

OWNER NAME RESIDENCE : PROJECT ADDRESS

2.835 KW DC ROOF MOUNTED PHOTOVOLTAIC SYSTEM

EQUIPMENT SUMMARY :

09 NO'S - HANWHA-Q-CELLS Q.PEAK-DUO BLK-G5 315W MODULES
 09 NO'S - ENPHASE IQ7-60-2-US MICROINVERTER

SHEET INDEX :

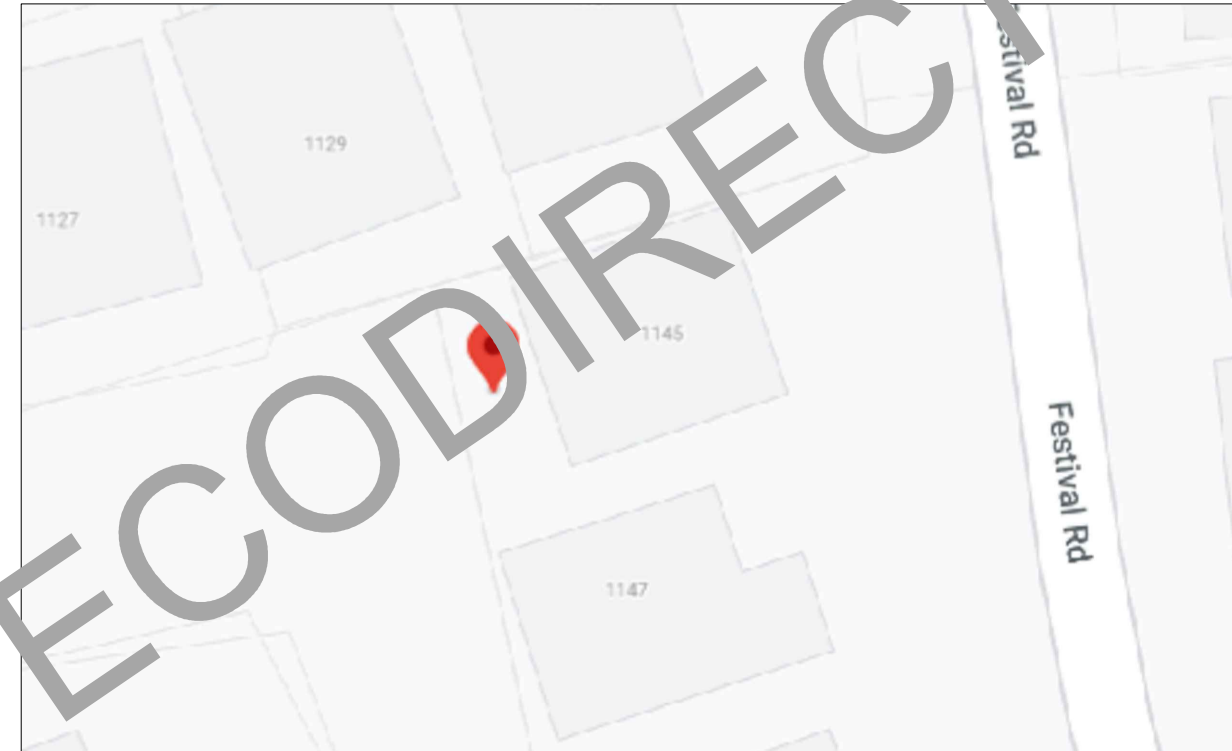
- T-01 COVER SHEET
- G-01 ELECTRICAL CONSTRUCTION GENERAL NOTES
- PV-01 ROOF MAP & PROPERTY LAYOUT
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GOVERNING CODES :

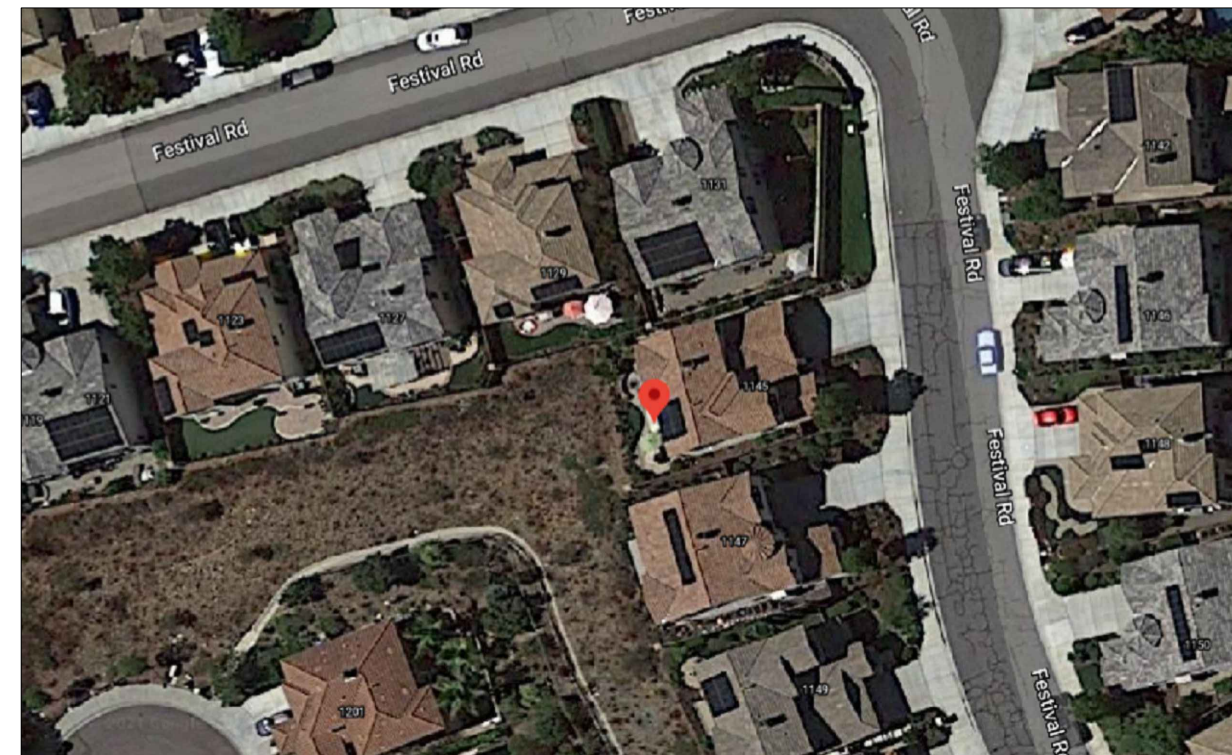
ALL WORK TO COMPLY WITH THE FOLLOWING CODES
 UNDERWRITERS LABORATORIES (UL) STANDARDS
 OSHA 29 CFR 1910.269
 2019 CALIFORNIA ELECTRICAL CODE
 2019 CALIFORNIA MECHANICAL CODE
 2019 CALIFORNIA BUILDING CODE
 2019 CALIFORNIA RESIDENTIAL CODE
 2019 CALIFORNIA PLUMBING CODE
 2019 CALIFORNIA FIRE CODE

PROPERTY ADDRESS:

OWNER / INSTALLER :



VICINITY MAP



SINGLE FAMILY RESIDENCE

OWNER / INSTALLER :

PROPERTY ADDRESS:

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ELECTRICAL CONSTRUCTION GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NEC (NATIONAL ELECTRIC CODE), NFPA (NATIONAL FIRE PROTECTION ASSOCIATION), AND ALL APPLICABLE LOCAL, STATE AND FEDERAL CODES, LAWS AND REGULATIONS.
2. ALL WORK SHALL CONFORM TO APPLICABLE STATE AND FEDERAL SAFETY CODES INCLUDING OSHA. NO 'HOT' WORK IS AUTHORIZED. ALL 'HOT WORK' SHALL BE APPROVED IN WRITING WITH THE GENERAL CONTRACTOR AND OWNER.
3. WORK UNDER THIS CONTRACT SHALL INCLUDE, BUT NOT BE LIMITED TO, FURNISHING, INSTALLING AND CONNECTION OF ALL ELECTRICAL EQUIPMENT AND TESTING OF ALL SYSTEMS AND SUB-SYSTEMS WITHIN THE SCOPE OF THIS CONTRACT. ANY ERRORS, OMISSION, OR UNCERTAINTY SHALL BE BROUGHT TO THE ATTENTION OF THE PRIME CONTRACTOR AND OR OWNER PRIOR TO CONSTRUCTION.
4. COORDINATE ALL WORK WITH ARCHITECTURAL, MECHANICAL AND STRUCTURAL DRAWINGS. INSTALL ALL WORK TO CLEAR NEW AND EXISTING ARCHITECTURAL AND STRUCTURAL MEMBERS. NO ITEM SUCH AS PIPE, DUCT, ETC. SHALL BE IN CONTACT WITH ANY ELECTRICAL EQUIPMENT.
5. CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY AND SECURITY OF THE WORKSITE. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
6. DO NOT SCALE DRAWINGS. LARGER SCALE DRAWINGS HAVE PRECEDENCE OVER SMALL SCALE DRAWINGS. SPECIFICATIONS HAVE PRECEDENCE OVER DRAWINGS. NOTIFY THE PRIME CONTRACTOR IMMEDIATELY AFTER DISCOVERY OF ANY DISCREPANCY BETWEEN DRAWINGS, SPECIFICATIONS OR FIELD CONDITIONS.
7. NOTIFY THE PRIME CONTRACTOR OR OWNER IMMEDIATELY AFTER DISCOVERING ANY HAZARDOUS MATERIAL.
8. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED. VERIFY THE EXACT LOCATIONS AND CONDITIONS OF ALL EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS PRIOR TO ANY WORK. LOCATIONS FOR EQUIPMENT SHALL BE TAKEN FROM THE OTHER SHEETS WHERE THEY OCCUR. EXTEND WIRING FROM ALL JUNCTION BOXES, CONTROL PANELS, PUMPS, RECEPTACLES, SWITCHES, ETC. AND MAKE ALL FINAL CONNECTIONS TO EQUIPMENT AS REQUIRED.
9. THE INTENT OF THESE DRAWINGS IS FOR A COMPLETE ELECTRICAL SYSTEM. ANY ERRORS OR UNCERTAINTY SHALL BE BROUGHT TO THE ATTENTION OF THE PRIME CONTRACTOR AND ENGINEER AS SOON AS FOUND.
10. THE COMPLETE ELECTRICAL INSTALLATION SHALL BE TESTED AS A COMPLETE WORKING SYSTEM.
11. RESTORE ALL DAMAGES RESULTING FROM WORK AND LEAVE PREMISES IN CLEAN CONDITION WHEN FINISHED WITH WORK.
12. ALL TYPES OF SWITCHES, RECEPTACLES, WALL PLATES AND LIGHTING FIXTURES SHALL BE AS APPROVED BY PRIME CONTRACTOR OR OWNER. VERIFY MATERIALS AND COLOR AND LOCATIONS, SUBMIT CATALOG CUTS OR SHOP DRAWINGS FOR ALL MATERIALS AND EQUIPMENT.
13. ALL ITEMS ARE NEW UNLESS NOTED AS EXISTING (E).
14. REMOVE ALL INDICATED ITEMS. REMOVE ALL EXPOSED CONDUITS. REMOVE WIRES TO NEAREST CONCEALED JUNCTION BOX OR PANEL. ABANDON IN PLACE EXISTING UNUSED CONCEALED CONDUITS NOT EXPOSED BY CONSTRUCTION.
15. ALL EQUIPMENT SHALL BE SECURED IN ACCORDANCE WITH GOVERNING SEISMIC REGULATIONS. PROVIDE EXPANSION AND DEFLECTION FITTINGS IN CONDUITS REQUIRED BY CEC (CALIFORNIA ELECTRIC CODE).
16. FIRE STOP ALL PENETRATIONS THROUGH FIRE RATED SURFACES. SEE DETAIL D/E5.
17. PROVIDE GROUND ROD, GROUNDING ELECTRODE AND BONDING FOR ALL SERVICE ENTRANCE EQUIPMENT, BUILDING STRUCTURAL STEEL, COLD WATER PIPE AND TRANSFORMER PER CEC (CALIFORNIA ELECTRIC CODE) 6' MIN. APART.
18. ALL NEW CIRCUIT BREAKER SHALL BE RATED 10,000 AIC OR HIGHER UNO.
19. ALL CONDUITS SHALL BE EMT, INTERMEDIATE METAL CONDUIT, OR RIGID STEEL. MINIMUM SIZE SHALL BE 1/2". ALL CONDUIT, BOXES AND ELECTRICAL FITTINGS SHALL BE STEEL.
20. DO NOT USE THE WORKING SPACE WITHIN ANY EXIT SIGN OR ASSOCIATED JUNCTION BOX FOR ANY OTHER CIRCUIT.
21. PROVIDE EXPANSION AND DEFLECTION FITTINGS IN CONDUITS CROSSING BUILDING EXPANSION AND SEISMIC JOINTS. SEE DETAIL E/E5.
22. PROVIDE JUNCTION AND/OR PULL BOXES WHEN NECESSARY OR REQUIRED BY CEC.
23. ALL CONDUCTORS SHALL BE COPPER, THHN, #2 AWG MINIMUM, UNLESS IN A WET LOCATION IN WHICH CASE THWN SHALL BE USED.
24. INSTALL GREEN INSULATED GROUND WIRE IN ALL CIRCUITS. SIZE PER NEC REQUIREMENTS OR THE SAME AS PHASE CONDUCTORS WHICH EVER IS LARGER. UNLESS INDICATED OTHERWISE.
25. ALL NEW WIRING, CONDUITS AND JUNCTION BOXES SHALL BE CONCEALED WITHIN NEW WALLS, CEILINGS OR FLOOR SPACES. SURFACE MOUNT CONDUIT ON OLD WALLS AND CEILINGS. RUN ALL SURFACE RACEWAY TIGHT TO STRUCTURE, PARALLEL TO BUILDING LINES.
26. PAINT ALL EXPOSED ELECTRICAL CONDUITS AND BOXES, PATCH AND PAINT ALL SCUFF MARKS AND/OR DAMAGE RESULTING FROM CONSTRUCTION. SELECT NEW PAINT COLOR TO MATCH EXISTING PAINT COLOR.
27. NO FOREIGN EQUIPMENT SHALL BE LOCATED WITHIN THE SPACE ABOVE OR BELOW ELECTRIC PANELS

28. PROVIDE SIGNAGE ON ALL ELECTRIC PANELS TO KEEP THE SPACE 36" IN FRONT OF THE PANELS FREE OF OBSTRUCTIONS.
29. PROVIDE WARNING LABEL ON ALL PANELS "WARNING, ELECTRICAL ARC FLASH HAZARD, PERSONAL PROTECTION EQUIPMENT REQUIRED, FAILURE TO COMPLY CAN RESULT, IN INJURY OR DEATH, REFER TO NFPA 70E."
30. UPDATE PANEL BOARD DIRECTORY AS CIRCUITS ARE INSTALLED. PREPARE NEW TYPE WRITTEN PANEL SCHEDULES.
31. ALL EXTERIOR EQUIPMENT SHALL BE IN WEATHERPROOF (NEMA 3R) ENCLOSURES. ALL NEW WIRING SHALL BE IN CONDUIT, SUITABLE FOR SUN EXPOSURE AND WET LOCATIONS. FIELD APPLIED COATING ARE NOT ACCEPTABLE.
32. DC SOLAR POWER SHALL BE NEGATIVELY GROUNDED.
33. ALL MARKING SHALL BE PER CODE REQUIREMENTS.
34. INVERTERS MUST COMPLY WITH UL 1741 TO PREVENT ISLANDING ON POWER FAILURE. THE INVERTER SHALL PUT NOT POWER ON TO THE GRID IF THE GRID IS OFF-LINE.
35. NOTHING IN THESE PLANS SHALL BE CONSTRUED TO CONTRADICT NEC, UL OR LOCAL CODES.
36. ALL SYSTEM COMPONENTS (MODULES AND INVERTERS ETC) SHALL BE UL LISTED.
37. MOUNT TO ROOF USING UL APPROVED MOUNTING HARDWARE, FOLLOWING MANUFACTURERS DIRECTIONS. MOUNTING HARDWARE EVERY 4' ON CENTER UNLESS OTHERWISE NOTED.
38. MARK ALL DC CONDUIT "CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED". MARK ALL DISCONNECTS INCLUDING DISCONNECTS INCLUDED IN INVERTERS WITH "CAUTION: SOLAR CIRCUIT DISCONNECT". MARK THE MAIN SERVICE WITH "CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED". USE DURABLE MARKING WITH 3/8" WHITE LETTERS ON RED BACKGROUND.
39. MARK THE NEC REQUIRED CLEAR SPACE ON THE FLOOR IN FRONT OF ALL DEVICES BEING INSTALLED.
40. SUPPORT ALL ROOF MOUNTED CONDUIT WITH FOAM 'SLEEPERS' IN UL APPROVED SYSTEM.
41. OBTAIN THE BEST INFORMATION ON UNDERGROUND UTILITIES IN AREAS BEING TRENCHED. USE 'DIG ALERT' OR OTHER LOCATING SERVICE BEFORE DIGGING.
42. SOLAR PANELS SHALL NOT BE INSTALLED OVER ANY PLUMBING OR MECHANICAL VENTS, EXHAUSTS OR CHIMNEYS.
43. REMOVAL OF INVERTER, METER OR OTHER EQUIPMENT SHALL NOT DISCONNECT THE BONDING CONNECTION BETWEEN THE GROUNDING ELECTRODE CONDUCTOR AND THE PHOTOVOLTAIC SOURCE AND/OR OUTPUT CIRCUIT GROUNDED CONDUCTOR.
44. ALL PV MODULES AND ASSOCIATED EQUIPMENT SHALL BE PROTECTED FROM ANY PHYSICAL DAMAGE, AND ACCESS BY UNQUALIFIED PERSONS.
45. NO PLASTIC ZIP TIES

STORM WATER PREVENTION NOTES:

STORM WATER POLLUTION PREVENTION DEVICES AND PRACTICES SHALL BE INSTALLED AND/OR INSTITUTED AS NECESSARY TO ENSURE COMPLIANCE WITH THE CITY WATER QUALITY STANDARDS CONTAINED IN LOCAL REGULATIONS, FEDERAL REGULATIONS AND ANY EROSION CONTROL PLAN ASSOCIATED WITH THIS PROJECT. ALL SUCH DEVICES AND PRACTICES SHALL BE MAINTAINED, INSPECTED AND/OR MONITORED TO ENSURE ADEQUACY AND PROPER FUNCTION THROUGHOUT THE DURATION OF THE CONSTRUCTION PROJECT.

COMPLIANCE WITH THE WATER QUALITY STANDARDS AND ANY EROSION CONTROL PLAN ASSOCIATED WITH THIS PROJECT INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

1. ALL POLLUTANTS SHALL BE RETAINED ON SITE UNTIL PROPERLY DISPOSED OF, AND MAY NOT BE TRANSPORTED FROM THE SITE VIA SHEET FLOW, SWALES, AREA DRAINS, NATURAL DRAINAGE COURSES OR WIND.
2. STOCKPILES OF CONSTRUCTION-RELATED MATERIALS SHALL BE PROTECTED FROM BEING TRANSPORTED FROM THE SITE BY FORCES OF WIND OR WATER FLOW.
3. TRASH AND CONSTRUCTION SOLID WASTES SHALL BE DEPOSITED INTO COVERED RECEPTACLE TO PREVENT CONTAMINATION OF RAINWATER AND DISPERSAL BY WIND.

VISIBILITY FROM ADJACENT PROPERTY:

1. THE SOLAR PANELS MAY BE VISIBLE FROM ADJACENT PROPERTIES. PAINT ALL STRUCTURAL ELEMENTS TO MATCH THE EXISTING ROOFING.

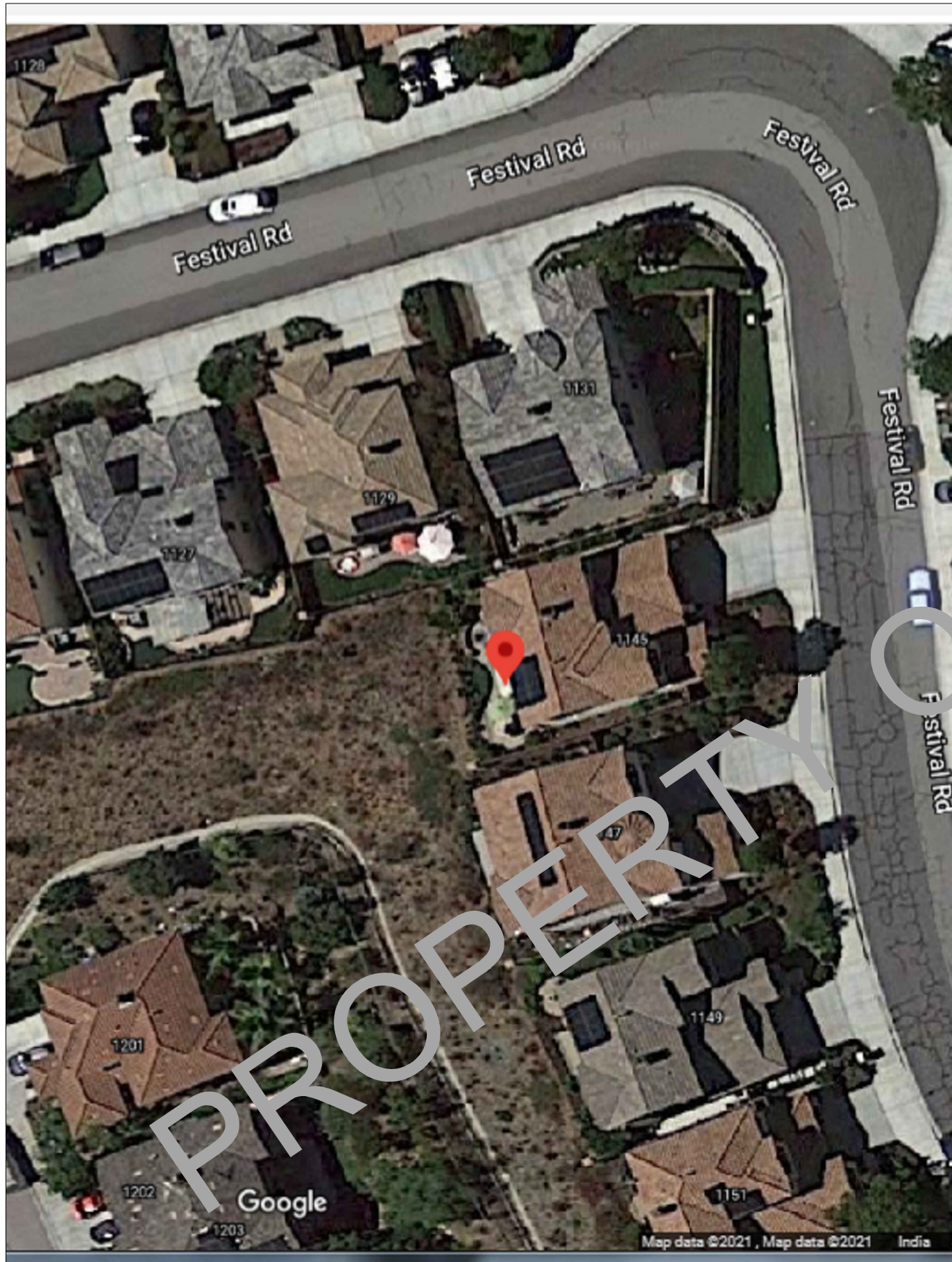
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PROPERTY ADDRESS:

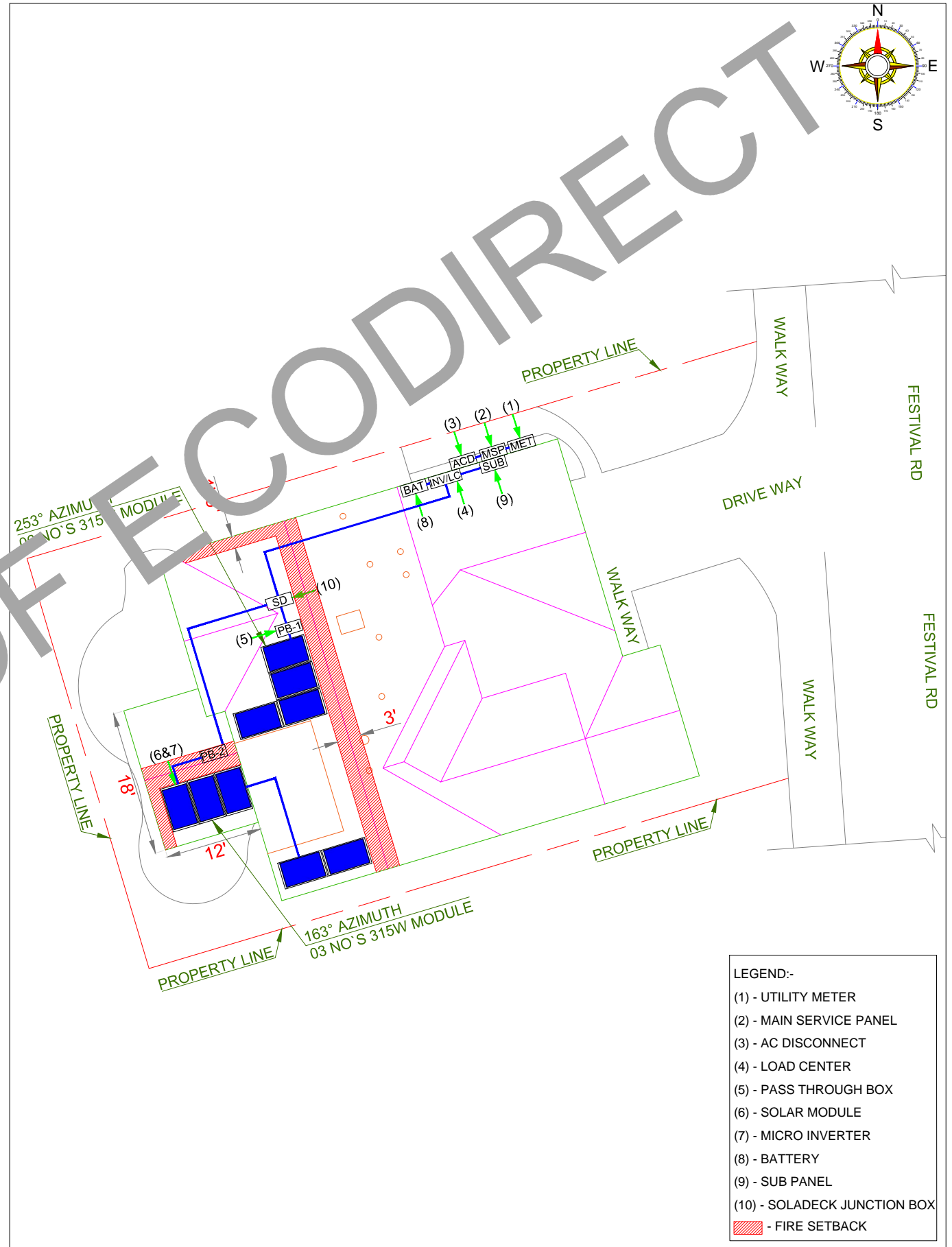
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ROOF MAP



PROPERTY LAYOUT

- LEGEND:-
- (1) - UTILITY METER
 - (2) - MAIN SERVICE PANEL
 - (3) - AC DISCONNECT
 - (4) - LOAD CENTER
 - (5) - PASS THROUGH BOX
 - (6) - SOLAR MODULE
 - (7) - MICRO INVERTER
 - (8) - BATTERY
 - (9) - SUB PANEL
 - (10) - SOLADECK JUNCTION BOX
 - FIRE SETBACK

OWNER / INSTALLER :

PROPERTY ADDRESS:

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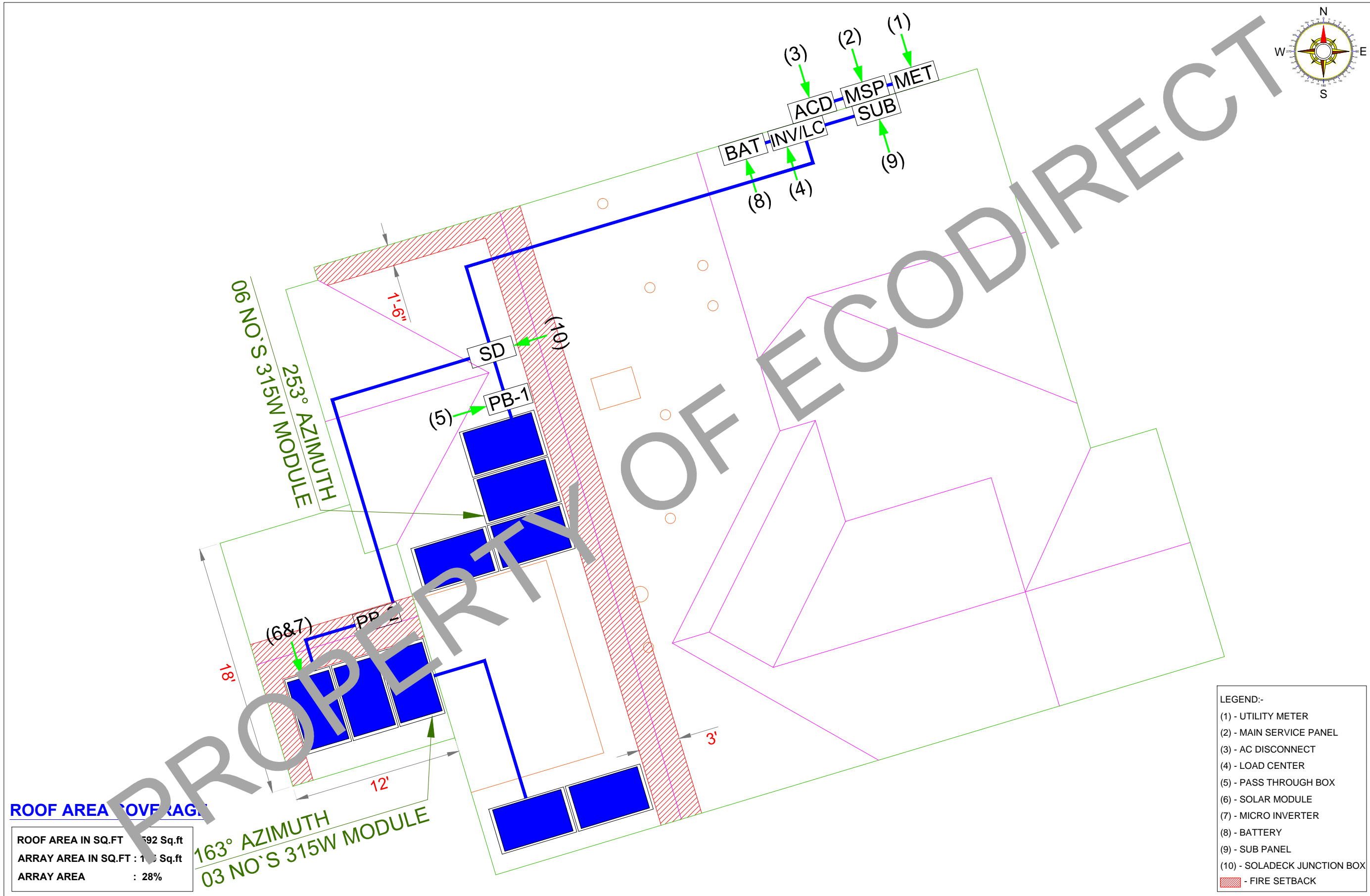


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ROOF AREA COVERAGE
 ROOF AREA IN SQ.FT : 592 Sq.ft
 ARRAY AREA IN SQ.FT : 163 Sq.ft
 ARRAY AREA : 28%

163° AZIMUTH
 03 NO'S 315W MODULE

09 NO'S 315W MODULE
 253° AZIMUTH

PV LAYOUT

- LEGEND:-**
- (1) - UTILITY METER
 - (2) - MAIN SERVICE PANEL
 - (3) - AC DISCONNECT
 - (4) - LOAD CENTER
 - (5) - PASS THROUGH BOX
 - (6) - SOLAR MODULE
 - (7) - MICRO INVERTER
 - (8) - BATTERY
 - (9) - SUB PANEL
 - (10) - SOLADECK JUNCTION BOX
 - [Red Hatched] - FIRE SETBACK

OWNER / INSTALLER :

PROPERTY ADDRESS:

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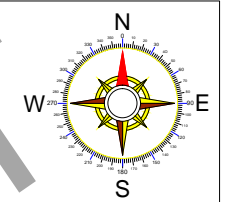
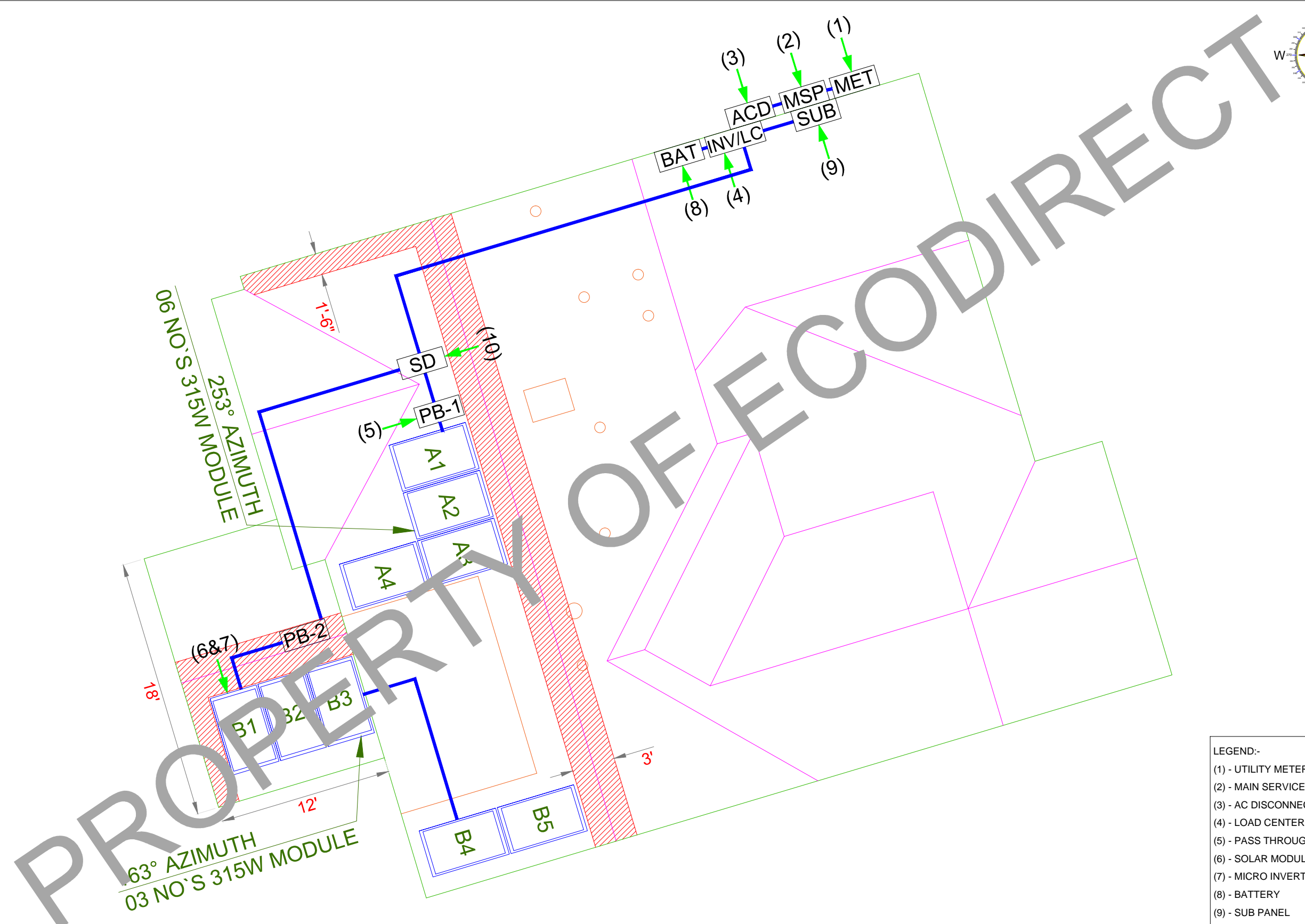


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- LEGEND:-**
- (1) - UTILITY METER
 - (2) - MAIN SERVICE PANEL
 - (3) - AC DISCONNECT
 - (4) - LOAD CENTER
 - (5) - PASS THROUGH BOX
 - (6) - SOLAR MODULE
 - (7) - MICRO INVERTER
 - (8) - BATTERY
 - (9) - SUB PANEL
 - (10) - SOLADECK JUNCTION BOX
 - [Red Hatched Box] - FIRE SETBACK

STRING LAYOUT

OWNER / INSTALLER :

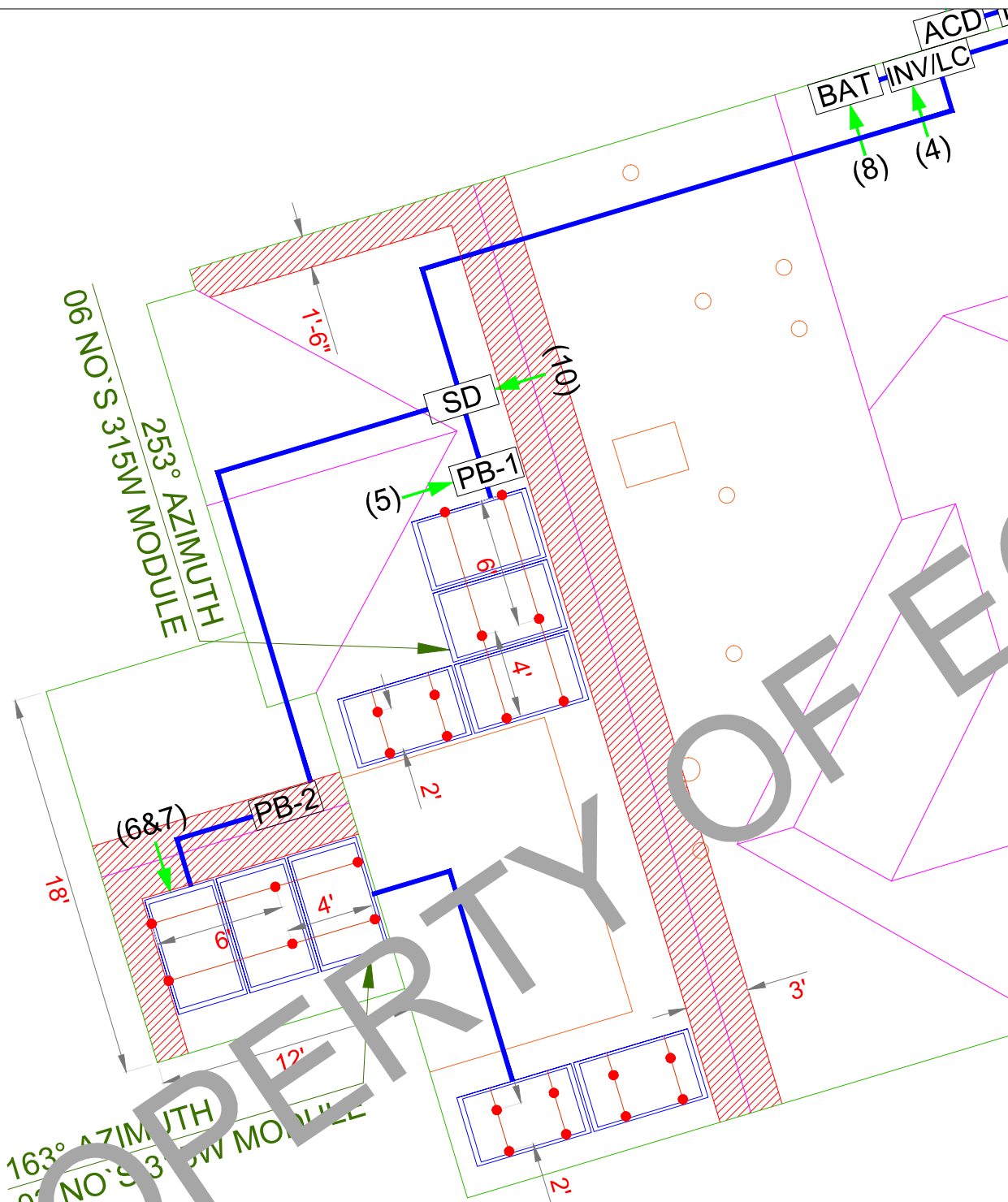
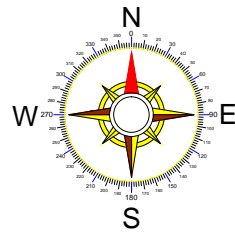
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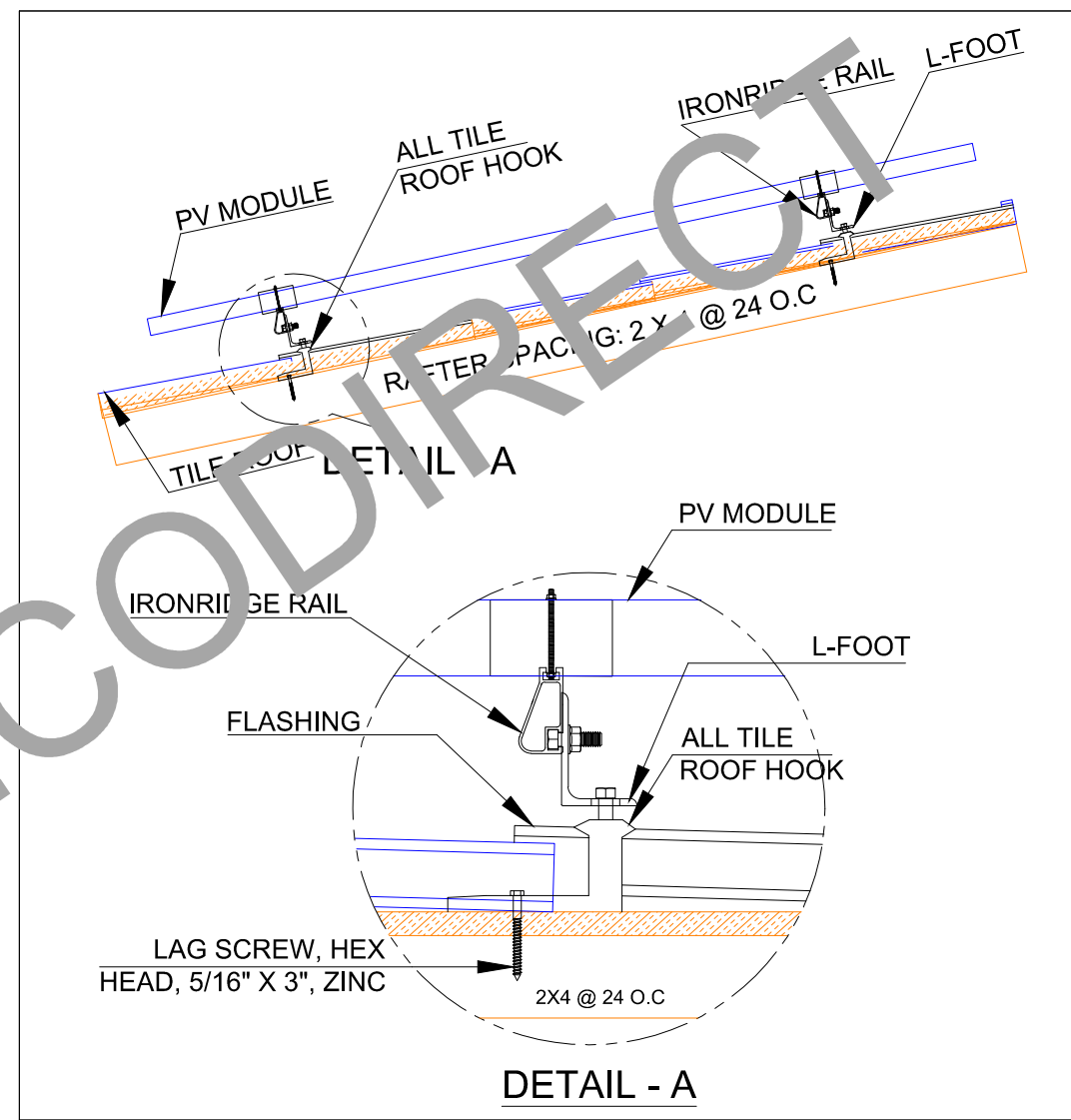


- PV MODULES
- - ROOF PENETRATION POINTS
- RAILS

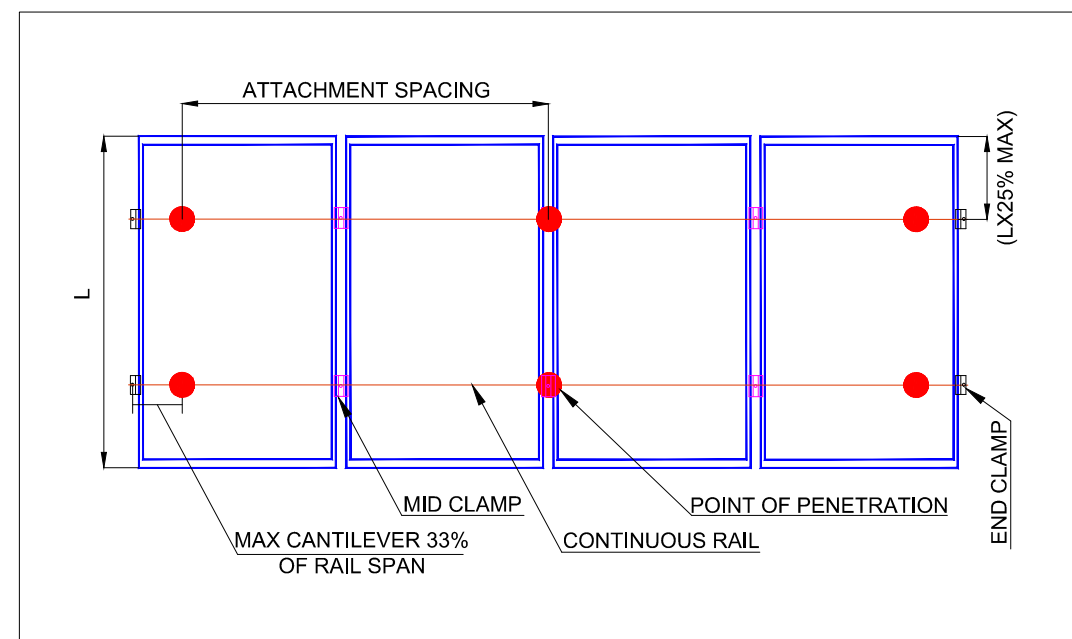
Reference Weights		
Module SF	1.11	
Module Weight	2.22	LBS
Module Loading	2.28	LBS/SF
Mounting Weight	1	LBS approx.
Total Weight	3.28	LBS/SF
Code Limit 4LBS/SF		
Site Data	Module	LBS
Home	9	370.98

Roof Cover Type : Tile Roof
 Rafter Size with O.C : 2" X 4" @ 24"
 Attachment Spacing : 6'
 No. of Attachment Points : 30

ATTACHMENT LAYOUT



ATTACHMENT DETAILS



ATTACHMENT SPACING DETAILS

OWNER / INSTALLER :

PROPERTY ADDRESS :

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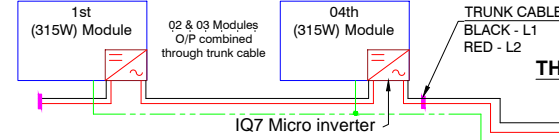
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2.835 kW PROPOSED PV SYSTEM THREE LINE DIAGRAM

(N)-NEW
(E)-EXISTING

PV ARRAY (N)
09 No's of Hanwha Q.Peak DUO BLK-G5 315W Modules connected to individual Enphase IQ7 Micro Inverter and output combined through trunk cable



PASS THROUGH BOX-1 (N)
ACE-1P

SOLADECK JUNCTION BOX (N)
1-9 Inverters

INVERTER (N)
OUTBACK RADIAN
GS4048A

OUTBACK GSLC LOAD CENTER (E)
240V Rated

BATTERY
9KWh Battery bank
IBR 2 battery enclosure
4 of 8 batteries

UTILITY SERVICE

Bidirectional
Utility Meter

AC DISCONNECT (N)
60A Rated
Non-Fused Metallic

MAIN SERVICE PANEL (E)
240V, 200A Rated

SUB PANEL (N)
240V, 60A Rated

PROPERTTY OFFECODIRECT

OWNER / INSTALLER :

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WIRING AND CONDUIT SCHEDULE																																
DC SCHEDULE																																
ITEM	DESCRIPTION	ID	QTY	Voc (V)	Vmpp (V) STC	I _{mp} (A) STC	ISC (A) STC	Max Circuit current (A)	Nominal Power	Minimum Ampacity (A)	Adjusted Ampacity (A)	OCPD rating (A)	Multiple conductor Derate	Temperature Derate	Max ONE WAY LENGTH (ft)	WIRE SIZE	Wire Ampacity (A)	Derated Ampacity (A)	GROUND	WIRE TYPE	R/1000FT	V LOSS %	TEMP MAX	TOTAL NO OF CONDUCTORS	NO. OF CURRENT CARRYING CONDUCTORS	CONDUIT						
1	MODULE	HANWHA SOLAR	A	9	40.29	33.46	9.89	12.36	315	15.5	16.4	20	1.00	0.76	3.6	#12 AWG	30	22.8	#6 Bare	PV	1.98	0.40%	52 C		2		N/A					
									Total Nominal Power	2835																	DC Drop	0.40%				
AC SCHEDULE																																
ITEM	DESCRIPTION	ID	QTY	VOLTAGE (V)	Max Circuit Current (A)	Power	Minimum Ampacity (A)	Adjusted Ampacity (A)	OCPD rating (A)	Multiple conductor Derate	Temperature Derate	Max ONE WAY LENGTH (ft)	WIRE SIZE	Wire Ampacity (A)	Derated Ampacity (A)	GROUND	WIRE TYPE	R/1000FT	V LOSS %	TEMP MAX	TOTAL NO OF CONDUCTORS	NO. OF CURRENT CARRYING CONDUCTOR	CONDUIT									
2	MICRO INVERTER OUTPUT CONNECTED TO INPUT OF TRUNK CABLE	B	9	240	1	240	1.3	1.3	NA	1.00	0.96	2	#10 AWG	40	38.4	#10 AWG	TRUNK CABLE	1.24	0.00%	52 C	3	2	N/A									
3	TRUNK CABLE OUTPUT TO PASS THROUGH BOX (MICRO INVERTERS AC OUTPUT CONNECTED PARALLEL BY USING TRUNK CABLE)	C	2	240	5	1200	6.3	6.6	20	1.00	0.96	15	#10 AWG	40	38.4	#10 AWG	TRUNK CABLE	1.24	0.18%	52 C	3	2	N/A									
4	PASS THROUGH BOX TO SOLADECK JUNCTION BOX	D	1	240	5	1200	6.3	6.6	20	1.00	0.96	15	#10 AWG	40	38.4	#10 AWG	THWN-2	1.24	0.04%	52 C	3	2	3/4" FMC ro EMT Min									
5	SOLADECK JUNCTION BOX TO INVERTER / LOAD CENTER	D	1	240	9	2160	11.3	12.0	20	1.00	0.96	25	#10 AWG	40	38.4	#10 AWG	THWN-2	1.24	0.12%	52 C	3	2	3/4" FMC ro EMT Min									
6	INVERTER / LOAD CENTER TO SUB PANEL	E	1	240	25.7	6160	32.1	34.2	40	1.00	0.96	25	#8 AWG	55	52.8	#10 AWG	THWN-2	0.778	0.21%	52 C	4	2	3/4" FMC ro EMT Min									
7	INVERTER / LOAD CENTER TO AC DISCONNECT TO MAIN SERVICE PANEL	F	1	240	50	-	62.5	66.5	50	1.00	0.96	25	#8 AWG	55	52.8	#10 AWG	THWN-2	0.778	0.41%	52 C	4	2	3/4" FMC ro EMT Min									
									Total Nominal Power	6160																	AC Drop	0.81%				

BILL OF MATERIAL				
REF. DES.	QTY.	MANUFACTURER	MODEL NUMBER	DESCRIPTION
SOLAR MODULES	9	HANWHA SOLAR	Q.PEAK DUO BLK-G5 315	SOLAR PANEL
NOTES: 1. TYPE-1 UL 1703 class C				
INVERTER	9	ENPHASE	IQ7-60-2-US	INVERTER
NOTES: 1. UL1741, UL 1998, UL 1699B, IEE1547 2. DC INPUT WIRE RANGE (2) #12 to #2; AC OUTPUT WIRE RANGE (3) #12				
INVERTER	1	OUTBACK	GS4048A	INVERTER
NOTES: 1. UL1741, UL 1998, UL 1699B, IEE1547 2. DC INPUT WIRE RANGE (2) #12 to #2; AC OUTPUT WIRE RANGE (3) #12				
MSP	1	TBD	TBD	MAIN SERVICE PANEL, NEMA 3R ENCLOSURE
AC DISCONNECT	1	TBD	TBD	AC DISCONNECT
NOTES: 1. USED AS PV UTILITY/SERVICE DISCONNECT 2. LOCKABLE HEAVY DUTY SWITCH WITH VISIBLE CONTACTS, UL LISTED				
PASS THROUGH BOX	2	TBD	TBD	PASS THROUGH BOX
SUB PANEL	1	TBD	TBD	SUB PANEL
SOLADECK	1	TBD	TBD	SOLADECK JUNCTION BOX

System Configuration		
Number of strings	2	No's
Number of Modules	9	No's
Modules Per string	1 X 1	
Number of inverter	9	No
Module Model	Q.PEAK DUO BLK-G5 315	
Inverter Model	IQ7-60-2-US & GS4048A	
PV Service Disconnect	-	A
DC Watts STC	2835	W
Max AC output Current	25.7	A
Operating AC Voltage	240	V

Inverter Rating Specs		
ENPHASE IQ7-60-2-US		
Nominal Input	-	A DC
Max.Short Circuit I/P	15	A DC
Output Voltage	240	V AC
I _{max}	1	A AC
I _{rec}	1.25	A (@125%)
Outdoor	NEMA Type 6	Enclosure
UL1741 / IEEE 1547		

Inverter Rating Specs		
GS-4048A		
Nominal Input	50	A DC
Max.Short Circuit I/P	-	A DC
Output Voltage	240	V AC
I _{max}	16.7	A AC
I _{rec}	20.875	A (@125%)
Outdoor		Enclosure
UL1741 / IEEE 1547		

Module Rating Specs		
HANWHA SOLAR		
Q.PEAK DUO BLK-G5 315		
P _{max}	15	Wp
V _{mp}	33.46	V
I _{mp}	9.41	A
V _{oc}	40.29	V
I _{sc}	9.89	A

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SYSTEM LABELING DETAIL:

All Plaques and signage required by the 2019 edition of California Electrical Code will be installed as required. Placards consist of white lettering on red background with text written in capitol lettering a minimum of 3/8" in height on plastic Engraved placards.

Alternate Power Source Placard shall be metallic or plastic with engraved or machine printed letters in a contrasting color to the plaque, include the location of meter, disconnects, inverter, the array and a footprint of the entire building and site. This plaque will be attached by pop rivets, screws or other approved fasteners. If exposed to sunlight, it shall be UV resistant.

Photovoltaic DC conductors entering the building shall be installed in a metallic raceway and shall be identified every 5 feet -- and within 1 foot of turns or bends and within 1 foot above and below penetrations of roof/ceiling assemblies, walls, or barriers labeled "Caution Solar Circuit" or equivalent. Examples of all required warning labels per NEC and CEC 690 below:

SIGNAGE REQUIREMENT :

RED BACKGROUND .WHITE LETTERING. ("WARNING"-3/8" LETTERS).ALL CAPITAL LETTERS.ARIAL OR SIMILAR FONT . WEATHER - RESISTANT MATERIAL 1/2" X 6" PL 969

<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">DC DISCONNECT WARNING</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>PHOTOVOLTAIC SYSTEM DC DISCONNECT</p> <p style="font-size: small;">PER NEC 680.14(C)(2), 680.17(4), 680.54</p> </div> <p style="text-align: center;"> ⚠ WARNING ⚠ </p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ELECTRIC SHOCK HAZARD</p> </div> <p style="text-align: center;">DO NOT TOUCH TERMINALS TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION</p> <p style="font-size: x-small;">Per NEC 690.53 operating voltage, operating current, max system voltage short circuit current and maximum output current of the charge controller if one is installed</p> <p style="font-size: x-small;">PLACE ON : Main Solar Disconnect</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>PHOTOVOLTAIC SYSTEM DISCONNECT</p> <p style="font-size: x-small;">"PV System Disconnect" label NEC 690.14(C)(2) Required Disconnect Markings</p> </div> </div> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">DC LABELS</p> <p style="font-size: x-small;">PLACE ON 1. DC Junction Boxes 2. DC Combiner Boxes</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p style="font-size: small;">⚠</p> <p style="font-weight: bold; font-size: small;">WARNING</p> <p style="font-size: x-small;">ELECTRIC SHOCK HAZARD</p> <p style="font-size: x-small;">THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MUST BE ENERGIZED</p> <p style="font-size: x-small;">"Electric Shock Hazard" label NEC 690.55(F) ungrounded PV system</p> <p style="font-size: x-small;">PLACE ON 1. DC Junction Boxes 2. DC Combiner Boxes</p> </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>PHOTOVOLTAIC POWER SOURCE</p> <p style="font-size: x-small;">"PV Power Source" Label. NEC 690.31(E)(3) DC-PV Source Conductor</p> </div> </div>	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">AC DISCONNECT WARNING</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>PHOTOVOLTAIC SYSTEM AC DISCONNECT</p> <p style="font-size: small;">OPERATING VOLTAGE 240 VAC OPERATING CURRENT 25.7 Amps</p> </div> <p style="text-align: center;"> ⚠ WARNING ⚠ </p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ELECTRIC SHOCK HAZARD</p> </div> <p style="text-align: center;">DO NOT TOUCH TERMINALS TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION</p> <p style="font-size: x-small;">Per NEC 680.14(C)(2), 680.17(4), 680.54</p> <p style="font-size: x-small;">PLACE ON: Inverter Breaker Panel if sum of breaker exceeds panel rating</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p style="font-size: small;">⚠</p> <p style="font-weight: bold; font-size: small;">WARNING</p> <p style="font-size: x-small;">INVERTER OUTPUT CONNECTION</p> <p style="font-size: x-small;">DO NOT RELOCATE THIS OVER CURRENT DEVICE</p> <p style="font-size: x-small;">Inverter output connection *label NEC 705.12(7) Point Of Connection</p> </div> </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>CAUTION SOLAR CIRCUIT</p> <p style="font-size: x-small;">"Caution Solar Circuit" *Label NEC 690.4(F), 690.31(E)(4) place on conduit every 10 feet IFC 605.11.1.1 & IFC 605.11.2 *MUST BE REFLECTIVE IF INDOORS OR IN ATTIC</p> </div>	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; font-weight: bold; font-size: large;">CAUTION</p> <p style="font-size: x-small;">SOLAR ELECTRIC SYSTEM CONNECTED WITH SOURCE AND DISCONNECTS AS SHOWN</p> <div style="text-align: right;"> </div> </div>	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"> ⚠ WARNING ⚠ </p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>INVERTER OUTPUT CONNECTION</p> <p style="font-size: x-small;">SOURCES : UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM</p> <p style="font-size: x-small;">"Dual Power Supply" label NEC 690.64, 705.12(4) point of connection</p> </div> <p style="text-align: center;"> ⚠ WARNING ⚠ </p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>ELECTRIC SHOCK HAZARD</p> <p style="font-size: x-small;">DO NOT TOUCH TERMINALS TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION</p> <p style="font-size: x-small;">"Don Not Touch terminals" labels NEC 690.17(4) Switch or Circuit Breaker</p> </div> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 10px;"> <p>THIS ELECTRIC SYSTEM PHOTOVOLTAIC SYSTEM IS ALSO SERVED BY A</p> </div> <p style="text-align: center; font-weight: bold;">CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">MAIN SERVICE PANEL (SSC)</p> <p style="font-size: x-small;">A GENERATION SOURCE IS CONNECTED TO THE SUPPLY (UTILITY) SIDE OF THE SERVICE DISCONNECTING MEANS. FOLLOW PROPER LOCK-OUT/TAG-OUT PROCEDURES TO ENSURE THE PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH IS OPENED PRIOR TO PERFORMING WORK ON THIS DEVICE</p> </div> </div>
<p>OTHERS</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>PV SOLAR BREAKER</p> <p style="font-size: x-small;">DO NOT RELOCATE THIS OVER CURRENT DEVICE</p> </div> </div> <div style="width: 30%;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN</p> <p style="font-size: x-small;">Label NEC 690.56(C)</p> </div> </div> <div style="width: 30%;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p style="font-size: small;">⚠</p> <p style="font-weight: bold; font-size: small;">WARNING</p> <p style="font-size: x-small;">ELECTRIC SHOCK HAZARD</p> <p style="font-size: x-small;">IF GROUND FAULT IS INDICATED ALL NORMALLY GROUNDED CONDUCTORS MAY BE UNGROUND AND ENERGIZED</p> <p style="font-size: x-small;">"Ground Fault Indicated" label Nec 690.5(C) Ground Fault Protection</p> </div> </div> </div>			

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Enphase IQ 7 and IQ 7+ Microinverters

The high-powered smart grid-ready **Enphase IQ 7 Micro™** and **Enphase IQ 7+ Micro™** dramatically simplify the installation process while achieving the highest system efficiency.

Part of the Enphase IQ System, the IQ 7 and IQ 7+ Microinverters integrate with the Enphase IQ Envoy™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.

Easy to Install

- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014 & 2017)

Productive and Reliable

- Optimized for high-powered 60-cell and 72-cell* modules
- More than a million hours of testing
- Class II double-insulated enclosure
- UL listed

Smart and Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

* The IQ 7+ Micro is required to support 72-cell modules.



To learn more about Enphase offerings, visit enphase.com



Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)	IQ7-60-2-US		IQ7PLUS-72-2-US	
Commonly used module pairings ¹	235 W - 350 W +		235 W - 440 W +	
Module compatibility	60-cell PV modules only		60-cell and 72-cell PV modules	
Maximum input DC voltage	48 V		60 V	
Peak power tracking voltage	27 V - 37 V		27 V - 45 V	
Operating range	16 V - 48 V		16 V - 60 V	
Min/Max start voltage	22 V / 48 V		22 V / 60 V	
Max DC short circuit current (module Isc)	15 A		15 A	
Overvoltage class DC port	II		II	
DC port backfeed current	0 A		0 A	
PV array configuration	1 x 1 ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit			
OUTPUT DATA (AC)	IQ 7 Microinverter		IQ 7+ Microinverter	
Peak output power	250 VA		295 VA	
Maximum continuous output power	250 VA		290 VA	
Nominal (L-L) voltage/range ²	240 V / 208 V		240 V / 208 V	
Maximum continuous output current	1.0 A (10 V)		1.15 A (208 V) 1.21 A (240 V) 1.39 A (208 V)	
Nominal frequency	60 Hz		60 Hz	
Extended frequency range	47 - 68 Hz		47 - 68 Hz	
AC short circuit fault current over 3 cycles	5.8 Arms		5.8 Arms	
Maximum faults per 20A (L-L) branch circuit ³	16 (240 VAC) 13 (208 VAC)		13 (240 VAC) 11 (208 VAC)	
Overvoltage class AC port	III		III	
AC port backfeed current	18 mA		18 mA	
Power factor setting	1.0		1.0	
Power factor (adjustable)	0.85 leading ... 0.85 lagging		0.85 leading ... 0.85 lagging	
EFFICIENCY	@240 V	@208 V	@240 V	@208 V
Peak efficiency	97.6 %	97.6 %	97.5 %	97.3 %
CEC weighted efficiency	97.0 %	97.0 %	97.0 %	97.0 %
MECHANICAL DATA				
Ambient temperature range	-40°C to +65°C			
Relative humidity range	4% to 100% (condensing)			
Connector type	MC4 (or Amphenol H4 UTX with additional Q-DCC-5 adapter)			
Dimensions (HxWxD)	212 mm x 175 mm x 30.2 mm (without bracket)			
Weight	1.08 kg (2.38 lbs)			
Cooling	Natural convection - No fans			
Approved for wet locations	Yes			
Pollution degree	PD3			
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure			
Environmental category / UV exposure rating	NEMA Type 6 / outdoor			
FEATURES				
Communication	Power Line Communication (PLC)			
Monitoring	Enlighten Manager and MyEnlighten monitoring options. Both options require installation of an Enphase IQ Envoy.			
Disconnecting means	The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.			
Compliance	CA Rule 21 (UL 1741-SA) UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC-2014 and NEC-2017 section 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according manufacturer's instructions.			

1. No enforced DC/AC ratio. See the compatibility calculator at <https://enphase.com/en-us/support/module-compatibility>.
 2. Nominal voltage range can be extended beyond nominal if required by the utility.
 3. Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

To learn more about Enphase offerings, visit enphase.com



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MOUNT ACCORDING TO MOUNTING MFG INSTRUCTIONS AND CIVIL/STRUCTURAL DIRECTIONS.

USE FASTENERS SUITABLE TO SURFACE BEING ATTACHED. LAG-SCREWS FOR WOOD, NUTS (LOCKING) AND BOLTS FOR METAL STRUCTURES.

MOUNT 4' ON CENTER UNLESS OTHERWISE NOTED OR REQUIRED TO CONNECT TO STRUCTURAL MEMBERS.



Radian A-Series™ 60Hz, 120/240V Inverter/Chargers



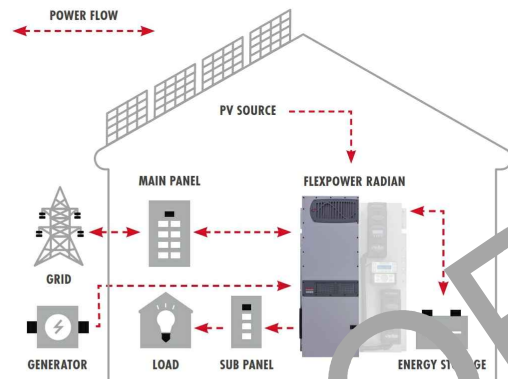
- Modular, stackable: up to nine units can be combined for three-phase operation and ten in parallel, single-phase operation
- Compliant with California Rule 21 and Hawaii 14H grid support requirements
- Seven different programmable operating modes, with generator assist
- GridZero operating mode minimizes grid dependence in areas where incentives are changing and utility sell-back is limited
- 8000 and 4000VA of continuous power with dual AC inputs and peak operating efficiency of 96%
- Off-grid and grid-tied functionality in one unit
- Integrates both grid and generator with dual inputs
- Performs AC coupling with both legacy and UL1741-A inverters, using frequency shifting

OutBack Power's advanced Radian Series made the benefits of solar technology available and accessible on one platform.

The Radian GS8048A and GS4048A features dual AC inputs for grid/generator flexibility, no external switching required, unparalleled surge capability and operational stability, easy field upgrade capability and stacking capability for large system scaling, simplified system commissioning through a powerful, easy to use configuration wizard and multi-mode operational flexibility.

The Radian GS8048A and GS4048A incorporate OutBack's GridZero technology: energy management for self-generation and self-consumption programs providing precise balancing between using stored energy, solar and utility power, blending-in the latter to overcome surges and load spikes when needed.

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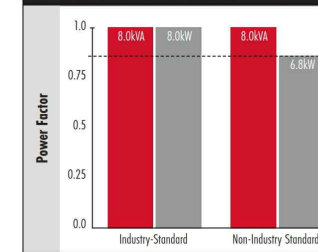


Radian A-Series Specifications

1/2019

Models:	GS8048A	GS4048A
Instantaneous Power (100ms)	16970VA	8500VA
Surge Power (5 sec)	12000VA	6000VA
Peak Power (30 min)	9000VA	4000VA
Continuous Power Rating (@ 25°C)	8000VA	4000VA
Nominal DC Input Voltage	48VDC	48VDC
AC Output Voltage (selectable)	120/240VAC (200 to 260VAC)	120/240VAC (200 to 260VAC)
AC Output Frequency (selectable)	60Hz (50Hz)	60Hz (50Hz)
Continuous AC Output Current (@ 25°C)	33.3AAC @ 240VAC	16.7AAC
Idle Power	Invert mode, no load: 34W Search: 10W	Invert mode, no load: 34W Search: 10W
Typical Efficiency	93%	93%
CEC Weighted Efficiency	92.5%	92.5%
Total Harmonic Distortion	Typical: <2% Maximum: <5%	Typical: <2% Maximum: <5%
Output Voltage Regulation	±2%	±2%
AC Input Voltage Range (MATE3s: selectable)	L1-N or L2-N: 85 to 140VAC	L1-N or L2-N: 85 to 140VAC
AC Input Frequency Range	@ 60Hz: 54 to 60.5Hz @ 50Hz: 45 to 55Hz	—
Grid-Interactive Voltage Range	L1-N or L2-N: 85 to 140VAC	L1-N or L2-N: 108 to 132VAC
Grid-Interactive Frequency Range	59.3 to 60.5Hz	59.3 to 60.5Hz
Maximum AC Input Current	30A @ 240VAC	50AAC @ 240VAC
Maximum Grid-Interactive Current	30A	15A
Continuous Battery Charge Current	115ADC	57.5ADC
Advanced Battery Charging	Flooded, gel, AGM, lithium-ion and flow chemistry	Flooded, gel, AGM, lithium-ion and flow chemistry
DC Input Voltage Range	40 to 64VDC	40 to 64VDC
Accessory Ports	Remote temperature sensor (included), MATE3s and HUB communications	Remote temperature sensor (included), MATE3s and HUB communications
Warranty	Standard 5 year, extended 10 year available	Standard 5 year, extended 10 year available
Weight (lb/kg)	Unit: 125 / 56.7 Shipping: 140 / 63.5	Unit: 82 / 37.2 Shipping: 94 / 42.6
Dimensions H × W × D (in/cm)	Unit: 28 × 16 × 8.7 / 71.1 × 40.6 × 22.1 Shipping: 34.5 × 21 × 14.5 / 87.6 × 53.3 × 36.8	Unit: 28 × 16 × 8.7 / 71.1 × 40.6 × 22.1 Shipping: 34.5 × 21 × 14.5 / 87.6 × 53.3 × 36.8
Temperature Range	Rated: -20 to 50°C Maximum: -40 to 60°C	Rated: -20 to 50°C Maximum: -40 to 60°C
Listings/Certifications	ETL listed to UL 1741 SA, CE, CSA C22.2 No. 1071, UL 778 Annex F, IEC 62109-1 ETL, RoHS compliant per directive 2011/65/EU, FCC Class B, IEEE 1574-1, EN61000-6-1, EN61000-6-3, EN61000-3-2, EN61000-3-3	ETL listed to UL 1741 SA, CE, CSA C22.2 No. 1071, UL 778 Annex F, IEC 62109-1 ETL, RoHS compliant per directive 2011/65/EU, FCC Class B, IEEE 1574-1, EN61000-6-1, EN61000-6-3, EN61000-3-2, EN61000-3-3
Non-Volatile Memory	Yes	Yes
Field Upgradeable Firmware	Yes	Yes
Chassis Type	Vented	Vented

Radian GS8048A Power Factor Chart

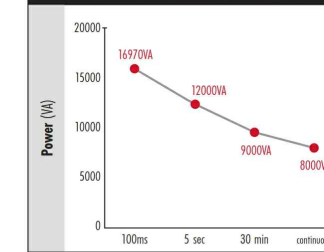


Power Rating Notes
Inverters that specify power in VA but do not use the unity standard Power Factor (PF) could have misleading power specifications. Volt-amps (VA) is a total inverter output, while watts (W) represent the power consumed by the electrical loads. PF, which varies by types of loads, is the ratio of W to VA, and the difference between the two is power in the circuit that does no useful work. At 1.0PF (unity), all power is used. This is the industry standard used by OutBack Power.



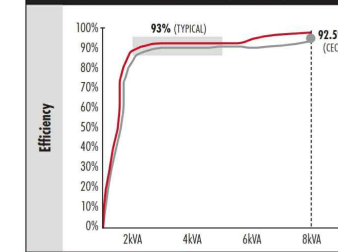
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Radian GS8048A Power Rating Chart



Instantaneous Power Rating
Most stringent, massive load start GS8048A: 16970VA
Surge Power Rating
Less stringent load start GS8048A: 12000VA
Peak Power Rating
Frequent "heavy duty" load requirements: GS8048A: 9000VA
Continuous Power Rating
Sustained "real world" load requirements: GS8048A: 8000VA

Radian GS8048A Efficiency Rating Chart



Typical Efficiency Rating
Real world efficiency with variable loads: GS8048A: 93%
CEC Efficiency Rating
Most stringent US rating: GS8048A: 92.5%

2

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#980-00076-01-001 REV A

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MOUNT ACCORDING TO MOUNTING MFG INSTRUCTIONS AND CIVIL/STRUCTURAL DIRECTIONS.

USE FASTENERS SUITABLE TO SURFACE BEING ATTACHED. LAG-SCREWS FOR WOOD, NUTS (LOCKING) AND BOLTS FOR METAL STRUCTURES.

MOUNT 4' ON CENTER UNLESS OTHERWISE NOTED OR REQUIRED TO CONNECT TO STRUCTURAL MEMBERS.

Radian Series GS Load Center



Features:

- Pre-wired or customized options for quick and easy installation
- Dual AC inputs and DC connections
- 120/240VAC and 230VAC designs
- Radian Series inverter/charger with a GS Load Center create a system that has greater dynamic stability
- Fully integrated from an industry-leading brand
- UL1741 end-to-end

The OutBack GS Load Centers simplify the configuration, distribution and implementation of energy storage of the Radian Series inverter/charger through a standardized approach.

OutBack Power's GS Load Centers are an integrated connection enclosure series for AC and DC system connections in *OutBack Radian Series inverter/charger applications*, through provided inverter DC over current protection and disconnects, dual AC inputs, grid-tied inverter connection and 120/240VAC or 230V maintenance bypass.

Designed for use with the Radian Series inverter/charger family, the enclosures offer *solutions for group-up custom designs* or *factory pre-wired configurations for specific applications*.

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Radian Series GS Load Center Specifications

04/2019

Models:	All GS Load Center Models
Maximum Input Voltage	600V
Maximum Input Current	500A
Operating Frequency Range	50/60Hz and DC
Dimensions H x W x D (in/cm)	UNIT: 17 x 16 x 8.5 / 43.2 x 40.6 x 21.6cm SHIPPING: 23.25 x 20.5 x 13.5 / 59.1 x 52.1 x 33.7
Enclosure Type	Indoor Type 1 (IP30)
Certifications	UL 1741, CSA 22.2, No. 107.1-16, RoHS
Warranty	Standard 5 year

Model Numbers	GSLC	GSLC175-120/240	GSLC175-PV-120/240	GSLC-PV-300VDC	GSLC175 PV1-120/240	GSLC-PV1-300VDC
Enclosure w/ Hinged Door	◆	◆	◆	◆	◆	◆
175A Breakers	2	2	2	2	1	1
Dual AC Inputs	◆	◆	◆	◆	◆	◆
GFDI	◆	◆	◆	◆	◆	◆
FLEXnet DC	◆	◆	◆	◆	◆	◆
PV Disconnects	2	2	2	2	1	1
500A DC Shunt	1	3	3	3	2	2
Weight (lb/kg)	UNIT: 11.8 / 5.3 SHIPPING: 34 / 15.4	UNIT: 37 / 16.8 SHIPPING: 45 / 20.4	UNIT: 40 / 18.1* SHIPPING: 45 / 20.4	UNIT: 40 / 18.1* SHIPPING: 45 / 20.4	UNIT: 40 / 18.1* SHIPPING: 45 / 20	UNIT: 40 / 18.1* SHIPPING: 45 / 20.4
Recommended Charge Controller Model	FLEXmax 60 and 80	FLEXmax 60 and 80	FLEXmax 100	FLEXmax 100	FLEXmax 60 and 80	FLEXmax 100
Recommended Radian Model	GS4048A-01 GS7035E GS3548E	GS8048A-01 GS4048A-01	GS8048A-01	GS8048A-01	GS4048A-01	GS4048A-01

Model Numbers	GSLC175-230	GSLC175-PV-230	GSLC-PV-300VDC-230	GSLC175PV1-230	GSLC-PV1-300VDC-230
Enclosure w/ Hinged Door	◆	◆	◆	◆	◆
175A Breakers	2	2	2	1	1
Dual AC Inputs	◆	◆	◆	◆	◆
GFDI	◆	◆	◆	◆	◆
FLEXnet DC	◆	◆	◆	◆	◆
PV Disconnects	2	2	2	1	1
500A DC Shunt	1	3	3	2	2
Weight (lb/kg)	UNIT: 37 / 16.8 SHIPPING: 45 / 20.4	UNIT: 40 / 18.1* SHIPPING: 45 / 20.4	UNIT: 40 / 18.1* SHIPPING: 45 / 20.4	UNIT: 40 / 18.1* SHIPPING: 45 / 20.4	UNIT: 40 / 18.1* SHIPPING: 45 / 20.4
Recommended Charge Controller Model	FLEXmax 60 and 80	FLEXmax 60 and 80	FLEXmax 100	FLEXmax 60 and 80	FLEXmax 100
Recommended Radian Model	GS7048E	GS7048E	GS7048E	GS3548E	GS3548E

The GS Load Centers enclosures provide mounting holes for HUB communications manager and for up to 2 FLEXmax charge controller mounting brackets. The following components are sold separately or integrated for the GS Load Centers: AC Load Circuit Breakers, PV and DC Circuit Breakers, PV Ground Fault Detector-Interrupter (GFDI), FLEXnet DC Battery Monitor, Additional DC shunts and GS-SBUS (if desired).

980-0051-01-00 REV B
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MOUNT ACCORDING TO MOUNTING MFG INSTRUCTIONS AND CIVIL/STRUCTURAL DIRECTIONS.

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MOUNT 4' ON CENTER UNLESS OTHERWISE NOTED OR REQUIRED TO CONNECT TO STRUCTURAL MEMBERS.

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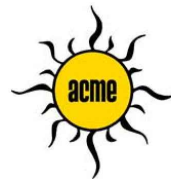


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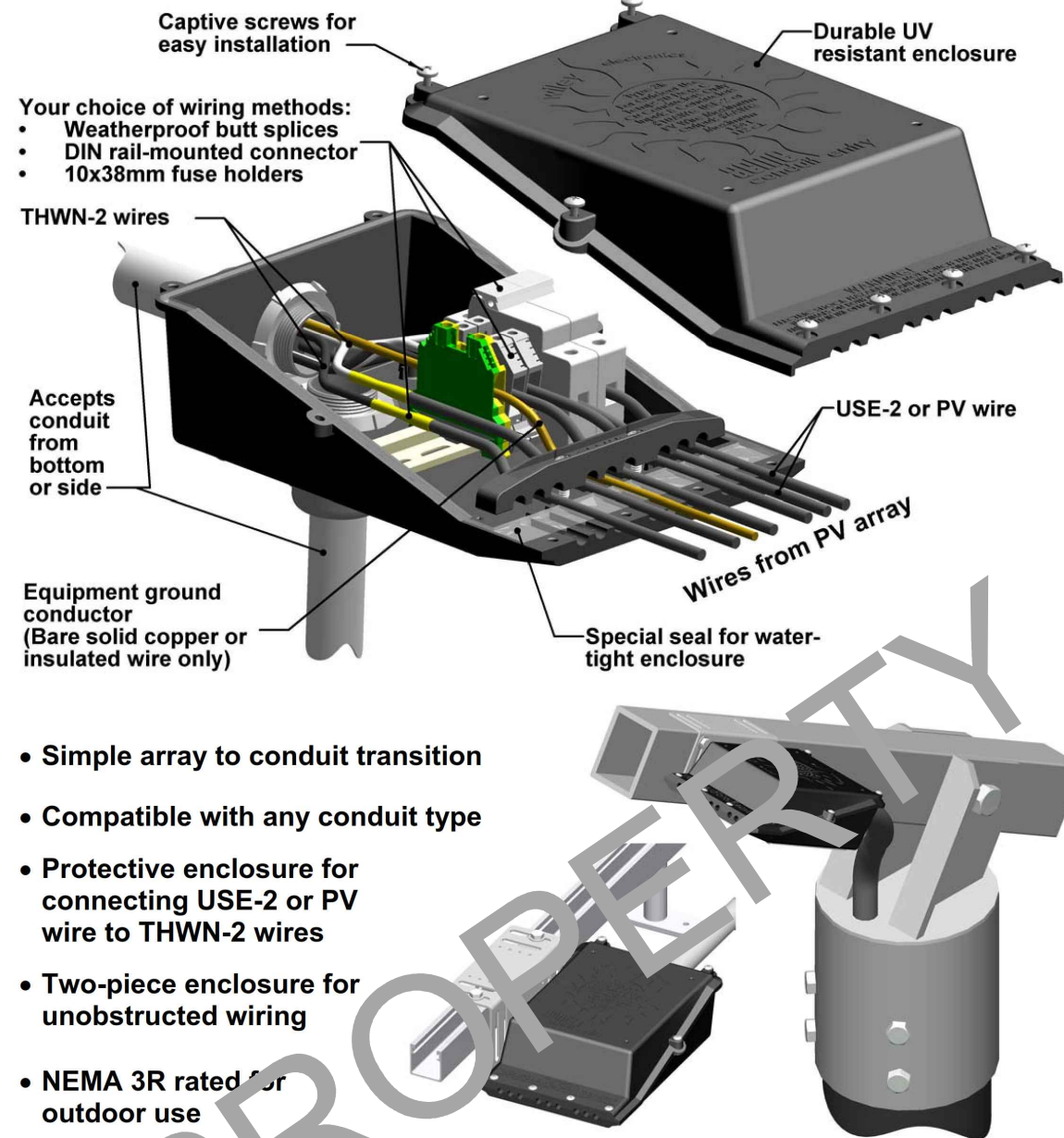
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acme CONDUIT ENTRY (ace)

another great innovation by Wiley Electronics

Faster, Cleaner Wiring!



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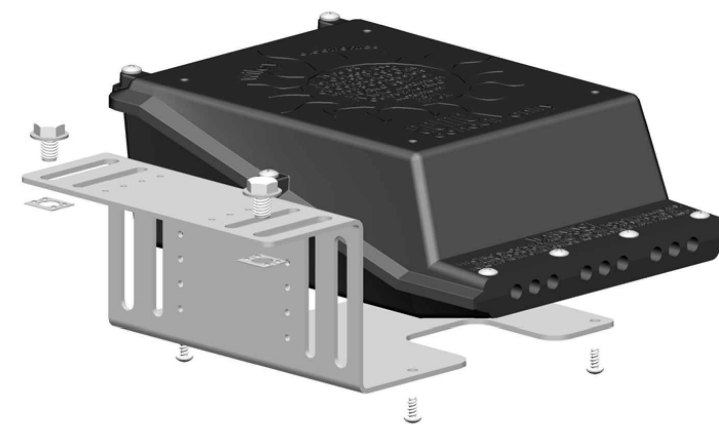
Specifications

Input Wire Diameter Range	5.0 - 6.8mm [0.20 - 0.27in] (10-12AWG USE-2/PV Wire)
Maximum number of input conductor slots	9
Maximum number of PV strings	4
Maximum number of combined strings	4
Equipment Ground Conductor Type	Bare solid or jacketed only
Equipment Ground Conductor Diameter range	4.0 - 6.8mm [0.157 - 0.27in]
Acceptable Conduit sizes	19.05mm - 25.4mm [0.75in, 1.0in]
Internal Volume	1840cm ³ [112in ³]
Internal Height	72.0mm [2.83in]
Knockouts	Side & Bottom

Configurations

ACE Part Number	ACE Configuration	Original Block	Terminal Block	Fuse Holder	Fuse Combiner Bus	Grounding Terminal	DIN Rail
ACE-PT	Pass-Through using Butt Splices/Wire Nuts	N/A	N/A	N/A	N/A	N/A	N/A
ACE-1P	1-String Pass-through	2	N/A	N/A	N/A	1	1
ACE-2P	2-String Pass-through	4	N/A	N/A	N/A	1	1
ACE-3P	3-String Pass-through	6	N/A	N/A	N/A	1	1
ACE-4P	4-String Pass-through	8	N/A	N/A	N/A	1	1
ACE-2C	2-Strings Combiner	4	2X 2-Pole	Not required for 2-string combiner	N/A	1	1
ACE-3C	3-Strings Combiner	3	1X 3-Pole	3	1X 3-Pole	1	1
ACE-4C	4-Strings Combiner	4	1X 4-Pole	4	1X 4-Pole	1	1

ACE Mounting Bracket



Made of lightweight, corrosion resistant anodized aluminum. Available in Black or Clear Anodize.

Mounting Bracket Assembly Includes:
1X ACE Mounting Bracket
4X Mounting Screws
2X Bonding Washers

PO Box 361 / 44 Peoples Rd
Saugerties, NY 12477
Tel: (845) 633.2065 (845) 247.3852
Website: www.we-llc.com

~acme PV peripherals~

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MOUNT ACCORDING TO MOUNTING MFG INSTRUCTIONS AND CIVIL/STRUCTURAL DIRECTIONS.

USE FASTENERS SUITABLE TO SURFACE BEING ATTACHED. LAG-SCREWS FOR WOOD, NUTS (LOCKING) AND BOLTS FOR METAL STRUCTURES.

MOUNT 4' ON CENTER UNLESS OTHERWISE NOTED OR REQUIRED TO CONNECT TO STRUCTURAL MEMBERS.

OWNER / INSTALLER :

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SolaDeck

FLASHED PV ROOF-MOUNT COMBINER/ENCLOSURE

Basic Features

- Stamped Seamless Construction
- 18 Gauge Galvanized Steel
- Powder Coated Surfaces
- Flashes into the roof deck
- 3 Roof deck knockouts .5", .75", 1"
- 5 Centering dimples for entry/exit fittings or conduit
- 2 Position Ground lug installed
- Mounting Hardware Included



SolaDeck Model SD 0786-41



SolaDeck UL50 Type 3R Enclosures

Available Models:

- Model SD 0783 - (3" fixed Din Rail)
- Model SD 0786 - (6" slotted Din Rail)



SolaDeck UL1741 Combiner/Enclosures

Models SD 0783-41 and SD 0786-41 are labeled and ETL listed UL STD 1741 according to the UL STD 1741 for photovoltaic combiner enclosures.

Max Rated - 600VDC, 120AMPS

Model SD 0783-41 3" Fixed Din Rail fastened using Norlock System

**Typical System Configuration

- 4- Din Rail Mounted Fuse Holders 600VDC 30 AMP
- 1- Power Distribution Block 600VDC 175AMP
- 1- Bus Bar with UL lug

Model SD 0786-41 6" Slotted Din Rail fastened using steel studs

**Typical System Configuration

- 4- Din Rail Mounted Fuse Holders 600VDC 30 AMP
- 4- Din Rail Mounted Terminal Blocks
- Bus Bars with UL lug

**Fuse holders and terminal blocks used in the field must be UL listed or recognized and meet 600 VDC 30 AMP 110C for fuse holders, 600V 50 AMP 90C for rail mounted terminal blocks and 600 V 175 AMP 90C for Power Distribution Blocks. Use Copper Wire Conductors.



Cover is trimmed to allow conduit or fittings, base is center dimpled for fitting locations.



Model SD 0783-41, wired with Din Rail mounted fuse holders, bus bar and power distribution block.



Model SD 0786-41, wired with Din Rail mounted fuse holders, terminal blocks and bus bars.

RSTC Enterprises, Inc • 2219 Heimstead Road • Eau Claire, WI 54703
For product information call 1(866) 367-7782

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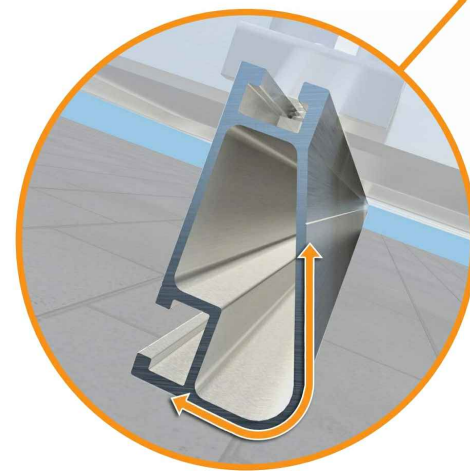
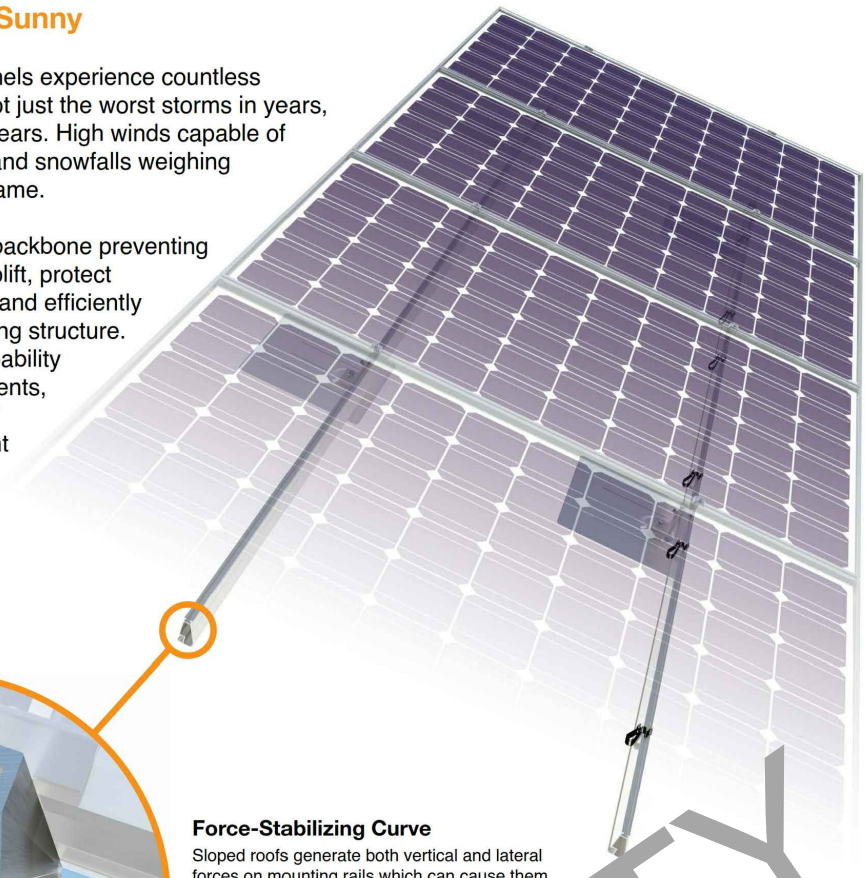
XR Rail Family

Tech Brief

Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This feature ensures greater security during extreme weather and a longer system lifetime.

Compatible with Flat & Pitched Roofs



XR Rails are compatible with FlashFoot and other pitched roof attachments.



IronRidge offers a range of tilt applications for roof mounting applications.

Corrosion-Resistant Materials

All XR Rails are made of marine-grade aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.



XR Rail Family

The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.

Tech Brief



XR10

XR10 is a sleek, low-profile mounting rail, designed for regions with light snow. It achieves 6 foot spans while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Clear anodized finish
- Internal splices available



XR100

XR100 is the ultimate residential mounting rail that supports a range of wind and snow conditions, while also maximizing spans up to 8 feet.

- 8' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans 12 feet or more for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

Rail Selection

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed span tables and certifications.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	100						
	120						
	140	XR10		XR100		XR1000	
	160						
10-20	100						
	120						
	140						
	160						
30	100						
	160						
40	100						
	160						
50-70	160						
80-90	160						

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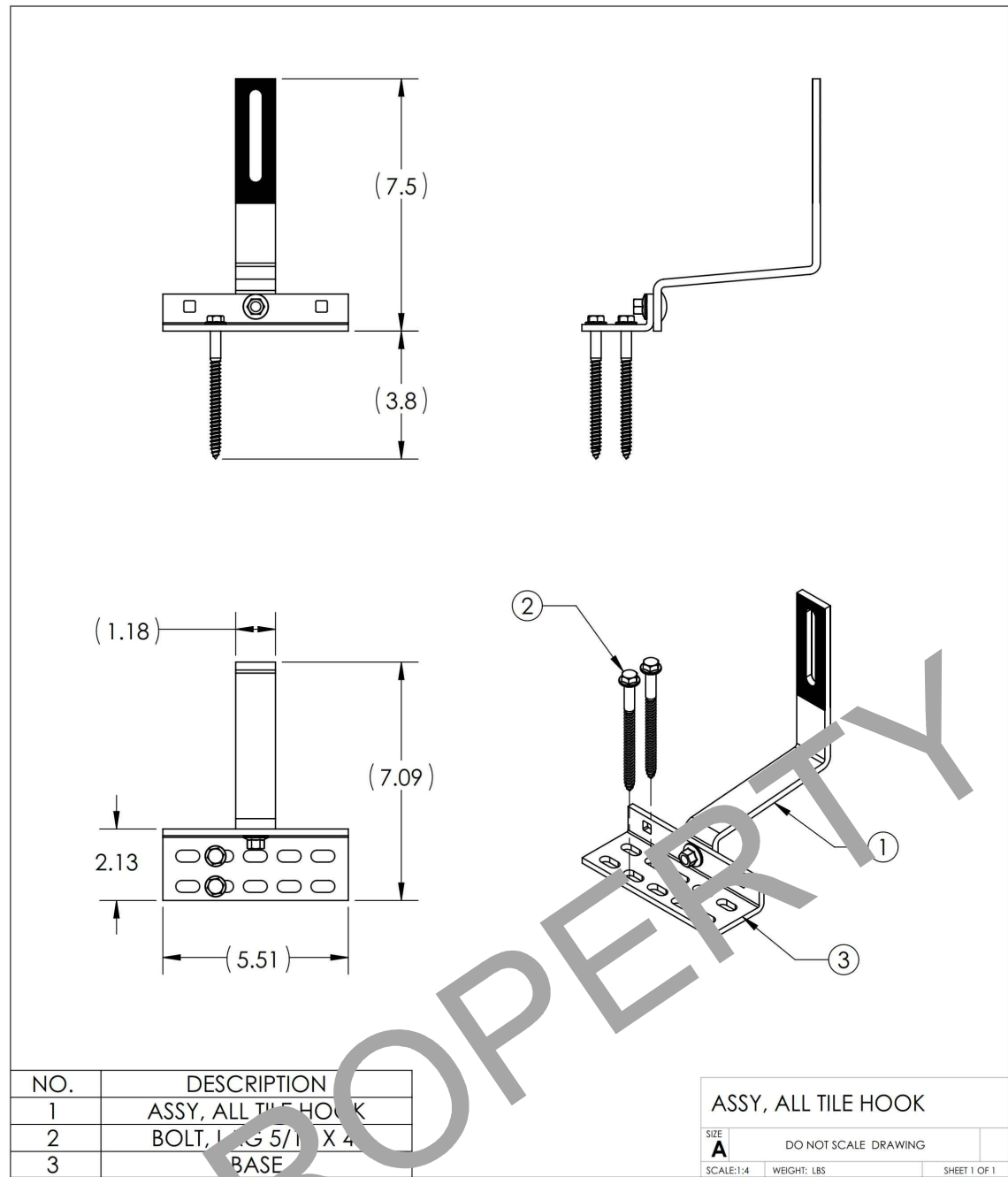
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All Tile Hook



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All Tile Hook Installation

Tools Required: tape measure, chalk, caulking gun, driver, 7/16" hex socket, and 1/4" drill bit (optional: stud finder and tile grinder)

1 Remove tile and locate rafter.

2 Position base over rafter, adjust arm if necessary and torque hardware to 132 in-lbs (11 ft-lbs). Position arm near center of valley for curved tiles, and away from joining seam for flat tiles.

3 Use base as guide to drill 1/4" pilot holes, then fill with roofing manufacturer's approved sealant. Insert lag bolts and tighten until fully seated. IronRidge offers an optional aluminum deck flashing. Other approved flashing methods include user supplied adhesive backed flexible flashing.

4 Replace tiles and notch if necessary to ensure proper fit.

5 Attach rails to either side of slot using bonding hardware. Level rails at desired height. Ensure hook does not extend above rail. Torque hardware to 250 in-lbs (21 ft-lbs).

Structural Certification
 Designed and Certified for Compliance with the International Building Code & ASCE/SEI-7.

Water Seal Ratings
 Water Sealing Tested to UL 441 Section 27 "Rain Test" and TAS 100(A)-95 "Wind Driven Rain Test" by Intertek. Ratings applicable for concrete tile roofs having slopes between 2:12 and 12:12. Tested and evaluated without sealant. Any roofing manufacturer approved sealant is allowed.

UL 2703
 Conforms to UL 2703 Mechanical and Bonding Requirements. See IronRidge Flush Mount Installation Manual for full ratings.

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