WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

Scott E. Wyssling, PE
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June 3, 2022

Jacob Humpherys, COO
Meraki Solutions
30700 Wekiva River Road
Sorrento, FL 32776

Scott E Wyssling, PE

Digitally signed by Scott E Wyssling, PE
DN: C=US, S=Utah, L=Alpine, O=Wyssling Consulting, CN="Scott E Wyssling, PE", E=swyssling@wysslingconsulting.com
Reason: I am the author of this document
Location: your signing location here
Date: 2022.06.03 10:24:22-04'00'
Foxit PhantomPDF Version: 10.1.3

Re: Engineering Services
Brooks Residence
645 SW Troy Street, Lake City FL
5.920 kW System

To Whom It May Concern:

We have received information regarding solar panel installation on the roof of the above referenced structure. Our evaluation of the structure is to verify the existing capacity of the roof system and its ability to support the additional loads imposed by the proposed solar system.

A. Site Assessment Information

1. Site visit documentation identifying attic information including size and spacing of framing for the existing roof structure.
2. Design drawings of the proposed system including a site plan, roof plan and connection details for the solar panels. This information will be utilized for approval and construction of the proposed system.

B. Description of Structure:

Roof Framing: Prefabricated wood trusses with all truss members constructed of 2 x 4 dimensional lumber at 24" on center.
Roof Material: Metal roofing
Roof Slope: 20 degrees
Attic Access: Accessible
Foundation: Permanent

Columbia County Building Department
Plans Reviewed for Code Compliance
State of Florida

C. Loading Criteria Used

- **Dead Load**
  - Existing Roofing and framing = 7 psf
  - New Solar Panels and Racking = 3 psf
  - TOTAL = 10 PSF
- **Live Load** = 20 psf (reducible) – 0 psf at locations of solar panels
- **Ground Snow Load** = 0 psf
- **Wind Load** based on ASCE 7-16
  - Ultimate Wind Speed = 160 mph (based on Risk Category II)
  - Exposure Category C

Analysis performed of the existing roof structure utilizing the above loading criteria is in accordance with the FBC 2020 7th Edition, including provisions allowing existing structures to not require strengthening if the new loads do not exceed existing design loads by 105% for gravity elements and 110% for seismic elements. This analysis indicates that the existing framing will support the additional panel loading without damage, if installed correctly.

D. Solar Panel Anchorage

1. The solar panels shall be mounted in accordance with the most recent "*S-5 Installation Manual*", which can be found on the S-5 website (*http://s-5.com/*). If during solar panel installation, the roof framing members appear unstable or deflect non-uniformly, our office should be notified before proceeding with the installation.
2. System will be attached to the metal roofing material utilizing the patented S-5 connection. Installation of the connections shall be in accordance with the manufacturer's recommendations.
3. Considering the roof slopes, the size, spacing, condition of roof, the panel supports shall be placed no greater than 48" o/c.

Based on the above evaluation, this office certifies that with the racking and mounting specified, the existing roof system will adequately support the additional loading imposed by the solar system. This evaluation is in conformance with the FBC 2020 7th Edition, current industry standards, and is based on information supplied to us at the time of this report.

Should you have any questions regarding the above or if you require further information do not hesitate to contact me.

Very truly yours,

Scott E. Wyssling, PE
Florida License No. 81558

SCOTT E WYSSLING
LICENSE
No. 81558
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

Wyssling Consulting, PLLC
76 N Meadowbrook Drive
Alpine UT 84004 COA # RY34912

THIS PLAN HAS BEEN ELECTRONICALLY SIGNED AND SEALED BY SCOTT WYSSLING, PE USING A DIGITAL SIGNATURE AND DATE. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES

Date Signed 6/3/2022

AERIAL VIEW:

STREET VIEW:

MERAKI
ZERO DOWN SOLAR

CONTRACTOR INFORMATION:

Meraki Installers
484-663-3792
21 N New Warrington Rd
Pensacola, FL 32507
License # CVC57044
HVAC License # CAC1820256

SITE INFORMATION

Alexander Brooks
645 SW Troy St
Lake City, FL 32024
AC SYSTEM SIZE: 5 kW AC
DC SYSTEM SIZE: 5.92 kW DC
Lat, 30.155225
Long, -82.7002089
(16) Suntech STP370S - B60/Wnhb PV MODULES
(1) SolarEdge SE5000H-US (240V) INVERTER(S)

Clay Electric Cooperative

GENERAL NOTES

1. INSTALLATION OF SOLAR PHOTOVOLTAIC SYSTEM SHALL BE IN ACCORDANCE WITH NEC ARTICLE 690, AND ALL OTHER APPLICABLE NEC CODES WHERE NOTED OR EXISTING.
2. PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL COMPLY WITH NEC ARTICLE 110.
3. ALL WIRES, INCLUDING THE GROUNDING ELECTRODE CONDUCTOR SHALL BE PROTECTED FROM PHYSICAL DAMAGE IN ACCORDANCE WITH NEC ARTICLE 250
4. THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE; THIS SYSTEM IS UTILITY INTERACTIVE PER UL 1741 AND DOES NOT INCLUDE STORAGE BATTERIES OR OTHER ALTERNATIVE STORAGE SOURCES.
5. ALL DC WIRES SHALL BE SIZED ACCORDING TO [NEC 690.8]
6. DC CONDUCTORS SHALL BE WITHIN PROTECTED RACEWAYS IN ACCORDANCE WITH [NEC 690.31]
7. ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL JURISDICTIONAL BUILDING CODE.

PHOTOVOLTAIC (PV) SYSTEM SPECIFICATIONS

EQUIPMENT:
AC SYSTEM SIZE: 5 kW AC
DC SYSTEM SIZE: 5.92 kW DC
(16) Suntech STP370S - B60/Wnhb PV MODULES
(1) SolarEdge SE5000H-US (240V) INVERTER(S)
RACKING: S-5! - PROTEA BRACKET - 48" O.C.

APPLICABLE GOVERNING CODES

2017 NEC
2020 FBC 7TH EDITION, BUILDING
2020 FBC 7TH EDITION, RESIDENTIAL
2020 FBC 7TH EDITION, EXISTING BUILDING
2020 FFPC

SITE SPECIFICATIONS

OCCUPANCY: R-3
ZONING: RESIDENTIAL

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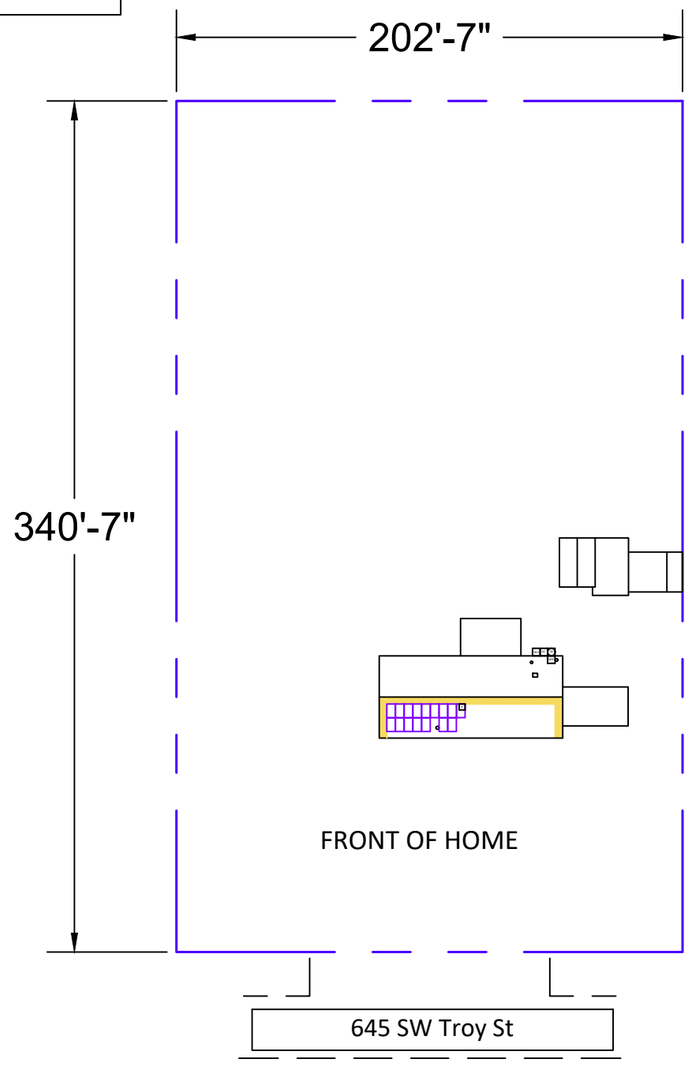
SHEET INDEX:

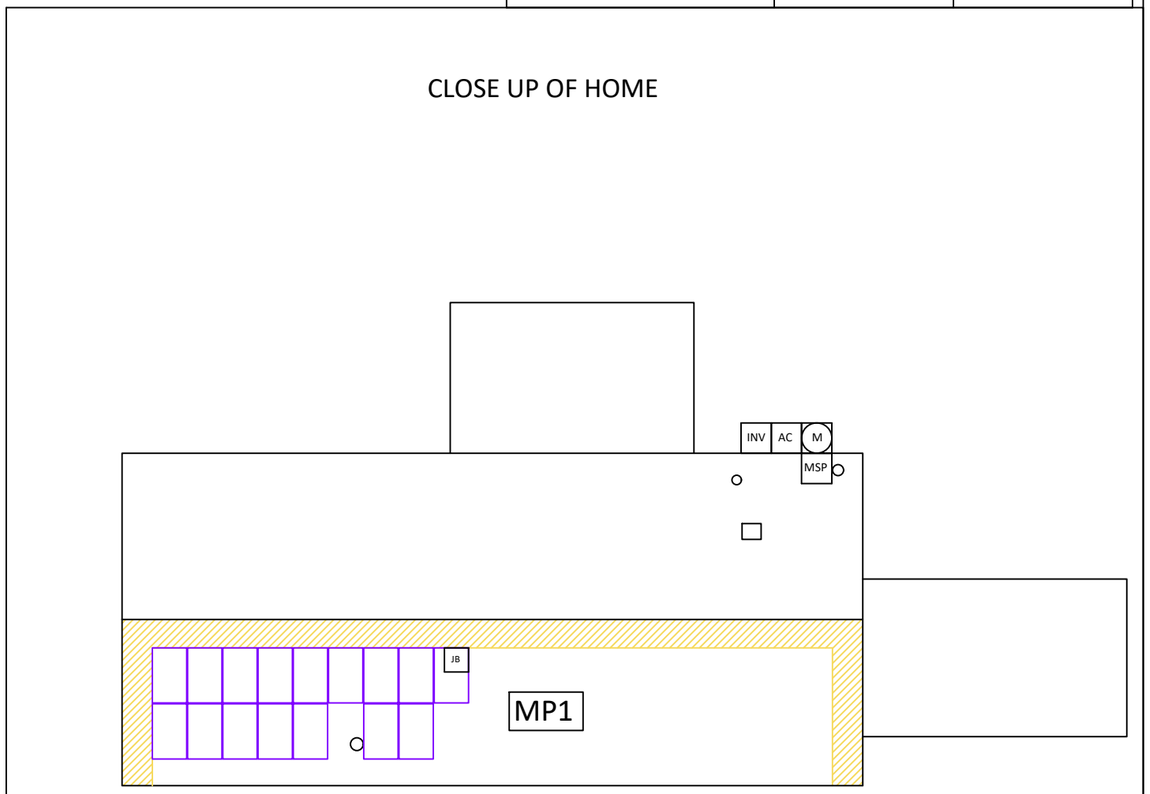
DRAWN BY: SoloCAD

DATE:
June 1, 2022

COVER PAGE - PV01



ARRAY DETAILS:		
MOUNTING PLANE:	AZIMUTH:	TILT:
MP1	180°	20°



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EQUIPMENT LEGEND:

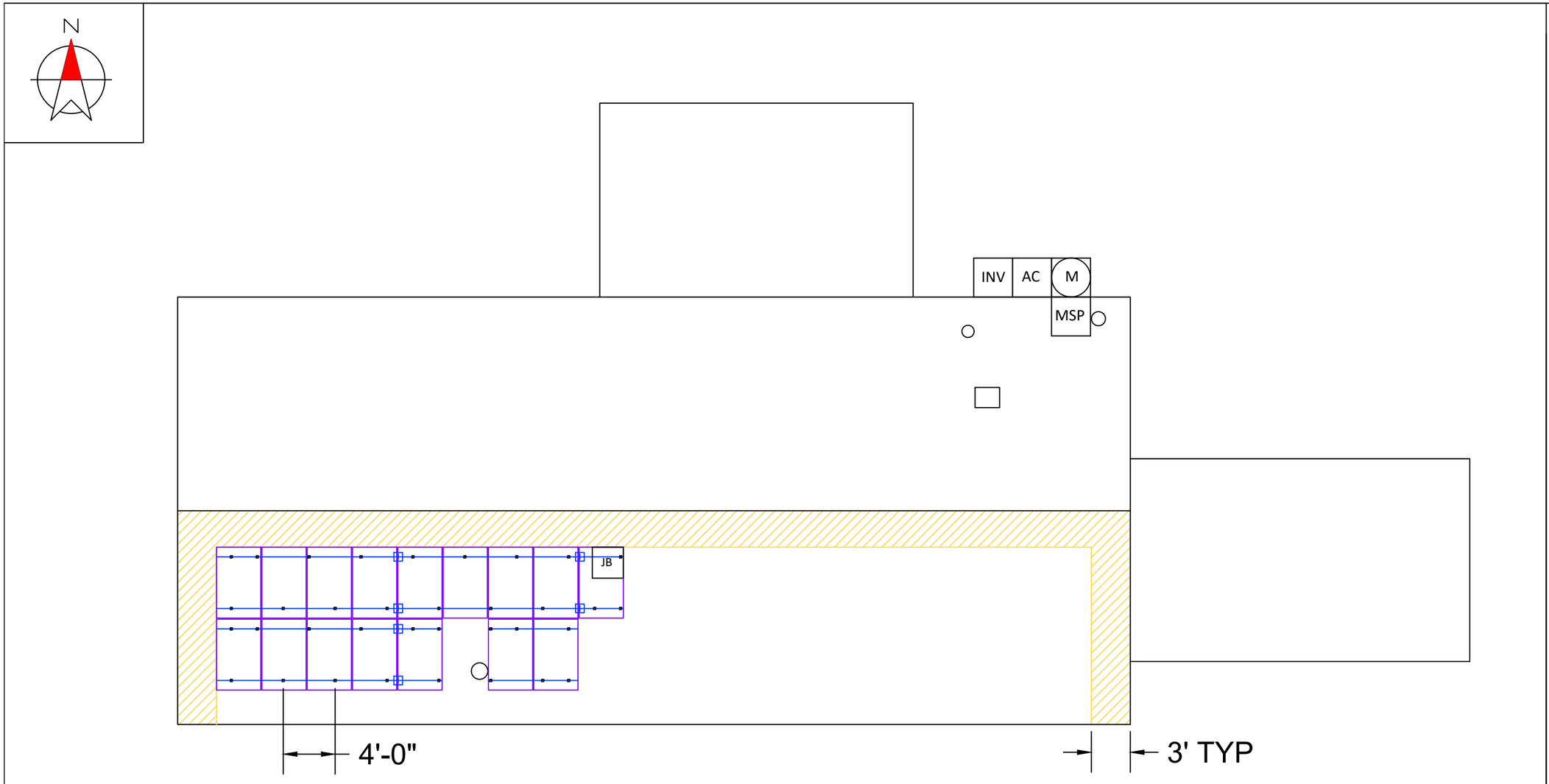
- M — UTILITY METER
- AC — VISIBLE, LOCKABLE, LABELED AC DISCONNECT
- INV — INVERTER
- SUB — SUB PANEL
- SD — SERVICE DISCONNECT
- FIRE ACCESS PATHWAY (3' TYP)
- MSP — MAIN SERVICE PANEL
- PV — METER SOCKET (FOR UTILITY PV METER)
- C — COMBINER BOX
- LC — LOAD CENTER
- BATT — BATTERY(IES)
- PROPERTY LINE

VISIBLE, LOCKABLE, LABELED AC DISCONNECT

DRAWN BY: SoloCAD

DATE: June 1, 2022

SITE PLAN - PV02



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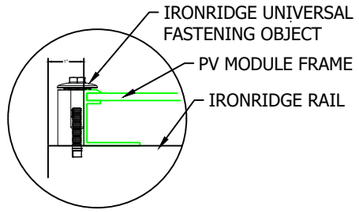
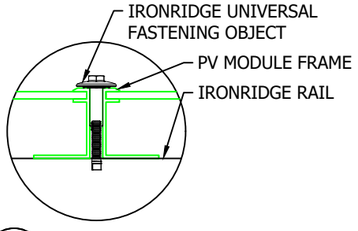
ROOF ATTACHMENTS - PV03

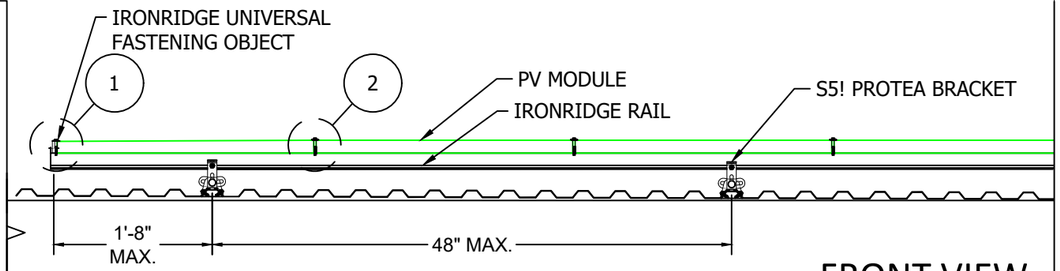
EQUIPMENT INFORMATION:		ROOF INFO:		PHOTOVOLTAIC ARRAY STRUCTURAL CRITERIA:	
RAIL MANUFACTURER:	IronRidge	ROOF TYPE:	Trap Metal	PV MODULE COUNT:	16
RAIL PART NUMBER:	XR-100	ROOF FRAMING:	Manufactured Truss	ARRAY AREA:	MODULE COUNT * 19.64 ft² = 314.24
ATTACHMENTS	S-5! - PROTEA BRACKET	RAFTER/TOP CHORD SIZE:	2x4	ROOF AREA:	2857 ft²
ATTACHMENT QTY:	35	RAFTER/TOP CHORD SPACING:	24"	PERCENT OF ROOF COVERED:	11%
SPLICE QTY:	6	ATTACHMENT SPACING:	48''	ARRAY WEIGHT:	MODULE COUNT * 45 lbs = 720 lbs
MIDCLAMP QTY:	26			POINT LOAD:	ARRAY LBS/ATTACHMENTS = 20.57
ENDCLAMP QTY:	12			DISTRIBUTED LOAD: (lbs/ft²)	(ARRAY) WEIGHT/AREA = 2.29 lbs/ft²



1 END CLAMP DETAILS

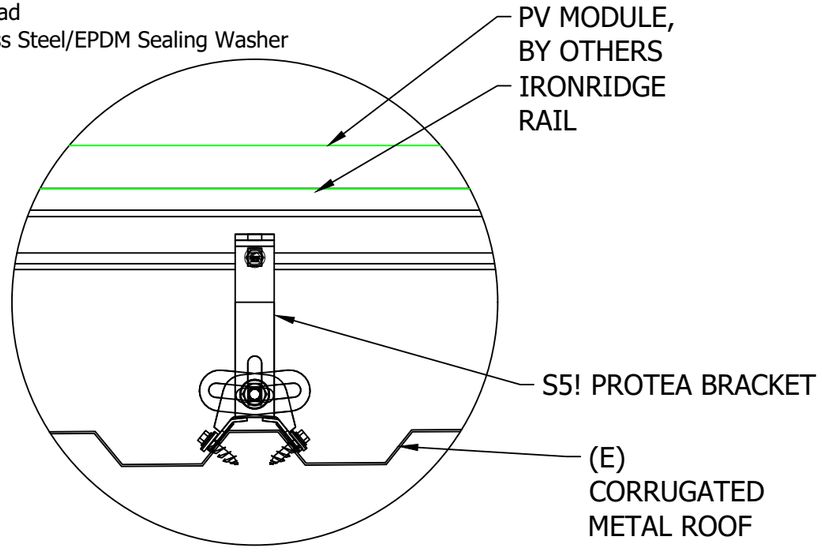


2 MID CLAMP DETAILS

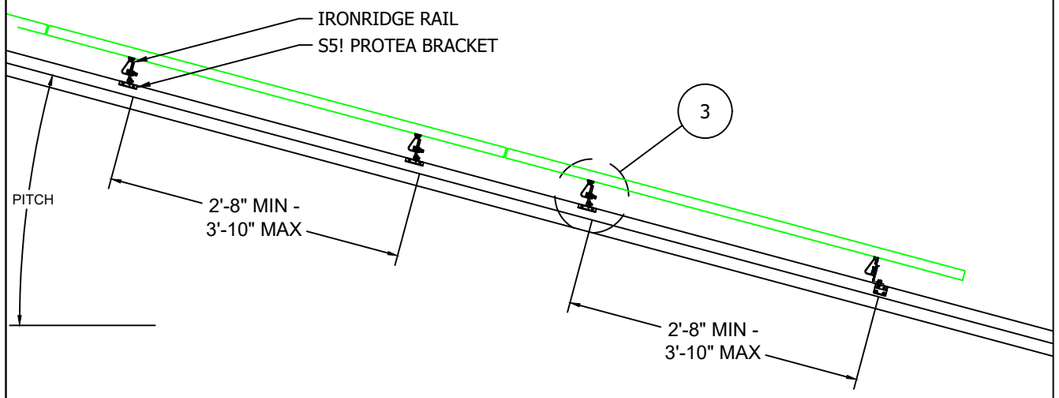


FRONT VIEW

SCREW ATTACHMENT DETAILS FOR PROTEA BRACKET
1/4" (6.3mm) Diameter
1" (25mm) Length
Stainless Steel Self Tapping Screw with Hardened Steel Piercing Point
5/16" (8mm) Hex Head
5/8" (16mm) Stainless Steel/EPDM Sealing Washer



3 DETAIL, MOUNTING AND FLASHING



SIDE VIEW

EQUIPMENT INFORMATION:		ROOF INFO:		PHOTOVOLTAIC ARRAY STRUCTURAL CRITERIA:	
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RAIL PART NUMBER:	XR-100	ROOF FRAMING:	Manufactured Truss	ARRAY AREA:	MODULE COUNT * 19.64 ft² = 314.24
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DRAWN BY: SoloCAD

DATE:
June 1, 2022

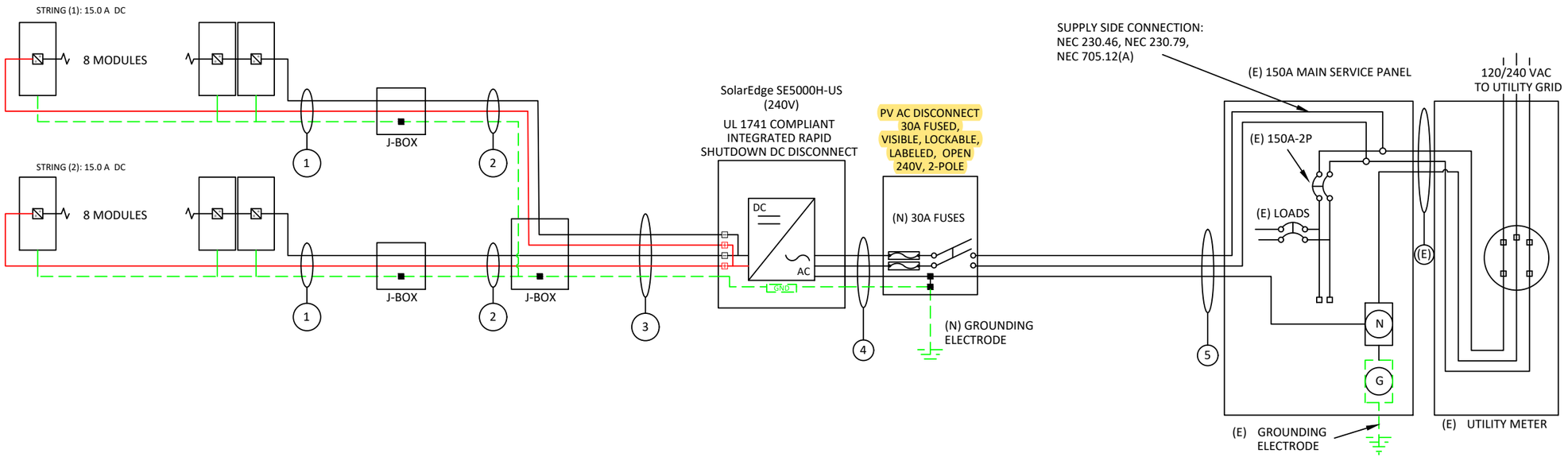
MOUNTING DETAIL - PV04

Suntech STP370S - B60/Wnhb Specs	
POWER MAX (PMAX):	370W
OPEN CIRCUIT VOLTAGE (VOC):	40.9V
MAX POWER-POINT CURRENT (IMP):	10.79A
MAX POWER-POINT VOLTAGE (VMP):	34.3V
SHORT CIRCUIT CURRENT (ISC):	11.49A
SERIES FUSE RATING:	20 A

SolarEdge SE5000H-US (240V) Specs	
MAX INPUT VOLTAGE:	480 V
MAX INPUT CURRENT:	13.5 A
NOMINAL DC INPUT VOLTAGE:	380 V
MAXIMUM OUTPUT POWER:	5000 W
NOM. OUTPUT VOLTAGE:	240 V
MAX OUTPUT CURRENT:	21 A
1-Phase, 60 HZ, UL 1741 Listed	

Equipment Schedule			
TYPE:	QTY:	DESCRIPTION:	RATING:
MODULES:	(16)	Suntech STP370S - B60/Wnhb	370 W
INVERTERS:	(1)	SolarEdge SE5000H-US (240V)	5000 W
AC DISCONNECTS:	(1)	PV AC Disconnect, 240V, 2-Pole	30 A
DC OPTIMIZERS:	(16)	SolarEdge P401	15 Adc

Conduit & Conductor Schedule				
TAG	QTY	WIRE GAUGE	DESCRIPTION	CONDUIT SIZE
1	(2)	10 AWG	PV-WIRE , USE-2, COPPER (L1, L2)	N/A - FREE AIR
	(1)	6 AWG	THWN-2 COPPER - (GROUND)	
2	(2)	10 AWG	THHN/THWN-2, COPPER - (L1, L2)	3/4"
	(1)	10 AWG	THWN-2 COPPER - (GROUND)	
3	(4)	10 AWG	THHN/THWN-2, COPPER - (L1, L2)	3/4"
	(1)	10 AWG	THWN-2 COPPER - (GROUND)	
4	(3)	10 AWG	THWN-2 COPPER - (L1, L2, NEUTRAL)	3/4"
	(1)	10 AWG	THWN-2 COPPER - (GROUND)	
5	(3)	6 AWG	THWN-2 COPPER - (L1,L2,NEUTRAL)	3/4"
	(0)	NONE	N/A - NO GROUND WIRE PRESENT	



SUBJECT PV SYSTEMS HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE NEC 2017, AND THOSE SET FORTH BY THE FLORIDA SOLAR ENERGY CENTER CERTIFICATION, INCLUDING- MAXIMUM NUMBER OF MODULE STRINGS. MAXIMUM NUMBER OF MODULES PER STRING, MAXIMUM OUTPUT, MODULE MANUFACTURER AND MODEL NUMBER, INVERTER MANUFACTURER AND MODEL NUMBER.

VISIBLE, LOCKABLE,
LABELED AC DISCONNECT

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LINE DIAGRAM - PV05

STRING CALCULATIONS		
SolarEdge SE5000H-US (240V)	STRING #1	STRING #2
OPTIMIZER MAX OUTPUT CURRENT	15A	15A
OPTIMIZERS IN SERIES:	8	8
NOMINAL STRING VOLTAGE:	380V	380V
ARRAY OPERATING CURRENT:	7.789474A	7.789474A
ARRAY DC POWER:	5920W	
TOTAL MAX AC CURRENT:	21A	

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

SYSTEM OCPD CALCULATIONS	
INVERTER MODEL(S):	SolarEdge SE5000H-US (240V)
# OF INVERTERS:	1
MAX OUTPUT CURRENT:	21A
(# OF INVERTERS) X (MAX OUTPUT CURRENT) X 125% <= OCPD RATING	
(1 X 21A X 1.25) = 26.25A <= 30A, OK	

SUPPLY SIDE INTERCONNECTION	
MAIN BUSBAR RATING:	150A
MAIN DISCONNECT RATING:	150A
PV OCPD RATING:	30A
SERVICE RATING >= PV OCPD	
150A >= 30A, OK	

Conduit & Conductor Schedule

TAG	QTY	WIRE GAUGE	DESCRIPTION	CONDUIT SIZE	CONDUCTOR RATING	CONDUCTOR TEMP. RATE	AMBIENT TEMP	TEMP. DERATE	# OF CONDUCTORS DERATE	CONDUCTOR RATING W/DERATES	
1	(2)	10 AWG	PV-WIRE , USE-2, COPPER (L1, L2)	N/A - FREE AIR	40A	90°C	34°C	0.96	1	38.4A	
	(1)	6 AWG	THWN-2 COPPER - (GROUND)								
2	(2)	10 AWG	THHN/THWN-2, COPPER - (L1, L2)	3/4"	40A	90°C	34°C	0.96	1	38.4A	
	(1)	10 AWG	THWN-2 COPPER - (GROUND)								
3	(4)	10 AWG	THHN/THWN-2, COPPER - (L1, L2)	3/4"	40A	90°C	34°C	0.96	0.8	30.72A	
	(1)	10 AWG	THWN-2 COPPER - (GROUND)								
4	(3)	10 AWG	THWN-2 COPPER - (L1, L2, NEUTRAL)	3/4"	35A	75°C	34°C	0.96	1	33.6A	
	(1)	10 AWG	THWN-2 COPPER - (GROUND)								
5	(3)	6 AWG	THWN-2 COPPER - (L1,L2,NEUTRAL)	3/4"	65A	75°C	34°C	0.96	1	62.4A	
	(0)	NONE	N/A - NO GROUND WIRE PRESENT								

GROUNDING & GENERAL NOTES:

1. PV INVERTER IS UNGROUNDED, TRANSFORMER-LESS TYPE.
2. DC GEC AND AC EGC TO BE SPLICED TO EXISTING ELECTRODE
3. ANY EXISTING WIRING INVOLVED WITH PV SYSTEM CONNECTION THAT IS FOUND TO BE INADEQUATE PER CODE SHALL BE CORRECTED PRIOR TO FINAL INSPECTION.
4. JUNCTION BOX QUANTITIES, AND PLACEMENT SUBJECT TO CHANGE IN THE FIELD - JUNCTION BOXES DEPICTED ON ELECTRICAL DIAGRAM REPRESENT WIRE TYPE TRANSITIONS.
5. AC DISCONNECT NOTED IN EQUIPMENT SCHEDULE OPTIONAL IF OTHER AC DISCONNECTING MEANS IS LOCATED WITHIN 10' OF SERVICE DISCONNECT.

INTERCONNECTION NOTES

1. GROUND FAULT PROTECTION IN ACCORDANCE WITH [NEC 215.9] & [NEC 230.95]
2. SUPPLY SIDE INTERCONNECTION ACCORDING TO [NEC705.12(A)] WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH [NEC 240.21(B)]

DISCONNECT NOTES

1. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING LIVE ARE CONNECTED TO THE TERMINALS MARKED “LINE SIDE” (TYPICALLY THE UPPER TERMINALS)
2. AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH.
3. FUSED AC DISCONNECT TO BE USED.

MERAKI
ZERO DOWN SOLAR

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DATE:
June 1, 2022

ELECTRICAL CALCS - PV06

WARNING
ELECTRIC SHOCK HAZARD
TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LABEL 1
FOR PV DISCONNECTING MEANS WHERE THE LINE AND LOAD TERMINALS MAY BE ENERGIZED IN THE OPEN POSITION.
[NEC 690.13(B)]

WARNING
THIS EQUIPMENT IS FED BY MULTIPLE SOURCES. TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR.

LABEL 2
PLACED ADJACENT TO THE BACK-FED BREAKER FROM THE INVERTER IF TIE IN CONSISTS OF LOAD SIDE CONNECTION TO BUSBAR.
[NEC 705.12(B)(2)(3)(b)]

WARNING
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL 3
PLACED ADJACENT TO THE BACK-FED BREAKER FROM THE INVERTER IF TIE IN CONSISTS OF LOAD SIDE CONNECTION TO BUSBAR.
[NEC 705.12(B)(2)(3)(c)]

WARNING
DUAL POWER SUPPLY
SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

LABEL 4
EQUIPMENT CONTAINING OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO A BUSBAR OR CONDUCTOR SUPPLIED FROM MULTIPLE SOURCES SHALL BE MARKED TO INDICATE THE PRESENCE OF ALL SOURCES
[NEC 705.12(B)(3)]

PHOTOVOLTAIC AC DISCONNECT
RATED AC OUTPUT CURRENT: 21
NOMINAL OPERATING AC VOLTAGE: 240

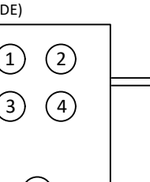
LABEL 5
AT POINT OF INTERCONNECTION, MARKED AT AC DISCONNECTING MEANS.
[NEC 690.54, NEC 690.13 (B)]

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL 6
AT DIRECT-CURRENT EXPOSED RACEWAYS, CABLE TRAYS, COVERS AND ENCLOSURES OF JUNCTION BOXES, AND OTHER WIRING METHODS; SPACED AT MAXIMUM 10FT SECTION OR WHERE SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS.
[NEC 690.31(G)(3&4)]

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

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



LABEL 7
FOR PV SYSTEMS THAT SHUT DOWN THE ARRAY AND CONDUCTORS LEAVING THE ARRAY:
SIGN TO BE LOCATED ON OR NO MORE THAN 3 FT AWAY FROM SERVICE DISCONNECTING MEANS TO WHICH THE PV SYSTEMS ARE CONNECTED AND SHALL INDICATE THE LOCATION OF ALL IDENTIFIED RAPID SHUTDOWN SWITCHES IF NOT AT THE SAME LOCATION.
[NEC 690.56(C)(1)(A)]

MAXIMUM VOLTAGE: 480
MAXIMUM CIRCUIT CURRENT: 14
MAX RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC TO DC CONVERTER (IF INSTALLED) : 15

LABEL 8
AT EACH DC DISCONNECTING MEANS [NEC 690.53]

WARNING
IN CASE OF EMERGENCY, CONTACT:
MERAKI SOLAR
PH: (850) 378-1257

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL 9
SIGN LOCATED AT RAPID SHUT DOWN DISCONNECT SWITCH [NEC 690.56(C)(3)].

LABELING DIAGRAM:

LABELING NOTES:
1. LABELS CALLED OUT ACCORDING TO ALL COMMON CONFIGURATIONS. ELECTRICIAN TO DETERMINE EXACT REQUIREMENTS IN THE FIELD PER CURRENT NEC AND LOCAL CODES AND MAKE APPROPRIATE ADJUSTMENTS.
2. LABELING REQUIREMENTS BASED ON THE 2017 NATIONAL ELECTRIC CODE, OSHA STANDARD 19010.145, ANSI Z535.
3. MATERIAL BASED ON THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
4. LABELS TO BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED [NEC 110.21(B)(3)]
5. LABELS TO BE A MINIMUM LETTER HEIGHT OF 3/8", WHITE ON RED BACKGROUND; REFLECTIVE, AND PERMANENTLY AFFIXED [IFC 605.11.1.1]

*ELECTRICAL DIAGRAM SHOWN ABOVE IS FOR LABELING PURPOSES ONLY. NOT AN ACTUAL REPRESENATION OF EQUIPMENT AND CONNECTIONS TO BE INSTALLED. LABEL LOCATIONS PRESENTED MAY VERY DEPENDING ON TYPE OF INTERCONNECTION METHOD AND LOCATION PRESENTED ON THE ELECTRICAL DIAGRAM PAGE.

MERAKI
ZERO DOWN SOLAR

CONTRACTOR INFORMATION:
Meraki Installers
484-663-3792
21 N New Warrington Rd
Pensacola, FL 32507
License # CVC57044
HVAC License # CAC1820256

SITE INFORMATION
Alexander Brooks
645 SW Troy St
Lake City, FL 32024
AC SYSTEM SIZE: 5 kW AC
DC SYSTEM SIZE: 5.92 kW DC
Lat, 30.155225
Long, -82.7002089
(16) Suntech STP370S - B60/Wnhb PV MODULES
(1) SolarEdge SE5000H-US (240V) INVERTER(S)

Clay Electric Cooperative

SCOTT WYSSLING LICENSE No. 81558 STATE OF FLORIDA PROFESSIONAL ENGINEER

Wyssling Consulting, PLLC
76 N Meadowbrook Drive
Alpine UT 84004 COA # RY34912

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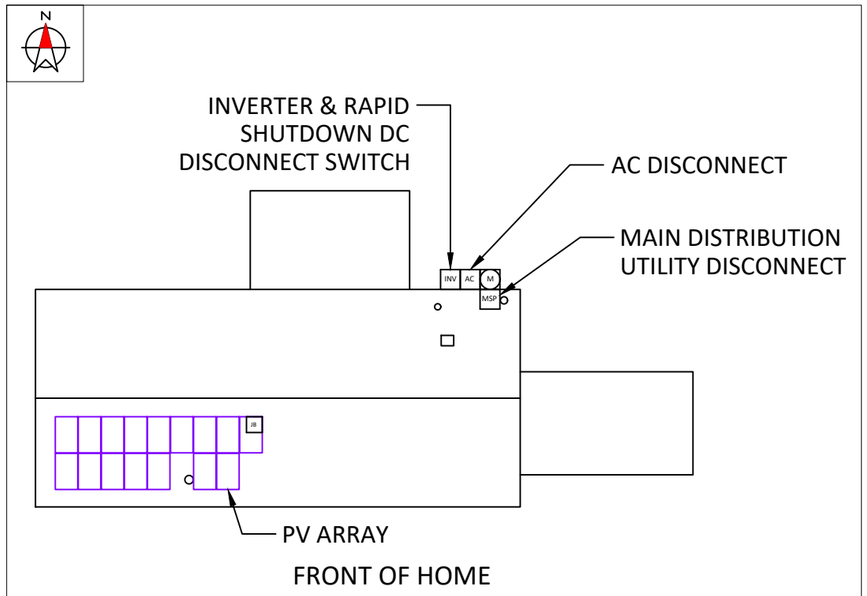
DRAWN BY: SoloCAD
DATE: June 1, 2022
LABELS - PV07

CAUTION

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM ROOF MOUNTED SOLAR ARRAYS WITH SAFETY DISCONNECTS AS SHOWN:



645 SW Troy St, Lake City FL 32024

DIRECTORY

PERMANENT PLAQUE OR DIRECTORY PROVIDING THE LOCATION OF THE SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC SYSTEM.

(ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS OUTLINED WITHIN: NEC 690.56(B)&(C), [NEC 705.10])

MERAKI
ZERO DOWN SOLAR

CONTRACTOR INFORMATION:

Meraki Installers
484-663-3792
21 N New Warrington Rd
Pensacola, FL 32507
License # CVC57044
HVAC License # CAC1820256

SITE INFORMATION

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Lake City, FL 32024
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(1) SolarEdge SE5000H-US (240V) INVERTER(S)

Clay Electric Cooperative

SCOTT E. WYSSLING LICENSE No. 81558 STATE OF FLORIDA PROFESSIONAL ENGINEER

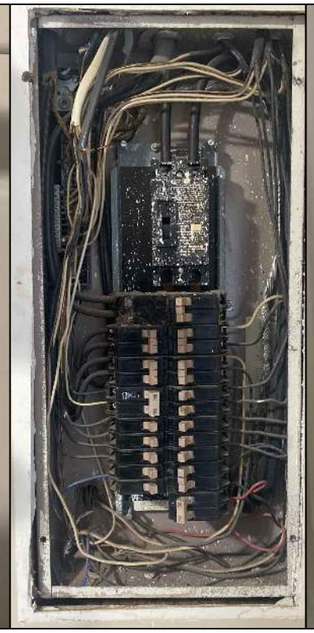
Wyssling Consulting, PLLC
76 N Meadowbrook Drive
Alpine UT 84004 COA # RY34912

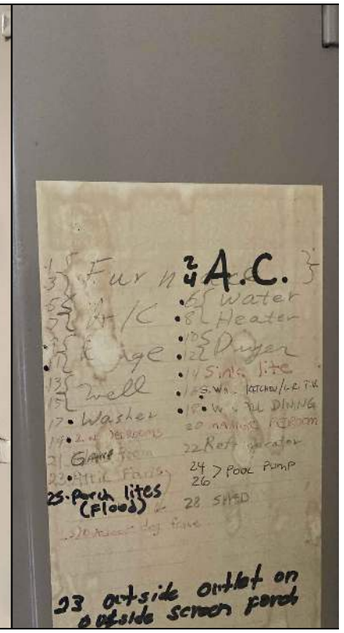
DRAWN BY: SoloCAD

DATE:
June 1, 2022

PLACARD - PV08

SITE PHOTOS:





MERAKI
ZERO DOWN SOLAR

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Clay Electric Cooperative

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PROFESSIONAL ENGINEER

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DRAWN BY: SoloCAD

DATE:
June 1, 2022

SITE PHOTOS - PV09

SUNTECH

Ultra S mini

120 HALF-CELL MONOFACIAL MODULE

350-370 Watt

STP*XXXS* - B60/Wnhb

Features

High module conversion efficiency
Module efficiency up to 20.3 % achieved through advanced cell technology and manufacturing process

Suntech current sorting process
Up to 2 % power loss caused by current mismatch could be diminished by current sorting technique to maximize system power output

Excellent weak light performance
More power output in weak light condition, such as cloudy, morning and sunset

Lower operating temperature
Lower operating temperature and temperature coefficient increases the power output

Extended wind and snow load tests
Module certified to withstand extreme wind (3800 Pascal) and snow loads (5400 Pascal) *

Withstanding harsh environment
Reliable quality leads to a better sustainability even in harsh environment like desert, farm and coastline

Certifications and standards:
IEC 61215, IEC 61730, conformity to CE

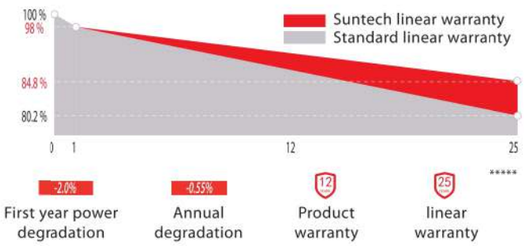
Trust Suntech to Deliver Reliable Performance Over Time

- World-class manufacturer of crystalline silicon photovoltaic modules
- Rigorous quality control meeting the highest international standards: ISO 9001, ISO 14001 and ISO17025
- Regular independently checked production process from international accredited institute/company
- Tested for harsh environments (IEC 61701, IEC 62716, DIN EN 60068-2-68) ****
- Long-term reliability tests
- 2 x 100% EL inspection ensuring defect-free modules

Special Cell Design

The unique cell design leads to reduced electrodes resistance and smaller current, thus enables higher fill factor. Meanwhile, it can reduce losses of mismatch and cell wear, and increase total reflection.

Industry-leading Warranty based on nominal power



IP68 Rated Junction Box

The Suntech IP68 rated junction box ensures an outstanding waterproof level, supports installations in all orientations and reduces stress on the cables.

* Please refer to Suntech Standard Module Installation Manual for details. ** Suntech reserves the right to the final interpretation of the warranty by Munich Re.
*** WEEE only for EU market. **** Please refer to Suntech Product Near-coast Installation Manual for details.
***** Please refer to Suntech Product Warranty for details.

SUNTECH

Electrical Characteristics

STC	STPXXXS-B60/Wnhb				
Maximum Power at STC (Pmax)	370 W	365 W	360 W	355 W	350 W
Optimum Operating Voltage (Vmp)	34.3 V	34.1 V	33.9 V	33.7 V	33.5 V
Optimum Operating Current (Imp)	10.79 A	10.71 A	10.62 A	10.54 A	10.46 A
Open Circuit Voltage (Voc)	40.9 V	40.7 V	40.5 V	40.3 V	40.1 V
Short Circuit Current (Isc)	11.49 A	11.42 A	11.35 A	11.28 A	11.21 A
Module Efficiency	20.3%	20.0%	19.7%	19.5%	19.2%
Operating Module Temperature	-40 °C to +85 °C				
Maximum System Voltage	1000 V DC (IEC)				
Maximum Series Fuse Rating	20 A				
Power Tolerance	0/+5 W				

STC: Irradiance 1000 W/m², module temperature 25 °C, AM=1.5;
Tolerance of Pmax is within +/- 3%.

NMOT	STPXXXS-B60/Wnhb				
Maximum Power at NMOT (Pmax)	278.2 W	274.3 W	270.7 W	266.8 W	263.3 W
Optimum Operating Voltage (Vmp)	32.0 V	31.8 V	31.6 V	31.5 V	31.3 V
Optimum Operating Current (Imp)	8.69 A	8.62 A	8.56 A	8.48 A	8.42 A
Open Circuit Voltage (Voc)	38.7 V	38.5 V	38.4 V	38.2 V	38.0 V
Short Circuit Current (Isc)	9.17 A	9.10 A	9.04 A	8.96 A	8.89 A

NMOT: Irradiance 800 W/m², ambient temperature 20 °C, AM=1.5, wind speed 1 m/s.

Temperature Characteristics

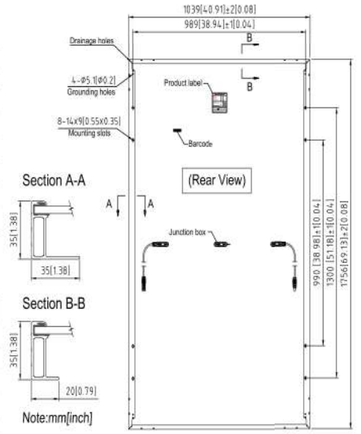
Nominal Module Operating Temperature (**NMOT**)	42 ± 2 °C
Temperature Coefficient of Pmax	-0.36%/°C
Temperature Coefficient of Voc	-0.304%/°C
Temperature Coefficient of Isc	0.050%/°C

Mechanical Characteristics

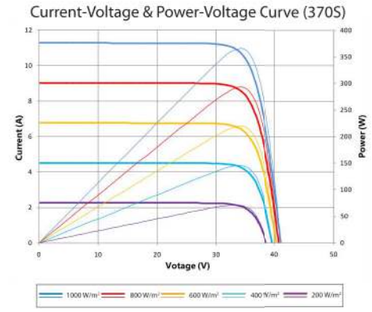
Solar Cell	Monocrystalline silicon 166 mm
No. of Cells	120 (6 × 20)
Dimensions	1756 × 1039 × 35 mm (69.1 × 40.9 × 1.4 inches)
Weight	20.3 kgs (44.8 lbs.)
Front Glass	3.2 mm (0.13 inches) tempered glass
Frame	Anodized aluminium alloy
Junction Box	IP68 rated (3 bypass diodes)
Output Cables	4.0 mm², Portrait: (-) 350 mm and (+) 160 mm in length Landscape: (-) 1300 mm and (+) 1300 mm in length or customized length
Connectors	MC4 compatible

Packing Configuration

Container	20' GP	40' HC
Pieces per pallet	31	31
Pallets per container	6	26
Pieces per container	186	806
Packaging box dimensions	1786 × 1130 × 1203 mm	
Packaging box weight	679 kg	



Current-Voltage & Power-Voltage Curve (370S)



Dealer information

Information on how to install and operate this product is available in the installation instruction. All values indicated in this data sheet are subject to change without prior announcement. The specifications may vary slightly. All specifications are in accordance with standard EN 50380. Color differences of the modules relative to the figures as well as discolorations of/in the modules which do not impair their proper functioning are possible and do not constitute a deviation from the specification.

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Power Optimizer

For North America

P320 / P340 / P370 / P400 / P401 / P405 / P485 / 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
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)
- Module-level voltage shutdown for installer and firefighter safety

solaredge.com

solaredge

Power Optimizer

For North America

P320 / P340 / P370 / P400 / P401 / P405 / P485 / P505

Optimizer model (typical module compatibility)	P320 (for 60-cell modules)	P340 (for high-power 60-cell modules)	P370 (for higher-power 60 and 72-cell modules)	P400 (for 72 & 96-cell modules)	P401 (for high power 60 and 72 cell modules)	P405 (for high-voltage modules)	P485 (for high-voltage modules)	P505 (for higher current modules)	
INPUT									
Rated Input DC Power(1)	320	350	370	400	405		485	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	48		60	80	60	125(2)		83(2)	Vdc
MPPT Operating Range	8 - 48		8 - 60	8 - 80	8-60	12.5 - 105		12.5 - 83	Vdc
Maximum Short Circuit Current (Isc)	11	11.02	11	10.1	11.75	11		14	Adc
Maximum DC Input Current	13.75			12.5	14.65	12.5		17.5	Adc
Maximum Efficiency	99.5								%
Weighted Efficiency	98.8							98.6	%
Overvoltage Category	II								
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)									
Maximum Output Current	15								Adc
Maximum Output Voltage	60					85			Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR SOLAREDGE INVERTER OFF)									
Safety Output Voltage per Power Optimizer	1 ± 0.1								Vdc
STANDARD COMPLIANCE									
EMC	FCC Part15 Class B, IEC61000-6-2, IEC61000-6-3								
Safety	IEC62109-1 (class II safety), UL1741								
Material	UL94 V-0, UV Resistant								
RoHS	Yes								
INSTALLATION SPECIFICATIONS									
Maximum Allowed System Voltage	1000								Vdc
Compatible inverters	All SolarEdge Single Phase and Three Phase inverters								
Dimensions (W x L x H)	129 x 153 x 27.5 / 5.1 x 6 x 1.1		129 x 153 x 33.5 / 5.1 x 6 x 1.3	129 x 153 x 29.5 / 5.1 x 6 x 1.16	129 x 159 x 49.5 / 5.1 x 6.3 x 1.9			129 x 162 x 59 / 5.1 x 6.4 x 2.3	mm / in
Weight (including cables)	630 / 1.4		750 / 1.7	655 / 1.5	845 / 1.9			1064 / 2.3	gr / lb
Input Connector	MC4(3)						Single or dual MC4(3)(4)	MC4(3)	
Input Wire Length	0.16 / 0.52			0.16 or 0.9 /0.52 or 2.95(5)	0.16 / 0.52				m / ft
Output Wire Type / Connector	Double Insulated / MC4								
Output Wire Length	0.9 / 2.95	1.2 / 3.9							m / ft
Operating Temperature Range(6)	-40 to +85 / -40 to +185								°C / °F
Protection Rating	IP68 / NEMA6P								
Relative Humidity	0 - 100								%

(1) Rated power of the module at STC will not exceed the optimizer "Rated Input DC Power". Modules with up to +5% power tolerance are allowed
(2) NEC 2017 requires max input voltage be not more than 80V
(3) For other connector types please contact SolarEdge
(4) For dual version for parallel connection of two modules use P485-4NMDMRM. In the case of an odd number of PV modules in one string, installing one P485 dual version power optimizer connected to one PV module. When connecting a single module seal the unused input connectors with the supplied pair of seals
(5) Longer inputs wire length are available for use. For 0.9m input wire length order P401-xxxLxxx
(6) For ambient temperature above +85°C / +185°F power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details

PV System Design Using a SolarEdge Inverter(7)(8)		Single Phase HD-Wave	Single phase	Three Phase for 208V grid	Three Phase for 277/480V grid	
Minimum String Length (Power Optimizers)	P320, P340, P370, P400, P401	8		10	18	
	P405, P485, P505	6		8	14	
Maximum String Length (Power Optimizers)		25		25	50(9)	
Maximum Power per String		5700 (6000 with SE7600-US - SE11400-US)	5250	6000(10)	12750(11)	W
Parallel Strings of Different Lengths or Orientations		Yes				

(7) For detailed string sizing information refer to: http://www.solaredge.com/sites/default/files/string_sizing_na.pdf
(8) It is not allowed to mix P405/P485/P505 with P320/P340/P370/P400/P401 in one string
(9) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement
(10) For 208V grid: it is allowed to install up to 6,500W per string when the maximum power difference between each string is 1,000W
(11) For 277/480V grid: it is allowed to install up to 15,000W per string when the maximum power difference between each string is 2,000W

Intertek RoHS

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

12-25 YEAR WARRANTY

Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking 99% weighted 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, NEC 2017 and NEC 2020 per article 690.11 and 690.12
- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Small, lightweight, and easy to install both outdoors or indoors
- Built-in module-level monitoring
- Optional: Faster installations with built-in consumption metering (1% accuracy) and production revenue grade metering (0.5% accuracy, ANSI C12.20)

solaredge.com

solaredge

Single Phase Inverter with HD-Wave Technology

for North America

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

MODEL NUMBER	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
APPLICABLE TO INVERTERS WITH PART NUMBER	SEXXXXH-XXXXXBXX4							
OUTPUT								
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[1]							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							
INPUT								
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[2]	8.5	10.5	13.5	16.5	20	27	30.5	Adc
Maximum Input Current @208V[2]	-	9	-	13.5	-	-	27	Adc
Max. Input Short Circuit Current	45							Adc
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600kΩ Sensitivity							
Maximum Inverter Efficiency	99	99.2						%
CEC Weighted Efficiency	99						99 @ 240V 98.5 @ 208V	%
Nighttime Power Consumption	< 2.5							W

(1) For other regional settings please contact SolarEdge support
(2) A higher current source may be used; the inverter will limit its input current to the values stated

Single Phase Inverter with HD-Wave Technology

for North America

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

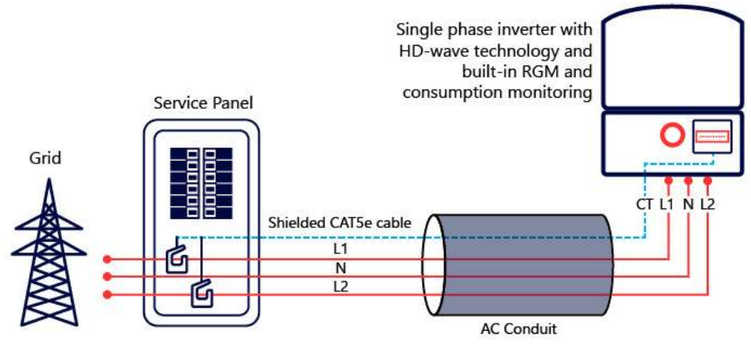
MODEL NUMBER	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
ADDITIONAL FEATURES								
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)							
Revenue Grade Metering, ANSI C12.20	Optional[3]							
Consumption metering								
Inverter Commissioning	With the SetApp mobile application using Built-in Wi-Fi Access Point for Local Connection							
Rapid Shutdown - NEC 2014, NEC 2017 and NEC 2020, 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect							
STANDARD COMPLIANCE								
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							
INSTALLATION SPECIFICATIONS								
AC Output Conduit Size / AWG Range	1" Maximum / 14-6 AWG					1" Maximum /14-4 AWG		
DC Input Conduit Size / # of Strings / AWG Range	1" Maximum / 1-2 strings / 14-6 AWG					1" Maximum / 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		dBA
Cooling	Natural Convection							
Operating Temperature Range	-40 to +140 / -40 to +60[4]							°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)							

(3) Inverter with Revenue Grade Meter P/N: SExxxxH-US000BNC4; Inverter with Revenue Grade Production and Consumption Meter P/N: SExxxxH-US000BNI4 . For consumption metering, current transformers should be ordered separately: SEACT0750-200NA-20 or SEACT0750-400NA-20. 20 units per box

(4) Full power up to at least 50°C / 122°F, for power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf

How to Enable Consumption Monitoring

By simply wiring current transformers through the inverter's existing AC conduits and connecting them to the service panel, homeowners will gain full insight into their household energy usage helping them to avoid high electricity bills



RoHS

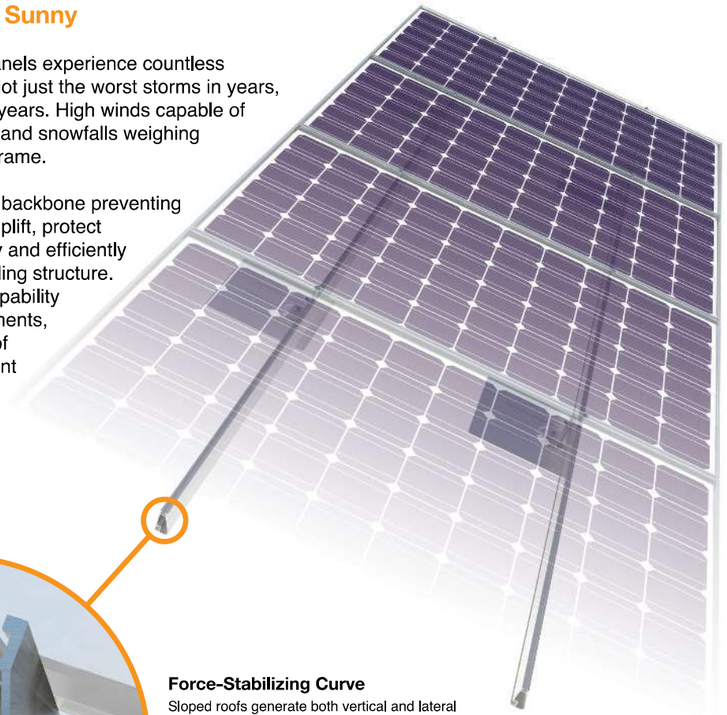
Tech Brief

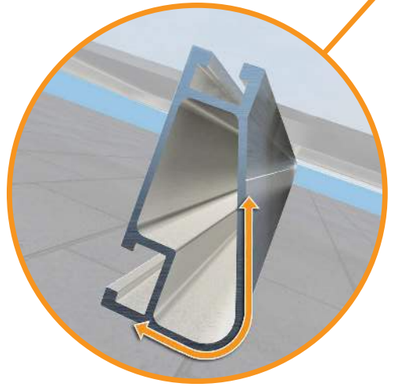
XR Rail Family

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 6000-series aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.

Tech Brief

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 spans up to 6 feet, while remaining light and economical.

- 6’ spanning capability
- Moderate load capability
- Clear & black 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 10 feet.

- 10’ 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 up to 12 feet for commercial applications.

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

Rail Selection

The table below was prepared in compliance with applicable engineering codes and standards.* Values are based on the following criteria: ASCE 7-16, Gable Roof Flush Mount, Roof Zones 1 & 2e, Exposure B, Roof Slope of 8 to 20 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed certification letters.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4’	5’ 4”	6’	8’	10’	12’
None	90	XR10		XR100		XR1000	
	120						
	140						
	160						
20	90						
	120						
	140						
	160						
30	90						
	160						
40	90						
	160						
80	160						
120	160						

*Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification letters for actual design guidance.

S-5!®

The Right Way!

The right way to attach almost anything to metal roofs!

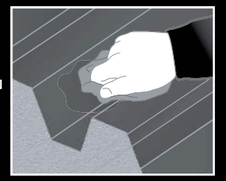
ProteaBracket™

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!® 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.

1


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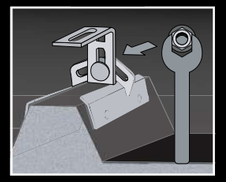

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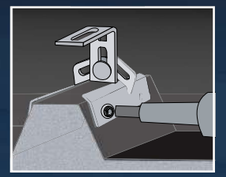

ProteaBracket™

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

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S-5!®

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** 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!® holding strength is unmatched in the industry.

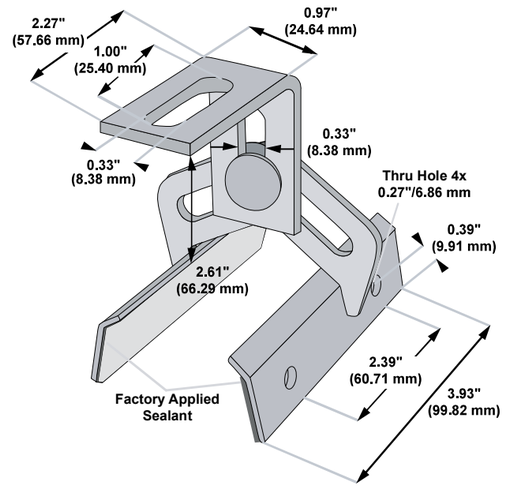
Multiple Attachment Options:

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!® 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.

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