NEW PHOTOVOLTAIC SYSTEM 7.110kW DC / 5.000kW AC
207 BARNSLEY ROAD, ANGIER, NC 27501

AHJ

NC-COUNTYOFHARNETT

UTILITY

DUKEENERGY(PROGRESSENERGYCAROLINASINC)

CODESANDSTANDARDS

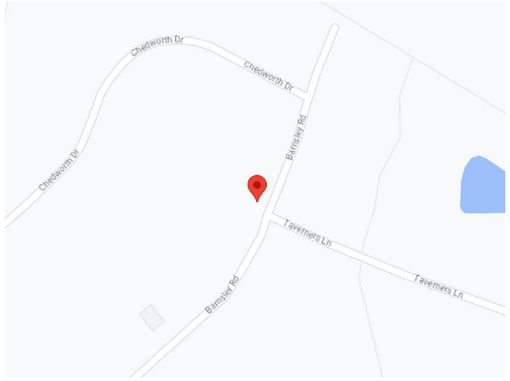
ELECTRICCODE:NEC2017WITHNCAMENDMENTS
FIRECODE:NCFC2018
BUILDINGCODE:NCBC2018
RESIDENTIALCODE:NCRC2018
WIND SPEED: 117 MPH
SNOW LOAD: 20 PSF

SCOPE OF WORK

(N) 7.110kW DC / 5.000kW AC ROOF MOUNT PV SYSTEM
(18) MISSION SOLAR MSE395SX9R (395W) MODULES
(1) SOLAREDGE TECHNOLOGIES SE5000H-US (240V) INVERTER
(18) SOLAREDGE S440 POWER OPTIMIZERS

STRUCTURAL NOTES :
1. THESE PLANS ARE STAMPED FOR STRUCTURAL CODE COMPLIANCE OF THE ROOF FRAMING SUPPORTING THE PROPOSED PV INSTALLATION ONLY.
2. THESE PLANS ARE NOT STAMPED FOR WATER LEAKAGE.
3. PV MODULES, RACKING, AND ATTACHMENT COMPONENTS MUST FOLLOW MANUFACTURER GUIDELINES AND REQUIREMENTS.
4. PLEASE SEE THE ACCOMPANYING STRUCTURAL CALCULATIONS REPORT FOR ADDITIONAL INFORMATION.
5. PRIOR TO COMMENCEMENT OF WORK, THE SOLAR INSTALLER SHALL VERIFY THE ROOF FRAMING INFO BEFORE INSTALLATION AND NOTIFY THE E.O.R. IF THERE IS ANY INCONSISTENCY BETWEEN SITE VERIFICATION AND FOLLOWING: 2x4 RAFTERS @ 24" OC SPACING WITH MAX UNSUPPORTED SPAN EQUAL OR LESS THAN 9.5 FT.

VICINITY MAP



GENERAL NOTES

1.MODULES ARE LISTED UNDER UL 1703 / UL 61730 AND CONFORM TO THE STANDARDS.
2.INVERTERS ARE LISTED UNDER UL 1741 AND CONFORM TO THE STANDARDS.
3.DRAWINGS ARE DIAGRAMMATIC, INDICATING GENERAL ARRANGEMENT OF THE PV SYSTEM. ACTUAL SITE CONDITIONS MAY VARY.
4.WORKING CLEARANCES AROUND THE NEW PV ELECTRICAL EQUIPMENT SHALL BE MAINTAINED IN ACCORDANCE WITH NEC 110.26.
5.ALL GROUND WIRING CONNECTED TO THE MAIN SERVICE GROUNDING IN MAIN SERVICE PANEL / SERVICE EQUIPMENT.
6.ALL CONDUCTORS SHALL BE 600V, 90°C STANDARD COPPER UNLESS OTHERWISE NOTED.
7.WHEN REQUIRED, A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
8.THE SYSTEM WILL NOT BE INTERCONNECTED BY THE CONTRACTOR UNTIL APPROVAL FROM UTILITY IS RECEIVED.
9.ROOF ACCESS POINT SHALL BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS OR DOORS, AND LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREES, WIRES OR SIGNS.
10.PV ARRAY COMBINER / JUNCTION BOX PROVIDES TRANSITION FROM ARRAY WIRING TO CONDUIT WIRING.
11.RACKING SYSTEM SHALL BE LISTED TO UL 2703.
12.FIRE RATING OF EXISTING ROOF ASSEMBLY SHALL BE MAINTAINED WITH ADDITIONAL OF PHOTOVOLTAIC SYSTEM.

SHEET CATALOG

METER NUMBER: 5F9442

CONTRACTOR INFORMATION

PALMETTO SOLAR

ADDRESS: 997 MORRISON DRIVE, SUITE 200, CHARLESTON, SC 29403

PHONE NUMBER: (855) 339-1831

CUSTOMER INFORMATION

NAME: MIKALE BOHLMANN

ADDRESS: 207 BARNSLEY ROAD, ANGIER, NC 27501

COORDINATES: 35.471050, -78.785892

APN: 040662010439

7.110kW DC / 5.000kW AC ROOF MOUNT PV SYSTEM

NORTH CAROLINA PROFESSIONAL SEAL 54524 Exp: 12/31/2024 ENGINEER ROBERT A. LADE

STAMPED 08/31/2023

PROJECT ID	AUR-84551
DATE	8/30/2023
CREATED BY	VV
SIGNATURE	

COVER SHEET
PV-1

SCOPE OF WORK

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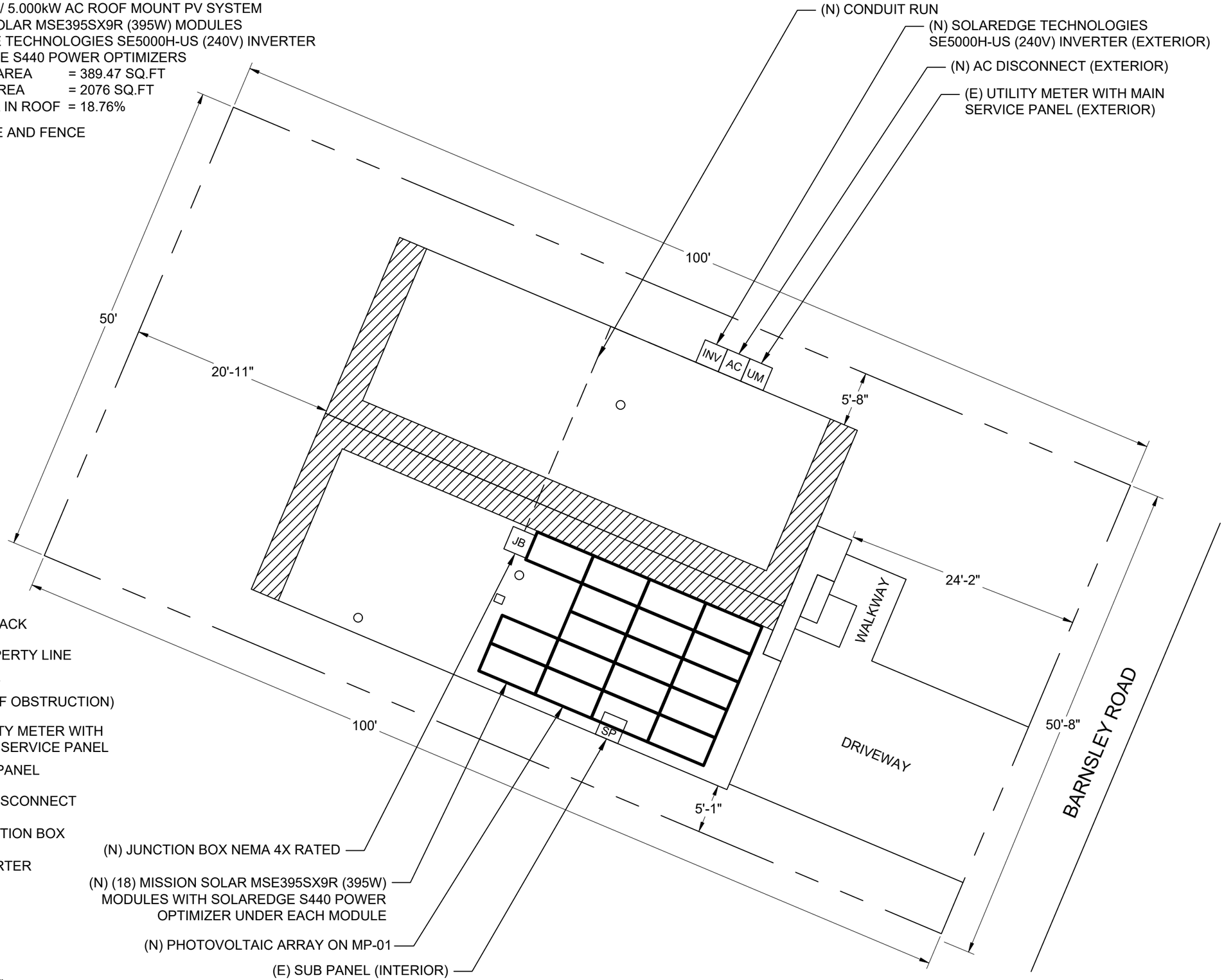
(18) MISSION SOLAR MSE395SX9R (395W) MODULES
(1) SOLAREDGE TECHNOLOGIES SE5000H-US (240V) INVERTER
(18) SOLAREDGE S440 POWER OPTIMIZERS
TOTAL ARRAY AREA = 389.47 SQ.FT
TOTAL ROOF AREA = 2076 SQ.FT
% ARRAY AREA IN ROOF = 18.76%

NOTE: NO GATE AND FENCE



LEGEND

- SETBACK
- PROPERTY LINE
- VENT (ROOF OBSTRUCTION)
- UM — UTILITY METER WITH MAIN SERVICE PANEL
- SP — SUB PANEL
- AC — AC DISCONNECT
- JB — JUNCTION BOX
- INV — INVERTER

N

SCALE: 1"=10'-0"

CONTRACTOR INFORMATION

Palmetto

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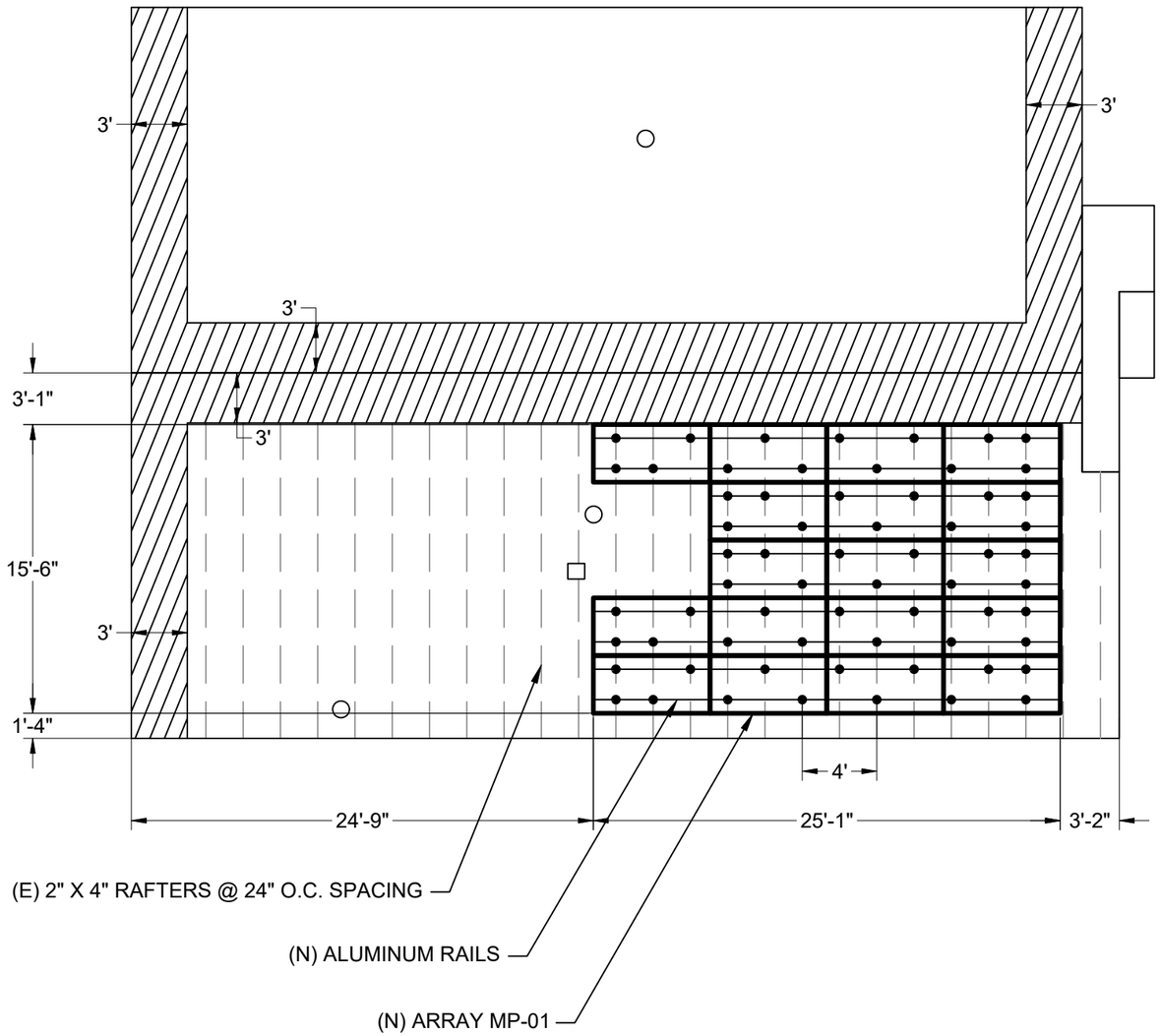
SITE PLAN

PV-2

WIND SPEED: 117 MPH AND SNOW LOAD: 20 PSF													
S.NO	AZIMUTH	PITCH	NO. OF MODULES	ARRAY AREA (SQ.FT)	ROOF TYPE	ATTACHMENT	ATTACHMENT QUANTITY	ROOF EXPOSURE	FRAME TYPE	FRAME SIZE	FRAME SPACING	MAX ATTACHMENT SPACING	MAX OVER HANG
MP-01	203°	27°	18	389.47	COMPOSITION SHINGLE	IRONRIDGE QUICKMOUNT L-MOUNT	64	ATTIC	RAFTERS	2" X 4"	24" O.C.	4'-0"	1'-6"

NOTE: PENETRATIONS ARE STAGGERED

TOTAL ATTACHMENTS: 64



LEGEND

- SETBACK
- MODULE
- RAIL
- ATTACHMENT
- ROOF FRAME
- VENT (ROOF OBSTRUCTION)

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

CONTRACTOR INFORMATION

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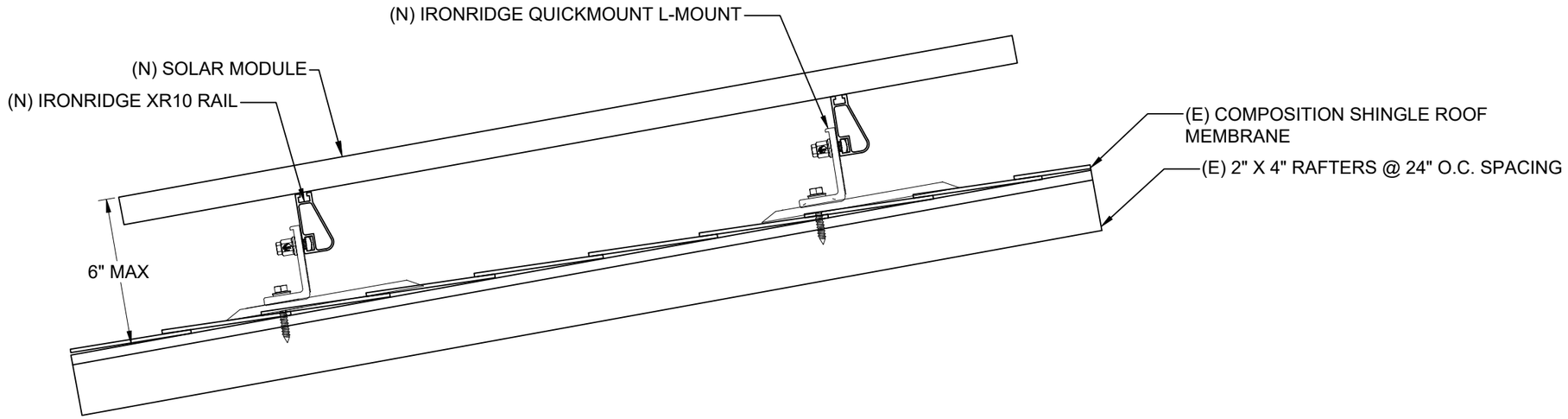
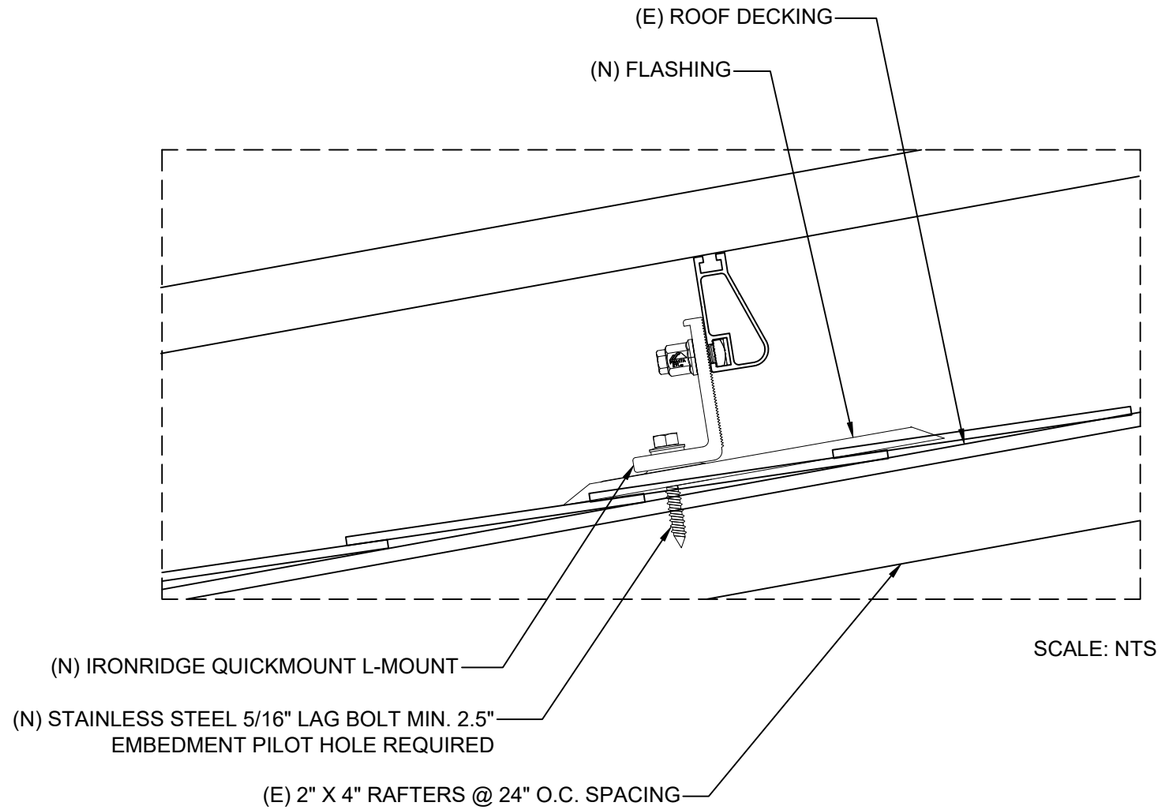
MOUNTING DETAILS

PV-3





SCALE: NTS

DEAD LOAD CALCULATIONS

BOM	QUANTITY	LBS/UNIT	TOTAL WEIGHT (LBS)
MODULES	18	48.5	873
MID-CLAMP	26	0.05	1.3
END-CLAMP	20	0.05	1
RAIL LENGTH	229	0.43	98.47
SPLICE BAR	10	0.36	3.6
IRONRIDGE QUICKMOUNT L-MOUNT	64	0.7565	48.41
OPTIMIZER	18	1.58	28.44
TOTAL WEIGHT OF THE SYSTEM (LBS)			1054.22
TOTAL ARRAY AREA ON THE ROOF (SQ. FT.)			389.47
WEIGHT PER SQ. FT.(LBS)			2.7
WEIGHT PER PENETRATION (LBS)			16.47

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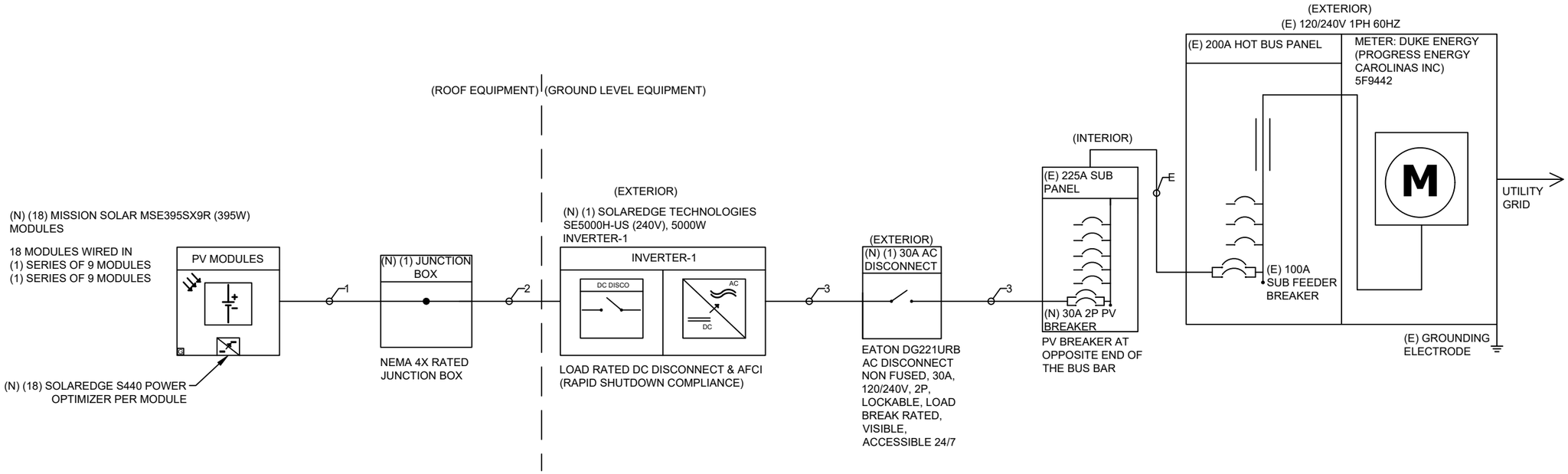
STRUCTURAL DETAILS

PV-3.1

MODULE SPECIFICATIONS	
MODEL	MISSION SOLAR MSE395SX9R (395W)
MODULE POWER @ STC	395W
OPEN CIRCUIT VOLTAGE:Voc	45.18V
MAX POWER VOLTAGE:Vmp	36.99V
SHORT CIRCUIT CURRENT:Isc	11.24A
MAX POWER CURRENT:Imp	10.68A
TEMPERATURE COEFFICIENT:Voc	-0.259%/°C
MODULE DIMENSIONS: L x W x H	75.08" x 41.5" x 1.57"
NUMBER OF MODULES	18

INVERTER-1 SPECIFICATIONS	
MODEL	SOLAREDGE TECHNOLOGIES SE5000H-US (240V)
POWER RATING	5000W
MAX OUTPUT CURRENT	21A
CEC WEIGHTED EFFICIENCY	99%
MAX INPUT CURRENT	13.5A
MAX DC VOLTAGE	480V
NUMBER OF INVERTER	1

OPTIMIZER CHARACTERISTICS	
MODEL	SOLAREDGE S440 POWER OPTIMIZER
MIN INPUT VOLTAGE	8VDC
MAX INPUT VOLTAGE	60VDC
MAX INPUT CURRENT	14.5ADC
MAX OUTPUT CURRENT	15ADC
NUMBER OF OPTIMIZERS	18



CONDUCTOR SCHEDULE				
TAG ID	**CONDUIT SIZE**	**CONDUCTOR**	**NEUTRAL**	**GROUND**
1	NONE	(4) 10 AWG PV WIRE	NONE	(1) 6 AWG BARE COPPER, EGC
2	3/4" EMT	(4) 10 AWG THHN/THWN-2, Cu	NONE	(1) 10 AWG THHN/THWN-2, EGC
3	3/4" EMT	(2) 10 AWG THHN/THWN-2, Cu	(1) 10 AWG THHN/THWN-2, Cu	(1) 10 AWG THHN/THWN-2, EGC
E	EXISTING			

CONTRACTOR INFORMATION

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SINGLE LINE DIAGRAM

PV-4

SYSTEM CHARACTERISTICS

DC SYSTEM SIZE	7110W
INVERTER STRING VOLTAGE:Vmp	380V
MAX INVERTER SYSTEM VOLTAGE:Voc	480V
MAX SHORT CIRCUIT CURRENT	30A
OPERATING CURRENT	18.71A

ELECTRICAL NOTES

1. CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC 310.10(D).
2. CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC 310.10(C).
3. MAXIMUM DC/AC VOLTAGE DROP SHALL BE NO MORE THAN 2%.
4. ALL CONDUCTORS SHALL BE IN CONDUIT UNLESS OTHERWISE NOTED.
5. BREAKER/FUSE SIZES PER NEC 240.
6. AC EQUIPMENT GROUNDING CONDUCTOR SIZED PER NEC 250.122.
7. AMBIENT TEMPERATURE CORRECTION FACTOR IS BASED ON NEC 310.15(B)(2)(a).
8. MAX. SYSTEM VOLTAGE COEFFICIENT IS FROM MODULE MANUFACTURER OR NEC 690.7 WHEN MANUFACTURER COEFFICIENT UNAVAILABLE.
9. CONDUCTORS ARE SIZED PER NEC TABLE 310.15(B)(16).
10. CONDUIT SHALL BE INSTALLED MINIMUM 7/8" FROM ROOF SURFACE.

DC WIRE SIZING CALCULATIONS BASED ON FOLLOWING EQUATIONS

REQUIRED CONDUCTOR AMPACITY:
Isc(A) * # OF PARALLEL STRINGS = MAX CURRENT PER 690.8(A)(5) * 125%
= MAX CURRENT PER 690.8(B)(1)

CORRECTED AMPACITY CALCULATIONS:
DERATED CONDUCTOR AMPACITY PER 690.8(B)(2) = AMPACITY * TEMPERATURE DERATE FACTOR * CONDUIT FILL DERATE
DERATED CONDUCTOR AMPACITY CHECK : MAX CURRENT PER 690.8(B)(1) < DERATED CONDUCTOR AMPACITY

AC WIRE SIZING CALCULATIONS BASED ON FOLLOWING EQUATIONS

REQUIRED CONDUCTOR AMPACITY:
INVERTER OUTPUT CURRENT * # OF INVERTERS = MAX CURRENT PER 690.8(A)(3) * 125%
= MAX CURRENT PER 690.8(B)(1)

CORRECTED AMPACITY CALCULATIONS:
DERATED CONDUCTOR AMPACITY PER 690.8(B)(2) = AMPACITY * TEMPERATURE DERATE FACTOR * CONDUIT FILL DERATE
DERATED CONDUCTOR AMPACITY CHECK : MAX CURRENT PER 690.8(B)(1) < DERATED CONDUCTOR AMPACITY

OCPD CALCULATION

ALLOWABLE BACKFEED:
SUB PANEL RATING = 225A
SUB FEEDER BREAKER RATING = 100A
120% RULE: = (SUB PANEL RATING * 1.2) - SUB FEEDER BREAKER RATING
= (225A * 1.2) - 100A
= 270A - 100A
ALLOWABLE BACKFEED = 170A

INVERTER OVERCURRENT PROTECTION:
INVERTER OVERCURRENT PROTECTION = INVERTER O/P CURRENT * CONTINUOUS LOAD (1.25)
= 21 * 1.25
= 26.25A
PV OVERCURRENT PROTECTION = 30A

ALLOWABLE BACKFEED 170A ≥ 30A PV OVERCURRENT PROTECTION

THE DESIGNED INTERCONNECTION MEETS THE 705.12(B)(2)(3)(b) REQUIREMENTS.

WIRE SIZE CALCULATIONS

AMBIENT TEMPERATURE @ 36°C

TAG 1: (DC)
REQUIRED CONDUCTOR AMPACITY (15 * 1.25) = 18.75A
CORRECTED AMPACITY CALCULATION (0.91 * 1 * 40) = 36.40A
18.75A < 36.40A (#10 AWG PV WIRE)

TAG 2: (DC)
REQUIRED CONDUCTOR AMPACITY (15 * 1.25) = 18.75A
CORRECTED AMPACITY CALCULATION (0.91 * 0.8 * 40) = 29.12A
18.75A < 29.12A (3/4" EMT, #10 AWG THHN/THWN-2, Cu)

TAG 3: (AC)
REQUIRED CONDUCTOR AMPACITY (21 * 1 * 1.25) = 26.25A
CORRECTED AMPACITY CALCULATION (0.88 * 1 * 35) = 30.80A
26.25A < 30.80A (3/4" EMT, #10 AWG THHN/THWN-2, Cu)

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ELECTRICAL CALCULATIONS

PV-4.1

⚠ WARNING

ELECTRIC SHOCK HAZARD

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

DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR MODULES ARE EXPOSED TO SUNLIGHT

LABEL LOCATION
AC DISCONNECT, POINT OF INTERCONNECTION
PER CODE: NEC 690.13

WARNING:PHOTOVOLTAIC POWER SOURCE

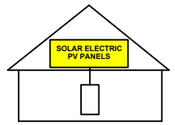
LABEL LOCATION
CONDUIT, INVERTER DC DISCONNECT
PER CODE: NEC 690.31(G)(3)

PHOTOVOLTAIC
AC DISCONNECT

LABEL LOCATION
AC DISCONNECT, POINT OF INTERCONNECTION
PER CODE: NEC 690.13(B)

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 LOCATION
AC DISCONNECT, INVERTER DC DISCONNECT,
POINT OF INTERCONNECTION
PER CODE: NEC 690.56(C)(1)(a)

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL LOCATION
INVERTER DC DISCONNECT
PER CODE: NEC 690.56(C)(3)

PHOTOVOLTAIC SYSTEM AC DISCONNECT SWITCH

RATED AC OPERATING CURRENT **21.00** AMPS AC
AC NOMINAL OPERATING VOLTAGE **240** VAC

LABEL LOCATION
AC DISCONNECT, POINT OF INTERCONNECTION
PER CODE: NEC 690.54

⚠ WARNING

DUAL POWER SOURCE SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION
POINT OF INTERCONNECTION
PER CODE: NEC 705.12(B)(3)

WARNING

POWER SOURCE OUTPUT CONNECTION
DO NOT RELOCATE THIS OVER-CURRENT DEVICE

LABEL LOCATION
POINT OF INTERCONNECTION
PER CODE: NEC 705.12(B)(2)(3)(b)

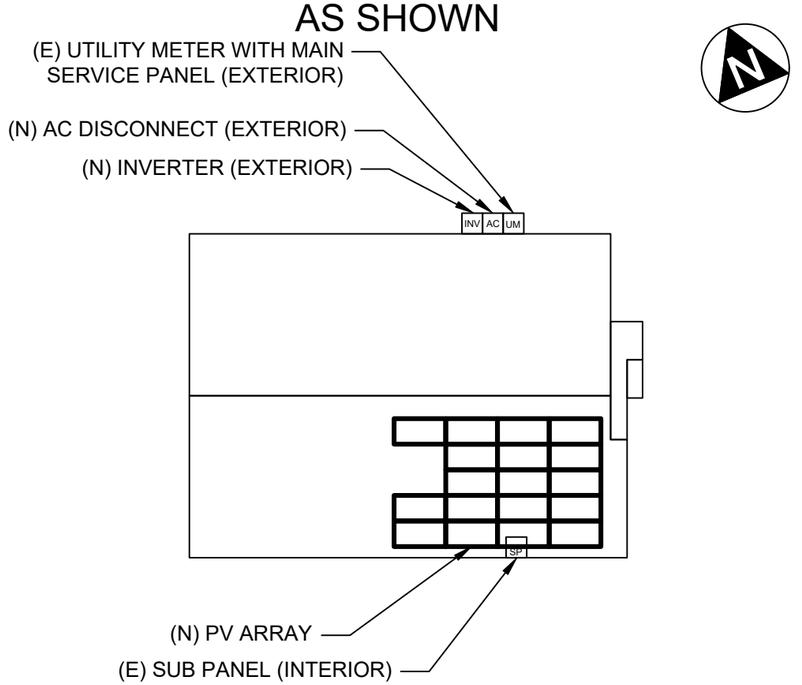
INVERTER-1

MAXIMUM SYSTEM VOLTAGE(Voc)	480	V
MAXIMUM CIRCUIT CURRENT(Isc)	30	A
MAXIMUM RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-TO-DC CONVERTER(IF INSTALLED)	15	A

LABEL LOCATION
INVERTER DC DISCONNECT
PER CODE: NEC 690.53

CAUTION:MULTIPLE SOURCES OF POWER

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN



207 BARNSLEY ROAD, ANGIER, NC 27501

LABEL LOCATION
SERVICE PANEL
PER CODE: NEC 705.10

NOTES

1.PLACARDS SHALL MEET THE REQUIREMENTS OF ARTICLES 690 AND 705, UNLESS OTHERWISE SPECIFIED PER LOCAL AHJ REQUIREMENTS.
2.PLACARDS SHALL MEET THE REQUIREMENTS OF SECTION 110.21(B) AS REQUIRED AND SHALL COMPLY WITH ANSI Z535.4-2011, PRODUCT SAFETY SIGNS AND LABELS.
3.PLACARDS SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD.
4.PLACARDS SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED AND SHALL BE HANDWRITTEN.
5.PLACARDS SHALL NOT COVER EXISTING MANUFACTURER LABELS.
6.WARNING SIGNAGE TEXT SHALL BE MINIMUM 3/8" TALL.

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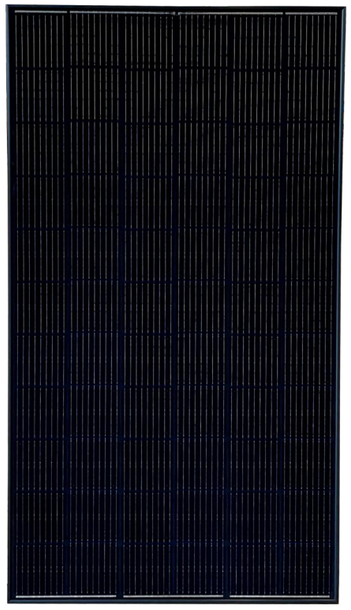
PLACARDS
PV-5

MSE PERC 66

MISSION SOLAR ENERGY

395W
Class leading power output

Positive Power Tolerance
-0 to +3%



FRAME-TO-FRAME WARRANTY

Degradation guaranteed not to exceed 2% in year one and 0.58% annually from years two to 30 with 84.08% capacity guaranteed in year 25.
For more information, visit www.missionsolar.com/warranty

CERTIFICATIONS

CEC · TÜV SUD · c UL us LISTED

UL 61730 / IEC 61215 / IEC 61730 / IEC 61701

If you have questions or concerns about certification of our products in your area, please contact Mission Solar Energy.

True American Quality
True American Brand

Mission Solar Energy is headquartered in San Antonio, Texas where we manufacture our modules. We produce American, high-quality solar modules ensuring the highest-in-class power output and best-in-class reliability. Our product line is tailored for residential, commercial and utility applications. Every Mission Solar Energy solar module is certified and surpasses industry standard regulations, proving excellent performance over the long term.

Demand the best. Demand Mission Solar Energy.

Certified Reliability
- Tested to UL 61730 & IEC Standards
- PID resistant
- Resistance to salt mist corrosion

Advanced Technology
- 9 Busbar
- Passivated Emitter Rear Contact
- Ideal for all applications

Extreme Weather Resilience
- Up to 5,400 Pa front load & 3,600 Pa back load
- Tested load to UL 61730
- 40 mm frame

BAA Compliant for Government Projects
- Buy American Act
- American Recovery & Reinvestment Act

MODULES ASSEMBLED & DESIGNED & ENGINEERED IN THE USA OF U.S. AND NON-U.S. PARTS

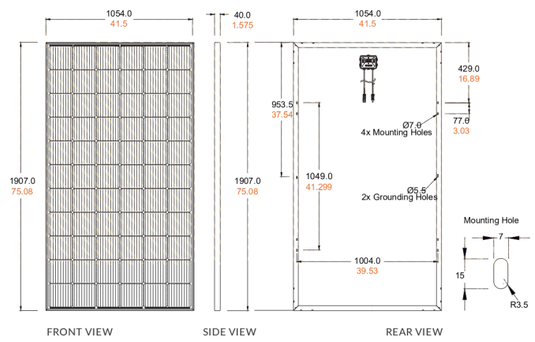
FRAME-TO-FRAME 25 YEAR WARRANTY

Class Leading
390-400W

MSE PERC 66

BASIC DIMENSIONS

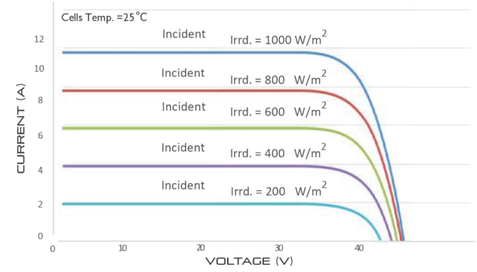
[UNITS: MM/IN]



CURRENT-VOLTAGE CURVE

MSE385SX9R: 385WP, 66 CELL SOLAR MODULE

Current-voltage characteristics with dependence on irradiance and module temperature



CERTIFICATIONS AND TESTS

IEC	61215, 61730, 61701
UL	61730

TÜV SUD · CEC · c UL us LISTED

ELECTRICAL SPECIFICATION

PRODUCT TYPE			MSExxxSX9R (xxx = P_{max})		
Power Output	P_{max}	W_p	390	395	400
Module Efficiency		%	19.4	19.7	19.9
Tolerance		%	0/+3	0/+3	0/+3
Short Circuit Current	I_{sc}	A	11.19	11.24	11.31
Open Circuit Voltage	V_{oc}	V	45.04	45.18	45.33
Rated Current	I_{mp}	A	10.63	10.68	10.79
Rated Voltage	V_{mp}	V	36.68	36.99	37.07
Fuse Rating		A	20	20	20
System Voltage		V	1,000	1,000	1,000

TEMPERATURE COEFFICIENTS

Normal Operating Cell Temperature (NOCT)	43.75°C (±3.7%)
Temperature Coefficient of Pmax	-0.367%/°C
Temperature Coefficient of Voc	-0.259%/°C
Temperature Coefficient of Isc	0.033%/°C

OPERATING CONDITIONS

Maximum System Voltage	1,000Vdc
Operating Temperature Range	-40°F to 185°F (-40°C to +85°C)
Maximum Series Fuse Rating	20A
Fire Safety Classification	Type 1*
Front & Back Load (UL Standard)	Up to 5,400 Pa front and 3,600 Pa back load, Tested to UL 61730
Hail Safety Impact Velocity	25mm at 23 m/s

*Mission Solar Energy uses quality sourced materials that result in a Type 1 fire rating. Please note, the 'Fire Class' Rating is designated for the fully-installed PV system, which includes, but is not limited to, the module, the type of mounting used, pitch and roof composition.

MECHANICAL DATA

Solar Cells	P-type mono-crystalline silicon
Cell Orientation	66 cells (6x11)
Module Dimension	1,907mm x 1,054mm x 40mm
Weight	48.5 lbs. (22 kg)
Front Glass	3.2mm tempered, low-iron, anti-reflective
Frame	40mm Anodized
Encapsulant	Ethylene vinyl acetate (EVA)
Junction Box	Protection class IP67 with 3 bypass-diodes
Cable	1.2m, Wire 4mm2 (12AWG)
Connector	Staubli PV-KBT4/6II-UR and PV-KST4/6II-UR, MC4, Renhe 05-8

SHIPPING INFORMATION

Container Feet	Ship To	Pallet	Panels	390W Bin
53'	Most States	30	780	304.20 kW
Double Stack	CA	26	676	263.64 kW

PALLET [26 PANELS]

Weight	Height	Width	Length
1,300 lbs. (572 kg)	47.56 in (120.80 cm)	46 in (116.84 cm)	77 in (195.58 cm)

Mission Solar Energy
8303 S. New Braunfels Ave., San Antonio, Texas 78235
www.missionsolar.com | info@missionsolar.com

CONTRACTOR INFORMATION

Palmetto®

PALMETTO SOLAR

ADDRESS: 997 MORRISON DRIVE, SUITE 200, CHARLESTON, SC 29403

PHONE NUMBER: (855) 339-1831

CUSTOMER INFORMATION

NAME: MIKALE BOHLMANN

ADDRESS: 207 BARNSLEY ROAD, ANGIER, NC 27501

COORDINATES: 35.471050, -78.785892

APN: 040662010439

7.110kW DC / 5.000kW AC ROOF MOUNT PV SYSTEM

PROJECT ID	AUR-84551
DATE	8/30/2023
CREATED BY	VV
SIGNATURE	

MODULE SPEC SHEET

SS

SolarEdge Home Wave Inverter

For North America

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 99% weighted efficiency
- Quick and easy inverter commissioning directly from a smartphone using SolarEdge SetApp
- Fixed voltage inverter for longer strings
- Integrated arc fault protection and rapid shutdown for NEC 2014-2023 per articles 690.11 and 690.12
- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Small, lightweight, and easy to install both outdoors or indoors
- Built-in module-level monitoring
- Optional: Faster installations with built-in consumption metering (1% accuracy) and production revenue grade metering (0.5% accuracy, ANSI C12.20)

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SolarEdge Home Wave Inverter

For North America

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

Applicable to inverters with part number	SEXXXXH-XXXXXBXX4					SE11400H-XXXXXBXX5	Units
	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
OUTPUT							
Rated AC Power Output	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
Maximum AC Power Output	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	Vac
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	✓	-	✓	-	-	✓	Vac
AC Frequency (Nominal)	59.3 - 60 - 60.5(1)						Hz
Maximum Continuous Output Current @240V	16	21	25	32	42	47.5	A
Maximum Continuous Output Current @208V	16	-	24	-	-	48.5	A
Power Factor	1, Adjustable - 0.85 to 0.85						
GFDI Threshold	1						A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes						
INPUT							
Maximum DC Power @240V	5900	7750	9300	11800	15500	17650	W
Maximum DC Power @208V	5100	-	7750	-	-	15500	W
Transformer-less, Ungrounded	Yes						
Maximum Input Voltage	480						Vdc
Nominal DC Input Voltage	380						Vdc
Maximum Input Current @240V(2)	10.5	13.5	16.5	20	27	30.5	Adc
Maximum Input Current @208V(2)	9	-	13.5	-	-	27	Adc
Max. Input Short Circuit Current	45						Adc
Reverse-Polarity Protection	Yes						
Ground-Fault Isolation Detection	600k Sensitivity						
Maximum Inverter Efficiency	99.2						%
CEC Weighted Efficiency	99					99 @ 240V 98.5 @ 208V	%
Nighttime Power Consumption	< 2.5						W

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

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INVERTER SPEC SHEET

SS

SolarEdge Home Wave Inverter

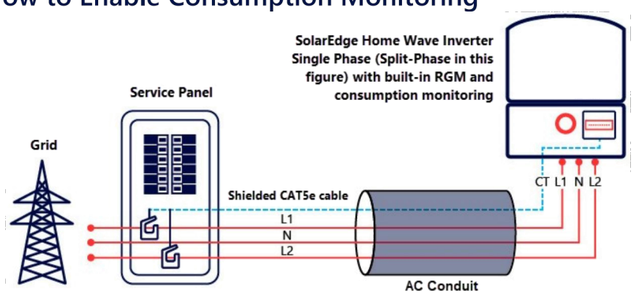
For North America

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

Applicable to inverters with part number	SEXXXXH-XXXXXBXX4					SE11400H-XXXXXBXX5	
	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
ADDITIONAL FEATURES							
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), wireless SolarEdge Home Network (optional)[3], Wi-Fi (optional), Cellular (optional)						
Revenue Grade Metering, ANSI C12.20	Optional[4]						
Consumption Metering							
Inverter Commissioning	With the SetApp mobile application using Built-in Wi-Fi Access Point for Local Connection						
Rapid Shutdown - NEC 2014-2023 per articles 690.11 and 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect						
STANDARD COMPLIANCE							
Safety	UL1741, UL1741 SA, UL1741 SB, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07						
Grid Connection Standards	IEEE1547-2018, Rule 21, Rule 14 (HI), CSA C22.3 No. 9						
Emissions	FCC Part 15 Class B						
INSTALLATION SPECIFICATIONS							
AC Output Conduit Size / AWG Range	1" Maximum / 14 – 6 AWG				1" Maximum / 14 – 4 AWG		
DC Input Conduit Size / # of Strings / AWG Range	1" Maximum / 1 – 2 strings / 14 – 6 AWG				1" Maximum / 1 – 3 strings / 14 – 6 AWG		
Dimensions with Safety Switch (H x W x D)	17.7 x 14.6 x 6.8 / 450 x 370 x 174				21.06 x 14.6 x 7.3 / 535 x 370 x 185	21.06 x 14.6 x 8.2 / 535 x 370 x 208[5]	in / mm
Weight with Safety Switch	22 / 10	25.1 / 11.4	26.2 / 11.9		38.8 / 17.6	44.9 / 20.4[5]	lb / kg
Noise	< 25			<50			dBA
Cooling	Natural Convection						
Operating Temperature Range	-40 to +140 / -40 to +60[6]						°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)						

(3) For more information, refer to the SolarEdge Home Network datasheet
(4) Inverter with Revenue Grade Production and Consumption Meter P/N: SExxxxH-US000BEI4. For consumption metering, current transformers should be ordered separately: SEACT0750-200NA-20 or SEACT0750-400NA-20. 20 units per box.
(5) SE11400H-USxxxBxx**5** is the updated PN, though SE11400H-USxxxBxx**4** will still be available. All specifications are similar for both models, **EXCLUDING** the weight and dimensions [HxWxD]; The weight and dimensions of SE11400H-USxxxBxx**4** are 17.6 [kg] and 21.06-14.6-7.3 / 535-370-185 [in/mm], accordingly.
(6) Full power up to at least 50°C / 122°F, for power de-rating information refer to the Temperature De-rating Technical Note for North America

How to Enable Consumption Monitoring



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

CE

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INVERTER SPEC SHEET

SS

Power Optimizer

For Residential Installations

S440 / S500 / S500B / S650B

POWER OPTIMIZER

Enabling PV power optimization at the module level

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

* Functionality subject to inverter model and firmware version

solaredge.com

solaredge

Power Optimizer

For Residential Installations

S440 / S500 / S500B / S650B

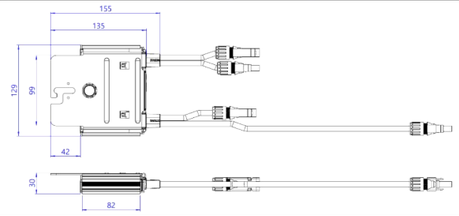
	S440	S500	S500B	S650B	UNIT
INPUT					
Rated Input DC Power(1)	440	500		650	W
Absolute Maximum Input Voltage (Voc)	60		125	85	Vdc
MPPT Operating Range	8 – 60		12.5 – 105	12.5 - 85	Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	14.5	15			Adc
Maximum Efficiency	99.5				%
Weighted Efficiency	98.6				%
Overvoltage Category	II				
OUTPUT DURING OPERTION					
Maximum Output Current	15				Adc
Maximum Output Voltage	60		80		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)					
Safety Output Voltage per Power Optimizer	1 ± 0.1				Vdc
STANDARD COMPLIANCE(2)					
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3, CISPR11, EN-55011				
Safety	IEC62109-1 (class II safety), UL1741				
Material	UL94 V-0, UV Resistant				
RoHS	Yes				
Fire Safety	VDE-AR-E 2100-712:2018-12				
INSTALLATION SPECIFICATIONS					
Maximum Allowed System Voltage	1000				Vdc
Dimensions (W x L x H)	129 x 155 x 30		129 x 165 x 45		mm
Weight	720		790		gr
Input Connector	MC4(3)				
Input Wire Length	0.1				m
Output Connector	MC4				
Output Wire Length	(+) 2.3, (-) 0.10				m
Operating Temperature Range(4)	-40 to +85				°C
Protection Rating	IP68				
Relative Humidity	0 – 100				%

(1) Rated power of the module at STC will not exceed the Power Optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed.
(2) For details about CE compliance, see Declaration of Conformity – CE
(3) For other connector types please contact SolarEdge.
(4) Power de-rating is applied for ambient temperatures above +85°C for S440 and S500, and for ambient temperatures above +75°C for S500B. Refer to the Power Optimizers Temperature De-Rating Technical Note for details.

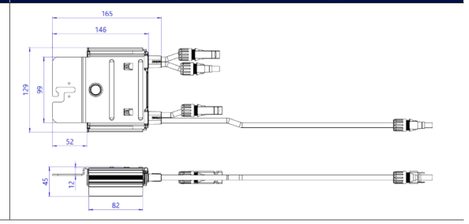
PV System Design Using a SolarEdge Inverter(5)		SolarEdge Home Wave Inverter Single Phase	SolarEdge Home Short String Inverter Three Phase	Three Phase for 230/400V Grid	Three Phase for 277/480V Grid	
Minimum String Length (Power Optimizers)	S440, S500	8	9	16	18	
	S500B, S650B	6	8	14		
Maximum String Length (Power Optimizers)		25	20	50		
Maximum Continuous Power per String		5700	5625	11250	12750	W
Maximum Allowed Connected Power per String (Permitted only when the power difference between strings is less than 2,000W)		See(6)	See(6)	13500	15000	W
Parallel Strings of Different Lengths or Orientations		Yes				

(5) It is not allowed to mix S-series and P-series Power Optimizers in new installations.
(6) If the inverter's rated AC power ≤ maximum nominal power per string, then the maximum power per string will be able to reach up to the inverters maximum input DC power. Refer to Application Note: Single String Design Guidelines

S440, S500 (Flat Bracket)



S500B, S650B (Bent Bracket)



CE RoHS

CONTRACTOR INFORMATION

Palmetto®

PALMETTO SOLAR

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PHONE NUMBER: (855) 339-1831

CUSTOMER INFORMATION

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SIGNATURE	

OPTIMIZER SPEC SHEET

SS

Tech Brief

IRONRIDGE

QuickMount™ L-Mount®

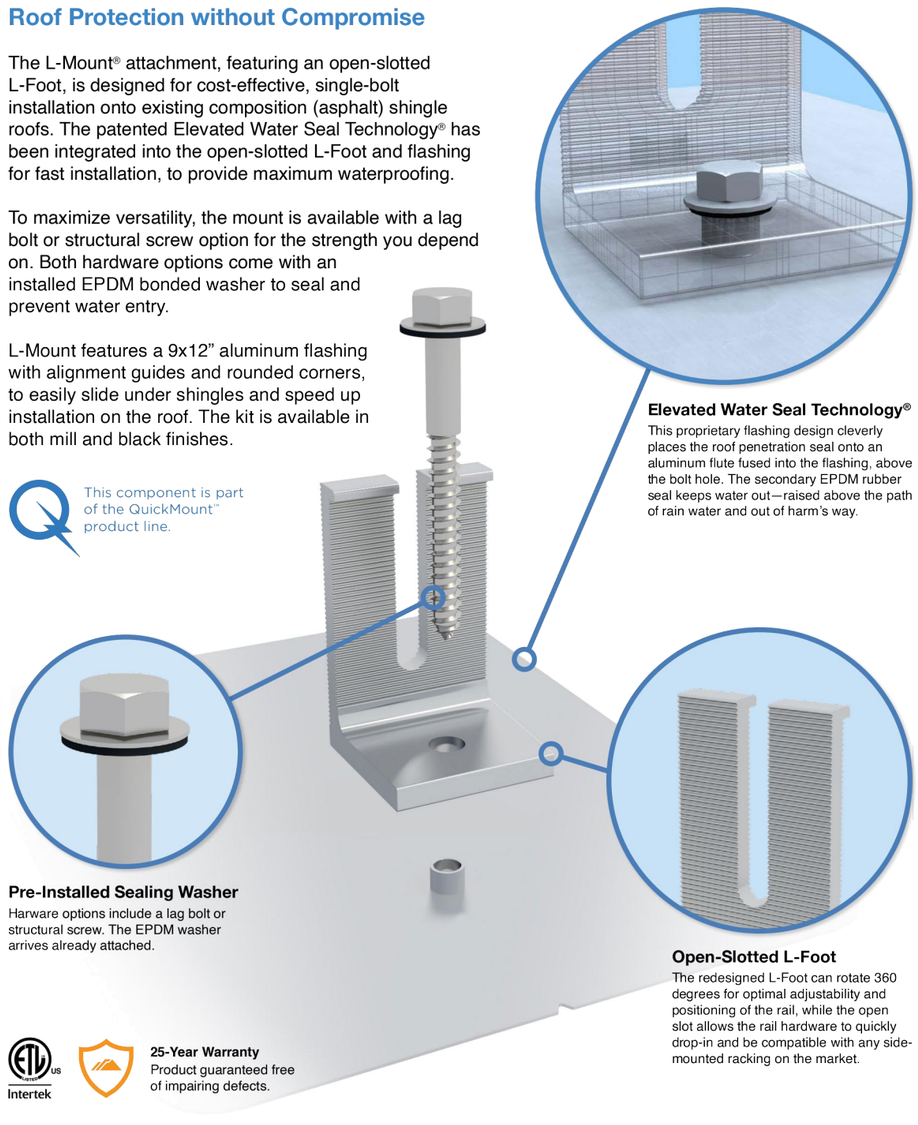
Roof Protection without Compromise

The L-Mount® attachment, featuring an open-slotted L-Foot, is designed for cost-effective, single-bolt installation onto existing composition (asphalt) shingle roofs. The patented Elevated Water Seal Technology® has been integrated into the open-slotted L-Foot and flashing for fast installation, to provide maximum waterproofing.

To maximize versatility, the mount is available with a lag bolt or structural screw option for the strength you depend on. Both hardware options come with an installed EPDM bonded washer to seal and prevent water entry.

L-Mount features a 9x12" aluminum flashing with alignment guides and rounded corners, to easily slide under shingles and speed up installation on the roof. The kit is available in both mill and black finishes.

This component is part of the QuickMount™ product line.



Elevated Water Seal Technology®
This proprietary flashing design cleverly places the roof penetration seal onto an aluminum flute fused into the flashing, above the bolt hole. The secondary EPDM rubber seal keeps water out—raised above the path of rain water and out of harm's way.

Pre-Installed Sealing Washer
Harware options include a lag bolt or structural screw. The EPDM washer arrives already attached.

Open-Slotted L-Foot
The redesigned L-Foot can rotate 360 degrees for optimal adjustability and positioning of the rail, while the open slot allows the rail hardware to quickly drop-in and be compatible with any side-mounted racking on the market.

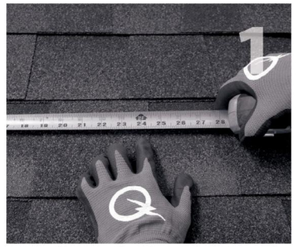
Intertek

25-Year Warranty
Product guaranteed free of impairing defects.

Tech Brief

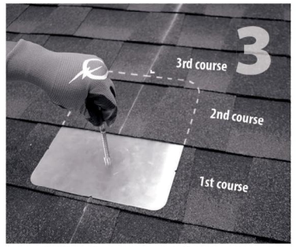
L-Mount® Installation Instructions

Installation Tools Required: tape measure, roofing bar, chalk line, stud finder, caulking gun, sealant compatible with roofing materials, drill with 7/32" or 1/8" bit, drill or impact gun with 1/2" socket.

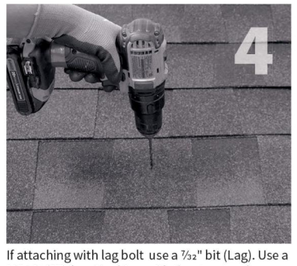


Locate, choose, and mark centers of rafters to be mounted. Select the courses of shingles where mounts will be placed.

Carefully lift composition roof shingle with roofing bar, just above placement of mount. Remove nails as required and backfill holes with aproved sealant. See "Proper Flashing Placement" on next page.



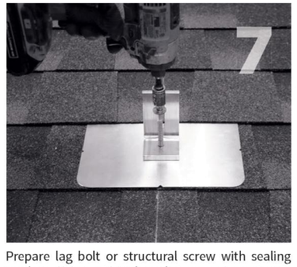
Insert flashing between 1st and 2nd course. Slide up so top edge of flashing is at least ¾" higher than the butt-edge of the 3rd course and lower flashing edge is above the butt-edge of 1st course. Mark center for drilling.



If attaching with lag bolt use a 7/32" bit (Lag). Use a ⅛" bit (ST) for attaching with the structural screw. Drill pilot hole into roof and rafter, taking care to drill square to the roof. Do not use mount as a drill guide. Drill a 2" deep hole into rafter.

Clean off any sawdust, and fill hole with sealant compatible with roofing materials.

Place L-foot onto elevated flute and rotate L-foot to desired orientation.



Prepare lag bolt or structural screw with sealing washer. Using a ½-inch socket on an impact gun, drive prepared lag bolt through L-foot until L-foot can no longer easily rotate. **DO NOT over-torque.** NOTE: Structural screw can be driven with T-30 hex head bit.

You are now ready for the rack of your choice. Follow all the directions of the rack manufacturer as well as the module manufacturer. NOTE: Make sure top of L-Foot makes solid contact with racking.

All roofing manufacturers' written instructions must also be followed by anyone modifying a roof system. Consult the roof manufacturer's specs and instructions prior to working on the roof.

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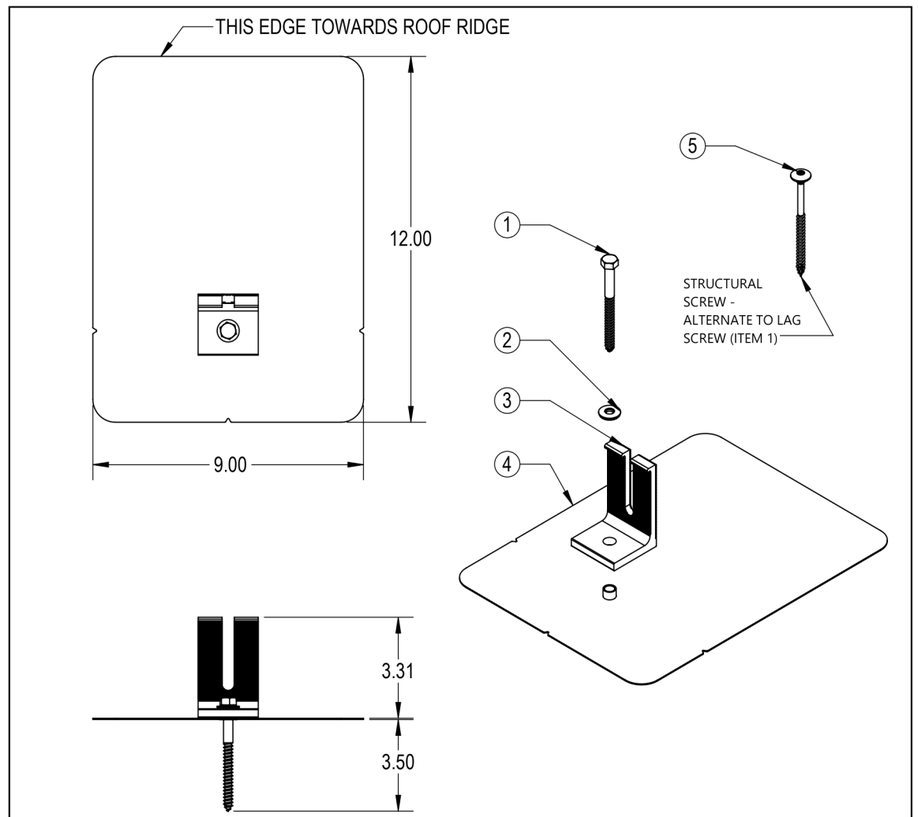
MOUNT SPEC SHEET
SS

QuickMount®

L-Mount®



ITEM NO	DESCRIPTION
1	LAG SCREW, HEX HEAD 5/16"X4", 1/2" HEAD
2	WASHER, SEALING, EPDM BONDED SS
3	L-FOOT, 2"X3.3"
4	FLAHING, ROUNDED CORNERS
5	STRUCTURAL SCREW, T-30 HEX WASHER HEAD, 5/16"x4.5"

L-MOUNT®

SIZE A | DO NOT SCALE DRAWING | WEIGHT: 0.7565 lbs | SHEET 1 OF 1

L-Mount MAN Rev 1.12

CONTRACTOR INFORMATION

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MOUNT SPEC SHEET

SS

Tech Brief

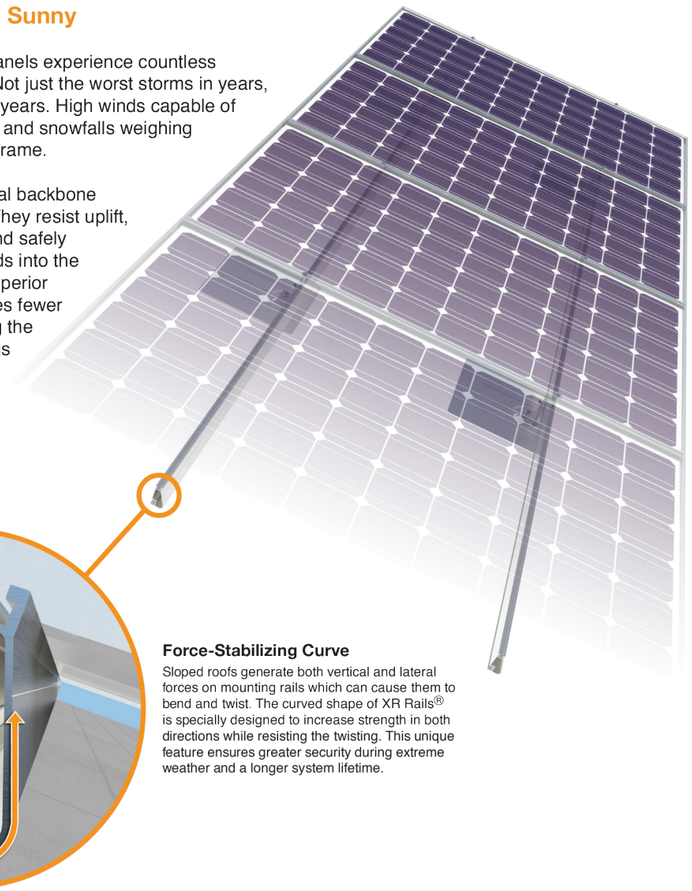
IRONRIDGE

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.

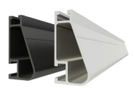
Compatible with Flat & Pitched Roofs

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



Tech Brief

XR Rail® Family

The XR Rail® Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail® to match.

XR10

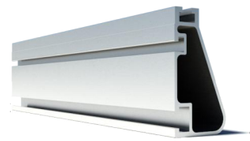
XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves spans up to 6 feet, while remaining light and economical.

- 6’ spanning capability
- Moderate load capability
- Clear & black anodized finish
- Internal splices available

XR100

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 10 feet.

- 10’ spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



XR1000

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

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

Rail Selection

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

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

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

CONTRACTOR INFORMATION

Palmetto®

PALMETTO SOLAR

ADDRESS: 997 MORRISON DRIVE, SUITE 200, CHARLESTON, SC 29403

PHONE NUMBER: (855) 339-1831

CUSTOMER INFORMATION

NAME: MIKALE BOHLMANN

ADDRESS: 207 BARNSLEY ROAD, ANGIER, NC 27501

COORDINATES: 35.471050, -78.785892

APN: 040662010439

7.110kW DC / 5.000kW AC ROOF MOUNT PV SYSTEM

PROJECT ID	AUR-84551
DATE	8/30/2023
CREATED BY	VV
SIGNATURE	

RAIL SPEC SHEET

SS

Tech Brief

IRONRIDGE

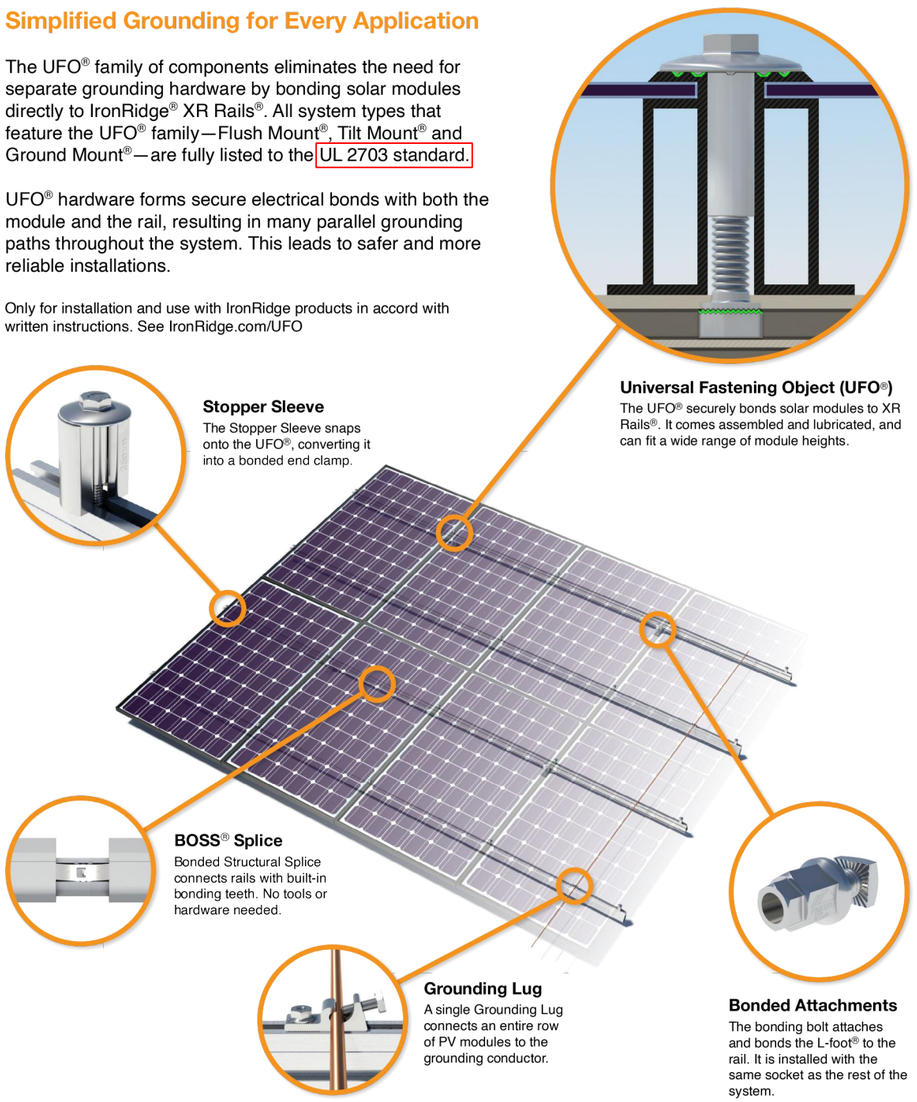
UFO® Family of Components

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.

Only for installation and use with IronRidge products in accord with written instructions. See 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.

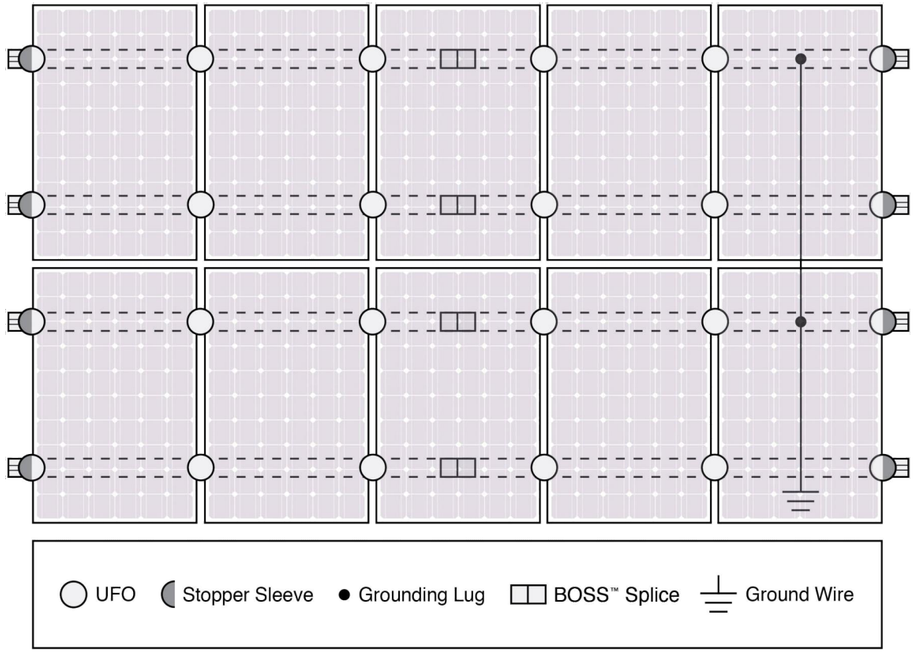
BOSS® Splice
Bonded Structural Splice connects rails with built-in bonding teeth. No tools or hardware needed.

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.

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®	✔	✔	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.		

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