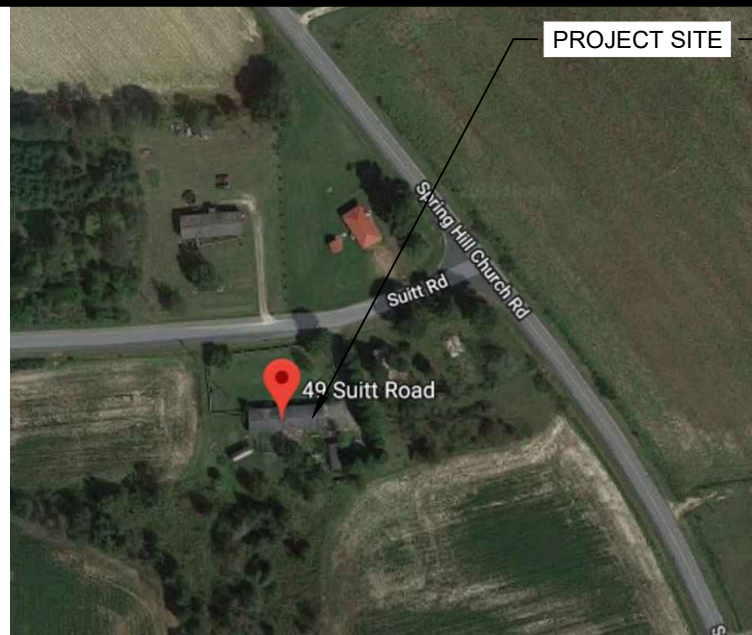
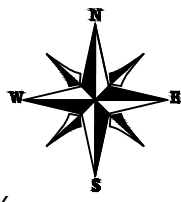
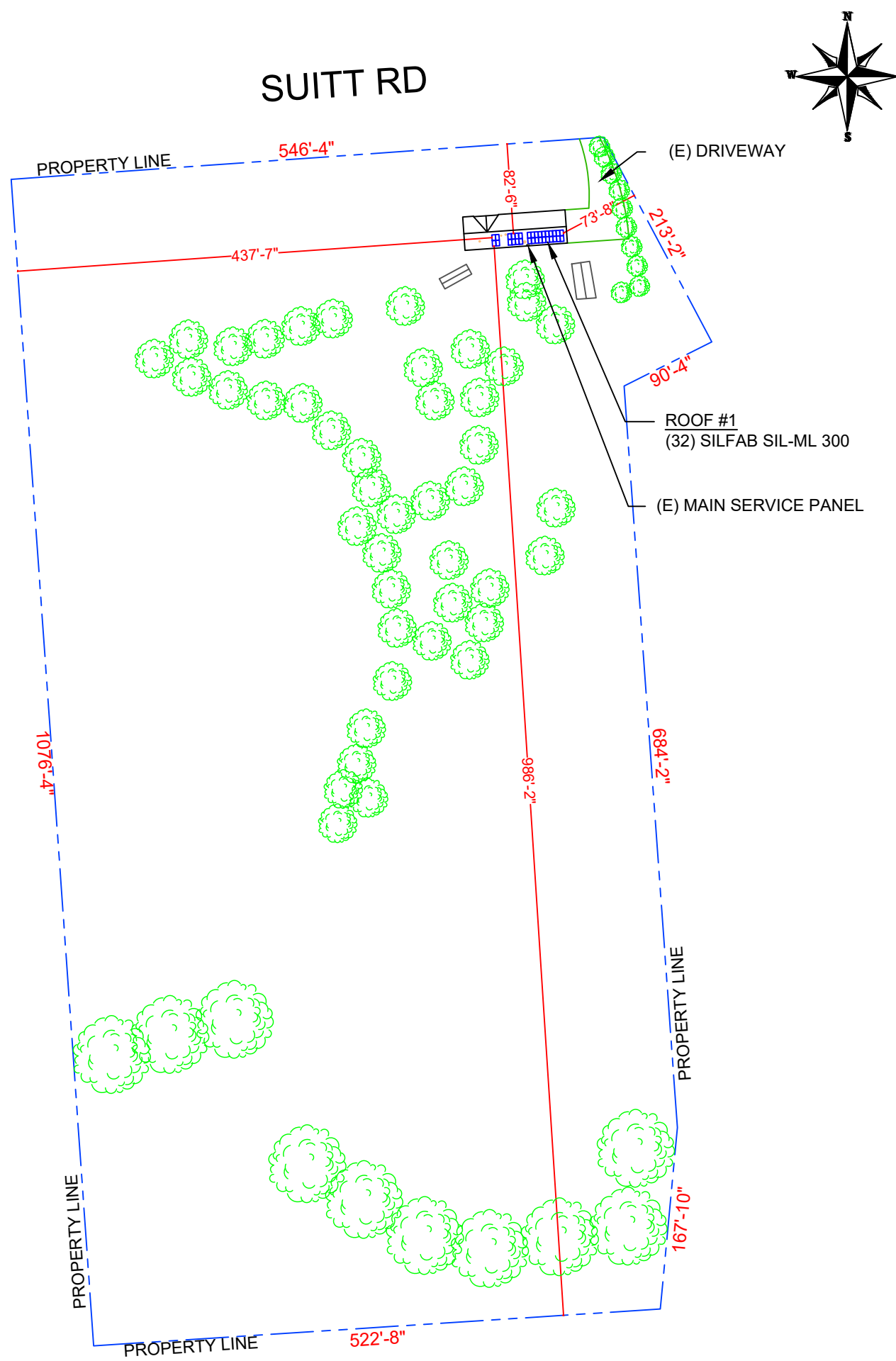


# PROJECT DESCRIPTION:

32x SILFAB SIL-ML 300 MODULES  
 ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES  
 SYSTEM SIZE: 9.6 kW DC STC  
 ARRAY AREA: ROOF #1- 585.6 SQ FT  
EQUIPMENT SUMMARY  
 32 SILFAB SIL-ML 300 MODULES  
 32 SOLAREEDGE POWER OPTIMIZER P320  
 01 SOLAREEDGE SE10000H-US INVERTER

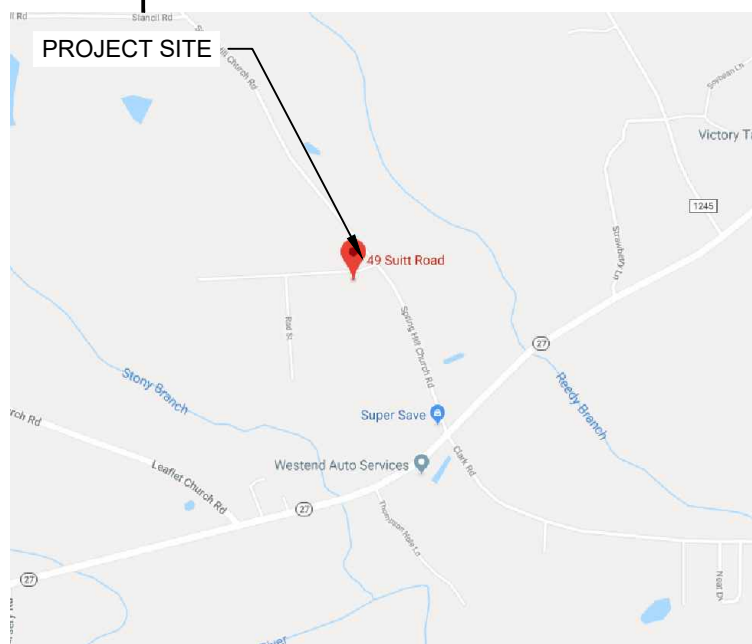
APPLICABLE CODES & STANDARDS  
 BUILDING: NCBC 2018  
 ELECTRICAL: NEC 2017  
DESIGN SPECIFICATION  
 OCCUPANCY: II  
 CONSTRUCTION: SINGLE-FAMILY  
 ZONING: RESIDENTIAL  
 GROUND SNOW LOAD: SEE STRUCTURAL  
 WIND EXPOSURE: SEE STRUCTURAL  
 WIND SPEED: SEE STRUCTURAL

AUTHORITIES HAVING JURISDICTION  
 BUILDING: HARNETT COUNTY  
 ZONING: HARNETT COUNTY  
 UTILITY: SOUTH RIVER ELECTRIC MEMBERSHIP COOP



## 2 HOUSE PHOTO

PV-1 | SCALE: NTS



## 3 VICINITY MAP

PV-1 | SCALE: NTS

SHEET INDEX

PV-1	PLOT PLAN & VICINITY MAP
PV-2	ROOF PLAN & MODULES
PV-2A	STRING LAYOUT
PV-3	ATTACHMENT DETAIL
PV-4	ELECTRICAL LINE DIAGRAM
PV-5	WIRING CALCULATIONS
PV-6	SOLAREEDGE OPTIMIZER CHART
PV-7 to 12	EQUIPMENT SPECIFICATIONS

## 1 PLOT PLAN WITH ROOF PLAN

PV-1 | SCALE: 1/16"=1'-0"

**POWERHOME SOLAR & ROOFING**

POWER HOME SOLAR, LLC  
 "POWER YOUR FUTURE"  
 919 N. MAIN ST.  
 MOORESVILLE, NC 28115  
 Phone: 704-800-6591 (OFFICE)  
 Email: info@powerhome.com  
 Web: www.powerhome.com

REVISIONS

DESCRIPTION	DATE	REV
INITIAL	11/05/2019	

Signature with Seal

DATE: 11/05/2019

PROJECT NAME & ADDRESS

**RONALD J COOKE  
 RESIDENCE**

49 SUITT RD,  
 LILLINGTON, NC 27546

DESIGNED BY

**PHS**

SHEET NAME

**PLOT PLAN &  
 VICINITY MAP**

SHEET SIZE

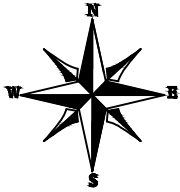
**ANSI B  
 11" X 17"**

SHEET NUMBER

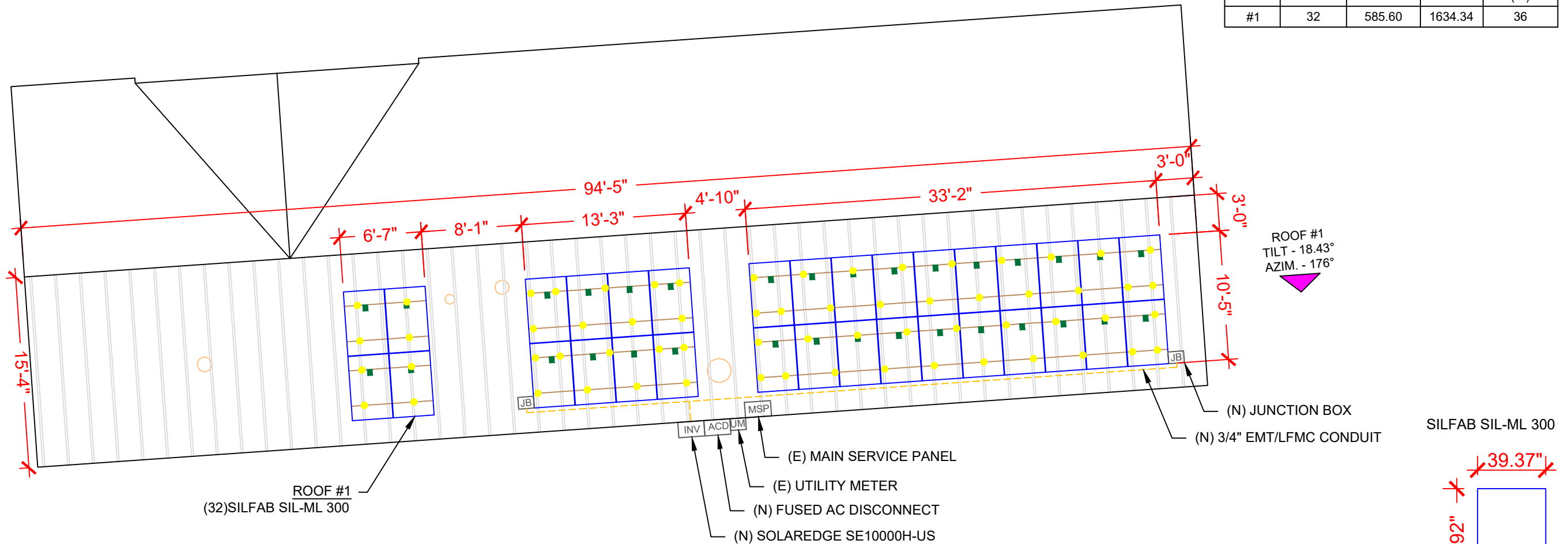
**PV-1**

**MODULE TYPE, DIMENSIONS & WEIGHT**

NUMBER OF MODULES = 32 MODULES  
 MODULE TYPE = SILFAB SIL-ML 300 MODULES  
 MODULE WEIGHT = 41.89 LBS / 19 KG.  
 MODULE DIMENSIONS = 66.92"x 39.37" = 18.3 SF



(E) FRONT OF RESIDENCE



(E) BACK OF RESIDENCE

ROOF DESCRIPTION				
ROOF TYPE		SHINGLE		
ROOF LAYER		1 LAYER		
ROOF	ROOF TILT	AZIMUTH	TRUSS/ RAFTER SIZE	TRUSS/ RAFTER SPACING
#1	18.43°	176°	REFER STRUCTURAL LETTER	

ARRAY AREA & ROOF AREA CALC'S				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	32	585.60	1634.34	36

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 DATE: 11/05/2019

PROJECT NAME & ADDRESS  
**RONALD J COOKE RESIDENCE**  
 49 SUITT RD,  
 LILLINGTON, NC 27546

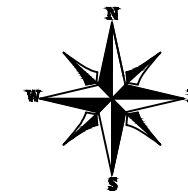
DESIGNED BY  
**PHS**

SHEET NAME  
**ROOF PLAN & MODULES**

SHEET SIZE  
**ANSI B  
 11" X 17"**

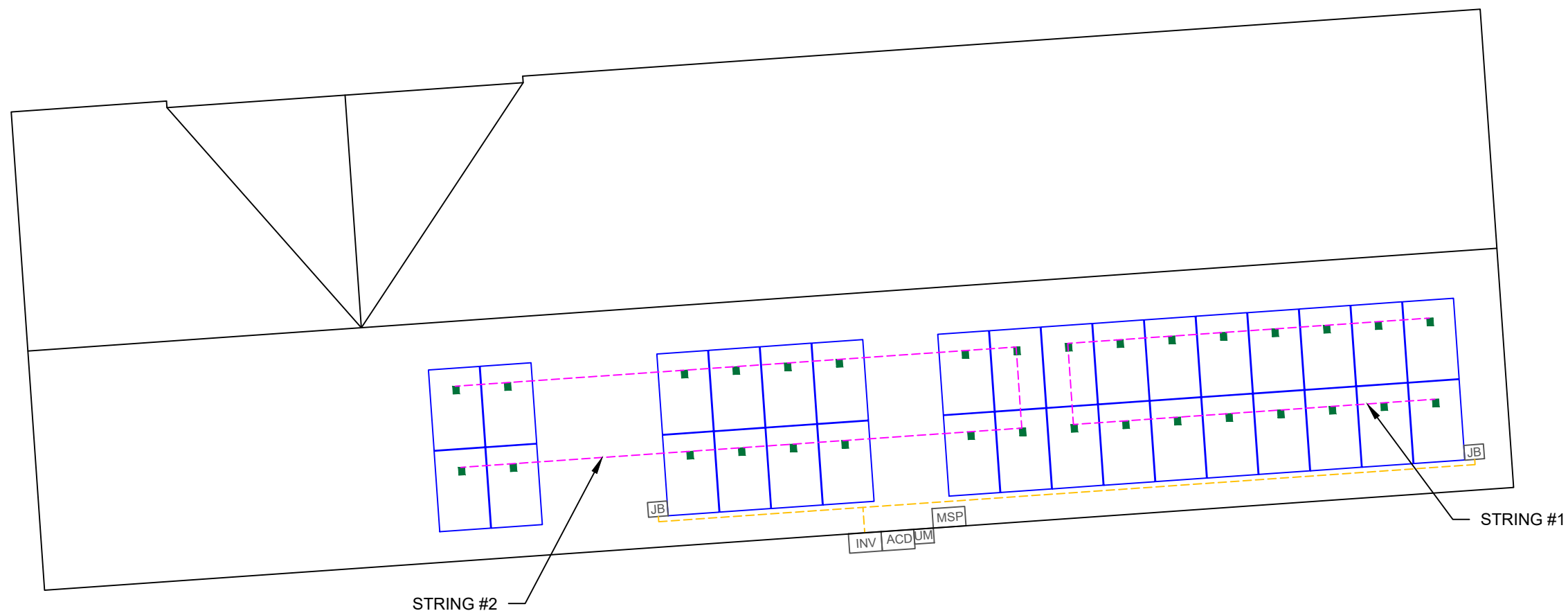
SHEET NUMBER  
**PV-2**

LEGEND	
[JB]	- JUNCTION BOX
[INV]	- INVERTER
[DC]	- INTEGRATED DC DISCONNECT
[SLD]	- SOLAR LOAD CENTER
[PM]	- PRODUCTION METER
[MSP]	- MAIN SERVICE PANEL
○ □	- VENT, ATTIC FAN (ROOF OBSTRUCTION)
●	- ROOF ATTACHMENT
—	- RAFTERS
- - -	- CONDUIT
[CB]	- COMBINER BOX



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(E) FRONT OF RESIDENCE



(E) BACK OF RESIDENCE

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL	11/05/2019	

Signature with Seal  
  
 DATE: 11/05/2019

PROJECT NAME & ADDRESS  
**RONALD J COOKE  
 RESIDENCE**  
 49 SUITT RD,  
 LILLINGTON, NC 27546

DESIGNED BY  
**PHS**

SHEET NAME  
**STRING  
 LAYOUT**

SHEET SIZE  
**ANSI B  
 11" X 17"**

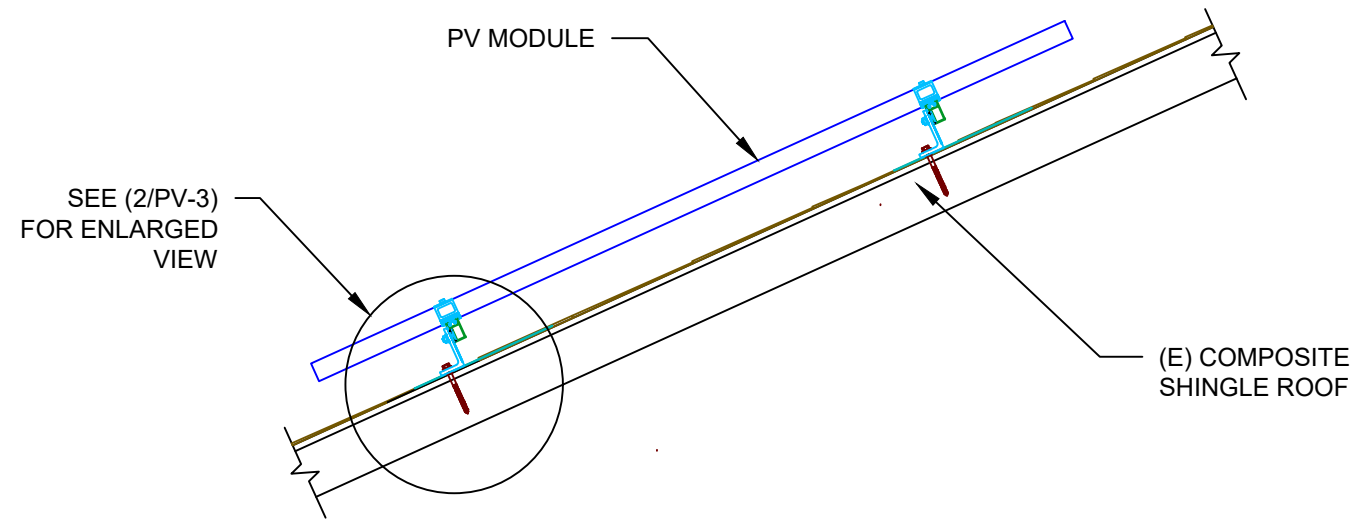
SHEET NUMBER  
**PV-2A**

BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULE	32	SILFAB SIL-ML 300 MODULES
OPTIMIZER	32	SOLAREEDGE POWER OPTIMIZER P320
INVERTER	01	SOLAREEDGE SE 10000H-US INVERTER
AC DISCONNECT	1	60A FUSED, (2) 60A FUSES, 240V, NEMA 3R, UL LISTED
SOLADECK	2	SOLADECKS
RAILS	18	QRAIL LIGHT 14 FT. BLACK
SPLICE KIT	10	QSPLICE INTERNAL LIGHT
BMC MILL	0	WEEB BMC MILL
MODULE CLAMPS	58	UNIVERSAL MID CLAMP
GROUNDING LUG	7	WEEB LUG W/ T-BOLT
END CLAMPS	26	UNIVERSAL END CLAMPS
ATTACHMENT	66	QUICKMOUNT L-MOUNT
T-BOLT	100	T-BOLT W/ NUT M8 X 20MM

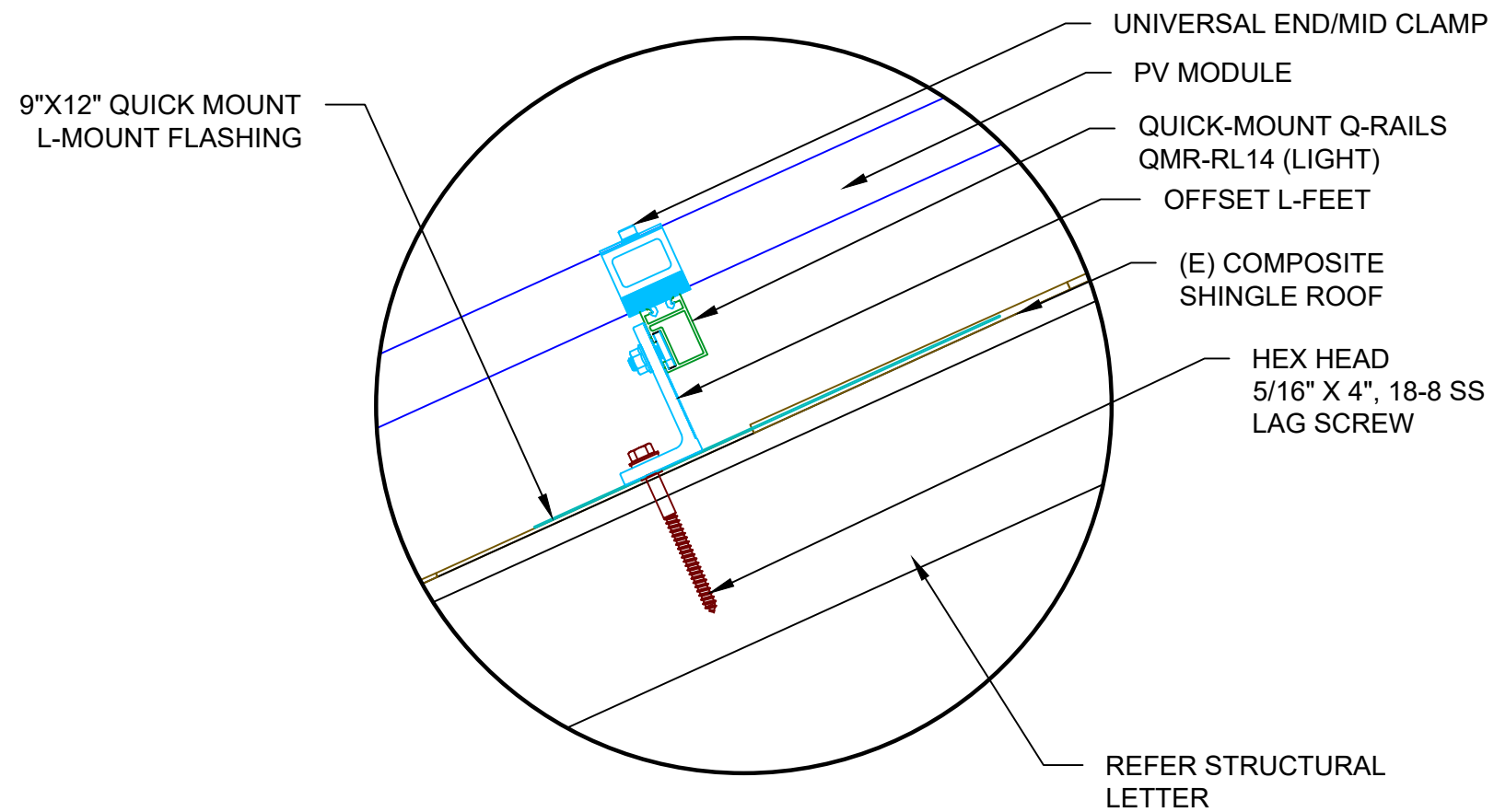
**1** ROOF PLAN WITH STRING LAYOUT

PV-2A

SCALE: 1/8"=1'-0"



**1** | ATTACHMENT DETAIL  
 PV-3 | SCALE: 1" = 1'-0"



**2** | ATTACHMENT DETAIL (enlarged view)  
 PV-3 | SCALE: NTS

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PROJECT NAME & ADDRESS

**RONALD J COOKE**  
**RESIDENCE**  
 49 SUITT RD,  
 LILLINGTON, NC 27546

DESIGNED BY  
**PHS**

SHEET NAME  
**ATTACHMENT  
 DETAIL**

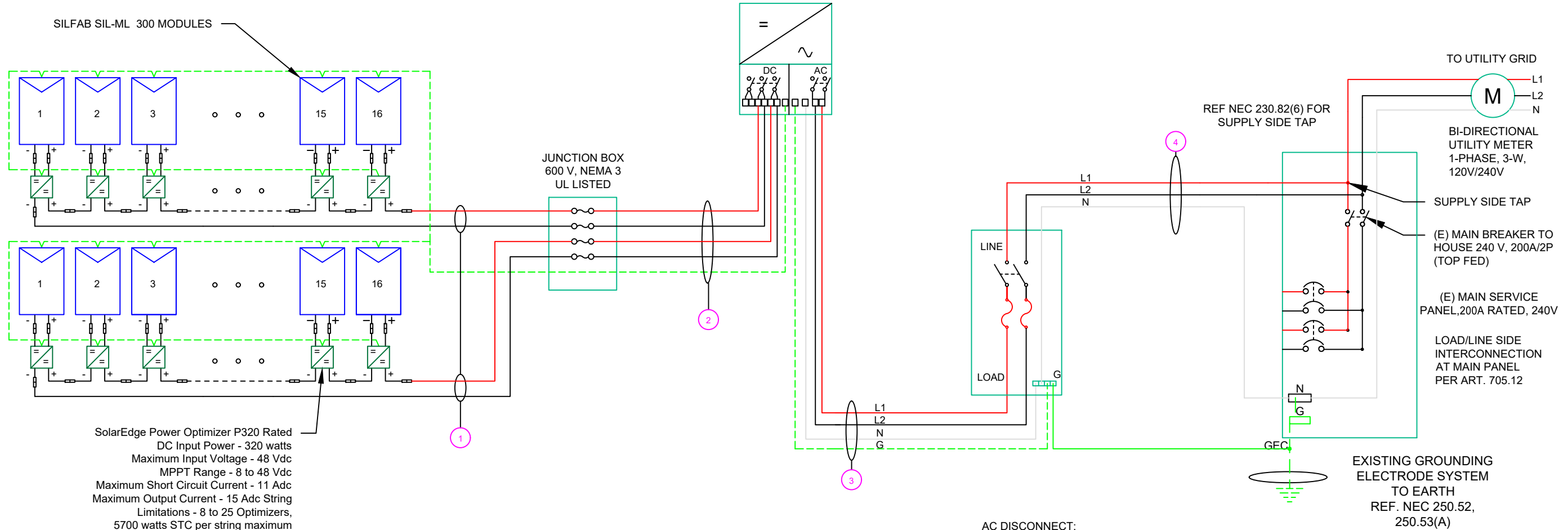
SHEET SIZE  
**ANSI B  
 11" X 17"**

SHEET NUMBER  
**PV-3**



(32) SILFAB SIL-ML 300 W MODULES  
(2) STRING OF 16 MODULES  
CONNECTED IN SERIES

SOLAREGE SE10000H-US (240V)  
OUTPUT: 240 VAC, 42A  
99% CEC WEIGHTED EFFICIENCY  
NEMA 3R, UL LISTED, INTERNAL GFDI  
WITH INTEGRATED DC DISCONNECT



**WARNING:**  
PHOTOVOLTAIC  
POWER SOURCE

LABEL 1  
ON ALL CONDUITS SPACED AT MAX 10FT

**! CAUTION !**  
SOLAR ELECTRIC  
SYSTEM DISCONNECTED  
AND ENERGIZED

LABEL 2  
AT INVERTER

**SOLAR PV SYSTEM EQUIPPED  
WITH RAPID SHUTDOWN**

RAPID SHUTDOWN  
SWITCH TO THE  
"OFF" POSITION TO  
SHUT DOWN PV SYSTEM  
AND REDUCE  
SHOCK HAZARD  
IN THE AREA

LABEL 3  
AT INVERTER

**PHOTOVOLTAIC  
DC DISCONNECT**

LABEL 4  
AT DC DISCONNECT

**! WARNING !**  
ELECTRIC SHOCK HAZARD  
DO NOT TOUCH TERMINALS.  
TERMINALS ON BOTH LINE AND LOAD SIDES  
MAY BE ENERGIZED IN THE OPEN POSITION

LABEL 5  
AT EACH AC DISCONNECT

**PHOTOVOLTAIC  
AC  
DISCONNECT**

LABEL 6  
AT EACH AC DISCONNECT

**! WARNING !**  
DUAL POWER SOURCES  
SECOND SOURCE IS PV SYSTEM

LABEL 7  
AT MEP

**! WARNING !**  
SOLAR SYSTEM  
CONNECTED  
AND ENERGIZED

LABEL 8  
AT MEP

**! CAUTION !**  
SOLAR POINT OF  
INTERCONNECTION

LABEL 9  
AT UTILITY METER

**! WARNING !**  
THE SERVICE METER IS ALSO SERVED  
BY A PHOTOVOLTAIC SYSTEM

LABEL 10  
AT UTILITY METER

QTY	CONDUCTOR INFORMATION	CONDUIT TYPE	CONDUIT SIZE
(4)	#10AWG - PV WIRE/USE-2	N/A	N/A
(1)	#6AWG - BARE COPPER IN FREE AIR	N/A	N/A
(4)	#10AWG - THWN-2	EMT OR LFMC IN ATTIC	3/4"
(1)	#6AWG - THWN-2 GND		
(3)	#6AWG - THWN-2	PVC, LFNC OR LFMC	3/4"
(1)	#6AWG - THWN-2 GND		
(3)	#6AWG - THWN-2	PVC, LFNC OR LFMC	3/4"

**SERVICE INFO**

UTILITY PROVIDER: SOUTH-RIVER ELECTRIC CO-OP  
MAIN SERVICE VOLTAGE: 240V  
MAIN PANEL BRAND: SIEMENS  
MAIN SERVICE PANEL: 200A  
MAIN CIRCUIT BREAKER RATING: 200A  
MAIN SERVICE LOCATION: SOUTH  
SERVICE FEED SOURCE: UNDERGROUND

**POWERHOME**  
SOLAR & ROOFING

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Web: www.powerhome.com

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DATE: 11/05/2019

**PROJECT NAME & ADDRESS**

**RONALD J COOKE  
RESIDENCE**  
49 SUITT RD,  
LILLINGTON, NC 27546

DESIGNED BY  
**PHS**

SHEET NAME  
**ELECTRICAL LINE  
DIAGRAM**

SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-4**

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	SILFAB SIL-ML 300
VMP	32.8V
IMP	9.16A
VOC	39.85V
ISC	9.71A
TEMP. COEFF. VOC	-0.28%/°C
MODULE DIMENSION	66.92"L x 39.37"W x 1.49"D (In Inch)

INVERTER #1 SPECIFICATIONS	
MANUFACTURER / MODEL #	SOLAREEDGE SE10000H-US
NOMINAL AC POWER	10.0 KW
NOMINAL OUTPUT VOLTAGE	240 VAC
NOMINAL OUTPUT CURRENT	42A

POWER OPTIMIZER (OPTIMIZER P320-2NM4ARS)	
MAXIMUM INPUT POWER	320W
MINIMUM INPUT VOLTAGE	8 VDC
MAXIMUM INPUT VOLTAGE	48VDC
MAXIMUM MODULE ISC	11 ADC
MAXIMUM OUTPUT CURRENT	15 ADC

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT
.80	4-6
.70	7-9
.50	10-20

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-11°
AMBIENT TEMP (HIGH TEMP 2%)	34°
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	56°
CONDUCTOR TEMPERATURE RATE	90°
MODULE TEMPERATURE COEFFICIENT OF Voc	-0.30%/°C

### DC CONDUCTOR AMPACITY CALCULATIONS: ARRAY TO JUNCTION BOX:

EXPECTED WIRE TEMP (In Celsius)	56°
TEMP. CORRECTION PER TABLE (310.16)	0.71
NO. OF CURRENT CARRYING CONDUCTORS	4
CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a)	0.8
CIRCUIT CONDUCTOR SIZE	10 AWG
CIRCUIT CONDUCTOR AMPACITY	40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	18.750A
1.25 X Isc	
DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC TABLE 310.16	28.4A
TEMP. CORRECTION PER TABLE (310.16) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY	
Result should be greater than (18.750A) otherwise less the entry for circuit conductor size and ampacity	

### DC CONDUCTOR AMPACITY CALCULATIONS: FROM JUNCTION BOX TO INVERTER:

AMBIENT TEMPERATURE ADJUSTMENT FOR EXPOSED CONDUIT PER NEC 310.15(B)(2)(c)	+22°
EXPECTED WIRE TEMP (In Celsius)	34°+22° = 56°
TEMP. CORRECTION PER TABLE (310.16)	0.71
NO. OF CURRENT CARRYING CONDUCTORS	4
CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a)	0.8
CIRCUIT CONDUCTOR SIZE	10AWG
CIRCUIT CONDUCTOR AMPACITY	40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	18.750A
1.25 X Isc	
DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC TABLE 310.16	28.4A
TEMP. CORRECTION PER TABLE (310.16) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a) X CIRCUIT CONDUCTOR AMPACITY	
Result should be greater than (18.750A) otherwise less the entry for circuit conductor size and ampacity	

### AC CONDUCTOR AMPACITY CALCULATIONS:

No. OF INVERTER	1
EXPECTED WIRE TEMP (In Celsius)	34°
TEMP. CORRECTION PER TABLE (310.16)	0.96
NO. OF CURRENT CARRYING CONDUCTORS	3
CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a)	1
CIRCUIT CONDUCTOR SIZE	6 AWG
CIRCUIT CONDUCTOR AMPACITY	75A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(B)	52.5 A
1.25 X MAX INVERTER OUTPUT CURRENT	
DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC TABLE 310.16	72A
TEMP. CORRECTION PER TABLE (310.16) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a) X CIRCUIT CONDUCTOR AMPACITY	
Result should be greater than (52.5 A) otherwise less the entry for circuit conductor size and ampacity	

#### ELECTRICAL NOTES

- 1.) ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- 2.) ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
- 3.) WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
- 4.) WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- 5.) DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
- 6.) WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- 7.) ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- 8.) MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
- 9.) MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
- 10.) THE POLARITY OF THE GROUNDED CONDUCTORS IS NEGATIVE



REVISIONS		
DESCRIPTION	DATE	REV
INITIAL	11/05/2019	

Signature with Seal

DATE: 11/05/2019

#### PROJECT NAME & ADDRESS

RONALD J COOKE  
RESIDENCE

49 SUITT RD,  
LILLINGTON, NC 27546

DESIGNED BY  
PHS

SHEET NAME  
WIRING  
CALCULATIONS

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-5

1-10    11-20    21-30    31-40    41-50    51-60

# SOLAREEDGE OPTIMIZER CHART

1  
2  
3  
4  
5  
6  
7  
8  
9  
10




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PROJECT NAME & ADDRESS

**RONALD J COOKE  
 RESIDENCE**

49 SUITT RD,  
 LILLINGTON, NC 27546

DESIGNED BY

**PHS**

SHEET NAME

**SOLAREEDGE  
 OPTIMIZER CHART**

SHEET SIZE

**ANSI B  
 11" X 17"**

SHEET NUMBER

**PV-6**





# SIL-300 ML



## 60 Cell Monocrystalline PV Module



**CHUBB**  
\*Chubb provides error and omission insurance to Silfab Solar Inc.

### INDUSTRY LEADING WARRANTY

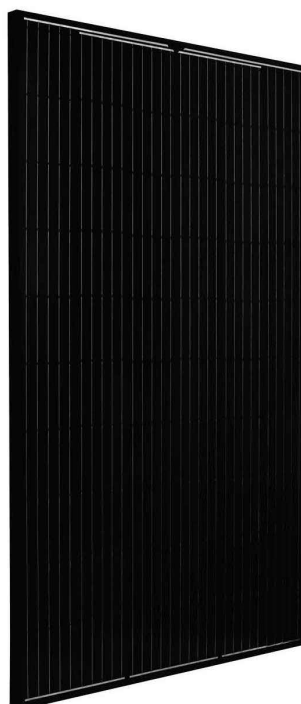
All our products include an industry leading 25-year product workmanship and 30-year performance warranty.

### 35+ YEARS OF SOLAR INNOVATION

Leveraging over 35+ years of worldwide experience in the solar industry, Silfab is dedicated to superior manufacturing processes and innovations such as Bifacial and Back Contact technologies, to ensure our partners have the latest in solar innovation.

### NORTH AMERICAN QUALITY

Silfab is the largest and most automated solar manufacturer in North America. Utilizing premium quality materials and strict quality control management to deliver the highest efficiency, premium quality PV modules 100% made in North America.



### BAA / ARRA COMPLIANT

Silfab panels are designed and manufactured to meet Buy American Act Compliance. The US State Department, US Military and FAA have all entrusted Silfab panels in their solar installations.

### LIGHT AND DURABLE

Engineered to accommodate low load bearing structures up to 5400Pa. The light-weight frame is exclusively designed for wide-ranging racking compatibility and durability.

### LOWEST DEFECT RATE

Total automation ensures strict quality controls during the entire manufacturing process at our ISO certified facilities. 48.18 ppm as per December 2018.

### DOMESTIC PRODUCTION

Silfab is 100% North American which means our customer service is direct, efficient and local. Your solar panels can be delivered anywhere in the Continental USA within days.

### AESTHETICALLY PLEASING

All black sleek design doesn't compromise on quality.

### PID RESISTANT

PID Resistant due to advanced cell technology and material selection. In accordance to IEC 62804-1

Electrical Specifications		SILFAB SIL-300 ML mono PERC	
Test Conditions		STC	NOCT
Module Power (Pmax)	Wp	300	227
Maximum power voltage (Vpmax)	V	32.8	29.5
Maximum power current (Ipmax)	A	9.16	7.69
Open circuit voltage (Voc)	V	39.85	36.9
Short circuit current (Isc)	A	9.71	7.96
Module efficiency	%	18.4	17.3
Maximum system voltage (VDC)	V		1000
Series fuse rating	A		20
Power Tolerance	Wp		-0/+10

Measurement conditions: STC 1000 W/m<sup>2</sup> • AM 1.5 • Temperature 25 °C • NOCT 800 W/m<sup>2</sup> • AM 1.5 • Measurement uncertainty ≤ 3%  
• Sun simulator calibration reference modules from Fraunhofer institute. Electrical characteristics may vary by ±5% and power by -0/+10W.

Temperature Ratings		SILFAB SIL-300 ML mono PERC	
Temperature Coefficient Isc	%/°C		0.064
Temperature Coefficient Voc	%/°C		-0.28
Temperature Coefficient Pmax	%/°C		-0.36
NOCT (± 2°C)	°C		45
Operating temperature	°C		-40/+85

Mechanical Properties and Components		SILFAB SIL-300 ML mono PERC	
Module weight (± 1 kg)	kg		19
Dimensions (H x L x D; ± 1mm)	mm		1700 x 1000 x 38
Maximum surface load (wind/snow)*	N/m <sup>2</sup>		4000 Pa rear load / 5400 Pa front load
Hail impact resistance			Ø 25 mm at 83 km/h
Cells			60 - Si monocrystalline - 4 or 5 busbar - 156.75 x 156.75 mm
Glass			3.2 mm high transmittance, tempered, antireflective coating
Backsheet			Multilayer polyester-based
Frame			Anodized Al (Black)
Bypass diodes			3 diodes, 20SQ040 (45V/20A)
Cables and connectors			1200 mm Ø 5.7 mm (4 mm <sup>2</sup> ), MC4 compatible (refer to installation manual)
Junction Box			UL 3730 Certified, IP67 rated

Warranties		SILFAB SIL-300 ML mono PERC	
Module product workmanship warranty			25 years**
			30 years
			≥ 97% end of 1 <sup>st</sup> year
			≥ 90% end of 12 <sup>th</sup> year
			≥ 82% end of 25 <sup>th</sup> year
			≥ 80% end of 30 <sup>th</sup> year

Linear power performance guarantee

Certifications		SILFAB SIL 300 ML mono PERC	
Product			ULC ORD C1703, UL 1703, IEC 61215, IEC 61730-1 and IEC 61730-2 Certified FSEC and CEC listed. IEC 62716 Ammonia Corrosion, IEC 61701:2011 Salt Mist Corrosion Certified
Factory			UL Fire Rating: Type 2 ISO9001:2015

\*Please refer to the Safety and Installation Manual for mounting specifications.  
\*\*12 year extendable to 25 years subject to registration and conditions outlined under "Warranty" at [www.silfabsolar.com](http://www.silfabsolar.com).

⚠ Warning: Read the installation and User Manual before handling, installing and operating modules.

Third-party generated pan files from Fraunhofer-Institute for Solar Energy Systems ISE are available for download at: [www.silfabsolar.com/downloads](http://www.silfabsolar.com/downloads)



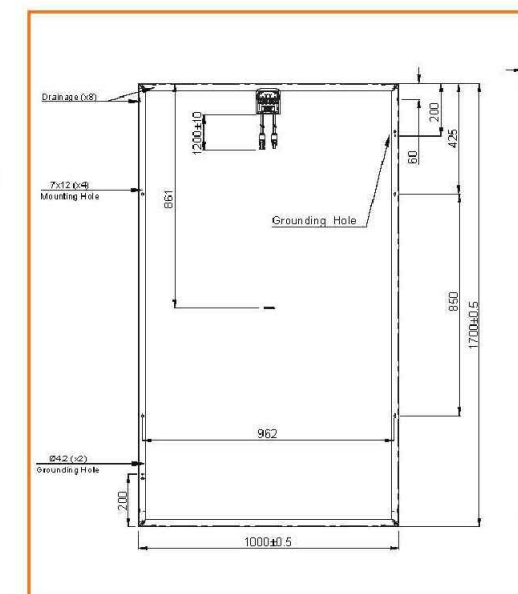
Modules Per Pallet: 26  
Pallets Per Truck: 36  
Modules Per Truck: 936



Silfab Solar Inc.  
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**POWERHOME SOLAR & ROOFING**  
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Web: [www.powerhome.com](http://www.powerhome.com)

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL	11/05/2019	

Signature with Seal  
  
DATE: 11/05/2019

PROJECT NAME & ADDRESS  
**RONALD J COOKE RESIDENCE**  
49 SUITT RD,  
LILLINGTON, NC 27546

DESIGNED BY  
**PHS**

SHEET NAME  
**EQUIPMENT SPECIFICATION**

SHEET SIZE  
**ANSI B 11" X 17"**

SHEET NUMBER  
**PV-7**



# Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US



12-25  
YEAR  
WARRANTY

INVERTERS

## Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking efficiency
- Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- Fixed voltage inverter for longer strings
- Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Extremely small
- Built-in module-level monitoring
- Outdoor and indoor installation
- Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)

solaredge.com



## Single Phase Inverter with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
APPLICABLE TO INVERTERS WITH PART NUMBER	SEXXXXH-XXXXXBXX4							
<b>OUTPUT</b>								
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓	Vac
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	✓	-	✓	-	-	✓	Vac
AC Frequency (Nominal)	59.3 - 60 - 60.5 <sup>①</sup>							Hz
Maximum Continuous Output Current @240V	12.5	16	21	25	32	42	47.5	A
Maximum Continuous Output Current @208V	-	16	-	24	-	-	48.5	A
Power Factor	1, adjustable -0.85 to 0.85							
GFDI Threshold	1							A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes							
<b>INPUT</b>								
Maximum DC Power @240V	4650	5900	7750	9300	11800	15500	17650	W
Maximum DC Power @208V	-	5100	-	7750	-	-	15500	W
Transformer-less, Ungrounded	Yes							
Maximum Input Voltage	480							Vdc
Nominal DC Input Voltage	380				400			Vdc
Maximum Input Current @240V <sup>②</sup>	8.5	10.5	13.5	16.5	20	27	30.5	Adc
Maximum Input Current @208V <sup>②</sup>	-	9	-	13.5	-	-	27	Adc
Max. Input Short Circuit Current	45							Adc
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600 $\mu$ a Sensitivity							
Maximum Inverter Efficiency	99	99.2						%
CEC Weighted Efficiency	99						99 @ 240V 98.5 @ 208V	%
Nighttime Power Consumption	< 2.5							W
<b>ADDITIONAL FEATURES</b>								
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)							
Revenue Grade Data, ANSI C12.20	Optional <sup>③</sup>							
Inverter Commissioning	with the SetApp mobile application using built-in Wi-Fi station for local connection							
Rapid Shutdown - NEC 2014 and 2017 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect							
<b>STANDARD COMPLIANCE</b>								
Safety	UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCE according to T.I.L. M-07							
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (HI)							
Emissions	FCC Part 15 Class B							
<b>INSTALLATION SPECIFICATIONS</b>								
AC Output Conduit Size / AWG Range	3/4" minimum / 14-6 AWG				3/4" minimum / 14-4 AWG			
DC Input Conduit Size / # of Strings / AWG Range	3/4" minimum / 1-2 strings / 14-6 AWG				3/4" minimum / 1-3 strings / 14-6 AWG			
Dimensions with Safety Switch (HxWxD)	17.7 x 14.6 x 6.8 / 450 x 370 x 174				21.3 x 14.6 x 7.3 / 540 x 370 x 185			in / mm
Weight with Safety Switch	22 / 10	25.1 / 11.4	26.2 / 11.9	38.8 / 17.6			lb / kg	
Noise	< 25				< 50			dB(A)
Cooling	Natural Convection							
Operating Temperature Range	-40 to +140 / -40 to +60 <sup>④</sup>							°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)							



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DESIGNED BY

PHS

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-8





# Power Optimizer

P320 / P370 / P400 / P405 / P505



POWER OPTIMIZER

## PV power optimization at the module-level

- Specifically designed to work with SolarEdge inverters
- Up to 25% more energy
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch losses, from manufacturing tolerance to partial shading
- Flexible system design for maximum space utilization
- Fast installation with a single bolt
- Next generation maintenance with module-level monitoring
- Compliant with arc fault protection and rapid shutdown NEC requirements (when installed as part of the SolarEdge system)
- Module-level voltage shutdown for installer and firefighter safety

www.solaredge.us



# Power Optimizer

P320 / P370 / P400 / P405 / P505

OPTIMIZER MODEL (typical module compatibility)	P320 (for high-power 60-cell modules)	P370 (for higher-power 60 and 72-cell modules)	P400 (for 72 & 96-cell modules)	P405 (for thin film modules)	P505 (for higher current modules)	
<b>INPUT</b>						
Rated Input DC Power <sup>(1)</sup>	320	370	400	405	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	48	60	80	125	83	Vdc
MPPT Operating Range	8 - 48	8 - 60	8 - 80	12.5 - 105	12.5 - 83	Vdc
Maximum Short Circuit Current (Isc)	11			10.1	14	Adc
Maximum DC Input Current	13.75			12.63	17.5	Adc
Maximum Efficiency			99.5			%
Weighted Efficiency			98.8		98.6	%
Overvoltage Category			II			
<b>OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREEDGE INVERTER)</b>						
Maximum Output Current			15			Adc
Maximum Output Voltage		60		85		Vdc
<b>OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREEDGE INVERTER OR SOLAREEDGE INVERTER OFF)</b>						
Safety Output Voltage per Power Optimizer			1 ± 0.1			Vdc
<b>STANDARD COMPLIANCE</b>						
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3					
Safety	IEC62109-1 (class II safety), UL1741					
RoHS	Yes					
<b>INSTALLATION SPECIFICATIONS</b>						
Maximum Allowed System Voltage	1000					Vdc
Compatible inverters	All SolarEdge Single Phase and Three Phase inverters					
Dimensions (W x L x H)	128 x 152 x 28 / 5 x 5.97 x 1.1	128 x 152 x 36 / 5 x 5.97 x 1.42	128 x 152 x 50 / 5 x 5.97 x 1.96	128 x 152 x 59 / 5 x 5.97 x 2.32		mm / in
Weight (including cables)	630 / 1.4	750 / 1.7	845 / 1.9	1064 / 2.3		g / lb
Input Connector	MC4 <sup>(2)</sup>					
Output Wire Type / Connector	Double Insulated; MC4					
Output Wire Length	0.95 / 3.0		1.2 / 3.9			m / ft
Operating Temperature Range	-40 - +85 / -40 - +185					°C / °F
Protection Rating	IP68 / NEMA6P					
Relative Humidity	0 - 100					%

<sup>(1)</sup> Rated STC power of the module. Module of up to +5% power tolerance allowed.

<sup>(2)</sup> For other connector types please contact SolarEdge.

PV SYSTEM DESIGN USING A SOLAREEDGE INVERTER <sup>(3)(4)</sup>	SINGLE PHASE HD-WAVE	SINGLE PHASE	THREE PHASE 208V	THREE PHASE 480V	
Minimum String Length (Power Optimizers)	P320, P370, P400 P405 / P505	8	10	18	
Maximum String Length (Power Optimizers)		6	8	14	
Maximum Power per String	5700 (6000 with SE7600-US - SE11400- US)	25	25	50 <sup>(5)</sup>	W
Parallel Strings of Different Lengths or Orientations	Yes				

<sup>(3)</sup> For detailed string sizing information refer to: [http://www.solaredge.com/sites/default/files/string\\_sizing\\_na.pdf](http://www.solaredge.com/sites/default/files/string_sizing_na.pdf).

<sup>(4)</sup> It is not allowed to mix P405/P505 with P320/P370/P400/P600/P700/P800 in one string.

<sup>(5)</sup> A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement.



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DESIGNED BY

PHS

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-9





## QRail™ — Fully Integrated Mounting and Racking System

The QRail Series is a strong and versatile solar array mounting system that provides unrivaled benefits to solar designers and installers. Combined with Quick Mount PV's industry-leading waterproof mounts, QRail offers a complete racking solution for mounting solar modules on any roof.



Easily design array configurations with the QDesign software application. Generate complete engineering reports and calculate a precise bill of materials for all the mounting, racking and accessories needed for a complete solar array.

## Comprehensive, One-Source Solution

QRail, together with Quick Mount PV's waterproof mounting products, provides the benefit of a single-sourced, seamlessly integrated rooftop installation that works with all roof types — composition/asphalt shingles, flat or curved tile, metal shingle, shake, slate and low slope roofs. The QRail system also works with any roof attachment system for maximum flexibility.

## Superior Strength and Versatility

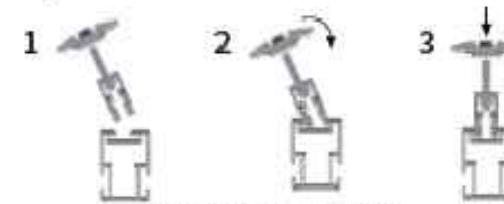
QRail is engineered for optimal structural performance. The system is certified to UL 2703, fully code compliant and backed by a 25-year warranty. QRail is available in Light, Standard and Heavy versions to match all geographic locations. QRail is compatible with virtually all modules and works on a wide range of pitched roof surfaces. Modules can be mounted in portrait or landscape orientation in standard or shared-rail configurations.



## Fast, Simple Installation: It Just Clicks

### QClick Technology™

The universal mid and end clamps use QClick technology to simply "click" into the rail channel and remain upright, ready to accept the module. The pre-assembled clamps fit virtually all module frames and require no extra hardware, eliminating pre-loading and reducing installation time.



Installing is as easy as 1-2-3



### QSplice™ Technology

QRail's innovative internal QSplice installs in seconds, requiring no tools or screws. Simply insert QSplice into the rail and slide the other rail on to create a fully structural, bonded splice. An external splice is also available.



Installs in seconds — no tools or hardware required

## Fully Integrated Electrical Bonding

The QRail system provides an integrated electrical bonding path, ensuring that all exposed metal parts and the solar module frames are electrically connected. All electrical bonds are created when the components are installed and tightened down.

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DESIGNED BY

**PHS**

SHEET NAME

**EQUIPMENT SPECIFICATION**

SHEET SIZE

**ANSI B  
11" X 17"**

SHEET NUMBER

**PV-10**



# QRail™ Configurations



Item Code	Part Number	Description	Finish
QMR-RL14 A 60	800	QRail Light, 14 ft., 60 Pack	Mill
QMR-RL17.3 A 60	801	QRail Light, 17.3 ft., 60 Pack	Mill
QMR-RL14 B 60	805	QRail Light, 14 ft., 60 Pack	Black
QMR-RL17.3 B 60	806	QRail Light, 17.3 ft., 60 Pack	Black
QMR-RS14 A 60	810	QRail Standard, 14 ft., 60 Pack	Mill
QMR-RS17.3 A 60	811	QRail Standard, 17.3 ft., 60 Pack	Mill
QMR-RS14 B 60	815	QRail Standard, 14 ft., 60 Pack	Black
QMR-RS17.3 B 60	816	QRail Standard, 17.3 ft., 60 Pack	Black
QMR-RH14 A 60	820	QRail Heavy, 14 ft., 60 Pack	Mill
QMR-RH17.3 A 60	821	QRail Heavy, 17.3 ft., 60 Pack	Mill
QMR-RH14 B 60	825	QRail Heavy, 14 ft., 60 Pack	Black
QMR-RH17.3 B 60	826	QRail Heavy, 17.3 ft., 60 Pack	Black

# QSplice™ Internal Structural Splice



Item Code	Part Number	Description	Finish
QMR-ISL A 15	830	QSplice Internal, Light, 15 Pack	Mill
QMR-ISS A 15	831	QSplice Internal, Standard, 15 Pack	Mill
QMR-ISH A 15	832	QSplice Internal, Heavy, 15 Pack	Mill

# QSplice™ External Structural Splice



Item Code	Part Number	Description	Finish
QMR-ESS A 15	834	QSplice External, Standard, 15 Pack	Mill
QMR-ESH A 15	835	QSplice External, Heavy, 15 Pack	Mill

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**ANSI B 11" X 17"**

SHEET NUMBER  
**PV-11 A**

## Universal End Clamp with QClick™ Technology



Black

Mill

Item Code	Part Number	Description	Finish
QMR-UEC3045 A 20	860	Universal End Clamp, 30-45mm, 20 Pack	Mill
QMR-UEC3850 A 20	861	Universal End Clamp, 38-50mm, 20 Pack	Mill
QMR-UEC3045 B 20	865	Universal End Clamp, 30-45mm, 20 Pack	Black
QMR-UEC3850 B 20	866	Universal End Clamp, 38-50mm, 20 Pack	Black
QMR-UEC3045BP A 20	862	Universal End Clamp, 30-45mm, w/ Bonding, 20 Pack	Mill
QMR-UEC3850BP A 20	863	Universal End Clamp, 38-50mm, w/ Bonding, 20 Pack	Mill
QMR-UEC3045BP B 20	867	Universal End Clamp, 30-45mm, w/ Bonding, 20 Pack	Black
QMR-UEC3850BP B 20	868	Universal End Clamp, 38-50mm, w/ Bonding, 20 Pack	Black

## Mid Clamp with QClick™ Technology



Black

Mill

Item Code	Part Number	Description	Finish
QMR-UM C3045BP 1.2 A 20	872	Universal Mid Clamp, 30-45mm, w/ Bonding, 20 Pack	Mill
QMR-UM C3850BP 1.2 A 20	873	Universal Mid Clamp, 38-50mm, w/ Bonding, 20 Pack	Mill
QMR-UM C3045BP 1.2 B 20	877	Universal Mid Clamp, 30-45mm, w/ Bonding, 20 Pack	Black
QMR-UM C3850BP 1.2 B 20	878	Universal Mid Clamp, 38-50mm, w/ Bonding, 20 Pack	Black

## Single-Slot L-Foot



Item Code	Part Number	Description	Finish
QMC-LF A 12	892	Single-slot L-foot, 12 Pack	Mill
QMC-LF B 12	893	Single-slot L-foot, 12 Pack	Black

## End Caps



Heavy

Standard

Light

Item Code	Part Number	Description	Finish
QMR-CPL B 50	885	End Cap Light, 50 Pack	Black
QMR-CPS B 50	886	End Cap Standard, 50 Pack	Black
QMR-CPH B 50	887	End Cap Heavy, 50 Pack	Black



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 SPECIFICATION

SHEET SIZE

ANSI B  
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SHEET NUMBER

PV-11 B

## T-Bolt



Item Code	Part Number	Description	Finish
QMR-TB A 300	880	T-Boltw/ Nut, 300 Pack	stainless steel

## Wire Clip



*Works with both PV and Trunk Cabling*

Item Code	Part Number	Description	Finish
QMR-WCA 300	892	Trunk/PV Cable, 300 Pack	stainless steel

## Grounding Lug



Item Code	Part Number	Description	Finish
QMR-GL A 50	890	WEEB Lug w/ T-Bolt, 50 Pack	n/a

## WEEB BMC



Item Code	Part Number	Description	Finish
QMR-ECW A 50	891	WEEB BMC, 50 Pack	stainless steel



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ANSI B  
 11" X 17"

SHEET NUMBER

PV-11 C



# L-Mount | QMLM / QMLM-ST

Elevated Water Seal Technology®

ITEM NO.	DESCRIPTION	QTY.
1	FLASHING, ROUNDED CORNERS, 9" X 12" X .040", .438" HOLE, 5052, MILL	1
2	L-FOOT, 2" X 3.30" FOR .438" O.D. FASTENER, 2-1/16" SLOT, 6061-T6/6005A-T61, MILL	1
3	WASHER, SEALING, 5/16" ID X 3/4" OD, EPDM BONDED SS	1
4	LAG SCREW, HEX HEAD, 5/16" x 4", 18-8 SS	1
*5	STRUCTURAL SCREW, QMPV, T-30 HEX WASHER HEAD, 5/16" X 4-1/2", 18-8SS	1

THIS EDGE TOWARDS ROOF RIDGE

12.00

3.00 (4.20)

4.50

9.00

2.00

1.00

2.09

Ø .408

3.30

(.90)

.040

(2.50)

(3.54)

QMLM

2.75

4.04

QMLM-ST

\*5

4

3

2

1

STRUCTURAL SCREW AVAILABLE ON QMLM-ST VERSIONS ONLY

AVAILABLE IN MILL AND BLACK FINISHES

Quick Mount PV®

TITLE: QMLM & QMLM-ST: L-MOUNT, 2-1/16" SLOT

UNLESS OTHERWISE SPECIFIED:	SIZE	DRAWN BY: AAP	REV
DIMENSIONS ARE IN INCHES	<b>A</b>	DATE: 4/4/2019	11
TOLERANCES:			
FRACTIONAL ± 1/8			
TWO PLACE DECIMAL ± .19			
THREE PLACE DECIMAL ± .094			
SCALE: 1:4	WEIGHT: 0.7565	SHEET 1 OF 1	

5 4 3 2 1

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DO NOT SCALE DRAWING

## L-Mount Installation Instructions

**Installation Tools Required:** tape measure, roofing bar, chalk line, stud finder, caulking gun, sealant compatible with roofing materials, drill with 7/32" or 1/8" bit, drill or impact gun with 1/2" socket.

**WARNING:** Quick Mount PV products are NOT designed for and should NOT be used to anchor fall protection equipment.



1 Locate, choose, and mark centers of rafters to be mounted. Select the courses of shingles where mounts will be placed.



2 Carefully lift composition roof shingle with roofing bar, just above placement of mount. Remove nails as required and backfill holes with approved sealant. See "Proper Flashing Placement" on next page.



3 Insert flashing between 1st and 2nd course. Slide up so top edge of flashing is at least 3/4" higher than the butt-edge of the 3rd course and lower flashing edge is above the butt-edge of 1st course. Mark center for drilling.



4 If attaching with lag bolt use a 7/32" bit (Lag). Use a 1/8" bit (ST) for attaching with the structural screw. Drill pilot hole into roof and rafter, taking care to drill square to the roof. Do not use mount as a drill guide. Drill a 2" deep hole into rafter.



5 Clean off any sawdust, and fill hole with sealant compatible with roofing materials.



6 Place L-foot onto elevated flute and rotate L-foot to desired orientation.



7 Prepare lag bolt or structural screw with sealing washer. Using a 1/2-inch socket on an impact gun, drive prepared lag bolt through L-foot until L-foot can no longer easily rotate. **DO NOT over-torque.** NOTE: Structural screw can be driven with T-30 hex head bit.



8 You are now ready for the rack of your choice. Follow all the directions of the rack manufacturer as well as the module manufacturer. NOTE: Make sure top of L-Foot makes solid contact with racking.

All roofing manufacturers' written instructions must also be followed by anyone modifying a roof system. Consult the roof manufacturer's specs and instructions prior to working on the roof.

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**PHS**

SHEET NAME

**EQUIPMENT SPECIFICATION**

SHEET SIZE

**ANSI B 11" X 17"**

SHEET NUMBER

**PV-12**