

# PROJECT DESCRIPTION:

16 X 300 SILFAB SOLAR SIL-300 ML (300WATT) MODULES  
 ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES  
 SYSTEM SIZE: 4.80 kW DC STC  
 ARRAY AREA: ROOF#1 - 292.80 SQ FT.

## APPLICABLE CODES & STANDARDS

NCBC 2018  
 NEC 2017  
 AUTHORITIES HAVING JURISDICTION  
 BUILDING : HARNETT COUNTY  
 ZONING : HARNETT COUNTY  
 UTILITY : DUKE ENERGY PROGRESS

## EQUIPMENT SUMMARY

16 SILFAB SOLAR SIL-300 ML (300WATT) MODULES  
 16 SOLAREEDGE POWER OPTIMIZERS P320  
 01 SOLAREEDGE SE5000H-US (5kW) INVERTER

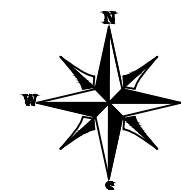
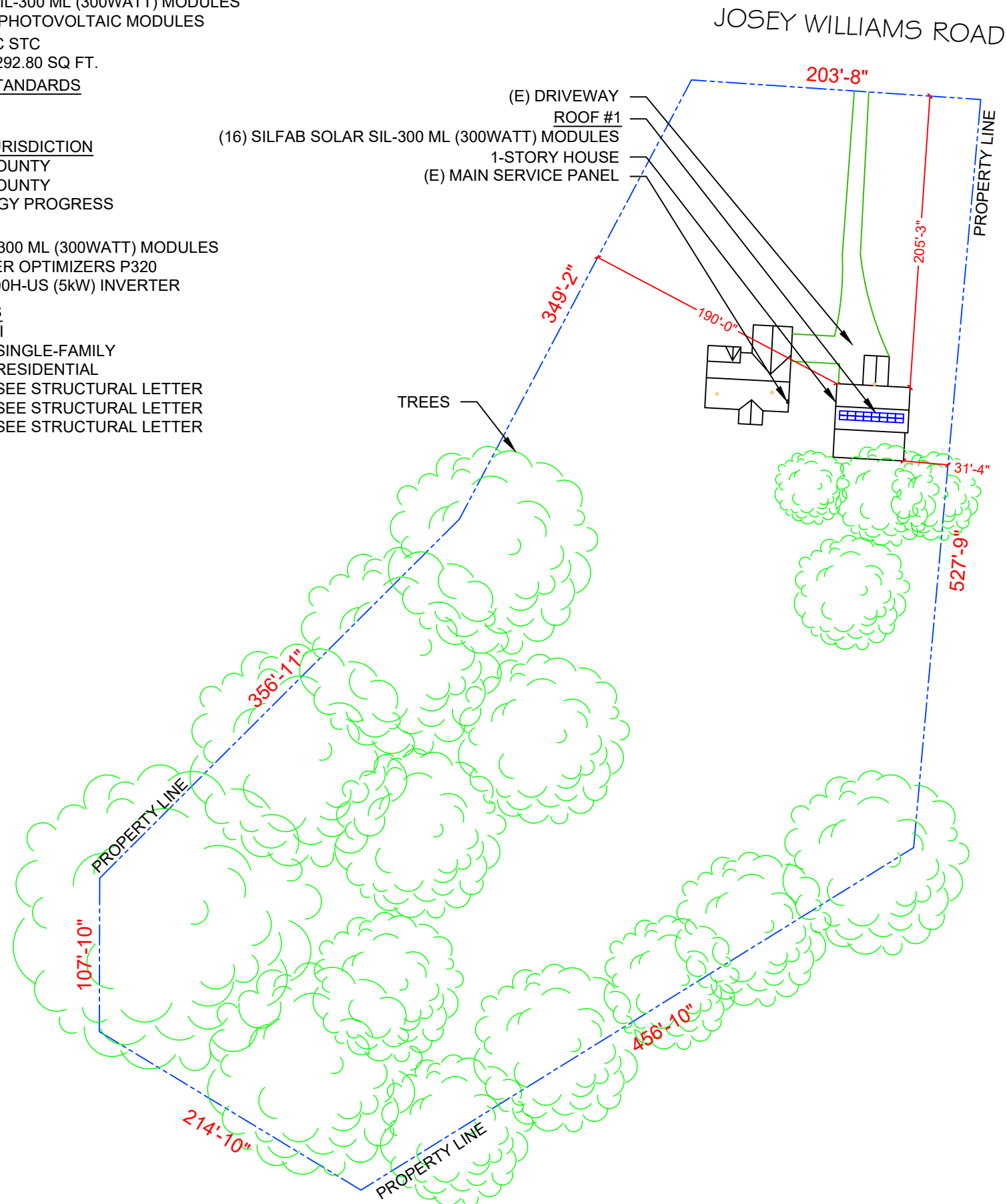
## DESIGN SPECIFICATIONS

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

# 1 PLOT PLAN & VICINITY MAP

PV-1

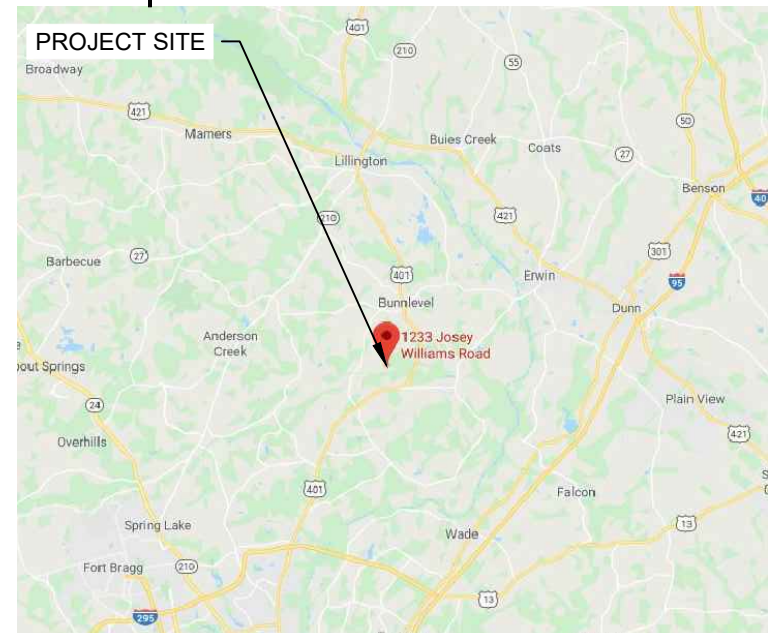
SCALE: 1"=90'-0"



# 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 12 EQUIPMENT SPECIFICATIONS



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 Email: info@powerhome.com  
 Web: www.powerhome.com

## REVISIONS

DESCRIPTION	DATE	REV

Signature with Seal

DATE: 01/08/2020

PROJECT NAME & ADDRESS

GAIL DAVISON  
 RESIDENCE  
 1233 JOSEY WILLIAMS ROAD,  
 ERWIN, NC 28339

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 SOLAR SIL-300 ML (300WATT) MODULES  
 MODULE WEIGHT = 41.89 LBS / 19 KG.  
 MODULE DIMENSIONS = 66.92"x 39.37" = 18.30 SF  
 UNIT WEIGHT OF ARRAY = 2.30 PSF

(E) FRONT OF RESIDENCE

ROOF DESCRIPTION				
ROOF TYPE			CORRUGATED METAL	
ROOF	ROOF TILT	AZIMUTH	FRAMING SIZE	FRAMING SPACING
#1	22.62°	183°	SEE 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	16	292.80	658.66	44

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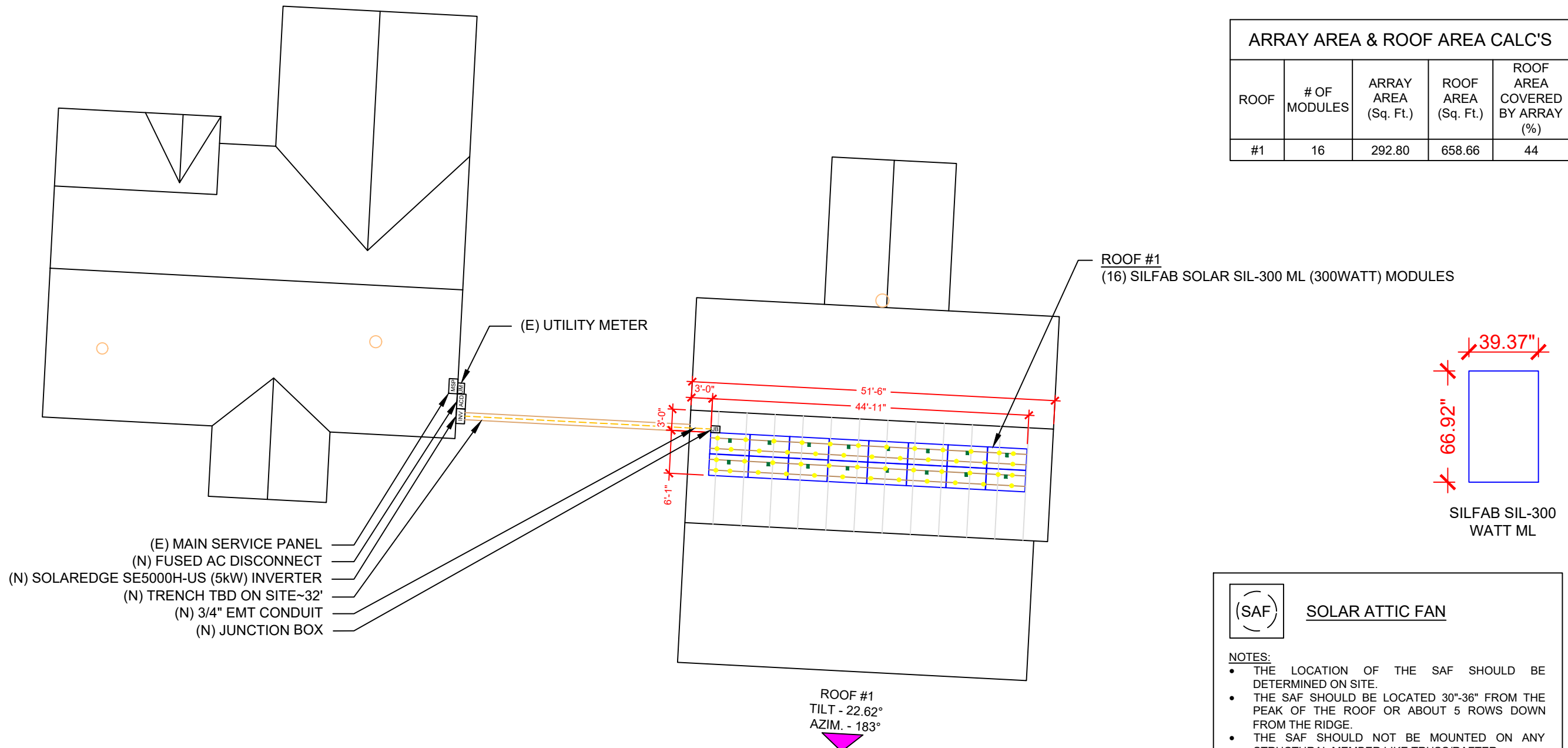
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SHEET NAME  
**ROOF PLAN & MODULES**

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

SHEET NUMBER  
**PV-2**



(E) BACK OF RESIDENCE

ROOF #1  
 (16) SILFAB SOLAR SIL-300 ML (300WATT) MODULES

- (E) MAIN SERVICE PANEL
- (N) FUSED AC DISCONNECT
- (N) SOLAREEDGE SE5000H-US (5kW) INVERTER
- (N) TRENCH TBD ON SITE~32'
- (N) 3/4" EMT CONDUIT
- (N) JUNCTION BOX

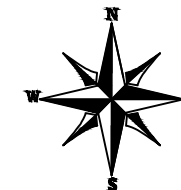
**(SAF) SOLAR ATTIC FAN**

**NOTES:**

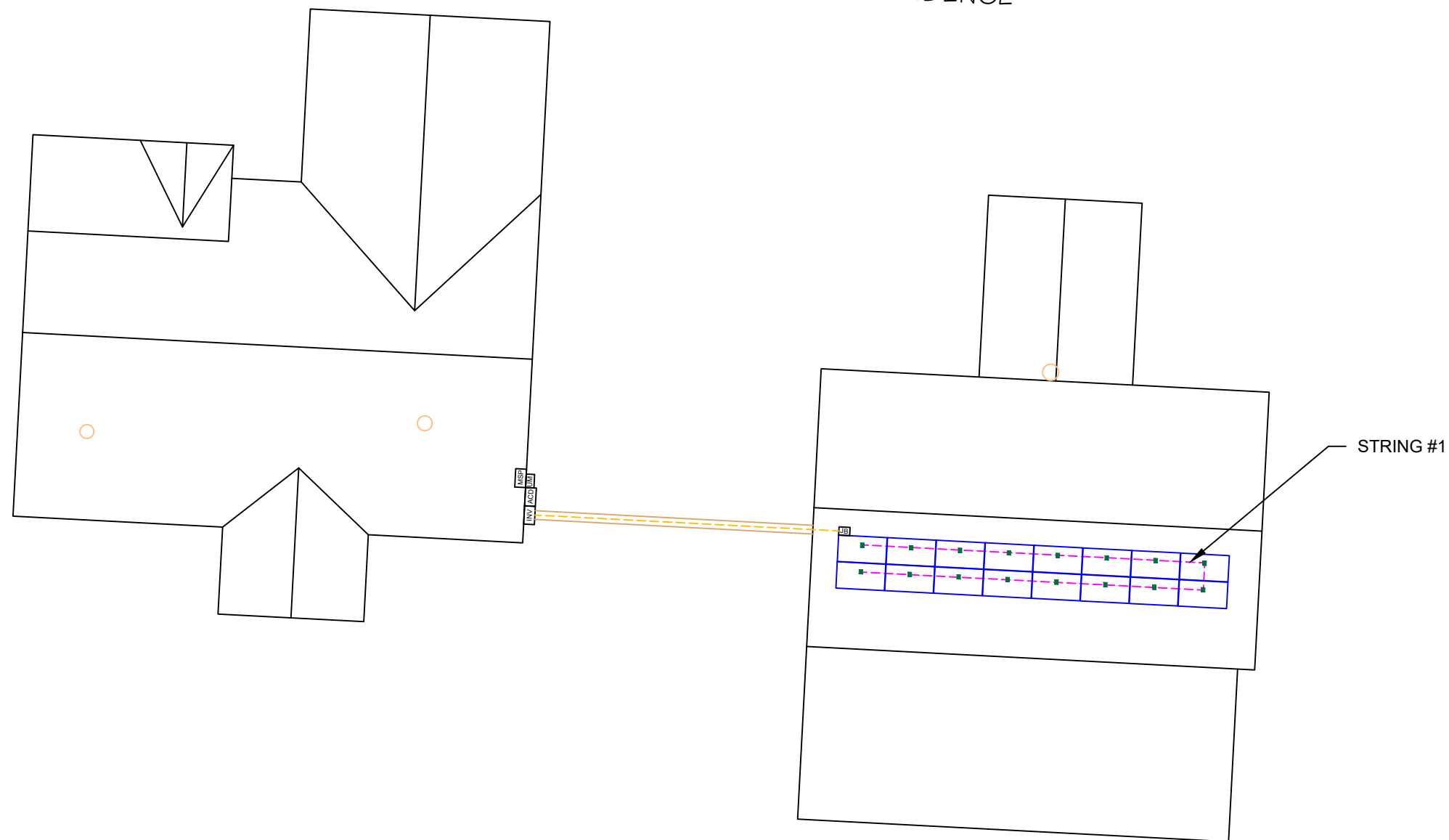
- THE LOCATION OF THE SAF SHOULD BE DETERMINED ON SITE.
- THE SAF SHOULD BE LOCATED 30"-36" FROM THE PEAK OF THE ROOF OR ABOUT 5 ROWS DOWN FROM THE RIDGE.
- THE SAF SHOULD NOT BE MOUNTED ON ANY STRUCTURAL MEMBER LIKE TRUSS/RAFTER.
- "CAN VENTS" CAN BE REPLACED BY SAF.
- SAF CANNOT BE MOUNTED ON A METAL ROOF. PLEASE CARRY GABLE VENT FANS FOR METAL ROOF INSTALLATION (IF APPLICABLE).

**LEGEND**

<b>[JB]</b> - JUNCTION BOX	<b>○</b> - VENT, ATTIC FAN (ROOF OBSTRUCTION)
<b>[INV]</b> - INVERTER	<b>●</b> - ROOF ATTACHMENT
<b>[ACD]</b> - AC DISCONNECT	<b>---</b> - RAFTERS
<b>[MSP]</b> - MAIN SERVICE PANEL	<b>---</b> - CONDUIT



(E) FRONT OF RESIDENCE



(E) BACK OF RESIDENCE

BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULE	16	SILFAB SOLAR SIL-300 ML (300WATT) MODULES
OPTIMIZER	16	SOLAREEDGE POWER OPTIMIZERS P320
INVERTER	1	SOLAREEDGE SE5000H-US (5kW) INVERTER
AC DISCONNECT	1	60A FUSED, (2) 30A FUSES, 240V, NEMA 3R, UL LISTED
JUNCTION BOX	1	JUNCTION BOX 600 V, NEMA 3 UL LISTED
RAILS	13	QRAIL LIGHT 14 FT. BLACK
SPLICE KIT	12	QSPLICE INTERNAL LIGHT
TRUNK CABLE	32	TRUNK/PV CABLE CLIP
MODULE CLAMPS	28	UNIVERSAL MID CLAMP
GROUNDING LUG	2	WEEB LUG W/ T-BOLT
END CLAMPS	8	UNIVERSAL END CLAMPS
ATTACHMENT	46	S-5! PROTEA BRACKET
T-BOLT	62	T-BOLT W/ NUT M8 X 20MM
L-FOOT	46	SINGLE - SLOT L-FOOT (QMC-LF A12)



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SHEET NAME

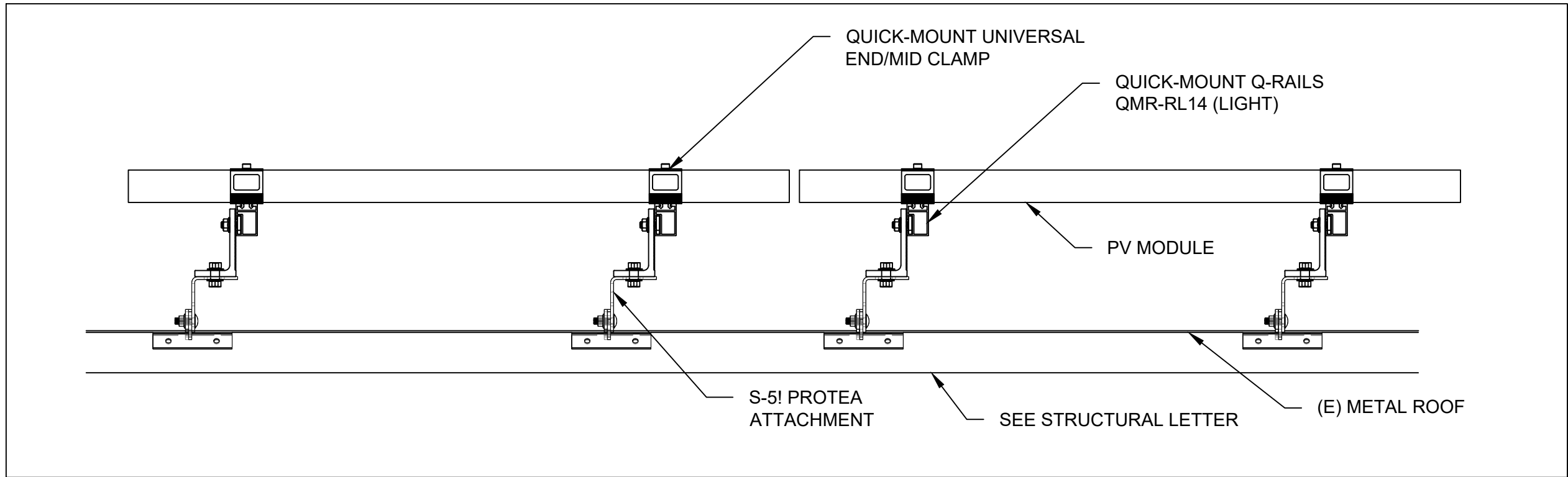
STRING  
 LAYOUT

SHEET SIZE

ANSI B  
 11" X 17"

SHEET NUMBER

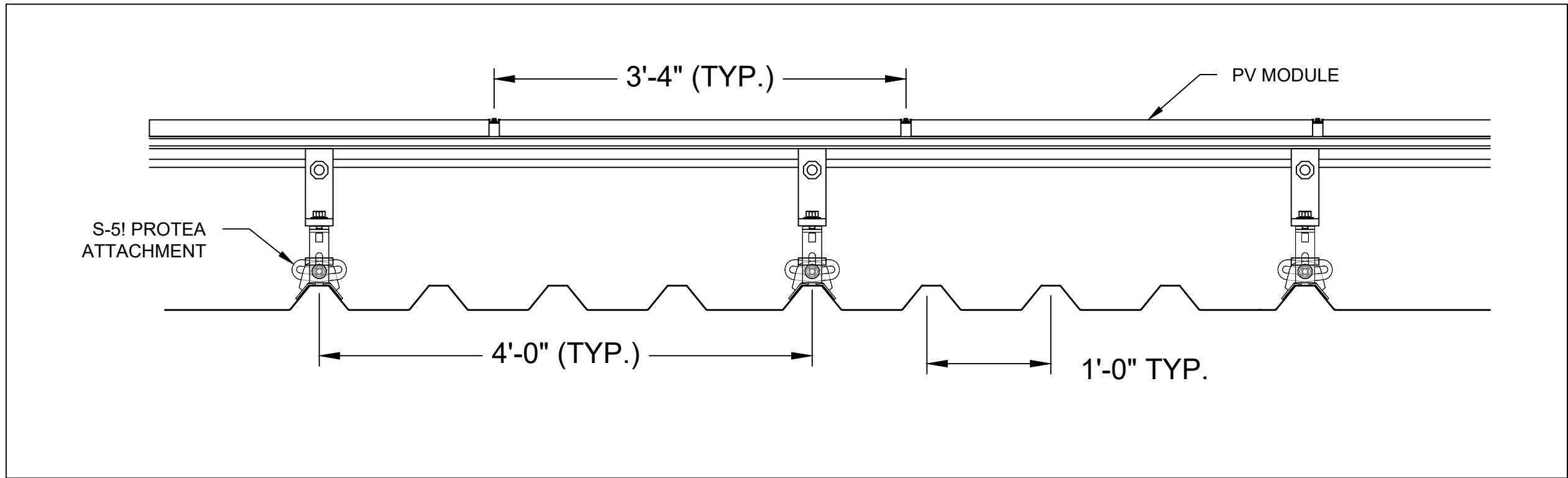
PV-2A



**1** STRUCTURAL ATTACMENT (SIDE VIEW)

PV-3

SCALE: NTS



**2** ATTACHMENT DETAIL (enlarged view)

PV-3

SCALE: NTS

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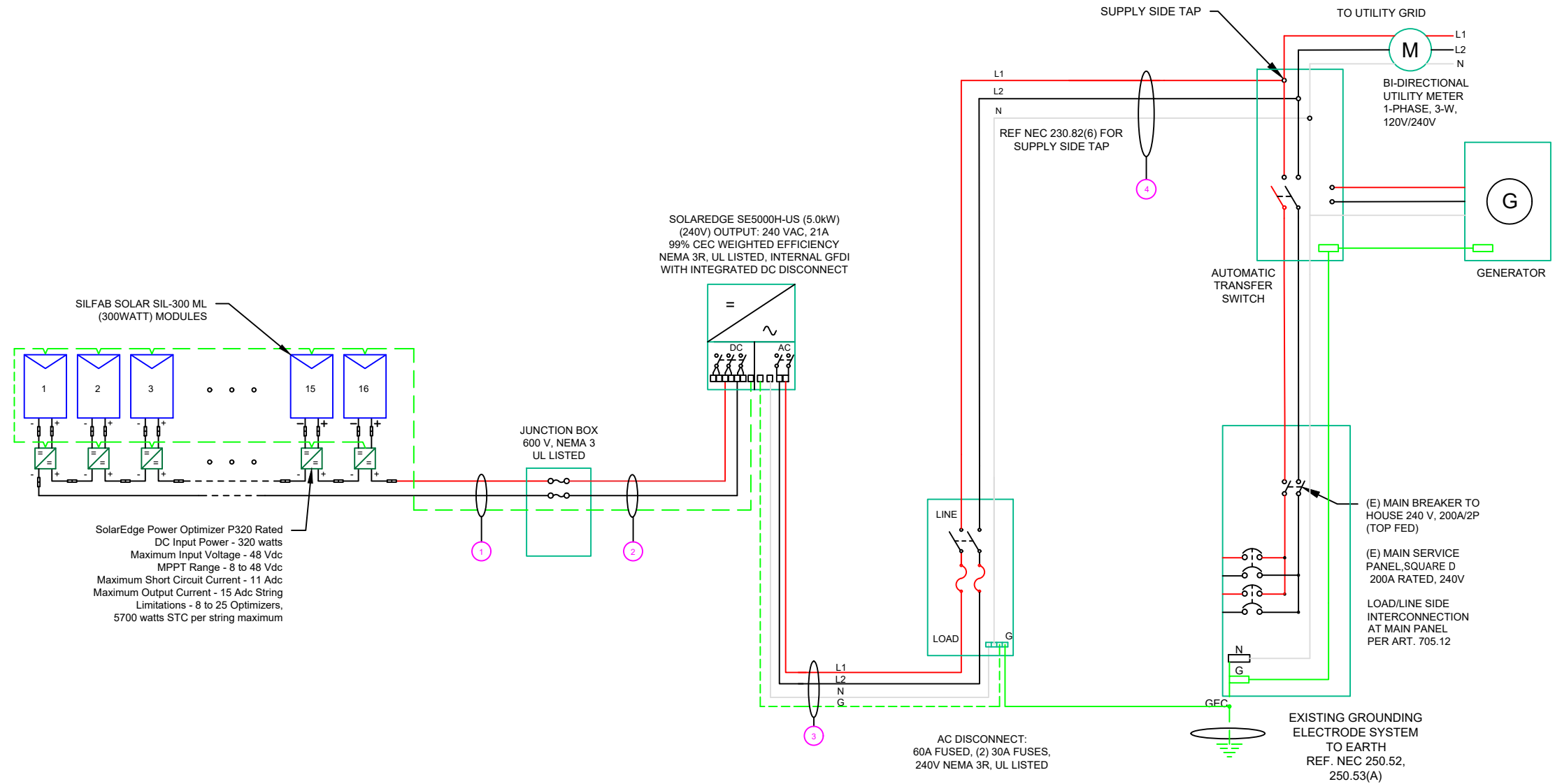
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SHEET NAME  
 ATTACHMENT  
 DETAIL

SHEET SIZE  
 ANSI B  
 11" X 17"

SHEET NUMBER  
 PV-3

(16) SILFAB SOLAR SIL-300 ML (300WATT) MODULES  
 (1) STRING OF 16 MODULES CONNECTED IN SERIES



SILFAB SOLAR SIL-300 ML (300WATT) MODULES

SolarEdge Power Optimizer P320 Rated  
 DC Input Power - 320 watts  
 Maximum Input Voltage - 48 Vdc  
 MPPT Range - 8 to 48 Vdc  
 Maximum Short Circuit Current - 11 Adc  
 Maximum Output Current - 15 Adc String  
 Limitations - 8 to 25 Optimizers,  
 5700 watts STC per string maximum

SOLAREEDGE SE5000H-US (5.0kW)  
 (240V) OUTPUT: 240 VAC, 21A  
 99% CEC WEIGHTED EFFICIENCY  
 NEMA 3R, UL LISTED, INTERNAL GFDI  
 WITH INTEGRATED DC DISCONNECT

JUNCTION BOX  
 600 V, NEMA 3  
 UL LISTED

AC DISCONNECT:  
 60A FUSED, (2) 30A FUSES,  
 240V NEMA 3R, UL LISTED

EXISTING GROUNDING  
 ELECTRODE SYSTEM  
 TO EARTH  
 REF. NEC 250.52,  
 250.53(A)

(E) MAIN BREAKER TO  
 HOUSE 240 V, 200A/2P  
 (TOP FED)

(E) MAIN SERVICE  
 PANEL, SQUARE D  
 200A RATED, 240V

LOAD/LINE SIDE  
 INTERCONNECTION  
 AT MAIN PANEL  
 PER ART. 705.12

**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

FOR SERVICE TECHNICIANS:  
 REFER TO THE  
 "RAPID SHUTDOWN"  
 LABEL ON THE SYSTEM  
 AND INSURE  
 PROTECTIVE  
 DEVICES  
 IN THE CABINET

LABEL 3  
 AT INVERTER

PHOTOVOLTAIC  
 DC DISCONNECT

LABEL 4  
 AT DC DISCONNECT

**WARNING!**  
 ELECTRIC SHOCK HAZARD  
 DO NOT TOUCH TERMINALS  
 UNLESS THE MAIN LINES AND LOADS ARE  
 DE-ENERGIZED IN THE DISCONNECT

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
(2)	#10AWG - PV WIRE/USE-2	N/A	N/A
(1)	#6AWG - BARE COPPER IN FREE AIR		
(2)	#10AWG - THWN-2	IMC OR PVC IN TRENCH / LFNC	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		

SERVICE INFO	
UTILITY PROVIDER:	DUKE ENERGY PROGRESS
MAIN SERVICE VOLTAGE:	240V
MAIN PANEL BRAND:	CUTLER - HAMMER
MAIN SERVICE PANEL:	200A
MAIN CIRCUIT BREAKER RATING:	200A
MAIN SERVICE LOCATION:	WEST
SERVICE FEED SOURCE:	UNDERGROUND

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SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	SILFAB SIL-300 ML MODULES
VMP	32.8V
IMP	9.16A
VOC	39.85V
ISC	9.71A
TEMP. COEFF. VOC	-0.28%/°C
PTC RATING	270.4W
MODULE DIMENSION	66.92"L x 39.37"W x 1.50"D (In Inch)

INVERTER #1 SPECIFICATIONS	
MANUFACTURER / MODEL #	SOLAREEDGE SE5000H-US (5KW)
NOMINAL AC POWER	5.0 KW
NOMINAL OUTPUT VOLTAGE	240 VAC
NOMINAL OUTPUT CURRENT	21.0 A

POWER OPTIMIZER (OPTIMIZER P320)	
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
0.80	4-6
0.70	7-9
0.50	10-20

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-10°
AMBIENT TEMP (HIGH TEMP 2%)	35°
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	90°
CONDUCTOR TEMPERATURE RATE	57°
MODULE TEMPERATURE COEFFICIENT OF Voc	-0.28%/°C

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

EXPECTED WIRE TEMP (In Celsius)	35°
TEMP. CORRECTION PER TABLE (310.16)	0.96
NO. OF CURRENT CARRYING CONDUCTORS	2
CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a)	1
CIRCUIT CONDUCTOR SIZE	10 AWG
CIRCUIT CONDUCTOR AMPACITY	40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	18.75A
1.25 X Isc	
DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC TABLE 310.16	
CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a) X CIRCUIT CONDUCTOR AMPACITY	40A
Result should be greater than (18.75A) 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)	35°+22° = 57°
TEMP. CORRECTION PER TABLE (310.16)	0.71
NO. OF CURRENT CARRYING CONDUCTORS	2
CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a)	1
CIRCUIT CONDUCTOR SIZE	10 AWG
CIRCUIT CONDUCTOR AMPACITY	40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	18.75A
1.25 X Isc	
DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC TABLE 310.16	
CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a) X CIRCUIT CONDUCTOR AMPACITY	40A
Result should be greater than (18.75A) otherwise less the entry for circuit conductor size and ampacity	

### AC CONDUCTOR AMPACITY CALCULATIONS:

No. OF INVERTER	1
EXPECTED WIRE TEMP (In Celsius)	35°
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)	26.25A
1.25 X MAX INVERTER OUTPUT CURRENT	
DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC TABLE 310.16	
TEMP. CORRECTION PER TABLE (310.16) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a) X CIRCUIT CONDUCTOR AMPACITY	72A
Result should be greater than (26.25A) 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 SOLADECK, 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



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SHEET NAME  
**WIRING  
CALCULATIONS**

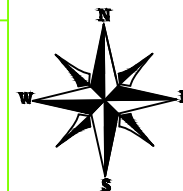
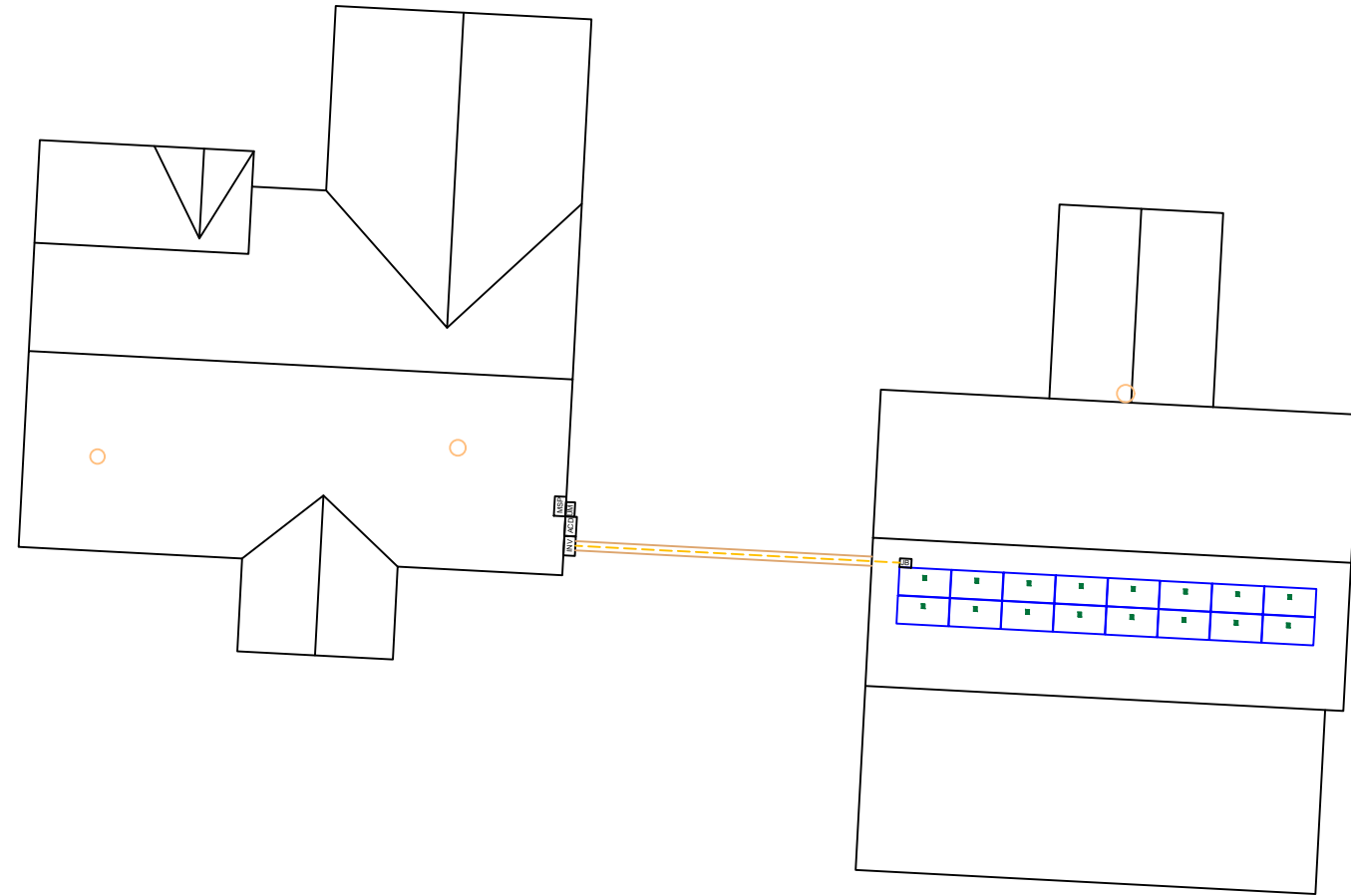
SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-5**

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

1  
2  
3  
4  
5  
6  
7  
8  
9  
10

# SOLAREGE OPTIMIZER CHART



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SHEET NAME  
 SOLAREGE  
 OPTIMIZER CHART

SHEET SIZE  
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SHEET NUMBER  
 PV-6



# SIL-300 ML



## 60 Cell Monocrystalline PV Module

### INDUSTRY LEADING WARRANTY

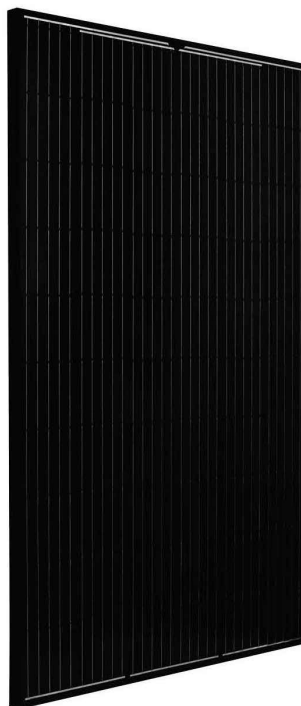
All our products include an industry leading 25-year product workmanship and 30-year performance warranty.

### 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.



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

### 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			UI 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)

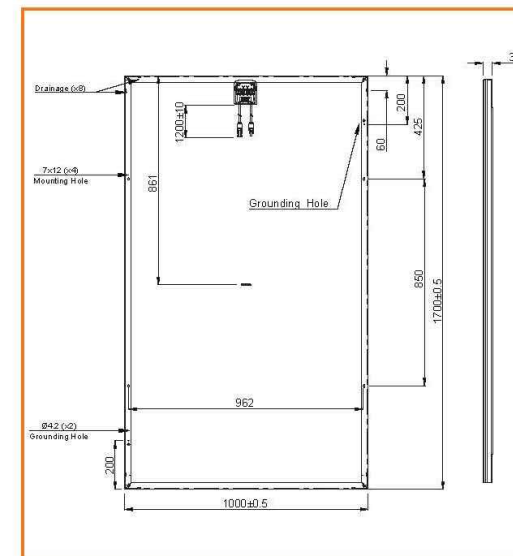


Modules Per Pallet: 26  
Pallets Per Truck: 36  
Modules Per Truck: 936



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info@silfabsolar.com | [www.silfabsolar.com](http://www.silfabsolar.com)

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REVISIONS		
DESCRIPTION	DATE	REV

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DATE: 01/08/2020

PROJECT NAME & ADDRESS

GAIL DAVISON  
RESIDENCE  
1233 JOSEY WILLIAMS ROAD,  
ERWIN, NC 28339

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
- 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](http://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				EXXXXXH-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>m</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								
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	A <sub>dc</sub>	
Maximum Input Current @208V <sup>(2)</sup>	-	9	-	13.5	-	-	27	A <sub>dc</sub>	
Max. Input Short Circuit Current	45								
Reverse-Polarity Protection	Yes								
Ground-Fault Isolation Detection	600 $\mu$ s Sensitivity								
Maximum Inverter Efficiency	99	99.2							%
CEC Weighted Efficiency	99						99 @ 240V 98.5 @ 208V		%
Nighttime Power Consumption	< 2.5								
<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 AFCI 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				
Weight with Safety Switch	22 / 10	25.1 / 11.4	26.2 / 11.9	38.8 / 17.6				lb / kg	
Noise	< 25				< 50				
Cooling	Natural Convection								
Operating Temperature Range	-40 to +140 / -40 to +60 <sup>m</sup>								
Protection Rating	NEMA 4X (Inverter with Safety Switch)								



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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 Part15 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		gr. / 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				
	P320, P370, P400 P405 / P505	SINGLE PHASE	THREE PHASE 208V	THREE PHASE 480V	
Minimum String Length (Power Optimizers)	8	10	18		
Maximum String Length (Power Optimizers)	6	8	14		
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



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ERWIN, NC 28339

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.

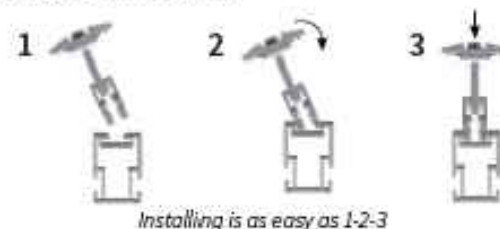


QRails come in two lengths —  
168 inches (14 ft) and 208 inches (17.3 ft)  
Mill and Black Finish

## 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



**UNIVERSAL END CLAMP**  
2 clamps for modules from  
30-45mm or 38-50mm thick



**UNIVERSAL BONDED MID CLAMP**  
2 clamps for modules from  
30-45mm or 38-50mm thick

### 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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ERWIN, NC 28339

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

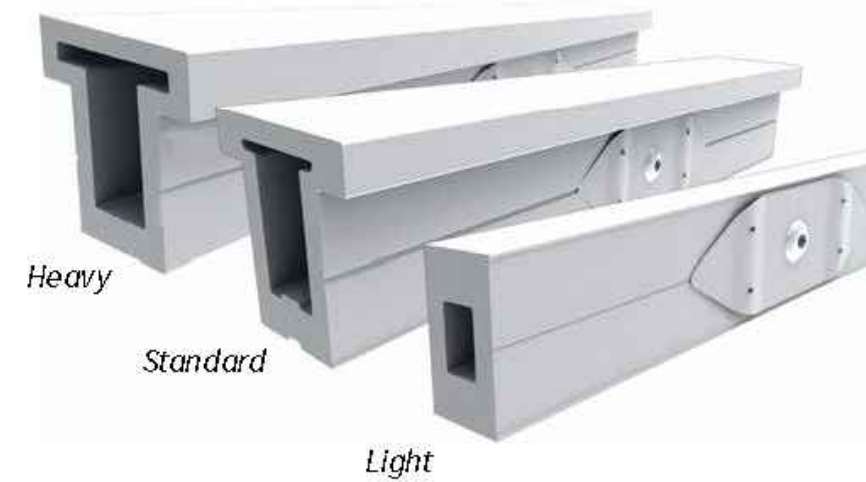
PV-10

# 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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SHEET SIZE  
 ANSI B  
 11" X 17"

SHEET NUMBER  
 PV-11A

## 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-UMC3045BP 1.2 A 20	872	Universal Mid Clamp, 30-45mm, w/ Bonding, 20 Pack	Mill
QMR-UMC3850BP 1.2 A 20	873	Universal Mid Clamp, 38-50mm, w/ Bonding, 20 Pack	Mill
QMR-UMC3045BP 1.2 B 20	877	Universal Mid Clamp, 30-45mm, w/ Bonding, 20 Pack	Black
QMR-UMC3850BP 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	692	Single-slot L-foot, 12 Pack	Mill
QMC-LF B 12	693	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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EQUIPMENT  
 SPECIFICATION

### SHEET SIZE

ANSI B  
 11" X 17"

### SHEET NUMBER

PV-11B

## T-Bolt



Item Code	Part Number	Description	Finish
QMR-TB A 300	880	T-Bolt w/ Nut, 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

## 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

## WEEB BMC



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



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SHEET NAME  
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SHEET SIZE  
 ANSI B  
 11" X 17"

SHEET NUMBER  
 PV-11C

# S-5!<sup>®</sup>

## The Right Way!

### ProteaBracket™

ProteaBracket™ is the most versatile standing seam metal roof attachment solution on the market, fitting most trapezoidal sheet profiles with and without intermediate insulation. It features an adjustable attachment base and multiple solar module attachment options (illustrated on back) to accommodate varying widths and heights. There are no messy sealants to apply and no chance for leaks; the ProteaBracket comes with factory-applied, adhesive rubber sealant to ensure quick installation and a weather-proof fit.

Installation is simple! The ProteaBracket is mounted directly onto the crown of the panel, straddling the profile. No surface preparation is necessary; simply wipe away excess oil and debris, align, and apply. Secure ProteaBracket through its pre-punched holes, using the hardened drill point S-5!<sup>®</sup> screws.

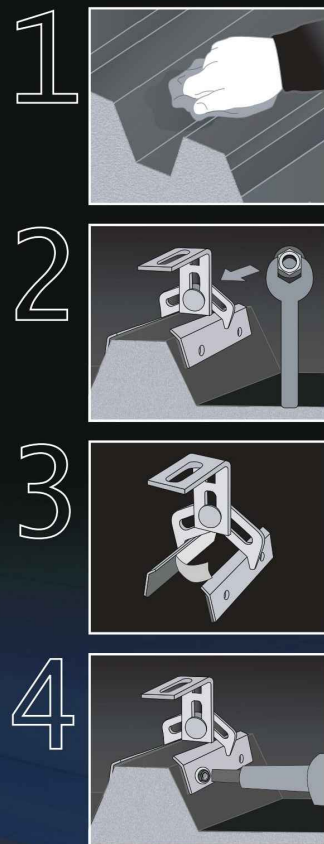
ProteaBracket is the perfect match for our S-5-PV Kit and spares you the hassle of cold-bridging! For a solar attachment solution that is both economical and easy to use, choose ProteaBracket.\*

\*When ProteaBracket is used in conjunction with the S-5-PV Kit, an additional nut is required during installation.

S-5!<sup>®</sup> ProteaBracket™ is a versatile bracket that adjusts easily to most trapezoidal roof profiles.

ProteaBracket™

888-825-3432 | www.S-5.com



# S-5!<sup>®</sup>

## The Right Way!

ProteaBracket™ is the perfect solar attachment solution for most trapezoidal exposed-fastened metal roof profiles! No messy sealants to apply. The factory-applied adhesive rubber sealant weather-proofs and makes installation easy!

Each ProteaBracket™ comes with a factory-applied, adhesive rubber sealant on the base. A structural A2 stainless steel bimetal attachment bracket, ProteaBracket is compatible with most common metal roofing materials. All four pre-punched holes must be used to achieve tested strength. Mounting hardware is furnished with the ProteaBracket. For design assistance, ask your distributor, or visit [www.S-5.com](http://www.S-5.com) for the independent lab test data that can be used for load-critical designs and applications. Also, please visit our website for more information including metallurgical compatibilities and specifications. S-5!<sup>®</sup> holding strength is unmatched in the industry.

### Multiple Attachment Options:

Side Rail Option



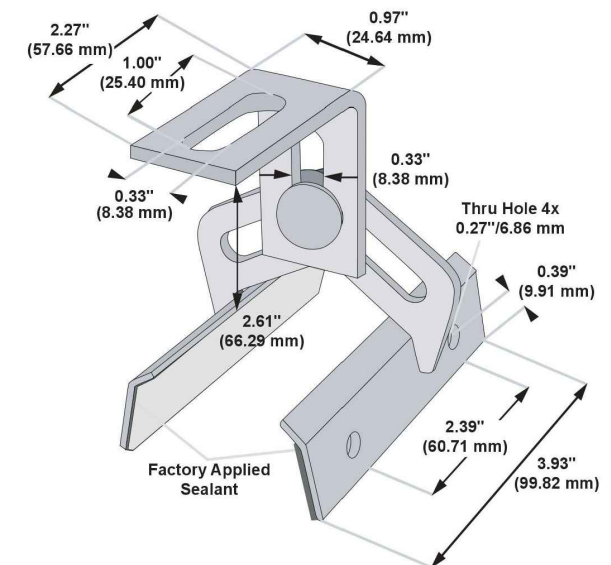
Top Rail Option



S-5-PV Kit Option

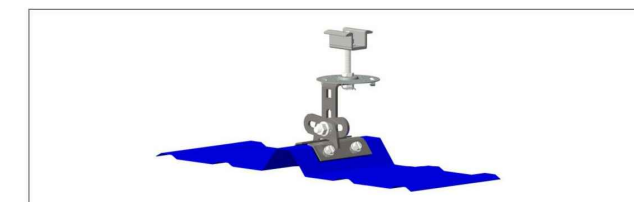


### ProteaBracket™



Please note: All measurements are rounded to the second decimal place.

### Example Applications



S-5-PV Kit demonstrated with a ProteaBracket on a trapezoidal profile.

### Example Profile



**S-5!<sup>®</sup> Warning! Please use this product responsibly!**  
 Products are protected by multiple U.S. and foreign patents. For published data regarding holding strength, bolt torque, patents, and trademarks, visit the S-5! website at [www.S-5.com](http://www.S-5.com).  
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