

PHOTOVOLTAIC ROOF MOUNT SYSTEM

14 MODULES-ROOF MOUNTED - 5.530 kW DC, 6.000 kW AC

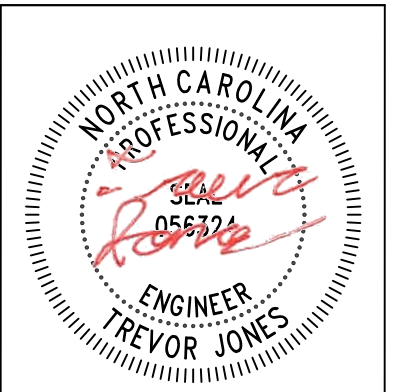
146 TRENTON PL, CAMERON, NC 28326



TOP TIER SOLAR SOLUTIONS

1530 CENTER PARK DR #2911,
CHARLOTTE, NC 28217,
UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	01/30/2024	



STRUCTURAL ONLY
01/30/2024

PROJECT NAME & ADDRESS

AARON GEER
RESIDENCE
146 TRENTON PL,
CAMERON, NC 28326

DRAWN BY
ESR

SHEET NAME
COVER SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-1

PROJECT DATA

PROJECT ADDRESS: 146 TRENTON PL, CAMERON, NC 28326

OWNER: AARON GEER

DESIGNER: ESR

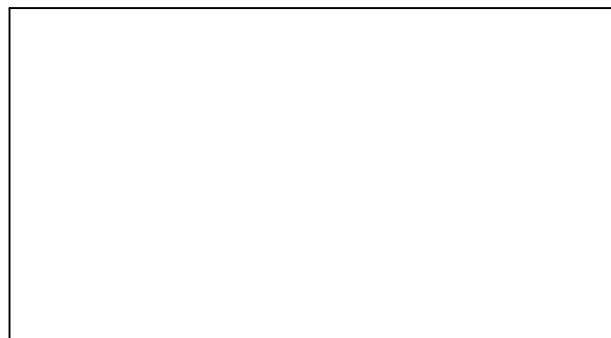
SCOPE: 5.530 kW DC ROOF MOUNT SOLAR PV SYSTEM WITH 14 MISSION SOLAR: MSE395SX9R 395W PV MODULES WITH 14 SOLAREEDGE: S440 POWER OPTIMIZERS AND 01 SOLAREEDGE: SE6000H-US (240V/6000W) INVERTER
01 10 kWh SOLAREEDGE ENERGY BANK

AUTHORITIES HAVING JURISDICTION:
BUILDING: HARNETT COUNTY
ZONING: HARNETT COUNTY
UTILITY: CENTRAL EMC

SHEET INDEX

PV-1	COVER SHEET
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PV-7	WIRING CALCULATIONS
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SIGNATURE



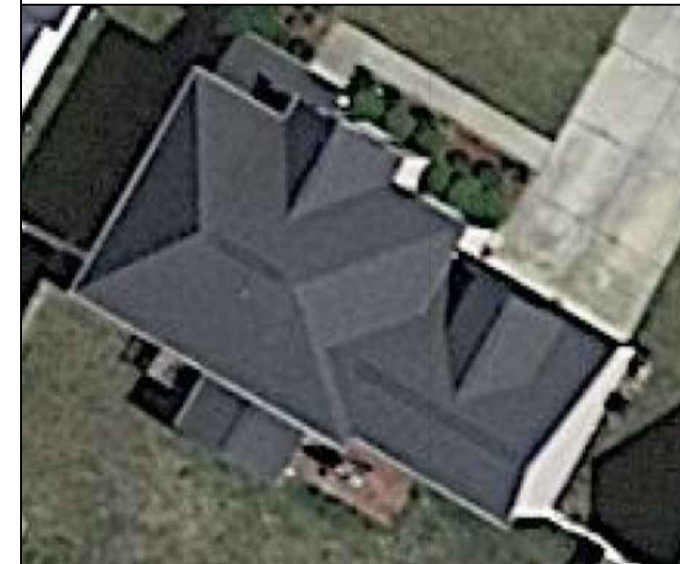
GENERAL NOTES

- ALL COMPONENTS ARE UL LISTED AND CEC CERTIFIED, WHERE WARRANTED.
- THE SOLAR PV SYSTEM WILL BE INSTALLED IN ACCORDANCE WITH ARTICLE 690 OF THE NEC 2017.
- THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION.
- ALL CONDUCTORS OF A CIRCUIT, INCLUDING THE EGC, MUST BE INSTALLED IN THE SAME RACEWAY, OR CABLE, OR OTHERWISE RUN WITH THE PV ARRAY CIRCUIT CONDUCTORS WHEN THEY LEAVE THE VICINITY OF THE PV ARRAY.
- WHERE METALLIC CONDUIT CONTAINING DC CONDUCTORS IS USED INSIDE THE BUILDING, IT SHALL BE IDENTIFIED AS "CAUTION: SOLAR CIRCUIT" EVERY 10FT.
- HEIGHT OF THE AC DISCONNECT SHALL NOT EXCEED 6'-7" PER NEC CODE 240.24.
- A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH CEC 690.47 AND 250.50 THROUGH 60 AND 250-166 SHALL BE PROVIDED. PER NEC GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED AND BONDED TO THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE OR INADEQUATE A SUPPLEMENTAL GROUNDING ELECTRODE WILL BE USED AT THE INVERTER LOCATION CONSISTING OF A UL LISTED 8 FT. GROUND ROD WITH ACORN CLAMP. GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #8 AWG AND NO LARGER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE SYSTEM.
- PHOTOVOLTAIC MODULES ARE TO BE CONSIDERED NON-COMBUSTIBLE.
- PHOTOVOLTAIC INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
- ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE. WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF THE ROOF SURFACE.
- ALL SINAGE TO BE PLACED IN ACCORDANCE WITH THE LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SINAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.
- INVERTER(S) USED IN UNGROUNDED SYSTEM SHALL BE UL 1741 LISTED.
- THE INSTALLATION OF EQUIPMENT AND ALL ASSOCIATED WIRING AND INTERCONNECTION SHALL BE PERFORMED ONLY BY QUALIFIED PERSONS [NEC 690.4(C)]
- ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED (OR BETTER), INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES.
- ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250.
- SYSTEM GROUNDING SHALL BE IN ACCORDANCE WITH NEC 690.41.
- PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION IN ACCORDANCE WITH NEC 690.12
- DISCONNECTING MEANS SHALL BE LOCATED IN A VISIBLE, READILY ACCESSIBLE LOCATION WITHIN THE PV SYSTEM EQUIPMENT OR A MAXIMUM OF 10 FEET AWAY FROM THE SYSTEM [NEC 690.13(A)]
- ALL WIRING METHODS SHALL BE IN ACCORDANCE WITH NEC 690.31
- WORK CLEARANCES AROUND ELECTRICAL EQUIPMENT WILL BE MAINTAINED PER NEC 110.26(A)(1), 110.26(A)(2) AND 110.26(A)(3).
- ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED & IDENTIFIED IN ACCORDANCE WITH UL1703
- ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.

VICINITY MAP



HOUSE PHOTO



CODE REFERENCES

2018 NORTH CAROLINA BUILDING CODE
2018 NORTH CAROLINA RESIDENTIAL CODE
2018 NORTH CAROLINA FIRE CODE
2017 NATIONAL ELECTRICAL CODE



PROJECT DESCRIPTION:

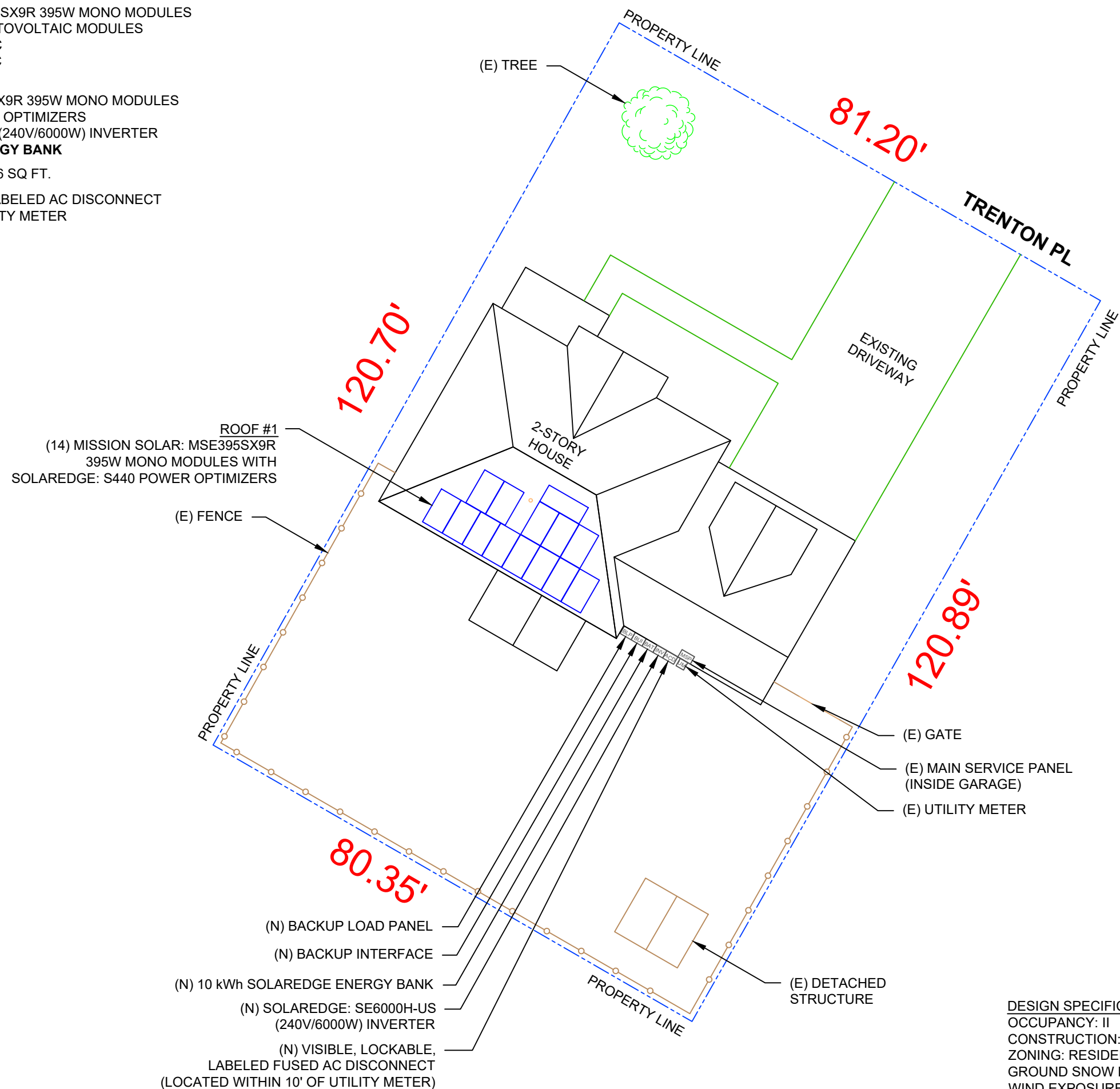
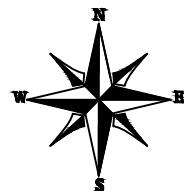
14 X MISSION SOLAR: MSE395SX9R 395W MONO MODULES
 ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES
 DC SYSTEM SIZE: 5.530 kW DC
 AC SYSTEM SIZE: 6.000 kW AC

EQUIPMENT SUMMARY

14 MISSION SOLAR: MSE395SX9R 395W MONO MODULES
 14 SOLAREEDGE: S440 POWER OPTIMIZERS
 01 SOLAREEDGE: SE6000H-US (240V/6000W) INVERTER
01 10 kWh SOLAREEDGE ENERGY BANK

ROOF ARRAY AREA #1:- 302.96 SQ. FT.

NOTE: VISIBLE, LOCKABLE, LABELED AC DISCONNECT
 LOCATED WITHIN 10' OF UTILITY METER



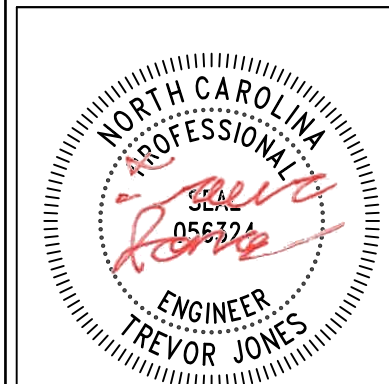
DESIGN SPECIFICATION
 OCCUPANCY: II
 CONSTRUCTION: SINGLE-FAMILY
 ZONING: RESIDENTIAL
 GROUND SNOW LOAD: REFER STRUCTURAL LETTER
 WIND EXPOSURE: REFER STRUCTURAL LETTER
 WIND SPEED: REFER STRUCTURAL LETTER



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 RESIDENCE**
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 CAMERON, NC 28326

DRAWN BY

ESR

SHEET NAME

SITE PLAN

SHEET SIZE

**ANSI B
 11" X 17"**

SHEET NUMBER

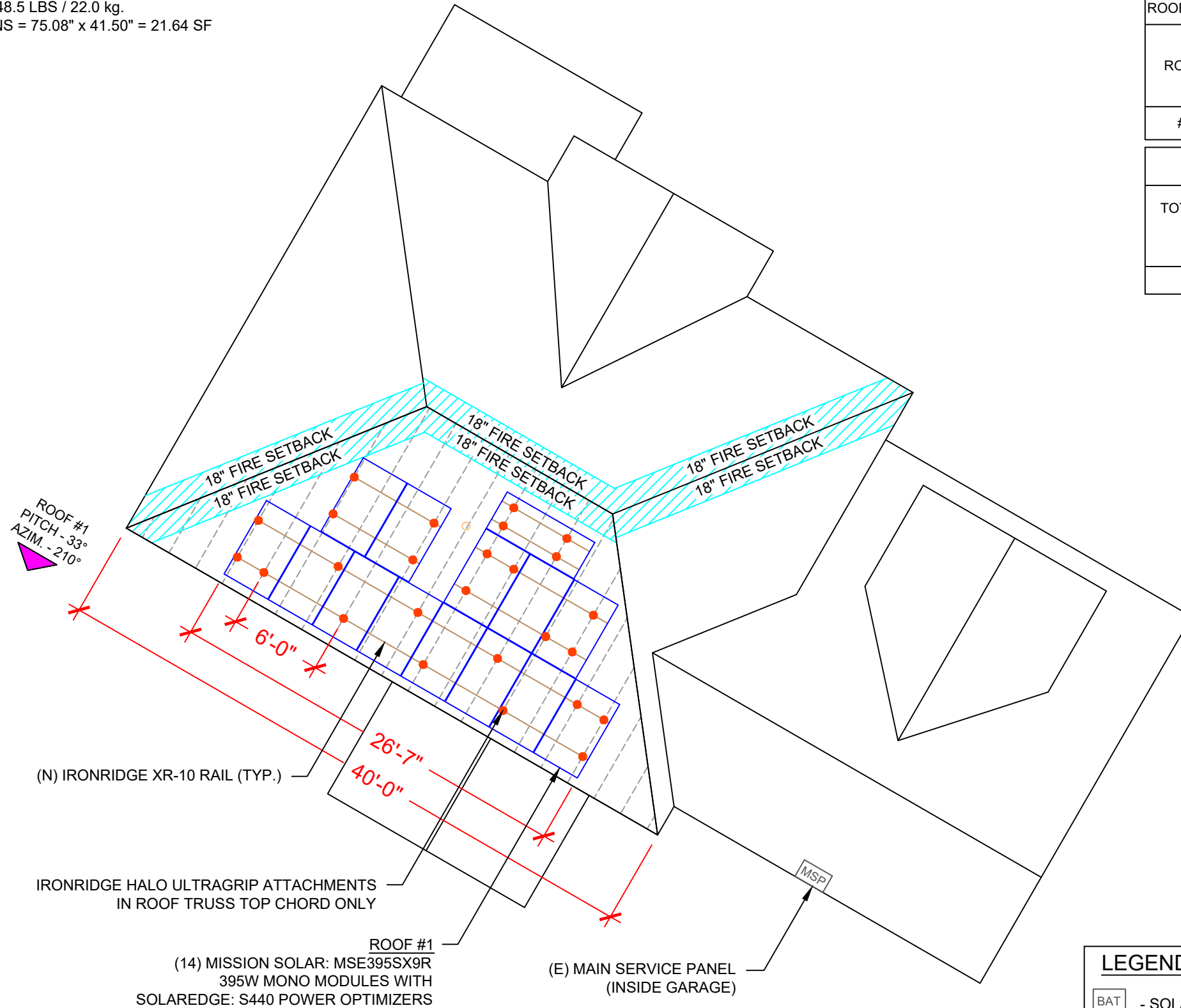
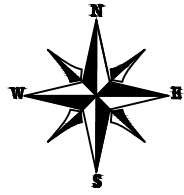
PV-2

1 SITE PLAN

PV-2 SCALE: 1/16" = 1'-0"

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 14 MODULES
 MODULE TYPE = MISSION SOLAR: MSE395SX9R 395W MONO MODULES
 MODULE WEIGHT = 48.5 LBS / 22.0 kg.
 MODULE DIMENSIONS = 75.08" x 41.50" = 21.64 SF



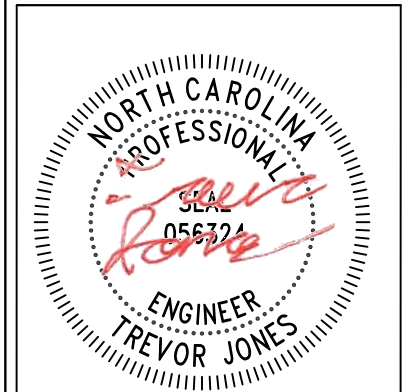
ROOF DESCRIPTION					
ROOF TYPE			ASPHALT SHINGLE		
ROOF LAYER			1 LAYER		
ROOF	# OF MODULES	ROOF PITCH	AZIMUTH	TRUSS SIZE	TRUSS SPACING
#1	14	33°	210°	2"X4"	24"

ARRAY AREA & ROOF AREA CALC'S		
TOTAL PV ARRAY AREA (SQ. FT.)	TOTAL ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
302.96	2231.86	14

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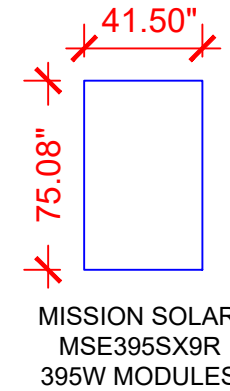
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 CAMERON, NC 28326

DRAWN BY
ESR

SHEET NAME
ROOF PLAN & MODULES

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

SHEET NUMBER
PV-3

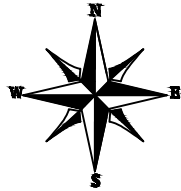


LEGEND

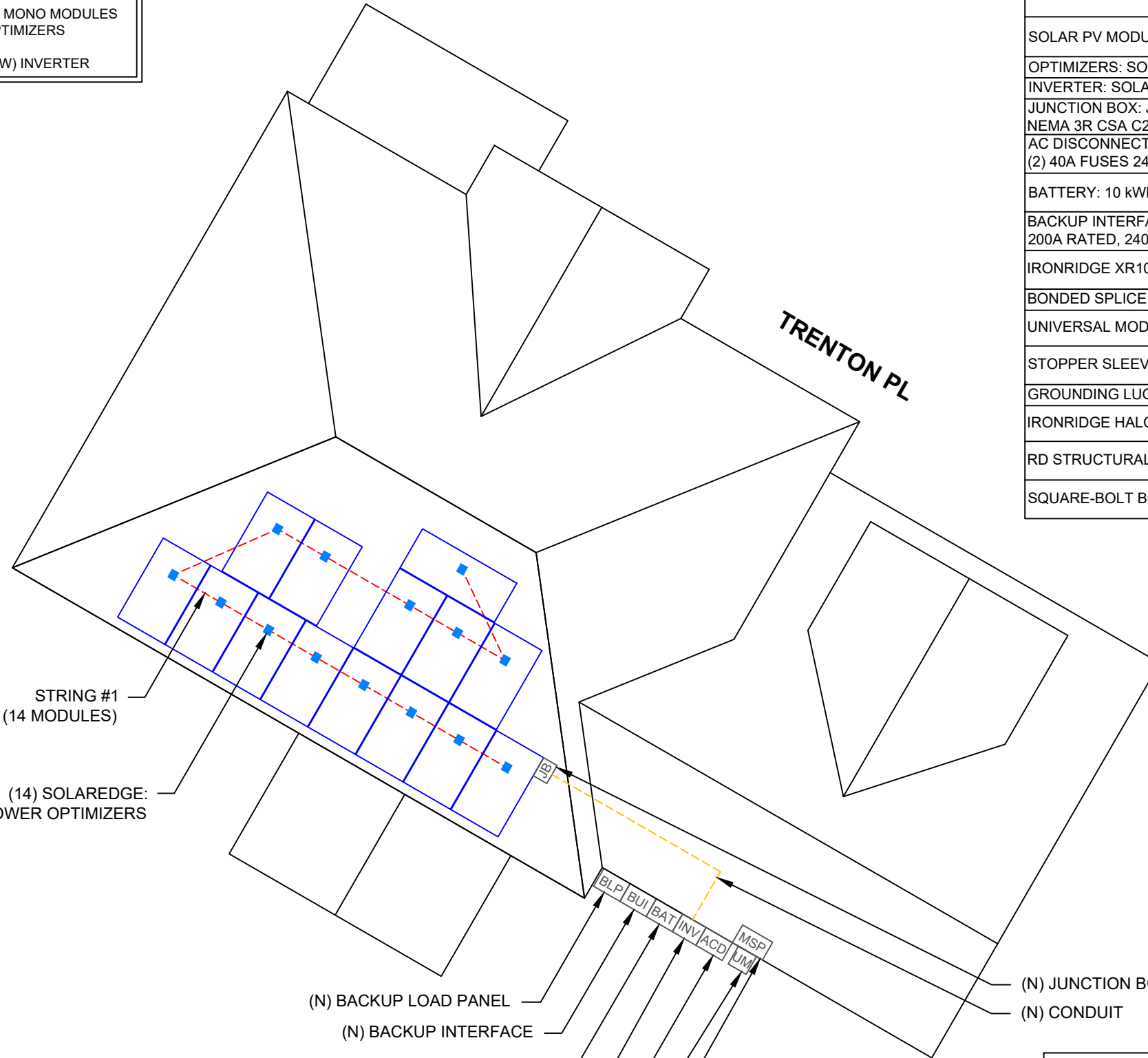
[BAT]	- SOLAREEDGE BATTERY	[INV]	- INVERTER
[BLP]	- BACKUP LOAD PANEL	[JB]	- JUNCTION BOX
[BUJ]	- BACKUP INTERFACE	○	- VENT, ATTIC FAN (ROOF OBSTRUCTION)
[ACD]	- AC DISCONNECT	●	- ROOF ATTACHMENT
[UM]	- UTILITY METER	---	- TRUSS
[MSP]	- MAIN SERVICE PANEL	---	- CONDUIT

DC SYSTEM SIZE: 5.530 kW DC
 AC SYSTEM SIZE: 6.000 kW AC
 (14) MISSION SOLAR: MSE395SX9R 395W MONO MODULES
 WITH (14) SOLAREEDGE: S440 POWER OPTIMIZERS
 LOCATED UNDER EACH PANEL AND
 01 SOLAREEDGE: SE6000H-US (240V/6000W) INVERTER

STRING LEGENDS
 - - - - - STRING #1



STRING #1
 (14 MODULES)
 (14) SOLAREEDGE:
 S440 POWER OPTIMIZERS



(N) BACKUP LOAD PANEL
 (N) BACKUP INTERFACE
 (N) 10 kWh SOLAREEDGE ENERGY BANK
 (N) SOLAREEDGE: SE6000H-US
 (240V/6000W) INVERTER
 (N) VISIBLE, LOCKABLE,
 LABELED FUSED AC DISCONNECT
 (LOCATED WITHIN 10' OF UTILITY METER)
 (E) UTILITY METER
 (E) MAIN SERVICE PANEL
 (INSIDE GARAGE)

BILL OF MATERIALS	
EQUIPMENT DESCRIPTION	QTY
SOLAR PV MODULES: MISSION SOLAR: MSE395SX9R 395W MODULE	14
OPTIMIZERS: SOLAREEDGE: S440 POWER OPTIMIZERS	14
INVERTER: SOLAREEDGE: SE6000H-US (240V/6000W) INVERTER	01
JUNCTION BOX: JUNCTION BOX UL 1741, NEMA 3R CSA C22.2 NO.290	1
AC DISCONNECT: FUSED AC DISCONNECT, 60A FUSED, (2) 40A FUSES 240V NEMA 3R, UL LISTED	1
BATTERY: 10 kWh SOLAREEDGE ENERGY BANK	1
BACKUP INTERFACE: SOLAREEDGE BACKUP INTERFACE BI-NUSGN-01 200A RATED, 240V NEMA 3R, UL LISTED	1
IRONRIDGE XR10 RAIL (RAIL 168" (14 FEET) CLEAR) (XR-10-168A)	12
BONDED SPLICE, XR10 (XR10-BOSS-01-M1)	4
UNIVERSAL MODULE CLAMP, CLEAR (UFO-CL-01-A1)	36
STOPPER SLEEVE, 40MM, MILL (UFO-STP-40MM-M1)	16
GROUNDING LUG (XR-LUG-03-A1)	4
IRONRIDGE HALO ULTRAGRIP ATTACHMENTS (QM-HUG-01-M1)	26
RD STRUCTURAL SCREW,3.0L (HW-RD1430-01-M1)	52
SQUARE-BOLT BONDING HARDWARE (BHW-SQ-02-A1)	26

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DRAWN BY
ESR

SHEET NAME
ELECTRICAL PLAN

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

SHEET NUMBER
PV-4

LEGEND

[BAT]	- SOLAREEDGE BATTERY	[INV]	- INVERTER
[BLP]	- BACKUP LOAD PANEL	[JB]	- JUNCTION BOX
[BUJ]	- BACKUP INTERFACE	○	- VENT, ATTIC FAN (ROOF OBSTRUCTION)
[ACD]	- AC DISCONNECT	●	- ROOF ATTACHMENT
[UM]	- UTILITY METER	- - - - -	- TRUSS
[MSP]	- MAIN SERVICE PANEL	- - - - -	- CONDUIT

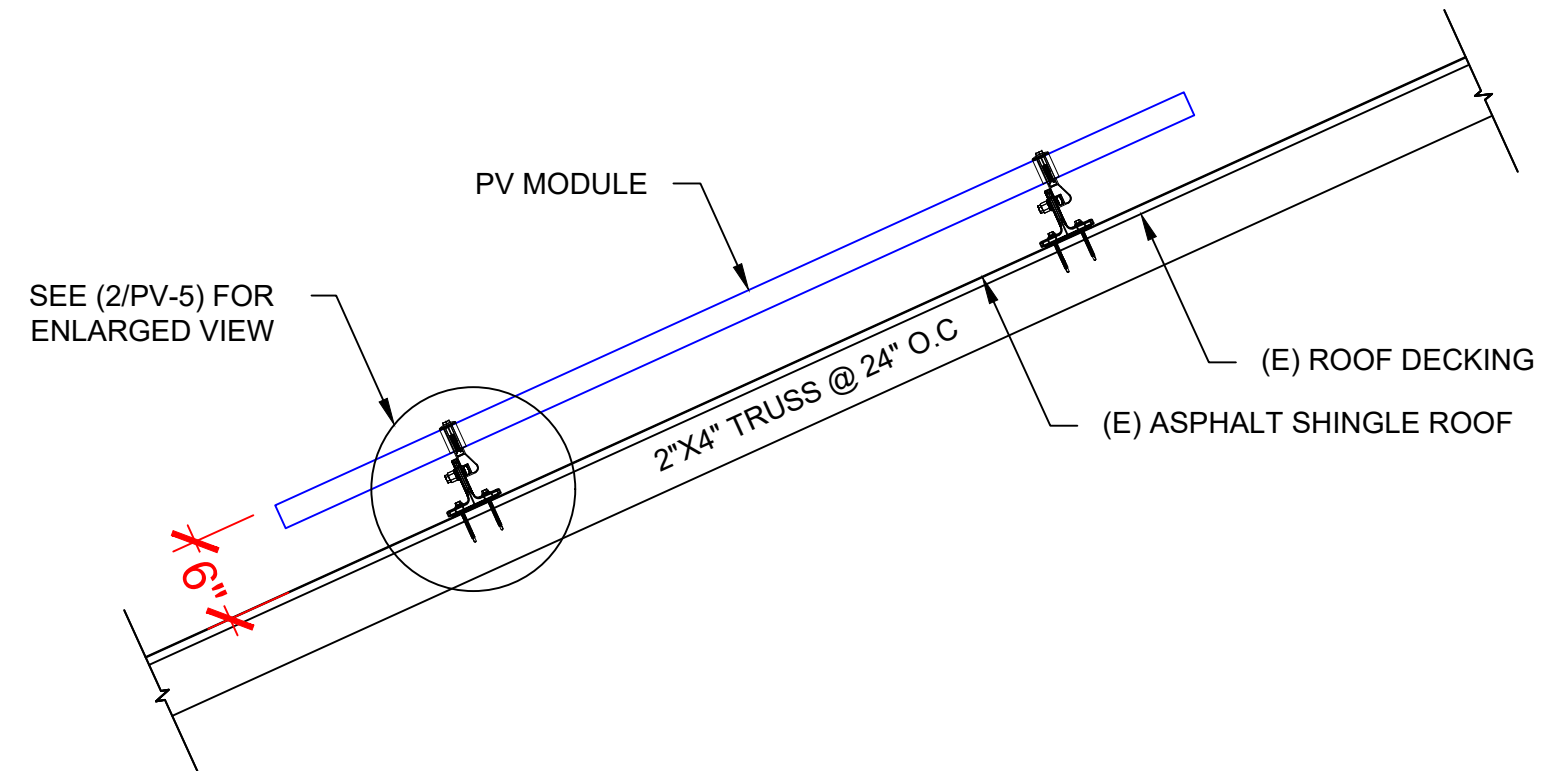


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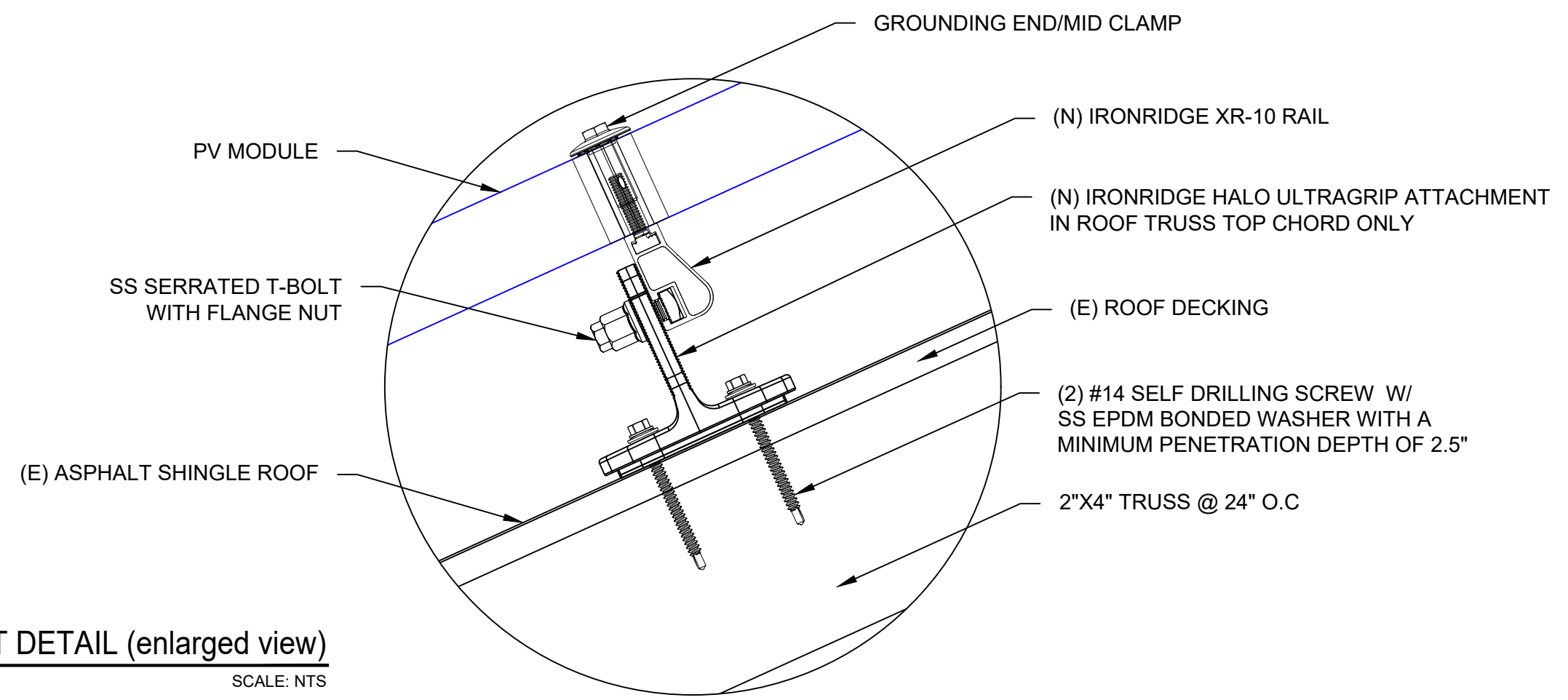
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1 | **STRUCTURAL ATTACHMENT (Side view)**
 PV-5 | SCALE: N.T.S



2 | **ATTACHMENT DETAIL (enlarged view)**
 PV-5 | SCALE: NTS

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SHEET NAME
STRUCTURAL DETAIL

SHEET SIZE
**ANSI B
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SHEET NUMBER
PV-5

DC SYSTEM SIZE: 5.530 kW DC
AC SYSTEM SIZE: 6.000 kW AC

(14) MISSION SOLAR: MSE395SX9R 395W MONO MODULES WITH (14) SOLAREEDGE: S440 POWER OPTIMIZERS LOCATED UNDER EACH PANEL (240V) AND (01) SOLAREEDGE: SE6000H-US (240V/6000W) INVERTER (01) STRING OF 14 MODULES ARE CONNECTED IN SERIES

INTERCONNECTION NOTES:

1. INTERCONNECTION SIZING, LIMITATIONS AND COMPLIANCE DETERMINED IN ACCORDANCE WITH [NEC 705.12], AND [NEC 690.59].
2. GROUND FAULT PROTECTION IN ACCORDANCE WITH [NEC 215.9], [NEC 230.95].
3. ALL EQUIPMENT TO BE RATED FOR BACKFEEDING.
4. PV BREAKER TO BE POSITIONED AT THE OPPOSITE END OF THE BUSBAR RELATIVE TO THE MAIN BREAKER.

DISCONNECT NOTES:

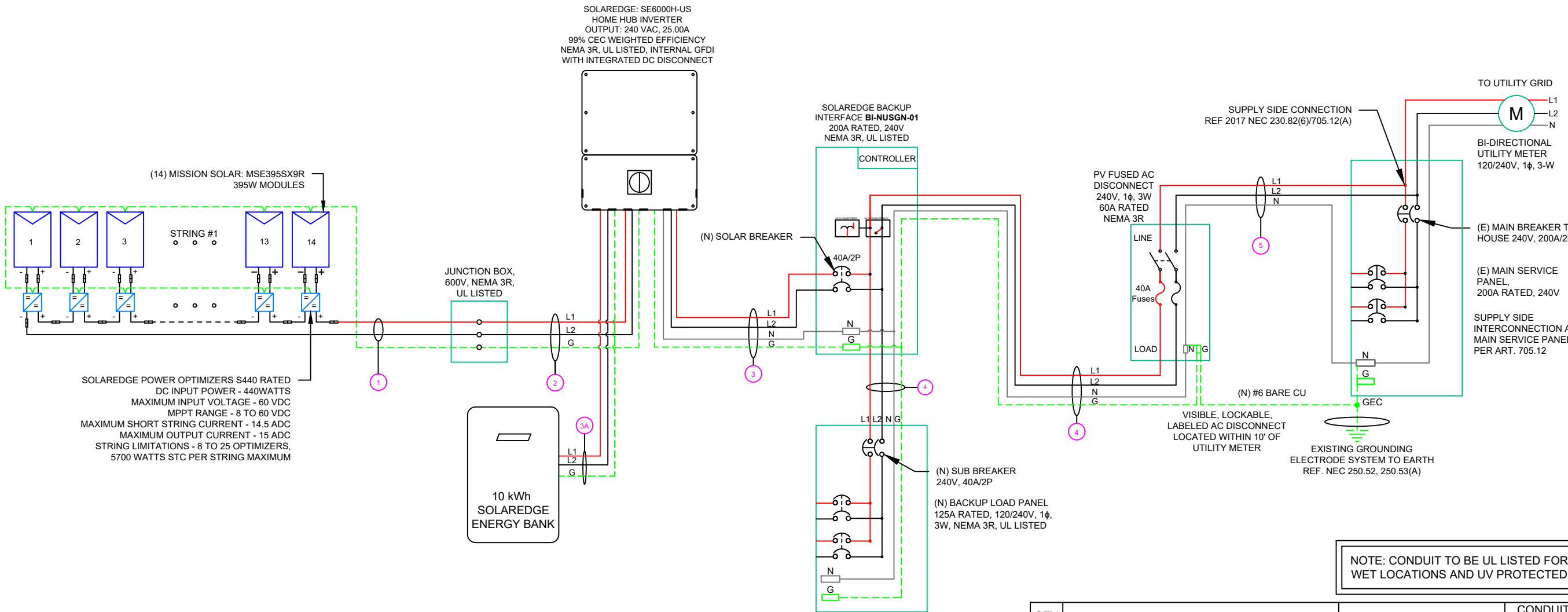
1. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING LIVE ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS)
2. AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
3. DISCONNECT MEANS AND THEIR LOCATION SHALL BE IN ACCORDANCE WITH [NEC 225.31] AND [NEC 225.32].

GROUNDING & GENERAL NOTES:

1. PV GROUNDING ELECTRODE SYSTEM NEEDS TO BE INSTALLED IN ACCORDANCE WITH [NEC 690.43]
2. PV INVERTER IS UNGROUNDED, TRANSFORMER-LESS TYPE.
3. DC GEC AND AC EGC TO REMAIN UNSPLICED, OR SPLICED TO EXISTING ELECTRODE
4. ANY EXISTING WIRING INVOLVED WITH PV SYSTEM CONNECTION THAT IS FOUND TO BE INADEQUATE PER CODE SHALL BE CORRECTED PRIOR TO FINAL INSPECTION.
5. JUNCTION BOX QUANTITIES, AND PLACEMENT SUBJECT TO CHANGE IN THE FIELD - JUNCTION BOX DEPICTED ON ELECTRICAL DIAGRAM REPRESENT WIRE TYPE TRANSITIONS.
6. AC DISCONNECT NOTED IN EQUIPMENT SCHEDULE OPTIONAL IF OTHER AC DISCONNECTING MEANS IS LOCATED WITHIN 10' OF SERVICE DISCONNECT.
7. RACEWAYS AND CABLES EXPOSED TO SUNLIGHT ON ROOFTOPS SHOULD BE INSTALLED MORE THAN 7/8" ABOVE THE ROOF USING CONDUIT SUPPORTS.

RACKING NOTE:

1. BOND EVERY OTHER RAIL WITH #6 BARE COPPER



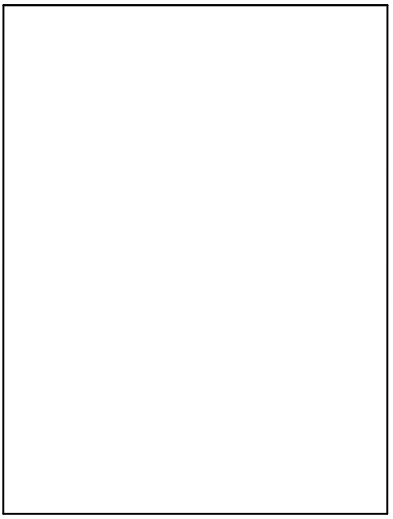
QTY	CONDUCTOR INFORMATION		CONDUIT TYPE	CONDUIT SIZE
(2)	#10AWG -	PV WIRE/USE-2	N/A	N/A
(1)	#6AWG -	BARE COPPER IN FREE AIR		
(2)	#10AWG -	CU, THWN-2	EMT OR LFMC IN ATTIC	3/4"
(1)	#10AWG -	CU, THWN-2 GND		
(2)	#8AWG -	CU, THWN-2	EMT, LFMC OR PVC	3/4"
(1)	#8AWG -	CU, THWN-2 N		
(1)	#10AWG -	CU, THWN-2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



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RESIDENCE**

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CAMERON, NC 28326

DRAWN BY ESR
SHEET NAME ELECTRICAL LINE DIAGRAM
SHEET SIZE ANSI B 11" X 17"
SHEET NUMBER PV-6

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	MISSION SOLAR: MSE395SX9R 395W MODULE
VMP	36.99V
IMP	10.68A
VOC	45.18V
ISC	11.24A
TEMP. COEFF. VOC	-0.259%/°C
MODULE DIMENSION	75.08"L x 41.50"W x 1.57"D (In Inch)

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	SOLAREEDGE: SE6000H-US (240V/6000W) INVERTER
NOMINAL AC POWER	6.000 kW
NOMINAL OUTPUT VOLTAGE	240 VAC
NOMINAL OUTPUT CURRENT	25.00A

AMBIENT TEMPERATURE SPECS	
AMBIENT TEMP (HIGH TEMP 2%)	38°
RECORD LOW TEMPERATURE	-11°
MODULE TEMPERATURE COEFFICIENT OF Voc	-0.259%/°C

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

DC FEEDER CALCULATIONS																					
CIRCUIT ORIGIN	CIRCUIT DESTINATION	VOLTAGE (V)	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OCPD SIZE (A)	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a)	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)	CONDUIT SIZE	CONDUIT FILL (%)
STRING 1	JUNCTION BOX	380	15.00	18.75	20	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	38	2	40	0.91	1	36.4	PASS	5	1.24	0.049	N/A	#N/A
JUNCTION BOX	INVERTER	380	15.00	18.75	20	CU #10 AWG	CU #10 AWG	35	PASS	38	2	40	0.91	1	36.4	PASS	40	1.24	0.392	3/4" EMT	11.87617
SOLAREEDGE BANK	INVERTER	380	11.11	13.89	20	CU #10 AWG	CU #8 AWG	50	PASS	38	2	55	0.91	1	50.05	PASS	5	0.778	0.023	3/4" EMT	17.69231

String 1 Voltage Drop 0.441

AC FEEDER CALCULATIONS																						
CIRCUIT ORIGIN	CIRCUIT DESTINATION	VOLTAGE (V)	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OCPD SIZE (A)	NEUTRAL SIZE	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a)	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)	CONDUIT SIZE	CONDUIT FILL (%)
INVERTER	BACKUP INTERFACE	240	25	31.25	40	CU #8 AWG	CU #10 AWG	CU #8 AWG	50	PASS	38	2	55	0.91	1	50.05	PASS	5	0.778	0.081	3/4" EMT	24.5591
BACKUP INTERFACE	BACKUP LOAD PANEL	240	40	40	40	CU #4 AWG	CU #6 AWG	CU #4 AWG	85	PASS	38	2	95	0.91	1	86.45	PASS	5	0.308	0.051	1" EMT	34.4792
BACKUP INTERFACE	AC DISCONNECT	240	25	31.25	40	CU #4 AWG	CU #6 AWG	CU #4 AWG	85	PASS	38	2	95	0.91	1	86.45	PASS	5	0.308	0.032	1" EMT	34.4792
AC DISCONNECT	POI	240	25	31.25	40	CU #4 AWG	N/A	CU #4 AWG	85	PASS	38	2	95	0.91	1	86.45	PASS	5	0.308	0.032	1" EMT	28.6111

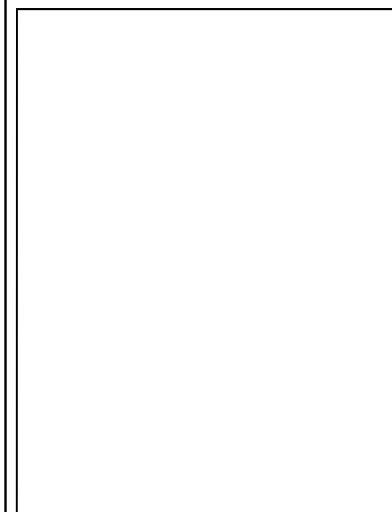
CUMULATIVE VOLTAGE DROP 0.197



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146 TRENTON PL,
CAMERON, NC 28326

DRAWN BY
ESR

SHEET NAME
WIRING CALCULATIONS

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

SHEET NUMBER
PV-7

ELECTRICAL NOTES

- ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
- WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
- WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
- WHERE SIZES OF JUNCTION BOX, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
- MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSKO GBL-4DBT LAY-IN LUG.
- 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.

PHOTOVOLTAIC POWER SOURCE

EVERY 10' ON CONDUIT & ENCLOSURES

LABEL- 1:
 LABEL LOCATION:
 EMT/CONDUIT RACEWAY
 SOLADECK / JUNCTION BOX
 CODE REF: NEC 690.31 (D)(2)

WARNING

ELECTRIC SHOCK HAZARD

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

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

**WARNING TRI POWER SOURCE
 SECOND SOURCE IS PHOTOVOLTAIC SYSTEM
 THIRD SOURCE IS BATTERY SYSTEM**

LABEL- 3:
 LABEL LOCATION:
 UTILITY METER
 MAIN SERVICE PANEL
 SUBPANEL
 CODE REF: NEC 705.12(C) & NEC 690.59

SOLAR PV BREAKER:

**BREAKER IS BACKFED
 DO NOT RELOCATE**

LABEL-4:
 LABEL LOCATION:
 MAIN SERVICE PANEL
 CODE REF: NEC 705.12(C) & NEC 690.59

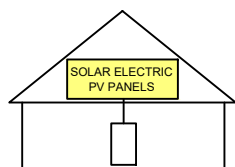
WARNING

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

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

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

**RAPID SHUTDOWN SWITCH
 FOR SOLAR PV SYSTEM**

LABEL- 7:
 LABEL LOCATION:
 INVERTER
 CODE REF: NEC 690.56(C)(2)

DC DISCONNECT

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

**AC DISCONNECT
 PHOTOVOLTAIC SYSTEM
 POWER SOURCE**

NOMINAL OPERATING AC VOLATGE **240 V**
 RATED AC OUTPUT CURRENT **25.00 A**

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

MAXIMUM VOLTAGE **480 V**
 MAXIMUM CIRCUIT CURRENT **16.50A**
 MAXIMUM RATED OUTPUT
 CURRENT OF THE CHARGE
 CONTROLLER OR DC-TO-DC
 CONVERTER (IF INSTALLED)

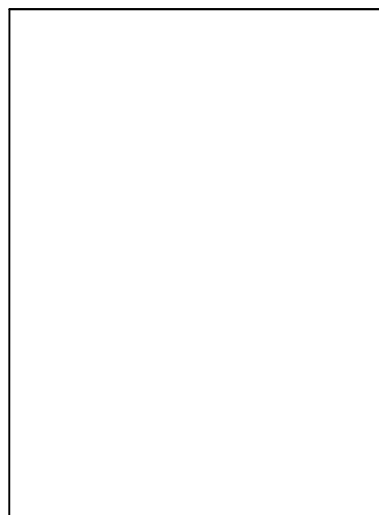
LABEL- 10:
 LABEL LOCATION:
 ON THE RIGHT SIDE OF THE INVERTER (PRE-EXISTING ON THE INVERTER)
 CODE REF: NEC 690.53



TOP TIER SOLAR SOLUTIONS

1530 CENTER PARK DR #2911,
 CHARLOTTE, NC 28217,
 UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	01/30/2024	



PROJECT NAME & ADDRESS

**AARON GEER
 RESIDENCE**
 146 TRENTON PL,
 CAMERON, NC 28326

DRAWN BY
ESR

SHEET NAME
LABELS

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

SHEET NUMBER
PV-8

MSE PERC 66

MISSION SOLAR ENERGY



395W

Class leading power output -0 to +3%

Positive Power Tolerance

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

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



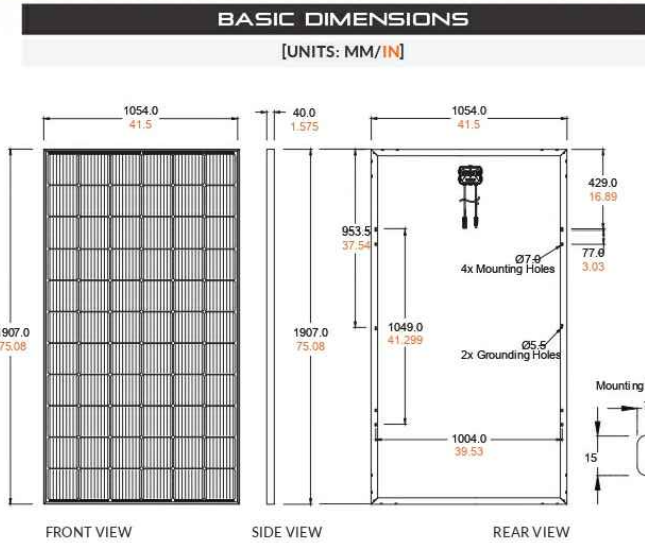
UL 61730 / IEC 61215 / IEC 61730 / IEC 61701

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



Class Leading
390-400W

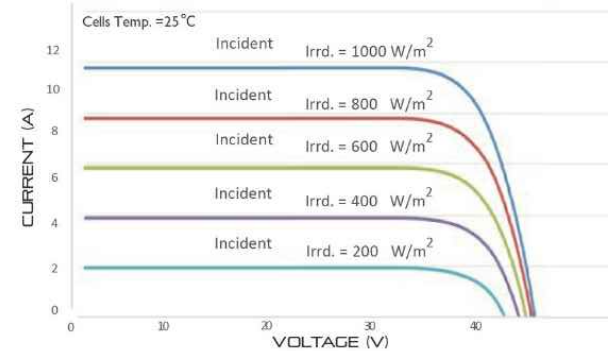
MSE PERC 66



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



CEC



Mission Solar Energy

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

Mission Solar Energy reserves the right to make specification changes without notice.
C-SA2-MKTG-0027 REV 4 03/18/2022

ELECTRICAL SPECIFICATION					
PRODUCT TYPE	MSE _{xxx} SX9R (xxx = P _{max})				
	P _{max}	W _p	390	395	400
Power Output					
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 P _{max}	-0.367%/°C
Temperature Coefficient of V _{oc}	-0.259%/°C
Temperature Coefficient of I _{sc}	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 4mm ² (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 (195.54 cm)	

TOP TIER SOLAR SOLUTIONS

TOP TIER SOLAR SOLUTIONS

1530 CENTER PARK DR #2911,
CHARLOTTE, NC 28217,
UNITED STATES

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PROJECT NAME & ADDRESS	
AARON GEER RESIDENCE	146 TRENTON PL, CAMERON, NC 28326

DRAWN BY	
ESR	
SHEET NAME	
EQUIPMENT SPECIFICATION	
SHEET SIZE	
ANSI B 11" X 17"	
SHEET NUMBER	
PV-9	

CERTIFICATE OF COMPLIANCE

Certificate Number E364743
Report Reference E364743-20201208
Date 2021-August-04

Issued to: Mission Solar Energy LLC
 8303 S New Braunfels Ave
 San Antonio TX, 78235 US

This is to certify that representative samples of PHOTOVOLTAIC MODULES AND PANELS WITH SYSTEM VOLTAGE RATINGS OVER 600 VOLTS
 See Addendum Page for Product Designation(s).

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 61730-1, Photovoltaic (PV) Module Safety Qualification - Part 1: Requirements for Construction
 UL 61730-2, Photovoltaic (PV) Module Safety Qualification - Part 2: Requirements for Testing
 CSA C22.2 No. 61730-2:2019, Photovoltaic (PV) Module Safety Qualification - Part 2: Requirements for Testing

Additional Information: See the UL Online Certifications Directory at <https://iq.ulprospector.com> for additional information

This Certificate of Compliance does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.



CERTIFICATE OF COMPLIANCE

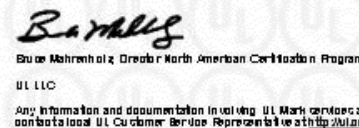
Certificate Number E364743
Report Reference E364743-20201208
Date 2021-August-04

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements

Photovoltaic Modules and Panels with System Voltage Ratings Over 600 Volts (QIIA) Models:

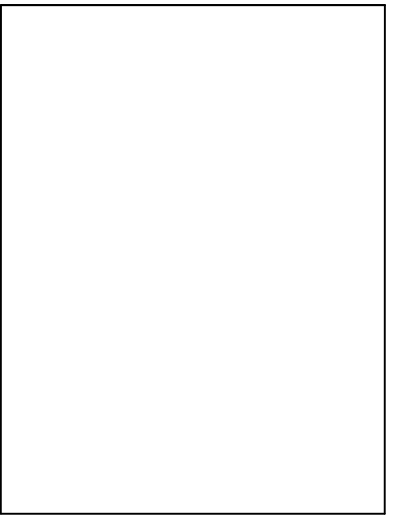
Model	Where XXX is wattage
MSEXXXSX6S, may be followed by -IV	where XXX is 405-425
MSEXXXSX6W, may be followed by -IV	where XXX is 405-425
MSEXXXSX6Z, may be followed by -IV	where XXX is 405-425
MSEXXXSX5R, may be followed by -IV	where XXX is 375-390
MSEXXXSX5K, may be followed by -IV	where XXX is 335-355
MSEXXXSX5T, may be followed by -IV	where XXX is 330-350
MSEXXXSX9W, may be followed by -IV	where XXX is 420-440
MSEXXXSX9Z, may be followed by -IV	where XXX is 415-435
MSEXXXSX9R, may be followed by -IV	where XXX is 380-400
MSEXXXSX9K, may be followed by -IV	where XXX is 345-365
MSEXXXSX9T, may be followed by -IV	where XXX is 340-360

-IV indicates Type 4 module



TOP TIER SOLAR SOLUTIONS
 1530 CENTER PARK DR #2911,
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**AARON GEER
 RESIDENCE**

**146 TRENTON PL,
 CAMERON, NC 28326**

DRAWN BY
 ESR

SHEET NAME
 EQUIPMENT
 SPECIFICATION

SHEET SIZE
 ANSI B
 11" X 17"

SHEET NUMBER
 PV-10

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

*Functionality subject to inverter model and firmware version

solaredge.com



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 OPERATION					
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](#).

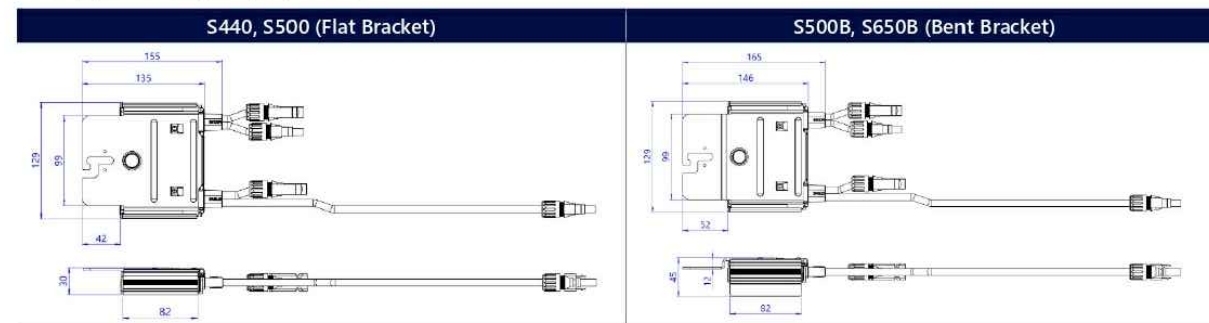
⁽³⁾ For other connector types please contact SolarEdge.

⁽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 S500B, S650B: 6	9 8	16	18	
Maximum String Length (Power Optimizers)	25	20	50	50	
Maximum Continuous Power per String	5700	5625	11250	12750	W
Maximum Allowed Connected Power per String (In multiple string designs, the maximum is permitted only when the difference in connected power between strings is 2,000W or less)	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 in the same string.

⁽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 inverter's maximum input DC power. Refer to [Application Note: Single String Design Guidelines](#).



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CE RoHS

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1530 CENTER PARK DR #2911,
CHARLOTTE, NC 28217,
UNITED STATES

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RESIDENCE
146 TRENTON PL,
CAMERON, NC 28326

DRAWN BY

ESR

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-11

SolarEdge Home Hub Inverter For North America

SE3800H-US / SE5700H-US / **SE6000H-US** / SE7600H-US /
SE10000H-US / SE11400H-US⁽¹⁾



**12-25
YEAR
WARRANTY**

HOME BACKUP

Optimized battery storage with HD-Wave technology

- Record-breaking 99% weighted efficiency with 200% DC oversizing
- Small, lightweight, and easy to install
- Modular design, future ready with optional upgrades to:
 - DC-coupled storage for full or partial home backup
 - Built-in consumption monitoring
 - Direct connection to the SolarEdge Home EV Charger
- Multi-inverter, scalable storage solution, with enhanced battery power up to 10kW
- Integrated arc fault protection and rapid shutdown for NEC 2014 – 2023, per article 690.11 and 690.12
- Embedded revenue grade production data, ANSI C12.20 Class 0.5

solaredge.com



/ SolarEdge Home Hub Inverter

For North America

SE3800H-US / SE5700H-US / **SE6000H-US** / SE7600H-US / SE10000H-US /
SE11400H-US⁽¹⁾

Applicable to inverters with part number	SEXXXXH-USMNBXXXX / SEXXXXH-USSNBXXXX						Units
	SE3800H-US	SE5700H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
OUTPUT – AC ON GRID							
Rated AC Power	3800 @ 240V 3300 @ 208V	5760 @ 240V 5000 @ 208V	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	W
Maximum AC Power Output	3800 @ 240V 3300 @ 208V	5760 @ 240V 5000 @ 208V	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	W
AC Output Voltage (Nominal)	208 / 240						Vac
AC Output Voltage (Range)	183 – 264						Vac
AC Frequency Range (min - nom - max)	59.3 – 60 – 60.5 ⁽²⁾						Hz
Maximum Continuous Output Current @ 240V	16	24	25	32	42	47.5	A
Maximum Continuous Output Current @ 208V	16	24	24	-	-	48	A
GFDI Threshold	1						A
Total Harmonic Distortion (THD)	< 3						%
Power Factor	1, adjustable -0.85 to 0.85						
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes						
Charge Battery from AC (if allowed)	Yes						
Typical Nighttime Power Consumption	< 2.5						W
OUTPUT – AC BACKUP⁽³⁾							
Rated AC Power in Backup Operation ⁽⁴⁾	7600	5760	6000	7600 11400*	10000 11400*	11400	W
AC L-L Output Voltage Range in Backup	211 – 264						Vac
AC L-N Output Voltage Range in Backup	105 – 132						Vac
AC Frequency Range in Backup (min - nom - max)	55 – 60 – 65						Hz
Maximum Continuous Output Current in Backup Operation	32	24	25	32 47.5	42 47.5	47.5	A
GFDI	1						A
THD	< 5						%
OUTPUT – SOLAREEDGE HOME EV CHARGER AC							
Rated AC Power	9600						W
AC Output Voltage Range	211 – 264						Vac
On-Grid AC Frequency Range (min - nom - max)	59.3 – 60 – 60.5						Hz
Maximum Continuous Output Current @240V (grid, PV and battery)	40						Aac
INPUT – DC (PV AND BATTERY)							
Transformer-less, Ungrounded	Yes						
Max Input Voltage	480						Vdc
Nom DC Input Voltage	380						Vdc
Reverse-Polarity Protection	Yes						
Ground-Fault Isolation Detection	600kΩ Sensitivity						
INPUT – DC (PV)							
Maximum DC Power @ 240V	7600	11520	12000	15200	20000	22800	W
Maximum DC Power @ 208V	6600	10000	10000	-	-	20000	W
Maximum Input Current ⁽⁵⁾ @ 240V	20	16	16.5	20 30	30	30	Adc
Maximum Input Current ⁽⁵⁾ @ 208V	9	13.5	13.5	-	-	27	Adc
Max. Input Short Circuit Current	45						
Maximum Inverter Efficiency	99.2						%
CEC Weighted Efficiency	99						99 @ 240V 98.5 @ 208V
2-pole Disconnection	Yes						

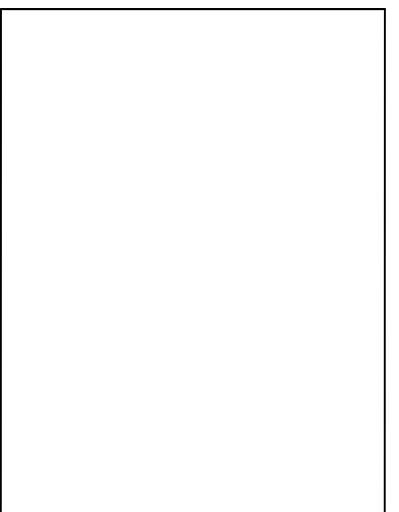
* Supported with PN SExxxxH-USMNBxxxx.
 (1) These specifications apply to inverters with part numbers SExxxxH-USMNBxxxx or SExxxxH-USSNBxxxx and connection unit model number DCD-1PH-US-PxH-F-x.
 (2) For other regional settings please contact SolarEdge support.
 (3) Not designed for standalone applications and requires AC for commissioning. Backup functionality is only supported for 240V grid.
 (4) Rated AC power in Backup Operation is valid for installations with multiple inverters. For a single backup inverter operation, rated AC power in Backup is 90% of the value stated.
 (5) A higher current source may be used; the inverter will limit its input current to the values stated.

TOP TIER
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CAMERON, NC 28326

DRAWN BY
ESR

SHEET NAME
**EQUIPMENT
SPECIFICATION**

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

SHEET NUMBER
PV-12

/ SolarEdge Home Hub Inverter

For North America

SE3800H-US / SE5700H-US / **SE6000H-US** / SE7600H-US / SE10000H-US / SE11400H-US⁽¹⁾

Applicable to inverters with part number	SEXXXXH-USMNBXXXX / SEXXXXH-USSNBXXXX					Units
	SE3800H-US	SE5700H-US	SE6000H-US	SE7600H-US	SE10000H-US	
OUTPUT – DC (BATTERY)						
Supported Battery Types	SolarEdge Home Battery, LG RESU Prime					
Number of Batteries per Inverter	Up to 3 SolarEdge Home Battery, up to 2 LG RESU Prime					
Continuous Power ⁽⁶⁾	7600 @ 240V 3800 @ 208V	5760 @ 240V 5000 @ 208V	6000	11400	11400 @ 240V 10000 @ 208V	W
Peak Power ⁽⁶⁾	7600 @ 240V 3800 @ 208V	5760 @ 240V 5000 @ 208V	6000	11400	11400 @ 240V 10000 @ 208V	W
Max Input Current	20	26.5				Adc
2-pole Disconnection	Up to inverter rated backup power					
SMART ENERGY CAPABILITIES						
Consumption Metering	Built-in ⁽⁷⁾					
Backup & Battery Storage	With Backup Interface (purchased separately) for service up to 200A; up to 3 inverters					
EV Charging	Direct connection to SolarEdge Home EV Charger					
ADDITIONAL FEATURES						
Supported Communication Interfaces	RS485, Ethernet, Cellular ^(8, 9) , Wi-Fi ⁽⁹⁾ , SolarEdge Home Network					
Revenue Grade Metering, ANSI C12.20	Built-in ⁽⁷⁾					
Integrated AC, DC and Communication Connection Unit	Yes					
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi Access Point for local connection					
DC Voltage Rapid Shutdown (PV and Battery)	Yes, according to NEC 2014 – 2023 per article 690.11 and 690.12					
STANDARD COMPLIANCE						
Safety	UL1741, UL1741 SA, UL1741 SB, UL1741 PCS, UL1699B, UL1998, UL9540, CSA 22.2					
Grid Connection Standards	IEEE1547-2018, Rule 21, Rule 14H, CSA C22.3 No. 9					
Emissions	FCC part 15 class B					
INSTALLATION SPECIFICATIONS						
AC Output and EV AC Output Conduit Size / AWG Range	1" maximum / 14-4 AWG					
DC Input (PV and Battery) Conduit Size / AWG Range	1" maximum / 14-6 AWG					
Dimensions with Connection Unit (H x W x D)	17.7 x 14.6 x 6.8 / 450 x 370 x 174	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***	21.06 x 14.6 x 8.2 / 535 x 370 x 208***	in / mm
Weight with Connection Unit	30.8 / 14	30.8 / 14**	41.7 / 18.9**	44.9 / 20.3***	44.9 / 20.3***	lb / kg
Noise	< 50					dBA
Cooling	Natural Convection					
Operating Temperature Range	-40 to +140 / -40 to +60 ⁽¹⁰⁾					°F / °C
Protection Rating	NEMA 4X					

** Supported with PN SEXXXXH-USSNBXXXX or SEXXXXH-USMNBXXXX4.

*** Supported with PN SEXXXXH-USSNBXXXX5 or SEXXXXH-USMNBXXXX5.

(6) Discharge power is limited up to the inverter rated AC power for on-grid and backup applications, as well as up to the installed batteries' rating.

(7) For consumption metering current transformers should be ordered separately: SECT-SPL-225A-T-20 or SEACT0750-400NA-20 units per box. Revenue grade metering is only for production metering.

(8) Information concerning the Data Plan's terms & conditions is available in the following link: [SolarEdge Communication Plan Terms and Conditions](#).

(9) The part number SEXXXXH-USXNBXXXX only supports the Wi-Fi communication interface, and the part number SEXXXXH-USXNBLLXX only supports the cellular communication interface.

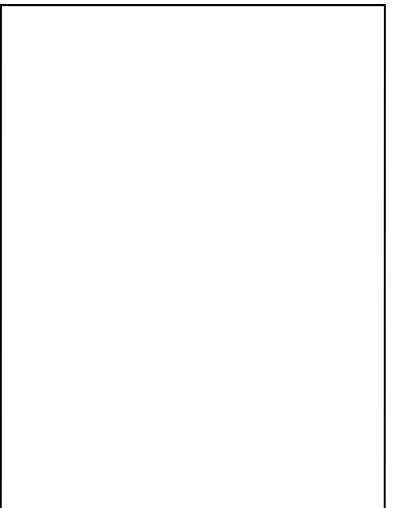
(10) Full power up to at least 50°C / 122°F; for power de-rating information refer to the [Temperature Derating Technical Note for North America](#).



TOP TIER SOLAR SOLUTIONS

1530 CENTER PARK DR #2911,
CHARLOTTE, NC 28217,
UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	01/30/2024	



PROJECT NAME & ADDRESS

**AARON GEER
RESIDENCE**

**146 TRENTON PL,
CAMERON, NC 28326**

DRAWN BY
ESR

SHEET NAME
**EQUIPMENT
SPECIFICATION**

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

SHEET NUMBER
PV-13

Backup Interface for North America

BI-EUSGN-01 / **BI-NUSGN-01**



**12
YEAR
WARRANTY**

STOREDGE®

Backup Interface for Flexible Backup

- Automatically provides backup power to home loads in the event of grid interruption
- Full flexibility in which loads to backup - the entire home or selected loads
- Scalable solution to support higher power & higher capacity^(*)
- Built-in Auto Transformer and Energy Meter for easier and faster installation
- Seamless integration with the Energy Hub Inverter with Prism Technology to manage and monitor both PV generation and energy storage
- Generator connection support^(*)

^(*) Requires supporting inverter firmware

solaredge.com



/ Backup Interface for North America

BI-EUSGN-01 / **BI-NUSGN-01**

	BI-EUSGN-01	BI-NUSGN-01	
INPUT FROM GRID			
AC Current Input		200	A
AC Output Voltage (Nominal)		240	Vac
AC Output Voltage Range		211 - 264	Vac
AC Frequency (Nominal)		60	Hz
AC Frequency Range		59.3 - 60.5	Hz
Microgrid Interconnection Device Rated Current		200	A
Service Side AC Main Circuit Breaker Rated Current	200	N/A	A
Service Side AC Main Circuit Breaker Interrupt Current	10k	N/A	A
Grid Disconnection Switchover Time		<100	ms
OUTPUT TO MAIN DISTRIBUTION PANEL			
Maximum AC Current Output		200	A
AC L-L Output Voltage (Nominal)		240	Vac
AC L-L Output Voltage Range		211 - 264	Vac
AC Frequency (Nominal)		60	Hz
AC Frequency Range		59.3 - 60.5	Hz
Maximum Inverters AC Current Output in Backup Operation		78	A
Imbalance Compensation in Backup Operation		5000	W
AC L-N Output Voltage in Backup (Nominal)		120	V
AC L-N Output Voltage Range in Backup		105 - 132	V
AC Frequency Range in Backup		55 - 65	Hz
INPUT FROM INVERTER			
Number of Inverter Inputs		3	#
Rated AC Power		7,600	W
Maximum Continuous Input Current @ 240V		32	A
Rated AC Power in Continuous Backup Operation		6,100	W
Maximum Continuous Input Current in Backup Operation		26	A
Peak AC Power (<10 sec) in Backup Operation		7,000	W
Peak AC Current (<10 sec) in Backup Operation		30	A
Inverter Input AC Circuit Breaker		40	A
Upgradability		Up to 3 X 63A CB ⁽¹⁾	
GENERATOR⁽²⁾			
Maximum Rated AC Power		15,000	W
Maximum Continuous Input Current		63	Adc
Dry Contact Switch Voltage Rating		250/30	Vac/Vdc
Dry Contact Switch Current Rating		5	A
2-wire Start Switch		Yes	
ADDITIONAL FEATURES			
Installation Type	Suitable for use as service equipment	For main lug only	
Number of Communication Inputs		2	
Communication		RS485	
Energy Meter (for Import/Export)		1% accuracy	
Manual Control Over Microgrid Interconnection Device		Yes	

⁽¹⁾ Each 40A CB supports up to one 7.6kW inverter, with each 63A CB supporting one 10kW and one 11.4kW inverter. The CB upgrade kit is available with the following part numbers: for 40A CB, CB-UPG-40-01; for 63A, CB-UPG-63-01

⁽²⁾ Requires supporting inverter firmware

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**146 TRENTON PL,
CAMERON, NC 28326**

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SHEET NAME
**EQUIPMENT
SPECIFICATION**

SHEET SIZE

**ANSI B
11" X 17"**

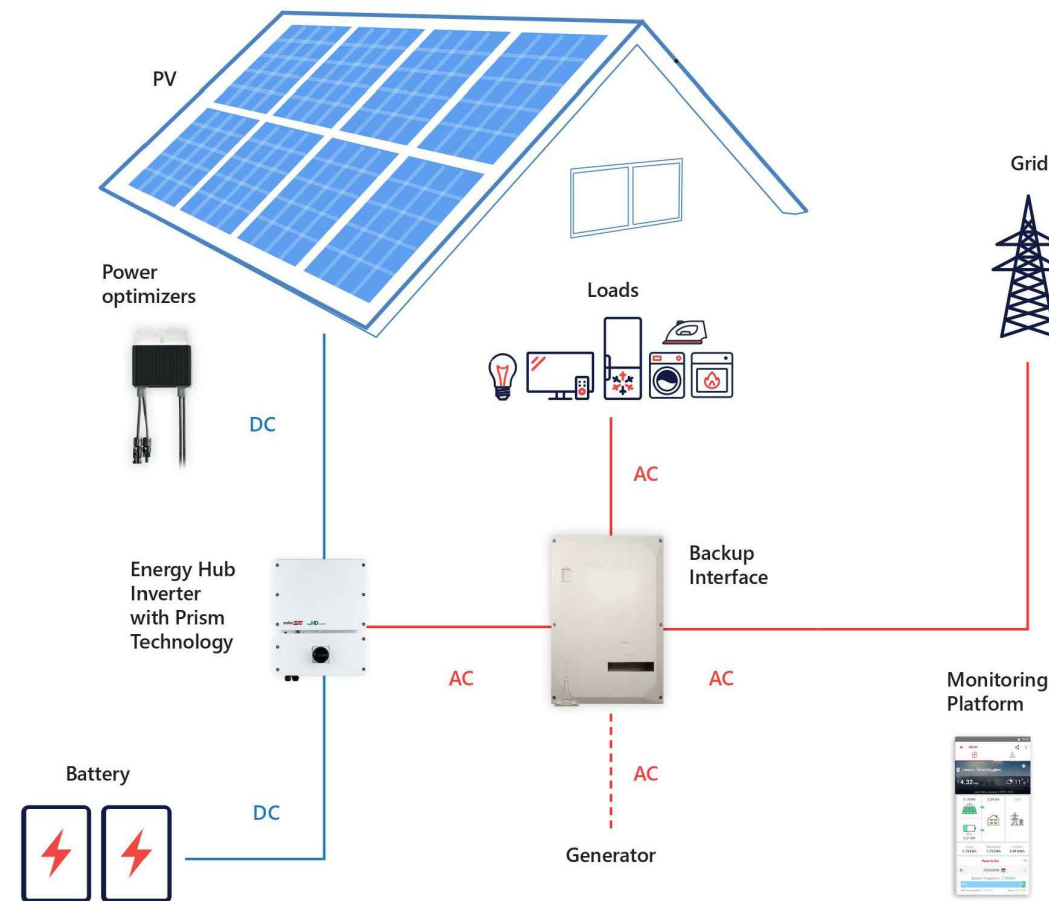
SHEET NUMBER

PV-14

/ Backup Interface for North America

BI-EUSGN-01 / **BI-NUSGN-01**

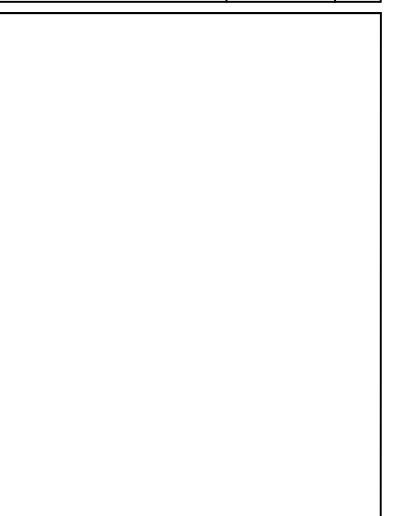
	BI-EUSGN-01	BI-NUSGN-01
STANDARD COMPLIANCE		
Safety	UL1741, CSA 22.2 NO. 107	
	UL869A	N/A
Emissions	FCC part 15 class B	
INSTALLATION SPECIFICATIONS		
Supported Inverters	StorEdge single phase inverter, Single phase Energy Hub inverter with Prism technology	
AC From Grid Conduit Size / AWG Range	2" conduits / #0 - 4/0 AWG	
AC Inverter Conduit Size / AWG Range	1" conduit / 14 - 4 AWG	
AC Generator Input Conduit Size / AWG Range	1" conduit / 8 - 3 AWG	
Communication Conduit Size / AWG Range	3/4" / 24 - 10 AWG	
Weight	73 / 33	lb / Kg
Cooling	Fan (user replaceable)	
Noise	< 50	dBa
Operating Temperature Range	-40 to +122 / -40 to +50	
Protection Rating	NEMA 3R, IP44	
Dimensions (HxWxD)	20.59 x 13.88 x 8.62 / 523.5 x 352.5 x 219	
		in / mm



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SHEET NAME
**EQUIPMENT
SPECIFICATION**

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

SHEET NUMBER
PV-15

SolarEdge Energy Bank 10kWh Battery For North America

HOME BACKUP



Optimized for SolarEdge Energy Hub Inverters⁽¹⁾

- Maximized system performance, gaining more energy to store and use for on-grid and backup power applications
- Integrates with the complete SolarEdge residential offering, providing a single point of contact for warranty, support, training, and simplified logistics & operations
- DC coupled battery featuring superior overall system efficiency, from PV to battery to grid
- Scalable solution for increased power and capacity with multiple SolarEdge inverters and batteries
- Solar, storage, EV charging, and smart devices all monitored and managed by a single app to optimize solar production, consumption and backup* power
- Wireless communication to the inverter, reducing wiring, labor and installation faults
- Simple plug and play installation, with automatic SetApp-based configuration
- Includes multiple safety features for battery protection

* Backup applications are subject to local regulation and may require additional components and firmware upgrade

solaredge.com



SolarEdge Energy Bank 10kWh Battery For North America

BAT-10K1P ⁽²⁾		
BATTERY SPECIFICATION		
Usable Energy (100% depth of discharge)	9700	Wh
Continuous Output Power	5000	W
Peak Output Power (for 10 seconds)	7500	W
Peak Roundtrip Efficiency	>94.5	%
Warranty ⁽³⁾	10	Years
Voltage Range	350-450	Vdc
Communication Interfaces	Wireless*	
Batteries per Inverter	Up to 3 ⁽⁴⁾	
STANDARD COMPLIANCE		
Safety	UL1642, UL1973, UL9540, UN38.3	
Emissions	FCC Part 15 Class B	
MECHANICAL SPECIFICATIONS		
Dimensions (W x H x D)	31.1 x 46.4 x 9.84 / 790 x 1179 x 250	in / mm
Weight	267 / 121	lb / kg
Mounting ⁽⁵⁾	Floor or wall mount ⁽⁶⁾	
Operating Temperature ⁽⁷⁾	+14 to +122 / -10 to +50	°F / °C
Storage Temperature (more than 3 months)	+14 to +86 / -10 to +30	°F / °C
Storage Temperature (less than 3 months)	-22 to +140 / -30 to +60	°F / °C
Altitude	6562 / 2000	ft / m
Enclosure Protection	IP55 / NEMA 3R - indoor and outdoor (water and dust protection)	
Cooling	Natural convection	
Noise (at 1m distance)	<25	dBA

* The SolarEdge Energy Bank is designed for use with SolarEdge Energy Net for wireless communication. The inverter might require a matching SolarEdge Energy Net Plug-in (more details below). Using RS485 could reduce the usable energy to 9500Wh.
⁽¹⁾ Please refer to the SolarEdge Energy Bank battery connections and configuration application note for compatible inverters.
⁽²⁾ These specifications apply to part number BAT-10K1P50B-01.
⁽³⁾ For warranty details please refer to the SolarEdge Energy Bank battery Limited Warranty.
⁽⁴⁾ Installations with multiple SolarEdge Energy Bank batteries connected to a single inverter require a pair of branch connectors (DC + and DC -) per battery excluding the last battery. Support for 3 batteries is pending supporting inverter firmware. The branch connectors should be purchased separately.
⁽⁵⁾ Installation and mounting requires handles that should be purchased separately. Please refer to the Accessories' PN table below.
⁽⁶⁾ The floor stand is purchased separately. One floor stand is required per SolarEdge Energy Bank battery. Please refer to the Accessories' PN table below.
⁽⁷⁾ Please note that operating the SolarEdge Energy Bank at extreme temperatures for extended durations of time may void the Energy Bank's warranty coverage. Please see the Energy Bank Limited Product Warranty for additional details.

SolarEdge Energy Bank Battery – Accessories (purchased separately)

Accessory	PN
Floor stand	IAC-RBAT-FLRSTD-01
Branch connectors set (includes a pair of DC + and DC - connectors) Required for installations with multiple SolarEdge Energy Bank batteries with a single inverter	IAC-RBAT-USYCBL-01
Handles	IAC-RBAT-HANDLE-01
SolarEdge Energy Net Plug-in	ENET-HBNP-01
Battery inverter extension cable 2m long (MC4 to terminal block)	IAC-RBAT-10M420-01

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INITIAL DESIGN	01/30/2024	

PROJECT NAME & ADDRESS

AARON GEER
RESIDENCE

146 TRENTON PL,
CAMERON, NC 28326

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ESR

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-16

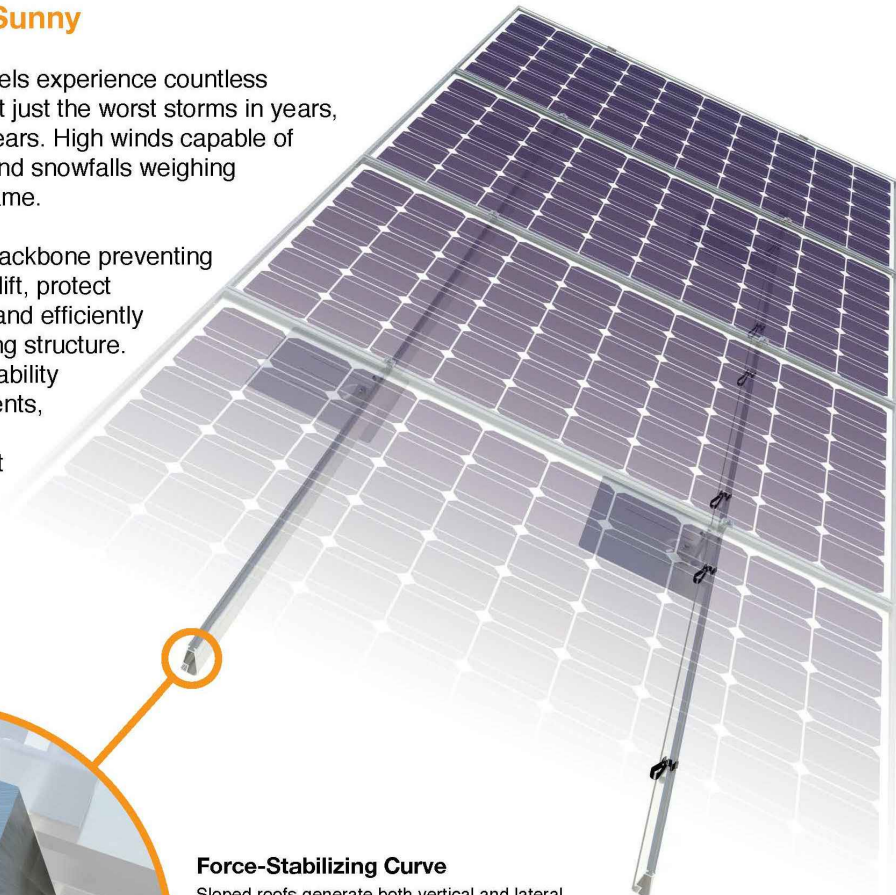


XR Rail Family

Solar Is Not Always Sunny

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

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



Force-Stabilizing Curve

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

Compatible with Flat & Pitched Roofs

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

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

Corrosion-Resistant Materials

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



XR Rail Family

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



XR10

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

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



XR100

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

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



XR1000

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

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

Rail Selection

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

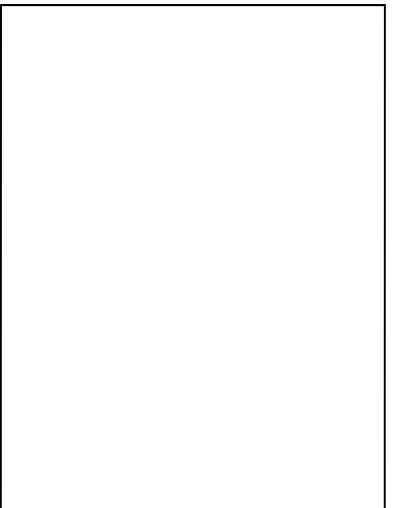
Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	100						
	120						
	140	XR10		XR100		XR1000	
	160						
10-20	100						
	120						
	140						
	160						
30	100						
	160						
40	100						
	160						
50-70	160						
80-90	160						



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PROJECT NAME & ADDRESS

**AARON GEER
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146 TRENTON PL,
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SHEET NAME
**EQUIPMENT
SPECIFICATION**

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

SHEET NUMBER
PV-17

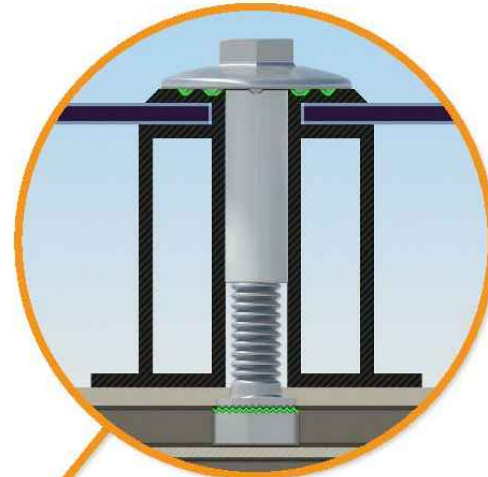


UFO Family of Components

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.



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.



Bonded Splice

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



Grounding Lug

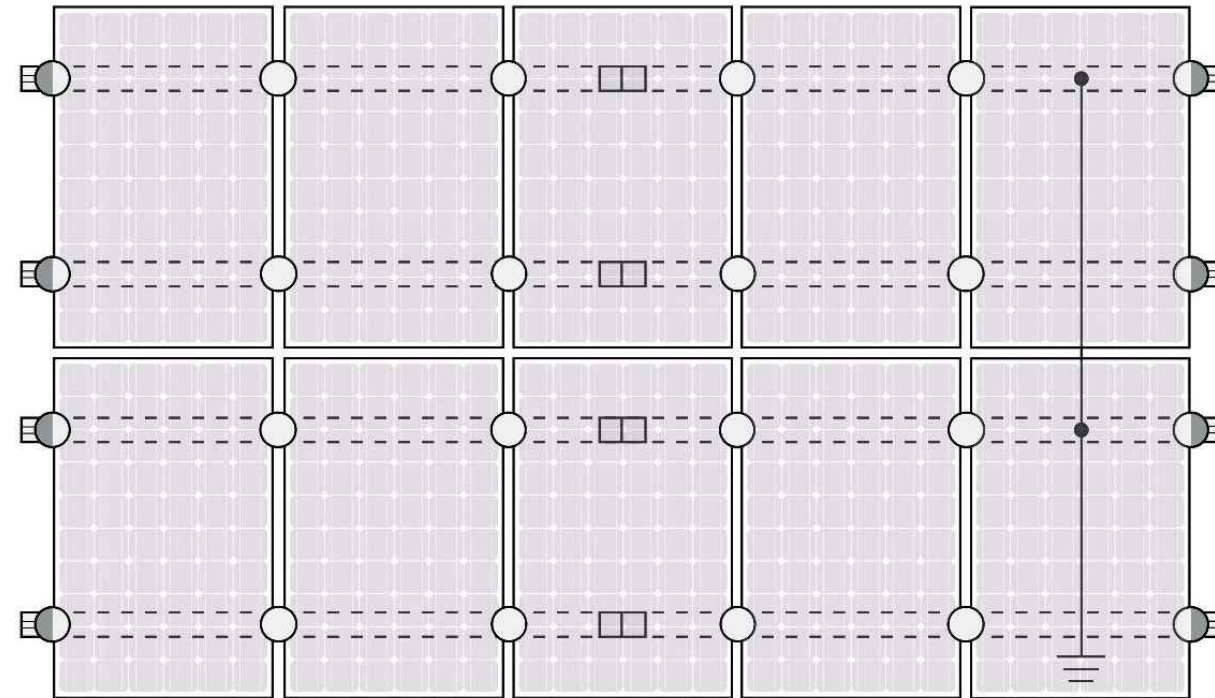
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.



Bonded Attachments

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

System Diagram



○ UFO ◐ Stopper Sleeve ● Grounding Lug □ Bonded Splice ⊥ Ground Wire

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

UL Certification

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

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

Go to IronRidge.com/UFO

Cross-System Compatibility

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



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AARON GEER
RESIDENCE
146 TRENTON PL,
CAMERON, NC 28326

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ESR

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-18

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

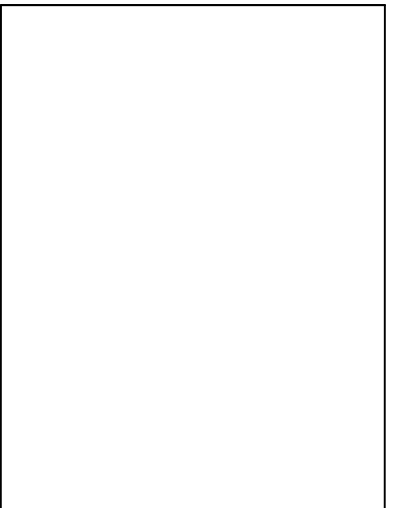
PART NUMBER	DESCRIPTION
QM-HUG-01-M1	Halo UltraGrip - Mill
QM-HUG-01-B1	Halo UltraGrip - Black

1. Halo UltraGrip

Dimensions: 3.35, .38, 3.83, .40, 1.63, .34, 2.99, 1.56, $\phi .26$

Property	Value
Material	3000 Series Aluminium
Finish	Mill or Black

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	01/30/2024	



PROJECT NAME & ADDRESS	
AARON GEER RESIDENCE	146 TRENTON PL, CAMERON, NC 28326

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SHEET NAME EQUIPMENT SPECIFICATION
--

SHEET SIZE ANSI B 11" X 17"

SHEET NUMBER PV-19



QuickMount® RD Structural Screw



TOP TIER SOLAR SOLUTIONS

1530 CENTER PARK DR #2911,
CHARLOTTE, NC 28217,
UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	01/30/2024	

ITEM NO	DESCRIPTION	QTY IN KIT
1	Self Drilling Screw, #14, Wood Tip	1
2	Washer, EPDM Backed	1

PART NUMBER	DESCRIPTION
RD-1430-01-M1	RD Structural Screw

1. Self Drilling Screw, #14, Wood Tip

5/16" Head
Ø .43

.22
#14 DIA
3.22

Property	Value
Material	300 Series Stainless Steel
Finish	Clear

2. Washer, EPDM Backed

Ø .26 Ø .57

.13

Property	Value
Material	300 Series Stainless Steel
Finish	Clear

PROJECT NAME & ADDRESS

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RESIDENCE**

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CAMERON, NC 28326

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SHEET NAME
**EQUIPMENT
SPECIFICATION**

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

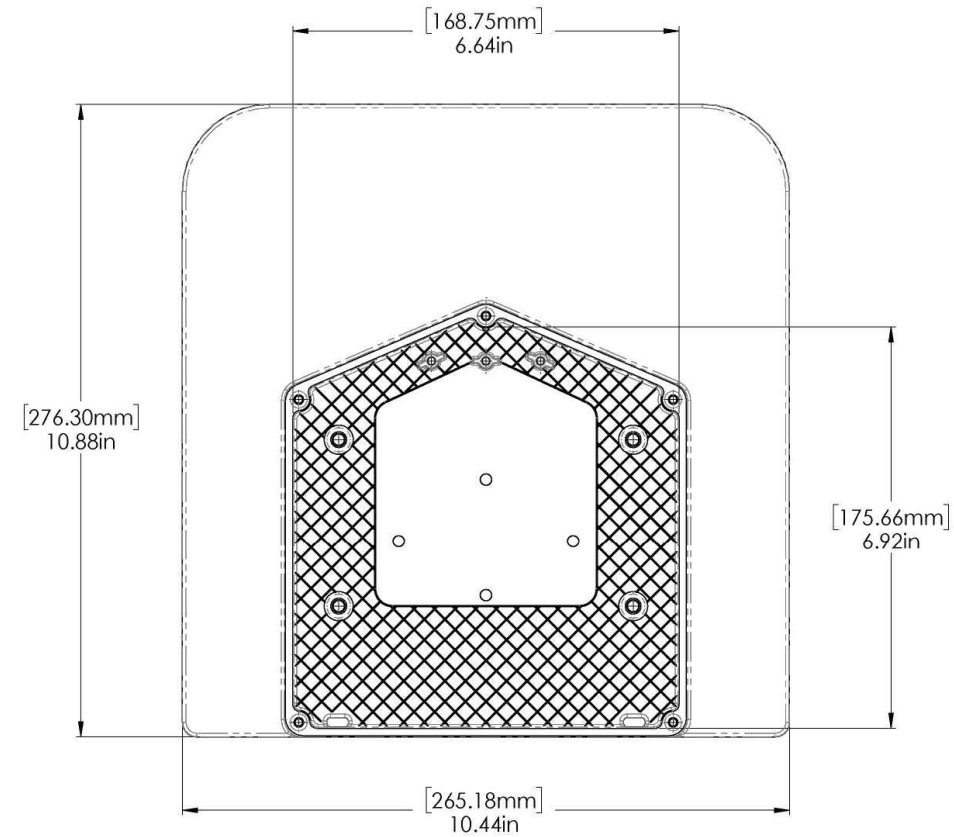
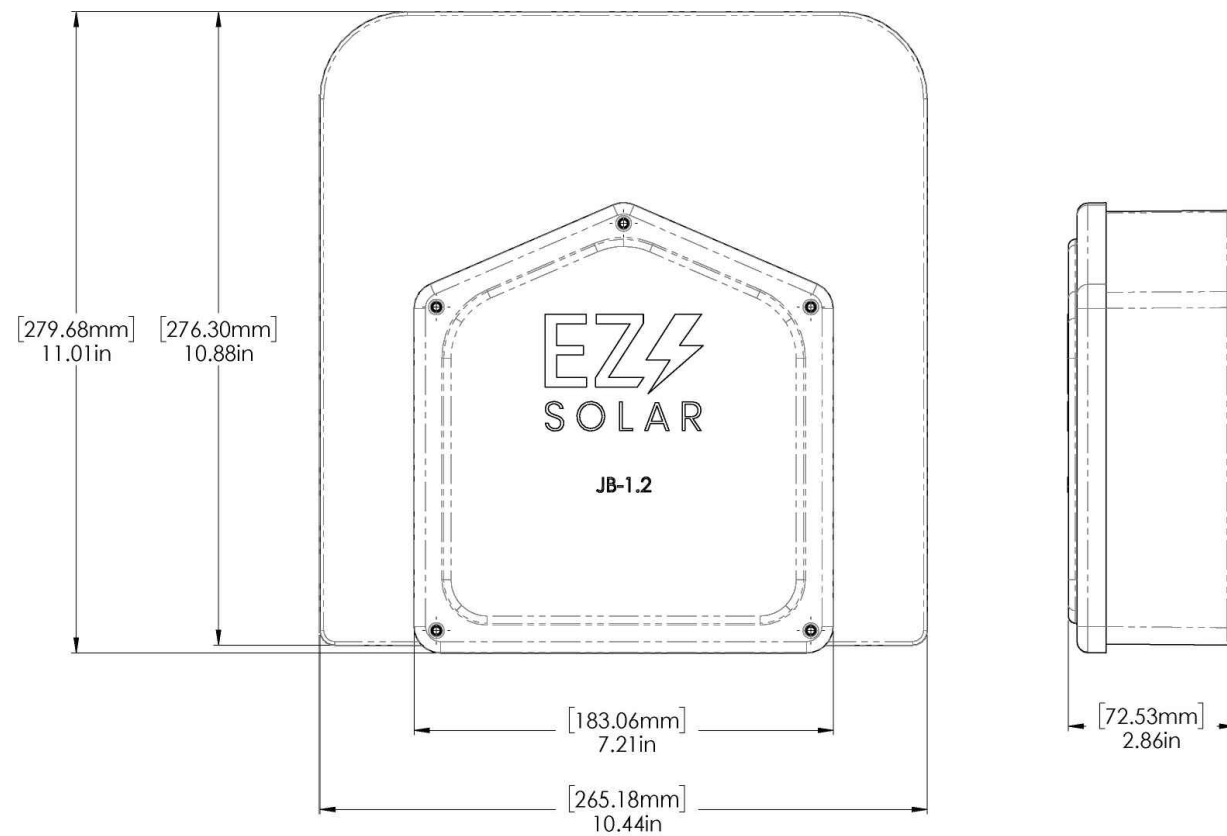
SHEET NUMBER
PV-20

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	JB-1.2 BODY	POLYCARBONATE WITH UV INHIBITORS	1
2	JB-1.2 LID	POLYCARBONATE WITH UV INHIBITORS	1
3	#10 X 1-1/4" PHILLIPS PAN HEAD SCREW		6
4	#8 X 3/4" PHILLIPS PAN HEAD SCREW		6

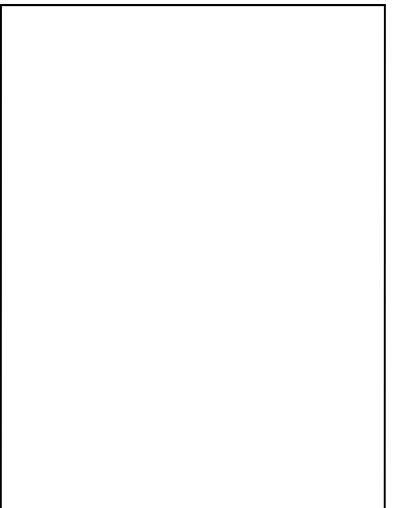
SIZE B	DWG. NO. JB-1.2	REV
SCALE: 1:2	WEIGHT: 1.45 LBS	SHEET 1 OF 3

TORQUE SPECIFICATION:	15-20 LBS
CERTIFICATION:	UL 1741, NEMA 3R CSA C22.2 NO. 290
WEIGHT:	1.45 LBS

SIZE B	DWG. NO. JB-1.2	REV
SCALE: 1:2	WEIGHT: 1.45 LBS	SHEET 2 OF 3



REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	01/30/2024	



PROJECT NAME & ADDRESS	
AARON GEER RESIDENCE	146 TRENTON PL, CAMERON, NC 28326

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SHEET NAME EQUIPMENT SPECIFICATION
--

SHEET SIZE ANSI B 11" X 17"

SHEET NUMBER PV-21
