

# PROJECT DESCRIPTION:

12 x VSUN SOLAR: VSUN400-108BMH 400W MONO MODULES  
 ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES  
 DC SYSTEM SIZE: (N) 4.800 kW DC + (E) 4.680 kW DC = 9.480 kW DC  
 AC SYSTEM SIZE: (N) 7.600 kW AC + (E) 5.700 kW AC = 13.300 kW AC  
 ROOF ARRAY AREA #1:- 252.24 SQ FT.

## EQUIPMENT SUMMARY

(N) 12 - VSUN SOLAR: VSUN400-108BMH 400W MONO MODULES WITH  
 (N) 01 - TESLA: 1538000-XX-Y 7.6 kW (240V) INVERTER  
 (N) 04 - TESLA: RSD MCI-2  
 (E) 12 - JINKO SOLAR: JKM390M-72HBL-V 390W MONO MODULES WITH  
 (E) 01 - SOLAREEDGE HOME HUB: SE5700H-US (240V) INVERTER

## AUTHORITIES HAVING JURISDICTION

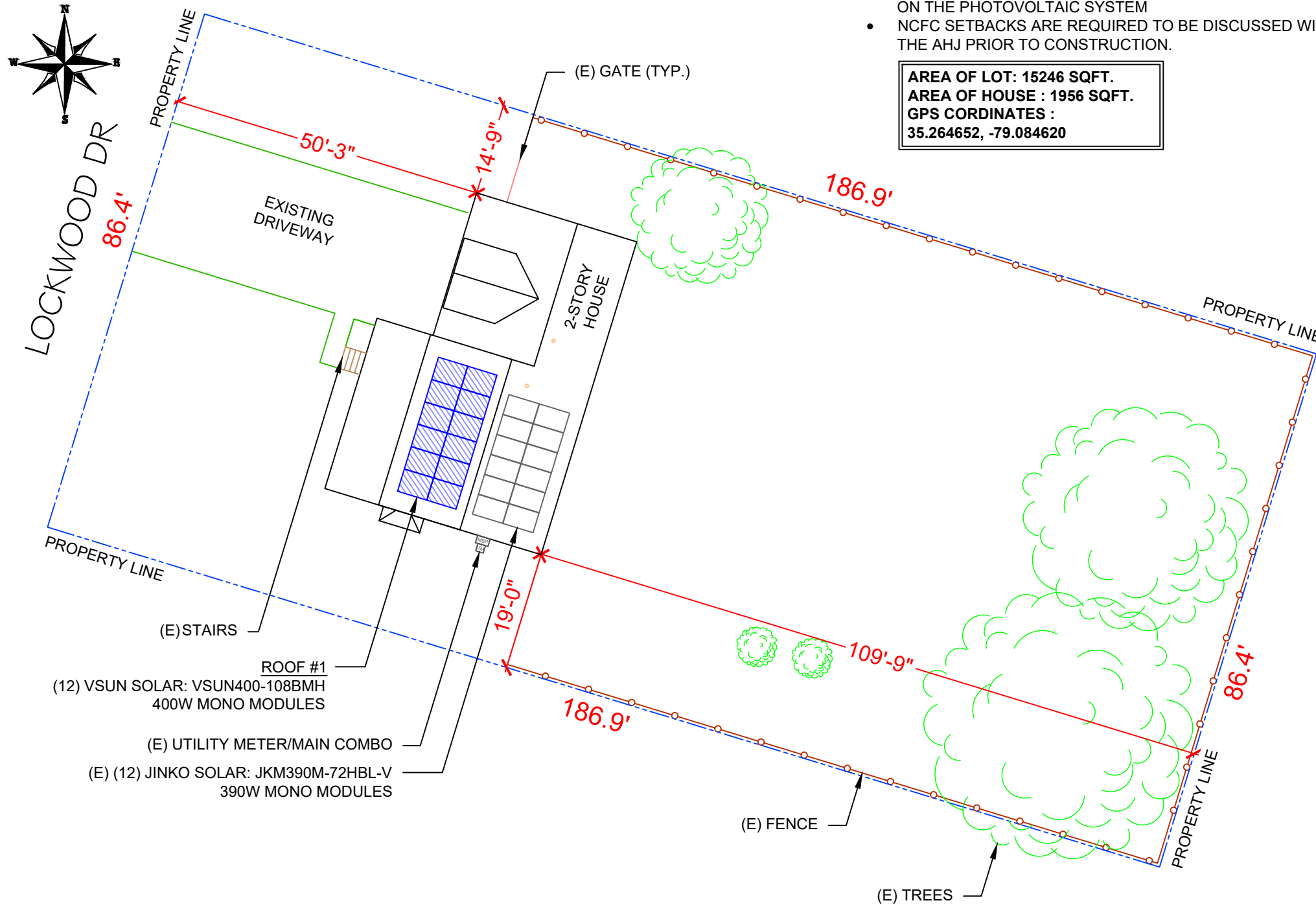
BUILDING: HARNETT COUNTY  
 ZONING: HARNETT COUNTY  
 UTILITY: CENTRAL EMC

## APPLICABLE CODES & STANDARDS

NEC 2020  
 NCFC 2018  
 NCBC 2018  
 NCRC 2018  
 NCECC 2018

- EXISTING PLUMBING VENTS, SKYLIGHTS, EXHAUST OUTLETS, VENTILATION'S INTAKE AIR OPENINGS SHALL NOT BE COVERED BY THE SOLAR PHOTOVOLTAIC SYSTEM.
- ALL EQUIPMENT SHALL BE LISTED AND LABELED BY A RECOGNIZED ELECTRICAL TESTING LABORATORY AND INSTALLED PER THE LISTING REQUIREMENTS AND THE MANUFACTURER'S INSTRUCTIONS. [NEC 690.4(D)]
- ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED, INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES.
- PAINT PV CONDUIT TO MATCH THE DWELLING EXTERIOR.
- CONTACT THE SERVICING UTILITY BEFORE POWERING ON THE PHOTOVOLTAIC SYSTEM
- NCFC SETBACKS ARE REQUIRED TO BE DISCUSSED WITH THE AHJ PRIOR TO CONSTRUCTION.

AREA OF LOT: 15246 SQFT.  
 AREA OF HOUSE : 1956 SQFT.  
 GPS CORDINATES :  
 35.264652, -79.084620



# 1 PLOT PLAN WITH ROOF PLAN

PV-1

SCALE: 1"=20'-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	LABELS
PV-6+	EQUIPMENT SPECIFICATIONS



LuminaSun Smart Home LLC  
 114 Morlake Drive suite 201,  
 Mooresville, NC 28117

## REVISIONS

DESCRIPTION	DATE	REV
INITIAL	02/07/2025	

## SIGNATURE WITH SEAL



Reviewed and approved  
 Richard Pantel, P.E.  
 NC Lic. No. 043326  
 02/10/2025

## PROJECT NAME & ADDRESS

YUBEIMEYE RAYMOND  
 33 LOCKWOOD DR,  
 CAMERON, NC 28326

DC SIZE:9.480kW

AC SIZE:13.300kW

## DRAWN BY

ESR

## SHEET NAME

PLOT PLAN &  
 VICINITY MAP

## SHEET SIZE

ANSI B  
 11" X 17"

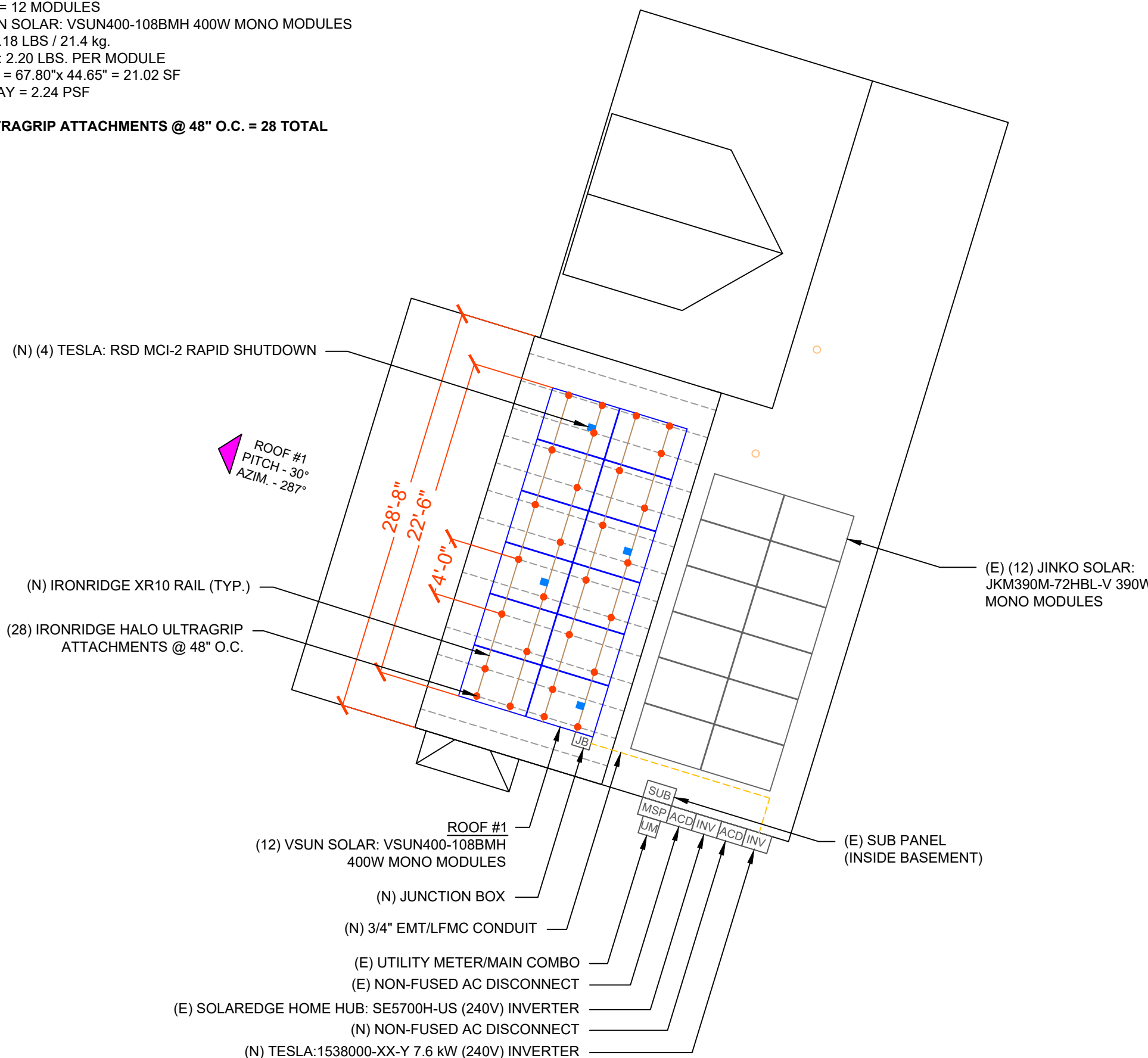
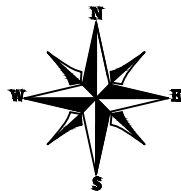
## SHEET NUMBER

PV-1

**MODULES TYPE, DIMENSIONS & WEIGHT**

NUMBER OF MODULE = 12 MODULES  
 MODULE TYPE = VSUN SOLAR: VSUN400-108BMH 400W MONO MODULES  
 MODULE WEIGHT = 47.18 LBS / 21.4 kg.  
 COMPONENT WEIGHT: 2.20 LBS. PER MODULE  
 MODULE DIMENSIONS = 67.80"x 44.65" = 21.02 SF  
 UNIT WEIGHT OF ARRAY = 2.24 PSF

**IRONRIDGE HALO ULTRAGRIP ATTACHMENTS @ 48" O.C. = 28 TOTAL**



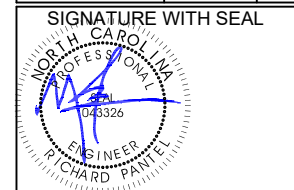
ROOF DESCRIPTION				
ROOF TYPE		COMPOSITION SHINGLE		
ROOF LAYER		1 LAYER		
ROOF	ROOF TILT	AZIMUTH	TRUSS SIZE	TRUSS SPACING
#1	30°	287°	2"X4"	24"

ARRAY AREA & ROOF AREA CALC'S				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	12	252.24	391.06	65
TOTAL	(N) 12 + (E) 12	512.04	1956	26



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**33 LOCKWOOD DR.,**  
**CAMERON, NC 28326**

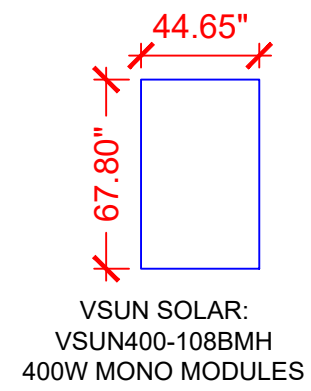
DC SIZE:9.480kW  
 AC SIZE:13.300kW

DRAWN BY  
**ESR**

SHEET NAME  
**ROOF PLAN & MODULES**

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

SHEET NUMBER  
**PV-2**



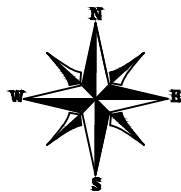
LEGEND	
[SUB]	- SUB PANEL
[CP]	- COMBINER PANEL
[JB]	- JUNCTION BOX
[INV]	- INVERTER
[ACD]	- AC DISCONNECT
[UM]	- UTILITY METER
[MSP]	- MAIN SERVICE PANEL
[Blue Square]	- TESLA: RSD MCI-2 RAPID SHUTDOWN
[Orange Circle]	- VENT, ATTIC FAN (ROOF OBSTRUCTION)
[Red Dot]	- ROOF ATTACHMENT
[Dashed Line]	- TRUSS
[Dotted Line]	- CONDUIT

**1 ROOF PLAN & MODULES**

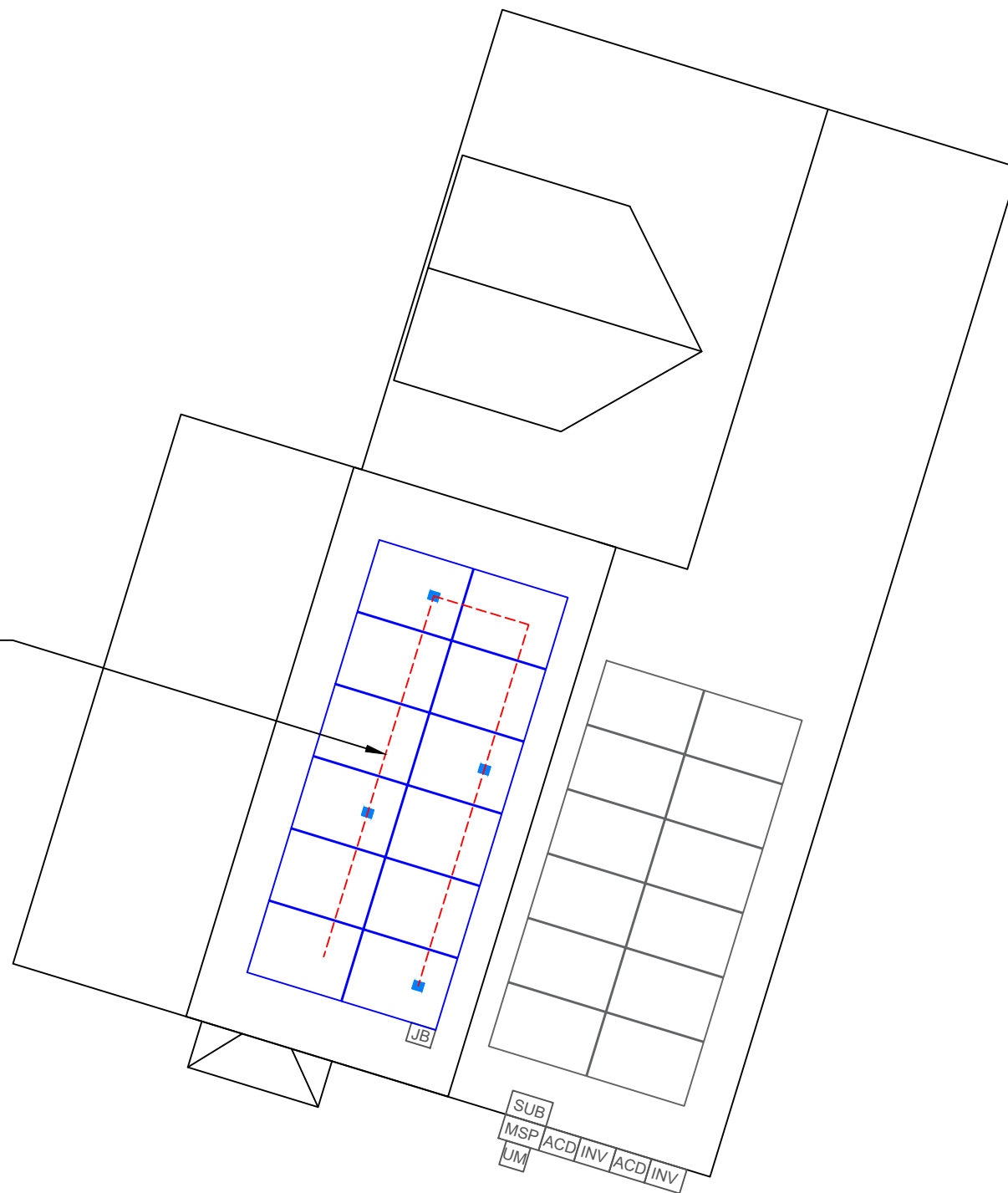
PV-2 SCALE: 1/8" = 1'-0"

STRING LEGEND

--- STRING #1



STRING #1  
(12 MODULES)

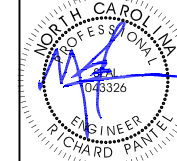


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33 LOCKWOOD DR,  
CAMERON, NC 28326

DC SIZE:9.480kW  
AC SIZE:13.300kW

DRAWN BY

ESR

SHEET NAME  
STRING  
LAYOUT

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-2A

1 ARRAY PLAN WITH STRING LAYOUT

PV-2A

SCALE: 1/8" = 1'-0"



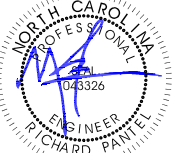


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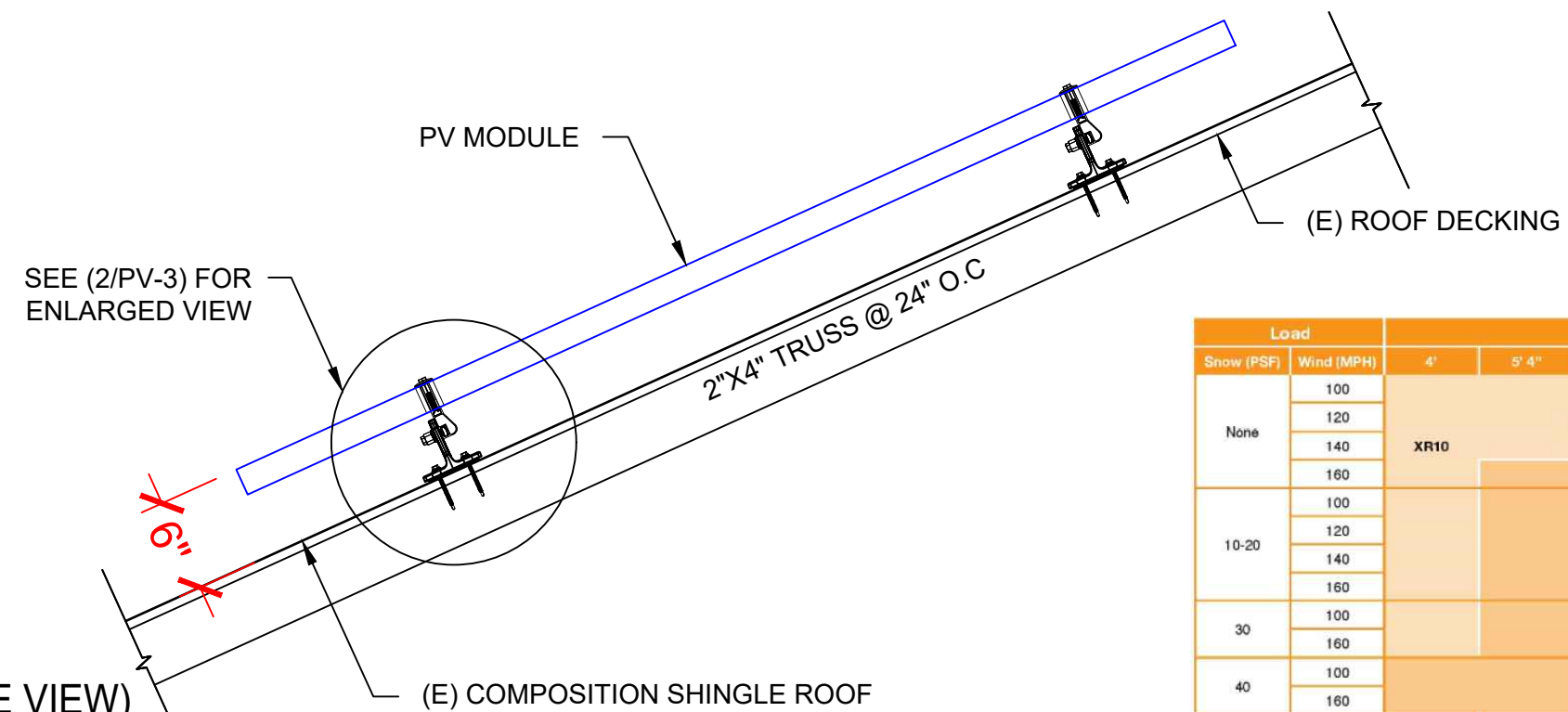
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SHEET NAME

SHEET SIZE

ANSI B  
11" X 17"

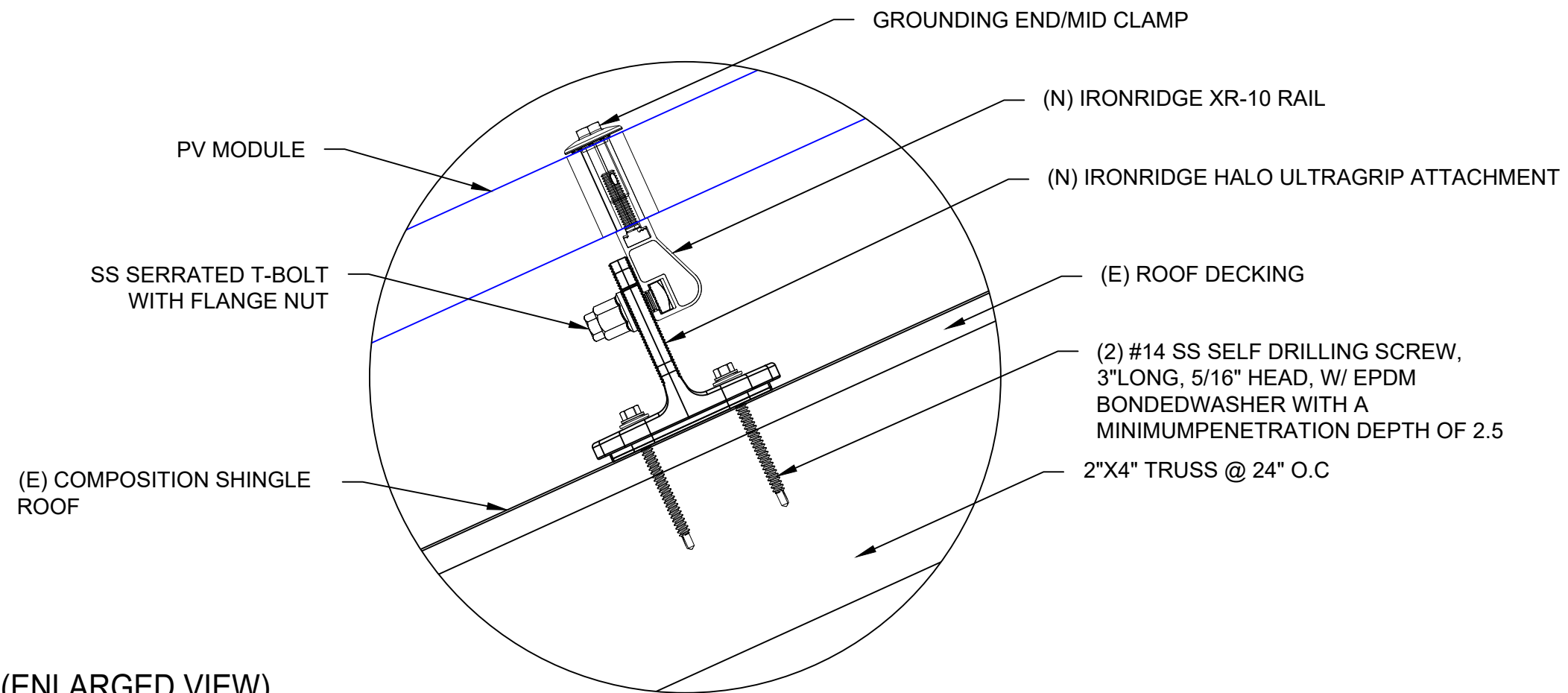
SHEET NUMBER



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

1 ATTACHMENT DETAIL (SIDE VIEW)

PV-3 SCALE: NTS



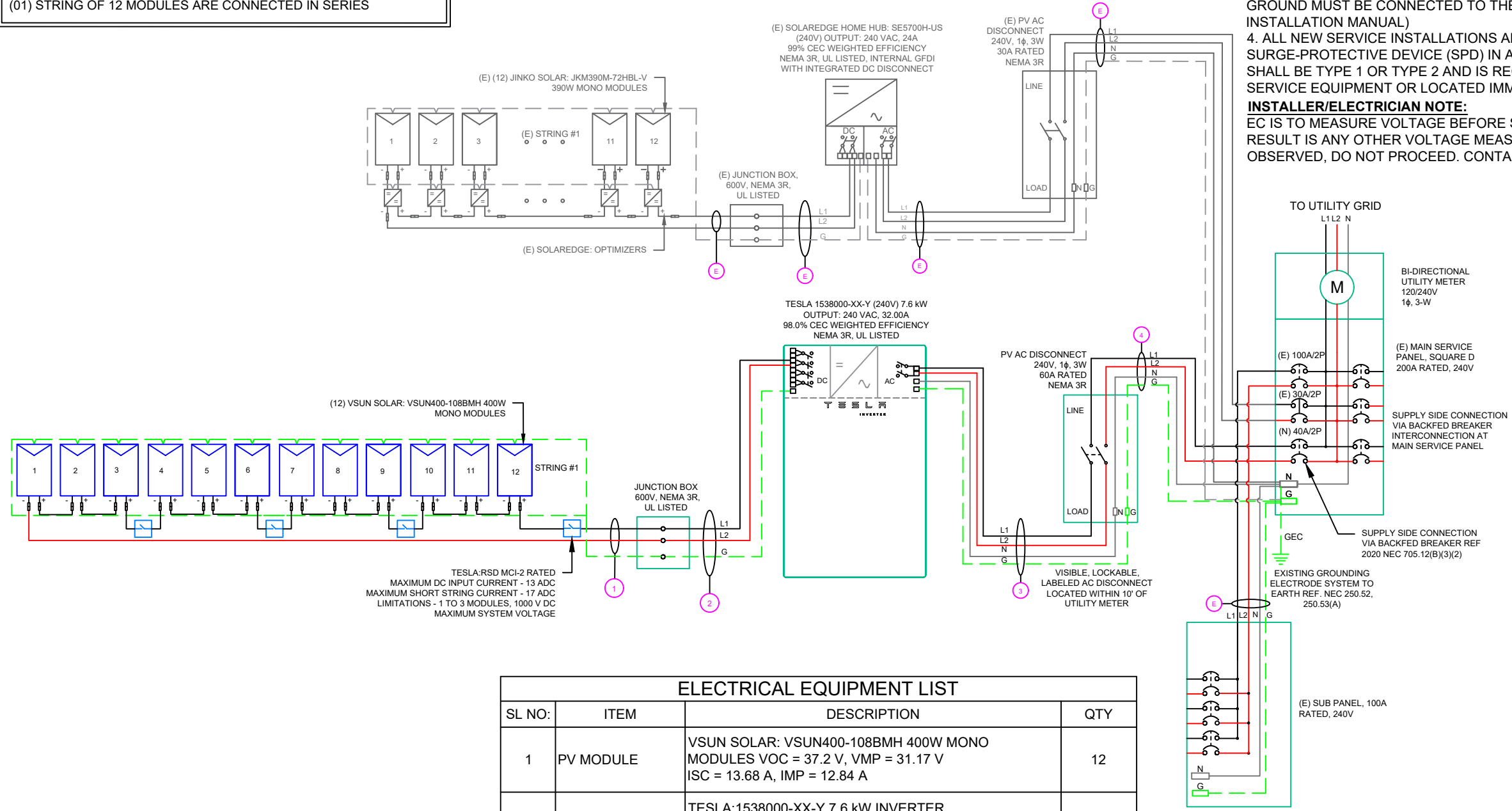
2 ATTACHMENT DETAIL (ENLARGED VIEW)

PV-3 SCALE: NTS

DC SYSTEM SIZE: (N) 4.800 kW DC + (E) 4.680 kW DC = 9.480 kW DC  
 AC SYSTEM SIZE: (N) 7.600 kW AC + (E) 5.700 kW AC = 13.300 kW AC

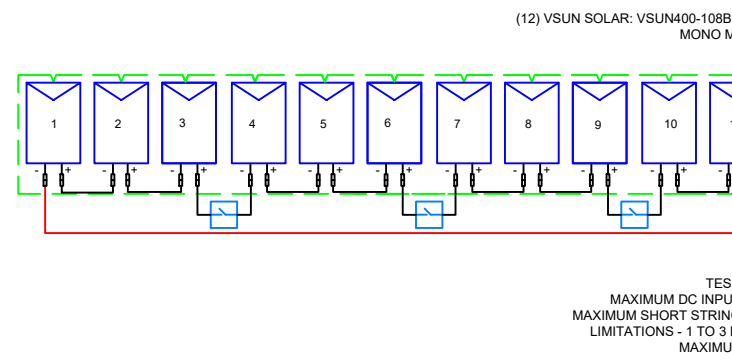
(N) (12) VSUN SOLAR: VSUN400-108BMH 400W MONO MODULES WITH  
 (N) (01) TESLA: 1538000-XX-Y 7.6 kW (240V) INVERTER  
 (N) (04) TESLA: RSD MCI-2  
 (E) (12) JINKO SOLAR: JKM390M-72HBL-V 390W MONO MODULES WITH  
 (E) (01) SOLAREEDGE HOME HUB: SE5700H-US (240V) INVERTER

(01) STRING OF 12 MODULES ARE CONNECTED IN SERIES



**NOTE:-**  
 1. RACEWAYS AND CABLES EXPOSED TO SUNLIGHT ON ROOFTOPS SHOULD BE INSTALLED MORE THAN 7/8" ABOVE THE ROOF USING CONDUIT SUPPORTS.  
 2. TEMPERATURE RATINGS OF ALL CONDUCTORS, TERMINATIONS, BREAKERS, OR OTHER DEVICES ASSOCIATED WITH THE SOLAR PV SYSTEM SHALL BE RATED FOR AT LEAST 75 DEGREE C.  
 3. THE GINLONG SOLIS INVERTER MONITORS VOLTAGE BETWEEN THE L1 AND L2, THE NEUTRAL CONDUCTOR IS OPTIONAL WHEN TYING THE INVERTER TO A 240V GRID (240 3Y SYSTEM). GROUND MUST BE CONNECTED TO THE PE TERMINAL. (REF: SHEET PV-9 FOR INSTALLATION MANUAL)  
 4. ALL NEW SERVICE INSTALLATIONS AND REPLACEMENTS REQUIRE A SURGE-PROTECTIVE DEVICE (SPD) IN ACCORDANCE WITH [NEC 230.67]. THE SPD SHALL BE TYPE 1 OR TYPE 2 AND IS REQUIRED TO BE AN INTEGRAL PART OF THE SERVICE EQUIPMENT OR LOCATED IMMEDIATELY ADJACENT THERETO.

**INSTALLER/ELECTRICIAN NOTE:**  
 EC IS TO MEASURE VOLTAGE BEFORE STARTING WORK. IF RESULT IS ANY OTHER VOLTAGE MEASURED THAN 120/240V IS OBSERVED, DO NOT PROCEED. CONTACT ENGINEER.



ELECTRICAL EQUIPMENT LIST			
SL NO:	ITEM	DESCRIPTION	QTY
1	PV MODULE	VSUN SOLAR: VSUN400-108BMH 400W MONO MODULES VOC = 37.2 V, VMP = 31.17 V ISC = 13.68 A, IMP = 12.84 A	12
2	INVERTER	TESLA:1538000-XX-Y 7.6 kW INVERTER OUTPUT: 240 VAC, 32A 98.0% CEC WEIGHTED EFFICIENCY NEMA 3R, UL LISTED	01
3	JUNCTION BOX	JUNCTION BOX UL 1741, NEMA 3R CSA C22.2 NO.290	01
4	AC DISCONNECT	EATON AC DISCONNECT: 60A NON-FUSED, 240V NEMA 3R, UL LISTED	01
5	MAIN SERVICE PANEL	(E) MAIN SERVICE PANEL AND METER: 200A MAIN BUSBAR	01
6	RAPID SHUTDOWN	TESLA:RSD MCI-2 RATED MAXIMUM DC INPUT CURRENT - 13 ADC MAXIMUM SHORT STRING CURRENT - 17 ADC LIMITATIONS - 1 TO 3 MODULES, 1000 V DC MAXIMUM SYSTEM VOLTAGE	4
7	BOLT	BX MLPE HARDWARE (BX-CMA-MI-M1)	4

QTY	CONDUCTOR INFORMATION	CONDUIT TYPE	CONDUIT SIZE
(2)	CU#10AWG - PV WIRE/USE-2	N/A	N/A
(1)	CU#6AWG - BARE COPPER IN FREE AIR		
(2)	CU#10AWG - THWN-2 (L1,L2)	EMT OR LFMC IN ATTIC	3/4"
(1)	CU#10AWG - THWN-2 GND		
(2)	CU#8AWG - THWN-2 (L1,L2)	EMT, LFNC OR LFMC	3/4"
(1)	CU#8AWG - THWN-2 N		
(1)	CU#10AWG - THWN-2 GND	EMT, LFNC OR LFMC	3/4"
(2)	CU#8AWG - THWN-2 (L1,L2)		
(1)	CU#8AWG - THWN-2 N		
(1)	CU#10AWG - THWN-2 GND		

NOTE: RELOCATE 30A/2P BREAKER FROM MSP TO SUB PANEL TO MAKE ROOM FOR SOLAR BREAKER IN THE MAIN PANEL

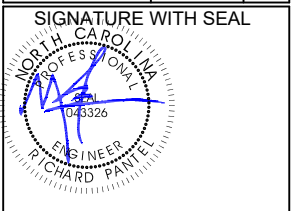
NOTE: WIRE SCHEDULE CALLOUT (E) IS EXISTING SYSTEM

NOTE: CONDUIT TO BE UL LISTED FOR WET LOCATIONS AND UV PROTECTED (EX.- EMT,PVC OR EQUIVALENT)



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PROJECT NAME & ADDRESS

YUBEIMEYE RAYMOND  
 33 LOCKWOOD DR,  
 CAMERON, NC 28326

DC SIZE:9.480kW  
 AC SIZE:13.300kW

DRAWN BY  
**ESR**

SHEET NAME  
**ELECTRICAL LINE DIAGRAM**

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

SHEET NUMBER  
**PV-4**

**LABEL 1**  
 LABEL LOCATION:  
 EMT/CONDUIT RACEWAY  
 SOLADECK / JUNCTION BOX  
 CODE REF: NEC 690.13 (G)  
 ON ALL CONDUITS SPACED AT MAX 10FT

**WARNING: PHOTOVOLTAIC  
 POWER SOURCE**

**LABEL 2**  
 LABEL LOCATION:  
 AC DISCONNECT  
 CODE REF: NEC 690.13(B)

**⚠ WARNING**

**ELECTRIC SHOCK HAZARD**

**TERMINALS ON THE LINE AND  
 LOAD SIDES MAY BE ENERGIZED  
 IN THE OPEN POSITION**

**LABEL 3**  
 LABEL LOCATION:  
 MAIN SERVICE PANEL, AC DISCONNECT  
 AND SUB PANEL (IF APPLICABLE)  
 CODE REF: NEC 705.12(C) & NEC 690.59

**⚠ WARNING**

**DUAL POWER SUPPLY  
 SOURCE: UTILITY GRID AND  
 PV SOLAR ELECTRIC SYSTEM**

**LABEL 4**  
 LABEL LOCATION:  
 MAIN SERVICE PANEL OR SUB PANEL  
 (ONLY IF SOLAR IS BACK-FED)  
 CODE REF: NEC 705.12(C) & NEC 690.59

**SOLAR PV BREAKER:**

**BREAKER IS BACKFED  
 DO NOT RELOCATE**

**LABEL 5**  
 LABEL LOCATION:  
 MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)  
 SUB PANEL (ONLY IF SOLAR IS BACK-FED)  
 CODE REF: NEC 705.12(B)(3)(2)

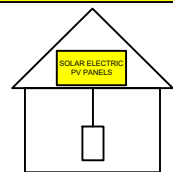
**⚠ WARNING**

**POWER SOURCE OUTPUT  
 CONNECTION. DO NOT  
 RELOCATE THIS  
 OVERCURRENT DEVICE**

**LABEL 6**  
 LABEL LOCATION:  
 INVERTER  
 CODE REF: [NEC 690.56(C)(1)(A)]

**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 7**  
 LABEL LOCATION:  
 AC DISCONNECT  
 MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)  
 CODE REF: NEC 690.56(C)(2)

**RAPID SHUTDOWN SWITCH  
 FOR SOLAR PV SYSTEM**

**LABEL 8**  
 LABEL LOCATION:  
 INVERTER  
 CODE REF: NEC 690.13(B)

**DC DISCONNECT**

**LABEL 9**  
 LABEL LOCATION:  
 AC DISCONNECT  
 CODE REF: NEC 690.54

**AC DISCONNECT  
 PHOTOVOLTAIC SYSTEM  
 POWER SOURCE**

NOMINAL OPERATING AC VOLTAGE   
 RATED AC OUTPUT CURRENT

**LABEL 10**  
 LABEL LOCATION:  
 INVERTER  
 CODE REF: NEC 690.53

MAXIMUM VOLTAGE   
 MAXIMUM CIRCUIT CURRENT   
 MAX. RATED OUTPUT CURRENT  
 OF THE CHARGE CONTROLLER OR  
 DC-TO-DC CONVERTER (IF INSTALLED)  N/A

**LABEL 11**  
 LABEL LOCATION:  
 MAIN SERVICE PANEL AND SUB PANEL  
 CODE REF: NEC 110.27(C) & OSHA 1910.145 (f) (7)

**⚠ WARNING**

**TURN OFF PHOTOVOLTAIC  
 AC DISCONNECT PRIOR TO  
 WORKING INSIDE PANEL**

**LABEL 12**  
 LABEL LOCATION:  
 UTILITY METER  
 CODE REF: NEC 690.13(B)

**⚠ WARNING**

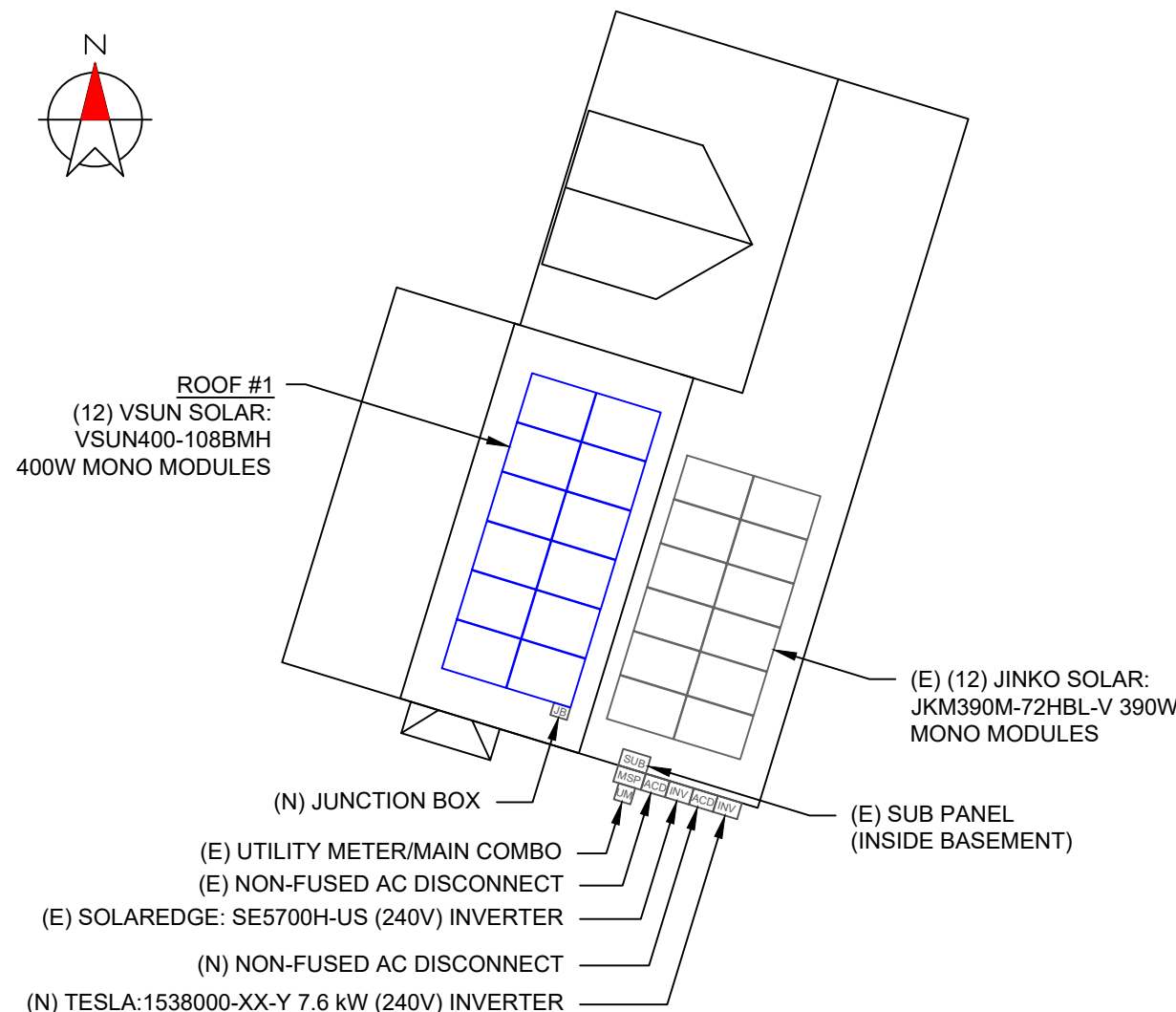
**THIS SERVICE METER  
 IS ALSO SERVED BY A  
 PHOTOVOLTAIC SYSTEM**

**LABEL 13**  
 LABEL LOCATION:  
 MAIN SERVICE PANEL  
 CODE REF: 2020 NEC 705.13

**NOTES**

1. NEC ARTICLES 690 AND 705 AND CRC SECTION R324 MARKINGS SHOWN HEREON
2. ALL MARKINGS SHALL CONSIST OF THE FOLLOWING:
  - A. UV RESISTANT SIGN MATERIAL WITH ENGRAVED OR MACHINE PRINTED LETTERS OR ELECTRO-PLATING
  - B. RED BACKGROUND COLOUR WITH WHITE TEXT AND LINE WORK
  - C. ARIAL FONT
3. ALL SIGNS SHALL BE SIZED APPROPRIATELY AND PLACED IN THE LOCATION SPECIFIED
4. SIGNS SHALL BE ATTACHED TO THE SERVICE EQUIPMENT USING POP-RIVETS OR SCREW
5. PLACARD ONLY REQUIRED WHEN PV UTILITY DISCONNECT & METER ARE NOT WITH IN 10'.

**CAUTION:  
 MULTIPLE SOURCES OF POWER**



33 LOCKWOOD DR, CAMERON, NC 28326

**"WARNING"**  
 PHOTOVOLTAIC ARRAY  
 DISCONNECTION OF NEUTRAL OR GROUNDED CONDUCTORS MAY RESULT IN OVERVOLTAGE ON ARRAY  
 OR INVERTER



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SHEET NAME

LABELS

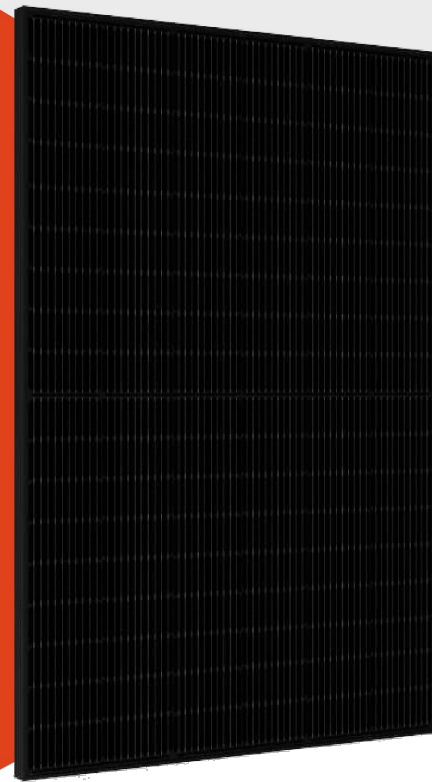
SHEET SIZE

ANSI B  
 11" X 17"

SHEET NUMBER

PV-5





**VSUN**  
Innovative & Smart

**25**  
YEAR  
QUALITY ASSURANCE

**30**  
YEAR  
POWER OUTPUT GUARANTEE

## VSUN405-108BMH

VSUN405-108BMH  
VSUN395-108BMH

VSUN400-108BMH  
VSUN390-108BMH

**405W**

Highest power output

**20.74%**

Module efficiency

**2.0%**

First-year degradation warranty

**0.45%**

Annual degradation over 30 years

### ABOUT VSUN

Invested by Fuji Solar. VSUN SOLAR is a solar solution provider with headquartered in Tokyo, Japan that offers reliability, high efficiency solar products and technology globally. VSUN is rated as BNEF Tier 1 PV module manufacturer, PVEL Lab "Best performer" and EcoVadis "Bronze Award".

### KEY FEATURES

**PERC** MBB technology with Circular Ribbon

Higher output power

Half-cell Technology

Positive tolerance offer

Bifacial cells, converting more sunlight into electricity

Better shading tolerance

Certified for salt/ammonia corrosion resistance

Load certificates: wind to 2400Pa and snow to 5400Pa

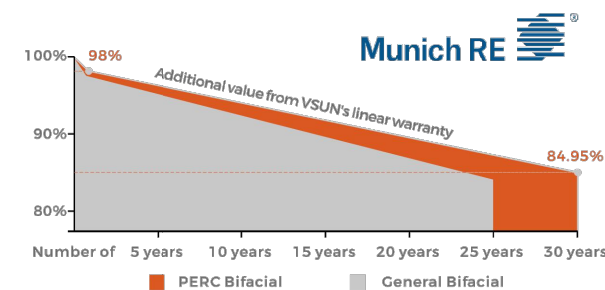
Lower LCOE

UL 61730 & CSA 61730  
IEC 61215 & IEC 61730

### PRODUCT CERTIFICATION



### WARRANTY



Update Time:2023.5.13

### Electrical Characteristics at Standard Test Conditions(STC)

Module Type	VSUN405-108BMH	VSUN400-108BMH	VSUN395-108BMH	VSUN390-108BMH
Maximum Power - Pmax (W)	405	400	395	390
Open Circuit Voltage - Voc (V)	37.36	37.2	37.03	36.84
Short Circuit Current - Isc (A)	13.78	13.68	13.59	13.5
Maximum Power Voltage - Vmpp (V)	31.36	31.17	31	30.82
Maximum Power Current - Imp (A)	12.92	12.84	12.75	12.66
Module Efficiency	20.74%	20.48%	20.23%	19.97%

Standard Test Conditions (STC): irradiance 1,000 W/m<sup>2</sup>; AM 1.5; module temperature 25°C. Pmax Sorting : 0~5W. Measuring Tolerance: ±3%.  
Remark: Electrical data do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.

### Electrical Characteristics with different rear side power gain(reference to 400 front)

Pmax (W)	Voc (V)	Isc (A)	Vmpp (V)	Imp (A)	Pmax gain
420	37.1	14.36	31.17	13.48	5%
440	37.1	15.05	31.17	14.12	10%
479	37.2	16.42	31.12	15.41	20%
499	37.2	17.10	31.12	16.05	25%

### Material Characteristics

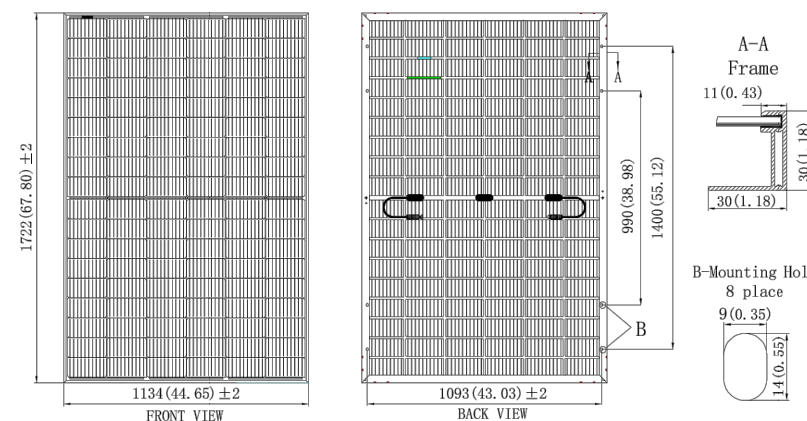
Dimensions	1722×1134×30mm (L×W×H) 67.80×44.65×1.18 inches (L×W×H)
Weight	21.4kg / 47.18lbs
Frame	Black anodized aluminum profile
Front Glass	AR-Coating toughened glass, 3.2 mm
Back sheet	Transparent black-mesh backsheet
Cells	12×9 pcs mono solar cells series strings
Junction Box	IP68, 3 diodes
Cable& Connector	Potrait: 1200 mm , 1×4 mm2 or 12AWG, Staubli MC4 Connector

### Packaging

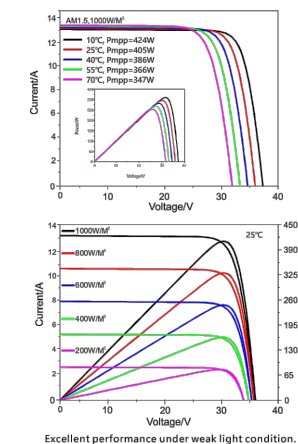
Dimensions(L×W×H)	1760×1125×1253mm / 69.29×44.29×49.33inches
Quantity per pallet	36 pcs
Container 20'	216
Container 40'	468
Container 40'HC	936 or 828 for US

### Dimensions

Note:mm (inch)



### IV-Curves



Update Time:2023.5.13



LuminaSun Smart Home LLC  
114 Morlake Drive suite 201,  
Mooresville, NC 28117

### REVISIONS

DESCRIPTION	DATE	REV
INITIAL	02/07/2025	

SIGNATURE WITH SEAL

### PROJECT NAME & ADDRESS

YUBEIMEYE RAYMOND  
33 LOCKWOOD DR.,  
CAMERON, NC 28326

DC SIZE:9.480kW

AC SIZE:13.300kW

DRAWN BY

ESR

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-6

## Tesla Solar Inverter with Site Controller

Tesla Solar Inverter completes the Tesla home solar system, converting DC power from solar to AC power for home consumption. Tesla's renowned expertise in power electronics has been combined with robust safety features and a simple installation process to produce an outstanding solar inverter that is compatible with both Solar Roof and traditional solar panels. Once installed, homeowners use the Tesla mobile app to manage their solar system and monitor energy consumption, resulting in a truly unique ecosystem experience.

### KEY FEATURES

- Built on Powerwall technology for exceptional efficiency and reliability
- Wi-Fi, Ethernet, and cellular connectivity with easy over-the-air updates
- Designed to integrate with Tesla Powerwall and Tesla App
- 0.5% revenue-grade metering for Solar Renewable Energy Credit (SREC) programs included



March 17, 2024

## Tesla Solar Inverter Technical Specifications

Electrical Specifications:	Model Number	1538000-xx-y			
Output (AC)	Output (AC) <sup>1</sup>	3.8 kW	5 kW	5.7 kW	7.6 kW
	Nominal Power	3,800 W	5,000 W	5,700 W	7,600 W
	Maximum Apparent Power	3,840 VA	5,040 VA	6,000 VA	7,680 VA
	Maximum Continuous Current	16 A	21 A	24 A	32 A
	Breaker (Overcurrent Protection)	20 A	30 A	30 A	40 A
	Nominal Power Factor	1 - 0.9 (leading / lagging)			
	THD (at Nominal Power)	<5%			

Electrical Specifications:	MPPT	4
Input (DC)	Input Connectors per MPPT	1-2-1-2
	Maximum Input Voltage	600 VDC
	DC Input Voltage Range	60 - 550 VDC
	DC MPPT Voltage Range	60 - 480 VDC <sup>1</sup>
	Maximum Current per MPPT ( $I_{mp}$ )	13 A <sup>2</sup>
	Maximum Short Circuit Current per MPPT ( $I_{sc}$ )	17 A <sup>2</sup>

<sup>1</sup>Maximum current.

<sup>2</sup>Where the DC input current exceeds an MPPT rating, jumpers can be used to allow a single MPPT to intake additional DC current up to 26 A  $I_{mp}$  / 34 A  $I_{sc}$ .

Performance Specifications	Peak Efficiency	98.6% at 240 V
	CEC Efficiency	98.0% at 240 V
	Allowable DC/AC Ratio	1.7
	Customer Interface	Tesla Mobile App
	Internet Connectivity	Wi-Fi (2.4 GHz, 802.11 b/g/n), Ethernet, Cellular (LTE/4G) <sup>3</sup>
	Revenue Grade Meter	Revenue Accurate (+/- 0.5%)
	AC Remote Metering Support	Wi-Fi (2.4 GHz, 802.11 b/g/n)
	Protections	Integrated arc fault circuit interrupter (AFCI), Rapid Shutdown
	Supported Grid Types	60 Hz, 240 V Split Phase
	Warranty	12.5 years

<sup>3</sup>Cellular connectivity subject to network operator service coverage and signal strength.

Tesla Solar Inverter and Solar Shutdown Device Datasheet



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Mooreville, NC 28117

### REVISIONS

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PROJECT NAME & ADDRESS

YUBEIMEYE RAYMOND  
33 LOCKWOOD DR.,  
CAMERON, NC 28326

DC SIZE:9.480kW

AC SIZE:13.300kW

DRAWN BY

ESR

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-7

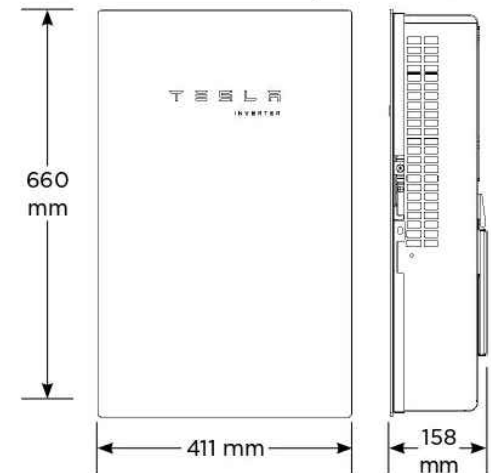


# Tesla Solar Inverter Technical Specifications

## Mechanical Specifications

### Dimensions

660 mm x 411 mm x 158 mm (26 in x 16 in x 6 in)



**Weight** 52 lb<sup>4</sup>  
**Mounting Options** Wall mount (bracket)

<sup>4</sup>Door and bracket can be removed for a mounting weight of 37 lb.

## Environmental Specifications

**Operating Temperature** -30°C to 45°C (-22°F to 113°F)<sup>5</sup>  
**Operating Humidity (RH)** Up to 100%, condensing  
**Storage Temperature** -30°C to 70°C (-22°F to 158°F)  
**Maximum Elevation** 3000 m (9843 ft)  
**Environment** Indoor and outdoor rated  
**Enclosure Rating** Type 3R  
**Ingress Rating** IP55 (Wiring compartment)  
**Pollution Rating** PD2 for power electronics and terminal wiring compartment, PD3 for all other components  
**Operating Noise @ 1 m** < 40 db(A) nominal, < 50 db(A) maximum

<sup>5</sup>Performance may be de-rated to 6.2 kW at 240 V when operating at temperatures greater than 45°C.

## Compliance Information

**Grid Certifications** UL 1741, UL 1741 SA, UL 1741 SB, UL 1741 PCS, IEEE 1547-2018, IEEE 1547.1  
**Safety Certifications** UL 1741 PVRSS, UL 1699B, UL 1998 (US), UL 3741  
**Emissions** EN 61000-6-3 (Residential), FCC 47CFR15.109 (a)



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 33 LOCKWOOD DR,  
 CAMERON, NC 28326

DC SIZE:9.480kW  
 AC SIZE:13.300kW

DRAWN BY  
**ESR**

SHEET NAME  
**EQUIPMENT SPECIFICATION**

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

SHEET NUMBER  
**PV-8**

## Solar Shutdown Device Technical Specifications

The Solar Shutdown Device is a Mid-Circuit Interrupter (MCI) and is part of the PV system rapid shutdown (RSD) function in accordance with Article 690 of the applicable NEC. When paired with Tesla Solar Inverter, solar array shutdown is initiated by any loss of AC power.

Electrical Specifications	Model	MCI-1	MCI-2
	Nominal Input DC Current Rating ( $I_{mp}$ )	12 A	13 A
	Maximum Input Short Circuit Current ( $I_{sc}$ )	19 A	17 A
	Maximum System Voltage (PVHCS)	600 V DC	1000 V DC <sup>7</sup>
	<sup>7</sup> Maximum System Voltage is limited by Tesla Solar Inverter to 600 V DC.		
RSD Module Performance	Maximum Number of Devices per String	5	5
	Control	Power Line Excitation	Power Line Excitation
	Passive State	Normally Open	Normally Open
	Maximum Power Consumption	7 W	7 W
	Warranty	25 years	25 years
Environmental Specifications	Operating Temperature	-40°C to 50°C (-40°F to 122°F)	-45°C to 70°C (-49°F to 158°F)
	Storage Temperature	-30°C to 70°C (-22°F to 158°F)	-30°C to 70°C (-22°F to 158°F)
	Enclosure Rating	NEMA 4X / IP65	NEMA 4X / IP65
Mechanical Specifications	Electrical Connections	MC4 Connector	MC4 Connector
	Housing	Plastic	Plastic
	Dimensions	125 x 150 x 22 mm (5 x 6 x 1 in)	173 x 45 x 22 mm (6.8 x 1.8 x 1 in)
	Weight	350 g (0.77 lb)	120 g (0.26 lb)
	Mounting Options	ZEP Home Run Clip M4 Screw (#10) M8 Bolt (5/16") Nail / Wood screw	Wire Clip
Compliance Information	Certifications	UL 1741 PVRSE, UL 3741, PVRSA (Photovoltaic Rapid Shutdown Array)	
	RSD Initiation Method	PV System AC Breaker or Switch	

### UL 3741 PV Hazard Control (and PVRSA) Compatibility

The following categories of solar module meet the UL 3741 PVHCS listing when installed with Tesla Solar Inverter and Solar Shutdown Devices.

Tesla Solar Roof	<a href="#">PV Hazard Control System: BIPV compliance document</a>
Tesla or Hanwha (Q.Peak Duo BLK or BLK-G6+) Modules certified for use with ZEP racking	<a href="#">PV Hazard Control System: ZS PVHCS compliance document</a>
Other module and racking combinations	<a href="#">PV Hazard Control System: Generic PV Array compliance document</a>



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33 LOCKWOOD DR,  
CAMERON, NC 28326

DC SIZE:9.480kW

AC SIZE:13.300kW

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SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-9





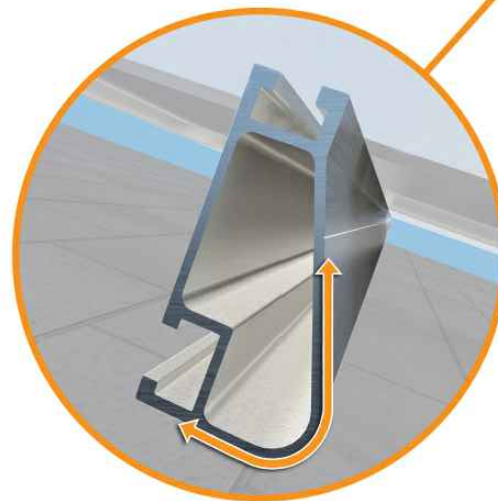
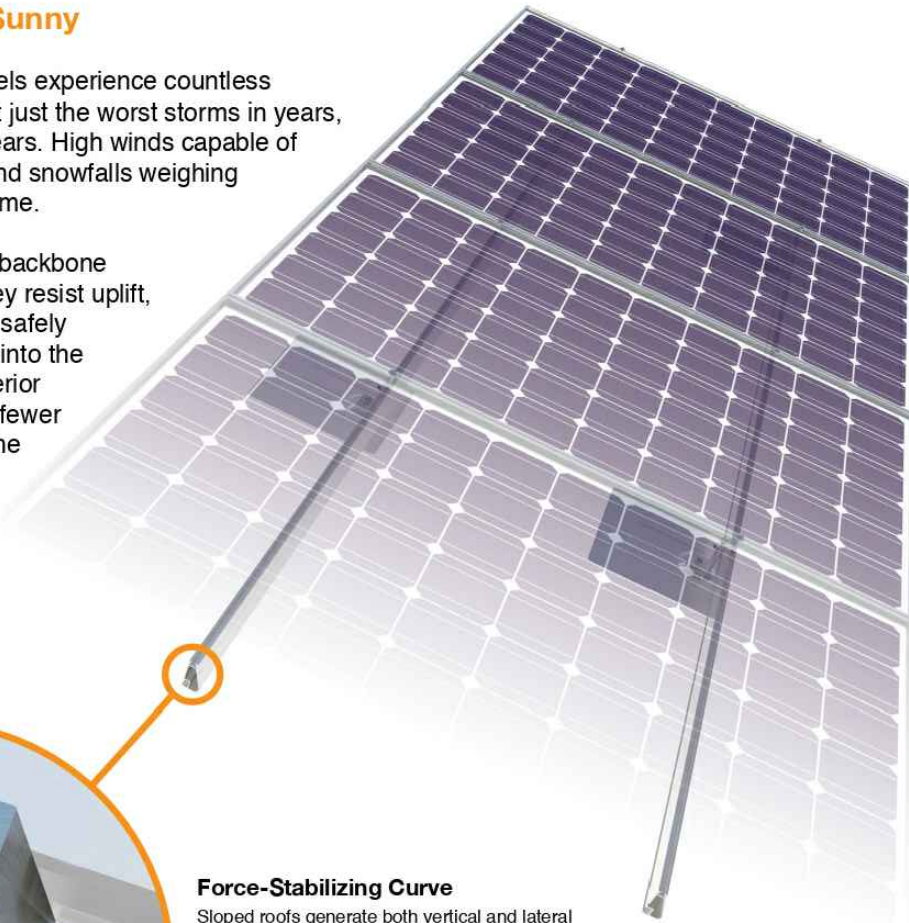
Tech Brief

## XR Rail® Family

### Solar Is Not Always Sunny

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

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



#### Force-Stabilizing Curve

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

#### Compatible with Flat & Pitched Roofs



#### 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 a residential and commercial 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](http://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						
	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.



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33 LOCKWOOD DR.,  
CAMERON, NC 28326

DC SIZE:9.480kW

AC SIZE:13.300kW

#### DRAWN BY

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SHEET NAME  
EQUIPMENT  
SPECIFICATION

#### SHEET SIZE

ANSI B  
11" X 17"

#### SHEET NUMBER

PV-10





## UFO® Family of Components

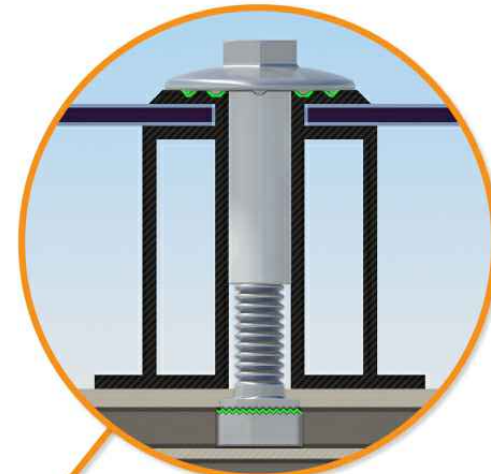
Tech Brief

### Simplified Grounding for Every Application

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

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

Only for installation and use with IronRidge products in accord with written instructions. See [IronRidge.com/UFO](http://IronRidge.com/UFO)



**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.



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



**BOSS® Splice**  
Bonded Structural Splice connects rails with built-in bonding teeth. No tools or hardware needed.

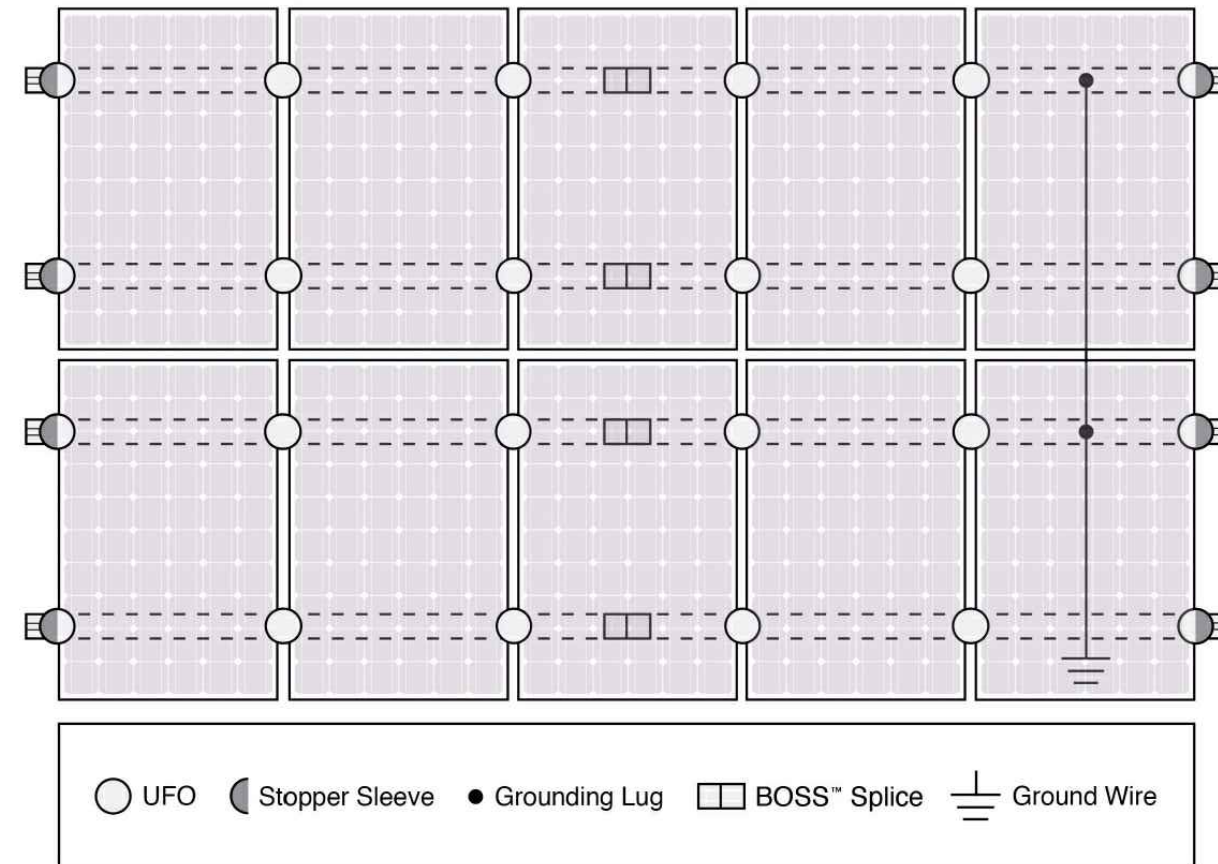


**Grounding Lug**  
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.



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

### System Diagram



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

### UL Certification

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

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

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

Feature	Cross-System Compatibility		
	Flush Mount	Tilt Mount	Ground Mount
<b>XR Rails®</b>	✓	✓	XR100 & XR1000
<b>UFO®/Stopper</b>	✓	✓	✓
<b>BOSS® Splice</b>	✓	✓	N/A
<b>Grounding Lugs</b>	1 per Row	1 per Row	1 per Array
<b>Microinverters &amp; Power Optimizers</b>	Compatible with most MLPE manufacturers. Refer to system installation manual.		
<b>Fire Rating</b>	Class A	Class A	N/A
<b>Modules</b>	Tested or Evaluated with over 400 Framed Modules. Refer to installation manuals for a detailed list.		



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Signature with Seal

#### PROJECT NAME & ADDRESS

YUBEIMEYE RAYMOND  
33 LOCKWOOD DR,  
CAMERON, NC 28326

DC SIZE:9.480kW

AC SIZE:13.300kW

#### DRAWN BY

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SHEET NAME  
EQUIPMENT  
SPECIFICATION

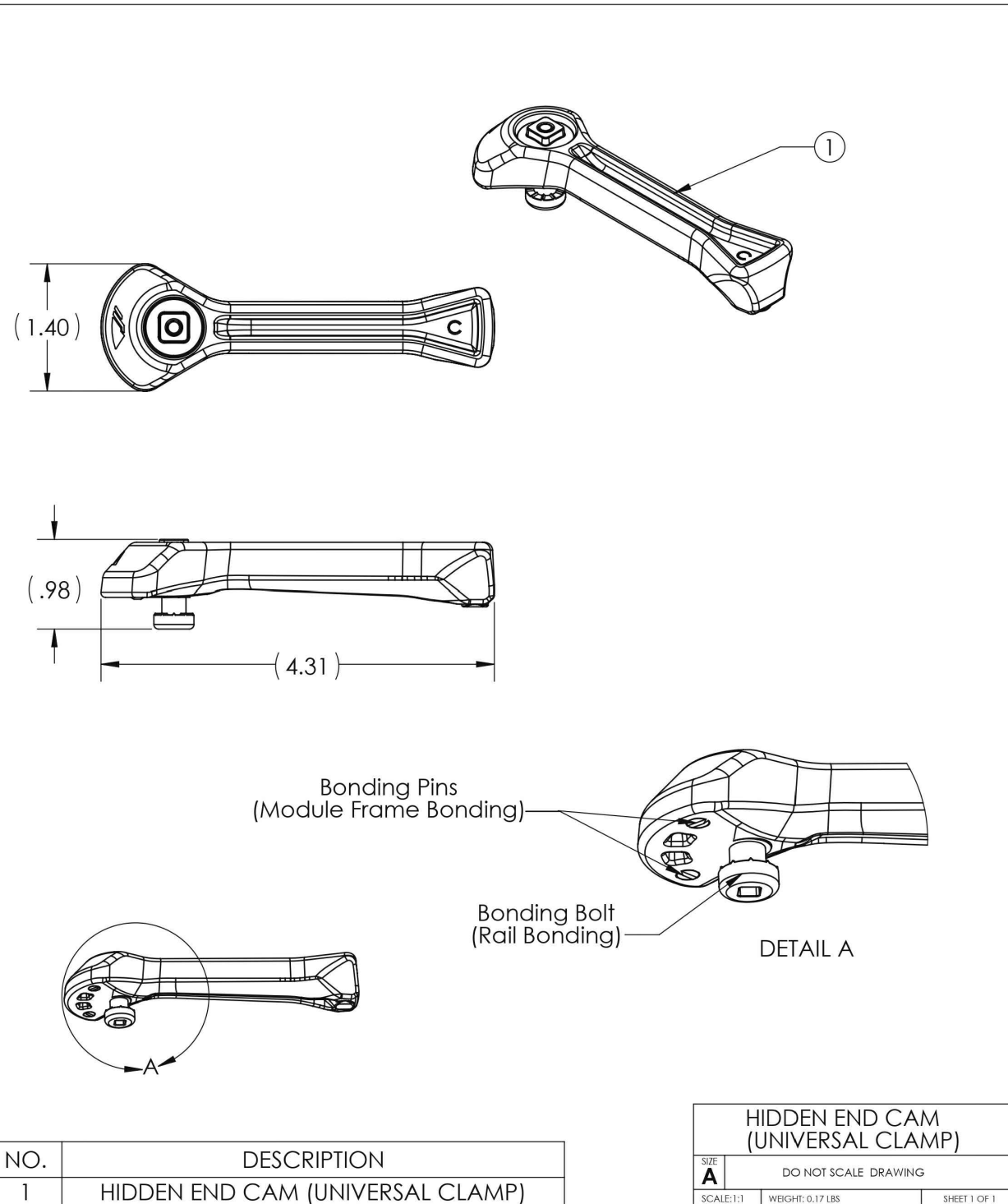
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ANSI B  
11" X 17"

#### SHEET NUMBER

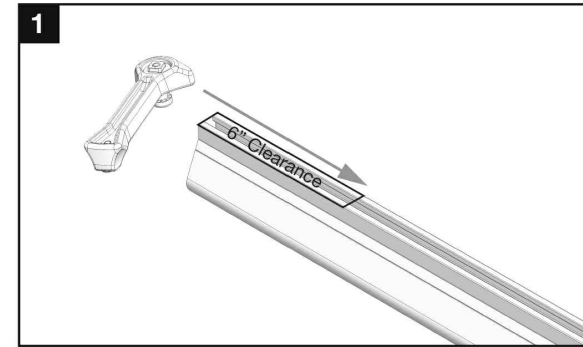
PV-11



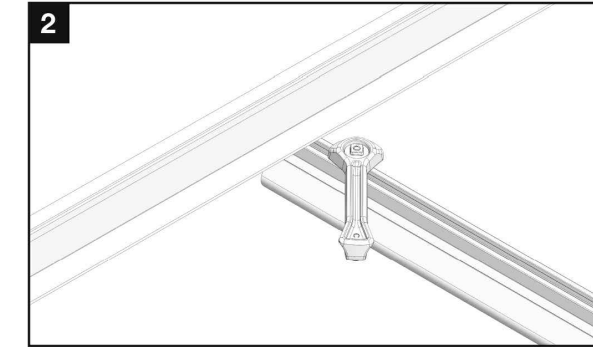


**Installation**

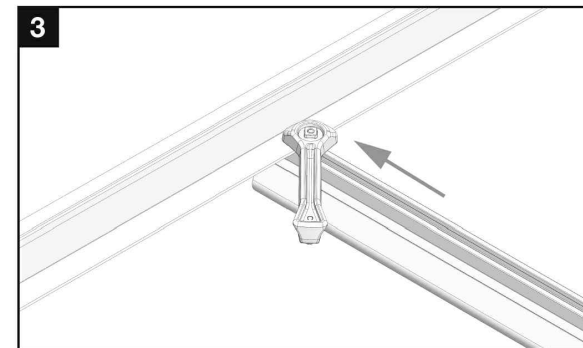
**Compatibility:** Fits modules with bottom flanges noted below. See IronRidge Flush, Tilt, Ground, or Ground Mount On The Roof Manual for full ratings and list of compatible modules.



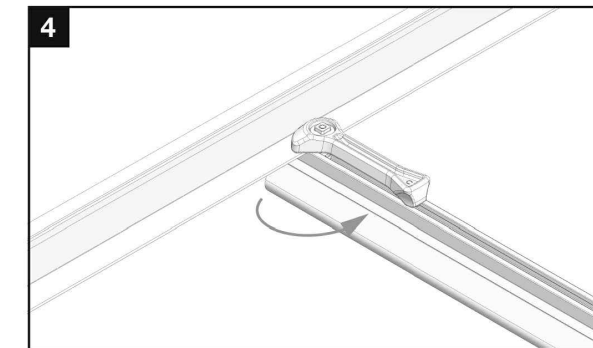
Slide CAMO into rail channel far enough to clear the module frame. CAMO requires 6" of clearance from end of rail.



Place module on rails (module cells not shown for clarity).

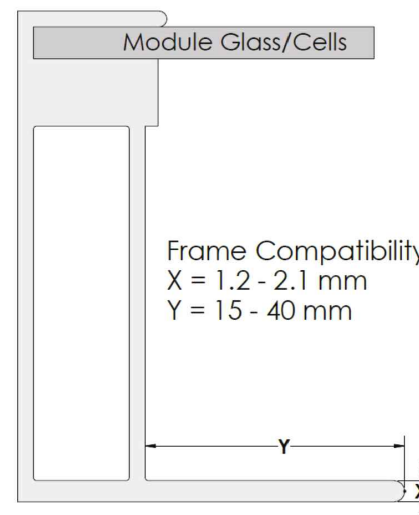


Pull CAMO towards rail ends, at 45 deg angle, so the bonding bolt contacts the module flange edge.



Rotate handle with an upwards motion until CAMO snaps into rail channel. Ensure Camo bonding pins are fully seated on top of module frame.

**Module Compatibility and Certifications**



**UL 2703**

Conforms to STD UL 2703 (2015) requirements. See IronRidge Flush, Tilt, Ground, or Ground Mount On The Roof Manual for full ratings and list of compatible modules.

**Allowable Design Load Rating**

50 PSF downward, 50 PSF upward, 15 PSF lateral. Actual system structural capacity is defined by PE stamped [certification letters](#).



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**YUBEIMEYE RAYMOND**  
**33 LOCKWOOD DR,**  
**CAMERON, NC 28326**

**DC SIZE: 9.480kW**

**AC SIZE: 13.300kW**

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**ESR**

SHEET NAME  
**EQUIPMENT  
SPECIFICATION**

SHEET SIZE

**ANSI B  
11" X 17"**

SHEET NUMBER

**PV-12**

ITEM NO	DESCRIPTION	QTY IN KIT
1	QM Halo UltraGrip(Mill or Black)	1

PART NUMBER	DESCRIPTION
QM-HUG-01-M1	Halo UltraGrip - Mill
QM-HUG-01-B1	Halo UltraGrip - Black

1. Halo UltraGrip

Property	Value
Material	3000 Series Aluminium
Finish	Mill or Black



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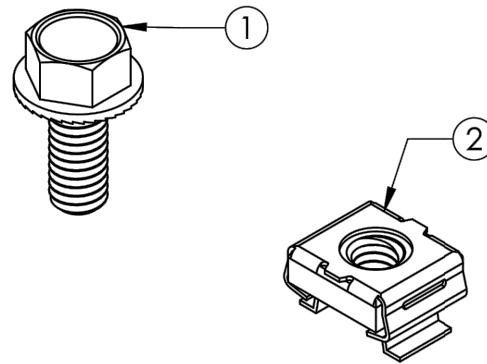
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11" X 17"

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PV-13





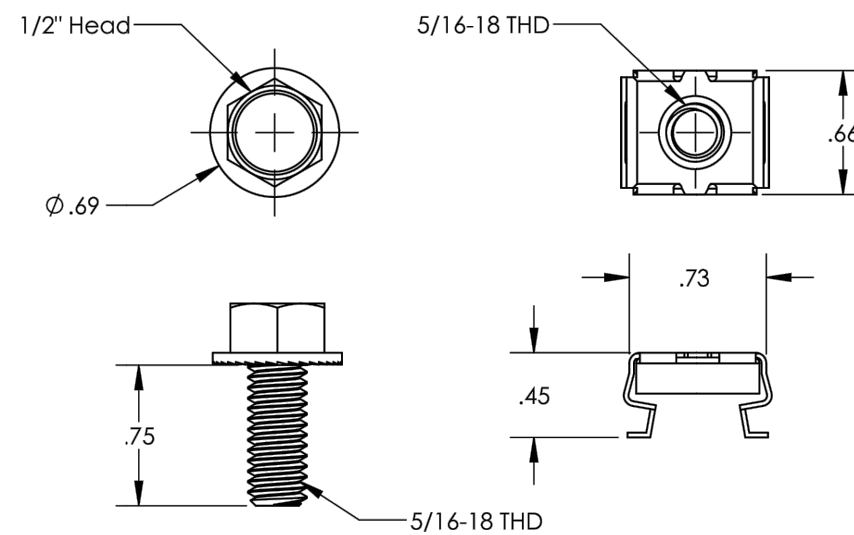
# BX MLPE Hardware



ITEM NO.	DESCRIPTION	QTY.
1	FLANGE HEAD CAP SCREW 5/16-18	20
2	CAGENUT, 5/16	20

Part Number	Description
BX-CMA-MI-M1	BX MLPE MOUNTING ASSEMBLY

1) Flange Head Cap Screw 5/16-18      2) Cagenut, 5/16-18



Property	Value
Material	300 Series Stainless Steel
Finish	Clear

v1.0



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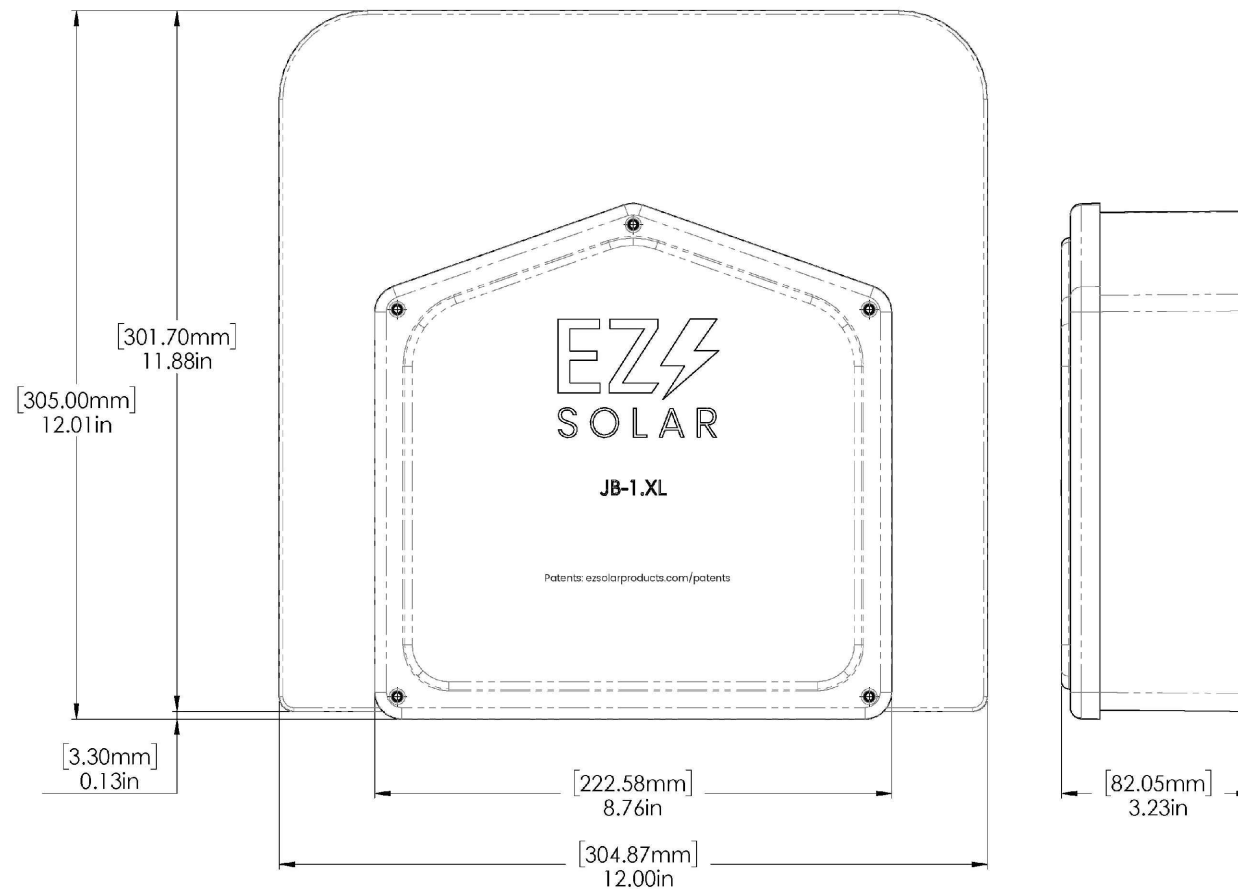
ANSI B  
11" X 17"

SHEET NUMBER

PV-14

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	JB-1.XL BODY	POLYCARBONATE WITH UV INHIBITORS	1
2	JB-1.XL LID	POLYCARBONATE WITH UV INHIBITORS	1
3	#10 X 1-1/4" PHILLIPS PAN HEAD SCREW		4
4	#8 X 3/4" PHILLIPS PAN HEAD SCREW		6

SIZE	DWG. NO.	REV
<b>B</b>	<b>JB-1.XL</b>	
SCALE: 1:2	WEIGHT: 1.9 LBS	SHEET 1 OF 3
TORQUE SPECIFICATION:	<b>15-20 LBS</b>	
CERTIFICATION:	<b>UL 1741, NEMA 3R CSA C22.2 NO. 290</b>	
WEIGHT:	<b>1.9 LBS</b>	



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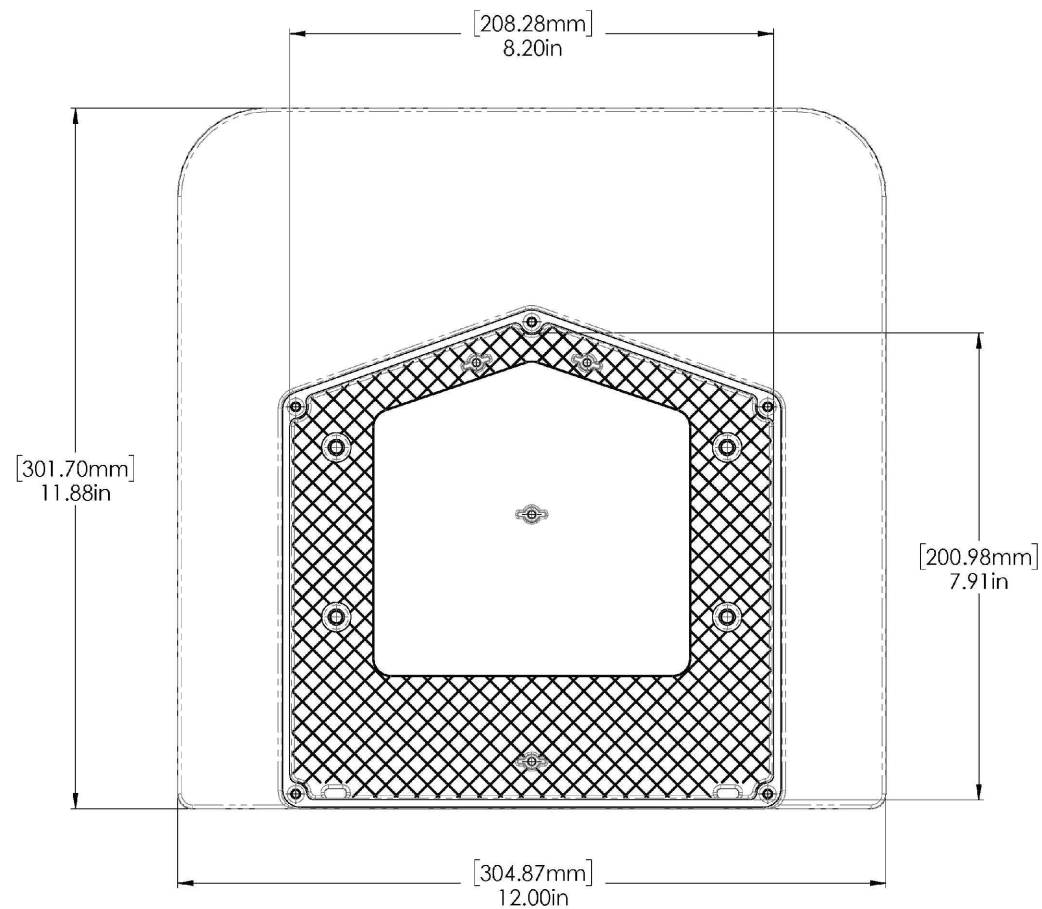
**ANSI B  
11" X 17"**

SHEET NUMBER

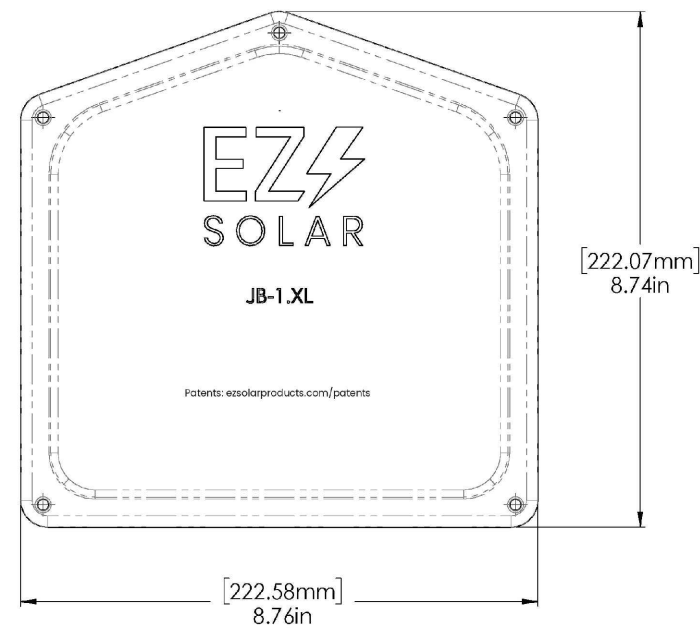
**PV-15**

SIZE <b>B</b>	DWG. NO. JB-1.XL	REV
SCALE: 1:2	WEIGHT: 1.9 LBS	SHEET 2 OF 3

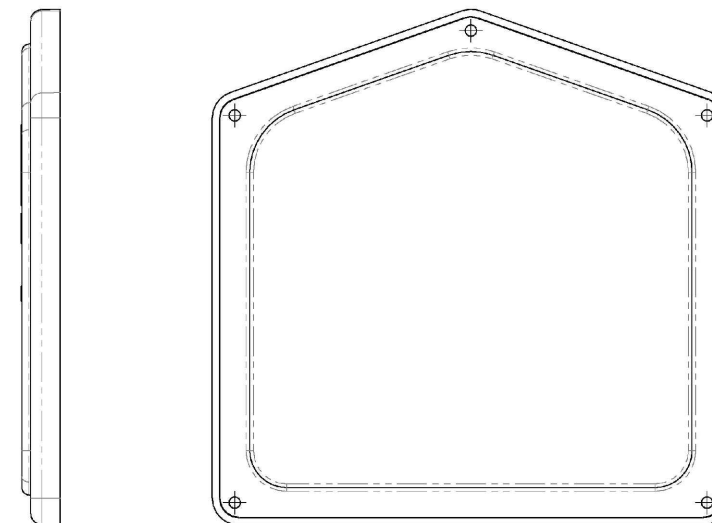
SIZE <b>B</b>	DWG. NO. JB-1.XL	REV
SCALE: 1:2	WEIGHT: 1.9 LBS	SHEET 3 OF 3



OUTSIDE



INSIDE



LuminaSun Smart Home LLC  
114 Morlake Drive suite 201,  
Mooresville, NC 28117

REVISIONS

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AC SIZE:13.300kW

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SPECIFICATION

SHEET SIZE

ANSI B  
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SHEET NUMBER

PV-16

