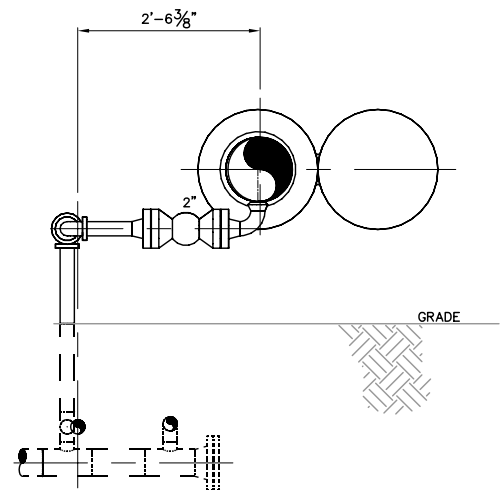


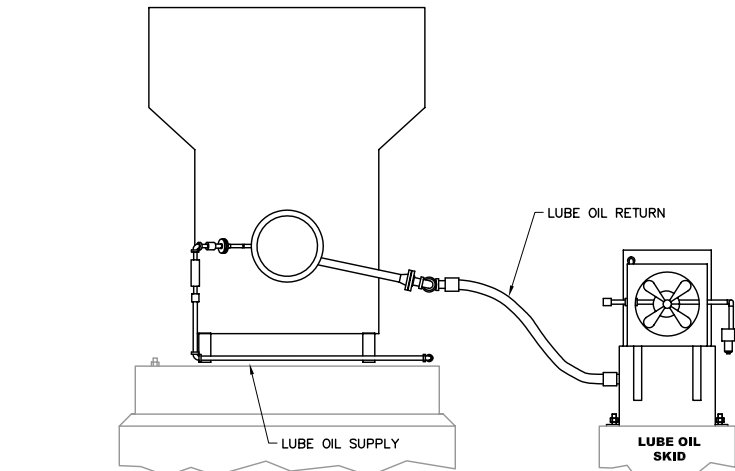
SECTION E
SCALE 3/4"=1'-0"



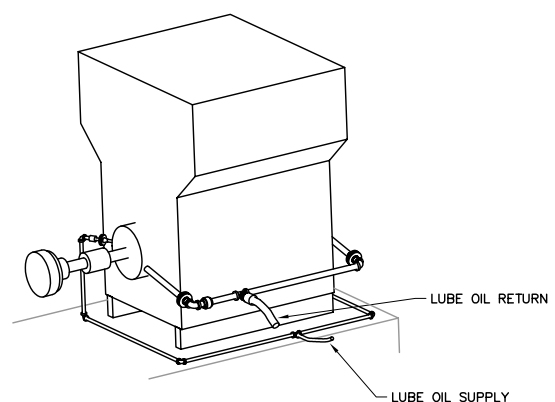
SECTION F
SCALE 3/4"=1'-0"

DETAIL 1
SCALE NTS
(VENT: 2 REQ'D)

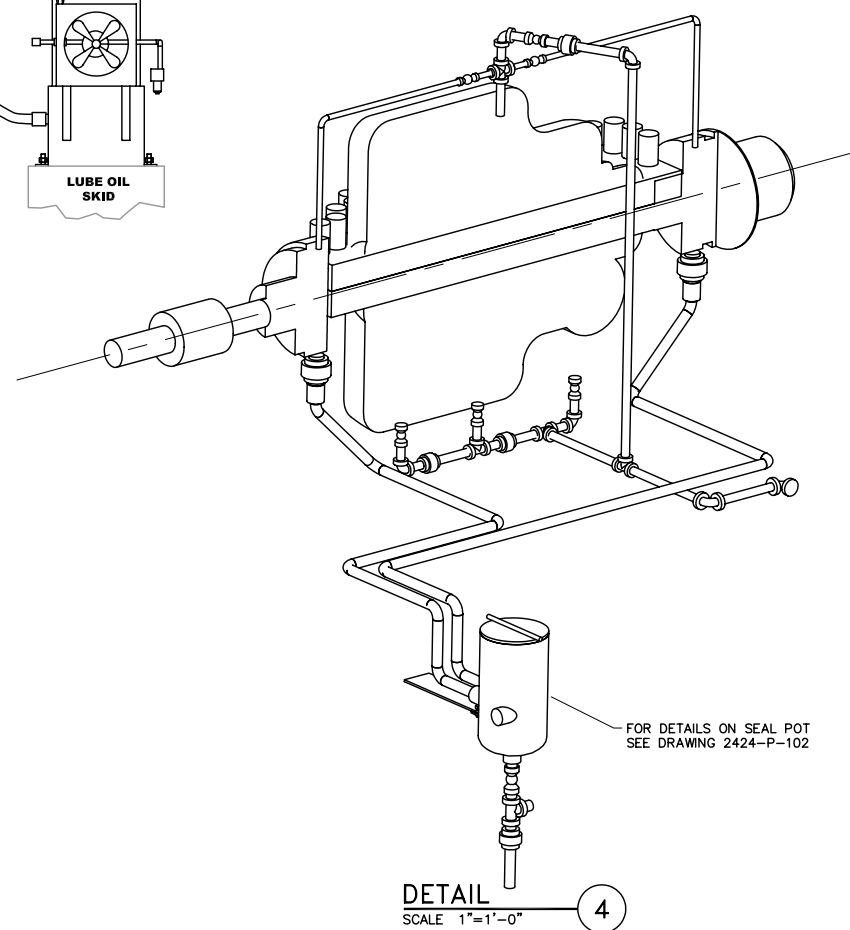
DETAIL 2
SCALE NTS
(DRAIN: 1 REQ'D)



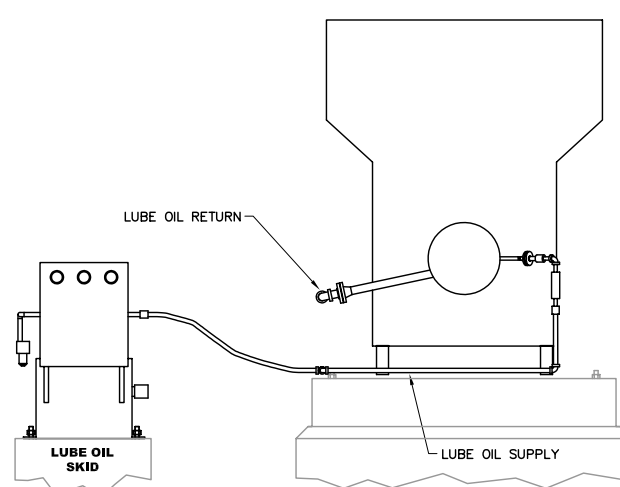
DETAIL 5
SCALE 1/2"=1'-0"



DETAIL 3
SCALE N.T.S.



DETAIL 4
SCALE 1"=1'-0"



DETAIL 6
SCALE 1/2"=1'-0"

BILL OF MATERIAL					BILL OF MATERIAL				
MARK	QTY	SIZE	DESCRIPTION	LENGTH	MARK	QTY	SIZE	DESCRIPTION	LENGTH
1	1	3/4"	PIPE, API 5L, XH, GRADE B, SMLS, DRL, PE	31'-3"	42	4	2"	GASKET, ANSI 150, FLEXITALLIC SPIRAL WOUND, TYPE "CG", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING	
2	1	1"	PIPE, API 5L, XH, GRADE B, SMLS, DRL, PE	4'-5"					
3	1	1 1/2"	PIPE, API 5L, XH, GRADE B, SMLS, DRL, PE	4'-8"	43	11	2"	GASKET, ANSI 600, FLEXITALLIC SPIRAL WOUND, TYPE "CG", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING	
4	1	2"	PIPE, API 5L, XH, GRADE B, SMLS, DRL, PE	18'-1"					
5	1	2"	PIPE, API 5L, XH, GRADE B, SMLS, DRL, PE, FBE COATED 14-16 MILS	70'-2"	44	2	4"	GASKET, ANSI 600, FLEXITALLIC SPIRAL WOUND, TYPE "CG", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING	
5A	1	4"	PIPE, API 5L, STD, GRADE B, SMLS, DRL, PE, FBE COATED 14-16 MILS	140'-6"	45	1	8"	GASKET, ANSI 900, FLEXITALLIC SPIRAL WOUND, TYPE "CG", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING	
6	1	8"	PIPE, API 5L, STD, GRADE B, SMLS, DRL, PE	5'-4"	46	15	10"	GASKET, ANSI 600, FLEXITALLIC SPIRAL WOUND, TYPE "CG", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING	
7	1	10"	PIPE, API 5L, STD, GRADE B, ERW, DRL, PE	30'-0"					
8	1	10"	PIPE, API 5L, STD, GRADE B, ERW, DRL, PE, FBE COATED 14-16 MILS	222'-5"	47	1	10"	GASKET, ANSI 900, FLEXITALLIC SPIRAL WOUND, TYPE "CG", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING	
9	1	3/4"	FLEXIBLE HOSE, ASSY. W/FNPT FITTINGS	4'-5"					
10	1	2"	FLEXIBLE HOSE, ASSY. W/FNPT FITTINGS	5'-1"	48	2	1/4"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	3"
11	1	1"	PIPE, COPPER	17'-8"	49	6	1/2"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	3"
12	10	1"	ELL, 90°, COPPER, SWEAT FITTING		50	2	1/2"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	5"
13	2	1"	ELL, 45°, COPPER, SWEAT FITTING		51	2	3/4"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	CLOSE
14	12	2"	ELL, 90° LR, ASTM A-234, BUTT WELD, STD WALL, WPB		52	19	3/4"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	3"
14A	3	4"	ELL, 90° LR, ASTM A-234, BUTT WELD, STD WALL, WPB		53	-	-	-	-
15	14	10"	ELL, 90° LR, ASTM A-234, BUTT WELD, STD WALL, WPB		54	7	1"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	6"
16	5	2"	TEE, ASTM A-234, BUTT WELD, STD WALL, WPB		55	2	1 1/2"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	CLOSE
17	3	10"	TEE, ASTM A-234, BUTT WELD, STD WALL, WPB		56	4	1 1/2"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	3"
18	2	3/4"	FLG, RF, FNPT, 150LB		57	11	2"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	6"
19	2	1 1/2"	FLG, RF, FNPT, 150LB		57A	1	2"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	CLOSE
20	3	2"	FLG, ANSI 150 RFWN, ASTM A-105, XH, WPB		58A	2	1/2"	ELL, 90°, FNPT, 3000#, ASTM A-105, GRADE B	
21	10	2"	FLG, ANSI 600 RFWN, ASTM A-105, XH, WPB		58	13	3/4"	ELL, 90°, FNPT, 3000#, ASTM A-105, GRADE B	
21A	2	4"	FLG, ANSI 150 RFWN, ASTM A-105, STD WALL, WPB		59	7	1"	ELL, 90°, FNPT, 3000#, ASTM A-105, GRADE B	
22	2	4"	FLG, ANSI 600 RFWN, ASTM A-105, STD WALL, WPB		60	2	1 1/2"	ELL, 90°, FNPT, 3000#, ASTM A-105, GRADE B	
23	1	8"	FLG, ANSI 900 RFWN, ASTM A-105, STD WALL, WPB		61	12	2"	ELL, 90°, FNPT, 3000#, ASTM A-105, GRADE B	
24	16	10"	FLG, ANSI 600 RFWN, ASTM A-105, STD WALL, WPB		62	4	3/4"	TEE, ASTM A-106, FNPT, 3000#, GRADE B	
25	1	10"	FLG, ANSI 900 RFWN, ASTM A-105, STD WALL, WPHY-42		63	1	1 1/2"	TEE, ASTM A-106, FNPT, 3000#, GRADE B	
26	1	2"	FLG, RF BLIND 150LB, ASTM A-105		64	3	2"	TEE, ASTM A-106, FNPT, 3000#, GRADE B	
26A	1	4"	FLG, RF BLIND 150LB, ASTM A-105		65	2	3/4"x1/2"	TEE, RED. ASTM A-106, FNPT, 3000#, GRADE B	
27	1	10"	FLG, RF BLIND 600LB, ASTM A-105		66	5	10"x2"	WELD-O-LET, ASTM A-105, BUTT WELD, 3000#, GRADE B	
28	2	10"x4"	TEE, REDUCING, ASTM A-234, BUTT WELD, STD WALL, WPB		67	3	8"x3/4"	THRED-O-LET, ASTM A-105, FNPT, 3000#, GRADE B	
28A	4	4"x2"	TEE, REDUCING, ASTM A-234, BUTT WELD, STD WALL, WPB		68	7	10"x3/4"	THRED-O-LET, ASTM A-105, FNPT, 3000#, GRADE B	
29	1	2"x1"	REDUCER, CONC S/XS, ASTM A-234 GR WPB		68A	1	10"x2"	THRED-O-LET, ASTM A-105, FNPT, 3000#, GRADE B	
30	1	10"x8"	REDUCER, ECC, ASTM A-234, BUTT WELD, STD WALL, WPB		69	3	3/4"	UNION, FNPT, 3000#, ASTM A-105, GRADE B	
31	2	1/2"	(4) STUD BOLTS FOR 3/4" 150LB FLANGES, ASTM A-193, GR. B7 W/TWO (2) ASTM A-194, GR. 2H, HEAVY HEX NUTS EACH	2 3/4"	70	2	1"	UNION, FNPT, 3000#, ASTM A-105, GRADE B	
32	2	1/2"	(4) STUD BOLTS FOR 1 1/2" 150LB FLANGES, ASTM A-193, GR. B7 W/TWO (2) ASTM A-194, GR. 2H, HEAVY HEX NUTS EACH	3 1/4"	71	4	1 1/2"	UNION, FNPT, 3000#, ASTM A-105, GRADE B	
33	4	5/8"	(4) STUD BOLTS FOR 2" 150LB FLANGES, ASTM A-193, GR. B7 W/TWO (2) ASTM A-194, GR. 2H, HEAVY HEX NUTS EACH	3 1/2"	72	6	2"	UNION, FNPT, 3000#, ASTM A-105, GRADE B	
34	10	5/8"	(8) STUD BOLTS FOR 2" 600LB FLANGES, ASTM A-193, GR. B7 W/TWO (2) ASTM A-194, GR. 2H, HEAVY HEX NUTS EACH	4 3/4"	73	2	1 1/2"x1"	BUSHING, RED. THRD 3000LB, ASTM A-105	
34A	2	5/8"	(8) STUD BOLTS FOR 4" 150LB FLANGES, ASTM A-193, GR. B7 W/TWO (2) ASTM A-194, GR. 2H, HEAVY HEX NUTS EACH	4"	74	2	1/2"x1/4"	BUSHING, THRD 3000LB, HEXAGON HEAD (LADISH PART NO. 600),(LGT,THD,(LE)&THD,(SE) PER ASME B16.11-2001)	
35	2	7/8"	(8) STUD BOLTS FOR 4" 600LB FLANGES, ASTM A-193, GR. B7 W/TWO (2) ASTM A-194, GR. 2H, HEAVY HEX NUTS EACH	6"	75	2	1"x1"	NPT TO SWEAT COPPER FITTING	
36	1	1 3/8"	(12) STUD BOLTS FOR 8" 900LB FLANGES, ASTM A-193, GR. B7 W/TWO (2) ASTM A-194, GR. 2H, HEAVY HEX NUTS EACH	9 1/4"	76	1	3/4"	CPLG, THRD 3000# FNPT, ASTM A-105	
37	1	1 3/8"	(16) STUD BOLTS FOR 10" 900LB FLANGES, ASTM A-193, GR. B7 W/TWO (2) ASTM A-194, GR. 2H, HEAVY HEX NUTS EACH	9 3/4"	77	2	3/4"x1/2"	COUPLING RED THRD, ASTM A-105	
38	2	1 1/4"	(16) STUD BOLTS FOR 10" 600LB FLANGES WITH SPECTACLE BLIND, ASTM A-193, GR. B7 W/TWO (2) ASTM A-194, GR. 2H, HEAVY HEX NUTS EACH	10 1/2"	78	1	2"x1"	COUPLING RED THRD, ASTM A-105	
38A	2	4"	GASKET, ANSI 150, FLEXITALLIC SPIRAL WOUND, TYPE "CG", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		79	1	2"x1 1/2"	COUPLING RED THRD, ASTM A-105	
39	11	1 1/4"	(16) STUD BOLTS FOR 10" 600LB FLANGES, ASTM A-193, GR. B7 W/TWO (2) ASTM A-194, GR. 2H, HEAVY HEX NUTS EACH	8 3/4"	80	3	3/4"	PLUG, ASTM A-106, MNPT, SCH. 160, GRADE B	
40	2	3/4"	GASKET, ANSI 150, FLEXITALLIC SPIRAL WOUND, TYPE "CG", 304/316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		80A	1	2"	PLUG, ASTM A-106, MNPT, SCH. 160, GRADE B	
41	2	1 1/2"	GASKET, ANSI 150, FLEXITALLIC SPIRAL WOUND, TYPE "CG", 304/316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		81	1	2"x3/4"	SWAGE, CONC., ASTM A-105, FNPT, SCH. 160, WPB	
					82	2	1/2"	BALL VALVE, SERIES 800 WOG 3000#, FNPT, REDUCED PORT, 316 SS BALL AND TRIM, SS BODY, PTFE SEATS, API 6D OR ASME B16.34, FIRE SAFE DESIGN	1 7/16"
					83	9	3/4"	BALL VALVE, SERIES 800 WOG 3000#, FNPT, REDUCED PORT, 316 SS BALL AND TRIM, SS BODY, PTFE SEATS, API 6D OR ASME B16.34, FIRE SAFE DESIGN	1 5/8"
					84	2	2"	BALL VALVE, ANSI 150, RFFE, FULL PORT, 316 SS BALL AND TRIM, PTFE SEATS, API 6D, FIRE SAFE DESIGN	7"
					85	4	2"	BALL VALVE, ANSI 600, RFFE, FULL PORT, 316 SS BALL AND TRIM, PTFE SEATS, API 6D, FIRE SAFE DESIGN	7"
					85A	1	2"	BALL VALVE, SERIES 800 WOG 3000#, FNPT, REDUCED PORT, 316 SS BALL AND TRIM, SS BODY, PTFE SEATS, API 6D OR ASME B16.34, FIRE SAFE DESIGN	
					86	1	10"	CHECK VALVE, ANSI 600, RFFE, FULL CONDUIT W/BONNET COVER, API 6D, 13 CR TRIM, SWNG TYPE, HF SEAT	2'-7"
					87	2	10"	GATE VALVE, ANSI 600, RFFE, FULL CONDUIT, SLAB GATE, FABRICATED STEEL BODY, C.S. ENP GATE, WTON SEATS, API-6D, FIRE SAFE DESIGN	2'-7"
					88	2	3/4"x1"	RELIEF VALVE, 800LB THRD	
					89	2	10"	BLIND, SPECTACLE, 600LB, ASTM A-105	1 3/8"
					90	2	1/2"	FLOW METER, LUBE OIL	

Rooney Engineering, Inc.
12201 E. Arapahoe Rd.
Centennial, CO 80112
(303) 792-5911

1	AS-BUILT	2/28/08	EK	ADJ
0	ISSUED FOR CONSTRUCTION	02/13/07	EK	ADJ
NO	REVISION	DATE	APPR	BY
ENBRIDGE PIPELINES (ND)				
STANLEY (ND) STATION				
PIPING SECTIONS AND DETAILS MAINLINE PUMP ADDITION				
PROJECT: ENBRIDGE ND EXPANSION				
SCALE: 3/8"=1'-0"	DATE: 05/02/06	DRAWN: ADJ		
CHECK:	APPR:	DATE:		
DWG. NO. 2408-P-004				