

BILL OF MATERIAL					BILL OF MATERIAL					BILL OF MATERIAL					BILL OF MATERIAL				
MARK	QTY	SIZE	DESCRIPTION	LENGTH	MARK	QTY	SIZE	DESCRIPTION	LENGTH	MARK	QTY	SIZE	DESCRIPTION	LENGTH	MARK	QTY	SIZE	DESCRIPTION	LENGTH
1	1	3/4"	PIPE, API 5L, XH, GRADE B, SMLS, DRL, PE	26'-2"	52	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"	89	1	2"x3/4"	SWAGE, CONC., ASTM A-105, FNPT, SCH. 160, WPB		137	2	1"x3/4"	TEE, RED. ASTM A-106, FNPT, 3000#, GRADE B	
2	1	1"	PIPE, API 5L, XH, GRADE B, SMLS, DRL, PE	12'-6"						90	3	1/2"x1/4"	BUSHING, THRD 3000LB, HEXAGON HEAD (LADISH PART NO. 600),(LGT,THD.(LE)&THD.(SE) PER ASME B16.11-2001)		138	2	1/2"	ELL, 90°, FNPT, MALLEABLE IRON 300LBS.	
3	1	1 1/2"	PIPE, API 5L, XH, GRADE B, SMLS, DRL, PE	4'-7"											139	2	1"	UNION, COPPER, SWEAT FITTING	
4	1	2"	PIPE, API 5L, XH, GRADE B, SMLS, DRL, PE	30'-5"	53	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"	91	1	3/4"x1/2"	BUSHING, RED. THRD 3000LB, ASTM A-105		140	10	2"	PLUG, ASTM A-106, MNPT, SCH. 160, GRADE B	
5	1	2"	PIPE, API 5L, XH, GRADE B, SMLS, DRL, PE, FBE COATED 14-16 MILS	270'-1"						92	1	3/4"	CPLG, THRD 3000# FNPT, ASTM A-105		141	1	10"x2"	ELBOW-LET, ASTM A-105, FNPT, 3000#, GRADE B	
6	1	4"	PIPE, API 5L, STD, GRADE B, SMLS, DRL, PE	1'-1"	54	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"	93	4	3/4"x1/2"	COUPLING RED THRD, MALLEABLE IRON 300LBS.		142	3	12"x2"	ELBOW-LET, ASTM A-105, FNPT, 3000#, GRADE B	
7	1	4"	PIPE, API 5L, STD, GRADE B, SMLS, DRL, PE, FBE COATED 14-16 MILS	97'-1"						94	3	2"x1"	COUPLING RED THRD, ASTM A-105		143	1	10"x2"	THRED-O-LET, ASTM A-105, FNPT, 3000#, GRADE B	
8	1	8"	PIPE, API 5L, STD, GRADE B, SMLS, DRL, PE	5'-4"	55	21	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 1/2"	95	1	2"x1 1/2"	COUPLING RED THRD, MALLEABLE IRON 300LBS.		144	2	12"x2"	THRED-O-LET, ASTM A-105, FNPT, 3000#, GRADE B	
9	1	10"	PIPE, API 5L, STD, GRADE B, ERW, DRL, PE	11'-8"						96	10	3/4"	ELL, 90°, FNPT, 3000#, ASTM A-105, GRADE B		145	2	16"x2"	THRED-O-LET, ASTM A-105, FNPT, 3000#, GRADE B	
10	1	10"	PIPE, API 5L, STD, GRADE B, ERW, DRL, PE, FBE COATED 14-16 MILS	28'-5"						97	12	1"	ELL, 90°, FNPT, 3000#, ASTM A-105, GRADE B		146	4	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	3"
11	1	12"	PIPE, API 5L, STD, GRADE B, ERW, DRL, PE	143'-4"	56	7	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"	98	2	1 1/2"	ELL, 90°, FNPT, MALLEABLE IRON 300LBS.						
12	1	12"	PIPE, API 5L, STD, GRADE B, ERW, DRL, PE, FBE COATED 14-16 MILS	34'-7"	57	1	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"	99	22	2"	ELL, 90°, FNPT, 3000#, ASTM A-105, GRADE B		147	2	3/4"x1"	RELIEF VALVE, THRD, 800LB	
13	1	16"	PIPE, API 5L, STD, X-52, ERW, DRL, PE	49'-7"						100	3	3/4"	TEE, ASTM A-106, FNPT, 3000#, GRADE B		148	2	1/2"	FLOW METER, LUBE OIL	
14	1	16"	PIPE, API 5L, STD, X-52, ERW, DRL, PE, FBE COATED 14-16 MILS	354'-5"	58	1	3/4"	(8) STUD BOLTS FOR 6" 150LB FLANGES, ASTM A-193, GR. B7 W/TWO (2) ASTM A-194, GR. 2H, HEAVY HEX NUTS EACH	4 1/4"	101	2	1"	TEE, ASTM A-106, FNPT, 3000#, GRADE B		149	1	3/4"	TEE, FNPT, MALLEABLE IRON 300LBS.	
15	1	1"	PIPE, COPPER	16'-1"						102	1	1 1/2"	TEE, FNPT, MALLEABLE IRON 300LBS.		150	4	3/4"	ELL, 90°, FNPT, MALLEABLE IRON 300LBS.	
16	4	16"	BEND,30°, 6D, 2'-0" TANGENT, STD, X-52, ERW, DRL, PE	8'-2"	59	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"	103	4	2"	TEE, ASTM A-106, FNPT, 3000#, GRADE B		151	1	3/4"	ELL STREET, 90°, THREADED	
17	2	4"	FLEX HOSE, BRAIDED	1'-7" EA.						104	3	3/4"x1/2"	TEE, RED. ASTM A-106, FNPT, 3000#, GRADE B						
18	2	4"	FLG, FFWN 150LB							105	3	3/4"	UNION, FNPT, 3000#, ASTM A-105, GRADE B						
19	4	16"	BEND,90°, 6D, 2'-0" TANGENT, STD, X-52, ERW, DRL, PE	16'-7"						106	3	1"	UNION, FNPT, 3000#, ASTM A-105, GRADE B						
20	1	3/4"	FLEXIBLE HOSE	4'-5"	60	2	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"	107	1	1 1/2"	UNION, FNPT, MALLEABLE IRON 300LBS.						
21	1	2"	FLEXIBLE HOSE	5'-1"						108	11	2"	UNION, FNPT, 3000#, ASTM A-105, GRADE B						
22	28	2"	ELL, 90° LR, ASTM A-234, BUTT WELD, XH WALL, WPB							109	2	10"x2"	WELD-O-LET, ASTM A-105, BUTT WELD, 3000#, GRADE B						
23	3	4"	ELL, 90° LR, ASTM A-234, BUTT WELD, STD WALL, WPB		61	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 1/2"	110	8	12"x2"	WELD-O-LET, ASTM A-105, BUTT WELD, 3000#, GRADE B						
24	4	10"	ELL, 90° LR, ASTM A-234, BUTT WELD, STD WALL, WPB							111	3	8"x3/4"	THRED-O-LET, ASTM A-105, FNPT, 3000#, GRADE B						
25	16	12"	ELL, 90° LR, ASTM A-234, BUTT WELD, STD WALL, WPB		62	2	1 1/4"	(20) STUD BOLTS FOR 12" 600LB FLANGES WITH SPECTACLE BLIND, ASTM A-193, GR. B7 W/TWO (2) ASTM A-194, GR. 2H, HEAVY HEX NUTS EACH	11"	112	3	10"x3/4"	THRED-O-LET, ASTM A-105, FNPT, 3000#, GRADE B						
26	2	1"	ELL, 45°, COPPER, SWEAT FITTING							113	4	12"x3/4"	THRED-O-LET, ASTM A-105, FNPT, 3000#, GRADE B						
27	10	1"	ELL, 90°, COPPER, SWEAT FITTING		63	9	1 1/4"	(20) STUD BOLTS FOR 12" 600LB FLANGES, ASTM A-193, GR. B7 W/TWO (2) ASTM A-194, GR. 2H, HEAVY HEX NUTS EACH	9"	114	4	16"x3/4"	THRED-O-LET, ASTM A-105, FNPT, 3000#, GRADE B						
28	6	2"	TEE, ASTM A-234, BUTT WELD, XH WALL, WPB							115	4	2"	THREAD-O-RING						
29	2	12"	TEE, ASTM A-234, BUTT WELD, STD WALL, WPB							116	8	3/4"	PLUG, ASTM A-106, MNPT, SCH. 160, GRADE B						
30	6	4"x2"	TEE, REDUCING, ASTM A-234, BUTT WELD, STD WALL, WPB		64	6	1 1/2"	(20) STUD BOLTS FOR 16" 600LB FLANGES, ASTM A-193, GR. B7 W/TWO (2) ASTM A-194, GR. 2H, HEAVY HEX NUTS EACH	10 1/2"	117	2	1 1/2"	1 1/2" NPT TO 1" SWEAT						
31	2	12"x10"	TEE, REDUCING, ASTM A-234, STD WALL, WPB							118	2	1 1/2"	FLG, RF, FNPT, 150LB						
32	2	16"x12"	TEE, REDUCING, BARRED, ASTM A-234, STD WALL, WPB		65	2	1 1/2"	GASKET, ANSI 150, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		119	2	3/4"	FLG, RF, FNPT, 150LB						
33	1	2"x1"	REDUCER, CONC S/XS, ASTM A-234 GR WPB							120	3	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						
34	1	10"x8"	REDUCER, ECC., ASTM A-234, BUTT WELD, STD WALL, WPB		66	2	3/4"	GASKET, ANSI 150, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		121	15	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						
35	1	12"x10"	REDUCER, ECC., ASTM A-234, BUTT WELD, STD WALL, WPB							122	2	1"	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						
36	3	2"	FLG, ANSI 150 RFWN, ASTM A-105, XH, WPB		67	3	10"	GASKET, ANSI 600, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		123	2	2"	BALL VALVE, ANSI 150, RFFE , FULL PORT, 316 SS BALL AND TRIM, PTFE SEATS, API 6D, FIRE SAFE DESIGN						
37	21	2"	FLG, ANSI 600 RFWN, ASTM A-105, XH, WPB							124	11	2"	BALL VALVE, ANSI 600, RFFE , FULL PORT, 316 SS BALL AND TRIM, PTFE SEATS, API 6D, FIRE SAFE DESIGN						
38	5	4"	FLG, ANSI 150 RFWN, ASTM A-105, STD WALL, WPB		68	1	10"	GASKET, ANSI 900, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		125	1	10"	GATE VALVE, ANSI 600, RFFE , FULL CONDUIT, SLAB GATE, FABRICATED STEEL BODY, C.S. ENP GATE, VITON SEATS, API-6D, FIRE SAFE DESIGN						
39	1	4"	FLG, ANSI 600 RFWN, ASTM A-105, STD WALL, WPB							126	3	12"	GATE VALVE, ANSI 600, RFFE , FULL CONDUIT, SLAB GATE, FABRICATED STEEL BODY, C.S. ENP GATE, VITON SEATS, API-6D, FIRE SAFE DESIGN						
40	1	8"	FLG, ANSI 900 RFWN, ASTM A-105, STD WALL, WPB		69	11	12"	GASKET, ANSI 600, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		127	1	16"	GATE VALVE, ANSI 600, RFFE , FULL CONDUIT, SLAB GATE, FABRICATED STEEL BODY, C.S. ENP GATE, VITON SEATS, API-6D, FIRE SAFE DESIGN						
41	3	10"	FLG, ANSI 600 RFWN, ASTM A-105, STD WALL, WPB							128	1	2"	CHECK VALVE, ANSI 600, RFFE , FULL CONDUIT W/BONNET COVER, API 6D, 13 CR TRIM, SWING TYPE, HF SEAT						
42	1	10"	FLG, ANSI 900 RFWN, ASTM A-105, STD WALL, WPB		70	4	16"	GASKET, ANSI 600, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		129	2	12"	CHECK VALVE, ANSI 600, RFFE , FULL CONDUIT W/BONNET COVER, API 6D, 13 CR TRIM, SWING TYPE, HF SEAT						
43	11	12"	FLG, ANSI 600 RFWN, ASTM A-105, STD WALL, WPB							130	1	16"	CHECK VALVE, PINNABLE, ANSI 600, RFFE , FULL CONDUIT W/BONNET COVER, API 6D, 13 CR TRIM, SWING TYPE, HF SEAT						
44	8	16"	FLG, ANSI 600 RFWN, ASTM A-105, STD WALL, WPB		71	4	2"	GASKET, ANSI 150, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		131	1	3/4"x1"	RELIEF VALVE, THRD, 800LB RELIEF PRESSURE						
45	1	2"	FLG, RF BLIND 150LB, ASTM A-105							132	2	12"	BLIND, SPECTACLE, 600LB, ASTM A-105						
46	2	2"	FLG, RF BLIND 600LB, ASTM A-105		72	23	2"	GASKET, ANSI 600, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		133	2	12"	INSULATING FLANGE KIT, 600LB						
47	1	4"	FLG, RF BLIND 150LB, ASTM A-105							134	2	16"	INSULATING FLANGE KIT, 600LB						
48	1	4"	FLG, RF BLIND 600LB, ASTM A-105		73	7	4"	GASKET, ANSI 150, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		135	1	2"	INSULATING FLANGE KIT, 600LB						
49	1	6"	FLG, FF BLIND 150LB, ASTM A-105							136	1	2"	FLG, RF, FNPT, 600LB						
50	1	10"	FLG, RF BLIND 600LB, ASTM A-105		74	1	4"	GASKET, ANSI 600, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING											
51	1	12"	FLG, RF BLIND 600LB, ASTM A-105																
					75	1	6"	GASKET, NEOPRENE											
					76	1	8"	GASKET, ANSI 900, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING											
					77	3	1/4"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	3"										
					78	6	1/2"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	3"										
					79	3	1/2"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	5"										
					80	27	3/4"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	3"										
					80A	3	3/4"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	CLOSE										
					81	1	1"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	CLOSE										
					82	7	1"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	3"										
					83	11	1"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	6"										
					84	1	3/4"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	6"										
					85	2	4"	GASKET, NEOPRENE											
					86	4	1 1/2"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	3"										
					87	7	2"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	3"										
					88	19	2"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	6"										

1	AS-BUILT	01/25/08	EK	ADJ
0	ISSUED FOR CONSTRUCTION	6/25/07	EK	ADJ
NO				