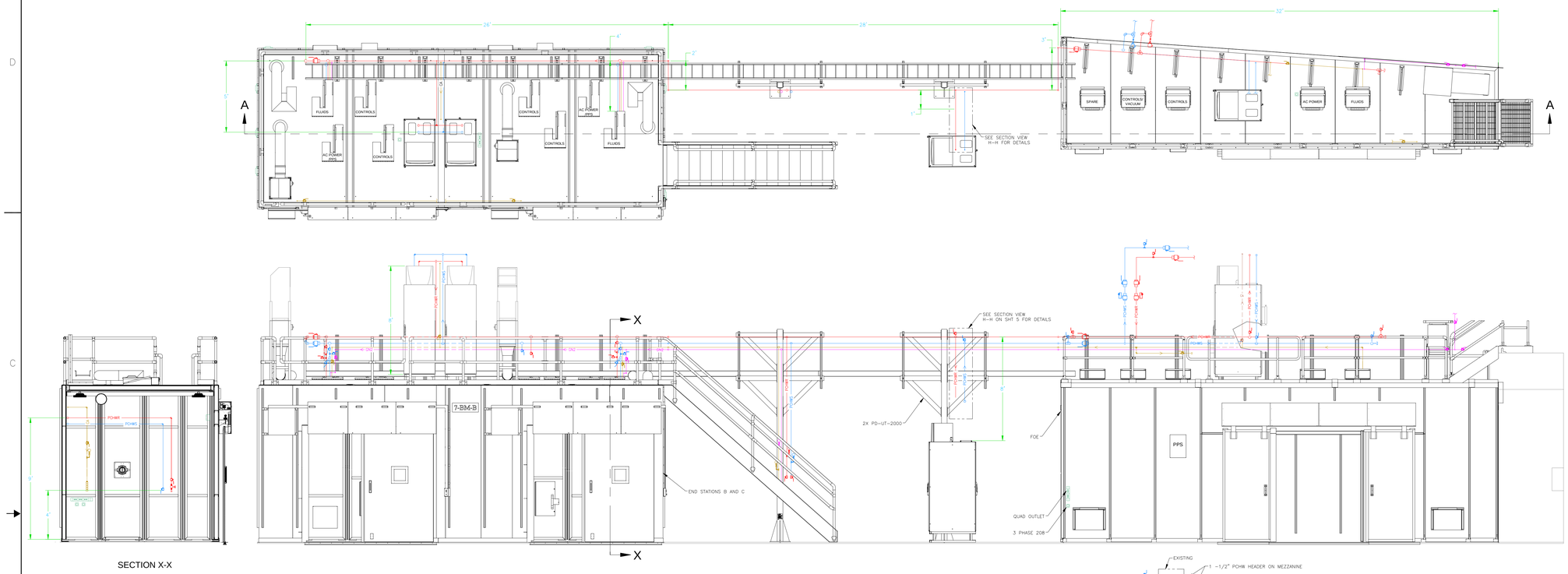
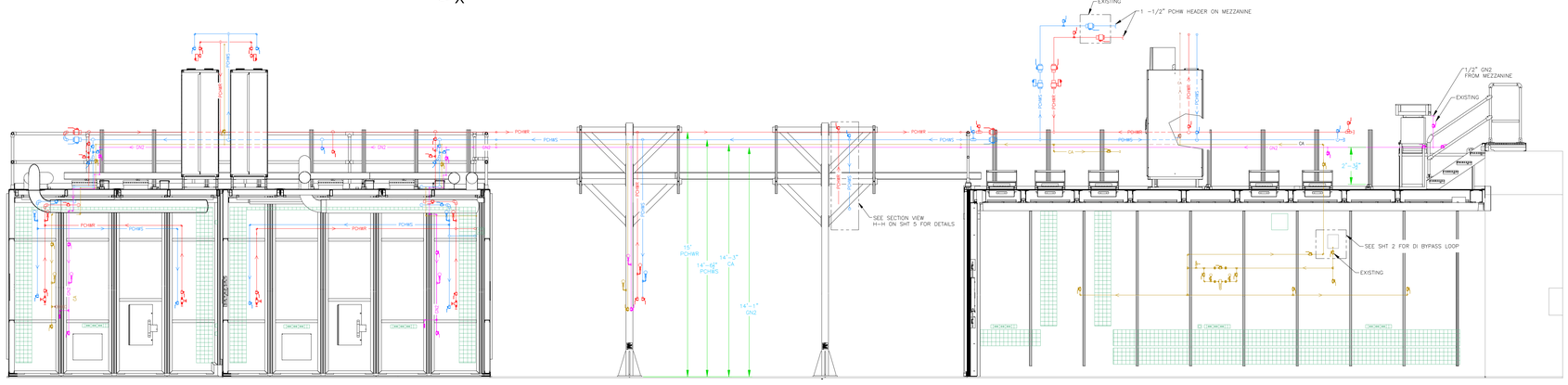
REVISION HISTORY					
REV	DESCRIPTION	DATE	DESIGNER	CHECKED BY	ENGINEER
A	RELEASE PER ECO-004143	2/2017	R. M./B.M.	C.A.	W. O'BRIEN



SECTION X-X



SECTION A-A
1/2" = 1'-0"

OVERALL PIPING LAYOUT, SEE SEPARATE SHEETS FOR DETAILS.

NOTES:

1. ALL UTILITY PIPING TO BE RUN ON THE OUTBOARD SIDE OF PYLONS AND L-BRACKETS.
2. ENSURE THAT ALL VALVE HANDLES ARE OPERATIONAL AND ARE NOT IN CONFLICT WITH ANY ADJACENT PIPING OR VALVES.
3. MOUNTING FOR ALL PIPING IN PYLON AREAS WILL BE FIELD ERECTED UNISTRUT SUPPORT STRUCTURE.
4. ALL DIMENSIONS SHOWN ARE INTENDED TO CONVEY APPROXIMATE LOCATIONS. EXACT LOCATIONS ARE TO BE DETERMINED ACCORDING TO FIELD CONDITIONS AT TIME OF INSTALLATION.
5. INSTALL OWENS-CORNING 1.0" FIBERGLASS ASJ/SSL-II INSULATION ON PCHW SUPPLY AND RETURN INSIDE END STATIONS B AND C 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.
6. 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
7. INSIDE END STATIONS B AND C, INSTALL ALL PCHW VALVES IN RECESSED AREAS AGAINST INSIDE WALLS. ALSO INSIDE END STATIONS B AND C, INSTALL CA AND GN2 IN RECESSED AREAS AS MUCH AS POSSIBLE AND RUN ALL PIPING HEADERS AS HIGH AS POSSIBLE.

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
DIMENSIONS IN BRACKETS (in.mm) (WHERE PRESENT) ARE 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 .X ± 0.030 .XX ± 0.015 .XXX ± 0.005	± .5°
FINISH 125	

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

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

DRAWN BY	R. M./B.M.	2/2017
CHECKED BY	C. Amarillo	2/2017
VACUUM APPROVAL	N/A	N/A
ENGINEER APPROVAL	W. O'BRIEN	2/2017
SUPERVISOR APPROVAL	J. GOSMAN	2/2017
ESH APPROVAL	L. STIEGLER	5/2016
QA APPROVAL	J. Zipper	2/2017

NSLSII
NATIONAL SYNCHROTRON LIGHT SOURCE II

PHOTON DIVISION
QAS BEAMLINE, UTILITIES
UTILITIES INSTALLATION, 7-BM

E	PD-QAS-UT-1500	A
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A2	SHEET 1 OF 10	

NEXT ASSY:
PROJECT:
THIRD ANGLE PROJECTION
SCALE: AS NOTED
WBS# 6.08.04.02

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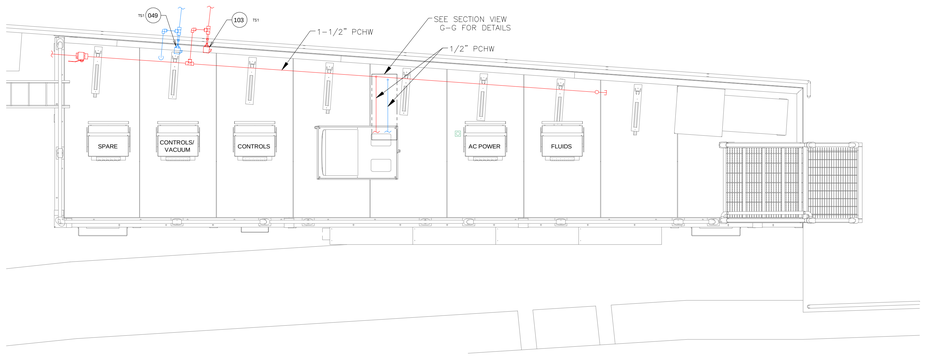
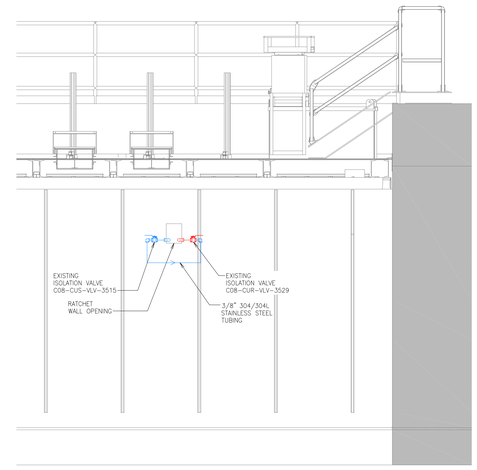
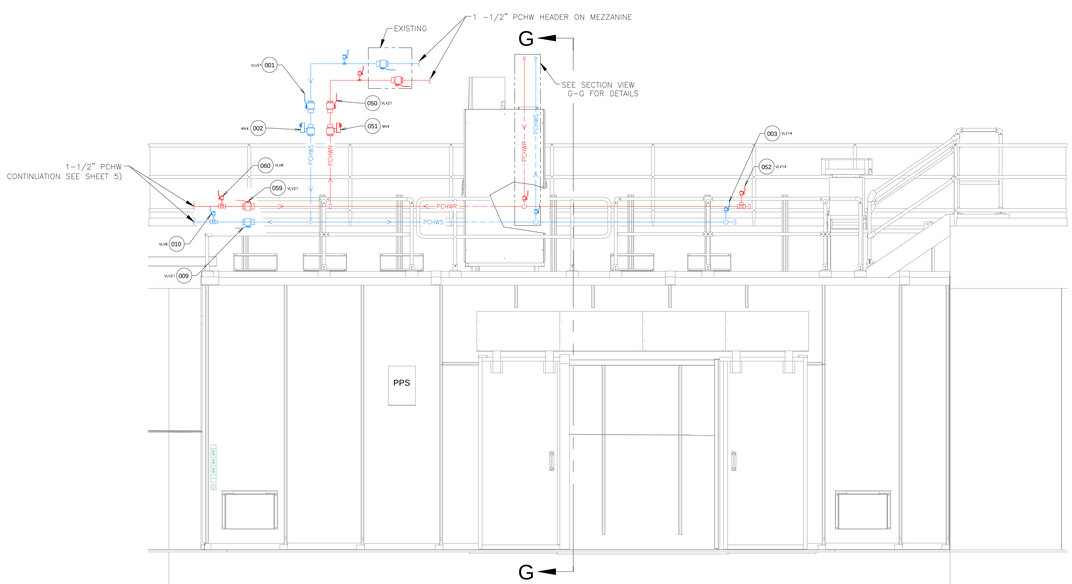
RELEASED – EFFECTIVE



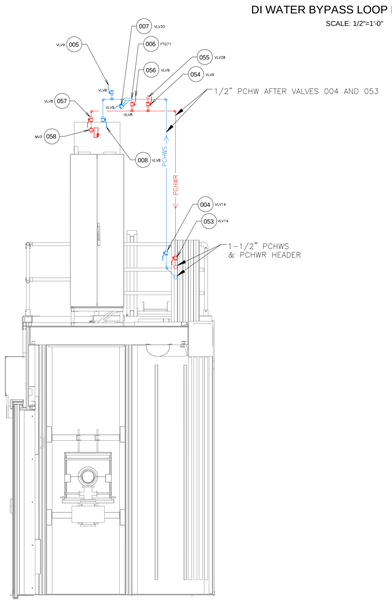
FOE ROOF PLAN
SCALE: 1/2"=1'-0"



DI WATER BYPASS LOOP INSIDE FOE
SCALE: 1/2"=1'-0"

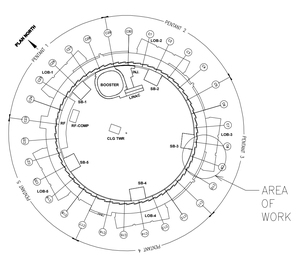


FOE ELEVATION
SCALE: 1/2"=1'-0"



SECTION G-G
1/2" = 1'-0"

PCWH ON FOE AND DI BYPASS LOOP
SEE NOTE 5 ON SHEET 1



KEY PLAN AREA OF WORK

E SHEET SIZE	PD-QAS-UT-1500 DRAWING/PLANT NUMBER	A REVISION
ESH&Q RISK LEVEL A2		SHEET 2 OF 10

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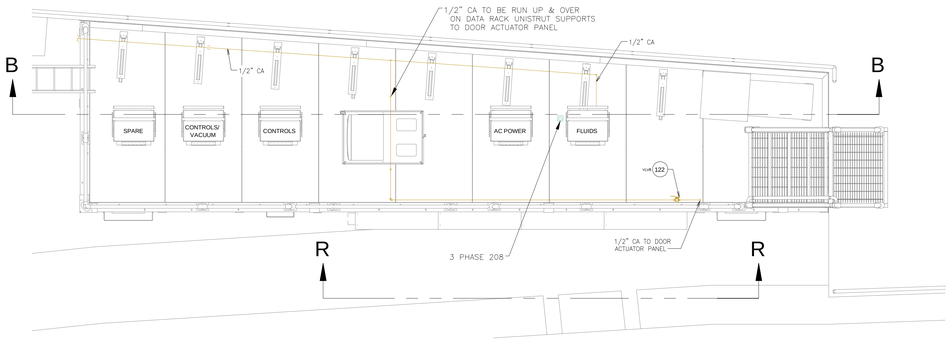
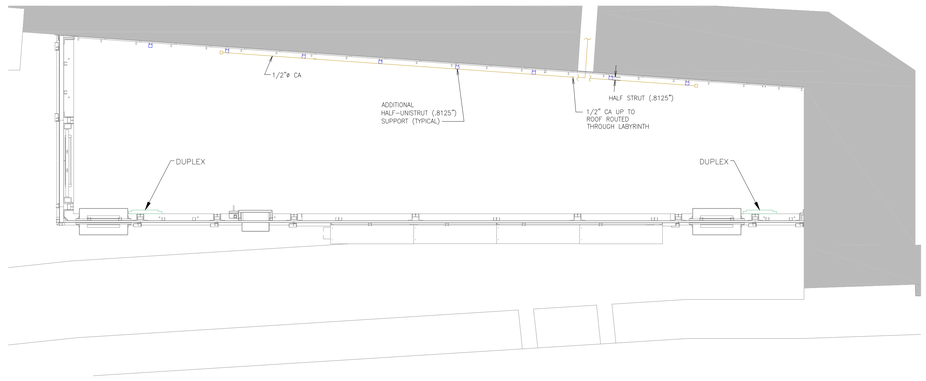
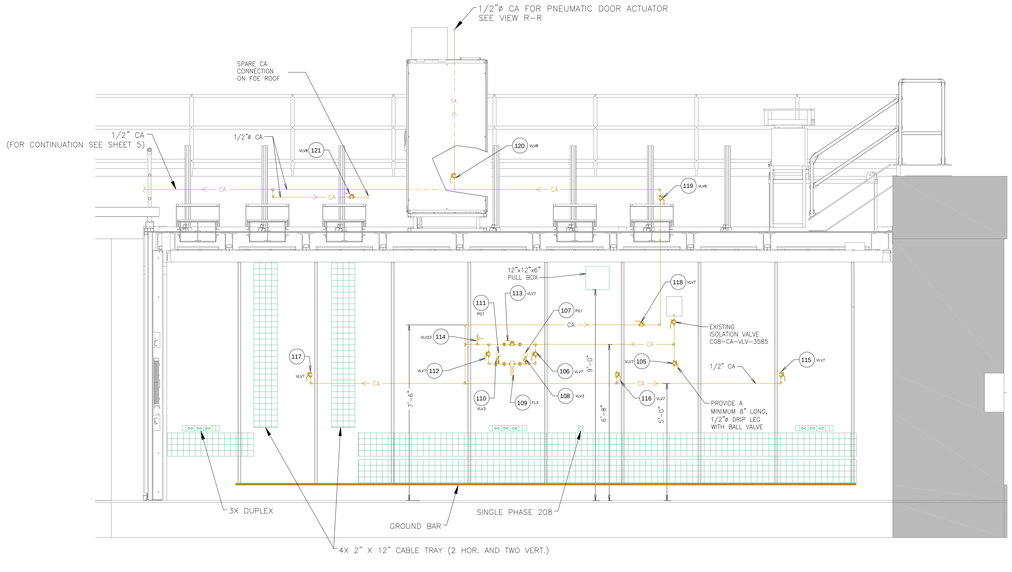


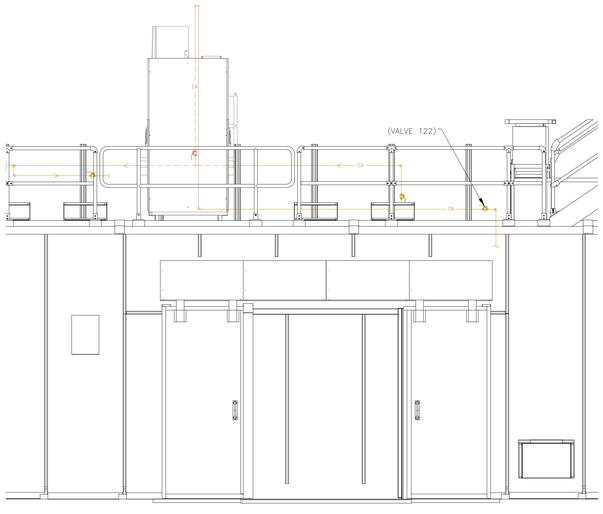
FOE ROOF PLAN
SCALE: 1/2"=1'-0"



FOE PLAN
SCALE: 1/2"=1'-0"



SECTION B-B
1/2" = 1'-0"



VIEW R-R
1/2" = 1'-0"

CA IN AND ON FOE

E SHEET SIZE	PD-QAS-UT-1500 DRAWING/PART NUMBER	A REVISION
ESHKQ RISK LEVEL A2		SHEET 3 OF 10

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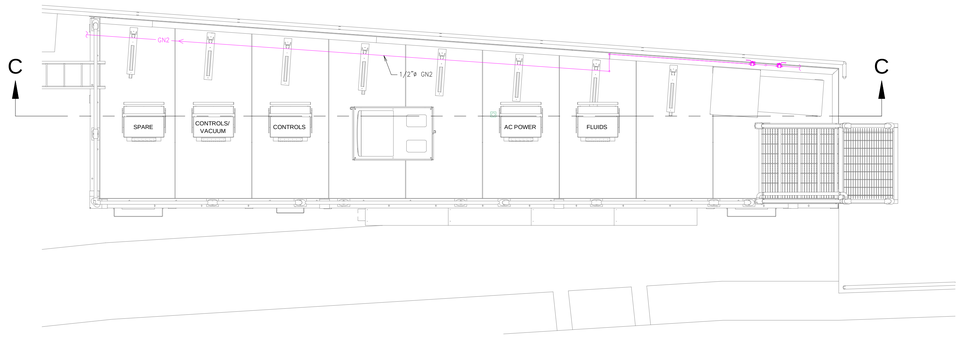
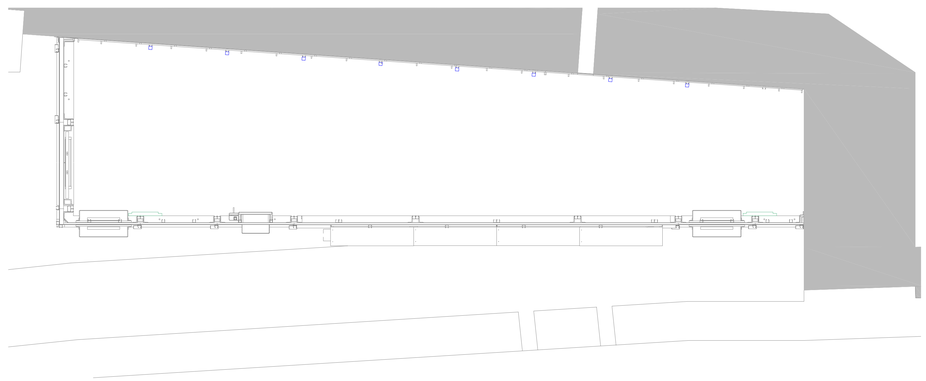
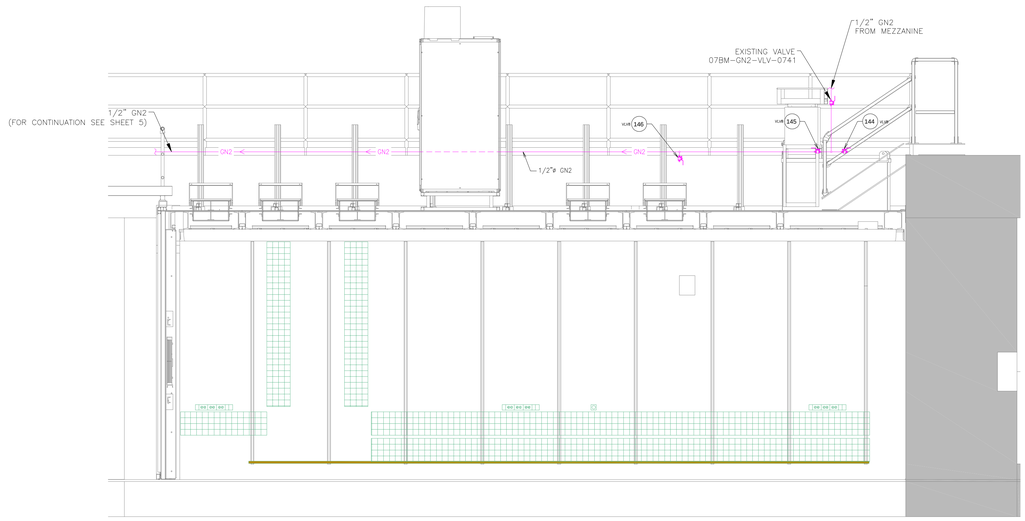


FOE ROOF PLAN
SCALE: 1/2"=1'-0"



FOE PLAN
SCALE: 1/2"=1'-0"



SECTION C-C
1/2" = 1'-0"

GN2 ON FOE

E	PD-QAS-UT-1500	A
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A2		SHEET 4 OF 10

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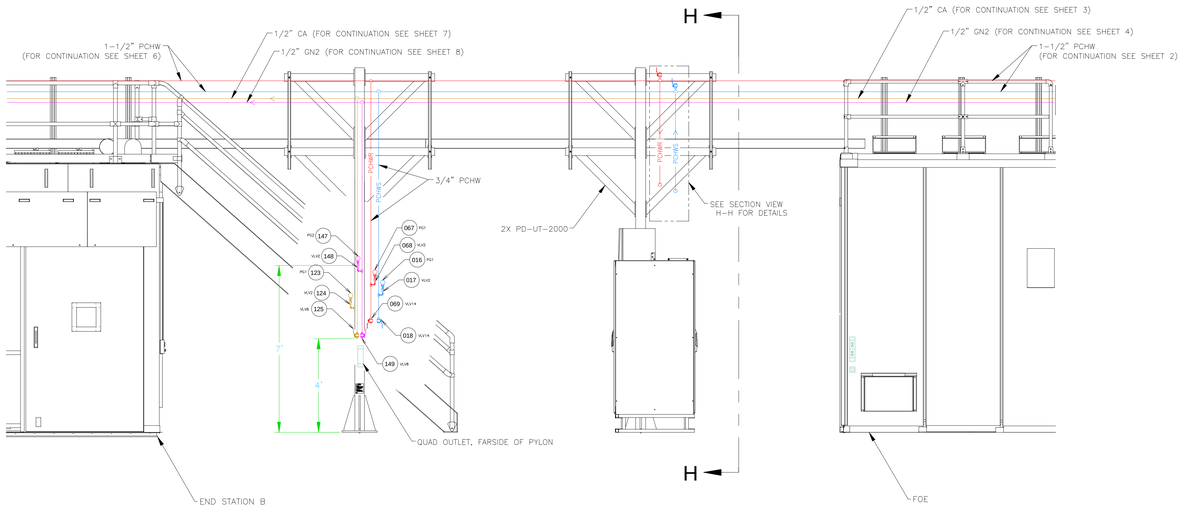
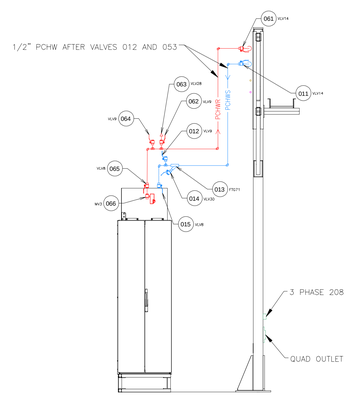


ELEVATION LOOKING AT PYLONS

SCALE: 1/2"=1'-0"



SECTION H-H
1/2" = 1'-0"

ALL UTILITIES ON PYLONS
SEE NOTE 5 ON SHEET 1

E	PD-QAS-UT-1500	A
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A2	SHEET 5 OF 10	

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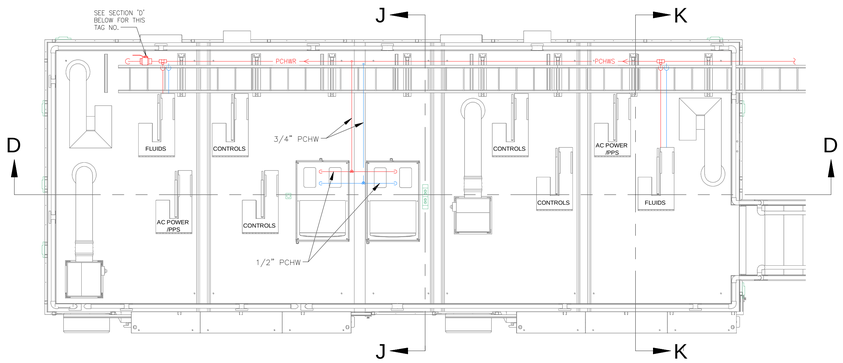
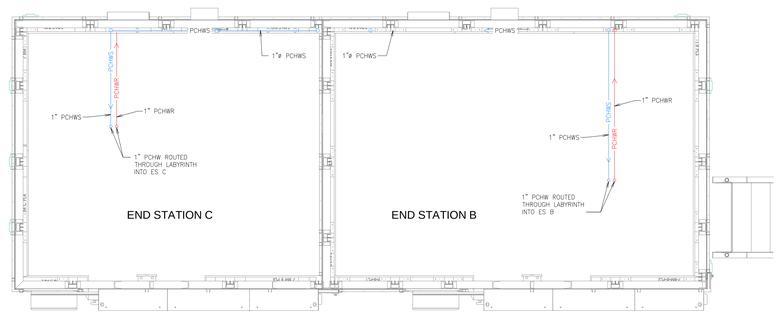
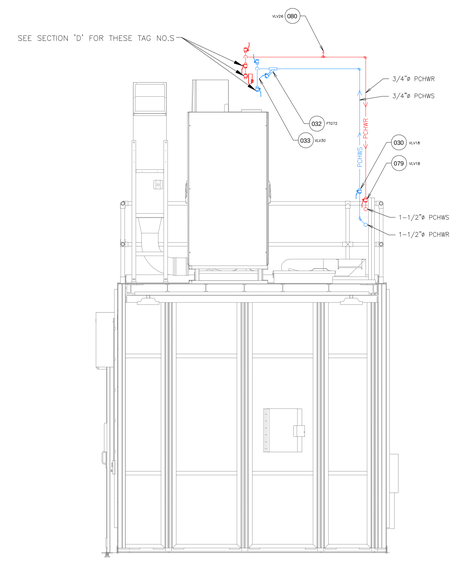


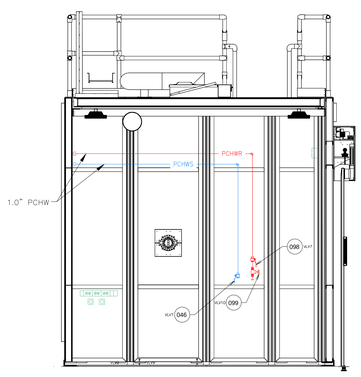
END STATION B & C ROOF PLAN VIEW
SCALE: 1/2"=1'-0"



END STATION B & C PLAN VIEW
SCALE: 1/2"=1'-0"



SECTION J-J (ROTATED FOR CLARITY)
1/2" = 1'-0"



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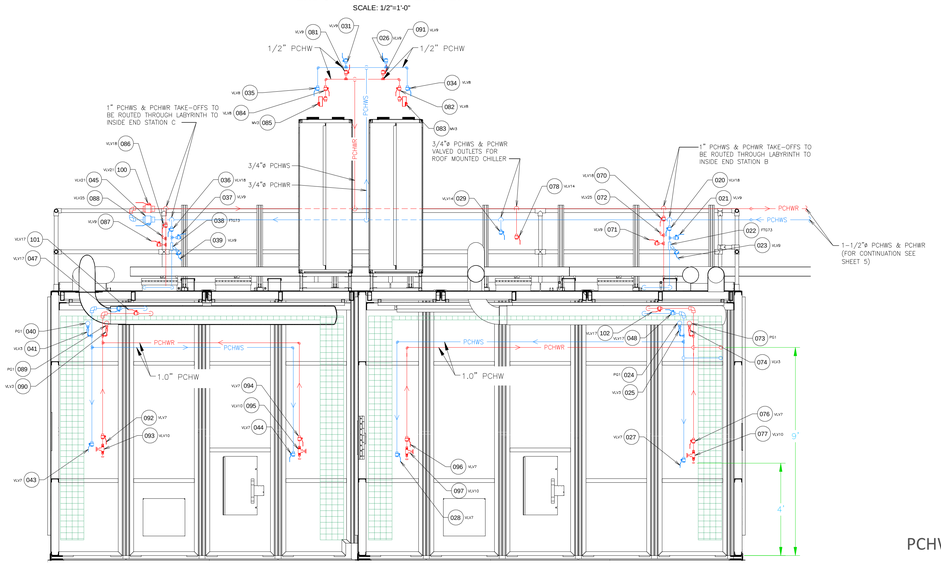

SECTION D-D
1/2" = 1'-0"

PCHW ON AND IN END STATIONS B AND C
SEE NOTES 5 AND 7 ON SHEET 1

E	PD-QAS-UT-1500	A
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A2	SHEET 6 OF 10	

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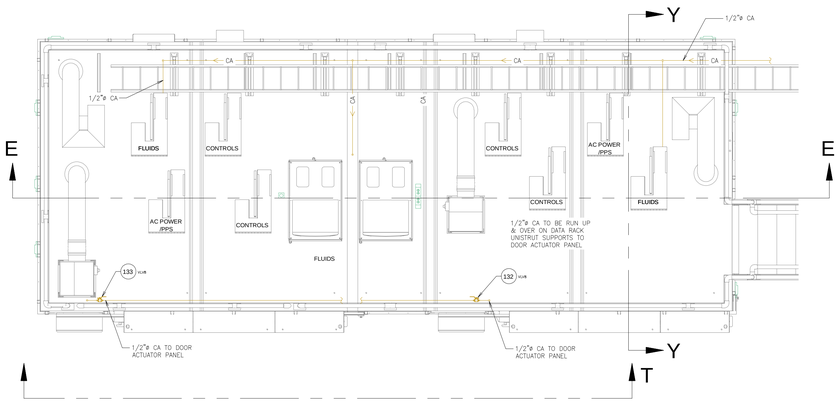
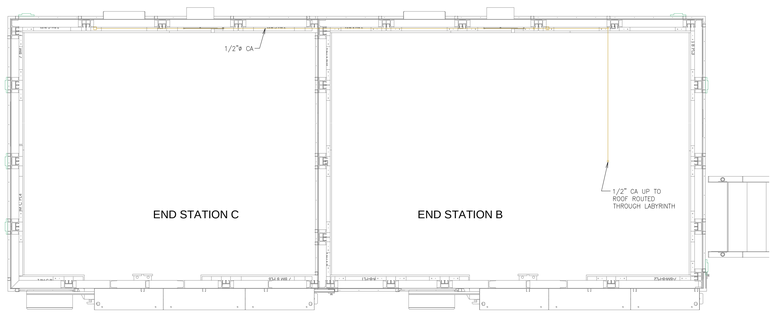


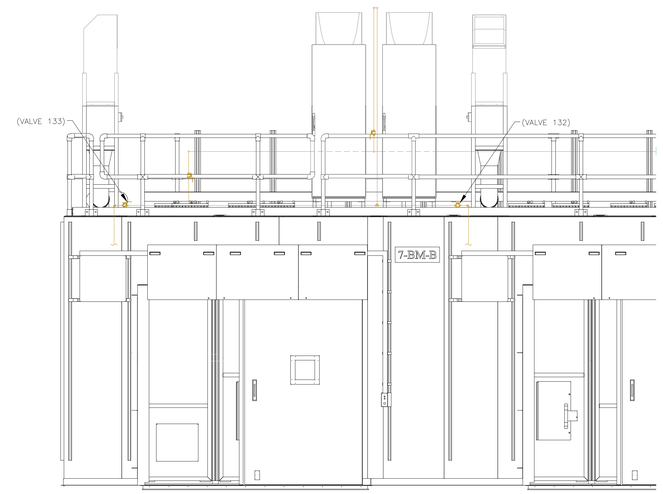
END STATION B & C ROOF PLANs

SCALE: 1/2"=1'-0"



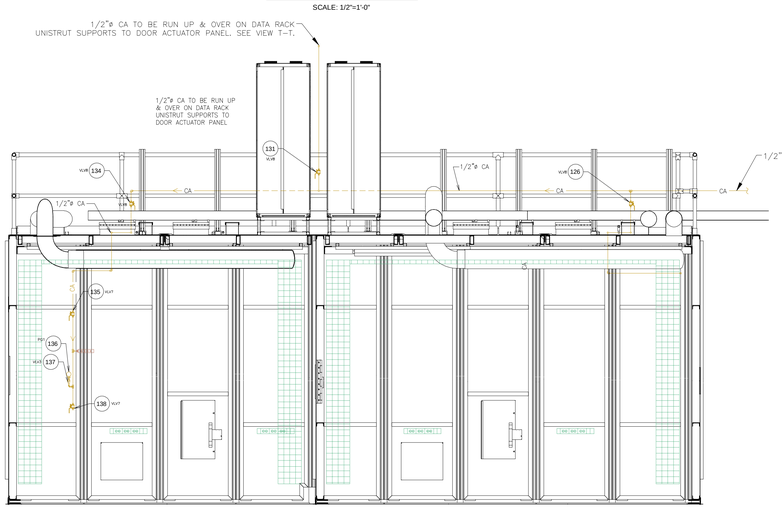
END STATION B & C PLANS

SCALE: 1/2"=1'-0"



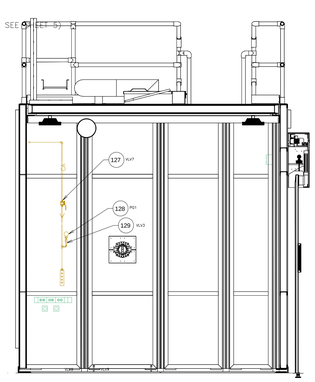
VIEW T-T (CA VALVES FOR DOOR ACTUATORS)

SCALE: 1/2"=1'-0"



SECTION E-E

1/2" = 1'-0"



SECTION Y-Y

(ROTATED FOR CLARITY)

CA IN AND ON END STATIONS B AND C,
SEE NOTE 7 ON SHEET 1.

E	PD-QAS-UT-1500	A
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A2	SHEET 7 OF 10	

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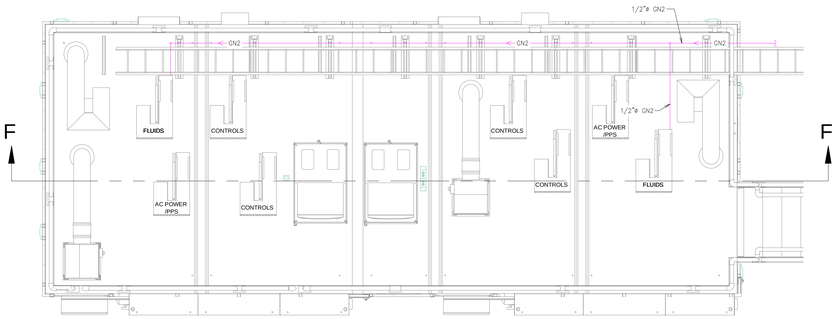
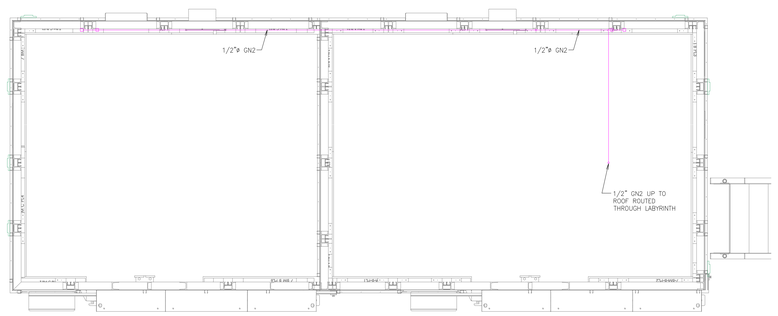
RELEASED – EFFECTIVE



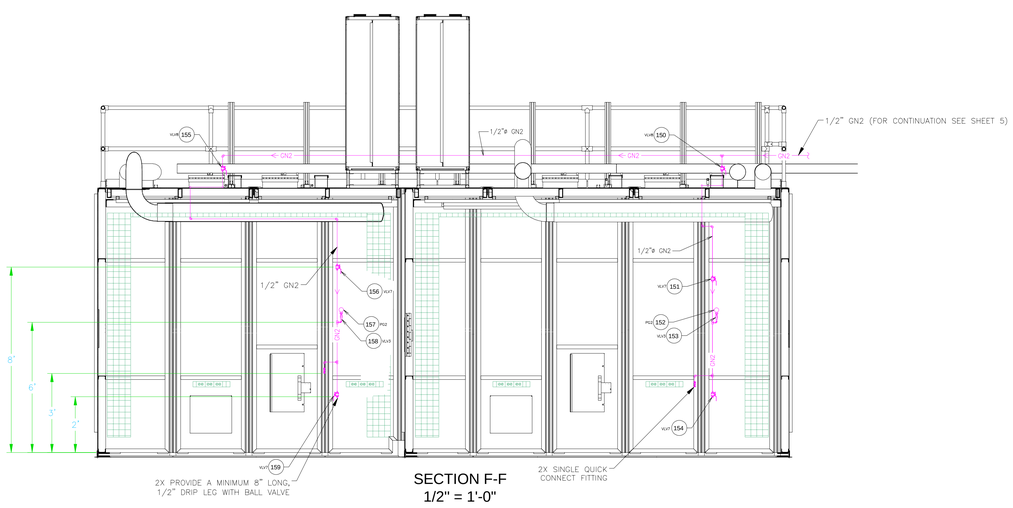
END STATION B & C ROOF PLANS

SCALE: 1/2"=1'-0"



END STATION B & C PLANS

SCALE: 1/2"=1'-0"



SECTION F-F
1/2" = 1'-0"

GN2 IN AND ON END STATIONS B AND C,
SEE NOTE 7 ON SHEET 1.

E	PD-QAS-UT-1500	A
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A2	SHEET 8 OF 10	

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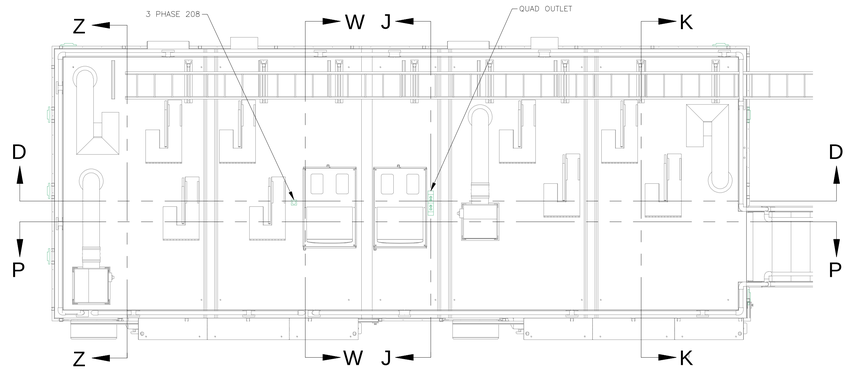
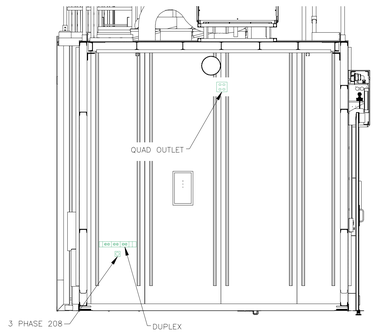


END STATION B & C ROOF PLAN VIEW
SCALE: 1/2"=1'-0"



SECTION W-W (ROTATED FOR CLARITY)
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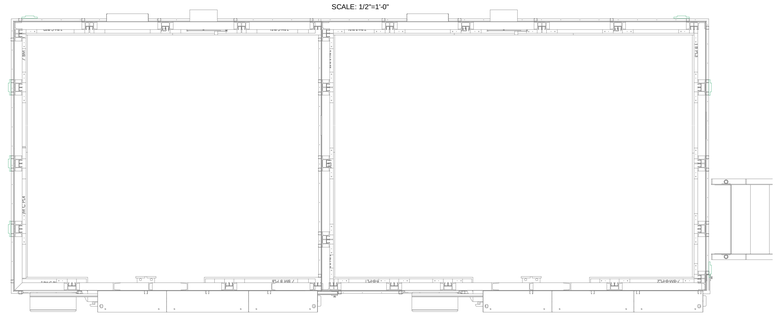
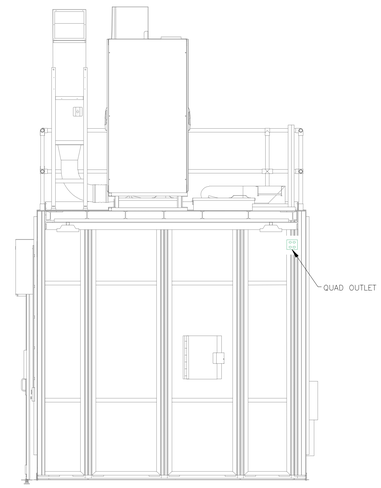


END STATION B & C PLAN VIEW
SCALE: 1/2"=1'-0"



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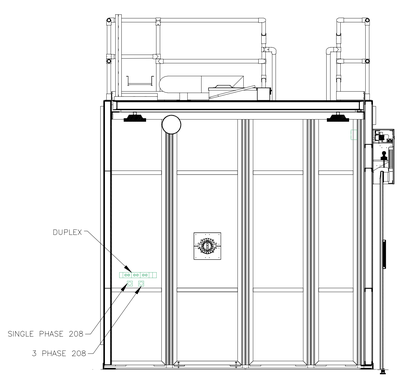

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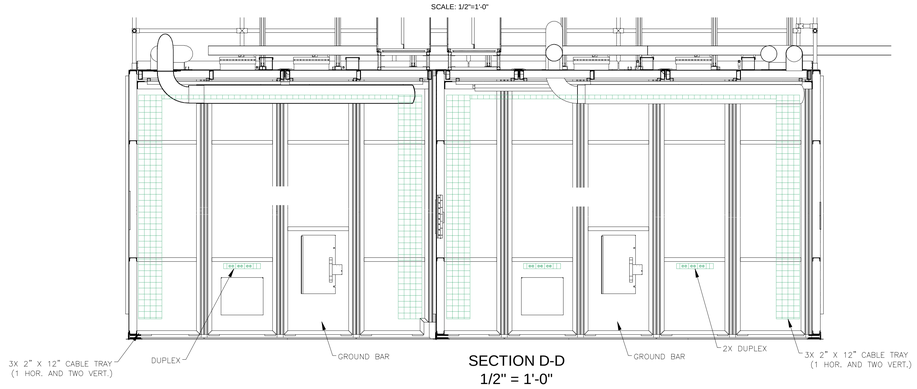

SECTION D-D
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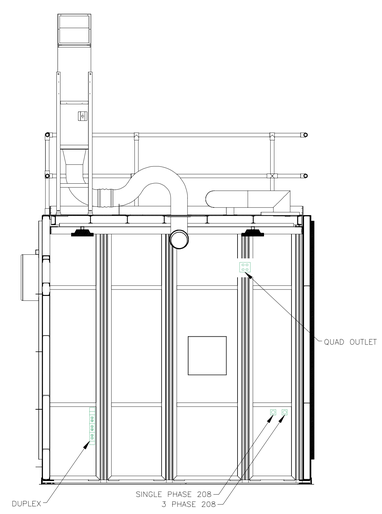

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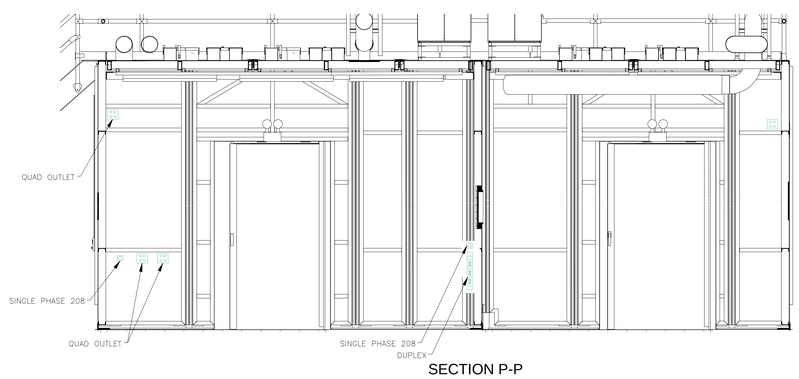

SECTION P-P
1/2" = 1'-0"

ELECTRICAL IN END STATIONS B AND C

E	PD-QAS-UT-1500	A
SHEET SIZE	DRAWING/PART NUMBER	REVISION
ESH&Q RISK LEVEL A2		SHEET 9 OF 10

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RELEASED – EFFECTIVE

EQUIPMENT SCHEDULE

VALVES

ID	#	SIZE	TYPE	MATERIAL	CONNECTION	TRIM	MANUFACTURER	PART NUMBER	DESCRIPTION	USE
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	INSTRUMENTATION ON PCHW, GN2, OR CA - INSIDE OF HUTCHES
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, GN2, OR CA - OUTSIDE OF HUTCHES
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	14	3/4"	BALL	BRONZE	SWEAT	STANDARD	APOLLO	70-244-27	3/4", LEVER LOCKING, STAINLESS BALL & STEM	PCHW OR CA - OUTSIDE OF HUTCHES
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 CA - 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 CA - OUTSIDE OF HUTCHES
VLV	23	1/2"	RELIEF	BRONZE	NPT	STANDARD	KINGSTON	118CSS	85 PSIG POP PRESSURE; ASME 'NB' STAMPED	COMPRESSED AIR SAFETY VALVE
VLV	25	1"	AUTO AIR VENT	BRASS	NPT	STANDARD	SPIROTHERM SPIROVENT	VJV100FT	THREADED MODEL IN VERTICAL	PCHW
VLV	26	3/4"	AUTO AIR VENT	BRASS	NPT	STANDARD	SPIROTHERM SPIROVENT	VJR075TM	THREADED MODEL IN HORIZONTAL	PCHW
VLV	28	1/2"	AUTO AIR VENT	BRASS	NPT	STANDARD	SPIROTHERM SPIROTOP	VTP050FT	THREADED MODEL IN HALF INCH	PCHW
VLV	30	3/8"	BALL	BRONZE	NPT	STANDARD	APOLLO	70-142-27	3/8", LEVER LOCKING, STAINLESS BALL & STEM	PCHW STRAINER BLOW DOWNS
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

COPPER FITTINGS

ID	#	SIZE	TYPE	MATERIAL	SPECIFICATION	DESCRIPTION	USE	QTY
FTG	71	1/2"	STRAINER	BRONZE	KECKLEY STYLE E-150	1/2" 1SJY-BCM20MI34-FTI-E	3/8" BLOW DOWN; SWEAT SOCKET - PCHW SUPPLY LINES	
FTG	72	3/4"	STRAINER	BRONZE	KECKLEY STYLE E-150	3/4" 1SJY-BCM20MI34-FTI-E	3/8" BLOW DOWN; SWEAT SOCKET - PCHW SUPPLY LINES	
FTG	73	1"	STRAINER	BRONZE	KECKLEY STYLE E-150	1" 1SJY-BCM20MI34-FTI-E	1/2" BLOW DOWN; SWEAT SOCKET - PCHW SUPPLY LINES	

FILTERS & INSTRUMENTATION

ID	#	SIZE	TYPE	MATERIAL	CONNECTION	MANUFACTURER	PART NUMBER	DESCRIPTION	USE
FL	3	1/2"	FILTER/REGULATOR COMBO	ACETAL	NPT	PARKER	FB11-04WGC-SS	5 MICRON MESH	COMPRESSED AIR
PG	1	1/4"	PRESSURE GAUGE	STAINLESS	NPT	NISCO	G252562L12	0-160 PSIG NEEDLE GAUGE	DIW/HCA/CA/GN2
PG	2	1/4"	PRESSURE GAUGE	STAINLESS	NPT	NO SHOK	25-500-60-PSI-1/4	0-60 PSIG NEEDLE GAUGE	GN2
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 & PCHW HEADER

QAS BEAMLINE, 7-BM MECHANICAL UTILITIES

DRAWING ID	DEVICE ID	COMMENT
1001	7BM R - PCHWS - VLV - 1001	
1002	7BM R - PCHWS - MV - 1002	
1003	7BM R - PCHWS - VLV - 1003	
1004	7BM R - PCHWS - VLV - 1004	
1005	7BM R - PCHWS - VLV - 1005	
1006	7BM R - PCHWS - STR - 1006	
1007	7BM R - PCHWS - VLV - 1007	
1008	7BM R - PCHWS - VLV - 1008	
1009	7BM R - PCHWS - VLV - 1009	
1010	7BM R - PCHWS - VLV - 1010	
1011	7BM F - PCHWS - VLV - 1011	
1012	7BM F - PCHWS - VLV - 1012	
1013	7BM F - PCHWS - STR - 1013	
1014	7BM F - PCHWS - VLV - 1014	
1015	7BM F - PCHWS - VLV - 1015	
1016	7BM F - PCHWS - PG - 1016	
1017	7BM F - PCHWS - VLV - 1017	
1018	7BM F - PCHWS - VLV - 1018	
1019	Not Used - 1019	
1020	7BM R - PCHWS - VLV - 1020	
1021	7BM R - PCHWS - VLV - 1021	
1022	7BM R - PCHWS - STR - 1022	
1023	7BM R - PCHWS - VLV - 1023	
1024	7BM B - PCHWS - PG - 1024	
1025	7BM B - PCHWS - VLV - 1025	
1026	7BM B - PCHWS - VLV - 1026	
1027	7BM B - PCHWS - VLV - 1027	
1028	7BM B - PCHWS - VLV - 1028	
1029	7BM R - PCHWS - VLV - 1029	
1030	7BM R - PCHWS - VLV - 1030	
1031	7BM R - PCHWS - VLV - 1031	
1032	7BM R - PCHWS - STR - 1032	
1033	7BM R - PCHWS - VLV - 1033	
1034	7BM R - PCHWS - VLV - 1034	
1035	7BM R - PCHWS - VLV - 1035	
1036	7BM R - PCHWS - VLV - 1036	
1037	7BM R - PCHWS - VLV - 1037	
1038	7BM R - PCHWS - STR - 1038	
1039	7BM R - PCHWS - VLV - 1039	
1040	7BM C - PCHWS - PG - 1040	
1041	7BM C - PCHWS - VLV - 1041	
1042	Not Used - 1042	
1043	7BM C - PCHWS - VLV - 1043	
1044	7BM C - PCHWS - VLV - 1044	
1045	7BM R - PCHWS - VLV - 1045	
1046	7BM B - PCHWS - VLV - 1046	
1047	7BM C - PCHWS - VLV - 1047	
1048	7BM B - PCHWS - VLV - 1048	
1049	7BM R - PCHWS - TS - 1049	
1050	7BM R - PCHWR - VLV - 1050	
1051	7BM R - PCHWR - MV - 1051	
1052	7BM R - PCHWR - VLV - 1052	
1053	7BM R - PCHWR - VLV - 1053	
1054	7BM R - PCHWR - VLV - 1054	
1055	7BM R - PCHWR - AV - 1055	
1056	7BM R - PCHWR - VLV - 1056	
1057	7BM R - PCHWR - VLV - 1057	
1058	7BM R - PCHWR - MV - 1058	
1059	7BM R - PCHWR - VLV - 1059	
1060	7BM R - PCHWR - VLV - 1060	
1061	7BM F - PCHWR - VLV - 1061	
1062	7BM F - PCHWR - VLV - 1062	
1063	7BM F - PCHWR - AV - 1063	
1064	7BM F - PCHWR - VLV - 1064	
1065	7BM F - PCHWR - VLV - 1065	
1066	7BM F - PCHWR - MV - 1066	
1067	7BM F - PCHWR - PG - 1067	

QAS BEAMLINE, 7-BM MECHANICAL UTILITIES

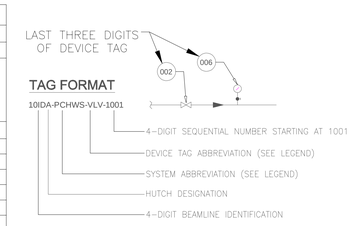
DRAWING ID	DEVICE ID	COMMENT
1068	7BM F - PCHWR - VLV - 1068	
1069	7BM F - PCHWR - VLV - 1069	
1070	7BM R - PCHWR - VLV - 1070	
1071	7BM R - PCHWR - VLV - 1071	
1072	7BM R - PCHWR - AV - 1072	
1073	7BM B - PCHWR - PG - 1073	
1074	7BM B - PCHWR - VLV - 1074	
1075	Not Used - 1075	
1076	7BM B - PCHWR - VLV - 1076	
1077	7BM B - PCHWR - VLV - 1077	
1078	7BM R - PCHWR - VLV - 1078	
1079	7BM R - PCHWR - VLV - 1079	
1080	7BM R - PCHWR - AV - 1080	
1081	7BM R - PCHWR - VLV - 1081	
1082	7BM R - PCHWR - VLV - 1082	
1083	7BM R - PCHWR - MV - 1083	
1084	7BM R - PCHWR - VLV - 1084	
1085	7BM R - PCHWR - MV - 1085	
1086	7BM R - PCHWR - VLV - 1086	
1087	7BM R - PCHWR - VLV - 1087	
1088	7BM R - PCHWR - AV - 1088	
1089	7BM C - PCHWR - PG - 1089	
1090	7BM C - PCHWR - VLV - 1090	
1091	7BM B - PCHWR - VLV - 1091	
1092	7BM C - PCHWR - VLV - 1092	
1093	7BM C - PCHWR - VLV - 1093	
1094	7BM C - PCHWR - VLV - 1094	
1095	7BM C - PCHWR - VLV - 1095	
1096	7BM B - PCHWR - VLV - 1096	
1097	7BM B - PCHWR - VLV - 1097	
1098	7BM B - PCHWR - VLV - 1098	
1099	7BM B - PCHWR - VLV - 1099	
1100	7BM R - PCHWR - VLV - 1100	
1101	7BM C - PCHWR - VLV - 1101	
1102	7BM B - PCHWR - VLV - 1102	
1103	7BM R - PCHWR - TS - 1103	
1104	Not Used - 1104	
1105	7BM A - CA - VLV - 1105	
1106	7BM A - CA - VLV - 1106	
1107	7BM A - CA - PG - 1107	
1108	7BM A - CA - VLV - 1108	
1109	7BM A - CA - FL - 1109	
1110	7BM A - CA - VLV - 1110	
1111	7BM A - CA - PG - 1111	
1112	7BM A - CA - VLV - 1112	
1113	7BM A - CA - VLV - 1113	
1114	7BM A - CA - PRV - 1114	
1115	7BM A - CA - VLV - 1115	
1116	7BM A - CA - VLV - 1116	
1117	7BM A - CA - VLV - 1117	
1118	7BM A - CA - VLV - 1118	
1119	7BM R - CA - VLV - 1119	
1120	7BM R - CA - VLV - 1120	
1121	7BM R - CA - VLV - 1121	
1122	7BM R - CA - VLV - 1122	
1123	7BM F - CA - PG - 1123	
1124	7BM F - CA - VLV - 1124	
1125	7BM F - CA - VLV - 1125	
1126	7BM R - CA - VLV - 1126	
1127	7BM B - CA - VLV - 1127	
1128	7BM B - CA - PG - 1128	
1129	7BM B - CA - VLV - 1129	
1130	Not Used - 1130	
1131	7BM R - CA - VLV - 1131	
1132	7BM R - CA - VLV - 1132	
1133	7BM R - CA - VLV - 1133	
1134	7BM R - CA - VLV - 1134	

QAS BEAMLINE, 7-BM MECHANICAL UTILITIES

DRAWING ID	DEVICE ID	COMMENT
1135	7BM C - CA - VLV - 1135	
1136	7BM C - CA - PG - 1136	
1137	7BM C - CA - VLV - 1137	
1138	7BM C - CA - VLV - 1138	
1139	Not Used - 1139	
1140	Not Used - 1140	
1141	Not Used - 1141	
1142	Not Used - 1142	
1143	Not Used - 1143	
1144	7BM R - GN2 - VLV - 1144	
1145	7BM R - GN2 - VLV - 1145	
1146	7BM R - GN2 - VLV - 1146	
1147	7BM F - GN2 - PG - 1147	
1148	7BM F - GN2 - VLV - 1148	
1149	7BM F - GN2 - VLV - 1149	
1150	7BM R - GN2 - VLV - 1150	
1151	7BM B - GN2 - VLV - 1151	
1152	7BM B - GN2 - PG - 1152	
1153	7BM B - GN2 - VLV - 1153	
1154	7BM B - GN2 - VLV - 1154	
1155	7BM R - GN2 - VLV - 1155	
1156	7BM C - GN2 - VLV - 1156	
1157	7BM C - GN2 - PG - 1157	
1158	7BM C - GN2 - VLV - 1158	
1159	7BM C - GN2 - VLV - 1159	

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
FL	FILTER
PG	PRESSURE GAUGE
PRV	PRESSURE RELIEF VALVE
MV	MOTORIZED VALVE
TS	TEMPERATURE SENSOR
VLV	MANUAL VALVE
STR	STRAINER
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, TAGS NUMBERS AND LEGENDS.

E SHEET SIZE	PD-QAS-UT-1500 DRAWING/DIRECT NUMBER	A REVISION
ESH&Q RISK LEVEL A2		SHEET 10 OF 10

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