

1234 ADDRESS ST, ASPEN, CO 81611

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***In a Partial Home Backup Scenario loads on a panel without backup power may be swapped with loads on a backed up panel to provide desired backup.**

BRIGHTVAULT

DENVER OFFICE:
6899 PECOS ST. UNIT D,
DENVER, CO 80221
PHONE: 303.228.6898
SALES@BRIGHTVAULT.COM

PRIVATE RESIDENCE
COLORADO

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Project Directory

0.0

PROJECT ADDRESS

1234 Aspen House
Aspen CO, 81611

BRIGHTVAULT

BRIGHTVAULT
303.228.6898
6899 Pecos St. Unit D, Denver, CO

BRIGHTVAULT CERTIFIED INSTALLER

CERTIFIED INSTALL INC
222.222.2222
123 Street St, Aspen, CO 81611

UTILITY INFORMATION

MOUNTAIN AREA UTILITY
333.333.3333
1234 CO-82, Glenwood Springs, CO 81601

ELECTRICAL ENGINEER

PROFESSIONAL BUILDERS
444.444.4444
1234 Mountain Blvd, Lakewood, CO 80401

SOLAR CONTRACTOR

MOUNTAIN SOLAR
555.555.5555
1234 Solar Way, Carbondale, CO 81623

ELECTRICAL CONTRACTOR

JOHNS ELECTRIC
666.666.6666
1234 Electric Rd. Aspen, CO 81611

GENERAL CONTRACTOR

JACKS CONTRACTING
777.777.7777
123 W Address St, Aspen, CO 81611

PROJECT ARCHITECT

SMITH & CO ARCHITECTS
888.888.8888
123 W Address St, Aspen, CO 81611

LOW-VOLTAGE INTEGRATOR

AV PROFESSIONALS
999.999.9999
455 Streed Rd, Basalt, CO 81623

SYSTEM SPECIFICATIONS

SYSTEM CAPACITY

153.6 kWh

MAX SYSTEM AMPERAGE (OFF-GRID)

200 Amps

MAX SYSTEM POWER (OFF-GRID)

48 kW

MAX SYSTEM PASS-THROUGH (ON-GRID)

800 Amps

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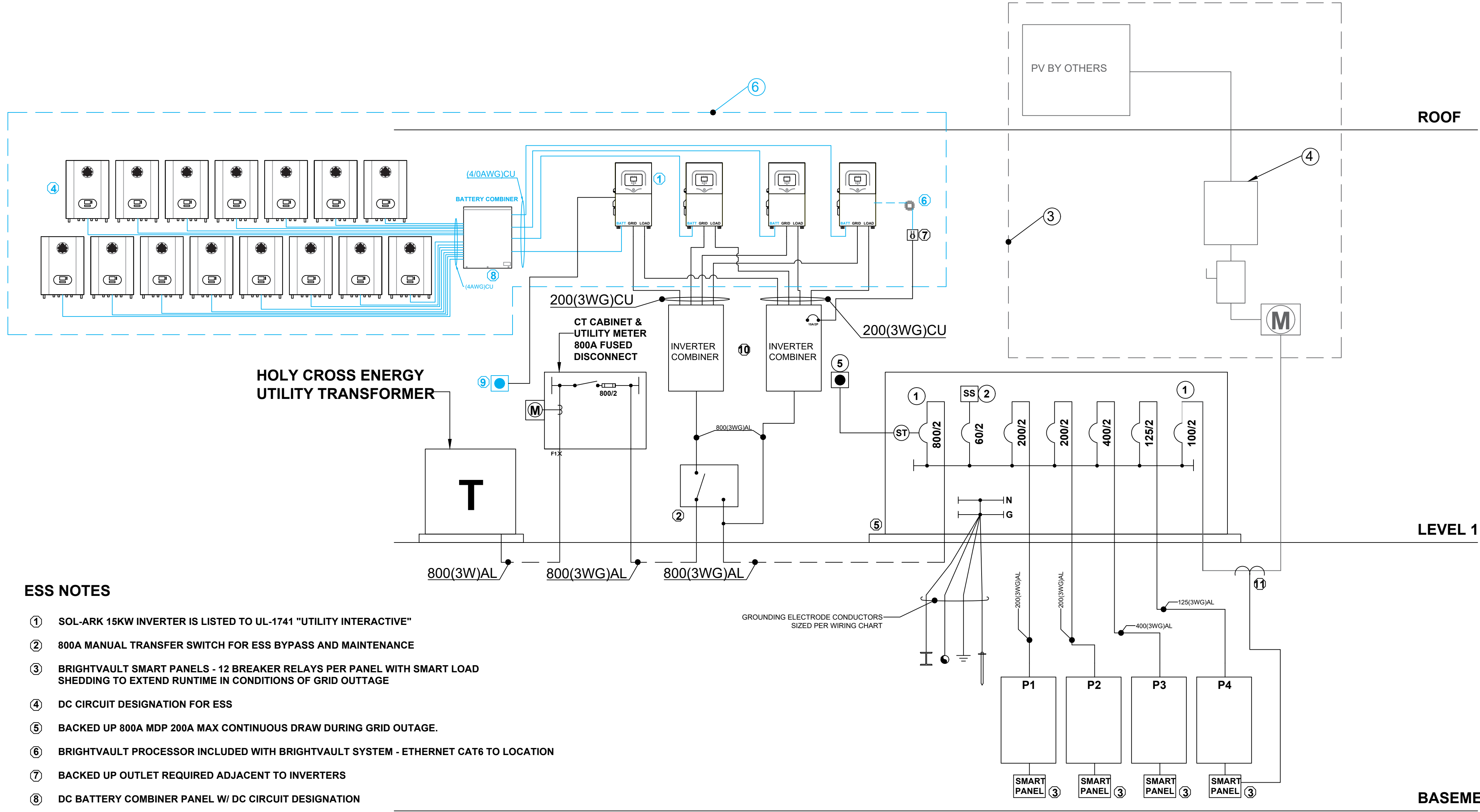
PROJECT INFO

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System Runtime Estimate							
Average Draw			System Capacity (kWh)	Average Draw			System Capacity (kWh)
AMPS	KW	%	153.6	AMPS	KW	%	153.6
5	1.2	1	128 Hours	110	26.4	17	5.8 Hours
10	2.4	2	64 Hours	115	27.6	18	5.6 Hours
15	3.6	2	42.7 Hours	120	28.8	19	5.3 Hours
20	4.8	3	32 Hours	125	30	20	5.1 Hours
25	6	4	25.6 Hours	130	31.2	20	4.9 Hours
30	7.2	5	21.3 Hours	135	32.4	21	4.7 Hours
40	9.6	6	16 Hours	140	33.6	22	4.6 Hours
45	10.8	7	14.2 Hours	145	34.8	23	4.4 Hours
50	12	8	12.8 Hours	150	36	23	4.3 Hours
55	13.2	9	11.6 Hours	155	37.2	24	4.1 Hours
60	14.4	9	10.7 Hours	160	38.4	25	4 Hours
65	15.6	10	9.8 Hours	165	39.6	26	3.9 Hours
70	16.8	11	9.1 Hours	170	40.8	27	3.8 Hours
75	18	12	8.5 Hours	175	42	27	3.7 Hours
80	19.2	13	8 Hours	180	43.2	28	3.6 Hours
85	20.4	13	7.5 Hours	185	44.4	29	3.5 Hours
90	21.6	14	7.1 Hours	190	45.6	30	3.4 Hours
95	22.8	15	6.7 Hours	195	46.8	30	3.3 Hours
100	24	16	6.4 Hours	200	48	31	3.2 Hours
105	25.2	16	6.1 Hours				

NOTES: *PERCENT DRAW BASED ON 80% OF 800A MDP
 *RUNTIME DOES NOT ACCOUNT FOR SOLAR PRODUCTION OR LOAD SHEDDING
 *RUNTIME MAY VARY DEPENDING ON OCCUPANCY HABITS



FLAG NOTES:

- 1 PROVIDE BACK-FEED TYPE CIRCUIT BREAKER.
- 2 PROVIDE TYPE 2 SURGE PROTECTION DEVICE. COORDINATE CIRCUIT BREAKER SIZE WITH REVIEWED MANUFACTURERS SUBMITTAL PRIOR TO ROUGH-IN.
- 3 NET METERED PV SYSTEM. SYSTEM DESIGNED BY OTHERS; ANTICIPATED SIZE TBD. RE: PV SYSTEM CONSTRUCTIONS DOCUMENTS; COORDINATE WITH PV DESIGN/BUILD CONTRACTOR AS NECESSARY.
- 4 PV AC COMBINER PANEL, DISCONNECT, AND PRODUCTION METER (BY OTHERS). LABEL PV DISCONNECTING MEANS IN ACCORDANCE WITH NEC 690.13(B)
- 5 PROVIDE PUSH-BUTTON FOR SHUNT-TRIP DISCONNECT.
- 6 BRIGHTVAULT SCOPE OF WORK EXCLUDING LINE-VOLTAGE CONNECTIONS AT INVERTER. EVERYTHING OUTSIDE TO BE SPECIFIED BY OTHERS.

ESS NOTES

- ① SOL-ARK 15KW INVERTER IS LISTED TO UL-1741 "UTILITY INTERACTIVE"
- ② 800A MANUAL TRANSFER SWITCH FOR ESS BYPASS AND MAINTENANCE
- ③ BRIGHTVAULT SMART PANELS - 12 BREAKER RELAYS PER PANEL WITH SMART LOAD SHEDDING TO EXTEND RUNTIME IN CONDITIONS OF GRID OUTTAGE
- ④ DC CIRCUIT DESIGNATION FOR ESS
- ⑤ BACKED UP 800A MDP 200A MAX CONTINUOUS DRAW DURING GRID OUTTAGE.
- ⑥ BRIGHTVAULT PROCESSOR INCLUDED WITH BRIGHTVAULT SYSTEM - ETHERNET CAT6 TO LOCATION
- ⑦ BACKED UP OUTLET REQUIRED ADJACENT TO INVERTERS
- ⑧ DC BATTERY COMBINER PANEL W/ DC CIRCUIT DESIGNATION
- ⑨ RAPID SHUTDOWN DESIGNATION FOR ESS
- ⑩ 800A INPUT & OUTPUT INVERTER COMBINER PANELS
- ⑪ SOLAR CT CONNECTED TO AUX CT FEED ON SMART PANEL

GENERAL ESS OPERATION:
THE ESS INVERTERS WILL UTILIZE AN INTERNAL 5MS AUTOMATIC TRANSFER SWITCH DURING A UTILITY OUTAGE TRANSFERRING POWER FROM GRID TO BATTERIES TO SUPPLY THE MDP. EACH ESS INVERTER MAX CONTINUOUS OUTPUT DURING GRID OUTAGE IS 50A. FOR A COMBINED 200A OUTPUT DURING AN OUTAGE. DURING NORMAL OPERATION, WHEN UTILITY POWER IS PRESENT, POWER WILL PASS-THROUGH ESS INVERTER TO MDP. EACH INVERTER MAX PASS-THROUGH CURRENT IS 200A FOR A TOTAL AVAILABLE PASS-THROUGH OF 800A FOR THE MDP.

WIRE SIZE NOTE:
INVERTER AC INPUT/OUTPUT: 1/0 - 4/0 AWG (3/8" LUGS)
INVERTER BATTERY INPUT 2/0 - 4/0 AWG (3/8" LUGS)
ALL DC CONNECTIONS ARE STRANDED WELDING CABLE TYPE
ANY WIRE ETC OUTSIDE THE ENERGY STORAGE SYSTEM AND SOLAR SCOPE TO BE CONFIRMED BY MEP

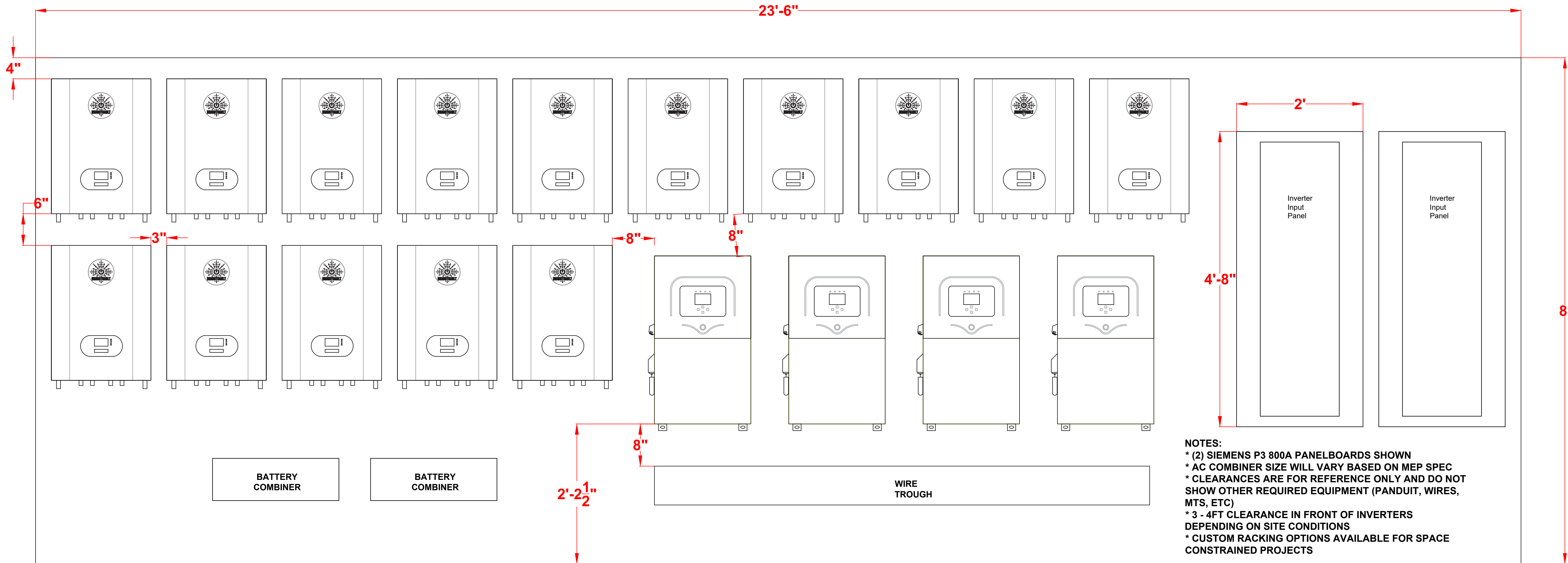
SERVICE WIRING SCHEDULE						
AMPS	ALUMINUM					
	(3W)	GROUNDING ELECTRODE CONDUCTOR				
		W.P.	M.F.	C.E.C.	G.RING	G. ROD
800	3(3-400 KCMIL) 3°C	#2 CU	#2 CU	#2 CU	#6 CU	

CONDUIT SIZES ARE BASED ON NEC TABLE 4 (RNC SCHEDULE 80) AND TABLE 5 (THHN INSULATION).
ABBREVIATIONS: W.P. - WATER PIPE; M.F. - METAL FRAME OR STRUCTURE; C.E.C. - CONCRETE ENCASED ELECTRODE; G.RING - GROUND RING; G.ROD - GROUND ROD; PIPE OR PLATE ELECTRODE.
REFER TO GROUNDING ELECTRODE CONDUCTOR (GEC) DETAIL DRAWING. IF A DIFFERENT CONFIGURATION IS USED, THE CONTRACTOR IS RESPONSIBLE FOR SIZING THE GEC AND BONDING JUMPERS PER NEC 250.66.

WIRING SCHEDULE - ALUMINUM		BRIGHTVAULT WIRING SCHEDULE - COPPER	
AMPS	(3WG)	AMPS	(3WG)
	1Ø, 3 WIRE, GROUND OR 3Ø, 3 WIRE, GROUND		1Ø, 3 WIRE, GROUND OR 3Ø, 3 WIRE, GROUND
100	3(1/2 & 1/4 G) 1 1/4°C	200	3(3/4 & 1/4 G) 2°C
125	3(3/4 & 1/4 G) 1 1/2°C	COPPER CONDUCTORS ARE RATED FOR 90°C TERMINATIONS TO THE WIRE TROUGH UNDER INVERTERS. EACH 3" CONDUIT CARRIES (2) SETS OF 200(3WG)CU. SIZING BASED ON CU 4/0 RATED 90°C PER TABLE 310.15(C)(1) (THHN INSULATION).	
150	3(3/4 & 1/4 G) 2°C		
200	3(250 KCMIL & 1/4 G) 2 1/2°C		
400	2(3-250 KCMIL & 1/4 G) 2 1/2°C		
800	3(3-400 KCMIL & 1/4 G) 3°C	TWO 3" PVC SCHEDULE 80 CONDUITS USED FROM EACH COMBINER TO THE WIRE TROUGH UNDER INVERTERS. SIZING BASED ON CU 4/0 RATED 90°C PER TABLE 310.15(C)(1) (THHN INSULATION).	

CONDUCTOR SIZES ARE BASED ON 60 TERMINATIONS FOR AMPACITIES EQUAL TO OR LESS THAN 100A AND 75° TERMINATIONS FOR AMPACITIES GREATER THAN 100A, NEC TABLE 310.15(B)(16).
CONDUIT SIZES ARE BASED ON NEC TABLE 4 (EMT) AND TABLE 5 (THHN INSULATION).

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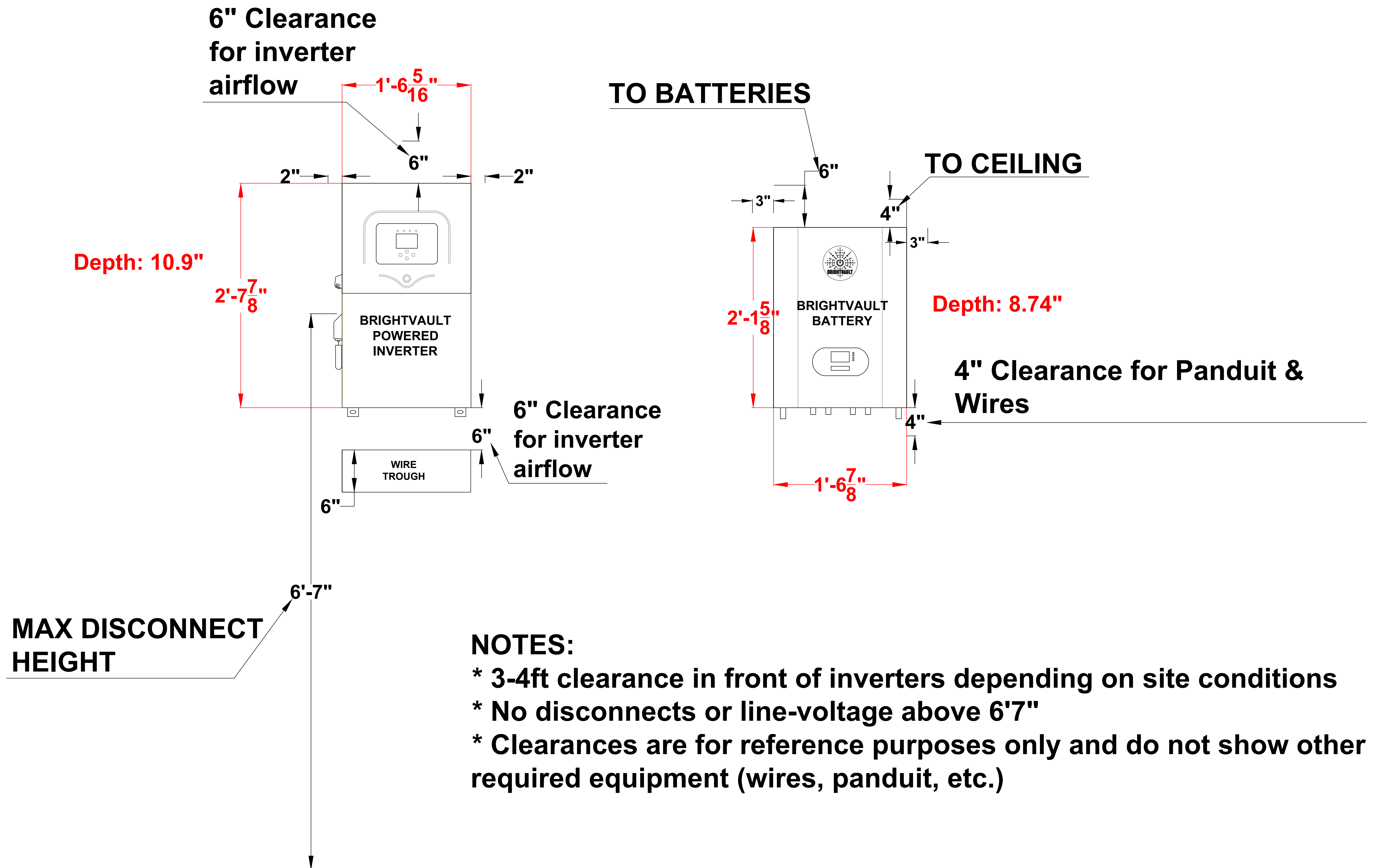


- NOTES:**
- * (2) SIEMENS P3 800A PANELBOARDS SHOWN
 - * AC COMBINER SIZE WILL VARY BASED ON MEP SPEC
 - * CLEARANCES ARE FOR REFERENCE ONLY AND DO NOT SHOW OTHER REQUIRED EQUIPMENT (PANDUIT, WIRES, MTS, ETC)
 - * 3 - 4FT CLEARANCE IN FRONT OF INVERTERS DEPENDING ON SITE CONDITIONS
 - * CUSTOM RACKING OPTIONS AVAILABLE FOR SPACE CONSTRAINED PROJECTS

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PANEL:	EM		VOLTAGE:	120/240		
LOCATION:	MECH ROOM		MINIMUM BUS:	200A		PANEL TOTAL (KVA): 28633
MOUNTING:			MAIN:			PANEL TOTAL (A): 119.3
			MINIMUM AIC:			
LEFT						
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING
1	WASHER	1500	A	A	1	20
3	DRYER	2880	B	A	2	30
5		2880	A		-	-
7	KITCHEN RANGE	4800	B	A		50
9		4800	A		-	-
11	KITCHEN HOOD	528	B	M		
13	KITCHEN REF	1500	A	E		
15	PANTRY REF	1500	B	E		
17	KITCHEN MICROWAVE	1500	A	A		
19	WINE COOLER	1200	B	E		
21						
23						
25						
27						
29						
31						
33						
35						
RIGHT						
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING
2	AV PANEL	1200	A	R		
4	BOILER 1	1440	B	E	1	20
6	BOILER PUMP	480	A	M	1	20
8	RADIANT HEAT PUMP	625	B	M	1	20
10	KITCHEN TOASTER	1800	A	A	1	20
12						
14						
16						
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						

PANEL:	LIGHTING		VOLTAGE:	120/240		
LOCATION:	MECH ROOM		MINIMUM BUS:	200A		PANEL TOTAL (KVA): 10425
MOUNTING:			MAIN:			PANEL TOTAL (A): 43.44
			MINIMUM AIC:			
LEFT						
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING
1	BASEMENT	1005	A	L	1	20
3	OFFICE	780	B	L	1	20
5	KITCHEN	1400	A	L	1	20
7	MASTER SUITE	1200	B	L	1	20
9	LIGHTING CNTRL	240	A	L	1	20
11	PANTRY	800	B	L	1	20
13						
15						
17						
19						
21						
23						
25						
27						
29						
RIGHT						
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING
2	OUTDOOR SITTING	360	A	L	1	20
4	EXTERIOR LIGHTING	240	B	L	1	20
6	CRAWL SPACE	600	A	L	1	20
8	MEDIA ROOM	1200	B	L	1	20
10	FITNESS ROOM	800	A	L	1	20
12	NORTH MAIN LEVEL	900	B	L	1	20
14	SOUTH MAIN LEVEL	900	A	L	1	20
16						
18						
20						
22						
24						
26						
28						
30						

DENVER OFFICE:
6899 PECOS ST. UNIT D,
DENVER, CO 80221
PHONE: 303.228.6898
SALES@BRIGHTVAULT.COM

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PANEL:	MAIN PANEL		VOLTAGE:	120/240		
LOCATION:	MECH ROOM		MINIMUM BUS:	200A	PANEL TOTAL (KVA):	12000
MOUNTING:			MAIN:		PANEL TOTAL (A):	50
			MINIMUM AIC:			
LEFT						
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING
1	EXTERIOR OUTLETS	280	A	R	1	20
3	PANTRY OUTLETS	900	B	R	1	20
5	STORAGE OUTLETS	360	A	R	1	20
7	MUDROOM	900	B	R	1	20
9	GARAGE	900	A	R	1	20
11	BOOT DRYER	1500	B	A	1	20
13	GRILL	180	A	R	1	20
15	GRILL HOOD	1500	B	M	1	20
17	OUTDOOR FIRE	180	A	R	1	20
19	GARAGE DOOR	1500	B	M	1	20
21	GARAGE DOOR	1500	A	M	1	20
23	CRAWL OUTLETS	900	B	R	1	20
25	SPA EQUIPMENT ROOM	1100	A	R	1	20
27						
29						
31						
33						
35						
RIGHT						
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING
2	SHADE CTRL PANEL	1200	A	M	1	20
4	BATH 3	620	B	R	1	20
6	FITNESS ROOM	720	A	R	1	20
8	FITNESS ROOM TV	360	B	R	1	20
10	MEDIA ROOM	900	A	R	1	20
12	MEDIA ROOM TV	360	B	R	1	20
14	OFFICE	720	A	R	1	20
16	OFFICE	900	B	R	1	20
18	OFFICE	360	A	R	1	20
20	KITCHEN SMALL APP	1500	B	A	1	20
22						
24						
26						
28						
30						
32						
34						
36						

PANEL:	BREAKOUT PANEL		VOLTAGE:	120/240		
LOCATION:	MECH ROOM		MINIMUM BUS:	200A	PANEL TOTAL (KVA):	7820
MOUNTING:			MAIN:		PANEL TOTAL (A):	32.58
			MINIMUM AIC:			
LEFT						
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING
1	FAMILY ROOM	900	A	R	1	20
3	FAMILY ROOM TV	360	B	R	1	20
5	GUEST BED 2		A	R	1	20
7	GUEST BATH2		B	R	1	20
9	GUEST BED	900	A	R	1	20
11	GUEST BAR	1100	B	R	1	20
13						
15						
17						
19						
21						
23						
25						
27						
29						
31						
33						
35						
RIGHT						
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING
2	NORTH EXTERIOR	720	A	R	1	20
4	NORTH EXTERIOR	720	B	R	1	20
6	SOUTH OUTDOOR SIT	900	A	R	1	20
8	DINING ROOM	720	B	R	1	20
10	MEDIA ROOM FRIDGE	1500	A	A	1	20
12	MEDIA ROOM MW	1800	B	A	1	20
14	BEV COOLER	1500	A	A	1	20
16						
18						
20						
22						
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32						
34						
36						

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BACKED UP MAIN PANEL

RED LOADS MOVED TO NON-BACKED UP PANEL

PANEL:		MAIN PANEL		VOLTAGE:		120/240							
LOCATION:		MECH ROOM		MINIMUM BUS:		200A		PANEL TOTAL (KVA):		19340		NEW PANEL TOTAL (KVA):	
MOUNTING:				MAIN:				PANEL TOTAL (A):		80.58		NEW PANEL TOTAL (A):	
				MINIMUM AIC:									
LEFT													
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING	CONTROLLED LOAD	SWAP LOAD (MP#/BP#)	NEW DESCRIPTION	NEW LOAD	NEW TYPE		
1	EXTERIOR OUTLETS	280	A	R	1	20	x						
3	PANTRY OUTLETS	900	B	R	1	20	x	SWAP 3/1	FAMILY ROOM	900	R		
5	STORAGE OUTLETS	360	A	R	1	20	x	SWAP 5/3	FAMILY ROOM TV	360	R		
7	MUDROOM	900	B	R	1	20							
9	GARAGE	900	A	R	1	20	x						
11	BOOT DRYER	1500	B	A	1	20							
13	GRILL	180	A	R	1	20							
15	GRILL HOOD	1500	B	M	1	20							
17	OUTDOOR FIRE	180	A	R	1	20							
19	GARAGE DOOR	1500	B	M	1	20							
21	GARAGE DOOR	1500	A	M	1	20							
23	CRAWL OUTLETS	900	B	R	1	20	x		GUEST BED	900	R		
25	SPA EQUIPMENT ROOM	1100	A	R	1	20	x		GUEST BAR	1100	R		
27													
29													
31													
33													
35													
RIGHT													
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING	CONTROLLED LOAD	SWAP LOAD (MP#/BP#)	NEW DESCRIPTION	NEW LOAD	NEW TYPE		
2	SHADE CTRL PANEL	1200	A	M	1	20							
4	BATH 3	620	B	R	1	20	x	SWAP 4/8	DINING ROOM	720			
6	FITNESS ROOM	720	A	R	1	20							
8	FITNESS ROOM TV	360	B	R	1	20	x						
10	MEDIA ROOM	900	A	R	1	20	x						
12	MEDIA ROOM TV	360	B	R	1	20	x						
14	OFFICE	720	A	R	1	20							
16	OFFICE	900	B	R	1	20	x						
18	OFFICE	360	A	R	1	20							
20	KITCHEN SMALL APP	1500	B	A	1	20	x						
22													
24													
26													
28													
30													
32													
34													
36													

GREEN LOADS MOVED TO BACKED UP PANEL

NON-BACKED UP BREAKOUT PANEL

GREEN LOADS SWAPPED TO BACKED UP PANEL

PANEL:		BREAKOUT PANEL		VOLTAGE:		120/240							
LOCATION:		MECH ROOM		MINIMUM BUS:		200A		PANEL TOTAL (KVA):		12560		NEW PANEL TOTAL (KVA):	
MOUNTING:				MAIN:				PANEL TOTAL (A):		52.33		NEW PANEL TOTAL (A):	
				MINIMUM AIC:									
LEFT													
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING	CONTROLLED LOAD	SWAP LOAD (BP#/MP#)	NEW DESCRIPTION	NEW LOAD	NEW TYPE		
1	FAMILY ROOM	900	A	R				SWAP 1/3	PANTRY OUTLETS	900	R		
3	FAMILY ROOM TV	360	B	R				SWAP 3/5	STORAGE OUTLETS	360	R		
5	GUEST BED 2	1080	A	R									
7	GUEST BATH2	360	B	R									
9	GUEST BED	900	A	R				SWAP 9/23	CRAWL OUTLETS	900	R		
11	GUEST BAR	1100	B	R				SWAP 11/25	SPA EQUIPMENT ROOM	1100	R		
13													
15													
17													
19													
21													
23													
25													
27													
29													
31													
33													
35													
RIGHT													
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING	CONTROLLED LOAD	SWAP LOAD (BP#/MP#)	NEW DESCRIPTION	NEW LOAD	NEW TYPE		
2	NORTH EXTERIOR	720	A	R	1	20							
4	NORTH EXTERIOR	720	B	R	1	20							
6	SOUTH OUTDOOR SIT	900	A	R	1	20							
8	DINING ROOM	720	B	R	1	20		SWAP 8/4	BATH 3	620	R		
10	MEDIA ROOM FRIDGE	1500	A	A	1	20							
12	MEDIA ROOM MW	1800	B	A	1	20							
14	BEV COOLER	1500	A	A	1	20							
16													
18													
20													
22													
24													
26													
28													
30													
32													
34													
36													

RED LOADS SWAPPED TO NON-BACKED UP PANEL

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BRIGHTVAULT ESS LOAD SCHEDULE	CONTACT INFO JESSE KAHN JESSE@BRIGHTVAULT.COM 215-688-1970	BRIGHTVAULT SYSTEM SIZE: 150kWh	123 Aspen St	TOTAL AMPERAGE ON BACKED UP PANELS = 232
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BACKED UP PANELS

PANEL:	EM	VOLTAGE:	120/240	PANEL TOTAL (VA):	25933
LOCATION:	MECH ROOM	MINIMUM BUS:	200	PANEL TOTAL (A):	108.05
MOUNTING:	RECESSED	MAIN:			
		MINIMUM AIC:			

PANEL:	LIGHTING	VOLTAGE:	120/240	PANEL TOTAL (VA):	10425
LOCATION:	MECH ROOM	MINIMUM BUS:	200	PANEL TOTAL (A):	43.44
MOUNTING:	RECESSED	MAIN:			
		MINIMUM AIC:			

PANEL:	MAIN PANEL	VOLTAGE:	120/240	PANEL TOTAL (VA):	19440
LOCATION:	MECH ROOM	MINIMUM BUS:	200	PANEL TOTAL (A):	81
MOUNTING:	RECESSED	MAIN:			
		MINIMUM AIC:			

Panel Name	On BrightVault ESS	Loads Moved	Panel Location
EM	YES	NO	MECH ROOM
LIGHTING	YES	NO	MECH ROOM
MAIN PANEL	YES	YES	MECH ROOM
BREAKOUT PANEL	NO	YES	MECH ROOM

PANEL:	EM	VOLTAGE:	120/240	PANEL TOTAL (VA):	25933			
LOCATION:	MECH ROOM	MINIMUM BUS:	200	PANEL TOTAL (A):	108.05			
MOUNTING:	RECESSED	MAIN:						
		MINIMUM AIC:						
	NEW PANEL TOTAL (VA):							
	NEW PANEL TOTAL (A):							
LEFT								
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING	CONTROLLED LOAD	NOTES
1	WASHER	1500	A	A	1	20		
3	DRYER	2880	B	A	2	30		
5		2880	A		-	-		
7	KITCHEN RANGE	4800	B	A		50		
9		4800	A		-	-		
11	KITCHEN HOOD	528	B	M				
13	KITCHEN REF	1500	A	E				
15	PANTRY REF	1500	B	E				
17	KITCHEN MICROWAVE	1500	A	A				
19	WINE COOLER	1200	B	E				
21								
23								
25								
27								
29								
31								
33								
35								
RIGHT								
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING	CONTROLLED LOAD	NOTES
2	AV PANEL	1200	A	R	1	20		
4	BOILER 1	1440	B	E	1	20		
6	BOILER PUMP	480	A	M	1	20		
8	RADIANT HEAT PUMP	625	B	M	1	20		
10	KITCHEN TOASTER	1800	A	A	1	20		
12								
14								
16								
18								
20								
22								
24								
26								
28								
30								
32								
34								
36								

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GREEN LOADS MOVED FROM
NON-BACKED UP PANEL

PANEL:		LIGHTING		VOLTAGE:		120/240			
LOCATION:		MECH ROOM		MINIMUM BUS:		200A		PANEL TOTAL (VA): 10425	
MOUNTING:		RECESSED		MAIN:				PANEL TOTAL (A) 43.44	
				MINIMUM AIC:					
LEFT									
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING	CONTROLLED LOAD	NOTES	
1	BASEMENT	1005	A	L	1	20			
3	OFFICE	780	B	L	1	20			
5	KITCHEN	1400	A	L	1	20			
7	MASTER SUITE	1200	B	L	1	20			
9	LIGHTING CNTRL	240	A	L	1	20			
11	PANTRY	800	B	L	1	20			
13									
15									
17									
19									
21									
23									
25									
27									
29									
RIGHT									
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING	CONTROLLED LOAD	NOTES	
2	OUTDOOR SITTING	360	A	L	1	20			
4	EXTERIOR LIGHTING	240	B	L	1	20			
6	CRAWL SPACE	600	A	L	1	20			
8	MEDIA ROOM	1200	B	L	1	20			
10	FITNESS ROOM	800	A	L	1	20			
12	NORTH MAIN LEVEL	900	B	L	1	20			
14	SOUTH MAIN LEVEL	900	A	L	1	20			
16									
18									
20									
22									
24									
26									
28									
30									

PANEL:		MAIN PANEL		VOLTAGE:		120/240			
LOCATION:		MECH ROOM		MINIMUM BUS:		200		PANEL TOTAL (VA): 19440	
MOUNTING:		RECESSED		MAIN:				PANEL TOTAL (A) 81	
				MINIMUM AIC:					
LEFT									
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING	CONTROLLED LOAD	NOTES	
1	EXTERIOR OUTLETS	280	A	R	1	20	x		
3	FAMILY ROOM	900	B	R	1	20	x		
5	FAMILY ROOM TV	360	A	R	1	20	x		
7	MUDROOM	900	B	R	1	20			
9	GARAGE	900	A	R	1	20	x		
11	BOOT DRYER	1500	B	A	1	20			
13	GRILL	180	A	R	1	20			
15	GRILL HOOD	1500	B	M	1	20			
17	OUTDOOR FIRE	180	A	R	1	20			
19	GARAGE DOOR	1500	B	M	1	20			
21	GARAGE DOOR	1500	A	M	1	20			
23	GUEST BED	900	B	R	1	20	x		
25	GUEST BAR	1100	A	R	1	20	x		
27									
29									
31									
33									
35									
37									
39									
41									
RIGHT									
BREAKER #	LOAD DESCRIPTION	LOAD	PHASE	TYPE	POLE	BREAKER RATING	CONTROLLED LOAD	NOTES	
2	SHADE CTRL PANEL	1200	A	M	1	20			
4	DINING ROOM	720	B	R	1	20	x		
6	FITNESS ROOM	720	A	R	1	20			
8	FITNESS ROOM TV	360	B	R	1	20	x		
10	MEDIA ROOM	900	A	R	1	20	x		
12	MEDIA ROOM TV	360	B	R	1	20	x		
14	OFFICE	720	A	R	1	20			
16	OFFICE	900	B	R	1	20	x		
18	OFFICE	360	A	R	1	20			
20	KITCHEN SMALL APP	1500	B	A	1	20	x		
22									
24									
26									
28									
30									
32									
34									
36									
38									
40									
42									

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DENVER OFFICE:
6899 PECOS ST. UNIT D,
DENVER, CO 80221
PHONE: 303.228.6898
SALES@BRIGHTVAULT.COM

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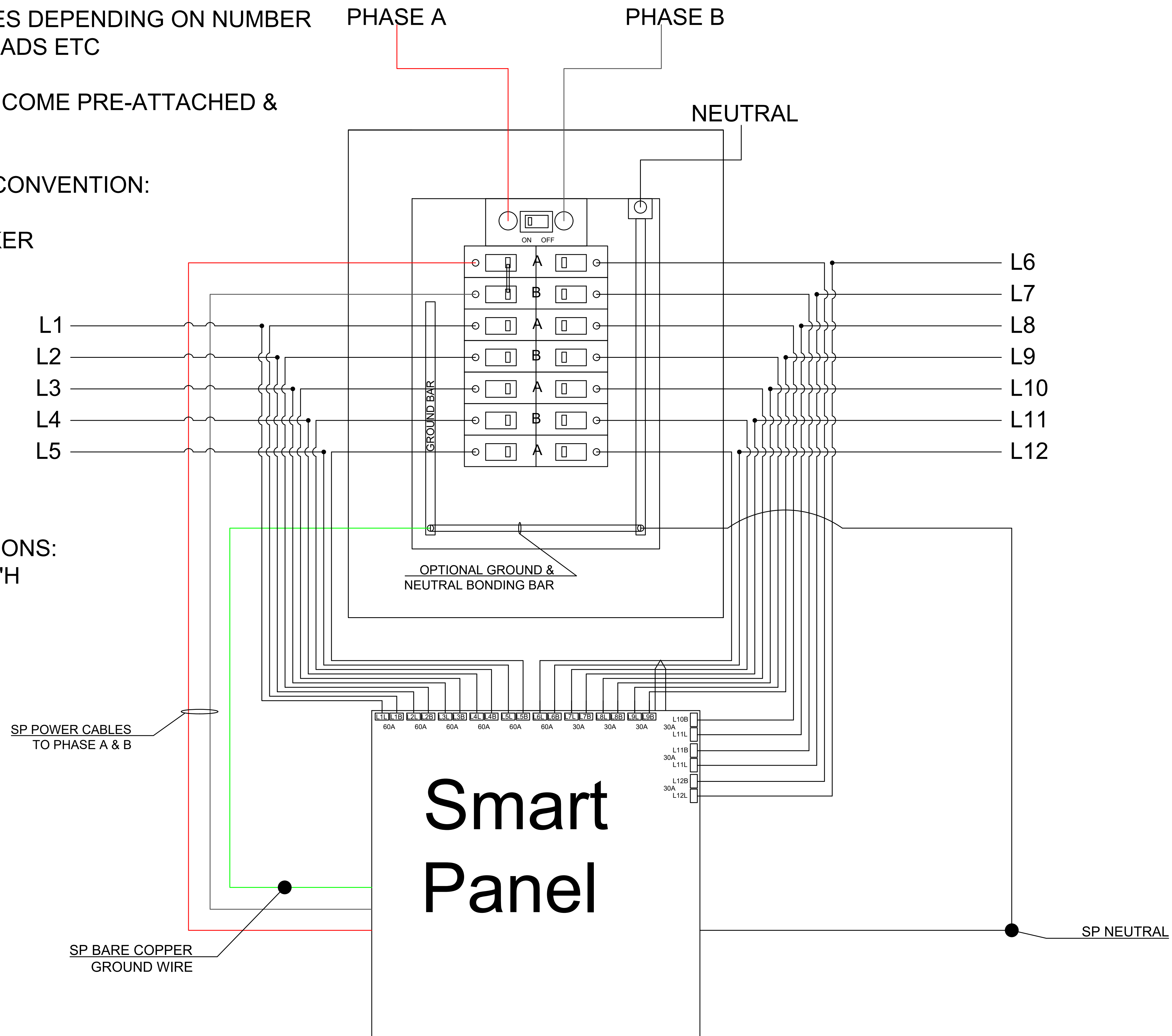
PANEL:	SMART PANEL 1		LINE SIDE GRID DETECT:	YES
LOCATION:	MAIN PANEL		MAIN CTs:	MAIN PANEL PHASE A&B
MOUNTING:	BENEATH PANEL		AUX CTs:	SOLAR FEED
CONTROLLED LOAD	LUMIN LOAD AMPS	BREAKER AMPS	CONTROLLED BREAKER #	CONTROLLED LOAD
1	60	20	1	EXTERIOR OUTLETS
2	60	20	3	FAMILY ROOM
3	60	20	4	DINING ROOM
4	60	20	5	FAMILY ROOM TV
5	60	20	8	FITNESS ROOM TV
6	60	20	9	GARAGE
7	30	20	10	MEDIA ROOM
8	30	20	12	MEDIA ROOM TV
9	30	20	16	OFFICE
10	30	20	20	KITCHEN SMALL APP
11	30	20	23	GUEST BED
12	30	20	25	GUEST BAR

NOTES:
 INSTALLATION VARIES DEPENDING ON NUMBER
 OF CONTROLLED LOADS ETC

ALL SP WIRE WHIPS COME PRE-ATTACHED &
 LABELED

SP WHIP LABELING CONVENTION:
 L1L = LINE #1 LOAD
 L1B = LINE #1 BREAKER

SMART PANEL DIMENSIONS:
 15.75"T x 15.75"W x 4.73"H



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RESPONSIBILITIES MATRIX

Equipment	Responsible Party			
BrightVault ESS	BrightVault & Certified Installer	Custom Integrator	Solar Installer	Electrician
BrightVault Batteries	PROVIDES & INSTALLS	-	-	-
BrightVault Powered Hybrid Inverter	PROVIDES & INSTALLS	-	-	-
BrightVault Battery Combiner	PROVIDES & INSTALLS	-	-	-
BrightVault Processor	PROVIDES & INSTALLS	-	-	-
Rapid Shutdown ESS	PROVIDES & INSTALLS	-	-	-
4/0 Stranded DC Cable (inverter connections)	PROVIDES & INSTALLS	-	-	-
4AWG Stranded DC Cable (battery connections)	PROVIDES & INSTALLS	-	-	-
Rapid Shutdown & Processor Connections	PROVIDES & INSTALLS	COORDINATE CONDUIT RUN	-	PROVIDE CONDUITS
Electrical				
Manual Transfer Switch	-	VERIFY	-	PROVIDES & INSTALLS
Load Centers	-	VERIFY	-	PROVIDES & INSTALLS
AC Combiner Panels	-	VERIFY	-	PROVIDES & INSTALLS
All AC Cable & Lugs	-	VERIFY	-	PROVIDES & INSTALLS
AC Conduit & Connections	-	VERIFY	-	PROVIDES & INSTALLS
Solar PV Combiner & Disconnect	-	VERIFY	-	PROVIDES & INSTALLS
Backed Up Outlet Adjacent to Inverters	-	VERIFY	-	PROVIDES & INSTALLS
Wire Trough	PROVIDES	VERIFY	-	INSTALLS
Smart Panels	PROVIDES	VERIFY	-	INSTALLS
Solar				
Solar Panels	-	-	PROVIDES & INSTALLS	-
Roof-Mount Racking	-	-	PROVIDES & INSTALLS	-
Microinverters	-	-	PROVIDES & INSTALLS	-
Junction Box	-	-	PROVIDES & INSTALLS	-
Energy Monitor	-	-	PROVIDES & INSTALLS	-
DC Connections	-	-	PROVIDES & INSTALLS	-
Solar PV Junction Box	-	-	PROVIDES & INSTALLS	-
AC Connection to Rooftop	-	-	TBD	TBD
ESS Inverter AC Connection	-	-	TBD	TBD
Low-Voltage				
CAT6 Ethernet to Each Inverter & Processor	-	COORDINATE & INSTALL	-	-
Programming Endpoints	PROVIDES	COMPLETES	-	-
CT's as Necessary	PROVIDES	VERIFY	-	CONNECT AT LUMIN
Permitting				
ESS & PV Interconnection Permit	PROVIDE & COMPLETE	-	PROVIDE & COMPLETE	-
Electrical Permit	-	-	-	PROVIDE & COMPLETE

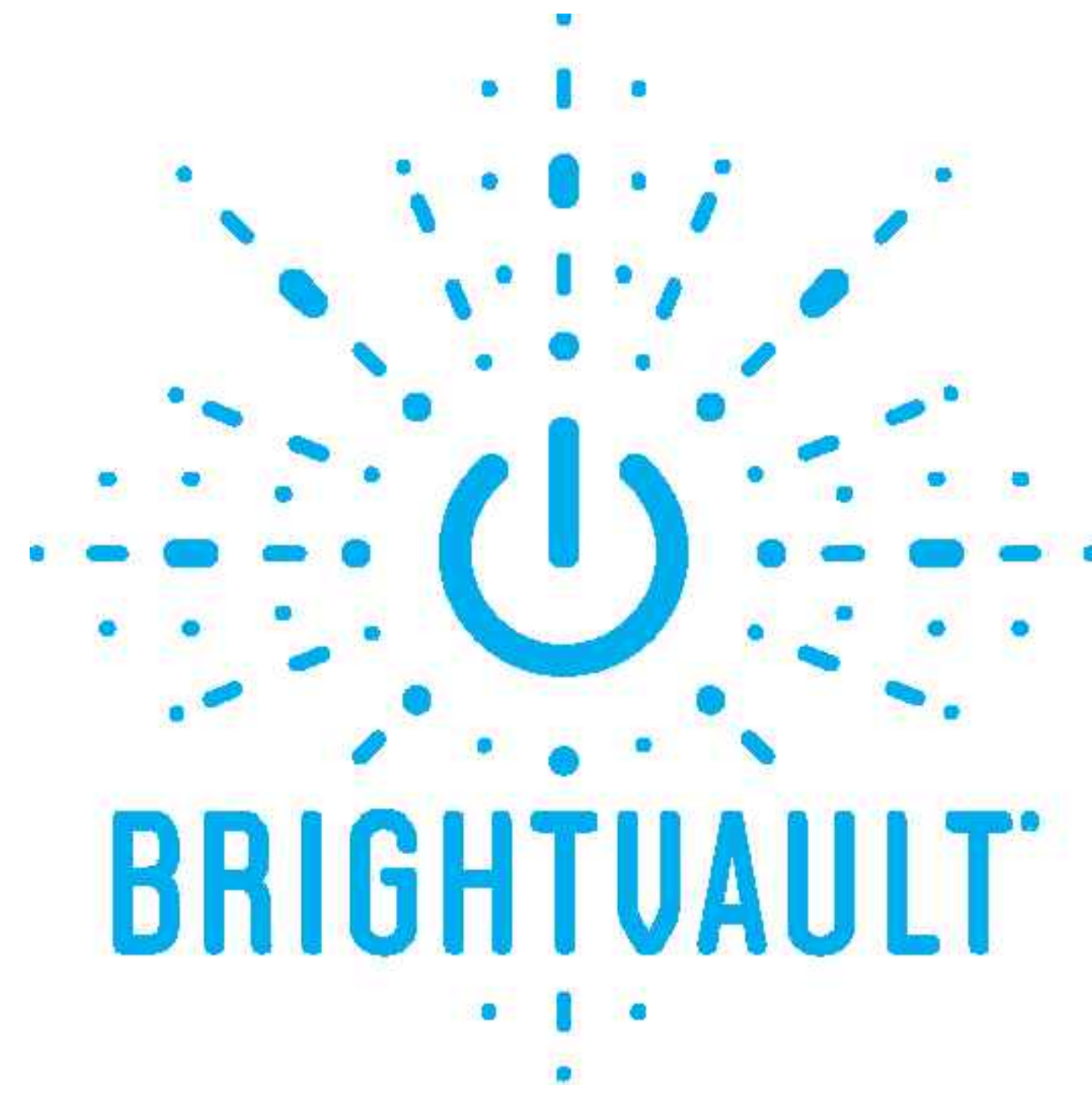


DENVER OFFICE:
6899 PECOS ST. UNIT D,
DENVER, CO 80221
PHONE: 303.228.6898
SALES@BRIGHTVAULT.COM

PRIVATE RESIDENCE
COLORADO

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STAMPED ELECTRICAL DRAWINGS PLACEHOLDER

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DENVER OFFICE:
6899 PECOS ST. UNIT D,
DENVER, CO 80221
PHONE: 303.228.6898
SALES@BRIGHTVAULT.COM

PRIVATE RESIDENCE
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8.0

9.0: SAMPLE PERMIT DOCUMENTS

Declaration⁴

I, (print name and title of Installer/Developer) BRIGHTVAULT

_____ declare that the electric storage system identified below complies with National Electric Code (NEC) Article 702 for optional standby power and complies with the applicable provisions of the Energy Storage Guidelines document for systems that are not capable of Parallel Operation of Energy Storage. (Applicable sections are 3.1.1 and Sections 3.2.1)

I further declare and/or agree that:

1. Applicable state or local safety inspections have been obtained, including specific inspection as to compliance to National Electric Code (NEC) Article 702 for optional standby power.

Installer/developer initials BV

2. System software and programming that is required to meet NEC Article 702⁵ and the Energy Storage Guidelines document provisions are inaccessible and/or password protected, with access restricted to manufacturer/developer/installer. This may include locks or other physical security or other means of securing the settings; or as mutually agreed upon on a case-by-case basis and identified in this declaration⁶.

Installer/developer initials BV

3. Xcel Energy has the right to conduct an inspection to verify compliance at a later date if problems arise or indications of possible non-compliance to NEC Article 702 or the applicable Technical Specification Manual provisions are present.

Installer/developer initials BV

Applications that cannot parallel and cannot be readily changed to parallel operation may interconnect without review or Interconnection Agreement as stated in the Technical Specification Manual.

Electric Storage System (ESS) Details

⁴ Declaration must be agreed to and this form signed for eligibility for the non-parallel storage portion waiver of Interconnection Agreement as described in the Technical Specification Manual.

⁵ If specific settings are required to achieve the 702 mode, these must be listed in Section 3 below.

⁶ If the Operating Mode cannot be secured to ensure continued operation in a NEC 702 Standby compliant manner, the electric storage system is not eligible for use of the declaration in lieu of full interconnection review. A full interconnection review will examine all operating modes that are readily selectable and establish operating restrictions and mitigations to cover all selectable modes.

This declaration covers the following electric storage system in whole or part as identified below:

Interconnection Customer Information:

Name	Residence Owner			
Address	123 Aspen St			
City	Aspen	State	CO	ZIP 81611

SAMPLE

ESS Equipment Details

ESS Battery (B) Rating & ESS Inverter (I) Information

(B) Energy Capacity (kWh)	153.6 kWh
(B) Real Power, max continuous charge (kW)	153.6 kW
(B) Real Power, recovery charge rate after utility outage (kW)	60 kW
(B) Real Power, max continuous discharge (kW)	48 kW
(I) Real Power, peak output (kW)	120 kW
(I) Peak Output Duration Capability (sec)	.1s (100ms)
(I) Apparent Power, max continuous for charging (kVA)	52.8 kVA
(I) Apparent Power, peak during discharge (kVA)	48 kVA
(I) Power Factor Output Range (+/- range)	+/- .9 - 1.0
(I) Power Factor Capability at full rated real power (+/- range)	+/- .9-1.0
(I) Charging: using rectifier or inverter	Inverter
(B) Charge Rate kW (Maximum continuous)	60 kW
(B) Charge Rate kW (Recovery charge rate)	48 kW
(I) Firmware version	
(I) Operating Modes available	Limited to household/Fully Grid-Tied
(I) Operating Modes enabled	Fully Grid-Tied

Additional ESS Hardware: Description, Model and Part Number and General Specifications

To be used for devices such as the charge controller, external automatic transfer switches, etc.

Model Number(s)	
Model Name(s)	BrightVault
UL Listing(s)	UL1741-2010/2018 UL1741SA UL1642
Firmware Version	

SAMPLE

Summary of Energy Storage Programming and Operation

(Include mode selection and specific settings required)

When ESS is transitioning the loads between off-grid and on-grid, the following steps will occur:

<p>Prior to grid outage, describe system operation</p>	<p>Grid power pass-through inverters, PV charges Batteries</p>
<p>Detail steps taken to disconnect from the grid to meet NEC 702</p>	<p>Internal ATS disconnects from grid at Inverter with 200A AC Breakers per Inverter (800A total passthrough)</p>
<p>Detail steps taken to reconnect to the grid to meet NEC 702</p>	<p>Internal ATS reconnects to grid</p>
<p>Operating Modes available</p>	<p>Limited to Household & Fully Grid-Tied</p>
<p>Operating Modes enabled</p>	<p>Fully Grid-Tied with Priority Load Shedding</p>

System Installer:

I, (print name and title of Installer/Developer) BRIGHTVAULT certify that I have personal knowledge of the facts stated in this declaration and have the authority to make this declaration on behalf of the Interconnection Customer. I further certify that all of the statements and representations made in this declaration are true and correct.

Installer/Developer Signature _____

Date _____

Interconnection Customer:

I, (print name of Interconnection Customer) Residence Owner authorize the above identified Installer/Developer to represent the declarations on my behalf and will operate and maintain the system within the requirements set forth in this declaration for the life of the system in this authorized configuration.

Customer Signature _____

Date _____

