

PHOTOVOLTAIC GROUND MOUNT SYSTEM

28 MODULES-GROUND MOUNTED - 11.060 kW DC, 11.400 kW AC
 1591 OAKRIDGE DUNCAN RD, FUQUAY-VARINA, NC 27526

TOP TIER
SOLAR SOLUTIONS

TOP TIER SOLAR SOLUTIONS

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

PROJECT DATA

PROJECT ADDRESS: 1591 OAKRIDGE DUNCAN RD, FUQUAY-VARINA, NC 27526

OWNER: PATRICIA SCARDINO

DESIGNER: ESR

SCOPE: 11.060 kW DC GROUND MOUNT SOLAR PV SYSTEM WITH 28 MISSION SOLAR: MSE395SX9R 395W PV MODULES WITH 28 SOLAREEDGE: S440 POWER OPTIMIZERS AND 01 SOLAREEDGE: SE11400H-US (240V/11400W) INVERTER

AUTHORITIES HAVING JURISDICTION:
 BUILDING: HARNETT COUNTY
 ZONING: HARNETT COUNTY
 UTILITY: DUKE ENERGY PROGRESS

SHEET INDEX

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PV-3	GROUND PLAN & MODULES
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SIGNATURE

[Signature Line]

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

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	12/26/2023	
ARRAY LOCATION CHANGE	01/18/2024	A
CAPACITY INCREASE	02/28/2024	B
CAPACITY INCREASE & LAYOUT CHANGE	03/13/2024	C
AS BUILT	04/05/2024	D

NORTH CAROLINA
PROFESSIONAL
ENGINEER
TREVOR JONES

STRUCTURAL ONLY
04/08/2024

PROJECT NAME & ADDRESS

PATRICIA SCARDINO
RESIDENCE
1591 OAKRIDGE DUNCAN RD,
FUQUAY-VARINA, NC 27526

DRAWN BY
ESR

SHEET NAME
COVER SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-1

PROJECT DESCRIPTION:

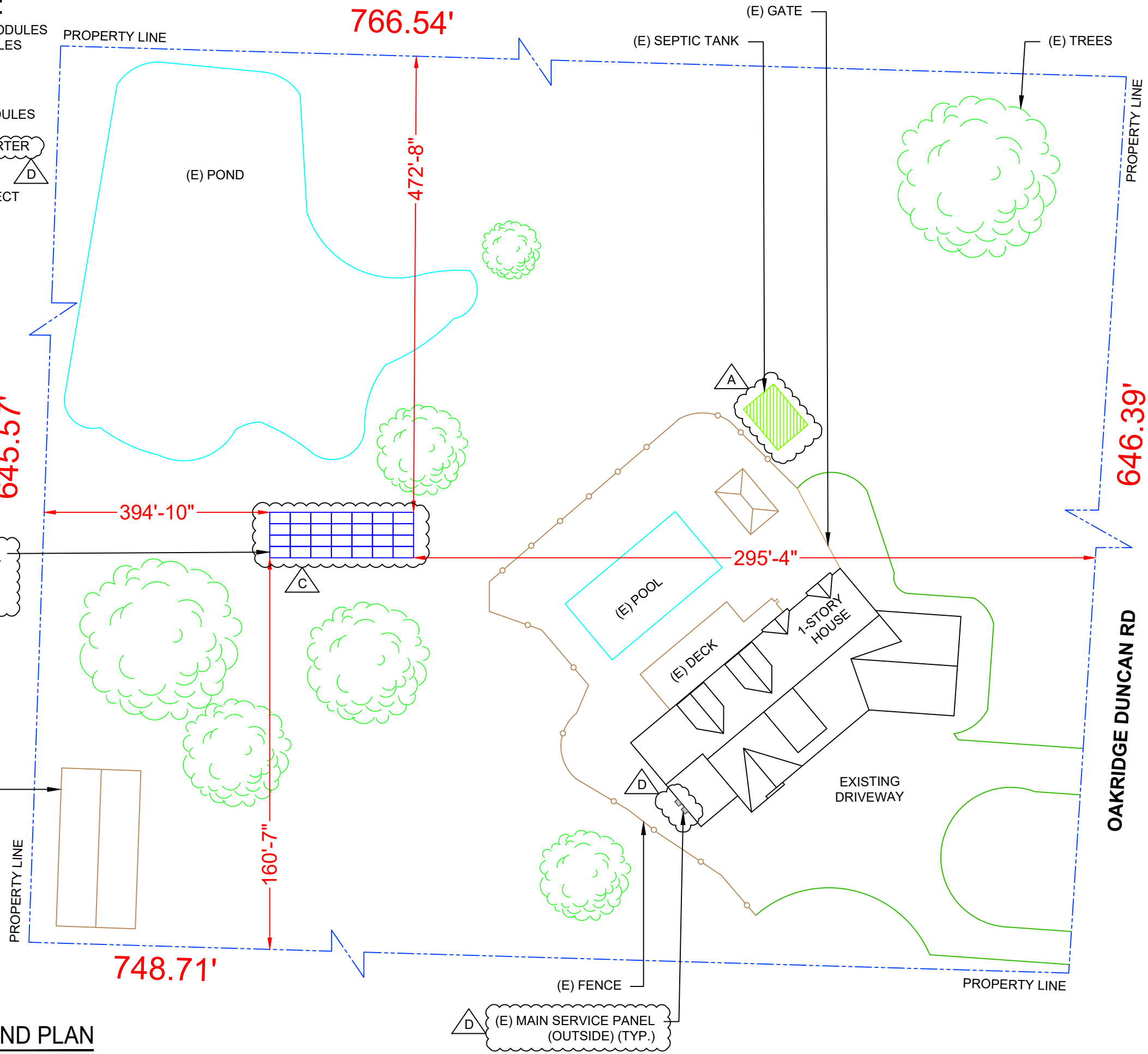
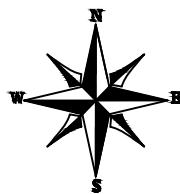
28 X MISSION SOLAR: MSE395SX9R 395W MONO MODULES
 GROUND MOUNTED SOLAR PHOTOVOLTAIC MODULES
 DC SYSTEM SIZE: 11.060 kW DC
 AC SYSTEM SIZE: 11.400 kW AC

EQUIPMENT SUMMARY

28 MISSION SOLAR: MSE395SX9R 395W MONO MODULES
 28 SOLAREDGE: S440 POWER OPTIMIZERS
 01 SOLAREDGE: SE11400H-US (240V/11400W) INVERTER

GROUND MOUNT ARRAY AREA #1:- 605.92 SQ FT.

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



GROUND MOUNT #1
 (28) MISSION SOLAR: MSE395SX9R
 395W MONO MODULES WITH
 SOLAREDGE: S440 POWER OPTIMIZERS



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SHEET NAME
**PLOT PLAN WITH
 GROUND PLAN**

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

SHEET NUMBER
PV-2

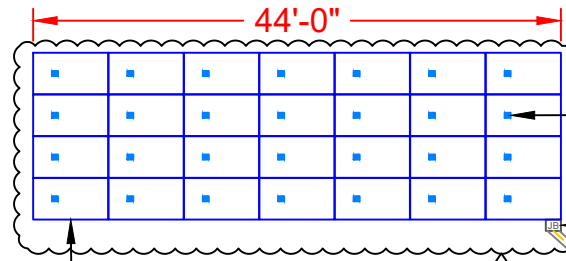
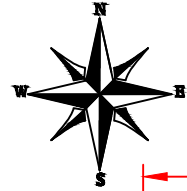
1 | PLOT PLAN WITH GROUND PLAN

PV-2

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

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 28 MODULES
 MODULE TYPE = MISSION SOLAR: MSE395SX9R 395W MONO MODULES
 MODULE WEIGHT = 48.50 LBS / 22.0KG.
 MODULE DIMENSIONS = 75.08" x 41.50" = 21.64 SF



(28) SOLAREEDGE: S440 POWER OPTIMIZERS

(N) JUNCTION BOX

GROUND MOUNT #1
 (28) MISSION SOLAR: MSE395SX9R 395W MONO MODULES WITH SOLAREEDGE: S440 POWER OPTIMIZERS

GROUND MOUNT #1
 PITCH - 20°
 AZIM. - 180°

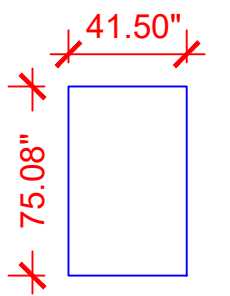
DC TRENCHING THROUGH DIRT
 APPROX 105'-00"
 IMC BURIAL (MIN 18"DEPTH)

(N) TRENCH TBD ON-SITE

(E) MAIN HOUSE

(N) SOLAREEDGE: SE11400H-US (240V/11400W) INVERTER
 (N) VISIBLE, LOCKABLE, LABELED FUSED AC DISCONNECT (LOCATED WITHIN 10' OF UTILITY METER)

(E) MAIN SERVICE PANEL (OUTSIDE) (TYP.)
 (E) UTILITY METER



MISSION SOLAR: MSE395SX9R 395W MODULES

LEGEND

ACD	- AC DISCONNECT
INV	- INVETER
UM	- UTILITY METER
MSD	- MAIN SERVICE PANEL
MSP	- MAIN SERVICE PANEL
JB	- JUNCTION BOX
---	- CONDUIT
---	- TRENCH



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 FUQUAY-VARINA, NC 27526

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ESR

SHEET NAME
GROUND PLAN & MODULES

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

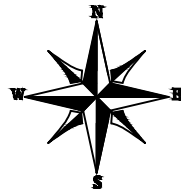
SHEET NUMBER
PV-3

1 GROUND PLAN & MODULES

PV-3 SCALE: 1/16" = 1'-0"

STRING LEGENDS

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



Bill of Materials		
Part	Spares	Total Qty
Rails		
XR-1000-204A XR1000, Rail 204" Clear	0	14
Clamps & Grounding		
UFO-CL-01-A1 Universal Module Clamp, Clear	0	70
UFO-STP-40MM-M1 Stopper Sleeve, 40MM, Mill	0	28
XR-LUG-03-A1 Grounding Lug, Low Profile	0	1
Substructure		
70-0300-SGA SGA Top Cap at 3"	0	10
GM-BRC3-01-M1 Ground Mount Bonded Rail Connector - 3"	0	28

BILL OF MATERIALS	
EQUIPMENT DESCRIPTION	QTY
SOLAR PV MODULES: MISSION SOLAR: MSE395SX9R 395W MODULE	28
OPTIMIZERS: SOLAREEDGE: S440 POWER OPTIMIZERS	28
INVERTER: SOLAREEDGE: SE11400H-US (240V/11400W) INVERTER	01
JUNCTION BOX: 6"X6"X4" UL LISTED, STEEL WATER TIGHT NEMA TYPE 3R, UL LISTED	1
AC DISCONNECT: FUSED AC DISCONNECT, 60A FUSED, (2) 60A FUSES 240V NEMA 3R, UL LISTED	1

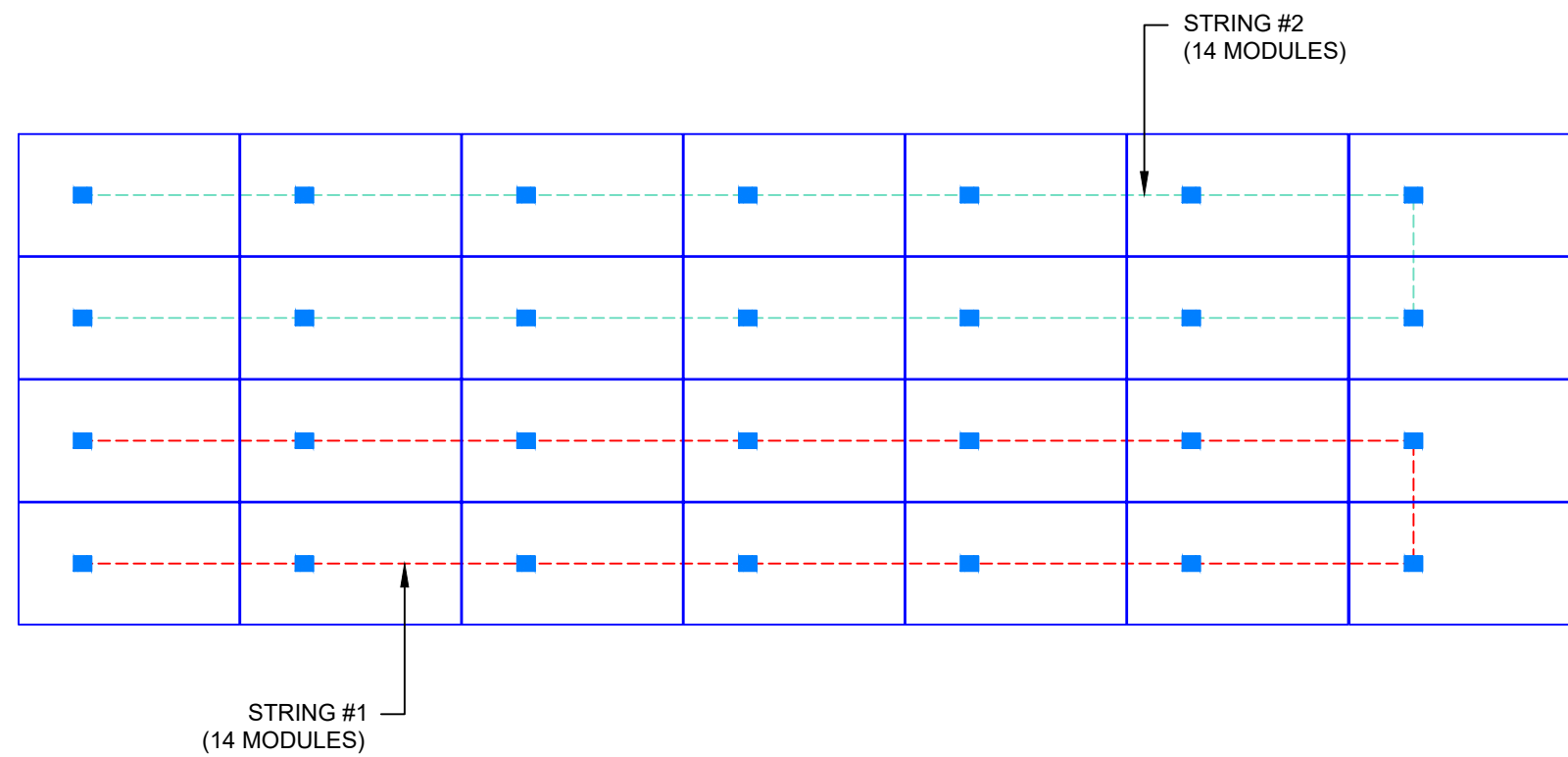
TOP TIER

SOLAR SOLUTIONS

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SHEET NAME
ELECTRICAL PLAN

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

SHEET NUMBER
PV-4



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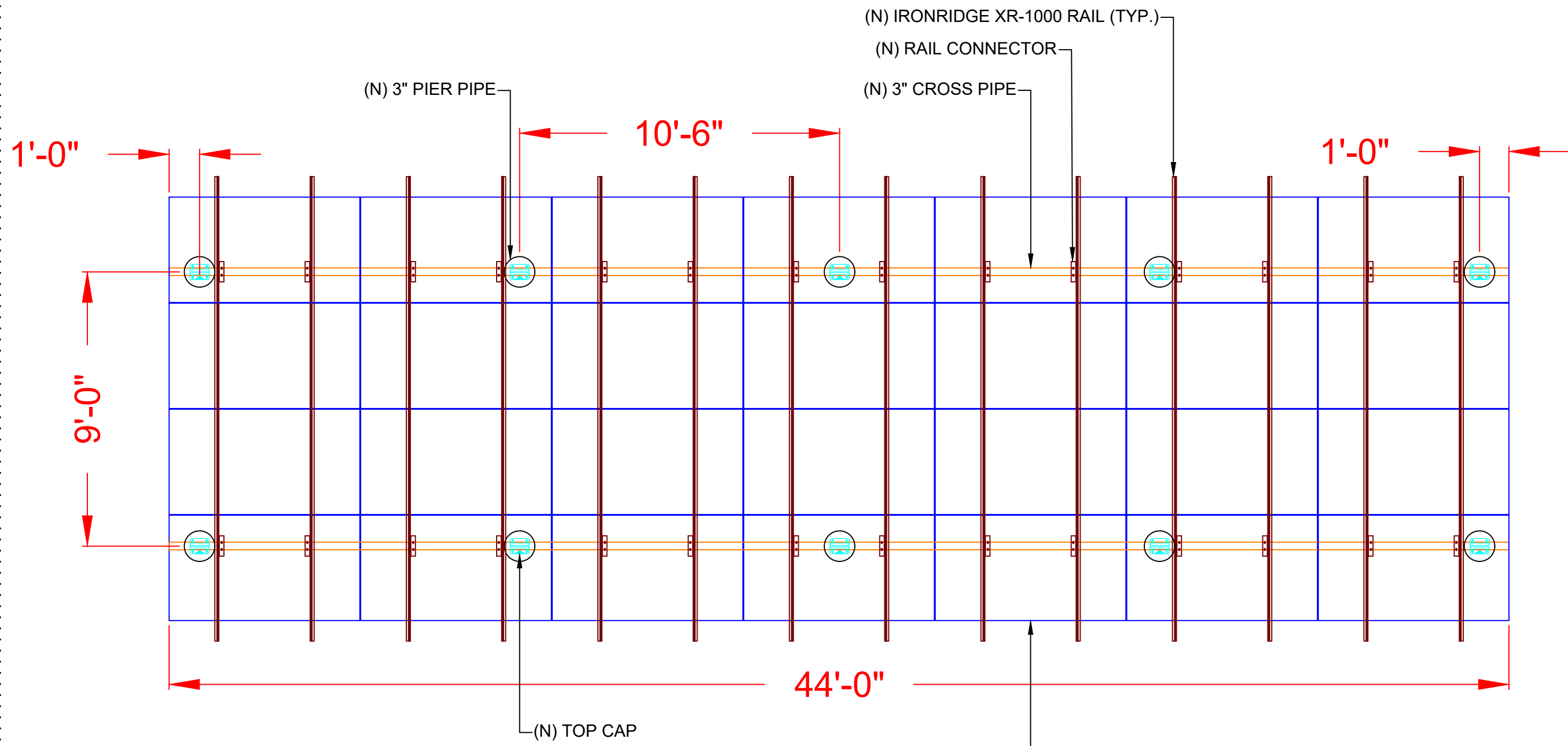
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SHEET NAME
MOUNTING DETAIL-1

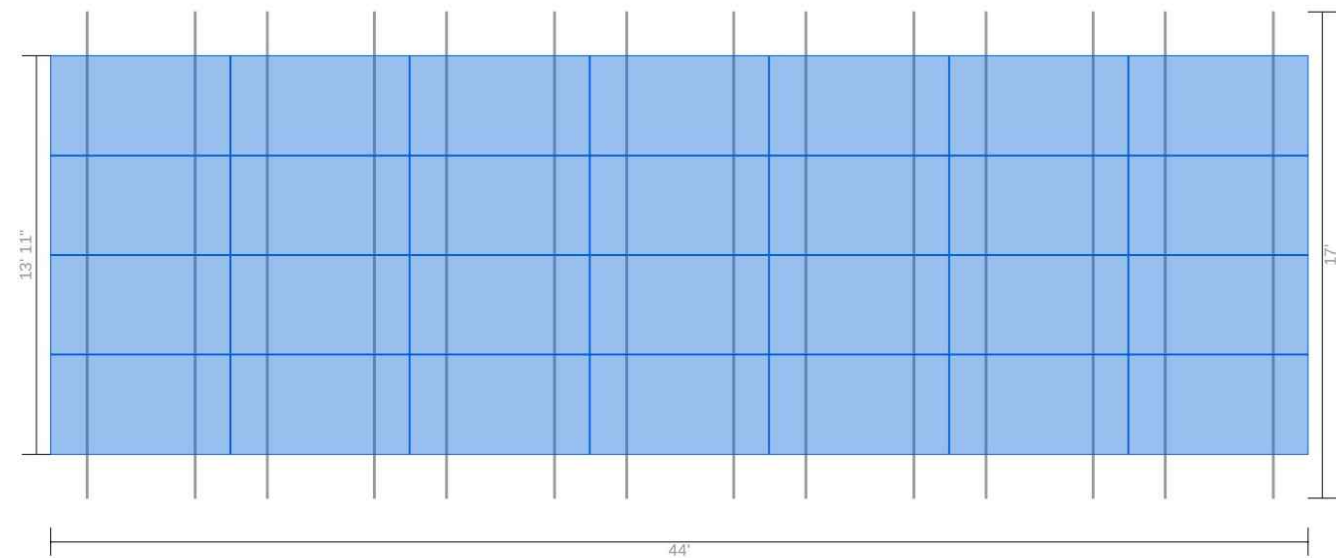
SHEET SIZE
**ANSI B
 11" X 17"**

SHEET NUMBER
PV-5

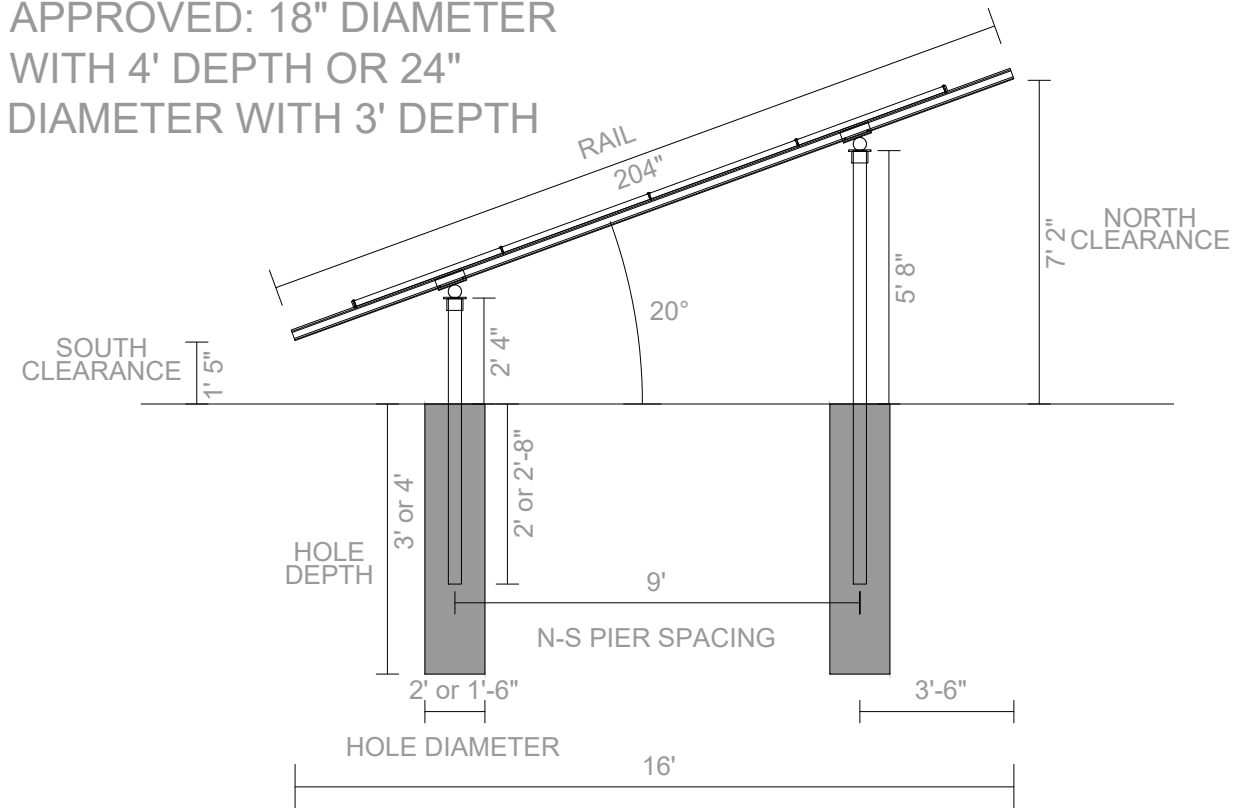


1 | **ARRAY PLAN WITH MOUNTING DETAIL**
 PV-5 | SCALE: NTS

GROUND MOUNT #1
 (28) MISSION SOLAR: MSE395SX9R
 395W MONO MODULES WITH
 SOLAREEDGE: S440 POWER OPTIMIZERS



ALTERNATE FOOTING
 OPTIONS ARE
 APPROVED: 18" DIAMETER
 WITH 4' DEPTH OR 24"
 DIAMETER WITH 3' DEPTH



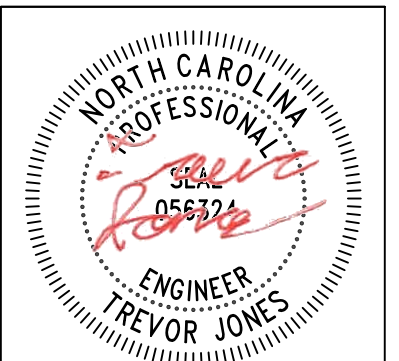
C

TOP TIER
 SOLAR SOLUTIONS

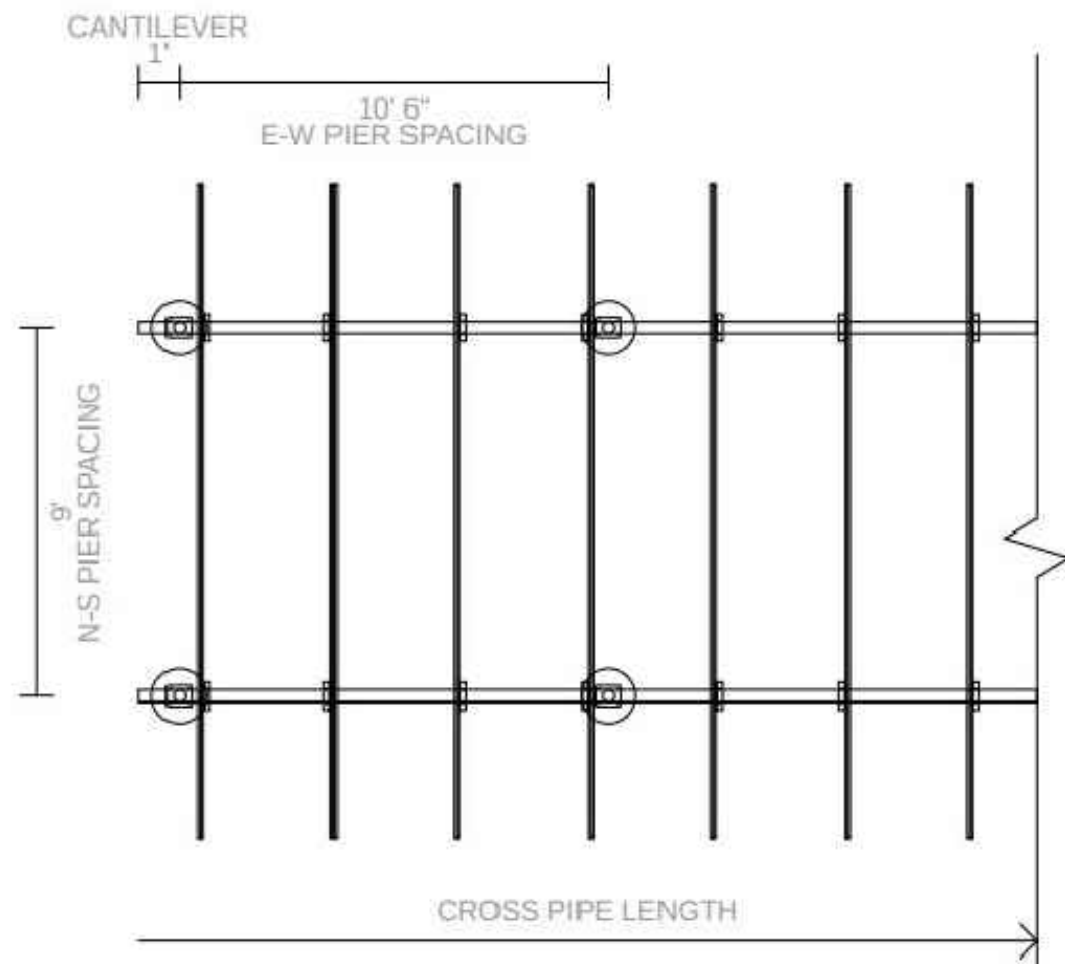
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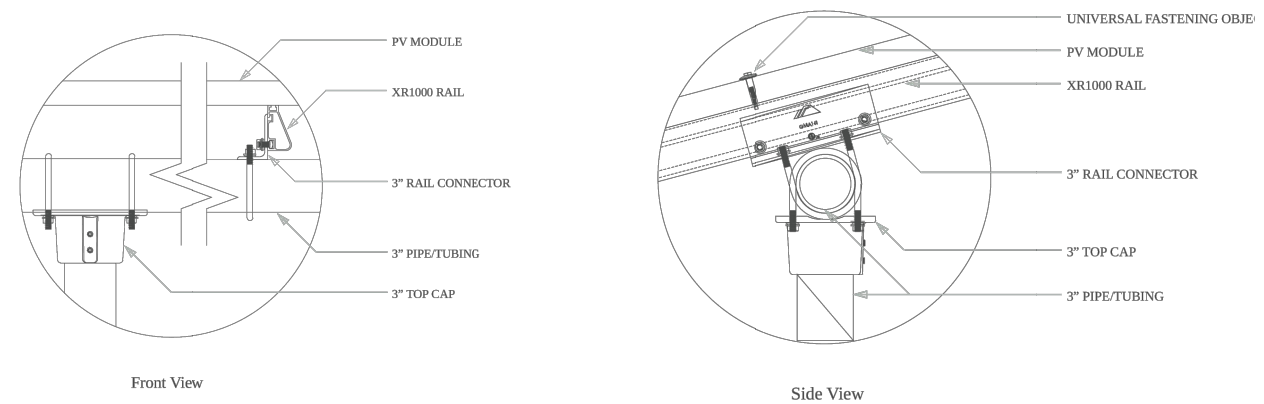


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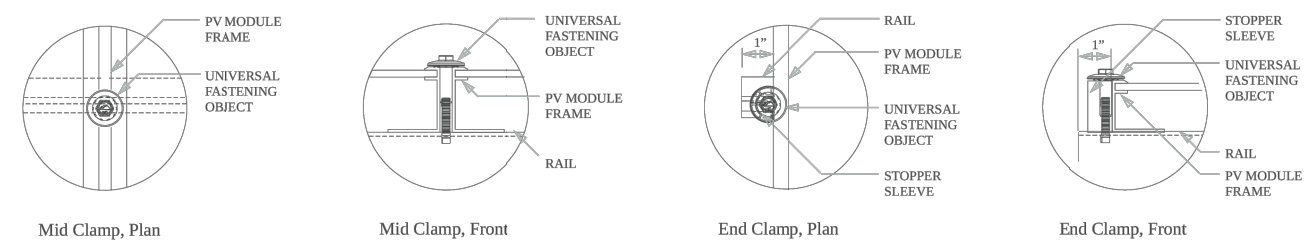


Pipe Fitting Detail

XR1000 Rail



Clamp Detail



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SHEET NAME
MOUNTING DETAIL-2

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

SHEET NUMBER
PV-5A

DC SYSTEM SIZE: 11,060 kW DC
 AC SYSTEM SIZE: 11,400 kW AC

- (28) MISSION SOLAR: MSE395SX9R 395 W MONO MODULES WITH (28) SOLAREEDGE: S440 POWER OPTIMIZERS LOCATED UNDER EACH PANEL (240V) AND
- (01) SOLAREEDGE: SE11400H-US (240V/11400W) INVERTER
- (02) STRINGS 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:

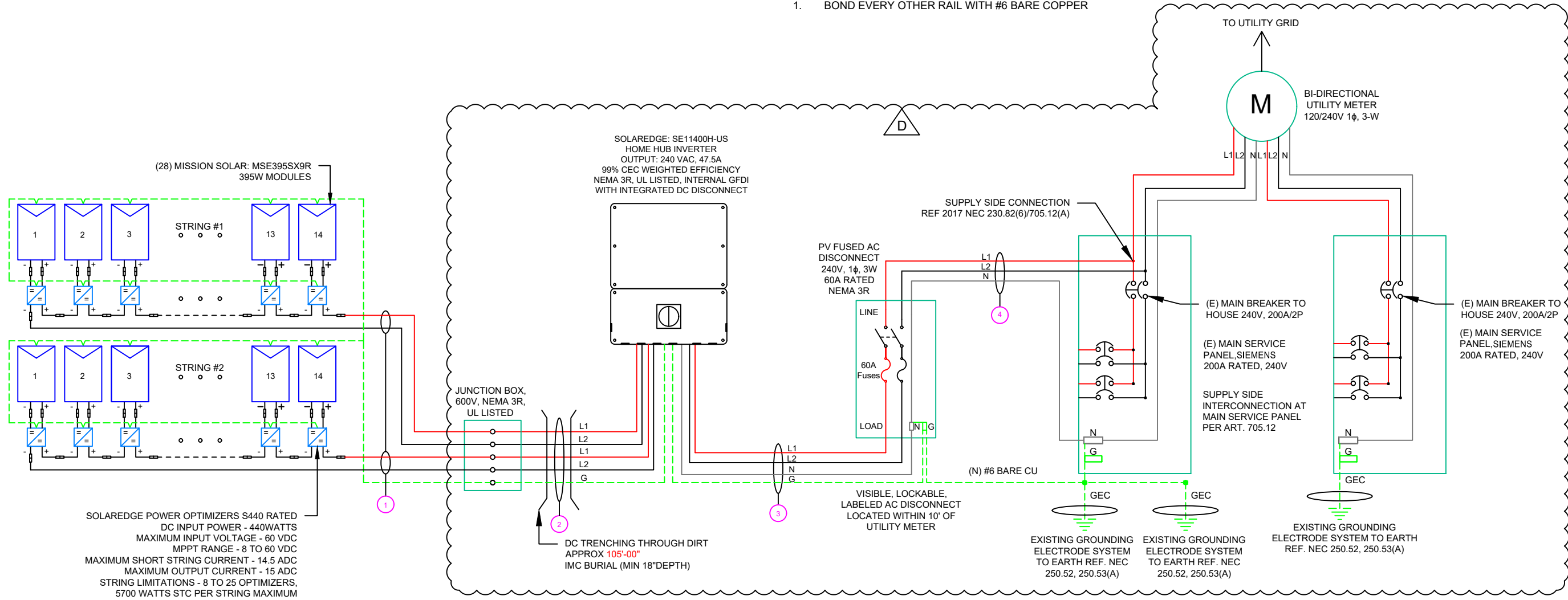
1. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING LIVE ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS)
2. AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
3.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



SOLAREEDGE POWER OPTIMIZERS S440 RATED
 DC INPUT POWER - 440WATTS
 MAXIMUM INPUT VOLTAGE - 60 VDC
 MPPT RANGE - 8 TO 60 VDC
 MAXIMUM SHORT STRING CURRENT - 14.5 ADC
 MAXIMUM OUTPUT CURRENT - 15 ADC
 STRING LIMITATIONS - 8 TO 25 OPTIMIZERS,
 5700 WATTS STC PER STRING MAXIMUM

SOLAREEDGE: SE11400H-US
 HOME HUB INVERTER
 OUTPUT: 240 VAC, 47.5A
 99% CEC WEIGHTED EFFICIENCY
 NEMA 3R, UL LISTED, INTERNAL GFDI
 WITH INTEGRATED DC DISCONNECT

JUNCTION BOX,
 600V, NEMA 3R,
 UL LISTED

PV FUSED AC
 DISCONNECT
 240V, 1 ϕ , 3W
 60A RATED
 NEMA 3R

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

TO UTILITY GRID
 M
 BI-DIRECTIONAL
 UTILITY METER
 120/240V 1 ϕ , 3-W

SUPPLY SIDE CONNECTION
 REF 2017 NEC 230.82(6)/705.12(A)

(E) MAIN BREAKER TO
 HOUSE 240V, 200A/2P

(E) MAIN SERVICE
 PANEL, SIEMENS
 200A RATED, 240V

SUPPLY SIDE
 INTERCONNECTION AT
 MAIN SERVICE PANEL
 PER ART. 705.12

(E) MAIN BREAKER TO
 HOUSE 240V, 200A/2P

(E) MAIN SERVICE
 PANEL, SIEMENS
 200A RATED, 240V

EXISTING GROUNDING
 ELECTRODE SYSTEM
 TO EARTH REF. NEC
 250.52, 250.53(A)

EXISTING GROUNDING
 ELECTRODE SYSTEM
 TO EARTH REF. NEC
 250.52, 250.53(A)

EXISTING GROUNDING
 ELECTRODE SYSTEM TO EARTH
 REF. NEC 250.52, 250.53(A)

DC TRENCHING THROUGH DIRT
 APPROX 105'-00"
 IMC BURIAL (MIN 18"DEPTH)

QTY	CONDUCTOR INFORMATION		CONDUIT TYPE	CONDUIT SIZE
(4)	#10AWG -	PV WIRE/USE-2	N/A	N/A
(1)	#6AWG -	BARE COPPER IN FREE AIR		
(4)	#10AWG -	CU, THWN-2	IMC BURIAL (MIN 18"DEPTH)	3/4"
(1)	#10AWG -	CU, THWN-2 GND		
(4)	#10AWG -	CU, THWN-2	EMT OR LFMC	3/4"
(1)	#10AWG -	CU, THWN-2 GND		
(2)	#6AWG -	CU, THWN-2	EMT, LFMC OR PVC	3/4"
(1)	#6AWG -	CU, THWN-2 N		
(1)	#6AWG -	CU, THWN-2 GND	EMT, LFMC OR PVC	3/4"
(2)	#6AWG -	CU, THWN-2		
(1)	#6AWG -	CU, THWN-2 N		

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

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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: SE11400H-US (240V/11400W) INVERTER
NOMINAL AC POWER	11.400 kW
NOMINAL OUTPUT VOLTAGE	240 VAC
NOMINAL OUTPUT CURRENT	47.5A
PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT
.80	4-6
.70	7-9
.50	10-20

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-12°
AMBIENT TEMP (HIGH TEMP 2%)	37°
MODULE TEMPERATURE COEFFICIENT OF Voc	-0.259%/°C

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	37	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	37	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	37	4	40	0.91	0.8	29.12	PASS	105	1.24	1.028	3/4" IMC	19.7936

String 1 Voltage Drop	1.077
String 2 Voltage Drop	1.077

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	AC DISCONNECT	240	47.5	59.375	60	CU #6 AWG	CU #6 AWG	CU #6 AWG	65	PASS	37	2	75	0.91	1	68.25	PASS	5	0.491	0.097	3/4" EMT	38.0488
AC DISCONNECT	POI	240	47.5	59.375	60	CU #6 AWG	N/A	CU #6 AWG	65	PASS	37	2	75	0.91	1	68.25	PASS	5	0.491	0.097	3/4" EMT	28.5366

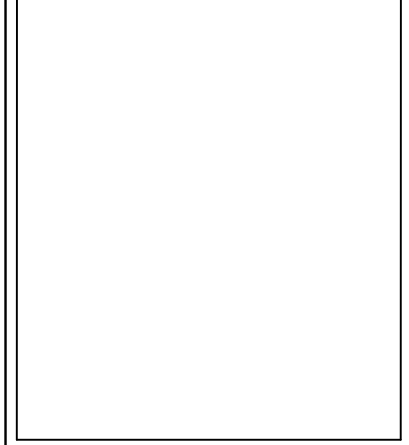
CUMULATIVE VOLTAGE DROP	0.194
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TOP TIER SOLAR SOLUTIONS

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

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AS BUILT	04/05/2024	D



PROJECT NAME & ADDRESS

**PATRICIA SCARDINO
RESIDENCE**

1591 OAKRIDGE DUNCAN RD,
FUQUAY-VARINA, NC 27526

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 GROUNDTOPS 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

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

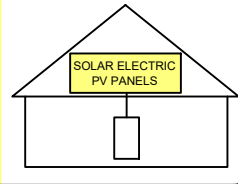
⚠ WARNING

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 **47.50 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

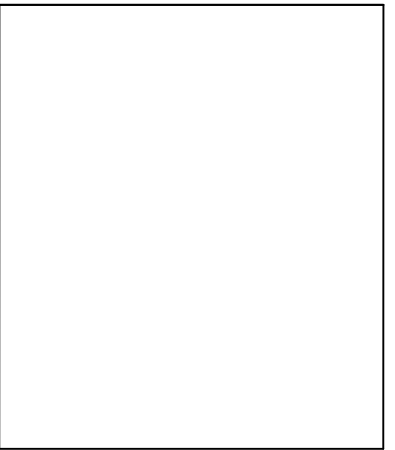
⚠ D



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 RESIDENCE**

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DRAWN BY
ESR

SHEET NAME
LABELS

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

SHEET NUMBER
PV-8

MSE PERC 66

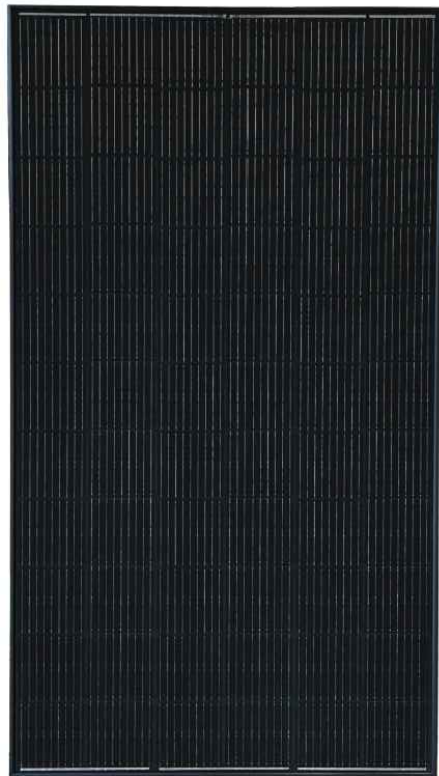
MISSION SOLAR ENERGY



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

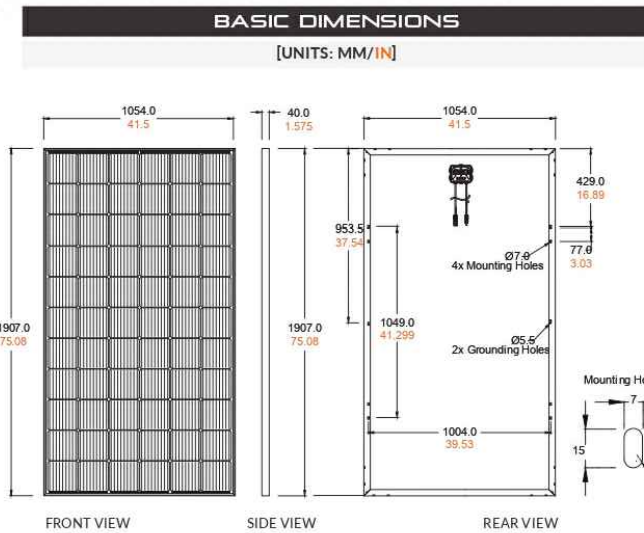


If you have questions or concerns about certification of our products in your area, please contact Mission Solar Energy.

UL 61730 / IEC 61215 / IEC 61730 / IEC 61701



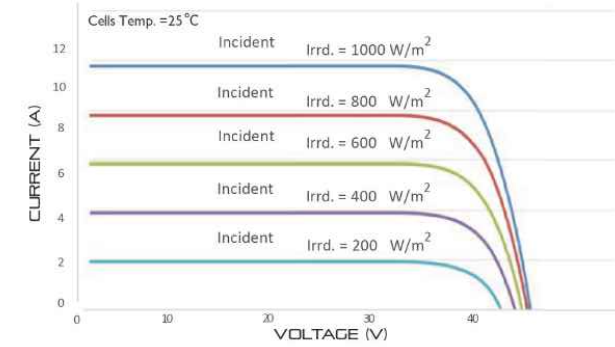
Class Leading 390-400W



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

MSE PERC 66

ELECTRICAL SPECIFICATION

PRODUCT TYPE	MSE	XXX	SX9R	(XXX = P _{max})
Power Output	P _{max}	W _p	390	395 400
Module Efficiency	%		19.4	19.7 19.9
Tolerance	%	0/+3	0/+3	0/+3
Short Circuit Current	I _{sc}	A	11.19	11.24 11.31
Open Circuit Voltage	V _{oc}	V	45.04	45.18 45.33
Rated Current	I _{mp}	A	10.63	10.68 10.79
Rated Voltage	V _{mp}	V	36.68	36.99 37.07
Fuse Rating	A		20	20
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 (195.58 cm)

TOP TIER SOLAR SOLUTIONS

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PROJECT NAME & ADDRESS

PATRICIA SCARDINO
RESIDENCE
1591 OAKRIDGE DUNCAN RD,
FUQUAY-VARINA, NC 27526

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.

Barthel
 Bruce Barthelholz, Director, North American Certification Program
 UL LLC



Any information and documentation in using UL Mark certifies are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact local UL Customer Service Representative at <http://ul.com/about/ul/contact-us/>

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

Barthel
 Bruce Barthelholz, Director, North American Certification Program
 UL LLC



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ESR

SHEET NAME
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 SPECIFICATION

SHEET SIZE
 ANSI B
 11" X 17"

SHEET NUMBER

PV-10

Power Optimizer For Residential Installations

S440, S500

25
YEAR
WARRANTY



POWER OPTIMIZER

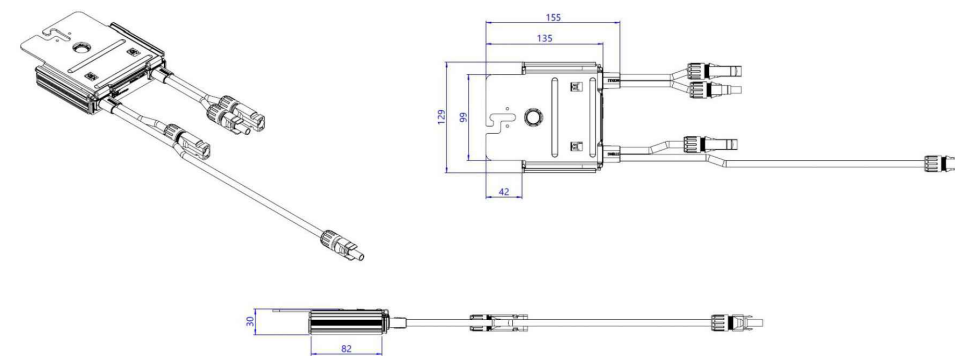
Power Optimizer For Residential Installations S440, S500

	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	%
Overvoltage 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	18
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 \leq 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



Enabling PV power optimization at the module level

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

* Functionality subject to inverter model and firmware version

solaredge.com



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SOLAR SOLUTIONS

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SHEET NUMBER

PV-11

SolarEdge Home Hub Inverter For North America

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



HOME BACKUP

Optimized battery storage with HD-Wave technology

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

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-USMNBxxx / SEXxxxH-USSNBxxx						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 SExxxH-USMNBxxx.
 (1) These specifications apply to inverters with part numbers SExxxH-USMNBxxx or SExxxH-USSNBxxx 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

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

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	12/26/2023	
ARRAY LOCATION CHANGE	01/18/2024	A
CAPACITY INCREASE	02/28/2024	B
CAPACITY INCREASE & LAYOUT CHANGE	03/13/2024	C
AS BUILT	04/05/2024	D

PROJECT NAME & ADDRESS

PATRICIA SCARDINO
RESIDENCE
1591 OAKRIDGE DUNCAN 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-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-USXNBBLXX only supports the cellular communication interface.

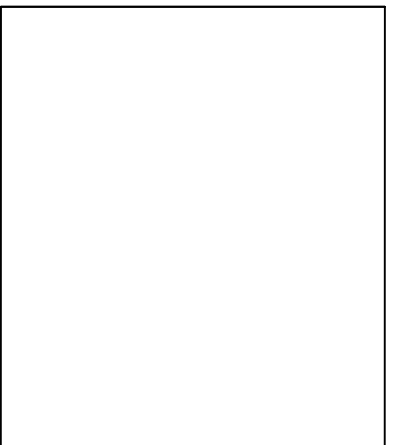
(10) Full power up to at least 50°C / 122°F; for power de-rating information refer to the [Temperature Derating Technical Note for North America](#).



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ESR

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

SHEET NUMBER
PV-13



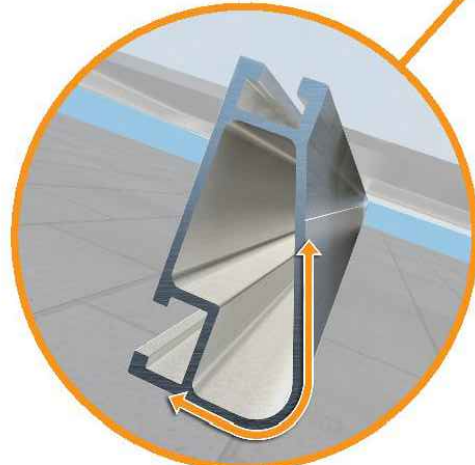
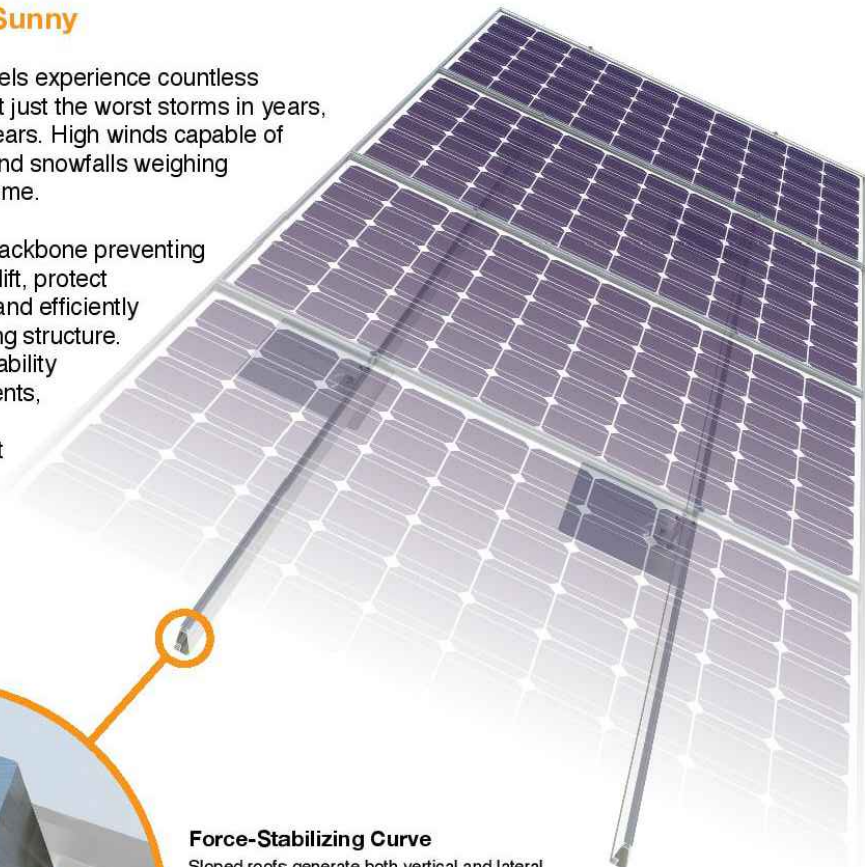
Tech Brief

XR Rail Family

Solar Is Not Always Sunny

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

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



Force-Stabilizing Curve

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

Compatible with Flat & Pitched Roofs



Corrosion-Resistant Materials

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



XR Rail Family

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



XR10

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

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



XR100

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

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



XR1000

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

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

Rail Selection

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

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

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

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SHEET NUMBER

PV-14



Ground Mount System

Datasheet



360° Product Tour
Visit ironridge.com

Substructure

Top Caps



Connect vertical and cross pipes.

Rail Connectors



Attach Rail Assembly to horizontal pipes.

Diagonal Braces



Optional Brace provides additional support.

Cross Pipe & Piers



Steel pipes or mechanical tubing for substructure.

Rail Assembly

XR1000 Rails



Curved rails increase spanning capabilities.

Top-Down Clamps



Secure modules to rails and substructure.

Under Clamps



Alternative clamps for pre-attaching modules to rails.

Accessories



Wire Clips and End Caps provide a finished look.

Resources



Design Assistant
Go from rough layout to fully engineered system. For free.
Go to ironridge.com/gm



NABCEP Certified Training
Earn free continuing education credits, while learning more about our systems.
Go to ironridge.com/training

Mount on all terrains, in no time.

The IronRidge Ground Mount System combines our XR1000 rails with locally-sourced steel pipes, or mechanical tubing, to create a cost-effective structure capable of handling any site or terrain challenge.

Installation is simple with only a few structural components and no drilling, welding, or heavy machinery required. In addition, the system works with a variety of foundation options, including concrete piers and driven piles.



Rugged Construction

Engineered steel and aluminum components ensure durability.



PE Certified

Pre-stamped engineering letters available in most states.



Simple Assembly

Just a few simple components and no heavy equipment.



Design Software

Online tool generates engineering values and bill of materials.



Flexible Architecture

Multiple foundation and array configuration options.



20 Year Warranty

Twice the protection offered by competitors.

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SHEET NUMBER

PV-15