	UNIVERSITY OF IOWA MAIN POWER PLANT (MPP) PIPING STANDARD SPECIFICATIONS TABLE OF CONTENTS										
PIPE			ONDITIONS	-	NG CONDITIONS	UIHC OPERATII	NG CONDITIONS				
SPECIFICATION	SYSTEM	PRESSURE (PSIG)	TEMPERATURE (°F)	PRESSURE (PSIG)	TEMPERATURE (°F)	PRESSURE (PSIG)	TEMPERATURE (°F)	PAGE	REV	DATE	
UI-GSP	GENERAL SERVICE PIPING	150	350	N/A	N/A	N/A	N/A	2	2	2/22/2021	
UI-MPP-LPS	MAIN POWER PLANT LOW PRESSURE STEAM	50	530	20	300	12	300	3	5	2/22/2021	
UI-MPP-MPS	MAIN POWER PLANT MEDIUM PRESSURE STEAM	325	775	155	350	155	370	4	6	2/22/2021	
UI-MPP-HPS	MAIN POWER PLANT HIGH PRESSURE STEAM	600	775	500	750	N/A	N/A	5	6	2/22/2021	
UI-MPP-LP-CON	MAIN POWER PLANT LOW PRESSURE CONDENSATE	50	530	20	300	12	300	6	4	2/22/2021	
UI-MPP-MP-CON	MAIN POWER PLANT MEDIUM PRESSURE CONDENSATE	325	775	155	350	155	370	7	4	2/22/2021	
UI-MPP-HP-CON	MAIN POWER PLANT HIGH PRESSURE CONDENSATE	600	775	500	750	N/A	N/A	8	4	2/22/2021	
UI-MPP-VENT	RELIEF DEVICE VENT PIPING	600	775	NO	TE 1	NOTE 1		9	1	2/22/2021	
UI-MPP-ED	EQUIPMENT DRAIN PIPING	600	775	NO	TE 1	NO	TE 1	10	1	2/22/2021	
UI-DSH	<u>DESUPERHEATER</u>	800	400	700	240	N/A	N/A	11	4	2/22/2021	
UI-MPP-FW	BOILER FEEDWATER	800	400	700	245	250	245	12	4	2/22/2021	
UI-GFS	NATURAL GAS	150	150	58	55		90	13	3	2/22/2021	
UI-AIR	COMPRESSED AIR	150	150	80-100	75	90	75	14	3	2/22/2021	
UI-MUS-PWS	MAKE-UP WATER	150	150	100	55	60	55	15	6	2/22/2021	
UI-MUS-PWS	POTABLE WATER	150	150	60	55	60	55	15	6	2/22/2021	
UI-NPW	NON-POTABLE WATER	150	150	60	55	60	55	16	5	2/22/2021	
UI-CWS-CWR	COOLING WATER	100	100	65	98	N/A	N/A	17	6	2/22/2021	
UI-SEW	<u>SANITARY SEWER</u>	15	140	0	75	0	75	18	0	2/22/2021	
UI-RWS	<u>RIVER WATER</u>	100	120	75	90	N/A	N/A	19	2	2/22/2021	
UI-MPP-BOS-BDS	BOILER BLOWOFF	600	500	535	480	180	370	20	4	2/22/2021	
UI-MPP-BOS-BDS	BOILER BLOWDOWN	600	500	535	480	180	370	20	4	2/22/2021	
UI-CHEM (SS)	CHEMICAL FEED	150	140	NO	TE 1	NO	TE 1	21	2	2/22/2021	
UI-CHEM (PVC)	CHEMICAL FEED	150	140	NO	TE 1	NO	TE 1	22	0	2/22/2021	

200

685

100

N/A

245

-1

N/A

150

685

- -

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

23

24

25

26

300

-6

-6

N/A

2 2/22/2021

1

1

1

2/22/2021

9/22/2017

2/22/2021

NOTES

UI-TOS

UI-MPP-ASH

UI-VAC

1) OPERATING CONDITIONS DETERMINED ON A SYSTEM BY SYSTEM BASIS

TURBINE OIL

ASH SYSTEM

VACUUM SYSTEM

BRANCH TABLE

2) ALL SYSTEMS ARE ABOVE GROUND UNLESS OTHERWISE STATED

DIDING 9	PECIFICATION:	DPO:	CESS:	DESIGN CO	NDITIONS:
	LOI IOATION.		SERVICE	150 PSIG	
UI-GSP	PIPE SIZE (NPS)		SMALLER	2 1/2" Ti	
PIPE MATERIAL:	WEIGHT/SCHEDULE	>	(S	Sī	D
ASME B36.10M	MATERIAL		B - SEAMLESS	A53 GRADE B	
	CONSTRUCTION		KETWELD - B16.11	BUTTWELD -	
FITTINGS:	WALL THICKNESS		JOINING PIPE	SAME AS AD.	
	MATERIAL		STEEL - ASTM A105	BUTTWELD FITTING - ASTM	
PIPING JOINTS:	TYPE		TUBEAD DECUMED	BUTTWELD - END WHERE FLAN	
	OTHER		THREAD REQUIRED	WHERE FLAN	SE REQUIRED
	CONSTRUCTION		- FLAT FACE WITH SPIRAL SKET DESIGN	NOT PER	RMITTED
UNIONS:	WALL THICKNESS		JOINING PIPE	-	-
	MATERIAL		STEEL - ASTM A105	-	-
	CONSTRUCTION		CLASS 150 - WELD	NECK - ASME B16.5	
FLANGES:	WALL THICKNESS	SAME AS AD	JOINING PIPE	SAME AS AD	OINING PIPE
	MATERIAL	FORGED CARBON STEEL - ASTM A105		FORGED CARBON	
FLANGE BOLTS:	CONSTRUCTION	ALLOY STEEL, AISI 4140/4142 QUENCH			ADE B7
FLANGE NUTS:	CONSTRUCTION			1194 GRADE 2H	
WASHER:	CONSTRUCTION	CDID		ISED FACE OR ELAT FACE ELA	NOTO
GASKETS:	CONSTRUCTION			ISED-FACE OR FLAT-FACE FLA 4 STAINLESS - FLEXICARB FILI	
	MATERIAL			RESSURE CLASS - SEAL WELL	
THERMOWELLS:	CONSTRUCTION MATERIAL	INSERTION		ARBON STEEL	LD MILLO
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:
CARBON STEEL	ASTM B36.10M	ASME		2	2/22/2021
ALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:		I CODE:	_,,,
	CARBON STEEL	150 PSIG	ASME B31.1	ASME B16.34	
UI-GSP	PIPE SIZE (NPS)	2" AND \$	SMALLER	2 1/2" Ti	
	CONNECTION AND RATING	CLASS 800 PSI	G SOCKETWELD	CLASS 150 FL	ANGED ENDS
GATE VALVE	CONSTRUCTION	BODY/BONNET: A105, TRIM 13% CR OUTSIDE SCREW & YOKE, BOLTED GLAND, SOLID WEDGE, HARD FACED SEATS, CLASS 800 PACKING: GRAPHITE		BODY/BONNET: A216 GR. WCB SEAT RING: STELLITE 6 FACED DISC/WEDGE: A217 GR. CA15 OR WCB WITH 13% (OVERLAY STEM: 410 SS PACKING: GRAPHITE GASKET: CORRUGATED SS WITH GRAPHITE	
	VALVE SELECTION	POWELL FIGURE GA08 VOGT SW12111 BONNEY FORGE FIG. H11SW		POWELL FIGURE 1503 CRANE FIGURE 47 BONNEY FORGE 1-11 RF	
	CONNECTION AND RATING	-	-	CLASS 150 FLANGED	ENDS (LUG STYLE)
BUTTERFLY VALVE	CONSTRUCTION			BODY/BONNET: A216 GR. WCB SEAT RING: PTFE/RTFE/UHMWPE DISC: A351 CF8M SHAFT: 17-4 PH PACKING: PTFE GLAND: 304 SS POWELL FIGURE 1572	
	VALVE SELECTION			JAMESBURY SERIES 815 FLOWSEAL TYPE 1LA	
	CONNECTION AND RATING		G SOCKETWELD	CLASS 150 FL	ANGED ENDS
CHECK VALVE	CONSTRUCTION	SWING SEAT RING: STELL DISC: 1	.105 (BOLTED) CHECK ITE 6 FACED 410 SS 13% CR IRAL WOUND	BODY/CAP: A216 C SEAT RING: I DISC: A105 OR A216 WCE GASKET: CORRUGATEI	HARDFACED WITH 13% CR OVERLAY
	VALVE SELECTION		GURE SW08 SW701 SE FIG. H61SW	POWELL FIGURE 1561 CRANE FIGURE 147 BONNEY FORGE 1-61 RF	
•					RGE 1-61 RF
	CONNECTION AND RATING	CLASS 800 PSI	G SOCKETWELD	CLASS 150 FLANGE	RGE 1-61 RF
BALL VALVE	CONNECTION AND RATING CONSTRUCTION	BODY/BONNET: AS SEAT RII BALL: SEAL PACKING: LOCKING	G SOCKETWELD TM A216 TYPE WCB NG: PTFE SS 316 : PTFE GRAPHITE S HANDLE	CLASS 150 FLANGE BODY/BONNET: A100 SEAT RING: MPT BALL AND S' PACKING: PITE BODY SEAL: S LOCKING LEVER (LOCKING GEAR OPERA	RGE 1-61 RF D ENDS (UP TO 6") 5 OR WCB (BOLTED) FE/PTFE/RPTFE TEM: SS 316 AND GRAPHITE 3" AND SMALLER) TOR (4" AND LARGER)
BALL VALVE		BODY/BONNET: AS SEAT RII BALL: SEAL PACKING: LOCKING JAMESBURY SER KITZ AW	G SOCKETWELD TM A216 TYPE WCB NG: PTFE SS 316 : PTFE GRAPHITE	CLASS 150 FLANGE BODY/BONNET: A108 SEAT RING: MPT BALL AND S' PACKING: PTEE BODY SEAL: SS LOCKING LEVER (RGE 1-61 RF D ENDS (UP TO 6*) 5 OR WCB (BOLTED) FE/PTFE/RPTFE FEM: SS 316 AND GRAPHITE 3" AND SMALLER) TOR (4" AND LARGER) UB-150 SERIES 7000
BALL VALVE	CONSTRUCTION	BODY/BONNET: AS SEAT RI BALL: SEAL PACKING: LOCKING JAMESBURY SER KITZ AW KECKLE CLASS 800 PSI	G SOCKETWELD TM A216 TYPE WCB NG: PTFE SS 316 PTFE GRAPHITE HANDLE IES 4000 MODEL A 800 SCTK YY BVM3 G SOCKETWELD	CLASS 150 FLANGE BODY/BONNET: A10: SEAT RING: MPT BALL AND S' PACKING: PTFE BODY SEAL: SS LOCKING LEVER (LOCKING GEAR OPERA' VELAN JAMESBURY	RGE 1-61 RF D ENDS (UP TO 6") 5 OR WCB (BOLTED) 5 OR WCB (BOLTED) 5 OR WCB (BOLTED) 5 OR WCB (BOLTED) 6 OR WCB (BOLTED) 7 AND SHALLER) 7 AND SMALLER) 10 B-150 10 SERIES 7000 Y BVF1
BALL VALVE	CONSTRUCTION VALVE SELECTION	BODY/BONNET: AS SEAT RII BALL: SEAL PACKING: LOCKING JAMESBURY SER KITZ AW KECKLE CLASS 800 PSI BODY/BONNET: A105 (B01) DISC: TRIM: STEM: PACKING: GASKET: SPIRAL WOU!	TM A216 TYPE WCB NG: PTFE SS 316 PTFE SS 316 PTFE GRAPHITE HANDLE IES 4000 MODEL A 8000 SCTK EY BVM3 G SOCKETWELD TED) (BODY HARDFACED) 420SST 133% Cr 1183 F6A GRAPHITE ND SST WITH GRAPHITE	CLASS 150 FLANGE BODY/BONNET: A108 SEAT RING: MPT BALL AND S' PACKING: PTFE BODY SEAL: SS LOCKING GEAR OPER/ VELAN JAMESBURY KECKLE CLASS 150 FL BODY/BONNET: A216 SEAT RING: A105 OR DISC: A105 OR A216 WCE STEM: PACKING: GASKET: CORRUGATE!	RGE 1-61 RF D ENDS (UP TO 6") 5 OR WCB (BOLTED) 5 OR WCB (BOLTED) 5 OR WCB (BOLTED) 5 OR WCB (BOLTED) 6 OR WCB (BOLTED) 6 OR WCB (BOLTED) 7 AND SMALLER) 7 AND SMALLER) 7 AND SMALLER) 7 AND LARGER) 10 B-150 SERIES 7000 Y BVF1 ANGED ENDS GR. WCB (BOLTED) WITH 13% CR OVERLAY 110 SS SRAPHITE D SST WITH GRAPHITE
	CONSTRUCTION VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION	BODY/BONNET: AS SEAT RII BALL: SEAL PACKING: LOCKING JAMESBURY SER KITZ AW KECKLE CLASS 800 PSI BODY/BONNET: A105 (B0) DISC: TRIM: STEM: A PACKING: GASKET: SPIRAL WOUL POWELL FI VOGT S BONNEY FOR	G SOCKETWELD TM A216 TYPE WCB NG: PTFE SS 316 : PTFE GRAPHITE 6 HANDLE IES 4000 MODEL A 800 SCTK EY BVM3 G SOCKETWELD TED) (BODY HARDFACED) 420SST 13% Cr 1183 F6A GRAPHITE	CLASS 150 FLANGE BODY/BONNET: A100 SEAT RING: MPT BALL AND S' PACKING: PTFE BODY SEAL: SS LOCKING LEVER (LOCKING GEAR OPER/ VELAN JAMESBURY KECKLE CLASS 150 FL BODY/BONNET: A216 SEAT RING: A105 OF DISC: A105 OR A216 WCB PACKING:	RGE 1-61 RF D ENDS (UP TO 6") 5 OR WCB (BOLTED) 5 OR WCB (BOLTED) 5 OR WCB (BOLTED) 5 OR WCB (BOLTED) 6 OR WCB (BOLTED) 7 OR WCB (BOLTED) 8 OR WCB (BOLTED) 9 OR WCB (BOLTED) 10 OR WCB (BOLTED)
GLOBE VALVE	CONSTRUCTION VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION REVISION	BODY/BONNET: AS SEAT RII BALL: SEAL PACKING: LOCKING JAMESBURY SER KITZ AW KECKLE CLASS 800 PSIC BODY/BONNET: A105 (BOL DISC: TRIM: STEM: A PACKING: GASKET: SPIRAL WOUT POWELL FI VOGT S BONNEY FORCE	TM A216 TYPE WCB NG: PTFE SS 316 PFFE SS 316 PFFE GRAPHITE HANDLE IES 4000 MODEL A 800 SCTK YE BVM3 G SOCKETWELD TED) (BODY HARDFACED) 420SST 13% Cr 1183 F6A GRAPHITE UD SST WITH GRAPHITE GURE GL08 W12141 GE FIG. H31SW	CLASS 150 FLANGE BODY/BONNET: A100 SEAT RING: MP7 BALL AND S' PACKING: P1TE BODY SEAL: SS LOCKING LEVER (LOCKING GEAR OPER/ VELAN JAMESBURY KECKLE CLASS 150 FL BODY/BONNET: A216 SEAT RING: A105 OR DISC: A105 OR A216 WCB PACKING: GASKET: CORRUGATE! POWELL FI CRANE FI	RGE 1-61 RF D ENDS (UP TO 6") 5 OR WCB (BOLTED) 5 OR WCB (BOLTED) 5 OR WCB (BOLTED) 5 OR WCB (BOLTED) 6 OR WCB (BOLTED) 7 OR WCB (BOLTED) 8 OR WCB (BOLTED) 9 OR WCB (BOLTED) 10 OR WCB (BOLTED)
	CONSTRUCTION VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION	BODY/BONNET: AS SEAT RII BALL: SEAL PACKING: LOCKING JAMESBURY SER KITZ AW KECKLE CLASS 800 PSIC BODY/BONNET: A105 (BOI DISC: TRIIM: STEM: FPACKING: GASKET: SPIRAL WOUT POWELL FI VOGT S BONNEY FORC	G SOCKETWELD TM A216 TYPE WCB NG: PTFE SS 316 :PTFE SS 316 :PTFE GRAPHITE S HANDLE IES 4000 MODEL A 800 SCTK EY BVM3 G SOCKETWELD .TED) (BODY HARDFACED) 420SST 13% Cr 1183 F6A GRAPHITE ND SST WITH GRAPHITE GURE GL08 W12141	CLASS 150 FLANGE BODY/BONNET: A100 SEAT RING: MP7 BALL AND S' PACKING: P1TE BODY SEAL: SS LOCKING LEVER (LOCKING GEAR OPER/ VELAN JAMESBURY KECKLE CLASS 150 FL BODY/BONNET: A216 SEAT RING: A105 OR DISC: A105 OR A216 WCB PACKING: GASKET: CORRUGATE! POWELL FI CRANE FI	RGE 1-61 RF D ENDS (UP TO 6") 5 OR WCB (BOLTED) 5 OR WCB (BOLTED) 5 OR WCB (BOLTED) 5 OR WCB (BOLTED) 6 OR WCB (BOLTED) 7 OR WCB (BOLTED) 8 OR WCB (BOLTED) 9 OF WITH 13% CR OVERLAY 110 SS 9 SRAPHITE 9 SST WITH GRAPHITE 5 URE 1531 5 URE 1531

UPDATED LARGE BORE BUTTERFLY SPECIFICATION; VALVE SELECTIONS

				DESIGN CONDITIONS		
PIPING S	PECIFICATION:		CESS:			
UI-MPP-LPS			SURE STEAM			
01 1	PIPE SIZE (NPS)		SMALLER			
PIPE MATERIAL:	WEIGHT/SCHEDULE		(S			
ASME B36.10M	MATERIAL		B - SEAMLESS			
	CONSTRUCTION		KETWELD - B16.11			
FITTINGS:	WALL THICKNESS		JOINING PIPE			
	MATERIAL		STEEL - ASTM A105			
PIPING JOINTS:	TYPE		TWELD			
	OTHER		THREAD REQUIRED	WHERE FLAN	GE REQUIRED	
	CONSTRUCTION	CLASS 3000 - SW - B16.11		NOT PEI	RMITTED	
UNIONS:		WOUND GAS		OVERLAY STEM: 410 SS PACKING: GRAPHITE GASKET: CORRUGATED SS WITH GRAF POWELL FIGURE 1503 CRANE FIGURE 47 BONNEY FORGE 1-11 RF CLASS 150 FLANGED ENDS BODY/BONNET: A216 GR. WCB SEAT RING: PTFE/RTFE/UHMWPE DISC: A251 CF8M SHAFT: 17-4 PH PACKING: PTFE GLAND: 304 SS POWELL FIGURE 1572 DEZURIK STYLE BHP FLOWSEAL TYPE 1LA CLASS 150 FLANGED ENDS BODY/CAP: A216 GR. WCB (BOLTE) SEAT RING: HARDFACED DISC: A105 OR A216 WCB WITH 13% CR O GASKET: CORRUGATED SST WITH GRA POWELL FIGURE 1571 BONNEY FORGE 1-61 RF CLASS 150 FLANGED ENDS (UP TO BODY/BONNET: A105 OR WCB (BOLTE) SEAT RING: SS 316/STELLITE BALL AND STEM: SS 316 DACKING: GRAPHITE BALL AND STEM: SS 316 DACKING: GRAPHITE BALL AND STEM: SS 316		
	WALL THICKNESS		JOINING PIPE			
	MATERIAL	FORGED CARBON	STEEL - ASTM A105		-	
	CONSTRUCTION	0.115.10.15			IONINIO DIDE	
FLANGES:	WALL THICKNESS		JOINING PIPE			
	MATERIAL		STEEL - ASTM A105			
FLANGE BOLTS:	CONSTRUCTION	ALLUY		· · · · · · · · · · · · · · · · · · ·	RADE B7	
FLANGE NUTS:	CONSTRUCTION					
WASHER:	CONSTRUCTION	CDIDA			MCES	
GASKETS:	CONSTRUCTION MATERIAL					
THERMOWELLS:	CONSTRUCTION MATERIAL	INSERTION			DED WELLS	
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:		DATE DEVISED:	
CARBON STEEL	ASTM B36.10M	ASME				
CARBON STEEL	ASTIVI B30. TUIVI					
VENT PIPING FINISH:	SPECIFICATION MATERIAL:	2-COF			R, AND	
VENT FIFING FINISH:	SI ESH ISATION WATERIAL:	Ī			;	
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:			l	
	CARBON STEEL	150 PSIG	ASME B31.1		1	
UI-MPP-LPS	PIPE SIZE (NPS)		MALLER		HRU 24"	
	CONNECTION AND RATING	CLASS 800 PSIG SOCI	KETWELD (1" THRU 2")			
	301112011011711101111110		(
			105, TRIM 13% CR	SEAT RING: HARDFACED DISC/WEDGE: A217 GR. CA15 OR WCB WITH 13% CR		
	CONSTRUCTION	OUTSIDE SCREW & YOKE, BOLTED GLAND, SOLID WEDGE, HARD FACED SEATS, CLASS 800 PACKING: GRAPHITE		OVERLAY		
GATE VALVE				STEM: 410 SS		
		FACKING.	GRAFHITE			
				GASKET: CORRUGATE	ED SS WITH GRAPHITE	
			GURE GA08			
	VALVE SELECTION		W12111			
			GE FIG. H11SW			
	CONNECTION AND RATING	-	-			
	CONSTRUCTION	-	-			
BUTTERFLY VALVE						
				GLAND	: 304 SS	
				POWELL FIGURE 1572		
	VALVE SELECTION	-				
	CONNECTION AND RATING		G SOCKETWELD	CLASS 150 FL	_ANGED ENDS	
		BODY/CAP: A105 (BOLTED) SWING CHECK SEAT RING: STELLITE 6 FACED 410 SS DISC: 13% CR		BODY/CAP: A216 (GR. WCB (BOLTED)	
	CONSTRUCTION					
CHECK VALVE	CONSTRUCTION			DISC: A105 OR A216 WCB WITH 13% CR OVERLAY		
		GASKET: SPI		GASKET: CORRUGATED SST WITH GRAPHITE		
		POWELL FIGURE SW08				
	VALVE SELECTION		SW701			
			GE FIG. H61SW			
	CONNECTION AND RATING		G SOCKETWELD	CLASS 150 FLANGE	ED ENDS (UP TO 6")	
			M SS 410 COND. 2			
			ITE 6; BALL AND SEAT: SS RBIDE COATED:			
		410/CROME CARBIDE COATED; STEM: SS 410; THRUST BUSHING: BRONZE; PACKING FLANGE SS 304		SEAT RING: SS 316/STELLITE		
BALL VALVE	CONSTRUCTION					
BALL VALVE			SS410 COND. 2; SEAT SS 410			
		COND.2 CHROME CARBIDE COATED		BODT SEAL. SC	3 3 10 GIVAL THILE	
		LOCKABL	_E LEVER			
	VALVE SELECTION	VELANITADE DI META	L SEATED, CLASS 900	\/E1 ANI	TYPE R	
	VALVE SELECTION	VELANTIFE IN, INIETA	L 32/11 LD, OLAGO 300	VELAN	= 11	
	CONNECTION AND RATING	CLASS 800 PSIC	G SOCKETWELD	CLASS 150 FL	ANGED ENDS	
			.TED) (BODY HARDFACED)			
			420SST			
	CONSTRUCTION		13% Cr	DISC: A105 OR A216 WCE	3 WITH 13% CR OVERLAY	
GLOBE VALVE	CONSTRUCTION		183 F6A			
JEODE VALVE	1		GRAPHITE			
			ND SST WITH GRAPHITE			
		POWELL FIGURE GL08				
	VALVE SELECTION		W12141			
	DEVISION I		GE FIG. H31SW	RONNEA EO	יתטב ו-1 וגד	
NUMBER	REVISION F DESCRIP		DATE	ŀ		
	i		DATE			
	TOURNICED CHANLE BODE VALVES TO SLAG	SS 800 FROM CLASS 3000	6/30/2017			
1	CHANGED SMALL BORE VALVES TO CLAS	.,,				
	ADDED WALL THICKNESS TO TABLE, REN	MOVED OTHER REFERENCES TO	MOVED OTHER REFERENCES TO 9/22/2017			
2		MOVED OTHER REFERENCES TO	9/22/2017			
2	ADDED WALL THICKNESS TO TABLE, REN WALL THICKNESS					
	ADDED WALL THICKNESS TO TABLE, REN		9/22/2017 11/22/2017			
2	ADDED WALL THICKNESS TO TABLE, REN WALL THICKNESS	ASKETED DESIGN				

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UPDATED VALVE SELECTIONS

PIPING SPECIFICATION:			CESS:	DESIGN CONDITIONS:		
UI-MPP-MPS	DIDE OUZE (NOO)		SSURE STEAM SMALLER		AT 775 °F	
PIPE MATERIAL:	PIPE SIZE (NPS) WEIGHT/SCHEDULE		SMALLER (S	2 1/2" THRU 18" STD	20" AND 24" XS	
ASME B36.10M	MATERIAL		B - SEAMLESS	A106 GRADE	B - SEAMLESS	
FITTINGS:	CONSTRUCTION WALL THICKNESS		JOINING PIPE		- ASME B16.9 DJOINING PIPE	
TITTINGS.	MATERIAL	FORGED CARBON	STEEL - ASTM A105	BUTTWELD FITTING - ASTM	A A234 GRADE B - SEAMLESS	
PIPING JOINTS:	TYPE		TWELD R THREAD REQUIRED		PREP PER B16.25 NGE REQUIRED	
	OTHER		- FLAT FACE WITH SPIRAL			
UNIONS:	CONSTRUCTION	WOUND GAS	SKET DESIGN	NOT PE	RMITTED	
citione.	WALL THICKNESS MATERIAL		JOINING PIPE STEEL - ASTM A105			
	CONSTRUCTION	TORGED CARBON		NECK - ASME B16.5		
FLANGES:	WALL THICKNESS		JOINING PIPE		JOINING PIPE	
FLANGE BOLTS:	MATERIAL CONSTRUCTION		STEEL - ASTM A105 II 4140/4142 QUENCHED AND TE		STEEL - ASTM A105 FUD - FULL LENGTH	
FLANGE NUTS:	CONSTRUCTION			A194 GRADE 2H		
WASHER:	CONSTRUCTION CONSTRUCTION	SPIRA	F4 AL WOUND - SUITABLE FOR RA	I36 ISED-FACE OR ELAT-FACE EL	ANGES	
GASKETS:	MATERIAL	FLE	EXITALLIC STYLE CGI - TYPE 30	04 STAINLESS - FLEXICARB FIL	LER	
THERMOWELLS:	CONSTRUCTION MATERIAL	INSERTION	THERMOWELLS - 3000 PSIG F	PRESSURE CLASS - SEAL WEL ARBON STEEL	DED WELLS	
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:	
CARBON STEEL	ASTM B36.10M		B31.1	6	2/22/2021	
VENT PIPING FINISH:	SPECIFICATION MATERIAL:		COLOR TO MATCH RED OF EX	POLYMER TOP COAT ISTING RELIEF DEVICE PIPING		
VALVE SPECIFICATION:	SPECIFICATION MATERIAL: CARBON STEEL	PRESSURE CLASS: 300 PSIG	DESIGN ASME B31.1	ASME B16.34		
UI-MPP-MPS	PIPE SIZE (NPS)		ASME B31.1 SMALLER		THRU 24"	
	CONNECTION AND RATING		KETWELD (1" THRU 2")	BUTTWE	ELD ENDS	
GATE VALVE	CONSTRUCTION	OUTSIDE SCREW & YOKE, BO HARD FACED SE	BODY/BONNET: A105, TRIM 13% CR OUTSIDE SCREW & YOKE, BOLTED GLAND, SOLID WEDGE, HARD FACED SEATS, CLASS 800 PACKING: GRAPHITE		J5 OR A216 GR. WCB HARDFACED :A15 OR WCB WITH 13% CR :RLAY : 410 SS : GRAPHITE JND SS WITH GRAPHITE	
	VALVE SELECTION	VOGT S	GURE GA08 SW12111 GE FIG. H11SW	POWELL FIGURE 3003 CRANE FIGURE 33-1/2 BONNEY FORGE 3-11 BW		
	CONNECTION AND RATING				ELD ENDS	
BUTTERFLY VALVE	CONSTRUCTION			CAP: A 516 GR 60 OR A 696 CLOSE STOP: A 516 GR 60 GR B DRIVE SHAFT: A 276 GR 43 BEARING: A 439 TPD2 SEAL/SEAT GASKET: BEARING: SEAL: GRAPHITE GRAPHITE GASKET: GRAPHITE		
	VALVE SELECTION			ADAMS SERIES MAK BUTTWELD ENDS		
	CONNECTION AND RATING		G SOCKETWELD 105 (BOLTED)			
CHECK VALVE	CONSTRUCTION	SWING SEAT RIN DISC: GASKET: SP	CHÈCK IG: 316 HF 13% CR IRAL WOUND	BODY/CAP: A216 GR. WCB (BOLTED) SEAT RING: HARDFACED DISC: A105 OR A216 WCB WITH 13% CR OVERLAY GASKET: CORRUGATED SST WITH GRAPHITE		
	VALVE SELECTION	VOGT	GURE SW08 SW701	POWELL FIGURE 3061 CRANE FIGURE 159-1/2		
	CONNECTION AND RATING		GE FIG. H61SW G SOCKETWELD	BONNEY FORGE 3-61 BW		
BALL VALVE	CONSTRUCTION	THRUST WASHER: STELL 410/CROME CA STEM: SS 410; THRUST BU FLANG! STEM BUSHING: NITRIDED S COND.2 CHROME	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER			
	VALVE SELECTION	VELAN TYPE R, META	L SEATED, CLASS 900			
	CONNECTION AND RATING		G SOCKETWELD		ELD ENDS	
GLOBE VALVE	CONSTRUCTION	DIŚC: 4 TRIM: STEM: A PACKING: GASKET: SPIRAL WOUN	TED) (BODY HARDFACED) 420SST 13% Cr A183 F6A GRAPHITE ND SST WITH GRAPHITE GURE GL08	SEAT RING: A105 C DISC: A105 OR A216 WCI STEM: PACKING: GASKET: CORRUGATE	6 GR. WCB (BOLTED) DR A216 HARDFACED B WITH 13% CR OVERLAY : 410 SS : GRAPHITE ED SST WITH GRAPHITE	
	VALVE SELECTION REVISION I	VOGT S BONNEY FOR	SW12141 GE FIG. H31SW	CRANE FIG	GURE 151-1/2 DRGE 3-31 BW	
NUMBER	DESCRIP		DATE			
1	CHANGED SMALL BORE VALVES TO CLAS	SS 800 FROM CLASS 3000	6/30/2017			
2	ADDED WALL THICKNESS TO TABLE, REN	MOVED OTHER REFERENCES TO	9/22/2017			
	WALL THICKNESS		9/22/2017			
3	CHANGED LARGE BORE VALVE CONNEC VALVE SELECTION	IION TYPE; LARGE BORE BUTTERFLY	11/15/2017			
4	CHANGED UNIONS TO A FLAT-FACED GA	ASKETED DESIGN	11/22/2017			
5	ADDED VENT PIPE COATING SPECIFICAT	ION	10/19/2019			
6	UPDATED VALVE SELECTIONS		2/22/2021			

PIPING S	PECIFICATION:	PROCESS:		DESIGN CONDITIONS:			
		HIGH PRESS		600 PSIG	AT 775 °F		
UI-MPP-HPS	PIPE SIZE (NPS)	2 " AND \$	SMALLER	2 1/2" THRU 10"	10"-20" (CONSULT DESIGN PROFESSIONAL IF GREATER THAN 20")		
PIPE MATERIAL:	WEIGHT/SCHEDULE		S	STD	SCHEDULE 40		
ASME B36.10M	MATERIAL	A106 GRADE I			B - SEAMLESS		
	CONSTRUCTION		KETWELD - B16.11	BUTTWELD - ASME B16.9	BUTTWELD - ASME B16.9		
FITTINGS:	WALL THICKNESS		JOINING PIPE		JOINING PIPE		
	MATERIAL	FORGED CARBON			A234 GRADE B - SEAMLESS		
PIPING JOINTS:	TYPE		TWELD		PREP PER B16.25		
	OTHER	WHERE FLANGE OR		WHERE FLAN	GE REQUIRED		
	CONSTRUCTION	CLASS 3000 - SW - B16.11		NOT PE	RMITTED		
UNIONS:		WOUND GAS					
	WALL THICKNESS	SAME AS AD.		-			
	MATERIAL	FORGED CARBON		-	-		
	CONSTRUCTION			NECK - ASME B16.5			
FLANGES:	WALL THICKNESS	SAME AS AD	JOINING PIPE	SAME AS AD	JOINING PIPE		
	MATERIAL	FORGED CARBON STEEL - ASTM A105		FORGED CARBON STEEL -	FORGED CARBON STEEL -		
				ASTM A105	ASTM A105		
FLANGE BOLTS:	CONSTRUCTION			B1.1 - CLASS 2A THREADS			
	MATERIAL		HIGH-STRENGTH STEEL				
FLANGE NUTS:	CONSTRUCTION			.1 - CLASS 2B THREADS			
. 24102 11010.	MATERIAL			ADE 2H HEAVY - F436 WASHER			
GASKETS:	CONSTRUCTION			ISED-FACE OR FLAT-FACE FLA			
57.5.1E10.	MATERIAL)4 STAINLESS - FLEXICARB FILI			
THERMOWELLS:	CONSTRUCTION	INSERTION		PRESSURE CLASS - SEAL WELL	DED WELLS		
	MATERIAL			ARBON STEEL			
CARBON STEEL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:		
CARBON STEEL	ASTM B36.10M	ASME		6	2/22/2021		
		2-CO	AT SYSTEM WITH SOLVENT-RA	SED INORGANIC ZINC PRIMER			
VENT PIPING FINISH:	SPECIFICATION MATERIAL:	1		POLYMER TOP COAT			
· · · · · ·		1	COLOR TO MATCH RED OF EX	ISTING RELIEF DEVICE PIPING			
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN	CODE:			
	CARBON STEEL	600 PSIG	ASME B31.1	CLASS 150 FLANGED ENDS	Ť		
					18"-20" (CONSULT DESIGN		
UI-MPP-HPS	PIPE SIZE (NPS)	2" AND S	MALLER	2 1/2" THRU 16"			
	PIPE SIZE (NPS)	2" AND SMALLER		2 1/2 THRU 16	PROFESSIONAL IF GREATER THAN 20")		
	CONNECTION AND RATING	CLASS 800 BSIC SOCI	KETWELD (1" THRU 2")	DITTWE	LD ENDS		
	CONNECTION AND RATING	CLASS 600 F319 30CF	KETWEED (T THRO 2)				
		BODY/BONNET: A105, TRIM 13% CR OUTSIDE SCREW & YOKE, BOLTED GLAND, SOLID WEDGE,			: A217 GR. WC6		
				SEAT RING: A182 F11; STELLITE 6 FACED DISC/WEDGE: A217 GR. WC6; STELLITE 6 FACED STEM: 410 SS			
	CONSTRUCTION						
GATE VALVE	CONSTRUCTION	HARD FACED SE			RIM 5		
OATE VALVE		PACKING:	GRAPHITE		GRAPHITE		
					ND SS WITH GRAPHITE		
		POWELL FIG	CLIDE CAOS		IGURE 6003		
	VALVE SELECTION	VOGT S			GURE 76 -1/2		
	VALVE SELECTION	BONNEY FORG		BONNEY FORGE 6-11 BW			
	CONNECTION AND RATING		-		LD ENDS		
	CONNECTION AND RATING			BODY: A216 GR. WCB	100		
				CAP: A 516 GR 60 OR A 696	CLOSE STOP: A 516 GR 60		
				GR B	DRIVE SHAFT: A 276 GR 431		
	CONSTRUCTION			DISC: A351 CF8M	BEARING: A 439 TPD2		
BUTTERFLY VALVE	001101110011011			SEAL/SEAT GASKET:	BEARING SEAL: GRAPHITE		
				GRAPHITE	GASKET: GRAPHITE		
				PACKING: GRAPHITE			
	VALVE SELECTION			ADAMS SERIES MAK			
		<u> </u>					
	CONNECTION AND RATING	CLASS 800 PSIC	SOCKETWELD	BUTTWE	ELD ENDS		
		BODY/CAP: A	105 (BOLTED)	BODY (1015 1-11	OD WOD (DOLTES)		
		SWING			GR. WCB (BOLTED)		
	CONSTRUCTION	SEAT RIN			HARDFACED B WITH 13% CR OVERLAY		
CHECK VALVE		DISC: 1			ND SS W/ITH GRAPHITE		
		GASKET: SPI					
		POWELL FIG			IGURE 6061		
	VALVE SELECTION	VOGT			URE 175-1/2		
		BONNEY FORG		BONNEY FO	RGE 6-61 BW		
	CONNECTION AND RATING		SOCKETWELD	-	-		
		BODY: A105, STE					
		THRUST WASHER: STELL	ITE O, DALL AND OLAT. OO				
			RBIDE COATED;				
	CONSTRUCTION	STEM: SS 410; THRUST BU		-			
BALL VALVE		FLANGE					
		STEM BUSHING: NITRIDED 410 COND. 2 CHROM					
		LOCKABL					
		LOCKABL					
	VALVE SELECTION	VELAN TYPE R, META	SEATED CLASS DOD				
	VALVE SELECTION	VELSA LIFE IS, WEIA	2 32 (12b, 32nd3 300				
	CONNECTION AND RATING	CLASS 800 PSIG	SOCKETWELD	BUTTWE	ELD ENDS		
	SOURCE HOW AND NATING						
		BODY/BONNET: A105 (BOL			GR. WCB (BOLTED) R A216 HARDFACED		
		SEAT: Co DISC: 420 SS, CA15			B WITH 13% CR OVERLAY		
	CONSTRUCTION	STEM: A182 F			410 SS		
GLOBE VALVE		PACKING:			GRAPHITE		
		GASKET: SPIRAL WOUL			ND SS WITH GRAPHITE		
		POWELL FI			IGURE 6031		
	VALVE SELECTION	VOGT S			URE 171-1/2		
	VALVE SELECTION	BONNEY FORG			RGE 6-31 BW		
	İ	•		BONNETTO			
NOTES:	(1) 22" PIPE IS NOT ALLOWED IN	HIGH PRESSURE STEAM SERVI	CE				
	1						

	REVISION HISTORY							
NUMBER	DESCRIPTION	DATE						
1	CHANGED SMALL BORE VALVES TO CLASS 800 FROM CLASS 3000	6/30/2017						
2	ADDED WALL THICKNESS TO TABLE, REMOVED OTHER REFERENCES TO WALL THICKNESS	9/22/2017						
3	CHANGED LARGE BORE VALVE CONNECTION TYPE; LARGE BORE BUTTERFLY VALVE SELECTION	11/15/2017						
4	CHANGED UNIONS TO A FLAT-FACED GASKETED DESIGN	11/22/2017						
5	ADDED VENT PIPE COATING SPECIFICATION	10/19/2019						
6	UPDATED LARGE BORE DESIGN WALL THICKNESS; UPDATED VALVE SELECTIONS	2/22/2021						

DIDING OF	PECIFICATION:	I BBO	CESS:	DEGION CO	ANDITIONS:
	EGIFICATION:		E CONDENSATE	DESIGN CONDITIONS: 50 PSIG AT 530 °F	
UI-MPP-LP-CON	PIPE SIZE (NPS)		SMALLER	2 1/2" Ti	
PIPE MATERIAL:	WEIGHT/SCHEDULE		(S	X	
ASME B36.10M	MATERIAL		B - SEAMLESS	A106 GRADE I	
FITTINGS:	CONSTRUCTION		KETWELD - B16.11 JOINING PIPE	BUTTWELD - SAME AS AD	- ASME B16.9
FILLINGS:	WALL THICKNESS MATERIAL		STEEL - ASTM A105	BUTTWELD FITTING - ASTM	
	TYPE		TWELD		PREP PER B16.25
PIPING JOINTS:	OTHER	WHERE FLANGE OR	THREAD REQUIRED	WHERE FLAN	GE REQUIRED
	CONSTRUCTION		- FLAT FACE WITH SPIRAL	NOT PER	RMITTED
UNIONS:			JOINING PIPE		
	WALL THICKNESS MATERIAL		STEEL - ASTM A105		<u>-</u>
	CONSTRUCTION	TORGED OF INDOR		NECK - ASME B16.5	
FLANGES:	WALL THICKNESS	SAME AS AD	JOINING PIPE	SAME AS AD.	JOINING PIPE
	MATERIAL	FORGED CARBON STEEL - ASTM A105		FORGED CARBON	
FLANGE BOLTS:	CONSTRUCTION CONSTRUCTION	ALLOY		HED AND TEMPERED, A193 GR A194 GRADE 2H	ADE B7
FLANGE NUTS: WASHER:	CONSTRUCTION			436	
	CONSTRUCTION	SPIRA		ISED-FACE OR FLAT-FACE FLA	NGES
GASKETS:	MATERIAL			04 STAINLESS - FLEXICARB FIL	
THERMOWELLS:	CONSTRUCTION	INSERTION		PRESSURE CLASS - SEAL WELL	DED WELLS
PIPE MATERIAL:	MATERIAL PIPE CODE:	DESIGN/CONST	ASTM A106 C RUCTION CODE:	ARBON STEEL REVISION:	DATE REVISED:
CARBON STEEL	ASTM B36.10M		B31.1	REVISION:	2/22/2021
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:		N CODE:	LILLICUL I
UI-MPP-LP-CON	CARBON STEEL	150 PSIG	ASME B31.1	ASME B16.34	
UI-WIFF-LF-CON	PIPE SIZE (NPS)		SMALLER	2 1/2" TI	
	CONNECTION AND RATING	CLASS 800 PSIG SOC	KETWELD (1" THRU 2")	CLASS 150 FL	
GATE VALVE	CONSTRUCTION	OUTSIDE SCREW & YOKE, BO HARD FACED SE	105, TRIM 13% CR DLTED GLAND, SOLID WEDGE, :ATS, CLASS 800 GRAPHITE	BODY/BONNET: A105 OR A216 GR. WCB SEAT RING: HARDFACED DISC/WEDGE: A217 GR. CA15 OR WCB WITH 13% CR OVERLAY STEM: 410 SS PACKING: GRAPHITE GASKET: CORRUGATED SS WITH GRAPHITE	
	VALVE SELECTION	VOGT S	GURE GA08 W12111 GE FIG. H11SW	POWELL FI CRANE F BONNEY FO	IGURE 47
	CONNECTION AND RATING	-		CLASS 150 FL	ANGED ENDS
BUTTERFLY VALVE	CONSTRUCTION	-	-	SEAT RING:PTFE/RTFE/JHMWPE DISC: A351 CF8M SHAFT: 17-4 PH PACKING: PTFE GLAND: 304 SS POWELL FIGURE 1572	
	VALVE SELECTION			DEZURIK STYLE BHP FLOWSEAL TYPE 1LA	
	CONNECTION AND RATING		G SOCKETWELD	CLASS 150 FL	ANGED ENDS
CHECK VALVE	CONSTRUCTION	BODY/CAP: A105 (BOLTED) SWING CHECK SEAT RING: STELLLITE 6 FACED 410 SS DISC: 13% CR GASKET: SPIRAL WOUND		BODV/CAP: A216 GR. WCB (BOLTED) SEAT RING: HARDFACED DISC: A105 OR A216 WCB WITH 13% CR OVERLAY GASKET: CORRUGATED SST WITH GRAPHITE	
	VALVE SELECTION	VOGT	GURE SW08 SW701 GE FIG. H61SW	POWELL FIGURE 1561 CRANE FIGURE 147 BONNEY FORGE 1-61 RF	
	CONNECTION AND RATING		G SOCKETWELD	CLASS 150 FLANGE	
BALL VALVE	CONSTRUCTION	BODY: A105, STEM SS 410 COND. 2 THRUST WASHER: STELLITE 6; BALL AND SEAT: SS 410/CROME CARBIDE COATED; STEM: SS 410; THRUST BUSHING: BRONZE; PACKING FLANGE SS 304 STEM BUSHING: NITRIDED SS410 COND. 2; SEAT SS 410 COND.2 CHROME CARBIDE COATED LOCKABLE LEVER		BODY/BONNET: A105 OR WCB (BOLTED) SEAT RING: SS 316/STELLITE BALL AND STEM: SS 316 PACKING: GRAPHITE BODY SEAL: SS 316 GRAPHITE	
	VALVE SELECTION	VELAN TYPE R, META	L SEATED, CLASS 900	VELAN	TYPE R
	CONNECTION AND RATING		G SOCKETWELD		ANGED ENDS
GLOBE VALVE	CONSTRUCTION	BODY/BONNET: A105 (BOLTED) (BODY HARDFACED) DISC: 420SST TRIM: 13% Cr STEM: A183 F6A PACKING: GRAPHITE GASKET: SPIRAL WOUND SST WITH GRAPHITE		BODY/BONNET: A216 GR. WCB (BOLTED) SEAT RING: A105 OR A216 HARDFACED DISC: A105 OR A216 WCB WITH 13% CR OVER! STEM: 410 SS PACKING: GRAPHITE GASKET: CORRUGATED SST WITH GRAPHIT	
	VALVE SELECTION	VOGT S BONNEY FOR	GURE GL08 W12141 GE FIG. H31SW	POWELL FI CRANE FI BONNEY FO	GURE 143
NUMBER	REVISION I		D. ***	ļ	
	DESCRIP		DATE	1	
1	CHANGED SMALL BORE VALVES TO CLAS	SS 800 FROM CLASS 3000	6/30/2017		
2	ADDED WALL THICKNESS TO TABLE, REM	MOVED OTHER REFERENCES TO	9/22/2017		
	WALL THICKNESS		9/22/2017		

2/22/2021

CHANGED UNIONS TO A FLAT-FACED GASKETED DESIGN

UPDATED LARGE BORE PIPE SCHEDULE; VALVE SELECTIONS

3

DIDING CD	ECIFICATION:	BBO	CESS:	DESIGN CO	ONDITIONS:	
	LOII IOATION.		IRE CONDENSATE	325 PSIG AT 775 °F		
UI-MPP-MP-CON	PIPE SIZE (NPS)	2" AND S	SMALLER	2 1/2" T	HRU 24"	
PIPE MATERIAL:	WEIGHT/SCHEDULE		(S		(S	
ASME B36.10M	MATERIAL		B - SEAMLESS CKETWELD - B16.11		B - SEAMLESS - ASME B16.9	
FITTINGS:	CONSTRUCTION WALL THICKNESS		JOINING PIPE		JOINING PIPE	
	MATERIAL		STEEL - ASTM 105	BUTTWELD FITTING - ASTM		
PIPING JOINTS:	TYPE	SOCKE	TWELD	BUTTWELD - END	PREP PER B16.25	
FIFING JOIN 13.	OTHER		THREAD REQUIRED	WHERE FLAN	GE REQUIRED	
	CONSTRUCTION		- FLAT FACE WITH SPIRAL SKET DESIGN	NOT PE	RMITTED	
UNIONS:	WALL THICKNESS		JOINING PIPE			
	MATERIAL		STEEL - ASTM A105		· <u>-</u>	
	CONSTRUCTION			NECK - ASME B16.5		
FLANGES:	WALL THICKNESS		JOINING PIPE		JOINING PIPE	
	MATERIAL		STEEL - ASTM A105		STEEL - ASTM A105	
FLANGE BOLTS: FLANGE NUTS:	CONSTRUCTION	ALLOY STEEL, AIS		EMPERED, A193 GRADE B7, S1 A194 GRADE 2H	UD - FULL LENGTH	
WASHER:	CONSTRUCTION			436		
	CONSTRUCTION	SPIRA	AL WOUND - SUITABLE FOR RA	ISED-FACE OR FLAT-FACE FLA	ANGES	
GASKETS:	MATERIAL	FLE	EXITALLIC STYLE CGI - TYPE 30	04 STAINLESS - FLEXICARB FIL	LER	
THERMOWELLS:	CONSTRUCTION	INSERTION		PRESSURE CLASS - SEAL WEL	DED WELLS	
	MATERIAL			ARBON STEEL		
PIPE MATERIAL: CARBON STEEL	PIPE CODE: ASTM B36.10M		RUCTION CODE: B31.1	REVISION:	DATE REVISED: 2/22/2021	
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:		N CODE:	Z1ZZ1ZUZ 1	
	CARBON STEEL	300 PSIG	ASME B31.1	ASME B16.34	1	
UI-MPP-MP-CON	PIPE SIZE (NPS)	2" AND S	SMALLER	2 1/2" T	HRU 24"	
	CONNECTION AND RATING	CLASS 800 PSIG SOC	KETWELD (1" THRU 2")		ANGED ENDS	
GATE VALVE	CONSTRUCTION	OUTSIDE SCREW & YOKE, BO HARD FACED SE PACE		BODY/BONNET: A105 OR A216 GR. W SEAT RING: HARDFACED DISC/WEDGE: A217 GR. CA15 OR WCB WITI OVERLAY STEM: 410 SS PACKING: GRAPHITE GASKET: SPIRAL WOUND SS WITH GRA		
	VALVE OF LEGICAL		GURE GA08		IGURE 3003	
	VALVE SELECTION		W12111 GE FIG. H11SW	CRANE FIGURE 33 BONNEY FORGE 3-11 RF		
	CONNECTION AND RATING	BONNETT ON			D ENDS (LUG STYLE)	
BUTTERFLY VALVE	CONSTRUCTION			DISC: A351 CF8M SHAFT: 17-4 PH PACKING: PTFE GLAND: 304 SS		
	VALVE SELECTION			POWELL FIGURE 3072* (3" AND LARGER) FLOWSEAL METAL SEAT CLASS 300		
	CONNECTION AND RATING	CLASS 800 PSI	G SOCKETWELD	CLASS 300 FI	ANGED ENDS	
CHECK VALVE	CONSTRUCTION	BODY/CAP: A105 (BOLTED) SWING CHECK SEAT RING: 316 HF DISC: 13% CR GASKET: SPIRAL WOUND		BODY/CAP: A216 GR. WCB (BOLTED) SEAT RING: HARDFACED DISC: A105 OR A216 WCB WITH 13% CR OVERLAY GASKET: CORRUGATED SST WITH GRAPHITE		
	VALVE SELECTION		GURE SW08 SW701 GE FIG. H61SW	POWELL FIGURE 3061 CRANE FIGURE 159 BONNEY FORGE 3-61 RF		
	CONNECTION AND RATING	CLASS 900 PSI	G SOCKETWELD	CLASS 300 FI	ANGED ENDS	
BALL VALVE	CONSTRUCTION	BODY: A105, STEM SS 410 COND. 2 THRUST WASHER: STELLITE 6; BALL AND SEAT: SS 410/CROME CARBIDE COATED; STEM: SS 410; THRUST BUSHING: BRONZE; PACKING FLANGE SS 304 STEM BUSHING: NITRIDED SS410 COND. 2; SEAT SS 410 COND.2 CHROME CARBIDE COATED LOCKABLE LEVER		THRUST WASHER: STELLITE 6; BALL AND SEAT: SS 410/CROME CARBIDE COATED; STEM: SS 410; THRUST BUSHING: BRONZE; PACKING FLANCE SS 304 STEM BUSHING: NITRIDED SS410 COND. 2; SEAT SS 410 COND.2 CHROME CARBIDE COATED BODY SEAL: SPIRAL WOUND		S 316/STELLITE STEM: SS 316 GRAPHITE
	VALVE SELECTION		L SEATED, CLASS 900		TYPE R	
	CONNECTION AND RATING	CLASS 800 PSI	G SOCKETWELD	CLASS 300 FI	ANGED ENDS	
GLOBE VALVE	CONSTRUCTION	DISC: 4 TRIM: STEM: A PACKING:	.TED) (BODY HARDFACED) 420SST 13% Cr 13% G6 4183 F6A GRAPHITE ND SST WITH GRAPHITE	SEAT RING: A105 O DISC: A105 OR A216 WCI STEM: PACKING:	G GR. WCB (BOLTED) R A216 HARDFACED B WITH 13% CR OVERLAY 410 SS GRAPHITE ID SST WITH GRAPHITE	
	VALVE SELECTION	VOGT S	GURE GL08 6W12141 GE FIG. H31SW	POWELL FIGURE 3031 CRANE FIGURE 151 BONNEY FORGE 3-31 RF		
	REVISION I					
NUMBER	DESCRIP	TION	DATE	J		
1	CHANGED SMALL BORE VALVES TO CLAS	SS 800 FROM CLASS 3000	6/30/2017			
1 2	CHANGED SMALL BORE VALVES TO CLAS ADDED WALL THICKNESS TO TABLE, REN WALL THICKNESS		6/30/2017 9/22/2017			

2/22/2021

CHANGED UNIONS TO A FLAT-FACED GASKETED DESIGN

UPDATED LARGE BORE WALL THICKNESS; VALVE SELECTIONS

3

DIDING C	PECIFICATION:	BBO(ree.	DESIGN CO	NDITIONS:	
	PEGILICATION.			600 PSIG		
UI-MPP-HP-CON	PIPE SIZE (NPS)			2 1/2" T		
PIPE MATERIAL:	WEIGHT/SCHEDULE			X		
ASME B36.10M	MATERIAL			A106 GRADE E		
FITTINGS:	CONSTRUCTION WALL THICKNESS			BUTTWELD - SAME AS ADJ		
FILLINGS.	MATERIAL	SAME AS ADJOINING PIPE - XS ALLOY STEEL, AISI 4140/4142 QUENCHED AND THEAVY HEX- FERRIT SPIRAL WOUND - SUITABLE FOR RY FLEXITALLIC STYLE CGI - TYPE 3 INSERTION THERMOWELLS - 3000 PSIG INSERTION TO CODE: ASTM A106 CODE: ASME B31.1 PRESSURE CLASS: 600 PSIG 2" AND SMALLER CLASS 800 PSIG SOCKETWELD (1" THRU 2") BODY/BONNET: A105, TRIM 13% CR		BUTTWELD FITTING - ASTM.		
DIDING IGNITO	TYPE			BUTTWELD - END		
PIPING JOINTS:	OTHER	WHERE FLANGE OR	R THREAD REQUIRED	WHERE FLANC	GE REQUIRED	
	CONSTRUCTION			NOT PER	RMITTED	
UNIONS:	WALL THICKNESS					
	MATERIAL			-		
	CONSTRUCTION			NECK - ASME B16.5		
FLANGES:	WALL THICKNESS			SAME AS ADJ		
=: A110= = 01 = 0	MATERIAL		7.0	FORGED CARBON S		
FLANGE BOLTS: FLANGE NUTS:	CONSTRUCTION CONSTRUCTION	ALLOT STEEL, AIS			JD - FULL LENGTH	
WASHER:	CONSTRUCTION			36		
GASKETS:	CONSTRUCTION					
OAGNETO.	MATERIAL					
THERMOWELLS:	CONSTRUCTION MATERIAL	INSERTION			DED WELLS	
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST		REVISION:	DATE REVISED:	
CARBON STEEL	ASTM B36.10M	ASME	B31.1	4	2/22/2021	
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:			CODE:		
UI-MPP-HP-CON	CARBON STEEL PIPE SIZE (NPS)			ASME B16.34 2 1/2" T	LIDIL 6"	
	CONNECTION AND RATING			CLASS 600 FL		
			·	BODY/BONNET:	AZ17 GR. WC6	
		OUTSIDE SCREW & YOKE, BOLTED GLAND, SOLID WEDGE, HARD FACED SEATS, CLASS 800		SEAT RING: A182 F11; STELLITE 6 FACED DISC/WEDGE: A217 GR. WC6; STELLITE 6 FACED		
GATE VALVE	CONSTRUCTION			STEM: 410 SS		
OATE TALTE		PACI	KING:	API TE PACKING: (
		POWELL FI	GURE GA08	POWELL FIGURE 6003		
	VALVE SELECTION			CRANE FI		
	CONNECTION AND RATING			BONNEY FOR CLASS 600 FL		
				BODY/BONNET:	-	
				SEAT RING: A182 F11		
	CONSTRUCTION			DISC/WEDGE: A217 GR. V		
CHECK VALVE		DISC: 1	13% CR	STEM: 4 PACKING: 0		
		GASKET: SP	IRAL WOUND	GASKET: SPIRAL WOUND SS WITH GRAPHITE		
		POWELL FIGURE SW08		POWELL FIGURE 6061		
	VALVE SELECTION			CRANE FIGURE 175		
	CONNECTION AND RATING			BONNEY FOR		
	CONNECTION AND RATING					
		BODY: A105, STE			-	
		THRUST WASHER: STELL	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS		-	
		THRUST WASHER: STELL 410/CROME CA	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED;		-	
BALL WALVE	CONSTRUCTION	THRUST WASHER: STELL 410/CROME CA STEM: SS 410; THRUST BU	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING	-	-	
BALL VALVE	CONSTRUCTION	THRUST WASHER: STELL 410/CROME CA STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING E SS 304 SS 410 COND. 2; SEAT SS 410	-	-	
BALL VALVE	CONSTRUCTION	THRUST WASHER: STELL 410/CROME CA STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED	-		
BALL VALVE	CONSTRUCTION	THRUST WASHER: STELL 410/CROME CA STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING E SS 304 SS 410 COND. 2; SEAT SS 410	-	-	
BALL VALVE	CONSTRUCTION VALVE SELECTION	THRUST WASHER: STELL 410/CROME CA STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME LOCKABI	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED	-	-	
BALL VALVE	VALVE SELECTION	THRUST WASHER: STELL 410/CROME CA: STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME LOCKABI VELAN TYPE R, META	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; SHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER L SEATED, CLASS 900		-	
BALL VALVE		THRUST WASHER: STELL 410/CROME CA: STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME LOCKABI VELAN TYPE R, META CLASS 800 PSIG	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER	BUTTWE	- - LD ENDS	
BALL VALVE	VALVE SELECTION	THRUST WASHER: STELL 410/CROME CA 410/CROME CA STEM: SS 410; THRUST BU FLANG STEM BUSHING: NITRIDED S COND.2 CHROME LOCKABI VELAN TYPE R, META CLASS 800 PSIG BODY/BONNET: A105 (BOL SEAT: Cc	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER L SEATED, CLASS 900 G SOCKETWELD LTED) (BODY HARDFACED) ICT ALLOY	BUTTWEI BODY/BONNET: A216 SEAT RING: A105 OF	- LD ENDS GR. WCB (BOLTED) 4 A216 HARDFACED	
BALL VALVE	VALVE SELECTION	THRUST WASHER: STELL 410/CROME CA: STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME LOCKABI VELAN TYPE R, META CLASS 800 PSIC BODY/BONNET: A105 (B0L) SEAT: Co DISC: 420 SS, CA15	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER L SEATED, CLASS 900 G SOCKETWELD LTED) (BODY HARDFACED) HT, OR COCT ALLOY HT, OR COCT ALLOY	BUTTWEI BODY/BONNET: A216 SEAT RING: A105 OF DISC: A105 OR A216 WCB	- D ENDS GR. WCB (BOLTED) R A216 HARDFACED WITH 13% CR OVERLAY	
BALL VALVE GLOBE VALVE	VALVE SELECTION CONNECTION AND RATING	THRUST WASHER: STELL 410/CROME CA STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME LOCKABI VELAN TYPE R, META CLASS 800 PSIC BODY/BONNET: A105 (BOL SEAT: CO DISC: 420 SS, CA15 STEM: A182 F	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER L SEATED, CLASS 900 G SOCKETWELD LTED) (BODY HARDFACED) Cr ALLOY HT, OR CoCr ALLOY 6a OR 410 SS	BUTTWEI BODY/BONNET: A216 SEAT RING: A105 OF DISC: A105 OR A216 WCB STEM: A		
	VALVE SELECTION CONNECTION AND RATING	THRUST WASHER: STELL 410/CROME CA 5TEM: SS 410; THRUST BU FLANG STEM BUSHING: NITRIDED S COND.2 CHROME LOCKABI VELAN TYPE R, META CLASS 800 PSIG BODY/BONNET: A105 (BOL SEAT: Co DISC: 420 SS, CA15 STEM: A182 F PACKING:	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER L SEATED, CLASS 900 G SOCKETWELD LTED) (BODY HARDFACED) HT, OR COCT ALLOY HT, OR COCT ALLOY	BUTTWEI BODY/BONNET: A216 SEAT RING: A105 OF DISC: A105 OR A216 WCB	- DENDS GR. WCB (BOLTED) A 216 HARDFACED WITH 13% CR OVERLAY 110 SS SRAPHITE	
	VALVE SELECTION CONNECTION AND RATING CONSTRUCTION	THRUST WASHER: STELL 410/CROME CA STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME LOCKABI VELAN TYPE R, META CLASS 800 PSIC BODY/BONNET: A105 (BOL SEAT: CO DISC: 420 SS, CA15 STEM: A182 F PACKING: GASKET: SPIRAL WOU POWELL FI	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING ES 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER L SEATED, CLASS 900 G SOCKETWELD LTED) (BODY HARDFACED) CG ALLOY HT, OR CoCT ALLOY EG OR 410 SS GRAPHITE ND SS WITH GRAPHITE GURE GL08	BUTTWEI BODY/BONNET: A216 SEAT RING: A105 OF DISC: A105 OR A216 WCB STEM: PACKING: GASKET: SPIRAL WOUN POWELL FI	- DENDS GR. WCB (BOLTED) A216 HARDFACED WITH 13% CR OVERLAY 410 SS SRAPHITE JUS SWITH GRAPHITE GURE 6031	
	VALVE SELECTION CONNECTION AND RATING	THRUST WASHER: STELL 410/CROME CA STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME LOCKABI VELAN TYPE R, META CLASS 800 PSIC BODY/BONNET: A105 (BOL SEAT: Cc DISC: 420 SS, CA15 STEM: A182 F PACKING: GASKET: SPIRAL WOU POWELL FI VOCT S	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER L SEATED, CLASS 900 G SOCKETWELD LTED) (BODY HARDFACED) OCT ALLOY HT, OR COCT ALLOY F6a OR 410 SS GRAPHITE ND SS WITH GRAPHITE GURE GL08 W12141	BUTTWEI BODY/BONNET: A216 SEAT RING: A105 OF DISC: A105 OR A216 WCB STEM: A PACKING: (GASKET: SPIRAL WOUL POWELL FIL CRANE FILE	- LD ENDS GR. WCB (BOLTED) R 2216 HARDFACED WITH 13% CR OVERLAY 110 SS GRAPHITE ID SS WITH GRAPHITE GURE 6031 SURE 171	
	VALVE SELECTION CONNECTION AND RATING CONSTRUCTION	THRUST WASHER: STELL 410/CROME CA STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED 3 COND.2 CHROME LOCKABI VELAN TYPE R, META CLASS 800 PSIC BODY/BONNET: A105 (BOL SEAT: CO. DISC: 420 SS, CA15 STEM: A182 F PACKING. GASKET: SPIRAL WOU POWELL FI VOGT S BONNEY FORC	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING ES 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER L SEATED, CLASS 900 G SOCKETWELD LTED) (BODY HARDFACED) CG ALLOY HT, OR CoCT ALLOY EG OR 410 SS GRAPHITE ND SS WITH GRAPHITE GURE GL08	BUTTWEI BODY/BONNET: A216 SEAT RING: A105 OF DISC: A105 OR A216 WCB STEM: PACKING: GASKET: SPIRAL WOUN POWELL FI	- LD ENDS GR. WCB (BOLTED) R 2216 HARDFACED WITH 13% CR OVERLAY 110 SS GRAPHITE ID SS WITH GRAPHITE GURE 6031 SURE 171	
	VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION	THRUST WASHER: STELL 410/CROME CA STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME LOCKABI VELAN TYPE R, META CLASS 800 PSIC BODY/BONNET: A105 (BOL SEAT: CO. DISC: 420 SS, CA15 STEM: A182 F PACKING: GASKET: SPIRAL WOU POWELL FI VOCT S BONNEY FORG	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER L SEATED, CLASS 900 G SOCKETWELD LTED) (BODY HARDFACED) OCT ALLOY HT, OR COCT ALLOY F6a OR 410 SS GRAPHITE ND SS WITH GRAPHITE GURE GL08 W12141	BUTTWEI BODY/BONNET: A216 SEAT RING: A105 OF DISC: A105 OR A216 WCB STEM: A PACKING: (GASKET: SPIRAL WOUL POWELL FIL CRANE FILE	- LD ENDS GR. WCB (BOLTED) R 2216 HARDFACED WITH 13% CR OVERLAY 110 SS GRAPHITE ID SS WITH GRAPHITE GURE 6031 SURE 171	
GLOBE VALVE	VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION REVISION I	THRUST WASHER: STELL 410/CROME CA STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME LOCKABI VELAN TYPE R, META CLASS 800 PSIC BODY/BONNET: A105 (BOL SEAT: CO. DISC: 420 SS, CA15 STEM: A182 F PACKING: GASKET: SPIRAL WOU POWELL FI VOCT S BONNEY FORG	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER L SEATED, CLASS 900 G SOCKETWELD LTED) (BODY HARDFACED) CT ALLOY HT, OR CoCT ALLOY '6a OR 410 SS GRAPHITE ND SS WITH GRAPHITE GURE GL08 W12141 GE FIG. H31SW	BUTTWEI BODY/BONNET: A216 SEAT RING: A105 OF DISC: A105 OR A216 WCB STEM: A PACKING: (GASKET: SPIRAL WOUL POWELL FIL CRANE FILE	- LD ENDS GR. WCB (BOLTED) R A216 HARDFACED WITH 13% CR OVERLAY 110 SS GRAPHITE ID SS WITH GRAPHITE GURE 6031 SURE 1711	
GLOBE VALVE NUMBER 1	VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION REVISION I	THRUST WASHER: STELL 410/CROME CA STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME LOCKABI VELAN TYPE R, META CLASS 800 PSIC BODY/BONNET: A105 (BOL SEAT: CO. DISC: 420 SS, CA15 STEM: A182 F PACKING: GASKET: SPIRAL WOU POWELL FI VOCT S BONNEY FORG IISTORY TION SS 800 FROM CLASS 3000	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; SHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER L SEATED, CLASS 900 G SOCKETWELD LTED) (BODY HARDFACED) OCT ALLOY HT, OR COCT ALLOY '6a OR 410 SS GRAPHITE ND SS WITH GRAPHITE GURE GL08 WITH GRAPHITE GURE GL08 WITH GRAPHITE DATE DATE OATE	BUTTWEI BODY/BONNET: A216 SEAT RING: A105 OF DISC: A105 OR A216 WCB STEM: A PACKING: (GASKET: SPIRAL WOUL POWELL FIL CRANE FILE	- LD ENDS GR. WCB (BOLTED) R A216 HARDFACED WITH 13% CR OVERLAY 110 SS GRAPHITE ID SS WITH GRAPHITE GURE 6031 SURE 1711	
GLOBE VALVE NUMBER	VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION REVISION I DESCRIP CHANGED SMALL BORE VALVES TO CLAY	THRUST WASHER: STELL 410/CROME CA STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME LOCKABI VELAN TYPE R, META CLASS 800 PSIC BODY/BONNET: A105 (BOL SEAT: CO. DISC: 420 SS, CA15 STEM: A182 F PACKING: GASKET: SPIRAL WOU POWELL FI VOCT S BONNEY FORG IISTORY TION SS 800 FROM CLASS 3000	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING ES 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER L SEATED, CLASS 900 G SOCKETWELD LTED) (BODY HARDFACED) ICT ALLOY HT, OR CoCT ALLOY GA OR 410 SS GRAPHITE GURE GLOB WITH GLOB WI	BUTTWEI BODY/BONNET: A216 SEAT RING: A105 OF DISC: A105 OR A216 WCB STEM: A PACKING: (GASKET: SPIRAL WOUL POWELL FIL CRANE FILE	- LD ENDS GR. WCB (BOLTED) R A216 HARDFACED WITH 13% CR OVERLAY 110 SS GRAPHITE ID SS WITH GRAPHITE GURE 6031 SURE 1711	
GLOBE VALVE NUMBER 1	VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION REVISION 1 DESCRIP CHANGED SMALL BORE VALVES TO CLA: ADDED WALL THICKNESS TO TABLE, REN	THRUST WASHER: STELL 410/CROME CA STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME LOCKABI VELAN TYPE R, META CLASS 800 PSIG BODY/BONNET: A105 (BOL SEAT: Co DISC: 420 SS, CAT: STEM: A182 F PACKING: GASKET: SPIRAL WOU POWELL FI VOGT S BONNEY FORG BISTORY TION SS 800 FROM CLASS 3000	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; SHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER L SEATED, CLASS 900 G SOCKETWELD LTED) (BODY HARDFACED) OCT ALLOY HT, OR COCT ALLOY '6a OR 410 SS GRAPHITE ND SS WITH GRAPHITE GURE GL08 WITH GRAPHITE GURE GL08 WITH GRAPHITE DATE DATE OATE	BUTTWEI BODY/BONNET: A216 SEAT RING: A105 OF DISC: A105 OR A216 WCB STEM: A PACKING: (GASKET: SPIRAL WOUL POWELL FIL CRANE FILE	- LD ENDS GR. WCB (BOLTED) R 2216 HARDFACED WITH 13% CR OVERLAY 110 SS GRAPHITE ID SS WITH GRAPHITE GURE 6031 SURE 171	
GLOBE VALVE NUMBER 1 2	VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION REVISION 1 DESCRIP CHANGED SMALL BORE VALVES TO CLACE ADDED WALL THICKNESS TO TABLE, REN WALL THICKNESS	THRUST WASHER: STELL 410/CROME CA STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME LOCKABI VELAN TYPE R, META CLASS 800 PSIG BODY/BONNET: A105 (BOL SEAT: Co DISC: 420 SS, CAT: STEM: A182 F PACKING: GASKET: SPIRAL WOU POWELL FI VOGT S BONNEY FORG BISTORY TION SS 800 FROM CLASS 3000	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER L SEATED, CLASS 900 G SOCKETWELD LTED) (BODY HARDFACED) CIT ALLOY HT, OR CoCT ALLOY 6a OR 410 SS GRAPHITE MD SS WITH GRAPHITE GURE GL08 W12141 GE FIG. H31SW DATE 6/30/2017 9/22/2017	BUTTWEI BODY/BONNET: A216 SEAT RING: A105 OF DISC: A105 OR A216 WCB STEM: A PACKING: (GASKET: SPIRAL WOUL POWELL FIL CRANE FILE	- LD ENDS GR. WCB (BOLTED) R 2216 HARDFACED WITH 13% CR OVERLAY 110 SS GRAPHITE ID SS WITH GRAPHITE GURE 6031 SURE 171	

PIPING S	PECIFICATION:		CESS:		ONDITIONS:
UI-MPP-ED			NT DRAINS	600 PSIG	
	PIPE SIZE (NPS)		SMALLER	2 1/2" THRU 10"	12" THRU 24"
PIPE MATERIAL:	WEIGHT/SCHEDULE	S	TD	STD	SCHEDULE 40
ASME B36.10M	MATERIAL	A106 GRADE	B - SEAMLESS	A106 GRADE	B - SEAMLESS
	CONSTRUCTION	CLASS 3000 - SOC	CKETWELD - B16.11	BUTTWELD	- ASME B16.9
FITTINGS:	WALL THICKNESS	SAME AS AD	JOINING PIPE	SAME AS AD	JOINING PIPE
	MATERIAL	FORGED CARBON	STEEL - ASTM a 105	BUTTWELD FITTING - ASTM	A234 GRADE B - SEAMLES
	TYPE	SOCKE	TWELD	BUTTWELD - END PREP PER B16.25	
PIPING JOINTS:	OTHER		R THREAD REQUIRED		GE REQUIRED
			- FLAT- FACE WITH SPIRAL		
	CONSTRUCTION		SKET DESIGN	NOT PE	RMITTED
UNIONS:	WALL THICKNESS		JOINING PIPE		-
	MATERIAL		STEEL - ASTM A105		
	CONSTRUCTION	1 011025 0112011		NECK - ASME B16.5	
FLANGES:	WALL THICKNESS	SAME AS AD			JOINING PIPE
I LANGES.	MATERIAL		SAME AS ADJOINING PIPE FORGED CARBON STEEL - ASTM A105		STEEL - ASTM A105
FLANGE BOLTS:	CONSTRUCTION		SI 4140/4142 QUENCHED AND T		
		ALLOY STEEL, AIS		194 GRADE 2H	UD - FULL LENGTH
FLANGE NUTS:	CONSTRUCTION				
WASHER:	CONSTRUCTION		·	136	NOTO
GASKETS:	CONSTRUCTION		AL WOUND - SUITABLE FOR RA		
	MATERIAL		EXITALLIC STYLE CGI - TYPE 30		
THERMOWELLS:	CONSTRUCTION	INSERTION	N THERMOWELLS - 3000 PSIG F		DED WELLS
	MATERIAL			ARBON STEEL	
PIPE MATERIAL:	PIPE CODE:		RUCTION CODE:	REVISION:	DATE REVISED:
CARBON STEEL	ASTM B36.10M	ASME	E B31.1	1	2/22/2021
FINISH:	SPECIFICATION MATERIAL:	REFER TO PROJEC PAINT EQUIPMENT D			
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIG	I CODE:	
III MDD ED	CARBON STEEL	300 PSIG	ASME B31.1	ASME B16.34	
UI-MPP-ED	PIPE SIZE (NPS)	2" AND :	SMALLER	2/1/2" AN	LARGER
	CONNECTION AND RATING	CLASS 800 PSIG SOC	KETWELD (1" THRU 2")	CLASS 600 FI	ANGED ENDS
GATE VALVE	CONSTRUCTION	BODY/BONNET: A105, TRIM 13% CR OUTSIDE SCREW & YOKE, BOLTED GLAND, SOLID WEDGE, HARD FACED SEATS, CLASS 800 PACKING: GRAPHITE		STEM: API T PACKING:	WC6; STELLITE 6 FACED 410 SS RIM 5 GRAPHITE ND SS WITH GRAPHITE
	VALVE SELECTION	VOGT S	IGURE GA08 SW12111 GE FIG. H11SW	POWELL FIGURE 6003 CRANE FIGURE 76 BONNEY FORGE 6-11 RF	
	CONNECTION AND RATING	CLASS 800 PSI	G SOCKETWELD	CLASS 600 FI	ANGED ENDS
CHECK VALVE	CONSTRUCTION	SWING SEAT RIN DISC: GASKET: SP	M105 (BOLTED) G CHECK NG: 316 HF 13% CR PIRAL WOUND	BODY/CAP: A216 GR. WCB (BOLTED) SEAT RING: HARDFACED DISC: A105 OR A216 WCB WITH 13% CR OVERLAY GASKET: SPIRAL WOUND SS W/ITH GRAPHITE	
	VALVE SELECTION	VOGT	GURE SW08 SW701 GE FIG. H61SW	POWELL FIGURE 6061 CRANE FIGURE 175 BONNEY FORGE 6-61 RF	
	CONNECTION AND RATING	CLASS 800 PSI	G SOCKETWELD	CLASS 600 FL	ANGED ENDS
GLOBE VALVE	CONSTRUCTION	BODY/BONNET: A105 (BOLTED) (BODY HARDFACED) SEAT: COC: ALLOY DISC: 420 SS, CA15 HT, OR COC: ALLOY STEM: A182 F6a OR 410 SS PACKING: GRAPHITE GASKET: SPIRAL WOUND SS WITH GRAPHITE		SEAT RING: A105 O DISC: A105 OR A216 WCF STEM: PACKING:	G GR. WCB (BOLTED) R A216 HARDFACED 3 WITH 13% CR OVERLAY 410 SS GRAPHITE ND SS WITH GRAPHITE
	VALVE SELECTION	VOGT	IGURE GL08 SW12141 GE FIG. H31SW		IGURE 6031 GURE 171 RGE 6-31 RF
NOTES:	(1) 22" PIPE IS NOT ALLOWED IN				
	REVISION				
NUMBER	DESCRIF	PTION	DATE		
0	INITIAL ISSUE		10/23/2019		

UPDATED VALVE SELECTIONS

PIPING S	SPECIFICATION:	PRO	CESS:	DESIGN CO	NDITIONS:	
UI-MPP-VENT		RELIEF DEVIC	E VENT PIPING	600 PSIG	AT 775 °F	
UI-WIPP-VEN I	PIPE SIZE (NPS)	2" AND \$	SMALLER	2 1/2" THRU 10"	12" THRU 24"	
PIPE MATERIAL:	WEIGHT/SCHEDULE	>	(S	STD	SCHEDULE 40	
ASME B36.10M	MATERIAL	A106 GRADE	B - SEAMLESS	A106 GRADE E	B - SEAMLESS	
	CONSTRUCTION	CLASS 3000 - SOC	CKETWELD - B16.11	BUTTWELD -	ASME B16.9	
FITTINGS:	WALL THICKNESS	SAME AS ADJOINING PIPE SAME AS ADJOINI			IOINING PIPE	
	MATERIAL	FORGED CARBON	STEEL - ASTM A105	BUTTWELD FITTING - ASTM	A234 GRADE B - SEAMLE	
DIDING IGNITS	TYPE	SOCKE	TWELD	BUTTWELD - END	PREP PER B16.25	
PIPING JOINTS:	OTHER	WHERE FLANGE OF	THREAD REQUIRED	WHERE FLANG	GE REQUIRED	
	CONSTRUCTION		- FLAT FACE WITH SPIRAL SKET DESIGN	NOT PER	RMITTED	
UNIONS:	WALL THICKNESS	SAME AS AD	JOINING PIPE			
	MATERIAL	FORGED CARBON	STEEL - ASTM A105	-		
	CONSTRUCTION		CLASS 300 - WELD	NECK - ASME B16.5		
FLANGES:	WALL THICKNESS	SAME AS ADJOINING PIPE		SAME AS AD.	IOINING PIPE	
	MATERIAL	FORGED CARBON	FORGED CARBON	STEEL - ASTM A105		
FLANGE BOLTS:	CONSTRUCTION	ALLOY STEEL, AIS	I 4140/4142 QUENCHED AND T	EMPERED, A193 GRADE B7, ST	JD - FULL LENGTH	
FLANGE NUTS:	CONSTRUCTION		HEAVY HEX -	A194 GRADE 2H		
WASHER:	CONSTRUCTION		F	436		
0.40//570	CONSTRUCTION	SPIRA	AL WOUND - SUITABLE FOR RA	AISED-FACE OR FLAT-FACE FLA	NGES	
GASKETS:	MATERIAL	FLE	EXITALLIC STYLE CGI - TYPE 3	04 STAINLESS - FLEXICARB FILI	_ER	
	CONSTRUCTION	INSERTION	THERMOWELLS - 3000 PSIG I	PRESSURE CLASS - SEAL WELD	DED WELLS	
THERMOWELLS:	MATERIAL		ASTM A106 C	ARBON STEEL		
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:	
CARBON STEEL	ASTM B36.10M	ASME	B31.1	1	2/22/2021	
FINISH:	SPECIFICATION MATERIAL:	INORGANIC	SILICATE POLYMER TOP CO	ASED INORGANIC ZINC PRIMER AT - REFER TO PROJECT SPECI KISTING RELIEF DEVICE PIPING		
NOTES:	(1) 22" PIPE IS NOT ALLOWED IN	RELIEF VENT SERVICE				
	REVISION I					
NUMBER	DESCRIP	TION	DATE	1		

10/23/2019

2/22/2021

0

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INITIAL ISSUE

UPDATED LARGE BORE PIPE SCHEDULE

PIPING S	PECIFICATION:	PROC	CESS:	DESIGN CONDITIONS:		
UI-DSH		DESUPERHE	ATER WATER	800 PSIG	AT 400 °F	
	PIPE SIZE (NPS)		SMALLER		THRU 6"	
PIPE MATERIAL:	WEIGHT/SCHEDULE	A106 CBADE	S - SEAMLESS		KS B - SEAMLESS	
ASME B36.10M	MATERIAL CONSTRUCTION		KETWELD - B16.11		- ASME B16.9	
FITTINGS:	WALL THICKNESS		JOINING PIPE		JOINING PIPE	
	MATERIAL	FORGED CARBON	STEEL - ASTM 105	BUTTWELD FITTING - ASTM	1 A234 GRADE B - SEAMLESS	
PIPING JOINTS:	TYPE		TWELD		PREP PER B16.25	
	OTHER		THREAD REQUIRED	WHERE FLAN	IGE REQUIRED	
	CONSTRUCTION	CLASS 3000 - SW - B16.11 WOUND GAS		NOT PE	RMITTED	
UNIONS:	WALL THICKNESS		JOINING PIPE			
	MATERIAL	FORGED CARBON STEEL - ASTM A105				
	CONSTRUCTION		CLASS 600 - WELD	NECK - ASME B16.5		
FLANGES:	WALL THICKNESS		JOINING PIPE		JOINING PIPE	
FLANCE BOLTS.	MATERIAL CONSTRUCTION		STEEL - ASTM A105 I 4140/4142 QUENCHED AND TI		STEEL - ASTM A105	
FLANGE BOLTS: FLANGE NUTS:	CONSTRUCTION	ALLOT STEEL, AIS		A194 GRADE 2H	IOD - FOLL LENGTH	
WASHER:	CONSTRUCTION			136		
GASKETS:	CONSTRUCTION		AL WOUND - SUITABLE FOR RA			
GAGRETO.	MATERIAL		XITALLIC STYLE CGI - TYPE 30			
THERMOWELLS:	CONSTRUCTION	INSERTION	THERMOWELLS - 3000 PSIG P		DED WELLS	
PIPE MATERIAL:	MATERIAL PIPE CODE:	DESIGN/CONST	RUCTION CODE:	ARBON STEEL REVISION:	DATE REVISED:	
CARBON STEEL	ASTM B36.10M		B31.1	4	2/22/2021	
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:		CODE:		
UI-DSH	CARBON STEEL	600 PSIG	ASME B31.1	ASME B16.34	1	
0.5011	PIPE SIZE (NPS) CONNECTION AND RATING		SMALLER G SOCKETWELD		THRU 6" LANGED ENDS	
	CONNECTION AND RATING	CLASS 800 PSIC	3 SOCKET WELD		T: A217 GR. WC6	
GATE VALVE	CONSTRUCTION	BODY/BONNET: A105, TRIM 13% CR OUTSIDE SCREW & YOKE, BOLTED GLAND, SOLID WEDGE, STELLITE 6 SEATS, CLASS 800 PACKING: GRAPHITE		SEAT RING: A182 F11; STELLITE 6 FACED DISC/WEDGE: A217 GR. WC6; STELLITE 6 FACED STEM: 410 SS API TRIM 5 PACKING: GRAPHITE GASKET: SPIRAL WOUND SS WITH GRAPHITE		
	VALVE SELECTION	VOGT S BONNEY FORG	GURE GA08 W12111 GE FIG. H11SW	POWELL FIGURE 6003 CRANE FIGURE 76 BONNEY FORGE 6-11 RF		
	CONNECTION AND RATING	CLASS 800 PSIC	SOCKETWELD	CLASS 600 F	LANGED ENDS	
CHECK VALVE	CONSTRUCTION	BODY/CAP: A105 (BOLTED) SEAT RING: 410 SS + STELLITE 6 FACE DISC: A276 T420, CA15 HT, OR CoCr ALLOY GASKET: SPRIAL WOUND SS WITH GRAPHITE		SEAT RING: CARBON ST DISC/WEDGE: A105 + 13% (A216 GR. WCB TEEL + STELLITE 6 FACED OR FACED OR WCB +13% CR IND SS WITH GRAPHITE	
	VALVE SELECTION		GURE SW08 SW701 GE FIG. H61SW	POWELL FIGURE 6061 CRANE FIGURE 175 BONNEY FORGE 6-61 RF		
	CONNECTION AND RATING		G SOCKETWELD			
BALL VALVE	CONSTRUCTION	THRUST WASHER: STELL 410/CROME CAI STEM: SS 410; THRUST BU FLANGE	SHING: BRONZE; PACKING ESS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED			
	VALVE SELECTION	VELAN TYPE R, META	L SEATED, CLASS 900			
	CONNECTION AND RATING	CLASS 800 PSIC	G SOCKETWELD	CLASS 600 F	LANGED ENDS	
GLOBE VALVE	CONSTRUCTION	CLASS 800 PSIG SOCKETWELD BODY/BONNET: A105 (BOLTED) (BODY HARDFACED) SEAT: CoCr ALLOY DISC: 420 SS, CA15 HT, OR CoCr ALLOY STEM: A182 F8a OR 410 SS PACKING: GRAPHITE GASKET: SPIRAL WOUND SS WITH GRAPHITE		BODY/BONNET: A21 SEAT RING: A105 O DISC: A105 OR A216 WCI STEM: PACKING: GASKET: SPIRAL WOU	6 GR. WCB (BOLTED) IR A216 HARDFACED B WITH 13% CR OVERLAY 410 SS GRAPHITE IND SS WITH GRAPHITE	
	VALVE SELECTION	VOGT S BONNEY FOR	GURE GL08 W12141 GE FIG. H31SW	CRANE F	IGURE 6031 IGURE 171 DRGE 6-31 RF	
NUMBER	REVISION F		DATE	ř		
1	CHANGED SMALL BORE VALVES TO CLAS	SS 800 FROM CLASS 3000	6/30/2017			
2	ADDED WALL THICKNESS TO TABLE, REN WALL THICKNESS	MOVED OTHER REFERENCES TO	9/22/2017			
3	CHANGED UNIONS TO A FLAT-FACED GA		11/22/2017			
4	SET UPPER SIZE AT 6"; UPDATED VALVE	ELECTIONS 2/22/2021				

PIPING SPECIFICATION:		PROCESS:		DESIGN CONDITIONS:	
	FEGIFICATION:		EDWATER		AT 400 °F
UI-MPP-FW	PIPE SIZE (NPS)		SMALLER		HRU 10"
PIPE MATERIAL:	WEIGHT/SCHEDULE		S		(S
ASME B36.10M	MATERIAL	A106 GRADE I	B - SEAMLESS KETWELD - B16.11		B - SEAMLESS - ASME B16.9
FITTINGS:	CONSTRUCTION WALL THICKNESS		JOINING PIPE		JOINING PIPE
	MATERIAL	FORGED CARBON	STEEL - ASTM A105	BUTTWELD FITTING - ASTM	A234 GRADE B - SEAMLESS
PIPING JOINTS:	TYPE		TWELD		PREP PER B16.25
	OTHER	INSERTION THER CLASS 3000 - SW - B16.11		PSIG PRESSURE CLASS - SEA	
UNIONS:	CONSTRUCTION	WOUND GAS		NOT PE	RMITTED
UNIONS:	WALL THICKNESS	SAME AS ADJOINING PIPE		-	
	MATERIAL	FORGED CARBON	STEEL - ASTM A105	NECK - ASME B16.5	-
FLANGES:	CONSTRUCTION WALL THICKNESS	SAME AS AD.	JOINING PIPE		JOINING PIPE
	MATERIAL		STEEL - ASTM A105		STEEL - ASTM A105
FLANGE BOLTS:	CONSTRUCTION			E B1.1 - CLASS 2A THREADS	
FLANGE NUTS:	CONSTRUCTION CONSTRUCTION	SDIDA		.1 - CLASS 2B THREADS ISED-FACE OR FLAT-FACE FLA	MGES
GASKETS:	MATERIAL			04 STAINLESS - FLEXICARB FIL	
THERMOWELLS:	CONSTRUCTION	INSERTION		PRESSURE CLASS - SEAL WELI	DED WELLS
	MATERIAL	PENIONIOONOT		ARBON STEEL	
PIPE MATERIAL: CARBON STEEL	PIPE CODE: ASTM B36.10M	DESIGN/CONSTI ASME	RUCTION CODE: B31.1	REVISION:	DATE REVISED: 2/22/2021
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:		N CODE:	L, LL/2021
UI-MPP-FW	CARBON STEEL	600 PSIG	ASME B31.1	ASME B16.34	<u> </u>
J. III. 1 -1 11	PIPE SIZE (NPS) CONNECTION AND RATING	2" AND S CLASS 800 PSIC	SMALLER S SOCKETWELD		HRU 10" .ANGED ENDS
	CONNECTION AND RATING	CLASS 800 PSIC	OOONE I WELD		: A217 GR. WC6
GATE VALVE	CONSTRUCTION	OUTSIDE SCREW & YOKE, BO STELLITE 6 SEA PACKING:	ATS, CLASS 800 GRAPHITE	SEAT RING: A182 F1 DISC/WEDGE: A217 GR. STEM: API T PACKING: GASKET: SPIRAL WOU	1; STELLITE 6 FACED WC6; STELLITE 6 FACED 410 SS RIM 5 GRAPHITE ND SS WITH GRAPHITE
	VALVE SELECTION	BONNEY FORG	W12111 GE FIG. H11SW	CRANE F BONNEY FO	IGURE 6003 IGURE 76 RGE 6-11 RF
	CONNECTION AND RATING	-	-		GED - LUG STYLE 6 GR. WCB OR A105
BUTTERFLY VALVE	CONSTRUCTION			SEAT RING: INCONEL DISC: 316SS A351 CF8M OR A182 F316 NITRITED SHAFT & PINS: 17-4 PH SS A564 GR 630 PACKING: PTFE	
	VALVE SELECTION			FLOWSEAL METAL SEAT T	YPE 6LA (THRU 8") 6LC (10")
	CONNECTION AND RATING		SOCKETWELD		ANGED ENDS
CHECK VALVE	CONSTRUCTION	SEAT RING: 410 SS DISC: A276 T420, CA1 GASKET: SPRIAL WOUI	5 HT, OR CoCr ALLOY ND SS WITH GRAPHITE	SEAT RING: CARBON ST DISC/WEDGE: A105 + 13% C GASKET: SPIRAL WOU	.216 GR. WCB EEL + STELLITE 6 FACED :R FACED OR WCB +13% CR ND SS WITH GRAPHITE
	VALVE SELECTION	POWELL FIGURE SW08 VOGT SW701 BONNEY FORGE FIG. H61SW		CRANE FI	IGURE 6061 GURE 175 RGE 6-61 RF
	CONNECTION AND RATING	CLASS 800 PSIC			-
BALL VALVE	CONSTRUCTION	BODY: A105, STEI THRUST WASHER: STELLI 410/CROME CAI STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME LOCKABL	ITE 6; BALL AND SEAT: SS RBIDE COATED; SHING: BRONZE; PACKING : SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED		-
	VALVE SELECTION	VELAN TYPE R, META			
	CONNECTION AND RATING		SOCKETWELD		ANGED ENDS
GLOBE VALVE	CONSTRUCTION	BODY/BONNET: A105 (BOLTED) (BODY HARDFACED) SEAT: CoCr ALLOY DISC: 420 SS, CA15 HT, OR CoCr ALLOY STEM: A182 F6a OR 410 SS PACKING: GRAPHITE GASKET: SPIRAL WOUND SS WITH GRAPHITE		SEAT RING: A105 O DISC: A105 OR A216 WCF STEM: PACKING: GASKET: SPIRAL WOU	S GR. WCB (BOLTED) R A216 HARDFACED 3 WITH 13% CR OVERLAY 410 SS GRAPHITE ND SS WITH GRAPHITE
	VALVE SELECTION	POWELL FIGURE GL08 VOGT SW12141 BONNEY FORGE FIG. H31SW		CRANE FI	IGURE 6031 GURE 171 RGE 6-31 RF
MIMBES	REVISION I		0.475		
NUMBER 1	DESCRIP CHANGED SMALL BORE VALVES TO CLAS				
2	ADDED WALL THICKNESS TO TABLE, REN	MOVED OTHER REFERENCES TO	9/22/2017		
3	WALL THICKNESS CHANGED UNIONS TO A FLAT-FACED GA	ASKETED DESIGN	11/22/2017		
4	SET MAXIMUM SIZE AT 10"; UPDATED L	ARGE BORE PIPE SCHEDULE;	2/22/2021	1	
-	UPDATED VALVE SELECTIONS		2/22/2021	l	

PIPING SI	PECIFICATION:	PRO	CESS:	DESIGN CONDITIONS:	
UI-GFS		NATUR	AL GAS	150 PSIG	AT 150 °F
UI-GF3	PIPE SIZE (NPS)	2" AND SMALLER		2 1/2" T	HRU 10"
PIPE MATERIAL:	WEIGHT/SCHEDULE	Х	S	S ⁻	TD
ASME B36.10M	MATERIAL	ASTM A53 GRAD	DE B, SEAMLESS	ASTM A53 GRADE B, SEAMLESS	
	CONSTRUCTION	CLASS 3000 SOCKETWELD - ASME B16.11		BUTTWELD -	ASME B16.25
FITTINGS:	WALL THICKNESS	SAME AS AD	JOINING PIPE	SAME AS ADJOINING PIPE	
	MATERIAL	FORGED CARBON STEEL - ASTM A105		BUTTWELD FITTING - AST	M A234, GR. B SEAMLESS
PIPING JOINTS:	TYPE	SOCKE	TWELD	BUTTWELD - END PR	EP PER ASME B16.25
PIPING JOINTS:	OTHER	INSERTION THER	MOWELLS - ASTM A105 - 3000	PSIG PRESSURE CLASS - SEAL	L WELDED WELLS
UNIONS:	CONSTRUCTION	CLASS 3000 - SW - B16.11 - FLAT FACE WITH SPIRAL WOUND GASKET DESIGN		NOT PER	RMITTED
UNIONS.	WALL THICKNESS	SAME AS AD	JOINING PIPE	-	-
	MATERIAL	FORGED CARBON	STEEL - ASTM A105	-	-
	CONSTRUCTION		CLASS 150 - WELD	NECK - ASME B16.5	
FLANGES:	WALL THICKNESS	SAME AS AD	JOINING PIPE	SAME AS AD.	JOINING PIPE
	MATERIAL	FORGED CARBON	STEEL - ASTM A105	FORGED CARBON STEE	L - ASTM A105 - STD WT
FLANGE BOLTS:	CONSTRUCTION	ALLOY	STEEL, AISI 4140/4142 QUENC	HED AND TEMPERED, A193 GR	ADE B7
FLANGE NUTS:	CONSTRUCTION		HEAVY HEX - A	A194 GRADE 2H	
WASHER:	CONSTRUCTION		F-	436	
GASKETS:	CONSTRUCTION	SPIRA	AL WOUND - SUITABLE FOR RA	ISED-FACE OR FLAT-FACE FLA	NGES
GASKETS:	MATERIAL	FLEXITALLIC STYLE CGI - TYPE 304 STAINLESS - FLEXICARB FILLER			LER
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:
CARBON STEEL	ASTM B36.10M	ASME B31	.1/NFPA 54	3	2/22/2021
FINISH:	SPECIFICATION MATERIAL:	REFER TO P	ROJECT SPECIFICATION - PAI	NT NATURAL GAS PIPING SAFE	TY YELLOW
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIG	N CODE	
UI-GFS	CARBON STEEL	150 PSIG	ASME B31.1	ASME B16.34	
UI-GF3	PIPE SIZE (NPS)	2" AND S	SMALLER	2-1/2" T	HRU 10"
	CONNECTION AND RATING		CLASS 150 FI	LANGED ENDS	
BALL VALVE	CONSTRUCTION	BODY: A216 WCB BALL AND STEM: TYPE 316 STAINLESS STEEL SEATS: RTFE OR NYLON WITH SEAT RING AND GASKET SEALS: TFE FIRE-SAFE OPERATOR: LEVER HANDLE BLOWOUT PROOF PACKING ANTI-STATIC GROUNDING SPRING			
	VALVE SELECTION	JAMESBURY SERIES 7150 KECKLEY BVF1 VELAN TYPE R			
	CONNECTION AND RATING	-	-	CLASS 150 RAISED F	ACE FLANGED ENDS
PLUG VALVE	CONSTRUCTION	_		COVER, GLAND: PLUG: CAR STEM: CAR PACKING: GRAPHIT	BON STEEL BON STEEL FE/TFE COMPOUND
	VALVE SELECTION	-	-	GASKET: SS WITH GRAPHITE NORDSTROM FIGURE 1925 (THRU 4"): FIGURE 1945 (6"-8"); FIGURE 1949 (10")	

REVISION HISTORY					
NUMBER	DESCRIPTION	DATE			
1	ADDED WALL THICKNESS TO TABLE, REMOVED OTHER REFERENCES TO WALL THICKNESS	9/22/2017			
2	CHANGED UNIONS TO A FLAT-FACED GASKETED DESIGN	11/22/2017			
3	UPDATED VALVE SELECTIONS; ADDED PIPE FINISH SPECIFICATION	2/22/2021			

PIPING SP	ECIFICATION:	PROC	CESS:	DESIGN CO	ONDITIONS:
UI-AIR			R/INSTRUMENT AIR		AT 150 °F
=	PIPE SIZE (NPS)		LER (NOTE 1)		24" (NOTE 1)
PIPE MATERIAL:	WEIGHT/SCHEDULE		 TYPE L. HARD DRAWN	S ASTM A106 GRADE B - SEAI	NI ESS (NON BLACK STEEL)
ASME B36.10M	MATERIAL CONSTRUCTION	,	OR PRESS FIT	BUTT	. ,
FITTINGS:	WALL THICKNESS		JOINING PIPE		JOINING PIPE
FITTINGS:	MATERIAL		OR ASME B16.22 WROUGHT R ALLOY	BUTTWELD FITTING - ASTM	A234 GRADE B - SEAMLESS
PIPING JOINTS:	TYPE OTHER		OR PRESS FIT R JOINT DETAILS	BUTTWELD - END	PREP PER B16.25
	CONSTRUCTION	SOLDER: ASTM B32 ALLO		CLASS 150 - WELD	NECK - ASME B16.5
SOLDER/FLANGES:	WALL THICKNESS	ANTIMONY, LEAD FREE OR: A			JOINING PIPE
	MATERIAL	TIN-SILVER,		FORGED STEE	EL - ASTM A105
SOLDER/FLANGE BOLTS:	CONSTRUCTION	SOLDER: FILLER METAL LEAD-FREE - WATER-FLUSHABLE FLUX ASTM B813 - SILVER BRAZING FILLER METAL SHALL BE BCuP SERIES, COPPER PHOSPHORUS ALLOYS FOR		STUD - FULL-LEN	
	MATERIAL		RAZING - AWS A5.8	LENGTI	H STUD
DDEGG FITIEL ANGE MUTO.	CONSTRUCTION			HEAVY HEX - ASME B1.	
PRESS FIT/FLANGE NUTS:	MATERIAL	ASME B16.22 AND CRITER	NFORM TO ASME B16.18 OR: RIA UNDER IAPMO PS 117 -	CARBON STEEL - ASTM A19 WASI	HERS
PRESS FIT/GASKETS:	CONSTRUCTION	FACTORY INSTALLED - FITTI	DM - SEALING ELEMENTS NGS SHALL BE PRESSED BY	SPIRAL WOUND - SUITABLE FACE FI	ANGES
	MATERIAL		FITTING MANUFACTURER	TYPE 304 SS - FULL FACE - FL CGI OR	
	CONSTRUCTION	THRE			
UNIONS:	MATERIAL OTHER	INSTALL UNIONS: IN LONG I BYPASS OF VALVES/EQU	JOINING PIPE RUNS AT 80' INTERVALS - IN IIPMENT - AT EQUIPMENT CTIONS	NOT PER	RMITTED
PIPE MATERIAL:	PIPE CODE:		RUCTION CODE:	REVISION:	DATE REVISED:
COPPER	ASTM B36.10M	ASME		3	2/22/2021
FINISH:	SPECIFICATION MATERIAL:	DO NOT PAINT CO	OPPER AIR PIPING	REFER TO PROJECT	
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN	CODE:	
UI-AIR	AS NOTED	150 PSIG	ASME B31.1	ASME B16.34	ON MOTE A
017411	PIPE SIZE (NPS) CONNECTION AND RATING	4" AND SMAL	LER (NOTE 1)	2 1/2" THRU CLASS 150 FL	24" (NOTE 1)
GATE VALVE	CONSTRUCTION VALVE SELECTION	-		SEAT RING: STELLITE 6 FACED DISC/WEDGE: A217 GR. CA15 OR WCB WITH 13% CR OVERLAY STEM: 410 SS PACKING: GRAPHITE GASKET: CORRUGATED SS WITH GRAPHITE POWELL FIGURE 1503 CRANE FIGURE 47	
				BONNEY FO	
BUTTERFLY VALVE	CONNECTION AND RATING CONSTRUCTION	-	-	CLASS 150 FLANGED - LUG STYLE BODY/BONNET: A216 GR. WCB SEAT RING: PTFE/RTFE/UHMWPE DISC: A351 CF8M SHAFT: 17-4 PH PACKING: PTFE GLAND: 304 SS	
	VALVE SELECTION	-	-	POWELL FI JAMESBURY FLOWSEAI	
	CONNECTION AND RATING	CLASS 200 PSIG THRI	EADED OR SOLDERED		ANGED ENDS
CHECK VALVE	CONSTRUCTION	SEAT DIS HINGE PIN AND PLUG: BF	IET: BRONZE BRONZE C: BUNA-N RONZE ASTM B140 ALLOY SAME AS BODY	BODY/CAP: A216 (SEAT RING: I DISC: A105 OR A216 WCE GASKET: CORRUGATE	HARDFACED 3 WITH 13% CR OVERLAY
	VALVE SELECTION	NIBCO 433 SERIES APOLLO 161S SERIES (THRU 2")		POWELL FI CRANE FI BONNEY FO	GURE 147
	CONNECTION AND RATING	CLASS 600 PSIG THRI	EADED OR SOLDERED	CLASS 150 FL	
BALL VALVE	CONSTRUCTION	STEM: BRON: SEATS/SE/ PACKING LOCKABLE, QUARTER	ED BRONZE OR BRASS ZE OR BRASS ALS: RPTFE 3: RPTFE TURN LEVER HANDLE	SEAT RING: MP1 BALL AND S PACKING: PTFE BODY SEAL: SS LOCKING LEVER (LOCKING GEAR OPERA	TEM: SS 316 AND GRAPHITE : 316 GRAPHITE 3" AND SMALLER) ATOR (4" AND LARGER)
NOTES:	VALVE SELECTION	MILWAUKE	-200 SERIES EE BA-485B 600A SERIES	VELAN JAMESBURY KECKLE	SERIES 7000
	ON STEEL PIPE MATERIAL MAY BE DESIGN PROFESSIONAL SHALL (D BASED UPON THE

PIPING S	PECIFICATION:	PRO	CESS:	DESIGN CO	ONDITIONS:
UI-MUS-PWS			POTABLE WATER		AT 150 °F
	PIPE SIZE (NPS)		SMALLER		HRU 24"
PIPE MATERIAL:	WEIGHT/SCHEDULE		1 40S		1 10S
ASME B36.10M	MATERIAL		AMLESS OR WELDED CKETWELD - B16.11		- ASME B16.9
FITTINGS:	CONSTRUCTION WALL THICKNESS		JOINING PIPE		JOINING PIPE
111111100.	MATERIAL		A182, F304L, ASME B16.25		- SEAMLESS. B16.25
	TYPE		TWELD	BUTTWELD - END	PREP PER B16.25
PIPING JOINTS:	OTHER		- B16.11 - FLAT- FACE WITH	WHERE ELAN	IGE REQUIRED
	-		GASKET DESIGN		
	CONSTRUCTION		OT PERMITTED		150 PSIG
FLANGES:	WALL THICKNESS MATERIAL		JOINING PIPE		JOINING PIPE F330L, ASME B16.5
					S STEEL, GRADE B8, CLASS 2,
FLANGE BOLTS:	CONSTRUCTION	•			LL LENGTH
FLANGE NUTS:	CONSTRUCTION			HEAVY HEX -	A194 GRADE 8
WASHER:	CONSTRUCTION				S304
GASKETS:	CONSTRUCTION				CE OR FLAT-FACE FLANGES
	MATERIAL CONSTRUCTION		 N THERMOWELLS - 3000 PSIG F	1/16" ARAMID FIBER WITH SBR	
THERMOWELLS:	MATERIAL	INSERTION		INLESS STEEL	DED WELLS
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:
STAINLESS STEEL	ASTM B36.10M	ASME	B31.1	6	2/22/2021
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:		N CODE:	
UI-MUS-PWS	STAINLESS STEEL	150 PSIG	ASME B31.1	ASME B16.34	<u> </u>
3 3. 110	PIPE SIZE (NPS)		SMALLER SOCKETWELD		THRU 24" LANGED ENDS
	CONNECTION AND RATING		M A182 F316		M A351 CF8M
			TM A182 F316		TM A351 CF8M
	CONSTRUCTION		M A182 F316	DISC: ASTM	M A351 CF8M
GATE VALVE			M A182 F316		M A276 T316
			IG: PTFE IGURE GA08		IG: PTFE IGURE 1503
	VALVE SELECTION		SW12401		E 47 (THRU 24")
	11.212 0222011011		RGE HL-18-SW		PRGE 1-18 RF
	CONNECTION AND RATING			CLASS 150 PSIG	FLANGED ENDS
				BODY: A182 GR. F31	6 OR A351 GR. CF8M
				SEAT: TFE/VITON	
	CONSTRUCTION			DISC: A182 GR. F316 OR A351 GR. CF8M SHAFT: 17-4 PH PACKING: TFE	
BUTTERFLY VALVE					
					IGURE 1572 (12" AND SMALLER) TYPE 1LC
	VALVE SELECTION	-			LARGER)
					Y SERIES 815
	CONNECTION AND RATING	CLASS 800 S	SOCKETWELD	CLASS 150 FLANGED	ENDS (2-1/2" THRU 12")
			: A182 F316L		A351 GR. CF8M
	CONSTRUCTION	CARRIER/CARRIER PIN: 316SS DISC: A276 T316			.351 GR. CF8M RIER PIN: 316SS
CHECK VALVE	CONSTRUCTION	SEAT RING: 316 SST			A351 GR. CF8M
			OUND SST WITH PTFE		T: PTFE
			GURE SW08		IGURE 1561
	VALVE SELECTION		IES SWS718		E 147 (THRU 24")
	CONNECTION AND RATING		RGE HL-68-SW SOCKETWELD		PRGE 1-68 RF ENDS (2-1/2" THRU 20")
	SOURCE HOW AND INTING				T: A351 CF8M
			CF8M STAINLESS STEEL, FULL- DRT		316 SS
	CONSTRUCTION		G: XTREME		316 SS
BALL VALVE	CONSTRUCTION	BALL:	SS 316		: PTFE EAL: TFM
			: PTFE GRAPHITE	STEM SE	AL: PTFE
					R 4" AND LARGER
	VALVE SELECTION		IES 4000 MODEL A SYTE BVM3		SERIES 7150
	VALVE SELECTION		SYTE BVM3 U3TZM		VF1 (THRU 6") I SB-150
	CONNECTION AND RATING		SOCKETWELD		ENDS (2 1/2" THRU 12")
		RODY: ∆ST	M A182 F316	BODY: ∆STM	M A351 CF8M
			TM A182 F316		TM A351 CF8M
	CONSTRUCTION		M A182 F316		A A351 CF8M
GLOBE VALVE			M A182 F316 IG: PTFE		M A276 T316 IG: PTFE
	VALVE SELECTION	POWELL FIGURE GL08 VOGT SERIES SW12501			IGURE 1531 E 143 (THRU 24")
	GEEEGIION		RGE HL-38-SW		PRGE 1-38 RF
	REVISION H	IISTORY			
NUMBER	DESCRIP	TION	DATE		
1	CHANGED SMALL BORE VALVES TO	CLASS 800 FROM CLASS 3000	6/30/2017		
2	ADDED WALL THICKNESS TO TABLE, REN	MOVED OTHER REFERENCES TO	9/22/2017		
-	WALL THICKNESS		-,,2027		
3	CHANGED SMALL BORE BALL VALVES TO	JAMESBURY FROM KECKLEY	11/15/2017		
		CUSTED DECICIO		1	
4	CHANGED UNIONS TO A FLAT-FACED GA	ASKETED DESIGN	11/22/2017		
5	CHANGED SMALL BORE CHECK VALVES	O SWING CHECKS RATHER THAN	2/27/2018		
•	BALL CHECKS	2/2//2018		I	

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UPDATED VALVE SELECTIONS

PIPING SI	PECIFICATION:	PROC	CESS:	DESIGN CO	ONDITIONS:
UI-CWS-CWR			G WATER	100 PSIG	
01 2110 21111	PIPE SIZE (NPS)		SMALLER	2 1/2" Ti	
PIPE MATERIAL:	WEIGHT/SCHEDULE	X		ST ASS SPARE	
ASME B36.10M	MATERIAL	A53 GRADE B		A53 GRADE B	- SEAMLESS
	CONSTRUCTION	SOCKETWELD: CLASS 3000 2000, I		BUTTWELD -	ASME B16.9
FITTINGS:	WALL THICKNESS		JOINING PIPE	SAME AS AD	JOINING PIPE
	MATERIAL	FORGED CARBON		BUTTWELD FITTING - ASTM	
	TYPE	SOCKETWELD CLASS 3000 OR THREADED CLASS 2000		BUTTWELD - END	
JOINTS:	OTHER	UNIONS: CLASS 3000 - SW			
		SPIRAL WOUND		-	
	CONSTRUCTION	FLANGES NOT PERMITTED CLASS 150 - WELD NECK - ASME B16.47 AND SAME AS ADJOINING PIPE			
FLANGES:	WALL THICKNESS MATERIAL		·-	FORGED STEEL - ASTM A10	
FLANGE BOLTS:	CONSTRUCTION	ALLOY	STEEL, AISI 4140/4142 QUENCI		
FLANGE NUTS:	CONSTRUCTION		HEAVY HEX - A		
WASHER:	CONSTRUCTION		F4	36	
GASKETS:	CONSTRUCTION		SUITABLE FOR RAISED FAC		
	MATERIAL		AMID FIBER WITH NITRILE (NBI	,	
THERMOWELLS:	CONSTRUCTION MATERIAL	INSERTION	I THERMOWELLS - 3000 PSIG P ASTM A53 CA		DED WELLS
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:
CARBON STEEL	ASME B36.10M	ASME		6	2/22/2021
		, tolvie	REFER TO PROJEC		L, LL/2021
FINISH:	SPECIFICATION MATERIAL:	COLO	R TO MATCH DARK GREEN OF		IPING
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN		
UI-CWS-CWR	CARBON STEEL	150 PSIG	ASME B31.1	ASME B16.34	IDI I O III
<u> </u>	PIPE SIZE (NPS)		SMALLER	2 1/2" TI	
	CONNECTION AND RATING	CLASS 800 PSIC	G SOCKETWELD	CLASS 150 FL BODY/BONNET:	
GATE VALVE	CONSTRUCTION	BODY/BONNET: A105, TRIM 13% CR OUTSIDE SCREW & YOKE, BOLTED GLAND, SOLID WEDGE, HARD FACED SEATS, CLASS 800 PACKING: GRAPHITE		SEAT RING: STELLITE 6 FACED DISC/WEDGE: A217 GR. CA15 OR WCB WITH 13% CR OVERLAY STEM: 410 SS PACKING: GRAPHITE GASKET: CORRUGATED SS WITH GRAPHITE	
	VALVE SELECTION	POWELL FIGURE GA08 VOGT SW12111 BONNEY FORGE FIG. H11SW		POWELL FIGURE 1503 CRANE FIGURE 47 BONNEY FORGE 1-11 RF CLASS 150 FLANGED ENDS (LUG STYLE)	
	CONNECTION AND RATING	-	-		
BUTTERFLY VALVE	CONSTRUCTION			BODY/BONNET: SEAT RING: PTFI DISC: A3 SHAFT: PACKIN GLAND:	E/RTFE/UHMWPE 51 CF8M 17-4 PH G: PTFE
	VALVE SELECTION			POWELL FI JAMESBURY FLOWSEAL	SERIES 815
	CONNECTION AND RATING	CLASS 800 PSIC	G SOCKETWELD	CLASS 150 FL	ANGED ENDS
CHECK VALVE	CONSTRUCTION		13% CR	BODY/CAP: A216 (SEAT RING: I DISC: A105 OR A216 WCE GASKET: CORRUGATE	HARDFACED WITH 13% CR OVERLAY
	VALVE SELECTION	POWELL FIG VOGT BONNEY FORG		POWELL FI CRANE FI BONNEY FO	GURE 147
	CONNECTION AND RATING	CLASS 800 PSIC	G SOCKETWELD	CLASS 150 FLANGE	ED ENDS (UP TO 6")
BALL VALVE	CONSTRUCTION	BODY/BONNET: ASTM A216 TYPE WCB SEAT RING: PTFE BALL: SS 316 SEAL: PTFE PACKING: GRAPHITE		BODY/BONNET: A10: SEAT RING: MPT BALL AND S PACKING: PTFE BODY SEAL: SS GEAR OPERATOR	FE/PTFE/RPTFE TEM: SS 316 AND GRAPHITE 316 GRAPHITE
	VALVE SELECTION	KITZ AW8 KECKLE	EY BVM3	VELAN JAMESBURY KECKLE	SERIES 7000 EY BVF1
	CONNECTION AND RATING	CLASS 800 PSIC	G SOCKETWELD	CLASS 150 FL	ANGED ENDS
GLOBE VALVE	CONSTRUCTION	DIŠC: 4 TRIM: STEM: A PACKING:	.TED) (BODY HARDFACED) 120SST 13% Cr 138 Cf 1483 F6A GRAPHITE ID SST WITH GRAPHITE	SEAT RING: A105 OF DISC: A105 OR A216 WCE STEM:	8 WITH 13% CR OVERLAY 410 SS GRAPHITE
	VALVE SELECTION		GURE GL08 W12141 GE FIG. H31SW	POWELL FI CRANE FI BONNEY FO	GURE 143

REVISION HISTORY					
NUMBER	DESCRIPTION	DATE			
1	CHANGED SMALL BORE VALVES TO CLASS 800 FROM CLASS 3000	6/30/2017			
2	ADDED WALL THICKNESS TO TABLE, REMOVED OTHER REFERENCES TO WALL THICKNESS	9/22/2017			
3	CHANGED SMALL BORE BALL VALVES TO JAMESBURY FROM KECKLEY	11/15/2017			
4	CHANGED UNIONS TO A FLAT-FACED GASKETED DESIGN	11/22/2017			
5	ADDED 'FINISH' SPECIFICATION	10/10/2019			

DIDING S	PECIFICATION:	I DDO	CESS:	DESIGN CO	ONDITIONS:
	PECIFICATION.		BLE WATER		AT 150 °F
UI-NPW	PIPE SIZE (NPS)	2" AND 8	SMALLER		HRU 24"
PIPE MATERIAL:	WEIGHT/SCHEDULE			STD	
ASME B36.10M	MATERIAL	SCH 40 THREADED 135 B	SIG STANDARD FLAT BAND	EL, ASTM A795	ROLL-GROOVE FITTINGS AS
FITTINGS:	CONSTRUCTION		PATTERN		D BY CODE
TITTINGS.	WALL THICKNESS		JOINING PIPE		JOINING PIPE
	MATERIAL		RON FITTINGS		STEEL ROLL-GROOVE FITTINGS AS
	TYPE		SE TEFLON TAPE	APPROVE	D BY CODE
JOINTS:	WALL THICKNESS		JOINING PIPE - B16.11 - FLAT FACE WITH	SAME AS AD	JOINING PIPE
	OTHER	SPIRAL WOUND	GASKET DESIGN	-	-
	CONSTRUCTION		T PERMITTED		ANGED ENDS
FLANGES:	WALL THICKNESS MATERIAL		·-		JOINING PIPE D NECK OR SLIP-ON
		WHEN UNTHREADED PORT	ION IS EXCEEDS 1 1/2". USE		
NIPPLES:	CONSTRUCTION		O NOT USE CLOSE NIPPLES	-	· -
	MATERIAL CONSTRUCTION		JOINING PIPE ADED	EI ANGEI	D UNIONS
	MATERIAL		JOINING PIPE		ES - GASKET TYPE
UNIONS:	OTHER		ONG RUNS AT 80' INTERVALS	- IN BYPASS OF VALVES/EQUIP	
	CONSTRUCTION	INSERTION		ECTIONS PRESSURE CLASS - SEAL WELI	DED WELLS
THERMOWELLS:	MATERIAL			ARBON STEEL	
PIPE MATERIAL:	PIPE CODE:		RUCTION CODE:	REVISION:	DATE REVISED:
CARBON STEEL	ASTM B36.10M		B31.1	N CODE:	2/22/2021
VALVE SPECIFICATION:	SPECIFICATION MATERIAL: CARBON STEEL	PRESSURE CLASS: 150 PSIG	ASME B31.1	ASME B16.34	
UI-NPW	PIPE SIZE (NPS)		MALLER		HRU 24"
	CONNECTION AND RATING	CLASS 800	THREADED		ANGED ENDS
			105, TRIM 13% CR	BODY/BONNET: A216 WCB SEAT RING: HARDFACED	
	CONSTRUCTION	OUTSIDE SCREW & YOKE, BOLTED GLAND, SOLID WEDGE, HARD FACED SEATS, CLASS 800		DISC/WEDGE: A217 WCB WITH 13% CR OVERLAY	
GATE VALVE			GRAPHITE	STEM: 410 SS PACKING: GRAPHITE	
		POWELL FL	GURE GA08	POWELL FIGURE 1503	
	VALVE SELECTION	VOGT SW12111		CRANE F	IGURE 47
		BONNEY FOR	RGE FIG. H11T		RGE 1-11 RF
	CONNECTION AND RATING				D ENDS (LUG STYLE) : A216 GR. WCB
				SEAT RING: PTFE/RTFE/UHMWPE	
	CONSTRUCTION			DISC: A351 CF8M SHAFT: 17-4 PH	
BUTTERFLY VALVE				PACKING: PTFE	
					: 304 SS
	VALVE SELECTION				IGURE 1572 ' SERIES 815
			FLOWSEAL TYPE 1LA		L TYPE 1LA
	CONNECTION AND RATING		THREADED OR FORGED STEEL	CLASS 150 FL	ANGED ENDS
			DFACED SS		GR. WCB (BOLTED)
OUEOK VALVE	CONSTRUCTION	DISC: A276 T420 OR SS, WAFER OR SWING TYPE		SEAT RING: HARDFACED DISC: A105 OR A216 WCB WITH 13% CR OVERLAY GASKET: CORRUGATED SST WITH GRAPHITE	
CHECK VALVE		BOLTED BONNET GASKET: SPIRAL WOUND SS WITH GRAPHITE			
		POWELL FIGURE SW08		POWELL F	IGURE 1561
	VALVE SELECTION		SW701 GE FIG. H61SW		GURE 147 RGE 1-61 RF
	CONNECTION AND RATING		THREADED		S (THROUGH 6")
		BODY/BONNET: AS	TM A216 TYPE WCB		M A395 DUCTILE IRON
		SEAT RII	NG: PTFE		316 SS
	CONSTRUCTION		SS 316 : PTFE		316SS S: PTFE
BALL VALVE		PACKING:	GRAPHITE		ROELASTOMER
		LOCKING		LOCKING OPERATOR (GI	EAR OPERATOR OVER 4")
	VALVE SELECTION		IES 4000 MODEL A BOO SCTK	VICTAULIC	SERIES 726
		KECKLE	EY BVM3	GRUVLOK S	SERIES 7500
NUMBER	REVISION H		D	ļ <u> </u>	
	DESCRIP		DATE	=	
1	CHANGED SMALL BORE VALVES TO CLAS	1,,			
2	ADDED WALL THICKNESS TO TABLE, REN WALL THICKNESS	MOVED OTHER REFERENCES TO 9/22/2017			
3	CHANGED SMALL BORE BALL VALVES TO) JAMESBURY FROM KECKLEY	11/15/2017	1	
4	CHANGED UNIONS TO A FLAT-FACED GA	ASKETED DESIGN		1	
1 7	The state of the s	SKETED DESIGN 11/22/2017		1	
5	UPDATED VALVE SELECTIONS; ADDED G	BOOLES 10117 B	2/22/2021		

PIPING SF	PECIFICATION:	PROCESS:		DESIGN CONDITIONS:		
111.0514/		SANITARY SEWER, SEWER VENT, STORM			15 PSIG AT 140 °F	
UI-SEW	PIPE SIZE (NPS)	4" AND SMALLER		ALL S	SIZES	
PIPE MATERIAL:	WEIGHT/SCHEDULE		SERVICE	WEIGHT	SERVICE WEIGHT	
COPPER/CAST IRON	MATERIAL	ASTM B306, DWV	CAST IRON, ASTM A74		CAST IRON CISPI	301 OR ASTM A-888
	CONSTRUCTION	SOLDERED OR PRESS FIT	BELL AN	D SPIGOT	HUE	BLESS
FITTINGS:	MATERIAL	ASME B16.23 CAST BRONZE OR ASME B16.29 WROUGHT COPPER	CAST IRON	I, ASTM A74	CAST IRO	N CISPI 301
	ABOVE GRADE TYPE	SOLDERED OR PRESS FIT	ASTM C564, RUBBER GASKE AND C	TS JOINT DEVICES OR LEAD DAKUM		
JOINTS:	SOLDER/BURIED TYPE	SOLDER: ASTM B32 ALLOY, GRADE Sb-5 95/5 TIN-ANTIMONY, LEAD FREE OR: ASTM B32 ALLOY, GRADE SN95 TIN-SILVER, LEAD FREE	HUB AND SPIGOT, CISPI HSI ASTM C564 NEOPRENE GAS			KETS AND STAINLESS STEEL ELD ASSEMBLIES
		DED FOR MAIN DRAIN AND VENT LINES WITHIN THE POWER AND CH FOR BUILDING PLUMBING SYSTEMS (I.E. RESTROOMS, KITCHEN ARI			IPUS. FOLLOW THE UNIVERS	ITY OF IOWA DESIGN
		N PIPE MATERIAL MAY BE USED FOR PIPE SIZES BETWEEN 4" AND S ATE SELECTION OF PIPE MATERIAL WITH UTILITY OPERATOR.	SMALLER. FINAL PIPE MATERI	AL SHALL BE SELECTED BASED	UPON THE INDIVIDUAL PRO	JECT NEEDS. DESIGN
	3) 'PROVIDE TRAPS ON ALL SANI'	TARY BRANCH WASTE CONNECTIONS FROM FIXTURES WITHOUT TO	RAPS			
NOTES:	4) EXPOSED BRASS SHALL BE CI	HROME- PLATED POLISHED BRASS WITH NIPPLE AND SET SCREW B	ESCUTCHEONS			
	5) CONCEALED TRAPS MAY BE R	OUGH CAST BRASS OR SAME MATERIAL AS PIPE CONNECTED TO				
	6) SLIP JOINTS NOT ALLOWED OF	N SEWER SIDE OF TRAP				
	7) TRAPS SHALL CORRESPOND T	O FITTINGS ON CAST IRON SOIL PIPE OR STEEL PIPE				
	8) SIZE SHALL BE AS REQUIRED I	BY CONNECTED SERVICE OR FIXTURE				
PIPE MATERIAL:	PIPE CODE	TYPE			REVISION:	DATE REVISED:
COPPER/CAST IRON	ASTM B306/A74	PRESS FIT, SOLDER, BELL AN	D SPIGOT OR HUBLESS		2	2/22/2021
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:		DESIGN CODE:		
UI-SEW	CAST IRON	125 PSIG OR 150 PSIG		ASME B31.1 / ASME B16.34		
0.0211	PIPE SIZE (NPS)			ALL S	SIZES	
	CONNECTION AND RATING			PER ADJOINING PIPI	NG SPECIFICATIONS	
GATE VALVE	CONSTRUCTION		BODY: CAST IRON COVER: CAST IRON HANDWHEEL: CAST IRON (REMOVABLE) GATE/FLAPPER: BRONZE EXTENSIONS: CAST IRON			
	VALVE SELECTION		POWELL FIGURE 1787 (2" THRU 24") MILWAUKEE SERIES F-2882 CRANE F53			
	CONNECTION AND RATING			PER ADJOINING PIPI	NG SPECIFICATIONS	
PLUG VALVE	CONSTRUCTION		BODY/BONNET: ASTM A 126 CAST IRON BODY BEARING: SS 316 PACKING: PITE HANDWHEEL: CAST IRON (REMOVABLE) PLUG: SS 316 EXTENSIONS: CAST IRON			
	STANDARD			ANSI/AW		
	VALVE SELECTION		DEZURIK PEC SERIES OR EQUAL BY MILLIKEN			

CARBON STEEL:				
NUMBER	DESCRIPTION	DATE		
1	INITIAL ISSUE	4/14/2017		
2	UPDATED VALVE SELECTIONS; ADDED COPPER DWV PIPING AS AN OPTION FOR SMALLER SIZES	2/22/2021		

PIPING S	PECIFICATION:	PRO	CESS:	DESIGN CO	ONDITIONS:
	1		WATER		AT 120 °F
UI-RWS	PIPE SIZE (NPS)	2" AND \$	SMALLER	2 1/2" T	HRU 30"
PIPE MATERIAL:	WEIGHT/SCHEDULE	>	(S	S ⁻	ΓD
ASME B36.10M	MATERIAL		B - SEAMLESS	A53 GRADE E	3 - SEAMLESS
FITTINGS:	CONSTRUCTION	2000,), B16.11 THREADED: CLASS B16.11		ASME B16.9
11111100.	WALL THICKNESS		SAME AS ADJOINING PIPE		JOINING PIPE
	MATERIAL		STEEL - ASTM 105	BUTTWELD FITTING - ASTM A234 GRADE B - SEAMLI	
	TYPE		OR THREADED CLASS 2000	BUTTWELD - END	PREP PER B16.25
JOINTS:	OTHER	SPIRAL WOUND	- B16.11 - FLAT FACE WITH GASKET DESIGN	-	-
	CONSTRUCTION		T PERMITTED		- ASME B16.47 AND B16.5
FLANGES:	WALL THICKNESS				JOINING PIPE
	MATERIAL		OTES! AIO! 4440/4440 OUSNO		05 OR ASTM A516 GRADE 70
FLANGE BOLTS: FLANGE NUTS:	CONSTRUCTION	ALLOY	STEEL, AISI 4140/4142 QUENCI	NED AND TEMPERED, A193 GR	ADE B7
WASHER:	CONSTRUCTION			136	
	CONSTRUCTION			CE OR FLAT FACE FLANGES	
GASKETS:	MATERIAL	FIII FACE - 1/8" AR	AMID FIBER WITH NITRILE (NB		ARD 3000 OR FOLIAL
	CONSTRUCTION		MOWELLS - ASTM A403 - 3000		
THERMOWELLS:	MATERIAL	INCERTION THEIR	WOVVEECO - 710 TW 71400 - 0000	TOTAL NEGOCINE GENERAL SERVICE	WEEDED WEEEG
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:
CARBON STEEL	ASME B36.10M		B31.1	2	2/22/2021
FINISH:	SPECIFICATION MATERIAL:	3-COA1	SYSTEM WITH EPOXY PRIMERTOP COATCOLOR TO MATCH R	R, ACRYLIC INTERMEDIATE CO	AT AND
VALVE SPECIFICATION	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN	N CODE:	
	CARBON STEEL	150 PSIG	ASME B31.1	ASME B16.34	
UI-RWS	PIPE SIZE (NPS)		SMALLER		HRU 30"
	CONNECTION AND RATING		G SOCKETWELD		ANGED ENDS
GATE VALVE	CONSTRUCTION	BODY/BONNET: A105, TRIM 13% CR OUTSIDE SCREW & YOKE, BOLITED GLAND, SOLID WEDGE, HARD FACED SEATS. CLASS 800 PACKING: GRAPHITE		SEAT RING: STELLITE 6 FACED DISC/WEDGE: A217 GR. CA15 OR WCB WITH 13% CR OVERLAY STEM: 410 SS PACKING: GRAPHITE GASKET: CORRUGATED SS WITH GRAPHITE	
	VALVE SELECTION	VOGT S	GURE GA08 SW12111 GE FIG. H11SW	POWELL FIGURE 1503 CRANE FIGURE 47 (THRU 24") BONNEY FORGE 1-11 RF	
	CONNECTION AND RATING			CLASS 150 FLANGED ENDS	
BUTTERFLY VALVE	CONSTRUCTION			SHAFT DISC: GLAND/BEARING: BRONZE	KTREME : 316SS 316SS E OR ALUMINIZED BRONZE SKET: EPDM KING PRESSURE
	VALVE SELECTION			VANESSA/EMERSO	ON TRIPLE OFFSET
	CONNECTION AND RATING		G SOCKETWELD	CLASS 150 FL	ANGED ENDS
CHECK VALVE	CONSTRUCTION	SWING SEAT RING: STELL DISC:	.105 (BOLTED) CHECK ITE 6 FACED 410 SS 13% CR IRAL WOUND	BODY/CAP: A216 (SEAT RING: DISC: A105 OR A216 WCE GASKET: CORRUGATE	HARDFACED 3 WITH 13% CR OVERLAY
	VALVE SELECTION	POWELL FIGURE SW08 VOGT SW701 BONNEY FORGE FIG. H61SW			GURE 1561 E 147 (THRU 24") RGE 1-61 RF
	CONNECTION AND RATING		G SOCKETWELD	-	
BALL VALVE	CONSTRUCTION	BODY/BONNET: AS SEAT RI BALL: SEAL PACKING: LOCKING	TM A216 TYPE WCB NG: PTFE SS 316 : PTFE GRAPHITE & HANDLE	-	-
	VALVE SELECTION	KITZ AW	IES 4000 MODEL A 800 SCTK EY BVM3	-	-
NOTES	(1) FURNISH VALVES WITH GEAR OPERA	TORS GREATER THAN 8"			

REVISION HISTORY					
NUMBER	DESCRIPTION	DATE			
1	ADDED 'FINISH' AND CHANGED BUTTERFLY VALVE SPEC	10/10/2019			
2	ADDED THERMOWELL SPEC AND UPDATED VALVE SELECTIONS	2/22/2021			

PIPING SPECIFICATION:		PROCESS:		DESIGN CONDITIONS:	
UI-MPP-BOS-BDS		BLOWOFF/BLOV	VDOWN SYSTEM	600 PSIG	AT 500 °F
	PIPE SIZE (NPS)		SMALLER	2 1/2" Ti	
PIPE MATERIAL:	WEIGHT/SCHEDULE	·	(S	X	-
ASME B36.10M	MATERIAL		B - SEAMLESS	A106 GRADE B	
	CONSTRUCTION		KETWELD - B16.11	BUTTWELD - ASME B16.9	
FITTINGS:	WALL THICKNESS		JOINING PIPE	SAME AS ADJOINING PIPE	
	MATERIAL		STEEL - ASTM 105	BUTTWELD FITTING - ASTM A234 GRADE B - SEA BUTTWELD - END PREP PER B16.25	
PIPING JOINTS:	TYPE OTHER	SOCKE	TWELD	BOTTWELD - END	PREP PER B 16.25
		CLASS 2000 SW P16 11	- FLAT FACE WITH SPIRAL		
	CONSTRUCTION		SKET DESIGN	NOT PER	RMITTED
UNIONS:	WALL THICKNESS		JOINING PIPE	-	-
	MATERIAL		STEEL - ASTM A105	-	-
	CONSTRUCTION			NECK - ASME B16.5	
FLANGES:	WALL THICKNESS		SAME AS AD	JOINING PIPE	
	MATERIAL		FORGED CARBON	STEEL - ASTM A105	
FLANGE BOLTS:	CONSTRUCTION			B1.1 - CLASS 2A THREADS	
TEANGE BOETS.	MATERIAL			- ASTM A193 - GRADE B7	
FLANGE NUTS:	CONSTRUCTION			.1 - CLASS 2B THREADS	
TEAROE NOTO.	MATERIAL			ADE 2H HEAVY - F436 WASHER	
GASKETS:	CONSTRUCTION			ISED FACE OR FLAT FACE FLA	
	MATERIAL			04 STAINLESS - FLEXICARB FILE	
THERMOWELLS:	CONSTRUCTION	INSERTION		RESSURE CLASS - SEAL WELD	DED WELLS
	MATERIAL	DESIGN/CONST		ARBON STEEL	DATE DEVICE
PIPE MATERIAL: CARBON STEEL	PIPE CODE: ASTM B36.10M		RUCTION CODE: B31.1	REVISION:	DATE REVISED: 2/22/2021
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:		N CODE:	2/22/2021
	CARBON STEEL	600 PSIG	ASME B31.1	ASME B16.34	
UI-MPP-BOS-BDS	PIPE SIZE (NPS)		SMALLER	2 1/2" Th	HRI I 10"
	CONNECTION AND RATING		KETWELD (1" THRU 2")	CLASS 600 FL	
GATE VALVE	CONSTRUCTION	OUTSIDE SCREW & YOKE, BO	EATS, CLASS 800	BODY/BONNET: SEAT RING: A182 F11 DISC/WEDGE: A217 GR. \ STEM: API TI PACKING:	; STELLITE 6 FACED WC6; STELLITE 6 FACED 410 SS RIM 5 GRAPHITE
	VALVE SELECTION	POWELL FIGURE GA08 VOGT SW12111 BONNEY FORGE FIG. H11SW		GASKET: SPIRAL WOUND SS WITH GRAPHITE POWELL FIGURE 6003 CRANE FIGURE 76 BONNEY FORGE 6-11 RF	
	CONNECTION AND RATING	CLASS 800 PSI	G SOCKETWELD	CLASS 600 FL	ANGED ENDS
CHECK VALVE	CONSTRUCTION	SEAT RIN DISC: 1	105 (BOLTED) CHECK IG: 316 HF 13% CR IRAL WOUND	BODY/BONNET: A217 GR. WC6 SEAT RING: A182 F11; STELLITE 6 FACED DISC/WEDGE: A217 GR. WC6; STELLITE 6 FACED STEM: 410 SS PACKING: GRAPHITE GASKET: SPIRAL WOUND SS WITH GRAPHITE	
	VALVE SELECTION	VOGT	GURE SW08 SW701 GE FIG. H61SW	01 CRANE FIGURE 175	
	CONNECTION AND RATING	CLASS 900 PSI	G SOCKETWELD	-	
BALL VALVE	CONSTRUCTION	THRUST WASHER: STELL 410/CROME CAI STEM: SS 410; THRUST BU FLANGE STEM BUSHING: NITRIDED S COND.2 CHROME	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS RBIDE COATED; SHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER	ING	
	VALVE SELECTION	VELAN TYPE R, METAL SEATED, CLASS 900		-	-
	CONNECTION AND RATING	CLASS 800 PSI	G SOCKETWELD	CLASS 600 FL	ANGED ENDS
GLOBE VALVE	CONSTRUCTION	SEAT: Co DISC: 420 SS, CA15 STEM: A182 F PACKING:	.TED) (BODY HARDFACED) ICT ALLOY HT, OR CoCT ALLOY F6a OR 410 SS GRAPHITE ND SS WITH GRAPHITE	BODY/BONNET: A216 SEAT RING: A105 OF DISC: A105 OR A216 WCB STEM: · PACKING: GASKET: SPIRAL WOUN	R A216 HARDFACED WITH 13% CR OVERLAY 410 SS GRAPHITE
	VALVE SELECTION	VOGT S	GURE GL08 SW12141 GE FIG. H31SW	POWELL FI CRANE FIO BONNEY FOR	GURE 171

NOTES:						
	REVISION HISTORY					
NUMBER	DESCRIPTION	DATE				
1	CHANGED SMALL BORE VALVES TO CLASS 800 FROM CLASS 3000	6/30/2017				
2	ADDED WALL THICKNESS TO TABLE, REMOVED OTHER REFERENCES TO WALL THICKNESS	9/22/2017				
3	CHANGED UNIONS TO A FLAT-FACED GASKETED DESIGN	11/22/2017				
4	SET UPPER SIZE LIMIT TO 10"; UPDATED VALVE SELECTIONS; REVISED	2/22/2021				

PIPING SI	PECIFICATION:		PROCESS:		DESIGN CO	NDITIONS:
UI-CHEM (SS)		CHE	MICAL FEED		150 PSIG A	AT 140 °F
UI-CHEIVI (33)	PIPE SIZE (NPS)	2" AND SMALLER				
PIPE MATERIAL:	WEIGHT/SCHEDULE	TUBE WALL THICKNESS VARIES BY LINE SIZE				
ASME B36.10M	MATERIAL	ASTM A269 AND A213 TYPE 316/316L SEAMLESS TUBING - HARDNESS NOT TO EXCEED 90 HRB OR 200 HV				
TUBING WALL:	TUBING OD (IN.)	1/16 1/8 3/16	1/4 5/16	3/8 1/2 5	/8 3/4 7/8 1	1 1/4 1 1/2 2
TOBING WALL.	WALL THICKNESS (IN.)	0.010 0.028 0.028	0.028 0.035 0.	.035 0.035 0.0	49 0.049 0.049 0.06	55 0.083 0.095 0.109
	CONSTRUCTION		SWAGEL	OK COMPRESSION	TUBING FITTINGS	
FITTINGS:	WALL THICKNESS			SAME AS ADJOIN		
	MATERIAL				STM A182 TYPE 316	
PIPING JOINTS:	TYPE		SWAGEL	OK COMPRESSION	TUBING FITTINGS	
FIFING SOINTS.	OTHER					
	CONSTRUCTION			FLANGES NOT PE	RMITTED	
FLANGES:	WALL THICKNESS					
	MATERIAL					
FLANGE BOLTS:	CONSTRUCTION	FLANGES NOT PERMITTED				
TEANGE BOLTS.	MATERIAL					
FLANGE NUTS:	CONSTRUCTION	FLANGES NOT PERMITTED				
TEANGE NOTS:	MATERIAL					
GASKETS:	CONSTRUCTION			FLANGES NOT PE	RMITTED	
GASKETS.	MATERIAL					
PIPE MATERIAL:	PIPE CODE:	DESIG	N/CONSTRUCTION CO	DE:	REVISION:	DATE REVISED:
STAINLESS STEEL	ASTM A269/A269M		ASME B31.1		2	2/22/2021
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN CODE:			
UI-CHEM (SS)	STAINLESS STEEL	150 PSIG	ASME B31.1			
OI-CITEIN (33)	PIPE SIZE (NPS)			2" AND SMAL		
	CONNECTION AND RATING	SWAGELOK COMPRESSION TUBING FITTINGS				
		BODY: ASTM A479 316SS				
	CONSTRUCTION	BALL: ASTM A276 OR A479 316SS STEM: STM A276 OR A479 316SS				
BALL VALVE	CONSTRUCTION					
DALL VALVE			SEATS, S	STEM BEARING AN	D PACKING: PEEK	
	VALVE SELECTION	SWAGELOK SS-62P				

	REVISION HISTORY				
NUMBER	DESCRIPTION	DATE			
1	ADDED WALL THICKNESS TO TABLE, REMOVED OTHER REFERENCES TO WALL THICKNESS	9/22/2017			
2	CHANGED CONSTRUCTION TO 2" AND SMALLER TUBING SPEC	2/22/2021			

PIPING SI	PECIFICATION:	PROC	ESS:	DESIGN CO	ONDITIONS:	
UI-CHEM (PVC)		CHEMIC	AL FEED	150 PSIG	AT 140 °F	
UI-CHEIVI (PVC)	PIPE SIZE (NPS)	2" AND SMALLER				
PIPE MATERIAL:	WEIGHT/SCHEDULE	SCH 80, SDR 21 OR 26				
ASME B36.10M	MATERIAL	POLY	VINYL CHLORIDE (PVC) ASTM	D1784, WITH CELL CLASS OF	12454	
	CONSTRUCTION		SOLVENT \	WELD TYPE		
FITTINGS:	STANDARD		ASTM	D2467		
FITTINGS:	WALL THICKNESS	SAME AS ADJOINING PIPE				
	SOLVENT MATERIAL	SOLVENT CEMENT IN ACCORDANCE WITH ASTM D2564				
	CONSTRUCTION	SOLVENT WELD TYPE				
JOINTS:	WALL THICKNESS		SAME AS AD	JOINING PIPE		
	SOLVENT MATERIAL		SOLVENT CEMENT IN ACCO	ORDANCE WITH ASTM D2564		
	CONSTRUCTION	FLAN	GE ONLY PERMITTED FOR EQ	UIPMENT OR VALVE CONNECT	TIONS	
FLANGES:	WALL THICKNESS		SAME AS AD	JOINING PIPE		
	MATERIAL	POLYVINY	L CHLORIDE (PVC) ASTM F197	0, WITH CLASS 150 FLANGE DI	MENSIONS	
FLANGE BOLTS:	CONSTRUCTION	CARE	SON STEEL BOLTS AND STUDS	S IN ACCORDANCE WITH ASTM	A307	
FLANGE NUTS:	MATERIAL		HEAVY HEX -	A194 GRADE 8		
OACKETO.	CONSTRUCTION	SUITABLE FOR FLAT-FACE FLANGES				
GASKETS:	MATERIAL	FULL FACE - 1/8" POLYTETRAFLUOETHYLENE (PTFE) - GARLOCK 3500 OR EQUAL				
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:	
PVC 1120	ASTM B36.10M	ASME	B31.1	0	2/22/2021	
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN	N CODE:		
III CHEM (DVC)	PVC	150	ASME B31.1	ASME B16.34	1	
UI-CHEM (PVC)	PIPE SIZE (NPS)		2" AND S	SMALLER		
	CONNECTION AND RATING		CLASS 150 S	SOCKETWELD		
CHECK VALVE	CONSTRUCTION	BODY: ASTM D1784 CELL CLASS 12454, PVC, TYPE IV, "TRUE UNION" STYLE BALL: PVC, TYPE IV, ASTM D1784, CELL CLASSIFICATION 12454 SEAT PLATE: PVC, TYPE IV, ASTM D1784, CELL CLASSIFICATION 12454 PACKING: GRAPHITE O-RING: FKM			54	
	VALVE SELECTION	SPEARS TRUE UNION 2000 COLONIAL TRUE UNION CHECK VALVE HAYWARD TC SERIES				
•	CONNECTION AND RATING		CLASS 150 S	SOCKETWELD		
BALL VALVE	CONSTRUCTION	BODY: ASTM D1784 CELL CLASS 12454, PVC, SCH. 80, FULL-PORT, "TRUE UNION" STYLE BALL: PVC, TYPE 1, ASTM D1784, CELL CLASSIFICATION 12454 SEAT: PTFE STEM: PVC, TYPE 1, ASTM D1784, CELL CLASS 12454 HANDLE: POLYPROPYLENE PACKING: GRAPHITE O-RING: EPDM				
	VALVE SELECTION	O-RING: EPDM SPEARS TRUE UNION 2000 COLONIAL FULL BLOCK INDUSTRIAL TRUE UNION BALL VALVE HAYWARD TB SERIES				

REVISION HISTORY			
NUMBER	DESCRIPTION	DATE	
0	INITIAL ISSUE	2/22/2021	

PIPING S	PECIFICATION:	PROCI	SS:	DESIG	N CONDITIONS:
UI-TOS		TURBINE OII	SYSTEM	300 F	SIG AT 200 °F
01-103	PIPE SIZE (NPS)	2" AND SMALLER		2 1/2" THRU 6"	
PIPE MATERIAL:	WEIGHT/SCHEDULE	SCH 4	108	SCH 10S	
ASME B36.10M	MATERIAL	A312 TYPE 304 - SEAN	ILESS OR WELDED	A312 GRADE 304	- SEAMLESS OR WELDED
	CONSTRUCTION	CLASS 3000 - SOCKETWELD - B16.11 BUTTWELD - ASME B16.9		ELD - ASME B16.9	
FITTINGS:	WALL THICKNESS	SAME AS ADJO	DINING PIPE	SAME AS	ADJOINING PIPE
	MATERIAL	FORGED STEEL - ASTM A1	82, F304L, ASME B16.25	ASTMA403, WP3	304L - SEAMLESS, B16.25
PIPING JOINTS:	TYPE	SOCKET	WELD	BUTTWELD -	END PREP PER B16.25
PIPING JOINTS:	OTHER				
	CONSTRUCTION	FLANGES NOT	PERMITTED	(CLASS 300
FLANGES:	WALL THICKNESS			SAME AS	ADJOINING PIPE
	MATERIAL			SS, ASTM A1	82, F330L, ASME B16.5
FLANGE BOLTS:	CONSTRUCTION				
FLANGE BOLTS:	MATERIAL	HIGH STRENGTH STAINLESS STEEL - GRADE B8 - CLASS 2			SS 2
FLANGE NUTS:	CONSTRUCTION				
FLANGE NUTS:	MATERIAL	STAINLESS STEEL - ASTM A194 GRADE 8 - SS304 WASHERS			
GASKETS:	CONSTRUCTION	SUITABLE FOR RAISED FACE OR FLAT FACE FLANGES		ES	
GASKETS:	MATERIAL	FULL FACE - 1/16" ARAMID FIBER WITH SBR BINDER - GARLOCK BLUE-GARD OR EQUAL		E-GARD OR EQUAL	
THERMOWELLS:	CONSTRUCTION	INSERTION T	THERMOWELLS - 3000 PSIG I	PRESSURE CLASS - SEAL	WELDED WELLS
THERMOWELLS:	MATERIAL		304/304L STA	INLESS STEEL	
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONSTR	UCTION CODE:	REVISION:	DATE REVISED:
CARBON STEEL	ASTM B36.10M	ASME E	331.1	2	2/22/2021
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN CODE:		
UI-TOS	STAINLESS STEEL	150 PSIG	ASME B31.1		
01-103	PIPE SIZE (NPS)	2" AND SM	MALLER	2 1	/2" THRU 6"
	CONNECTION AND RATING	CLASS 800 SO	CKETWELD	CLASS 300 FLANGED ENDS	
BALL VALVE	CONSTRUCTION	BODY/BONNET: ASTM A351, CF8M STAINLESS STEEL, FULL-PORT SEAT RING: XTREME BALL: SS 316 SEAL: PTFE PACKING: GRAPHITE		BA ST SI BOD	SERT: A351 CF8M ALL: 316 SS EM: 316 SS EAT: PTFE IY SEAL: TFM M SEAL: PTFE
	VALVE SELECTION	JAMESBURY SERIES 4000 MODEL A VELAN TYPE R (CLASS 900) KITZ AW800 SCTK		JAMESBURY SERIES 7150 VELAN TYPE R KECKLEY BVF-1	

REVISION HISTORY				
NUMBER	DESCRIPTION	DATE		
1	ADDED WALL THICKNESS TO TABLE, REMOVED OTHER REFERENCES TO WALL THICKNESS	9/22/2017		
2	SET SIZE LIMIT AT 6"; UPDATED VALVE SELECTIONS; UPDATED DESIGN CONDITIONS, PIPE SCHEDULE AND FLANGE RATING	2/22/2021		

PIPING SI	PECIFICATION:	PRO	CESS:	DESIGN O	CONDITIONS:
UI-MPP-ASH		ASH S	YSTEM	-6 PSIG AT 685 °F	
UI-IVIPP-ASH	PIPE SIZE (NPS)	6" THRU 8"			
PIPE MATERIAL:	WEIGHT/SCHEDULE		WALL THICKNE	SS 0.5" MINIMUM	
ASME B36.10M	MATERIAL	CENTRIFUGAL	LY CAST, CHROME ALLOY CAS	ST IRON HARDNESS 285-400 B	HN, PLAIN ENDS
FITTINGS:	CONSTRUCTION	INTEGRALLY CAST FLA	NGES - TO INCLUDE 2" REMO	VABLE WEARBACK SECTION	- INTEGRAL HANDHOLES
FITTINGS:	MATERIAL	CHROME ALLOY CAS	ST IRON - BRINELL HARDNESS	NO LESS THAN 350 - WALL TI	HICKNESS 1" MINIMUM
PIPING JOINTS:	TYPE	MECHANICAL LOCKING CLAMPS/FLANGES ACCORDING TO MANUFACTURER'S RECOMMENDATIONS			RECOMMENDATIONS
EXPANSION JOINTS:	CONSTRUCTION	EXPANSION JOINTS SHALL BE PROVIDED AT LOCATIONS		O.D. OF LINER SHALL BE MACHINED TO ALLOW SMOOTH MOVEMENT - INTEGRAL STOPS TO LIMIT MOVEMENT	
23.17.11.010.11.01.11.01.	MATERIAL	DETERMINED BY THE ASH PIPNG SUPPLIER		CHROME ALLOY CAST IRON - BRINELL HARDNESS 280 MINIMUM	
FLANGE BOLTS:	CONSTRUCTION	MANUFACTURER'S RECOMMENDATION			
PLANGE BULTS:	MATERIAL		MANUFACTURER'S	RECOMMENDATION	
FLANGE NUTS:	CONSTRUCTION	MANUFACTURER'S RECOMMENDATION			
FLANGE NOTS.	MATERIAL		MANUFACTURER'S	RECOMMENDATION	
GASKETS:	CONSTRUCTION		MANUFACTURER'S	RECOMMENDATION	
GASKETS:	MATERIAL		MANUFACTURER'S	RECOMMENDATION	
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:
CARBON STEEL	ASTM B36.10M	ASME	B31.1	1	2/22/2021
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN CODE:		•
UI-MPP-ASH	CARBON STEEL	150 PSIG ASME B31.1			
OI-WIFF-ASH	PIPE SIZE (NPS)	6" THRU 8"			
	CONNECTION AND RATING	MECHANICAL LOCK	ING CLAMPS/FLANGES ACCOR	RDING TO MANUFACTURER'S	RECOMMENDATIONS
GATE VALVE	CONSTRUCTION	MECHANICAL LOCKING CLAMPS/FLANGES ACCORDING TO MANUFACTURER'S RECOMMENDATIONS TOTALLY ENCLOSED ROTARY SLIDE GATE VALVE POWER CHAMBER OPERATED			

REVISION HISTORY				
NUMBER	DESCRIPTION	DATE		
1	CHANGED FORMATTING; ADDED VALVE SPEC	2/22/2021		

PIPING SP	ECIFICATION:	PROCESS:	DESIGN CO	ONDITIONS:
UI-VAC		VACUUM SYSTEM	-6 PSIG	AT 100 °F
UI-VAC	PIPE SIZE (NPS)	2" THRU 3"	4" TF	IRU 6"
PIPE MATERIAL:	WEIGHT/SCHEDULE	5S	10	0S
ASME B36.10M	MATERIAL	TYPE 304 SS	TYPE	304 SS
	CONSTRUCTION	COMPRESSION COUPLINGS - SWEEP RADIUS TYPE ELBOWS	BUTTWELD FITTINGS - SW	EEP RADIUS TYPE ELBOWS
FITTINGS:	WALL THICKNESS	SAME AS ADJOINING PIPE	SAME AS AD	JOINING PIPE
	MATERIAL	TYPE 304 SS	TYPE	304 SS
PIPING JOINTS:	TYPE	COMPRESSION COUPLINGS	BUTTWELD	
FIFING JOINTS.	OTHER	BLACK NEOPRENE GASKETS	END PREP ASME B16.25	
	CONSTRUCTION	FLANGES NOT PERMITTED	CLASS 150 - WELD NECK - ASME B16.5	
FLANGES:	WALL THICKNESS	SAME AS ADJOINING PIPE	SAME AS ADJOINING PIPE	
	MATERIAL	UNIONS: GROUND JOINT: SOCKETWELD: CLASS 3000 - THREADED: CLASS 2000	ASME B16.5, ASTM A182, F3304L	
FLANGE BOLTS:	CONSTRUCTION	STUD - FULL LENGTH ASM	B1.1 - CLASS 2A THREADS	
TEANGE BOETS.	MATERIAL	HIGH STRENGTH STEEL	- ASTM A193 - GRADE B7	
FLANGE NUTS:	CONSTRUCTION	HEAVY HEX - ASME B1.	.1 - CLASS 2B THREADS	
FLANGE NOTS.	MATERIAL	CARBON STEEL - ASTM A194 GRADE 2H HEAVY - F436 WASHERS		
GASKETS:	CONSTRUCTION	SUITABLE FOR RAISED FACE OR FLAT FACE FLANGES		
GAGRETS.	MATERIAL	FULL FACE - 1/8" ARAMID FIBER WITH NITRILE (NBR) BINDER - GARLOCK BLUE-GARD 3000 OR EQUAL		ARD 3000 OR EQUAL
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONSTRUCTION CODE:	REVISION:	DATE REVISED:
CARBON STEEL	ASTM B36.10M	ASME B31.1	1	9/22/2017

REVISION HISTORY				
NUMBER	DESCRIPTION	DATE		
1	ADDED WALL THICKNESS TO TABLE, REMOVED OTHER REFERENCES TO WALL THICKNESS	9/22/2017		
2	UPDATED DESIGN CONDITIONS	2/22/2021		

BRANCH TABLE	HEADER SIZE (NPS)																	
BRANCH SIZE (NPS)	24	20	18	16	14	12	10	8	6	4	3	2 1/2	2	1 1/2	1 1/4	1	3/4	1/2
1/2	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	RT	RT	RT	RT	ST
3/4	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	RT	RT	RT	RT	ST	
1	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	RT	RT	RT	RT	ST		='
1 1/4	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	RT	RT	RT	ST		='	
1 1/2	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	RT	RT	RT	RT	ST				
2	SOL	SOL	SOL	SOL	SOL	SOL	SOL	SOL	RT	RT	RT	RT	ST					
2 1/2	WOL	WOL	WOL	WOL	WOL	WOL	WOL	WOL	RT	RT	RT	ST						
3	WOL	WOL	WOL	WOL	WOL	WOL	WOL	WOL	RT	RT	ST							
4	WOL	WOL	WOL	WOL	WOL	WOL	RT	RT	RT	ST								
6	WOL	WOL	WOL	RT	RT	RT	RT	RT	ST									
8	WOL	RT	RT	RT	RT	RT	RT	ST										
10	RT	RT	RT	RT	RT	RT	ST]										
12	RT	RT	RT	RT	RT	ST												
14	RT	RT	RT	RT	ST													
16	RT	RT	RT	ST														
18	RT	RT	ST															
20	RT ST												ST	STANDARD TEE				
24	ST										RT	REDUCING TEE						
30										WOL	WELDOLET							
36	FOR PIPE SIZES ABOVE 24". CONSULT DESIGN ENGINEER									SOL	SOCKETOLET							
42	CRBC CUSTO										REINFOR	-						
48																BRANCH	CONNECT	ΓΙΟΝ
											REV	REVISION:		EVISED:				
																1	2/22	/2021

REVISION HISTORY						
NUMBER	DESCRIPTION	DATE				
0	INITIAL ISSUE	12/5/2018				
1	CHANGED 2" BRANCH CONNECTIONS TO SOL; CHANGED 8" BRANCH ON 24" HEADER TO WOL; MADE ALL REDUCING BRANCHES RT WHERE AVAILABLE	2/22/2021				