



Data Book

CLIENT: Husky Oil Operations Ltd.

AGENT: Bar Engineering

P.O#: 8401416112

FOREMOST WORK ORDER NO.: W03-066731

DESCRIPTION: 1,000 BBL Sales Tank Modifications

FOREMOST DOCUMENT NUMBER: W03-066731-DB_r0

REFERENCE DOCUMENT NUMBER: N/A

DOC REV		DOCUMENT #	PAGES	BY	APPD	DATE
0		W03-066731-DB	30	JM		June 18, 2020

DESIGN STANDARD				COMMENTS

Notes:

This document contains all documentation for S/N 028328-1 & 028328-3.



Data Book

Husky Oil Operations Ltd.
C/O Bar Engineering

Foremost Work Order: W03-066731

Location: Sandall Bottom Water De-Pressurization

P.O. #: 8401416112

1,000 BBL Sales Tank (Modification)

Serial Number: 028328-1 & 028328-3

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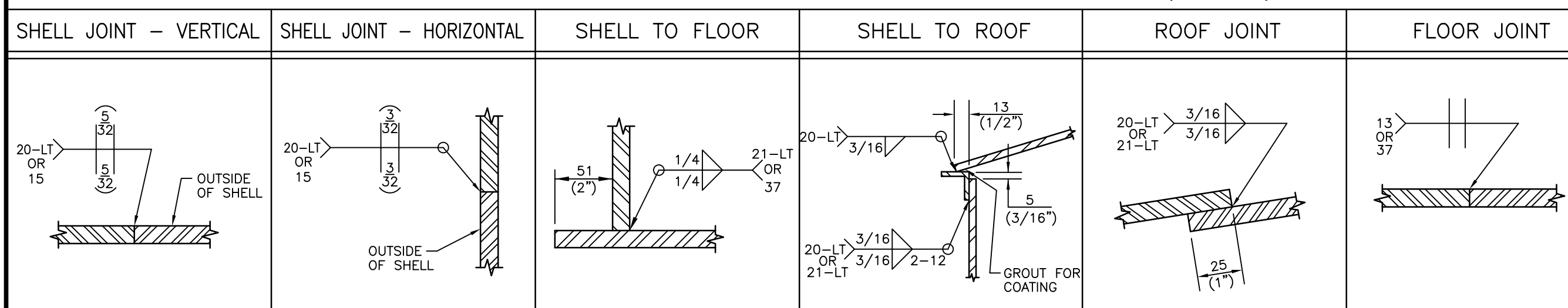
Section 1: Drafting/ Engineering

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2. Anode Roller Support Details
3. Nozzle Detail (Modification)
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5. Insulation Report
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STANDARD WELD DETAILS (N.T.S.)



CUSTOMER SPECIFICATIONS

DESIGN CODE: API-650 MODIFIED
SERIAL NO: 028328-1 & 3
DESIGN PRESSURE: 12 oz. PRESS. / 0.4 oz. VAC.
DESIGN TEMPERATURE: -13°C(8.6°F) TO 93°C(200°F)
OPERATING TEMPERATURE: _____
SERVICE: _____
OPERATING LEVEL: _____
CORROSION ALLOWANCE: NONE
OTHER: _____

FINISHING

INTERNAL: SANDBLAST TANK SHELL, FLOOR & ROOF TO SSPC-SP5, APPLY 12-16mils DFT OF DEVOE 253HS, 2 COAT SYSTEM (OR EQUIVALENT). REMOVABLE INTERNAL PIPING TO BE UNCOATED C.S.
EXTERNAL: NONE
TESTING: AIR TEST AS PER API-650 7.3.7.1(a) TO 18.0 oz. (SPOT X-RAY, BY OTHERS)
FLOOR SEAMS TO BE VACUUM TESTED.
100% MAG. PARTICLE ON SHELL TO FLOOR EXTERNAL AND INTERNAL FILLET WELDS.
100% MAG. PARTICLE ON FIRETUBE FLANGE TO PIPE WELDS AND RANDOM SPOT X-RAY.
FIRETUBES TO BE HYDROTESTED AT 15 PSIG FOR 10 MINUTES.
AIR TEST ALL REPADS TO 15 PSIG.
INSULATION: 51(2") URETHANE SPRAY FOAM INSULATION TO ENTIRE TANK SHELL & ROOF. ADDITIONAL 3" OF INSULATION ON ROOF AND 1" DOWN FROM TOP OF SHELL. FINISH WITH 20-25 MILS DFT BLACK ELASTOMERIC SEALER.

- MODIFICATION SUMMARY
- ADDED N13 NOZZLE.
 - ADDED N14a,b NOZZLES.
 - ADDED N15 NOZZLE.
 - ADDED N16a-d NOZZLES.
 - ADDED N17 NOZZLE.
 - ADDED N18 NOZZLE.
 - ADDED INTERNAL RISER AND SUPPORTS TO N13 NOZZLE TO ELEVATION OF 6772mm.
 - ADDED ANODE SUPPORTS TO N16a-d NOZZLES.
 - ADDED ENARDO PVRV, MODEL# 950-3-1113-Z8.0/20.4-C-F
 - ADDED ENARDO EPRV, MODEL# 2020-21T-1-Z11.5-101
 - REMOVED OLD INTERNAL SAMPLE LINES AND INSTALLED NEW INTERNAL SAMPLE LINES C/W SUPPORTS FOR C3c-e
 - LOWERED ELEVATION OF N2 RISER TO 5300mm FROM 6483mm AND SWAPPED WITH N8 INTERNAL SPOOL.
 - CHANGED N9 FLANGES TO CLASS 300.
 - TURNED EXISTING N9 INTERNAL 90° ELBOW TO SIDEWAYS FOR CENTRIFUGAL MOTION.
 - AIR TESTED REPADS, LP OUTSIDE OF NOZZLE FLANGE TO PIPE WELD JOINT AND LP OUTSIDE OF NON REPADED NOZZLE/COUPLING TO SHELL WELD JOINTS.
 - REPAIRED INTERNAL COATING AND INSULATION USING SCAFFOLDING.
 - BLASTED ALL THE INTERNAL PIPING (INSIDE AND OUTSIDE OF SPOOLS) TO SSPC-SP5 AND APPLIED 12-16 mils DFT OF DEVOE 253.

TYP. SHELL COUPLING DETAIL
SCALE 1:10

SCALE 1:10

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NOZZLE SCHEDULE

MK	NO	SIZE	SCH	RATE	TYPE	PROJECTION		REPAD		DESCRIPTION
						INT.	EXT.	YES	NO	
N2	1	219 8"	STD	CLASS 150	RFSO	203 8"	203 8"	✓		SPILL OVER OUTLET C/W INTERNAL RISER
N3	1	60 2"	STD	CLASS 150	RFSO	FLUSH	254 10"		✓	TANK LEVEL
N4	a	114 4"	XS	CLASS 150	RFSO	25 1"	356 1-2"		✓	DRAIN C/W GATE VALVE (IN VAULT)
N4	b	114 4"	XS	CLASS 150	RFSO	25 1"	203 8"	✓		STINGER
N5	1	89 3"	STD	CLASS 150	RFSO	AS SHOWN	152 6"	✓		WATER OUTLET C/W BALL VALVE BY OTHERS & DOWNCOMER (IN VAULT)
N6	1	89 3"	STD	CLASS 150	RFSO	AS SHOWN	152 6"	✓		OIL UNLOADING C/W BALL VALVE BY OTHERS, RISER & VORTEX BREAKER (IN VAULT)
N7	1	89 3"	STD	CLASS 150	RFSO	AS SHOWN	152 6"	✓		WATER OUTLET C/W DOWNCOMER (IN VAULT)
N8	1	219 8"	STD	CLASS 150	RFSO	203 8"	203 8"	✓		SPILL OVER INLET FROM PROD. TANK C/W INTERNAL DOWNCOMER & 90° ELBOW
N9	1	89 3"	XS	CLASS 3000	RFSO	152 6"	203 8"	✓		INLET C/W INTERNAL FLANGE & ELBOW TURNING SIDEWAY
N10	1	89 3"	STD	CLASS 150	RFSO	152 6"	203 8"	✓		FUTURE OIL OUTLET TO TRANSFER PUMP C/W RISER & VORTEX BREAKER
N11	1	114 4"	STD	CLASS 150	RFSO	152 6"	203 8"	✓		INCINERATOR C/W INTERNAL RISER (C.S.)
N12	1	114 4"	STD	CLASS 150	RFSO	25 1"	203 8"	✓		FG/BLANKET
C3	5	25 1"	-	CLASS 3000	FULL CPLG	HALF	HALF	✓		SAMPLE CONNECTIONS C/W SPRING LOADED BALL VALVES (IN VAULT)
C5	1	51 2"	-	CLASS 3000	S.S. FULL CPLG	HALF	HALF	✓		LEVEL INDICATOR (HAWKEYE - REDTAIL)
C5	2	32 1 1/4"	-	CLASS 3000	S.S. FULL CPLG	HALF	HALF	✓		FLOAT GUIDE WIRES
C6	2	19 3/4"	-	CLASS 3000	S.S. FULL CPLG	HALF	HALF	✓		TI (0°C - 100°C)
C7	1	25 1"	-	CLASS 3000	S.S. FULL CPLG	HALF	HALF	✓		TC C/W PLUG (FUTURE)
C8	1	19 3/4"	-	CLASS 3000	S.S. FULL CPLG	HALF	HALF	✓		TI (200°F - 1000°F) STACK
C10	1	19 3/4"	-	CLASS 3000	S.S. FULL CPLG	HALF	HALF	✓		STACK SPARE C/W PLUG
C11	1	19 3/4"	-	CLASS 3000	S.S. FULL CPLG	HALF	HALF	✓		BURNER MAINTENANCE C/W PLUG
T1	1	219 8" STD	-	FAB'D	25 1"	229 9"	229 9"	✓		THIEF HATCH c/w HAWKEYE (MARSH HAWK)
M1	1	610/219 2"x4"	-	FAB'D	25 1"	102 4"	102 4"	✓		SHELL MANWAY (SPLIT DOOR)
F1	1	254 10"	-	FAB'D	AS-SHOWN	152 6"	152 6"	✓		THROAT NOZZLE FOR 10" REMOVABLE FIRETUBE
N13	1	89 3"	XS	CLASS 150	RFSO	152 6"	203 8"	✓		SKIM NOZZLE C/W INTERNAL RISER (C.S.)
N14	9.b	2 114 4"	XS	CLASS 150	RFSO	25 1"	356 1-2"		✓	STINGER
N15	1	60 2"	XS	CLASS 150	RFSO	25 1"	203 8"		✓	LLSD
N16	4	114 4"	XS	CLASS 150	RFSO	25 1"	203 8"	✓		ANODE CONNECTION C/W SUPPORT
N17	1	89 3"	STD	CLASS 150	FFSO	25 1"	254 10"	✓		PVRV C/W ENARDO MODEL 950-3-1113-Z8.0/20.4-C-F
N18	1	508 20"	STD	CLASS 150	FFSO	25 1"	356 1-1/2"	✓		EPRV C/W ENARDO MODEL 2020-21T-1-Z11.5-101

MATERIAL LIST

MK	QTY	DESCRIPTION	MATERIAL	WT
1	2	FLOOR PLATE (HALF) 1/4" THK. x 15'-7 1/2" DIA. (G40.21-38W)	PRT-2425	1956
2	2	ROOF PLATE (HALF) 3/16" THK. x 15'-9 1/8" FLAT DIA. (G40.21-38W)	PRT-6996	1452
3	4	SHELL PLATE 1/4" THK. x 8'-0" x 47'-11 11/16" LG.	G40.21-38W	15674
4				
5				
6				
7	1	RUNAROUND ANGLE 2" x 2" x 3/16" x 48'-6 3/8" LG.	G40.21-44W	118
8	1	STACK 8" THIN WALL (NO DAMPER)	T-028328-B106	-
9	1	UPPER & LOWER LADDER (CWB STYLE)	PRT-6997 PRT-7002	404
10				
11	1	BURNER CONTROL BOX (2'-0" HIGH x 2'-6" LG. x 8" DEEP)	ALUMINUM	-
12	1	HAWKEYE REDTAIL LEVEL INDICATOR ASSY C/W GAUGE HEAD, METRIC BOARD, PVC FLOAT GUIDE WIRES, FLOOR CLIPS, CABLE TIGHTENERS & MISC. HARDWARE	REF. DWG. T-028328-B111	111
13	4	LIFTING LUG	PRT-4275	30
14	1	SERVICE LUG C/W REPAD	PRT-4276	10
15	1	SHELL MANWAY 2'-0" x 4'-0" C/W 1/4" SPLIT COVER	PRT-1221 PRT-1492	191
16	1	NAMEPLATE BRACKET C/W NAMEPLATE	PRT-2896	5
17	6	TANK HAULING PAD (1/4" - 6" DEEP)	REF. DWG. T-028328-A108	180
18	1	NOZZLE DETAIL	REF. DWG. T-028328-D102	390
19	1	FIRETUBE REMOVABLE U-TUBE 10" SCH STD. (EXTENDED LENGTH) 750,000 BTU/HR.	REF. DWG. T-028328-B106	1986
20	1	CHANNEL C4 x 5.4# x 7'-6 11/16" LG.	G40.21-44W	41
21	1	THIEF HATCH NOZZLE C/W HAWKEYE (MARSH HAWK)	REF. DWG. T-028328-A110	21
22	1	FIRETUBE HOLD-DOWN FOR 10" U-TUBE	PRT-6992	13
23	1	CHANNEL C4 x 5.4# x 15'-2 5/8" LG.	G40.21-44W	82
24	4	REPAD PLATE 1/4" THK. x 6" DIA.	G40.21-38W	4
25				
26				
27	1	INTERMEDIATE PLATFORM C/W SAFETY GATE	PRT-6999	229
28	3	HALF COUPLING 1/4" CL. 3000 F.S. SCR'D	SA-105	1
29	1	N2 NOZZLE & INTERNAL RISER DETAILS	REF. DWG. T-028328-A104	627
30				
31	1	ENVIRO-VAULT WALL/ROOF DETAILS (6' WIDE x 5' HIGH)	REF. DWG. T-028328-A109	759
32				
33	1	N11 NOZZLE & INTERNAL RISER DETAILS	REF. DWG. T-028328-B115	481
34	1	ENVIRO-VAULT DOOR DETAILS	REF. DWG. T-028328-C112	73
35	1	N8, N9 & N10 NOZZLE & INTERNAL RISER DETAILS	REF. DWG. T-028328-B105	312
36				
37	1	FULL COUPLING 1" CL. 3000 F.S. SCR'D	SA182-F316L S.S.	1
38	1	FULL COUPLING 2" CL. 3000 F.S. SCR'D	SA182-F316L S.S.	3
39	2	FULL COUPLING 1 1/4" CL. 3000 F.S. SCR'D	SA182-F316L S.S.	3
40				
41				
42	1	GROUNDING LUG	REF. DWG. T-028328-A114	3
43				
44	1	HEX PLUG 1" CL.3000 F.S. THR'D	SA-105	1
45	1	NOZZLE DETAIL (MODIFICATION)	REF. DWG. W03-066731-D102	1173
46	1	ANODE ROLLER SUPPORT DETAIL	REF. DWG. W03-066731-A103	60
47				
48				
49				
50				
51	1	CLIP GATE VALVE 2"	-	-
52	1	PIPE 2" SCH XS x 6" LG. SMLS TOE x 45° MITER	SA-106-B	2
53	2	TEMPERATURE GAUGE 4" FACE x 1'-0" LG. STEM x 1/2" NPT. CONN. (-20°C - 120°C) RANGE	-	1
54	1	SAFETY GATE	REF. DWG. T-028328-B113	11
55	4	TANK ROOF SAFETY HARNESS LUG (EXTENDED)	REF. DWG. T-028328-A116	8

*QTY'S ARE FOR ONE TANK - 2 REQ'D SUBTOTAL 21859 x 1.06 = 23171 lbs. TOTAL

19/05/20	AS-BUILT, CHANGED NOTE 15 IN MODIFICATION SUMMARY	RR	TZ
19/12/19	ISSUED FOR CONSTRUCTION	RR	TZ
09/12/19	ISSUED FOR CUSTOMER APPROVAL	RR	TZ

NO	DATE (d/m/y)	REVISIONS	BY	APPD
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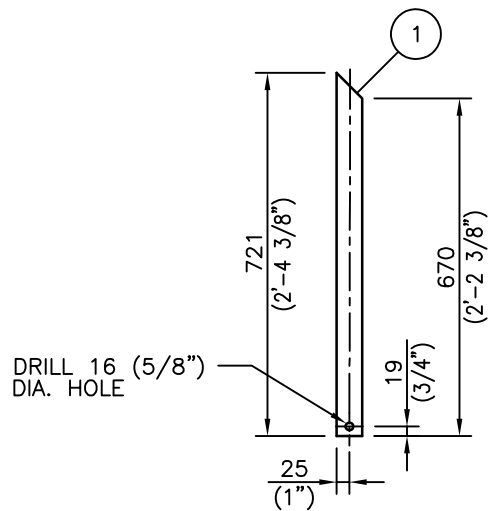
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FOREMOST

CLIENT: HUSKY OIL OPERATIONS LTD.
C/O BAR ENGINEERING
SANDALL BOTTOM WATER DE-PRESSURIZATION
P.O. # 8401416112

DWG TITLE: 1000 BBL SALES TANK - SOUR VERSION GENERAL ARRANGEMENT (MODIFICATION)			
SIZE: 4648mm I.D. x 9754mm HIGH (15'-3" I.D. x 32'-0" HIGH)	VOLUME: 159 CU. METERS (1000 Bbl)	DWG NO.: W03-066731-D101	SHEET NO. (REV. NO.): 1 of 1
SCALE: 1:30	DWN BY: R. RANASINGHE	DATE (d/m/y): 27/11/19	CHKD: GLB APPD: TZ 19/05/20 19/05/20

PROJECTS\W03-066731\W03-066731-D101



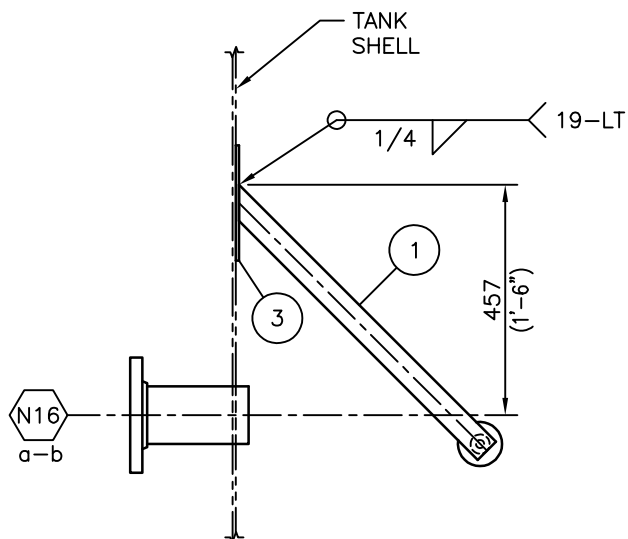
MK.#1 DETAIL

MATERIAL REQUIREMENTS						
M (MTR's):		NONE				
I (IMPACT TESTING):		NONE				
C (CHEMISTRY):		NONE				
MK	QTY	PART NO.	DESCRIPTION	CUT LENGTH	MAT'L	WT
1	2	2111	FLATBAR 1/4" THK. x 2" WIDE	721	SA479-316L S.S.	8
2	1	4190	ROLLER ASS'Y	-	WOOD	2
3	1	2521	REPAD PLATE 1/4" THK. x 9" DIA.	-	G40.21-38W	5
4						
5						

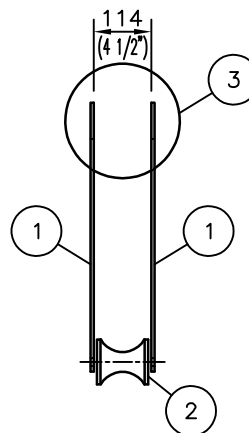
SUBTOTAL	15
x 1.06	
TOTAL (lbs.)	16

NOTES:

- ALL DIMENSIONS ARE IN S.I. AND IMPERIAL UNITS. DIMENSIONS IN BRACKETS ARE IMPERIAL HARD CONVERSIONS FOR SHOP REFERENCE ONLY.

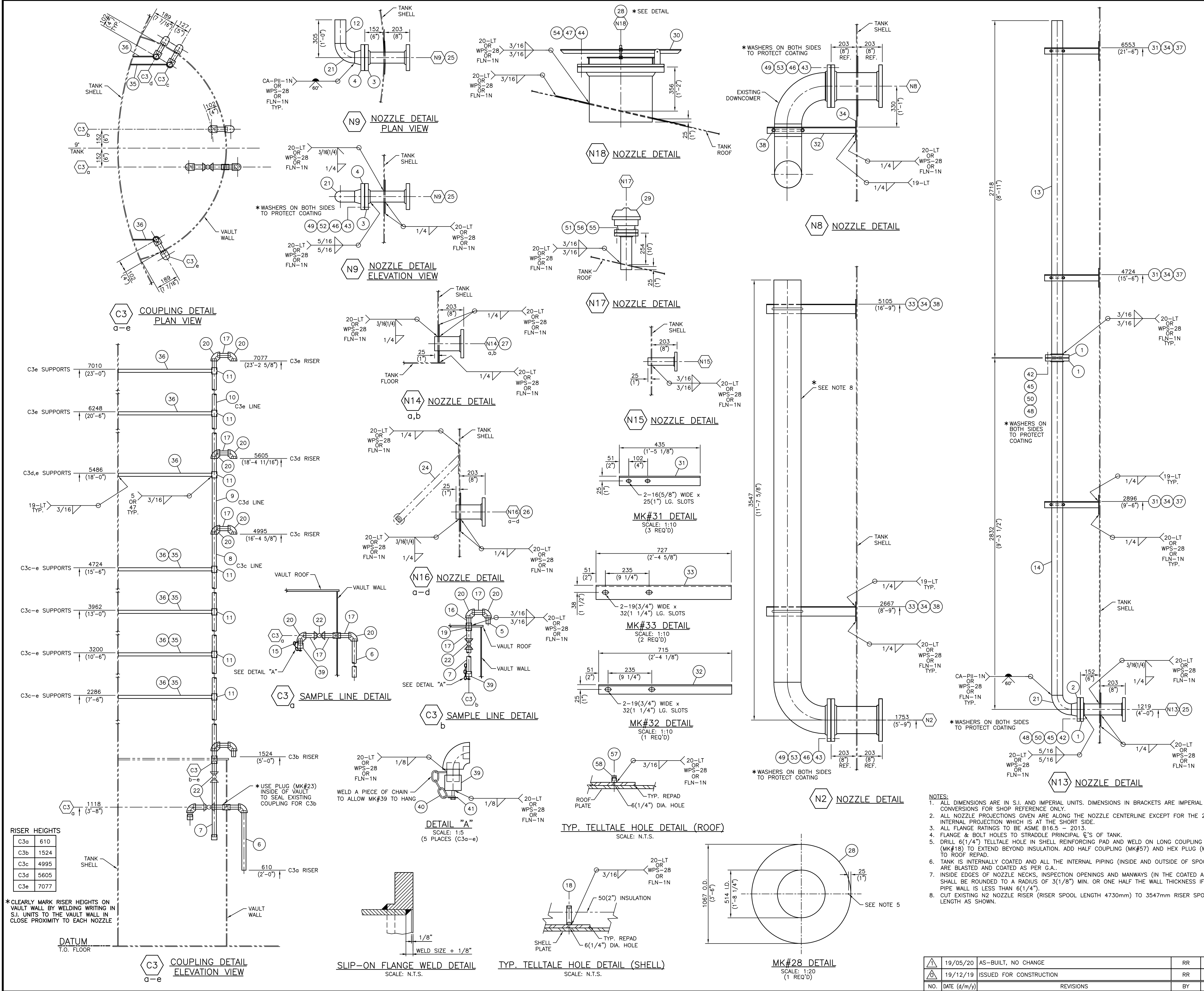


INSTALLATION DETAIL



ROLLER ASSEMBLY

1	19/05/20	AS-BUILT, NO CHANGE	RR	TZ
0	19/12/19	ISSUED FOR CONSTRUCTION	RR	TZ
NO.	DATE (d/m/y)	REVISIONS	BY	APPD
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FOREMOST				
CLIENT		HUSKY OIL OPERATIONS LTD. C/O BAR ENGINEERING		
DWG TITLE		1000 BBL SALES TANK - SOUR VERSION ANODE ROLLER SUPPORT DETAILS		
NO. REQ'D 4 PER TANK (8 TOTAL)		WO. NO. 03-066731	LEG NO.	
SCALE 1:15	DWN BY R. RANASINGHE	DWG NO. W03-066731-A103	SHT NO. 1 OF 1	REV 1
DATE (d/m/y) 17/12/19	CHKD GLB 19/05/20	APPD TZ 19/05/20		



MATERIAL LIST									
MATERIAL REQUIREMENTS									
M (MTR's):	NONE								
I (IMPACT TESTING):	NONE								
C (CHEMISTRY):	NONE								
MK	QTY	PART NO.	DESCRIPTION	CUT LENGTH	MATERIAL	WT	MAT REQ		
1	3	1329	FLANGE 3" CLASS 150 RF50	—	SA-105N	27	—		
2	1	1122	FLANGE 3" CLASS 150 RFWN x SCH STD BORE	—	SA-105N	12	—		
3	1	9606	FLANGE 3" CLASS 300 RF50	—	SA-105N	13	—		
4	1	1435	FLANGE 3" CLASS 300 RFWN x SCH STD BORE	—	SA-105N	16	—		
5	1	2182	PIPE 1" SCH XS SMLS POE x TOE	65	SA-106-B	1	—		
6	1	2182	PIPE 1" SCH XS SMLS POE x TOE	481	SA-106-B	3	—		
7	4	2182	PIPE 1" SCH XS SMLS TBE	457	SA-106-B	13	—		
8	1	2182	PIPE 1" SCH XS SMLS TBE	3500	SA-106-B	25	—		
9	1	2182	PIPE 1" SCH XS SMLS TBE	4110	SA-106-B	29	—		
10	1	2182	PIPE 1" SCH XS SMLS TBE	5582	SA-106-B	40	—		
11	16	—	PIPE 1 1/4" SCH 40S "WELDED" PBE	51	SA312-TP316L SS	6	—		
12	1	2234	PIPE 3" SCH STD SMLS BOE x ROE	191	SA-106-B	5	—		
13	1	2234	PIPE 3" SCH STD SMLS POE x ROE	2710	SA-106-B	68	—		
14	1	2234	PIPE 3" SCH STD SMLS POE x BOE	2710	SA-106-B	68	—		
15	1	1164	NIPPLE 1" SCH XS x 2" LG. SMLS TBE	—	SA-106-B	1	—		
16	1	1327	NIPPLE 1" SCH XS x 3" LG. SMLS TBE	—	SA-106-B	1	—		
17	11	1250	NIPPLE 1" SCH XS x 4" LG. SMLS TBE	—	SA-106-B	8	—		
18	9	21510	LONG CPLG. 1/4" x 3000# F.S. SCR'D x 3" LG.	—	SA-105N	2	—		
19	1	1260	FULL CPLG. 1" 3000# F.S. SCR'D	—	SA-105N	1	—		
20	10	1879	ELBOW 1" 3000# x 90° F.S. SCR'D	—	SA-105N	4	—		
21	2	1593	ELBOW 3" SCH STD x 90° L.R.	—	SA-234-WPB	10	—		
22	5	6514	BALL VALVE 1" 2000# WOG RP CS	—	—	10	—		
23	1	1330	HEX PLUG 1" 3000# F.S. THR'D	—	SA-105N	1	—		
24	4	—	ANODE ROLLER SUPPORT DETAIL	—	—	—	—		
25	2	1586	REPAD PLATE 1/4" THK. - 3" SHELL NOZZLE	—	G40.21-38W	10	—		
26	4	1540	REPAD PLATE 1/4" THK. - 4" SHELL NOZZLE	—	G40.21-38W	28	—		
27	2	4393	DOGHOUSE REPAD PLATE 1/4" THK. - 4" SHELL NOZZLE	—	G40.21-38W	16	—		
28	1	3108	REPAD PLATE 3/16" THK. 1'-8 1/4" I.D. x 3'-6" O.D.	—	G40.21-38W	57	—		
29	1	—	ENARDO PVRG, MODEL # 950-3-1113-28.0/Z0.4-C-F	—	—	15	—		
30	1	—	ENARDO EPRV, MODEL # 2020-21T-1-Z11.5-1D1	—	—	30	—		
31	3	7023	ANGLE 2" x 2" x 1/4"	435	SA479-316L S.S.	23	—		
32	1	7023	ANGLE 2" x 2" x 1/4"	715	SA479-316L S.S.	8	—		
33	2	10833	ANGLE 3" x 3" x 1/4"	727	SA479-316L S.S.	24	—		
34	6	5948	REPAD PLATE 1/4" THK. x 6" DIA.	—	G40.21-38W	12	—		
35	4	10356	FLATBAR 1/4" x 1"	300	SA479-304L S.S.	3	—		
36	12	10356	FLATBAR 1/4" x 1"	170	SA479-304L S.S.	6	—		
37	3	1698	U-BOLT 1/2" x 3" NPS C/W NUTS	—	S.S.	6	—		
38	3	1681	U-BOLT 5/8" x 8" NPS C/W NUTS	—	S.S.	12	—		
39	5	2384	PIPE CAP 1" 3000# F.S. THR'D	—	SA-105N	5	—		
40	5	—	CHAIN LIGHT DUTY 3/16" x 6" LG.	—	GR.30 C.S.	2	—		
41	5	—	BOLT 1/4" DIA. x 1" LG. C/W FLAT WASHER	—	GR. 5	1	—		
42	8	1788	STUD 5/8" DIA. x 4 1/4" LG.	—	SA-193-BBM (316 S.S.)	2	—		
43	24	11517	STUD 3/4" DIA. x 5" LG.	—	SA-193-BBM (316 S.S.)	15	—		
44	20	—	STUD 1 1/8" DIA. x 7 1/4" LG.	—	SA-193-B7 (316 S.S.)	40	—		
45	16	1787	HEAVY HEX NUT 5/8" NOM.	—	SA-194-BM (316 S.S.)	1	—		
46	48	1851	HEAVY HEX NUT 3/4" NOM.	—	SA-194-BM (316 S.S.)	4	—		
47	40	1806	HEX NUT 1 1/8" NOM.	—	SA-194-2H	8	—		
48	16	1852	WASHER 5/8" NOM.	—	S.S.	1	—		
49	48	1709	WASHER 3/4" NOM.	—	S.S.	1	—		
50	2	11740	GASKET 3" CLASS 150 RF x 1/8" THK.	—	LINEBACKER	2	—		
51	1	—	GASKET 3" CLASS 150 FF x 1/8" THK.	—	LINEBACKER	1	—		
52	1	11766	GASKET 3" CLASS 300 RF x 1/8" THK.	—	LINEBACKER	1	—		
53	2	11743	GASKET 8" CLASS 150 RF x 1/8" THK.	—	LINEBACKER	2	—		
54	1	—	GASKET 20" CLASS 150 FF x 1/8" THK.	—	LINEBACKER	1	—		
55	4	1848	STUD 5/8" DIA. x 4 1/4" LG.	—	SA-193-B7	1	—		
56	8	1802	HEX NUT 5/8" NOM.	—	SA-194-2H	1	—		
57	1	1926	HALF CPLG. 1/4" 3000# F.S. SCR'D	—	SA-105N	1	—		
58	1	1288	HEX PLUG 1/4" 3000# F.S. THR'D	—	SA-105N	1	—		
						TOTAL	747		

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FOREMOST

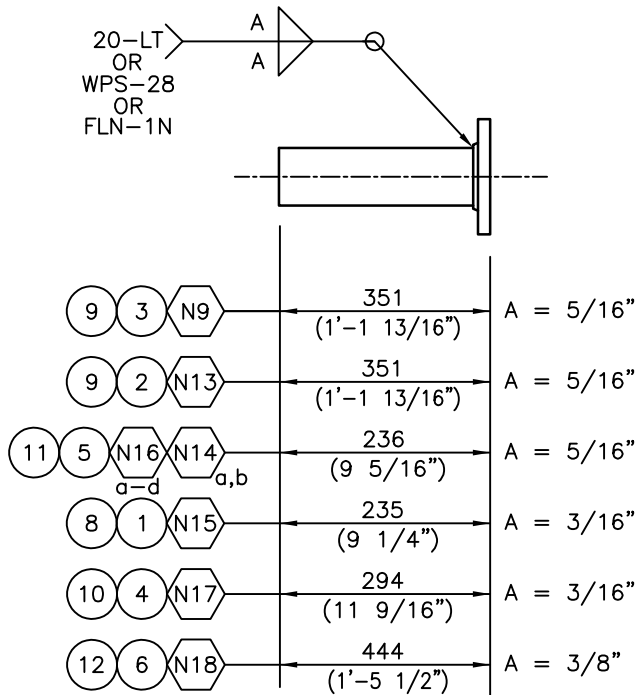
CLIENT
HUSKY OIL OPERATIONS LTD.
C/O BAR ENGINEERING
SANDALL BOTTOM WATER DE-PRESSURIZATION
P.O.# 8401416112

DWG TITLE
1000 BBL SALES TANK - SOUR VERSION
NOZZLE DETAIL (MODIFICATION)

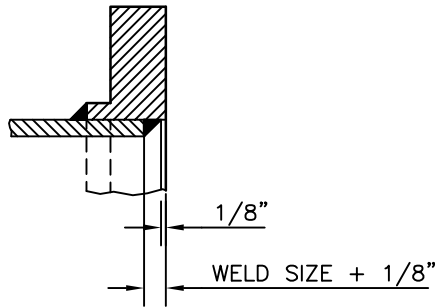
NO. REQ'D 2	WO. NO. 03-066731	LEG. NO.
SCALE 1:15	DWN BY R. RANASINGHE	SHEET NO. REV. NO. 1 of 2
DATE (d/m/y) 11/12/19	CHKD 19/05/20	APPD 19/05/20
DWG NO. W03-066731-D102		

- NOTES:
- ALL DIMENSIONS ARE IN S.I. AND IMPERIAL UNITS. DIMENSIONS IN BRACKETS ARE IMPERIAL HARD CONVERSIONS FOR SHOP REFERENCE ONLY.
 - ALL NOZZLE PROJECTIONS GIVEN ARE ALONG THE NOZZLE CENTERLINE EXCEPT FOR THE 25(1") INTERNAL PROJECTION WHICH IS AT THE SHORT SIDE.
 - ALL FLANGE RATINGS TO BE ASME B16.5 - 2013.
 - FLANGE & BOLT HOLES TO STRADDLE PRINCIPAL C'S OF TANK.
 - DRILL 6(1/4") TELLTALE HOLE IN SHELL REINFORCING PAD AND WELD ON LONG COUPLING (MK#18) TO EXTEND BEYOND INSULATION. ADD HALF COUPLING (MK#57) AND HEX PLUG (MK#58) TO ROOF REPAD.
 - TANK IS INTERNALLY COATED AND ALL THE INTERNAL PIPING (INSIDE AND OUTSIDE OF SPOOLS) ARE BLASTED AND COATED AS PER G.A..
 - INSIDE EDGES OF NOZZLE NECKS, INSPECTION OPENINGS AND MANWAYS (IN THE COATED AREA) SHALL BE ROUNDED TO A RADIUS OF 3(1/8") MIN. OR ONE HALF THE WALL THICKNESS IF THE PIPE WALL IS LESS THAN 6(1/4").
 - CUT EXISTING N2 NOZZLER RISER (RISER SPOOL LENGTH 4730mm) TO 3547mm RISER SPOOL LENGTH AS SHOWN.

19/05/20	AS-BUILT, NO CHANGE	RR	TZ
19/12/19	ISSUED FOR CONSTRUCTION	RR	TZ
NO.	DATE (d/m/y)	REVISIONS	BY



NOZZLE SPOOL DETAIL



SLIP-ON FLANGE WELD DETAIL
N.T.S.

- NOTES:
1. ALL DIMENSIONS ARE IN S.I. AND IMPERIAL UNITS. DIMENSIONS IN BRACKETS ARE IMPERIAL HARD CONVERSIONS FOR SHOP REFERENCE ONLY.
 2. ALL FLANGE RATINGS TO BE ASME B16.5 - 2013.
 3. TAG SPOOLS WITH TANK # AND NOZZLE #.

MATERIAL REQUIREMENTS							
M (MTR's):		NONE					
I (IMPACT TESTING):		NONE					
C (CHEMISTRY):		NONE					
MK	QTY	PART NO.	DESCRIPTION	CUT LENGTH	MAT'L	WT	MAT REQ
1	1	1349	FLANGE 2" CLASS 150 RFSO	—	SA-105N	5	—
2	1	1329	FLANGE 3" CLASS 150 RFSO	—	SA-105N	9	—
3	1	9606	FLANGE 3" CLASS 300 RFSO	—	SA-105N	13	—
4	1	1322	FLANGE 3" CLASS 150 FFSO	—	SA-105N	9	—
5	6	1462	FLANGE 4" CLASS 150 RFSO	—	SA-105N	72	—
6	1	—	FLANGE 20" CLASS 150 FFSO	—	SA-105N	155	—
7							
8	1	2218	PIPE 2" SCH XS SMLS POE x ROE	227	SA-106-B	4	—
9	2	2237	PIPE 3" SCH XS SMLS PBE	340	SA-106-B	23	—
10	1	2234	PIPE 3" SCH STD SMLS POE x ROE	287	SA-106-B	7	—
11	6	2248	PIPE 4" SCH XS SMLS POE x ROE	225	SA-106-B	66	—
12	1	—	PIPE 20" SCH STD SMLS POE x ROE	431	SA-106-B	112	—
						SUBTOTAL	475
						x 1.06	
						TOTAL (lbs.)	504

	19/05/20	AS-BUILT, NO CHANGE	RR	TZ
	19/12/19	ISSUED FOR CONSTRUCTION	RR	TZ
NO.	DATE (d/m/y)	REVISIONS	BY	APPD

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CLIENT HUSKY OIL OPERATIONS LTD. C/O BAR ENGINEERING				
DWG TITLE 1000 BBL SALES TANK – SOUR VERSION NOZZLE SPOOL DETAILS (MODIFICATION)				
NO. REQ'D 2		WO. NO. 03-066731		LEG NO.
SCALE 1:15		DWN BY R. RANASINGHE		SHT NO.
DATE (d/m/y) 17/12/19		CHKD GLB 19/05/20	APPD TZ 19/05/20	REV 1
		DWG NO. W03-066731-D102		2 OF 2



Storage Tank
Quality / Inspection & Test Plan
Revision 0

W.O.# W03-066731

Serial Number: 028328-1

Description: 1000BBL Sales Tank – Sour Mod's

Ref	Activity Description	QC Activity Required	Acceptance Criterion	Verifying Documents	Foremost Req	Duty	Foremost Approval and Date
A. Approvals							
1.	Drawing Approvals	- Confirm fabrication drawing approvals	API-650 / 12F	Issued for Construction Drawings	H D	QC / F	<i>Sw</i> Feb 24, 2020
B. Receipt Inspection							
1.	Nozzle Pipe	- Confirm thickness, material type, dimensions and quantities as per approved drawings	Approved Drawings	This ITP	H I	QC / F	<i>hl</i> Mar 5, 2020
C. In Process Inspection							
1.	Material cutting and beveling	- Monitor correct material per drawing and traceable to the work order number	Component drawing(s)	This ITP	I / V	F	<i>hl</i> Mar 5, 2020
2.	Nozzle Prefabrication	- Confirm correct size, rating, schedule and dimensions	Nozzle drawings	This ITP	I / V	F	<i>hl</i> Mar 5, 2020
3.	Nozzle Flange Condition	- Confirm gasket surface is free from damage	ASME B16.5	This ITP	I / V	F	<i>hl</i> Mar 5, 2020
4.	Nozzle Lay-out (Shell and Roof)	- Confirm correct orientation and elevation - Confirm correct nozzle size, rating, schedule and if repad req'd	General Arrangement & Nozzle drawings	This ITP	I / V	F	<i>hl</i> Mar 5, 2020
5.	Nozzle Fit-up	- Confirm flange face is two-holed, level & square to vessel - Confirm proper external & internal projection - Confirm repad dimensions - Confirm weld joint configuration and gap	General Arrangement & Nozzle drawings	This ITP	I / V	F	<i>hl</i> Mar 5, 2020

Legend:

Requirements: I – Inspect
W – Witness
H – Hold Point
D – Documents Required
V – Verify

Duty: QC – Quality Control
F – Foreman
P – Projects








Storage Tank
Quality / Inspection & Test Plan
Revision 0

W.O.# W03-066731

Serial Number: 028328-1

Description: 1000BBL Sales Tank – Sour Mod's

Ref	Activity Description	QC Activity Required	Acceptance Criterion	Verifying Documents	Foremost Req	Duty	Foremost Approval and Date
6.	Internal Piping and Attachments	- Confirm all internal piping is installed c/w appropriate studs, nuts and gaskets, and that all pipe support and flange nuts have been tightened. - Confirm internal attachments are in correct location/position	Component drawings	This ITP	I / V	F	 Mar 5, 2020
7.	Welding Visual Examination	- Verify weld profile, appearance, size, reinforcement and contours on all welds	Component drawings and Foremost's storage tank visual inspection criteria	This ITP	I / V	QC / F	 Mar 26, 2020
D. NDE							
D.1 Liquid Penetrant Examination							
1.	Nozzle Flange to Pipe Outside Welds and Nozzle Pipe / Coupling to Shell Outside Welds	- Perform PT on all nozzle pipe to flange outside welds and on all non repaded nozzle / coupling to shell outside welds	ASME Section VIII, Annex 8, Paragraphs 8-3, 8-4 and 8-5	NDE Reports and this ITP	I D	QC / F	 Mar 5, 2020
D.2 Air Testing							
1.	Nozzle Repads	- Ensure test gauge is of proper range and condition is acceptable for the test. - Ensure test gauge calibration is current - Air / soap test nozzle repads to 15 psi - Ensure test gauge serial number is recorded on the test report	Gauge must have been calibrated within one year of the test date and API-650 Paragraph 7.3.4	Test Gauge Calibration Records, Nozzle Repad Test Reports and this ITP	I D	QC / F	 Mar 26, 2020
E. Final Inspection and Release for Coating & Insulation Repairs							
1.	Mechanical Walk Through and Release for Air Test	- Ensure tank is complete and as per the construction drawings. - Confirm all welds have been marked with welder I.D. symbols. - Confirm all internal and external welds are in accordance with Code requirements - Confirm all required NDE has been completed.	Approved for construction drawings	This ITP	H I D	QC / F	 Mar 26, 2020

Legend:

Requirements: I – Inspect
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Duty: QC – Quality Control
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Storage Tank
Quality / Inspection & Test Plan
Revision 0

W.O.# W03-066731

Serial Number: 028328-1

Description: 1000BBL Sales Tank – Sour Mod's

Ref	Activity Description	QC Activity Required	Acceptance Criterion	Verifying Documents	Foremost Req	Duty	Foremost Approval and Date
G. Internal Coating (Foremost)							
1.	Test Equipment Calibration	- Confirm testing equipment is calibrated and acceptable for use	Calibration Records	This ITP	V	QC/F	BM Mar 27-20
2.	Internal Blast Profile Achieved (As Per Drawings)	- Confirm internal blast profile is in accordance with Coating Manufacturer's	Approved Drawings	Surface Preparation Section of Coating Report and this ITP	D	F	BM Mar 27-20
3.	Verify Coating Material (As Per Drawings)	- Confirm coating material is as per Client requirements	Approved Drawings and	Applied Coating Section of Coating Report and this ITP	D	F	BM Mar 27-20
4.	First Internal Coat Inspection (As Per Drawings)	- Visually inspect coating for defects, measure and record DFT.	Manufacturer's Recommendations	Applied Coating Section of Coating Report and this ITP	D	F	BM Apr. 1-20
5.	Second Internal Coat Inspection (if applicable) (As Per Drawings)	- Visually inspect coating for defects, measure and record DFT.	Manufacturer's Recommendations	Applied Coating Section of Coating Report and this ITP	D	F	N/A
6.	Final Coating Inspection	- Visually inspect coating for defects, measure and record final DFT.	Manufacturer's Recommendations	Applied Coating Section of Coating Report and this ITP	D	F	BM Apr. 1-20
7.	Holiday Testing	- Examine the entire coated surface for defects using a wet sponge type holiday detector/ or high voltage	Holiday Free	Holiday Testing Section of Coating Report and this ITP	D	F	BM Apr. 1-20
I. Insulation							
1.	Foam Urethane Thickness (As Per Drawings)	- Ensure urethane insulation thickness is no less that specified on the drawings	Approved Drawings	This ITP	V	F	BM Apr. 2-20
2.	Sealer Coverage (As Per Drawings)	- Ensure sealer coverage is even and no urethane is exposed	No Exposed Insulation	This ITP	V	F	BM Apr. 2-20

Legend:

Requirements: I – Inspect
W – Witness
H – Hold Point
D – Documents Required
V – Verify

Duty: QC – Quality Control
F – Foreman
P – Projects





Storage Tank
Quality / Inspection & Test Plan
Revision 0

W.O.# W03-066731

Serial Number: 028328-1

Description: 1000BBL Sales Tank – Sour Mod's

Ref	Activity Description	QC Activity Required	Acceptance Criterion	Verifying Documents	Foremost Req	Duty	Foremost Approval and Date
3.	Final Insulation Inspection	<ul style="list-style-type: none"> - Ensure all masking tape and poly has been removed - Ensure even trimming around appurtenances - Ensure all openings are accounted for (shell and roof couplings) 	Industry Standards	This ITP	V	F	Bm April 3-20
J. Preparation for Shipment							
1.	Preparation for Shipment	<ul style="list-style-type: none"> - Ensure tank internal has been swept and free of debris - Ensure all enviro vault internal / external piping, applicable valves and riser labeling have been installed - Ensure all accessories have been installed on and in the tank in accordance with the approved drawings - Ensure burner flange, stack, couplings and all nozzles have appropriate blinds, shipping covers or plugs installed 	Approved Drawings	This ITP	H I	QC / P	 Apr 6, 2020
K. Documentation							
1.	Document Review and Retention	<ul style="list-style-type: none"> - Confirm all documents required for the turnover package have been checked for accuracy and completeness - Ensure data package is scanned and saved electronically by tank serial number 	Approved Drawings Project Specifications	Approved Data Package	H I D	QC	 Apr 6, 2020

Legend:

Requirements: I – Inspect
 W – Witness
 H – Hold Point
 D – Documents Required
 V – Verify

Duty: QC – Quality Control
 F – Foreman
 P – Projects



Storage Tank
Quality / Inspection & Test Plan
Revision 0

W.O.# W03-066731

Serial Number: 028328-3

Description: 1000BBL Sales Tank – Sour Mod's

Ref	Activity Description	QC Activity Required	Acceptance Criterion	Verifying Documents	Foremost Req	Duty	Foremost Approval and Date
A. Approvals							
1.	Drawing Approvals	- Confirm fabrication drawing approvals	API-650 / 12F	Issued for Construction Drawings	H D	QC / F	<i>DL</i> Feb 24, 2020
B. Receipt Inspection							
1.	Nozzle Pipe	- Confirm thickness, material type, dimensions and quantities as per approved drawings	Approved Drawings	This ITP	H I	QC / F	<i>DL</i> Mar 5, 2020
C. In Process Inspection							
1.	Material cutting and beveling	- Monitor correct material per drawing and traceable to the work order number	Component drawing(s)	This ITP	I / V	F	<i>DL</i> Mar 5, 2020
2.	Nozzle Prefabrication	- Confirm correct size, rating, schedule and dimensions	Nozzle drawings	This ITP	I / V	F	<i>DL</i> Mar 5, 2020
3.	Nozzle Flange Condition	- Confirm gasket surface is free from damage	ASME B16.5	This ITP	I / V	F	<i>DL</i> Mar 5, 2020
4.	Nozzle Lay-out (Shell and Roof)	- Confirm correct orientation and elevation - Confirm correct nozzle size, rating, schedule and if repad req'd	General Arrangement & Nozzle drawings	This ITP	I / V	F	<i>DL</i> Mar 5, 2020
5.	Nozzle Fit-up	- Confirm flange face is two-holed, level & square to vessel - Confirm proper external & internal projection - Confirm repad dimensions - Confirm weld joint configuration and gap	General Arrangement & Nozzle drawings	This ITP	I / V	F	<i>DL</i> Mar 5, 2020

Legend:

Requirements: I – Inspect
W – Witness
H – Hold Point
D – Documents Required
V – Verify

Duty: QC – Quality Control
F – Foreman
P – Projects








Storage Tank
Quality / Inspection & Test Plan
Revision 0

W.O.# W03-066731

Serial Number: 028328-3

Description: 1000BBL Sales Tank – Sour Mod's

Ref	Activity Description	QC Activity Required	Acceptance Criterion	Verifying Documents	Foremost Req	Duty	Foremost Approval and Date
6.	Internal Piping and Attachments	- Confirm all internal piping is installed c/w appropriate studs, nuts and gaskets, and that all pipe support and flange nuts have been tightened. - Confirm internal attachments are in correct location/position	Component drawings	This ITP	I / V	F	 Mar 5, 2020
7.	Welding Visual Examination	- Verify weld profile, appearance, size, reinforcement and contours on all welds	Component drawings and Foremost's storage tank visual inspection criteria	This ITP	I / V	QC / F	 Mar 31, 2020
D. NDE							
D.1 Liquid Penetrant Examination							
1.	Nozzle Flange to Pipe Outside Welds and Nozzle Pipe / Coupling to Shell Outside Welds	- Perform PT on all nozzle pipe to flange outside welds and on all non repaded nozzle / coupling to shell outside welds	ASME Section VIII, Annex 8, Paragraphs 8-3, 8-4 and 8-5	NDE Reports and this ITP	I D	QC / F	 Mar 5, 2020
D.2 Air Testing							
1.	Nozzle Repads	- Ensure test gauge is of proper range and condition is acceptable for the test. - Ensure test gauge calibration is current - Air / soap test nozzle repads to 15 psi - Ensure test gauge serial number is recorded on the test report	Gauge must have been calibrated within one year of the test date and API-650 Paragraph 7.3.4	Test Gauge Calibration Records, Nozzle Repad Test Reports and this ITP	I D	QC / F	 Mar 31, 2020
E. Final Inspection and Release for Coating & Insulation Repairs							
1.	Mechanical Walk Through and Release for Air Test	- Ensure tank is complete and as per the construction drawings. - Confirm all welds have been marked with welder I.D. symbols. - Confirm all internal and external welds are in accordance with Code requirements - Confirm all required NDE has been completed.	Approved for construction drawings	This ITP	H I D	QC / F	 Mar 31, 2020

Legend:

Requirements: I – Inspect
W – Witness
H – Hold Point
D – Documents Required
V – Verify

Duty: QC – Quality Control
F – Foreman
P – Projects



Storage Tank
Quality / Inspection & Test Plan
Revision 0

W.O.# W03-066731

Serial Number: 028328-3

Description: 1000BBL Sales Tank – Sour Mod's

Ref	Activity Description	QC Activity Required	Acceptance Criterion	Verifying Documents	Foremost Req	Duty	Foremost Approval and Date
G. Internal Coating (Foremost)							
1.	Test Equipment Calibration	- Confirm testing equipment is calibrated and acceptable for use	Calibration Records	This ITP	V	QC/F	Bm Apr. 1-20
2.	Internal Blast Profile Achieved (As Per Drawings)	- Confirm internal blast profile is in accordance with Coating Manufacturer's	Approved Drawings	Surface Preparation Section of Coating Report and this ITP	D	F	Bm Apr. 2-20
3.	Verify Coating Material (As Per Drawings)	- Confirm coating material is as per Client requirements	Approved Drawings and	Applied Coating Section of Coating Report and this ITP	D	F	Bm Apr. 1-20
4.	First Internal Coat Inspection (As Per Drawings)	- Visually inspect coating for defects, measure and record DFT.	Manufacturer's Recommendations	Applied Coating Section of Coating Report and this ITP	D	F	Bm Apr. 3-20
5.	Second Internal Coat Inspection (if applicable) (As Per Drawings)	- Visually inspect coating for defects, measure and record DFT.	Manufacturer's Recommendations	Applied Coating Section of Coating Report and this ITP	D	F	N/A
6.	Final Coating Inspection	- Visually inspect coating for defects, measure and record final DFT.	Manufacturer's Recommendations	Applied Coating Section of Coating Report and this ITP	D	F	Bm Apr. 3-20
7.	Holiday Testing	- Examine the entire coated surface for defects using a wet sponge type holiday detector/ or high voltage	Holiday Free	Holiday Testing Section of Coating Report and this ITP	D	F	Bm Apr. 3-20
I. Insulation							
1.	Foam Urethane Thickness (As Per Drawings)	- Ensure urethane insulation thickness is no less that specified on the drawings	Approved Drawings	This ITP	V	F	Bm Apr. 6-20
2.	Sealer Coverage (As Per Drawings)	- Ensure sealer coverage is even and no urethane is exposed	No Exposed Insulation	This ITP	V	F	Bm Apr. 6-20

Legend:

Requirements: I – Inspect
W – Witness
H – Hold Point
D – Documents Required
V – Verify

Duty: QC – Quality Control
F – Foreman
P – Projects





Storage Tank
Quality / Inspection & Test Plan
Revision 0

W.O.# W03-066731

Serial Number: 028328-3

Description: 1000BBL Sales Tank – Sour Mod's

Ref	Activity Description	QC Activity Required	Acceptance Criterion	Verifying Documents	Foremost Req	Duty	Foremost Approval and Date
3.	Final Insulation Inspection	<ul style="list-style-type: none"> - Ensure all masking tape and poly has been removed - Ensure even trimming around appurtenances - Ensure all openings are accounted for (shell and roof couplings) 	Industry Standards	This ITP	V	F	BM Apr. 6 - 20
J. Preparation for Shipment							
1.	Preparation for Shipment	<ul style="list-style-type: none"> - Ensure tank internal has been swept and free of debris - Ensure all enviro vault internal / external piping, applicable valves and riser labeling have been installed - Ensure all accessories have been installed on and in the tank in accordance with the approved drawings - Ensure burner flange, stack, couplings and all nozzles have appropriate blinds, shipping covers or plugs installed 	Approved Drawings	This ITP	H I	QC / P	 Apr 6, 2020
K. Documentation							
1.	Document Review and Retention	<ul style="list-style-type: none"> - Confirm all documents required for the turnover package have been checked for accuracy and completeness - Ensure data package is scanned and saved electronically by tank serial number 	Approved Drawings Project Specifications	Approved Data Package	H I D	QC	 Apr 6, 2020

Legend:

Requirements: I – Inspect
W – Witness
H – Hold Point
D – Documents Required
V – Verify

Duty: QC – Quality Control
F – Foreman
P – Projects



Penetrant Test Report

Foremost Job #: W03-066731		Tag Name: 1000BBL Sales Tank - Sour Mods	
Client: Husky Oil		Tag #: N/A	
Location: FLW		Tank Serial #: 028328-1	
Job Coordinator: Braden Musyj		Site Supervisor: Dustin Henning	
Location of Test:			
Floor to Shell Seam: N/A		Horizontal Seam: N/A	
Non-Repadded Nozzles: X		Vertical Seam: N/A	
Other: External flange to pipe nozzle welds			
Testing Instructions:			
Penetrant to be Used: See below		Dwell Time: 4 Hours min.	
Ambient Conditions: Shop		Ambient Temperature: Shop	
Additional Requirements: Penetrant to be used is diesel or other suitable penetrant			
Nozzles tested: N18 nozzle flange to pipe welds; N17 nozzle flange to pipe welds and nozzle to shell weld.			
Pre-Test Inspection:			
Item to be tested to be visually checked for completion prior to testing.			
Supervisor Sign-Off		Quality Control Sign-Off	
Print: <i>Derek Pendree</i>		Print:	
Sign: <i>D. Pendree</i>		Sign:	
Date: <i>MAY 5/2020</i>		Date:	
Comments:			
Test Record:			
Penetrant Used: Lubriplate Penetrating Oil		Date of Test:	
Dwell Time: 4 hours		Time of Test:	
Result: <i>Good</i>			
Ambient Conditions:		Ambient Temperature: <i>Shop</i>	
Comments:			
Sign-Off			
Foremost Representative		Client Representative	
Print: <i>Derek Pendree</i>		Print:	
Sign: <i>D. Pendree</i>		Sign:	
Date: <i>MAY 5/2020</i>		Date:	



Penetrant Test Report

Foremost Job #: W03-066731	Tag Name: 1000BBL Sales Tank - Sour Mods
Client: Husky Oil	Tag #: N/A
Location: FLW	Tank Serial #: 028328-3
Job Coordinator: Braden Musyj	Site Supervisor: Dustin Henning
Location of Test:	
Floor to Shell Seam: N/A	Horizontal Seam: N/A
Non-Repadded Nozzles: X	Vertical Seam: N/A
Other: External flange to pipe nozzle welds	
Testing Instructions:	
Penetrant to be Used: See below	Dwell Time: 4 Hours min.
Ambient Conditions: Shop	Ambient Temperature: Shop
Additional Requirements: Penetrant to be used is diesel or other suitable penetrant	
Nozzles tested: N18 nozzle flange to pipe welds; N17 nozzle flange to pipe welds and nozzle to shell weld.	
Pre-Test Inspection:	
Item to be tested to be visually checked for completion prior to testing.	
Supervisor Sign-Off	Quality Control Sign-Off
Print:	Print: Ben Reed
Sign:	Sign:
Date:	Date: Mar 31, 2020
Comments:	
Test Record:	
Penetrant Used: Lubriplate Penetrating Oil	Date of Test: Mar 31, 2020
Dwell Time: 4 hours	Time of Test: 10:00 am
Result: Pass	
Ambient Conditions: Shop	Ambient Temperature: Shop
Comments: No leaks found	
Sign-Off	
Foremost Representative	Client Representative
Print: Ben Reed	Print:
Sign:	Sign:
Date: Mar 31, 2020	Date:






Penetrant Test Report

Foremost Job #: W03-066731	Tag Name: 1000BBL Sales Tank - Sour Mods
Client: Husky Oil	Tag #: N/A
Location: FLW	Tank Serial #: 028328-1
Job Coordinator: Braden Musyj	Site Supervisor: Dustin Henning
Location of Test:	
Floor to Shell Seam: N/A	Horizontal Seam: N/A
Non-Repadded Nozzles: X	Vertical Seam: N/A
Other: External flange to pipe nozzle welds	
Testing Instructions:	
Penetrant to be Used: See below	Dwell Time: 4 Hours min.
Ambient Conditions: Shop	Ambient Temperature: Shop
Additional Requirements: Penetrant to be used is diesel or other suitable penetrant	
Nozzles tested: N14a & b, N13, N16a-d, N9 - nozzle flange to pipe welds; N15 nozzle flange to pipe welds and nozzle to shell weld.	
Pre-Test Inspection:	
Item to be tested to be visually checked for completion prior to testing.	
Supervisor Sign-Off	Quality Control Sign-Off
Print: Derek Pendree	Print: Danton Weston
Sign:	Sign:
Date: Mar 5, 2020	Date: Mar 5, 2020
Comments:	
Test Record:	
Penetrant Used: Lubriplate Penetrating Oil	Date of Test: Mar 5, 2020
Dwell Time: 4 hours	Time of Test: 7:30am - 11:30am
Result: Pass, no evidence of wicking	
Ambient Conditions: In shop	Ambient Temperature: 15°C
Comments:	
Sign-Off	
Foremost Representative	Client Representative
Print: Danton Weston	Print:
Sign:	Sign:
Date: Mar 5, 2020	Date:



Penetrant Test Report

Foremost Job #: W03-066731		Tag Name: 1000BBL Sales Tank - Sour Mods	
Client: Husky Oil		Tag #: N/A	
Location: FLW		Tank Serial #: 028328-3	
Job Coordinator: Braden Musyj		Site Supervisor: Dustin Henning	
Location of Test:			
Floor to Shell Seam: N/A		Horizontal Seam: N/A	
Non-Repadded Nozzles: X		Vertical Seam: N/A	
Other: External flange to pipe nozzle welds			
Testing Instructions:			
Penetrant to be Used: See below		Dwell Time: 4 Hours min.	
Ambient Conditions: Shop		Ambient Temperature: Shop	
Additional Requirements: Penetrant to be used is diesel or other suitable penetrant			
Nozzles tested: N14a & b, N13, N16a-d, N9 - nozzle flange to pipe welds; N15 nozzle flange to pipe welds and nozzle to shell weld.			
Pre-Test Inspection:			
Item to be tested to be visually checked for completion prior to testing.			
Supervisor Sign-Off		Quality Control Sign-Off	
Print: Derek Pendree		Print: Danton Weston	
Sign: 		Sign: 	
Date: Mar 4, 2020		Date: Mar 4, 2020	
Comments:			
Test Record:			
Penetrant Used: Lubriplate Penetrating Oil		Date of Test: Mar 4, 2020	
Dwell Time: 4 hours		Time of Test: 9:45am - 2:00pm	
Result: Pass, no evidence of wicking			
Ambient Conditions: In shop		Ambient Temperature: 15°C	
Comments:			
Sign-Off			
Foremost Representative		Client Representative	
Print: Danton Weston		Print:	
Sign: 		Sign:	
Date: Mar 4, 2020		Date:	

Foremost Job #: W03-066731						Tag Name: 1000BBL Sales Tank - Sour Mod					
Client: Husky Oil						Tag #: N/A					
Location FLW						Tank Serial #: 028328-1					
Job Coordinator: Braden Musyj						Site Supervisor: Dustin Henning					
Location of Test											
Shell Nozzles: X						Roof Nozzles: X					
Other:											
Testing Instructions:											
Test Pressure: 15psi						Hold Time: Duration					
Testing Medium: Air / Soap Solution						Test Medium Temperature: >0°C					
Pressurizing Unit Used: Compressor w/ regulator						Ambient Temperature: >0°C					
Additional Requirements:											
Pre-Test Inspection:											
Nozzles to be visually inspected prior to testing.											
Supervisor Sign-Off						Quality Control Sign-Off					
Print: Derek Pendree						Print: Danton Weston					
Sign: [Signature]						Sign: [Signature]					
Date: Mar 5, 2020						Date: Mar 5, 2020					
Comments:											
Test Record:											
Nozzle #:	Size:	Pressure:	Result:	Initial:	Nozzle #:	Size:	Pressure:	Result:	Initial:		
N9	3" XS	15psi	Pass	[Signature]							
N13	3" XS	15psi	Pass	[Signature]							
N14a	4" XS	15psi	Pass	[Signature]							
N14b	4" XS	15psi	Pass	[Signature]							
N16a	4" XS	15psi	Pass	[Signature]							
N16b	4" XS	15psi	Pass	[Signature]							
N16c	4" XS	15psi	Pass	[Signature]							
N16d	4" XS	15psi	Pass	[Signature]							
N18	20" STD	15psi									
						Test Gauge Serial #: ED55684					
Sign-Off											
Foremost Representative						Client Representative					
Print: Derek Pendree						Print:					
Sign:						Sign:					
Date:						Date:					

Foremost Job #: W03-066731						Tag Name: 1000BBL Sales Tank - Sour Mod							
Client: Husky Oil						Tag #: N/A							
Location FLW						Tank Serial #: 028328-3							
Job Coordinator: Braden Musyj						Site Supervisor: Dustin Henning							
Location of Test													
Shell Nozzles:						X	Roof Nozzles:						X
Other:													
Testing Instructions:													
Test Pressure: 15psi						Hold Time: Duration							
Testing Medium: Air / Soap Solution						Test Medium Temperature: >0°C							
Pressurizing Unit Used: Compressor w/ regulator						Ambient Temperature: >0°C							
Additional Requirements:													
Pre-Test Inspection:													
Nozzles to be visually inspected prior to testing.													
Supervisor Sign-Off						Quality Control Sign-Off							
Print: Derek Pendree						Print: Danton Weston							
Sign: [Signature]						Sign: [Signature]							
Date: Mar 5, 2020						Date: Mar 5, 2020							
Comments:													
Test Record:													
Nozzle #:	Size:	Pressure:	Result:	Initial:	Nozzle #:	Size:	Pressure:	Result:	Initial:				
N9	3" XS	15psi	Pass	[Signature]									
N13	3" XS	15psi	Pass	[Signature]									
N14a	4" XS	15psi	Pass	[Signature]									
N14b	4" XS	15psi	Pass	[Signature]									
N16a	4" XS	15psi	Pass	[Signature]									
N16b	4" XS	15psi	Pass	[Signature]									
N16c	4" XS	15psi	Pass	[Signature]									
N16d	4" XS	15psi	Pass	[Signature]									
N18	20" STD	15psi											
					Test Gauge Serial #: ED55684								
Sign-Off													
Foremost Representative					Client Representative								
Print: Derek Pendree					Print:								
Sign: [Signature]					Sign:								
Date: MAR 5/2020					Date:								



Insulating Report

FIF-QMR-68

Foremost Job #:	W03-066731-1	Tag Name:	1000 bbl
Client:	Husky	Tag #:	
Location:	FLW	Tank Serial #:	028328-1
Job Coordinator:	Braden M.	Site Supervisor:	Dustin H.

Insulating

Chemical

Strokes	84	Res Batch#		Amount	12	Kgs
Thickness	Patch	Iso batch#		Amount	13	Kgs

Temperature

Hose	105	Prepping	Barry	Time	1
ISO	110	Prepping	Allen	Time	1
Resin	110	Prepping	Cody	Time	1
Tank	80				
AMB	80	Applicator	Cody	Time	1.5
Humidity	25%	Helper	Sasha	Time	1.5
Pressure	1600				

Sealing

Product	PSC 1050	Applicator	Jim	Time	1
Paint Name	Tankcoat	Helper	Allen	Time	1
Batch #					
Color	Black				
Amount	5 gals				

Q.C./Foreman Signature 

3rd Party Signature

Comments



Insulating Report

FIF-QMR-68

Foremost Job #:	W03-066731-2	Tag Name:	1000 bbl
Client:	Husky	Tag #:	
Location:	FLW	Tank Serial #:	028328-3
Job Coordinator:	Braden M.	Site Supervisor:	Dustin H.

Insulating


Chemical

Strokes	92	Res Batch#		Amount	13	Kgs
Thickness	Patch	Iso batch#		Amount	14	Kgs

Temperature

Hose	105	Prepping	Barry	Time	1.5
ISO	110	Prepping	Allen	Time	1.5
Resin	110	Prepping		Time	
Tank	80				
AMB	80	Applicator	Barry	Time	1.5
Humidity	25%	Helper	Allen	Time	1.5
Pressure	1600				

Sealing

Product	PSC 1050	Applicator	Jim	Time	1	
Paint Name	Tankcoat	Helper	Allen	Time	1	
Batch #						
Color	Black					
Amount	5 gals					
Q.C./Foreman Signature						
3rd Party Signature						
Comments						

ABRASIVE BLASTING DATA

Foremost Job #:	403-066731-1	Tank Name:	100661
Client:	Husky	Tag #:	
Location:	FLW	Tank Serial #:	028328+1
Job Coordinator:	Bradley M.	Site Supervisor:	Dustin Henning
Date:	Mar 27/20		
Blasted Area:	Nozzles + clips internal.		

STEEL CONTAMINANT TESTING:

SCAT Test Location:	Nitrate Levels:	Chloride Levels:	Sulphate Levels:	PH:

ENVIRONMENTAL DATA:

START TIME	AMIENT TEMP.	RELATIVE HUMIDITY	DEW POINT	STEEL TEMP.
9Am	-5°C	59%	-11.8°C	-4°C
END TIME	AMIENT TEMP.	RELATIVE HUMIDITY	DEW POINT	STEEL TEMP.

SPECIFICATION STANDARD:

TYPE AND GRADE OF ABRASIVE:

Internal:	Sp5	Starblast
External:		

Abrasive Checked for Cleanliness: ☐ Yes ☒ No

Surface Conforms to SP 0178: ☒ Yes ☐ No

BLOTTER TESTING:

Time:	8Am	Clean and Dry:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Time:		Clean and Dry:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Time:		Clean and Dry:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Time:		Clean and Dry:	<input type="checkbox"/> Yes <input type="checkbox"/> No

ANCHOR PROFILE MEASUREMENTS:

LOCATION / NOZZLE:	ANCHOR PROFILE:			DATE & TIME:	VERIFIED BY:
internal shell	3.1	3.0	3.3		

TESTEX TAPE:

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SIGN-OFF:

FOREMOST REPRESENTATIVE:		CLIENT REPRESENTATIVE:	
Print:	Jim German	Print:	
Sign:	[Signature]	Sign:	
Date:	April 1/20	Date:	



COATING DATA					
Foremost Job #: <u>W03-066731-1</u>		Tank Name: <u>1000 bbl.</u>			
Client: <u>Hu5ky</u>		Tag #:			
Location: <u>FLW</u>		Tank Serial #: <u>028328-1</u>			
Job Coordinator: <u>Braden M</u>		Site Supervisor: <u>Dustin Henning</u>			
Date: <u>Mar 30/20</u>					
Application Area: <u>Repairs (nozzles; clips)</u>					
PRODUCT INFORMATION:					
Coat #:	Product Description:	Batch #:	Application Method:	Colour:	
<u>1</u>	<u>Devco 253 HS A</u>	<u>06999AH</u>	<u>airless spray</u>	<u>green/blue</u>	
	<u>B VA4135UA</u>				
ENVIRONMENTAL DATA:					
START TIME	AMIENT TEMP.	RELATIVE HUMIDITY	DEW POINT	STEEL TEMP.	
<u>10:30AM</u>	<u>26°C</u>	<u>11.5%</u>	<u>-6.2°C</u>	<u>27.5°C</u>	
END TIME	AMIENT TEMP.	RELATIVE HUMIDITY	DEW POINT	STEEL TEMP.	
COATING THICKNESS MEASUREMENTS:					
Coat #:	WFT Avg.:	DFT Avg.:	DFT Min.:	DFT Max.:	Defects:
<u>1</u>	<u>15</u>	<u>13.5</u>	<u>9</u>	<u>19</u>	
COMMENTS:					
SIGN-OFF:					
Foremost Representative:			Client Representative:		
Print: <u>Juan German</u>			Print:		
Sign: <u>[Signature]</u>			Sign:		
Date: <u>April 1/20</u>			Date:		

COATING DATA

Foremost Job #: 403-066731-1		Tank Name: 1000 bbl.			
Client: Husky		Tag #:			
Location: FLW		Tank Serial #: 02832871			
Job Coordinator: Braden m		Site Supervisor: Dustin Henning			
Date: Mar 30:31 / 20					
Application Area: nozzles internal					
PRODUCT INFORMATION:					
Coat #:	Product Description:	Batch #:	Application Method:	Colour:	
1	Duane 253HS A	469949uH	roller	green	
	B	VA4135uH			
2	Duane 253HS A	469949uH	roller.	green	
	B	VA4135uH			
ENVIRONMENTAL DATA:					
START TIME	AMIENT TEMP.	RELATIVE HUMIDITY	DEW POINT	STEEL TEMP.	
① 9am	25°C	11.4%	-7.3°C	24°C	
END TIME	AMIENT TEMP.	RELATIVE HUMIDITY	DEW POINT	STEEL TEMP.	
② 8am	23°C	12.1%	-7.7°C	24°C	
COATING THICKNESS MEASUREMENTS:					
Coat #:	WFT Avg.:	DFT Avg.:	DFT Min.:	DFT Max.:	Defects:
1	9	6.5	4.1	8.2	
2	8	14	9	18	
COMMENTS:					
SIGN-OFF:					
Foremost Representative:			Client Representative:		
Print: Jim German			Print:		
Sign: [Signature]			Sign:		
Date: April 1/20			Date:		

COATING DATA

Foremost Job #: <u>W03-066731-1</u>		Tank Name: <u>1000 bbl.</u>	
Client: <u>Husky</u>		Tag #:	
Location: <u>FLW</u>		Tank Serial #: <u>0283281</u>	
Job Coordinator: <u>Braden M.</u>		Site Supervisor: <u>Dustin Henning</u>	
Date: <u>Mar 31/20</u>			
Application Area: <u>Floor + 1' of shell</u>			

PRODUCT INFORMATION:				
Coat #:	Product Description:	Batch #:	Application Method:	Colour:
<u>1</u>	<u>Devco III</u>	<u>A V68255UH</u> <u>B A10493UH</u>	<u>airless spray</u>	<u>grey</u>

ENVIRONMENTAL DATA:				
START TIME	AMIENT TEMP.	RELATIVE HUMIDITY	DEW POINT	STEEL TEMP.
<u>1pm</u>	<u>24°C</u>	<u>12.1%</u>	<u>-7.1°C</u>	<u>26°C</u>
END TIME	AMIENT TEMP.	RELATIVE HUMIDITY	DEW POINT	STEEL TEMP.

COATING THICKNESS MEASUREMENTS:					
Coat #:	WFT Avg.:	DFT Avg.:	DFT Min.:	DFT Max.:	Defects:
<u>1</u>	<u>15</u>	<u>14</u>	<u>10</u>	<u>18</u>	

COMMENTS:
<u>Floor and 1 ft. of shell was sweep blasted and coated with III.</u>

SIGN-OFF:	
Foremost Representative:	Client Representative:
Print: <u>Jim German</u>	Print:
Sign: <u>[Signature]</u>	Sign:
Date: <u>April 1/20</u>	Date:

ABRASIVE BLASTING DATA

Foremost Job #:	403-066731-2				Tank Name:	1000 bbl.			
Client:	Husky				Tag #:				
Location:	FLW				Tank Serial #:	028320-3			
Job Coordinator:	Brandon M.				Site Supervisor:	Dustin Henning			
Date:	April 1/20								
Blasted Area:	Nozzles + clips.								
STEEL CONTAMINANT TESTING:									
SCAT Test Location:	Nitrate Levels:	Chloride Levels:	Sulphate Levels:	PH:					
ENVIRONMENTAL DATA:									
START TIME	AMIENT TEMP.	RELATIVE HUMIDITY	DEW POINT	STEEL TEMP.					
1pm	-16°C	71%	-20°C	-12°C					
END TIME	AMIENT TEMP.	RELATIVE HUMIDITY	DEW POINT	STEEL TEMP.					
4pm	-17°C	69%	-21.3°C	-12.9°C					
SPECIFICATION STANDARD:					TYPE AND GRADE OF ABRASIVE:				
Internal:	Sp5								
External:									

Abrasive Checked for Cleanliness: ☐ Yes ☒ No
 Surface Conforms to SP 0178: ☒ Yes ☐ No

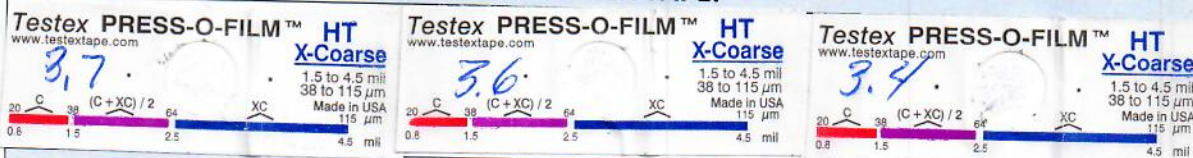
BLOTTER TESTING:

Time: 11Am	Clean and Dry:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Time:	Clean and Dry:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Time:	Clean and Dry:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Time:	Clean and Dry:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

ANCHOR PROFILE MEASUREMENTS:

LOCATION / NOZZLE:	ANCHOR PROFILE:	DATE & TIME:	VERIFIED BY:
internal	3.7 3.6 3.4	April 2/20 8Am	SD

TESTEX TAPE:



SIGN-OFF:

FOREMOST REPRESENTATIVE:		CLIENT REPRESENTATIVE:	
Print: Jim Gorman		Print:	
Sign: [Signature]		Sign:	
Date: April 2/20		Date:	

COATING DATA

Foremost Job #:	403-066731-2	Tank Name:	1000 bbl
Client:	Husky	Tag #:	
Location:	FL W	Tank Serial #:	028328-13
Job Coordinator:	Graden M.	Site Supervisor:	Dustin Henning
Date:	April 23/20		
Application Area:	NOZZLES internal		

PRODUCT INFORMATION:

Coat #:	Product Description:	Batch #:	Application Method:	Colour:
1	Devco 253 Hs		Roller	green
	A 469949AH			
	B VA4135AH			
2	Devco 253 Hs		Roller	green
	A 469949AH			
	B VA4135AH			

ENVIRONMENTAL DATA:

START TIME	AMIENT TEMP.	RELATIVE HUMIDITY	DEW POINT	STEEL TEMP.
11Am	24°C	11.2%	-8.1°C	26°C
END TIME	AMIENT TEMP.	RELATIVE HUMIDITY	DEW POINT	STEEL TEMP.
9Am	25°C	11	-7.5°C	27°C

COATING THICKNESS MEASUREMENTS:

Coat #:	WFT Avg.:	DFT Avg.:	DFT Min.:	DFT Max.:	Defects:
1	8	6	4	10	
2	8	13.2	9	18.4	

COMMENTS:

SIGN-OFF:

Foremost Representative:		Client Representative:	
Print:	Jim Gorman	Print:	
Sign:	[Signature]	Sign:	
Date:	April 6/20	Date:	



FIF-QMR-71

HOLIDAY TESTING

Foremost Job #:	403-066731-2	Tank Name:	1000 bbl.
Client:	Husky	Tag #:	
Location:	FLW	Tank Serial #:	028328-3
Job Coordinator:	Braden M.	Site Supervisor:	Dustin Henning
HOLIDAY TESTING EQUIPMENT:			
Inspection Equipment Used:	2v Linker	Voltage Used:	67.5
Serial Number:	28090	Make / Model:	Linker + Razor
Calibration Date:	Feb 14/20		m1
TESTING:			
Specification:	SP0 183	Date & Time:	April 6/20
Area Tested:	Shell	No. of Holidays:	2
Area Tested:	nozzles int	No. of Holidays:	0
Area Tested:	Floor	No. of Holidays:	4
Area Tested:		No. of Holidays:	
Area Tested:		No. of Holidays:	
Area Tested:		No. of Holidays:	
Area Tested:		No. of Holidays:	
Area Tested:		No. of Holidays:	
Cause of Holiday(s):	shell - welds Floor - pin hole; welds.		
COMMENTS:			
SIGN-OFF:			
Foremost Representative:		Client Representative:	
Print:	Jim Germain	Print:	
Sign:	[Signature]	Sign:	
Date:	April 7/20	Date:	