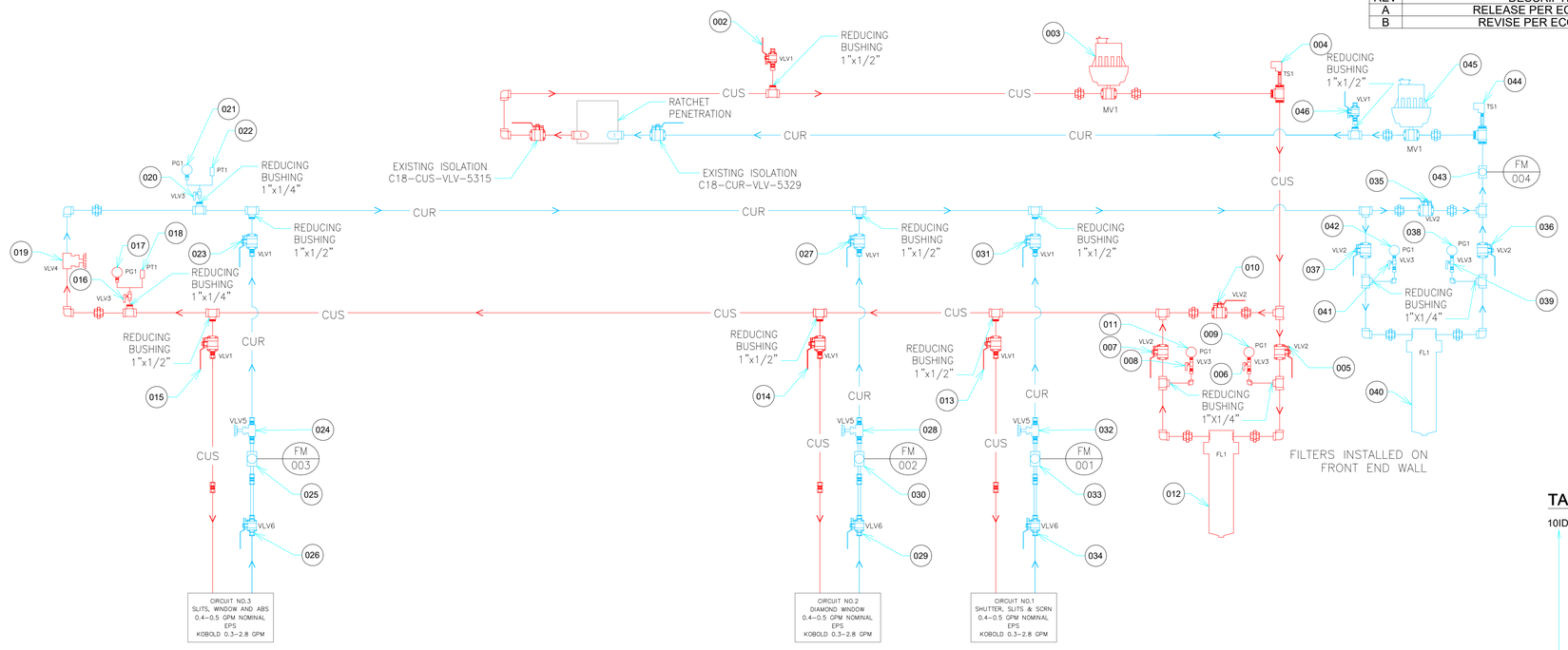
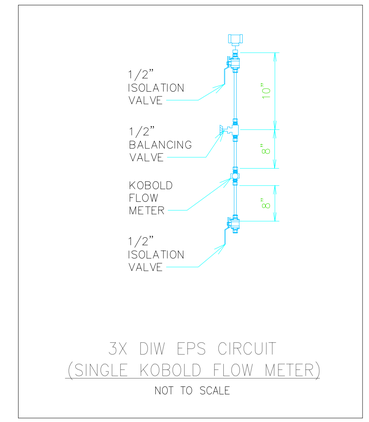
REVISION HISTORY					
REV	DESCRIPTION	DATE	DESIGNER	CHECKED BY	ENGINEER
A	RELEASE PER ECO-003403	4/2016	B.J.M./R.O.	C. A./C.S.	W .O'BRIEN
B	REVISE PER ECO-005349	7/2018	B.J.M./R.O.	R. Gambella	W .O'BRIEN



DI WATER FLOW DIAGRAM

NO SCALE



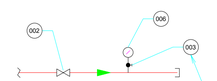
3X DIW EPS CIRCUIT (SINGLE KOBOLD FLOW METER)

NOT TO SCALE

TAG FORMAT

10IDA-PCHWS-VLV-1001

- 4-DIGIT SEQUENTIAL NUMBER STARTING AT 1001
- DEVICE TAG ABBREVIATION (SEE LEGEND)
- SYSTEM ABBREVIATION (SEE LEGEND)
- HUTCH DESIGNATION
- 4-DIGIT BEAMLINE IDENTIFICATION



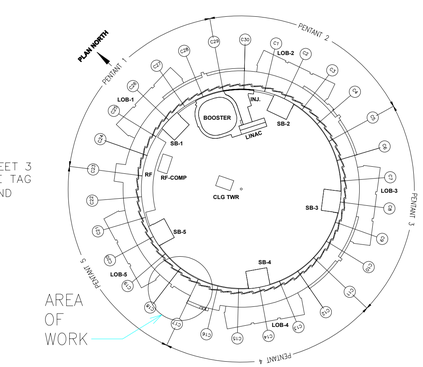
LAST THREE DIGITS OF DEVICE ID

TAG LEGEND

BEAMLINE LOCATION	
BEAMLINE NO.	1BM/1ID THROUGH 30BM/30ID
HUTCH DESIGNATION	A = HUTCH A (FOE) B = HUTCH B C = HUTCH C D = HUTCH D F = FLOOR MOUNTED R = HUTCH ROOF MOUNTED
DEVICE TYPE	
ABBREVIATION	DEVICE
AV	AIR VENT
DPS	DIFFERENTIAL SENSOR
FL	FILTER
FM	FLOW METER
PG	PRESSURE GAUGE
PRG	PRESSURE REGULATOR
PRV	PRESSURE RELIEF VALVE
PT	GAUGE PRESSURE TRANSMITTER
MV	MOTORIZED VALVE
TI	TEMPERATURE INDICATOR
TS	TEMPERATURE SENSOR
VLV	MANUAL VALVE
SYSTEM DESIGNATION	
ABBREVIATION	SYSTEM
CA	COMPRESSED AIR
PCHWS	PROCESS CHILLED WATER SUPPLY
PCHWR	PROCESS CHILLED WATER RETURN
CUS	COPPER SKID DE-IONIZED WATER SUPPLY
CUR	COPPER SKID DE-IONIZED WATER RETURN
GN2	GASEOUS NITROGEN
LN2	LIQUID NITROGEN

NOTES:

1. SEE SHEET 2 FOR GN2 AND CA, SEE SHEET 3 FOR PCHWS&R, SEE SHEET 4 FOR DEVICE TAG ID'S, SEE SHEET 5 FOR VALVE, FILTER AND INSTRUMENTATION SCHEDULES.



KEY PLAN AREA OF WORK

PIPE IDENTIFICATION LABEL FORMAT

SYSTEM	LABEL TEXT	LABEL FIELD COLOR	COLOR OF LETTERS
COMPRESSED AIR	COMPRESSED AIR	BLUE	WHITE
PROCESS CHILLED WATER	PROCESS CHILLED WATER SUPPLY PROCESS CHILLED WATER RETURN	GREEN	WHITE
INSTRUMENT WATER	INSTRUMENT WATER SUPPLY INSTRUMENT WATER RETURN	GREEN	WHITE
COPPER SKID DE-IONIZED WATER	COPPER DI SUP COPPER DI RET	GREEN	WHITE
GASEOUS NITROGEN	GASEOUS NITROGEN	PURPLE	WHITE

NEXT ASSY:

PROJECT:

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
DIMENSIONS IN BRACKETS [xx.xx] (WHERE PRESENT) ARE MILLIMETERS AND ARE FOR REFERENCE ONLY
INTERPRET DRAWING AS PER ANSI Y14.5-1994 OR Y32.2-1975

DIMENSIONAL TOLERANCES: X. ± 0.060, .X ± 0.030, .XX ± 0.015, .XXX ± 0.005
ANGULAR TOLERANCE: ± .5°
FINISH: 125
BREAK EDGES & SHARP CORNERS 0.005 MIN. TO 0.030 MAX
THIRD ANGLE PROJECTION
SCALE: NONE

BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN SCIENCE ASSOCIATES
UPTON, NEW YORK 11973
Exploring Life's Mysteries, Protecting Its Future
NSLSII NATIONAL SYNCHROTRON LIGHT SOURCE II

DRAWN BY	O'BRIEN/BJM	8-2015
CHECKED BY	C. AMARITO	8-2015
VACUUM APPROVAL	N/A	N/A
ENGINEER APPROVAL	W. O'BRIEN	8-2015
SUPERVISOR APPROVAL	J. GOSMAN	8-2015
ES&H APPROVAL	L. STIEGLER	8-2015
QA APPROVAL	J. Zipper	8-2015

WBS# 7.01.04.02

PHOTON DIVISION
XFP BEAMLINE, UTILITIES
FLOW DIAGRAM,17-BM

SHEET SIZE: D
DRAWING/PART NUMBER: PD-XFP-UT-1500
REVISION: B
ES&H RISK LEVEL: A2
SHEET 1 OF 5

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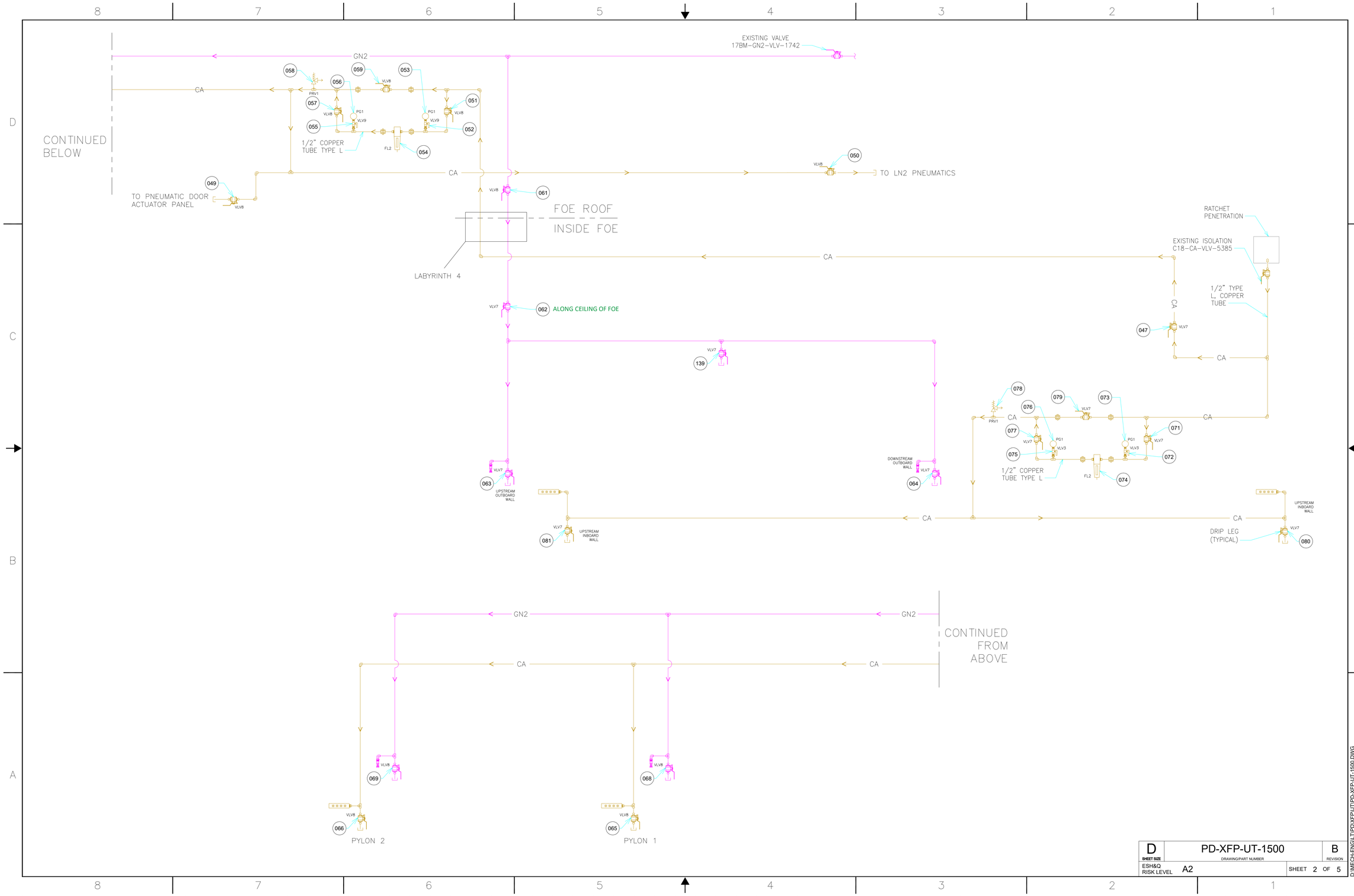
RELEASED – EFFECTIVE



D	PD-XFP-UT-1500	B
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A2		SHEET 2 OF 5

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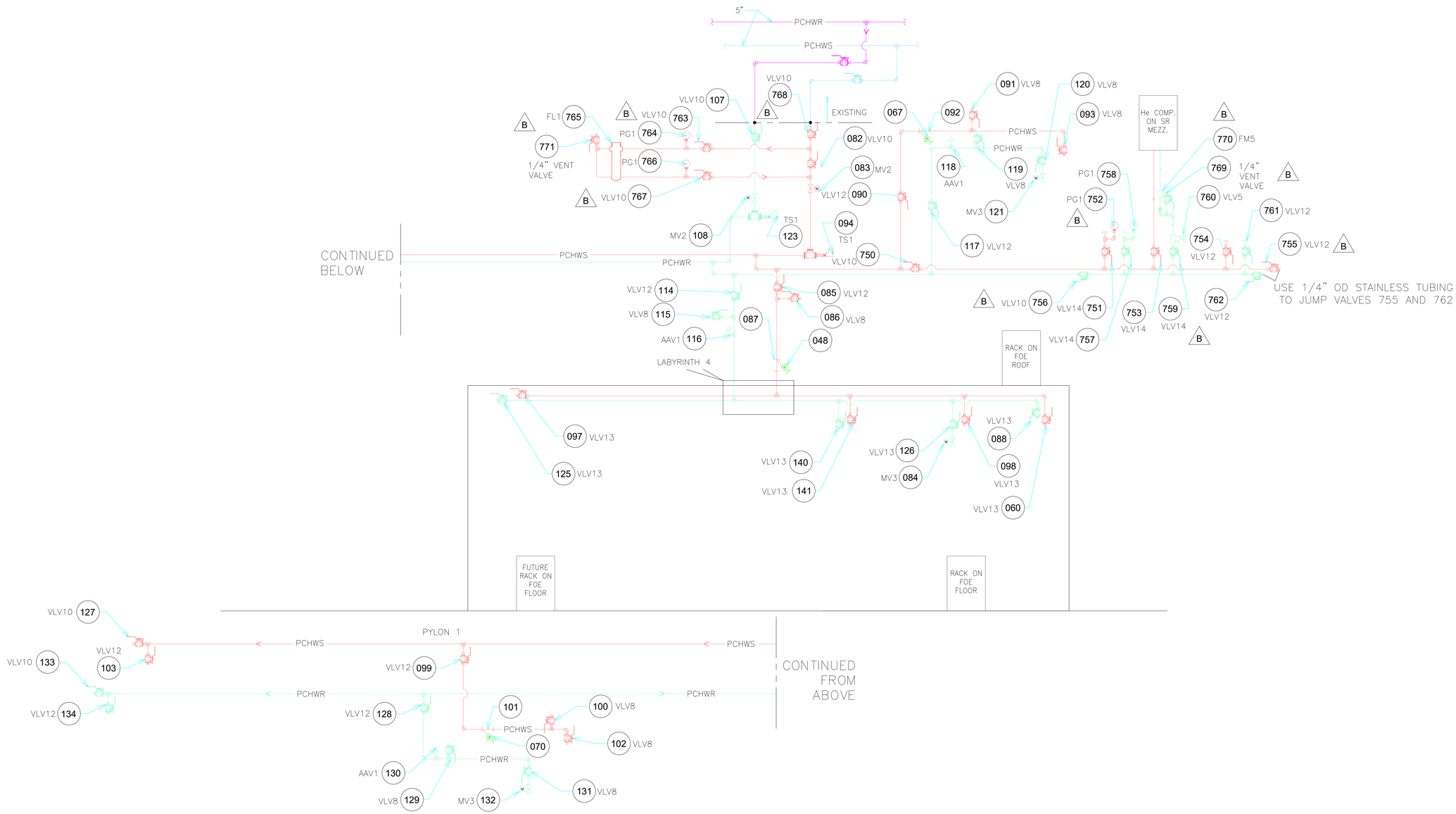
RELEASED – EFFECTIVE



D	PD-XFP-UT-1500	B
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A2		SHEET 3 OF 5

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RELEASED – EFFECTIVE

BEAMLINE XFP (17BM) MECHANICAL UTILITIES

DRAWING ID	DEVICE ID									COMMENT
1001	NOT USED									
1002	17BM	A	-	CUS	-	VLV	-	1002		
1003	17BM	A	-	CUS	-	MV	-	1003		
1004	17BM	A	-	CUS	-	TS	-	1004		
1005	17BM	A	-	CUS	-	VLV	-	1005		
1006	17BM	A	-	CUS	-	VLV	-	1006		
1007	17BM	A	-	CUS	-	VLV	-	1007		
1008	17BM	A	-	CUS	-	VLV	-	1008		
1009	17BM	A	-	CUS	-	PG	-	1009		
1010	17BM	A	-	CUS	-	VLV	-	1010		
1011	17BM	A	-	CUS	-	PG	-	1011		
1012	17BM	A	-	CUS	-	FL	-	1012		
1013	17BM	A	-	CUS	-	VLV	-	1013		
1014	17BM	A	-	CUS	-	VLV	-	1014		
1015	17BM	A	-	CUS	-	VLV	-	1015		
1016	17BM	A	-	CUS	-	VLV	-	1016		
1017	17BM	A	-	CUS	-	PG	-	1017		
1018	17BM	A	-	CUS	-	PT	-	1018		
1019	17BM	A	-	CUS	-	VLV	-	1019		
1020	17BM	A	-	CUR	-	VLV	-	1020		
1021	17BM	A	-	CUR	-	PG	-	1021		
1022	17BM	A	-	CUR	-	PT	-	1022		
1023	17BM	A	-	CUR	-	VLV	-	1023		
1024	17BM	A	-	CUR	-	VLV	-	1024		
1025	17BM	A	-	CUR	-	FM	-	1025		
1026	17BM	A	-	CUR	-	VLV	-	1026		
1027	17BM	A	-	CUR	-	VLV	-	1027		
1028	17BM	A	-	CUR	-	VLV	-	1028		
1029	17BM	A	-	CUR	-	VLV	-	1029		
1030	17BM	A	-	CUS	-	FM	-	1030		
1031	17BM	A	-	CUR	-	VLV	-	1031		
1032	17BM	A	-	CUR	-	VLV	-	1032		
1033	17BM	A	-	CUR	-	FM	-	1033		
1034	17BM	A	-	CUR	-	VLV	-	1034		
1035	17BM	A	-	CUR	-	VLV	-	1035		
1036	17BM	A	-	CUR	-	VLV	-	1036		
1037	17BM	A	-	CUR	-	VLV	-	1037		
1038	17BM	A	-	CUR	-	PG	-	1038		
1039	17BM	A	-	CUR	-	VLV	-	1039		
1040	17BM	A	-	CUR	-	FL	-	1040		
1041	17BM	A	-	CUR	-	VLV	-	1041		
1042	17BM	A	-	CUR	-	PG	-	1042		
1043	17BM	A	-	CUR	-	FM	-	1043		
1044	17BM	A	-	CUR	-	TS	-	1044		
1045	17BM	A	-	CUR	-	MV	-	1045		
1046	17BM	A	-	CUR	-	VLV	-	1046		
1047	17BM	A	-	CA	-	VLV	-	1047		
1048	17BM	R	-	PCHWS	-	VLV	-	1048		
1049	17BM	R	-	CA	-	VLV	-	1049		
1050	17BM	R	-	CA	-	VLV	-	1050		
1051	17BM	R	-	CA	-	VLV	-	1051		
1052	17BM	R	-	CA	-	VLV	-	1052		
1053	17BM	R	-	CA	-	PG	-	1053		
1054	17BM	R	-	CA	-	FL	-	1054		
1055	17BM	R	-	CA	-	VLV	-	1055		
1056	17BM	R	-	CA	-	PG	-	1056		
1057	17BM	R	-	CA	-	VLV	-	1057		
1058	17BM	R	-	CA	-	PRV	-	1058		
1059	17BM	R	-	CA	-	VLV	-	1059		
1060	17BM	A	-	PCHWS	-	VLV	-	1060		
1061	17BM	R	-	GN2	-	VLV	-	1061		
1062	17BM	A	-	GN2	-	VLV	-	1062		
1063	17BM	A	-	GN2	-	VLV	-	1063		
1064	17BM	A	-	GN2	-	VLV	-	1064		
1065	17BM	F	-	CA	-	VLV	-	1065		
1066	17BM	F	-	CA	-	VLV	-	1066		
1067	17BM	R	-	PCHWS	-	VLV	-	1067		
1068	17BM	F	-	GN2	-	VLV	-	1068		
1069	17BM	F	-	GN2	-	VLV	-	1069		
1070	17BM	F	-	PCHWS	-	VLV	-	1070		
1071	17BM	A	-	CA	-	VLV	-	1071		
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1076	17BM	A	-	CA	-	PG	-	1076		
1077	17BM	A	-	CA	-	VLV	-	1077		
1078	17BM	A	-	CA	-	PRV	-	1078		
1079	17BM	A	-	CA	-	VLV	-	1079		
1080	17BM	A	-	CA	-	VLV	-	1080		
1081	17BM	A	-	CA	-	VLV	-	1081		
1082	17BM	R	-	PCHWS	-	VLV	-	1082		
1083	17BM	R	-	PCHWS	-	MV	-	1083		
1084	17BM	A	-	PCHWR	-	MV	-	1084		
1085	17BM	R	-	PCHWS	-	VLV	-	1085		
1086	17BM	R	-	PCHWS	-	VLV	-	1086		
1087	17BM	R	-	PCHWS	-	STR	-	1087		
1088	17BM	A	-	PCHWR	-	VLV	-	1088		
1089	NOT USED									
1090	17BM	R	-	PCHWS	-	VLV	-	1090		
1091	17BM	R	-	PCHWS	-	VLV	-	1091		
1092	17BM	R	-	PCHWS	-	STR	-	1092		
1093	17BM	R	-	PCHWS	-	VLV	-	1093		
1094	17BM	R	-	PCHWS	-	TS	-	1094		
1095	NOT USED									
1096	NOT USED									
1097	17BM	A	-	PCHWS	-	VLV	-	1097		
1098	17BM	A	-	PCHWS	-	VLV	-	1098		
1099	17BM	F	-	PCHWS	-	VLV	-	1099		
1100	17BM	F	-	PCHWS	-	VLV	-	1100		
1101	17BM	F	-	PCHWS	-	STR	-	1101		
1102	17BM	F	-	PCHWS	-	VLV	-	1102		
1103	17BM	F	-	PCHWS	-	VLV	-	1103		
1104	NOT USED									
1105	NOT USED									
1106	NOT USED									
1107	17BM	R	-	PCHWR	-	VLV	-	1107		
1108	17BM	R	-	PCHWR	-	MV	-	1108		
1109	NOT USED									
1110	NOT USED									
1111	NOT USED									
1112	NOT USED									
1113	NOT USED									
1114	17BM	R	-	PCHWR	-	VLV	-	1114		
1115	17BM	R	-	PCHWR	-	VLV	-	1115		
1116	17BM	R	-	PCHWR	-	AAV	-	1116		
1117	17BM	R	-	PCHWR	-	VLV	-	1117		
1118	17BM	R	-	PCHWR	-	AAV	-	1118		
1119	17BM	R	-	PCHWR	-	VLV	-	1119		
1120	17BM	R	-	PCHWR	-	VLV	-	1120		
1121	17BM	R	-	PCHWR	-	MV	-	1121		
1122	NOT USED									
1123	17BM	R	-	PCHWR	-	TS	-	1123		
1124	NOT USED									
1125	17BM	A	-	PCHWR	-	VLV	-	1125		
1126	17BM	A	-	PCHWR	-	VLV	-	1126		
1127	17BM	F	-	PCHWS	-	VLV	-	1127		
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1132	17BM	F	-	PCHWR	-	MV	-	1132		
1133	17BM	F	-	PCHWR	-	VLV	-	1133		
1134	17BM	F	-	PCHWR	-	VLV	-	1134		
1135	NOT USED									
1136	NOT USED									
1137	NOT USED									
1138	NOT USED									
1139	17BM	A	-	GN2	-	VLV	-	1139		
1140	17BM	A	-	PCHWR	-	VLV	-	1140		
1141	17BM	A	-	PCHWS	-	VLV	-	1141		
1742	17BM		-	GN2	-	VLV	-	1742		EXISTING
5385	C18		-	CA	-	VLV	-	5385		EXISTING
5315	C18		-	CUS	-	VLV	-	5315		EXISTING
5329	C18		-	CUR	-	VLV	-	5329		EXISTING
1750	17BM	R	-	PCHWS	-	VLV	-	1750		
1751	17BM	R	-	PCHWS	-	VLV	-	1751		
1752	17BM	R	-	PCHWS	-	PG	-	1752		
1753	17BM	R	-	PCHWS	-	VLV	-	1753		
1754	17BM	R	-	PCHWS	-	VLV	-	1754		
1755	17BM	R	-	PCHWS	-	VLV	-	1755		
1756	17BM	R	-	PCHWR	-	VLV	-	1756		
1757	17BM	R	-	PCHWR	-	VLV	-	1757		
1758	17BM	R	-	PCHWR	-	PG	-	1758		
1759	17BM	R	-	PCHWR	-	VLV	-	1759		
1760	17BM	R	-	PCHWR	-	VLV	-	1760		
1761	17BM	R	-	PCHWR	-	VLV	-	1761		
1762	17BM	R	-	PCHWR	-	VLV	-	1762		
1763	17BM	R	-	PCHWS	-	VLV	-	1763		
1764	17BM	R	-	PCHWS	-	PG	-	1764		
1765	17BM	R	-	PCHWS	-	FL	-	1765		
1766	17BM	R	-	PCHWS	-	PG	-	1766		
1767	17BM	R	-	PCHWS	-	VLV	-	1767		
1768	17BM	R	-	PCHWS	-	VLV	-	1768		
1769	17BM	R	-	PCHWR	-	VLV	-	1769		
1770	17BM	R	-	PCHWR	-	FM	-	1770		
1771	17BM	R	-	PCHWS	-	VLV	-	1771		

SHEET SIZE	DRAWING/PART NUMBER	REVISION
D	PD-XFP-UT-1500	B
ESH&Q RISK LEVEL A2	SHEET 4 OF 5	

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RELEASED – EFFECTIVE

XFP VALVE SCHEDULE						
MV1	ELECTRIC ON/OFF	1"	FNPT	WORCESTER	4466U-SE/1075WM2	SERIES 44, 3 PIECE VALVE WITH UHMWPE SEATS AND BODY SEALS, 75 SERIES ELECTRIC ACTUATOR IN 24 VDC, WITH SIDE MOUNTED MANUAL OVERRIDE, PERPENDICULAR LOW PROFILE MOUNTING, AND LOCK IN LAST POSITION, IN PLACE FAIL ACTION, 2 LIMIT SWITCHES
MV2	ELECTRIC ON/OFF	1-1/2"	FNPT	BELLIMO	B240+ARB24-3-S	BRONZE CHARACTERIZED BALL VALVE WITH SS BALL AND STEM, ELECTRIC ACTUATOR IN 24 VDC, IN PLACE FAIL ACTION
MV3	ELECTRIC ON/OFF	1/2"	FNPT	BELLIMO	B240+ARB24-3-S	BRONZE CHARACTERIZED BALL VALVE WITH SS BALL AND STEM, ELECTRIC ACTUATOR IN 24 VDC, IN PLACE FAIL ACTION
VLV1	MANUAL BALL	1/2"	FNPT X COMPRESSION	SWAGELOK	SS-63ES8-F8-JL	3 PIECE, LEVER LOCKING HANDLE, UHMWPE SEATS & BODY SEALS
VLV2	MANUAL BALL	1"	FEMALE NPT	SWAGELOK	SS-65EF16-JL	3 PIECE, LEVER LOCKING HANDLE, UHMWPE SEATS & BODY SEALS
VLV3	INSTRUMENTATION	1/4"	FNPT	SWAGELOK	SS-43GEF4-LL	3 PIECE, LEVER LOCKING HANDLE, UHMWPE SEATS & BODY SEALS
VLV4	MANUAL GLOBE	1"	FNPT	APOLLO	60A-705-09-24	LOCKABLE TEE HANDLE WITH GRAPHOIL PACKING
VLV5	MANUAL GLOBE	1/2"	FNPT	APOLLO	60A-703-07-09-24	LOCKABLE TEE HANDLE WITH GRAPHOIL PACKING
VLV6	MANUAL BALL	1/2"	COMPRESSION	SWAGELOK	SS-63ES8-JL	3 PIECE, LEVER LOCKING HANDLE, UHMWPE SEATS & BODY SEALS
VLV7	MANUAL BALL	1/2"	SWEAT	WORCESTER	1/2" K4411UUTE	3 PIECE, LEVER LOCKING HANDLE, UHMWPE SEATS & BODY SEALS
VLV8	MANUAL BALL	1/2"	SWEAT	APOLLO	70-243-27	2 PIECE; 316 SS BALL & STEM; SS LATCH LOCK LEVER & NUT
VLV9	INSTRUMENTATION	1/4"	SWEAT	APOLLO	70-241-27	2 PIECE; 316 SS BALL & STEM; SS LATCH LOCK LEVER & NUT
VLV10	MANUAL BALL	1-1/2"	SWEAT	APOLLO	70-247-27	2 PIECE; 316 SS BALL & STEM; SS LATCH LOCK LEVER & NUT
VLV11	MANUAL BALL	3/4"	SWEAT	APOLLO	70-244-27	2 PIECE; 316 SS BALL & STEM; SS LATCH LOCK LEVER & NUT
VLV12	MANUAL BALL	1"	SWEAT	APOLLO	70-245-27	2 PIECE; 316 SS BALL & STEM; SS LATCH LOCK LEVER & NUT
VLV14	MANUAL BALL	1/2"	NPT	APOLLO	70-143-27	2 PIECE; 316 SS BALL & STEM; SS LATCH LOCK LEVER & NUT

XFP INSTRUMENTATION SCHEDULE						
ID	TYPE	SERVICE	SIZE	MAKE	MODEL	DESCRIPTION
PG1	PRESSURE GAUGE	WATER, AIR, & GAS	1/4" FNPT	MCMASTER	3902K11	2.5" DIAL WITH BOTTOM PORT
TS1	TEMPERATURE SENSOR	DI & PCHW WATER	1/2" MNPT	ROSEMOUNT	0078-D-21-N-00-A-030-T44-A-X8-Q4	PLATINUM IEC CLASS A SENSOR
FL1	WATER FILTER	DI WATER/PCHW	1" FNPT	FILTERSOURCE	OMG-20C-1.0	FM-BB-20-1A 1 MICRON CARTRIDGE DI/ 5 MICRON PCHW
PT1	GAUGE TRANSMITTER	DI WATER	1/4" MNPT	SETRA	3100B150PG02B	0-150 PSIG; 4-20 MA SIGNAL
FM1	FLOW METER	DI WATER	1/2" FNPT	KOBOLD	0.3-2.8 GPM	RCD-1292GN4C34P
FM2	FLOW METER	DI WATER	1/2" FNPT	KOBOLD	0.3-2.8 GPM	RCD-1292GN4C34P
FM3	FLOW METER	DI WATER	1/2" FNPT	KOBOLD	0.3-2.8 GPM	RCD-1292GN4C34P
FM4	FLOW METER	DI WATER	1" FNPT	KOBOLD	2.0 - 15.0 GPM	RCD-1214GN6C34P
FM5	FLOW METER	PCHW WATER	1/2" FNPT	KOBOLD	0.4 - 2.6 GPM	DVZ-11U3N4C34P
PRV1	RELIEF VALVE	COMPRESSED AIR	1/4" MNPT	MCMASTER	9889K25	85 PSIG POP
FL2	AIR FILTER/REGULATOR	COMPRESSED AIR	1/2" FNPT	PARKER	FB11-04WGC-SS	0-125 PSIG REGULATION; 5 MICRON FILTRATION; 0-72 SCFM
AAV1	AUTO AIR VENT	PCHW	1" FNPT	SPIROVENT	VJR100TM	

D:\MECH-ENGL\TPD\XFP\UT\PD-XFP-UT-1500.DWG

D SHEET SIZE	PD-XFP-UT-1500 DRAWING/PART NUMBER	B REVISION
ESH&Q RISK LEVEL A2		SHEET 5 OF 5

RELEASED – EFFECTIVE