	UNIVERSITY OF IOWA CHILLED WATER PLANT PIPING STANDARD SPECIFICATIONS									
	TABLE OF CONTENTS									
PIPE	CVCTEM	DESIGN C	DESIGN CONDITIONS		OPERATING CONDITIONS					
SPECIFICATION	SYSTEM	PRESSURE (PSIG)	TEMPERATURE (°F)	PRESSURE (PSIG)	TEMPERATURE (°F)	PAGE:	REV:	DATE:		
UI-CHW	<u>CHILLED WATER</u>	150	100	50-120	SUPPLY: 42 RETURN: 54-60	2	0	2/22/2021		
UI-CS-DI	CONDENSER WATER - DI	150	150	50-75	SUPPLY: 85 RETURN: 95-102	3	0	2/22/2021		
UI-CS-CS	CONDENSER WATER - CS	150	150	50-75	SUPPLY: 85 RETURN: 95-102	4	0	2/22/2021		
UI-CS-SS	CONDENSER WATER - SS	150	150	50-75	SUPPLY: 85 RETURN: 95-102	5	0	2/22/2021		
UI-CS-DRAIN	CONDENSER WATER DRAINS	150	120	50-75	SUPPLY: 85 RETURN: 95-102	6	0	2/22/2021		
UI-LPS	LOW PRESSURE STEAM	50	340	20	260	7	0	2/22/2021		
UI-HPS	HIGH PRESSURE STEAM	175	500	155	350	8	0	2/22/2021		
UI-LP-CON	LOW PRESSURE CONDENSATE	50	340	20	260	9	4	2/22/2021		
UI-HP-CON	HIGH PRESSURE CONDENSATE	175	500	155	350	10	4	2/22/2021		
UI-AIR	COMPRESSED AIR	150	150	80-100	75	11	3	2/22/2021		
UI-SEW	SANITARY SEWER	15	140	0	75	12	2	2/22/2021		
UI-PCW (CS)	PROCESS COLD WATER - CS	135	200	60-80	55	13	2	2/22/2021		
UI-PCW (SS)	PROCESS COLD WATER - SS	150	100	60-80	55	14	1	2/22/2021		
UI-PCW (DI)	PROCESS COLD WATER - DI	150	100	60-80	55	15	0	2/22/2021		
UI-CSS	SAMPLE WATER	150	100	50-75	95-102	16	0	2/22/2021		
UI-CHEM (CPVC)	CHEMICAL TREATMENT SERVICE	150	100	50-75	75	17	0	2/22/2021		
UI-CHEM (PVDF)	CHEMICAL TREATMENT SERVICE - ACID	150	100	50-75	75	18	0	2/22/2021		
UI-DCW	DOMESTIC WATER SYSTEM	135	200	60	COLD: 50 HOT: 150	19	0	2/22/2021		
UI-LOL	<u>LUBE OIL</u>	230	100	10	75-95	20	0	2/22/2021		
UI-REF	<u>REFRIGERANT</u>	300	250	NO	OTE 1	21	0	2/22/2021		
UI-RV	REFRIGERANT VENT PIPING	285	150	NO	OTE 1	22	0	2/22/2021		
	BRANCH TABLE					23	1	2/22/2021		

NOTES

¹⁾ OPERATING CONDITIONS DETERMINED ON A SYSTEM BY SYSTEM BASIS

²⁾ ALL SYSTEMS ARE ABOVE GROUND UNLESS OTHERWISE STATED

PIPING SPECIFICATION: PROCESS: DESIGN CONDITIONS:						
	EGIFICATION:		CESS: D WATER		AT 100 °F	
UI-CHW	PIPE SIZE (NPS)		SMALLER	2 1/2" THRU 30"	36" THRU 48"	
PIPE MATERIAL:	WEIGHT/SCHEDULE	-		STD	STD	
ASME B36.10M/B88	MATERIAL	-	TYPE L, HARD DRAWN	A53 OR A106 GRADE B - SEAMLESS	API 5L GRADE B - SEAMLESS	
	CONSTRUCTION WALL THICKNESS		OR PRESS FIT JOINING PIPE		- ASME B16.9 JOINING PIPE	
FITTINGS:	MATERIAL	ASME B16.18 CAST COPPER	R OR ASME B16.22 WROUGHT R ALLOY		A234 GRADE B - SEAMLESS	
	TYPE		OR PRESS FIT	BUTTWELD - END	PREP PER B16.25	
PIPING JOINTS:	OTHER	SEE BELOW FO	R JOINT DETAILS	-	·-	
OOLDED/ELANOEO	CONSTRUCTION		OY, GRADE Sb-5 95/5 TIN-		- ASME B16.47 AND B16.5 JOINING PIPE	
SOLDER/FLANGES:	WALL THICKNESS MATERIAL		STM B32 ALLOY, GRADE SN95 , LEAD FREE		D5 OR ASTM A516 GRADE 70	
SOLDER/FLANGE BOLTS:	CONSTRUCTION	SOLDER: FILLER METAL LEA FLUX ASTM B813 - SILVER BI BE BCuP SERIES, COPPER	D-FREE - WATER-FLUSHABLE RAZING FILLER METAL SHALL PHOSPHORUS ALLOYS FOR RAZING - AWS A5.8	ALLOY STEEL, AISI 4140/4142	QUENCHED AND TEMPERED, RADE B7	
	MATERIAL	GENERAL DOTT B	NAZING - AWO A0.0		STM A193 - GRADE B7, FULL 'H STUD	
	CONSTRUCTION			HEAVY HEX - ASME B1	.1 - CLASS 2B THREADS	
PRESS FIT/FLANGE NUTS:	MATERIAL	ASME B16.22 AND CRITER	NFORM TO ASME B16.18 OR: RIA UNDER IAPMO PS 117 - DM - SEALING ELEMENTS		94 GRADE 2H HEAVY - F436 HERS	
DDESC EIT/CASVETS	CONSTRUCTION	FACTORY INSTALLED - FITTI	DM - SEALING ELEMENTS INGS SHALL BE PRESSED BY Y FITTING MANUFACTURER		FOR RAISED-FACE OR FLAT- LANGES	
PRESS FIT/GASKETS:	MATERIAL			CGI OF	LEXITALLIC FLEXICARB STYLE R EQUAL	
WASHER:	CONSTRUCTION	-			94 GRADE 2H HEAVY - F436 HERS	
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:	
COPPER/CARBON STEEL	ASME B36.10M/B88		B31.1	0	2/22/2021	
VALVE SPECIFICATION:	SPECIFICATION MATERIAL: AS NOTED	PRESSURE CLASS: 150 PSIG	ASME B31.1	ASME B16.34	+	
UI-CHW	PIPE SIZE (NPS)		SMALLER		HRU 48"	
	CONNECTION AND RATING			LUGGED FOR CL	ASS 150 FLANGES	
BUTTERFLY VALVE	CONSTRUCTION			DISC: SS GLAND/BEARING: SS WITH RIFE IMPREGNATED OPERATOR: GEARED HANDWHEEL W/ POSITION INDICATOR SEAT: PITE 200 PSIG WORKING PRESSURE		
	VALVE SELECTION			ABZ SERIES 400 DEZURIK STYLE BHP JAMESBURY SERIES 815		
	CONNECTION AND RATING	CLASS 600 PSIG THR	EADED OR SOLDERED		ENDS (2 1/2" THRU 24")	
CHECK VALVE	CONSTRUCTION	DISC: E SEAT DIS HINGE PIN AND PLUG: BF	IET: BRONZE BRONZE C: BUNA-N RONZE ASTM B140 ALLOY SAME AS BODY	SEAT RING: DISC: A105 OR A216 WC	GR. WCB (BOLTED) HARDFACED B WITH 13% CR OVERLAY ED SST WITH GRAPHITE	
	VALVE SELECTION		33 SERIES 51S SERIES	POWELL FIGURE 1561 CRANE FIGURE 147 BONNEY FORGE 1-61 RF		
	CONNECTION AND RATING				LANGED ENDS	
SILENT CHECK VALVE	CONSTRUCTION			CARBO SEAT: STAIN DISC OR PLUG: TYPE STEM: STAIN TORSION SPRING: TYP GASKET: SPIRAL WOU 12" THRU 10" AND SMA	ED ASTM A216 GRADE WCB N STEEL ILESS STEEL 316 STAINLESS STEEL NLESS STEEL E 316 STAINLESS STEEL IND SS WITH GRAPHITE 42"; GLOBE LLER: WAFER	
	VALVE SELECTION	-		MUELLER MODEL	(GLOBE) OR CW (WAFER) 101MDT OR 105MDT STYLE CSC	
	CONNECTION AND RATING	CLASS 600 PSIG THR	EADED OR SOLDERED			
BALL VALVE	CONSTRUCTION	BALL: STEM: STAINLESS STE PACKIN SEATS AND SEALS:	PIECE, FULL-PORT SS 316 EEL, BLOWOUT PROOF IG: PTFE : REINFORCED PTFE			
	VALVE SELECTION	NIBCO MOD	-140 SERIES EL 580-70-66 20BS SERIES			
	REVISION I			İ		
NUMBER						
1	DESCRIP CHANGED SMALL BORE VALVES TO CLAS		DATE 6/30/2017			
L			l	I		

ADDED SPECIFICATIONS FOR PIPE SIZES 36" THRU 48", CHANGED SMALL BORE BALL VALVE MODEL; CHANGED SMALL BORE PIPING TO COPPER

PIPING S	PECIFICATION:	PROC	ESS:	DESIGN CONDITIONS:		
UI-CS-DI		CONDENSE	ER WATER	150 PSI	IG at 150 °F	
01-C2-DI	PIPE SIZE (NPS)	3" THRU 48"				
PIPE MATERIAL:	WEIGHT/SCHEDULE		SPECIAL THICKNESS CLASS	5 53 ANSI/AWWA C150/A21.50		
ANSI/AWWA C151/A21.51	MATERIAL	ANSI/AWWA C151/A21.51 DUCTILE IRON PIPING				
	CONSTRUCTION		ANSI/AWWA C110	0/A21.10 FLANGED		
FITTINGS:	DESIGN RATING		150 PSIG IN ACCORDANCE V	VITH ANSI/AWWA C110/A21.10)	
	MATERIAL		DUCTII	_E IRON		
	TYPE		ANSI/AWWA C11	5/A21.15 FLANGED		
JOINTS:	DESIGN RATING		250 PSIG IN ACCORDANCE V	VITH ANSI/AWWA C115/A21.15	5	
	OTHER		-	-		
	CONSTRUCTION		DUCTILE IRON			
0501105 04001 50	DESIGN RATING		350 PSIG IN ACCORDANC	E WITH ANSI/AWWA C800		
SERVICE SADDLES:	COATING		FUSION BONDE	D BLACK NYLON		
	STRAPS		TYPE 304 STA	INLESS STEEL		
	CONSTRUCTION		CLASS 150 - WELD	NECK - ASME B16.5		
FLANGES:	WALL THICKNESS		SAME AS AD	JOINING PIPE		
	MATERIAL		FORGED CARBON	STEEL - ASTM A105		
BOLTS:	CONSTRUCTION		STAINLESS STEEL IN ACC	ORDANCE WITH ASTM A240		
NUTS:	CONSTRUCTION		HEAVY HEX - A	A194 GRADE 2H		
WASHERS:	CONSTRUCTION	TYPE 304 STAINLESS STEEL				
	CONSTRUCTION	SUITABLE FOR RAISED-FACE OR FLAT-FACE FLANGES AND FOR USE WITH SERVICE SADDLES				
GASKETS:	STANDARD	ANSI/AWWA C111/A21.11				
	MATERIAL	FULL FACE - 1/16" ARAMID FIBER WITH SBR BINDER - GARLOCK BLUE-GARD OR EQUAL				
PIPE LINING:	CONSTRUCTION		CEMENT MORTAR LII	NING AND SEAL COAT		
PIPE LINING:	STANDARD		ANSI/AWW	A C104/A21.4		
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONSTR	RUCTION CODE:	REVISION:	DATE REVISED:	
DUCTILE IRON	ANSI/AWWA C151/A21.51		-	0	2/22/2021	
ALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN	CODE:		
UI-CS-DI	DUCTILE IRON					
ות-פס-וו	PIPE SIZE (NPS)		3" TH	RU 48"		
	CONNECTION AND RATING		LUGGED FOR CL	ASS 150 FLANGES		
BUTTERFLY VALVE	CONSTRUCTION	BODY/SEAT: CARBON STEEL STEM: SS DISC: SS GLAND/BEARING: SS WITH RTFE IMPREGNATED OPERATOR: GEARED HANDWHEEL W/ POSITION INDICATOR SEAT: PTFE 200 PSIG WORKING PRESSURE				
	ABZ SERIES 400 VALVE SELECTION DEZURIK STYLE BHP JAMESBURY SERIES 815					
	REVISION H					
NUMBER	DESCRIPT	TION	DATE			
0	INITIAL ISSUE		1/5/2018			

ADDED INFORMATION FOR BUTTERFLY VALVE

PIPING SPECIFICATION:		PROG	CESS:	DESIGN CONDITIONS:		
UI-CS-CS		CONDENS	ER WATER	150 PSIG	AT 150 °F	
PIPE MATERIAL:	PIPE SIZE (NPS) WEIGHT/SCHEDULE	2" AND S	SMALLER -	2 1/2" THRU 30" STD	36" THRU 48" STD	
ASME B36.10M/B88	MATERIAL	†	TYPE L, HARD DRAWN	A53 OR A106 GRADE B - SEAMLESS	API 5L GRADE B - SEAMLESS	
	CONSTRUCTION	SOLDERED C			- ASME B16.9	
FITTINGS:	WALL THICKNESS	SAME AS ADA ASME B16.18 CAST COPPER	JOINING PIPE		JOINING PIPE	
	MATERIAL	COPPER	RALLOY	BUTTWELD FITTING - ASTM	A234 GRADE B - SEAMLESS	
PIPING JOINTS:	TYPE	SOLDERED C	OR PRESS FIT	BUTTWELD - END	PREP PER B16.25	
FIFING SOINTS.	OTHER	SEE BELOW FOI	R JOINT DETAILS			
	CONSTRUCTION WALL THICKNESS	SOLDER: ASTM B32 ALLC			- ASME B16.47 AND B16.5 JOINING PIPE	
SOLDER/FLANGES:	MATERIAL		STM B32 ALLOY, GRADE SN95 LEAD FREE	FORGED STEEL - ASTM A10	05 OR ASTM A516 GRADE 70	
	CONSTRUCTION	SOLDER: FILLER METAL LEAL FLUX ASTM B813 - SILVER BF	D-FREE - WATER-FLUSHABLE RAZING FILLER METAL SHALL		QUENCHED AND TEMPERED, RADE B7	
SOLDER/FLANGE BOLTS:	MATERIAL		BE BCuP SERIES, COPPER PHOSPHORUS ALLOYS FOR GENERAL DUTY BRAZING - AWS A5.8		STM A193 - GRADE B7, FULL H STUD	
	CONSTRUCTION			HEAVY HEX - ASME B1	.1 - CLASS 2B THREADS	
PRESS FIT/FLANGE NUTS:	MATERIAL		RIA UNDER IAPMO PS 117 -		94 GRADE 2H HEAVY - F436 HERS	
	CONSTRUCTION	SEALING ELEMENTS: EPI FACTORY INSTALLED - FITTI			FOR RAISED-FACE OR FLAT-	
PRESS FIT/GASKETS:	MATERIAL	TOOLS RECOMMENDED BY	Y FITTING MANUFACTURER	TYPE 304 SS - FULL FACE - FI	LANGES LEXITALLIC FLEXICARB STYLE	
					94 GRADE 2H HEAVY - F436	
WASHER: PIPE MATERIAL:	CONSTRUCTION PIPE CODE:		RUCTION CODE:		HERS DATE REVISED:	
COPPER/CARBON STEEL	ASME B36.10M/B88		B31.1	0	2/22/2021	
FINISH:	SPECIFICATION MATERIAL:	MATCH GRAY OF EXIST	XY PRIMER, ACRYLIC INTERME FING CONDENSER WATER PIPI	NG - FOR UNINSULATED CONI		
VALVE SPECIFICATION:	SPECIFICATION MATERIAL: AS NOTED	PRESSURE CLASS: 150 PSIG	ASME B31.1	ASME B16.34		
UI-CS-CS	PIPE SIZE (NPS)		SMALLER	2 1/2" THRU 48"		
BUTTERFLY VALVE	CONSTRUCTION			BODY/SEAT: CARBON STEEL STEM: SS DISC: SS GLAND/BEARING: SS WITH RTFE IMPREGNATED OPERATOR: GEARED HANDWHEEL W/ POSITION INDICATOR SEAT: PTFE 200 PSIG WORKING PRESSURE		
	VALVE SELECTION			ABZ SERIES 400 DEZURIK STYLE BHP JAMESBURY SERIES 815		
	CONNECTION AND RATING	CLASS 600 PSIG THREADED OR SOLDERED BODY/BONNET: BRONZE DISC: BRONZE SEAT DISC: BUNA-N HINGE PIN AND PLUG: BRONZE ASTM B140 ALLOY DISC HANGER: SAME AS BODY		CLASS 150 FLANGED	ENDS (2 1/2" THRU 24")	
CHECK VALVE	CONSTRUCTION			DISC: BRONZE SEAT DISC: BUNAN ID PLUG: BRONZE AST B140 ALLOY C HANGER: SAME AS BODY BODY/CAP: A216 GR. WG8 (BOLTED) SEAT RING: HARDFACED DISC: A105 OR A216 WC8 WITH 13% CR OVERL GASKET: CORRUGATED SST WITH GRAPHITI		
	VALVE SELECTION		3 SERIES 31S SERIES	POWELL FIGURE 1561 CRANE FIGURE 147 BONNEY FORGE 1-61 RF		
	CONNECTION AND RATING	-	-		LANGED ENDS	
SILENT CHECK VALVE	CONSTRUCTION	-	-	BODY/CAP: CAST OR FORGED ASTM A216 GRADE WCB CARBON STEEL SEAT: STAINLESS STEEL DISC OR PLUG: TYPE 316 STAINLESS STEEL STEM: STAINLESS STEEL TORSION SPRING: TYPE 316 STAINLESS STEEL GASKET: SPIRAL WOUND SS WITH GRAPHITE 12" THRU 42": GLOBE 10" AND SMALLER: WAFER		
	VALVE SELECTION	-	-	MUELLER MODEL 1	(GLOBE) OR CW (WAFER) 101MDT OR 105MDT STYLE CSC	
	CONNECTION AND RATING		EADED OR SOLDERED			
BALL VALVE	CONSTRUCTION	BALL: STEM: STAINLESS STE PACKIN	PIECE, FULL-PORT SS 316 EEL, BLOWOUT PROOF G: PTFE REINFORCED PTFE	-		
	VALVE SELECTION	APOLLO 77- NIBCO MODE MILWAUKE 2		-		
	CONNECTION AND RATING	-		CLASS 150 FLANGED	ENDS (2 1/2" THRU 24")	
GLOBE VALVE	CONSTRUCTION			BODY/BONNET: A216 GR. WCB (BC SEAT RING: A105 OR A216 HARDF DISC: A105 OR A216 WCB WITH 13% CF TEM: 410 SS PACKING: GRAPHITE GASKET: CORRUGATED SST WITH G		R A216 HARDFACED B WITH 13% CR OVERLAY 410 SS GRAPHITE
	VALVE SELECTION	-	-	POWELL F	IGURE 143 IGURE 1531 GURE 0074C	
	REVISION I			72234110		
NUMBER	DESCRIP	TION	DATE			
0	INITIAL ISSUE		2/22/2021			

PIPING SF	PECIFICATION:	PROC		DESIGN CONDITIONS:		
UI-CS-SS			ER WATER		AT 150 °F	
	PIPE SIZE (NPS)		MALLER	2 1/2" Ti		
PIPE MATERIAL:	WEIGHT/SCHEDULE		40S	SCH		
ASME B36.10M	MATERIAL	A312 TYPE 30		A312 TYPE 304 - SEA	MLESS OR WELDED	
ĺ	CONSTRUCTION	SOCKETWELD: CLASS 3000		BUTTWELD -	ASME B16.9	
FITTINGS:		2000,				
	WALL THICKNESS		JOINING PIPE		JOINING PIPE	
	MATERIAL		- SEAMLESS, B16.25	ASTM A403, WP304L		
	TYPE	SOCKETWELD CLASS 3000		BUTTWELD - END	PREP PER B16.25	
JOINTS:	OTHER		B16.11 - FLAT FACE WITH	WHERE FLAN	GE REQUIRED	
		SPIRAL WOUND				
	CONSTRUCTION		FLANGES NOT PERMITTED CLASS 150 - WELD NECK - ASME			
FLANGES:	WALL THICKNESS	SAME AS AD	JOINING PIPE		JOINING PIPE	
	MATERIAL	-	-	SS, ASTM A182, F330L, ASME B16.5		
FLANGE BOLTS:	CONSTRUCTION	_	-	HIGH-STRENGTH STAINLESS ST		
				FULL L		
FLANGE NUTS:	CONSTRUCTION		-	HEAVY HEX - A		
WASHER:	CONSTRUCTION	-		SSS		
0.404570	CONSTRUCTION	-	-	SUITABLE FOR RAISED-FAC		
GASKETS:	MATERIAL	-	-		R WITH SBR BINDER - GARLOCK	
		PERIONIOGNAT	DUCTION CODE	BLUE-GARD		
PIPE MATERIAL:	PIPE CODE:		RUCTION CODE:	REVISION:	DATE REVISED:	
STAINLESS STEEL	ASME B36.10M	ASME		0	2/22/2021	
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:		N CODE:		
UI-CS-SS	CARBON STEEL	150 PSIG	ASME B31.1	ASME B16.34	IDII 40"	
	PIPE SIZE (NPS)		MALLER	2 1/2" T		
ĺ	CONNECTION AND RATING	-	-	LUGGED FOR CLA	ASS 150 FLANGES	
ĺ				BODY: A182 GR. F31		
				SEAT: TF	E/VITON	
	CONSTRUCTION	-	-	DISC: A182 GR. F316		
BUTTERFLY VALVE				SHAFT:		
BUTTERPLT VALVE				PACKIN	IG: IFE	
				POWELL FI	GURE 1572	
				POWELL FIGURE 1572 CRANE FLOWSEAL TYPE 1LA (12" AND SMALLER)		
	VALVE SELECTION			TYPE 1LC (14" AND LARGER)		
				JAMESBURY SERIES 815		
	CONNECTION AND RATING	CLASS 800 PSIC	SOCKETWELD	CLASS 150 FLANGED F	ENDS (2-1/2" THRU 12")	
	CONNECTION AND NATING					
		BODY/CAP:		BODY: ASTM A		
	CONCEDUCTION	CARRIER/CARRIER PIN: 316SS DISC: A276 T316 SEAT RING: 316 SST		CAP: ASTM A		
CHECK VALVE	CONSTRUCTION			CARRIER/CARF DISC: ASTM A		
CHECK VALVE		GASKET: SPIRAL WO		GASKE		
		POWELL FIG		POWELL FIGURE 1561		
	VALVE SELECTION	VOGT SERI		CRANE FIGURE 147 (THRU 24")		
		BONNEY FOR		BONNEY FORGE 1-68 RF CLASS 150 FLANGED ENDS		
	CONNECTION AND RATING	-	-	CLASS 150 FL	ANGED ENDS	
				BODY/CAP: CAST STAINLESS	STEEL ASTM A351 GR. CF8M	
				SEAT: CAST STAINLESS ST		
				DISC OR PLUG: CAST STAINLES		
	CONSTRUCTION			STEM: STAIN		
SILENT CHECK VALVE				SPRING: TYPE 316 STAINLESS STEEL GASKET: SPIRAL WOUND SS WITH GRAPHITE 12" THRU 42": GLOBE 10" AND SMALLER: WAFER		
				10 AND SMALLER: WAFER		
ĺ				KECKLEY CO. MODEL CG (GLOBE) OR CW (WAFER)		
•	VALVE OF:				(GLOBE) OR CW (WAFER)	
1	VALVE SELECTION	-	-	MUELLER MODEL 1	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT	
				MUELLER MODEL 1 DEZURIK S	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT STYLE CSC	
	VALVE SELECTION CONNECTION AND RATING	CLASS 800 PSIG		MUELLER MODEL 1 DEZURIK S CLASS 150 FLANGED E	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 6TYLE CSC ENDS (2-1/2" THRU 20")	
			SOCKETWELD	MUELLER MODEL 1 DEZURIK S CLASS 150 FLANGED B BODY/INSERT	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT STYLE CSC ENDS (2-1/2" THRU 20") T: A351 CF8M	
		CLASS 800 PSIC BODY/BONNET: ASTM A351, C	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT	MUELLER MODEL 1 DEZURIK S CLASS 150 FLANGED E BODY/INSER: BALL:	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC ENDS (2-1/2" THRU 20") F: A351 CF8M	
	CONNECTION AND RATING	CLASS 800 PSIC BODY/BONNET: ASTM A351, C PO SEAT RING	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT G: XTREME	MUELLER MODEL 1 DEZURIK S CLASS 150 FLANGED E BODY/INSERT BALL: STEM:	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC ENDS (2-1/2" THRU 20") F: A351 CF8M 316 SS	
BALL VALVE		CLASS 800 PSK BODY/BONNET: ASTM A351, C PO SEAT RINC BALL:	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316	MUELLER MODEL 1 DEZURIK S CLASS 150 FLANGED E BODY/INSER: BALL:	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 51TYLE CSC 5MDS (2-1/2" THRU 20") F: A351 CF8M 316 SS 9TFE	
BALL VALVE	CONNECTION AND RATING	CLASS 800 PSIC BODY/BONNET: ASTM A351, C PC SEAT RING BALL: SEAL:	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PTFE	MUELLER MODEL 1 DEZURIK S CLASS 150 FLANGED I BODY/INSER: BALL: STEM: SEAT: BODY SI	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 51TYLE CSC 5MDS (2-1/2" THRU 20") F: A351 CF8M 316 SS 9TFE	
BALL VALVE	CONNECTION AND RATING	CLASS 800 PSK BODY/BONNET: ASTM A351, C PO SEAT RINC BALL:	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PTFE	MUELLER MODEL 1 DEZURIK S CLASS 150 FLANGED I BODY/INSER: BALL: STEM: SEAT: BODY SI	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC ENDS (2-1/2" THRU 20") 7: A351 CF8M 316 SS PTFE EAL: TFM AL: PTFE	
BALL VALVE	CONNECTION AND RATING	CLASS 800 PSIG BODY/BONNET: ASTM A351, C PC SEAT RING BALL: SEAL: PACKING:	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PTFE	MUELLER MODEL I DEZURIK S CLASS 150 FLANGED I BODY/INSERT BALE: STEM SEAT: BODY SE STEM SE	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT STYLE CSC SUDS (2-1/2" THRU 20") T: A351 CF8M 316 SS 316 SS PTFE 2AL: TFM AL: PTFE R4" AND LARGER	
BALL VALVE	CONNECTION AND RATING	CLASS 800 PSIG BODY/BONNET: ASTM A351, C PO SEAT RIN BALL: SEAL: PACKING: JAMESBURY SERI KECKLEYS	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PTFE GRAPHITE ES 4000 MODEL A SYTE BVM3	MUELLER MODEL I DEZURIK S CLASS 150 FLANGED I BODY/INSERT BALE: STEM SEAT: BODY SI STEM SE GEAR OPERATOF JAMESBURY KECKLEY BW	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC 5TYLE CS	
BALL VALVE	CONNECTION AND RATING CONSTRUCTION VALVE SELECTION	CLASS 800 PSIG BODY/BONNET: ASTM A351, C PO SEAT RING BALL: SEAL: PACKING: JAMESBURY SER! KECKLEY KITZ L	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PTFE GRAPHITE ES 4000 MODEL A SYTE BVM3 13TZM	MUELLER MODEL 1 DEZURIK \$ CLASS 150 FLANGED I BODY/INSERI BALL: STEM. SEAT: BODY SI STEM SE GEAR OPERATOF JAMESBURY KECKLEY BW VELAN	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC 5MDS (2-1/2" THRU 20") 7: A351 CF8M 316 SS 916 SS 91FE 2AL: TFM AL: PTFE 2A" AND LARGER SERIES 7150 F1 (THRU 6") SB-150	
BALL VALVE	CONNECTION AND RATING CONSTRUCTION	CLASS 800 PSIG BODY/BONNET: ASTM A351, C PO SEAT RING BALL: SEAL: PACKING: JAMESBURY SER! KECKLEY KITZ L	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PTFE GRAPHITE ES 4000 MODEL A SYTE BVM3	MUELLER MODEL 1 DEZURIK \$ CLASS 150 FLANGED I BODY/INSERI BALL: STEM. SEAT: BODY SI STEM SE GEAR OPERATOF JAMESBURY KECKLEY BW VELAN	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC 5TYLE CS	
BALL VALVE	CONNECTION AND RATING CONSTRUCTION VALVE SELECTION	CLASS 800 PSIG BODY/BONNET: ASTM A351, C PO SEAT RING BALL: SEAL: PACKING: JAMESBURY SER! KECKLEY KITZ L	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PTFE GRAPHITE ES 4000 MODEL A SYTE BVM3 13TZM	MUELLER MODEL I DEZURIK S CLASS 150 FLANGED I BODY/INSERT BALE: STEM: SEAT: BODY SI STEM SE GEAR OPERATOF JAMESBURY KECKLEY BW VELAN CLASS 150 FLANGED I	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 517LC SCC ENDS (2-1/2" THRU 20") 7: A351 CF8M 316 SS 316 SS PTFE EAL: TFM AL: PTFE R 4" AND LARGER SERIES 7150 F1 (THRU 6") SB-150 ENDS (2 1/2" THRU 12")	
BALL VALVE	CONNECTION AND RATING CONSTRUCTION VALVE SELECTION	CLASS 800 PSIG BODY/BONNET: ASTM A351, C PO SEAT RING BALL: SEAL: PACKING: JAMESBURY SER! KECKLEY KITZ L	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PTFE GRAPHITE ES 4000 MODEL A SYTE BVM3 13TZM	MUELLER MODEL 1 DEZURIK S CLASS 150 FLANGED I BODY/INSER: BALL: STEM: SEAT: BODY S STEM S GEAR OPERATOR JAMESBURY KECKLEY BV VELAN CLASS 150 FLANGED I BODY: ASTM	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC 5TYLE CS	
BALL VALVE	CONNECTION AND RATING CONSTRUCTION VALVE SELECTION CONNECTION AND RATING	CLASS 800 PSIG BODY/BONNET: ASTM A351, C PO SEAT RING BALL: SEAL: PACKING: JAMESBURY SER! KECKLEY KITZ L	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PTFE GRAPHITE ES 4000 MODEL A SYTE BVM3 317ZM -	MUELLER MODEL 1 DEZURIK S CLASS 150 FLANGED I BODY/INSER: BALL: STEM: SEAT: BODY SI STEM SE GEAR OPERATOR JAMESBURY KECKLEY BV VELAN CLASS 150 FLANGED I BODY: ASTM	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC 5TYLE CS	
BALL VALVE	CONNECTION AND RATING CONSTRUCTION VALVE SELECTION	CLASS 800 PSIC BODY/BONNET: ASTM A351, C PO SEAT RIN BALL: SEAL: PACKING: JAMESBURY SERI KECKLEY'S KITZ L	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PTFE GRAPHITE ES 4000 MODEL A SYTE BVM3 317ZM -	MUELLER MODEL 1 DEZURIK S CLASS 150 FLANGED I BODY/INSER: BALL: STEM: SEAT: BODY S STEM S GEAR OPERATOR JAMESBURY KECKLEY BV VELAN CLASS 150 FLANGED I BODY: ASTM	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC ENDS (2-1/2* THRU 20*) 1: A351 CF8M 316 SS 316 SS 9TFE AL: TFM AL: PTFE 42 *AND LARGER SERIES 7150 F1 (THRU 6*) ENDS (2 1/2* THRU 12*) 1 A351 CF8M M A351 CF8M M A351 CF8M	
	CONNECTION AND RATING CONSTRUCTION VALVE SELECTION CONNECTION AND RATING	CLASS 800 PSIC BODY/BONNET: ASTM A351, C PO SEAT RIN BALL: SEAL: PACKING: JAMESBURY SERI KECKLEY'S KITZ L	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PTFE GRAPHITE ES 4000 MODEL A SYTE BVM3 317ZM -	MUELLER MODEL 1 DEZURIK \$ CLASS 150 FLANGED I BODY/INSERT: BALL: STEM: SEAT: BODY SE GEAR OPERATOR JAMESBURY KECKLEY BY VELAN CLASS 150 FLANGED I BODY: ASTM BONNET: AST DISC: ASTM	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC 316 SS 316 SS 316 SS 316 SS 9TFE 44" AND LARGER 5THE 44" AND LARGER 5ERIES 7150 F1 (THRU 6") SB-150 5TYLE CSC 5TYLE CS	
	CONNECTION AND RATING CONSTRUCTION VALVE SELECTION CONNECTION AND RATING	CLASS 800 PSIC BODY/BONNET: ASTM A351, C PO SEAT RIN BALL: SEAL: PACKING: JAMESBURY SERI KECKLEY'S KITZ L	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PTFE GRAPHITE ES 4000 MODEL A SYTE BVM3 317ZM -	MUELLER MODEL 1 DEZURIK S CLASS 150 FLANGED I BODY/INSER: BALL: STEM: SEAT: BODY SI STEM SE GEAR OPERATOR JAMESBURY KECKLEY BY VELAN CLASS 150 FLANGED I BODY: ASTM BONNET: AST DISC: ASTM STEM: ASTM STEM: ASTM PACKIN	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC 5TYLE CS	
	CONNECTION AND RATING CONSTRUCTION VALVE SELECTION CONNECTION AND RATING CONSTRUCTION	CLASS 800 PSIG BODY/BONNET: ASTM A351, C PO SEAT RING BALL: SEAL: PACKING: JAMESBURY SER! KECKLEY: KITZ L	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PTFE GRAPHITE ES 4000 MODEL A SYTE BVM3 13TZM -	MUELLER MODEL 1 DEZURIK S CLASS 150 FLANGED I BODY/INSER: BALL: STEM: SEAT: BODY SI STEM SE GEAR OPERATOR JAMESBURY KECKLEY BV VELAN CLASS 150 FLANGED I BODY: ASTM BONNET: AST DISC: ASTM STEM: ASTM STEM: ASTM PACKIN	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC 5TYLE CS	
	CONNECTION AND RATING CONSTRUCTION VALVE SELECTION CONNECTION AND RATING	CLASS 800 PSIC BODY/BONNET: ASTM A351, C PO SEAT RIN BALL: SEAL: PACKING: JAMESBURY SERI KECKLEY'S KITZ L	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PTFE GRAPHITE ES 4000 MODEL A SYTE BVM3 13TZM -	MUELLER MODEL 1 DEZURIK \$ CLASS 150 FLANGED I BODY/INSER: BALL: STEM: SEAT: BODY S STEM S GEAR OPERATOR JAMESBURY KECKLEY BV VELAN CLASS 150 FLANGED I BODY: ASTM BONNET: AST DISC: ASTM STEM: ASTM STEM: ASTM PACKIN POWELL FI CRANE FIGURE	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC 5TYLE CS	
	CONNECTION AND RATING CONSTRUCTION VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION	CLASS 800 PSIG BODY/BONNET: ASTM A351, C PO SEAT RIN BALL SEAL: PACKING: JAMESBURY SER KECKLEYS KITZ L	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PTFE GRAPHITE ES 4000 MODEL A SYTE BVM3 13TZM -	MUELLER MODEL 1 DEZURIK S CLASS 150 FLANGED I BODY/INSER: BALL: STEM: SEAT: BODY SI STEM SE GEAR OPERATOR JAMESBURY KECKLEY BV VELAN CLASS 150 FLANGED I BODY: ASTM BONNET: AST DISC: ASTM STEM: ASTM STEM: ASTM PACKIN	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC 5TYLE CS	
GLOBE VALVE	CONNECTION AND RATING CONSTRUCTION VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION REVISION I	CLASS 800 PSIG BODY/BONNET: ASTM A351, C PO SEAT RING BALL: SEAL: PACKING: JAMESBURY SER! KECKLEY: KITZ U	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PITE GRAPHITE ES 4000 MODEL A SYTE BVM3 13TZM -	MUELLER MODEL 1 DEZURIK \$ CLASS 150 FLANGED I BODY/INSER: BALL: STEM: SEAT: BODY S STEM S GEAR OPERATOR JAMESBURY KECKLEY BV VELAN CLASS 150 FLANGED I BODY: ASTM BONNET: AST DISC: ASTM STEM: ASTM STEM: ASTM PACKIN POWELL FI CRANE FIGURE	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC 5TYLE CS	
	CONNECTION AND RATING CONSTRUCTION VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION REVISION I	CLASS 800 PSIG BODY/BONNET: ASTM A351, C PO SEAT RING BALL: SEAL: PACKING: JAMESBURY SER! KECKLEY: KITZ U	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PTFE GRAPHITE ES 4000 MODEL A SYTE BVM3 13TZM -	MUELLER MODEL 1 DEZURIK \$ CLASS 150 FLANGED I BODY/INSER: BALL: STEM: SEAT: BODY S STEM S GEAR OPERATOR JAMESBURY KECKLEY BV VELAN CLASS 150 FLANGED I BODY: ASTM BONNET: AST DISC: ASTM STEM: ASTM STEM: ASTM PACKIN POWELL FI CRANE FIGURE	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC 5TYLE CS	
GLOBE VALVE	CONNECTION AND RATING CONSTRUCTION VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION REVISION I	CLASS 800 PSIG BODY/BONNET: ASTM A351, C PO SEAT RING BALL: SEAL: PACKING: JAMESBURY SER! KECKLEY: KITZ U	S SOCKETWELD F8M STAINLESS STEEL, FULL- RT S: XTREME SS 316 PITE GRAPHITE ES 4000 MODEL A SYTE BVM3 13TZM -	MUELLER MODEL 1 DEZURIK \$ CLASS 150 FLANGED I BODY/INSER: BALL: STEM: SEAT: BODY S STEM S GEAR OPERATOR JAMESBURY KECKLEY BV VELAN CLASS 150 FLANGED I BODY: ASTM BONNET: AST DISC: ASTM STEM: ASTM STEM: ASTM PACKIN POWELL FI CRANE FIGURE	(GLOBE) OR CW (WAFER) 01MDT OR 105MDT 5TYLE CSC 5TYLE CS	

CONDENSER WATER DRAINS (TO 150 PSIG)

PIPING SPECIFICATION:		PRO	CESS:	DESIGN CONDITIONS:				
UI-CS-DRAIN		CONDENS	ER WATER	150 PSIG	AT 120 °F			
UI-CS-DRAIN	PIPE SIZE (NPS)		2					
PIPE MATERIAL:	WEIGHT/SCHEDULE							
ASME B36.10M	MATERIAL		ASTM B88 COPPER, TYPE K, HARD DRAWN					
	CONSTRUCTION		SOLDERED O	R PRESS FIT				
FITTINGS:	WALL THICKNESS		SAME AS AD.	IOINING PIPE				
	MATERIAL	ASME	B16.18 CAST COPPER OR ASM	E B16.22 WROUGHT COPPER	ALLOY			
PIPING JOINTS:	TYPE		SOLDERED OR PRESS FIT					
PIPING JOIN 15:	OTHER		SEE BELOW FOR	R JOINT DETAILS				
	CONSTRUCTION							
SOLDER:	WALL THICKNESS	SOLDER: ASTM B32 ALLOY, GRADE SB-5 95/5 TIN-ANTIMONY, LEAD FREE OR: ASTM B32 ALLOY, GRADE SN95 TIN SILVER. LEAD FREE						
	MATERIAL	1	SILVER, LE	EAD FREE				
SOLDER:	CONSTRUCTION	SOLDER: FILLER METAL LEAD	D-FREE - WATER-FLUSHABLE F	LUX ASTM B813 - SILVER BRAZ	ZING FILLER METAL SHALL BE			
SOLDER:	MATERIAL	BCuP SERIES,	COPPER PHOSPHORUS ALLOY	S FOR GENERAL DUTY BRAZ	ING - AWS A5.8			
PRESS FIT:	CONSTRUCTION		NFORM TO ASME B16.18 OR: AS EALING ELEMENTS FACTORY IN					
TREGOTTI.	MATERIAL	ELLIMENTS. ET DIM - SE	RECOMMENDED BY FIT		ETRESSED BY TOOLS			
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:			
COPPER	ASTM B88	ASME	B31.1	0	2/22/2021			
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN	CODE:				
UI-CS-DRAIN	AS NOTED	150 PSIG	ASME B31.1	ASME B16.34				
UI-C3-DRAIN	PIPE SIZE (NPS)	2"						
	CONNECTION AND RATING	CLASS 200 PSIG THREADED						
CHECK VALVE	CONSTRUCTION	BODY/CAP: ASTM B584 BRONZE DISC: BRONZE, SWING TYPE, Y-PATTERN SEAT: BRASS SPRING: SS 316						
	VALVE SELECTION	APOLLO 161T-LF SERIES POWELL MSS SP-80 NIBCO T-413-Y-LF						
	CONNECTION AND RATING		CLASS 600 PS	IG THREADED				
BALL VALVE	CONSTRUCTION	BODY: BRONZE, 2-PIECE, FULL-PORT BALL: SS 316 STEM: STAINLESS STEEL, BLOWOUT PROOF PACKING: RPTFE SEATS AND SEALS: RPTFE						
	VALVE SELECTION		APOLLO 77-140 SERIES NIBCO MODEL T-580-70-66 MILWAUKE 20BS SERIES					
	REVISION H	HISTORY		_	_			
NUMBER	DESCRIP	TION	DATE					
0	INITIAL ISSUE		2/22/2021					

PIPING SE	PECIFICATION:	PROCESS:		DESIGN CONDITIONS:		
UI-LPS			SURE STEAM		AT 340 °F	
	PIPE SIZE (NPS)		SMALLER		HRU 24"	
PIPE MATERIAL:	WEIGHT/SCHEDULE		(S B - SEAMLESS		TD B - SEAMLESS	
ASME B36.10M	MATERIAL CONSTRUCTION		CKETWELD - B16.11		- ASME B16.9	
FITTINGS:	WALL THICKNESS		JOINING PIPE		JOINING PIPE	
	MATERIAL	FORGED CARBON	STEEL - ASTM A105		A234 GRADE B - SEAMLESS	
PIPING JOINTS:	TYPE		TWELD		PREP PER B16.25	
	OTHER		R THREAD REQUIRED	WHERE FLAN	GE REQUIRED	
	CONSTRUCTION		- FLAT FACE WITH SPIRAL SKET DESIGN	NOT PE	RMITTED	
UNIONS:	WALL THICKNESS		JOINING PIPE	-	-	
	MATERIAL	FORGED CARBON STEEL - ASTM A105			-	
	CONSTRUCTION	01115 10 15		NECK - ASME B16.5	LOW IN C. DIDE	
FLANGES:	WALL THICKNESS		JOINING PIPE STEEL - ASTM A105		JOINING PIPE STEEL - ASTM A105	
FLANGE BOLTS:	MATERIAL CONSTRUCTION		STEEL - ASTM A103			
FLANGE NUTS:	CONSTRUCTION			194 GRADE 2H		
WASHER:	CONSTRUCTION			36		
GASKETS:	CONSTRUCTION		AL WOUND - SUITABLE FOR RA			
	MATERIAL		EXITALLIC STYLE CGI - TYPE 30			
THERMOWELLS:	CONSTRUCTION MATERIAL	INSERTION	THERMOWELLS - 3000 PSIG P	ARBON STEEL	DED WELLS	
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:	
CARBON STEEL	ASTM B36.10M	ASME		0	2/22/2021	
VENT PIPING FINISH:	SPECIFICATION MATERIAL:		AT SYSTEM WITH SOLVENT-BA POLYMER TOP COAT - COLOR			
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN	I CODE:		
UI-LPS	CARBON STEEL	150 PSIG	ASME B31.1	ASME B16.34		
01-21-0	PIPE SIZE (NPS)		SMALLER		HRU 24"	
	CONNECTION AND RATING	CLASS 800 PSIG SOC	KETWELD (1" THRU 2")	BODY/BONNET:	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		OVERLAY STEM: 410 SS PACKING: GRAPHITE GASKET: CORRUGATED SS WITH GRAPHITE		
	VALVE SELECTION	VOGT S	GURE GA08 GW12111 GE FIG. H11SW	CRANE F	GURE 1503 IGURE 47 RGE 1-11 RF	
	CONNECTION AND RATING	-	-	CLASS 150 FLANGED ENDS		
BUTTERFLY VALVE	CONSTRUCTION	-		BODY/BONNET: A216 GR. WCB SEAT RING:METAL SEAT DISC: A351 CF8M SHAFT: 17-4 PH PACKING: PTFE GLAND: 304 SS		
	VALVE SELECTION	-		POWELL FIGURE 1572 DEZURIK STYLE BHP FLOWSEAL TYPE 1LA		
	CONNECTION AND RATING		G SOCKETWELD	CLASS 150 FL	ANGED ENDS	
CHECK VALVE	CONSTRUCTION	SWING SEAT RING: STELLI DISC: 1	.105 (BOLTED) : CHECK ITE 6 FACED 410 SS 13% CR IRAL WOUND	SEAT RING:	GR. WCB (BOLTED) HARDFACED 3 WITH 13% CR OVERLAY D SST WITH GRAPHITE	
	VALVE SELECTION		GURE SW08 SW701 GE FIG. H61SW		GURE 1561 GURE 147 RGE 1-61 RF	
	CONNECTION AND RATING		G SOCKETWELD		ED ENDS (UP TO 6")	
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 ITTE 6; BALL AND SEAT: SS RBIDE COATED; ISHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 410 CARBIDE COATED LE LEVER	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 : SS 304 6S410 COND. 2; SEAT SS 410 CARBIDE COATED IR OPERATOR OVER 4")	
	VALVE SELECTION	VELAN TYPE R, META	L SEATED, CLASS 900	VELAN	TYPE R	
	CONNECTION AND RATING	CLASS 800 PSI	G SOCKETWELD	CLASS 150 FL	ANGED ENDS	
GLOBE VALVE	CONSTRUCTION	DISC: 420SST SEAT RING: A105 C TRIM: 13% Cr DISC: A105 OR A216 WC STEM: A183 F6A STEM: PACKING: GRAPHITE PACKING: GRAPHITE PACKING: PACKI		SEAT RING: A105 OI DISC: A105 OR A216 WCE STEM: PACKING: GASKET: CORRUGATE	G GR. WCB (BOLTED) R A216 HARDFACED B WITH 13% CR OVERLAY 410 SS GRAPHITE D SST WITH GRAPHITE	
	VALVE SELECTION	VOGT S BONNEY FOR	IGURE GL08 GW12141 GE FIG. H31SW	CRANE FI	GURE 1531 GURE 143 RGE 1-31 RF	
NUMBER	REVISION I		D. ***			
NUMBER	DESCRIP	HUN	DATE			

INITIAL ISSUE

PIPING SPECIFICATION:		I DDO	CESS:	DESIGN CONDITIONS:			
	I		SURE STEAM	175 PSIG AT 500 °F			
UI-HPS	PIPE SIZE (NPS)		SMALLER		HRU 24"		
PIPE MATERIAL:	WEIGHT/SCHEDULE		(S		TD		
ASME B36.10M	MATERIAL		B - SEAMLESS		B - SEAMLESS		
ACINIC BOOLTON	CONSTRUCTION		CKETWELD - B16.11		- ASME B16.9		
FITTINGS:	WALL THICKNESS		JOINING PIPE		JOINING PIPE		
	MATERIAL		STEEL - ASTM A105		A234 GRADE B - SEAMLESS		
	TYPE		TWELD		PREP PER B16.25		
PIPING JOINTS:	OTHER	WHERE FLANGE OF	R THREAD REQUIRED	WHERE FLAN	GE REQUIRED		
		CLASS 3000 - SW - B16.11	- FLAT FACE WITH SPIRAL	NOT DE	DIAITTED		
UNIONO	CONSTRUCTION	WOUND GAS	SKET DESIGN	NOT PEI	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 AD	JOINING PIPE	SAME AS AD	JOINING PIPE		
	MATERIAL	FORGED CARBON	STEEL - ASTM A105	FORGED CARBON	STEEL - ASTM A105		
FLANGE BOLTS:	CONSTRUCTION	ALLOY	STEEL, AISI 4140/4142 QUENC	HED AND TEMPERED, A193 GR	ADE B7		
FLANGE NUTS:	CONSTRUCTION			A194 GRADE 2H			
WASHER:	CONSTRUCTION			436			
GASKETS:	CONSTRUCTION			ISED-FACE OR FLAT-FACE FLA			
G/10112101	MATERIAL			04 STAINLESS - FLEXICARB FIL			
THERMOWELLS:	CONSTRUCTION	INSERTION		PRESSURE CLASS - SEAL WELL	DED WELLS		
	MATERIAL			ARBON STEEL			
PIPE MATERIAL:	PIPE CODE:		RUCTION CODE:	REVISION:	DATE REVISED:		
CARBON STEEL	ASTM B36.10M		B31.1	0	2/22/2021		
VENT PIPING FINISH:	SPECIFICATION MATERIAL:		INORGANIC SILICATE	ASED INORGANIC ZINC PRIMER EPOLYMER TOP COAT (ISTING RELIEF DEVICE PIPING			
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN	N CODE:			
UI-HPS	CARBON STEEL	300 PSIG	ASME B31.1	ASME B16.34			
UI-875	PIPE SIZE (NPS)	2" AND \$	SMALLER	2 1/2" T	HRU 24"		
	CONNECTION AND RATING	CLASS 800 PSI	G SOCKETWELD	BUTTWE	LD ENDS		
GATE VALVE	CONSTRUCTION	OUTSIDE SCREW & YOKE, BO HARD FACED SE	x105, TRIM 13% CR DLTED GLAND, SOLID WEDGE, EATS, 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: SPIRAL WOUND 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		-	BUTTWE	LD ENDS		
BUTTERFLY VALVE	CONSTRUCTION			BODY: A216 GR. WCB CAP: A 516 GR 60 OR A 696 GR B DISC: A351 CF8M SEAL/SEAT GASKET: GRAPHITE PACKING: GRAPHITE	CLOSE STOP: A 516 GR 60 DRIVE SHAFT: A 276 GR 431 BEARING: A 439 TPD2 BEARING SEAL: GRAPHITE GASKET: GRAPHITE		
	VALVE SELECTION	-		ADAMS SERIES MAK			
	CONNECTION AND RATING	CLASS 800 PSI	G SOCKETWELD	BUTTWE	LD ENDS		
CHECK VALVE	CONSTRUCTION	SWING SEAT RIN DISC: GASKET: SP	.105 (BOLTED) CHECK IG: 316 HF 13% CR IRAL WOUND		HARDFACED 3 WITH 13% CR OVERLAY D SST WITH GRAPHITE		
	VALVE SELECTION	VOGT	GURE SW08 SW701 GE FIG. H61SW	POWELL FI CRANE FIG BONNEY FOI	URE 159-1/2		
	CONNECTION AND RATING	CLASS 900 PSI	G SOCKETWELD	-	-		
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	CLASS 800 PSI	G SOCKETWELD	BUTTWE	LD 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		DISC: 420SST TRIM: 13% Cr STEM: A183 F6A PACKING: GRAPHITE GASKET: SPIRAL WOUND SST WITH GRAPHITE		SEAT RING: A105 OI DISC: A105 OR A216 WCE STEM: PACKING: GASKET: CORRUGATE	410 SS GRAPHITE D SST WITH GRAPHITE
	VALVE SELECTION	VOGT S BONNEY FOR	IGURE GL08 SW12141 GE FIG. H31SW	POWELL FI CRANE FIG BONNEY FOI	URE 151-1/2		
MIMBER	REVISION I		B /	Į.			
NUMBER	DESCRIP	TIUN	DATE]			

INITIAL ISSUE

PIPING SI	PECIFICATION:		CESS:	DESIGN CONDITIONS:			
UI-LP-CON	PIPE SIZE (NPS)		E CONDENSATE SMALLER	50 PSIG AT 340 °F 2 1/2" THRU 24"			
PIPE MATERIAL:	WEIGHT/SCHEDULE		(S	XS			
ASME B36.10M	MATERIAL		B - SEAMLESS		B - SEAMLESS		
	CONSTRUCTION		KETWELD - B16.11		- ASME B16.9		
FITTINGS:	WALL THICKNESS		JOINING PIPE		JOINING PIPE		
	MATERIAL		STEEL - ASTM A105		A234 GRADE B - SEAMLESS		
PIPING JOINTS:	TYPE		TWELD		PREP PER B16.25		
	OTHER		- FLAT FACE WITH SPIRAL		GE REQUIRED		
	CONSTRUCTION		FLAT FACE WITH SPIRAL	NOT PE	RMITTED		
UNIONS:	WALL THICKNESS		JOINING PIPE	-	-		
	MATERIAL	FORGED CARBON	STEEL - ASTM A105				
	CONSTRUCTION			NECK - ASME B16.5			
FLANGES:	WALL THICKNESS		JOINING PIPE		JOINING PIPE		
FLANGE BOLTS:	MATERIAL		STEEL - ASTM A105	FORGED CARBON HED AND TEMPERED. A193 GR	STEEL - ASTM A105		
FLANGE NUTS:	CONSTRUCTION	ALLOT		A194 GRADE 2H	ADE B1		
WASHER:	CONSTRUCTION		F436				
GASKETS:	CONSTRUCTION	SPIRA	AL WOUND - SUITABLE FOR RA	AISED-FACE OR FLAT-FACE FLA	NGES		
GASKETS:	MATERIAL			04 STAINLESS - FLEXICARB FIL			
THERMOWELLS:	CONSTRUCTION	INSERTION		PRESSURE CLASS - SEAL WELI	DED WELLS		
DIDE MATERIAL	MATERIAL	DECICNICONET		ARBON STEEL	DATE DEVICED.		
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:	212212U21		
	CARBON STEEL	150 PSIG	ASME B31.1	ASME B16.34			
UI-LP-CON	PIPE SIZE (NPS)		SMALLER		HRU 24"		
	CONNECTION AND RATING	CLASS 800 PSI	G SOCKETWELD		ANGED ENDS		
			.105, TRIM 13% CR	SEAT RING:	A216 GR. WCB HARDFACED A15 OR WCB WITH 13% CR		
GATE VALVE	CONSTRUCTION		DETED GLAND, SOLID WEDGE, EATS, CLASS 800 GRAPHITE	OVERLAY STEM: 410 SS PACKING: GRAPHITE			
			GURE GA08	POWELL F	ED SS WITH GRAPHITE GURE 1503		
	VALVE SELECTION		W12111 GE FIG. H11SW	CRANE FIGURE 47 BONNEY FORGE 1-11 RF			
	CONNECTION AND RATING	- BONNET FOR	-	CLASS 150 FLANGED ENDS			
					: A216 GR. WCB		
	1				METAL SEAT		
	CONSTRUCTION			DISC: A3	51 CF8M		
BUTTERFLY VALVE	333				17-4 PH G: PTFE		
	1				G: PTFE : 304 SS		
	1			POWELL FIGURE 1572			
	VALVE SELECTION			DEZURIK STYLE BHP			
			0.000//ETA:-:-	FLOWSEAL TYPE 1LA			
	CONNECTION AND RATING	CLASS 800 PSI	G SOCKETWELD	CLASS 150 FLANGED ENDS			
	1	BODY/CAP: A	105 (BOLTED)	BODY/CAR ASSE	OD WOD (DOLTED)		
		SWING CHECK		BODY/CAP: A216 GR. WCB (BOLTED) SEAT RING: HARDFACED			
CHECK VALVE	CONSTRUCTION		ITE 6 FACED 410 SS	DISC: A105 OR A216 WC	3 WITH 13% CR OVERLAY		
OHLON VALVE	1	DISC: 13% CR GASKET: SPIRAL WOUND		GASKET: CORRUGATE	D SST WITH GRAPHITE		
	VALVE SELECTION		GURE SW08 SW701	POWELL FIGURE 1561 CRANE FIGURE 147			
	VALVE SELECTION		SW701 GE FIG. H61SW		RGE 1-61 RF		
	CONNECTION AND RATING		G SOCKETWELD		ED ENDS (UP TO 6")		
			M SS 410 COND. 2	BODY: A105, STE	M SS 410 COND. 2		
			ITE 6; BALL AND SEAT: SS		ITE 6; BALL AND SEAT: SS		
			RBIDE COATED; ISHING: BRONZE; PACKING		RBIDE COATED; SHING: BRONZE; PACKING		
BALL VALVE	CONSTRUCTION	FLANGE	E SS 304	FLANGE	SS 304		
DALL VALVE			SS410 COND. 2; SEAT SS 410		SS410 COND. 2; SEAT SS 410		
	1		CARBIDE COATED LE LEVER		CARBIDE COATED AR OPERATOR OVER 4")		
	 	LOOKABI		LOOK DEL LEVER (GEA			
	VALVE SELECTION	VELAN TYPE R, META	L SEATED, CLASS 900	VELAN	TYPE R		
	CONNECTION AND RATING		G SOCKETWELD		ANGED ENDS		
			TED) (BODY HARDFACED) 420SST		GR. WCB (BOLTED) R A216 HARDFACED		
	CONSTRUCTION		13% Cr		3 WITH 13% CR OVERLAY		
GLOBE VALVE	CONSTRUCTION	STEM: A	A183 F6A	STEM:	410 SS		
	1		GRAPHITE		GRAPHITE		
	1		ND SST WITH GRAPHITE GURE GL08		D SST WITH GRAPHITE GURE 1531		
	VALVE SELECTION	POWELL FIGURE GL08 POWELL FIGURE 15 VOGT SW12141 CRANE FIGURE 14		GURE 143			
]		GE FIG. H31SW	BONNEY FO	RGE 1-31 RF		
NUMBER	REVISION I		DATE	 			
NUMBER	DESCRIP		DATE	1			
1	CHANGED SMALL BORE VALVES TO CLA	SS 800 FROM CLASS 3000	6/30/2017	1			
2	ADDED WALL THICKNESS TO TABLE, REM	MOVED OTHER REFERENCES TO	9/22/2017	1			
	WALL THICKNESS		-,,	4			

2/22/2021

CHANGED UNIONS TO A FLAT-FACED GASKETED DESIGN

UPDATED LARGE BORE PIPE SCHEDULE; VALVE SELECTIONS

3

DIDING S	PECIFICATION:	I DDO	CESS:	DESIGN C	ONDITIONS:
	I Edition III		E CONDENSATE		AT 500 °F
UI-HP-CON	PIPE SIZE (NPS)		SMALLER	2 1/2" THRU 24"	
PIPE MATERIAL:	WEIGHT/SCHEDULE	Х	(S		KS
ASME B36.10M	MATERIAL		B - SEAMLESS		B - SEAMLESS
	CONSTRUCTION		CKETWELD - B16.11		- ASME B16.9
FITTINGS:	WALL THICKNESS		JOINING PIPE		JOINING PIPE
	MATERIAL		STEEL - ASTM 105	BUTTWELD FITTING - ASTN) PREP PER B16.25
PIPING JOINTS:	TYPE OTHER		THREAD REQUIRED		IGE REQUIRED
	OTHER		- FLAT FACE WITH SPIRAL	WHERE FLAN	IGE REQUIRED
	CONSTRUCTION		SKET DESIGN	NOT PE	RMITTED
UNIONS:	WALL THICKNESS		JOINING PIPE		
	MATERIAL		STEEL - ASTM A105		
	CONSTRUCTION		CLASS 300 - WELD	NECK - ASME B16.5	
FLANGES:	WALL THICKNESS	SAME AS AD	JOINING PIPE		JOINING PIPE
	MATERIAL		STEEL - ASTM A105		STEEL - ASTM A105
FLANGE BOLTS:	CONSTRUCTION	ALLOY STEEL, AIS	I 4140/4142 QUENCHED AND T		TUD - FULL LENGTH
FLANGE NUTS:	CONSTRUCTION			A194 GRADE 2H	
WASHER:	CONSTRUCTION	ODID		136	ANOTO
GASKETS:	CONSTRUCTION		AL WOUND - SUITABLE FOR RA		
	MATERIAL		EXITALLIC STYLE CGI - TYPE 30 I THERMOWELLS - 3000 PSIG F		
THERMOWELLS:	CONSTRUCTION MATERIAL	INSERTION		ARBON STEEL	DED WELLS
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:
CARBON STEEL	ASTM B36.10M		B31.1	4	2/22/2021
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:		N CODE:	
	CARBON STEEL	300 PSIG	ASME B31.1	ASME B16.34	1
UI-HP-CON	PIPE SIZE (NPS)		SMALLER	2 1/2" 1	HRU 24"
	CONNECTION AND RATING	CLASS 800 PSI	G SOCKETWELD	CLASS 300 F	LANGED ENDS
GATE VALVE	CONSTRUCTION	OUTSIDE SCREW & YOKE, BO HARD FACED SE	.105, TRIM 13% CR DLTED GLAND, SOLID WEDGE, EATS, CLASS 800 GRAPHITE	SEAT RING: DISC/WEDGE: A217 GR. C OVE STEM: PACKING:	J5 OR A216 GR. WCB HARDFACED A15 OR WCB WITH 13% CR RLAY 410 SS GRAPHITE IND SS WITH GRAPHITE
	VALVE SELECTION	VOGT S	GURE GA08 6W12111	POWELL FIGURE 3003 CRANE FIGURE 33-1/2	
	CONNECTION AND RATING		GE FIG. H11SW	BONNEY FORGE 3-11 RF CLASS 300 FLANGED ENDS (LUG	
BUTTERFLY VALVE	CONSTRUCTION	-	-	SEAT RING: A182 F11; S DISC/WEDGE: A217 GR. WC STEM: 410 PACKING: GR GASKET: SPIRAL WOUND	
	VALVE SELECTION				072 (3" AND LARGER) LL SEAT CLASS 300
	CONNECTION AND RATING		G SOCKETWELD	CLASS 300 F	LANGED 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	POWELL FIGURE SW08 VOGT SW701 BONNEY FORGE FIGURE H61SW		POWELL FIGURE 3061 CRANE FIGURE 159-1/2 BONNEY FORGE 3-61 RF	
	CONNECTION AND RATING		G SOCKETWELD		LANGED 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: STELL 410/CROME CA STEM: SS 410; THRUST BL FLANG STEM BUSHING: NITRIDED : COND.2 CHROME	M SS 410 COND. 2 ITE 6; BALL AND SEAT: SS IRBIDE COATED; ISHING: BRONZE; PACKING E SS 304 SS410 COND. 2; SEAT SS 4: CARBIDE COATED AR OPERATOR OVER 4")
	VALVE SELECTION	•	L SEATED, CLASS 900		TYPE R
	CONNECTION AND RATING	CLASS 800 PSI	G SOCKETWELD	CLASS 300 F	LANGED ENDS
GLOBE VALVE	CONSTRUCTION	DISC: 4 TRIM: STEM: A PACKING:	.TED) (BODY HARDFACED) 420SST 13% Cr 138 F6A GRAPHITE ND SST WITH GRAPHITE	BODY/BONNET: A216 GR. WCB (BOLTED) SEAT RING: A105 OR A216 HARDFACED DISC: A105 OR A216 WCB WITH 13% CR OVERLA: STEM: 410 SS PACKING: GRAPHITE GASKET: CORRUGATED SST WITH GRAPHITE	
	VALVE SELECTION	VOGT S	GURE GL08 6W12141	CRANE FIG	GURE 3031 GURE 151-1/2
	DEVICION		GE FIG. H31SW	BONNEY FO	ORGE 3-31 RF
MIMPER	REVISION I		0.175		
NUMBER	DESCRIP		DATE	1	
1	CHANGED SMALL BORE VALVES TO CLA	SS 800 FROM CLASS 3000	6/30/2017		
2	ADDED WALL THICKNESS TO TABLE, REN	MOVED OTHER REFERENCES TO	9/22/2017		
-	WALL THICKNESS				
_	CHANGED LINIONS TO A FLAT FACED G	ACKETED DECICAL	11/22/2017		

11/22/2017

1/18/2021

3

4

CHANGED UNIONS TO A FLAT-FACED GASKETED DESIGN

UPDATED LARGE BORE WALL THICKNESS; VALVE SELECTIONS

PIPING SPI	ECIFICATION:	PROCI		DESIGN CONDITIONS:		
UI-AIR	DIDE OUTE (AIDO)	COMPRESSED AIR/			AT 150 °F	
PIPE MATERIAL:	PIPE SIZE (NPS) WEIGHT/SCHEDULE	4" AND SMALL	EN (NOTE I)		24" (NOTE 1) TD	
ASME B36.10M/B88	MATERIAL	ASTM B88 COPPER, TY	/PE L, HARD DRAWN	ASTM A106 GRADE B - SEA		
	CONSTRUCTION	SOLDERED OF		BUTT		
FITTINGS:	WALL THICKNESS	SAME AS ADJO ASME B16.18 CAST COPPER O		SAME AS AD	JOINING PIPE	
	MATERIAL	ASME B16.18 CAST COPPER C		BUTTWELD FITTING - ASTM	A234 GRADE B - SEAMLES	
PIPING JOINTS:	TYPE	SOLDERED OF		BUTTWELD - END	PREP PER B16.25	
	OTHER CONSTRUCTION	SEE BELOW FOR		CLASS 150 - WELD	NECK - ASME B16.5	
SOLDER/FLANGES:	WALL THICKNESS	SOLDER: ASTM B32 ALLO' ANTIMONY, LEAD FREE OR: AS			JOINING PIPE	
	MATERIAL	TIN-SILVER, I			EL - ASTM A105	
SOLDER/FLANGE BOLTS:	CONSTRUCTION	SOLDER: FILLER METAL LEAD- FLUX ASTM B813 - SILVER BRA	AZING FILLER METAL SHALL	STUD - FULL-LE	NGTH ASME B1.1	
	MATERIAL	BE BCuP SERIES, COPPER P GENERAL DUTY BR		HIGH-STRENGTH STEEL - A	STM A193 - GRADE B7, FUL H STUD	
	CONSTRUCTION				1 - CLASS 2B THREADS	
PRESS FIT/FLANGE NUTS:	MATERIAL		PRESS FIT: MATERIALS CONFORM TO ASME B16.18 OR: ASME B16.22 AND CRITERIA UNDER IAPMO PS 117 -		94 GRADE 2H HEAVY - F436 HERS	
PRESS FIT/GASKETS:	CONSTRUCTION	SEALING ELEMENTS: EPDM - SEALING ELEMENTS FACTORY INSTALLED - FITTINGS SHALL BE PRESSED BY		SPIRAL WOUND - SUITABLE FACE F	FOR RAISED-FACE OR FLA LANGES	
	MATERIAL			TYPE 304 SS - FULL FACE - FL CGI OR	EXITALLIC FLEXICARB STY EQUAL	
	CONSTRUCTION	THREA				
UNIONS:	MATERIAL	SAME AS ADJ		NOT DE	RMITTED	
UNIONS:	OTHER	INSTALL UNIONS: IN LONG R BYPASS OF VALVES/EQUII CONNEC	PMENT - AT EQUIPMENT	NOT PE	RWITTED	
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONSTR		REVISION:	DATE REVISED:	
COPPER/CARBON STEEL	ASME B36.10M/B88	ASME E	331.1	3	2/22/2021	
FINISH:	SPECIFICATION MATERIAL:	DO NOT PAINT COR	PPER AIR PIPING	REFER TO PROJE PAINT COMPRESSE	CT SPECIFICATION D AIR PIPING WHITE	
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN	CODE:		
UI-AIR	AS NOTED	150 PSIG	ASME B31.1	ASME B16.34	0.00	
	PIPE SIZE (NPS) CONNECTION AND RATING	4" AND SMALL	ER (NOTE 1)		24" (NOTE 1) ANGED ENDS	
GATE VALVE	CONSTRUCTION			OVE STEM: PACKING:	A15 OR WCB WITH 13% CR RLAY 410 SS GRAPHITE ED SS WITH GRAPHITE	
	VALVE SELECTION			POWELL FIGURE 1503 CRANE FIGURE 47 BONNEY FORGE 1-11 R		IGURE 47
	CONNECTION AND RATING				GED - LUG STYLE	
BUTTERFLY VALVE	CONSTRUCTION				: A216 GR. WCB E/RTFE/UHMWPE 151 CF8M 17-4 PH G: PTFE : 304 SS	
	VALVE SELECTION			POWELL FIGURE 1572 JAMESBURY SERIES 815 FLOWSEAL TYPE 1LA		
	CONNECTION AND RATING	CLASS 200 PSIG THREA	ADED OR SOLDERED		ANGED ENDS	
CHECK VALVE	CONSTRUCTION	BODY/BONNE DISC: BF SEAT DISC HINGE PIN AND PLUG: BR(DISC HANGER: S	RONZE : BUNA-N ONZE ASTM B140 ALLOY	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	NIBCO 433 APOLLO 161S SE			GURE 1561 GURE 147 RGE 1-61 RF	
	CONNECTION AND RATING	CLASS 600 PSIG THREA	ADED OR SOLDERED		ANGED ENDS	
BALL VALVE	CONSTRUCTION	BALL: CHROME PLATEI STEM: BRONZI SEATS/SEAI PACKING: LOCKABLE, QUARTER 1	BODY: CAST BRONZE OR BRASS, FULL PORT BALL: CHROME PLATED BRONZE OR BRASS STEM: BRONZE OR BRASS SEATS/SEALS: RPTFE PACKING: RPTFE LOCKABLE, QUARTER TURN LEVER HANDLE		5 OR WCB (BOLTED) IFE/PTFE/RPTFE TEM: SS 316 AND GRAPHITE 316 GRAPHITE (3" AND SMALLER) ATOR (4" AND LARGER)	
	VALVE SELECTION	APOLLO 70-2 MILWAUKEE			UB-150 SERIES 7000	

REVISION HISTORY

NUMBER

DESCRIPTION

DATE

ADDED WALL THICKNESS TO TABLE, REMOVED OTHER REFERENCES TO 9/22/2017

ADDED 'FINISH' SPECIFICATION

10/10/2019

UPDATED VALVE SELECTIONS; INCREASED UPPER LIMIT FOR COPPER PIPE SIZE TO 4" AND ADDED OVERLAP SIZE RANGE

2/22/2021

PIPING SI	PECIFICATION:	PROCESS:		DESIGN CONDITIONS:			
UI-SEW		SANITARY SEWER, SEWER VENT, STO	RM		15 PSIG AT 140 °F		
UI-3EVV	PIPE SIZE (NPS)	4" AND SMALLER		ALL S	SIZES		
PIPE MATERIAL:	WEIGHT/SCHEDULE		SERVICE	WEIGHT	SERVIC	E WEIGHT	
COPPER/CAST IRON	MATERIAL	ASTM B306, DWV	CAST IRON	I, 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 IRC	N CISPI 301	
	ABOVE GRADE TYPE	SOLDERED OR PRESS FIT	ASTM C564, RUBBER GASKE AND C	TS JOINT DEVICES OR LEAD DAKUM	CIODI MA NEODDENE OACI	VETO AND OTAIN! FOO OTES!	
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 HSN 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 AR			MPUS. FOLLOW THE UNIVERS	ITY OF IOWA DESIGN	
		N PIPE MATERIAL MAY BE USED FOR PIPE SIZES BETWEEN 4" AND ATE SELECTION OF PIPE MATERIAL WITH UTILITY OPERATOR.	SMALLER. FINAL PIPE MATERIA	AL SHALL BE SELECTED BASE	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			
UI-SEVV	PIPE SIZE (NPS)			ALL S	SIZES		
	CONNECTION AND RATING			PER ADJOINING PIP	NG SPECIFICATIONS		
GATE VALVE	CONSTRUCTION			BODY: Co COVER: C HANDWHEEL: CAST GATE/FLAPF EXTENSIONS	AST IRON IRON (REMOVABLE) ER: BRONZE S: CAST IRON		
	VALVE SELECTION			POWELL FIGURE MILWAUKEES CRAN	SERIES F-2882		
	CONNECTION AND RATING			PER ADJOINING PIPI	NG SPECIFICATIONS		
PLUG VALVE	CONSTRUCTION		BODY/BONNET: ASTM A 126 CAST IRON BODY BEARING. SS 191 HANDWHEEL: CAST IRON (REMOVABLE) PLUG: SS 316 EXTENSIONS: CAST IRON				
	STANDARD			ANSI/AW	WA C517	-	
	VALVE SELECTION			DEZURIK P OR EQUAL I			

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			

UI-PCW (CS)	PIPING SP	ECIFICATION:	PRO	CESS:	DESIGN CO	ONDITIONS:
PPER MATERIAL ASSISTMENT CONSTRUCTION SECURET CONSTRUCTION SECURE CONSTRUCTION SECURET CONSTRUCTION SECURE CONSTRUCTION SECURET CONSTRUCTION SEC			PROCESS WATER			
MATERIAL OOSTRUCTION FITTINGS: WALL TRUCKIESS WALL	` ,		4" AND SMAL	LER (NOTE 1)		
PRITTINGS:			ASTM B88 CODDED	TVDE I HADD DDAWN		
MALERIAL AMERICA CONTRUCTION MATERIAL PRESS FIT/FALMOR BUTS CONSTRUCTION MATERIAL PRESS FIT/FALMOR BUTS AMERICA CONSTRUCTION FALMOR BUTS AMERICA CONSTRUCTION AMERICA CONSTRUCTION CONSTRUCTION AMERICA CONSTRUCTION CONSTRUCTION CONSTRUCTION AMERICA CONSTRUCTION CONS	ASIVIE D30. IUIVI/D00					
MATERIAL ASSIGNED S ASST COMPRET OR A DATE OF THE CAST MEDICAL PROPERTY	EITTINGS:		SAME AS AD	JOINING PIPE		
SAME AS ADJORNING PPE	FITTINGS.	MATERIAL			BUTTWELD FITTING - ASTM	A234 GRADE B - SEAMLESS
## OTHER SCALERFLANGES CONSTRUCTION SOCIDER ASTRESS SEA ALLOY, GRADE 96.95 STITM CLASS 100 - WILL TRICKNESS CONSTRUCTION SOCIDER ASTRESS SEA ALLOY, GRADE 96.95 STITM SOLIDE ASTRESS CONSTRUCTION SOLIDER ASTRESS SEA ALLOY, GRADE 96.95 STITM SOLIDER ASTRESS SEA ALLOY, GRADE 96.95 STITM SOLIDER ASTRESS SEA ALLOY AND ASTRESS CONSTRUCTION SOLIDER FLUER MINER PLUE ASTRESS CONSTRUCTION SOLIDER FLUER MINER FLUER ASTRESS SEA ALLOY AND ASSESS STILD - PULL LENDIT HIS TUDY SOLIDER FLUER MINER FLUER ASTRESS SOLIDER FLUER MINER FLUER MINER FLUER ASTRESS SOLIDER FLUER MINER FLUER FLUER MINER FLUER MINER FLUER FLUER MINER FLUER FLUER MINER FLUER FLUER FLUER FLUER FLUER MINER FLUER FL						
SOLDERFLANGES: WALTERIAL SOLDER STIM BEST ALLOY (READE SIS-0) 695 TIM- WALTERIAL SOLDER FLAME BED AND SISTED AND SAME BEST AND SOLDER FLAME SISTED AND SAME BEST AND SOLDER FLAME SISTED AND SOLDER FL	JOINTS:				SAME AS AD	JOINING PIPE
### APPER OR AST MATERIAL MATERIAL COMSTRUCTION SOLDER FILER METAL LEAD PREC - WATER FLUSHAGE STUD - FILL LENDTH AND BEST FORECT OWNER FORECT OWNER STUD - FILL LENDTH AND BEST FORECT OWNER FORECT O					CLASS 150 - WELD	NECK - ASME B16.5
CONSTRUCTION	SOLDER/FLANGES:		ANTIMONY, LEAD FREE OR: A	ASTM B32 ALLOY, GRADE SN95		
SOLDER/FLANGE BOLTS: MATERIAL PRESS FIT/ALANGE BULTS: MATERIAL PRESS FIT/ALANGE NUTS: MATERIAL CONSTRUCTION MATERIAL CONSTRUCTION MATERIAL DOUBLE PRESS FIT/ALANGE NUTS: MATERIAL MATERIAL CONSTRUCTION MATERIAL DOUBLE PRESS FIT/ALANGE NUTS: MATERIAL CONSTRUCTION INSTRUCTION MATERIAL SABLE 615 CADDINING PRESS FIT/ALANGE SERVING PRIOR PS 117- CONSTRUCTION MATERIAL SABLE 615 CADDINING PRESS FIT/ALANGE SERVING PRIOR PS 117- CONSTRUCTION MATERIAL SABLE 615 CADDINING PRESS FIT/ALANGE SERVING PRIOR PS 117- OTHER SPEASOR FULL PROBLEM PROPE PS 117- MATERIAL SABLE 615 CADDINING PRESS FIT/ALANGE PS 117- MATERIAL PRESS FIT/ALANGE PS 117- MATERIAL SABLE 615 CADDINING PRESS FIT/ALANGE PS 117- MATERIAL DATE SERVING PRESS FIT/ALANGE PS 117- MATERIAL SABLE 615 CADDINING PRESS FIT/ALANGE PS 117- MATERIAL DATE SERVING PRESS FIT/ALANGE PS 117- MATERIAL DATE SERVING PRESS FI		MATERIAL	TIN-SILVER	, LEAD FREE	FORGED CARBON	STEEL - ASTM A105
PRESS FIT/FLANGE NUTS: MATERIAL CONSTRUCTION PRESS FIT/MATERIALS CONFORM TO ASME BIG 15 OR. ASME BIG 2.4 AND CHITSTRIAL UNDER LAND BIG 15 OR. ASME BIG 2.4 AND CHITSTRIAL UNDER LAND BIG 15 OR. ASME BIG 2.4 AND CHITSTRIAL UNDER LAND BIG 15 OR. ASME BIG 2.4 AND CHITSTRIAL UNDER LAND BIG 15 OR. ASME BIG 2.4 AND CHITSTRIAL UNDER LAND BIG 15 OR. ASME BIG 2.4 AND CHITSTRIAL UNDER LAND BIG 15 OR. AMATERIAL WASHER: CONSTRUCTION INFA MATERIAL SAME AS ADJOINING PIPE OTHER OTHER PRESS FIT/MATERIALS ONE STILL INSTANCE IN LONG RUNS AT 80 INTERVALS IN OTHER BISTALL UNIONS: OTHER PRESS FIT/MATERIAL PRESS OF SIX FILL AGENT AND GRANDE 24 HEAVY - F430 WASHERIAL PRESS OF SIX FILL AGENT AND GRANDE 24 HEAVY - F430 CONSTRUCTION THEADOD OTHER BISTALL UNIONS: IN LONG RUNS AT 80 INTERVALS IN DIVERSOR OF AND GRANDE AT 80 INTERVALS IN OTHER PRESS MATERIAL PRESS OF SIX FILL AGENT AND GRANDE 24 HEAVY - F430 CONFECURIONS STEEL PRESS MATERIALS PRESS M	SOLDER/FLANGE BOLTS:	CONSTRUCTION	FLUX ASTM B813 - SILVER B	RAZING FILLER METAL SHALL		
PRESS FIT MATERIAL PRESS FIT MATERIALS CONTROL TO SAME 1918 RE, ANAMERISA CONSTRUCTION PRESS FIT MATERIALS CONTROL TO SAME 1918 RE, ANAMERISA CONSTRUCTION PRESS FIT MATERIALS CONTROL TO SAME 1918 RE, ANAMERISA CONSTRUCTION MATERIAL WASHER: CONSTRUCTION THEADED CONSTRUCTION THEADED CONSTRUCTION THEADED MATERIAL CONSTRUCTION THEADED CONSTRUCTION THEADED MATERIAL SAME AS ADJOINES IN LOOK RUNS AT 50 INTERNALS IN BYPASS CONTROL TO		MATERIAL				
PRESS FIT/GASKETS: CONSTRUCTION CONSTRUCTI		CONSTRUCTION			HEAVY HEX - ASME B1.	1 - CLASS 2B THREADS
PRESS FIT/GASKETS: MATERIAL MATERIAL CONSTRUCTION THEADED CONSTRUCTION THEADED CONSTRUCTION THEADED MATERIAL DYASS OF VALUES-EQUIPMENT - AT COLUMENT CONNECTION AND RATING PRE MATERIAL ASME DAY CONNECTION AND RATING CONSTRUCTION PRE MATERIAL ASME DAY CONNECTION AND RATING CONSTRUCTION THEADED DESIGN AS TO INTERVALS - IN BYPASS OF VALUES-EQUIPMENT - AT COLUMENT CONNECTION AND RATING CONNECTION AND RATING CONNECTION AND RATING CONSTRUCTION CONSTRUCTION THE SECRETARY OF THE ASME DAY CONNECTION AND RATING CONNECTION AND RATING CONSTRUCTION THE SECRETARY OF THE ASME DAY CONNECTION AND RATING CONNECTION AND RATING CONSTRUCTION CONNECTION AND RATING CONSTRUCTION THE SECRETARY OF THE ASME DAY ASME DAY CONNECTION AND RATING	PRESS FIT/FLANGE NUTS:	MATERIAL				
WASHER:	DDESS EIT/GASKETS	CONSTRUCTION	FACTORY INSTALLED - FITT	INGS SHALL BE PRESSED BY		
WASHERS CONSTRUCTION THREADED MATERIAL NOT PERMITTED NOT PERM	FRESS FII/GAGRETS:	MATERIAL				
UNIONS:	WASHER:					
UNIONS: OTHER INSTALL UNIONS: IN LONG RUINS AT 80 INTERVALS. IN BYPASS OF VALVESQUIDMENT. 1-A EQUIJMENT CONNECTIONS						
### OTHER BYPASS OF VALVESPOUPMENT - AT EQUIPMENT CONNECTIONS	UNIONS:	MATERIAL			NOT PE	RMITTED
ASME 581 (10	oniono.	OTHER BYPASS OF VALVES/EQUIPMENT		JIPMENT - AT EQUIPMENT	NOTTERWITTED	
VALVE SPECIFICATION: SPECIFICATION: PRESSURE CLASS: DESIGN CODE: ASMED 13.4					REVISION:	
UI-PCW (CS)						2/22/2021
DI-PCW (CS)						
CONSTRUCTION CONS	UI-PCW (CS)					24" (NOTE 1)
VALVE SELECTION		002011.0.072				
BUTTERFLY VALVE CONSTRUCTION	GATE VALVE	CONSTRUCTION			SEAT RING: STI DISC/WEDGE: A217 GR. C/ OVEI STEM: PACKING:	ELLITE 6 FACED A15 OR WCB WITH 13% CR RLAY 410 SS GRAPHITE
BUTTERFLY VALVE CONSTRUCTION	GATE VALVE				SEAT RING: STI DISC/WEDGE: A217 GR. C/ OVEI STEM: PACKING: GASKET: CORRUGATE POWELL FI CRANE F	ELLITE 6 FACED A15 OR WCB WITH 13% CR RLAY 410 SS GRAPHITE ED SS WITH GRAPHITE GURE 1503 IGURE 47
VALVE SELECTION CONNECTION AND RATING CLASS 200 PSIG THREADED OR SOLDERED CLASS 150 FLANGED ENDS BODY/BONNET: BRONZE DISC: BRONZE SEAT DISC: BINAN HINGE PIN AND PLUG: BRONZE ASTM B140 ALLOY DISC HANGER: SAME AS BODY VALVE SELECTION NIBCO 433 SERIES CONNECTION AND RATING CONSTRUCTION NIBCO 433 SERIES CONNECTION AND RATING CONSTRUCTION NIBCO 433 SERIES CONNECTION AND RATING CLASS 600 PSIG THREADED OR SOLDERED CONSTRUCTION BODY: CAST BRONZE OR BRASS, FULL PORT BALL: CHROME PLATED BRONZE OR BRASS SEAT RING: MPTE-PITE-RPTFE BALL: CHROME PLATED BRONZE OR BRASS SEAT RING: MPTE-PITE-RPTFE BALL AND STEM: SS 316 SEAT RING: MPTE-PITE-RPTFE BALL AND STEM: SS 316 PACKING: RPTFE PACKING: RPTFE LOCKABLE, QUARTER TURN LEVER HANDLE VALVE SELECTION MILWAUKEE BA-485B JAMESBURY SERIES 815 FLOWSEAL TYPE 1LA BODY/CAP: A216 GR WCB (BOLTED) SEAT RING: HARDFACED DISC: A105 OR A216 WCB (BOLTED) SEAT RING: MPTE-PITE-RPTFE BODY SEAL: SS 316 GRAPHITE BODY SEAL: SS 316 GRAPHITE GEAR OPERATOR 4" AND LARGER VALVE SELECTION MILWAUKEE BA-485B JAMESBURY SERIES 7000 KECKLEY BVF1	GATE VALVE	VALVE SELECTION			SEAT RING: STI DISC/WEDGE: A217 GR. C/ OVEI STEM: PACKING: GASKET: CORRUGATE POWELL FI CRANE F BONNEY FO	ELLITE 6 FACED A15 OR WCB WITH 13% CR RLAY 410 SS GRAPHITE ED SS WITH GRAPHITE GURE 1503 IGURE 47 RGE 1-11 RF
CHECK VALVE CONSTRUCTION CON		VALVE SELECTION CONNECTION AND RATING			SEAT RING: STI DISC/WEDGE: A217 GR. C/ OVEI STEM: PACKING: GASKET: CORRUGATE POWELL FI CRANE F BONNEY FO CLASS 150 FLANGE! BODY/BONNET SEAT RING: PTFI DISC: A3 SHAFT: PACKIN GLAND	ELLITE 6 FACED A15 OR WCB WITH 13% CR RLAY 410 SS GRAPHITE ED SS WITH GRAPHITE GURE 1503 IGURE 47 RGE 1-11 RF D ENDS (LUG STYLE) EA216 GR. WCB ERTFE/UHMWPE IS1 CF8M 17-4 PH G: PTFE 304 SS
CONSTRUCTION		VALVE SELECTION CONNECTION AND RATING CONSTRUCTION			SEAT RING: STI DISC/WEDGE: A217 GR. C/ OVEI STEM: PACKING: GASKET: CORRUGATE POWELL FI CRANE F BONNEY FO CLASS 150 FLANGEI BODY/BONNET SEAT RING: PTFI DISC: A3 SHAFT: PACKIN GLAND POWELL FI JAMESBURY	ELLITE 6 FACED A15 OR WCB WITH 13% CR RIAY 410 SS GRAPHITE ED SS WITH GRAPHITE GURE 1503 IGURE 47 RGE 1-11 RF D ENDS (LUG STYLE) EA216 GR. WCB E/RTFE/UHMWPE 151 CF8M 17-4 PH G: PTFE 304 SS GURE 1572 SERIES 815
VALVE SELECTION		VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION	CLASS 200 PSIG THR	EADED OR SOLDERED	SEAT RING: STI DISC/WEDGE: A217 GR. C/ OVEI STEM: PACKING: GASKET: CORRUGATE POWELL FI CRANE F BONNEY FO CLASS 150 FLANGEI BODY/BONNET SEAT RING: PTFI DISC: A3 SHAFT: PACKIN GLAND POWELL FI JAMESBURY FLOWSEAI	ELLITE 6 FACED A15 OR WCB WITH 13% CR RLAY 410 SS GRAPHITE ED SS WITH GRAPHITE GURE 1503 IGURE 47 RGE 1-11 RF D ENDS (LUG STYLE) EA216 GR. WCB ERTIFE/HMW/PE 151 CF8M 17-4 PH G: PTFE 304 SS GURE 1572 SERIES 815 L TYPE 1LA
CONNECTION AND RATING CLASS 600 PSIG THREADED OR SOLDERED BODY: CAST BRONZE OR BRASS, FULL PORT BALL: CHROME PLATEED BRONZE OR BRASS STEM: BRONZE OR BRASS SEAT SI/SEALS: RPTFE PACKING: RPTFE LOCKABLE, QUARTER TURN LEVER HANDLE VALVE SELECTION CONSTRUCTION CLASS 150 FLANGED ENDS (UP TO 6") BODY/BONNET: A105 OR WCB (BOLTED) SEAT RING: MPTFE/PTFE/RPTFE BALL AND STEM: SS 316 PACKING: PTFE AND GRAPHITE BODY SEAL: SS 316 GRAPHITE GEAR OPERATOR 4" AND LARGER VALVE SELECTION MILWAUKEE BA-485B JAMESBURY SERIES 7000 KECKLEY BVF1	BUTTERFLY VALVE	VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION CONNECTION AND RATING	CLASS 200 PSIG THR BODY/BONI DISC: E SEAT DIS HINGE PIN AND PLUG: BI	EADED OR SOLDERED WET: BRONZE SRONZE C: BUNA-N RONZE ASTM B140 ALLOY	SEAT RING: STI DISC/WEDGE: A217 GR. C/ OVEI STEM: PACKING: PACKING: GASKET: CORRUGATE POWELL FI CRANE F BONNEY FO CLASS 150 FLANGEI BODY/BONNET SEAT RING: PTFI DISC: A2 SHAFT: PACKIN GLAND POWELL FI JAMESBURY FLOWSEAI CLASS 150 FL BODY/CAP: A216 (SEAT RING: DISC: A105 OR A216 WCC GASKET: CORRUGATE	ELLITE 6 FACED A15 OR WCB WITH 13% CR RLAY 410 SS GRAPHITE ED SS WITH GRAPHITE GURE 1503 IGURE 47 RGE 1-11 RF D ENDS (LUG STYLE) A216 GR. WCB E-RTFE/LUHMWPE 51 CF8M 17-4 PH G: PTFE 304 SS GURE 1572 SERIES 815 L TYPE 1LA ANGED ENDS GR. WCB (BOLTED) HARDFACED B WITH 13% CR OVERLAY D SST WITH GRAPHITE
BALL: CHROME PLATED BRONZE OR BRASS SEAT RING: MPTEE/PTFE/RPTFE STEM: BRONZE OR BRASS SEATRING: MPTEE/PTFE/RPTFE BALL AND STEM: SS 316 PACKING: PTFE AND GRAPHITE PACKING: RPTFE LOCKABLE, QUARTER TURN LEVER HANDLE APOLLO 70-200 SERIES VALVE SELECTION MILWAUKEE BA-485B JAMESBURY SERIES 7000 KECKLEY BVF1	BUTTERFLY VALVE	VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION CONNECTION AND RATING CONSTRUCTION	CLASS 200 PSIG THR BODY/BONID DISC: 6 SEAT DIS HINGE PIN AND PLUG: 1 DISC HANGER: NIBCO 4:	EADED OR SOLDERED WET: BRONZE SRONZE C: BUNA-N SAME AS BODY SAME AS BODY	SEAT RING: STI DISC/WEDGE: A217 GR. C/ OVEI STEM: PACKING: GASKET: CORRUGATE POWELL FI CRANE F BONNEY FO CLASS 150 FLANGE! BODY/BONNET SEAT RING: PTFI DISC: A3 SHAFT: PACKIN GLAND POWELL FI JAMESBURY FLOWSEAI CLASS 150 FL BODY/CAP: A216 (SEAT RING: DISC: A105 OR A216 WCE GASKET: CORRUGATE POWELL FI CRANE FI CRANE FI CRANE FI CRANE FI CRANE FI CRANE FI CORRUGATE CORRUGATE CORRUGATE CRANE FI CRANE FI CRANE FI CRANE FI CRANE FI CORRUGATE CORRUGATE CRANE FI CRA	ELLITE 6 FACED A15 OR WCB WITH 13% CR RLAY 410 SS GRAPHITE ED SS WITH GRAPHITE GURE 1503 [GURE 47 RGE 1-11 RF D ENDS (LUG STYLE)
VALVE SELECTION MILWAUKEE BA-485B JAMESBURY SERIES 7000 NIBCO S-FP-600A SERIES KECKLEY BVF1	BUTTERFLY VALVE	VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION	CLASS 200 PSIG THR BODY/BONN DISC: 6 SEAT DIS HINGE PIN AND PLUG: 1 DISC HANGER: NIBCO 4: APOLLO 161S S	EADED OR SOLDERED HET: BRONZE SRONZE C: BUNA-N ROMZE ASTM B140 ALLOY SAME AS BODY 33 SERIES ERIES (THRU 2")	SEAT RING: STI DISC/WEDGE: A217 GR. C/ OVEI STEM: PACKING: GASKET: CORRUGATE POWELL FI CRANE F BONNEY FO CLASS 150 FLANGEI BODY/BONNET SEAT RING: PTFI DISC: A3 SHAFT: PACKIN GLAND POWELL FI JAMESBURY FLOWSEAI CLASS 150 FL BODY/CAP: A216 (C SEAT RING: DISC: A105 OR A216 WC GASKET: CORRUGATE POWELL FI CRANE FI DOWLL FI CRANE FI DOWLL FI DOWLL FI CRANE FI DOWNEY FO	ELLITE 6 FACED A15 OR WCB WITH 13% CR RLAY 410 SS GRAPHITE D SS WITH GRAPHITE GURE 1503 IGURE 47 RGE 1-11 RF D ENDS (LUG STYLE) : A216 GR. WCB E/RTFE/UHMWPE :51 CF8M 17-4 PH G: PTFE : 304 SS GURE 1572 'SERIES 815 L TYPE 1LA ANGED ENDS GR. WCB (BOLTED) HARDFACED J WITH 13% CR OVERLAY D SST WITH GRAPHITE GURE 1561 GURE 1561 GURE 1571 GURE 1561 GURE 1561 GURE 147 RGE 1-61 RF
	BUTTERFLY VALVE CHECK VALVE	VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION CONNECTION AND RATING CONSTRUCTION VALVE SELECTION CONNECTION AND RATING	CLASS 200 PSIG THR BODY/BONN DISC: SEAT DIS: HINGE PIN AND PLUG: BI DISC HANGER: APOLLO 161S S CLASS 600 PSIG THR BODY: CAST BRONZE BALL: CHROME PLATI STEM: BRON SEATS/SE PACKIN	EADED OR SOLDERED JET: BRONZE BRONZE C: BUNA-N RONZE ASTM B140 ALLOY SAME AS BODY 33 SERIES JERIES (THRU 2") EADED OR SOLDERED OR BRASS, FULL PORT ED BRONZE OR BRASS ZE OR BRASS ALS: RPTFE G: RPTFE	SEAT RING: STI DISC/WEDGE: A217 GR. C/ OVEI STEM: PACKING: GASKET: CORRUGATE POWELL FI CRANE F BONNEY FO CLASS 150 FLANGEI BODY/BONNET SEAT RING: PTFI JAMESBURY FLOWSEAI CLASS 150 FL BODY/CAP: A216 C SEAT RING: DISC: A105 OR A216 WCE GASKET: CORRUGATE POWELL FI CRANE FI BONNEY FO CLASS 150 FLANGEI BODY/CAP: A216 C SEAT RING: BODY/CAP: A216 C SEAT RING: DISC: A105 OR A216 WCE GASKET: CORRUGATE POWELL FI CRANE FI BONNEY FO CLASS 150 FLANGEI BODY/BONNET: A10 SEAT RING: MP1 BALL AND S PACKING: PTFE BODY SEAL: SS	ELLITE 6 FACED A15 OR WCB WITH 13% CR RLAY 410 SS GRAPHITE ED SS WITH GRAPHITE GURE 1503 IGURE 47 RGE 1-11 RF D ENDS (LUG STYLE) A216 GR. WCB E-RTFE/LUHMWPE 515 CF8M 17-4 PH G: PTFE 304 SS GURE 1572 SERIES 815 L TYPE 1LA ANGED ENDS GR. WCB (BOLTED) HARDFACED B WITH 13% CR OVERLAY D SST WITH GRAPHITE GURE 1561 GURE

NOTES:

1) EITHER COPPER OR CARBON STEEL PIPE MATERIAL MAY BE USED FOR PIPE SIZES BETWEEN 2-1/2" AND 4". FINAL PIPE MATERIAL SHALL BE SELECTED BASED UPON THE INDIVIDUAL PROJECT NEEDS. DESIGN PROFESSIONAL SHALL COORDINATE SELECTION OF PIPE MATERIAL WITH UTILITY OPERATOR.

REVISION HISTORY						
1	CHANGED SMALL BORE VALVES TO CLASS 600 FROM CLASS 3000	6/30/2017				
2	ADDED ADDITIONAL VALVE MANUFACTURERS; CHANGED SMALL BORE PIPING TO COPPER AND ALLOWED PIPE SIZE OVERLAP	2/22/2021				

PIPING SPECIFICATION: PROCESS: DESIGN COI	AT 100 °F HRU 24" 108 AMLESS OR WELDED - ASME B16.9 JOINING PIPE - SEAMLESS, B16.25	
DI-PCW (SS)	HRU 24" 10S AMLESS OR WELDED - ASME B16.9 JOINING PIPE - SEAMLESS, B16.25	
PIPE MATERIAL: WEIGHT/SCHEDULE SCH 40S SCH ASME B36.10M MATERIAL A312 TYPE 304 - SEAMLESS OR WELDED A312 GRADE 304 - SEA CONSTRUCTION CLASS 3000 - SOCKETWELD - B16.11 BUTTWELD - J FITTINGS: WALL THICKNESS SAME AS ADJOINING PIPE SAME AS ADJOINING PIPE MATERIAL FORGED STEEL - ASTM A182, F304L, ASME B16.25 ASTM A403, WP304L - TYPE SOCKETWELD BUTTWELD - END F	10S AMLESS OR WELDED - ASME B16.9 JOINING PIPE - SEAMLESS, B16.25	
ASME B36.10M MATERIAL A312 TYPE 304 - SEAMLESS OR WELDED A312 GRADE 304 - SEA CONSTRUCTION CLASS 3000 - SOCKETWELD - B16.11 BUTTWELD WALL THICKNESS SAME AS ADJOINING PIPE SAME AS ADJOINING PIPE SAME AS ADJOINING PIPE ATTEMPT AND	AMLESS OR WELDED - ASME B16.9 JOINING PIPE - SEAMLESS, B16.25	
CONSTRUCTION CLASS 3000 - SOCKETWELD - B16.11 BUTTWELD - FITTINGS: WALL THICKNESS SAME AS ADJOINING PIPE SAME	- ASME B16.9 JOINING PIPE - SEAMLESS, B16.25	
FITTINGS: WALL THICKNESS SAME AS ADJOINING PIPE SAME	JOINING PIPE - SEAMLESS, B16.25	
MATERIAL FORGED STEEL - ASTM A182, F304L, ASME B16.25 ASTM A403, WP304L - TYPE SOCKETWELD BUTTWELD - END F	- SEAMLESS, B16.25	
TYPE SOCKETWELD BUTTWELD - END F		
PIPING JOINTS: UNIONS: CLASS 3000 - SW - B16.11 - FLAT-FACE WITH SPIRAL WOUND GASKET DESIGN	-	
CONSTRUCTION FLANGES NOT PERMITTED CLASS 150 - WELD NECK -	- ASME B16.47 AND B16.5	
FLANGES: WALL THICKNESS SAME AS ADJ		
MATERIAL SS, ASTM A182, F3		
FLANGE BOLTS: CONSTRUCTION HIGH-STRENGTH STAINLESS: STUD - FULL	STEEL, GRADE B8, CLASS 2,	
FLANGE NUTS: CONSTRUCTION HEAVY HEX -A		
WASHER: CONSTRUCTION SSSS	3304	
CONSTRUCTION SUITABLE FOR RAISED-FACE	E OR FLAT-FACE FLANGES	
GASKETS: MATERIAL GARLOCK BLUE-G GRALOCK BLUE-G		
PIPE MATERIAL: PIPE CODE: DESIGN/CONSTRUCTION CODE: REVISION:	DATE REVISED:	
STAINLESS STEEL ASTM B36.10M ASME B31.1 1	2/22/2021	
VALVE SPECIFICATION: SPECIFICATION MATERIAL: PRESSURE CLASS: DESIGN CODE:		
CTAINLESS STEEL 450 DOLG AGME DOLA AGME DAG 24		
UI-PCW (SS) STAINLESS STEEL 130 F313 ASME B31.1 ASME B16.34 1212"TH	HRU 24"	
CONNECTION AND RATING CLASS 150 FLA	ANGED ENDS	
BONNET: ASTA CONSTRUCTION	BODY: ASTM A351 CF8M BONNET: ASTM A351 CF8M DISC: ASTM A351 CF8M STEM: ASTM A276 T316 PACKING: PTFE	
VALVE SELECTION CRANE FIGURE BONNEY FOR	POWELL FIGURE 1503 CRANE FIGURE 47 (THRU 24") BONNEY FORGE 1-18 RF	
CONNECTION AND RATING LUGGED FOR CLASS	150 FLANGED ENDS	
BODY: A182 GR. F316 SEAT: TFE CONSTRUCTION DISC: A182 GR. F316 SHATE: 1 BUTTERFLY VALVE BUTTERFLY VALVE BODY: A182 GR. F316 SHATE: 1 PACKING	FE/VITON 6 OR A351 GR. CF8M 17-4 PH	
VALVE SELECTION CRANE FLOWSEAL TYPE 1LA ((14" AND L JAMESBURY:	(12" AND SMALLER) TYPE 1LC LARGER)	
CONNECTION AND RATING CLASS 800 SOCKETWELD CLASS 150 FLANGED E	ENDS (2-1/2" THRU 12")	
BODY/CAP: A182 F316L BODY: ASTM A3	351 GR. CF8M RIER PIN: 316SS 351 GR. CF8M	
POWELL FIGURE SW08 POWELL FIGURE SW08 CRANE FIGURE VALVE SELECTION VOGT SERIES SWS718 CRANE FIGURE	POWELL FIGURE 1561 CRANE FIGURE 147 (THRU 24") BONNEY FORGE 1-68 RF	
CONNECTION AND RATING CLASS 800 SOCKETWELD CLASS 150 FLANGED E		
BODY/BONNET: ASTM A351, CF8M STAINLESS STEEL, FULL-BODY/INSERT:	T: A351 CF8M 316 SS	
CONSTRUCTION SEAT RING: XTREME SEAT:	: PTFE EAL: TFM 'AL: PTFE	
JAMESBURY SERIES 4000 MODEL A JAMESBURY S VALVE SELECTION KECKLEY SYTE BVM3 KECKLEY BVF KITZ U3TZM VELAN S	SERIES 7150 /F1 (THRU 6")	
REVISION HISTORY		
NUMBER DESCRIPTION DATE		
0 INITIAL ISSUE 12/5/2018		
1 ADDED VALVE MANUFACTURERS 1/21/2021		

PIPING SPECIFICATION:		PROC	CESS:	DESIGN C	ONDITIONS:
UI-PCW-DI		PROCESS WATER - OUTSIDE		150 PSIC	G at 150 °F
OI-PCVV-DI	PIPE SIZE (NPS)		3" THRU 24"		
PIPE MATERIAL:	WEIGHT/SCHEDULE		SPECIAL THICKNESS CLA	SS 53 ANSI/AWWA C150/A21.50	
ANSI/AWWA C151/A21.51	MATERIAL	ANSI/AWWA C151/A21.51 DUCTILE IRON PIPING			
	CONSTRUCTION		ANSI/AWWA C	110/A21.10 FLANGED	
FITTINGS:	DESIGN RATING	150 PSIG IN ACCORDANCE WITH ANSI/AWWA C110/A21.10			
	MATERIAL	DUCTILE IRON			
	TYPE		ANSI/AWWA C	115/A21.15 FLANGED	
JOINTS:	DESIGN RATING		250 PSIG IN ACCORDANCE	WITH ANSI/AWWA C115/A21.15	
	OTHER			==	
	CONSTRUCTION		ASTM A53	DUCTILE IRON	
SERVICE SADDLES:	DESIGN RATING		350 PSIG IN ACCORDA	NCE WITH ANSI/AWWA C800	
SERVICE SADDLES.	COATING		FUSION BON	DED BLACK NYLON	
	STRAPS		TYPE 304 S	TAINLESS STEEL	
	CONSTRUCTION	CLASS 150 - WELD NECK - ASME B16.5			
FLANGES:	WALL THICKNESS	SAME AS ADJOINING PIPE			
	MATERIAL			N STEEL - ASTM A105	
BOLTS:	CONSTRUCTION		STAINLESS STEEL IN AC	CORDANCE WITH ASTM A240	
NUTS:	CONSTRUCTION		HEAVY HEX	- A194 GRADE 2H	
WASHERS:	CONSTRUCTION		TYPE 304 S	TAINLESS STEEL	
	CONSTRUCTION	SUITABLE FOR R	AISED-FACE OR FLAT-FACE	FLANGES AND FOR USE WITH S	ERVICE SADDLES
GASKETS:	STANDARD		ANSI/AW\	VA C111/A21.11	
	MATERIAL	FULL FACE - 1	1/16" ARAMID FIBER WITH S	BR BINDER - GARLOCK BLUE-GA	RD OR EQUAL
PIPE LINING:	CONSTRUCTION		CEMENT MORTAR	LINING AND SEAL COAT	
FIFE LINING.	STANDARD		ANSI/AW	WA C104/A21.4	
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONSTI	RUCTION CODE:	REVISION:	DATE REVISED:
DUCTILE IRON	ANSI/AWWA C151/A21.51	-	-	0	2/22/2021
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DES	GN CODE:	
UI-PCW-DI	DUCTILE IRON				
OI-FCVV-DI	PIPE SIZE (NPS)		3" -	THRU 24"	
	CONNECTION AND RATING		LUGGED FOR	CLASS 150 FLANGES	
BUTTERFLY VALVE	CONSTRUCTION	BODY/SEAT: CARBON STEEL STEM: SS SISC: SS DISC: SS GLAND/BEARING: SS WITH RITE IMPREGNATED OPERATOR: GEARED HANDWHEEL W/ POSITION INDICATOR SEAT: PTFE 200 PSIG WORKING PRESSURE		₹	
	VALVE SELECTION		DEZURI	SERIES 400 K STYLE BHP RY SERIES 815	

NOTES:

1) DESIGN PROFESSIONAL SHALL DISCUSS THE USE OF DUCTILE IRON PIPING IN PROCESS WATER SERVICE WITH UTILITY OPERATOR DURING PROJECT DESIGN

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

LL		_
564	- S <i>t</i>	품
564 VE	SAMPLE WATER (TO 150 PSIG)	CHEMICAL TREATMENT SERVICE
S 150 WITH	Ę	\mathbf{S}
WITH	8	
ES) -	_	\mathbf{z}
ES.		m
=) -	표	\triangleright
	7	-
	T)	\equiv
	O	Ë
)	=
	 50	SE
	P	R
	S	\geq
	رو	'n
		,,,

PIPING SPECIFICATION:			CESS:	DESIGN CO	ONDITIONS:
UI-CSS		CHEMICAL TREATMENT		150 PSIG AT 100 °F	
01-033	PIPE SIZE (NPS)	2" AND S	SMALLER	2 1/2" THRU 6"	
PIPE MATERIAL:	WEIGHT/SCHEDULE	SCH 80, SD	OR 21 OR 26	SCH 80, SDR 21 OR 26	
ASME B36.10M	MATERIAL		C) ASTM D1784, WITH CELL OF 12454	POLYVINYL CHLORIDE (PVC) ASTM D1784, WITH CELL CLASS OF 12454	
	CONSTRUCTION	SOLVENT V	WELD TYPE	SOLVENT V	WELD TYPE
FITTINGS:	STANDARD	ASTM	D2467	ASTM	F1970
FITTINGS.	WALL THICKNESS		JOINING PIPE		JOINING PIPE
	SOLVENT MATERIAL		DRDANCE WITH ASTM D2564		DRDANCE WITH ASTM D2564
	CONSTRUCTION		WELD TYPE		WELD TYPE
JOINTS:	WALL THICKNESS		JOINING PIPE		JOINING PIPE
	SOLVENT MATERIAL		DRDANCE WITH ASTM D2564		DRDANCE WITH ASTM D2564
	CONSTRUCTION		FOR EQUIPMENT OR VALVE CTIONS		FOR EQUIPMENT OR VALVE ECTIONS
FLANGES:	WALL THICKNESS	SAME AS AD.	JOINING PIPE	SAME AS AD.	JOINING PIPE
	MATERIAL		ASTM F1970, WITH CLASS 150 IMENSIONS	POLYVINYL CHLORIDE (PVC) . FLANGE DI	ASTM F1970, WITH CLASS 150 IMENSIONS
FLANGE BOLTS:	CONSTRUCTION	ASTM	1 A307		A A307
FLANGE NUTS:	MATERIAL		A194 GRADE 8		A194 GRADE 8
	CONSTRUCTION	SUITABLE FOR RAISED-FAC	CE OR FLAT-FACE FLANGES	SUITABLE FOR RAISED-FAC	CE OR FLAT-FACE FLANGES
GASKETS:	MATERIAL	FULL FACE - 1/8" POLYTETRAFLUOETHYLENE (PTFE) - GARLOCK 3500 OR EQUAL		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 B3	1.1 (2012)	0	2/22/2021
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN	N CODE:	
UI-CSS	PVC	150	ASME B31.1	ASME B16.34	1
01-033	PIPE SIZE (NPS)			HRU 6"	
	CONNECTION AND RATING		CLASS: 150 S	SOCKETWELD	
CHECK VALVE	CONSTRUCTION	E	BALL: PVC, TYPE IV, ASTM D178 T PLATE: PVC, TYPE IV, ASTM I PACKING: O-RIN	4, PVC, TYPE IV, "TRUE UNION" 84, CELL CLASSIFICATION 1245 D1784, CELL CLASSIFICATION 1 GRAPHITE G: 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 SPEARS TRUE UNION 2000			
	VALVE SELECTION				
	REVISION H				
NUMBER	DESCRIP	TION	DATE		
0					

CHEMICAL TREATMENT SERVICE (TO 150 PSIG)

PIPING SPECIFICATION:		PROCESS:		DESIGN CONDITIONS:		
UI-CHEM (CPVC)			TREATMENT	150 PSIG AT 100°F		
UI-CHEW (CFVC)	PIPE SIZE (NPS)		SMALLER	2 1/2" THRU 6"		
PIPE MATERIAL:	WEIGHT/SCHEDULE	SCH 80		SCH 80		
ASTM F441	MATERIAL		HLORIDE (CPVC) ASTM D1784 H CELL CLASS OF 23447	CHLORINATED POLYVINYL CHLORIDE (PVC) ASTM D1784 TYPE IV, GRADE 1, WITH CELL CLASS OF 23447		
	CONSTRUCTION	SOLVENT/SOCK	KET WELD TYPE	FABRI	CATED	
	STANDARD	ASTM	/I F439	ASTM	F1970	
FITTINGS:	WALL THICKNESS	SAME AS AD	JOINING PIPE	SAME AS AD	JOINING PIPE	
	SOLVENT MATERIAL	SOLVENT CEMENT IN ACC	ORDANCE WITH ASTM F493	SOLVENT CEMENT IN ACC	ORDANCE WITH ASTM F493	
	CONSTRUCTION	SOLVENT V	WELD TYPE	SOLVENT \	WELD TYPE	
JOINTS:	WALL THICKNESS	SAME AS AD	JOINING PIPE	SAME AS AD	JOINING PIPE	
	SOLVENT MATERIAL	SOLVENT CEMENT IN ACC	ORDANCE WITH ASTM F493	SOLVENT CEMENT IN ACC	ORDANCE WITH ASTM F493	
	CONSTRUCTION		FOR EQUIPMENT OR VALVE		FOR EQUIPMENT OR VALVE	
FLANGES:	WALL THICKNESS	SAME AS AD	JOINING PIPE	SAME AS AD	JOINING PIPE	
	MATERIAL	CHLORINATED POLYVINYL CI	HLORIDE (CPVC) ASTM F1970, LANGE DIMENSIONS	CHLORINATED POLYVINYL C		
FLANGE BOLTS:	CONSTRUCTION	CARBON STEEL BOLTS AND STUDS IN ACCORDANCE WITH CARBON STEEL BOLTS AND S ASTM A307 ASTM		1 A307		
FLANGE NUTS:	MATERIAL	HEAVY HEX - A194 GRADE 8		HEAVY HEX - A194 GRADE 8		
	CONSTRUCTION	SUITABLE FOR RAISED-FAC	CE OR FLAT-FACE FLANGES	SUITABLE FOR RAISED-FAC	CE OR FLAT-FACE FLANGES	
GASKETS:	MATERIAL	FULL FACE - 1/8" POLYTETRAFLUOETHYLENE (PTFE) - GARLOCK 3500 OR EQUAL		FULL FACE - 1/8" POLYTETRAFLUOETHYLENE (PTFE) - GARLOCK 3500 OR EQUAL		
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:	
CPVC (ASTM D1784)	ASTM F441	ASME	B31.1	0	2/22/2021	
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN	I CODE:		
UI-CHEM (CPVC)	CHLORINATED POLYVINYL CHLORIDE (CPVC)	235 PSIG at 73°F	ASME B31.1	ASTM F1970		
, ,	PIPE SIZE (NPS)		1/2" T	HRU 6"		
	CONNECTION AND RATING	CLASS: 150 SOCKETWELD				
CHECK VALVE	CONSTRUCTION	B.	ASTM D1784 CELL CLASS 23447 ALL: CPVC, TYPE IV, ASTM D17 PLATE: CPVC, TYPE IV, ASTM O-RING	84, CELL CLASSIFICATION 234	47	
	VALVE SELECTION	SPEARS TRUE UNION 2000 COLONIAL TRUE UNION CHECK VALVE HAYWARD TC SERIES				
	CONNECTION AND RATING		CLASS: 150 S	OCKETWELD		
	CONSTRUCTION	BODY: ASTM D1784 CELL CLASS 23447, CPVC, SCH. 80, FULL-PORT, "TRU BALL: CPVC, TYPE 1, ASTM D1784, CELL CLASSIFICATION 23 SEAT: PTFE STEM: CPVC, TYPE 1, ASTM D1784, CELL CLASS 23447 HANDLE: POLYPROPYLENE PACKING: GRAPHITE O-RINGS: FKM				
BALL VALVE	CONSTRUCTION		PACKING:	GRAPHITE		

¹ FOR USE WITH LIQUID SERVICE: NOT FOR COMPRESSED AIR OR GAS SERVICE.
2 PRESSURE RATINGS FOR FITTINGS AND FLANGES SHALL MEET OR EXCEED MAXIMUM WORKING PRESSURE

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

CHEMICAL TREATMENT SERVICE - ACID (TO 150 PSIG)

PIPING SI	PECIFICATION:		CESS:	DESIGN (CONDITIONS:	
LII CHEM (DVDE)		CHEMICAL 1	TREATMENT	150 PSIG AT 100 ⁰ F		
UI-CHEM (PVDF)	PIPE SIZE (NPS)	2" AND S	SMALLER	2 1/2" THRU 6"		
PIPE MATERIAL:	WEIGHT/SCHEDULE	SC	H 80	S	CH 80	
ASTM D3222	MATERIAL		(PVDF) ASTM D3222 FOR TYPE TH 1.7% RED PIGMENT		E (PVDF) ASTM D3222 FOR TYPE VITH 1.7% RED PIGMENT	
	CONSTRUCTION	HEAT FUSIO	ON WELDED	HEAT FUS	SION WELDED	
FITTINGS:	STANDARD	ASTM	D2467	AST	M D2467	
	WALL THICKNESS	SAME AS AD	JOINING PIPE	SAME AS A	DJOINING PIPE	
JOINTS:	CONSTRUCTION	HEAT FUSIO	ON WELDED	HEAT FUS	SION WELDED	
JOINTS.	WALL THICKNESS	SAME AS AD	JOINING PIPE	SAME AS A	DJOINING PIPE	
	CONSTRUCTION	FLANGES NO	T PERMITTED	FLANGES N	IOT PERMITTED	
FLANGES:	WALL THICKNESS	-				
	MATERIAL	-				
FLANGE BOLTS:	CONSTRUCTION	-				
FLANGE NUTS:	MATERIAL	-				
GASKETS:	CONSTRUCTION	-				
GASKETS.	MATERIAL	-				
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:	
PVDF (ASTM D3222)	ASTM D1785	ASME	B31.1	0	2/22/2021	
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN	CODE:		
UI-CHEM (PVDF)	POLYVINYLIDENE FLUORIDE (PVDF)	150 PSIG at 73°F	ASME B31.1			
, ,	PIPE SIZE (NPS)			THRU 4"		
	CONNECTION AND RATING		CLASS: 150 S	50 SOCKETWELD		
CHECK VALVE	CONSTRUCTION	BODY: ASTM D3222, WITH CELL CLASS TYPE II, RED PV BALL: PVDF, ASTM D3222, WITH SEAT: FK STOP RING: RE O-RING: FE		WITH CELL CLASS TYPE II FKM RED PVDF		
	VALVE SELECTION	NIBCO PVDF TRU UNION BALL CHECK WATTS PVDF TRUE UNION BALL CHECK				
	CONNECTION AND RATING		CLASS: 150 S	OCKETWELD		
BALL VALVE	CONSTRUCTION	BODY: ASTM D3222, WITH CELL CLASS TYPE II, RED PVDF, SCH. 80, FULL-PORT, "TRUE UNION" STYLE BALL: PVDF, ASTM D3222, WITH CELL CLASS TYPE II SEAT: PTTE STEM: PVDF, ASTM D3222, WITH CELL CLASS TYPE II HANDLE: POLYPROPYLENE PACKING: GRAPHITE OF DINCE, FMM.			, "TRUE UNION" STYLE	
	VALVE SELECTION	O-RINGS: FKM NIBCO PVDF TRU-BLOC MODEL C WATTS PVDF TRUE UNION BALL				

NOTES:

¹ FOR USE WITH LIQUID SERVICE. NOT FOR COMPRESSED AIR OR GAS SERVICE.
2 PRESSURE RATINGS FOR FITTINGS AND FLANGES SHALL MEET OR EXCEED MAXIMUM WORKING PRESSURE.

NUMBER	DATE	
0	INITIAL ISSUE	2/22/2021

PIPING SPECIFICATION:		PRO	CESS:	DESIGN CONDITIONS:			
UI-DCW		DOMESTIC COLD	AND HOT WATER	135 PSIG AT 200 °F			
OI-DCVV	PIPE SIZE (NPS)	4" AND SMAL	LER (NOTE 1)	2 1/2" THRU	24" (NOTE 1)		
PIPE MATERIAL:	WEIGHT/SCHEDULE	-	-	S	TD		
ASME B36.10M/B88	MATERIAL	ASTM B88 COPPER, 1	TYPE K, HARD DRAWN	ASTM A53 GRADE B - SEAMLESS GALVANIZED			
	CONSTRUCTION	SOLDERED (OR PRESS FIT	BUTT	WELD		
FITTINGS:	WALL THICKNESS	SAME AS AD	JOINING PIPE	SAME AS ADJOINING PIPE			
FITTINGS:	MATERIAL		OR ASME B16.22 WROUGHT R ALLOY	CLASS 125	CLASS 125 FLANGED		
	TYPE	SOLDERED (OR PRESS FIT	CLASS 125	FLANGED		
PIPING JOINTS:	OTHER	SEE BELOW FO	R JOINT DETAILS	-	-		
CONSTRUCTION		SOLDER: ASTM B32 ALLO	DY, GRADE Sb-5 95/5 TIN-	CLASS 150 - WELD	NECK - ASME B16.5		
SOLDER/FLANGES:	WALL THICKNESS	ANTIMONY, LEAD FREE OR: A	STM B32 ALLOY, GRADE SN95	SAME AS AD	JOINING PIPE		
	MATERIAL		LEAD FREE	GALVANIZED ST	EEL - ASTM A105		
SOLDER/FLANGE BOLTS:	CONSTRUCTION		D-FREE - WATER-FLUSHABLE RAZING FILLER METAL SHALL	STUD - FULL LEI	NGTH ASME B1.1		
SULDER/FLANGE BULTS:	MATERIAL		PHOSPHORUS ALLOYS FOR RAZING - AWS A5.8	ASTM A307 - GRADE E	3, FULL LENGTH STUD		
	CONSTRUCTION			HEAVY HEX - ASME B1	.1 - CLASS 2B THREADS		
PRESS FIT/FLANGE NUTS:	MATERIAL	ASME B16.22 AND CRITER	NFORM TO ASME B16.18 OR: RIA UNDER IAPMO PS 117 -		94 GRADE 2H HEAVY - F436 HERS		
PRESS FIT/GASKETS:	CONSTRUCTION	FACTORY INSTALLED - FITT	DM - SEALING ELEMENTS INGS SHALL BE PRESSED BY Y FITTING MANUFACTURER	SPIRAL WOUND - SUITABLE FOR RAISED-FACE OR FL FACE FLANGES			
	MATERIAL			FULL FACE -	RED RUBBER		
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:		
COPPER/CARBON STEEL	ASTM B36.10M	ASME	B31.1	0	2/22/2021		
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN	I CODE:			
UI-DCW	AS NOTED	125 PSIG	ASME B31.1	ASME B16.34			
OI-DCVV	PIPE SIZE (NPS)	4" AND SMAL	LER (NOTE 1)	2 1/2" THRU	24" (NOTE 1)		
	CONNECTION AND RATING	-	-	CLASS 125 FL	ANGED ENDS		
GATE VALVE	CONSTRUCTION	-		'BODY/SEAT:ASTM SHAFT: B DISC: B INTERNAL: SEATS AND SEALS: F OS&Y CI	WITH MSS SP-70 I A395 CAST IRON 16 BRASS IRONZE S: BRONZE EXENEWABLE BRONZE LASS 125		
	VALVE SELECTION			POWELL FIG. NO. 1793 CRANE F84 ELITE GTVA-FCI1333-HW			
	CONNECTION AND RATING		DERED OR PRESS FIT				
BALL VALVE	CONSTRUCTION	BALL: C27451 LE STEM: C27451 LE SEATS/SEA PACKING	BRONZE, STANDARD PORT :AD-FREE BRASS EAD-FREE BRASS ALS: RPTFE 3: RPTFE ! TURN LEVER HANDLE	-	-		
	VALVE SELECTION	APOLLO 77VLF SE NIBCO 580 LF S	ERIES (SOLDER) ERIES (PRESS FIT) ERIES (THRU 3") 30B (PRESS FIT ENDS)	-	-		

NOTES:

1) PIPE SIZE RANGE OVERLAP IS INTENTIONAL. EITHER MATERIAL CAN BE USED BETWEEN 2-1/2" AND 4" PENDING DESIGN PROFESSIONAL DISCUSSION WITH UTILITY OPERATOR.

REVISION HISTORY								
NUMBER DESCRIPTION DATE								
0	0 ISSUED							
1	ADDED MODEL NUMBER FOR NIBCO BALL VALVE, ADDED VALVE MANUFACTURERS; INCREASED SMALL BORE COPPER SIZE TO 4" AND ALL OWED SIZE BANGE OVERLAP	2/22/2021						

_
=
J
ΒE
Г
0
0
2
230
0
P
PSI
9

PIPING SPECIFICATION:			CESS:	DESIGN CONDITIONS:		
UI-LOL			E OIL	230 PSIG AT 100 °F		
UI-LUL	PIPE SIZE (NPS)		SMALLER	2 1/2" THRU 10"	12" THRU 24"	
PIPE:	WEIGHT/SCHEDULE	SCH	140S	SCH 10S	SCH 40S	
ASME B36.10M	MATERIAL	ASTM A312 TYPE	304 - SEAMLESS	ASTM A312 TYPE 304 - SEAMLESS		
	CONSTRUCTION	CLASS 3000 - SOC	KETWELD - B16.11	BUTTWELD	- ASME B16.9	
FITTINGS:					JOINING PIPE	
	MATERIAL	FORGED STEEL - ASTM	A182, F304L, ASME 16.11	ASTMA403, WP304L - S	EAMLESS, ASME B16.25	
PIPING JOINTS:	TYPE	SOCKE	TWELD	BUTTWELD - END	PREP PER B16.25	
PIPING JOIN 15:	OTHER	-	-		-	
	CONSTRUCTION	FLANGES NO	T PERMITTED	FLANGES NO	T PERMITTED	
FLANGES:	WALL THICKNESS	-	-		_	
	MATERIAL	-	_		_	
FLANGE BOLTS:	CONSTRUCTION	-	-		-	
FLANGE NUTS:	CONSTRUCTION	-	-		_	
WASHER:	CONSTRUCTION	-	-			
GASKETS:	CONSTRUCTION				-	
GASKETS:	MATERIAL				-	
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:	
STAINLESS STEEL	ASTM B36.10M	ASME	B31.1	0	2/22/2021	
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:	DESIGN	I CODE:		
UI-LOL	STAINLESS STEEL	300 PSIG	ASME B31.1	MSS SP-110		
UI-LUL	PIPE SIZE (NPS)	2" AND S	MALLER	2 1/2" T	HRU 10"	
	CONNECTION AND RATING	CLASS 300	THREADED			
			F8M STAINLESS STEEL, FULL-			
			PRT			
			G: XTREME			
	CONSTRUCTION		SS 316	·		
BALL VALVE			SS 316			
			ORCED PTFE GRAPHITE			
	VALVE OF LEGICAL		76F-100-A 5-S6-R-66-LL			
	VALVE SELECTION	MILWAUKEE	1			
	REVISION H		DEINEO BAZOO			
NUMBER	DESCRIP*		DATE	1		
		IION		1		
0	INITIAL ISSUE		2/22/2021			
			4			

PIPING SPECIFICATION:		PROC	CESS:	DESIGN CONDITIONS:				
UI-REF		R1	34A	300 PSIG AT 250 °F				
<u> </u>	PIPE SIZE (NPS)		10" AND 5	SMALLER				
PIPE MATERIAL:	WEIGHT/SCHEDULE			-				
ASME B31.5	MATERIAL			K, HARD DRAWN, SEAMLESS				
	CONSTRUCTION			PRESSURE TYPE				
FITTINGS:	WALL THICKNESS			JOINING PIPE				
	MATERIAL		ASME B16.50 WROU					
PIPING JOINTS:	TYPE		ERIES FILLER METAL AND CAP					
PIPE MATERIAL:	PIPE CODE:		RUCTION CODE:	REVISION:	DATE REVISED:			
COPPER	ASTM B31.5		B31.5	0	2/22/2021			
VALVE SPECIFICATION:	SPECIFICATION MATERIAL:	PRESSURE CLASS:		CODE:	1			
UI-REF	AS NOTED	150 PSIG	ASME B31.1	ASME B16.34	<u> </u>			
OT INE.	PIPE SIZE (NPS)	3/8" THF			RU 10"			
	CONNECTION AND RATING	CLASS 500 PSIG SOLE	DERED OR THREADED					
CHECK VALVE	CONSTRUCTION	STEM: SILIC SEAT: NITRI DISC: BRON GASKET: SPIRAL WOUI GRAPHITE AF	P: BRONZE CON BRASS ILLE RUBBER IZE, IN-LINE ND SS WITH GRAPHITE RAMID FIBERS					
	VALVE SELECTION	ALCO SE	MPANY SERIES 205 ERIES EC SERIES C					
	CONNECTION AND RATING	CLASS 600 PSIG SOLE	DERED OR THREADED					
BALL VALVE	CONSTRUCTION	BALL: ELECTRO STEM: STAINLESS STEEL W SE/ PACKIN	RASS, 2-PIECE, FULL-PORT -PLATED BRASS ITH NOPHRENE RING STEM ALS G: PTFE SEALS: PTFE					
	VALVE SELECTION	ALCC PARKER S	MPANY SERIES 937) BVE SERIES 500					
	CONNECTION AND RATING	CLASS 500 PSIG SOLE	DERED OR THREADED					
RELIEF VALVE	CONSTRUCTION	STAMPED IN ACCORDANC STANDARD 15, SEALED AND S NATIONAL BOARD BODY/DIS SEAT: NE						
	VALVE SELECTION		NPTFE TO FLARE					
	REVISION I	IISTORY						
NUMBER	DESCRIP	TION	DATE					
0	INITIAL ISSUE		2/22/2021					

PIPING S	SPECIFICATION:	PRO	CESS:	DESIGN CONDITIONS:						
UI-RV		R134A	R134A OR R123 285 PSIG AT 150 °F							
UI-RV	PIPE SIZE (NPS)		4" THRU 12"							
PIPE MATERIAL:	WEIGHT/SCHEDULE	SCH. 40								
ASME B31.10M	MATERIAL		ASTM A53 GRAI	DE B - SEAMLESS						
	CONSTRUCTION	BUTTWELD - B16.25								
FITTINGS:	WALL THICKNESS		SAME AS AD	JOINING PIPE						
	MATERIAL		BUTTWELD FITTING - ASTN	1 A234 GRADE B - SEAMLESS						
PIPING JOINTS:	TYPE		BUTTWE	LD - B16.25						
FIFING JOINTS.	OTHER		WHERE FLANGE OF	R THREAD REQUIRED						
	CONSTRUCTION		NOT PE	RMITTED						
UNIONS:	WALL THICKNESS									
	MATERIAL									
	CONSTRUCTION	CLASS 300 - WELD NECK - ASME B16.5 AND ASME B16.47								
FLANGES:	WALL THICKNESS	SAME AS ADJOINING PIPE								
	MATERIAL	FORGED CARBON STEEL - ASTM A105 OR ASTM A516 GRADE 70								
FLANGE BOLTS:	CONSTRUCTION		HIGH-STRENGTH STEEL AS	TM A193, CLASS 2, GRADE B8						
FLANGE NUTS:	CONSTRUCTION		HEAVY HEX - A	A194 GRADE 2H						
WASHER:	CONSTRUCTION		F	436						
	CONSTRUCTION	SPIRA	AL WOUND - SUITABLE FOR RA	ISED-FACE OR FLAT-FACE FLA	NGES					
GASKETS:	MATERIAL	FLE	EXITALLIC STYLE CGI - TYPE 3	04 STAINLESS - FLEXICARB FILI	LER					
	MANUFACTURER		GARLOCK BLUE-GA	ARD 3000 OR EQUAL						
THERMOWELLS:	MATERIAL	INSERTION THERMOWELLS - ASTM A105 - 3000 PSIG PRESSURE CLASS - SEAL-WELDED WELLS								
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:					
CARBON STEEL	ASTM B36.10M	ASME	B31.1	0	2/22/2021					
FINISH:	SPECIFICATION MATERIAL:	INORGANIO	C SILICATE POLYMER TOP COA	ASED INORGANIC ZINC PRIMER, AND AT - REFER TO PROJECT SPECIFICATIONS XISTING RELIEF DEVICE PIPING						
	REVISION H									
NUMBER	DESCRIP	TION	DATE							
0	INITIAL ISSUE	2/22/2021								

PIPING S	SPECIFICATION:	PRO	CESS:	DESIGN CONDITIONS:				
UI-RV		R134A	OR R123	285 PSIG	AT 150 °F			
UI-RV	PIPE SIZE (NPS)		4" TH	RU 12"				
PIPE MATERIAL:	WEIGHT/SCHEDULE		SCH	I 10S				
ASME B31.10M	MATERIAL		A312 GRADE 304 - SE	AMLESS OR WELDED				
	CONSTRUCTION		BUTTWELD	- ASME B16.9				
FITTINGS:	WALL THICKNESS		SAME AS AD	JOINING PIPE				
	MATERIAL		ASTM A403, WP304L	- SEAMLESS, B16.25				
PIPING JOINTS:	TYPE		BUTTWELD - END	PREP PER B16.25				
PIPING JOIN 15:	OTHER		-	-				
	CONSTRUCTION		NOT PE	RMITTED				
UNIONS:	WALL THICKNESS		-	:=				
	MATERIAL							
	CONSTRUCTION	CLASS 300 - WELD NECK - ASME B16.5 AND ASME B16.47						
FLANGES:	WALL THICKNESS	SAME AS ADJOINING PIPE						
	MATERIAL	SS, ASTM A182, F330L, ASME B16.5						
FLANGE BOLTS:	CONSTRUCTION		HIGH-STRENGTH STEEL AS	TM A193, CLASS 2, GRADE B8				
FLANGE NUTS:	CONSTRUCTION		HEAVY HEX - A	A194 GRADE 2H				
WASHER:	CONSTRUCTION		F	136				
	CONSTRUCTION	SPIRA	AL WOUND - SUITABLE FOR RA	ISED-FACE OR FLAT-FACE FLA	INGES			
GASKETS:	MATERIAL	FLEXITALLIC STYLE CGI - TYPE 304 STAINLESS - FLEXICARB FILLER						
	MANUFACTURER	GARLOCK BLUE-GARD 3000 OR EQUAL						
THERMOWELLS:	MATERIAL	INSERTION THERMOWELLS - ASTM A105 - 3000 PSIG PRESSURE CLASS - SEAL-WELDED WELLS						
PIPE MATERIAL:	PIPE CODE:	DESIGN/CONST	RUCTION CODE:	REVISION:	DATE REVISED:			
CARBON STEEL	ASTM B36.10M		B31.1	0	2/22/2021			
	REVISION H	IISTORY						
NUMBER	DESCRIP*	TION	DATE					
0	INITIAL ISSUE		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	STANDA						
24	ST									RT	REDUCIN	IG TEE						
30									WOL	WELDOL	ET							
36	FOR PIPE SIZES ABOVE 24", CONSULT DESIGN ENGINEER							SOL	SOCKET	OLET								
42	TONT IL SIZES ABOVE 24 , CONSULT DESIGN ENGINEER								CRBC	CUSTOM	REINFOR	CED						
48		BRANCH CONNECTION								ΓΙΟΝ								
									REV	SION:	DATE R	EVISED:						
																1	2/22/	2021

REDUCING TEES: WELOLETS AND SOCKETOLETS WELDOLETS ASME 31.1 http://www.ritinoxoverseas.com/images/pdf/Unequal-tees-and-cross.pdf

http://petrowiki.org/File%3AVol3 Page 360 Image 0001.png http://www.bonneyforge.com/specs/branch/conventional.cfm

REVISION HISTORY										
NUMBER	NUMBER DESCRIPTION									
0	0 INITIAL ISSUE									
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								