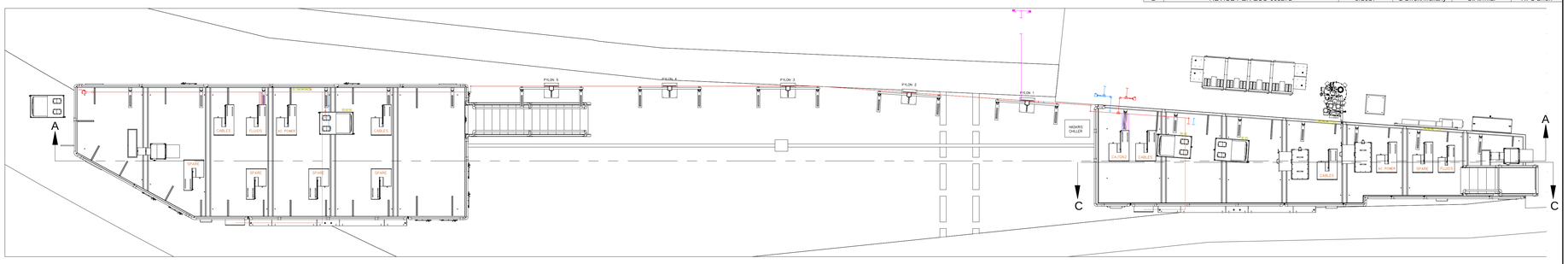
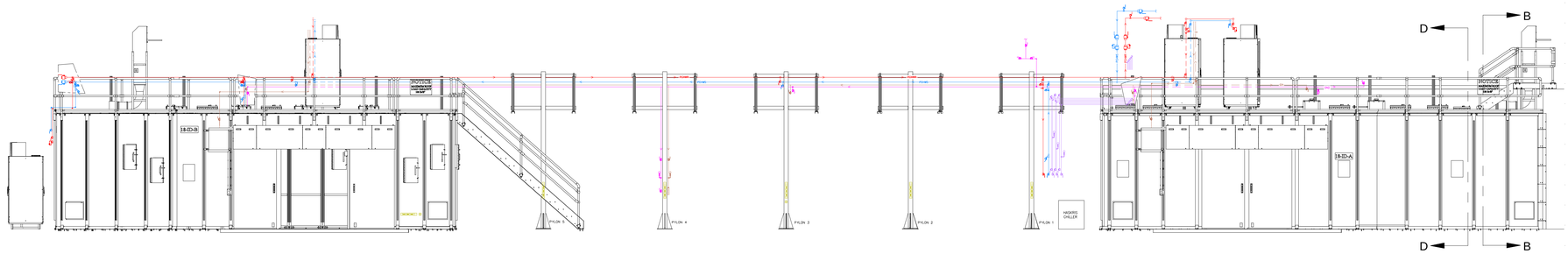
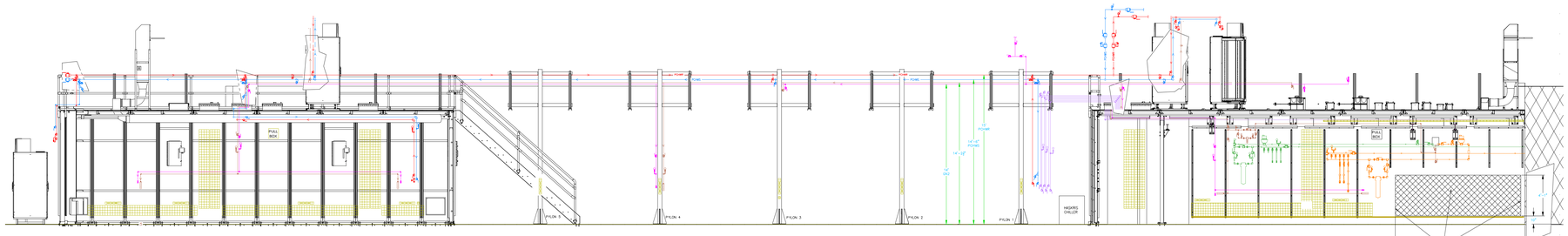
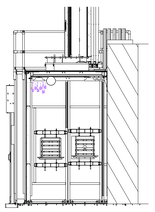
REVISION HISTORY					
REV	DESCRIPTION	DATE	DESIGNER	CHECKED BY	ENGINEER
A	RELEASE PER ECO-004716	2/2017	O'Brien/Mullany	C. Amarito	R. O'Brien
B	REVISE PER ECO-005271	9/2017	O'Brien/Mullany	C.A./M.L.	R. O'Brien



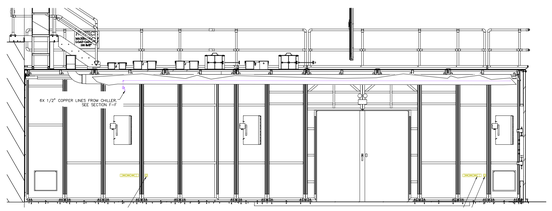




SECTION A-A



SECTION D-D



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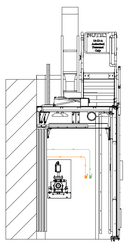


SECTION B-B

OVERALL PIPING LAYOUT
SEE SEPARATE PIPING SHEETS FOR DETAILS

HIGH CAPACITY COMPRESSED AIR LINE ONLY
SHOWN SCHEMATICALLY

NOTES:

1. ALL UTILITY PIPING ABOVE STAY CLEAR AREA MUST BE TURNED INBOARD AND INSTALLED AS CLOSE AS POSSIBLE TO WALL TO PROVIDE CLEARANCE FOR REMOVAL OF MIRROR LID.
2. ALL UTILITY PIPING TO BE RUN ON THE INBOARD SIDE OF PYLONS.
3. ENSURE THAT ALL VALVE HANDLES ARE OPERATIONAL AND ARE NOT IN CONFLICT WITH ANY ADJACENT PIPING OR VALVES.
4. MOUNTING FOR ALL PIPING IN PYLON AREAS WILL BE FIELD ERECTED UNISTRUT SUPPORT STRUCTURE.
5. ALL DIMENSIONS SHOWN ARE INTENDED TO CONVEY APPROXIMATE LOCATIONS. EXACT LOCATIONS ARE TO BE DETERMINED ACCORDING TO FIELD CONDITIONS AT TIME OF INSTALLATION.
6. INSTALL OWENS-CORNING 1.0" FIBERGLASS ASJ/SSL-II INSULATION ON PCHW SUPPLY AND RETURN INSIDE HUTCH B AND ALL PCHW SUPPLY LINES OUTSIDE THE HUTCHES. USE PRE-FABRICATED FITTING COVERS FROM JOHNS-MANVILLE AND SELF-SEALING FACING TABS WITH A MINIMUM OF 1 INCH JOINT OVERLAP.
7. COPPER TUBING SHALL BE ASTM B-88 TYPE L. SOLDERED JOINTS SHALL USE ASTM-B32 SOLDER, 95% TIN 5% ANTIMONY SOLDER (STAY BRITE #8) WITH WROUGHT COPPER FITTINGS IAW ASME B16.22.

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
DIMENSIONS IN BRACKETS (x.x) ARE IN MILLIMETERS AND ARE FOR REFERENCE ONLY
INTERPRET DRAWING AS PER ANSI Y14.5-1994 OR Y32.3-1975

DIMENSIONAL TOLERANCES	ANGULAR TOLERANCE
X. ± 0.060	± .5°
.X ± 0.030	
.XX ± 0.015	FINISH
.XXX ± 0.005	125

BREAK EDGES & SHARP CORNERS 0.005 MIN. TO 0.030 MAX.

THIRD ANGLE PROJECTION

SCALE: SEE VIEWS

BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN SCIENCE ASSOCIATES
UPTON, NEW YORK 11973
Exploring Life's Mysteries, Protecting Its Future

DRAWN BY	B. Mullany	6/2016
CHECKED BY		6/2016
VACUUM APPROVAL	N/A	N/A
ENGINEER APPROVAL	R. O'Brien	6/2016
SUPERVISOR APPROVAL	J. Gosman	6/2016
ESAH APPROVAL	L. STIEGLER	6/2016
QA APPROVAL	J. Zipper	6/2016

WBS# 6.13.04.02

NSLSII NATIONAL SYNCHROTRON LIGHT SOURCE II

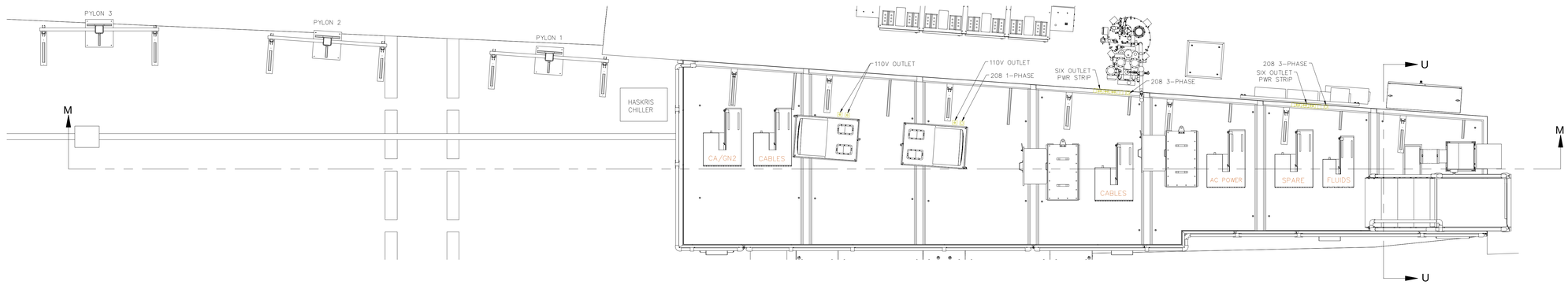
PHOTON DIVISION
FXI BEAMLINE, UTILITIES
UTILITIES INSTALLATION, 18-ID

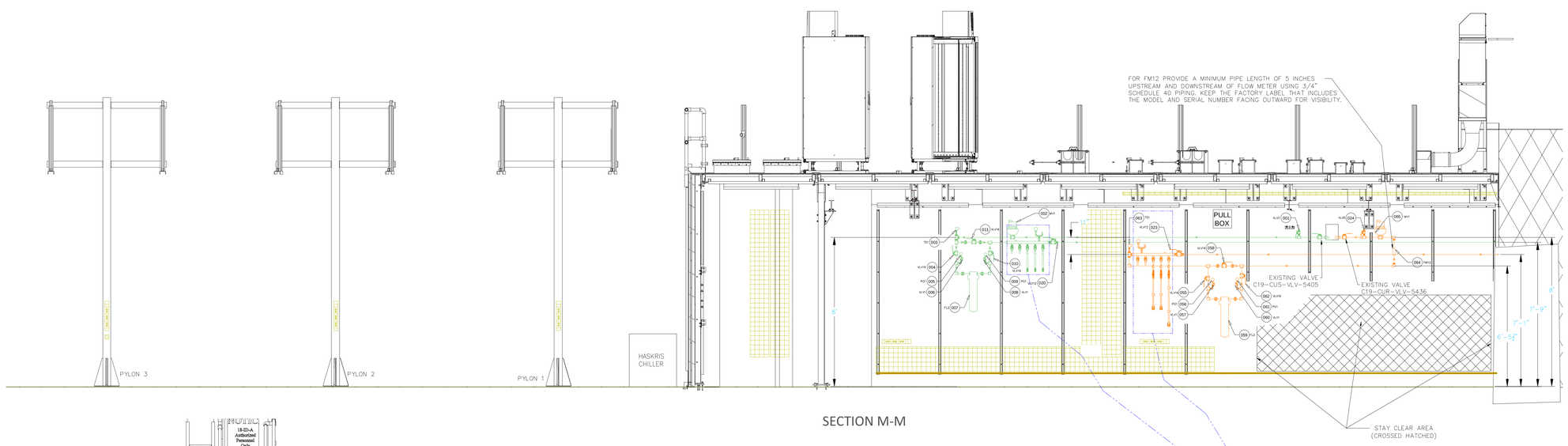
SHEET SIZE	DRAWING/PART NUMBER	REVISION
E	PD-FXI-UT-1500	B

ESH&Q RISK LEVEL A-2 SHEET 1 OF 11

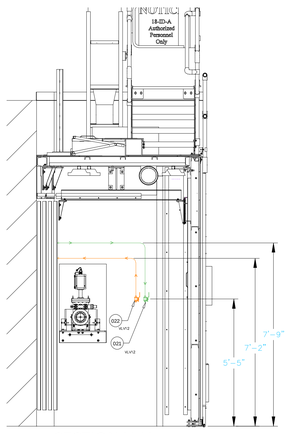
NEXT ASSY:
PROJECT:

RELEASED – EFFECTIVE



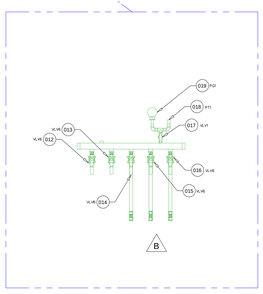


SECTION M-M

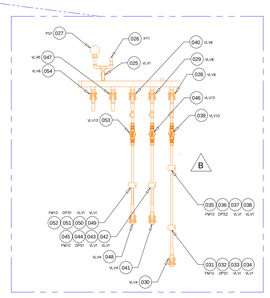


SECTION U-U

DI WATER INSIDE THE FOE
RUN ALL DI PIPING AS CLOSE TO WALL AS POSSIBLE WITH DI RETURN ON THE INBOARD SIDE
(CLOSEST TO WALL).



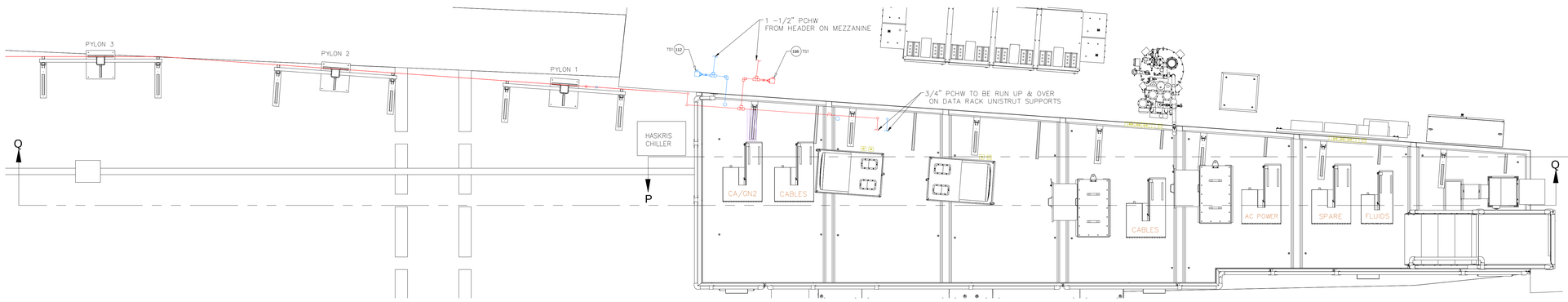
DETAIL Y
DI SUPPLY MANIFOLD



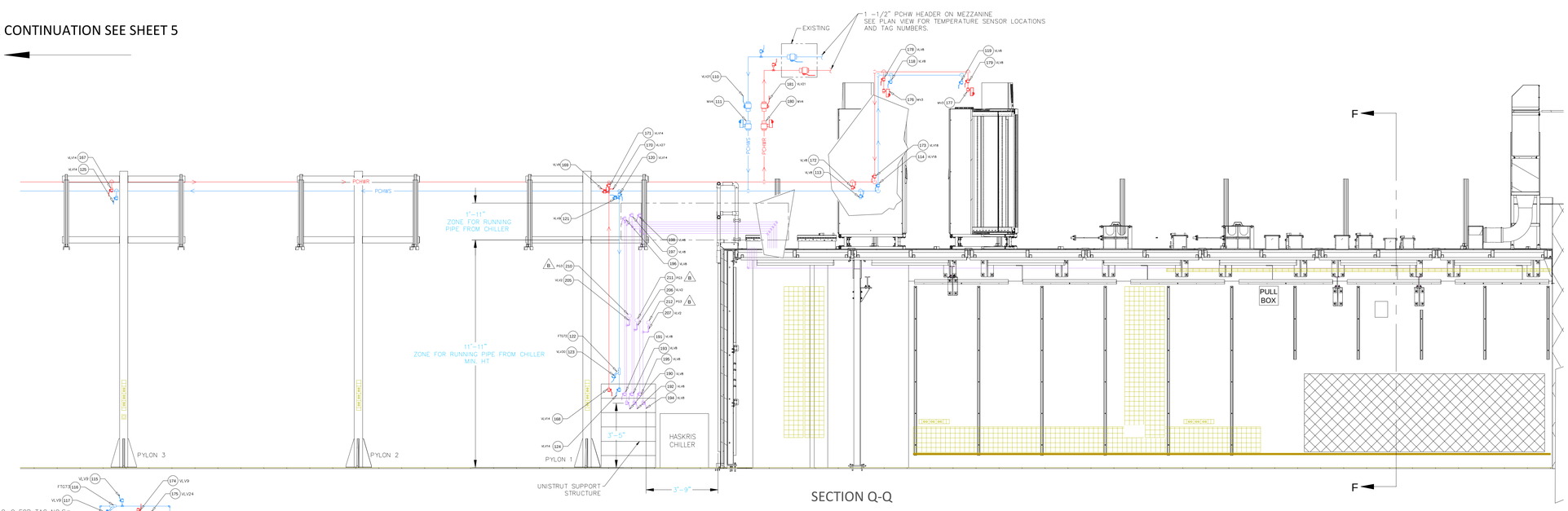
DETAIL Z
DI RETURN MANIFOLD

E	PD-FXI-UT-1500	B
SHEET NO.	DRAWING/SHEET NUMBER	REVISION
ESH&Q RISK LEVEL A-2	SHEET 2 OF 11	

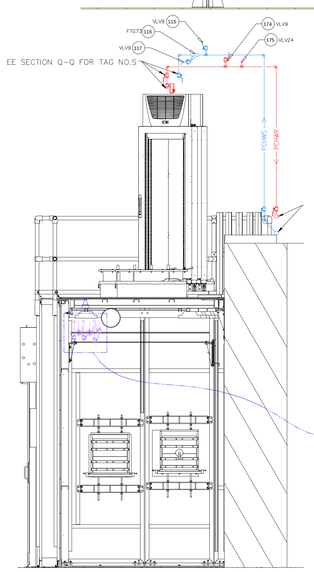
RELEASED – EFFECTIVE



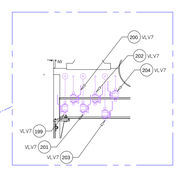
FOR CONTINUATION SEE SHEET 5



SECTION Q-Q

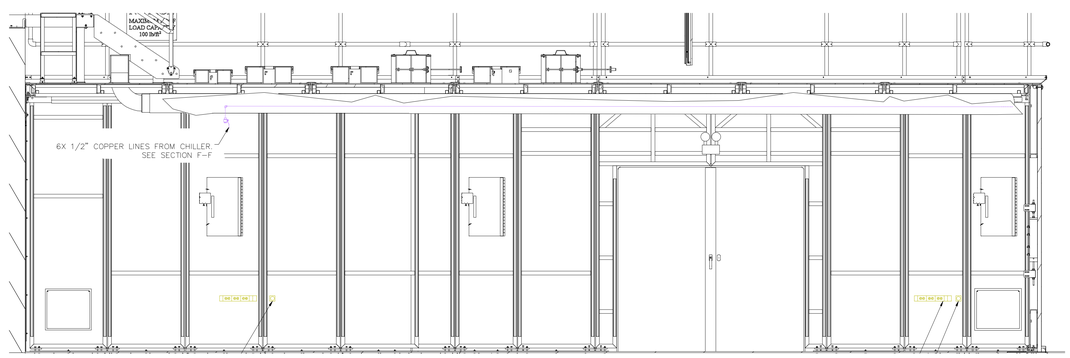


SECTION F-F



DETAIL A

PIPING FROM CHILLER TO BE INSTALLED BASED ON FIELD CONDITIONS AND MAY VARY FROM WHAT IS SHOWN.

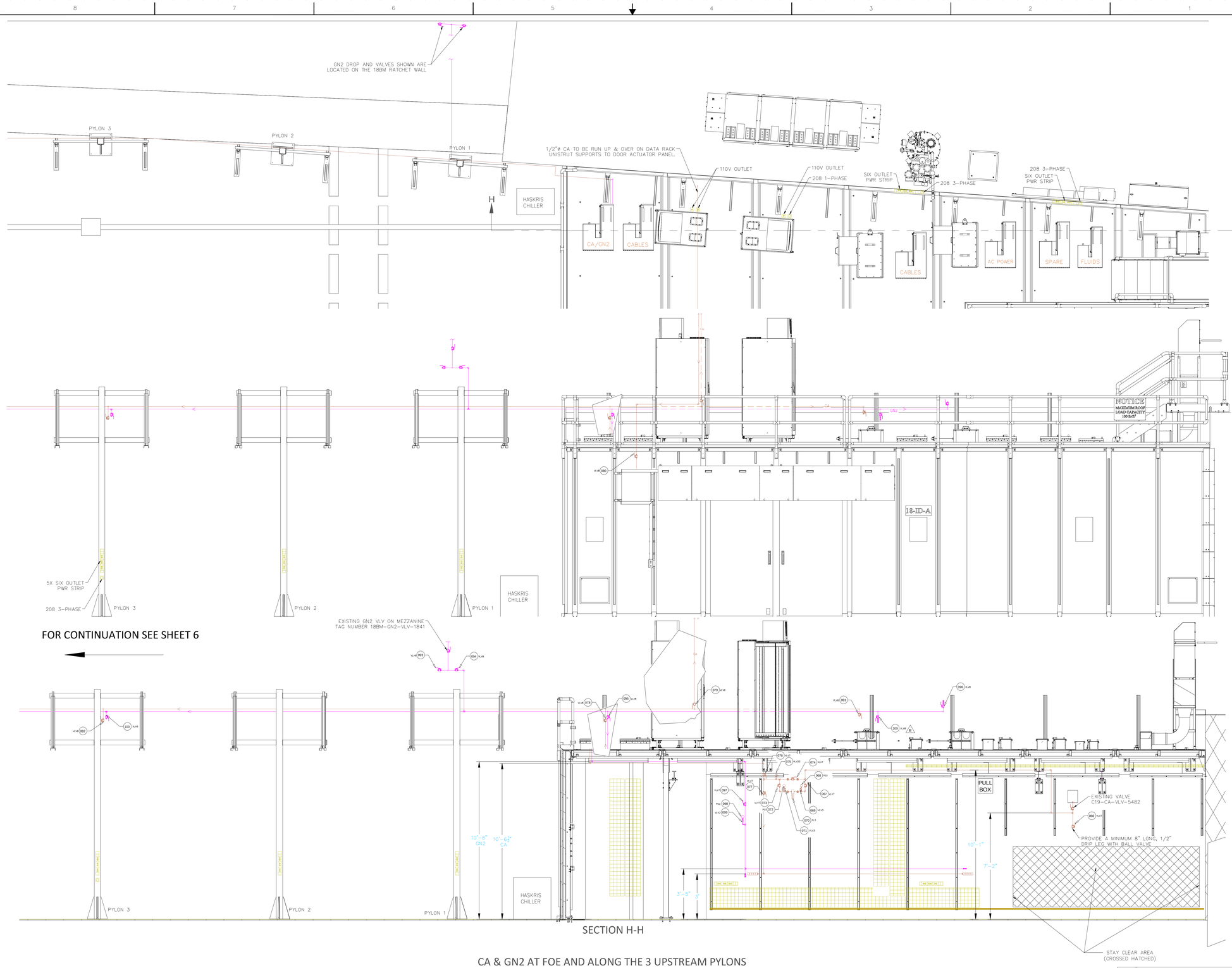


SECTION P-P (ROTATED FOR CLARITY)

PCHW AT FOE AND ALONG THE 3 UPSTREAM PYLONS

E	PD-FXI-UT-1500	B
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A-2		SHEET 3 OF 11

RELEASED – EFFECTIVE



FOR CONTINUATION SEE SHEET 6

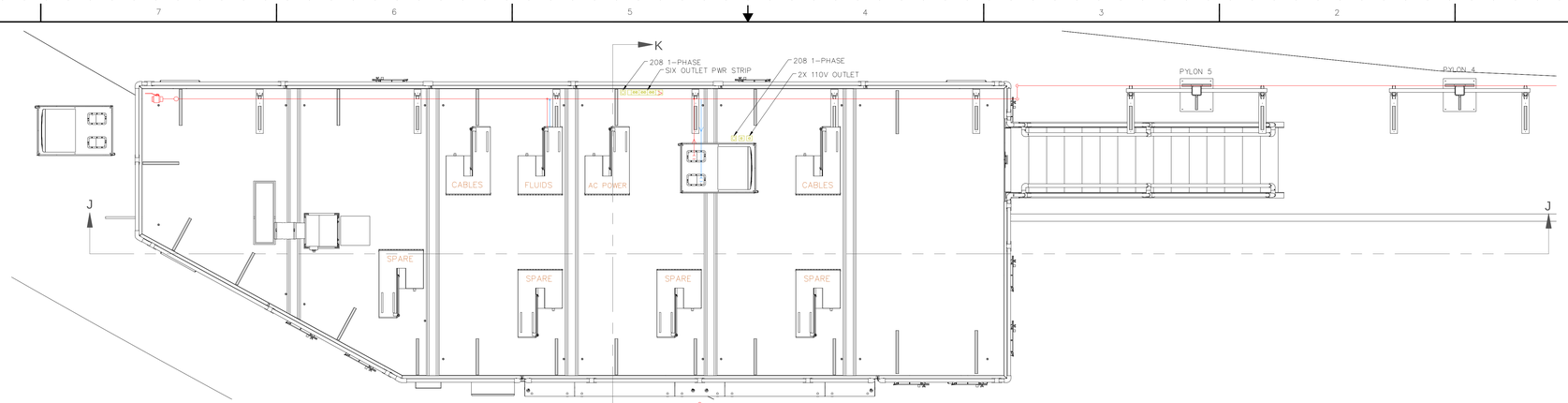
SECTION H-H

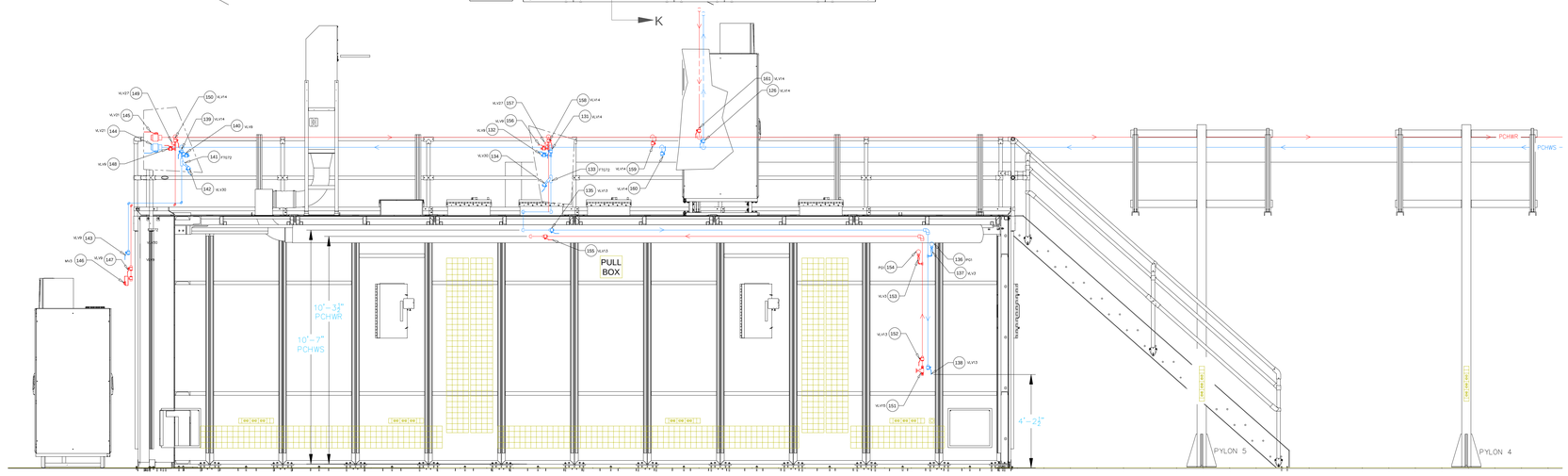
CA & GN2 AT FOE AND ALONG THE 3 UPSTREAM PYLONS

ALL PIPING INSIDE FOE TO BE INSTALLED ON INBOARD WALL SUPPORTED ONE UNISTRUT DEPTH OFF WALL .

E (SHEET SIZE)	PD-FXI-UT-1500 (DRAWING/PART NUMBER)	B (REVISION)
ES&HQ RISK LEVEL A-2		SHEET 4 OF 11

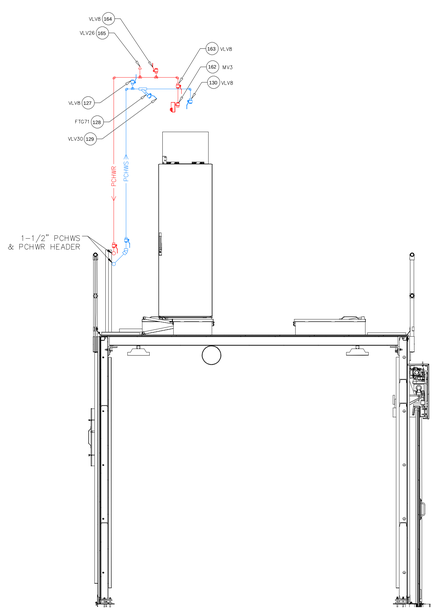
RELEASED – EFFECTIVE





SECTION J-J

BEAM DIRECTION



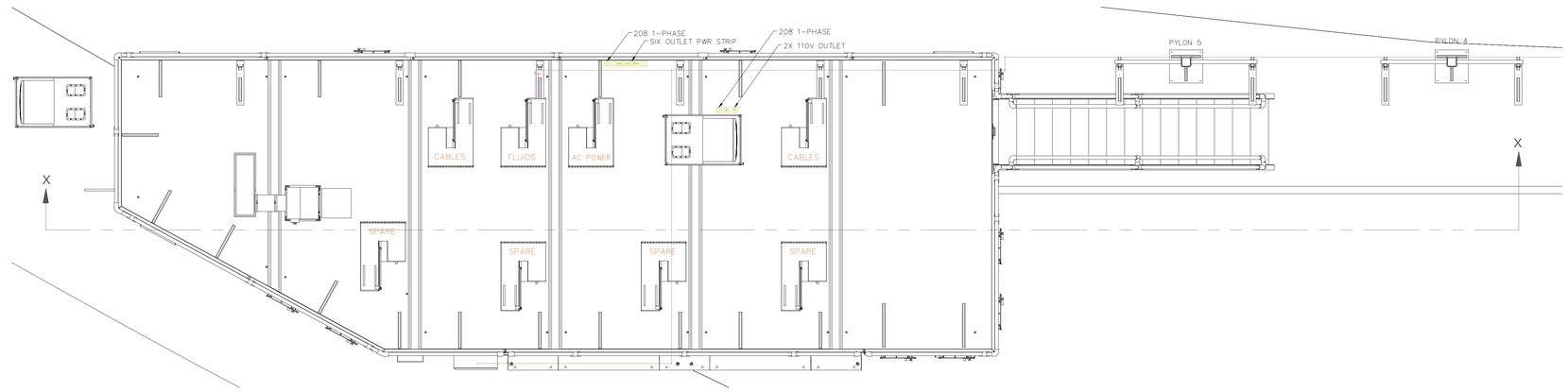
SECTION K-K (ROTATED FOR CLARITY)

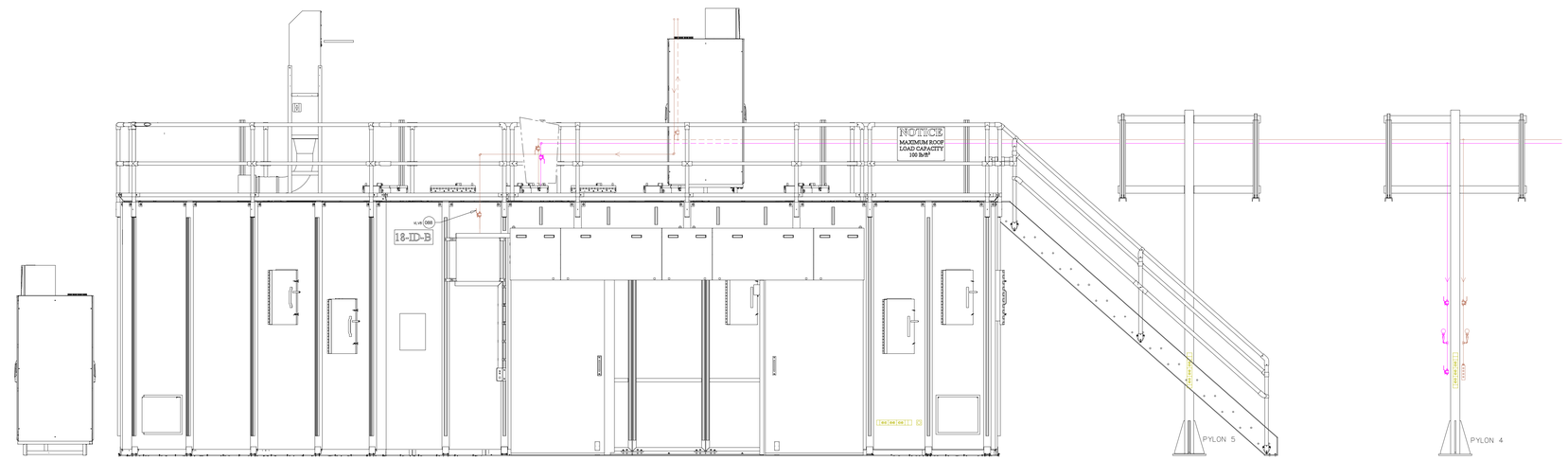
FOR CONTINUATION SEE SHEET 2

PCHW AT END STATION B AND ALONG THE 2 DOWNSTREAM PYLONS

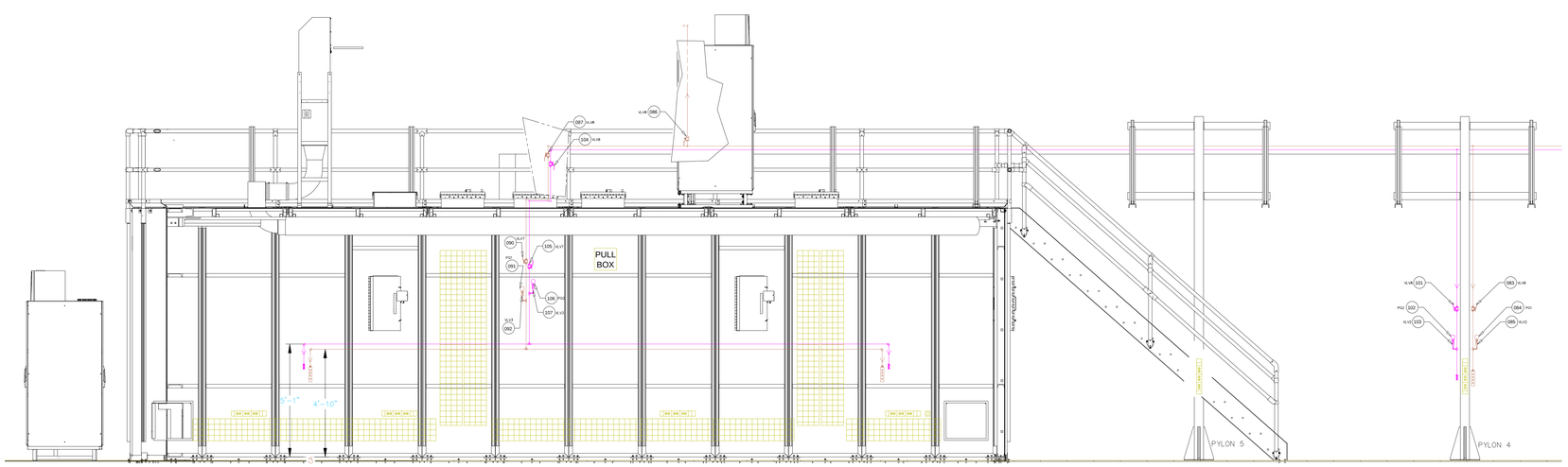
E	PD-FXI-UT-1500	B
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A-2		SHEET 5 OF 11

RELEASED – EFFECTIVE





FOR CONTINUATION SEE SHEET 3

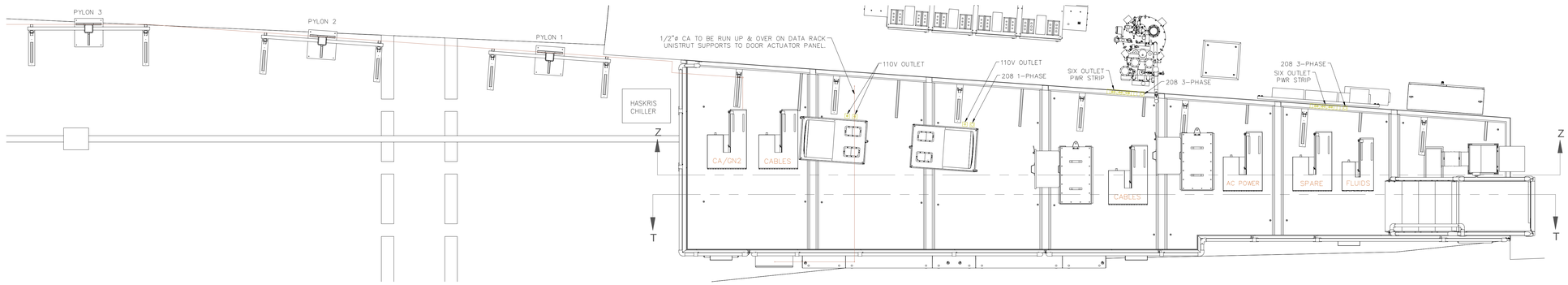


SECTION X-X

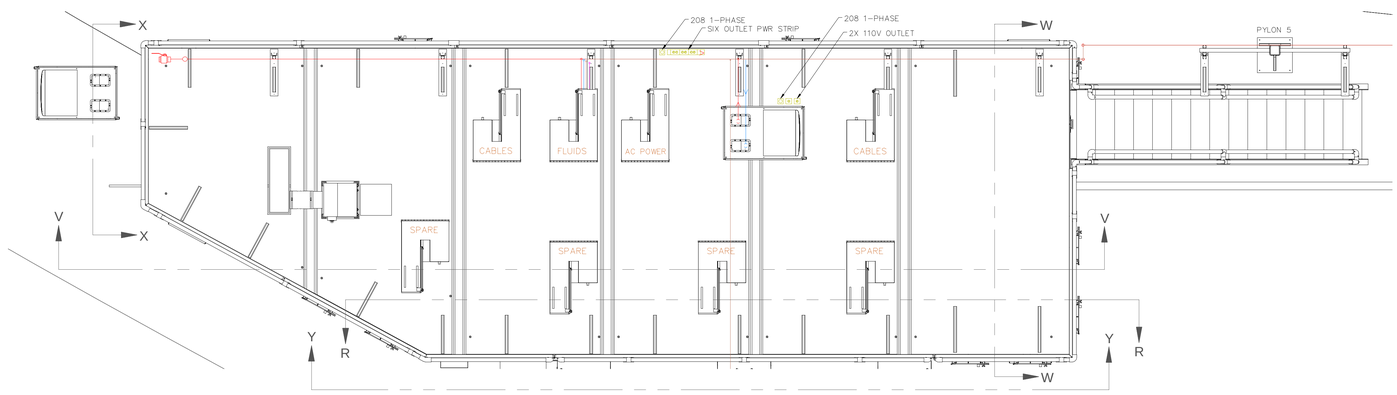
CA & GN2 AT END STATION B AND ALONG THE 2 DOWNSTREAM PYLONS

E	PD-FXI-UT-1500	B
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ES&HQ RISK LEVEL A-2	SHEET 6 OF 11	

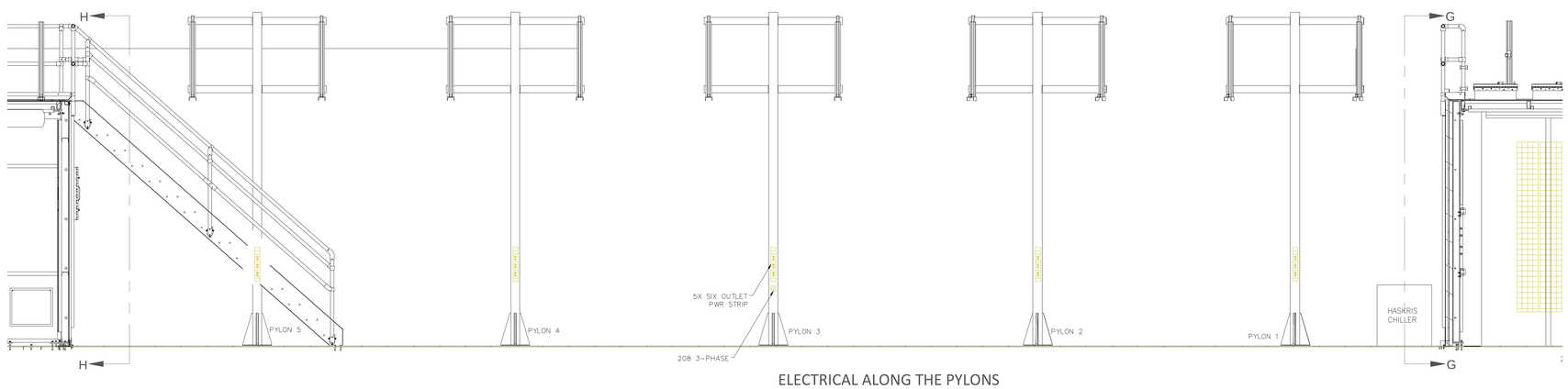
RELEASED – EFFECTIVE



ELECTRICAL ON ROOF OF FOE
½" = 1'-0"



ELECTRICAL ON ROOF OF B HUTCH
½" = 1'-0"

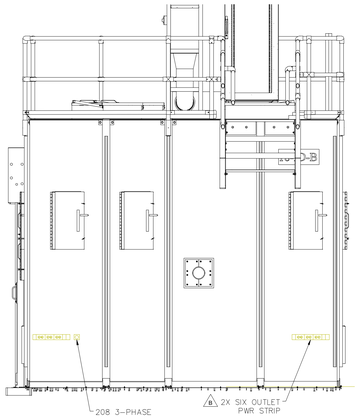


ELECTRICAL ALONG THE PYLONS
½" = 1'-0"

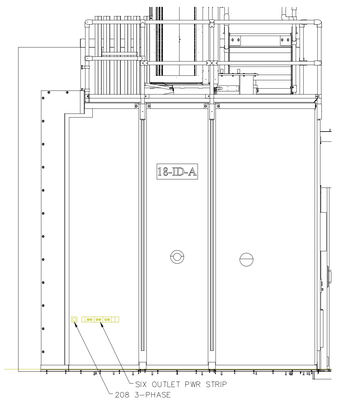
SEE SHEET 8 FOR SECTION VIEWS

E	PD-FXI-UT-1500	B
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A-2	SHEET 7 OF 11	

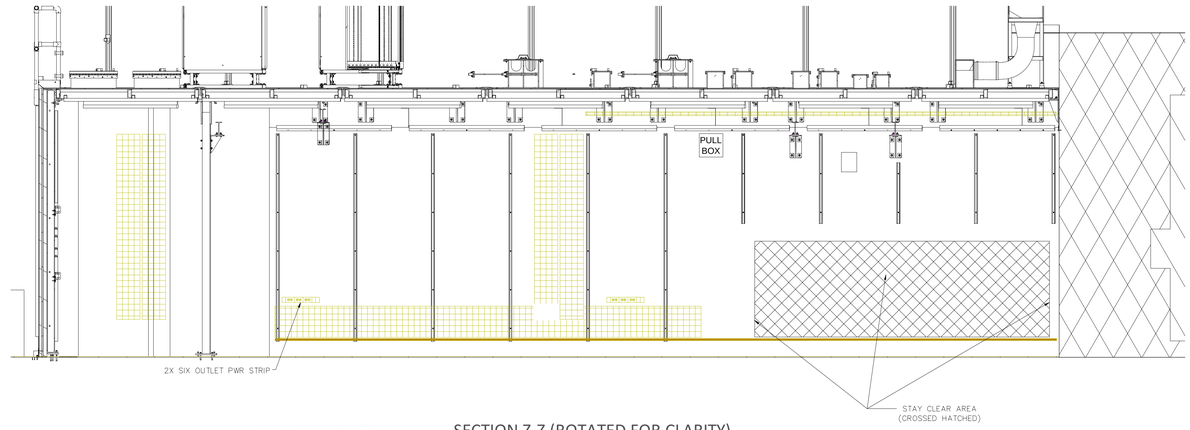
RELEASED – EFFECTIVE



VIEW H-H
ELECTRICAL OUTSIDE OF B HUTCH
UPSTREAM WALL

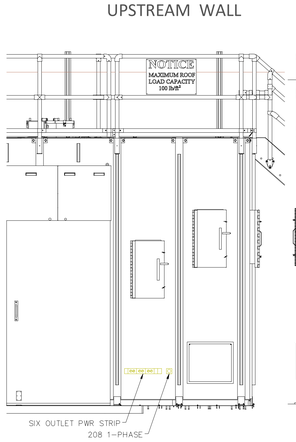


VIEW G-G
ELECTRICAL OUTSIDE OF FOE
DOWNSTREAM WALL

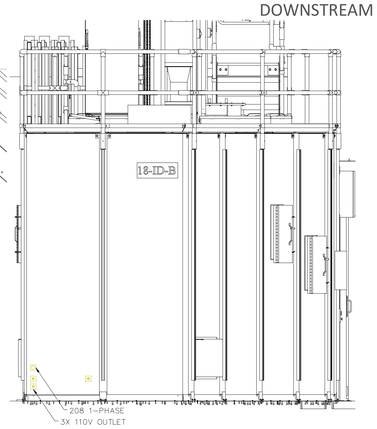


BEAM DIRECTION

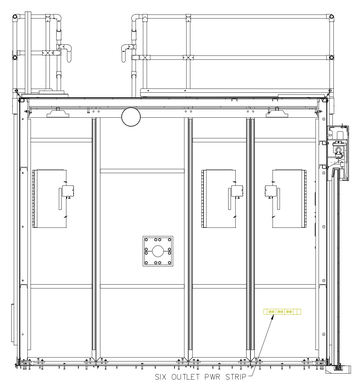
SECTION Z-Z (ROTATED FOR CLARITY)
ELECTRICAL IN FOE, INBOARD WALLS



PARTIAL VIEW Y-Y (ROTATED FOR CLARITY)
ELECTRICAL OUTSIDE OF B HUTCH
OUTBOARD WALL

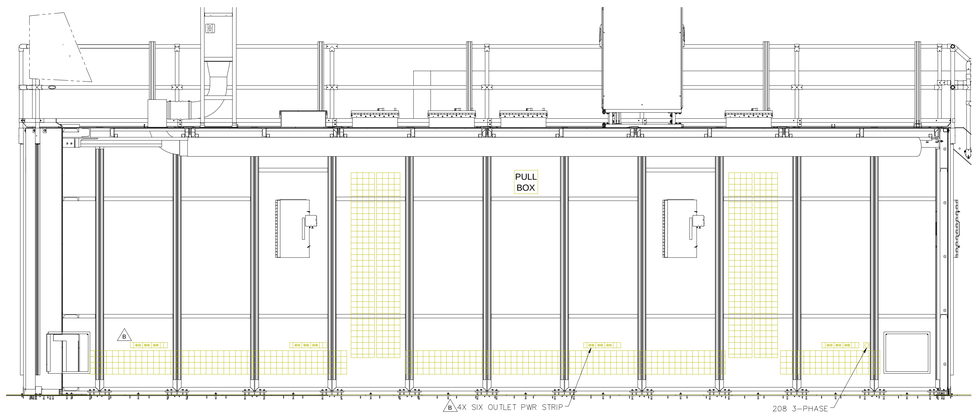


VIEW X-X (ROTATED FOR CLARITY)
ELECTRICAL OUTSIDE OF B HUTCH
DOWNSTREAM WALL

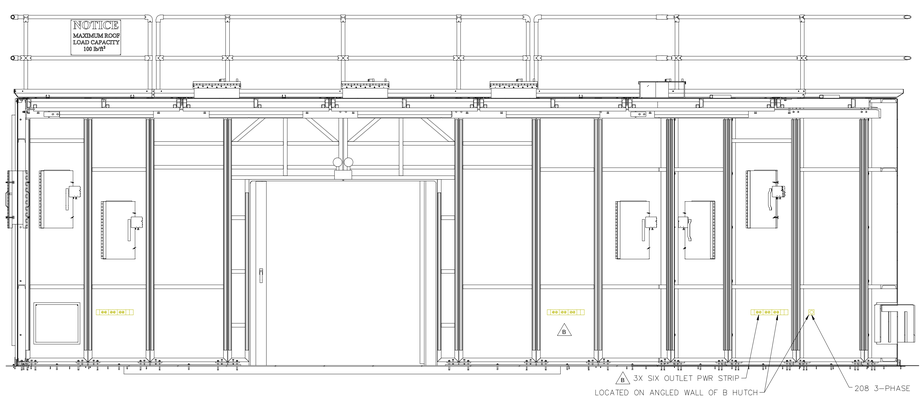


SECTION W-W (ROTATED FOR CLARITY)
ELECTRICAL INSIDE OF HUTCH B, UPSTREAM WALL

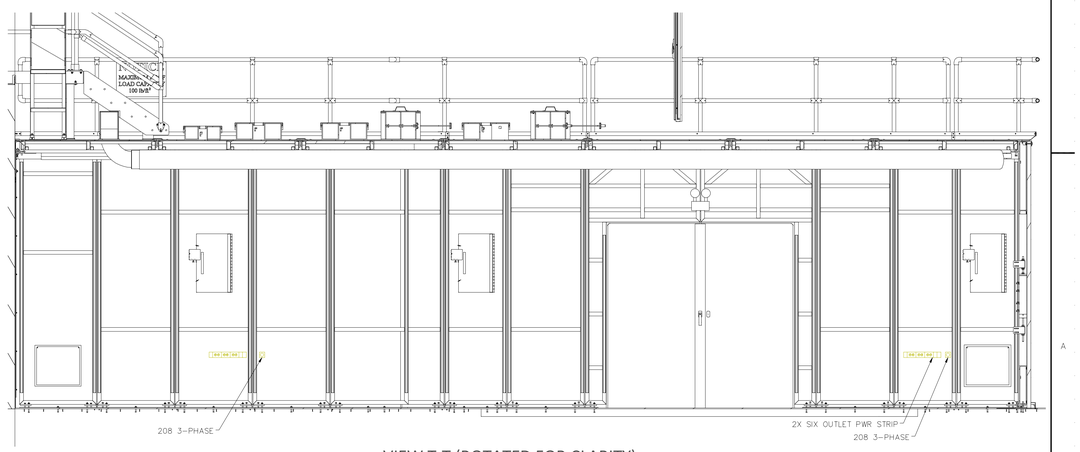
BEAM DIRECTION



SECTION V-V (ROTATED FOR CLARITY)
ELECTRICAL IN HUTCH B, INBOARD WALLS
$\frac{1}{2}$" = 1'-0"



VIEW R-R (ROTATED FOR CLARITY)
ELECTRICAL INSIDE OF HUTCH B, OUTBOARD WALLS
$\frac{1}{2}$" = 1'-0"



VIEW T-T (ROTATED FOR CLARITY)
ELECTRICAL INSIDE OF FOE, OUTBOARD WALLS

BEAM DIRECTION

E	PD-FXI-UT-1500	B
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A-2		SHEET 8 OF 11

RELEASED – EFFECTIVE

BEAMLINE FXI 18-ID MECHANICAL UTILITIES

DRAWING ID	DEVICE ID								COMMENT
1001	18ID	A	-	CUS	-	VLV	-	1001	
1002	18ID	A	-	CUS	-	MV	-	1002	
1003	18ID	A	-	CUS	-	TS	-	1003	
1004	18ID	A	-	CUS	-	VLV	-	1004	
1005	18ID	A	-	CUS	-	PG	-	1005	
1006	18ID	A	-	CUS	-	VLV	-	1006	
1007	18ID	A	-	CUS	-	FL	-	1007	
1008	18ID	A	-	CUS	-	VLV	-	1008	
1009	18ID	A	-	CUS	-	PG	-	1009	
1010	18ID	A	-	CUS	-	VLV	-	1010	
1011	18ID	A	-	CUS	-	VLV	-	1011	
1012	18ID	A	-	CUS	-	VLV	-	1012	
1013	18ID	A	-	CUS	-	VLV	-	1013	
1014	18ID	A	-	CUS	-	VLV	-	1014	
1015	18ID	A	-	CUS	-	VLV	-	1015	
1016	18ID	A	-	CUS	-	VLV	-	1016	
1017	18ID	A	-	CUS	-	VLV	-	1017	
1018	18ID	A	-	CUS	-	PT	-	1018	
1019	18ID	A	-	CUS	-	PG	-	1019	
1020	18ID	A	-	CUS	-	VLV	-	1020	
1021	18ID	A	-	CUS	-	VLV	-	1021	
1022	18ID	A	-	CUR	-	VLV	-	1022	
1023	18ID	A	-	CUR	-	VLV	-	1023	
1024	18ID	A	-	CUR	-	VLV	-	1024	
1025	18ID	A	-	CUR	-	VLV	-	1025	
1026	18ID	A	-	CUR	-	PT	-	1026	
1027	18ID	A	-	CUR	-	PG	-	1027	
1028	18ID	A	-	CUR	-	VLV	-	1028	
1029	18ID	A	-	CUR	-	VLV	-	1029	
1030	18ID	A	-	CUR	-	VLV	-	1030	
1031	18ID	A	-	CUR	-	FM	-	1031	
1032	18ID	R	-	CUR	-	DPS	-	1032	
1033	18ID	R	-	CUR	-	VLV	-	1033	
1034	18ID	R	-	CUR	-	VLV	-	1034	
1035	18ID	A	-	CUR	-	FM	-	1035	
1036	18ID	R	-	CUR	-	DPS	-	1036	
1037	18ID	R	-	CUR	-	VLV	-	1037	
1038	18ID	R	-	CUR	-	VLV	-	1038	
1039	18ID	A	-	CUR	-	VLV	-	1039	
1040	18ID	A	-	CUR	-	VLV	-	1040	
1041	18ID	A	-	CUR	-	VLV	-	1041	
1042	18ID	R	-	CUR	-	VLV	-	1042	
1043	18ID	R	-	CUR	-	VLV	-	1043	
1044	18ID	R	-	CUR	-	DPS	-	1044	
1045	18ID	A	-	CUR	-	FM	-	1045	
1046	18ID	A	-	CUR	-	VLV	-	1046	
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1048	18ID	A	-	CUR	-	VLV	-	1048	
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1056	18ID	A	-	CUR	-	PG	-	1056	
1057	18ID	A	-	CUR	-	VLV	-	1057	
1058	18ID	A	-	CUR	-	VLV	-	1058	
1059	18ID	A	-	CUR	-	FL	-	1059	
1060	18ID	A	-	CUR	-	VLV	-	1060	
1061	18ID	A	-	CUR	-	PG	-	1061	
1062	18ID	A	-	CUR	-	VLV	-	1062	
1063	18ID	A	-	CUR	-	TS	-	1063	
1064	18ID	A	-	CUR	-	FM	-	1064	
1065	18ID	A	-	CUR	-	MV	-	1065	
1066	18ID	A	-	CA	-	VLV	-	1066	
1067	18ID	A	-	CA	-	VLV	-	1067	
1068	18ID	A	-	CA	-	PG	-	1068	
1069	18ID	A	-	CA	-	VLV	-	1069	
1070	18ID	A	-	CA	-	FL	-	1070	
1071	18ID	A	-	CA	-	VLV	-	1071	
1072	18ID	A	-	CA	-	PG	-	1072	
1073	18ID	A	-	CA	-	VLV	-	1073	
1074	18ID	A	-	CA	-	VLV	-	1074	
1075	18ID	A	-	CA	-	PRV	-	1075	
1076	18ID	A	-	CA	-	VLV	-	1076	
1077	18ID	A	-	CA	-	VLV	-	1077	
1078	18ID	R	-	CA	-	VLV	-	1078	
1079	18ID	R	-	CA	-	VLV	-	1079	
1080	18ID	R	-	CA	-	VLV	-	1080	AT DOOR BOX
1081	18ID	R	-	CA	-	VLV	-	1081	
1082	18ID	F	-	CA	-	VLV	-	1082	PYLON SPARE
1083	18ID	F	-	CA	-	VLV	-	1083	
1084	18ID	F	-	CA	-	PG	-	1084	
1085	18ID	F	-	CA	-	VLV	-	1085	
1086	18ID	R	-	CA	-	VLV	-	1086	
1087	18ID	R	-	CA	-	VLV	-	1087	
1088	18ID	R	-	CA	-	VLV	-	1088	AT DOOR BOX
1089	18ID	R	-	CA	-	VLV	-	1089	
1090	18ID	B	-	CA	-	VLV	-	1090	
1091	18ID	B	-	CA	-	PG	-	1091	
1092	18ID	B	-	CA	-	VLV	-	1092	
1093	18ID	R	-	GN2	-	VLV	-	1093	
1094	18ID	R	-	GN2	-	VLV	-	1094	
1095	18ID	R	-	GN2	-	VLV	-	1095	
1096	18ID	R	-	GN2	-	VLV	-	1096	
1097	18ID	A	-	GN2	-	VLV	-	1097	
1098	18ID	A	-	GN2	-	PG	-	1098	
1099	18ID	A	-	GN2	-	VLV	-	1099	
1100	18ID	F	-	GN2	-	VLV	-	1100	PYLON SPARE
1101	18ID	F	-	GN2	-	VLV	-	1101	
1102	18ID	F	-	GN2	-	PG	-	1102	
1103	18ID	F	-	GN2	-	VLV	-	1103	
1104	18ID	R	-	GN2	-	VLV	-	1104	
1105	18ID	B	-	GN2	-	VLV	-	1105	
1106	18ID	B	-	GN2	-	PG	-	1106	
1107	18ID	B	-	GN2	-	VLV	-	1107	
1108	18ID	R	-	CA	-	VLV	-	1108	
1109	18ID	R	-	CA	-	VLV	-	1109	
1110	18ID	R	-	PCHWS	-	VLV	-	1110	
1111	18ID	R	-	PCHWS	-	MV	-	1111	
1112	18ID	R	-	PCHWS	-	TS	-	1112	
1113	18ID	R	-	PCHWS	-	VLV	-	1113	ROOF SPARES
1114	18ID	R	-	PCHWS	-	VLV	-	1114	
1115	18ID	R	-	PCHWS	-	VLV	-	1115	
1116	18ID	R	-	PCHWS	-	STR	-	1116	
1117	18ID	R	-	PCHWS	-	VLV	-	1117	
1118	18ID	R	-	PCHWS	-	VLV	-	1118	
1119	18ID	R	-	PCHWS	-	VLV	-	1119	
1120	18ID	F	-	PCHWS	-	VLV	-	1120	
1121	18ID	F	-	PCHWS	-	VLV	-	1121	
1122	18ID	F	-	PCHWS	-	STR	-	1122	
1123	18ID	F	-	PCHWS	-	VLV	-	1123	
1124	18ID	F	-	PCHWS	-	VLV	-	1124	
1125	18ID	F	-	PCHWS	-	VLV	-	1125	
1126	18ID	R	-	PCHWS	-	VLV	-	1126	
1127	18ID	R	-	PCHWS	-	VLV	-	1127	
1128	18ID	R	-	PCHWS	-	STR	-	1128	
1129	18ID	R	-	PCHWS	-	VLV	-	1129	
1130	18ID	R	-	PCHWS	-	VLV	-	1130	
1131	18ID	R	-	PCHWS	-	VLV	-	1131	
1132	18ID	R	-	PCHWS	-	VLV	-	1132	
1133	18ID	R	-	PCHWS	-	STR	-	1133	
1134	18ID	R	-	PCHWS	-	VLV	-	1134	
1135	18ID	B	-	PCHWS	-	VLV	-	1135	
1136	18ID	B	-	PCHWS	-	PG	-	1136	
1137	18ID	B	-	PCHWS	-	VLV	-	1137	
1138	18ID	B	-	PCHWS	-	VLV	-	1138	
1139	18ID	R	-	PCHWS	-	VLV	-	1139	
1140	18ID	R	-	PCHWS	-	VLV	-	1140	
1141	18ID	R	-	PCHWS	-	STR	-	1141	
1142	18ID	R	-	PCHWS	-	VLV	-	1142	
1143	18ID	F	-	PCHWS	-	VLV	-	1143	
1144	18ID	R	-	PCHWS	-	VLV	-	1144	
1145	18ID	R	-	PCHWR	-	VLV	-	1145	
1146	18ID	F	-	PCHWR	-	MV	-	1146	
1147	18ID	F	-	PCHWR	-	VLV	-	1147	
1148	18ID	R	-	PCHWR	-	VLV	-	1148	
1149	18ID	R	-	PCHWR	-	AV	-	1149	
1150	18ID	R	-	PCHWR	-	VLV	-	1150	
1151	18ID	B	-	PCHWR	-	VLV	-	1151	
1152	18ID	B	-	PCHWR	-	VLV	-	1152	
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1154	18ID	B	-	PCHWR	-	PG	-	1154	
1155	18ID	B	-	PCHWR	-	VLV	-	1155	
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1157	18ID	R	-	PCHWR	-	AV	-	1157	
1158	18ID	R	-	PCHWR	-	VLV	-	1158	
1159	18ID	R	-	PCHWR	-	VLV	-	1159	ROOF SPARES
1160	18ID	R	-	PCHWS	-	VLV	-	1160	ROOF SPARES
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1165	18ID	R	-	PCHWR	-	AV	-	1165	
1166	18ID	R	-	PCHWR	-	TS	-	1166	
1167	18ID	F	-	PCHWR	-	VLV	-	1167	PYLON SPARE
1168	18ID	F	-	PCHWR	-	VLV	-	1168	
1169	18ID	F	-	PCHWR	-	VLV	-	1169	
1170	18ID	F	-	PCHWR	-	AV	-	1170	
1171	18ID	F	-	PCHWR	-	VLV	-	1171	
1172	18ID	R	-	PCHWR	-	VLV	-	1172	ROOF SPARES
1173	18ID	R	-	PCHWR	-	VLV	-	1173	
1174	18ID	R	-	PCHWR	-	VLV	-	1174	
1175	18ID	R	-	PCHWR	-	AV	-	1175	
1176	18ID	R	-	PCHWR	-	MV	-	1176	
1177	18ID	R	-	PCHWR	-	MV	-	1177	
1178	18ID	R	-	PCHWR	-	VLV	-	1178	
1179	18ID	R	-	PCHWR	-	VLV	-	1179	
1180	18ID	R	-	PCHWR	-	MV	-	1180	
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1182	18ID	R	-	CA	-	VLV	-	1182	
1183	18ID	R	-	CA	-	PG	-	1183	
1184	18ID	R	-	CA	-	PG	-	1184	
1185	18ID	R	-	CA	-	VLV	-	1185	
1186	18ID	R	-	CA	-	VLV	-	1186	
1187	18ID	R	-	CA	-	FL	-	1187	
1188	18ID	R	-	CA	-	VLV	-	1188	
1189	18ID	B	-	CA	-	VLV	-	1189	
1190	18ID	F	-	PMP1S	-	VLV	-	1190	
1191	18ID	F	-	PMP1R	-	VLV	-	1191	
1192	18ID	F	-	PMP2S	-	VLV	-	1192	
1193	18ID	F	-	PMP2R	-	VLV	-	1193	
1194	18ID	F	-	PMP3S	-	VLV	-	1194	
1195	18ID	F	-	PMP3R	-	VLV	-	1195	
1196	18ID	F	-	PMP1R	-	VLV	-	1196	
1197	18ID	F	-	PMP2R	-	VLV	-	1197	
1198	18ID	F	-	PMP3R	-	VLV	-	1198	
1199	18ID	A	-	PMP1R	-	VLV	-	1199	
1200	18ID	A	-	PMP1S	-	VLV	-	1200	
1201	18ID	A	-	PMP2R	-	VLV	-	1201	
1202	18ID	A	-	PMP2S	-	VLV	-	1202	
1203	18ID	A	-	PMP3R	-	VLV	-	1203	
1204	18ID	A	-	PMP3S	-	VLV	-	1204	
1205	18ID	F	-	PMP1S	-	VLV	-	1205	B
1206	18ID	F	-	PMP2S	-	VLV	-	1206	B
1207	18ID	F	-	PMP3S	-	VLV	-	1207	B
1208	18ID	R	-	CA	-	VLV	-	1208	
1209	18ID	R	-	GN2	-	VLV	-	1209	B
1210	18ID	F	-	PMP1S	-	PG	-	1210	B
1211	18ID	F	-	PMP2S	-	PG	-	1211	B
1212	18ID	F	-	PMP3S	-	PG	-	1212	B
5405	C19		-	CUS	-	VLV	-	5405	Existing Valve
5436	C19		-	CUR	-	VLV	-	5436	Existing Valve
1841	18BM		-	GN2	-	VLV	-	1841	Existing Valve
5482	C19		-	CA	-	VLV	-	5482	Existing Valve

E (SHEET SIZE)	PD-FXI-UT-1500 (DRAWING/PART NUMBER)	B (REVISION)
ESH&Q RISK LEVEL A-2	SHEET 9 OF 11	

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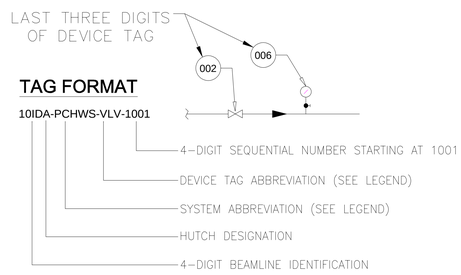
TAG LEGEND

BEAMLINE LOCATION	
BEAMLINE NO.	1BM/11D 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
PRV	PRESSURE RELIEF VALVE
PT	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

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
COPPER SKID DE-IONIZED WATER	COPPER DI SUP COPPER DI RET	GREEN	WHITE
GASEOUS NITROGEN	GASEOUS NITROGEN	PURPLE	WHITE



EQUIPMENT SCHEDULE

VALVES

ID	#	SIZE	TYPE	MATERIAL	CONNECTION	TRIM	MANUFACTURER	PART NUMBER	DESCRIPTION	USE
VLV	1	1/4"	BALL	STAINLESS	NPT	UHMWPE	SWAGELOK	SS-43GEF4-LL	1 PIECE, LATCH LOCK HANDLE	INSTRUMENTATION ON DI WATER ONLY
VLV	2	1/4"	BALL	BRONZE	NPT	STANDARD	APOLLO	70-141-27	1/4", LEVER LOCKING, STAINLESS BALL & STEM	OUTSIDE HUTCHES; CA, GN2, OR PCHW GAUGE ISOLATION
VLV	3	1/4"	BALL	BRONZE	NPT	UHMWPE	APOLLO	70-141-21-27	1/4", LEVER LOCKING, STAINLESS BALL & STEM	INSIDE HUTCHES; CA, GN2, OR PCHW GAUGE ISOLATION
VLV	4	1/2"	BALL	STAINLESS	COMPRESSION	UHMWPE	SWAGELOK	SS-63ES8-JL	3 PIECE, LEVER LOCKING HANDLE	DI WATER CIRCUITS
VLV	5	1/2"	BALL	STAINLESS	NPT	UHMWPE	SWAGELOK	SS-63EF8-JL	3 PIECE, LEVER LOCKING HANDLE	DI WATER VENTS
VLV	6	1/2"	BALL	STAINLESS	NPT X COMPRESSION	UHMWPE	SWAGELOK	SS-63ES8-F8-JL	3 PIECE, LEVER LOCKING HANDLE	DI WATER MANIFOLDS
VLV	7	1/2"	BALL	BRONZE	NPT	UHMWPE	APOLLO	70-143-21-27	1/2", LEVER LOCKING, STAINLESS BALL & STEM	PCHW, GN2, OR CA - INSIDE OF HUTCHES
VLV	8	1/2"	BALL	BRONZE	SWEAT	STANDARD	APOLLO	70-243-27	1/2", LEVER LOCKING, STAINLESS BALL & STEM	PCHW, GN2, OR CA - OUTSIDE OF HUTCHES
VLV	9	1/2"	BALL	BRONZE	NPT	STANDARD	APOLLO	70-143-27	1/2", LEVER LOCKING, STAINLESS BALL & STEM	PCHW OUTSIDE OF HUTCHES; 1" STRAINER BLOW DOWN
VLV	10	1/2"	GLOBE	STAINLESS	NPT	GRAPHOIL	APOLLO	60A-703-07-09-24	1 PIECE, LOCKING BONNET; STAINLESS TEE HANDLE	WATER BALANCING INSIDE HUTCHES
VLV	12	3/4"	BALL	STAINLESS	COMPRESSION	UHMWPE	SWAGELOK	SS-63ES12-JL	3 PIECE, LEVER LOCKING HANDLE	DI WATER CIRCUITS
VLV	13	3/4"	BALL	BRONZE	SWEAT	UHMWPE	WORCESTER	3/4" K4416U-TE	3/4", LEVER LOCKING, STAINLESS BALL & STEM	PCHW OR HCA - INSIDE OF HUTCHES
VLV	14	3/4"	BALL	BRONZE	SWEAT	STANDARD	APOLLO	70-244-27	3/4", LEVER LOCKING, STAINLESS BALL & STEM	PCHW OR HCA - OUTSIDE OF HUTCHES
VLV	15	3/4"	GLOBE	STAINLESS	NPT	GRAPHOIL	APOLLO	60A-704-09-24	1 PIECE, LOCKING BONNET; BLACK POLY HANDLE	WATER BALANCING INSIDE HUTCHES
VLV	16	1"	BALL	STAINLESS	NPT	UHMWPE	SWAGELOK	SS-65EF16-JL	3 PIECE, LEVER LOCKING HANDLE	DI WATER CIRCUITS
VLV	17	1"	BALL	BRONZE	NPT	UHMWPE	APOLLO	70-145-21-27	1", LEVER LOCKING, STAINLESS BALL & STEM	PCHW OR HCA - INSIDE OF HUTCHES
VLV	18	1"	BALL	BRONZE	SWEAT	STANDARD	APOLLO	70-245-27	1", LEVER LOCKING, STAINLESS BALL & STEM	PCHW OR HCA - OUTSIDE OF HUTCHES
VLV	21	1-1/2"	BALL	BRONZE	SWEAT	STANDARD	APOLLO	70-247-27	1-1/2", LEVER LOCKING, STAINLESS BALL & STEM	PCHW OR HCA - OUTSIDE OF HUTCHES
VLV	23	1/4"	RELIEF	BRASS	NPT	STANDARD	MCMASTER	4843SK72	85 PSIG POP PRESSURE; ASME 'NB' STAMPED	COMPRESSED AIR SAFETY VALVE
VLV	24	1"	AUTO AIR VENT	BRASS	NPT	STANDARD	SPIROTHERM SPIROVENT	VJR100TM	THREADED MODEL IN HORIZONTAL	PCHW
VLV	26	3/4"	AUTO AIR VENT	BRASS	NPT	STANDARD	SPIROTHERM SPIROVENT	VJR075TM	THREADED MODEL IN HORIZONTAL	PCHW
VLV	27	3/4"	AUTO AIR VENT	BRASS	NPT	STANDARD	SPIROTHERM SPIROVENT	VJV075FT	THREADED MODEL IN VERTICAL	PCHW
VLV	29	1/2"	RELIEF	BRASS	NPT	STANDARD	KINGSTON	MCM 4843SK83	110 PSIG RELIEF VALVE	
VLV	30	3/8"	BALL	BRONZE	NPT	STANDARD	APOLLO	70-142-27	3/8", LEVER LOCKING, STAINLESS BALL & STEM	PCHW STRAINER BLOW DOWNS
MV	1	1"	MOTORIZED	STAINLESS	NPT	UHMWPE	WORCESTER	4466U-SE/1075WM2	3 PIECE, SERIES 75 ELECTRIC ACTUATOR IN 24 VDC, FAIL IN PLACE	DI WATER ON/OFF VALVE
MV	3	1/2"	MOTORIZED	BRONZE	NPT	STANDARD	BELLIMO	B209+TR24-SR-T	NICKEL PLATED BODY, CHARACTERIZED SS BALL, FAIL IN PLACE	CHILLER TEMPERATURE CONTROL
MV	4	1-1/2"	MOTORIZED	BRONZE	NPT	STANDARD	BELLIMO	B240+ARB24-3-S	NICKEL PLATED BODY, CHARACTERIZED SS BALL, FAIL IN PLACE	PCHW ON/OFF VALVE

STAINLESS STEEL FITTINGS

FTG	72	3/4"	STRAINER	BRONZE	KECKLEY STYLE E-150	3/4" 1SJY-BCM20M34-FTI-E	3/8" BLOW DOWN; SWEAT SOCKET - PCHW SUPPLY LINES		
FTG	73	1"	STRAINER	BRONZE	KECKLEY STYLE E-150	1" 1SJY-BCM20M34-FTI-E	1/2" BLOW DOWN; SWEAT SOCKET - PCHW SUPPLY LINES		

FILTERS & INSTRUMENTATION

ID	#	SIZE	TYPE	MATERIAL	CONNECTION	MANUFACTURER	PART NUMBER	DESCRIPTION	USE	
FL	2	1"	HOUSING	STAINLESS	NPT	FILTERSOURCE	OMG-20C-1	FM-BB-20-1A 1 MICRON CARTRIDGE	DI WATER HEADER	
FL	3	1/2"	FILTER/REGULATOR COMBO	ACETAL	NPT	PARKER	F811-04WGC-SS	5 MICRON MESH	COMPRESSED AIR	
FL	6	1"	FILTER/REGULATOR COMBO	METAL WITH SIGHT GLASS	NPT	ARO	P39464-610 (GRAINGER P/N 6CRN8)	5 MICRON MESH	HIGH CAPACITY FILTER/REGULATOR COMBO	
PG	1	1/4"	PRESSURE GAUGE	STAINLESS	NPT	NO SHOK	25-500-160-PSI-1/4	0-160 PSIG NEEDLE GAUGE	DIW/HCA/CA/PCHW	
PG	2	1/4"	PRESSURE GAUGE	STAINLESS	NPT	NO SHOK	25-500-60-PSI-1/4	0-60 PSIG NEEDLE GAUGE	GN2	
PT	1	1/4"	PRESSURE GAUGE TRANSMITTER	STAINLESS	NPT	SETRA	3100B150PG02B	0-150 PSIG = 4-20 MA	DI WATER HEADER	
TS	1	1/2"	TEMPERATURE SENSORS	STAINLESS	NPT	ROSEMOUNT	0078-D-21-N-00-A-030-T44-A-X8-Q4	PLATINUM RTD W/THERMOWELL	DI WATER HEADER	
FM	10	1/2"	FLOW METER	STAINLESS	WELDMENT	LAMBDA SQUARE ORIPAC	0.1896" BORE / 240 INH20 / 2.00 GPM	NOM. 0.5 GPM ; MAX 2 GPM	DI WATER CIRCUITS	
FM	12	3/4"	FLOW METER	STAINLESS	NPT	LAMBDA SQUARE ORIPAC	0.3125" THROAT VENTURI	NOM. 1.4 GPM ; MAX 2 GPM	DI WATER CIRCUITS/MAIN	
DPS	1	1/4"	DIFFERENTIAL PRESSURE TRANSMITTERS	STAINLESS	NPT	YOKOGAWA	EJA110E-JMS3G-B12EM-FU1/D1	4-400 INH20	DI WATER CIRCUITS	
DPS	2	1/4"	DIFFERENTIAL PRESSURE TRANSMITTERS	STAINLESS	NPT	SIEMENS	7MF4433-1EB22-1NC7-Z+A02+A40+B21+C11+H3+Y1+Y21	2.4-240 INH20	DI WATER CIRCUITS	

E SHEET SIZE	PD-FXI-UT-1500 DRAWING/DATA/IT SLI NUMBER	B REVISION
ESH&Q RISK LEVEL A-2		SHEET 10 OF 11

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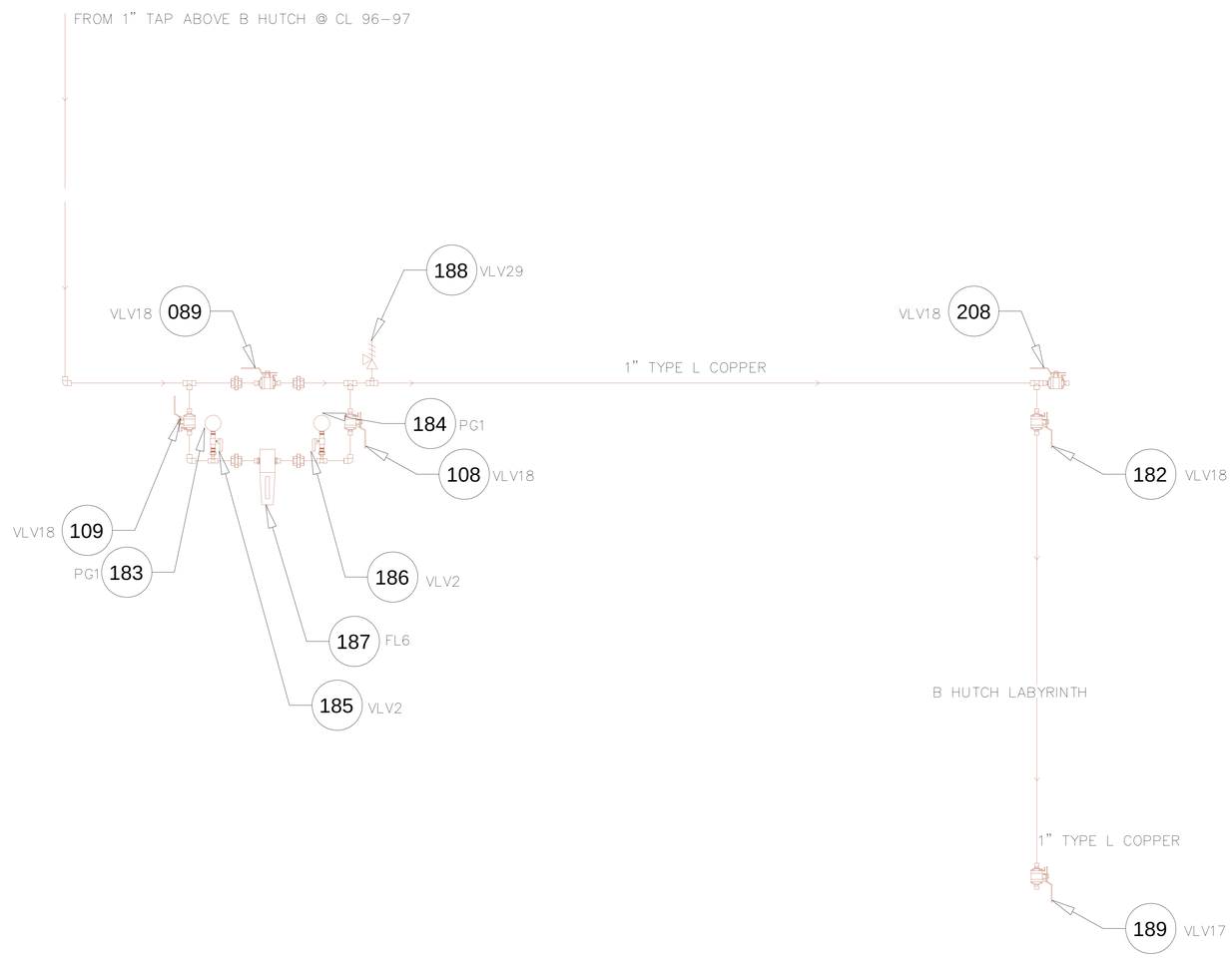

HIGH CAPACITY COMPRESSED AIR LINE SCHEMATIC

E SHEET SIZE	PD-FXI-UT-1500 DRAWING/PART NUMBER	B REVISION
ESH&Q RISK LEVEL A-2		SHEET 11 OF 11

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