

PHOTOVOLTAIC ROOF MOUNT SYSTEM

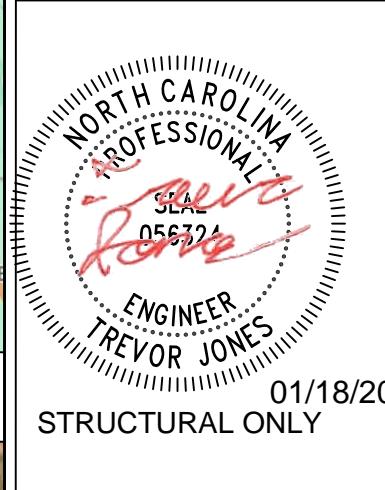
(E) (22) + (N) 4 MODULES-ROOF MOUNTED - 10.270 kW DC, 10.000 kW AC

3495 RAWLS CHURCH RD, FUQUAY-VARINA, NC 27526



TOP TIER
SOLAR SOLUTIONS
1530 CENTER PARK DR #2911,
CHARLOTTE, NC 28217,
UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	01/17/2024	



01/18/2024

STRUCTURAL ONLY

PROJECT NAME & ADDRESS
STEPHEN REGISTER RESIDENCE 3495 RAWLS CHURCH RD, FUQUAY-VARINA, NC 27526

PROJECT DATA	GENERAL NOTES	VICINITY MAP
PROJECT ADDRESS 3495 RAWLS CHURCH RD, FUQUAY-VARINA, NC 27526	1. ALL COMPONENTS ARE UL LISTED AND CEC CERTIFIED, WHERE WARRANTED. 2. THE SOLAR PV SYSTEM WILL BE INSTALLED IN ACCORDANCE WITH ARTICLE 690 OF THE NEC 2017. 3. THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION. 4. 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. 5. WHERE METALLIC CONDUIT CONTAINING DC CONDUCTORS IS USED INSIDE THE BUILDING, IT SHALL BE IDENTIFIED AS "CAUTION: SOLAR CIRCUIT" EVERY 10FT. 6. HEIGHT OF THE AC DISCONNECT SHALL NOT EXCEED 6'-7" PER NEC CODE 240.24. 7. 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. 8. PHOTOVOLTAIC MODULES ARE TO BE CONSIDERED NON-COMBUSTIBLE. 9. PHOTOVOLTAIC INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS. 10. 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. 11. 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. 12. INVERTER(S) USED IN UNGROUNDED SYSTEM SHALL BE UL 1741 LISTED. 13. THE INSTALLATION OF EQUIPMENT AND ALL ASSOCIATED WIRING AND INTERCONNECTION SHALL BE PERFORMED ONLY BY QUALIFIED PERSONS [NEC 690.4(C)] 14. ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED (OR BETTER), INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES. 15. ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250. 16. SYSTEM GROUNDING SHALL BE IN ACCORDANCE WITH NEC 690.41. 17. PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION IN ACCORDANCE WITH NEC 690.12. 18. 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)] 19. ALL WIRING METHODS SHALL BE IN ACCORDANCE WITH NEC 690.31 20. WORK CLEARANCES AROUND ELECTRICAL EQUIPMENT WILL BE MAINTAINED PER NEC 110.26(A)(1), 110.26(A)(2) AND 110.26(A)(3). 21. ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED & IDENTIFIED IN ACCORDANCE WITH UL1703 22. ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.	 VICINITY MAP
OWNER: STEPHEN REGISTER		 HOUSE PHOTO
DESIGNER: ESR		
SCOPE: (N) 1.580 KW DC ROOF MOUNT SOLAR PV SYSTEM WITH (N) 4 MISSION SOLAR: MSE395SX9R 395W PV MODULES WITH (N) 4 SOLAREDGE: S440 POWER OPTIMIZERS AND (N) 01 SOLAREDGE: SE10000H-US (240V/10000W) INVERTER		
EXISTING: (E) 8.690 kW DC ROOF MOUNT SOLAR PV SYSTEM WITH (E) 22 MISSION SOLAR: MSE395SX9R 395W PV MODULES WITH (E) 22 SOLAREDGE: S440 POWER OPTIMIZERS		
AUTHORITIES HAVING JURISDICTION: BUILDING: HARNETT COUNTY ZONING: HARNETT COUNTY UTILITY: DUKE ENERGY PROGRESS		
SHEET INDEX		
PV-1	COVER SHEET	
PV-2	SITE PLAN	
PV-3	ROOF PLAN & MODULES	
PV-4	ELECTRICAL PLAN	
PV-5	STRUCTURAL DETAIL	
PV-6	ELECTRICAL LINE DIAGRAM	
PV-7	WIRING CALCULATIONS	
PV-8+	EQUIPMENT SPECIFICATIONS	
SIGNATURE		
		CODE REFERENCES
		2018 NORTH CAROLINA BUILDING CODE 2018 NORTH CAROLINA RESIDENTIAL CODE 2018 NORTH CAROLINA FIRE CODE 2017 NATIONAL ELECTRICAL CODE
DRAWN BY	ESR	
SHEET NAME	COVER SHEET	
SHEET SIZE	ANSI B 11" X 17"	
SHEET NUMBER	PV-1	

PROJECT DESCRIPTION:

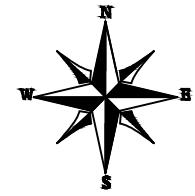
(N) 4 X MISSION SOLAR: MSE395SX9R 395W MONO MODULES AND
 (E) 22 X MISSION SOLAR: MSE395SX9R 395W MONO MODULES
 ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES
 DC SYSTEM SIZE: (N) 4 X 395W + (E) 22 X 395W = 10.270 kW DC
 AC SYSTEM SIZE: (N) 10.000 kW AC

EQUIPMENT SUMMARY

(N) 4 MISSION SOLAR: MSE395SX9R 395W MONO MODULES
 (N) 4 SOLAREDGE: S440 POWER OPTIMIZERS
 (N) 01 SOLAREDGE: SE1000H-US (240V/1000W) INVERTER
 (E) 22 MISSION SOLAR: MSE395SX9R 395W MONO MODULES
 (E) 22 SOLAREDGE: S440 POWER OPTIMIZERS

ROOF ARRAY AREA #1:- 86.56 SQ FT.

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



TOP TIER
SOLAR SOLUTIONS

TOP TIER SOLAR SOLUTIONS

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 UNITED STATES

REVISIONS

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INITIAL DESIGN	01/17/2024	



PROJECT NAME & ADDRESS

STEPHEN REGISTER
RESIDENCE

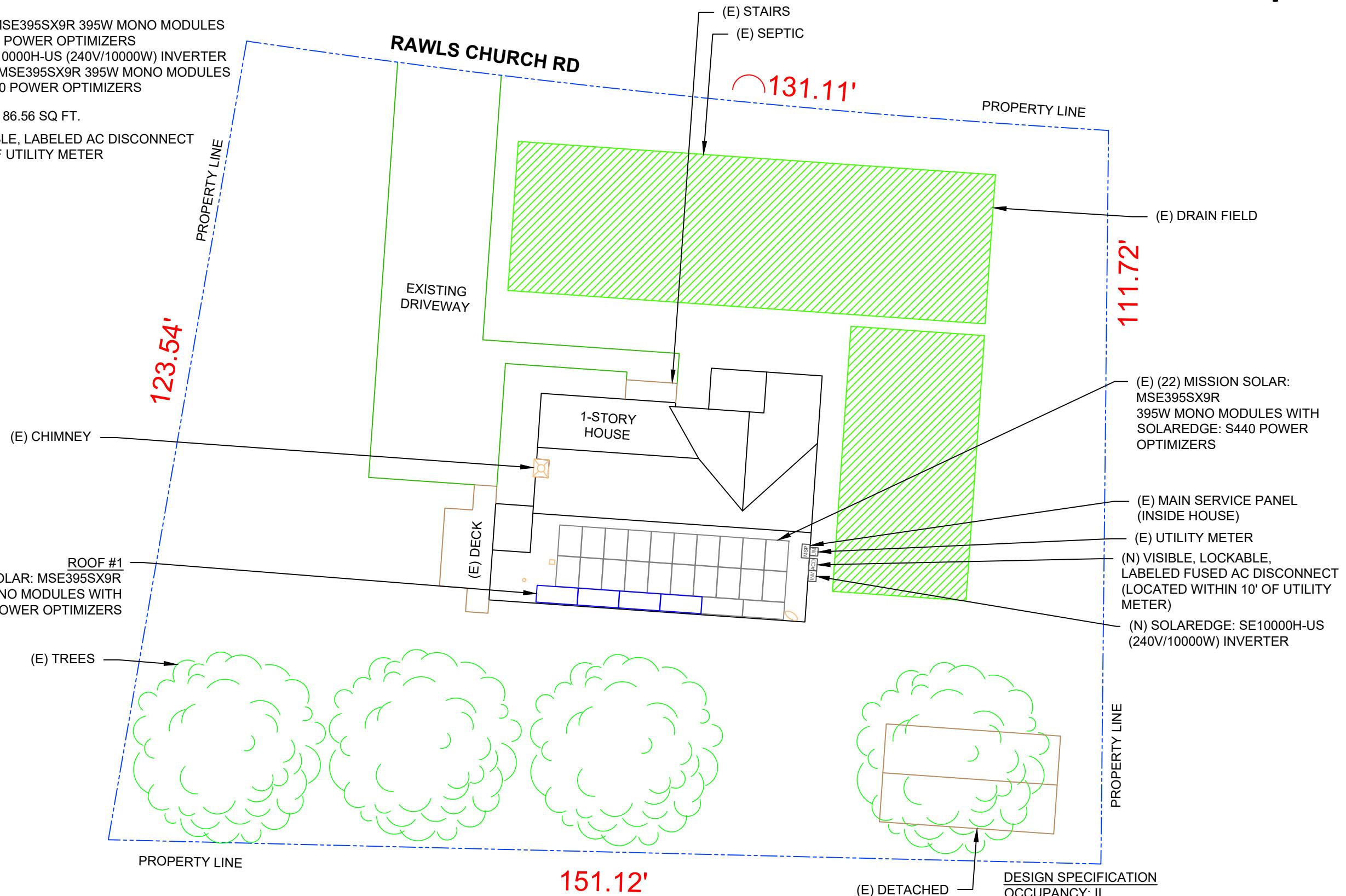
3495 RAWLS CHURCH RD,
 FUQUAY-VARINA, NC 27526

DRAWN BY
ESR

SHEET NAME
SITE PLAN

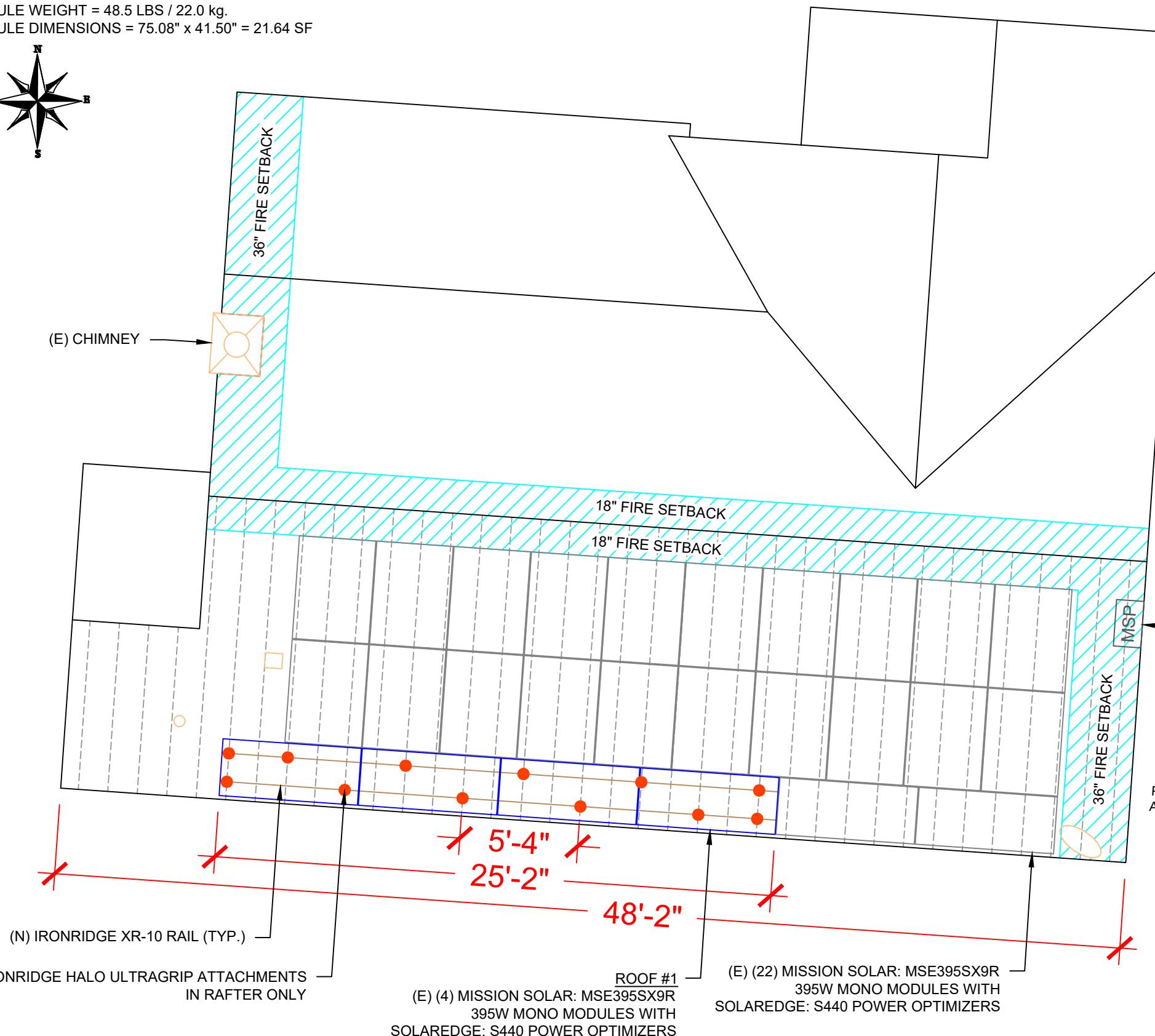
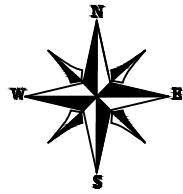
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-2



MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 4 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	RAFTER SIZE	RAFTER SPACING
#1	4	42°	184°	2"X6"	16"

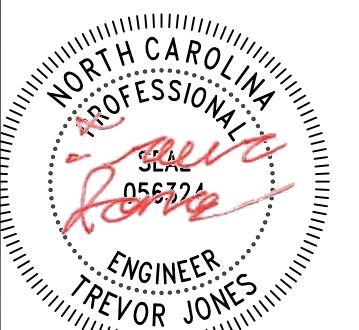
ARRAY AREA & ROOF AREA CALC'S

TOTAL PV ARRAY AREA (SQ. FT.)	TOTAL ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
562.64	1513.21	37



TOP TIER SOLAR SOLUTIONS
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01/18/2024
 STRUCTURAL ONLY

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 FUQUAY-VARINA, NC 27526

LEGEND

- [JB] - JUNCTION BOX
- [INV] - INVERTER
- [ACD] - AC DISCONNECT
- [UM] - UTILITY METER
- [MSP] - MAIN SERVICE PANEL
- [VENT] - VENT, ATTIC FAN (ROOF OBSTRUCTION)
- - ROOF ATTACHMENT
- - RAFTER
- - CONDUIT

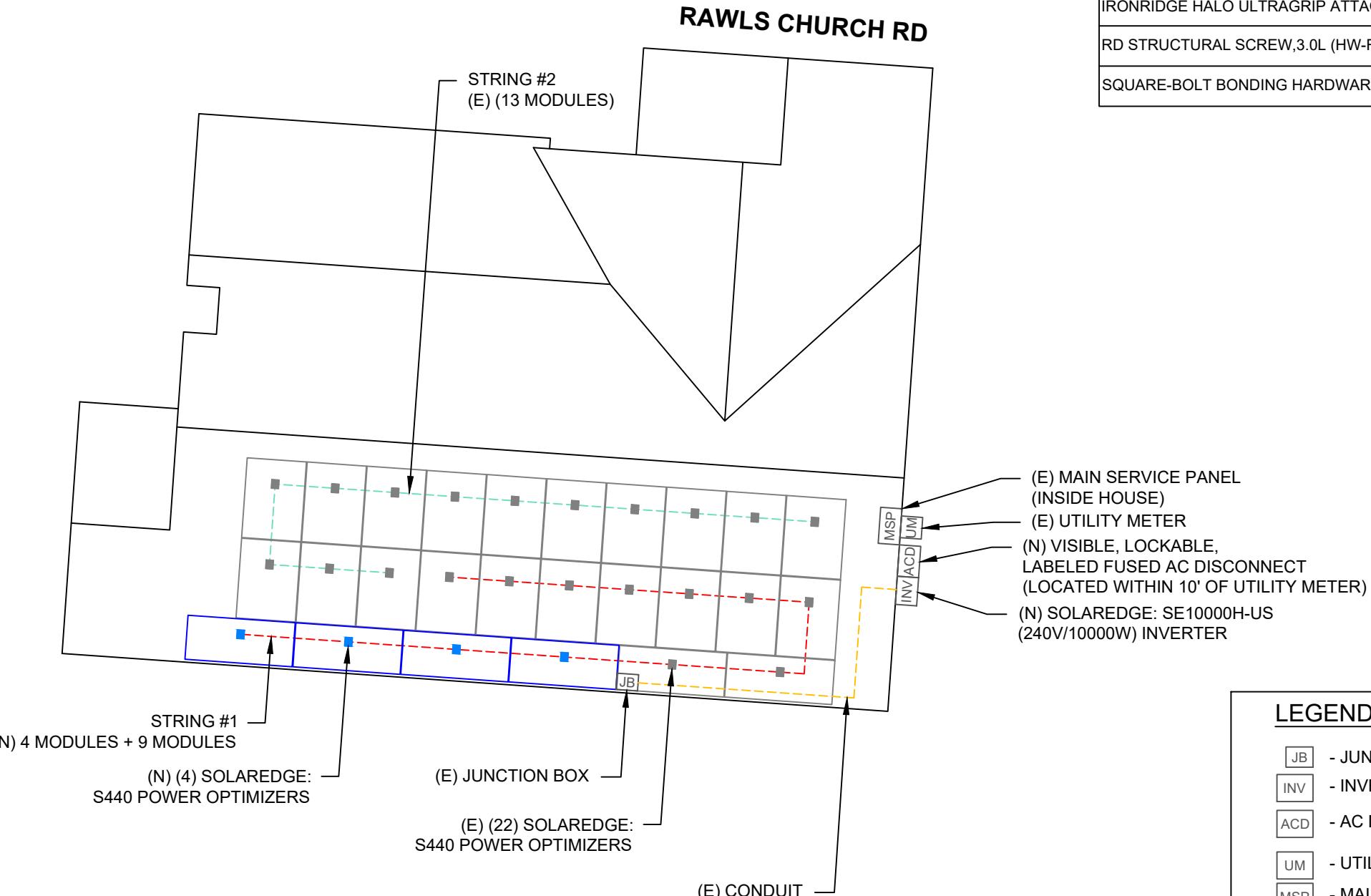
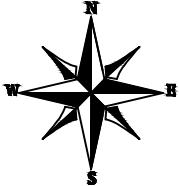
DRAWN BY
 ESR
 SHEET NAME
 ROOF PLAN & MODULES

SHEET SIZE
 ANSI B
 11" X 17"

SHEET NUMBER
 PV-3

DC SYSTEM SIZE: (N) 4 X 395W + (E) 22 X 395W = 10.270 kW DC
 AC SYSTEM SIZE: (N) 10.000 kW AC
 (N) (4) MISSION SOLAR: MSE395SX9R 395W MONO MODULES
 WITH (N) (4) SOLAREDGE: S440 POWER OPTIMIZERS
 LOCATED UNDER EACH PANEL AND
 (E) (22) MISSION SOLAR: MSE395SX9R 395W MONO MODULES
 (E) (22) SOLAREDGE: S440 POWER OPTIMIZERS
 (N) 01 SOLAREDGE: SE10000H-US (240V/10000W) INVERTER

STRING LEGENDS	
	(N + E) STRING #1
	(E) STRING #2



BILL OF MATERIALS		
EQUIPMENT DESCRIPTION	QTY	
SOLAR PV MODULES: MISSION SOLAR: MSE395SX9R 395W MODULE	4	
OPTIMIZERS: SOLAREDGE: S440 POWER OPTIMIZERS	4	
INVERTER: SOLAREDGE: SE10000H-US (240V/10000W) INVERTER	01	
AC DISCONNECT: FUSED AC DISCONNECT, 60A FUSED, (2) 60A FUSES 240V NEMA 3R, UL LISTED	1	
IRONRIDGE XR10 RAIL (RAIL 168" (14 FEET) CLEAR) (XR-10-168A)	4	
BONDED SPLICER, XR10 (XR10-BOSS-01-M1)	2	
UNIVERSAL MODULE CLAMP, CLEAR (UFO-CL-01-A1)	10	
STOPPER SLEEVE, 40MM, MILL (UFO-STP-40MM-M1)	4	
GROUNDING LUG (XR-LUG-03-A1)	1	
IRONRIDGE HALO ULTRAGRIP ATTACHMENTS (QM-HUG-01-M1)	11	
RD STRUCTURAL SCREW, 3.0L (HW-RD1430-01-M1)	22	
SQUARE-BOLT BONDING HARDWARE (BHW-SQ-02-A1)	11	



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 RESIDENCE
 3495 RAWLS CHURCH RD,
 FUQUAY-VARINA, NC 27526

LEGEND	
	- JUNCTION BOX
	- INVERTER
	- AC DISCONNECT
	- UTILITY METER
	- MAIN SERVICE PANEL
	- SUB PANEL
	- VENT, ATTIC FAN (ROOF OBSTRUCTION)
	- ROOF ATTACHMENT
	- RAFTER
	- CONDUIT

DRAWN BY
 ESR
 SHEET NAME
 ELECTRICAL PLAN

SHEET SIZE
 ANSI B
 11" X 17"

SHEET NUMBER
 PV-4

REVISIONS

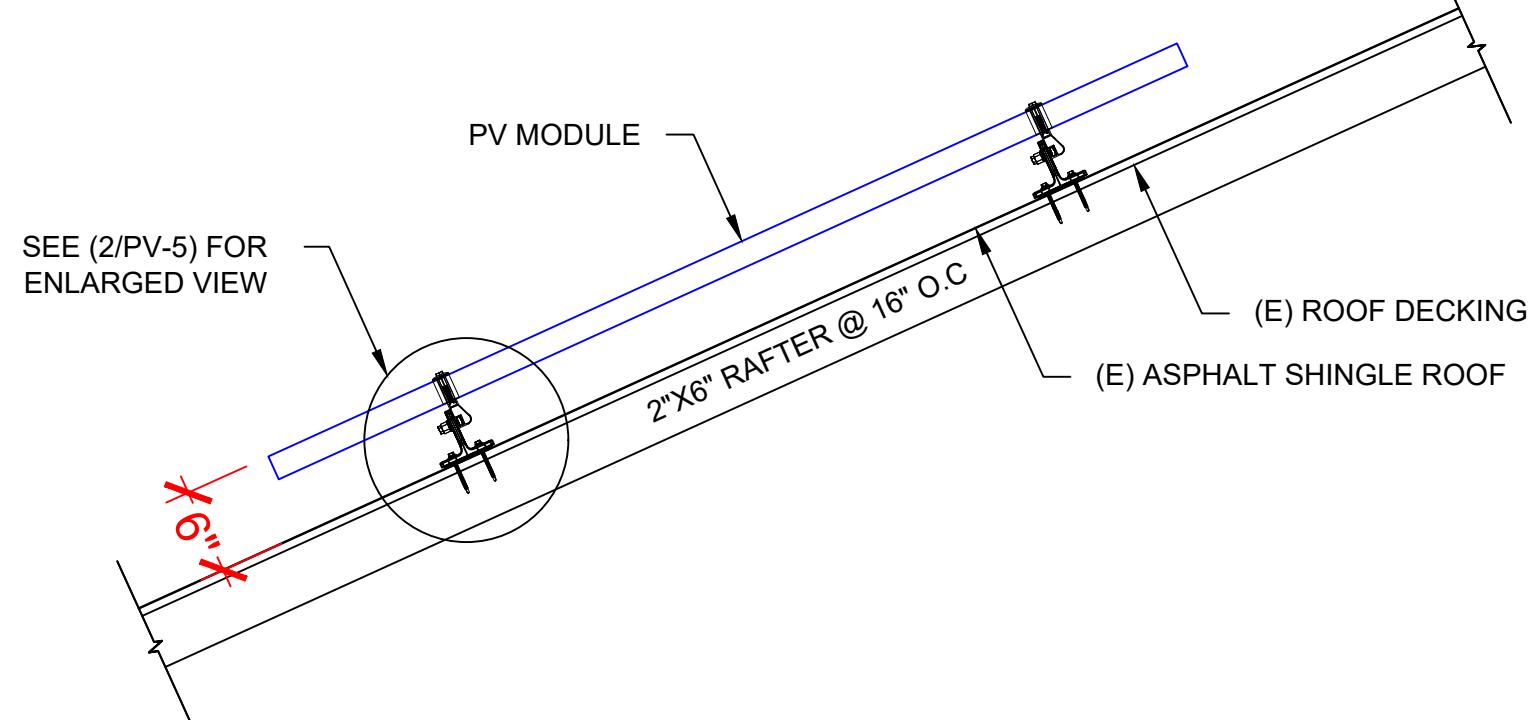
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1 | **STRUCTURAL ATTACHMENT (Side view)**

PV-5

SCALE: N.T.S



PROJECT NAME & ADDRESS

STEPHEN REGISTER
RESIDENCE

3495 RAWLS CHURCH RD,
FUQUAY-VARINA, NC 27526

DRAWN BY
ESR

SHEET NAME
STRUCTURAL DETAIL

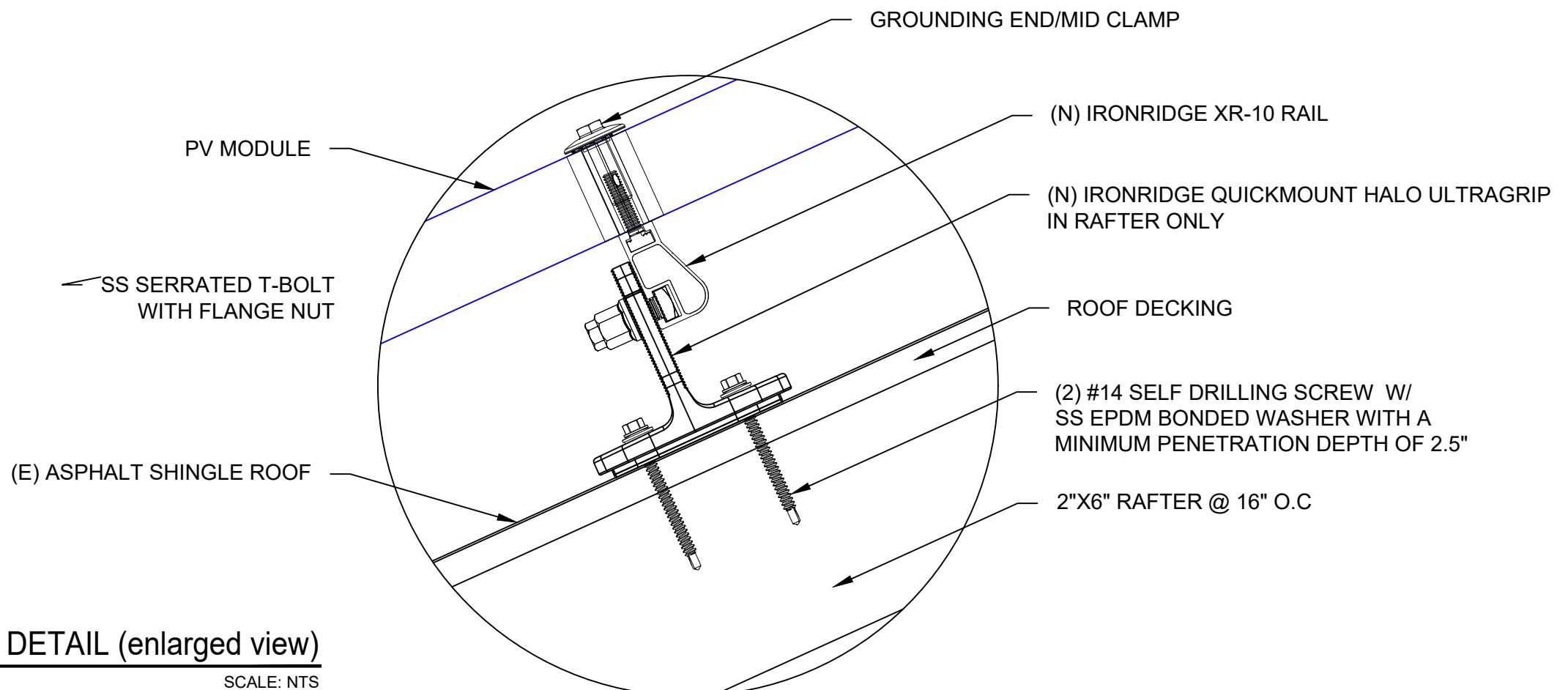
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-5

2 | **ATTACHMENT DETAIL (enlarged view)**

PV-5

SCALE: N.T.S



DC SYSTEM SIZE: (N) 4 X 395W + (E) 22 X 395W = 10.270 kW DC
AC SYSTEM SIZE: (N) 10.000 kW AC
(N) (4) MISSION SOLAR: MSE395SX9R 395W MONO MODULES WITH (N) (4) SOLAREDGE: S440 POWER OPTIMIZERS LOCATED UNDER EACH PANEL (240) AND (E) (22) MISSION SOLAR: MSE395SX9R 395W MONO MODULES (E) (22) SOLAREDGE: S440 POWER OPTIMIZERS (N) (01) SOLAREDGE: SE10000H-US (240V/10000W) INVERTER (N) (01) STRING OF (N) (4) + (E) (9) MODULES AND (01) STRING OF (E) 13 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].

GROUNDED & 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:

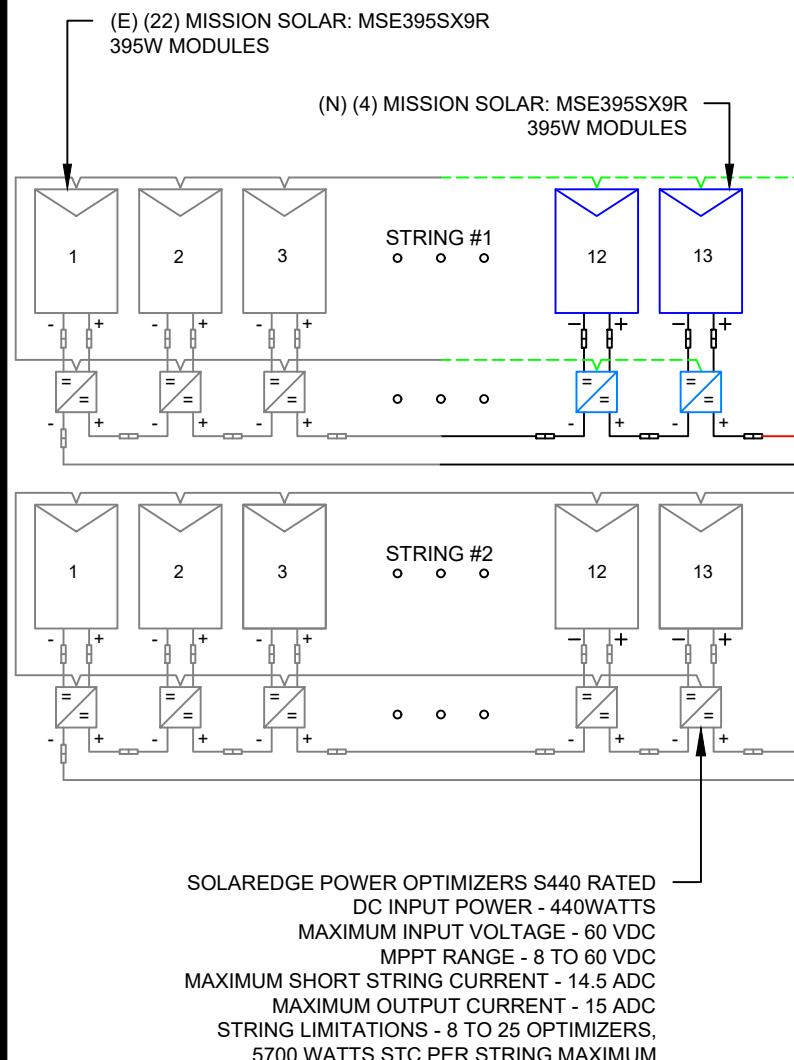
1. BOND EVERY OTHER RAIL WITH #6 BARE COPPER

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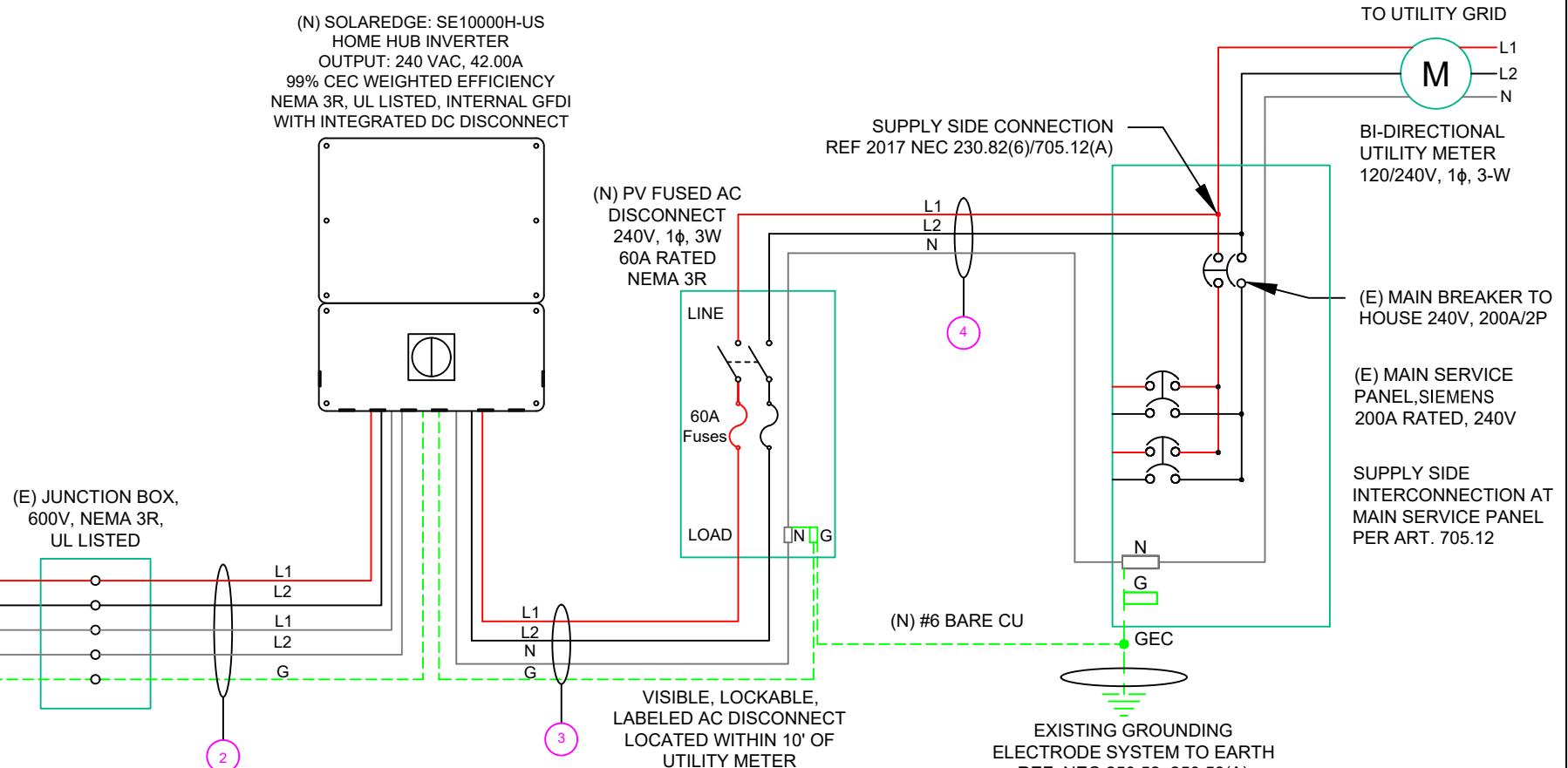
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(N) SOLAREDGE: SE10000H-US
HOME HUB INVERTER
OUTPUT: 240 VAC, 42.00A
99% CEC WEIGHTED EFFICIENCY
NEMA 3R, UL LISTED, INTERNAL GFDI
WITH INTEGRATED DC DISCONNECT



STEPHEN REGISTER RESIDENCE

3495 RAWLS CHURCH RD,
FUQUAY-VARINA, NC 27526

DRAWN BY
ESR

SHEET NAME
ELECTRICAL LINE DIAGRAM

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-6

REVISIONS

DESCRIPTION	DATE	REV
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<u>SOLAR MODULE SPECIFICATIONS</u>	
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)

<u>INVERTER SPECIFICATIONS</u>	
MANUFACTURER / MODEL #	SOLAREDGE: SE10000H-US (240V/10000W)
NOMINAL AC POWER	10.000 kW
NOMINAL OUTPUT VOLTAGE	240 VAC
NOMINAL OUTPUT CURRENT	42.00A

<u>AMBIENT TEMPERATURE SPECS</u>	
AMBIENT TEMP (HIGH TEMP 2%)	38°
RECORD LOW TEMPERATURE	-9°
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

<u>DC FEEDER CALCULATIONS</u>																					
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
STRING 2	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	4	40	0.91	0.8	29.12	PASS	20	1.24	0.196	3/4" EMT	19.79362

String 1 Voltage Drop	0.245
String 2 Voltage Drop	0.245

<u>AC FEEDER CALCULATIONS</u>																						
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	AC DISCONNECT	240	42	52.5	60	CU #6 AWG	CU #6 AWG	CU #6 AWG	65	PASS	38	2	75	0.91	1	68.25	PASS	5	0.491	0.086	3/4" EMT	38.0488
AC DISCONNECT	POI	240	42	52.5	60	CU #6 AWG	N/A	CU #6 AWG	65	PASS	38	2	75	0.91	1	68.25	PASS	5	0.491	0.086	3/4" EMT	28.5366

CUMULATIVE VOLTAGE	0.172
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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 ILSCO 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.

DRAWN BY
ESR

SHEET NAME
WIRING CALCULATIONS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-7

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

DUAL POWER SUPPLY

SOURCE: UTILITY GRID AND
PV SOLAR ELECTRIC SYSTEM

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

SOLAR PV BREAKER:

BREAKER IS BACKFED
DO NOT RELOCATE

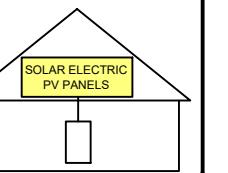
LABEL-4:
LABEL LOCATION:
MAIN SERVICE PANEL
CODE REF: NEC 705.12(C) & NEC 690.59

⚠️ **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:
AC DISCONNECT
MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)
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 **42.00 A**

LABEL- 9:

LABEL LOCATION:
AC DISCONNECT
CODE REF: NEC 690.54

MAXIMUM VOLTAGE

480 V

MAXIMUM CIRCUIT CURRENT

30.00 A

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

TOP TIER SOLAR SOLUTIONS

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

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	01/17/2024	

PROJECT NAME & ADDRESS
STEPHEN REGISTER
RESIDENCE
3495 RAWLS CHURCH RD,
FUQUAY-VARINA, NC 27526

DRAWN BY
ESR

SHEET NAME
WIRING CALCULATIONS

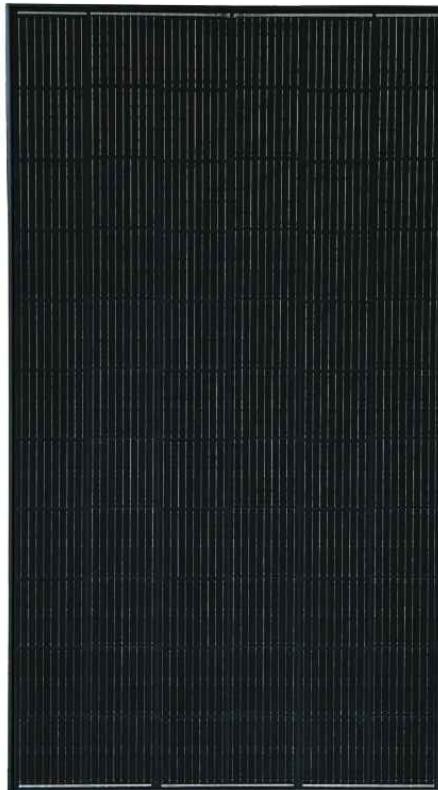
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-8

MSE PERC 66

395W
Class leading power output

Positive
Power
Tolerance
-0 to +3%



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

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

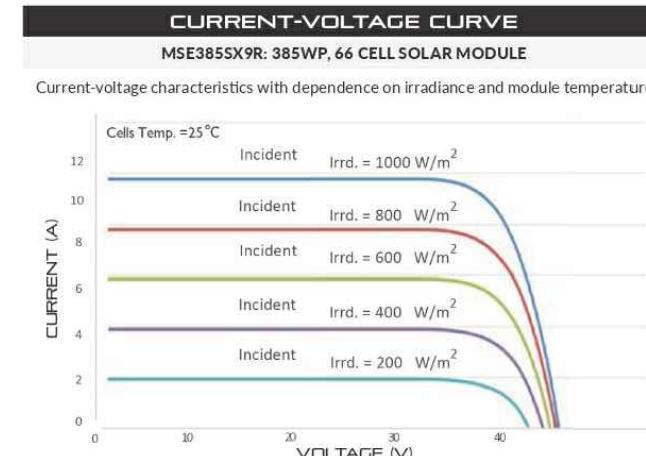
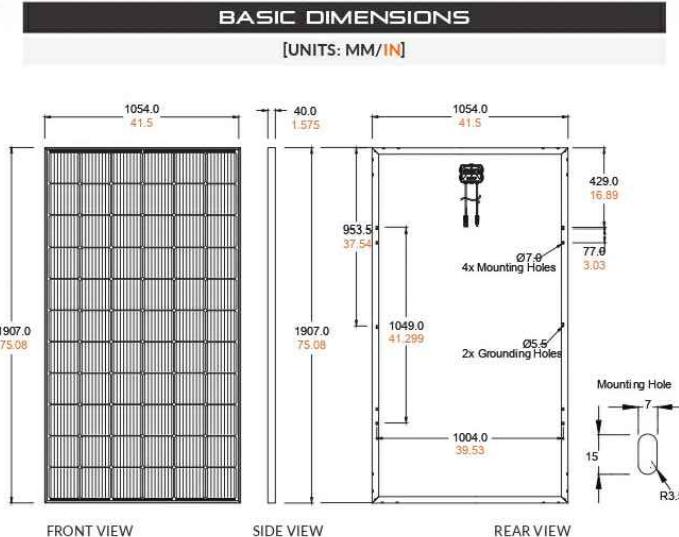


UL 61730 / IEC 61215 / IEC 61730 / IEC 61701



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

Class Leading
390-400W



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

MSE PERC 66

PRODUCT TYPE	MSE XXX SX9R (XXX = P _{max})	390	395	400
Power Output	P _{max}	W _p	390	395
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
Open Circuit Voltage	V _{oc}	V	45.04	45.18
Rated Current	I _{mp}	A	10.63	10.68
Rated Voltage	V _{mp}	V	36.68	36.99
Fuse Rating	A		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

PALLET [26 PANELS]			
Weight 1,300 lbs. (572 kg)	Height 47.56 in (120.80 cm)	Width 46 in (116.84 cm)	Length 77 in (195.58 cm)

STEPHEN REGISTER
RESIDENCE

3495 RAWLS CHURCH RD,
FUQUAY-VARINA, NC 27526

DRAWN BY
ESR

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-9

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	01/17/2024	

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.

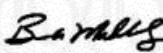
Standard(s) for Safety: UL 61730-1, Photovoltaic (PV) Module Safety Qualification - Part 1: Requirements for Construction
 UL 61730-2, Photovoltaic (PV) Module Safety Qualification - Part 2: Requirements for Testing
 CSA C22.2 No. 61730-2:2019, Photovoltaic (PV) Module Safety Qualification - Part 2: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


 Barry
 Duane Mahrenholz, Director North American Certification Program
 UL LLC

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CERTIFICATE OF COMPLIANCE

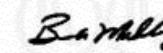
Certificate Number E364743
Report Reference E364743-20201208
Date 2021-August-04

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


 Barry
 Duane Mahrenholz, Director North American Certification Program
 UL LLC

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STEPHEN REGISTER
RESIDENCE
 3495 RAWLS CHURCH RD,
 FUQUAY-VARINA, NC 27526

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



25
YEAR
WARRANTY

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

solaedge.com

solaredge

POWER OPTIMIZER

/ Power Optimizer For Residential Installations S440, S500

	S440	S500	UNIT
Rated Input DC Power ⁽¹⁾	440	500	W
Absolute Maximum Input Voltage (Voc)		60	Vdc
MPPT Operating Range		8 - 60	Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	14.5	15	Adc
Maximum Efficiency	99.5		%
Weighted Efficiency	98.6		%
Oversupply Category	II		
OUTPUT DURING OPERATION			
Maximum Output Current	15		Adc
Maximum Output Voltage	60		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)			
Safety Output Voltage per Power Optimizer	1		Vdc
STANDARD COMPLIANCE			
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 2100-712:2013-05		
INSTALLATION SPECIFICATIONS			
Maximum Allowed System Voltage	1000		Vdc
Dimensions (W x L x H)	129 x 155 x 30		mm
Weight (including cables)	655 / 1.5		gr / lb
Input Connector	MC4 ⁽²⁾		
Input Wire Length	0.1		m
Output Connector	MC4		
Output Wire Length	(+) 2.3, (-) 0.10		m
Operating Temperature Range ⁽³⁾	-40 to +85		°C
Protection Rating	IP68 / NEMA6P		
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 other connector types please contact SolarEdge

(3) For ambient temperature above +70°C / +158°F power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details

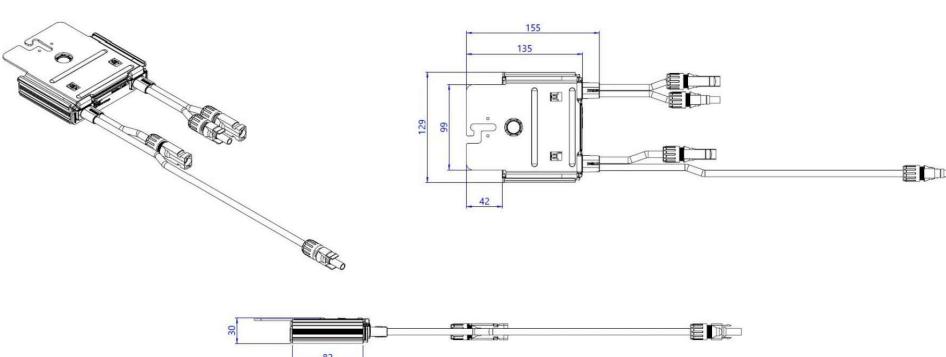
PV System Design Using a SolarEdge Inverter	Single Phase HD-Wave	Three Phase	Three Phase for 277/480V Grid
Minimum String Length (Power Optimizers)	S440, S500	8	16
Maximum String Length (Power Optimizers)		25	50
Maximum Nominal Power per String ⁽⁴⁾	5700	11250 ⁽⁵⁾	12750 ⁽⁶⁾
Parallel Strings of Different Lengths or Orientations		Yes	

(4) If the inverters 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: <https://www.solaredge.com/sites/default/files/se-power-optimizer-single-string-design-application-note.pdf>

(5) For the 230/400V grid: it is allowed to install up to 13,500W per string when the maximum power difference between each string is 2,000W

(6) For the 277/480V grid: it is allowed to install up to 15,000W per string when the maximum power difference between each string is 2,000W

(7) It is not allowed to mix S-series and P-series Power Optimizers in new installations



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CE RoHS

TOP TIER
SOLAR SOLUTIONS

TOP TIER SOLAR SOLUTIONS

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

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	01/17/2024	

PROJECT NAME & ADDRESS

STEPHEN REGISTER
RESIDENCE

3495 RAWLS CHURCH RD,
FUQUAY-VARINA, NC 27526

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⁾



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

HOME BACKUP

/ 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	SEXXXX-USMNBBXXX / SEXXXX-USNNBBXXX						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 – SOLAREDGE 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-USMNxxxx.

(1) These specifications apply to inverters with part numbers SExxxxH-USMNxxxx or SExxxxH-USNNxxxx 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
SOLAR SOLUTIONS

TOP TIER SOLAR SOLUTIONS

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INITIAL DESIGN	01/17/2024	

STEPHEN REGISTER
RESIDENCE

3495 RAWLS CHURCH RD,
FUQUAY-VARINA, NC 27526

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-USMNBBXXX / SEXXXXH-USSNBBXXX						
	SE3800H-US	SE5700H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	Units
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	11400 @ 240V 10000 @ 208V	W
Peak Power ⁽⁶⁾	7600 @ 240V 3800 @ 208V	5760 @ 240V 5000 @ 208V	6000	11400	11400 @ 240V 10000 @ 208V	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***	in / mm	
Weight with Connection Unit	30.8 / 14		21.06 x 14.6 x 8.2 / 535 x 370 x 208***	30.8 / 14**	41.7 / 18.9**	44.9 / 20.3***	lb / kg
Noise	< 50						
Cooling	Natural Convection						
Operating Temperature Range	-40 to +140 / -40 to +60 ⁽¹⁰⁾						
Protection Rating	NEMA 4X						

** Supported with PN SEXXXXH-USSNBBXX4 or SEXXXXH-USMNBBXX4.

*** Supported with PN SEXXXXH-USSNBBXX5 or SEXXXXH-USMNBBXX5.

(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-USXNBXXX only supports the Wi-Fi communication interface, and the part number SEXXXXH-USXNBLLX 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](#).

PROJECT NAME & ADDRESS

 STEPHEN REGISTER
RESIDENCE

 3495 RAWLS CHURCH RD,
FUQUAY-VARINA, NC 27526

 DRAWN BY
ESR

 SHEET NAME
**EQUIPMENT
SPECIFICATION**

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

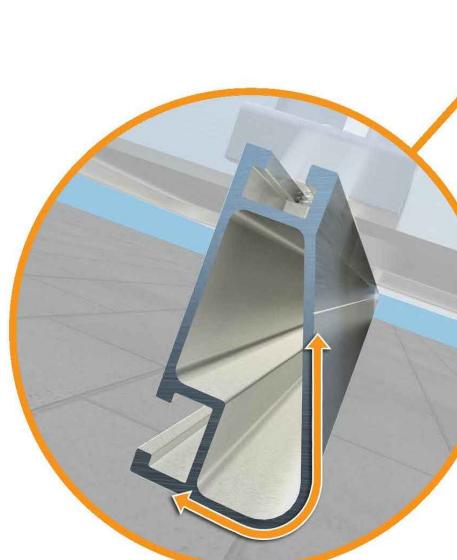
 SHEET NUMBER
PV-13



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.

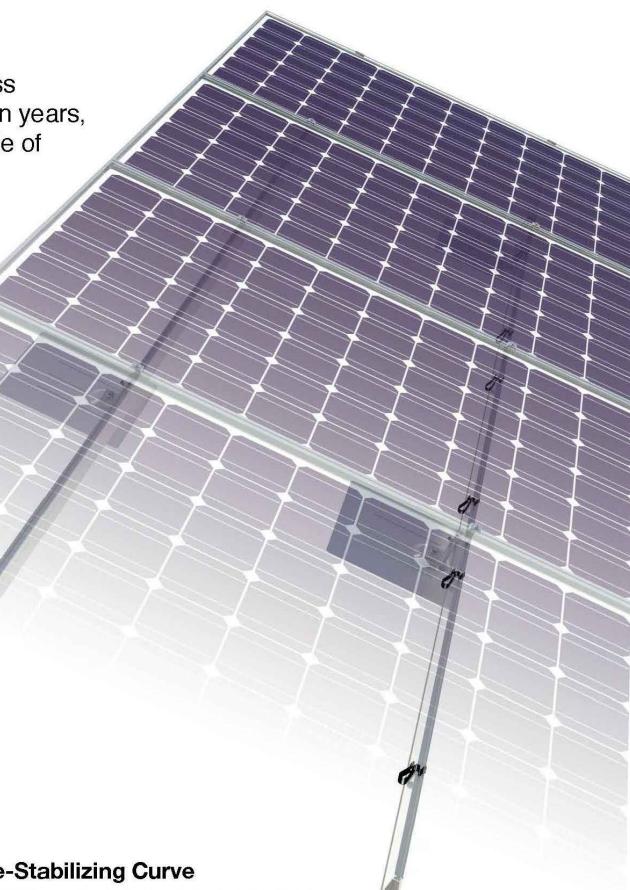
Corrosion-Resistant Materials

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

Tech Brief



XR Rail Family

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



XR10

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

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



XR100

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

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



XR1000

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

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

Rail Selection

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

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

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	01/17/2024	

PROJECT NAME & ADDRESS
STEPHEN REGISTER RESIDENCE
3495 RAWLS CHURCH RD,
FUQUAY-VARINA, NC 27526

DRAWN BY
ESR

SHEET NAME
EQUIPMENT SPECIFICATION

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

SHEET NUMBER
PV-14



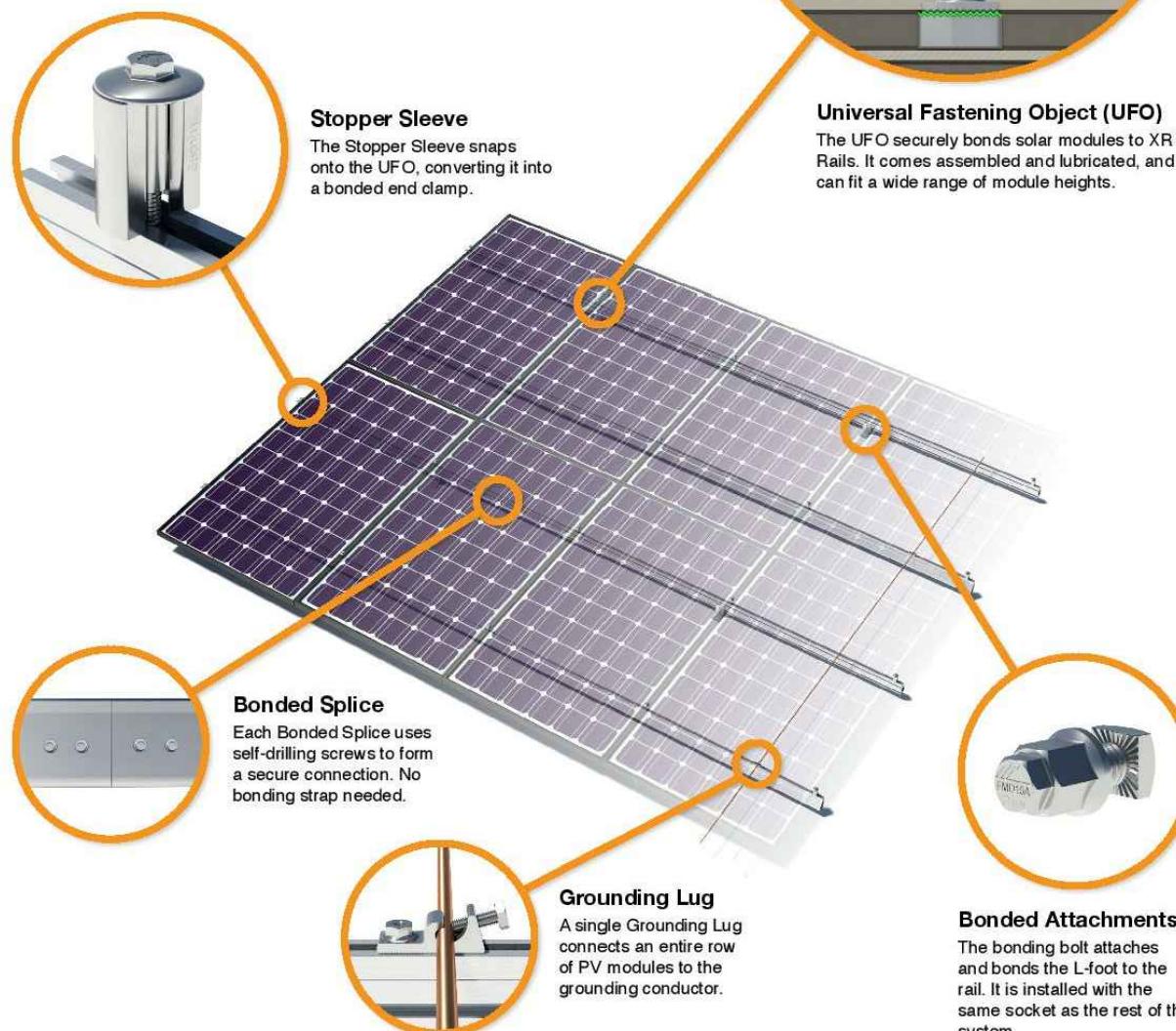
Tech Brief

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.

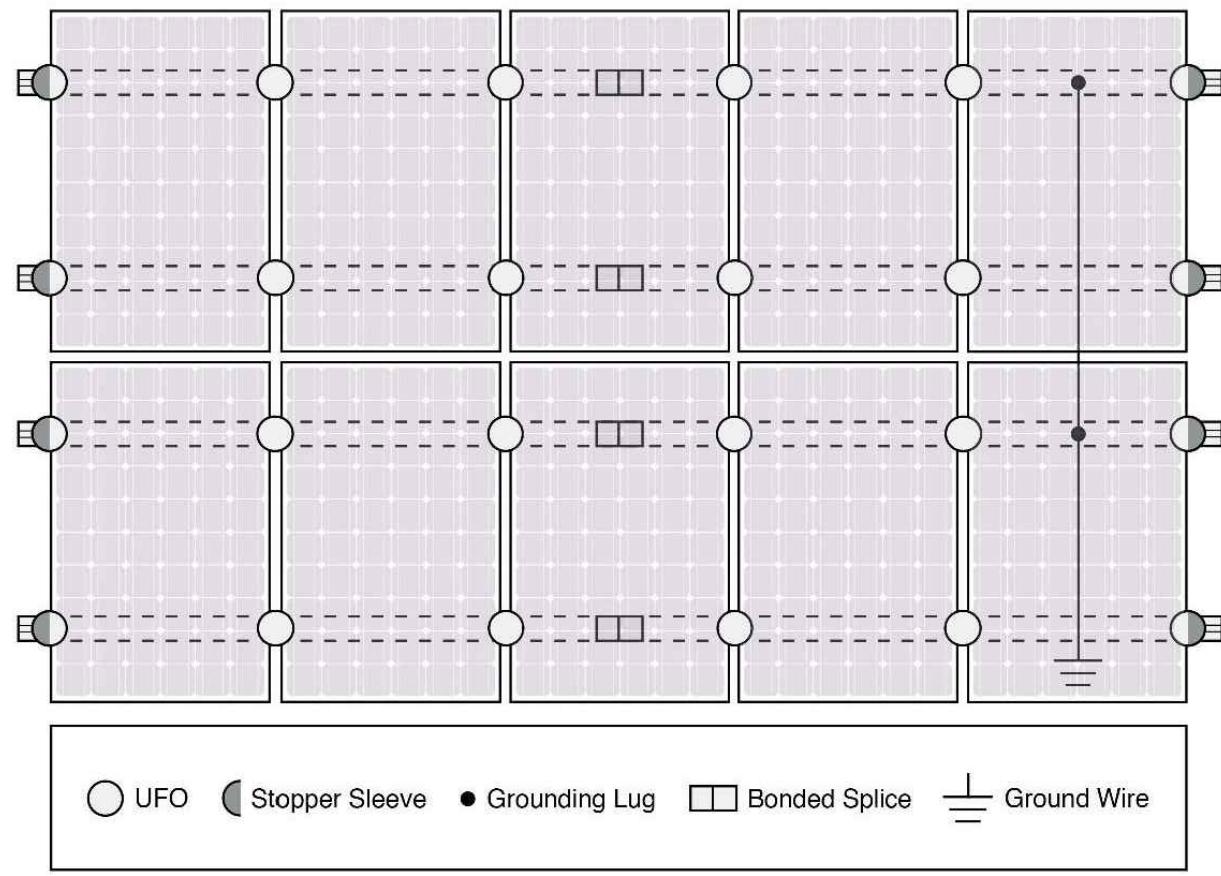
UFO hardware forms secure electrical bonds with both the module and the rail, resulting in many parallel grounding paths throughout the system. This leads to safer and more reliable installations.



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Tech Brief

System Diagram



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

UL Certification

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

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

Go to IronRidge.com/UFO

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

TOP TIER
SOLAR SOLUTIONS

TOP TIER SOLAR SOLUTIONS

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

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	01/17/2024	

PROJECT NAME & ADDRESS

STEPHEN REGISTER
RESIDENCE

3495 RAWLS CHURCH RD,
FUQUAY-VARINA, NC 27526

DRAWN BY
ESR

SHEET NAME
EQUIPMENT
SPECIFICATION

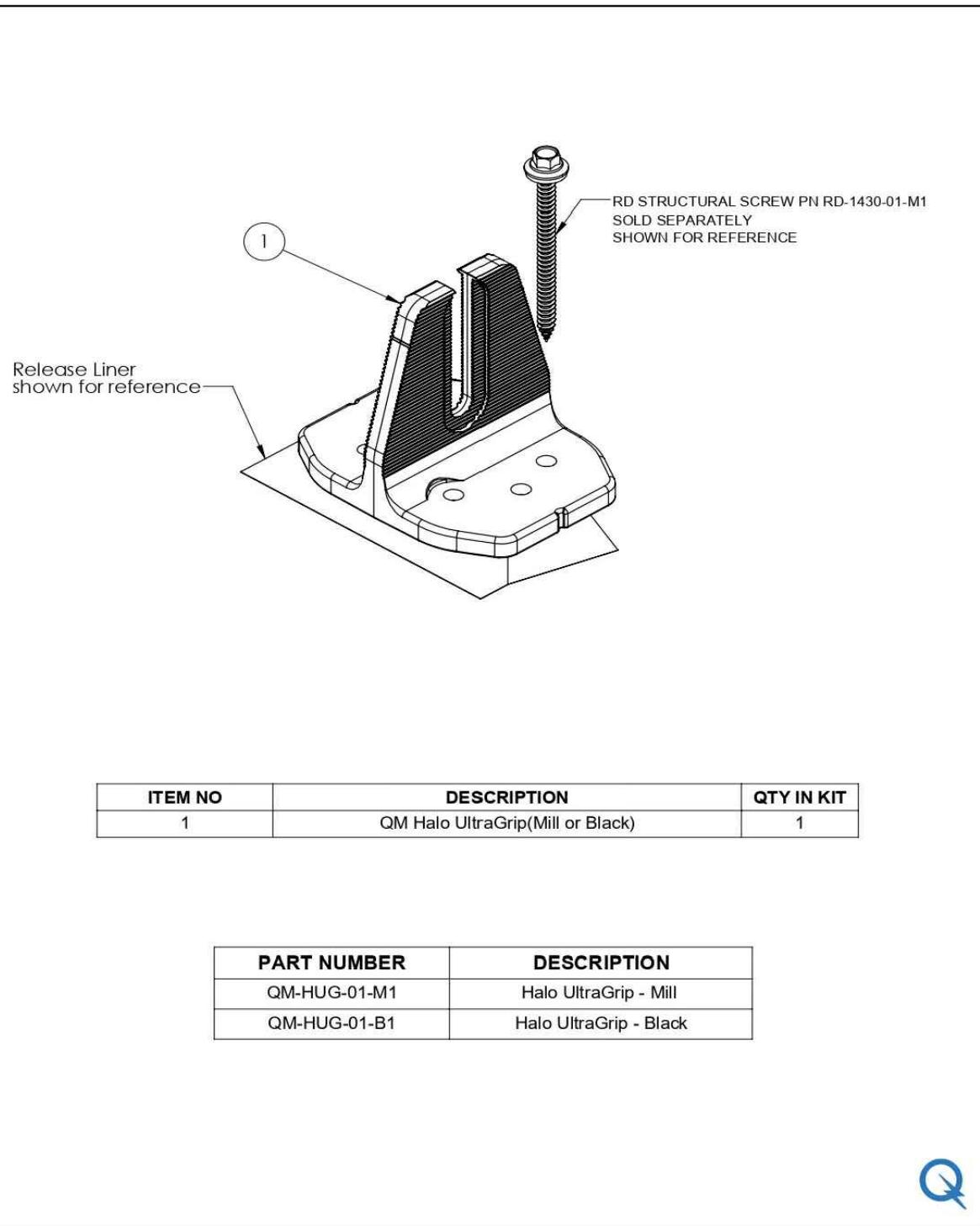
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-15



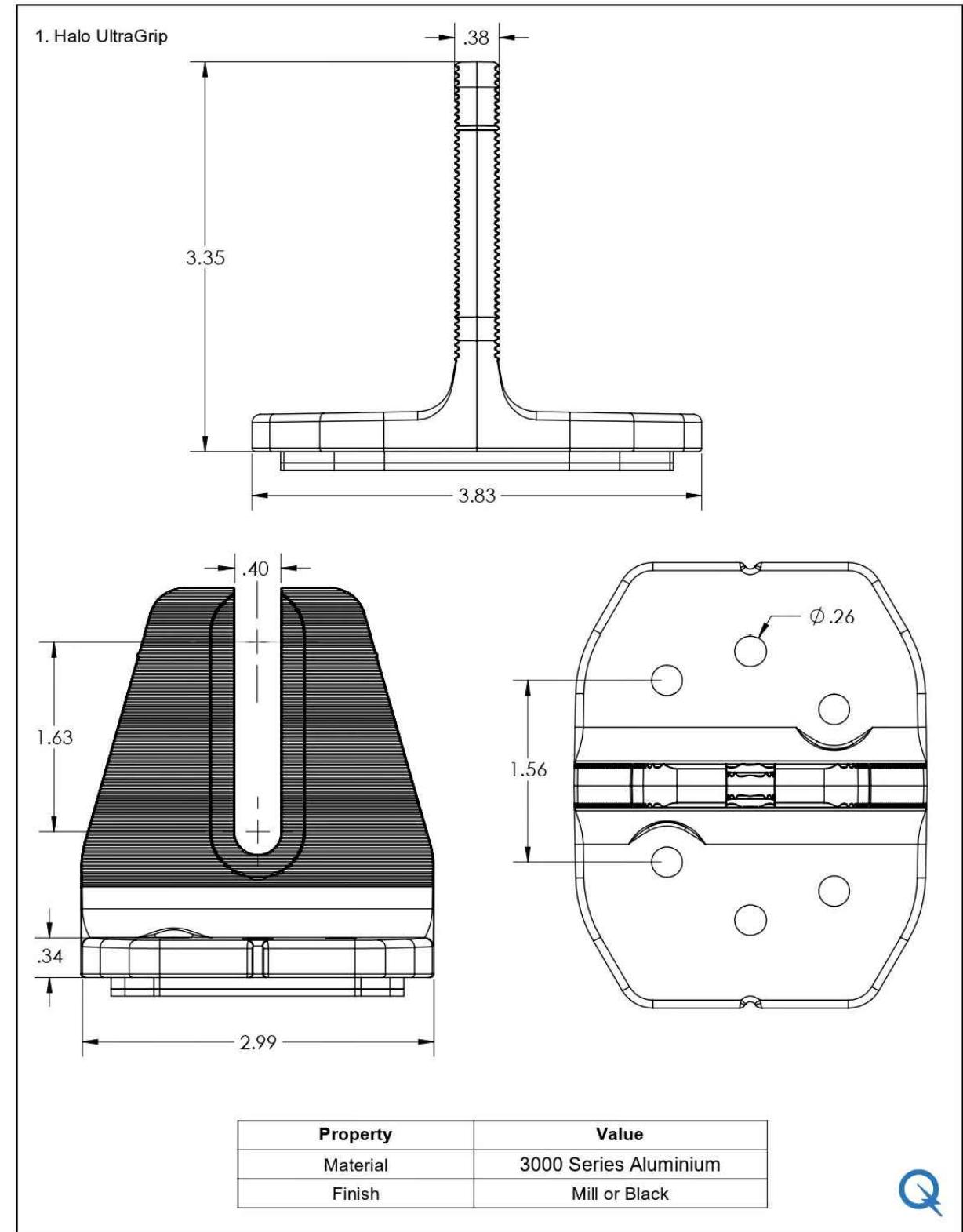
QuickMount® Halo UltraGrip

Cut Sheet



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QM-HUG-01-B1 or QM-HUG-01-M1 Cut Sheet Rev 1.0



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**STEPHEN REGISTER
RESIDENCE**
3495 RAWLS CHURCH RD,
FUQUAY-VARINA, NC 27526

DRAWN BY
ESR

SHEET NAME
**EQUIPMENT
SPECIFICATION**

SHEET SIZE

**ANSI B
11" X 17"**

SHEET NUMBER

PV-16



**TOP TIER
SOLAR SOLUTIONS**

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

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	01/17/2024	

PROJECT NAME & ADDRESS

3495 RAWLS CHURCH RD,
FUQUAY-VARINA, NC 27526

SHEET SIZE

**ANSI B
11" X 17"**

SHEET NUMBER

PV-16



QuickMount® RD Structural Screw

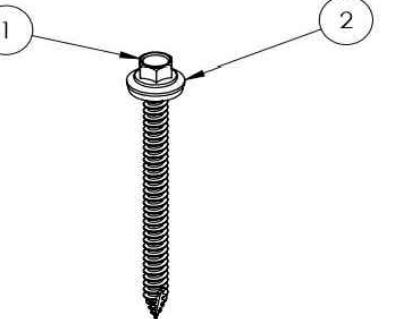
TOP TIER
 SOLAR SOLUTIONS

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 UNITED STATES

REVISIONS

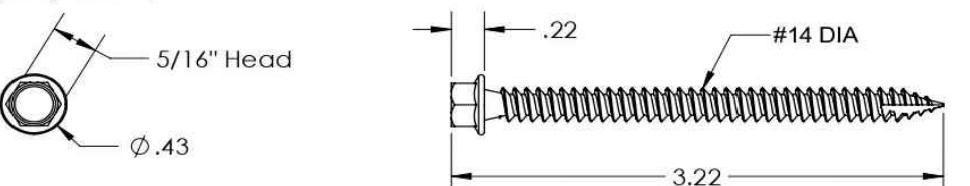
DESCRIPTION	DATE	REV
INITIAL DESIGN	01/17/2024	



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



Property	Value
Material	300 Series Stainless Steel
Finish	Clear

2. Washer, EPDM Backed



Property	Value
Material	300 Series Stainless Steel
Finish	Clear


 PROJECT NAME & ADDRESS
STEPHEN REGISTER
 RESIDENCE
 3495 RAWLS CHURCH RD,
 FUQUAY-VARINA, NC 27526

 DRAWN BY
ESR

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EQUIPMENT
 SPECIFICATION

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 SHEET NUMBER
PV-17