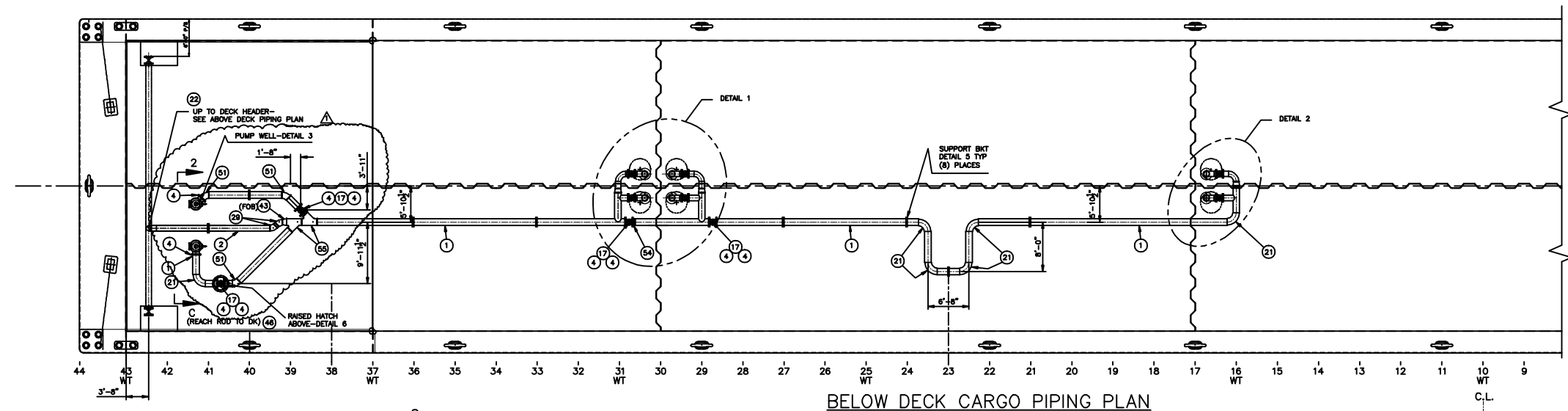
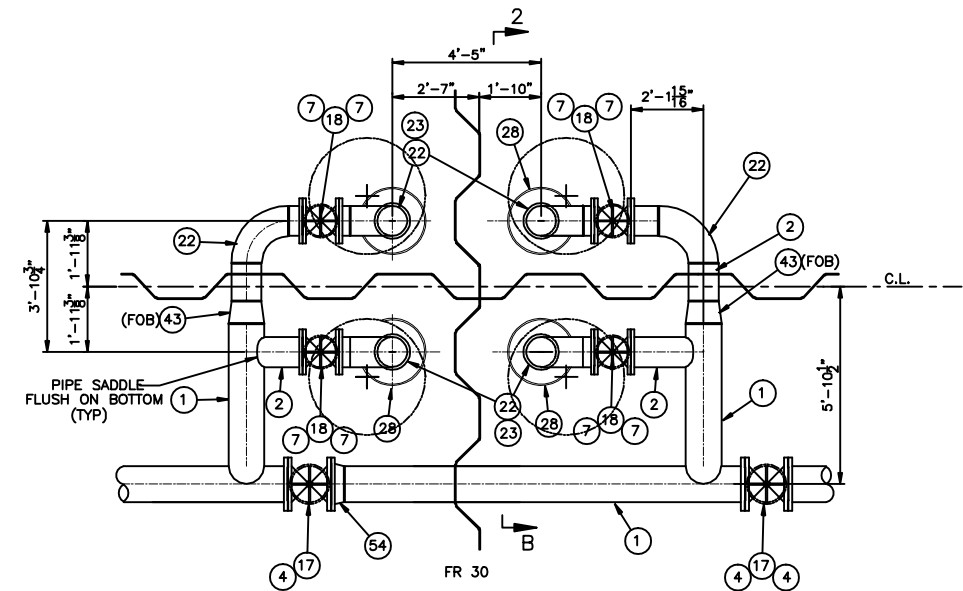


REVISIONS				
REV	ZONE	DESCRIPTION	DATE	APPROVED
1	VAR	REROUTED BELOW DECK CARGO PIPE, UPDATED B.O.M.	11/12/13	-

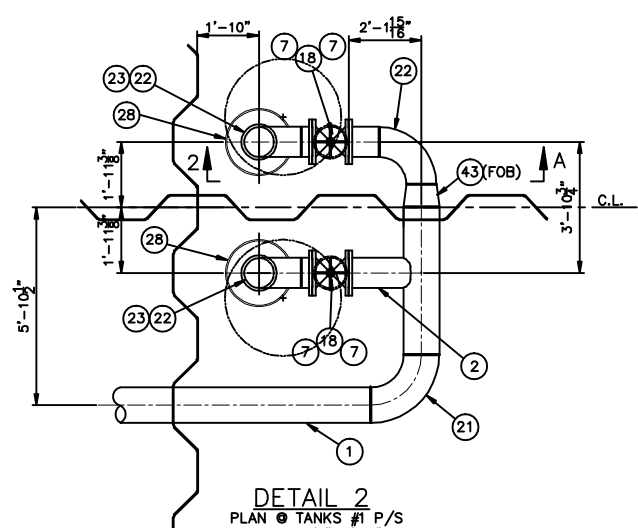
# CBC 345 AND CBC 346



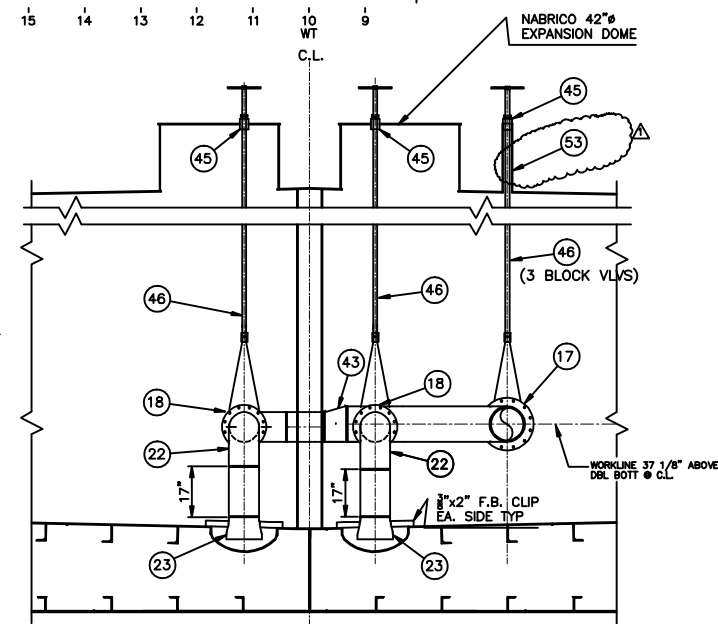
BELOW DECK CARGO PIPING PLAN



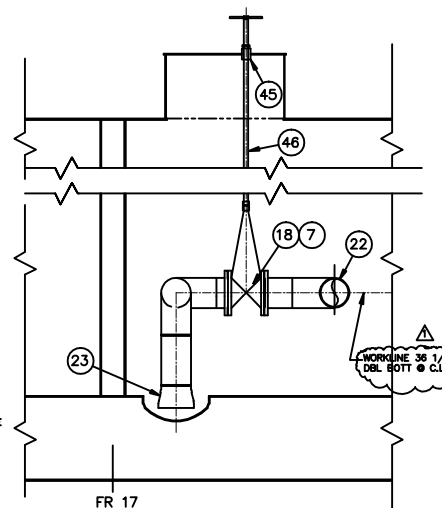
DETAIL 1  
PLAN @ TANKS #2 P/S & 3 P/S  
SCALE: 3/8"=1'-0"



DETAIL 2  
PLAN @ TANKS #1 P/S  
SCALE: 3/8"=1'-0"



SECTION 2-B  
TYP SECTION @ SUCTION WELLS  
LOOKING FORWARD  
SCALE: 3/8"=1'-0"



SECTION 2-A  
CARGO LINE ELEVATION LKG OUTBD  
TANK NO. 1P SHOWN-OTHER TANKS SIMILAR  
SEE DETAILS 1 & 2 FOR LOCATIONS & ORIENTATION  
SCALE: 3/8"=1'-0"

## GENERAL NOTES:

- ALL PIPING SHALL MEET CURRENT USCG REQUIREMENTS FOR CLASS II PIPING SYSTEMS.
- FIELD TO SECURE REACH RODS AS NEEDED.
- PIPES PASSING THROUGH WATER/OIL TIGHT BOUNDARIES SHALL BE WELDED DOUBLE CONTINUOUS.
- CARGO SYSTEM:  
PRESSURE: WORKING 100 PSI  
DESIGN 150 PSI  
TEST 225 PSI  
RELIEF VALVE 125 PSI
- LABELS SHALL BE INSTALLED ON ALL VALVES WHERE REQUIRED TO IDENTIFY SERVICE.
- ALL STRUCTURAL STEEL IS ASTM A36.
- ALL HATCHES, MANHOLES, STUFFING GLANDS, ETC. ON THE RAISED TRUNK WITH OPENINGS INTO THE CARGO TANKS SHALL BE FITTED WITH TEFLOON GASKETS. ALL HATCHES, MANHOLES, ETC. THAT OPEN INTO VOIDS OUTSIDE OF THE CARGO AREA SHALL BE FITTED WITH NEOPRENE GASKETS.
- CARGO PUMP ENGINE IS A CUMMINS MODEL 6CTA8.3D(M) RATED 270HP @ 1800RPM, IMO, US EPA TIER II COMPLIANT, CLASS I, DIVISION I COMPLIANT.
- CARGO PUMP IS A RUHRPUMPEN MODEL 12LS16GHC, 3 STAGE, RATED FOR 4285 BPH @ 105 PSI, COMPLETE WITH AN AMARILLO S250 RIGHT ANGLE DRIVE W/1:1 RATIO AND DANA SL1710 x 48" LG. DRIVE SHAFT AND REMOVABLE GUARD.

								64											
								63											
31	4	6"	ELBOW, 90° LR.B.W., SCH 40 BLK	STEEL	A-234	B16.9		62											
30	2	4"	FLANGE, 150# R.F.S.O.	FORGED STEEL	A-105	B16.5		61											
29	4	10"	ELBOW, 45° B.W., SCH 40 BLK	STEEL	A-234	B16.9		60											
28	6	24" DIA.	SEMI-ELLIPTICAL DISHED TANK HEAD x 3/8" THICK	STEEL	A-36		TANK SUMPS	59											
27	16	1/2"x1 1/2"	BOLT, HEX HEAD W/()	304 ST. STL.	A-320	B16.2.1	RAISED TRUNK FOR 12" BLOCK VALVE	58											
26	16	5/8"x3"	BOLT, HEX HEAD W/()	304 ST. STL.	A-320	B16.2.1	4" RELIEF VALVE FLANGE	57											
25	2	4"	RING GASKET, 150#, 1/8" THICK, NON-ASBESTOS, KLINGERSIL OR EQUAL					56											
24	2	10"	CHECK VALVE, WAFER TYPE, 150#, CARBON STEEL BODY/316 S.S. TRIM, KEYSTONE #810 OR EQUAL	CARBON STL.	A-216	B16.5		55	2	12"	LATERALS, 45°, SCH 40 BLK B.W.	STEEL	A-234	B16.9					
23	6	12"x10"	CONC. REDUCER, B.W., SCH 40 BLK	STEEL	A-234	B16.9		54	1	12"	FLANGE, 150# R.F., W.N.	FORGED STEEL	A105	B16.5					
22	9	10"	ELBOW, 90° LR. B.W., SCH 40 BLK	STEEL	A-234	B16.9		53	6'	4"	PIPE, SCH 40, ERW	BLK STEEL	A53 GR B	B36.10					
21	6	12"	ELBOW, 90° LR. B.W., SCH 40 BLK	STEEL	A-234	B16.9		52	-	-	NOT USED	-	-	-					
20	2	4"x6"	RELIEF VALVE SET @ 125 PSI, TELEDYNE #26PA10L OR EQUAL	CARBON STL.	A-216	B16.5		51	3	12"	ELBOW, 45° B.W., SCH 40 BLK	STEEL	A-234	B16.9					
19	6	10"	VALVE, GATE, 150# FLOD, OS&Y, R.S., C.S. BODY, CR13 TRIM, SPACE #15011C	CARBON STL.	A-216 GR WCB	B16.5		50	-	-	NOT USED	-	-	-					
18	6	10"	VALVE, GATE, 150# FLOD, NRS, C.S. BODY, CR13 TRIM, SPACE #15021C	CARBON STL.	A-216 GR WCB	B16.5		49	3	1 1/4"	UNION, 150# SCREWED,	304 ST. STL.	A-234						
17	4	12"	VALVE, GATE, 150# FLOD, NRS, C.S. BODY, CR13 TRIM, SPACE #15021C	CARBON STL.	A-216 GR WCB	B16.5		48	-	-	NOT USED	-	-	-					
16	3	3/4"x1 1/4"	BOLT, HEX HEAD W/()	304 ST. STL.	A-320	B16.2.1	6" FLD ON RELIEF VALVE	47											
15	304	7/8"x3 3/4"	BOLT, HEX HEAD W/()	304 ST. STL.	A-320	B16.2.1	FOR 10" FLANGES/VALVES	46	12	1 1/2" DIA.	ROUND BAR X 12'-0" LG.	304 ST. STL.	A-276-98						CARGO VALVE REACH RODS
14	158	7/8"x4"	BOLT, HEX HEAD W/()	304 ST. STL.	A-320	B16.2.1	FOR 12" FLG'S & DEEPMWELL TOP FLG.	45	12	1 1/2"	STUFFING GLAND	304 ST. STL.	A-276-98	B16.9					CARGO VALVE REACH RODS
13	2	6"	RING GASKET, 150#, 1/16" THICK, NON-ASBESTOS, GARLOCK OR EQUAL					44	1	10"	TEE, SCH 40 BLK B.W.	STEEL	A-234	B16.9					
12	32	10"	RING GASKET, 150#, 1/16" THICK, NON-ASBESTOS, GARLOCK OR EQUAL					43	4	12"x10"	ECC. REDUCER, SCH 40 BLK B.W.	STEEL	A-234	B16.9					
11	12	12"	RING GASKET, 150#, 1/16" THICK, NON-ASBESTOS, GARLOCK OR EQUAL					42	2	1 1/4"	SWING CHECK VALVE, 200# SCH'D, 316 S.S. TRIM	ST. STL.	A-351	B16.10					
10	2	6"	FLANGE, 150# R.F.S.O.	FORGED STEEL	A105	B16.5		41	2	1 1/4"	FLANGE, 150# R.F.S.O.	FORGED STEEL	A-105	B16.5					
9	2	10"	FLANGE, BLIND, 150# R.F., STAINLESS STEEL	304 ST. STL.	A234	B16.5		40	15'	1 1/4"	PIPE, SCH 40 BLK SEAMLESS	STEEL	A-106B	B36.10					
8	24	7/8"x8"	BOLT, HEX HEAD W/()	304 ST. STL.	A-320	B16.2.1	FOR 10" WAFER CHECK VALVE	39	6	1 1/4"	ELBOW, 90°, 3000# S.W.	FORGED STEEL	A-105	B16.11					
7	24	10"	FLANGE, 150# R.F.S.O.	FORGED STEEL	A105	B16.5		38	2	1 1/4"	GATE VALVE, 200# SCH'D, NRS, 316 S.S. TRIM, SHARPE FIG. 3027B	ST. STL.	A-351	B16.10					
6	2	12"	FLANGE, BLIND, 150# R.F.	FORGED STEEL	A105	B16.5		37	1	30"O.D.	GASKET x 24"L.D. x 1/8" THICK, TEFLOON ENVELOPE W/TETRA BLUE FILLER								
5	24	1/2"x2 1/4"	BOLT, HEX HEAD W/()	304 ST. STL.	A-320	B16.2.1	FOR 1 1/4" FLANGES/VALVES	36	10'	24"	PIPE, STD BLK ERW x .375" WALL	STEEL	A-53	B36.10					
4	9	12"	FLANGE, 150# R.F.S.O.	FORGED STEEL	A105	B16.5		35	8	12"	U-BOLT FOR 12" PIPE W/()	STEEL	A-307	B16.2.1					
3	20'	6"	PIPE, SCH 40, SEAMLESS	BLK STEEL	A53 GR B	B36.10		34	7	10"	U-BOLT FOR 10" PIPE W/()	STEEL	A-307	B16.2.1					
2	85'	10"	PIPE, SCH 40, SEAMLESS	BLK STEEL	A53 GR B	B36.10		33	1	1/2"	HALF COUPLING, 3000# THREADED BLK	FORGED STEEL	A-105	B16.11					
1	210	12"	PIPE, SCH 40, SEAMLESS	BLK STEEL	A53 GR B	B36.10		32	1	0-200 PSI	PRESSURE GAUGE, 4" DIAL, 1/2" MNPT BOTTOM CONNECTION, ASHROFT OR EQUAL								
MK	QTY	SIZE	DESCRIPTION	MATERIAL	ASTM SPEC	ANSI SPEC	REMARKS	MK	QTY	SIZE	DESCRIPTION	MATERIAL	ASTM SPEC	ANSI SPEC	REMARKS				
BILL OF MATERIAL																BILL OF MATERIAL			

BILL OF MATERIAL

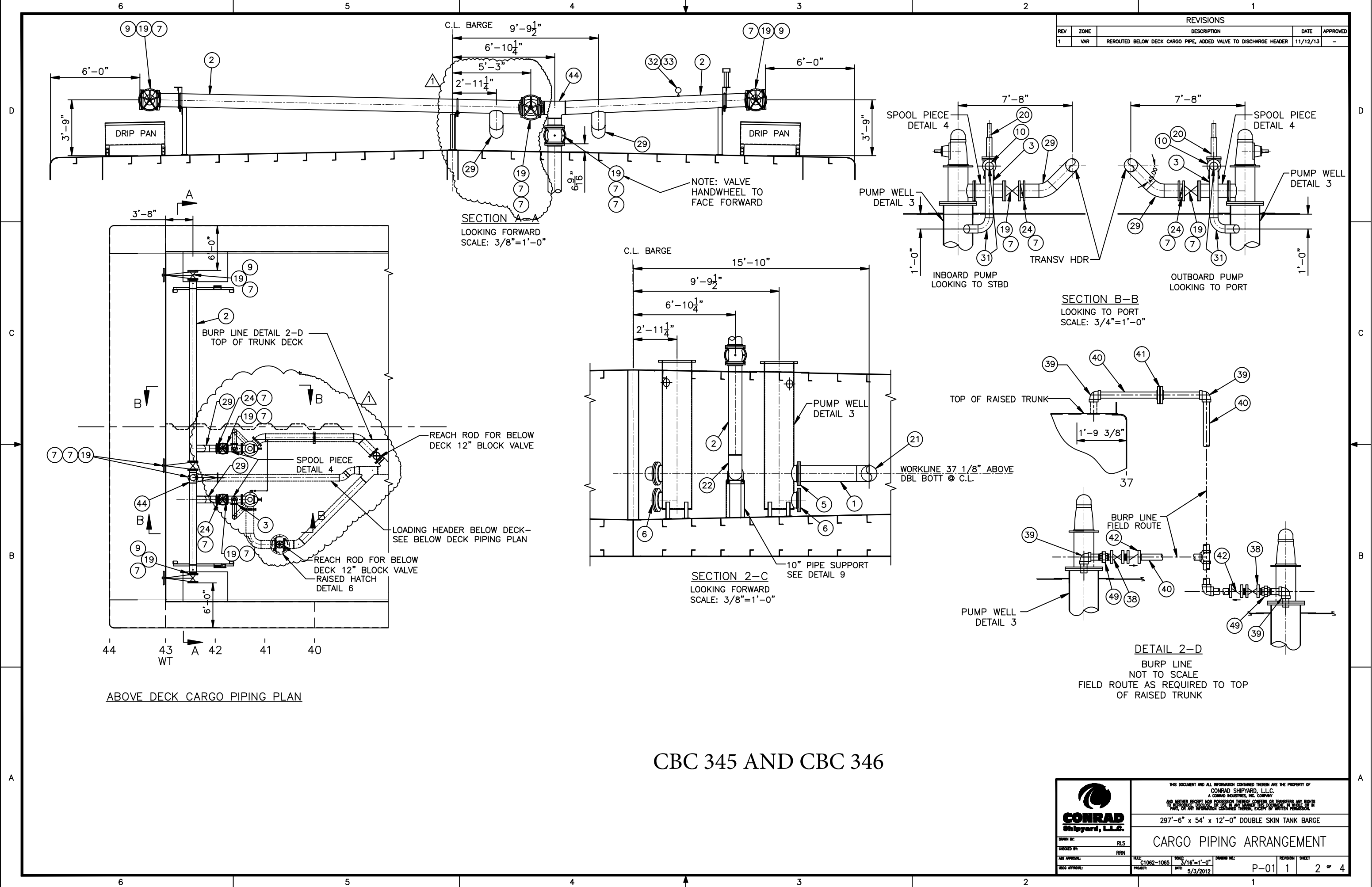
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297'-6" x 54' x 12'-0" DOUBLE SKIN TANK BARGE

### CARGO PIPING ARRANGEMENT

DRWN BY: RLS  
CHECKED BY: RRM  
DATE: 5/3/2012  
PROJECT: C1062-1065  
SCALE: 3/32"=1'-0"  
SHEET: P-01  
REV: 1  
OF: 4



REVISIONS				
REV	ZONE	DESCRIPTION	DATE	APPROVED
1	VAR	REROUTED BELOW DECK CARGO PIPE, ADDED VALVE TO DISCHARGE HEADER	11/12/13	-

CONRAD Shipyard, LLC

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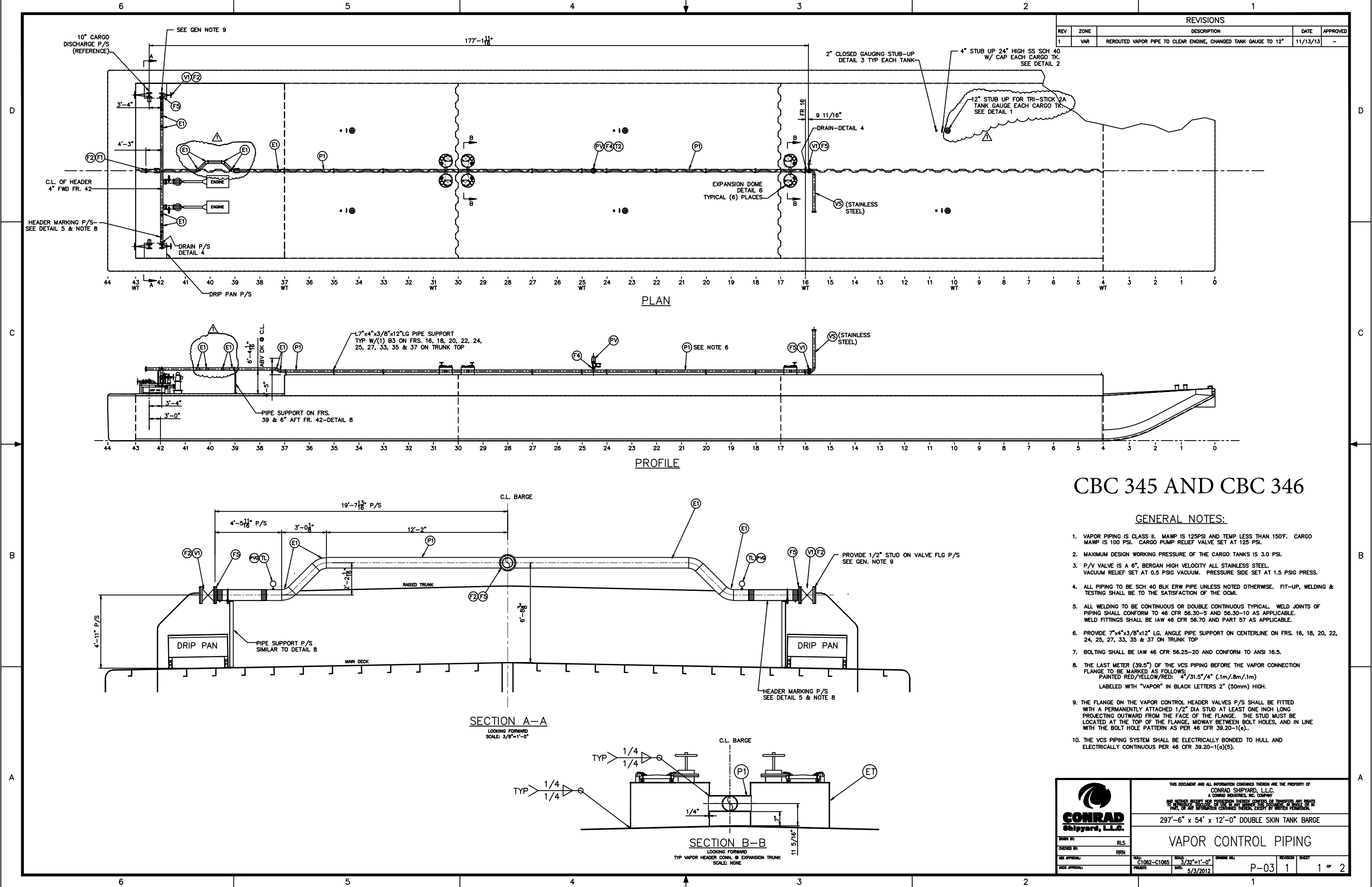
297'-6" x 54' x 12'-0" DOUBLE SKIN TANK BARGE

CARGO PIPING ARRANGEMENT

DATE: 5/3/2012

P-01 1 2 OF 4

CBC 345 AND CBC 346



# CBC 345 AND CBC 346

## GENERAL NOTES:

- VAPOR PIPING IS CLASS II. MAWP IS 125PSI AND TEMP LESS THAN 150F. CARGO MAWP IS 100 PSI. CARGO PUMP RELIEF VALVE SET AT 125 PSI.
- MAXIMUM DESIGN WORKING PRESSURE OF THE CARGO TANKS IS 3.0 PSI.
- P/V VALVE IS A 6", BERGAN HIGH VELOCITY ALL STAINLESS STEEL. VACUUM RELIEF SET AT 0.5 PSIG VACUUM. PRESSURE SIDE SET AT 1.5 PSIG PRESS.
- ALL PIPING TO BE SCH 40 BLK ERW PIPE UNLESS NOTED OTHERWISE. FIT-UP, WELDING & TESTING SHALL BE TO THE SATISFACTION OF THE OGI.
- ALL WELDING TO BE CONTINUOUS OR DOUBLE CONTINUOUS TYPICAL. WELD JOINTS OF PIPING SHALL CONFORM TO 46 CFR 56.30-5 AND 56.30-10 AS APPLICABLE. WELD FITTINGS SHALL BE IAW 46 CFR 56.70 AND PART 57 AS APPLICABLE.
- PROVIDE 7"x4"x3/8"x12" LG. ANGLE PIPE SUPPORT ON CENTERLINE ON FR. 16, 18, 20, 22, 24, 25, 27, 33, 35 & 37 ON TRUNK TOP
- BOLTING SHALL BE IAW 46 CFR 56.25-20 AND CONFORM TO ANSI 18.5.
- THE LAST METER (39.5") OF THE VCS PIPING BEFORE THE VAPOR CONNECTION FLANGE TO BE MARKED AS FOLLOWS:  
PAINTED RED/YELLOW/RED: 4"/31.5"/4" (.1m/.8m/.1m)  
LABELED WITH "VAPOR" IN BLACK LETTERS 2" (50mm) HIGH.
- THE FLANGE ON THE VAPOR CONTROL HEADER VALVES P/S SHALL BE FITTED WITH A PERMANENTLY ATTACHED 1/2" DIA STUD AT LEAST ONE INCH LONG PROJECTING OUTWARD FROM THE FACE OF THE FLANGE. THE STUD MUST BE LOCATED AT THE TOP OF THE FLANGE, MIDWAY BETWEEN BOLT HOLES, AND IN LINE WITH THE BOLT HOLE PATTERN AS PER 46 CFR 39.20-1(e).
- THE VCS PIPING SYSTEM SHALL BE ELECTRICALLY BONDED TO HULL AND ELECTRICALLY CONTINUOUS PER 46 CFR 39.20-1(c)(5).

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	297'-6" x 54' x 12'-0" DOUBLE SKIN TANK BARGE			
	VAPOR CONTROL PIPING			
	DRAWN BY: RLS	CHECKED BY: RRM	DATE: 5/3/2012	SCALE: 3/32"=1'-0"
	PROJECT: C1062-C1065	DATE: 5/3/2012	PROJECT: P-03	1 OF 2

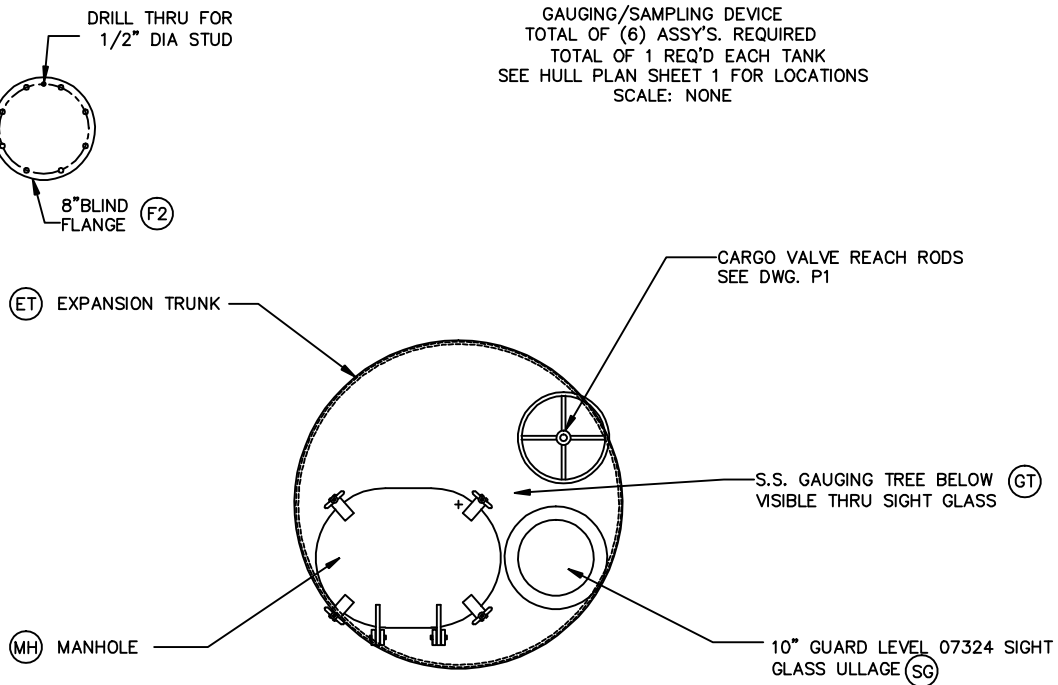
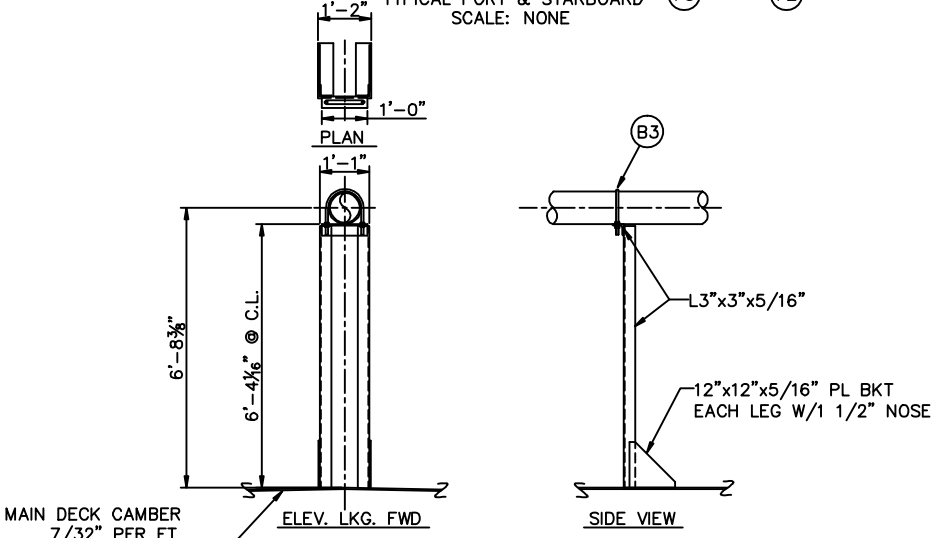
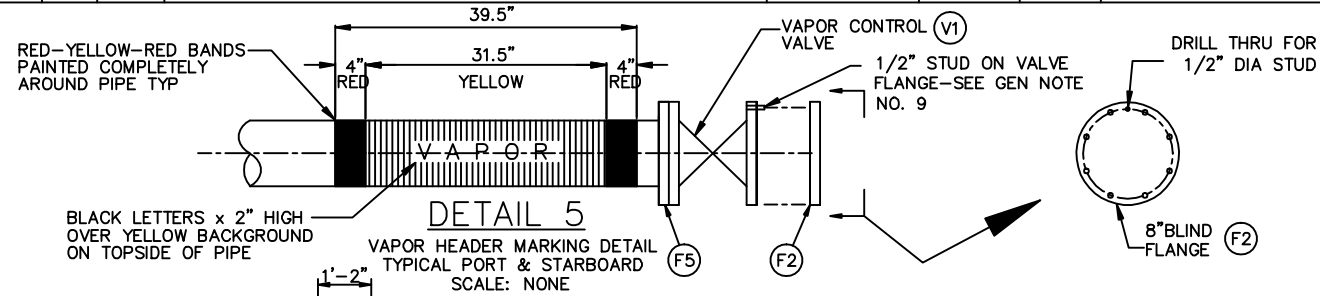
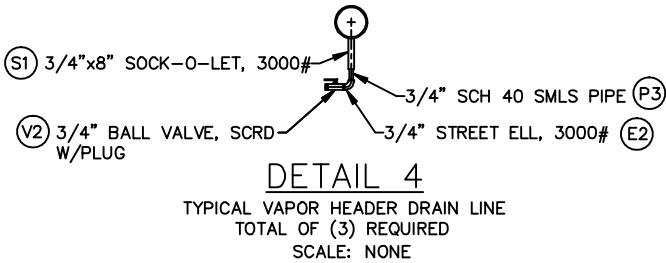
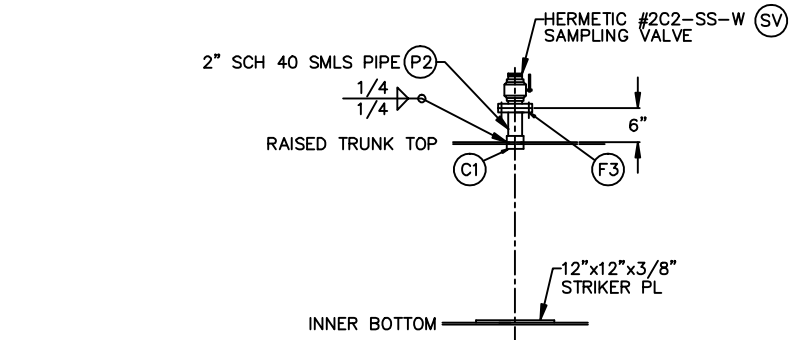
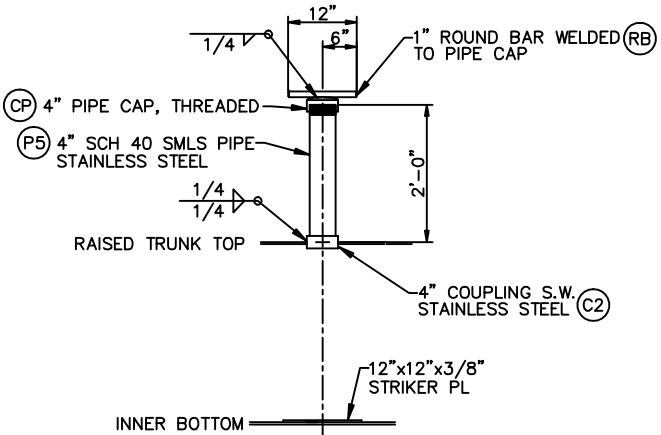
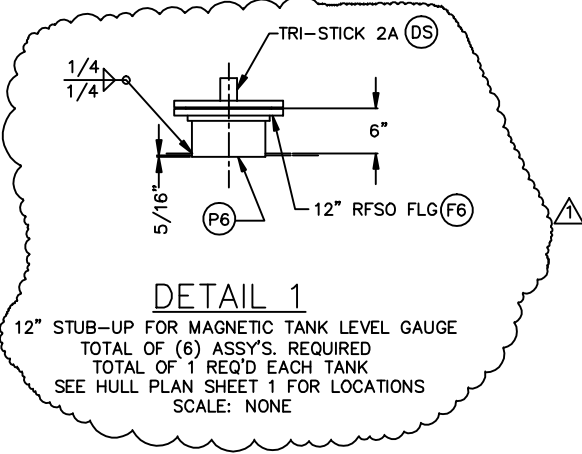
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BILL OF MATERIALS

MK	QTY	SIZE	DESCRIPTION	MATERIAL	ASTM SPEC	ANSI SPEC	COMMENTS
P1	240'	8"	PIPE, SCH 40 BLK ERW	MILD STEEL	A53	B36.10	
P2	12'	2"	PIPE, SCH 40 BLK ERW	MILD STEEL	A53	B36.10	
P3	4'	3/4"	PIPE, SCH 40 BLK ERW	MILD STEEL	A53	B36.10	
P4	3'	6"	PIPE, SCH 40 BLK ERW	MILD STEEL	A53	B36.10	
VS	1	8"	PIPE, .1875" WALL VAPOR STACK	STAINLESS STEEL	A312	B36.19M-85	COMPLETE WITH S.S. FLAME SCREEN, RAIN HOOD & SWIVEL FLANGE
F1	1	8"	FLANGE, 150# R.F.S.O.	ST. STEEL	A234	B16.5	
F2	3	8"	FLANGE, BLIND, 150# R.F.	ST. STEEL	A234	B16.5	
F3	6	2"	FLANGE, 150# R.F.S.O.	ST. STEEL	A234	B16.5	
F4	1	6"	FLANGE, 150# R.F.S.O.	FORGED STEEL	A105	B16.5	
F5	4	8"	FLANGE, 150# R.F.S.O.	FORGED STEEL	A105	B16.5	
E1	10	8"	ELL, 45', SCH 40 BLK B.W.	BLK STEEL	A234 GR WPB	B16.9	
E2	3	3/4"	STREET ELL, 3000#, THREADED	FORGED STEEL	A105	B16.11	
S1	3	3/4"x8"	SOCK-O-LET, 3000#	FORGED STEEL	A105	B16.5	
V1	3	8"	VALVE, GATE, 150# FLGD, OS&Y, R.S., C.S. BODY, CR13 TRIM, SPACE #15011C	CARBON STL	A-216 GR WCB	B16.5	
V2	3	3/4"	VALVE, BALL, 150#, THREADED, W/PLUG	CARBON STEEL	A216	B16.34	
PV	1	6"	VALVE, PRESS/VACUUM, FLANGED, BERGAN (TANKTECH) KLPH-6MARINE HIGH VELOCITY, VAC SET @ 0.5 PSIG, PRESS. SET @ 1.50 PSIG, U.S.C.G. APPROVAL NO. 162.017/144/3	STAINLESS STEEL	316L		
SG	6	10"	GUARD LEVEL 07324 SIGHT GLASS ULLAGE	STAINLESS STEEL	316L		
DS	6	12"	TRI-STICK 2A TANK GAUGE				
A1	-	-	NOT USED				
SV	6	-	SAMPLING VALVE, HERMETIC #2C2-SS-W	STAINLESS STEEL	A-351	B16.5	
MH	6	-	HATCH, RAISED, 18"x24", O.T., NABRICO MODEL DF-464-5-SS	STAINLESS STEEL			
ET	6	5/16"	EXPANSION TRUNK, 42" DIA. x 24" HIGH, NABRICO MODEL DF-449	MILD STEEL	A36		
GT	6	-	GAUGING TREE, 6 FT LONG RADIAL ARM, ERL OR EQUAL	STAINLESS STEEL			
TL	2	1/4"	THREAD-O-LET, 3000# FOR 8" PIPE	FORGED STEEL	A105	B16.11	
PVG	2	-	PRESSURE/VACUUM GAUGE, 1/4" MNPT BOTTOM CONN., ERL MODEL 505	STAINLESS STEEL			
B1	48	3/4"x3 1/2"	BOLT, HEX HEAD, -UNC W/(1) HEX NUT EACH (FOR 8" FLANGES)	STAINLESS STEEL	A320	B18.2.11	
B2	24	5/8"x2 1/2"	BOLT, HEX HEAD, -UNC W/(1) HEX NUT EACH (FOR 2" FLANGES)	STAINLESS STEEL	A320	B18.2.11	
B3	29	8"	U-BOLT W/4 HEX NUTS EACH (FOR 8" STD PIPE)	STAINLESS STEEL	A320	B18.2.11	
T2	1	8"x6"x8"	TEE, REDUCING, SCH 40 BLK B.W.	BLK STEEL	A234 GR WPB	B16.9	
P5	12'	4"	PIPE, SCH 40 SEAMLESS	STAINLESS STEEL	A312	B36.19	
C2	6	4"	COUPLING, SOCKET WELD	STAINLESS STEEL	A182	B16.5	
CP	6	4"	CAP, 3000#, THREADED	FORGED STEEL	A105		
RB	6'	1"	ROUND BAR	MILD STEEL	A53		
C1	6	2"	COUPLING, SOCKET WELD	STAINLESS STEEL	A234	B16.5	
P6	3'	12"	PIPE, SCH 40 SEAMLESS	STAINLESS STEEL	A312	B36.19	
F6	6	12"	FLANGE, 150# R.F.S.O.	ST. STEEL	A234	B16.5	
B4	72	7/8"x4"	BOLT, HEX HEAD, -UNC W/(1) HEX NUT EACH (FOR 12" FLANGES)	STAINLESS STEEL	A320	B18.2.11	



CBC 345 AND CBC 346

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297'-6" x 54' x 12' DOUBLE SKIN TANK BARGE

VAPOR CONTROL PIPING

DRAWN BY: RLS

CHECKED BY: RRM

DATE: 5/3/2012

SCALE: 1/8" = 1'-0"

PROJECT: C1062-C1065

REVISION: SHEET

P-03


1

2 of 2

BY 1-1 TIC 1-1 TISH 1-1



HEATEC ORDER INFO	
W.O.#:	14-060-000
JOB #:	14-060
ISSUE DATE:	4/17/14
CODE:	CPED (18)

REV.	DESCRIPTION	DATE	CHD.	APPR.	BY
CHANGE RECORD					
CUSTOMER:		JOB#			
HARLEY MARINE INC.		14-059			
DRAWING NAME:		JOB#			
P & ID DIAGRAM		14-059-000			
3010-30-S-0 HEATER		ISSUE DATE			
		P.O. BOX 72760      PHONE (423)821-5200 CHATTANOOGA, TN. 37407    FAX (423)821-7673			
DWG. DATE		CHRD. DATE		APPROVE	
SMD 4/15/14					
DWG/PART NO.		REV.		SCALE	WEIGHT
14059- PID				N/A	
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