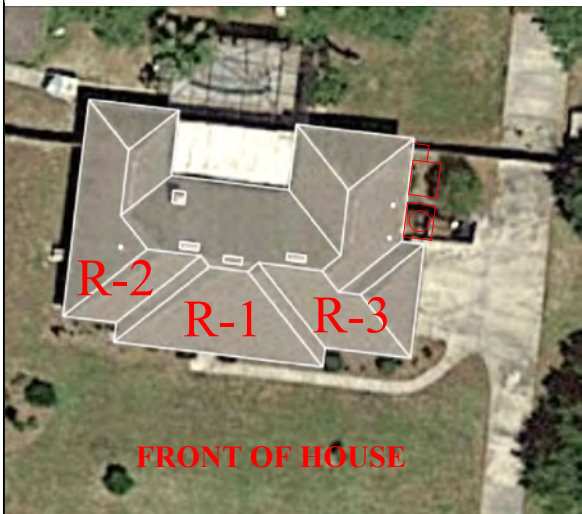




Inverter Type: (1) Solaredge SE11400H-US
PV Panel: (35) Q.PEAK DUO BLK-G6+/TS 340
Racking: Iron Ridge XR-10
Total Wattage: 11,900W DC
Roof Type: Composition Shingles
Wind Load: 20 to 27 Deg
Fastener Type: Use Unirac Flashlocs

Sheet Index	
S-1	Cover Sheet / Site Plan
S-2	Detail
E-1	One - Line
E-2	Electrical Code
S-1A	Mounting Plan

General Notes:
-SolarEdge SE11400H-US Inverter located near utility meter
-SolarEdge S440 Optimizers are located on roof behind each module.
-First responder access maintained and from adjacent roof.
-Wire run from array to connection is 60 feet.



605 W Lumsden Rd,
Brandon, FL 33511
855-577-7999

Legend

 Ground Access

 Utility Meter

 PV Disconnect

 3'

 1'-6"

 Chimney

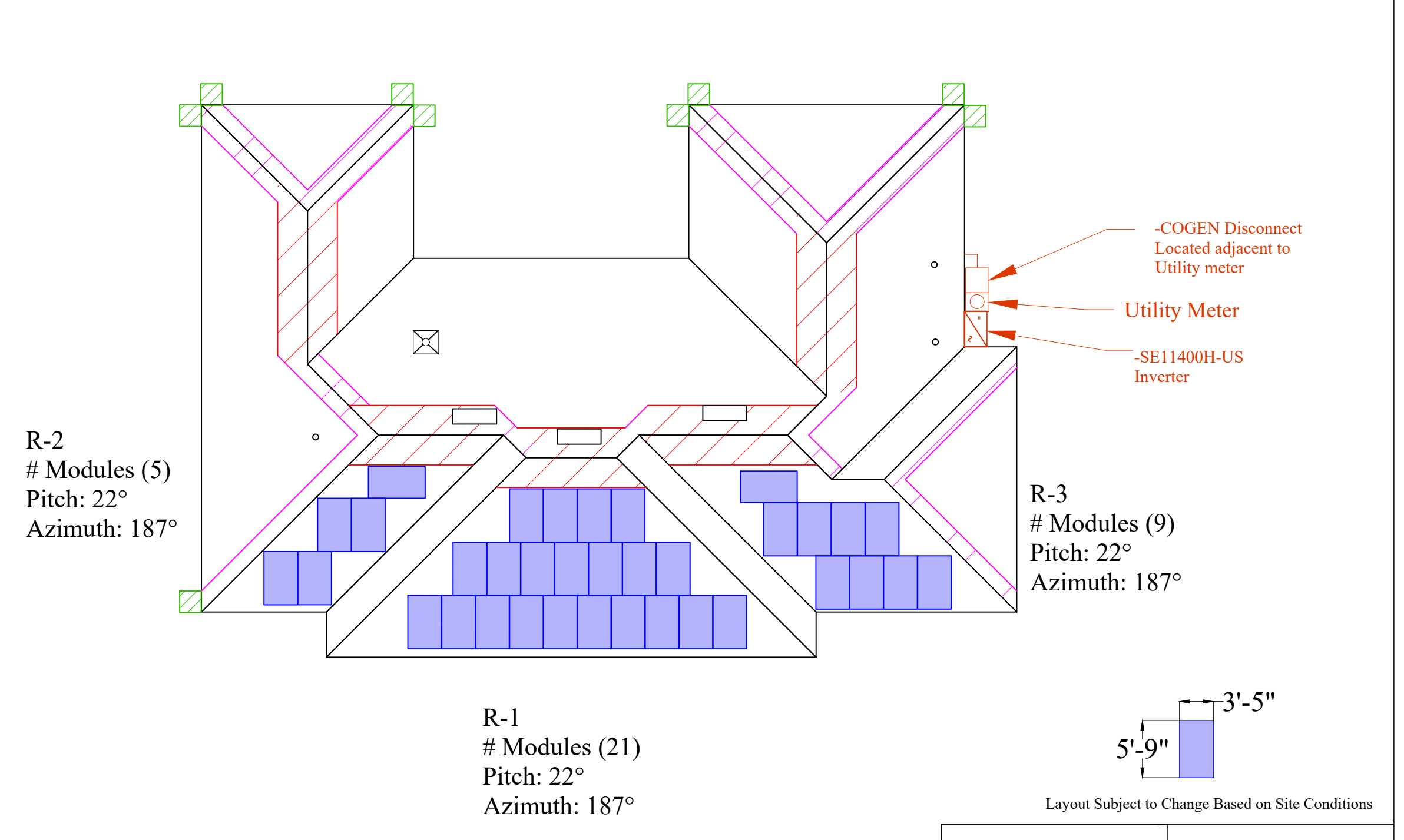
 Satellite

 Vent Pipe

 SolarEdge Inverter

First responder access

Meets the requirements of the following- (2020 FL Residential Code & FBC, 7th Edition (2020 International Residential Code) - 2nd Printing modified by the FL Building Standards, 2020 Florida Building Energy Conservation Code 7th edition, County of Columbia Code, 2017 National Electric Code.)



System meets the requirements of NFPA 70th Edition, Chapter 11.12

Install will be done to Manufacturer Spec

FRONT OF HOUSE

Meets All Editions of Florida Fire Prevention Code 2020 7th Edition
Meets all requirements of NFPA-1 7th Edition and NFPA-101



3' Access Pathway

Represents all Fire Clearance including Alternative methods

1st Responder Access minimum of 36" unobstructed as per Section R324 of the 2020 IRC

Customer Info:

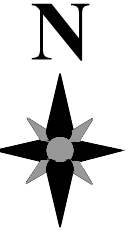
Jose Moreno
359 SW Ridgeview Pl
Lake City , FL
32024

Godwin Engineering and Design, LLC
8378 Foxtail Loop
Pensacola, FL 32526
D. Chad Godwin, PE
Chad@godwineng.com

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14:08:21
'00'05



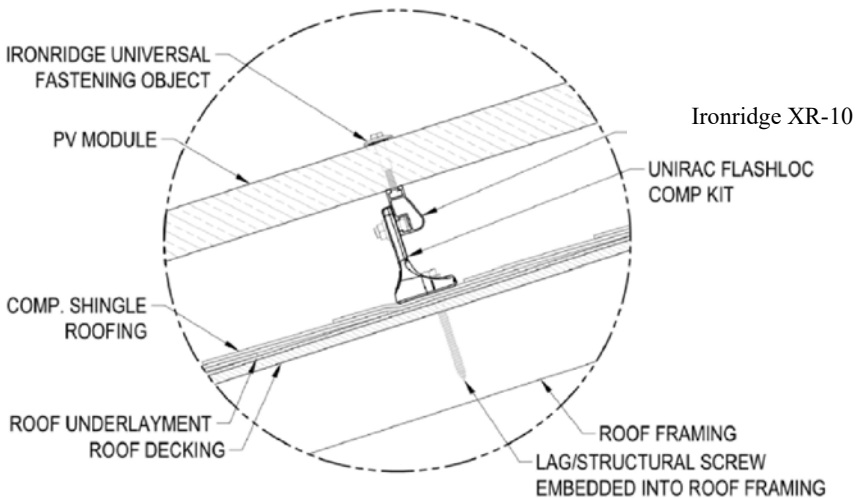
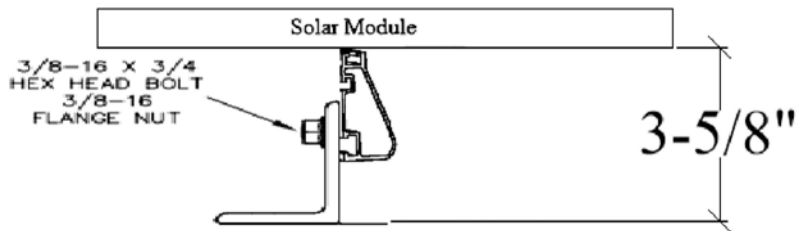
Date: 5/16/2022
Drawn by: CC
Revised by: NG
Rev #: 01
Rev Date: 07/19/2022
Page: 11"x17" S-1



Compass for Aerial



Ironridge XR-10



Install will be done to Manufacturer Spec

General Notes:

- Flashlocs are secured to roof rafters.
- @ 72" O.C. in Zone 1, @ 48" O.C in Zone 2e,
- @ 48" O.C. in Zone 2r, @ 48" O.C in Zone 3
- using 5/16" x 4" stainless steel Lag bolts.
- Subject roof has One layer.
- All penetrations are sealed and flashed.

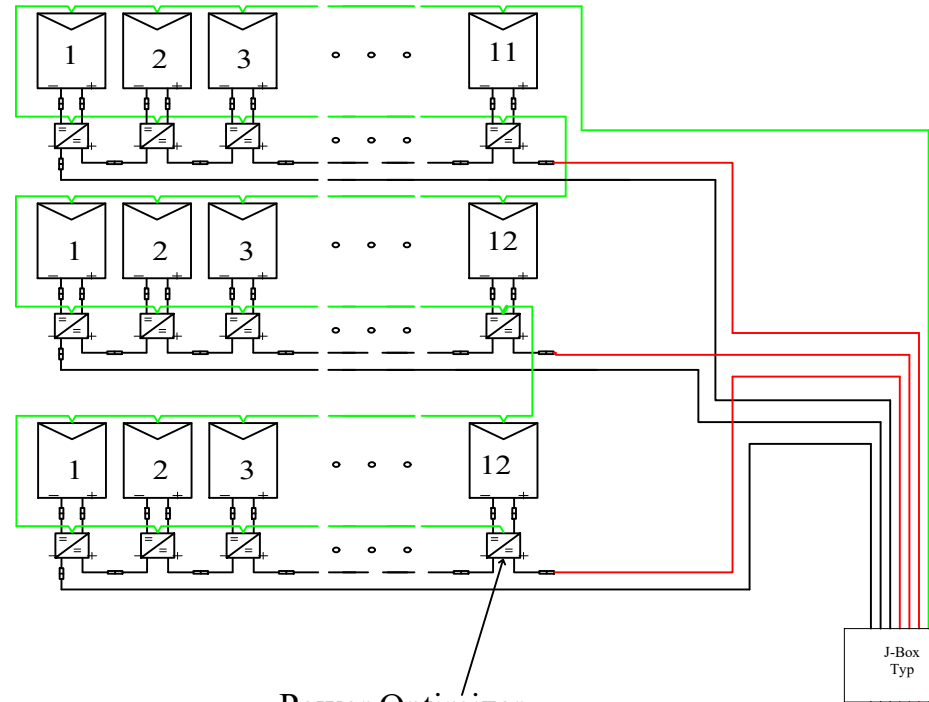
Godwin Engineering and Design, LLC
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Pensacola, FL 32526
D. Chad Godwin, PE
Chad@godwineng.com

Donnie C Godwin
2022.07.21
'00'05- 14:08:48

Roof Section	Pitch	Roof Rafter and Spacing	Overhang	Notes:
R1-R3	5/12	2"x4" @ 24 O.C.	12"	Truss
-Roof Height 15' -Per 2020 FBC, the Roof Mounted PV System will be subject to the following design criteria: Design Wind Speed(Vult) - 120mph 3 sec gust, Exposure Category - C -Designed as per ASCE7-16		Inverter Type: (1) Solaredge SE11400H-US PV Panel: (35) Q.PEAK DUO BLK-G6+/TS 340 Racking: Iron Ridge XR-10 Total Wattage: 11,900W DC Roof Type: Composition Shingles Wind Load: 20 to 27 Deg Fastener Type: Use Unirac Flashlocs		Customer Info: Jose Moreno 359 SW Ridgeview Pl Lake City , FL 32024

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Brandon, FL 33511
855-577-7999

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Page:	11"X17" S-2



- Equipment list:
- PV:
(35) Q.PEAK DUO BLK-G6+/TS 340

(35) SolarEdge Power Optimizer S440
(1) string of (11)
(1) string of (12)
(1) string of (12)
Inverter:
(1) SolarEdge SE11400H-US
SolarEdge AC/DC Safety Switch

Combiner:
AC Disconnect:
60A Disconnect

All wiring to meet the 2017 NEC and 2018 Energy Code

PHOTOVOLTIC SYSTEM DC DISCONNECT
MAX CIRCUIT CURRENT: 30.5A
MAX POWER POINT VOLTAGE: 400 VDC
MAX SYSTEM VOLTAGE: 480 DC
MAX RATED OUTPUT CURRENT: 15 A

WARNING
ELECTRIC SHOCK HAZARD
THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

Apply to DC disconnect/inverter

Apply to each J box, combiner box, disconnect, and device where energized, ungrounded circuits maybe exposed during service.

3/8 IN MIN. TEXT

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.

3/16 IN MIN. TEXT

! WARNING !

POWER SOURCE OUTPUT CONNECTION: DO NOT RELOCATE THIS OVERCURRENT DEVICE

PHOTOVOLTAIC SYSTEM ! AC DISCONNECT !

RATED AC OUTPUT CURRENT: 47.5A
NOMINAL OPERATING VOLTAGE: 240VAC

(6) #10 AWG Wire
(1) #8 EGC
In 3/4" Metal Conduit

SolarEdge Inverter SE11400H-US
w/ Integrated Disconnect

Manual Lockable Disconnect

60A Service Rated Fused Disconnect
Neutral to Ground Bond
AC Disconnect
60A Fuse

Located Adjacent to Utility Meter

Main Service Panel
200A Main

Line Side Tap

In Compliance with
NEC 705.12(B)

Refer to NEC 312.8 for Conditions on taps in switch and over current devices Enclosures. If the conditions are not met a tap box will need to be installed and revision completed.

Inverter Output Ckt	
To Overcurrent Protection Device	
AC Max Output Current	47.5
AC Max Output Current * 125%	59.4
Overcurrent Protection (A)	60
No. of Current Carrying Cond	<4
Conductor Gauge (AWG)	6

		Conduit (in)	L1,L2,N (Awg)	Ground (Awg)	OCPD
After Inverter	B	0.75	6	8	60
To Line Side Tap	C	0.75	6	N/A	60

- GEC NOTES
- Ungrounded system per 690.41(A)(4)
 - GEC must be installed per 250.64
 - GEC must be continuous un-spliced or irreversibly spliced from inverter to existing service ground system or continuous from the arrays to the existing service ground system.
 - GEC must be min #8 AWG and installed in conduit
 - If GEC is not in conduit, it must be #6 min
- Disconnects will be Visible, lockable, adjacent to and within 10' of utility meter
- All Labels & Markings for photovoltaic system will be reflective and meet all requirements for NFPA 11.12

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605 W Lumsden Rd,
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855-577-7999

Date:	5/16/2022	Inverter Type: SolarEdge SE5000H-US PV Panel: (35) Q.PEAK DUO BLK-G6+/TS 340 Total Wattage: 11,900W DC
Drawn by:	CC	
Revised by:	NG	
Rev #: 01		
Rev Date:	07/19/2022	
Page:	11"x17" E-1	

Including the label below

**In Case of Emergency Call
ACDC Solar LLC
at 855-577-7999**

Meets 11.12.2.1.5

Note:
-All wiring to meet the 2017 NEC and Florida electric codes.
60A Disconnect
-Type of conduit to be determined on site by contractor.

Install will be done to Manufacturer Spec

Customer Info:

Jose Moreno
359 SW Ridgeview Pl
Lake City , FL
32024

[illegible]

Install will be done to Manufacturer Spec

Jose Moreno
359 SW Ridgeview Pl
Lake City , FL
32024

Godwin Engineering and
Design, LLC
8378 Foxtail Loop
Pensacola, FL 32526
D. Chad Godwin, PE
Chad@godwineng.com

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Godwin
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'00'05-



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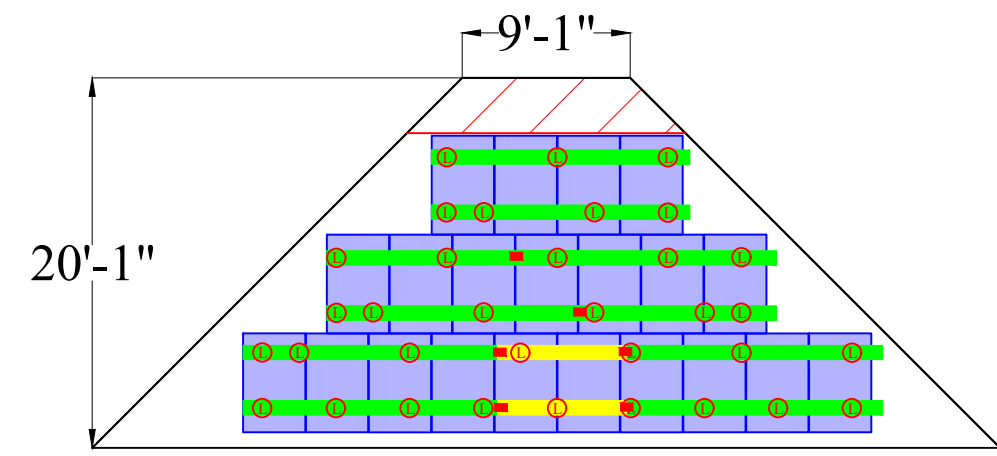
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Brandon, FL 33511
855-577-7999

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Drawn by:	CC
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Rev #:	01
Rev Date:	07/19/2022
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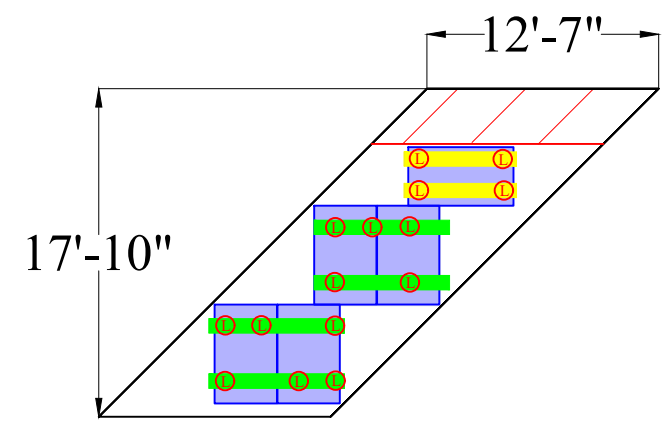
Inverter Type:
SolarEdge SE5000H-US
PV Panel:
(35)
Q.PEAK DUO BLK-G6+/TS 340
Total Wattage:
11,900W DC

Ⓛ ← Proposed Mounting locations

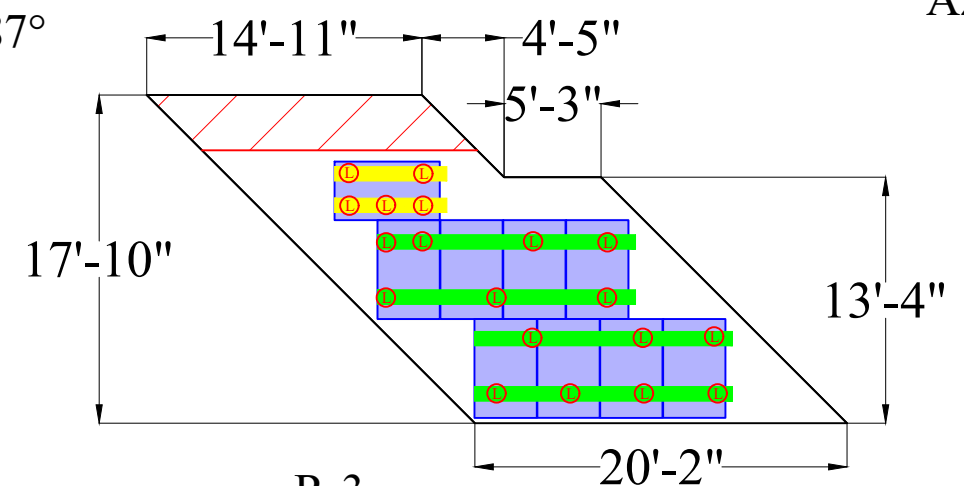
- Iron Ridge XR-10 Rail
- 14' 21
- 7'
- 4'
- 6 ■ Splice Bar
- 68 Unirac Flashloc
- 88 Iron Ridge UFO's
- 36 Iron Ridge Sleeves/End Caps
- 3 Roof Top Combiner
- 9 Iron Ridge Ground Lugs
- 35 Q.PEAK DUO BLK-G6+/TS 340
- 1 Solaredge SE11400H-US
- 1 60A Fused Disconnect
- 2 60A Fuses
- 35 S440 Optimizer



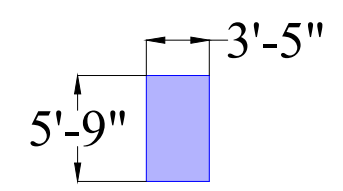
R-1
Modules (21)
Pitch: 22°
Azimuth: 187°



R-2
Modules (5)
Pitch: 22°
Azimuth: 187°



R-3
Modules (9)
Pitch: 22°
Azimuth: 187°



Plans satisfy zones FBC-1510.7.1
Install will be done to Manufacturer Spec

- Zone 1: Max cantilever is 24" as per manufacturer spec.
Max Cantilever = Max Span * ($\frac{1}{3}$) = 72" * ($\frac{1}{3}$) = 24"
- Zone 2e: Max cantilever is 16" as per manufacturer spec.
Max Cantilever = Max Span * ($\frac{1}{3}$) = 48" * ($\frac{1}{3}$) = 16"
- Zone 2r: Max cantilever is 16" as per manufacturer spec.
Max Cantilever = Max Span * ($\frac{1}{3}$) = 48" * ($\frac{1}{3}$) = 16"
- Zone 3: Max cantilever is 16" as per manufacturer spec.
Max Cantilever = Max Span * ($\frac{1}{3}$) = 48" * ($\frac{1}{3}$) = 16"

Inverter Type:	(1) Solaredge SE11400H-US	Customer Info: Jose Moreno 359 SW Ridgeview Pl Lake City , FL 32024
PV Panel:	(35) Q.PEAK DUO BLK-G6+/TS 340	
Racking:	Iron Ridge XR-10	
Total Wattage:	11,900W DC	
Roof Type:	Composition Shingles	
Wind Load:	20 to 27 Deg	
Fastener Type:	Use Unirac Flashlocs	

Godwin Engineering and Design, LLC 8378 Foxtail Loop Pensacola, FL 32526 D. Chad Godwin, PE Chad@godwineng.com	Donnie C Godwin 2022.07.21 14:12:46 '00'05-
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Rev #:	01
Rev Date:	07/19/2022
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powered by
Q.ANTUM DUO

Q.PEAK DUO BLK-G6+ /TS

330-345

ENDURING HIGH PERFORMANCE



Q.ANTUM TECHNOLOGY: LOW LEVELIZED COST OF ELECTRICITY
Higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 19.5%.

INNOVATIVE ALL-WEATHER TECHNOLOGY
Optimal yields, whatever the weather with excellent low-light and temperature behavior.

ENDURING HIGH PERFORMANCE
Long-term yield security with Anti LID and Anti PID Technology¹, Hot-Spot Protect and Traceable Quality Tra.Q™.

ZEP COMPATIBLE™ FRAME DESIGN
High-tech black Zep Compatible™ frame, for improved aesthetics, easy installation and increased safety.

A RELIABLE INVESTMENT
Inclusive 25-year product warranty and 25-year linear performance warranty².

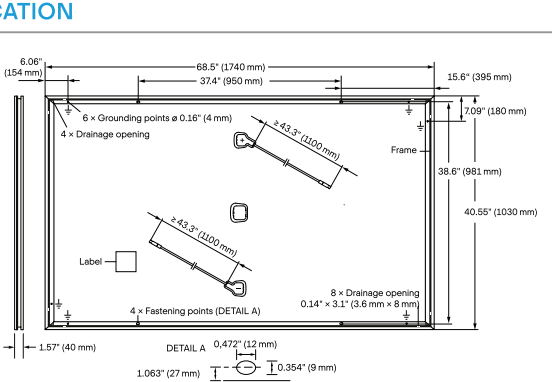
STATE OF THE ART MODULE TECHNOLOGY
Q.ANTUM DUO combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology.

¹ APT test conditions according to IEC/TS 62804-1:2015, method B (~1500V, 168h)
² See data sheet on rear for further information

THE IDEAL SOLUTION FOR:



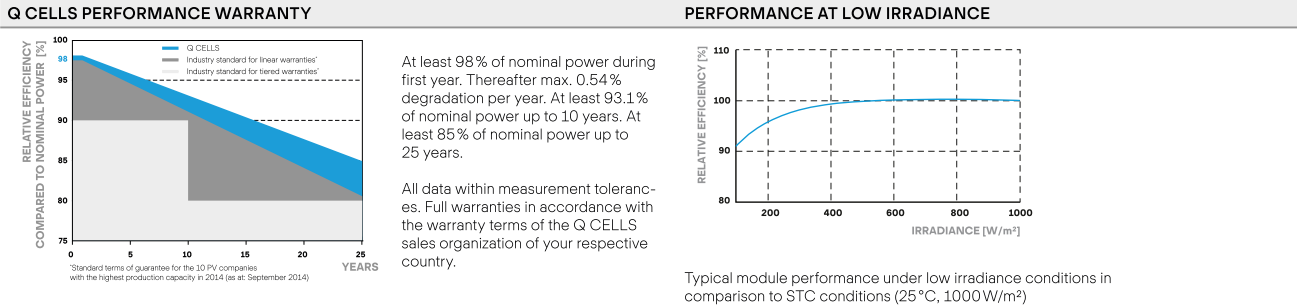
Rooftop arrays on commercial and industrial buildings



Format	68.5 × 40.6 × 1.57 in (including frame) (1740 × 1030 × 40 mm)
Weight	47.4 lbs (21.5 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodized aluminum
Cell	6 × 20 monocrystalline Q.ANTUM solar half cells
Junction Box	2.09-3.98 × 1.26-2.36 × 0.59-0.71 in (53-101 × 32-60 × 15-18 mm), Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥ 43.3 in (1100 mm), (-) ≥ 43.3 in (1100 mm)
Connector	Stäubli MC4; IP68

ELECTRICAL CHARACTERISTICS					
POWER CLASS		330	335	340	345
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC ¹ (POWER TOLERANCE +5 W / -0 W)					
Minimum	Power at MPP ¹	P _{MPP} [W]	330	335	340
	Short Circuit Current ¹	I _{SC} [A]	10.41	10.47	10.58
	Open Circuit Voltage ¹	V _{OC} [V]	40.15	40.41	40.92
	Current at MPP	I _{MPP} [A]	9.91	9.97	10.07
	Voltage at MPP	V _{MPP} [V]	33.29	33.62	34.25
		Efficiency ¹	η [%]	≥ 18.4	≥ 18.7
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT ²					
Minimum	Power at MPP	P _{MPP} [W]	247.0	250.7	254.5
	Short Circuit Current	I _{SC} [A]	8.39	8.43	8.52
	Open Circuit Voltage	V _{OC} [V]	37.86	38.10	38.59
	Current at MPP	I _{MPP} [A]	7.80	7.84	7.89
	Voltage at MPP	V _{MPP} [V]	31.66	31.97	32.27

¹ Measurement tolerances P_{MPP} ± 3%; I_{SC}; V_{OC} ± 5% at STC: 1000 W/m², 25 ± 2°C, AM 1.5 according to IEC 60904-3 • ² 800 W/m², NMOT, spectrum AM 1.5



TEMPERATURE COEFFICIENTS					
Temperature Coefficient of I _{SC}	α	[%/K]	+0.04	Temperature Coefficient of V _{OC}	β
Temperature Coefficient of P _{MPP}	γ	[%/K]	-0.36	Nominal Module Operating Temperature	NMOT
				[°F]	109 ± 5.4 (43 ± 3°C)

PROPERTIES FOR SYSTEM DESIGN			
Maximum System Voltage V _{sys}	[V]	1000 (IEC)/1000 (UL)	PV module classification
Maximum Series Fuse Rating	[A DC]	20	Class II
Max. Design Load, Push / Pull (UL) ³	[lbs / ft²]	50 (2400 Pa) / 50 (2400 Pa)	Fire Rating based on ANSI / UL 61730
Max. Test Load, Push / Pull (UL) ³	[lbs / ft²]	75 (3600 Pa) / 75 (3600 Pa)	TYPE 2
			Permitted Module Temperature on Continuous Duty
			-40°F up to +185°F (-40°C up to +85°C)

³ See Installation Manual

QUALIFICATIONS AND CERTIFICATES



Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Engineered in Germany



Hanwha Q CELLS America Inc.
400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | TEL +1 949 748 59 96 | EMAIL inquiry@us.q-cells.com | WEB www.q-cells.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

12-25
YEAR
WARRANTY



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
- Built-in module-level monitoring
- Outdoor and indoor installation
- Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)

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

SE3000H-US SE3800H-US SE5000H-US SE6000H-US SE7600H-US SE10000H-US SE11400H-US								
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
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	600ka Sensitivity							
Maximum Inverter Efficiency	99	99.2						%
CEC Weighted Efficiency	99						99 @ 240V 98.5 @ 208V	%
Nighttime Power Consumption	< 2.5							W
ADDITIONAL FEATURES								
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)							
Revenue Grade Data, ANSI C12.20	Optional ⁽³⁾							
Rapid Shutdown - NEC 2014 and 2017 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	3/4" minimum / 14-6 AWG				3/4" minimum /14-4 AWG			
DC Input Conduit Size / # of Strings / AWG Range	3/4" minimum / 1-2 strings / 14-6 AWG				3/4" minimum / 1-3 strings / 14-6 AWG			
Dimensions with Safety Switch (HxWxD)	17.7 x 14.6 x 6.8 / 450 x 370 x 174				21.3 x 14.6 x 7.3 / 540 x 370 x 185			in / mm
Weight with Safety Switch	22 / 10		25.1 / 11.4		26.2 / 11.9		38.8 / 17.6	lb / kg
Noise	< 25				<50			dBA
Cooling	Natural Convection							
Operating Temperature Range	-40 to +140 / -25 to +60 ⁽⁴⁾ (-40°F / -40°C option) ⁽⁵⁾							°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)							

⁽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

⁽³⁾ Revenue grade inverter P/N: SExxxxH-US000NNC2

⁽⁴⁾ For power de-rating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf>

⁽⁵⁾ -40 version P/N: SExxxxH-US000NNU4

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RoHS

Power Optimizer For Residential Installations

S440, S500



POWER OPTIMIZER

Enabling PV power optimization at the module level

- Specifically designed to work with SolarEdge residential inverters
- Mitigates all types of module mismatch loss, from manufacturing tolerance to partial shading
- Detects abnormal PV connector behavior, preventing potential safety issues*
- Faster installations with simplified cable management and easy assembly using a single bolt
- Module-level voltage shutdown for installer and firefighter safety
- Flexible system design for maximum space utilization
- Superior efficiency (99.5%)
- Compatible with bifacial PV modules

* Functionality subject to inverter model and firmware version

[solaredge.com](https://www.solaredge.com)

solaredge

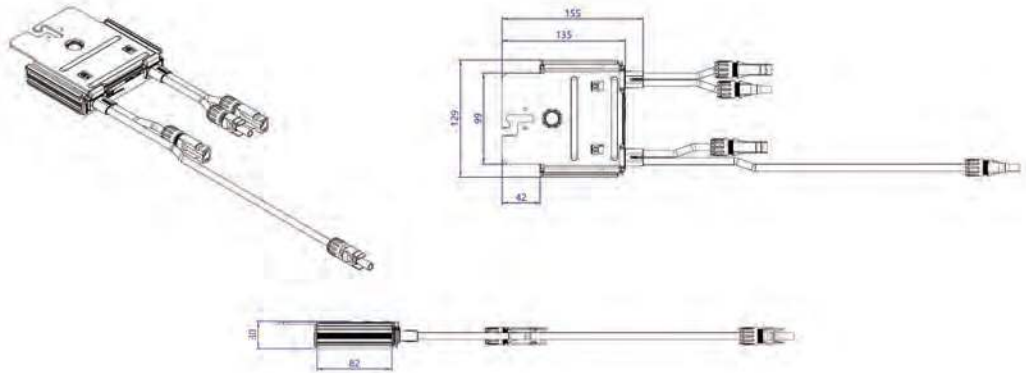
Power Optimizer For Residential Installations S440, S500

	S440	S500	UNIT
Rated Input DC Power ⁽¹⁾	440	500	W
Absolute Maximum Input Voltage (Voc)	60		Vdc
MPPT Operating Range	8 - 60		Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	14.5	15	Adc
Maximum Efficiency	99.5		%
Weighted Efficiency	98.6		%
Overtoltage Category	II		
OUTPUT DURING OPERATION			
Maximum Output Current	15		Adc
Maximum Output Voltage	60		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)			
Safety Output Voltage per Power Optimizer	1		Vdc
STANDARD COMPLIANCE			
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3, CISPR11, EN-55011		
Safety	IEC62109-1 (class II safety), UL1741		
Material	UL94 V-0, UV Resistant		
RoHS	Yes		
Fire Safety	VDE-AR-E 2100-712:2013-05		
INSTALLATION SPECIFICATIONS			
Maximum Allowed System Voltage	1000		Vdc
Dimensions (W x L x H)	129 x 155 x 30		mm
Weight (including cables)	655 / 1.5		gr / lb
Input Connector	MC4 ⁽²⁾		
Input Wire Length	0.1		m
Output Connector	MC4		
Output Wire Length	(+) 2.3, (-) 0.10		m
Operating Temperature Range ⁽³⁾	-40 to +85		°C
Protection Rating	IP68 / NEMA6P		
Relative Humidity	0 - 100		%

(1) Rated power of the module at STC will not exceed the Power Optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed
(2) For other connector types please contact SolarEdge
(3) For ambient temperature above +70°C / +158°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		Single Phase HD-Wave	Three Phase	Three Phase for 277/480V Grid	
Minimum String Length (Power Optimizers)	S440, S500	8	16	18	
Maximum String Length (Power Optimizers)		25	50		
Maximum Nominal Power per String ⁽⁴⁾		5700	11250 ⁽⁵⁾	12750 ⁽⁶⁾	W
Parallel Strings of Different Lengths or Orientations		Yes			

(4) If the inverters rated AC power ≤ maximum nominal power per string, then the maximum power per string will be able to reach up to the inverters maximum input DC power Refer to: <https://www.solaredge.com/sites/default/files/se-power-optimizer-single-string-design-application-note.pdf>
(5) For the 230/400V grid: it is allowed to install up to 13,500W per string when the maximum power difference between each string is 2,000W
(6) For the 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
(7) It is not allowed to mix S-series and P-series Power Optimizers in new installations



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CE RoHS

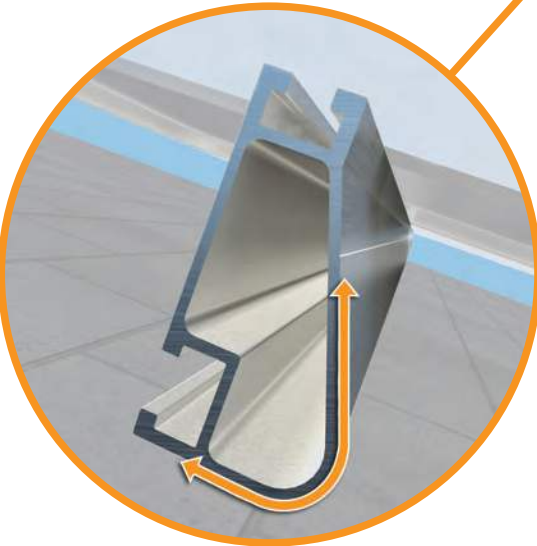
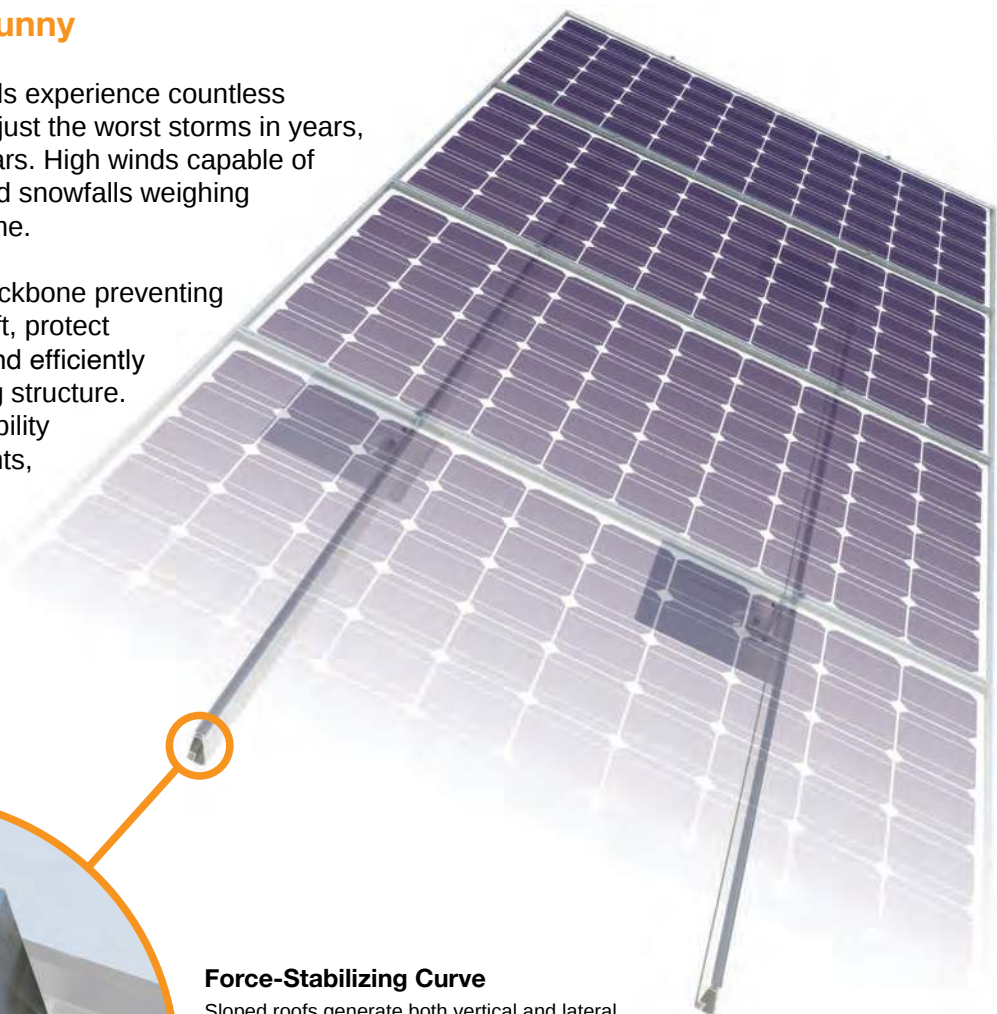


XR Rail Family

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.



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.

GODWIN ENGINEERING AND DESIGN, LLC

8378 Foxtail Loop, Pensacola, FL 32526 | (850)712-4219 | chad@godwineng.com

May 17, 2022

To: Columbia County Building Department
135 NE Hernando Ave
Lake City, FL 32055

Re: Moreno – Residential PV Roof Mount Installation
359 SW Ridgeview Pl
Lake City, FL 32024

Plan Reviewer,

This letter is regarding the installation of a new roof mounted Solar PV System on the existing residential structure at the address above. I have reviewed the attachment plan and have determined that the roof mounted PV system is in compliance with the applicable sections of the following Codes as amended and adopted by the jurisdiction:

2020 Florida Building Code 7th Edition, FBC
ASCE 7 Min. Design Loads for Buildings & Other Structures

Per 2020 FBC, the Roof Mounted PV system will be subject to the following design criteria:
Design Wind Speed (V_{ult}) - 120mph 3sec gust, Exposure Category – C

The PV System consist of the modules, railing, and connection hardware. The system will add a dead load of approximately 3 psf to the roof.

The existing roof covering is Asphalt Shingle with min. ½" plywood decking and 2" x 4" roof trusses 24" O.C. The roofing, decking, and roof trusses are in good condition. The existing structure will be adequate for supporting the additional PV dead load and wind loads.

The securement method of the PV system is to be flush mounted to the asphalt shingle roof with the Iron Ridge railing and Unirac Flashlocs. The attachments can be attached up to 72" apart in roof zone 1, and 48" apart in roof zones 2e, 2r, & 3. The mounts should be staggered, where possible, to allow distribution of the design loads evenly to the structure. The mounts shall be installed with a min. 5/16" x 4" stainless steel Lag bolts with minimum 2-5/16" thread length.

Please see attached documents and contact me should you have any questions.

Sincerely,

D. Chad Godwin, PE 81360
Exp. 02/28/2023

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ASCE 7-16 CHAPTER 29 WIND LOADS - Rooftop Solar Panels Minimum Design Loads - Part 1: Enclosed(Gable,Hip,Flat h<60ft, 0°<θ<45°)									
Wind Load Parameters - Inputs					Wind Load Parameters				
Risk Category	II	Table 1.5-1	Wind Speed (asf)	93	mph	FRC R301.2.1.3			
Basic Wind Speed (Ult)	120	mph	Effective Wind Area	19.31	ft ²	26.20			
Roof Angle	21° to 27°		Wind Directionality	K _d	0.85	Table 26.6-1			
Roof Type	Hip		Topographic factor	K _{zt}	1.00	26.8 or 26.8.2			
Exposure Cat.	B, C, or D	P	Ground Elevation Factor	K _e	1.00	Table 26.9-1			
Mean Roof Height	h	15.00	Velocity Exposure Coefficient	K _z	0.85	Table 26.10-1			
Roof attachment	5/16" x 4" Lag Screw		Array Edge Factor	γ _e	1.50	29.4.4	*Modules are considered Exposed		
Rafter/Truss Spacing	24	in O.C.	Solar Panel Equalization Factor	γ _s	0.69	Fig. 29.4-8			
No. of Rails	2		Velocity Pressure	q _h	15.98	psf	q _h =0.00256 K _z K _{zt} K _e V ²		
No. of Modules - Portrait	35		Added Safety Factor	1.2					
No. of Modules - Landscape	4		Allowable Pullout per mount	709.6	lbs				
Module Model Number	Q.PEAK DUO BLK-G6+ / TS		0.4h or 0.6h	6.00	ft	Flat - 0.6h, Gable, Hip - 0.4h			
bldg. least horizontal dim (typ.)	180	in	10% of least horizontal dim	1.50	ft	10% of least hor. Dim. Or 0.4h, whichever is smaller, but not less than either 4% of Least hor. Or 3ft. (flat roof - 0.6h)			
Elevation	<1000	ft	Roof Zone Set Back	a	3.00	ft			
Est. # of attachment points	74		h ₂	5	in	Not > 10in(panel height above roof)			
PV Dead Load			2h ₂	10	in	*min distance array shall be from the roof edge, Gable Ridge, or hip ridge			
Module and Racking Specs			d1	1.00	ft	min gap between all panels but not > 6.7ft			
# of Modules	39		d2	0.25	ft	Horizontal distance from edge of one panel to the nearest edge in the next row			
Module	W _{mod}	47	0.5h	7.50	ft	*modules are considered exposed that are within 1.51p from roof edge			
Array	W _{mods}	1849							
Micro/optimizer	W _{mic}	156							
PV Rail	W _{PV rail}	29							
Total Weight	W _{total}	2034							
Total Area	A _T	753.21							
Dead Load	D _{PV}	2.70							
Weight/attachment		27.5							
Module load ratings									
Ultimate Allowable									
Load Rating - Snow(psf)									
Load Rating - Wind(psf)									
PV Attachment - Results									
Roof Zones - Hip 21° to 27°									
	1	2e	2r	3					
GC _u - Uplift	-1.3	-1.8	-1.8	-1.8					
GC _d - Down	0.7	0.7	0.7	0.7					
p = q _h (GC _u)(γ _e)(γ _s)	-18.7	-26.9	-26.9	-26.9	psf	29.4-7			
p = q _h (GC _d)(γ _e)(γ _s)	11.5	11.5	11.5	11.5	psf	29.4-7			
Max Allowable Span	6	6	6	6	ft	*notes			
Max Cantilever (in)	24	24	24	24	Max span * 33% (in)				

Eq.1 Point Load = Roof Zone psf * TA
Eq.2 TA = (Module Length / 2) * Max Span
Eq.3 *Max span Equation, SF = Allowable pullout / Point Load
Eq.4 Max Span = Allowable Pullout / (SF * Roof Zone psf * L/2)

a) The Max span between attachment points must not exceed the rail spans provided by racking manufacture.

b) Allowable Module load ratings are determined by SF = 1.5

Donnie C
Godwin
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