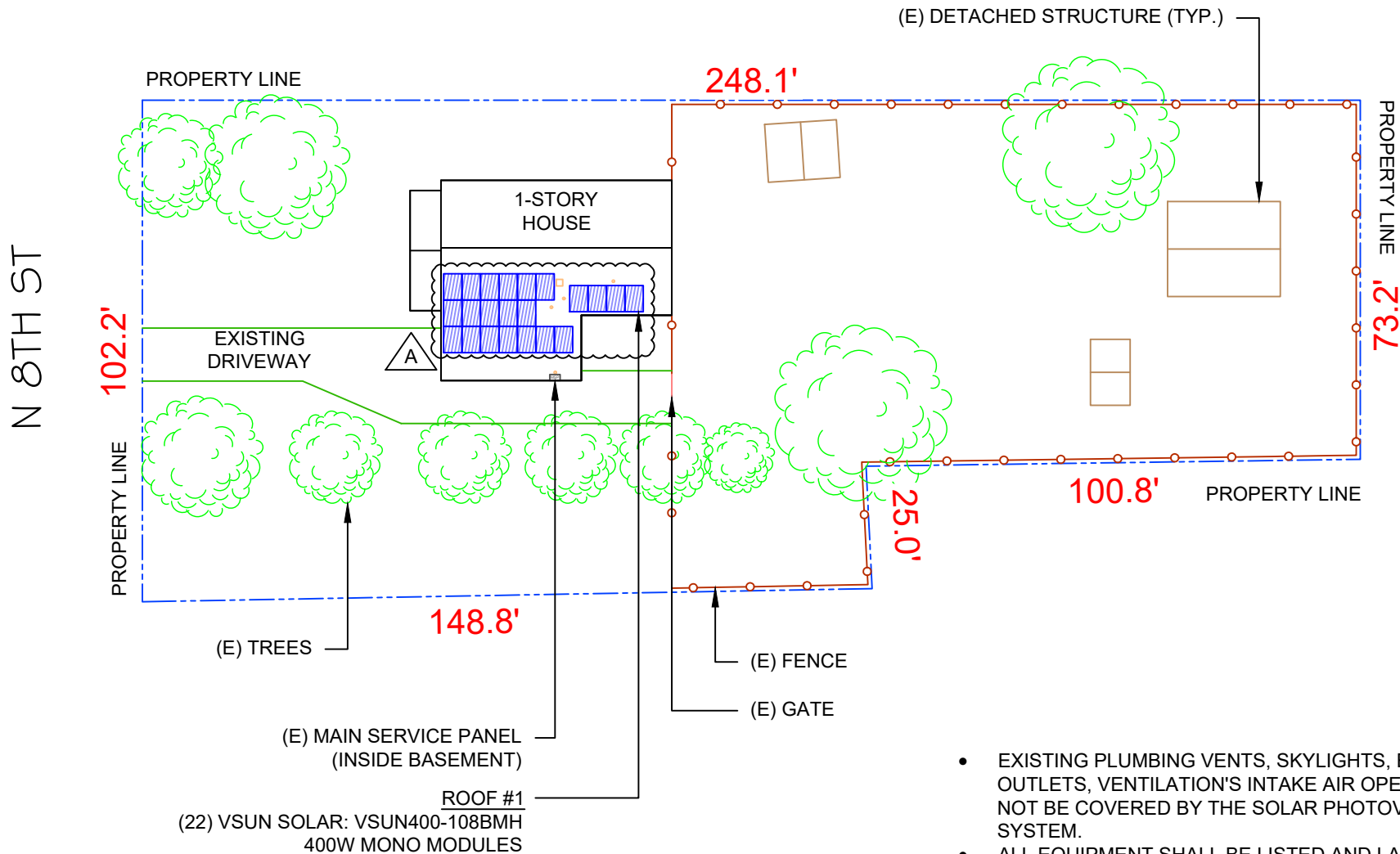
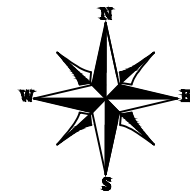


PROJECT DESCRIPTION:

22 x VSUN SOLAR: VSUN400-108BMH 400W MONO MODULES
ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES
DC SYSTEM SIZE: 8.800 kW DC
AC SYSTEM SIZE: 7.600 kW AC
ROOF ARRAY AREA #1:- 462.44 SQ FT.
EQUIPMENT SUMMARY
22 - VSUN SOLAR: VSUN400-108BMH 400W MONO MODULES
01 - TESLA: 1538000-XX-Y 7.6 kW (240V) INVERTER
08 - TESLA: RSD MCI-2

AUTHORITIES HAVING JURISDICTION
BUILDING: HARNETT COUNTY
ZONING: HARNETT COUNTY
UTILITY: DUKE ENERGY
APPLICABLE CODES & STANDARDS
NEC 2020
NCFC 2018
NCBC 2018
NCRC 2018
NCECC 2018

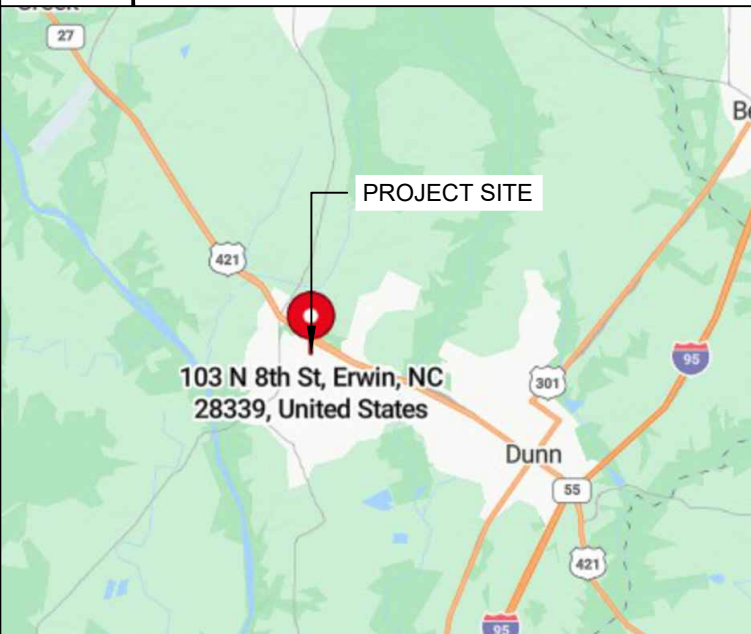


- EXISTING PLUMBING VENTS, SKYLIGHTS, EXHAUST OUTLETS, VENTILATION'S INTAKE AIR OPENINGS SHALL NOT BE COVERED BY THE SOLAR PHOTOVOLTAIC SYSTEM.
- ALL EQUIPMENT SHALL BE LISTED AND LABELED BY A RECOGNIZED ELECTRICAL TESTING LABORATORY AND INSTALLED PER THE LISTING REQUIREMENTS AND THE MANUFACTURER'S INSTRUCTIONS. [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.



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	02/25/2025	
REVISION	03/31/2025	A

SIGNATURE WITH SEAL

PROJECT NAME & ADDRESS
JEANETTE GILBERT
103 N 8TH ST,
ERWIN, NC 28339

DC SIZE:8.800kW
AC SIZE:7.600kW

DRAWN BY
ESR

SHEET NAME
PLOT PLAN &
VICINITY MAP

SHEET SIZE
ANSI B
11" X 17"

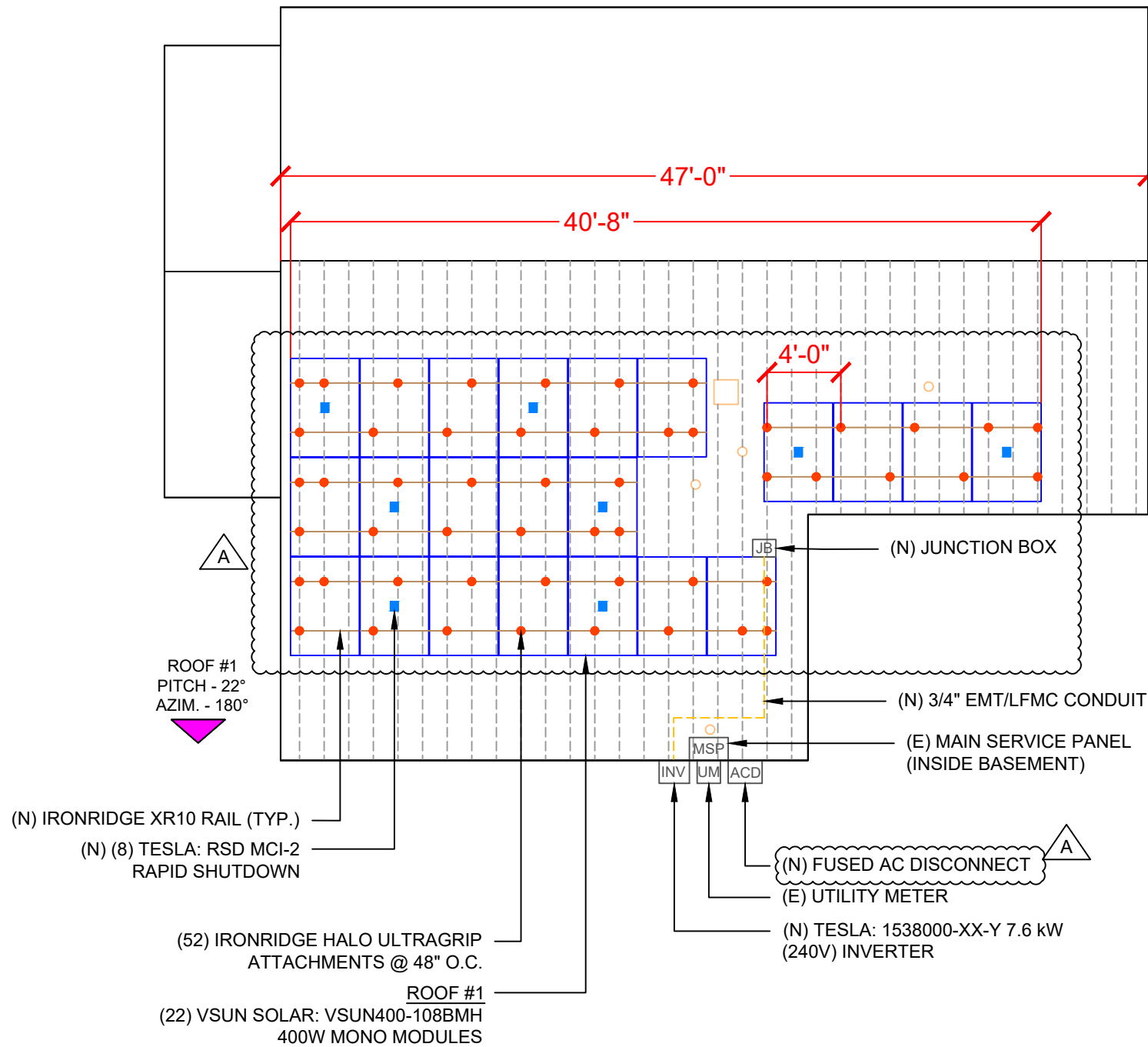
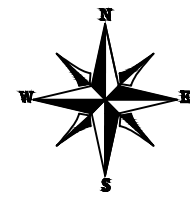
SHEET NUMBER
PV-1

1 PLOT PLAN WITH ROOF PLAN

PV-1 SCALE: 1/32" = 1'-0"

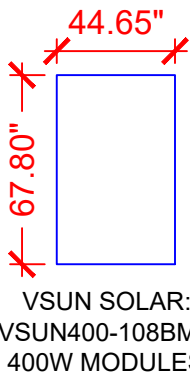
MODULES TYPE, DIMENSIONS & WEIGHT
NUMBER OF MODULE = 22 MODULES
MODULE TYPE = VSUN SOLAR: VSUN400-108BMH 400W MONO MODULES
MODULE WEIGHT = 47.18 LBS / 21.4 kg.
COMPONENT WEIGHT: 2.20 LBS. PER MODULE
MODULE DIMENSIONS = 67.80"x 44.65" = 21.02 SF
UNIT WEIGHT OF ARRAY = 2.24 PSF

IRONRIDGE HALO ULTRAGRIP ATTACHMENTS @ 48" O.C. = 52 TOTAL



ROOF DESCRIPTION				
ROOF TYPE		ASPHALT SHINGLE		
ROOF LAYER		1 LAYER		
ROOF	ROOF TILT	AZIMUTH	RAFTER SIZE	RAFTER SPACING
#1	22°	180°	2"X6"	16"

ARRAY AREA & ROOF AREA CALC'S				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	22	462.44	1026.24	45
TOTAL	22	462.44	1825.97	25



LEGEND	
	- JUNCTION BOX
	- INVERTER
	- AC DISCONNECT
	- UTILITY METER
	- MAIN SERVICE PANEL
	- TESLA: RSD MCI-2 RAPID SHUTDOWN
	- VENT, ATTIC FAN (ROOF OBSTRUCTION)
	- ROOF ATTACHMENT
	- RAFTER
	- CONDUIT



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103 N 8TH ST,
ERWIN, NC 28339

DC SIZE:8.800kW
AC SIZE:7.600kW

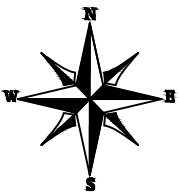
DRAWN BY
ESR

SHEET NAME
ROOF PLAN
& MODULES

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-2

STRING LEGENDS	
---	STRING #1
---	STRING #2



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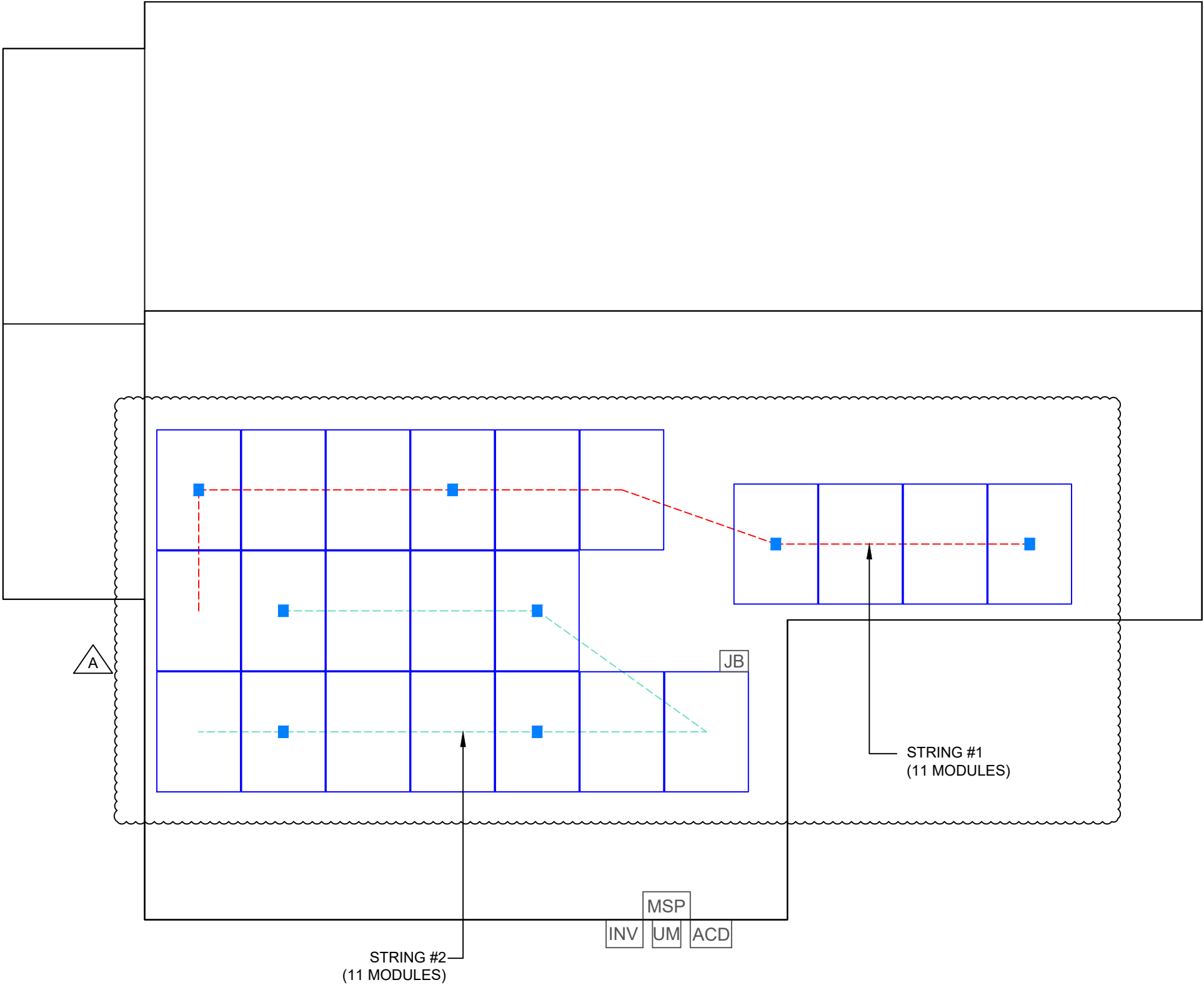
DC SIZE:8.800kW
AC SIZE:7.600kW

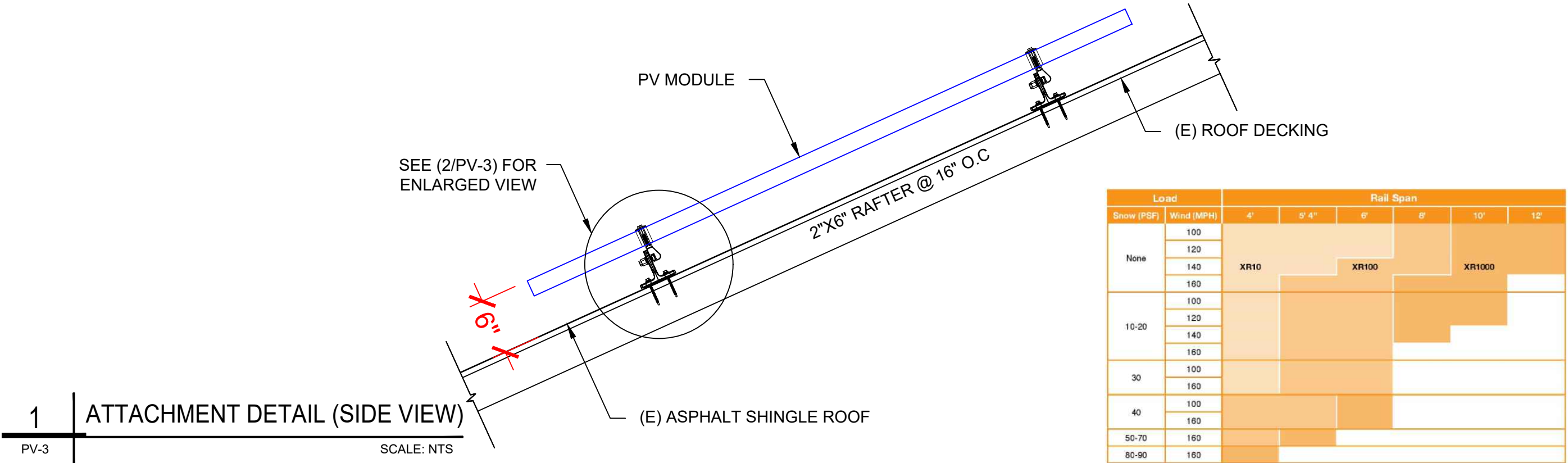
DRAWN BY
ESR

SHEET NAME
STRING
LAYOUT

SHEET SIZE
ANSI B
11" X 17"

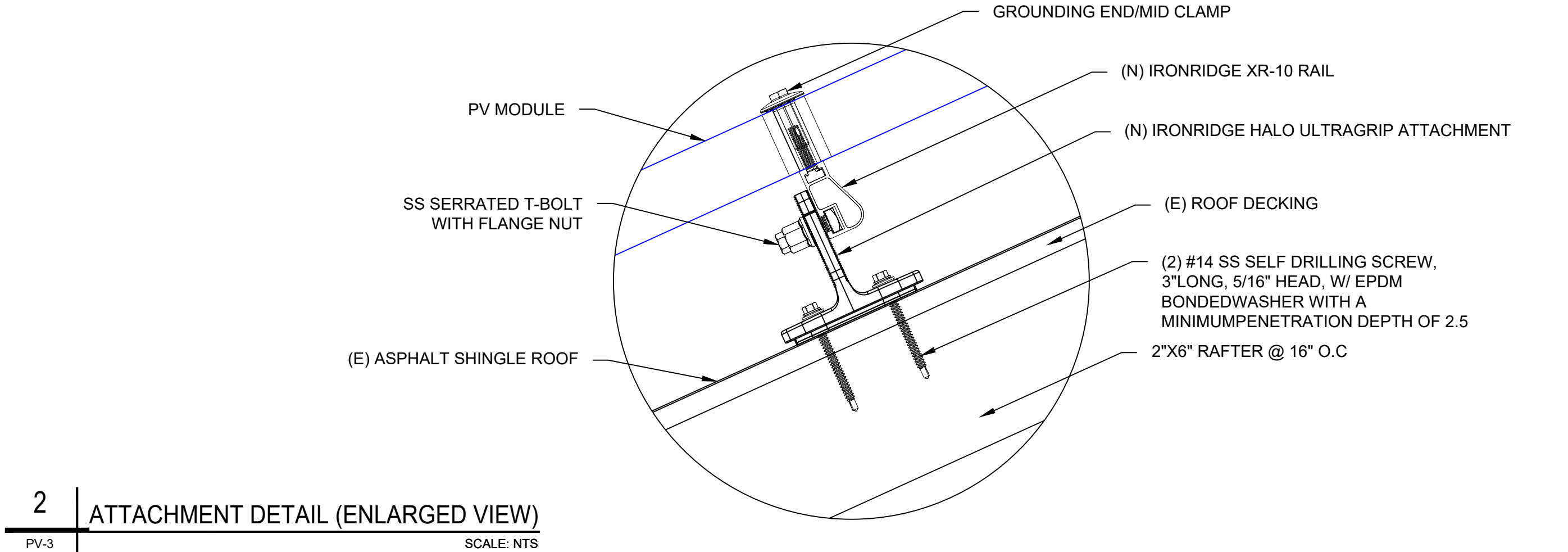
SHEET NUMBER
PV-2A





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						

1 ATTACHMENT DETAIL (SIDE VIEW)
PV-3 SCALE: NTS



2 ATTACHMENT DETAIL (ENLARGED VIEW)
PV-3 SCALE: NTS



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PROJECT NAME & ADDRESS

JEANETTE GILBERT
103 N 8TH ST,
ERWIN, NC 28339

DC SIZE:8.800kW
AC SIZE:7.600kW

DRAWN BY
ESR

SHEET NAME
ATTACHMENT
DETAIL

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-3

DC SYSTEM SIZE: 8.800kW DC
AC SYSTEM SIZE: 7.600kW AC

(22) VSUN SOLAR: VSUN400-108BMH 400W MONO MODULES

(02) STRINGS OF 11 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.

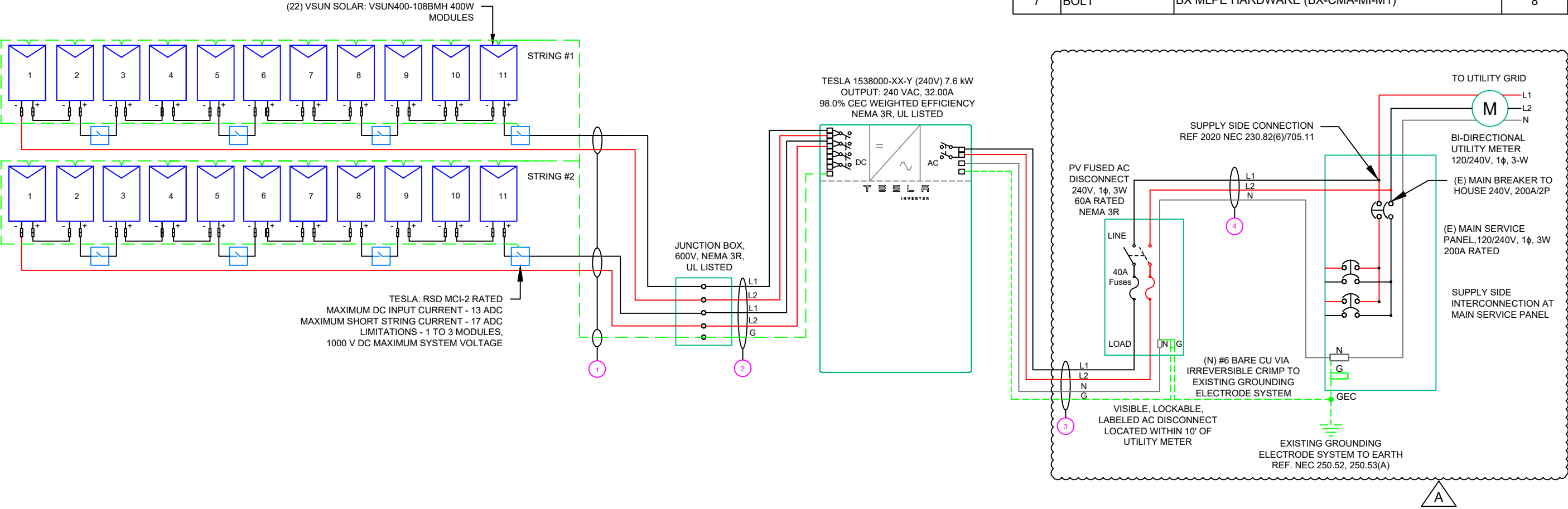
2. TEMPERATURE RATINGS OF ALL CONDUCTORS, TERMINATIONS, BREAKERS, OR OTHER DEVICES ASSOCIATED WITH THE SOLAR PV SYSTEM SHALL BE RATED FOR AT LEAST 75 DEGREE C.

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).

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	22
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 FUSED, (2) 40A FUSES, 240V NEMA 3R, UL LISTED	01
5	MAIN SERVICE PANEL	(E) MAIN SERVICE PANEL AND METER: 200A MAIN BUSBAR W(E) 200A MAIN BREAKER	01
6	RAPID SHUTDOWN	TESLA: MCI-2 RAPID SHUTDOWNS RATED MAXIMUM DC INPUT CURRENT - 13 ADC MAXIMUM SHORT CIRCUIT CURRENT - 17 ADC 1000 V DC MAXIMUM SYSTEM VOLTAGE	8
7	BOLT	BX MLPE HARDWARE (BX-CMA-MI-M1)	8



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PROJECT NAME & ADDRESS

JEANETTE GILBERT

103 N 8TH ST,
ERWIN, NC 28339

DC SIZE:8.800kW
AC SIZE:7.600kW

DRAWN BY

ESR

SHEET NAME

ELECTRICAL LINE
DIAGRAM

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-4

NOTE: LOACKABLE AC DISCONNECT MUST BE WITHIN SIGHT OF THE METER AND READILY ACCESSIBLE TO THE UTILITY DUKE ENERGY

NOTE: CONDUIT TO BE UL LISTED FOR WET LOCATIONS AND UV PROTECTED

MODULE RATED POWER (P_{MAX}):400W

QTY	CONDUCTOR INFORMATION	CONDUIT TYPE	CONDUIT SIZE
(4)	CU#10AWG - PV WIRE/USE-2	N/A	N/A
(1)	CU#6AWG - BARE COPPER IN FREE AIR		
(4)	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#6AWG - THWN-2 (L1,L2)		
(1)	CU#6AWG - THWN-2 N		

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)

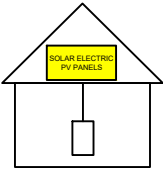
⚠ WARNING

**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 VOLATGE

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)

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**

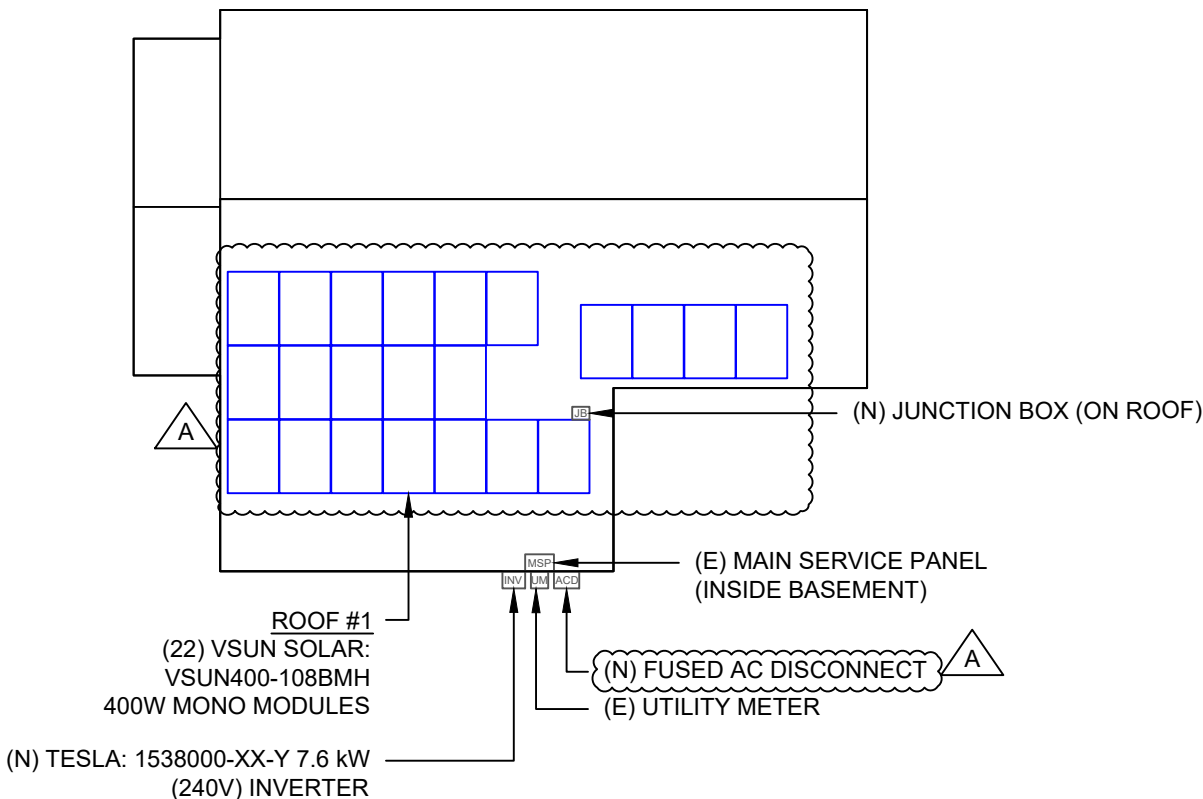
LABEL 13
LABEL LOCATION:
MAIN SERVICE PANEL
CODE REF: 2020 NEC 705.13

NOTES

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

CAUTION:

MULTIPLE SOURCES OF POWER



103 N 8TH ST, ERWIN, NC 28339

"WARNING"

PHOTOVOLTAIC ARRAY

DISCONNECTION OF NEUTRAL OR GROUNDED CONDUCTORS MAY RESULT IN OVERVOLTAGE ON ARRAY
OR INVERTER



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

REVISIONS

DESCRIPTION	DATE	REV
INITIAL	02/25/2025	
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SIGNATURE WITH SEAL

PROJECT NAME & ADDRESS

JEANETTE GILBERT
103 N 8TH ST,
ERWIN, NC 28339

DC SIZE:8.800kW

AC SIZE:7.600kW

DRAWN BY

ESR

SHEET NAME

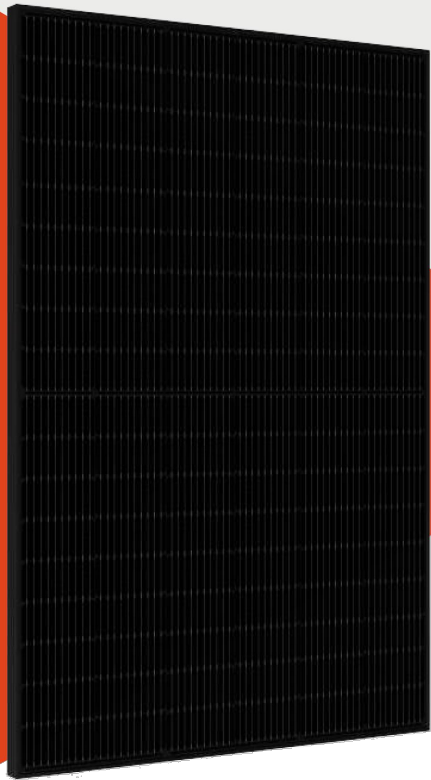
LABELS

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 VSUN400-108BMH
VSUN395-108BMH 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

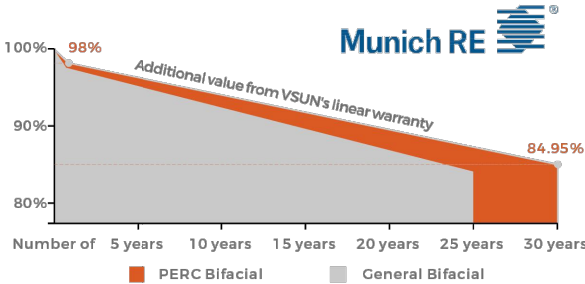
Lower LCOE

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/m²; 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

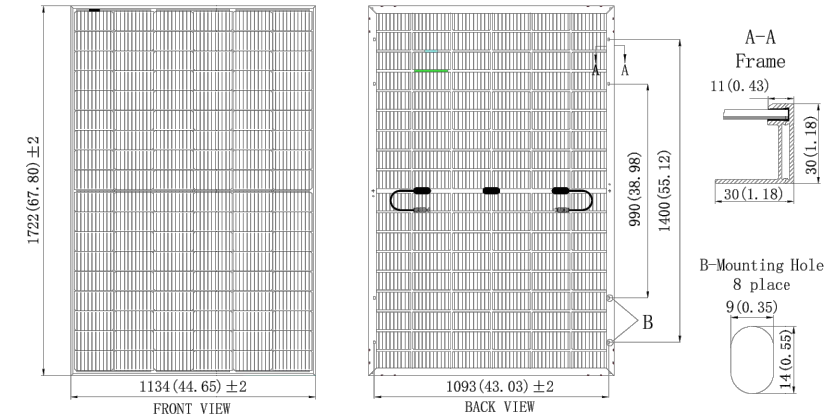
Dimensions	1722×1134×30mm (L×W×H) 67.80*44.65*1.18 inches (L×W×H)
Weight	21.4kg / 47.18lbs
Frame	Black anodized aluminum profile
Front Glass	AR-Coating toughened glass, 3.2 mm
Back sheet	Transparent black-mesh backsheet
Cells	12×9 pcs mono solar cells series strings
Junction Box	IP68, 3 diodes
Cable&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

Packaging

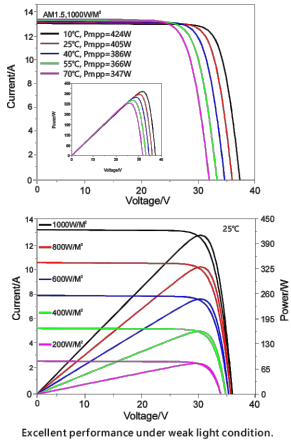
Dimensions(L×W×H)	1760×1125×1253mm / 69.29*44.29*49.33inches
Quantity per pallet	36 pcs
Container 20'	216
Container 40'	468
Container 40'HC	936 or 828 for US

Dimensions

Note:mm (inch)



IV-Curves



Update Time:2023.5.13



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SIGNATURE WITH SEAL

PROJECT NAME & ADDRESS

JEANETTE GILBERT
103 N 8TH ST,
ERWIN, NC 28339

DC SIZE:8.800kW
AC SIZE:7.600kW

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: Output (AC)	Model Number	1538000-xx-y			
	Output (AC) ¹	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: Input (DC)	MPPT	4
	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 ¹
	Maximum Current per MPPT (I _{MP})	13 A ²
	Maximum Short Circuit Current per MPPT (I _{SC})	17 A ²

¹Maximum current.
²Where 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) ³
	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

³Cellular connectivity subject to network operator service coverage and signal strength.



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Mooresville, NC 28117

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL	02/25/2025	
REVISION	03/31/2025	A

SIGNATURE WITH SEAL

PROJECT NAME & ADDRESS

JEANETTE GILBERT
103 N 8TH ST,
ERWIN, NC 28339

DC SIZE:8.800kW
AC SIZE:7.600kW

DRAWN BY
ESR

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

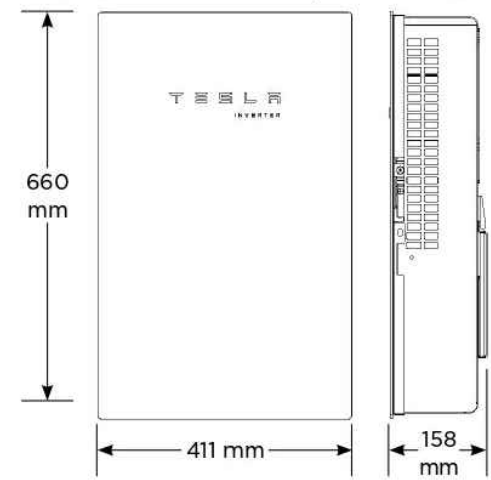
SHEET NUMBER
PV-7

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 lb⁴

Mounting Options Wall mount (bracket)

⁴Door 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) ⁵
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

⁵Performance 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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SHEET NUMBER
PV-8

Solar Shutdown Device Technical Specifications

The Solar Shutdown Device is a Mid-Circuit Interrupter (MCI) and is integral to the rapid shutdown (RSD) function required for rooftop PV systems in accordance with Article 690 of the NEC. When paired with Powerwall 3, solar array shutdown is initiated by an External System Shutdown Switch or the On/Off Enable switch located on Powerwall 3. Systems not subject to rapid shutdown requirements must still install one or more MCIs for functional purposes; see the Powerwall 3 installation manual for details.

Electrical Specifications

Model	MCI-1	MCI-2	MCI-2 High Current
Nominal Input DC Current Rating (I_{MP})	13 A	13 A	15 A
Maximum Input Short Circuit Current (I_{SC})	19 A	17 A	19 A
Maximum System Voltage	600 V DC	1000 V DC ¹⁵	1000 V DC ¹⁵
Maximum Disconnect Voltage ¹⁶	600 V DC	165 V DC	165 V DC

¹⁵ Maximum System Voltage is limited by Powerwall to 600 V DC.
¹⁶ Maximum Disconnect Voltage is the maximum voltage allowed across each MCI in the open position (Rapid Shutdown Initiated). An individual MCI-2 has a voltage rating of 165V but in combination (connected in the same string) their voltage ratings are additive.

RSD Module Performance

Maximum Number of Devices per String	5
Control	Power Line Excitation
Passive State	Normally Open
Maximum Power Consumption	7 W
Warranty	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	

Mechanical Specifications

Electrical Connections	MC4 Connector	
Housing	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	External System Shutdown Switch or Powerwall 3 Enable Switch

UL 3741 PV Hazard Control (and PVRSA) Compatibility

See [UL 3741 Application Addendum](#)



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PV-9



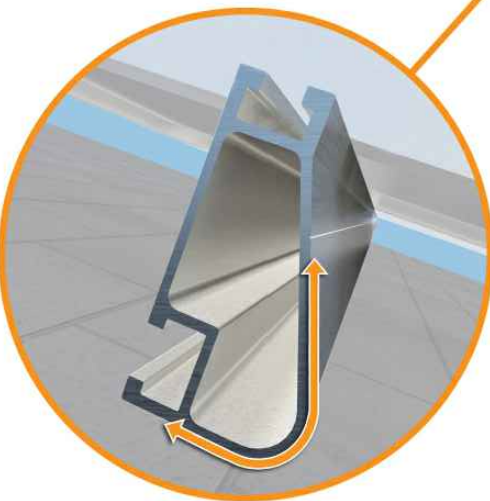
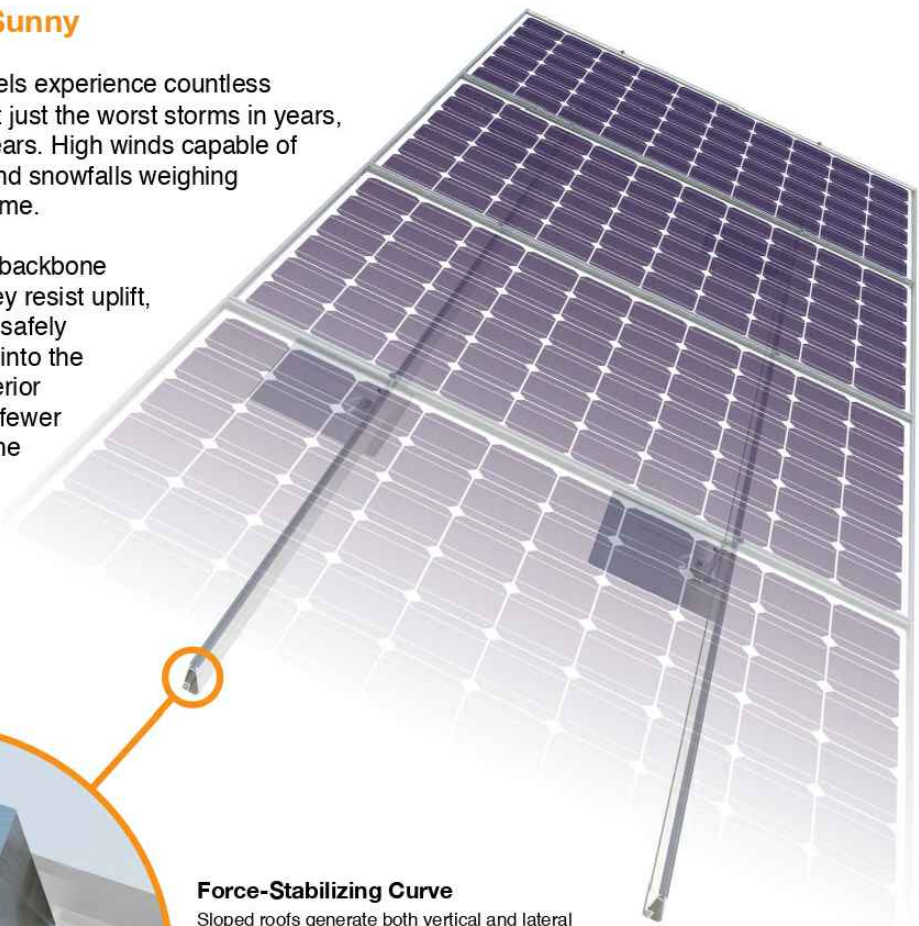
Tech Brief

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



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 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 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.



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AC SIZE:7.600kW

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SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-10



UFO® Family of Components

Tech Brief

Simplified Grounding for Every Application

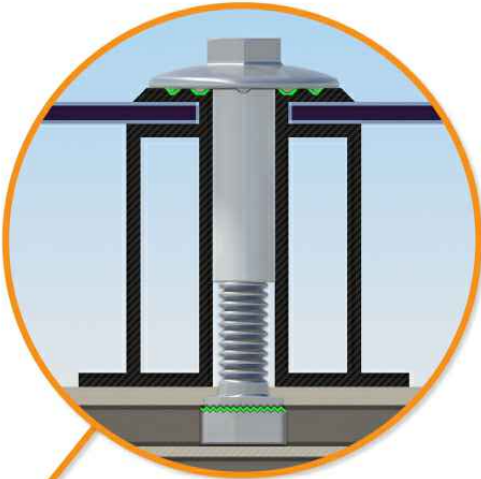
The UFO® family of components eliminates the need for separate grounding hardware by bonding solar modules directly to IronRidge® XR Rails®. All system types that feature the UFO® family—Flush Mount®, Tilt Mount® and Ground Mount®—are fully listed to the UL 2703 standard.

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



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.



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

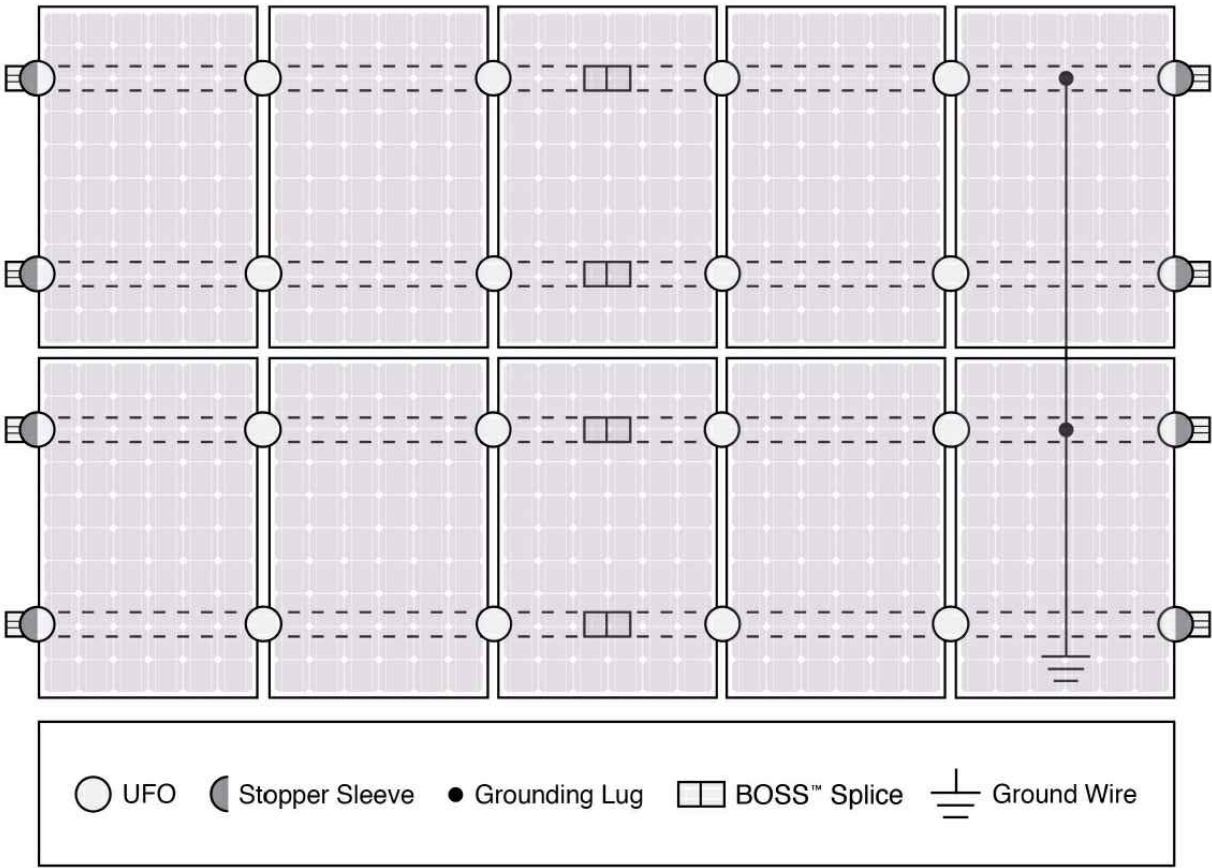


Grounding Lug
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.



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](https://www.ironridge.com/UFO)

Cross-System Compatibility			
Feature	Flush Mount	Tilt Mount	Ground Mount
XR Rails®	✓	✓	XR100 & XR1000
UFO®/Stopper	✓	✓	✓
BOSS® Splice	✓	✓	N/A
Grounding Lugs	1 per Row	1 per Row	1 per Array
Microinverters & Power Optimizers	Compatible with most MLPE manufacturers. Refer to system installation manual.		
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.		

Tech Brief



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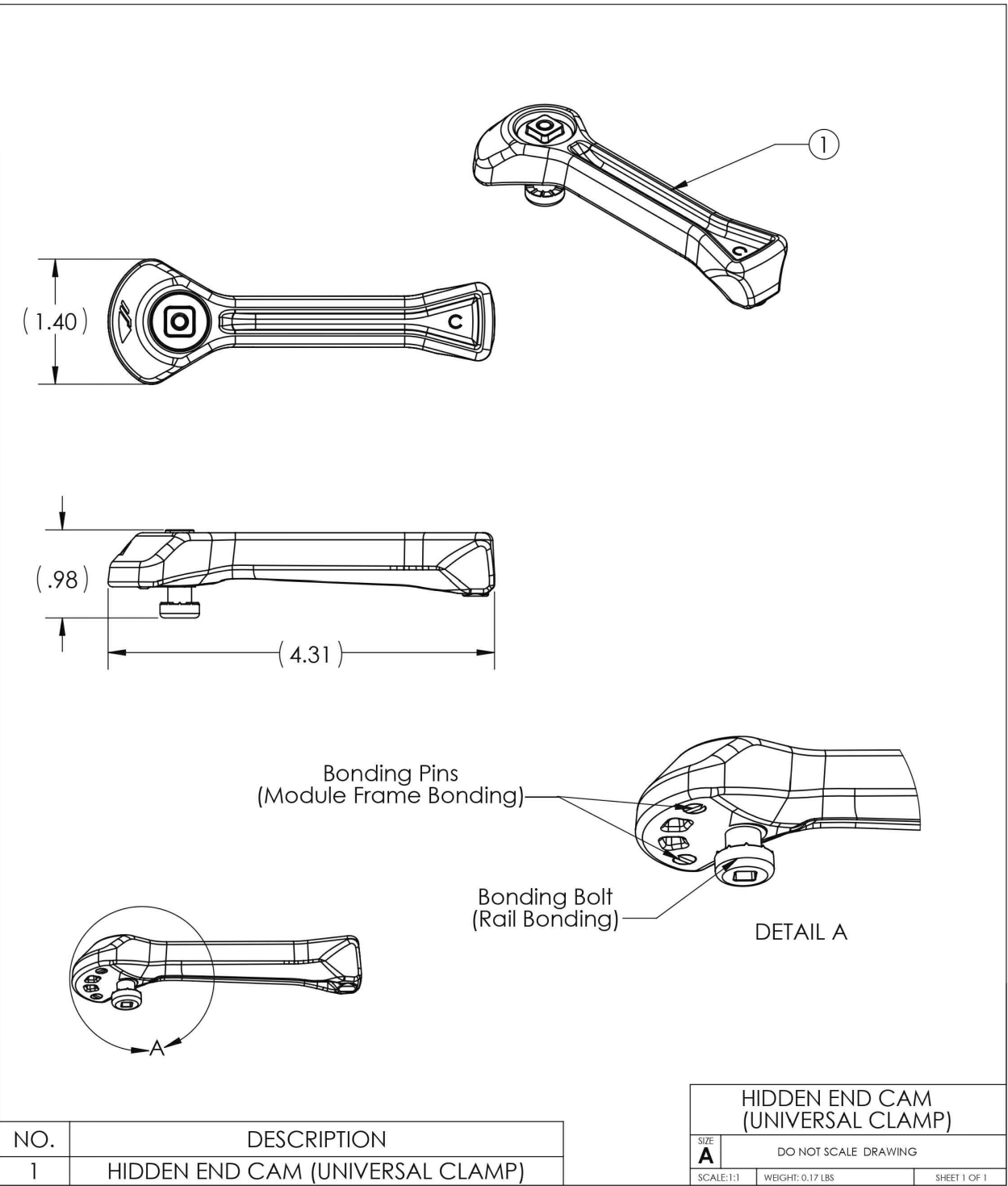
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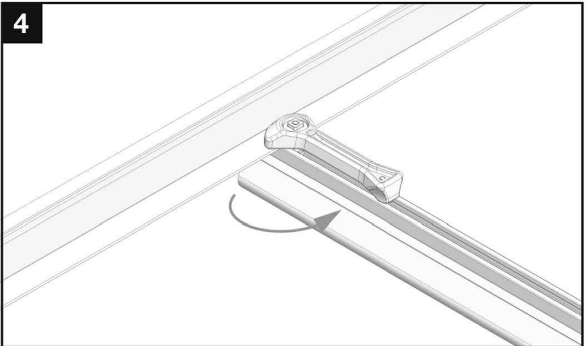
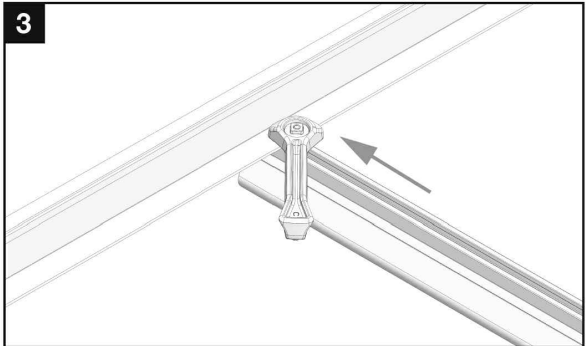
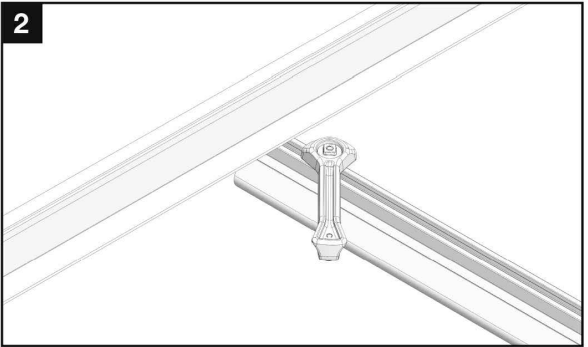
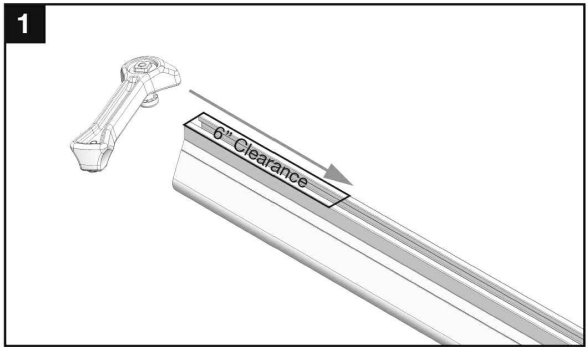
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ANSI B
11" X 17"

SHEET NUMBER
PV-11

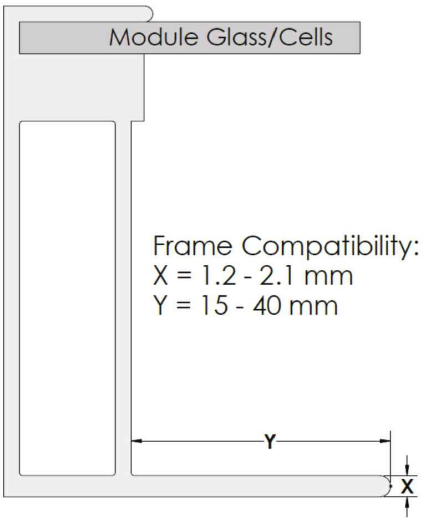


Installation

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.



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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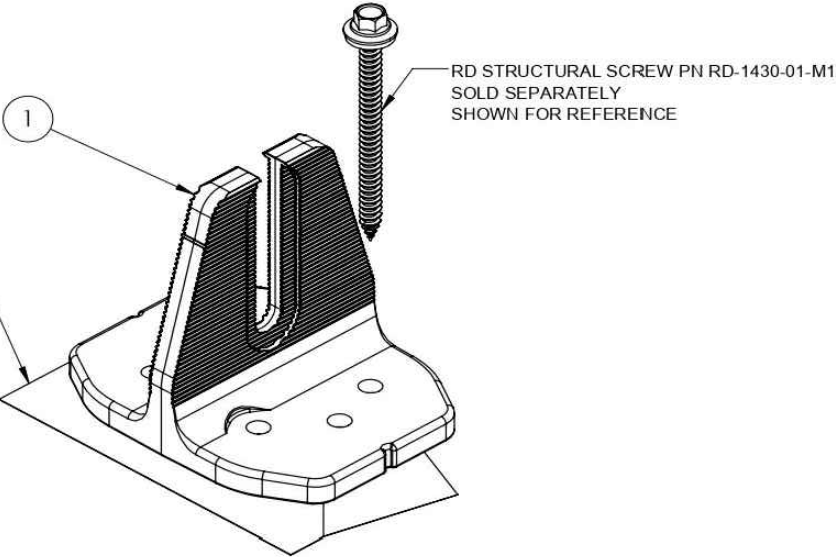
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-12



QuickMount® Halo UltraGrip

Cut Sheet



RD STRUCTURAL SCREW PN RD-1430-01-M1
SOLD SEPARATELY
SHOWN FOR REFERENCE

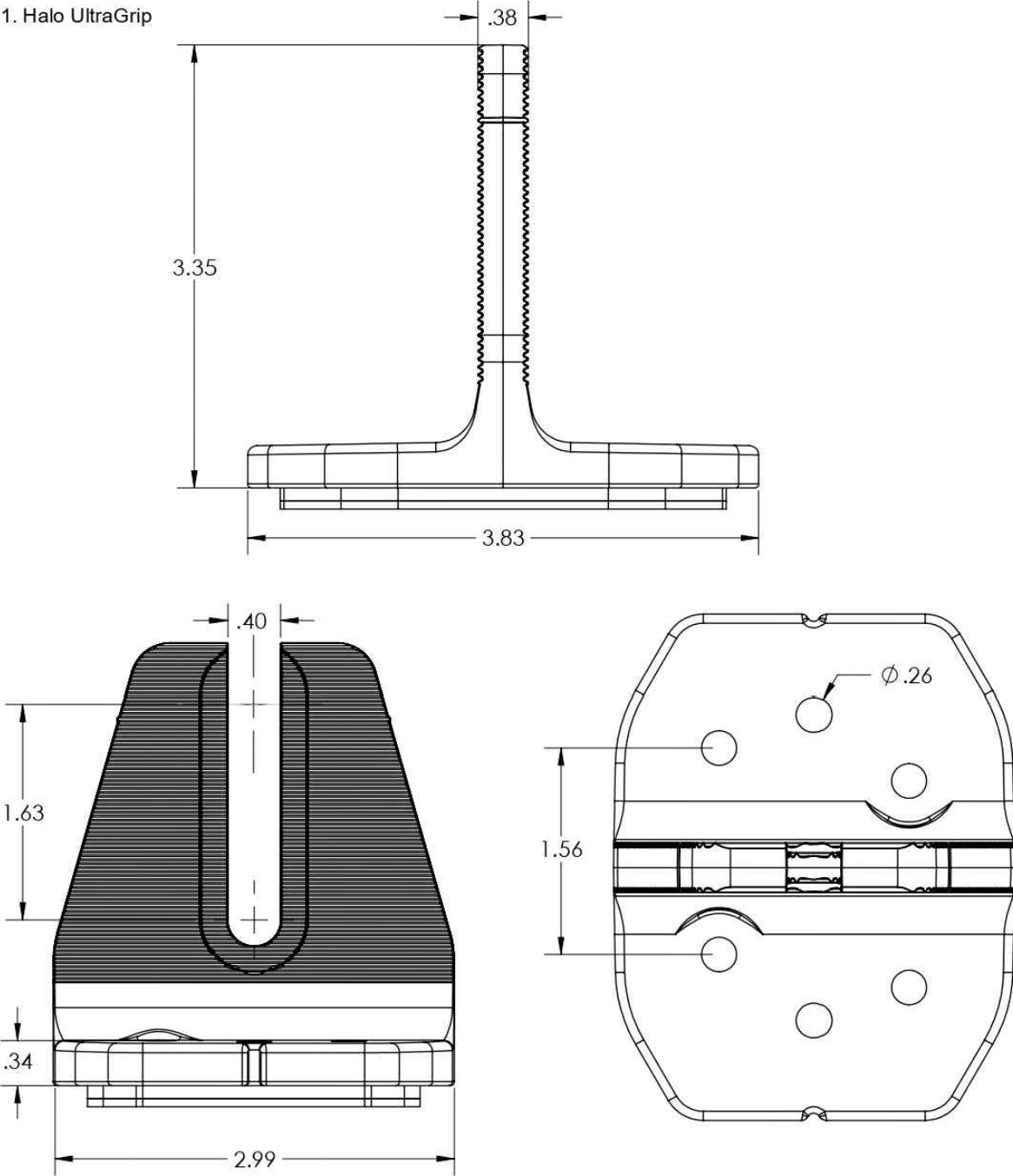
Release Liner
shown for reference

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

Cut Sheet

1. Halo UltraGrip



3.35

3.83

.38

1.63

.40

.34

2.99

1.56

Ø.26

Property	Value
Material	3000 Series Aluminium
Finish	Mill or Black



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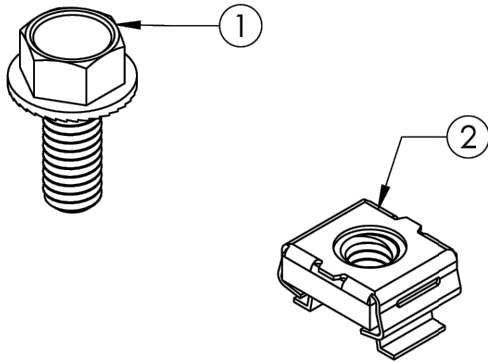
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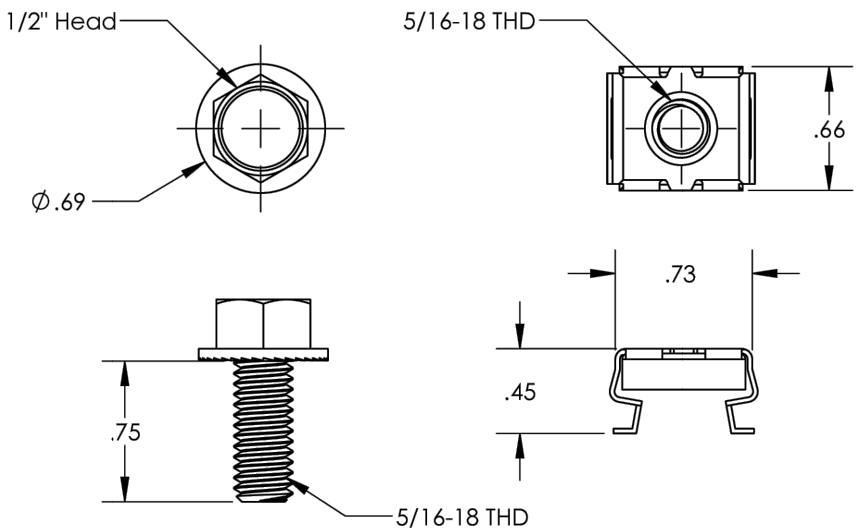
SHEET NUMBER
PV-13



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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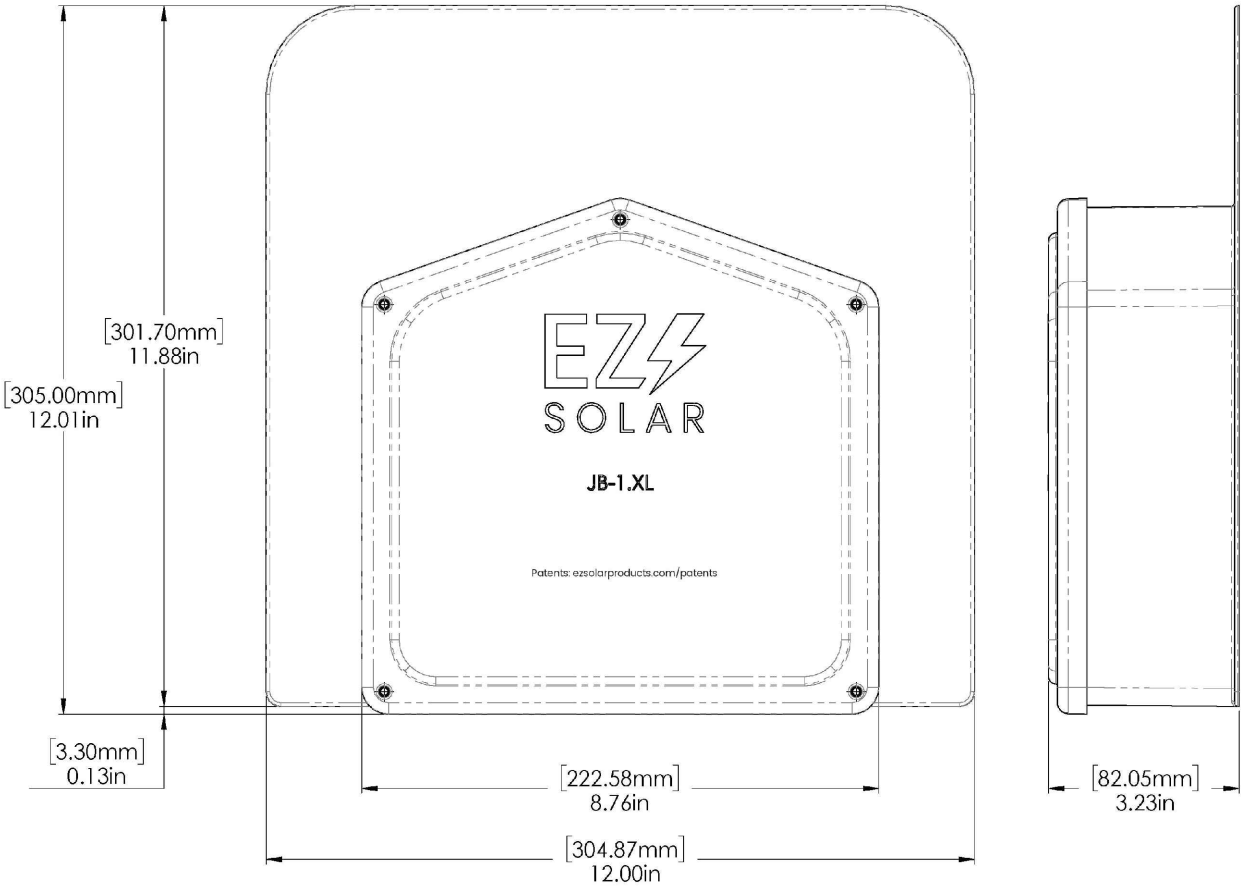
SHEET NAME
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PV-14

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



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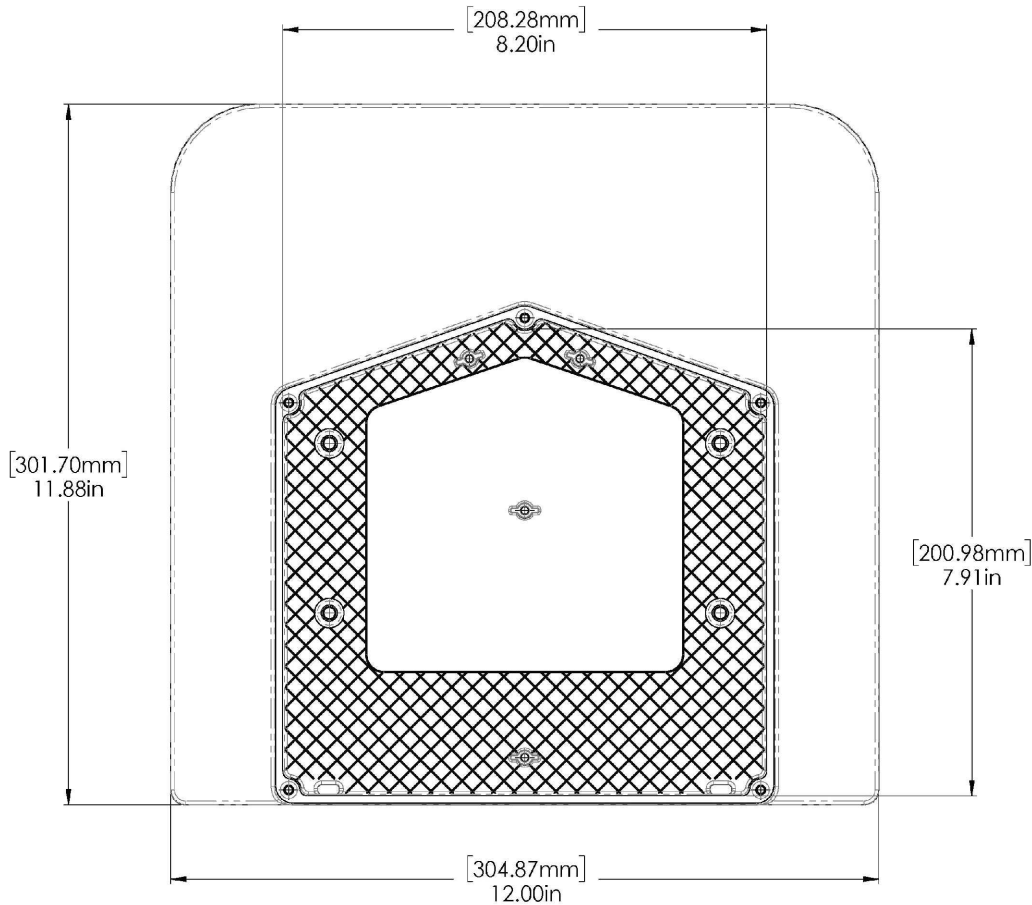
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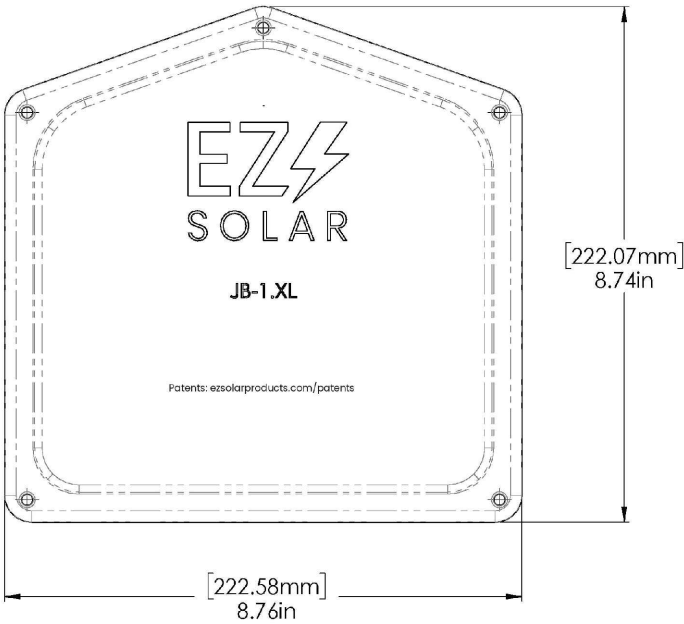
SHEET NUMBER
PV-15

SIZE	DWG. NO.	REV
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SCALE: 1:2	WEIGHT: 1.9 LBS	SHEET 2 OF 3

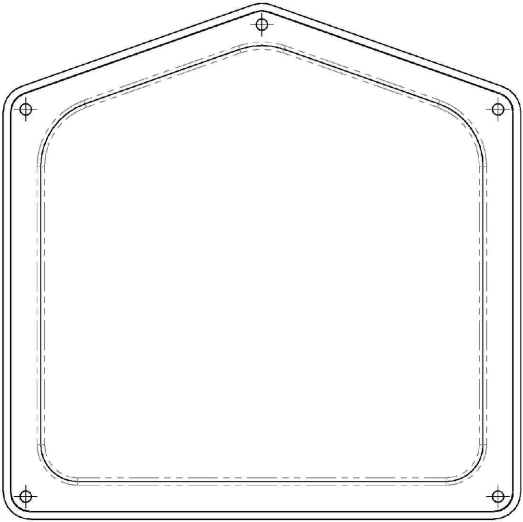
SIZE	DWG. NO.	REV
B	JB-1.XL	
SCALE: 1:2	WEIGHT: 1.9 LBS	SHEET 3 OF 3



OUTSIDE



INSIDE



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