PROJECT DESCRIPTION:

32 X SILFAB SOLAR SILFAB SLA 300W MONO MODULES
ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES
SYSTEM SIZE:9.60 kW DC STC

ARRAY AREA:ROOF #1-562.56 SQ FT.

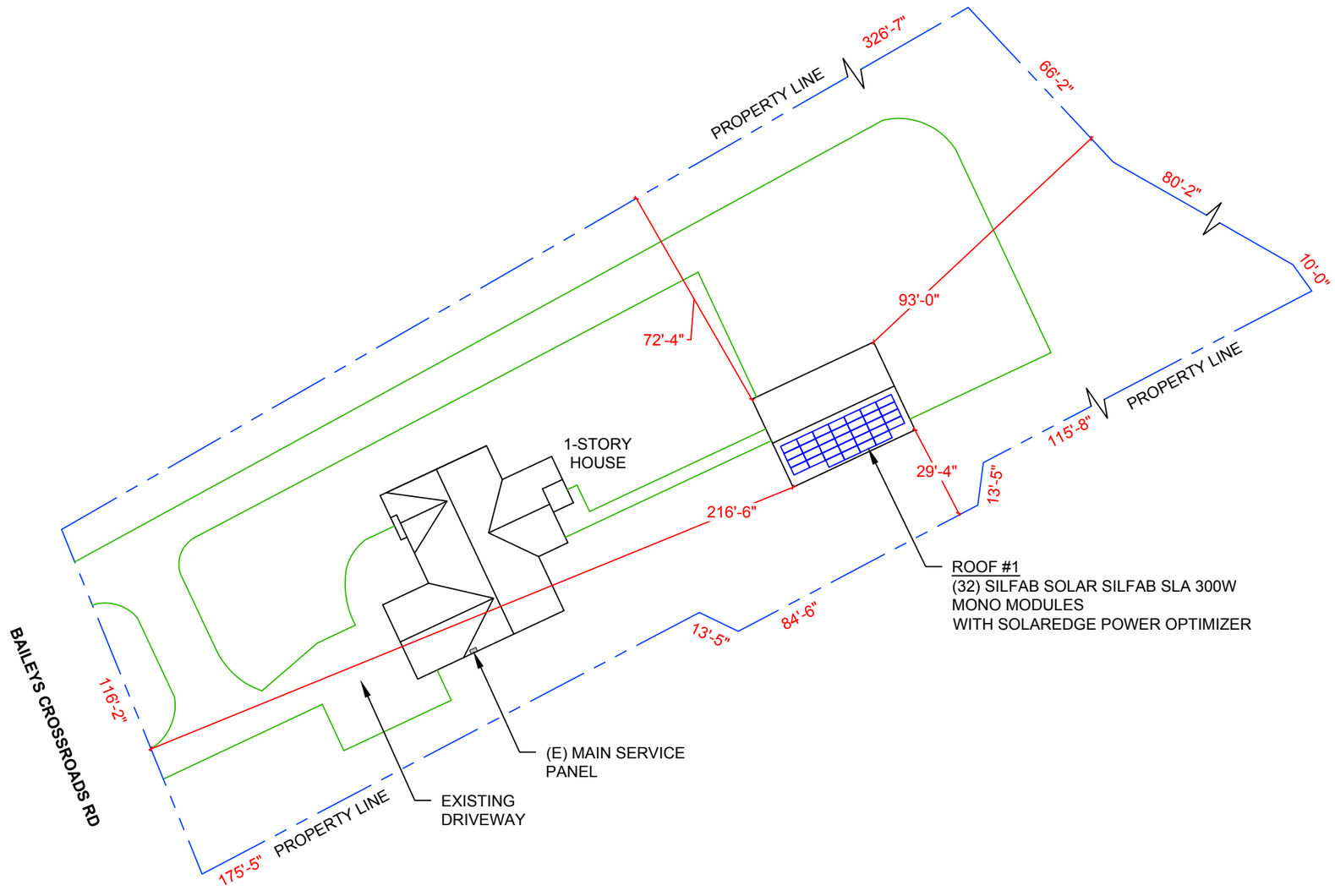
EQUIPMENT SUMMARY

32	SILFAB SOLAR SILFAB SLA 300W MONO MODULES
32	SOLAREDGE POWER OPTIMIZER P320
01	SOLAREDGE SE10000H-US INVERTER

AUTHORITIES HAVING JURISDICTION
BUILDING: HARNETT COUNTY
ZONING: HARNETT COUNTY
UTILITY: DUKE ENERGY

APPLICABLE CODES & STANDARDS
BUILDING: NCBC 2018
ELECTRICAL: NEC 2017

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



1 PLOT PLAN WITH ROOF PLAN
PV-1 SCALE: 1"=40'-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	SOLAREDGE OPTIMIZER CHART
PV-7 to 12	EQUIPMENT SPECIFICATIONS

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

REVISIONS

DESCRIPTION	DATE	REV

Signature with Seal

DATE:03/26/2019

PROJECT NAME & ADDRESS
JEFFREY BRIGGS RESIDENCE
2400 BAILEYS CROSSROADS RD.,
COATS NC 27521

DESIGNED BY
PHS

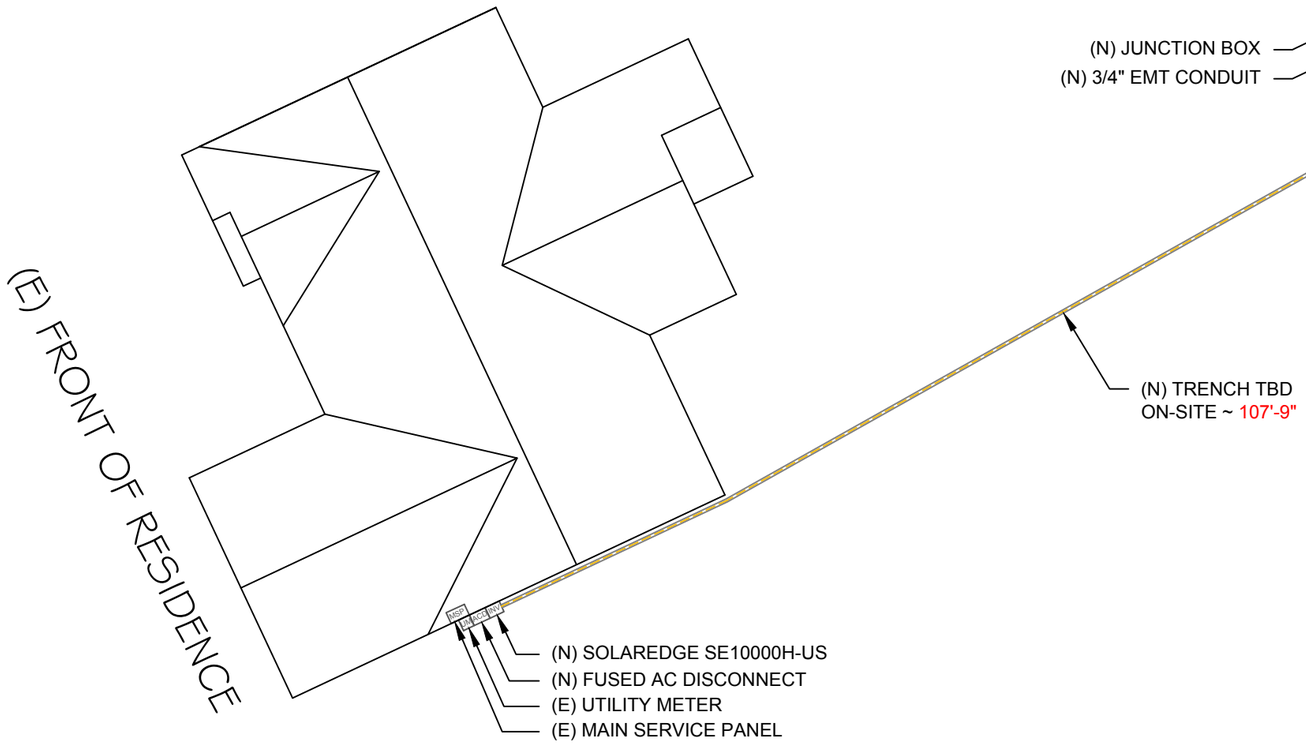
SHEET NAME
PLOT PLAN & VICINITY MAP

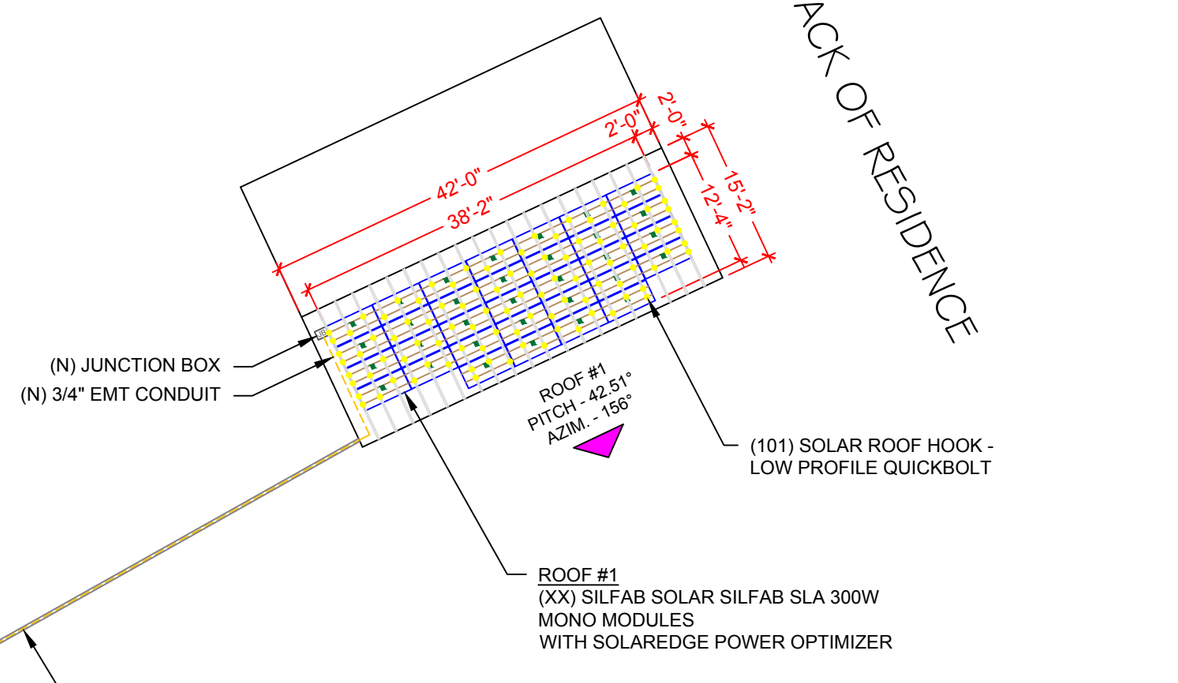
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-1

MODULE TYPE, DIMENSIONS & WEIGHT

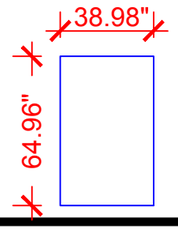
NUMBER OF MODULES = 32 MODULES
MODULE TYPE = SILFAB SOLAR SILFAB SLA 300W MONO MODULES
MODULE WEIGHT = 41.89 LBS / 19 KG.
MODULE DIMENSIONS = 64.96"x 38.98" = 17.58 SF





ROOF DESCRIPTION				
ROOF TYPE			COMPOSITE SHINGLE	
ROOF LAYER			1 LAYERS	
ROOF	ROOF PITCH	AZIMUTH	TRUSS SIZE	TRUSS SPACING
#1	42.51°	156°	2X4	24"

ARRAY AREA & ROOF AREA CALC'S				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	32	562.56	636.57	88



SILFAB SOLAR
SILFAB SLA 300W MONO MODULES

LEGEND

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

1 ROOF PLAN & MODULES
PV-2 SCALE: 1/16" = 1'-0"

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DATE:03/26/2019

PROJECT NAME & ADDRESS

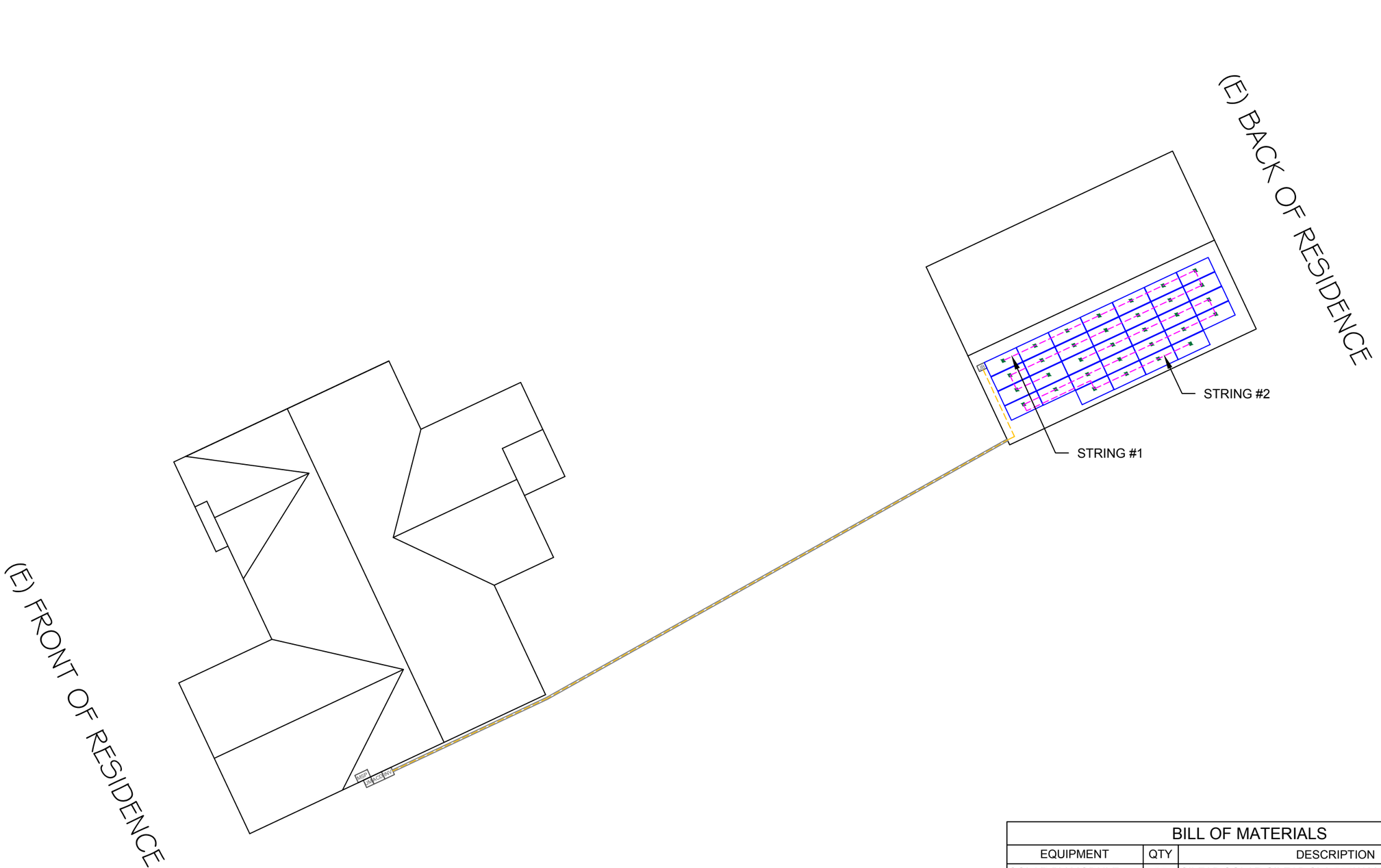
JEFFREY BRIGGS RESIDENCE
2400 BAILEYS CROSSROADS RD.,
COATS NC 27521

DESIGNED BY
PHS

SHEET NAME
ROOF PLAN & MODULES

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-2



1 ROOF PLAN WITH STRING LAYOUT

PV-2A

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

BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULE	32	SILFAB SOLAR SILFAB SLA 300W MONO MODULES
OPTIMIZER	32	SOLAREDGE POWER OPTIMIZER P320
INVERTER	01	SOLAREDGE SE10000H-US INVERTER
AC DISCONNECT	1	60A FUSED, (2) 60A FUSES, 240V, NEMA 3R, UL LISTED
SOLAR DECK	1	SOLAR DECKS
RAILS	28	IRONRIDGE XR10 RAIL 168" (14 FEET) BLACK
BONDED SPLICE	18	SPLICE KIT
MODULE CLAMPS	74	UNIVERSAL MODULE CLAMPS
GROUNDING LUG	5	IRONRIDGE GROUNDING LUG
END CLAMPS	20	END CLAMPS / STOPPER SLEEVE
ATTACHMENT	102	SRH LOW PROFILE QUICKBOLT
SQUARE-BOLT	102	SQUARE-BOLT BONDING ATTACHMENT HARDWARE

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PROJECT NAME & ADDRESS

JEFFREY BRIGGS
RESIDENCE

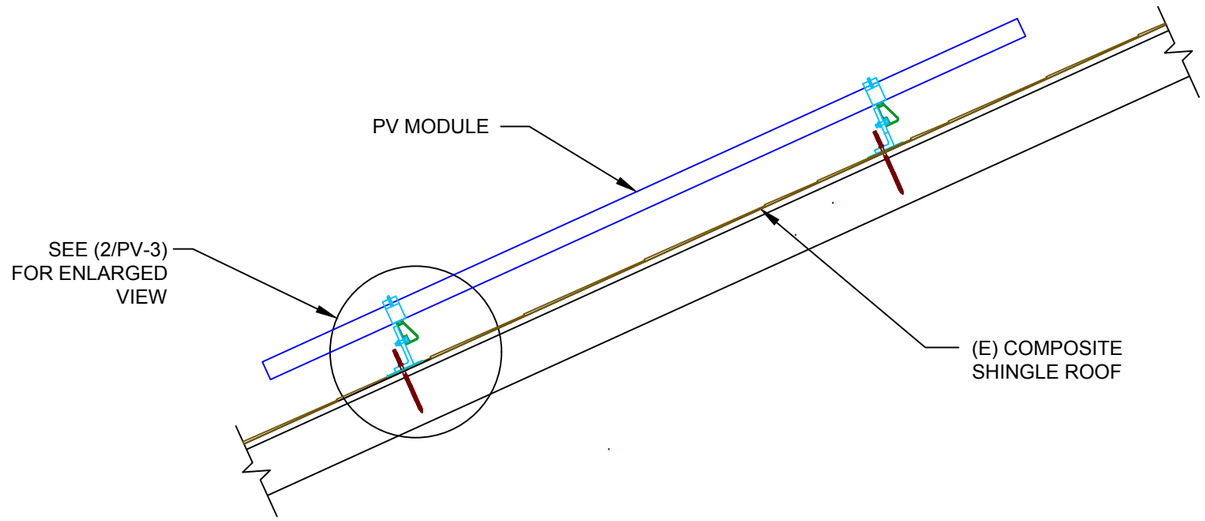
2400 BAILEYS CROSSROADS RD.,
COATS NC 27521

DESIGNED BY
PHS

SHEET NAME
STRING LAYOUT

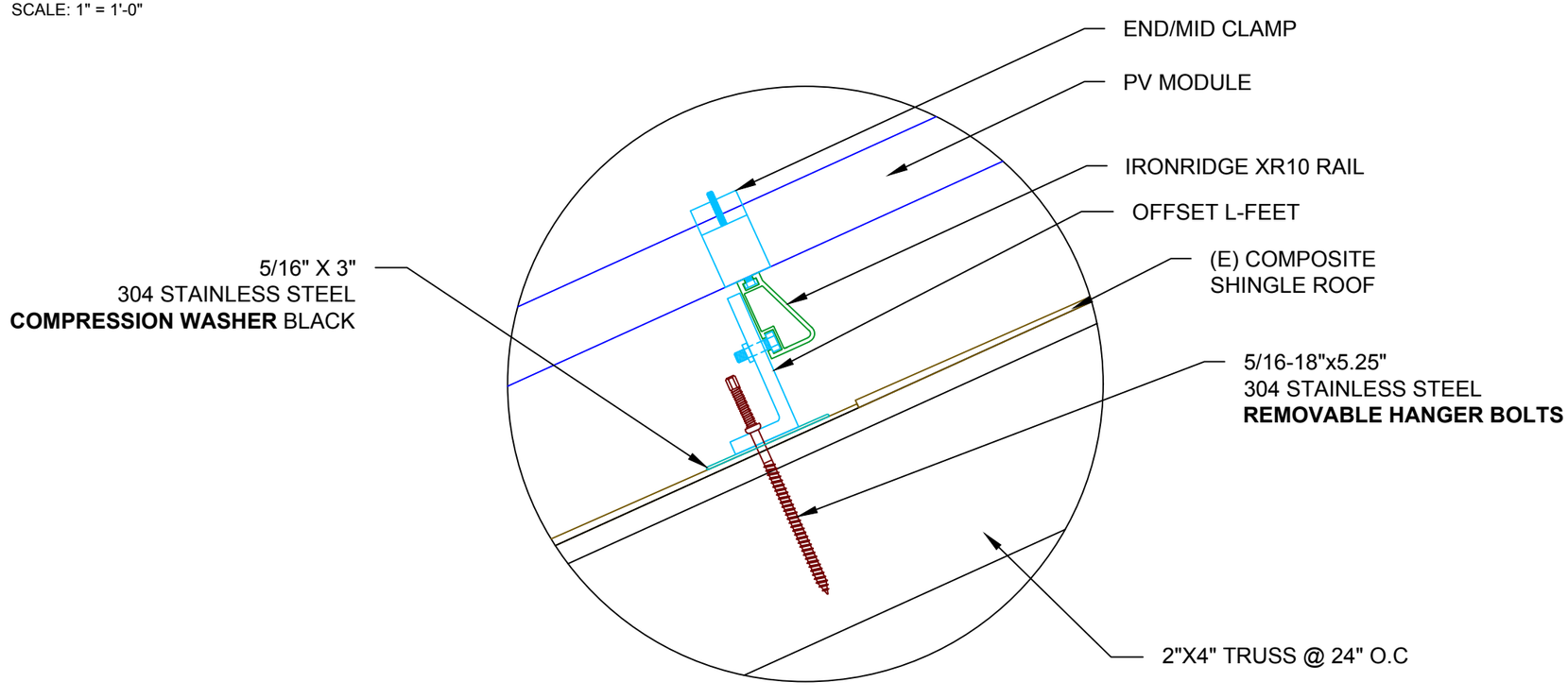
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-2A



1 ATTACHMENT DETAIL

SCALE: 1" = 1'-0"



2 ATTACHMENT DETAIL (enlarged view)

POWERHOME SOLAR & ROOFING
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PROJECT NAME & ADDRESS

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RESIDENCE

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COATS NC 27521

DESIGNED BY

PHS

SHEET NAME

ATTACHMENT
DETAIL

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-3

(32) SILFAB SOLAR SILFAB SLA 300W
MONO MODULES
(2) STRING OF 16 MODULES
CONNECTED IN SERIES

SILFAB SLA-M 300 MODULES

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

JUNCTION BOX
600 V, NEMA 3
UL LISTED

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

REF NEC 230.82(6) FOR
SUPPLY SIDE TAP

TO UTILITY GRID

BI-DIRECTIONAL
UTILITY METER
1-PHASE, 3-W,
120V/240V

SUPPLY SIDE TAP

(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

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

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

WARNING:
PHOTOVOLTAIC
POWER SOURCE

LABEL 1
ON ALL CONDUITS SPACED AT MAX 10FT

! CAUTION !
SOLAR ELECTRIC
SYSTEM CONNECTED
AND ENERGIZED

LABEL 2
AT INVERTER

SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN

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

LABEL 3
AT INVERTER

PHOTOVOLTAIC
DC DISCONNECT

LABEL 4
AT EACH DC DISCONNECT

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

LABEL 5
AT EACH AC DISCONNECT

PHOTOVOLTAIC
AC
DISCONNECT

LABEL 6
AT EACH AC DISCONNECT

! WARNING !
DUAL POWER SOURCES
SECOND SOURCE IS PV SYSTEM

LABEL 8
AT MEP

! WARNING !
SOLAR SYSTEM
CONNECTED
AND ENERGIZED

LABEL 9
AT MEP

! CAUTION !
SOLAR POINT OF
INTERCONNECTION

LABEL 10
AT UTILITY METER

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

LABEL 11
AT UTILITY METER

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

SERVICE INFO	
UTILITY PROVIDER:	DUKE ENERGY
MAIN SERVICE VOLTAGE:	240V
MAIN PANEL BRAND:	SQUARE D
MAIN SERVICE PANEL:	200A
MAIN CIRCUIT BREAKER RATING:	200A
MAIN SERVICE LOCATION:	SOUTHEAST
SERVICE FEED SOURCE:	OVERHEAD

1 ELECTRICAL LINE DIAGRAM
PV-4 SCALE: NTS

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REVISIONS

DESCRIPTION	DATE	REV

Signature with Seal

DATE:03/26/2019

PROJECT NAME & ADDRESS

JEFFREY BRIGGS RESIDENCE
2400 BAILEYS CROSSROADS RD.,
COATS NC 27521

DESIGNED BY
PHS

SHEET NAME
ELECTRICAL LINE DIAGRAM

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-4

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	SILFAB SOLAR SILFAB SLA 300W MONO
VMP	32.8V
IMP	9.16A
VOC	39.85V
ISC	9.71A
TEMP. COEFF. VOC	-0.300%/°C
MODULE DIMENSION	64.96"L x 38.98"W x 1.50"D (In Inch)

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

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

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

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-10°
AMBIENT TEMP (HIGH TEMP 2%)	36°
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	58°
CONDUCTOR TEMPERATURE RATE	90°
MODULE TEMPERATURE COEFFICIENT OF Voc	-0.29%/°K

DC CONDUCTOR AMPACITY CALCULATIONS: ARRAY TO JUNCTION BOX:

EXPECTED WIRE TEMP (In Celsius)	58°
TEMP. CORRECTION PER TABLE (310.16)	0.71
NO. OF CURRENT CARRYING CONDUCTORS	4
CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a)	0.8
CIRCUIT CONDUCTOR SIZE	10 AWG
CIRCUIT CONDUCTOR AMPACITY	40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	18.75A
1.25 X Isc	
DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC TABLE 310.16	32A
CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY	
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)	36°+22° = 58°
TEMP. CORRECTION PER TABLE (310.16)	0.71
NO. OF CURRENT CARRYING CONDUCTORS	4
CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a)	0.8
CIRCUIT CONDUCTOR SIZE	10AWG
CIRCUIT CONDUCTOR AMPACITY	40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	18.75A
1.25 X Isc	
DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC TABLE 310.16	32A
CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a) X CIRCUIT CONDUCTOR AMPACITY	
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)	36°
TEMP. CORRECTION PER TABLE (310.16)	0.91
NO. OF CURRENT CARRYING CONDUCTORS	3
CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a)	1
CIRCUIT CONDUCTOR SIZE	6 AWG
CIRCUIT CONDUCTOR AMPACITY	75A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(B)	52.5A
1.25 X MAX INVERTER OUTPUT CURRENT	
DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC TABLE 310.16	68.25A
TEMP. CORRECTION PER TABLE (310.16) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(a) X CIRCUIT CONDUCTOR AMPACITY	
Result should be greater than (52.5A) 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 ACESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
6.) WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
7.) ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
8.) MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
9.) MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
10.) THE POLARITY OF THE GROUNDED CONDUCTORS IS NEGATIVE

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REVISIONS		
DESCRIPTION	DATE	REV

Signature with Seal

DATE:03/26/2019

PROJECT NAME & ADDRESS

JEFFREY BRIGGS RESIDENCE
2400 BAILEYS CROSSROADS RD.,
COATS NC 27521

DESIGNED BY
PHS

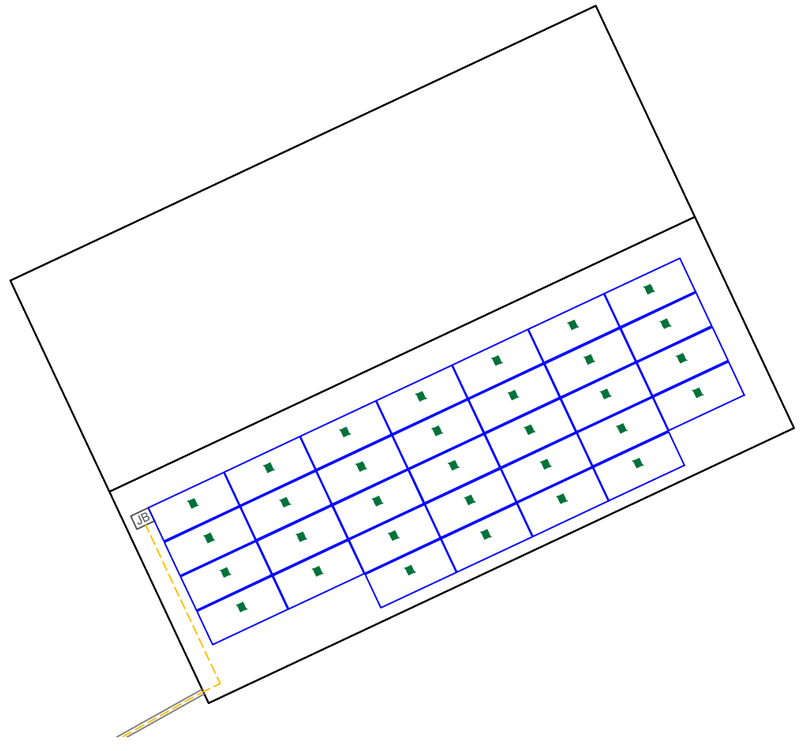
SHEET NAME
WIRING CALCULATIONS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-5

	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130
1													
2													
3													
4													
5													

SOLAREDGE OPTIMIZER CHART



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DATE:03/26/2019

PROJECT NAME & ADDRESS

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RESIDENCE

2400 BAILEYS CROSSROADS RD.,
COATS NC 27521

DESIGNED BY
PHS

SHEET NAME
SOLAREDGE
OPTIMIZER CHART

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-6

SLA-M
Monocrystalline

BAA FREE · 25 YEAR PRODUCT WARRANTY · AUTOMATED MANUFACTURING · JUST-IN-TIME · DNV·GL TOP PERFORMER · TIER 1 BANKABLE $$$ · HIGH EFFICIENCY

300 Wp 60 Cell

Monocrystalline PV Module

CE · ETL Intertek · CSA · ETL Intertek · IEC · CEC Listed · FSEC · Fraunhofer ISE

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

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

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

ENSURES MAXIMUM EFFICIENCY
60 of the highest efficiency, premium quality monocrystalline cells result in a maximum power rating of 300Wp.

ADVANCED PERFORMANCE WARRANTY
30-year linear power performance guarantee

ENHANCED PRODUCT WARRANTY
25-year product workmanship warranty*

BUILT BY INDUSTRY EXPERTS
With over 35 years of industry experience, Silfab's technical team are pioneers in PV technology and are dedicated to an innovative approach that provides superior manufacturing processes including: infra-red cell sorting, glass washing, automated soldering and meticulous cell alignment.

POSITIVE TOLERANCE
(-0/+5W) All positive module sorting ensures maximum performance

LOWEST DEFECT RATE*
Total automation ensures strict quality control during each step of the process at our certified ISO manufacturing facility. *82.56 ppm as per December 2017

LIGHT AND DURABLE
Over-engineered to weather low load bearing structures up to 5400 Pa. Light-weight frame exclusively designed with wide-ranging racking compatibility and durability.

PID RESISTANT
Proven in accordance to IEC 62804-1

AVAILABLE IN
All Black

*12 year, extendable based on registration at www.silfab.ca

Electrical Specifications		SILFAB SLA Monocrystalline	
Test Conditions		STC	NOCT
Module Power (Pmax)	Wp	300	227
Maximum power voltage (Vpmax)	V	32.8	29.5
Maximum power current (Ipmax)	A	9.16	7.69
Open circuit voltage (Voc)	V	39.85	36.9
Short circuit current (Isc)	A	9.71	7.96
Module efficiency	%	18.4	17.3
Maximum system voltage (VDC)	V	1000	
Series fuse rating	A	20	
Power Tolerance	Wp	-0/+5	

Measurement conditions: STC 1000 W/m2 • AM 1.5 • Temperature 25 °C • NOCT 800 W/m² • AM 1.5 • Measurement uncertainty ≤ 3%
• Sun simulator calibration reference modules from Fraunhofer Institute. Electrical characteristics may vary by ±5% and power by -0/+5.

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

Mechanical Properties and Components		SILFAB SLA Monocrystalline
Module weight (± 1 kg)	kg	19
Dimensions (H x L x D; ± 1mm)	mm	1650 x 990 x 38
Maximum surface load (wind/snow)*	N/m²	5400
Hail impact resistance		ø 25 mm at 83 km/h
Cells		60 - Si monocrystalline - 4 or 5 busbar - 156.75 x 156.75 mm
Glass		3.2 mm high transmittance, tempered, antireflective coating
Backsheet		Multilayer polyester-based
Frame		Anodized Al
Bypass diodes		3 diodes-45V/12A, IP67/IP68
Cables and connectors (See installation manual)		1200 mm ø 5.7 mm (4 mm2), MC4 compatible

Warranties	SILFAB SLA Monocrystalline
Module product workmanship warranty	25 years*
Linear power performance guarantee	30 years

Certifications	SILFAB SLA Monocrystalline
Product	ULC ORD C1703, UL 1703, IEC 61215, IEC 61730, IEC 61701, CEC listed IEC 62716 Ammonia Corrosion, IEC 61701:2011 Salt Mist Corrosion UL Fire Rating: Type 2 (Type 1 on request)
Factory	ISO9001:2015

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.silfab.ca/downloads

TOP PERFORMER 2017 DNV·GL PV MODULE RELIABILITY SCORECARD

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

Silfab SOLAR

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Tel +1 905-255-2501 • Fax +1 905-696-0267
info@silfab.ca • www.silfab.ca

Silfab Solar Inc.
800 Cornwall Ave
Bellingham, WA 98226
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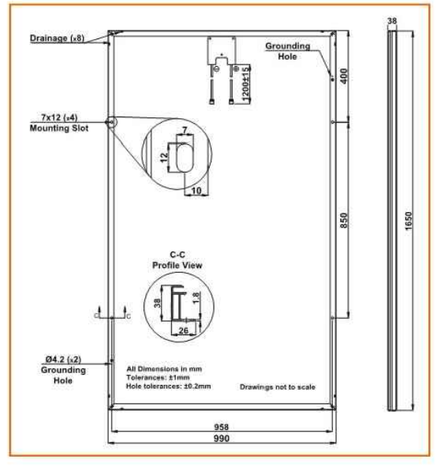

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MOORESVILLE, NC 28115
Phone: 704-800-6591 (OFFICE)
Email: info@powerhome.com
Web: www.powerhome.com

REVISIONS

DESCRIPTION	DATE	REV

Signature with Seal

DATE:03/26/2019

PROJECT NAME & ADDRESS

JEFFREY BRIGGS RESIDENCE
2400 BAILEYS CROSSROADS RD.,
COATS NC 27521

DESIGNED BY
PHS

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-7

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

INVERTERS

Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking efficiency
- Fixed voltage inverter for longer strings
- Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Extremely small
- High reliability without any electrolytic capacitors
- Built-in module-level monitoring
- Outdoor and indoor installation
- Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)

HD wave

www.solaredge.us

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	VA
Max. AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400	VA
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	✓	-	✓	-	-	-	Vac
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓	Vac
AC Frequency (Nominal)	59.3 - 60 - 60.5[1]							Hz
Maximum Continuous Output Current 208V	-	16	-	24	-	-	-	A
Maximum Continuous Output Current @240V	12.5	16	21	25	32	42	47.5	A
GFDI Threshold	1							A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes							
INPUT								
Maximum DC Power @240V	4650	5900	7750	9300	11800	15500	17650	W
Maximum DC Power @208V	-	5100	-	7750	-	-	-	
Transformer-less, Ungrounded	Yes							
Maximum Input Voltage	480							Vdc
Nominal DC Input Voltage	380					400		Vdc
Maximum Input Current 208V	-	9	-	13.5	-	-	-	Adc
Maximum Input Current @240V	8.5	10.5	13.5	16.5	20	27	30.5	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							%
Nighttime Power Consumption	< 2.5							W
ADDITIONAL FEATURES								
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)							
Revenue Grade Data, ANSI C12.20	Optional[2]							
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					Natural convection		
Operating Temperature Range	-13 to +140 / -25 to +60[3] (-40˚F / -40˚C option)[4]							˚F / ˚C
Protection Rating	NEMA 3R (Inverter with Safety Switch)							

(1) For other regional settings please contact SolarEdge support
(2) Revenue grade inverter P/N: SExxxxH-US000NNC2
(3) For power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf
(4) -40 version P/N: SExxxxH-US000NNU4

RoHS

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DESIGNED BY

PHS

SHEET NAME

EQUIPMENT SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-8

solaredge

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

solaredge

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)	
INPUT						
Rated Input DC Power[1]	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					
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					
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)	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[2]					
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					%

[1] Rated STC power of the module. Module of up to +5% power tolerance allowed.
[2] For other connector types please contact SolarEdge

PV SYSTEM DESIGN USING A SOLAREDGE INVERTER[3][4]		SINGLE PHASE HD-WAVE	SINGLE PHASE	THREE PHASE 208V	THREE PHASE 480V	
Minimum String Length (Power Optimizers)	P320, P370, P400	8		10	18	
	P405 / P505	6		8	14	
Maximum String Length (Power Optimizers)		25		25	50[5]	
Maximum Power per String		5700 (6000 with SE7600-US - SE11400-US)	5250	6000	12750	W
Parallel Strings of Different Lengths or Orientations		Yes				

[3] For detailed string sizing information refer to: http://www.solaredge.com/sites/default/files/string_sizing_na.pdf.
[4] It is not allowed to mix P405/P505 with P320/P370/P400/P600/P700/P800 in one string.
[5] A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement

CE ETL

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DESIGNED BY
PHS

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-9

Tech Brief

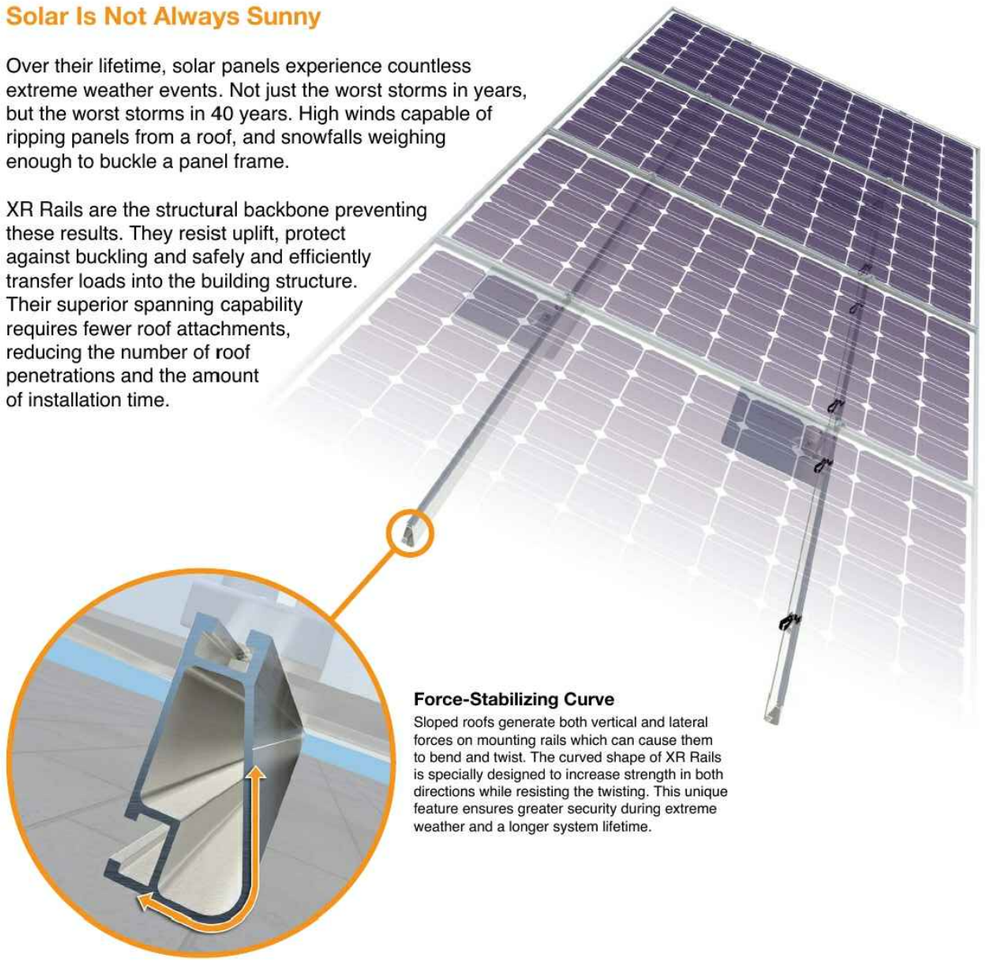
IRONRIDGE

XR Rail Family

Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

Compatible with Flat & Pitched Roofs

XR Rails are compatible with FlashFoot and other pitched roof attachments.

IronRidge offers a range of tilt leg options for flat roof mounting applications.

Corrosion-Resistant Materials

All XR Rails are made of marine-grade aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.

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 6 foot spans, while remaining light and economical.

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

XR100

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 8 feet.

- 8' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available

XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans 12 feet or more for commercial applications.

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

Rail Selection

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed span tables and certifications.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	100	XR10		XR100		XR1000	
	120						
	140						
	160						
10-20	100						
	120						
	140						
	160						
30	100						
	160						
40	100						
	160						
50-70	160						
80-90	160						

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SHEET NAME

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ANSI B
11" X 17"

SHEET NUMBER

PV-10

Tech Brief

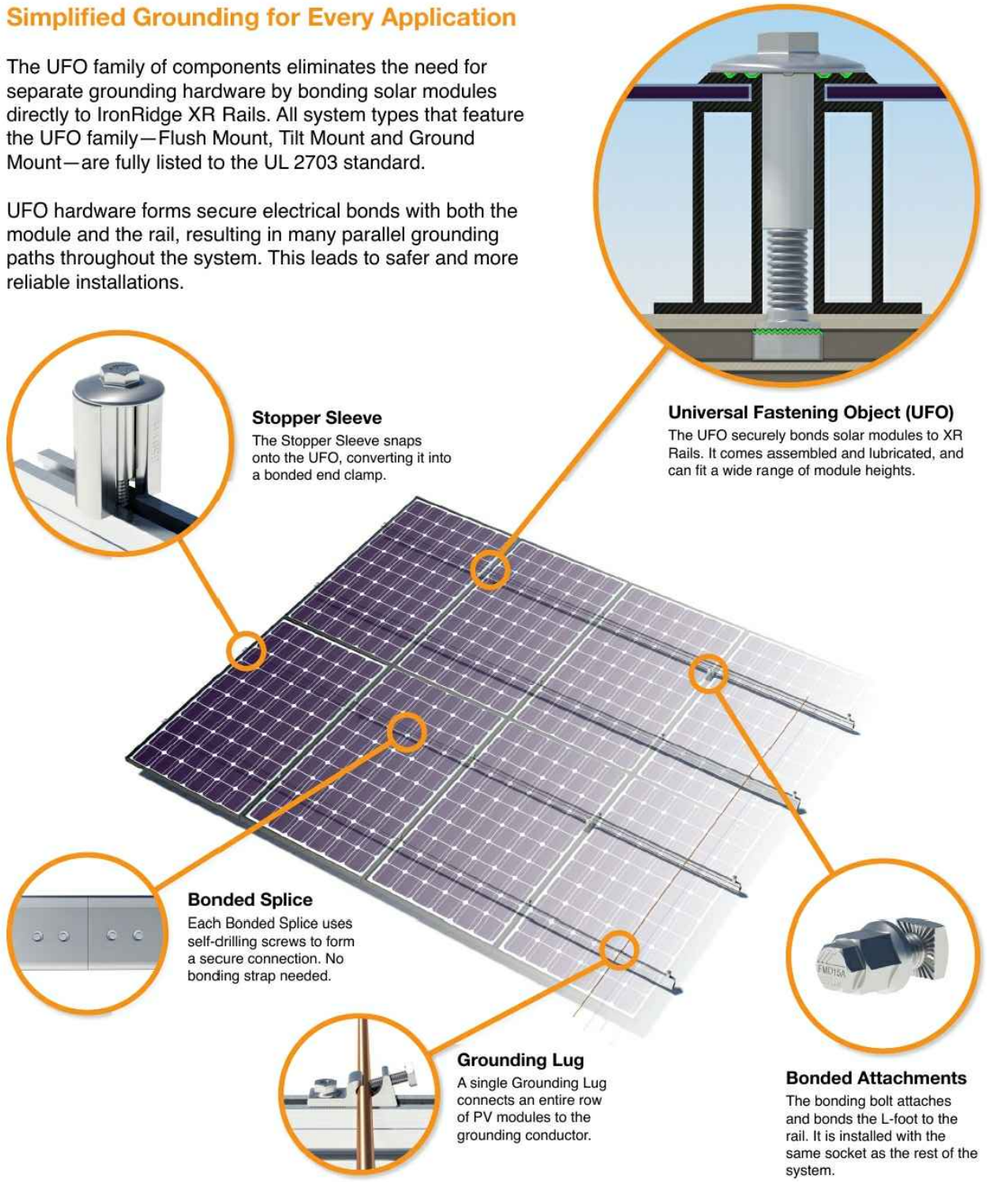
IRONRIDGE

UFO Family of Components

Simplified Grounding for Every Application

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

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



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

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

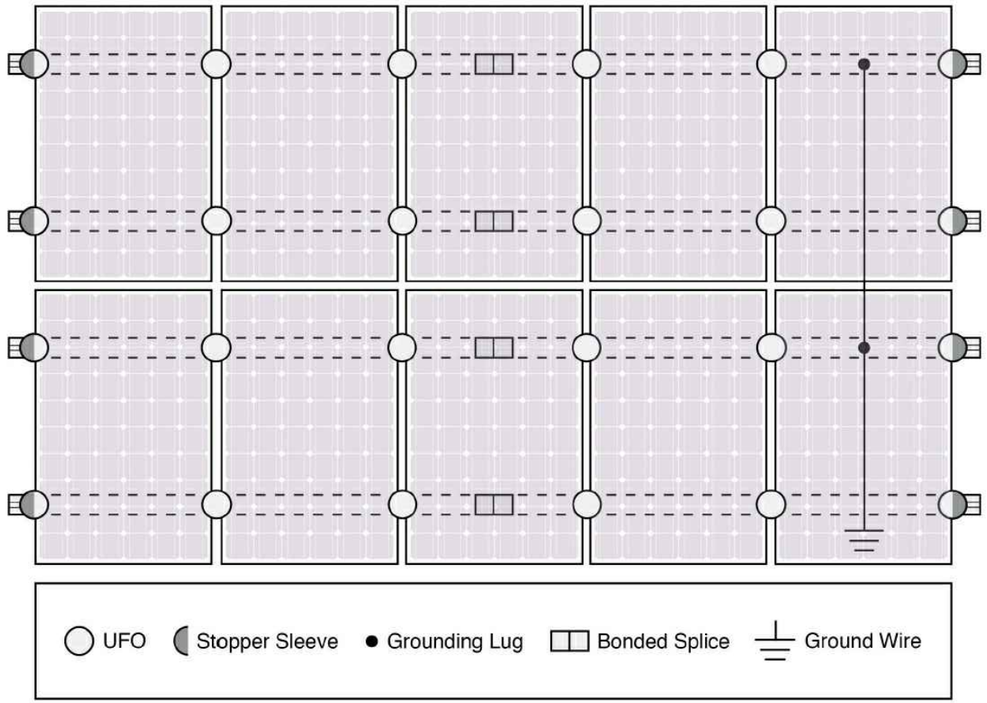
Bonded Splice
Each Bonded Splice uses self-drilling screws to form a secure connection. No bonding strap needed.

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

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

Tech Brief

System Diagram



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

UL Certification

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

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

Go to IronRidge.com/UFO

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

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SHEET NUMBER
PV-11

Low Profile QuickBOLT™

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

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

LOW PROFILE QUICKBOLT™
INSTALLATION INSTRUCTIONS

RECOMMENDED MATERIALS

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

INSTALLATION INSTRUCTIONS

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

WHERE IS MY FLASHING?

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

INSTALLATION VIDEOS, SPEC SHEETS, & TEST RESULTS AVAILABLE ON
WWW.SOLARROOFHOOK.COM

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PV-12