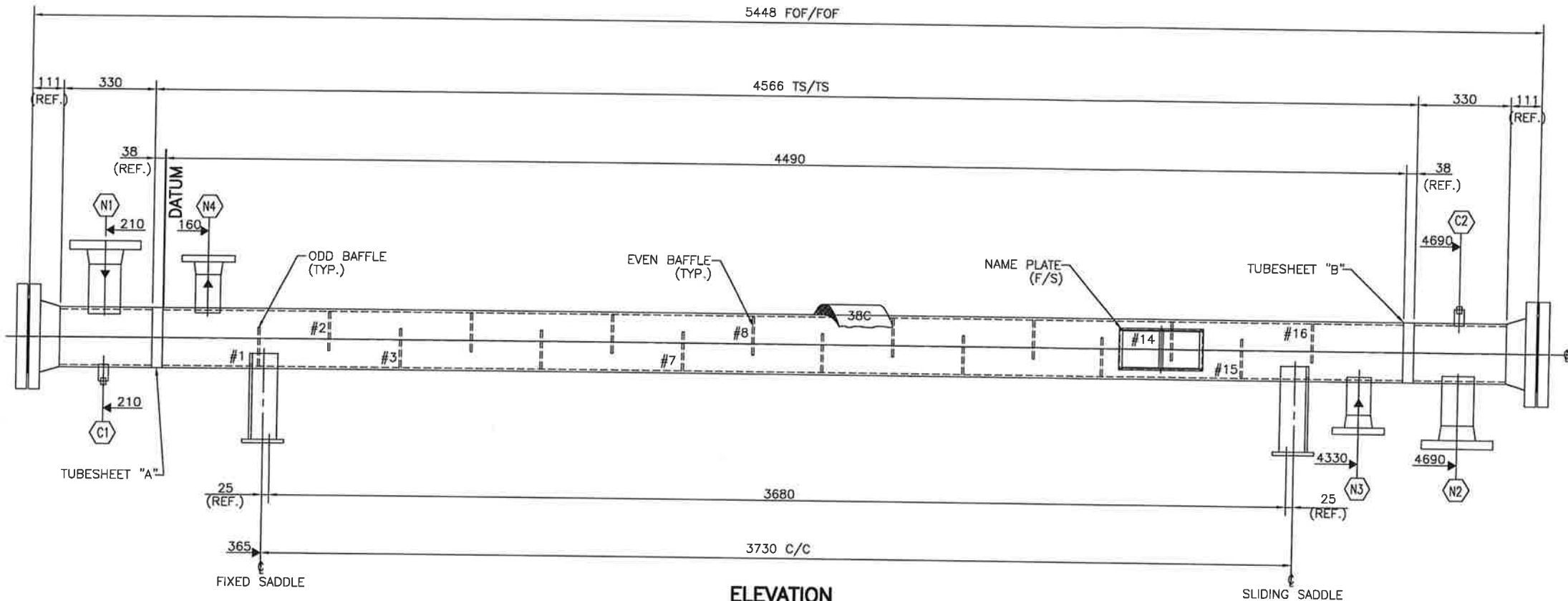
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APPROVED		DRAWN	
MECH./STRUCT.	BY	BY	DATE
ELECTRICAL	DATE	CHECKED	DATE
PROJECT	BY	DATE	DATE
DATE	SCALE	AS NOTED	

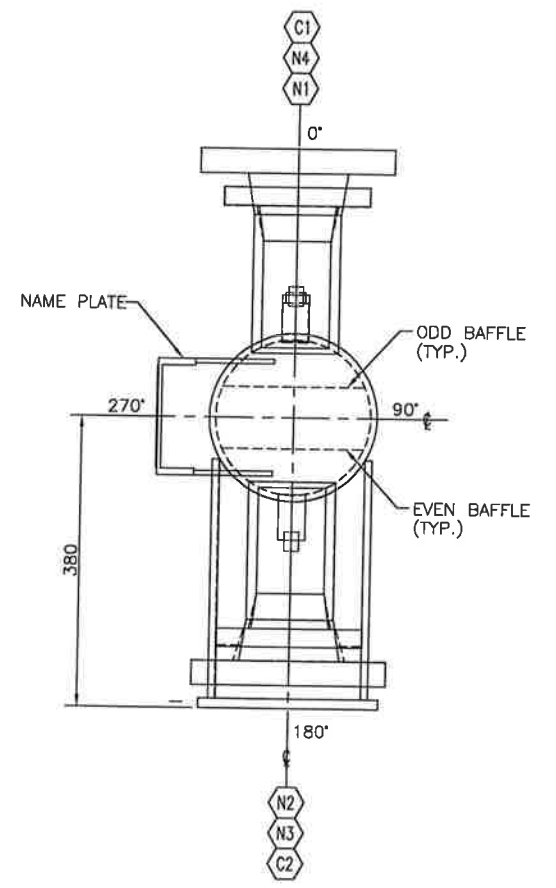
**PROPAK**  
 LEUCROTTA EXPLORATION INC.  
 DOE CREEK SOUR GAS PLANT  
 DEETHANIZER BOILER  
 508 O/D x 1823 TS/TS  
 440 East Lake Road,  
 Airdrie, Alberta  
 Canada T4A 2J8  
 DWG. No.: D-EXC-145165-111-05-SKT SHT. 1 OF 1 REV. SKT

TO OTHERS OR REPRODUCED IN ANY MANNER OR USED FOR ANY PURPOSE WHATSOEVER EXCEPT BY WRITTEN CONSENT OF PROPAC.

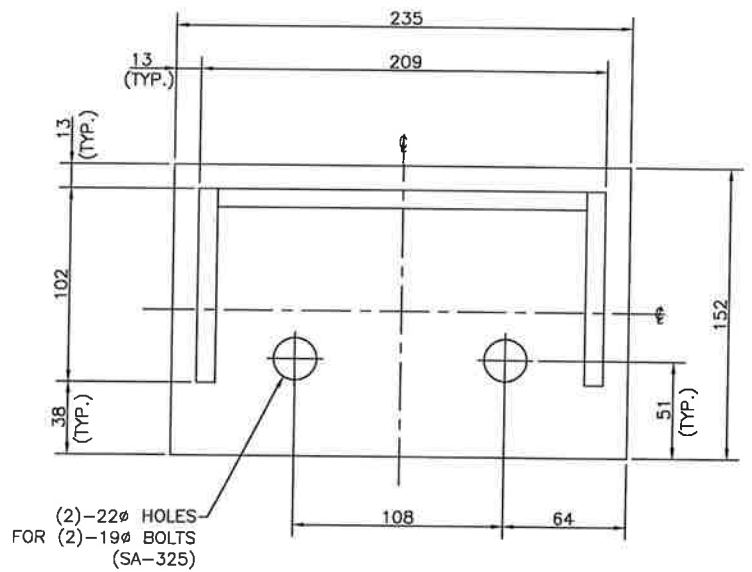
NOZZLE SCHEDULE						
MK	SIZE	RATING	FACING	SCH	SERVICE	EXT. PROJ WELD
N1	4 NPS	300#	RFWN	STD	TUBESIDE INLET	240
N2	4 NPS	300#	RFWN	STD	TUBESIDE OUTLET	240
N3	3 NPS	150#	RFWN	STD	SHELLSIDE INLET	190
N4	3 NPS	150#	RFWN	STD	SHELLSIDE OUTLET	190
C1	3/4 NPS	3000#	CPLG	XL	VENT c/w PLUG	56 MIN.
C2	3/4 NPS	3000#	CPLG	XL	DRAIN c/w PLUG	56 MIN.



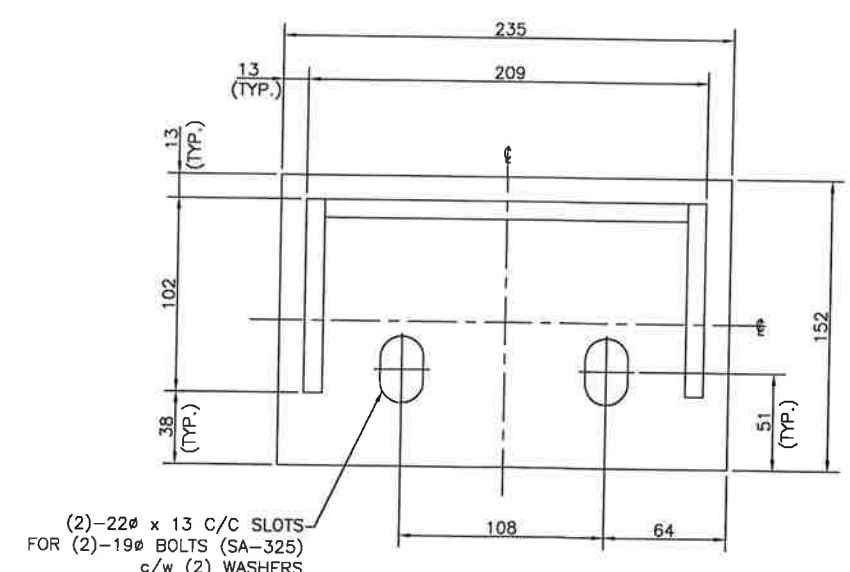
**ELEVATION**  
SCALE 1:10



**ORIENTATION**  
SCALE 1:5



**FIXED SADDLE BASE PLATE DETAIL**  
SCALE 1:2



**SLIDING SADDLE BASE PLATE DETAIL**  
SCALE 1:2

SERVICE: TS: HYDROCARBON  
SS: PROPANE  
LOADINGS PER UG-22(e) CONSIDERED GOVERNS: NO  
PRODUCTION IMPACT TEST REQ'D: NO  
IMPACT TESTING:  
VESSEL: NO-PER UG-20(f)(1-5)  
TUBESHEETS: NO-PER UCS-66(a)(1)(c) & FIG UCS-66  
CAPACITY: 0.176 m<sup>3</sup>  
SURFACE AREA OF TUBES: 13.70 m<sup>2</sup>  
WEIGHT EMPTY (INCL. BUNDLE): 655 kg  
WEIGHT FULL OF WATER: 831 kg  
APPROX. TUBE BUNDLE WEIGHT: 211 kg  
PAINT SPEC: PNT-11  
INSULATION: 38C THK FOAMGLASS  
C/W ALUMINUM JACKET  
SHIP LOOSE: NO

SERIAL NO:	145165-111-06	CRN:	W4763.2
YEAR BUILT:	2015	ADDENDA-	
LSD #:	13-24-80-15 W6M		
CODE:	ASME SECT. VIII DIV I, '13,		
		SHELLSIDE	TUBESIDE
DESIGN PRESSURE	1792 kPag	1792 kPag	3792 kPag
		NOTE: DES. PRESS. IS MAWP	
DESIGN TEMP.	65.5°C	65.5°C	65.5°C
M.D.M.T.	-28.8°C @ 1792 kPag	-28.8°C @ 1792 kPag	-28.8°C @ 3792 kPag
HYDRO. PRESSURE	2330 kPag	2330 kPag	4930 kPag
MATERIAL: HEAD:	SA-516-70N	SA-516-70N	SA-516-70N/SA-105N
MATERIAL: SHELL:	SA-106-B SMLS	SA-106-B SMLS	SA-106-B SMLS
RADIOGRAPHY: LONG	-	-	-
RADIOGRAPHY: CIRC.	-	-	SPOT UW-11(a)5(b),12(d)
P.W.H.T.	NO	NO	NO
MIN TEMP / TIME	-	-	-
CORR. ALLOWANCE	1.59mm	1.59mm	1.59mm
TAG NO: E-3206			

GENERAL NOTES		GENERAL NOTES		SKT		ISSUED FOR DOCUMENTATION		KAS		15/05/25		VAK		JLT																															
DATE: 2015/04/27 10:42 AM J:\JOBS\14\145165\20-DRAWINGS\FAB\MISC\SKT\EXC-145165-111-06-SKT-01 (E-3206).DWG		No edit pin		BY		DATE		CKD		ENG																																			
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