

PHOTOVOLTAIC ROOF MOUNT SYSTEM

25 MODULES-ROOF MOUNTED - 9.875 KW DC, 7.600 KW AC

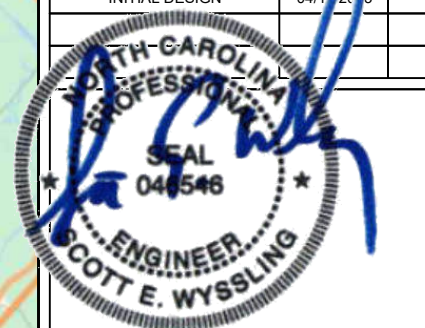
646 MELODY LN, CAMERON, NC 28326



TOP TIER SOLAR SOLUTIONS

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

| REVISIONS | | |
|----------------|------------|-----|
| DESCRIPTION | DATE | REV |
| INITIAL DESIGN | 04/11/2023 | |
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Wysling Consulting, PLLC
76 N Meadowbrook Drive Alpine UT 84004
North Carolina COA # P-2308
Signed 4/14/2023

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PROJECT DATA

PROJECT ADDRESS: 646 MELODY LN, CAMERON, NC 28326

OWNER: ELLIS ROYSTER

DESIGNER: ESR

SCOPE: 9.875 KW DC ROOF MOUNT SOLAR PV SYSTEM WITH 25 MISSION SOLAR: MSE395SX9R 395W PV MODULES WITH 25 SOLAREEDGE: S440 POWER OPTIMIZERS AND 01 SOLAREEDGE: SE7600H-US (240V) INVERTER

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

SHEET INDEX

| | |
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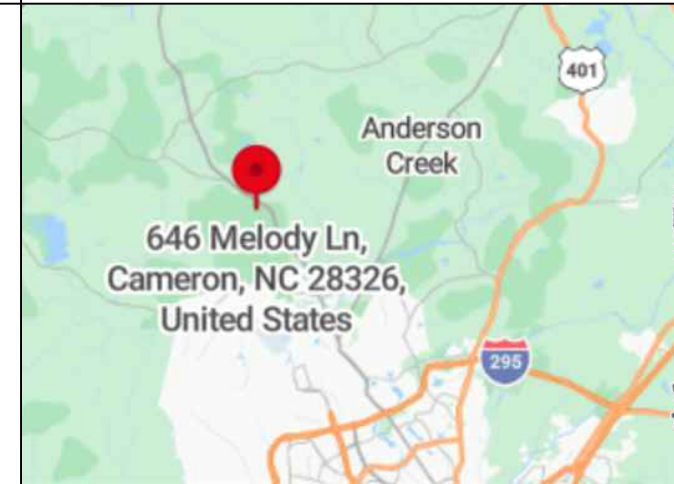
SIGNATURE



GENERAL NOTES

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

VICINITY MAP



HOUSE PHOTO



CODE REFERENCES

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

PROJECT NAME & ADDRESS

ELLIS ROYSTER
RESIDENCE
646 MELODY LN,
CAMERON, NC 28326

DRAWN BY

ESR

SHEET NAME

COVER SHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-1

PROJECT DESCRIPTION:

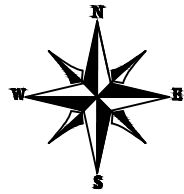
25 X MISSION SOLAR: MSE395SX9R 395W MONO MODULES
 ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES
 DC SYSTEM SIZE: 9.875KW DC
 AC SYSTEM SIZE: 7.600KW AC

EQUIPMENT SUMMARY

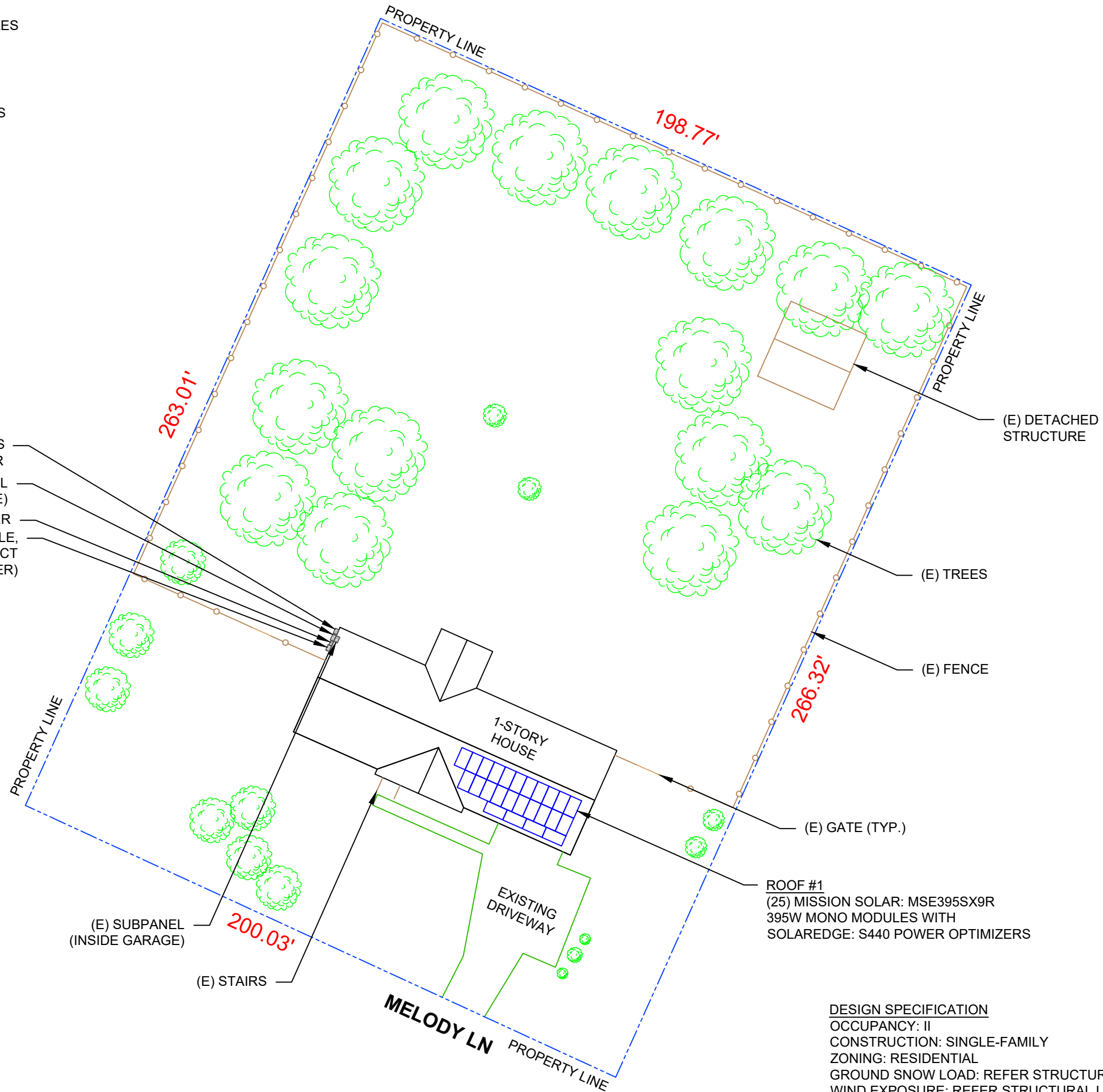
25 MISSION SOLAR: MSE395SX9R 395W MONO MODULES
 25 SOLAREEDGE: S440 POWER OPTIMIZERS
 01 SOLAREEDGE: SE7600H-US (240V) INVERTER

ROOF ARRAY AREA #1:- 541.00 SQ. FT.

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



- (N) SOLAREEDGE: SE7600H-US (240V) INVERTER
- (E) MAIN SERVICE PANEL (OUTSIDE)
- (E) UTILITY METER
- (N) VISIBLE, LOCKABLE, LABELED NON-FUSED AC DISCONNECT (LOCATED WITHIN 10' OF UTILITY METER)



ROOF #1
 (25) MISSION SOLAR: MSE395SX9R
 395W MONO MODULES WITH
 SOLAREEDGE: S440 POWER OPTIMIZERS

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



TOP TIER SOLAR SOLUTIONS
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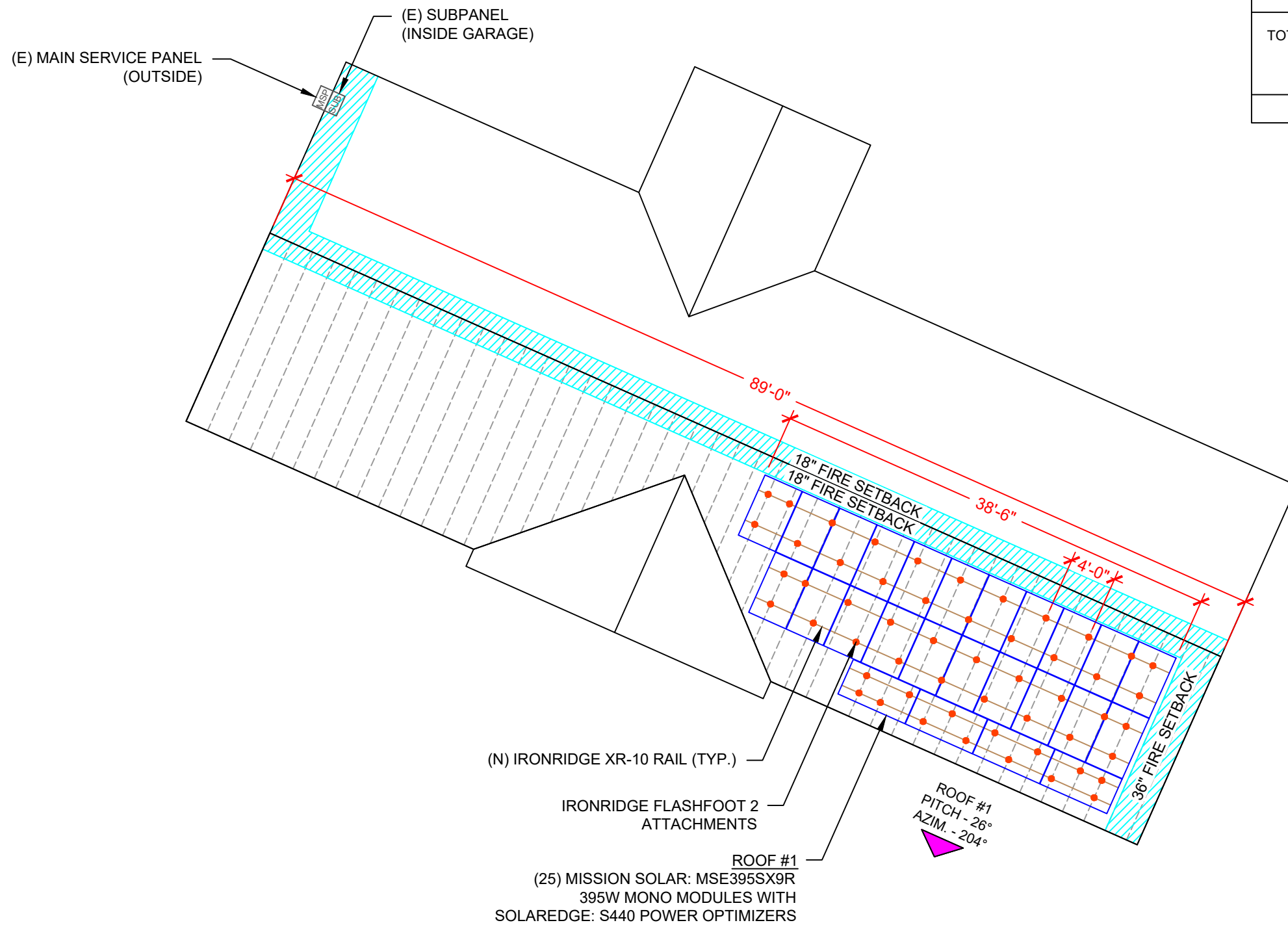
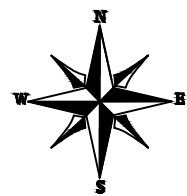
SHEET NAME
SITE PLAN

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

SHEET NUMBER
PV-2

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 25 MODULES
 MODULE TYPE = MISSION SOLAR: MSE395SX9R 395W MONO MODULES
 MODULE WEIGHT = 48.5 LBS / 22.0KG.
 MODULE DIMENSIONS = 75.08" x 41.50" = 21.64 SF



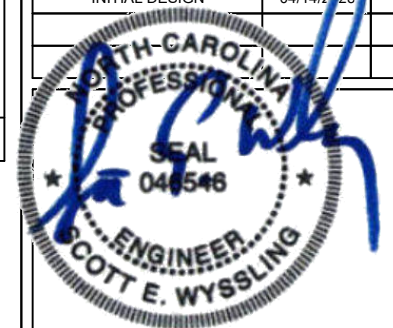
| ROOF DESCRIPTION | | | | | |
|------------------|--------------|------------|-----------------|------------|---------------|
| ROOF TYPE | | | ASPHALT SHINGLE | | |
| ROOF LAYER | | | 1 LAYER | | |
| ROOF | # OF MODULES | ROOF PITCH | AZIMUTH | TRUSS SIZE | TRUSS SPACING |
| #1 | 25 | 26° | 204° | 2"X4" | 24" |

| ARRAY AREA & ROOF AREA CALC'S | | |
|-------------------------------|---------------------------|--------------------------------|
| TOTAL PV ARRAY AREA (SQ. FT.) | TOTAL ROOF AREA (Sq. Ft.) | ROOF AREA COVERED BY ARRAY (%) |
| 541.00 | 3228.32 | 17 |

TOP TIER SOLAR SOLUTIONS

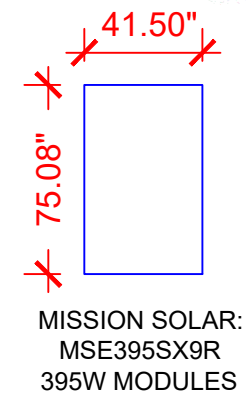
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LEGEND

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

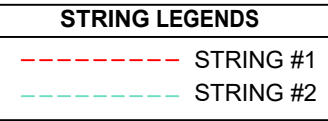
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SHEET NAME
ROOF PLAN & MODULES

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

SHEET NUMBER
PV-3

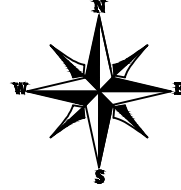
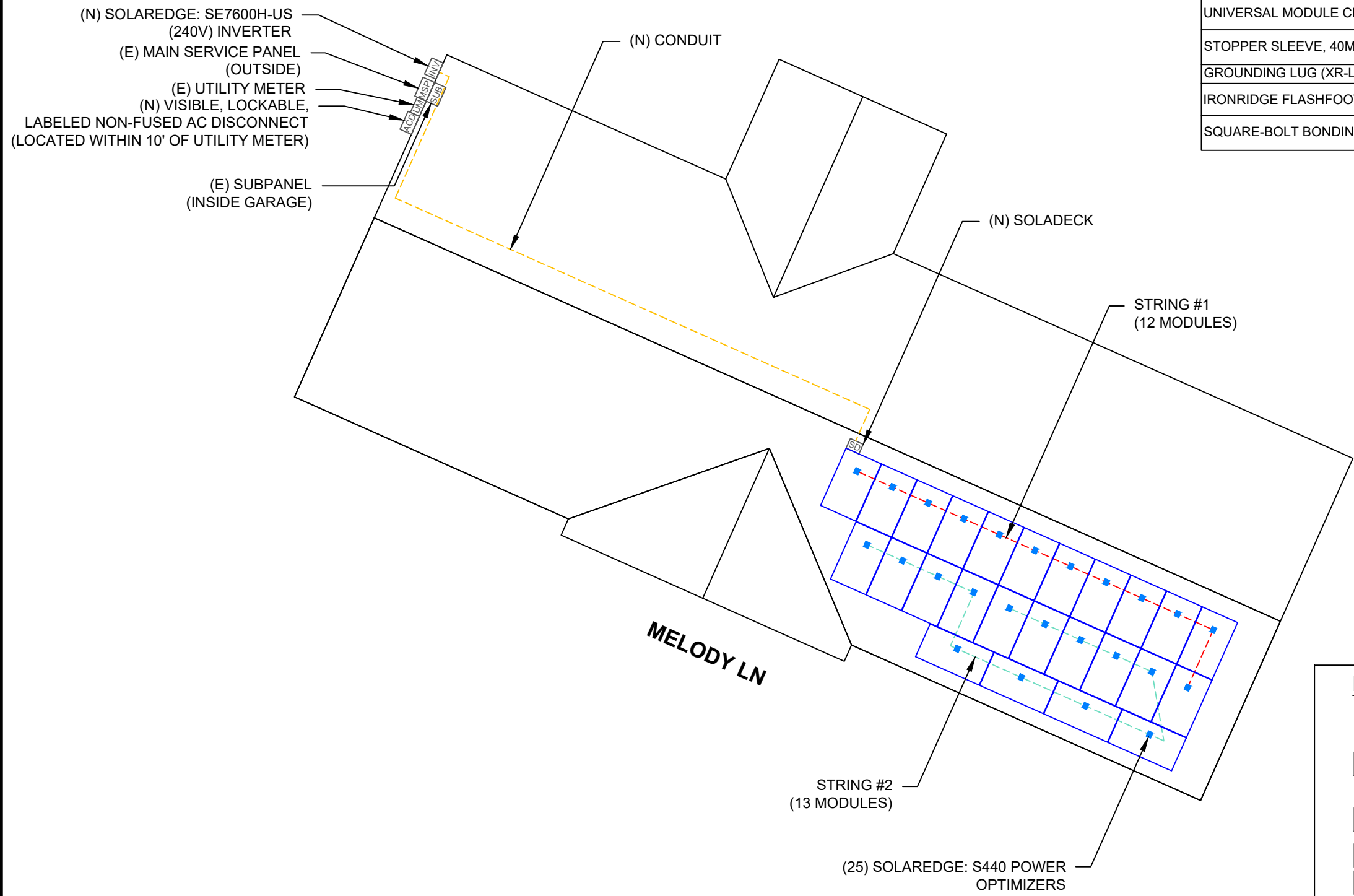
DC SYSTEM SIZE: 9.875KW DC
 AC SYSTEM SIZE: 7.600KW AC
 (25) MISSION SOLAR: MSE395SX9R 395W MONO MODULES
 WITH (25) SOLAREEDGE: S440 POWER OPTIMIZERS
 LOCATED UNDER EACH PANEL AND
 01 SOLAREEDGE: SE7600H-US (240V) INVERTER



| BILL OF MATERIALS | |
|--|-----|
| EQUIPMENT DESCRIPTION | QTY |
| SOLAR PV MODULES: MISSION SOLAR: MSE395SX9R 395W MODULE | 25 |
| OPTIMIZERS: SOLAREEDGE: S440 POWER OPTIMIZERS | 25 |
| INVERTER: SOLAREEDGE: SE7600H-US (240V) INVERTER | 01 |
| SOLADECK | 1 |
| AC DISCONNECT: NON-FUSED AC DISCONNECT 60A , 240V NEMA 3R, UL LISTED | 1 |
| IRONRIDGE XR10 RAIL (RAIL 168" (14 FEET) BLACK) (XR-10-168B) | 16 |
| BONDED SPLICE, XR10 (XR10-BOSS-01-M1) | 10 |
| UNIVERSAL MODULE CLAMP, BLACK (UFO-CL-01-B1) | 56 |
| STOPPER SLEEVE, 40MM, BLACK (UFO-STP-40MM-B1) | 12 |
| GROUNDING LUG (XR-LUG-03-A1) | 3 |
| IRONRIDGE FLASHFOOT2 ATTACHMENTS | 55 |
| SQUARE-BOLT BONDING HARDWARE (BHW-SQ-02-A1) | 55 |

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LEGEND

- JB - JUNCTION BOX
- SD - SOLADECK
- INV - INVERTER
- CB - COMBINER BOX
- ACD - AC DISCONNECT
- UM - UTILITY METER
- MSP - MAIN SERVICE PANEL
- VENT, ATTIC FAN (ROOF OBSTRUCTION)
- - ROOF ATTACHMENT
- — — - TRUSS
- - - - - CONDUIT

PROJECT NAME & ADDRESS

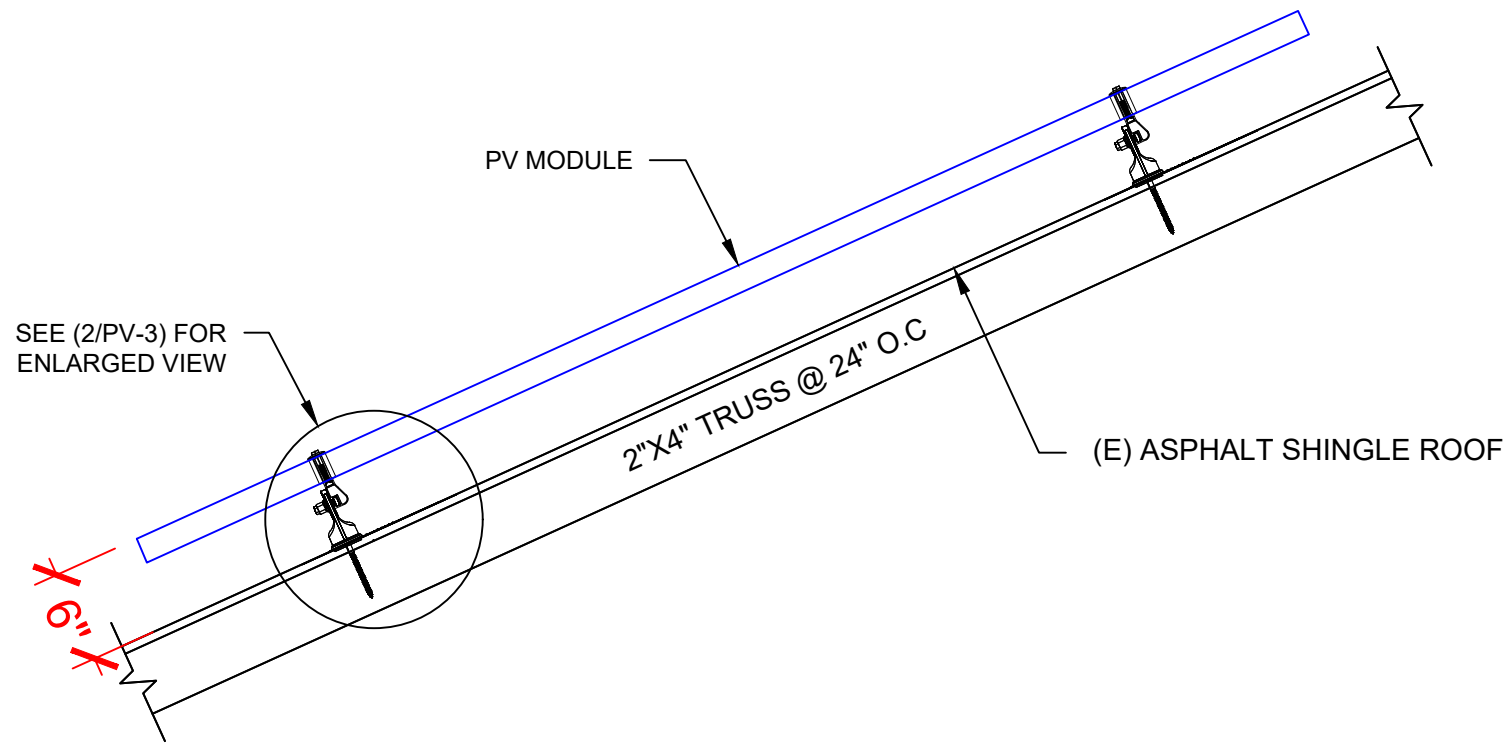
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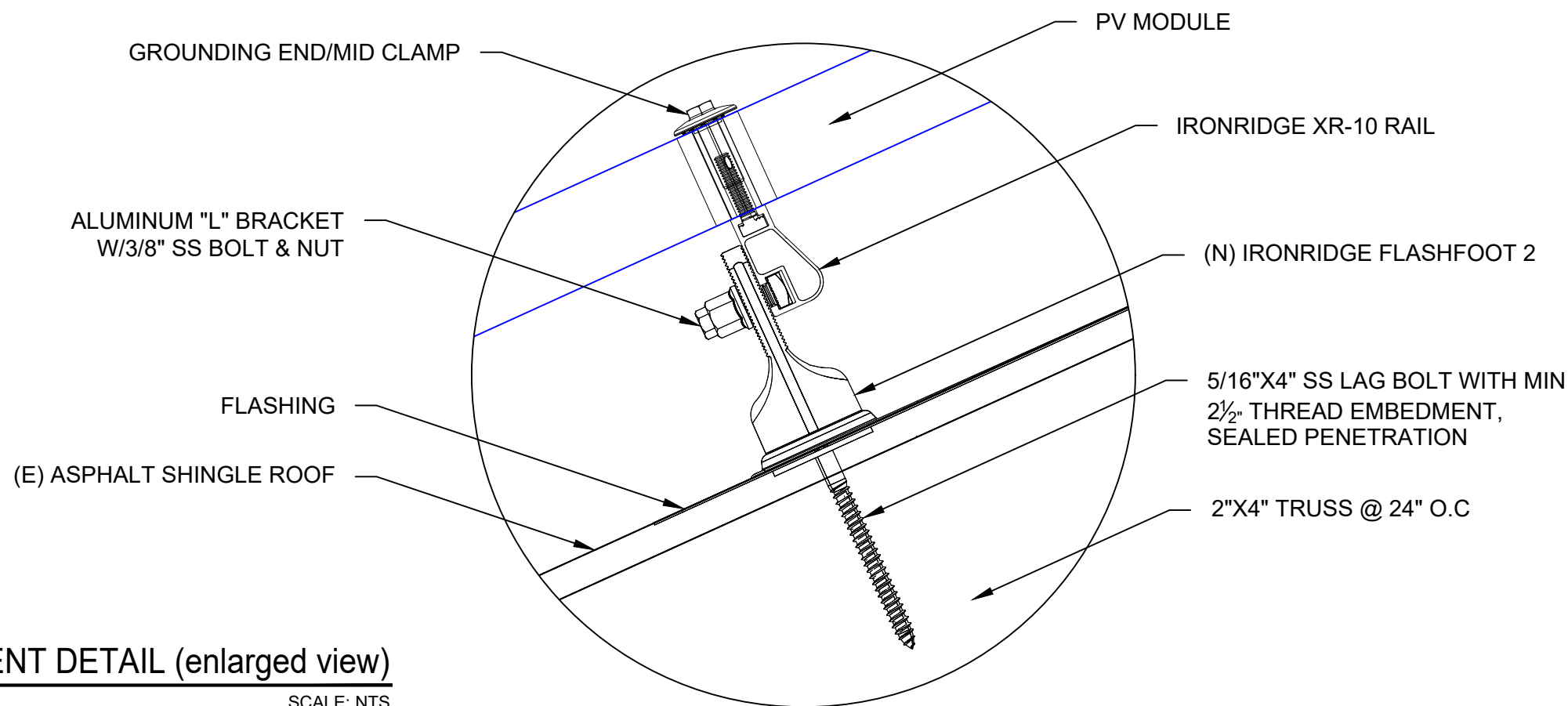
SHEET NAME
ELECTRICAL PLAN

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

SHEET NUMBER
PV-4



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



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



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SHEET NAME
STRUCTURAL DETAIL

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

SHEET NUMBER
PV-5

DC SYSTEM SIZE: 9.875KW DC
AC SYSTEM SIZE: 7.600KW AC

(25) MISSION SOLAR: MSE395SX9R 395W MONO MODULES WITH (25) SOLAREEDGE: S440 POWER OPTIMIZERS LOCATED UNDER EACH PANEL (240V) AND (01) SOLAREEDGE: SE7600H-US (240V) INVERTER (1) STRING OF 13 MODULES AND (1) STRING OF 12 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:

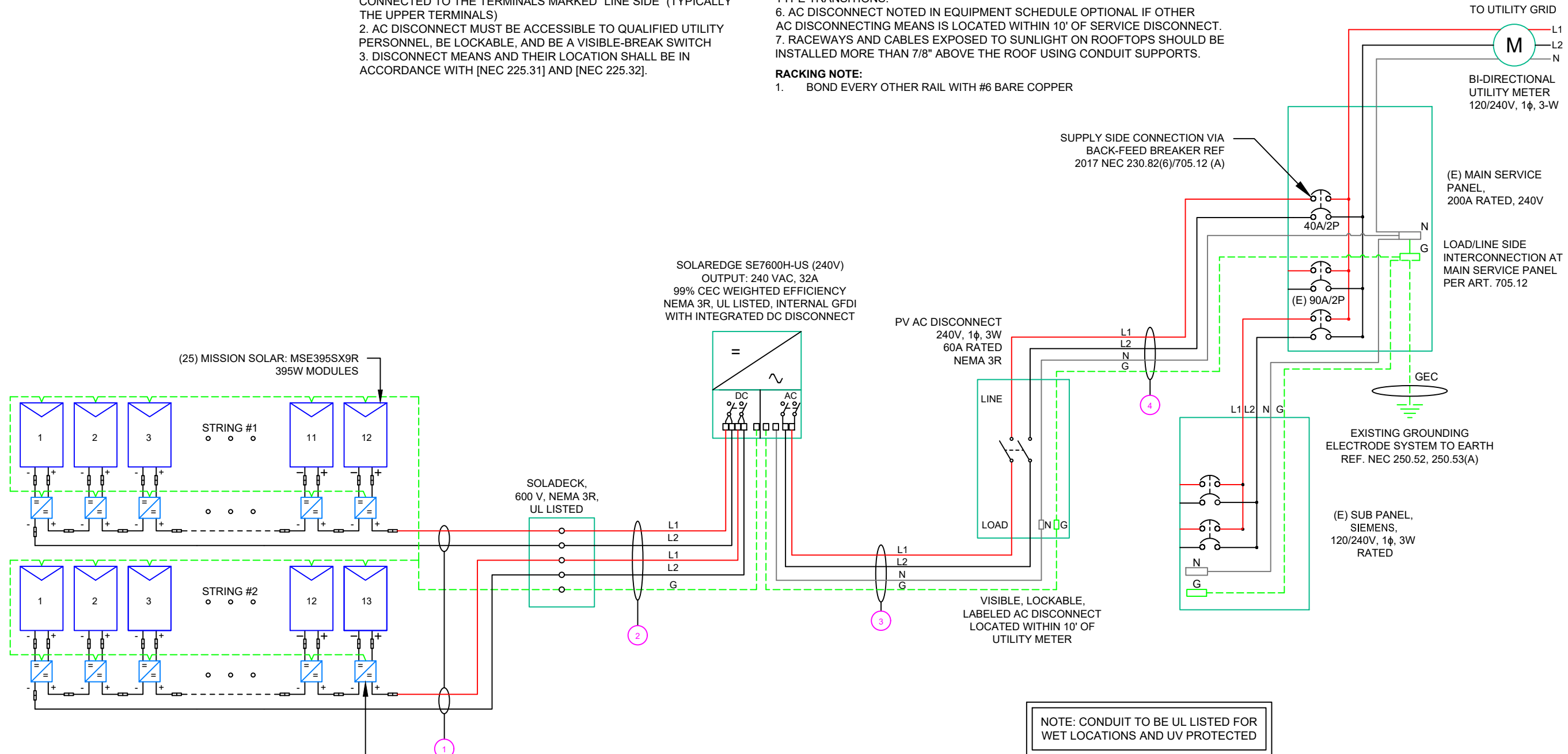
1. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING LIVE ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS)
2. AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
3.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



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

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

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

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

| INVERTER SPECIFICATIONS | |
|-------------------------|--------------------------------------|
| MANUFACTURER / MODEL # | SOLAREGE: SE7600H-US (240V) INVERTER |
| NOMINAL AC POWER | 7.6KW |
| NOMINAL OUTPUT VOLTAGE | 240 VAC |
| NOMINAL OUTPUT CURRENT | 32A |

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



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| 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 1 | AC DISCONNECT | 240 | 32 | 40 | 40 | CU #8 AWG | CU #10 AWG | CU #8 AWG | 50 | PASS | 38 | 2 | 55 | 0.91 | 1 | 50.05 | PASS | 5 | 0.778 | 0.104 | 3/4" EMT | 24.5591 |
| AC DISCONNECT | POI | 240 | 32 | 40 | 40 | CU #8 AWG | CU #10 AWG | CU #8 AWG | 50 | PASS | 38 | 2 | 55 | 0.91 | 1 | 50.05 | PASS | 5 | 0.778 | 0.104 | 3/4" EMT | 24.5591 |

CUMULATIVE VOLTAGE 0.207

| 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 | SOLADECK | 400 | 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 | 0.047 | N/A | #N/A |
| STRING 2 | SOLADECK | 400 | 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 | 0.047 | N/A | #N/A |
| SOLADECK | INVERTER | 400 | 15.00 | 18.75 | 20 | CU #10 AWG | CU #10 AWG | 35 | PASS | 38 | 4 | 40 | 0.91 | 0.8 | 29.12 | PASS | 35 | 1.24 | 0.326 | 3/4" EMT | 19.79362 |

String 1 Voltage Drop 0.372
String 2 Voltage Drop 0.372

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 SOLADECK, 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.

PROJECT NAME & ADDRESS

ELLIS ROYSTER
RESIDENCE
646 MELODY LN,
CAMERON, NC 28326

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
 INVERTER
 MAIN SERVICE PANEL
 SUBPANEL
 MAIN SERVICE 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

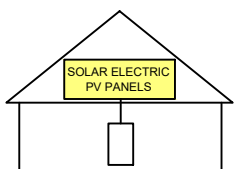
WARNING

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
 CODE REF: NEC 690.56(C)(2)

DC DISCONNECT

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

| | |
|--|---------|
| MAXIMUM VOLTAGE | 480 V |
| MAXIMUM CIRCUIT CURRENT | 20.00 A |
| MAXIMUM RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-TO-DC CONVERTER (IF INSTALLED) | |

LABEL- 9:
 LABEL LOCATION:
 INVERTER
 CODE REF: NEC 690.53

| | |
|---|---------|
| AC DISCONNECT PHOTOVOLTAIC SYSTEM POWER SOURCE | |
| NOMINAL OPERATING AC VOLATGE | 240 V |
| RATED AC OUTPUT CURRENT | 32.00 A |

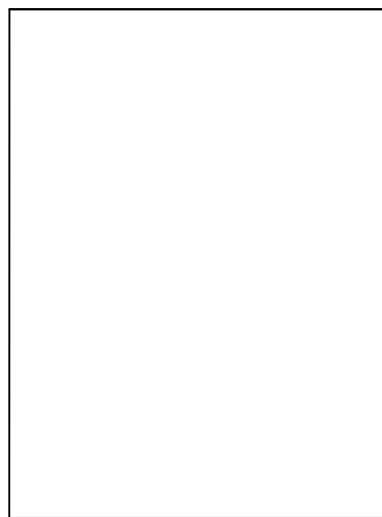
LABEL- 10:
 LABEL LOCATION:
 AC DISCONNECT
 CODE REF: NEC 690.54



TOP TIER SOLAR SOLUTIONS

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 UNITED STATES

| REVISIONS | | |
|----------------|------------|-----|
| DESCRIPTION | DATE | REV |
| INITIAL DESIGN | 04/14/2023 | |
| | | |



PROJECT NAME & ADDRESS

**ELLIS ROYSTER
 RESIDENCE**
 646 MELODY LN,
 CAMERON, NC 28326

DRAWN BY
ESR

SHEET NAME
LABELS

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

SHEET NUMBER
PV-8

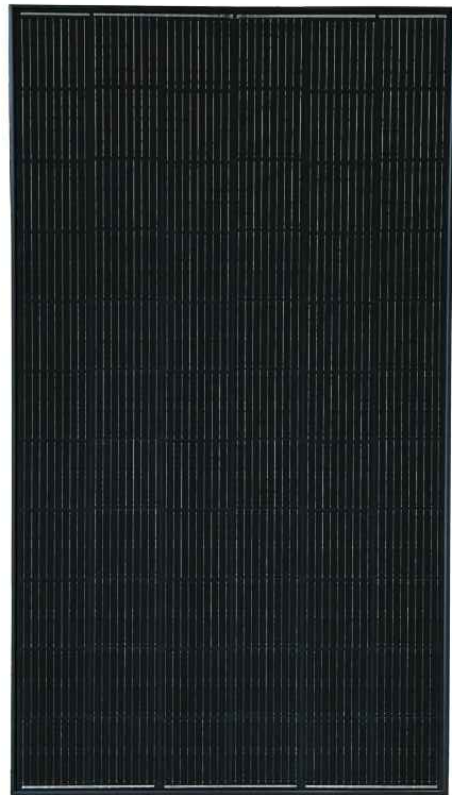
MSE PERC 66



395W

Class leading power output **-0 to +3%**

Positive Power Tolerance



True American Quality True American Brand

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

Demand the best. Demand Mission Solar Energy.



Certified Reliability

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



Advanced Technology

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



Extreme Weather Resilience

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



BAA Compliant for Government Projects

- Buy American Act
- American Recovery & Reinvestment Act

FRAME-TO-FRAME WARRANTY

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

CERTIFICATIONS

CEC



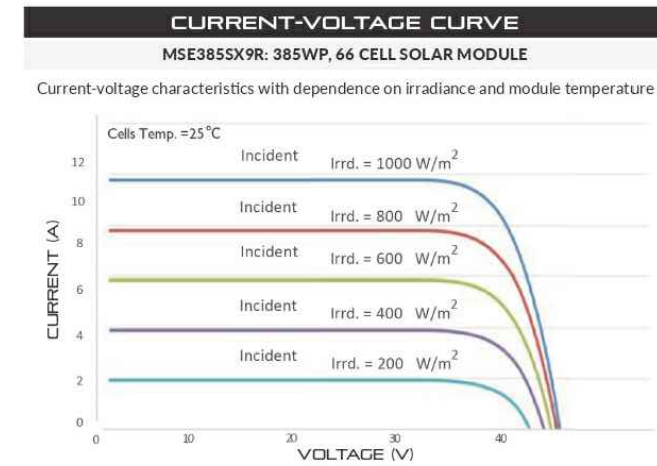
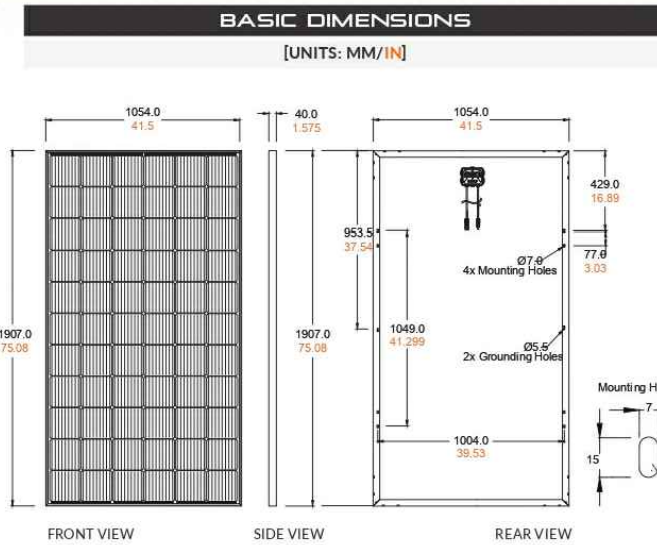
UL 61730 / IEC 61215 / IEC 61730 / IEC 61701

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



Class Leading
390-400W

MSE PERC 66



| CERTIFICATIONS AND TESTS | | |
|--------------------------|---------------------|--|
| IEC | 61215, 61730, 61701 | |
| UL | 61730 | |



CEC



Mission Solar Energy

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

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

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

| TEMPERATURE COEFFICIENTS | |
|---|-----------------|
| Normal Operating Cell Temperature (NOCT) | 43.75°C (±3.7%) |
| Temperature Coefficient of P _{max} | -0.367%/°C |
| Temperature Coefficient of Voc | -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 |

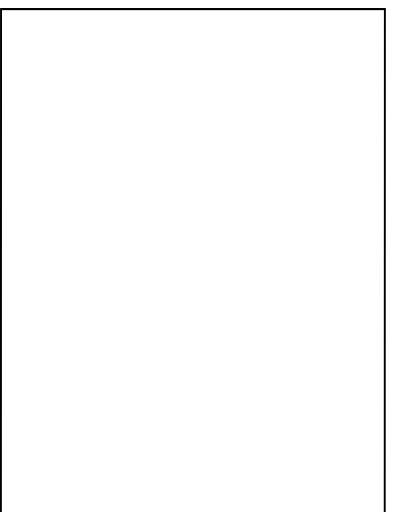
| SHIPPING INFORMATION | | | | |
|----------------------|----------------------|-------------------|-------------------|-----------|
| Container Feet | Ship To | Pallet | Panels | 390W Bin |
| 53' | Most States | 30 | 780 | 304.20 kW |
| Double Stack | CA | 26 | 676 | 263.64 kW |
| PALLET [26 PANELS] | | | | |
| 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

TOP TIER SOLAR SOLUTIONS

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

| REVISIONS | | |
|----------------|------------|-----|
| DESCRIPTION | DATE | REV |
| INITIAL DESIGN | 04/14/2023 | |
| | | |



PROJECT NAME & ADDRESS

ELLIS ROYSTER
RESIDENCE

646 MELODY LN,
CAMERON, NC 28326

DRAWN BY
ESR

SHEET NAME
**EQUIPMENT
SPECIFICATION**

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

SHEET NUMBER
PV-9

Power Optimizer For Residential Installations

S440, S500



POWER OPTIMIZER

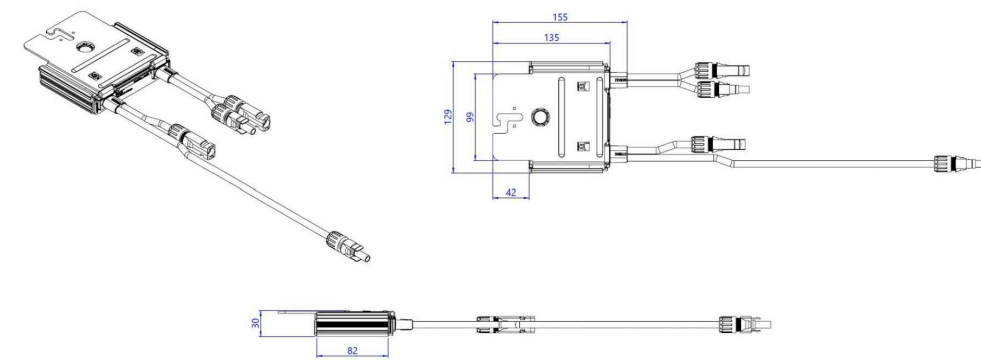
Power Optimizer For Residential Installations S440, S500

| | 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 | % |
| Overtoltage 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 ≤ 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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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 | 04/14/2023 | |

PROJECT NAME & ADDRESS

ELLIS ROYSTER
RESIDENCE
646 MELODY LN,
CAMERON, NC 28326

DRAWN BY

ESR

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-10

Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / **SE7600H-US** / SE10000H-US / SE11400H-US

12-25
YEAR
WARRANTY



INVERTERS

Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking efficiency
- Fixed voltage inverter for longer strings
- Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Extremely small
- Built-in module-level monitoring
- Outdoor and indoor installation
- Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)

solaredge.com



Single Phase Inverter with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / **SE7600H-US** / SE10000H-US / SE11400H-US

| | SE3000H-US | SE3800H-US | SE5000H-US | SE6000H-US | SE7600H-US | SE10000H-US | SE11400H-US | | |
|---|---|----------------------------|-------------|----------------------------|-------------------------------------|--------------------------|------------------------------|---------|---------|
| OUTPUT | | | | | | | | | |
| Rated AC Power Output | 3000 | 3800 @ 240V 3300 @ 208V | 5000 | 6000 @ 240V 5000 @ 208V | 7600 | 10000 | 11400 @ 240V 10000 @ 208V | VA | |
| Maximum AC Power Output | 3000 | 3800 @ 240V 3300 @ 208V | 5000 | 6000 @ 240V 5000 @ 208V | 7600 | 10000 | 11400 @ 240V 10000 @ 208V | VA | |
| AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Vac | |
| AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229) | - | ✓ | - | ✓ | - | - | ✓ | Vac | |
| AC Frequency (Nominal) | 59.3 - 60 - 60.5 ¹⁾ | | | | | | | Hz | |
| Maximum Continuous Output Current @240V | 12.5 | 16 | 21 | 25 | 32 | 42 | 47.5 | A | |
| Maximum Continuous Output Current @208V | - | 16 | - | 24 | - | - | 48.5 | A | |
| GFDI Threshold | 1 | | | | | | | A | |
| Utility Monitoring, Islanding Protection, Country Configurable Thresholds | Yes | | | | | | | | |
| INPUT | | | | | | | | | |
| Maximum DC Power @240V | 4650 | 5900 | 7750 | 9300 | 11800 | 15500 | 17650 | W | |
| Maximum DC Power @208V | - | 5100 | - | 7750 | - | - | 15500 | W | |
| Transformer-less, Ungrounded | Yes | | | | | | | | |
| Maximum Input Voltage | 480 | | | | | | | Vdc | |
| Nominal DC Input Voltage | 380 | | | | 400 | | | Vdc | |
| Maximum Input Current @240V ²⁾ | 8.5 | 10.5 | 13.5 | 16.5 | 20 | 27 | 30.5 | Adc | |
| Maximum Input Current @208V ²⁾ | - | 9 | - | 13.5 | - | - | 27 | Adc | |
| Max. Input Short Circuit Current | 45 | | | | | | | Adc | |
| Reverse-Polarity Protection | Yes | | | | | | | | |
| Ground-Fault Isolation Detection | 600µs Sensitivity | | | | | | | | |
| Maximum Inverter Efficiency | 99 | 99.2 | | | | | | % | |
| CEC Weighted Efficiency | 99 | | | | | 99 @ 240V 98.5 @ 208V | | % | |
| Nighttime Power Consumption | < 2.5 | | | | | | | W | |
| ADDITIONAL FEATURES | | | | | | | | | |
| Supported Communication Interfaces | RS485, Ethernet, ZigBee (optional), Cellular (optional) | | | | | | | | |
| Revenue Grade Data, ANSI C12.20 | Optional ³⁾ | | | | | | | | |
| Rapid Shutdown - NEC 2014 and 2017 690.12 | Automatic Rapid Shutdown upon AC Grid Disconnect | | | | | | | | |
| STANDARD COMPLIANCE | | | | | | | | | |
| Safety | UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07 | | | | | | | | |
| Grid Connection Standards | IEEE1547, Rule 21, Rule 14 (H-I) | | | | | | | | |
| Emissions | FCC Part 15 Class B | | | | | | | | |
| INSTALLATION SPECIFICATIONS | | | | | | | | | |
| AC Output Conduit Size / AWG Range | 1" Maximum / 14-6 AWG | | | | 1" Maximum / 14-4 AWG | | | | |
| DC Input Conduit Size / # of Strings / AWG Range | 1" Maximum / 1-2 strings / 14-6 AWG | | | | 1" Maximum / 1-3 strings / 14-6 AWG | | | | |
| Dimensions with Safety Switch (HxWxD) | 17.7 x 14.6 x 6.8 / 450 x 370 x 174 | | | | 21.3 x 14.6 x 7.3 / 540 x 370 x 185 | | | | in / mm |
| Weight with Safety Switch | 22 / 10 | 25.1 / 11.4 | 26.2 / 11.9 | | 38.8 / 17.6 | | | lb / kg | |
| Noise | < 25 | | | | < 50 | | | | dB(A) |
| Cooling | Natural Convection | | | | | | | | |
| Operating Temperature Range | -13 to +140 / -25 to +60 ⁴⁾ (-40°F / -40°C option) ³⁾ | | | | | | | °F / °C | |
| Protection Rating | NEMA 4X (Inverter with Safety Switch) | | | | | | | | |

¹⁾ For other regional settings please contact SolarEdge support.
²⁾ A higher current source may be used; the inverter will limit its input current to the values stated.
³⁾ Revenue grade inverter P/N: SExxxxH-US000NNC2.
⁴⁾ For power de-rating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf>
⁵⁾ -40 version P/N: SExxxxH-US000NNU4

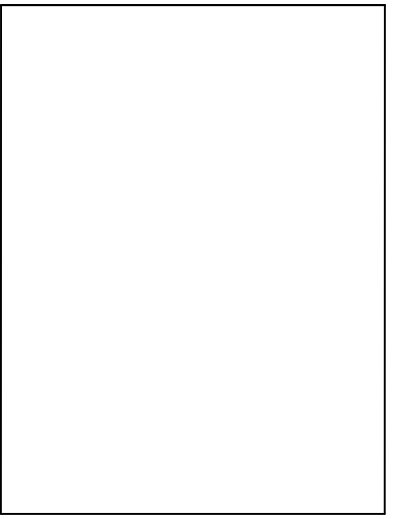
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RoHS



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

| REVISIONS | | |
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| DESCRIPTION | DATE | REV |
| INITIAL DESIGN | 04/14/2023 | |
| | | |



PROJECT NAME & ADDRESS

**ELLIS ROYSTER
RESIDENCE**

**646 MELODY LN,
CAMERON, NC 28326**

DRAWN BY
ESR

SHEET NAME
EQUIPMENT
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ANSI B
11" X 17"

SHEET NUMBER
PV-11



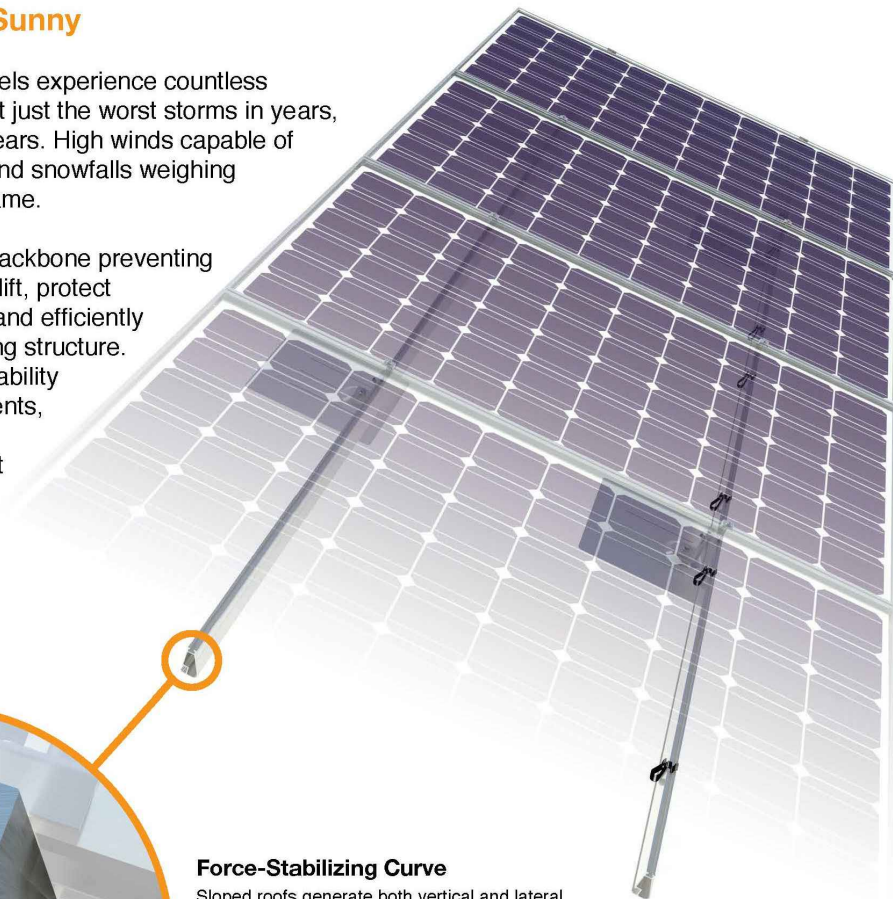
Tech Brief

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



Tech Brief

XR Rail Family

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



XR10

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

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



XR100

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

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



XR1000

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

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

Rail Selection

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

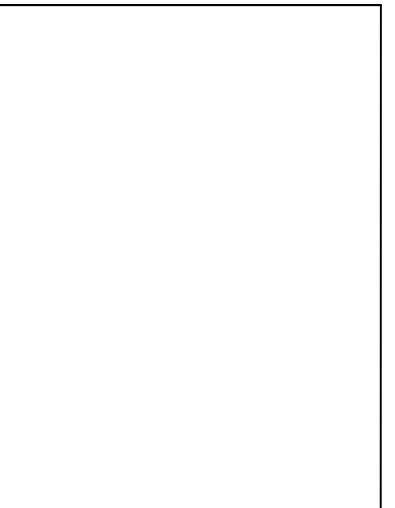
| Load | | Rail Span | | | | | |
|------------|------------|-----------|-------|-------|----|--------|-----|
| Snow (PSF) | Wind (MPH) | 4' | 5' 4" | 6' | 8' | 10' | 12' |
| None | 100 | | | | | | |
| | 120 | | | | | | |
| | 140 | XR10 | | XR100 | | XR1000 | |
| | 160 | | | | | | |
| 10-20 | 100 | |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



TOP TIER SOLAR SOLUTIONS

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

| REVISIONS | | |
|----------------|------------|-----|
| DESCRIPTION | DATE | REV |
| INITIAL DESIGN | 04/14/2023 | |
| | | |
| | | |



| PROJECT NAME & ADDRESS | |
|-------------------------|-------------------------------------|
| ELLIS ROYSTER RESIDENCE | 646 MELODY LN, CAMERON, NC 28326 |

| |
|------------------------|
| DRAWN BY ESR |
|------------------------|

| |
|--|
| SHEET NAME EQUIPMENT SPECIFICATION |
|--|

| |
|---|
| SHEET SIZE ANSI B 11" X 17" |
|---|

| |
|------------------------------|
| SHEET NUMBER PV-12 |
|------------------------------|

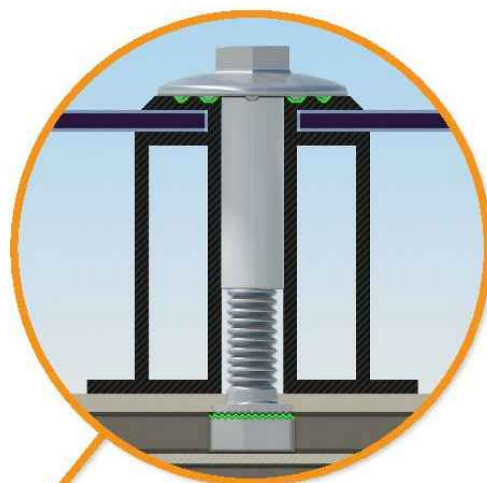


UFO Family of Components

Simplified Grounding for Every Application

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

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



Universal Fastening Object (UFO)

The UFO securely bonds solar modules to XR Rails. It comes assembled and lubricated, and can fit a wide range of module heights.



Stopper Sleeve

The Stopper Sleeve snaps onto the UFO, converting it into a bonded end clamp.



Bonded Splice

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



Grounding Lug

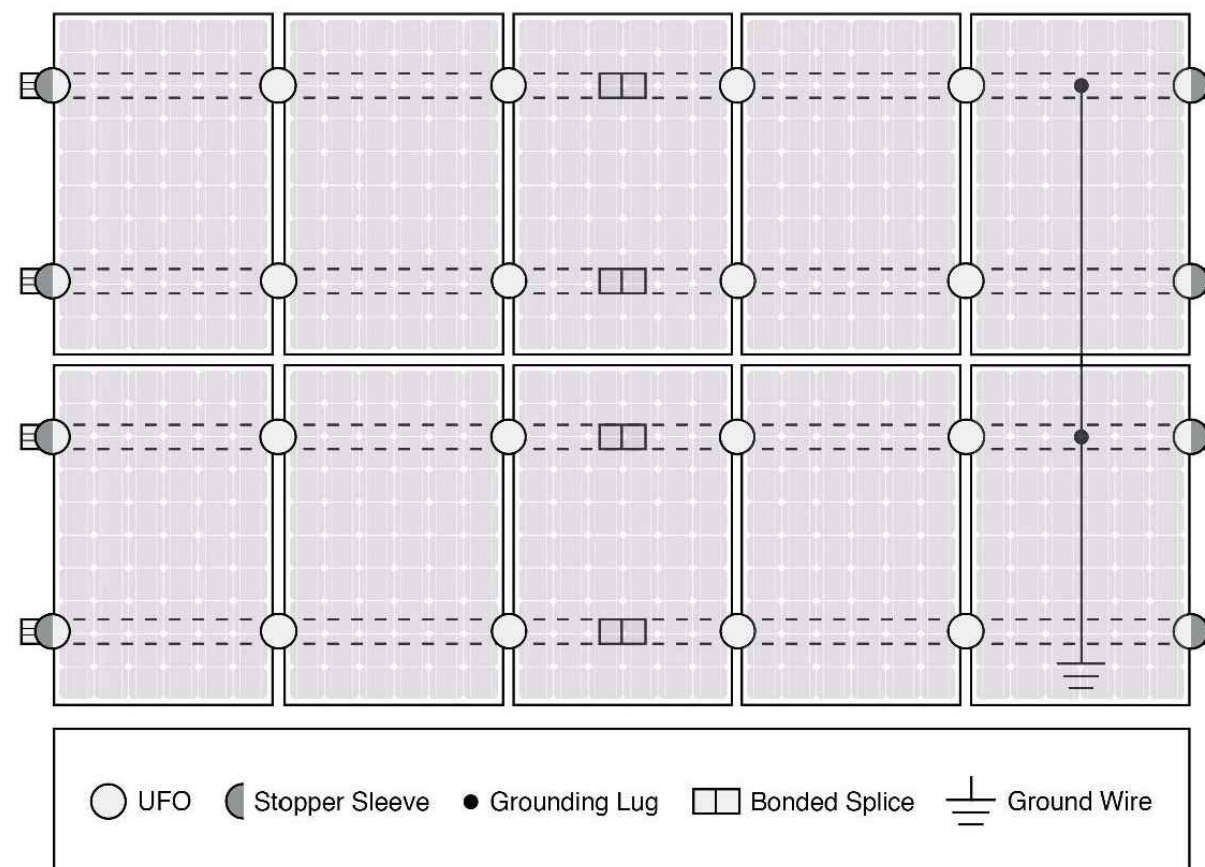
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.



Bonded Attachments

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

System Diagram



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

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PROJECT NAME & ADDRESS

ELLIS ROYSTER
RESIDENCE

646 MELODY LN,
CAMERON, NC 28326

DRAWN BY

ESR

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-13



Tech Brief

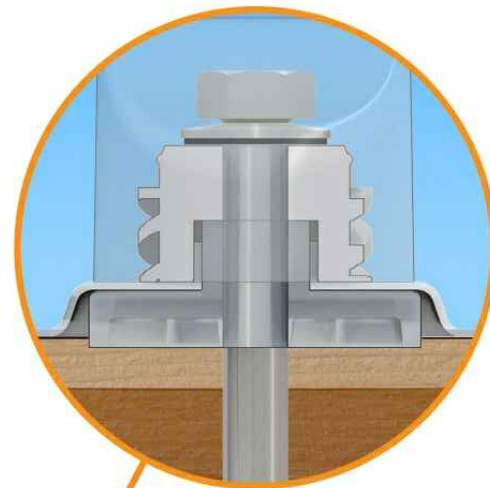
FlashFoot2

The Strongest Attachment in Solar

IronRidge FlashFoot2 raises the bar in solar roof protection. The unique water seal design is both elevated and encapsulated, delivering redundant layers of protection against water intrusion. In addition, the twist-on Cap perfectly aligns the rail attachment with the lag bolt to maximize mechanical strength.

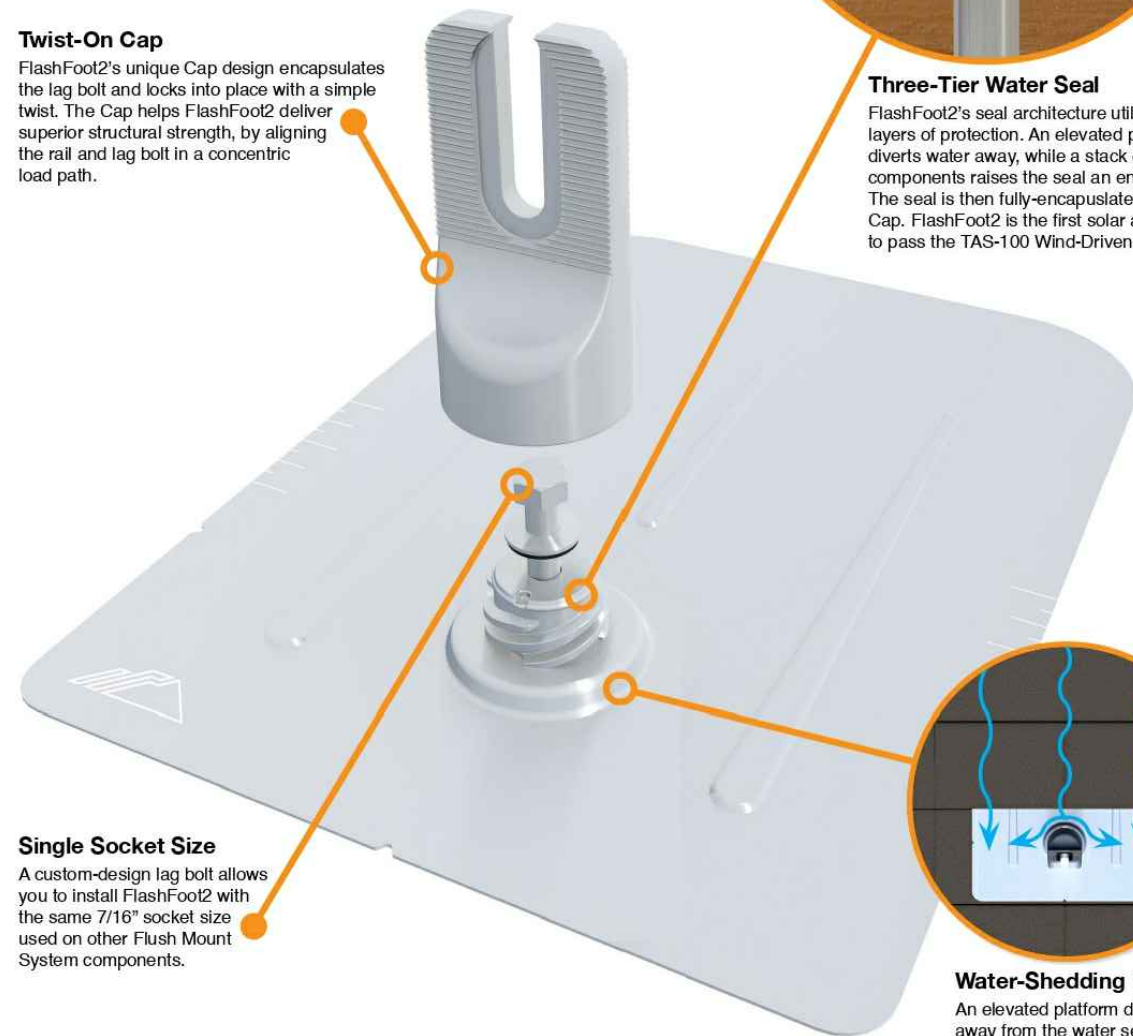
Twist-On Cap

FlashFoot2's unique Cap design encapsulates the lag bolt and locks into place with a simple twist. The Cap helps FlashFoot2 deliver superior structural strength, by aligning the rail and lag bolt in a concentric load path.



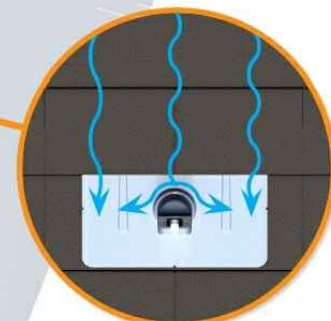
Three-Tier Water Seal

FlashFoot2's seal architecture utilizes three layers of protection. An elevated platform diverts water away, while a stack of rugged components raises the seal an entire inch. The seal is then fully-encapsulated by the Cap. FlashFoot2 is the first solar attachment to pass the TAS-100 Wind-Driven Rain Test.



Single Socket Size

A custom-design lag bolt allows you to install FlashFoot2 with the same 7/16" socket size used on other Flush Mount System components.

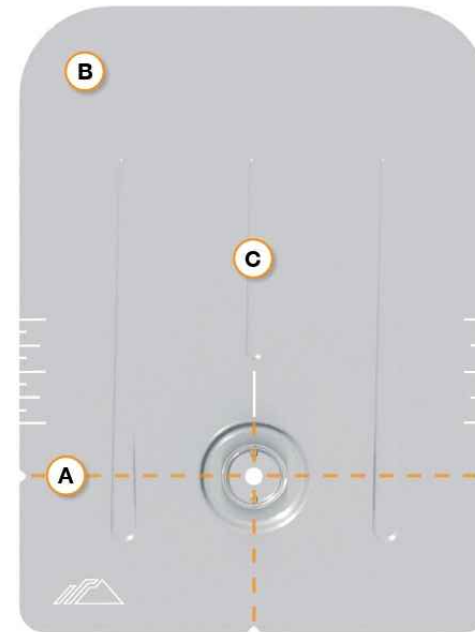


Water-Shedding Design

An elevated platform diverts water away from the water seal.

Tech Brief

Installation Features



A Alignment Markers

Quickly align the flashing with chalk lines to find pilot holes.

B Rounded Corners

Makes it easier to handle and insert under the roof shingles.

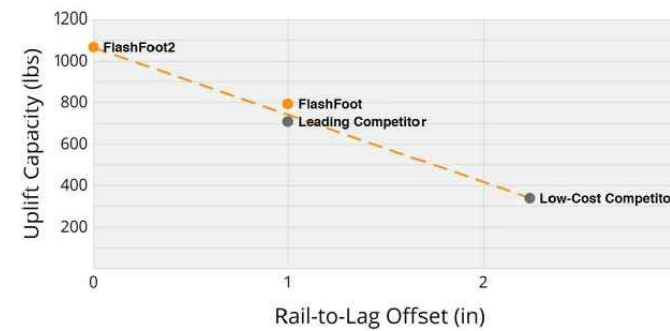
C Reinforcement Ribs

Help to stiffen the flashing and prevent any bending or crinkling during installation.

Benefits of Concentric Loading

Traditional solar attachments have a horizontal offset between the rail and lag bolt, which introduces leverage on the lag bolt and decreases uplift capacity.

FlashFoot2 is the only product to align the rail and lag bolt. This concentric loading design results in a stronger attachment for the system.



Testing & Certification

Structural Certification

Designed and Certified for Compliance with the International Building Code & ASCE/SEI-7.

Water Seal Ratings

Water Sealing Tested to UL 441 Section 27 "Rain Test" and TAS 100-95 "Wind Driven Rain Test" by Intertek. Ratings applicable for composition shingle roofs having slopes between 2:12 and 12:12.

UL 2703

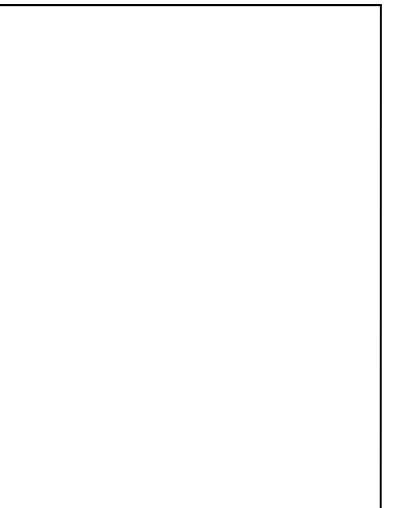
Conforms to UL 2703 Mechanical and Bonding Requirements. See Flush Mount Install Manual for full ratings.



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RESIDENCE

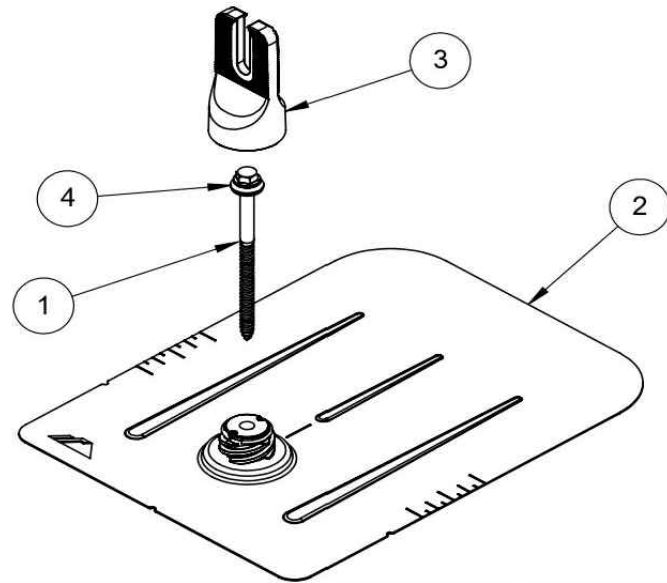
646 MELODY LN,
CAMERON, NC 28326

DRAWN BY
ESR

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-14

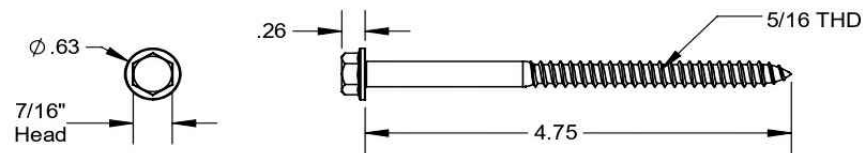


| ITEM NO. | DESCRIPTION | Qty in Kit |
|----------|-----------------------|------------|
| 1 | BOLT LAG 5/16 X 4.75" | 1 |
| 2 | ASSY, FLASHING | 1 |
| 3 | ASSY, CAP | 1 |
| 4 | WASHER, EPDM BACKED | 1 |

FLASHFOOT 2

| Part Number | Description |
|-------------|---------------------|
| FF2-02-M2 | FlashFoot2® (Mill) |
| FF2-02-B2 | FlashFoot2® (Black) |

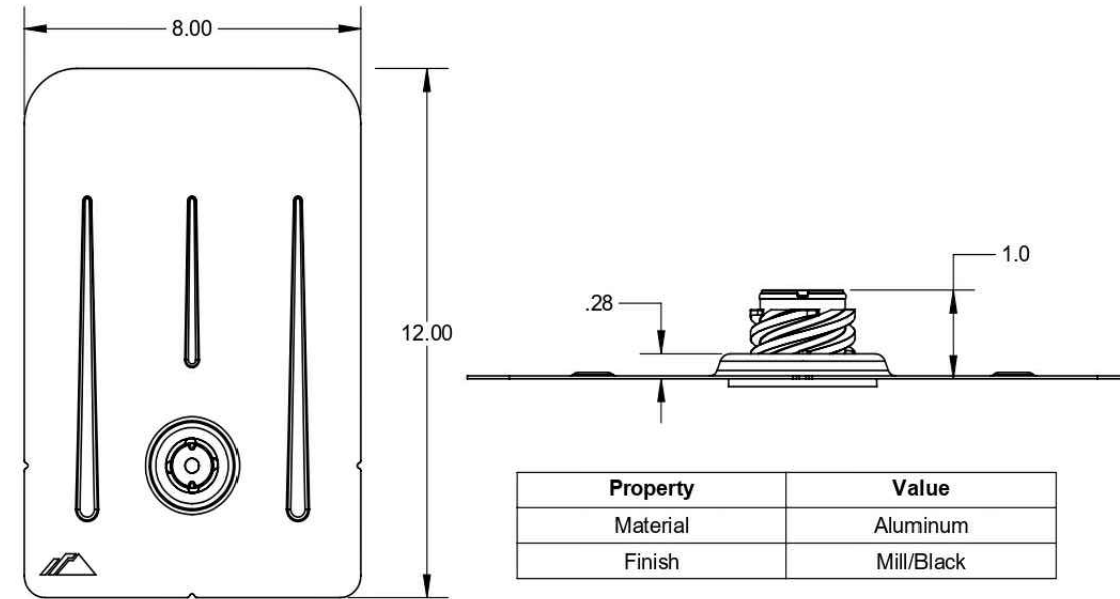
1) Bolt, Lag 5/16 x 4.75



| Property | Value |
|----------|----------------------------|
| Material | 300 Series Stainless Steel |
| Finish | Clear |

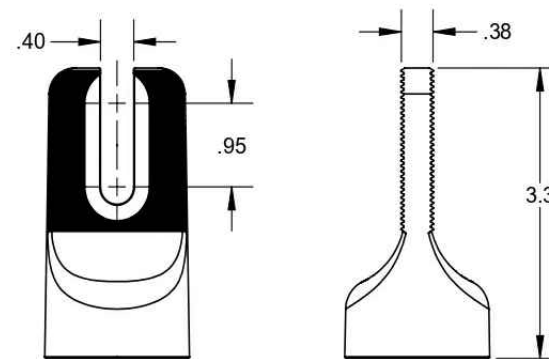
v2.0

2) Assy, Flashing



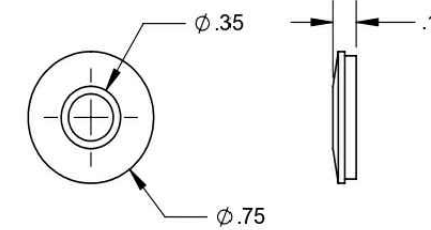
| Property | Value |
|----------|------------|
| Material | Aluminum |
| Finish | Mill/Black |

3) Assy, Cap



| Property | Value |
|----------|------------|
| Material | Aluminum |
| Finish | Mill/Black |

4) Washer, EPDM Backed



| Property | Value |
|----------|----------------------------|
| Material | 300 Series Stainless Steel |
| Finish | Clear |

v2.0

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ANSI B
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SHEET NUMBER

PV-15

SolaDeck

FLASHED PV ROOF-MOUNT COMBINER/ENCLOSURE

Basic Features

- Stamped Seamless Construction
- 18 Gauge Galvanized Steel
- Powder Coated Surfaces
- Flashes into the roof deck
- 3 Roof deck knockouts .5", .75", 1"
- 5 Centering dimples for entry/exit fittings or conduit
- 2 Position Ground lug installed
- Mounting Hardware Included



SolaDeck Model SD 0783



SolaDeck UL50 Type 3R Enclosures

Available Models:
 Model SD 0783 - (3" fixed Din Rail)
 Model SD 0786 - (6" slotted Din Rail)



SolaDeck UL 1741 Combiner/Enclosures

Models SD 0783-41 and SD 0786-41 are labeled and ETL listed UL STD 1741 according to the UL STD 1741 for photovoltaic combiner enclosures.
 Max Rated - 600VDC, 120AMPS

Model SD 0783-41 3" Fixed Din Rail fastened using Norlock System

**Typical System Configuration

- 4- Din Rail Mounted Fuse Holders 600VDC 30 AMP
- 1- Power Distribution Block 600VDC 175AMP
- 1- Bus Bar with UL lug

Model SD 0786-41 6" Slotted Din Rail fastened using steel studs

**Typical System Configuration

- 4- Din Rail Mounted Fuse Holders 600VDC 30 AMP
- 4- Din Rail Mounted Terminal Blocks
- Bus Bars with UL lug

**Fuse holders and terminal blocks added in the field must be UL listed or recognized and meet 600 VDC 30 AMP 110C for fuse holders, 600V 50 AMP 90C for rail mounted terminal blocks and 600 V 175 AMP 90C for Power Distribution Blocks. Use Copper Wire Conductors.



Cover is trimmed to allow conduit or fittings, base is center dimpled for fitting locations.



Model SD 0783-41, wired with Din Rail mounted fuse holders, bus bar and power distribution block.



Model SD 0786-41, wired with Din Rail mounted fuse holders, terminal blocks and bus bars.

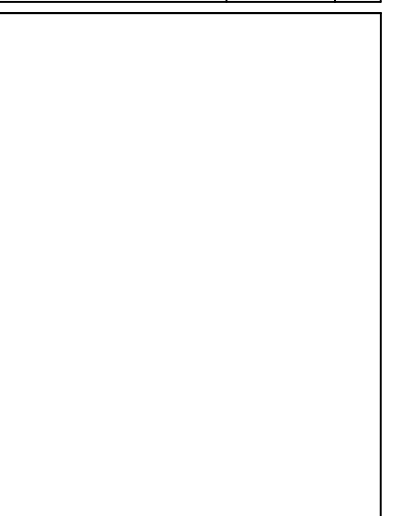
RSTC Enterprises, Inc • 2219 Heimstead Road • Eau Claire, WI 54703
 For product information call 1(866) 367-7782



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SHEET NUMBER
 PV-16