

BILL OF MATERIAL					BILL OF MATERIAL					BILL OF MATERIAL				
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'-9"	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	3"	106	3	1"	UNION, FNPT, 3000#, ASTM A-105, GRADE B	
2	1	1"	PIPE, API 5L, XH, GRADE B, SMLS, DRL, PE	10'-11"						107	1	1 1/2"	UNION, FNPT, MALLEABLE IRON 300 LBS.	
3	1	1 1/2"	PIPE, API 5L, XH, GRADE B, SMLS, DRL, PE	4'-7"						108	11	2"	UNION, FNPT, 3000#, ASTM A-105, GRADE B	
4	1	2"	PIPE, API 5L, XH, GRADE B, SMLS, DRL, PE	31'-1"	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 1/2"	109	2	10"x2"	WELD-O-LET, ASTM A-105, BUTT WELD, 3000#, GRADE B	
5	1	2"	PIPE, API 5L, XH, GRADE B, SMLS, DRL, PE, FBE COATED 14-16 MILS	270'-9"						110	8	12"x2"	WELD-O-LET, ASTM A-105, BUTT WELD, 3000#, GRADE B	
6	-	-	-	-	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	4"	111	3	8"x3/4"	THRED-O-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	122'-2"						112	3	10"x3/4"	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	5"	113	4	12"x3/4"	THRED-O-LET, ASTM A-105, FNPT, 3000#, GRADE B	
9	1	10"	PIPE, API 5L, STD, GRADE B, ERW, DRL, PE	11'-8"						114	4	16"x3/4"	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	29'-4"						115	4	2"	THREAD-O-RING	
11	1	12"	PIPE, API 5L, STD, GRADE B, ERW, DRL, PE	53'-0"	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"	116	2	3/4"	PLUG, ASTM A-106, MNPT, SCH. 160, GRADE B	
12	1	12"	PIPE, API 5L, STD, GRADE B, ERW, DRL, PE, FBE COATED 14-16 MILS	128'-9"						117	2	1"	UNION, COPPER, SWEAT FITTING	
13	1	16"	PIPE, API 5L, 0.312 W.T., X-52, ERW, DRL, PE	49'-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 1/2"	118	2	1 1/2"	FLG, RF, FNPT, 150LB	
14	1	16"	PIPE, API 5L, 0.312 W.T., X-52, ERW, DRL, PE, FBE COATED 14-16 MILS	370'-0"						119	2	3/4"	FLG, RF, FNPT, 150LB	
15	1	1"	PIPE, COPPER	18'-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 1/2"	120	3	1 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"
16	4	16"	BEND, 30', 6D, 2'-0" TANGENT, STD, X-52, ERW, DRL, PE	8'-2"						121	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	2"
17	1	16"	BEND, 60', 6D, 2'-0" TANGENT, STD, X-52, ERW, DRL, PE	12'-5"	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 1/2"	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	2"
18	2	16"	BEND, 75', 6D, 2'-0" TANGENT, STD, X-52, ERW, DRL, PE	14'-7"						123	2	2"	BALL VALVE, ANSI 150, RFFE, FULL PORT, 316 SS BALL AND TRIM, PTFE SEATS, API 6D, FIRE SAFE DESIGN	7"
19	1	16"	BEND, 90', 6D, 2'-0" TANGENT, STD, X-52, ERW, DRL, PE	16'-7"						124	11	2"	BALL VALVE, ANSI 600, RFFE, FULL PORT, 316 SS BALL AND TRIM, PTFE SEATS, API 6D, FIRE SAFE DESIGN	1'-0"
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	9"	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	2'-7"
21	1	2"	FLEXIBLE HOSE	5'-1"						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	2'-9"
21A	2	4"	FLEX HOSE, BRAIDED	19"	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	10"	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	3'-3"
22	30	2"	ELL, 90' LR, ASTM A-234, BUTT WELD, 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	11"
23	4	4"	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"	129	2	12"	CHECK VALVE, ANSI 600, RFFE, FULL CONDUIT W/BONNET COVER, API 6D, 13 CR TRIM, SWING TYPE, HF SEAT	2'-9"
24	4	10"	ELL, 90' LR, ASTM A-234, BUTT WELD, STD WALL, WPB							130	1	16"	CHECK VALVE, ANSI 600, RFFE, FULL CONDUIT W/BONNET COVER, API 6D, 13 CR TRIM, SWING TYPE, HF SEAT	3'-3"
25	16	12"	ELL, 90' LR, ASTM A-234, BUTT WELD, STD WALL, WPB							131	1	3/4"x1"	RELIEF VALVE, THRD, 800LB PRESSURE SETTING	
26	2	1"	ELL, 45', 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 1/2"	132	2	12"	BLIND, SPECTACLE, 600LB, ASTM A-105	2"
27	10	1"	ELL, 90', COPPER, SWEAT FITTING							133	2	12"	INSULATING FLANGE KIT, 600LB	
28	6	2"	TEE, 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"	134	2	16"	INSULATING FLANGE KIT, 600LB	
29	2	12"	TEE, ASTM A-234, BUTT WELD, STD WALL, WPB							135	1	2"	INSULATING FLANGE KIT, 600LB	
30	6	4"x2"	TEE, REDUCING, ASTM A-234, BUTT WELD, STD WALL, WPB		65	2	1 1/2"	GASKET, ANSI 150, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		136	1	2"	FLG, ANSI 600, FNPT, XS BORE, ASTM A-105, GRADE B	
31	2	12"x10"	TEE, REDUCING, ASTM A-234, STD WALL, WPB							137	2	1"x3/4"	TEE, RED. ASTM A-106, FNPT, 3000#, GRADE B	
32	2	16"x12"	TEE, REDUCING, BARRED, ASTM A-234, STD WALL, WPB		66	2	3/4"	GASKET, ANSI 150, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		138	1	3/4"	TEE, FNPT, MALLEABLE IRON 300 LBS.	
33	1	2"x1"	REDUCER, CONC XS, ASTM A-234 GR WPB							139	4	3/4"	ELL, 90', FNPT, MALLEABLE IRON 300 LBS.	
34	1	10"x8"	REDUCER, ECC., ASTM A-234, BUTT WELD, STD WALL, WPB		67	3	10"	GASKET, ANSI 600, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		140	2	1/2"	ELL, 90', FNPT, MALLEABLE IRON 300 LBS.	
35	1	12"x10"	REDUCER, ECC., ASTM A-234, BUTT WELD, STD WALL, WPB							141	1	10"x2"	ELBOW-LET, THRD 6000LB, ASTM A-105	
36	3	2"	FLG, ANSI 150 RFWN, ASTM A-105, XH, WPB		68	1	10"	GASKET, ANSI 900, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		142	3	12"x2"	ELBOW-LET, THRD 6000LB, ASTM A-105	
37	21	2"	FLG, ANSI 600 RFWN, ASTM A-105, XH, WPB		69	11	12"	GASKET, ANSI 600, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		143	2	1/2"	FLOW METER, LUBE OIL	
38	5	4"	FLG, ANSI 150 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		144	2	16"x2"	THRED-O-LET, ASTM A-105, FNPT, 3000#, GRADE B	
39	1	4"	FLG, ANSI 600 RFWN, ASTM A-105, STD WALL, WPB							145	1	3/4"	90 STREET ELL, SW, 3000LB	
40	1	8"	FLG, ANSI 900 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		146	2	12"x2"	THRED-O-LET, ASTM A-105, FNPT, 3000#, GRADE B	
41	3	10"	FLG, ANSI 600 RFWN, ASTM A-105, STD WALL, WPB							147	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	
42	1	10"	FLG, ANSI 900 RFWN, ASTM A-105, STD WALL, WPB		72	23	2"	GASKET, ANSI 600, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		148	2	1 1/2"x1"	1 1/2" NPT TO 1" SWEAT	
43	11	12"	FLG, ANSI 600 RFWN, ASTM A-105, STD WALL, WPB							149	2	4"	GASKET, VITON, ANSI 150	
44	8	16"	FLG, ANSI 600 RFWN, ASTM A-105, STD WALL, WPB		73	7	4"	GASKET, ANSI 150, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		150	1	10"x2"	THRED-O-LET, ASTM A-105, FNPT, 3000#, GRADE B	
44A	2	4"	FLG, FFWN 150LB							151	2	3/4"x1"	RELIEF VALVE, THRD, 1400LB PRESSURE SETTING	
45	1	2"	FLG, RF BLIND 150LB, ASTM A-105		74	1	4"	GASKET, ANSI 600, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING		152	1	3/4"	ELL STREET, 90', THREADED	
46	2	2"	FLG, RF BLIND 600LB, ASTM A-105											
47	1	4"	FLG, RF BLIND 150LB, ASTM A-105		75	1	6"	GASKET, NEOPRENE, ANSI 150						
48	1	4"	FLG, RF BLIND 600LB, ASTM A-105											
49	1	6"	FLG, FF BLIND 150LB		76	1	8"	GASKET, ANSI 900, FLEXITALLIC SPIRAL WOUND, TYPE "CGI", 316 SS WINDINGS, FLEXITALLIC CGI CENTERING RING						
50	1	10"	FLG, RF BLIND 600LB, ASTM A-105											
51	1	12"	FLG, RF BLIND 600LB, ASTM A-105		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	21	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	9	1"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	6"					
					84	3	3/4"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	6"					
					85	2	1 1/2"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	CLOSE					
					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	18	2"	NIPPLE, ASTM A-106, MNPT, SCH. 160, GRADE B TBE	6"					
					89	1	2"x3/4"	SWAGE, CONC., ASTM A-105, FNPT, SCH. 160, WPB						
					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)						
					91	10	2"	PLUG, ASTM A-106, MNPT, SCH. 160, GRADE B						
					91A	1	3/4"x1/2"	BUSHING, RED. THRD 3000LB, ASTM A-105						
					92	1	3/4"	COUPLING THRD, 3000# FNPT, ASTM A-105						
					93	4	3/4"x1/2"	COUPLING RED THRD, ASTM A-105						
					94	3	2"x1"	COUPLING RED THRD, ASTM A-105						
					95	1	2"x1 1/2"	COUPLING RED THRD, ASTM A-105						
					96	8	3/4"	ELL, 90', FNPT, 3000#, ASTM A-105, GRADE B						
					97	12	1"	ELL, 90', FNPT, 3000#, ASTM A-105, GRADE B						
					98	2	1 1/2"	ELL, 90', FNPT, MALLEABLE IRON 300 LBS.						
					99									