

CODE SHEET

VISTA Projects Limited VENDOR DRAWING/DOCUMENT SQUAD CHECK			
A	Reviewed without exception. Proceed with fabrication. Issue final drawings/documents.		
B	Reviewed except as marked and/or noted. Proceed with fabrication and resubmit drawing/document. Shipment will not be released, if any drawings/documents requiring approval, as per purchase order conditions, are at this code.		
C	Not accepted. Revise as marked and resubmit drawing/document for review. Shipment will not be released, if any drawings/documents requiring approval, as per purchase order conditions, are at this code.		
D	Not required for review. Received for information.		
Reviewed only as to general conformity with the design concept and specifications provided. The engineer does not warrant or represent that the information contained on this drawing/document is either accurate or complete. Sole responsibility for correct design, detail and dimensions shall remain with the party submitting the drawing/document.			
SDR CODE	EQUIPMENT TAG	REVIEWED BY	DATE
DM02	V-8010	D. Lemon	2012-03-14

PROJECT NAME: Murphy Oil - 1780-013

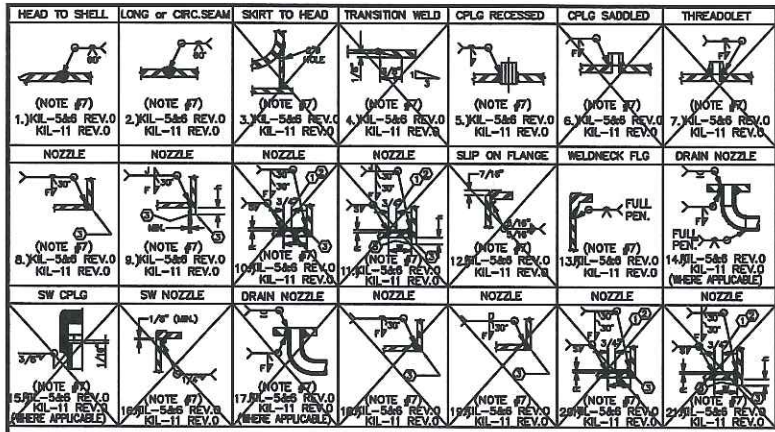
VENDOR NAME: Kootenay Industries Ltd.

DOCUMENT NUMBER: 12-025-A

VENDOR REVISION: 3

DOCUMENT DESCRIPTION: H.P. Flare Knockout Drum - V8010
(Sour Service)

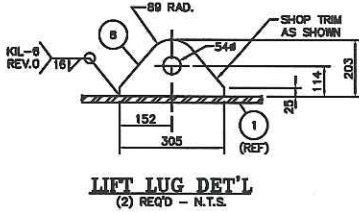
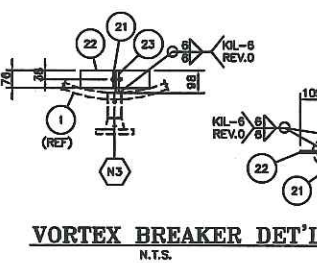
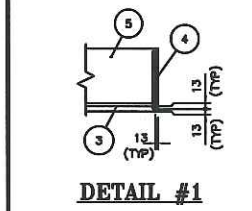
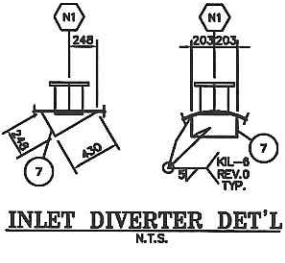
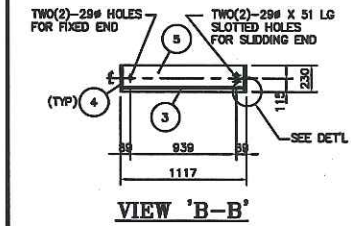
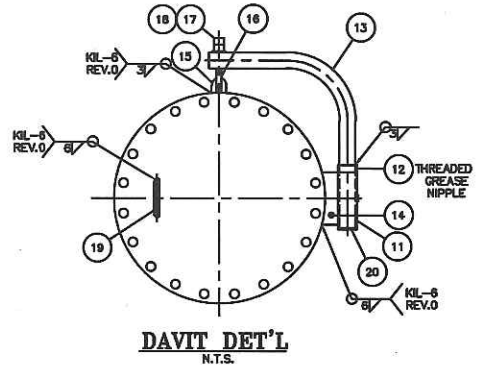
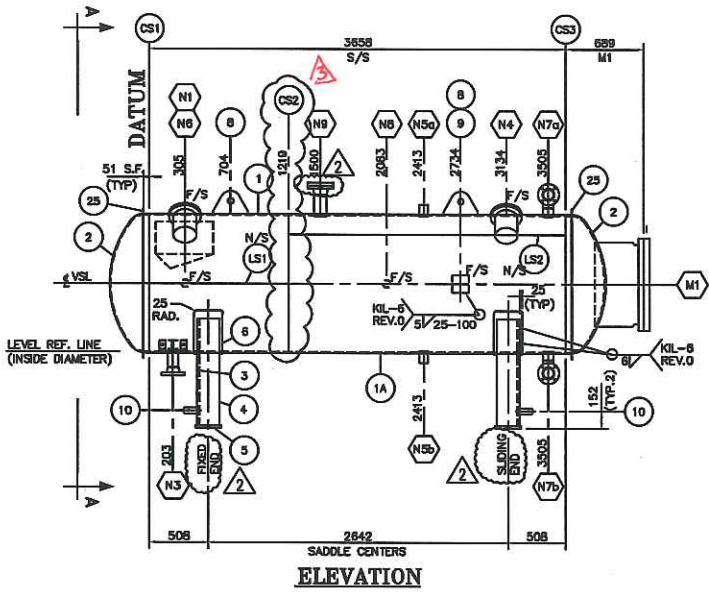
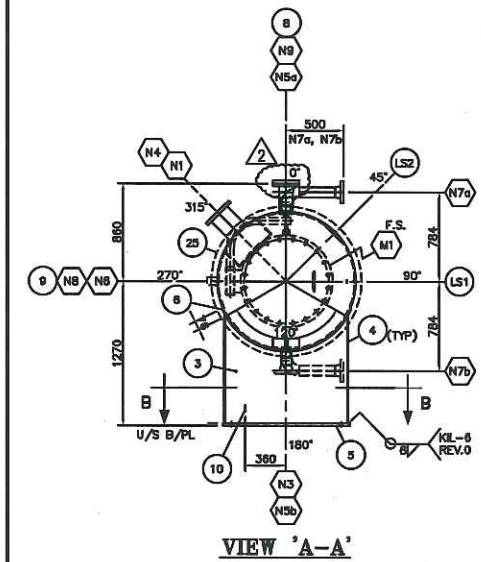
VENDOR TRANSMITTAL NUMBER: #7



DESIGN DATA
 20.10. ASME CODE SEC: VIII DIV. 1. ADD.: 2011
 PARA: UG-11(a)
 HEAD MATERIAL: SA-516-70N 0.375" (10 mm) NOM. WALL 0.3125" (8 mm MIN)
 SHELL MATERIAL: SA-516-70N 0.375" (10 mm) NOM. WALL
 MDMT: -20°F (-28°C) @ 80 PSIG (345 kPa)
 NOZZLE: SA-105N/SA-106-B SMLS FLANGES: SA-105N
 M.A.W.P.: 80 PSIG (345 kPa) / FULL VACUUM. TEMP.: 473°F (245°C)
 HYDROTEST: 85 PSIG (448 kPa) RADIOGRAPHY: RT-1 (FULL INCLUDE NOZZLE B.W.)
 STRESS RELIEVE: 60 MINUTES @ 1150°F ±25°F
 CORR. ALLOW.: 0.125" (3.2 mm) JOINT EFF.: LS-100% / CS-100%
 VOLUME: 182.98 CU. FT. (5.182 CU. M)
 EMPTY WT.: 8120 LBS (2778 Kg) FULL WT.: 18300 LBS (7394 Kg)
 YEAR BUILT: 2012 SERIAL No.: 12-025.HS
 CRN No.: SEE NOTE 9 CRN REFERENCE DRAWING No.:
 W.P.R. No.: WF-2840.2 AQP No.: 1479
 SURFACE PREP.: SSPC-SP9
 PRIME: 2 COATS OF RUST-OLEUM 7088 TAG No.: V-8010
 PAINT: 1 COAT OF RUST-OLEUM 808
 INSULATION: SEE NOTE 16 LOCATION: CADOTTE 13-09-085-17 W5M

MARK NO.	NO. REQ'D	SIZE	SCH.	RATING AND FACING	SERVICE	PROJECTION		FILLET		REPAD		WELD#
						INSIDE(mn)	OUTSIDE	"r"	"r"	"r"	"r"	
N1	1	6"	---	CL150 RFLWN	INLET	0	250mm	3/8"	---	---	---	8
N3	1	3"	180	CL150 RFLWN	LIQUID OUTLET	0	200mm	3/8"	---	---	---	8,13
N4	1	6"	---	CL150 RFLWN	VAPOR OUTLET	0	250mm	3/8"	---	---	---	8
N5a/b	2	2"	---	CL3000 CPLG	LG	---	---	---	---	---	---	5
N6	1	2"	---	CL3000 CPLG	TG	---	---	---	---	---	---	5
N7a/b	2	3"	160	CL150 RFLWN	LT	0	175mm	3/8"	---	---	---	8,13
N8	1	2"	---	CL3000 CPLG	LSH	---	---	---	---	---	---	5
N9	1	4"	160	CL150 RFLWN	SPARE C/W BLIND	0	250mm	3/8"	---	---	---	8,13
M1	1	24"	---	CL150 RFLWN	HW W/ BLIND & DAWT	0	AS SHOWN	3/8"	---	---	---	8

- WPS NOTES:**
- 2 WEEPHOLES REQUIRED WHEN PAD IS SPLIT.
 - WEEPHOLES 1/8" NPT UNLESS NOTED ON VESSEL DWG.
 - RADIUS AS PER UG-76
 - WPS KIL-6 REV.0 IS ACCEPTABLE FOR ALL TACK WELDS.
 - OMIT 2" OF WELD ON WEAR PLATE LOW POINT.



- GENERAL NOTES:**
- IMPACT TESTING OF ALL COMPONENTS ARE EXEMPT PER UCS-66(c) AND UCS-68(c). MDMT IS -20°C @ 345 kPa g.
 - MTR TO BE PROVIDED FOR ALL PRESSURE RETAINING MATERIAL.
 - EXTERNAL LOADINGS ARE NOT APPLICABLE (REF. UG-22) UNLESS NOTED OTHERWISE. NOZZLE LOAD TO BE PER VISTA'S PV EXTERNAL LOAD TABLE.
 - DIMENSIONAL TOLERANCES AS PER KOOTENAY ENGR. SPEC. KI-004 REV.0.
 - ALL BOLT HOLES TO STRADDLE CENTERLINES.
 - SUBSTITUTION OF MATERIAL OTHER THAN LISTED BELOW IS NOT ACCEPTABLE UNLESS ENGINEERING DEPARTMENT APPROVAL OBTAINED.
 - WELDING JOINT PREPARATION AND FIT-UP AS PER KOOTENAY ENGR. SPEC KI-003 REV.0.
 - ADJUST DIMENSION TO MAINTAIN INSIDE PROJECTION.
 - VESSEL NOT TO BE REGISTERED.
 - PRE-HEAT HEADS AND SHELL TO 200°F PRIOR TO WELDING.
 - ALL SHARP CORNERS SHALL BE ROUNDED PER UG-76.
 - ALL DIMENSION ARE IN MILLIMETERS UNLESS NOTED.
 - UT: 100% CAT 'D' WELDS (BEFORE AND AFTER PWHT)
 - MP: 100% ON ALL FILLET WELDS (BEFORE AND AFTER PWHT)
 - HARDNESS TESTING: MAX 200 BHN (BEFORE AND AFTER PWHT)
 - INSULATION: VESSEL FULLY INSULATED WITH 1 1/2" THICK MINERAL WOOL W/ALUMINUM CLADDING. FLANGES NOT INSULATED.
 - ELECTRICAL HEAT TRACING:
 - FREEZE PROTECTION HEAT TRACING.
 - INCLUDES HEAT TRACE, JUNCTION BOX RTD, SS BANDING/STRAPPING AND CAUTION LABELS.
 - BOTTOM HALF OF VESSEL ONLY.
 - DESIGN PRESSURE SHALL BE 345 kPa g / FULL VACUUM BUT STAMP FOR 100 kPa g - UNREGISTERED.

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	MAT'L
1	1	SHELL - 48" OD (1219 mm) x 4'-0" S/S (1219 mm) x 0.375" THK. (10 mm)	SA-516-70N
1A	1	SHELL - 48" OD (1219 mm) x 8'-0" S/S (2438 mm) x 0.375" THK. (10 mm)	SA-516-70N
2	2	HEADS - 48" OD (1219 mm) 2:1 S.E. X 0.375" NOM. (10 mm) [0.3125" MIN. (8 mm)] WITH 2" S.F. (51 mm)	SA-516-70N
3	2 PCS	WEB PLATE - 3/8" THK X 42" WD X 36 13/16" HT	SA-36
4	4 PCS	SIDE PLATE - 3/8" THK X 8" WD X 36 13/16" HT	SA-36
5	2 PCS	BASE PLATE - 1" THK X 9" WD X 44" LG	SA-36
6	2 PCS	WEAR PLATE - 3/8" THK X 10" WD X 57" LG (R.T. 48" ID), W/WEEP HOLE	SA-516-70N
7	3 PCS	INLET DIVERTER - 3/8" PL (CUT PER DWG DET'L)	SA-516-70N
8	2	LIFT LUG - 3/4" THK X 12" WD X 6" HT (CTS)	SA-516-70N
9	1	NAME PLATE C/W MOUNTING BRACKET	SS/SA-36
10	2	GROUND LUG - 1/4" THK X 2" WD X 5" LG	SA-36
11	1	DAVIT SLEEVE - 2" SCH. XH. SMLS PIPE X 10" LG (CTS)	SA-106-B
12	1	RING - 2" SCH. XH. SMLS PIPE X 1" LG	SA-106-B
13	1	DAVIT ARM - 1 1/2" SCH. XH. SMLS PIPE X 62" LG (CTS)	SA-106-B
14	1	PLATE - 5/8" THK. X 2" WD X 8" LG	SA-36
15	1	U BAR - 5/8" ROUND BAR 6" LG (BEND AS SHOWN)	SA-36
16	1	EYE BOLT - 5/8" ROUND BAR X 17" LG (BEND AS SHOWN)	SA-36
17	1	WASHER - 5/8"	S.S.
18	2	NUTS - 5/8"	2H
19	1	HANDLE - 5/8" ROUND BAR X 14" LG (BEND AS SHOWN)	SA-36
20	1	BLIND END - 1/4" PL X 2 3/8" OD	SA-36
21	1	VORTEX BREAKER - 3/8" PL X 9" LG X 3" W	SA-36
22	2	VORTEX BREAKER - 3/8" PL X 4 5/16" LG X 3" W	SA-36
23	2	SUPPT - 3/8" PL X 3 7/8" LG X 2" W (SEE DET'L)	SA-516-70N
24	2	BOLTS - 1/2" X 1 1/2" LG C/W ONE(1) NUT EACH, ONE(1) 316 SS WASHER EACH	316SS
25	2	INSULATION RING - 1/4" PL X 52" OD X 48 1/8" ID	SA-516-70N
N1	1	FLANGE - 6" CL150 RFLWN X 11" LG (CUT TO 10 13/16" LG) (0.88" WT)	SA-105N
N3	1	FLANGE - 3" CL150 RFLWN SCH. 180 BORE	SA-105N
	1 PC	NECK - 3" SCH. 160 SMLS PIPE X 5 11/16" LG	SA-106-B
(N4)	1	FLANGE - 6" CL150 RFLWN X 11" LG (CUT TO 10 13/16" LG) (0.88" WT)	SA-105N
N5a/b	2	LONG CPLG - 2" CL3000 NPT X 102 mm LG (LG-8010)	SA-105N
N6	1	LONG CPLG - 2" CL3000 NPT X 102 mm LG (TG-8010)	SA-105N
N7a/b	2	FLANGE - 3" CL150 RFLWN SCH. 180 BORE (LT-8010)	SA-105N
	2 PC	NECK - 3" SCH. 160 SMLS PIPE X 3" LG	SA-106-B
	2	ELBOW - 3" SCH. 160 X 90° LR	SA-234-WPB
	2 PC	NECK - 3" SCH. 160 SMLS PIPE X 12 3/16" LG	SA-106-B
N8	1	LONG CPLG - 2" CL3000 NPT X 102 mm LG (LSH-8011)	SA-105N
N9	1	FLANGE - 4" CL150 RFLWN SCH. 180 BORE	SA-105N
	1 PC	NECK - 4" SCH. 160 SMLS PIPE X 7 7/16" LG	SA-106-B
	1	BLIND FLANGE - 4" CL150 RF	SA-105N
	1	GASKET - 4" CL150 RF, 1/8" THK, GRAPHITE FILLED	316 SS
	8	STUD - 5/8" X 3 1/2" LG C/W 2 HEX. NUTS EA.	87M/2HM
M1	1	FLANGE - 24" CL150 RFLWN X 17" LG (1.12" WT)	SA-105N
	1	BLIND FLANGE - 24" CL150 RF	SA-105N
	1	GASKET - 24" CL150 RF, 1/8" THK, GRAPHITE FILLED	316 SS
	20	STUD - 1 1/4" X 6 3/4" LG C/W 2 HEX. NUTS EA.	87M/2HM

(1) REQ'D
 TIME CARD
 12-025-HS

REV.	DESCRIPTION	APP'D	DATE	BY	DATE
Δ	REVISED SHELL LENGTH TO 4'-0" AND 8'-0"			CF	12-03-06
Δ	REVISED AS PER MARK UP / ISSUED FOR CONSTR.	KT	12-02-02	CF	12-02-02
Δ	REVISED AS PER MARK UP	KT	11-12-01	KS	12-01-02
Δ	ISSUED FOR APPROVAL	KT	11-12-01	KS	11-12-01

KOOTENAY INDUSTRIES LTD.
 CALGARY, ALBERTA

DRAWN BY: KS
 CHECKED BY: KT

S/N: 12-025.HS

DATE: 11-12-01
 SCALE: 1:30

CADOTTE PILOT CSS 13-09-085-17 W5M
 1219mm OD x 3658mm S/S 345 kPa/F.V. x 245°C x 3.2mm CA
 H.P. FLARE KNOCKOUT DRUM - V-8010
 (SOUR SERVICE)

MURPHY OIL CORP.
 o/o VISTA PROJECTS LIMITED.

12-025-A

CODE SHEET

VISTA Projects Limited VENDOR DRAWING/DOCUMENT SQUAD CHECK			
A	Reviewed without exception. Proceed with fabrication. Issue final drawings/documents.		
B	Reviewed except as marked and/or noted. Proceed with fabrication and resubmit drawing/document. Shipment will not be released, if any drawings/documents requiring approval, as per purchase order conditions, are at this code.		
C	Not accepted. Revise as marked and resubmit drawing/document for review. Shipment will not be released, if any drawings/documents requiring approval, as per purchase order conditions, are at this code.		
D	Not required for review. Received for information.		
Reviewed only as to general conformity with the design concept and specifications provided. The engineer does not warrant or represent that the information contained on this drawing/document is either accurate or complete. Sole responsibility for correct design, detail and dimensions shall remain with the party submitting the drawing/document.			
SDR CODE	EQUIPMENT TAG	REVIEWED BY	DATE
DM02	V-8020	D. Lemov	2012-03-14

PROJECT NAME: Murphy Oil 1780-013

VENDOR NAME: Kootenay Industries Ltd.

DOCUMENT NUMBER: 12-026-A

VENDOR REVISION: 3

DOCUMENT DESCRIPTION: L.P. Flare Knockout Drum - V 8020
(sour service)

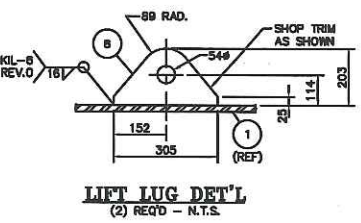
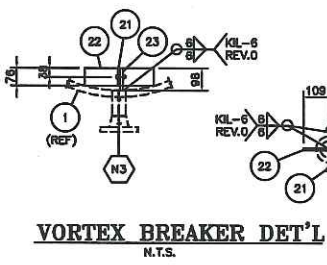
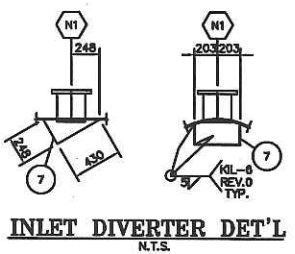
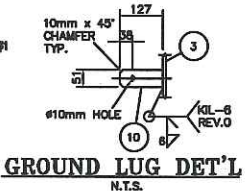
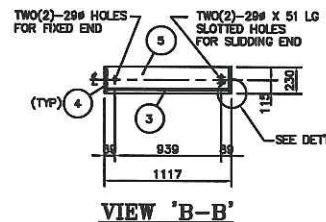
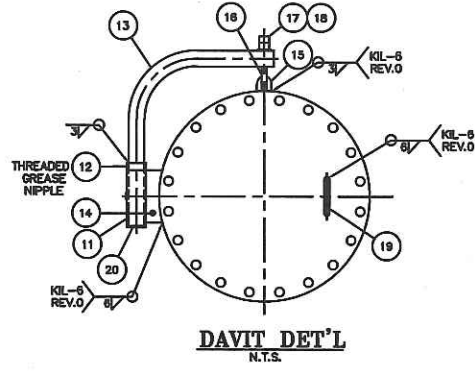
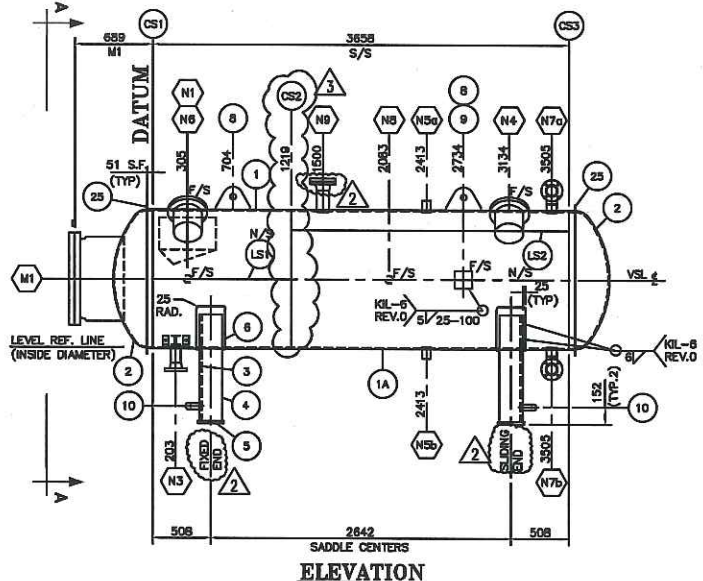
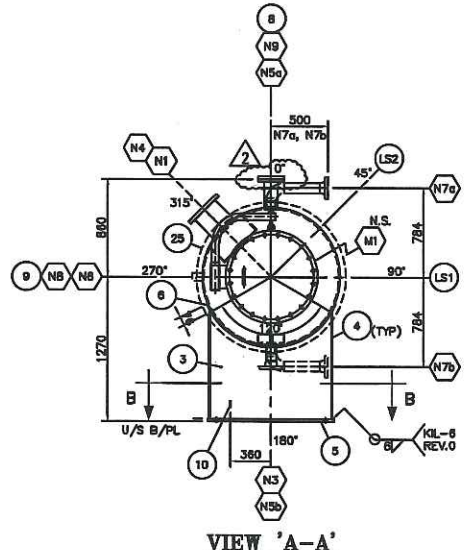
VENDOR TRANSMITTAL NUMBER: #7

HEAD TO SHELL	LONG OR CIRC. SEAM	SHORT TO HEAD	TRANSITION WELD	CPLG RECESSED	CPLG SADDLED	THREADOLET
(NOTE #7) 1. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 2. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 3. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 4. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 5. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 6. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 7. KIL-568 REV.0 KIL-11 REV.0
(NOTE #7) 8. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 9. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 10. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 11. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 12. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 13. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 14. KIL-568 REV.0 KIL-11 REV.0
(NOTE #7) 15. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 16. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 17. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 18. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 19. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 20. KIL-568 REV.0 KIL-11 REV.0	(NOTE #7) 21. KIL-568 REV.0 KIL-11 REV.0

DESIGN DATA
 20.10. ASME CODE SEC. VIII DIV. 1. ADD.: 2011.
 PARA: UG-110.
 HEAD MATERIAL: SA-516-70N 0.375" (10 mm) NOM WALL 0.3125" (8 mm MIN).
 SHELL MATERIAL: SA-516-70N 0.375" (10 mm) NOM WALL.
 MDMT: -20°F (-28°C) @ 50 PSIG (345 kPa).
 NOZZLE: SA-105N/SA-106-B SMLS FLANGES: SA-105N.
 M.A.W.P.: 50 PSIG (345 kPa) / FULL VACUUM. TEMP.: 473°F (245°C).
 HYDROTEST: 85 PSIG (588 kPa) RADIOGRAPHY: RT-1 (FULL INCLUDE NOZZLE & W).
 STRESS RELIEVE: 60 MINUTES @ 1150°F ±25°F.
 CORR. ALLOW.: 0.125" (3.2 mm) JOINT EFF.: LS-100% / CS-100%.
 VOLUME: 182.98 CU FT (5.162 CU M).
 EMPTY WT.: 8120 LBS (3728 Kg) FULL WT.: 16300 LBS (7394 Kg).
 YEAR BUILT: 2012 SERIAL No.: 12-026.HS
 CRN No.: SEE NOTE 9 CRN REFERENCE DRAWING No.:
 W.P.R. No.: WF-2840.2 AQP No.: 1478
 SURFACE PREP.: SSPC-SP9
 PRIME: 2 COATS OF RUST-OLEUM 7000 TAG No.: V-8020
 PAINT: 1 COAT OF RUST-OLEUM 906
 INSULATION: SEE NOTE 16 LOCATION: CADOTTE 13-09-085-17 W5M

MARK NO.	NO. REQ'D	SIZE	SCH.	RATING AND FACING	SERVICE	PROJECTION		FILLET		REPAD		WELD#
						INSIDE(MIN)	OUTSIDE	"r"	"R"	"w"	"R"	
N1	1	8"	----	CL150 RFLWN	INLET	0	250mm	3/8"	----	----	----	8
N3	1	3"	160	CL150 RFLWN	LIQUID OUTLET	0	200mm	3/8"	----	----	----	8,13
N4	1	8"	----	CL150 RFLWN	VAPOR OUTLET	0	250mm	3/8"	----	----	----	8
N5a/b	2	2"	----	CL3000 CPLG	LG	----	----	3/8"	----	----	----	5
N6	1	2"	----	CL3000 CPLG	TG	----	----	3/8"	----	----	----	5
N7a/b	2	3"	160	CL150 RFLWN	LT	0	175mm	3/8"	----	----	----	8,13
N8	1	2"	----	CL3000 CPLG	LSH	----	----	3/8"	----	----	----	5
N9	1	4"	160	CL150 RFLWN	SPARE C/W BLIND	0	250mm	3/8"	----	----	----	8,13
M1	1	24"	----	CL150 RFLWN	W/W BLIND & DAWT	0	AS SHOWN	3/8"	----	----	----	8

- WPS NOTES:**
- 2 WEEPHOLES REQUIRED WHEN PAD IS SPLIT.
 - WEEPHOLES 1/8" NPT UNLESS NOTED ON VESSEL DWG.
 - RADIUS AS PER UG-76
 - WPS KIL-6 REV.0 IS ACCEPTABLE FOR ALL TACK WELDS.
 - OMIT 2" OF WELD ON WEAR PLATE LOW POINT.



- GENERAL NOTES:**
- IMPACT TESTING OF ALL COMPONENTS ARE EXEMPT PER UCS-68(a) AND UCS-68(c). MDMT IS -20°F @ 345 kPa g.
 - MTR TO BE PROVIDED FOR ALL PRESSURE RETAINING MATERIAL.
 - EXTERNAL LOADINGS ARE NOT APPLICABLE (REF. UG-22) UNLESS NOTED OTHERWISE. NOZZLE LOAD TO BE PER VISTA'S PV EXTERNAL LOAD TABLE.
 - DIMENSIONAL TOLERANCES AS PER KOOTENAY ENGR. SPEC. KI-004 REV.0.
 - ALL BOLT HOLES TO STRADDLE CENTERLINES.
 - SUBSTITUTION OF MATERIAL OTHER THAN LISTED BELOW IS NOT ACCEPTABLE UNLESS ENGINEERING DEPARTMENT APPROVAL OBTAINED.
 - WELDING JOINT PREPARATION AND FIT-UP AS PER KOOTENAY ENGR. SPEC KI-003 REV.0.
 - ADJUST DIMENSION TO MAINTAIN INSIDE PROJECTION.
 - VESSEL NOT TO BE REGISTERED.
 - PRE-HEAT HEADS AND SHELL TO 200°F PRIOR TO WELDING.
 - ALL SHARP CORNERS SHALL BE ROUNDED PER UG-76.
 - ALL DIMENSION ARE IN MILLIMETERS UNLESS NOTED.
 - UT: 100% CAT 'D' WELDS (BEFORE AND AFTER PWHT)
 - MPR: 100% ON ALL FILLET WELDS (BEFORE AND AFTER PWHT)
 - HARDNESS TESTING: MAX 200 BRN (BEFORE AND AFTER PWHT)
 - INSULATION: VESSEL FULLY INSULATED WITH 1 1/2" THICK MINERAL WOOL W/ALUMINUM CLADDING. FLANGES NOT INSULATED.
 - ELECTRICAL HEAT TRACING: (1) FREEZE PROTECTION HEAT TRACING. (2) INCLUDES HEAT TRACE, JUNCTION BOX RTD, SS BANDING/STRAPPING AND CAUTION LABELS. (3) BOTTOM HALF OF VESSEL ONLY.
 - DESIGN PRESSURE SHALL BE 345 kPa g / FULL VACUUM BUT STAMP FOR 100 kPa g - UNREGISTERED.

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	MAT'L
3	1	SHELL - 48" OD (1219 mm) x 4'-0" S/S (1219 mm) x 0.375" THK. (10 mm)	SA-516-70N
3	1A	SHELL - 48" OD (1219 mm) x 8'-0" S/S (2438 mm) x 0.375" THK. (10 mm)	SA-516-70N
2	2	HEADS - 48" OD (1219 mm) 2:1 S.E. X 0.375" NOM. (10 mm) [0.3125" MIN. (8 mm)] WITH 2" S.F. (51 mm)	SA-516-70N
3	2 PCS	WEB PLATE - 3/8" THK X 42" WD X 36 13/16" HT	SA-36
4	4 PCS	SIDE PLATE - 3/8" THK X 8" WD X 36 13/16" HT	SA-36
5	2 PCS	BASE PLATE - 1" THK X 9" WD X 44" LG	SA-36
6	2 PCS	WEAR PLATE - 3/8" THK X 10" WD X 57" LG (R.T. 48" ID), W/WEEP HOLE	SA-516-70N
7	3 PCS	INLET DIVERTER - 3/8" PL (CUT PER DWG DET'L)	SA-516-70N
8	2	LIFT LUG - 3/4" THK X 12" WD X 8" HT (CTS)	SA-516-70N
9	1	NAME PLATE C/W MOUNTING BRACKET	SS/SA-36
10	2	GROUND LUG - 1/4" THK X 2" WD X 5" LG	SA-36
11	1	DAVIT SLEEVE - 2" SCH. XH SMLS PIPE X 10" LG (CTS)	SA-106-B
12	1	RING - 2" SCH. XH SMLS PIPE X 1" LG	SA-106-B
13	1	DAVIT ARM - 1 1/2" SCH. XH SMLS PIPE X 62" LG (CTS)	SA-106-B
14	1	PLATE - 5/8" THK. X 2" WD X 8" LG	SA-36
15	1	U BAR - 5/8" ROUND BAR 6" LG (BEND AS SHOWN)	SA-36
16	1	EYE BOLT - 5/8" ROUND BAR X 17" LG (BEND AS SHOWN)	SA-36
17	1	WASHER - 5/8"	S.S.
18	2	NUTS - 5/8"	2H
19	1	HANDLE - 5/8" ROUND BAR X 14" LG (BEND AS SHOWN)	SA-36
20	1	BLIND END - 1/4" PL X 2 3/8" OD	SA-36
21	1	VORTEX BREAKER - 3/8" PL X 9" LG X 3" W	SA-36
22	2	VORTEX BREAKER - 3/8" PL X 4 5/16" LG X 3" W	SA-36
23	2	SUPP'T - 3/8" PL X 3 7/8" LG X 2" W (SEE DET'L)	SA-516-70N
24	2	BOLTS - 1/2" X 1 1/2" LG C/W ONE(1) NUT EACH, ONE(1) 316 SS WASHER EACH	316SS
25	2	INSULATION RING - 1/4" PL X 52" OD X 48 1/8" ID	SA-516-70N
N1	1	FLANGE - 8" CL150 RFLWN X 11" LG (0.88" WT)	SA-105N
N3	1	FLANGE - 3" CL150 RFLWN SCH. 160 BORE	SA-105N
1	PC	NECK - 3" SCH. 160 SMLS PIPE X 5 11/16" LG	SA-106-B
N4	1	FLANGE - 8" CL150 RFLWN X 11" LG (0.88" WT)	SA-105N
N5a/b	2	LONG CPLG - 2" CL3000 NPT X 102 mm LG (LG-8020)	SA-105N
N6	1	LONG CPLG - 2" CL3000 NPT X 102 mm LG (TG-8020)	SA-105N
N7a/b	2	FLANGE - 3" CL150 RFLWN SCH. 160 BORE (UT-8020)	SA-105N
2	PC	NECK - 3" SCH. 160 SMLS PIPE X 3" LG	SA-106-B
2	PC	ELBOW - 3" SCH. 160 X 90° LR	SA-234-WPB
2	PC	NECK - 3" SCH. 160 SMLS PIPE X 12 3/16" LG	SA-106-B
N8	1	LONG CPLG - 2" CL3000 NPT X 102 mm LG (LSH-8021)	SA-105N
N9	1	FLANGE - 4" CL150 RFLWN SCH. 160 BORE	SA-105N
1	PC	NECK - 4" SCH. 160 SMLS PIPE X 7 7/16" LG	SA-106-B
1	PC	BLIND FLANGE - 4" CL150 RF	SA-105N
1	PC	GASKET - 4" CL150 RF, 1/8" THK, GRAPHITE FILLED	316 SS
8	PC	STUD - 5/8" X 3 1/2" LG C/W 2 HEX. NUTS EA.	87M/2HM
M1	1	FLANGE - 24" CL150 RFLWN X 17" LG (1.12" WT)	SA-105N
1	PC	BLIND FLANGE - 24" CL150 RF	SA-105N
1	PC	GASKET - 24" CL150 RF, 1/8" THK, GRAPHITE FILLED	316 SS
20	PC	STUD - 1 1/4" X 6 3/4" LG C/W 2 HEX. NUTS EA.	87M/2HM

(1) REQ'D
 TIME CARD
 12-026-HS

REV.	DESCRIPTION	APP'D	DATE	BY
1	REVISED SHELL LENGTH TO 4'-0" AND 8'-0"	KT	12-03-06	CF
2	REVISED AS PER MARK UP / ISSUED FOR CONSTR.	KT	12-02-02	CF
3	REVISED AS PER MARK UP	KT	11-12-01	KS
4	ISSUED FOR APPROVAL	KT	11-12-01	KS

KOOTENAY INDUSTRIES LTD.
 CALGARY, ALBERTA

DRAWN BY: KS
 CHECKED BY: KT

S/N: 12-026.HS

DATE: 11-12-01
 SCALE: 1:30

CADOTTE PILOT CSS 13-09-085-17 W5M
 1219mm OD x 3658mm S/S 345 kPa/F.V. x 245°C x 3.2mm CA
 L.P. FLARE KNOCKOUT DRUM - V-8020
 (SOUR SERVICE)

MURPHY OIL CORP.
 c/o VISTA PROJECTS LIMITED.

12-026-A

HEAT TRACE DATA														
TRACER TAG NO.	TRACER LENGTH (m)	TANK HEAT LOSS (W)	CABLE OUTPUT (W/m)	TOTAL WATTS (W)	ACTUAL S.F. (%)	CABLE VOLT (V)	SYSTEM VOLT (V)	NO. OF PHASE	OPERA. CURRENT (A)	MAX. CURRENT (A)	CABLE OHMS/m	MAX. TEMP. (°C)	CATALOGUE NUMBER	
1	EHT-V-8010-1	38.4	1235	38.9	1643	33.0	208	208	1	7.9	8.9	0.68	153	D/MIQ-20E2H-2S/38.4m/1643/208/2.1m/12/6
TOTAL FOR TANK		38.4	1235	38.9	1643	33.0	208	208	1	7.9	8.9			

VESEL: V-8010	LINE NUMBERS
INSUL. TYPE: MF	
INSULATION THK: 38.1mm	
MIN. STARTUP TEMP.: -45° C	
T.RATING: T2B (260° C)	
AREA: CLASS I, ZONE 2, GR IIA, T2B	

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	CATALOGUE NUMBER
1	1	MINERAL INSULATED HEATER CABLE	SEE HEAT TRACE DATA
2	1	NEMA 4X JUNCTION BOX	MIQ-PJBF8-TB4DRMOS
3	2	JUNCTION BOX MOUNTING BRACKET	MIQ-JBS
4	50	SS BULK BANDING (M)	SSBB1500-05
5	2	SS PRE-PUNCHED BANDING (ROLL)	PPS-75
6	16	SS BANDING CLIPS	SSCL05
7	4	EHT CAUTION LABELS	CL
8	1	TEMPERATURE SENSOR	RTD-100
9			
10			
11			

HTC CONTROLLER SETTING	
SETPOINT TEMP. (°C)	10° C
CONTROL MODE	LINE SENSING
GROUND FAULT ALARM/TRIP	25mA/50mA
HIGH TEMP. ALARM	210° C
LOW TEMP. ALARM	5° C
LOW CURRENT ALARM	5.9A

REFERENCE DRAWINGS	
P & ID NUMBER	
EQUIPMENT DWG	12-025-A REV 3 - KOOTENAY INDUSTRIES LTD.

PANEL BOARD SCHEDULE	
CONTROL PANEL DRAWINGS	

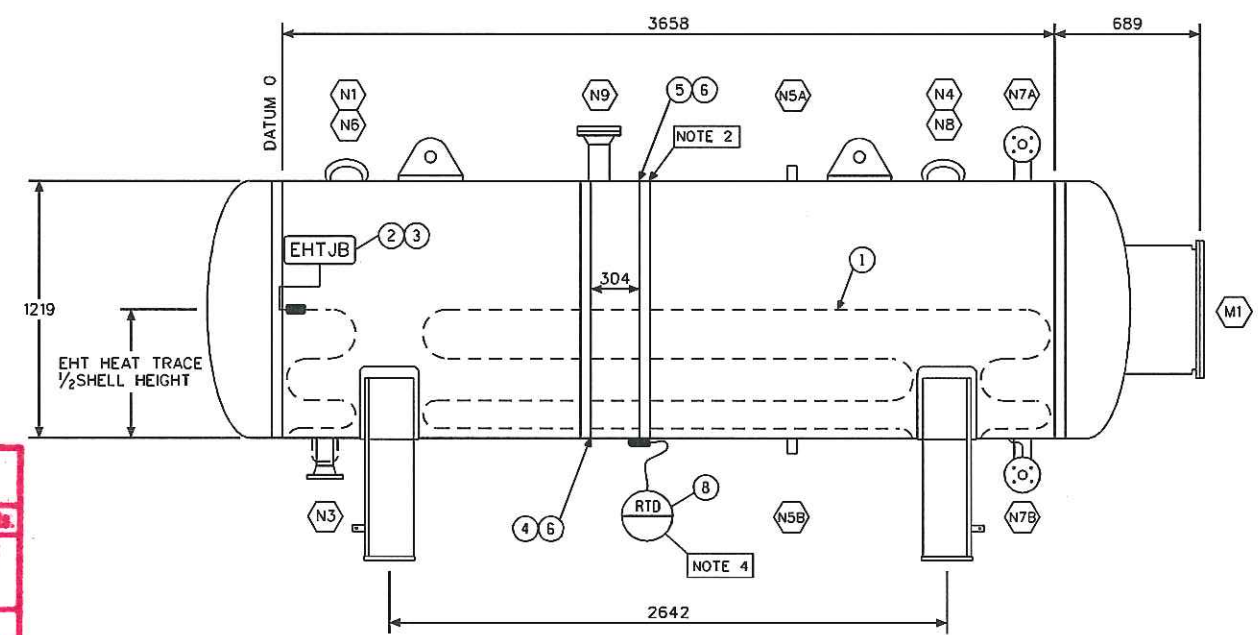
- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
 - THE SSBB AND PRE-PUNCHED SS BANDING ARE INSTALLED ALTERNATELY AS SHOWN ALONG THE LENGTH OF THE VESSEL WHERE POSSIBLE.
 - THE SEGMENT HAS 9 PASSES AT 239mm SPACING.
 - HEATER CABLE MAX. SHEATH TEMPERATURE BASED ON CONTROLLED DESIGN.
 - PANEL BOARD/CONTROL PANEL SHALL BE PROVIDED BY OTHERS.
 - MANWAY IS CONSIDERED TO BE FULLY INSULATED.

REV	DATE MM-DD-YY	DESCRIPTION	DRN	DND	CHK	ENG
1	05-08-12	RE-ISSUED FOR CONSTRUCTION	BR	MP	CS	
0	04-27-12	ISSUED FOR CONSTRUCTION	BR	MP	CS	

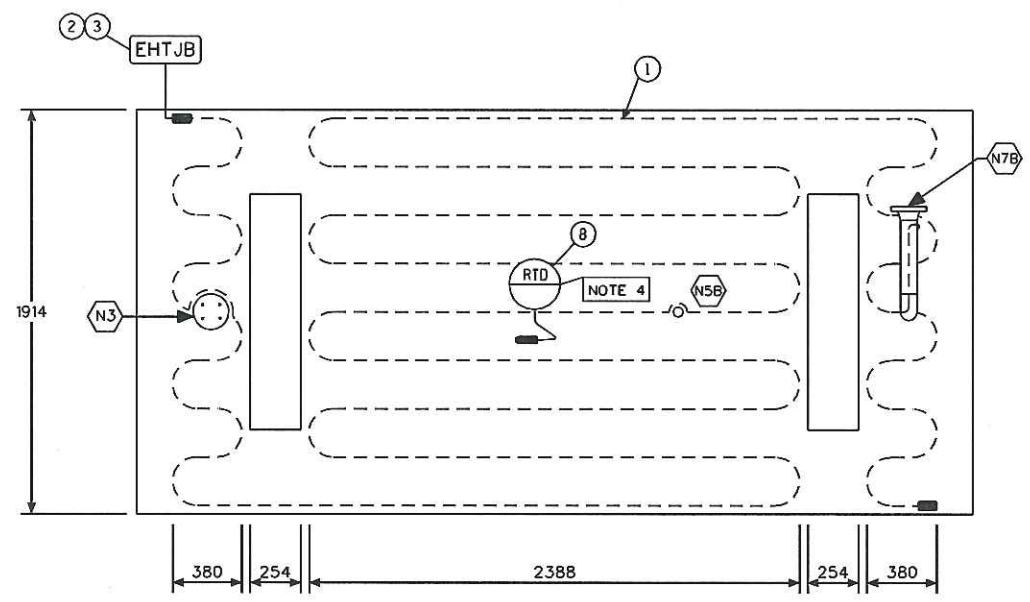


MURPHY OIL CORPORATION
V-8010
H.P. FLARE KNOCK OUT DRUM
ELECTRICAL HEAT TRACING

SCALE: NTS	DESIGN REF. NO.: TCAS00004040	PO: 002174931
DRAWING NO. EHT-V-8010-1		REV. 1



ELEVATION VIEW



HEATING CABLE LAYOUT ON VESSEL BOTTOM SURFACE

- LABELS:**
- PK-V-8010-1
DP-EHT-300
CB-1,3
 - RTD-V-8010-1
 - EHT-V-8010-1

VISTA Projects Limited
VENDOR DRAWING/DOCUMENT SQUAD CHECK

A Reviewed without exception. Proceed with fabrication. Issue final drawings/documents.

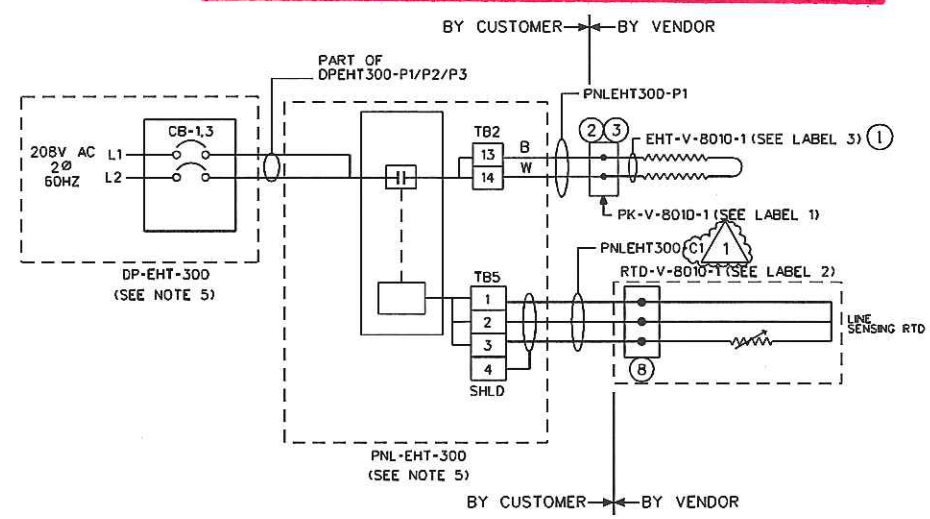
B Reviewed except as marked and/or noted. Proceed with fabrication and resubmit drawing/document. Shipment will not be released, if any drawings/documents requiring approval, as per purchase order conditions, are at this code.

C Not accepted. Revise as marked and resubmit drawing/document for review. Shipment will not be released, if any drawings/documents requiring approval, as per purchase order conditions, are at this code.

D Not required for review. Received for information.

Reviewed only as to general conformity with the design concept and specifications provided. The engineer does not warrant or represent that the information contained on this drawing/document is either accurate or complete. Sole responsibility for correct design, detail and dimensions shall remain with the party submitting the drawing/document.

SDR CODE	EQUIPMENT TAG	REVIEWED BY	DATE
	V-8010/V-8020	RL	202-05-15



CIRCUIT CONNECTION DIAGRAM

HEAT TRACE DATA													
TRACER TAG NO.	TRACER LENGTH (m)	TANK HEAT LOSS (W)	CABLE OUTPUT (W/m)	TOTAL WATTS (W)	ACTUAL S.F. (%)	CABLE VOLT (V)	SYSTEM VOLT (V)	NO. OF PHASE	OPERA. CURRENT (A)	MAX. CURRENT (A)	CABLE OHMS/m	MAX. TEMP. (°C)	CATALOGUE NUMBER
1 EHT-V-8020-1	38.4	1235	38.9	1643	33.0	208	208	1	7.9	8.9	0.68	153	D/MIQ-20E2H-2S/38.4m/1643/208/2.1m/12/6
TOTAL FOR TANK													

MAINTAIN TEMP.:	10° C	LINE NUMBERS	VESSEL: V-8020
OPERATING TEMP.:	85° C		INSUL. TYPE: MF
MAX. EXP. TEMP.:	245° C		INSULATION THK: 38.1mm
MIN. STARTUP TEMP.:	-45° C		
T. RATING:	T2B (260° C)		
AREA:	CLASS I, ZONE 2, GR IIA, T2B		

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	CATALOGUE NUMBER
1	1	MINERAL INSULATED HEATER CABLE	SEE HEAT TRACE DATA
2	1	NEMA 4X JUNCTION BOX	MIQ-PJBF6-TB4DRMOS
3	2	JUNCTION BOX MOUNTING BRACKET	MIQ-JBS
4	50	SS BULK BANDING (M)	SSBB1500-05
5	2	SS PRE-PUNCHED BANDING (ROLL)	PPS-75
6	16	SS BANDING CLIPS	SSCL05
7	4	EHT CAUTION LABELS	CL
8	1	TEMPERATURE SENSOR	RTD-100
9			
10			
11			

HTC CONTROLLER SETTING	
SETPOINT TEMP. (°C)	10° C
CONTROL MODE	LINE SENSING
GROUND FAULT ALARM/TRIP	25mA/50mA
HIGH TEMP. ALARM	210° C
LOW TEMP. ALARM	5° C
LOW CURRENT ALARM	5.9A

REFERENCE DRAWINGS	
P & ID NUMBER	
EQUIPMENT DWG	12-026-A REV 3 - KOOTENAY INDUSTRIES LTD.

PANEL BOARD SCHEDULE	
CONTROL PANEL DRAWINGS	

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
 - THE SSBB AND PRE-PUNCHED SS BANDING ARE INSTALLED ALTERNATELY AS SHOWN ALONG THE LENGTH OF THE VESSEL WHERE POSSIBLE.
 - THE SEGMENT HAS 9 PASSES AT 239mm SPACING.
 - HEATER CABLE MAX. SHEATH TEMPERATURE BASED ON CONTROLLED DESIGN.
 - PANEL BOARD/CONTROL PANEL SHALL BE PROVIDED BY OTHERS.
 - MANWAY IS CONSIDERED TO BE FULLY INSULATED.

REV	DATE MM-DD-YY	DESCRIPTION	DRN	DND	CHK	ENG
A	07-27-12	ISSUED FOR REVIEW	BR	MP	CS	



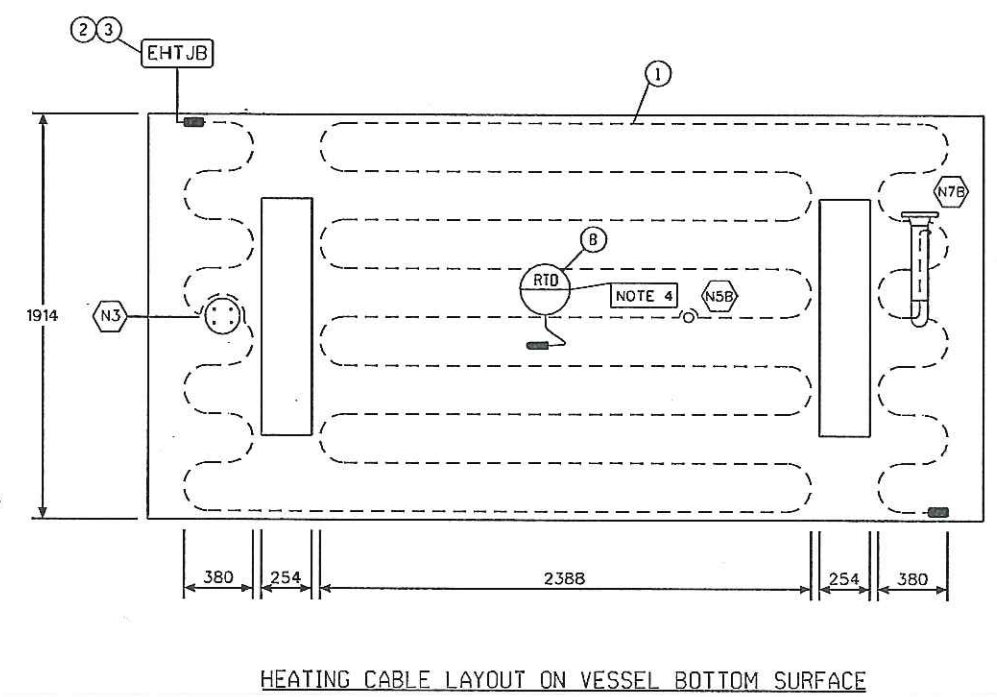
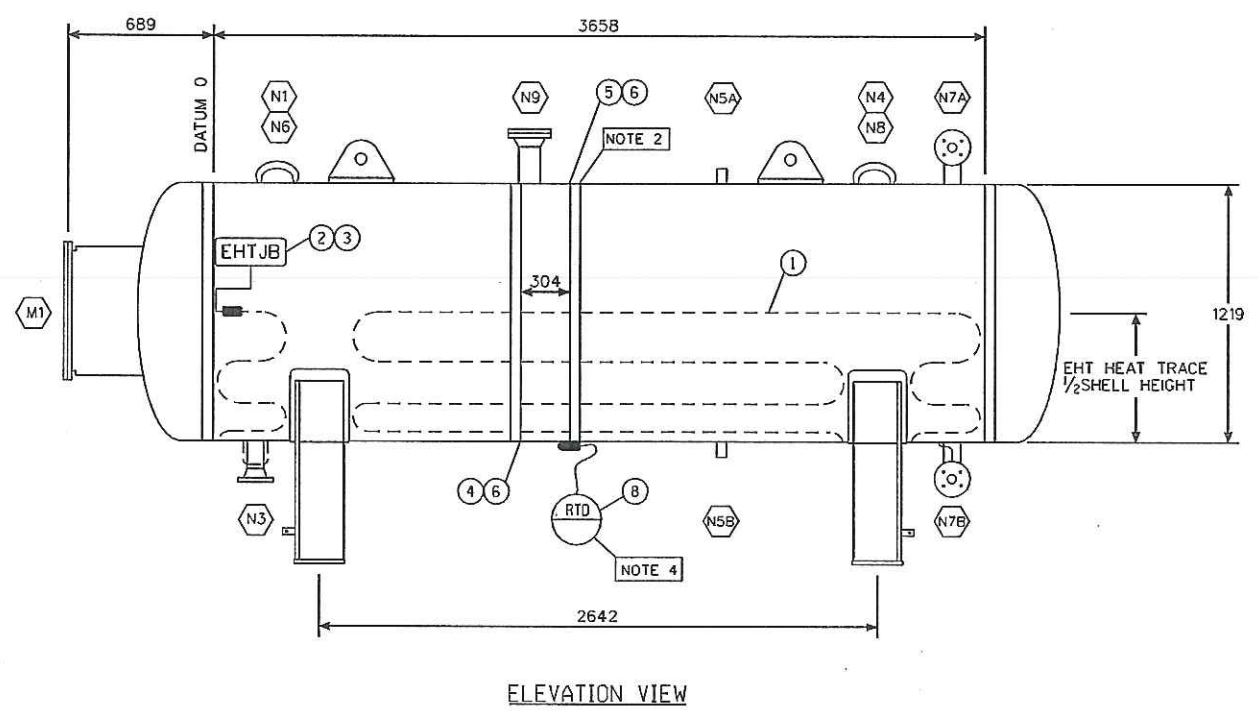
MURPHY OIL CORPORATION
V-8020
L.P. FLARE KNOCK OUT DRUM
ELECTRICAL HEAT TRACING

SCALE: NTS	DESIGN REF. NO.: TCAS00004040	PO: 002175171
DRAWING NO. EHT-V-8020-1	REV. A	

VISTA Projects Limited
VENDOR DRAWING/DOCUMENT SQUAD CHECK

A Reviewed without exception. Proceed with fabrication. Issue final drawings/documents.
B Reviewed except as marked and/or noted. Proceed with fabrication and resubmit drawing/document. Shipment will not be released, if any drawings/documents requiring approval, as per purchase order conditions, are at this code.
C Not accepted. Revise as marked and resubmit drawing/document for review. Shipment will not be released, if any drawings/documents requiring approval, as per purchase order conditions, are at this code.
D Not required for review. Received for information.
Reviews only as to general conformity with the design concept and specifications provided. The engineer does not warrant or represent that the information contained on this drawing/document is either accurate or complete. Sole responsibility for correct design, dimensions and dimensions shall remain with the party submitting the drawing/document.

SUR CODE: V-8020
EQUIPMENT TAG: V-8020
REVIEWED BY: [Signature]
DATE: 2012-08-02



- LABELS:**
- PK-V-8020-1
DP-EHT-300
CB-1,3
 - RTD-V-8020-1
 - EHT-V-8020-1

