

# PROJECT DESCRIPTION:

16 x SILFAB SLA-M 300 MODULES  
 ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES  
 SYSTEM SIZE: 4.80 kW DC STC  
 ARRAY AREA: ROOF #1 - 281.28 SQ FT.

## EQUIPMENT SUMMARY

16 SILFAB SLA-M 300 MODULES  
 16 SOLAREEDGE POWER OPTIMIZER P320  
 01 SOLAREEDGE SE5000H-US INVERTER

## APPLICABLE CODES & STANDARDS

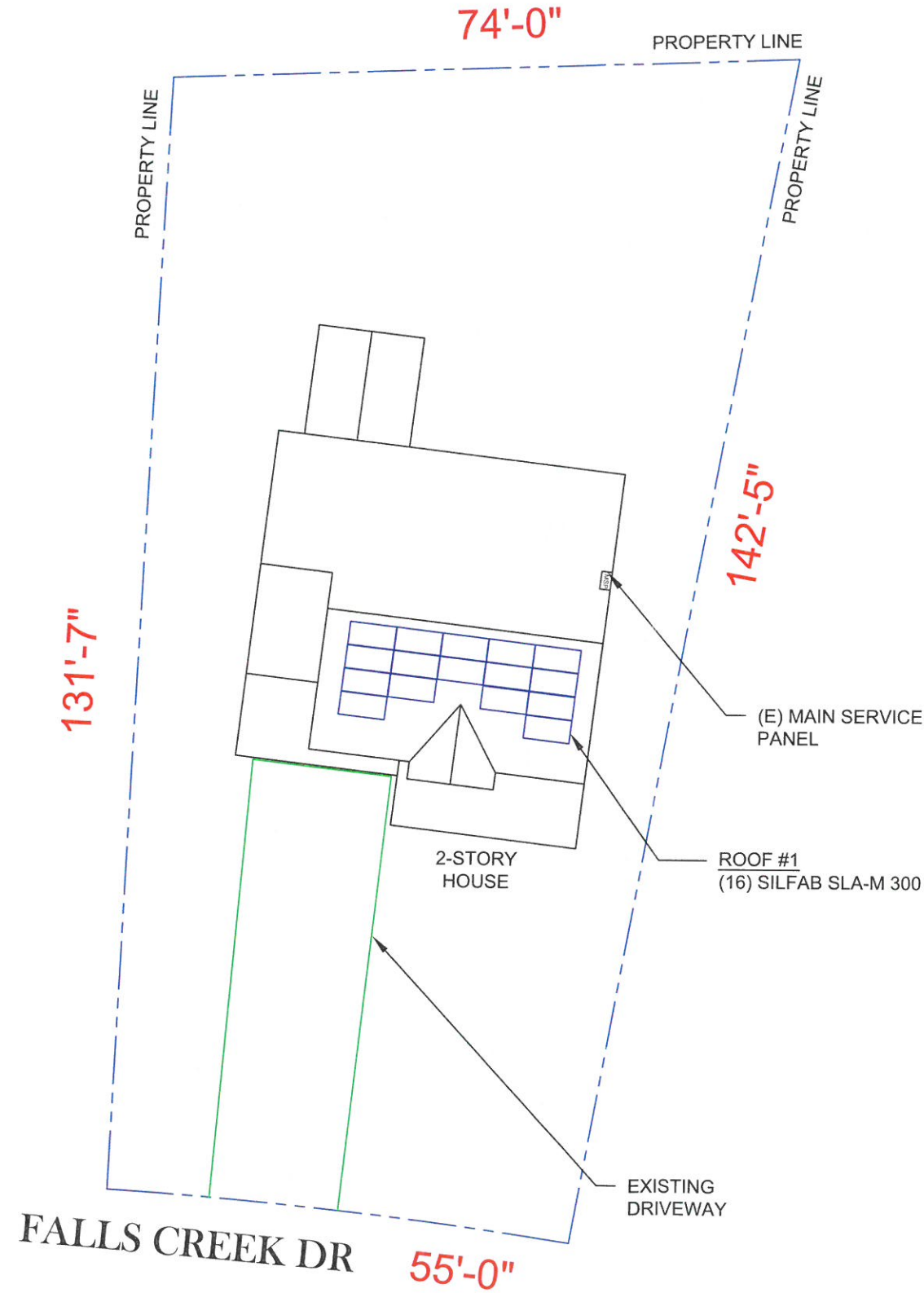
BUILDING: NCBC 2018  
 ELECTRICAL: NEC 2017

## DESIGN SPECIFICATION

OCCUPANCY: II  
 CONSTRUCTION: SINGLE-FAMILY  
 ZONING: RESIDENTIAL  
 GROUND SNOW LOAD: REFER STRUCTURAL LETTER  
 WIND EXPOSURE: B  
 WIND SPEED: REFER STRUCTURAL LETTER

## AUTHORITIES HAVING JURISDICTION

BUILDING: HARNETT COUNTY  
 ZONING: HARNETT COUNTY  
 UTILITY: SOUTH RIVER EMC.



**1** PLOT PLAN WITH ROOF PLAN

PV-1 SCALE: 1/32"=1'-0"



**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 11 EQUIPMENT SPECIFICATIONS

**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	1/29/2019	1

Signature with Seal

DATE: 1/29/2019

PROJECT NAME & ADDRESS

**GERARDO RODRIGUEZ**  
 RESIDENCE  
 271 FALLS CREEK DR  
 SPRING LAKE, NC 28390

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 = 16 MODULES  
 MODULE TYPE = SILFAB SLA-M 300 MODULES  
 MODULE WEIGHT = 41.89 LBS / 19 KG.  
 MODULE DIMENSIONS = 64.96"x 38.98" = 17.58 SF

ROOF DESCRIPTION				
ROOF TYPE		COMPOSITE SHINGLE		
ROOF LAYER		1 LAYER		
ROOF	ROOF TILT	AZIMUTH	TRUSS SIZE	TRUSS SPACING
#1	39.81°	186°	2X4	24"

ARRAY AREA & ROOF AREA CALC'S				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	16	281.28	511.48	55

**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	1/29/2019	1

Signature with Seal  
  
 DATE: 1/29/2019

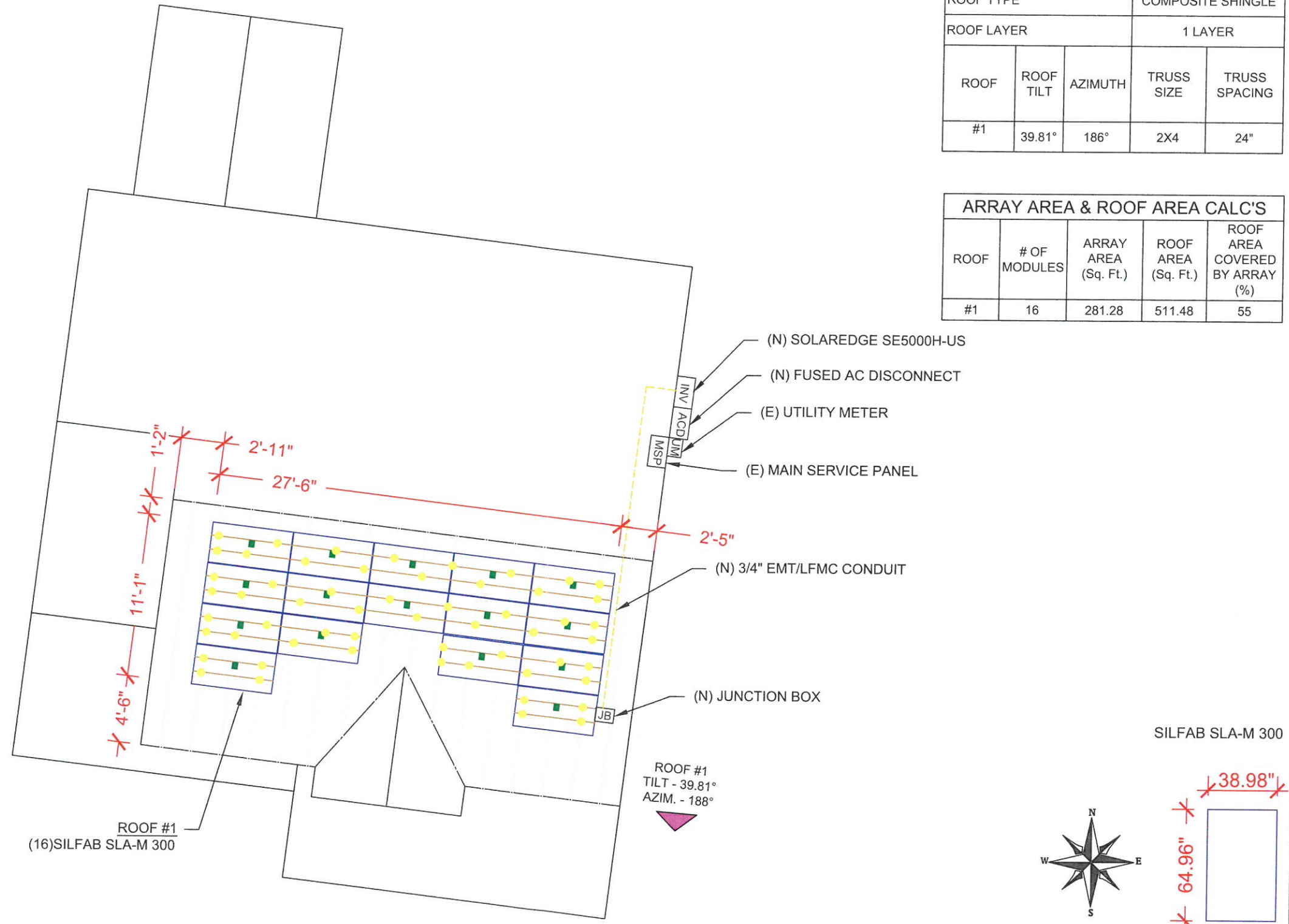
PROJECT NAME & ADDRESS  
**GERARDO RODRIGUEZ RESIDENCE**  
 271 FALLS CREEK DR  
 SPRING LAKE, NC 28390

DESIGNED BY  
**PHS**

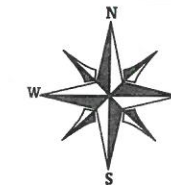
SHEET NAME  
**ROOF PLAN & MODULES**

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
[CB]	- COMBINER BOX
[Symbol]	- VENT, ATTIC FAN (ROOF OBSTRUCTION)
[Symbol]	- ROOF ATTACHMENT
[Symbol]	- RAFTERS
[Symbol]	- CONDUIT
[Symbol]	- COMBINER BOX



POWER HOME SOLAR, LLC  
 "POWER YOUR FUTURE"  
 919 N. MAIN ST.  
 MOORESVILLE, NC 28115  
 Phone: 704-800-6691 (OFFICE)  
 Email: info@powerhome.com  
 Web: www.powerhome.com

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL	1/29/2019	1

Signature with Seal

DATE: 1/29/2019

PROJECT NAME & ADDRESS

**GERARDO RODRIGUEZ  
 RESIDENCE**  
 271 FALLS CREEK DR  
 SPRING LAKE, NC 28390

DESIGNED BY  
**PHS**

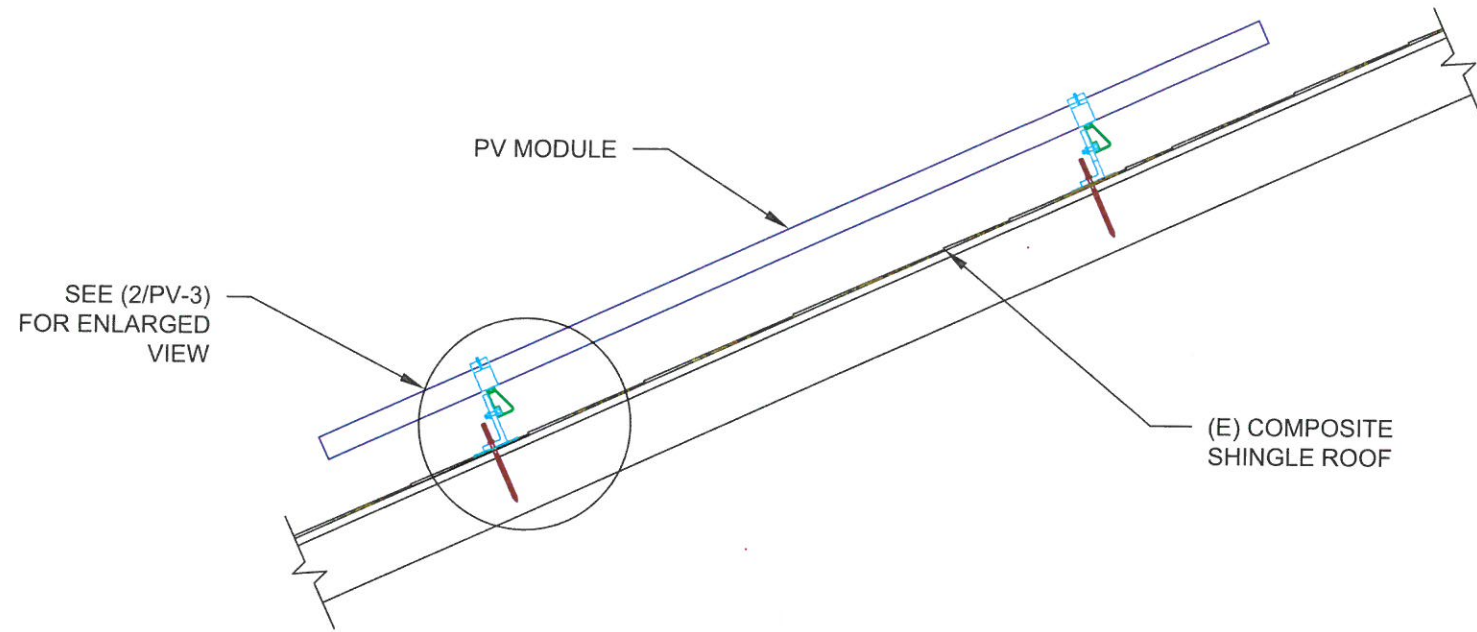
SHEET NAME  
**STRING LAYOUT**

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

SHEET NUMBER  
**PV-2A**

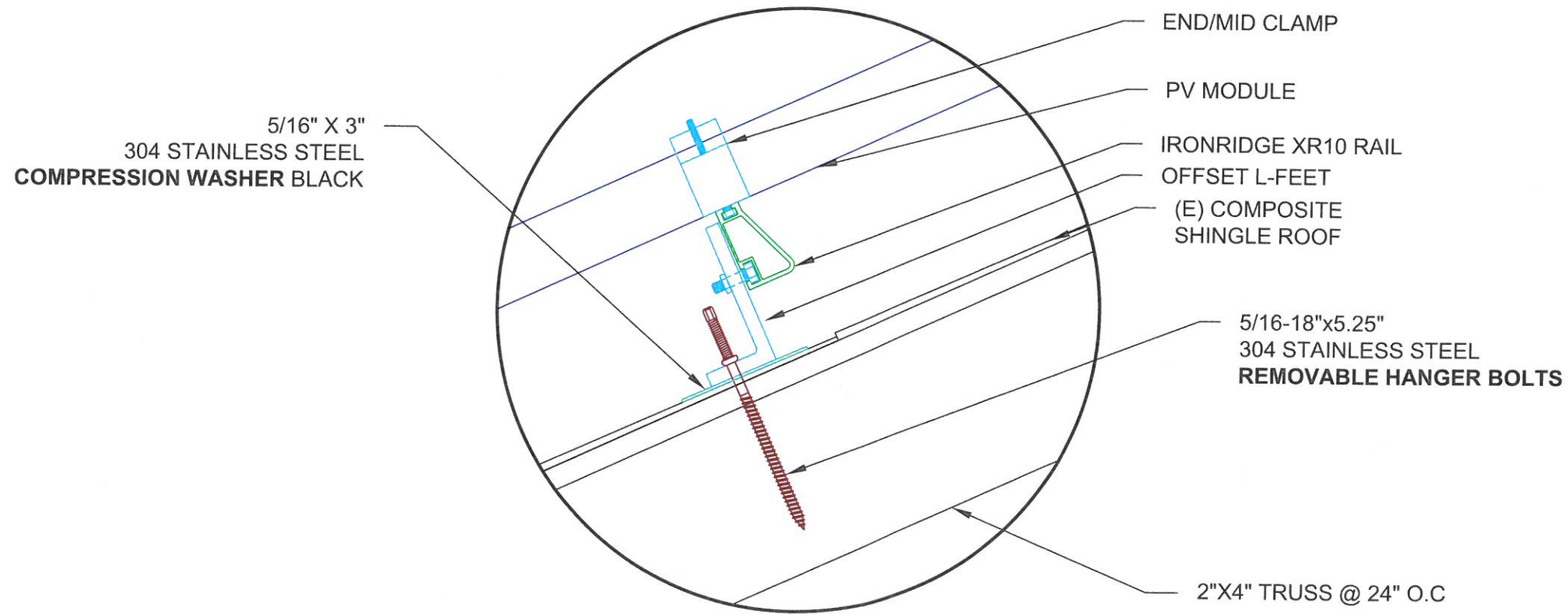


BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULE	16	SILFAB SLA-M 300
OPTIMIZER	16	SOLAREEDGE POWER OPTIMIZER P320
INVERTER	01	SOLAREEDGE SE5000H-US INVERTER
AC DISCONNECT	1	30A FUSED, (2) 30A FUSES, 240V, NEMA 3R, UL LISTED
SOLAR DECK	1	SOLAR DECKS
RAILS	16	IRONRIDGE XR10 RAIL 168" (14 FEET) BLACK
BONDED SPLICE	4	SPLICE KIT
MODULE CLAMPS	44	UNIVERSAL MODULE CLAMPS
GROUNDING LUG	6	IRONRIDGE GROUNDING LUG
END CLAMPS	24	END CLAMPS / STOPPER SLEEVE
ATTACHMENT	48	SRH LOW PROFILE QUICKBOLT
SQUARE-BOLT	48	SQUARE-BOLT BONDING ATTACHMENT HARDWARE



**1 ATTACHMENT DETAIL**

PV-3 SCALE: 1" = 1'-0"



**2 ATTACHMENT DETAIL (enlarged view)**

PV-3 SCALE: NTS

**POWERHOME SOLAR & ROOFING**  
 POWER HOME SOLAR, LLC  
 "POWER YOUR FUTURE"  
 919 N. MAIN ST.  
 MOORESVILLE, NC 28115  
 Phone: 704-800-6691 (OFFICE)  
 Email: info@powerhome.com  
 Web: www.powerhome.com

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL	1/29/2019	1

Signature with Seal  
  
  
  
DATE: 1/29/2019

PROJECT NAME & ADDRESS  
**GERARDO RODRIGUEZ RESIDENCE**  
 271 FALLS CREEK DR  
 SPRING LAKE, NC 28390

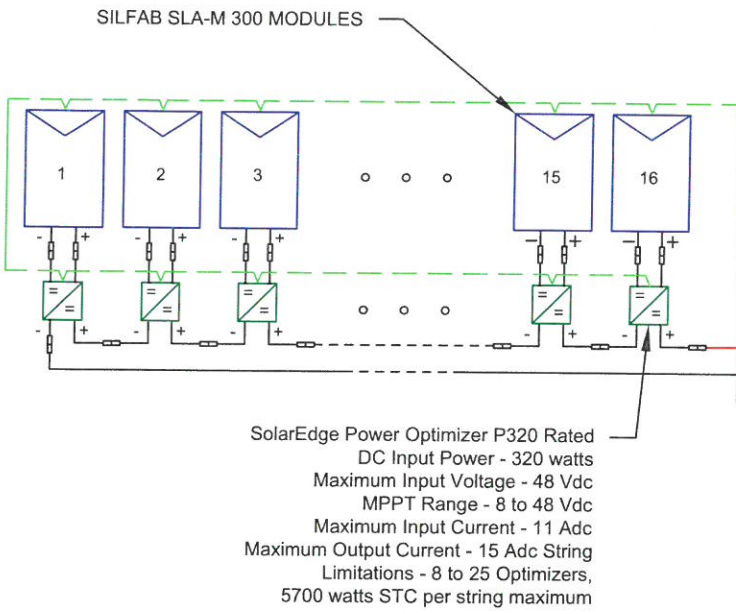
DESIGNED BY  
**PHS**

SHEET NAME  
**ATTACHMENT DETAIL**

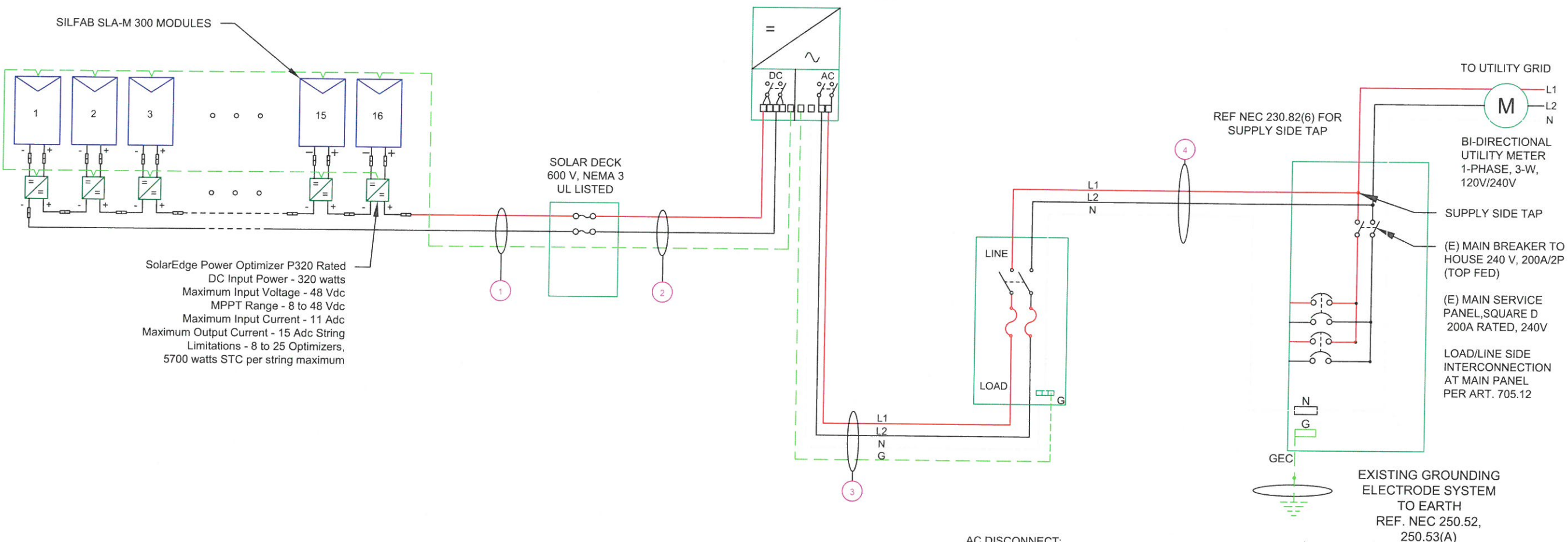
SHEET SIZE  
**ANSI B  
 11" X 17"**

SHEET NUMBER  
**PV-3**

(16) SILFAB SLA-M 300 MODULES  
(1) STRING OF 16 MODULES  
CONNECTED IN SERIES



SOLAREdge SE5000H-US (240V)  
OUTPUT: 240 VAC, 21A  
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 CONNECTED  
AND ENERGIZED

LABEL 2  
AT INVERTER

**SOLAR PV SYSTEM EQUIPPED  
WITH RAPID SHUTDOWN**

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

**! 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

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

LABEL 9  
AT MEP

**PHOTOVOLTAIC  
DC DISCONNECT**

LABEL 3  
AT INVERTER

**PHOTOVOLTAIC  
AC  
DISCONNECT**

LABEL 6  
AT EACH AC DISCONNECT

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

LABEL 8  
AT MEP

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

LABEL 9  
AT MEP

**! CAUTION !**  
SOLAR POINT OF  
INTERCONNECTION

LABEL 10  
AT UTILITY METER

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

LABEL 11  
AT UTILITY METER

1 | **ELECTRICAL LINE DIAGRAM**  
PV-4 | SCALE: NTS

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

**SERVICE INFO**

UTILITY PROVIDER: SOUTH RIVER EMC  
MAIN SERVICE VOLTAGE: 240V  
MAIN PANEL BRAND: SQUARE D  
MAIN SERVICE PANEL: 200A  
MAIN CIRCUIT BREAKER RATING: 200A  
MAIN SERVICE LOCATION: NORTH-EAST  
SERVICE FEED SOURCE: UNDERGROUND

**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	1/29/2019	1

Signature with Seal

DATE: 1/29/2019

**PROJECT NAME & ADDRESS**

**GERARDO RODRIGUEZ  
RESIDENCE**  
271 FALLS CREEK DR  
SPRING LAKE, NC 28390

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 SLA-M 300
VMP	32.8V
IMP	9.16A
VOC	39.85V
ISC	9.71A
TEMP. COEFF. VOC	-0.30%/°C
MODULE DIMENSION	64.96"L x 38.98"W x 1.49"D (In Inch)

INVERTER #1 SPECIFICATIONS	
MANUFACTURER / MODEL #	SOLAREEDGE SE5000H-US
NOMINAL AC POWER	5.0 KW
NOMINAL OUTPUT VOLTAGE	240 VAC
NOMINAL OUTPUT CURRENT	21A

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	2
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	2
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)	26.25 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 (26.25 A) otherwise less the entry for circuit conductor size and ampacity	



REVISIONS		
DESCRIPTION	DATE	REV
INITIAL	1/29/2019	1

Signature with Seal

DATE: 1/29/2019

PROJECT NAME & ADDRESS

**GERARDO RODRIGUEZ  
RESIDENCE**  
271 FALLS CREEK DR  
SPRING LAKE, NC 28390

DESIGNED BY  
**PHS**

SHEET NAME  
**WIRING  
CALCULATIONS**

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

SHEET NUMBER  
**PV-5**

### 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

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



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	1/29/2019	1

Signature with Seal

DATE: 1/29/2019

PROJECT NAME & ADDRESS

**GERARDO RODRIGUEZ  
RESIDENCE**  
271 FALLS CREEK DR  
SPRING LAKE, NC 28390

DESIGNED BY  
**PHS**

SHEET NAME  
**SOLAREEDGE  
OPTIMIZER CHART**

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

SHEET NUMBER  
**PV-6**



# SLA-M Monocrystalline



**300 Wp  
60 Cell  
Monocrystalline  
PV Module**

**100% MAXIMUM POWER DENSITY**  
Silfab's SLA-M 300 ultra-high-efficiency modules are optimized for both Residential and Commercial projects where maximum power density is preferred.

**100% NORTH AMERICAN QUALITY MATTERS**  
Silfab's fully-automated manufacturing facility ensures precision engineering is applied at every stage. Superior reliability and performance combine to produce one of the highest quality modules with the lowest defect rate in the industry.

**NORTH AMERICAN CUSTOMIZED SERVICE**  
Silfab's 100% North American based team leverages just-in-time manufacturing to deliver unparalleled service, on-time delivery and flexible project solutions.



- ENSURES MAXIMUM EFFICIENCY**  
60 of the highest efficiency, premium quality monocrystalline cells result in a maximum power rating of 300Wp.
- ADVANCED PERFORMANCE WARRANTY**  
25-year linear power performance guarantee to 82%
- ENHANCED PRODUCT WARRANTY**  
12-year product/workmanship warranty
- BUILT BY INDUSTRY EXPERTS**  
With over 35 years of industry experience, Silfab's technical team are pioneers in PV technology and are dedicated to an innovative approach that provides superior manufacturing processes including: infra-red cell sorting, glass washing, automated soldering and meticulous cell alignment.
- POSITIVE TOLERANCE**  
(-0/+5W) All positive module sorting ensures maximum performance

- 44 PPM DEFECT RATE\***  
Total automation ensures strict quality control during each step of the process at our certified ISO manufacturing facility. \*As of December 31, 2016
- LIGHT AND DURABLE**  
Over-engineered to weather low load bearing structures up to 5400 Pa. Light-weight frame exclusively designed with wide-ranging racking compatibility and durability.
- PID RESISTANT**  
Proven in accordance to IEC 62804-1
- AVAILABLE IN**  
All Black



Electrical Specifications		SILFAB SLA Monocrystalline	
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		15
Power Tolerance	Wp		+/- 1

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 +/- 1.

Temperature Ratings		SILFAB SLA Monocrystalline	
Temperature Coefficient Isc	%/K		0.03
Temperature Coefficient Voc	%/K		-0.30
Temperature Coefficient Pmax	%/K		-0.38
NOCT (± 2°C)	°C		45
Operating temperature	°C		-40/+85

Mechanical Properties and Components		SILFAB SLA Monocrystalline	
Module weight (± 1 kg)	kg		19
Dimensions (H x L x D; ± 1mm)	mm		1650 x 990 x 38
Maximum surface load (wind/snow)*	N/m <sup>2</sup>		5400
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
Bypass diodes			3 diodes-45V/12A, IP67/IP68
Cables and connectors (See installation manual)			1200 mm Ø 5.7 mm (4 mm <sup>2</sup> ), MC4 compatible

Warranties		SILFAB SLA Monocrystalline	
Module product warranty			12 years
			25 years
Linear power performance guarantee			≥ 97% end of 1 <sup>st</sup> year ≥ 90% end of 12 <sup>th</sup> year ≥ 82% end of 25 <sup>th</sup> year

Certifications		SILFAB SLA Monocrystalline	
Product			ULC ORD C1703, UL 1703, IEC 61215, IEC 61730, IEC 61701, CEC listed
Factory			UL Fire Rating: Type 2 (Type 1 on request) ISO 9001:2008

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

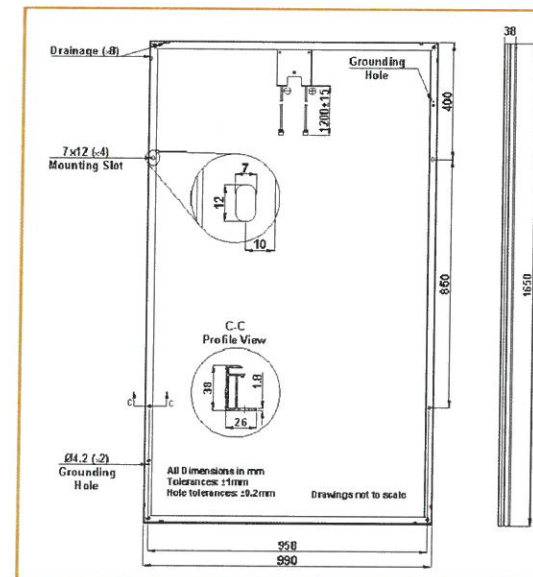
Third-party generated pan files from PV Evolution Labs available for download at:  
[www.silfab.ca/downloads](http://www.silfab.ca/downloads)



- Pallet Count: 26
- Container Count: 936



Silfab Solar Inc.  
240 Courtneypark Drive East • Mississauga,  
Ontario Canada L5T 2S5  
Tel +1 905-255-2501 • Fax +1 905-696-0267  
info@silfab.ca • www.silfab.ca



**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	1/29/2019	1

Signature with Seal  
  
DATE: 1/29/2019

PROJECT NAME & ADDRESS  
**GERARDO RODRIGUEZ RESIDENCE**  
271 FALLS CREEK DR  
SPRING LAKE, NC 28390

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

INVERTERS



### Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking efficiency
- 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
- High reliability without any electrolytic capacitors
- Built-in module-level monitoring
- Outdoor and indoor installation
- Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)



www.solaredge.us



## 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	
<b>OUTPUT</b>								
Rated AC Power Output	3000	3800 @ 240V	5000	6000 @ 240V	7600	10000	11400	VA
Max. AC Power Output	3000	3800 @ 240V	5000	6000 @ 240V	7600	10000	11400	VA
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	✓	-	✓	-	-	-	Vac
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓	Vac
AC Frequency (Nominal)	59.3 - 60 - 60.5 <sup>1)</sup>							Hz
Maximum Continuous Output Current @ 208V	-	16	-	24	-	-	-	A
Maximum Continuous Output Current @ 240V	12.5	16	21	25	32	42	47.5	A
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	-	-	-	W
Transformer-less, Ungrounded	Yes							
Maximum Input Voltage	480							Vdc
Nominal DC Input Voltage	380							Vdc
Maximum Input Current @ 208V	-	9	-	13.5	-	-	-	A
Maximum Input Current @ 240V	8.5	10.5	13.5	16.5	20	27	30.5	A
Max. Input Short Circuit Current	45							A
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600µs Sensitivity							
Maximum Inverter Efficiency	99.2							%
CEC Weighted Efficiency	99							%
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>2)</sup>							
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 AFCEI according to T.L.L. M-07							
Grid Connection Standards	IEEE 1547, Rule 21, Rule 14 (H)							
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			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			dBA
Cooling	Natural Convection				Natural convection			
Operating Temperature Range	-13 to +140 / -25 to +60 <sup>3)</sup> (-40°F / -40°C option) <sup>4)</sup>							°F / °C
Protection Rating	NEMA 3R (Inverter with Safety Switch)							

<sup>1)</sup> For other regional settings, please contact SolarEdge support  
<sup>2)</sup> Revenue grade inverter P/N: SExxxxH-US000NVC2  
<sup>3)</sup> For power derating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf>  
<sup>4)</sup> -40 version P/N: SExxxxH-US000NNU4



© SolarEdge Technologies, Inc. All rights reserved. SOLAREEDGE, the SolarEdge logo, OPTIMIZED BY SOLAREEDGE are trademarks or registered trademarks of SolarEdge Technologies, Inc. All other trademarks mentioned herein are trademarks of their respective owners. Date: 07/2018/ V01/ENG NAM. Subject to change without notice.



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	1/29/2019	1

Signature with Seal

DATE: 1/29/2019

PROJECT NAME & ADDRESS

**GERARDO RODRIGUEZ  
 RESIDENCE**  
 271 FALLS CREEK DR  
 SPRING LAKE, NC 28390

DESIGNED BY  
**PHS**

SHEET NAME  
**EQUIPMENT SPECIFICATION**

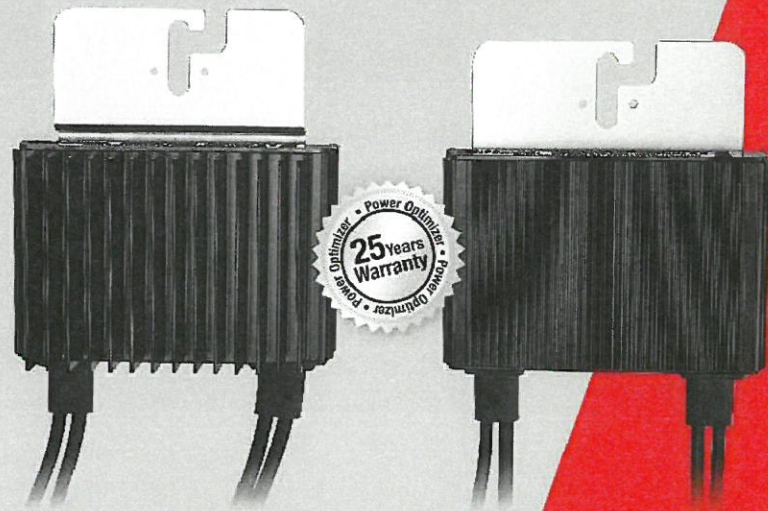
SHEET SIZE  
**ANSI B  
 11" X 17"**

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					
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	
	P320, P370, P400	P405 / P505				
Minimum String Length (Power Optimizers)	8	6		10	18	
Maximum String Length (Power Optimizers)	25			25	50 <sup>(5)</sup>	
Maximum Power per String	5700 (6000 with SE7600-US - SE11400- US)	5250		6000	12750	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.



© SolarEdge Technologies, Inc. All rights reserved. SOLAREEDGE, the SolarEdge logo, OPTIMIZED BY SOLAREEDGE are trademarks or registered trademarks of SolarEdge Technologies, Inc. All other trademarks mentioned herein are trademarks of their respective owners. Date: 07/2018; V01/ENG NAM. Subject to change without notice.



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	1/29/2019	1

Signature with Seal

DATE: 1/29/2019

PROJECT NAME & ADDRESS

**GERARDO RODRIGUEZ  
RESIDENCE**  
271 FALLS CREEK DR  
SPRING LAKE, NC 28390

DESIGNED BY  
**PHS**

SHEET NAME  
**EQUIPMENT  
SPECIFICATION**

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

SHEET NUMBER  
**PV-9**



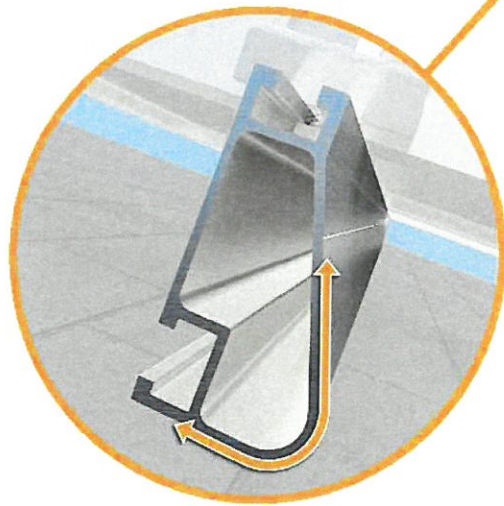
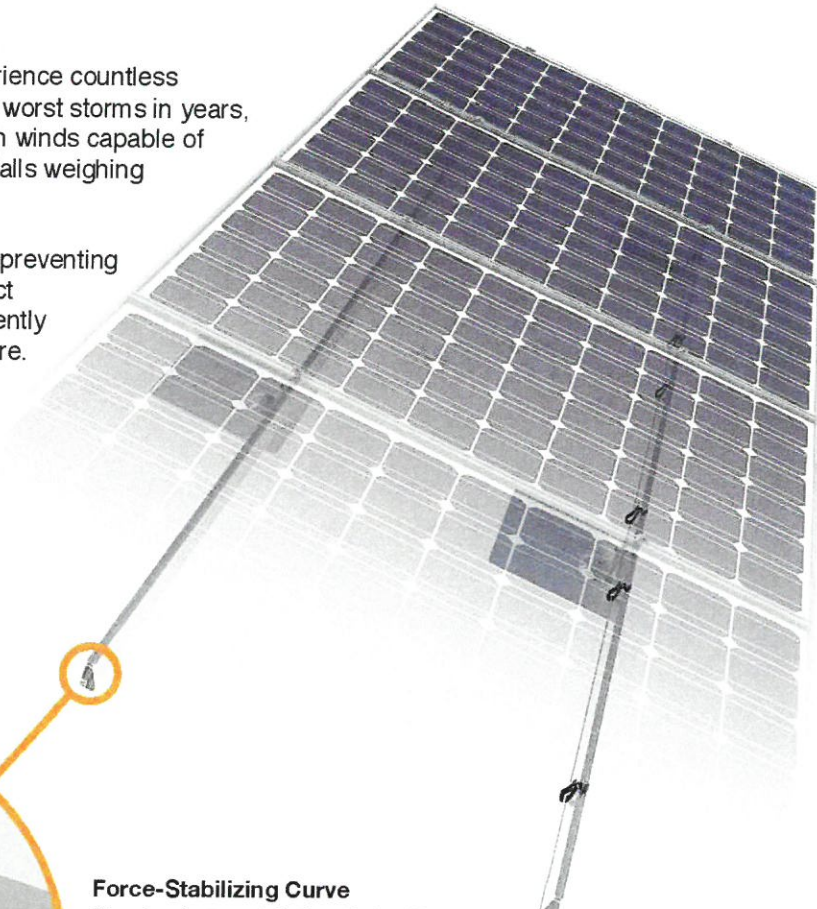
Tech Brief

## XR Rail Family

### 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 unique 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 leg options for flat 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

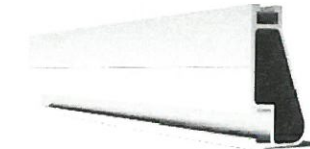
The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.



#### XR10

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves 6 foot spans, while remaining light and economical.

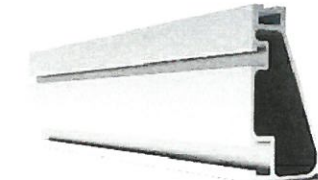
- 6' spanning capability
- Moderate load capability
- Clear anodized finish
- Internal splices available



#### XR100

XR100 is the ultimate residential mounting rail. It 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	XR10		XR100		XR1000	
	120						
	140						
	160						
10-20	100			XR100		XR1000	
	120						
	140						
	160						
30	100			XR100		XR1000	
	160						
40	100			XR100		XR1000	
	160						
50-70	160						
80-90	160						

Tech Brief



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	1/29/2019	1

Signature with Seal

DATE: 1/29/2019

PROJECT NAME & ADDRESS

GERARDO RODRIGUEZ  
RESIDENCE  
271 FALLS CREEK DR  
SPRING LAKE, NC 28390

DESIGNED BY

PHS

SHEET NAME

EQUIPMENT SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-10



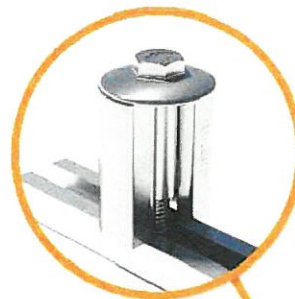
## UFO Family of Components

Tech Brief

### Simplified Grounding for Every Application

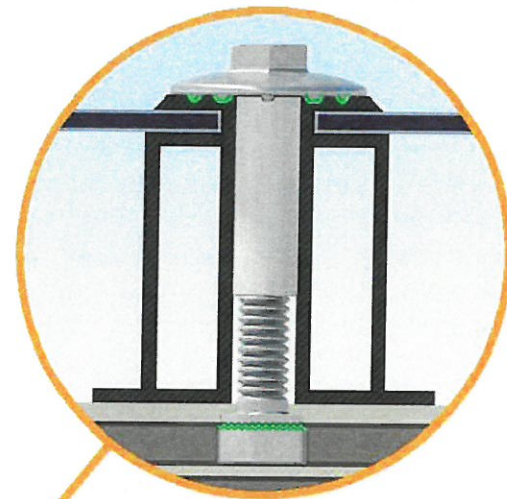
The UFO family of components eliminates the need for separate grounding hardware by bonding solar modules directly to IronRidge XR Rails. All system types that feature the UFO family—Flush Mount, Tilt Mount and Ground Mount—are fully listed to the UL 2703 standard.

UFO hardware forms secure electrical bonds with both the module and the rail, resulting in many parallel grounding paths throughout the system. This leads to safer and more reliable installations.



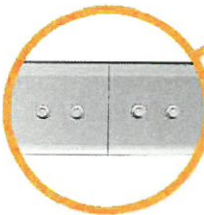
#### Stopper Sleeve

The Stopper Sleeve snaps onto the UFO, converting it into a bonded end clamp.



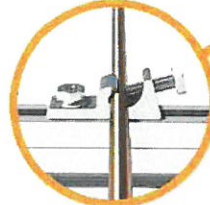
#### Universal Fastening Object (UFO)

The UFO securely bonds solar modules to XR Rails. It comes assembled and lubricated, and can fit a wide range of module heights.



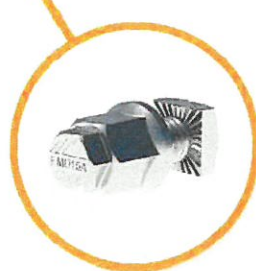
#### Bonded Splice

Each Bonded Splice uses self-drilling screws to form a secure connection. No bonding strap needed.



#### Grounding Lug

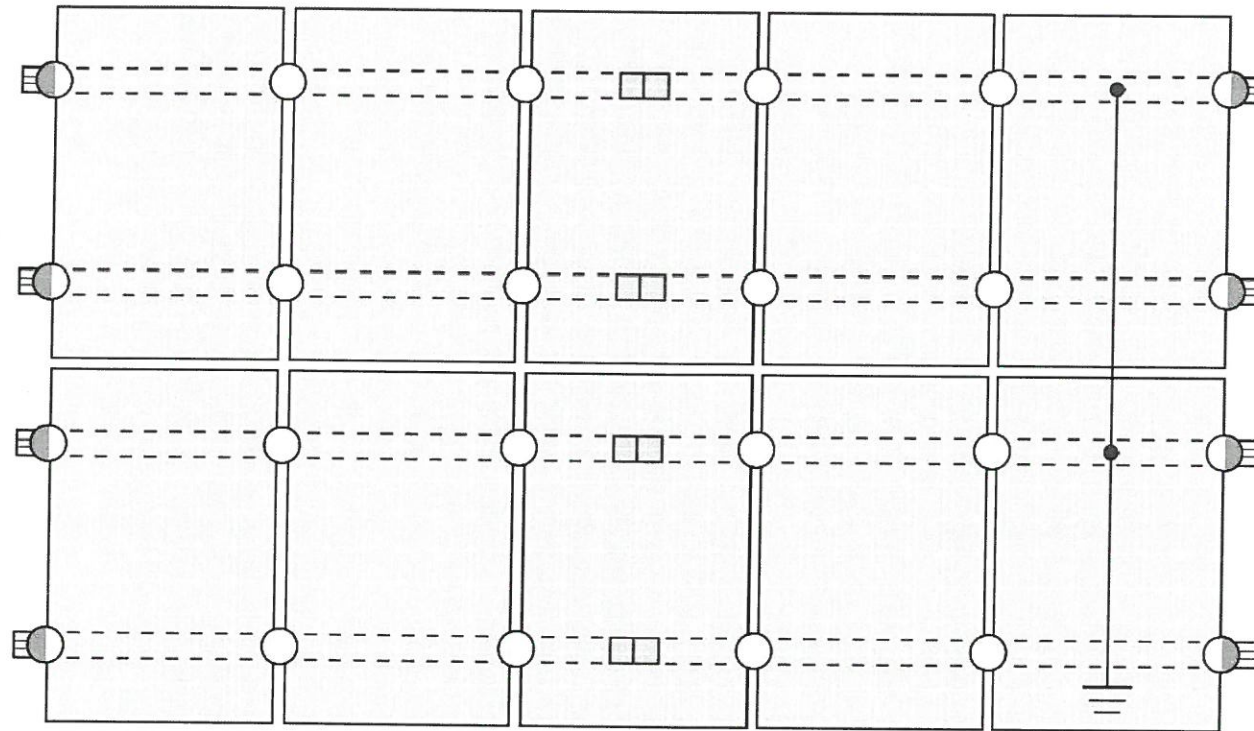
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.



#### Bonded Attachments

The bonding bolt attaches and bonds the L-foot to the rail. It is installed with the same socket as the rest of the system.

### System Diagram



○ UFO    ◐ Stopper Sleeve    ● Grounding Lug    ◻ Bonded Splice    ⊥ Ground Wire

⚠ Approved Enphase microinverters can provide equipment grounding of IronRidge systems, eliminating the need for grounding lugs and field installed equipment ground conductors (EGC). A minimum of two microinverters mounted to the same rail and connected to the same Engage cable is required. Refer to installation manuals for additional details.

### UL Certification

The IronRidge Flush Mount, Tilt Mount, and Ground Mount Systems have been listed to UL 2703 by Intertek Group plc.

UL 2703 is the standard for evaluating solar mounting systems. It ensures these devices will maintain strong electrical and mechanical connections over an extended period of time in extreme outdoor environments.

Go to [IronRidge.com/UFO](http://IronRidge.com/UFO)

### Cross-System Compatibility

Feature	Flush Mount	Tilt Mount	Ground Mount
XR Rails	✓	✓	XR1000 Only
UFO/Stopper	✓	✓	✓
Bonded Splice	✓	✓	N/A
Grounding Lugs	1 per Row	1 per Row	1 per Array
Microinverters & Power Optimizers	Enphase - M250-72, M250-60, M215-60, C250-72 Darfon - MIG240, MIG300, G320, G640 SolarEdge - P300, P320, P400, P405, P600, P700, P730		
Fire Rating	Class A	Class A	N/A
Modules	Tested or Evaluated with over 400 Framed Modules Refer to installation manuals for a detailed list.		

Tech Brief



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

#### REVISIONS

DESCRIPTION	DATE	REV
INITIAL	1/29/2019	1

Signature with Seal

DATE: 1/29/2019

PROJECT NAME & ADDRESS

GERARDO RODRIGUEZ  
RESIDENCE  
271 FALLS CREEK DR  
SPRING LAKE, NC 28390

DESIGNED BY

PHS

SHEET NAME

EQUIPMENT  
SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

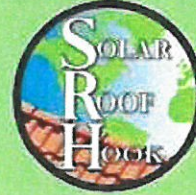
SHEET NUMBER

PV-11

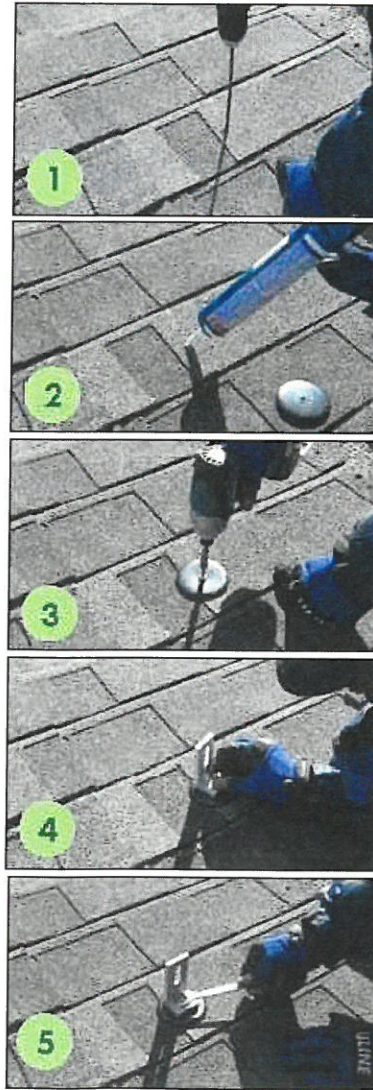
# Low Profile QuickBOLT™



Part #	Box Quantity	Size
17667	10 Washers; 10 Bolts; 10 Offset L-Feet; 10 Serrated Hex Flange Nuts	5/16" x 3"; 5/16" x 5.25"; NA; 5/16"



## LOW PROFILE QUICKBOLT™ INSTALLATION INSTRUCTIONS



### RECOMMENDED MATERIALS

- Rafter locator
- Chalk or crayon
- 3/16" Drill Bit
- Roofing Manufacturer's approved sealant

### INSTALLATION INSTRUCTIONS

1. Locate and mark the rafters.
2. Predrill the hole with the 3/16" Drill Bit.
3. Fill the predrilled hole with sealant.  
\*We also recommend creating a circle of sealant on the back of the washer.
4. Place the EPDM Washer & drive the Bolt until the Washer compresses to the roof.
5. Place the L-Foot & Nut.
6. Tighten the Nut until the L-Foot is secure.

### WHERE IS MY FLASHING?

The Stainless Steel backed EPDM Washer is fully Code-Compliant and does not require additional Sheet Metal Flashing. The collar on the QuickBOLT™ compresses the washer down onto the roof, forming a 100% leak-proof seal.

INSTALLATION VIDEOS, SPEC SHEETS, & TEST RESULTS AVAILABLE ON  
[WWW.SOLARROOFHOOK.COM](http://WWW.SOLARROOFHOOK.COM)

5830 Las Positas Road, Livermore, California 94551 | 3948 Airway Drive, Rock Hill, South Carolina 29732  
Phone: (844)-671-6045 | Fax: (800)-689-7975 | [www.solarroofhook.com](http://www.solarroofhook.com)  
SolarRoofHook is a division of Quickscrews International Corp.

**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](mailto:info@powerhome.com)  
Web: [www.powerhome.com](http://www.powerhome.com)

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL	1/29/2019	1

Signature with Seal

DATE: 1/29/2019

PROJECT NAME & ADDRESS

GERARDO RODRIGUEZ  
RESIDENCE  
271 FALLS CREEK DR  
SPRING LAKE, NC 28390

DESIGNED BY

PHS

SHEET NAME

EQUIPMENT  
SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-11