# PHOTOVOLTAIC ROOF MOUNT SYSTEM

8 MODULES-ROOF MOUNTED - 3.240 kW DC, 7.600 kW AC (A)

555 NORTHVIEW DR, SANFORD, NC 27332

## PROJECT DATA

PROJECT ADDRESS: 555 NORTHVIEW DR, SANFORD, NC 27332

OWNER: CAROL EDWARDS

DESIGNER: ESR

SCOPE: 3.240 kW DC ROOF MOUNT
SOLAR PV SYSTEM WITH
8 JA SOLAR: JAM54S31-405/MR 405W
PV MODULES WITH
8 SOLAREDGE: S440 POWER OPTIMIZERS AND
01 SOLAREDGE: SE7600H-US (240V/7600W)
INVERTER (A)

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

## SHEET INDEX

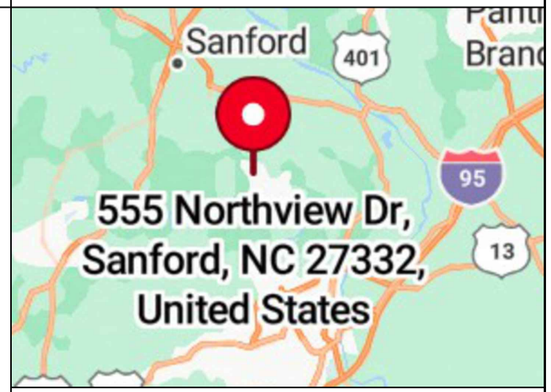


## SIGNATURE

## GENERAL NOTES

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

## VICINITY MAP




## HOUSE PHOTO

## CODE REFERENCES

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

NOTICE TO CONTRACTOR
All construction must comply with current NC Building Codes and is subject to field inspection and verification.
APPROVED
Limited building only review
Permit holder responsible for full compliance with the code
05/27/2025
Harnett COUNTY NORTH CAROLINA

REV1


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


| REVISIONS | | |
|---|---|---|
| DESCRIPTION | DATE | REV |
| INITIAL DESIGN | 05/09/2025 | |
| REVISION | 05/20/2025 | A |
| | | |

NORTH CAROLINA PROFESSIONAL ENGINEER TREVOR JONES 056324

STRUCTURAL ONLY
5/20/2025

PROJECT NAME & ADDRESS

CAROL EDWARDS RESIDENCE
555 NORTHVIEW DR, SANFORD, NC 27332

DRAWN BY
ESR

SHEET NAME
COVER SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-1

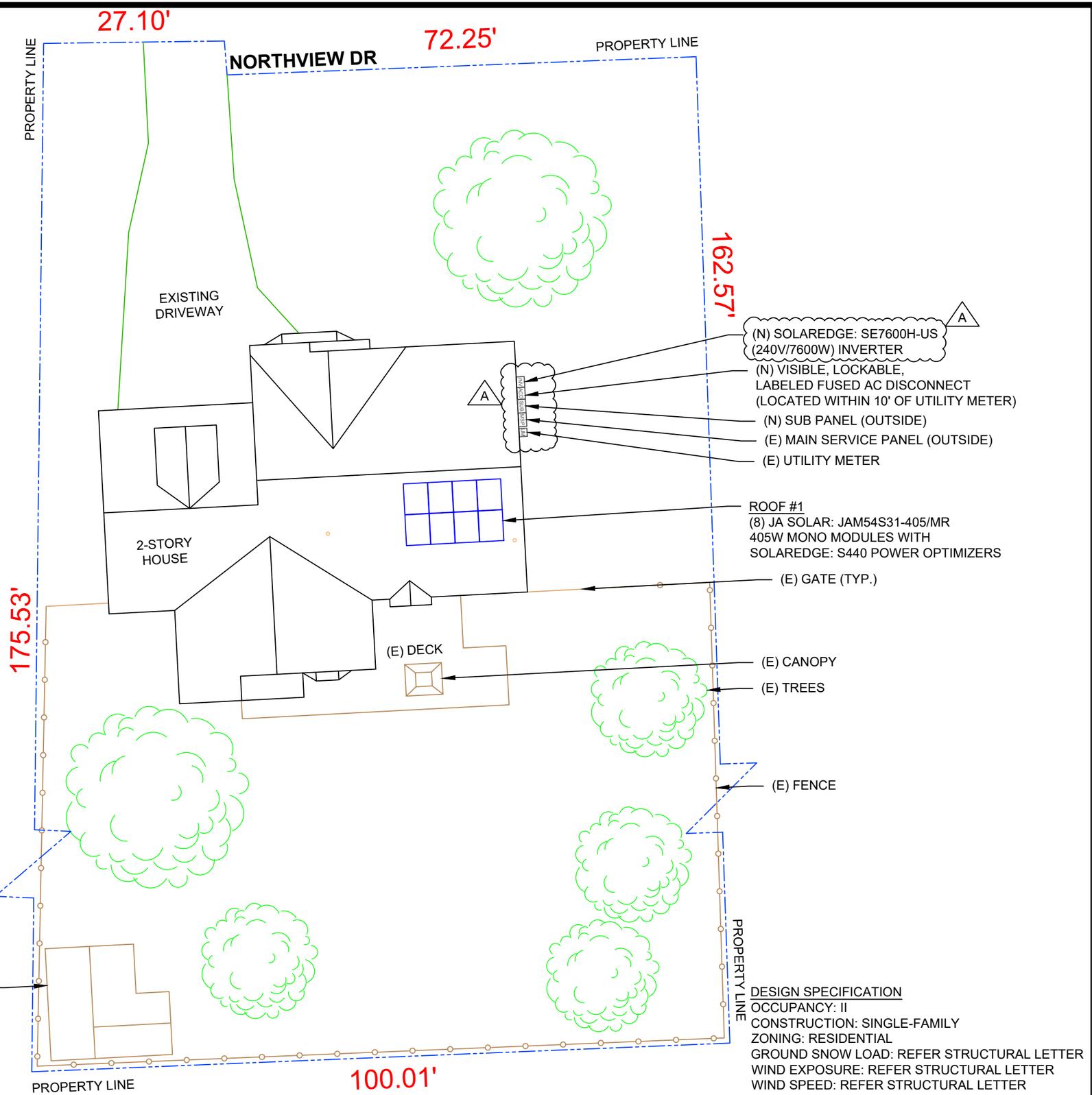
# PROJECT DESCRIPTION:

8 X JA SOLAR: JAM54S31-405/MR 405W MONO MODULES
ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES
DC SYSTEM SIZE: 3.240 kW DC
AC SYSTEM SIZE: 7.600 kW AC (A)

EQUIPMENT SUMMARY
8 JA SOLAR: JAM54S31-405/MR 405W MONO MODULES
8 SOLAREDGE: S440 POWER OPTIMIZERS
01 SOLAREDGE: SE7600H-US (240V/7600W) INVERTER (A)

ROOF ARRAY AREA #1:- 168.08 SQ FT.

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


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

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


TOP TIER SOLAR SOLUTIONS

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NORTH CAROLINA PROFESSIONAL SEAL 056324 ENGINEER TREVOR JONES

STRUCTURAL ONLY
5/20/2025

PROJECT NAME & ADDRESS
CAROL EDWARDS RESIDENCE
555 NORTHVIEW DR,
SANFORD, NC 27332

DRAWN BY
ESR

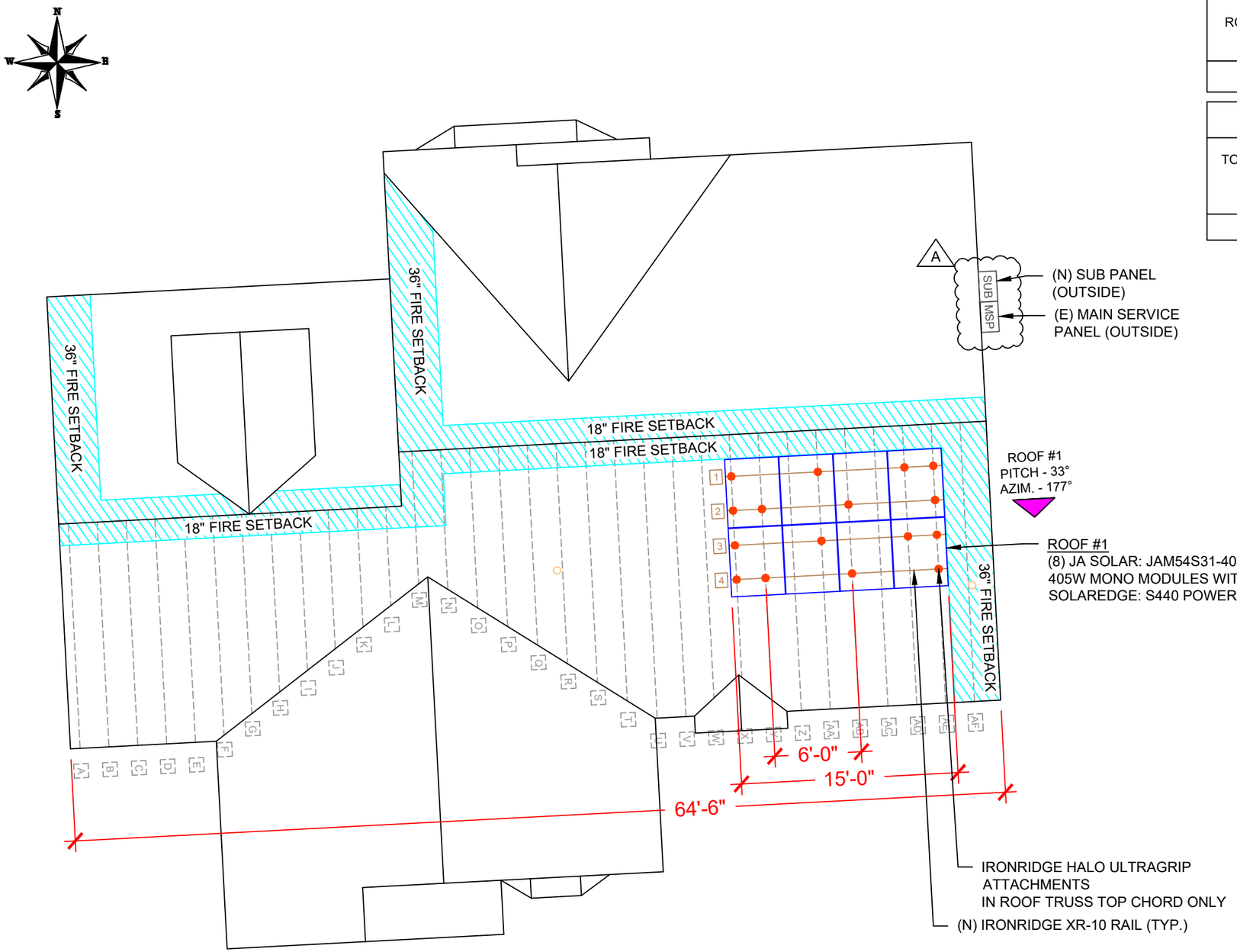
SHEET NAME
SITE PLAN

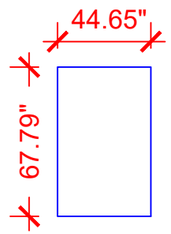
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-2

## MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 8 MODULES
MODULE TYPE = JA SOLAR: JAM54S31-405/MR 405W MONO MODULES
MODULE WEIGHT = 47.39 LBS / 21.5 kg.
MODULE DIMENSIONS = 67.79" x 44.65" = 21.01 SF




JA SOLAR:
JAM54S31-405/MR
405W MODULES

## ROOF DESCRIPTION

| | | | | | |
|---|---|---|---|---|---|
| ROOF TYPE | | | | ASPHALT SHINGLE | |
| ROOF LAYER | | | | 1 LAYER | |
| ROOF | # OF MODULES | ROOF PITCH | AZIMUTH | TRUSS SIZE | TRUSS SPACING |
| #1 | 8 | 33° | 177° | 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 (%) |
|---|---|---|
| 168.08 | 2772.95 | 6 |

## LEGEND

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

1 ROOF PLAN & MODULES
PV-3 SCALE: 1/8" = 1'-0"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555 NORTHVIEW DR, SANFORD, NC 27332

DRAWN BY
ESR

SHEET NAME
ROOF PLAN & MODULES

SHEET SIZE
ANSI B
11" X 17"

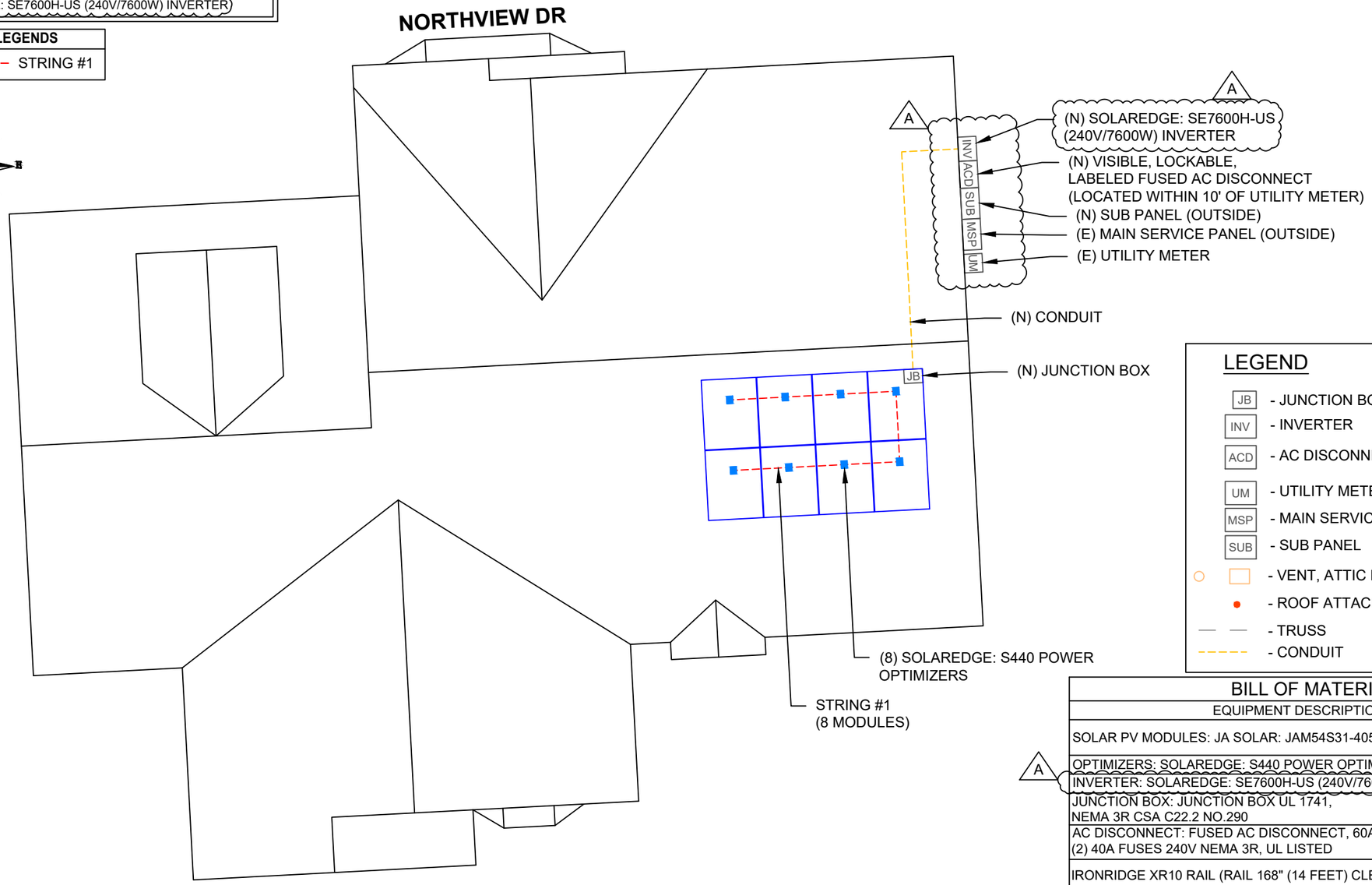
SHEET NUMBER
PV-3

DC SYSTEM SIZE: 3.240 kW DC
AC SYSTEM SIZE: 7.600 kW AC
(8) JA SOLAR: JAM54S31-405/MR 405W MONO MODULES
WITH (8) SOLAREDGE: S440 POWER OPTIMIZERS
LOCATED UNDER EACH PANEL AND
01 SOLAREDGE: SE7600H-US (240V/7600W) INVERTER

A

**STRING LEGENDS**

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


## LEGEND

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

## BILL OF MATERIALS

| EQUIPMENT DESCRIPTION | QTY |
|---|---|
| SOLAR PV MODULES: JA SOLAR: JAM54S31-405/MR 405W MODULE | 8 |
| OPTIMIZERS: SOLAREDGE: S440 POWER OPTIMIZERS | 8 |
| A INVERTER: SOLAREDGE: SE7600H-US (240V/7600W) INVERTER | 01 |
| JUNCTION BOX: JUNCTION BOX UL 1741, NEMA 3R CSA C22.2 NO.290 | 1 |
| AC DISCONNECT: FUSED AC DISCONNECT, 60A FUSED, (2) 40A FUSES 240V NEMA 3R, UL LISTED | 1 |
| IRONRIDGE XR10 RAIL (RAIL 168" (14 FEET) CLEAR) (XR-10-168A) | 8 |
| BONDED SPLICE, XR10 (XR10-BOSS-01-M1) | 4 |
| UNIVERSAL MODULE CLAMP, CLEAR (UFO-CL-01-A1) | 12 |
| END FASTENING OBJECT (END CLAMP, 30-40MM), MILL (UFO-END-01-A1) | 8 |
| GROUNDING LUG (XR-LUG-03-A1) | 2 |
| IRONRIDGE HALO ULTRAGRIP ATTACHMENTS (QM-HUG-01-M1) | 14 |
| RD STRUCTURAL SCREW,3.0L (HW-RD1430-01-M1) | 28 |
| T-BOLT BONDING HARDWARE (BHW-TB-02-A1) (PRODUCT CODE 590-0116) | 14 |
| OPTIMIZER BONDING HARDWARE T-BOLT (BHW-MI-01-A1) (PRODUCT CODE 270-0152) | 8 |

1 ELECTRICAL PLAN
PV-4 SCALE: 1/8" = 1'-0"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555 NORTHVIEW DR, SANFORD, NC 27332

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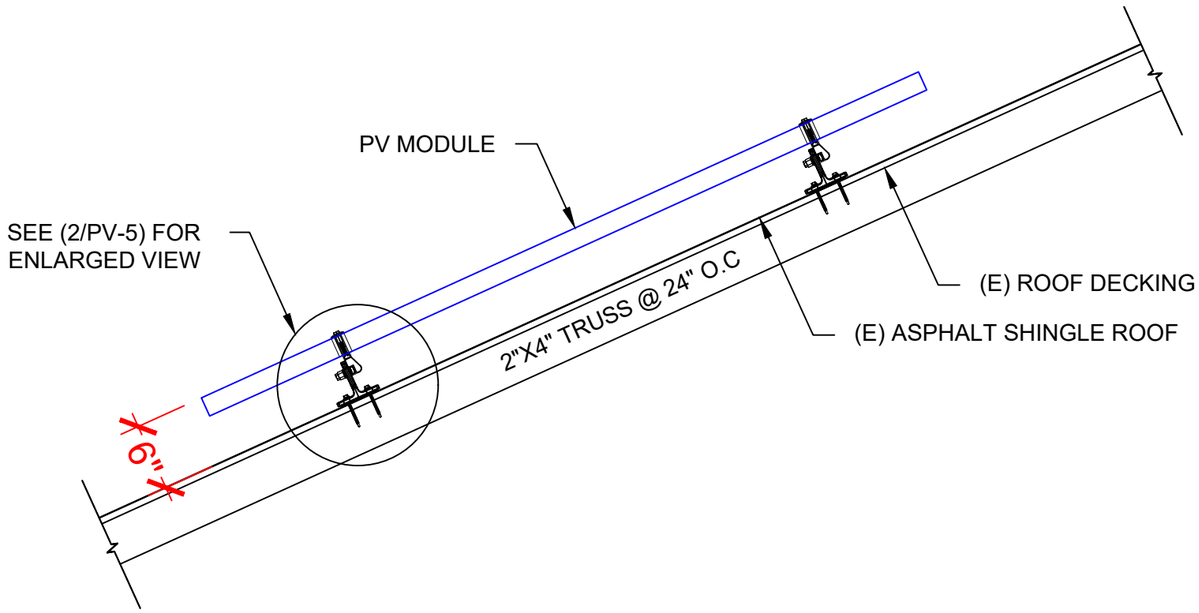
ESR

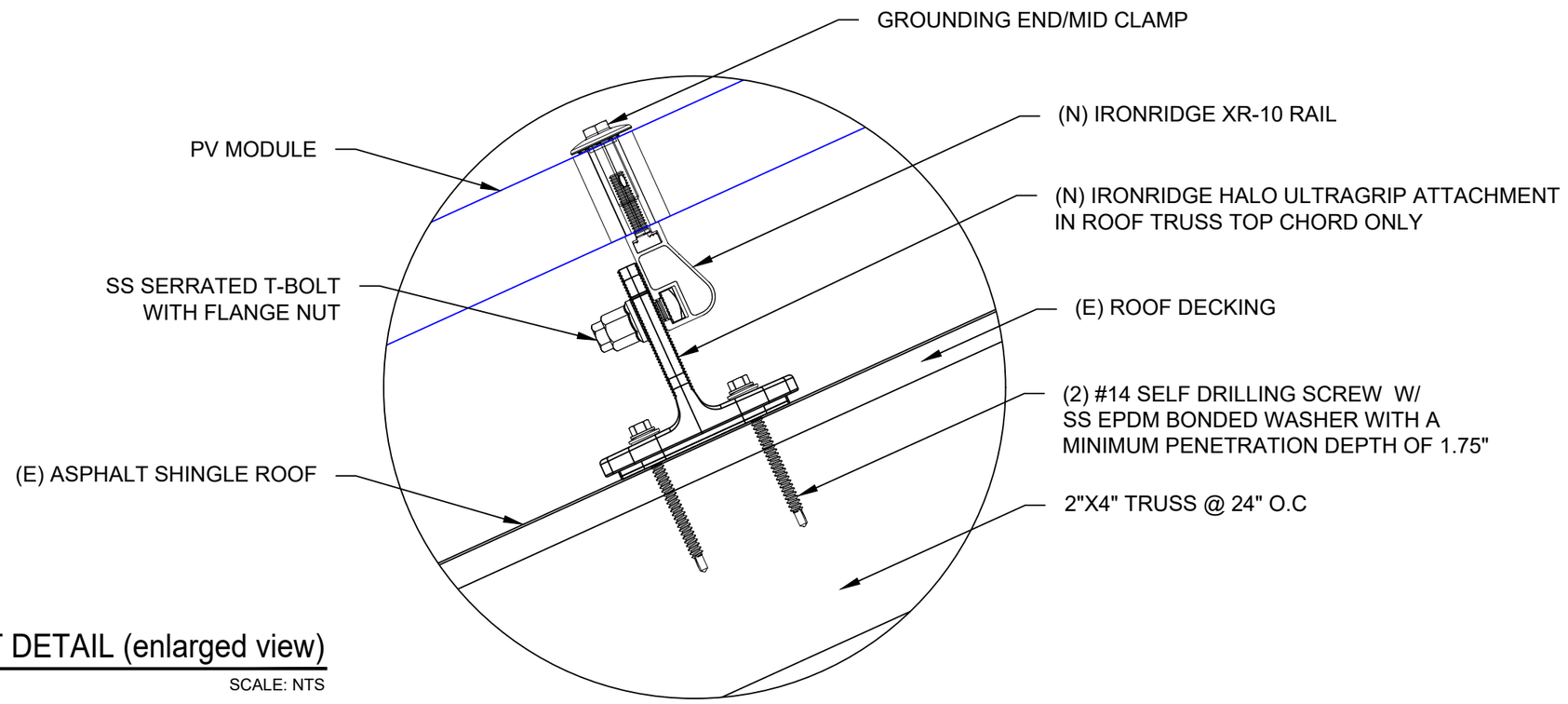
SHEET NAME
ELECTRICAL PLAN

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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NORTH CAROLINA PROFESSIONAL SEAL 056324 ENGINEER TREVOR JONES

STRUCTURAL ONLY
5/20/2025

PROJECT NAME & ADDRESS

CAROL EDWARDS RESIDENCE
555 NORTHVIEW DR,
SANFORD, NC 27332

DRAWN BY
ESR

SHEET NAME
STRUCTURAL DETAIL

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-5

DC SYSTEM SIZE: 3.240 kW DC
AC SYSTEM SIZE: 7.600 kW AC

(8) JA SOLAR: JAM54S31-405/MR 405W MONO MODULES WITH (8) SOLAREDGE: S440 POWER OPTIMIZERS LOCATED UNDER EACH PANEL (240V) AND
(01) SOLAREDGE: SE7600H-US (240V/7600W) INVERTER
(01) STRING OF 8 MODULES ARE CONNECTED IN SERIES

**BACKFEED BREAKER CALCULATION (120% RULE):**
(MAIN BUS X 1.2 - MAIN BREAKER) >= (PV BREAKER)
(100A X 1.2 - 60A) >= (40A)
(60A) >= (40A) HENCE OK

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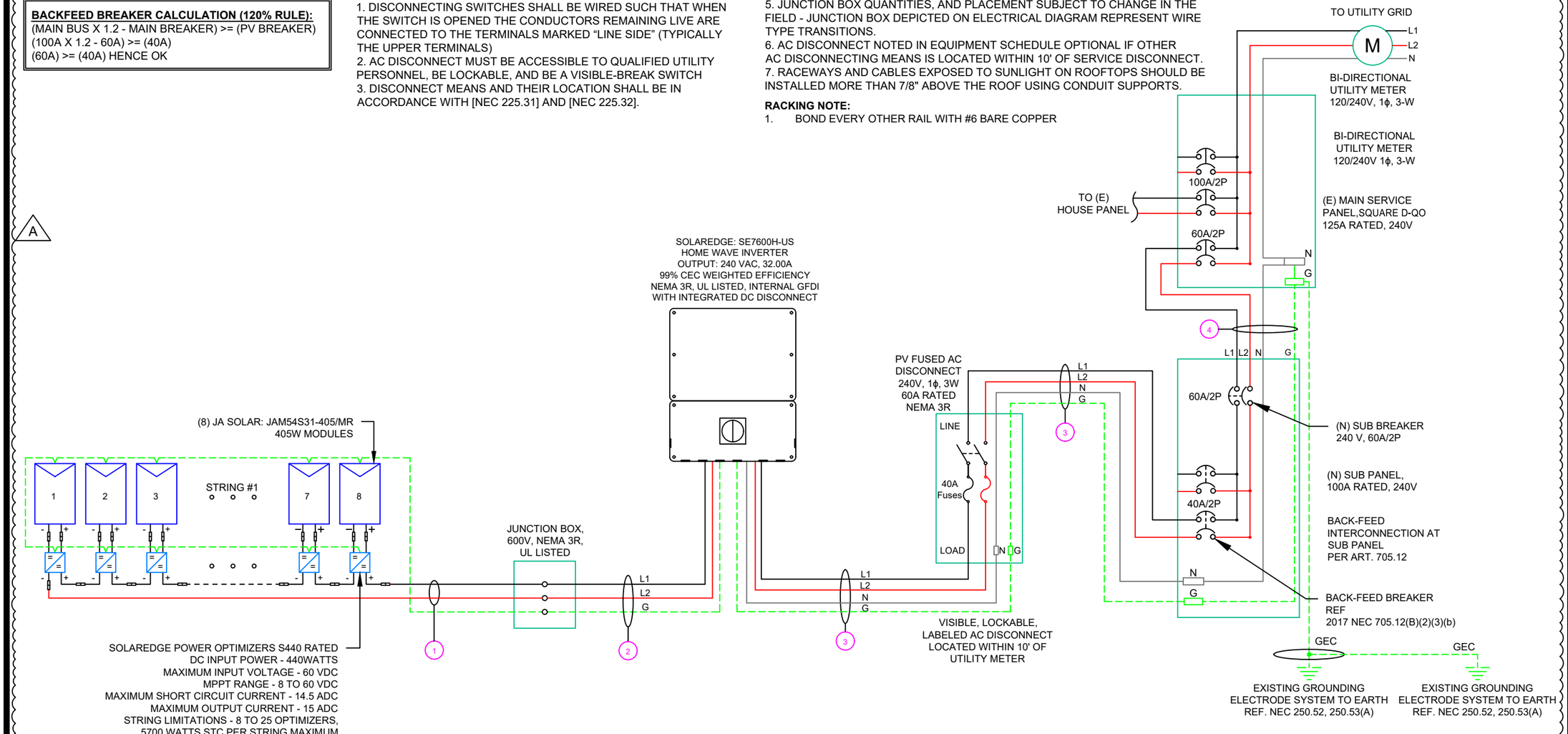
**INTERCONNECTION NOTES:**
1. INTERCONNECTION SIZING, LIMITATIONS AND COMPLIANCE DETERMINED IN ACCORDANCE WITH [NEC 705.12], AND [NEC 690.59].
2. GROUND FAULT PROTECTION IN ACCORDANCE WITH [NEC 215.9], [NEC 230.95].
3. ALL EQUIPMENT TO BE RATED FOR BACKFEEDING.
4. PV BREAKER TO BE POSITIONED AT THE OPPOSITE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

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

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

**RACKING NOTE:**
1. BOND EVERY OTHER RAIL WITH #6 BARE COPPER




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

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

1 ELECTRICAL LINE DIAGRAM
PV-6 SCALE: NTS


TOP TIER SOLAR SOLUTIONS

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


REVISIONS

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PROJECT NAME & ADDRESS

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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 # | JA SOLAR: JAM54S31-405/MR 405W MODULE |
| VMP | 31.21V |
| IMP | 12.98A |
| VOC | 37.23V |
| ISC | 13.87A |
| TEMP. COEFF. VOC | -0.275%/°C |
| MODULE DIMENSION | 67.79"L x 44.65"W x 1.18"D (In Inch) |

| INVERTER SPECIFICATIONS | |
|---|---|
| MANUFACTURER / MODEL # | SOLAREDGE: SE7600H-US (240V/7600W) INVERTER |
| NOMINAL AC POWER | 7.600 kW |
| NOMINAL OUTPUT VOLTAGE | 240 VAC |
| NOMINAL OUTPUT CURRENT | 32.00A |

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

| AMBIENT TEMPERATURE SPECS | |
|---|---|
| AMBIENT TEMP (HIGH TEMP 2%) | 38° |
| RECORD LOW TEMPERATURE | -11° |
| MODULE TEMPERATURE COEFFICIENT OF Voc | -0.275%/°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 | 38 | 2 | 40 | 0.91 | 1 | 36.4 | PASS | 5 | 1.24 | 0.049 | N/A | #N/A |
| JUNCTION BOX | INVERTER | 380 | 15.00 | 18.75 | 20 | CU #10 AWG | CU #10 AWG | 35 | PASS | 38 | 2 | 40 | 0.91 | 1 | 36.4 | PASS | 25 | 1.24 | 0.245 | 3/4" EMT | 11.88% |
| | | | | | | | | | | | | | | | | | String 1 Voltage Drop | | 0.294 | | |

**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 | 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 | 24.56% |
| AC DISCONNECT | SUBPANEL | 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 | 24.56% |
| SUBPANEL | MAIN SERVICE PANEL | 240 | 60 | 60 | 60 | CU #6 AWG | CU #10 AWG | CU #6 AWG | 65 | PASS | 38 | 2 | 75 | 0.91 | 1 | 68.25 | PASS | 5 | 0.491 | 0.123 | 3/4" EMT | 32.50% |
| | | | | | | | | | | | | | | | | | | CUMULATIVE VOLTAGE DROP | | 0.330 | | |

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ELECTRICAL NOTES

1. ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
2. ALL CONDUCTORS SHALL BE RATED UPTO 600V FOR RESIDENTIAL AND 1000V FOR COMMERCIAL AND 90 DEGREE C WET ENVIRONMENT.
3. 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.
4. WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
5. DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
6. WHERE SIZES OF JUNCTION BOX, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
7. ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
8. MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
9. MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
10. 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.


**TOP TIER SOLAR SOLUTIONS**

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


REVISIONS

| DESCRIPTION | DATE | REV |
|---|---|---|
| INITIAL DESIGN | 05/09/2025 | |
| REVISION | 05/20/2025 | A |
| | | |

PROJECT NAME & ADDRESS

CAROL EDWARDS RESIDENCE

555 NORTHVIEW DR, SANFORD, NC 27332

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:
DC/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

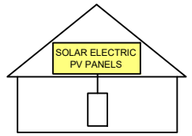
**⚠ WARNING**

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 | 32.00 A |

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

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

A

TOP TIER SOLAR SOLUTIONS

**TOP TIER SOLAR SOLUTIONS**
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CHARLOTTE, NC 28217,
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PROJECT NAME & ADDRESS

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555 NORTHVIEW DR,
SANFORD, NC 27332

DRAWN BY
ESR

SHEET NAME
LABELS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-8


**Introduction**

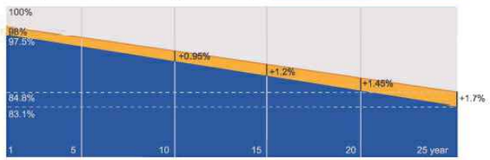
Assembled with 11BB PERC cells, the half-cell configuration of the modules offers the advantages of higher power output, better temperature-dependent performance, reduced shading effect on the energy generation, lower risk of hot spot, as well as enhanced tolerance for mechanical loading.

- Higher output power
- Lower LCOE
- Less shading and lower resistive loss
- Better mechanical loading tolerance

## Superior Warranty

- 25-year product warranty
- 25-year linear power output warranty

0.55% Annual Degradation Over 25 years




New linear power warranty ■ Standard module linear power warranty

## Comprehensive Certificates

- IEC 61215, IEC 61730,UL 61215, UL 61730
- ISO 9001: 2015 Quality management systems
- ISO 14001: 2015 Environmental management systems
- ISO 45001: 2018 Occupational health and safety management systems
- IEC TS 62941: 2016 Terrestrial photovoltaic (PV) modules – Guidelines for increased confidence in PV module design qualification and type approval

JA SOLAR

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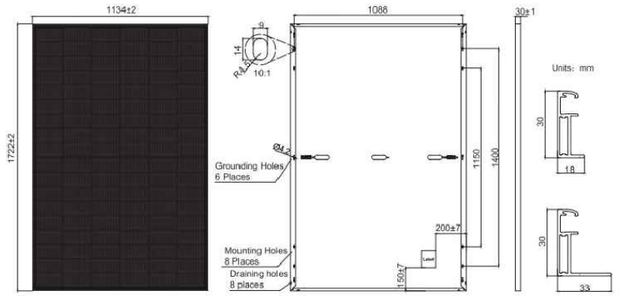
Specifications subject to technical changes and tests.
JA Solar reserves the right of final interpretation.

JA SOLAR

# JAM54S31 380-405/MR Series

## MECHANICAL DIAGRAMS




Remark: customized frame color and cable length available upon request

## SPECIFICATIONS

| | |
|---|---|
| Cell | Mono |
| Weight | 21.5kg±3% |
| Dimensions | 1722±2mm×1134±2mm×30±1mm |
| Cable Cross Section Size | 4mm² (IEC), 12 AWG(UL) |
| No. of cells | 108(6x18) |
| Junction Box | IP68, 3 diodes |
| Connector | MC4-EVO2(1500V) |
| Cable Length (Including Connector) | Portrait: 300mm(+)/400mm(-); Landscape: 1200mm(+)/1200mm(-) |
| Packaging Configuration | 36pcs/Pallet, 864pcs/40ft Container |

## ELECTRICAL PARAMETERS AT STC

| TYPE | JAM54S31 -380/MR | JAM54S31 -385/MR | JAM54S31 -390/MR | JAM54S31 -395/MR | JAM54S31 -400/MR | JAM54S31 -405/MR |
|---|---|---|---|---|---|---|
| Rated Maximum Power(Pmax) [W] | 380 | 385 | 390 | 395 | 400 | 405 |
| Open Circuit Voltage(Voc) [V] | 36.58 | 36.71 | 36.85 | 36.98 | 37.07 | 37.23 |
| Maximum Power Voltage(Vmp) [V] | 30.28 | 30.46 | 30.64 | 30.84 | 31.01 | 31.21 |
| Short Circuit Current(Isc) [A] | 13.44 | 13.52 | 13.61 | 13.70 | 13.79 | 13.87 |
| Maximum Power Current(Imp) [A] | 12.55 | 12.64 | 12.73 | 12.81 | 12.90 | 12.98 |
| Module Efficiency [%] | 19.5 | 19.7 | 20.0 | 20.2 | 20.5 | 20.7 |
| Power Tolerance | ±2% | | | | | |
| Temperature Coefficient of Isc(α_Isc) | +0.045%/℃ | | | | | |
| Temperature Coefficient of Voc(β_Voc) | -0.275%/℃ | | | | | |
| Temperature Coefficient of Pmax(γ_Pmp) | -0.350%/℃ | | | | | |
| STC | Irradiance 1000W/m², cell temperature 25°C, AM1.5G | | | | | |

Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer.They only serve for comparison among different module types.

## ELECTRICAL PARAMETERS AT NOCT

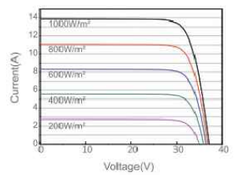
| TYPE | JAM54S31 -380/MR | JAM54S31 -385/MR | JAM54S31 -390/MR | JAM54S31 -395/MR | JAM54S31 -400/MR | JAM54S31 -405/MR |
|---|---|---|---|---|---|---|
| Rated Max Power(Pmax) [W] | 286 | 290 | 294 | 298 | 302 | 306 |
| Open Circuit Voltage(Voc) [V] | 34.36 | 34.49 | 34.62 | 34.75 | 34.88 | 35.12 |
| Max Power Voltage(Vmp) [V] | 28.51 | 28.68 | 28.87 | 29.08 | 29.26 | 29.47 |
| Short Circuit Current(Isc) [A] | 10.75 | 10.82 | 10.89 | 10.96 | 11.03 | 11.10 |
| Max Power Current(Imp) [A] | 10.03 | 10.11 | 10.18 | 10.25 | 10.32 | 10.38 |
| NOCT | Irradiance 800W/m², ambient temperature 20°C,wind speed 1m/s, AM1.5G | | | | | |

## OPERATING CONDITIONS

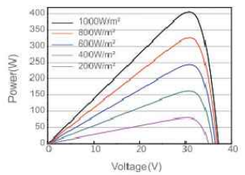
| | |
|---|---|
| Maximum System Voltage | 1000V/1500V DC |
| Operating Temperature | -40℃~+85℃ |
| Maximum Series Fuse Rating | 25A |
| Maximum Static Load,Front* Maximum Static Load,Back* | 5400Pa(112lb/ft²) 2400Pa(50lb/ft²) |
| NOCT | 45±2℃ |
| Safety Class | Class Ⅱ |
| Fire Performance | UL Type 1 |

## CHARACTERISTICS

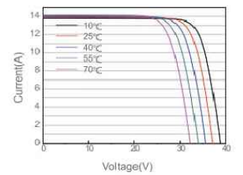
Current-Voltage Curve JAM54S31-405/MR




Power-Voltage Curve JAM54S31-405/MR




Current-Voltage Curve JAM54S31-405/MR




**Premium Cells, Premium Modules**

Version No. : Global_EN_20231130A

TOP TIER SOLAR SOLUTIONS

**TOP TIER SOLAR SOLUTIONS**

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DRAWN BY
ESR

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-9

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Total Quality. Assured.

# AUTHORIZATION TO MARK

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listee model(s) identified on the correlation page of the Listing Report.

This document is the property of Intertek Testing Services and is not transferable. The certification mark(s) may be applied only at the location of the Party Authorized To Apply Mark.

| | | | |
|---|---|---|---|
| **Applicant:** | Shanghai JA Solar Technology Co., Ltd. | **Manufacturer:** | JA SOLAR VIET NAM COMPANY LIMITED. |
| **Address:** | No. 118, Lane 3111, West Huancheng Road, Fengxian District, 201401 Shanghai | **Address:** | Lot G, Quang Chau industrial park, Quang Chau Ward, Viet Yen Town, Bac Giang Province, 236110 |
| **Country:** | P. R. China | **Country:** | Vietnam |

**Party Authorized To Apply Mark:** Same as Manufacturer
**Report Issuing Office:** Intertek Testing Services Shanghai Limited

**Control Number:** *5020189* **Authorized by:** _____
for L. Matthew Snyder, Certification Manager

C ETL LISTED US
Intertek

This document supersedes all previous Authorizations to Mark for the noted Report Number.



Intertek Testing Services NA Inc.
545 East Algonquin Road, Arlington Heights, IL 60005
Telephone 800-345-3851 or 847-439-5667 Fax 312-283-1672

| | |
|---|---|
| **Standard(s):** | Terrestrial Photovoltaic (PV) Modules - Design Qualification And Type Approval - Part 1: Test Requirements [UL 61215-1:2017 Ed.1 ]<br><br>Terrestrial Photovoltaic (PV) Modules - Design Qualification And Type Approval - Part 1-1: Special Requirements For Testing Of Crystalline Silicon Photovoltaic (PV) Modules [UL 61215-1-1:2017 Ed.1 ]<br><br>Terrestrial Photovoltaic (PV) Modules - Design Qualification And Type Approval - Part 2: Test Procedures [UL 61215-2:2017 Ed.1 ]<br><br>Photovoltaic (PV) Module Safety Qualification - Part 1: Requirements For Construction [UL 61730-1:2017 Ed.1]<br><br>Photovoltaic (PV) Module Safety Qualification - Part 2: Requirements For Testing [UL 61730-2:2017 Ed.1]<br><br>Photovoltaic (PV) Module Safety Qualification - Part 1: Requirements for Construction [CSA C22.2#61730-1:2019 Ed.2]<br><br>Photovoltaic (PV) Module Safety Qualification - Part 2: Requirements for Testing [CSA C22.2#61730-2:2019 Ed.2] |



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Total Quality. Assured.

# AUTHORIZATION TO MARK

| | |
|---|---|
| **Product:** | Crystalline Silicon Photovoltaic modules |
| **Brand Name:** | JA SOLAR 晶澳 |
| **Models:** | JAM72S03-385/PR,<br>JAP72S03-340/SC,<br>JAM72S10- followed by 395, 400, 405, 410 or 415 followed by /MB,<br>JAM60S10- followed by 330, 335, 340 or 345 followed by /MB,<br>JAM72S10- followed by 395, 400, 405, 410 or 415 followed by /MR,<br>JAM66S10- followed by 365, 365, 370, 375 or 380 followed by /MR,<br>JAM60S10- followed by 330, 335, 340 or 345 followed by /MR,<br>JAM72S09- followed by 370, 375, 380, 385, 390, 395 or 400 followed by /PR,<br>JAM60S09- followed by 310, 315, 320 or 325 followed by /PR,<br>JAM72S09- followed by 375, 380 or 385 followed by /BP,<br>JAM60S09- followed by 315 or 320 followed by /BP,<br>JAM72S10- followed by 385, 390, 395 or 400 followed by /BP,<br>JAM60S10- followed by 320, 325 or 330 followed by /BP,<br>JAM72S10- followed by 380, 385, 390, 395, 400 or 405 followed by /PR,<br>JAM60S10- followed by 320, 325, 330 or 335 followed by /PR,<br>JAM72S12- followed by 365, 370, 375, 380 or 385 followed by /PR,<br>JAM60S12- followed by 305, 310, 315 or 320 followed by /PR,<br>1JAM78S10- followed by 435, 440, 445, 450 or 455 followed by /MR,<br>1JAM6(K)-72-335/4BB/1500V,<br>JAM60S17- followed by 320, 325, or 330 followed by /MR,<br>JAM72S20- followed by 430, 435, 440, 445, 450, 455, 460, 465 or 470 followed by /MR,<br>JAM60S20- followed by 355, 360, 365, 370, 375, 380, 385 or 390 followed by /MR,<br>JAM72S30- followed by 530, 535, 540, 545, 550 or 555 followed by /MR,<br>JAM66S30- followed by 490, 495 or 500 followed by /MR,<br>JAM68S11- followed by 355, 360 or 365 followed by /PR,<br>JAM68S11- followed by 345, 350, 355, 360 or 365 followed by /PR(B),<br>JAM76S11- followed by 395, 400, 405, 410 or 415 followed by /PR(B),<br>JAM76S11- followed by 395, 400, 405, 410 or 415 followed by /PR(B)/1000V,<br>JAM78S30-followed by 575, 580, 585, 590, 595, 600, 605 or 610 followed by /GR,<br>JAM72S30-followed by 535, 540, 545, 550, 555 or 560 followed by /GR,<br>JAM66S30-followed by 490, 495, 500 or 505 followed by /GR,<br>JAM60S30-followed by 445, 450, 455 or 460 followed by /GR,<br>JAM54S30-followed by 400, 405, 410, 415 or 420 followed by /GR,<br>JAM78S31-followed by 570, 575, 580, 585 or 590 followed by /GR,<br>JAM72S31-followed by 530, 535 or 540 followed by /GR,<br>JAM66S31-followed by 485, 490 or 495 followed by /GR,<br>JAM60S31-followed by 440, 445 or 450 followed by /GR,<br>JAM54S31-followed by 395, 400 , 405, 410 or 415 followed by /GR,<br>JAM60S31-followed by 430, 435, 440, 445 or 450 followed by /GR/1000V,<br>JAM54S31-followed by 390, 395, 400, 405, 410 or 415 followed by /GR/1000V,<br>JAM54S30-followed by 400, 405, 410, 415, 420 or 425 followed by /MR,<br>JAM72S31-followed by 510, 515, 520, 525, 530, 535, 540 or 545 followed by /MR,<br>JAM54S31-followed by 385, 390, 395, 400 or 405 followed by /MR,<br>JAM54S30-followed by 400, 405, 410, 415, 420 or 425 followed by /MR/1000V,<br>JAM72S31-followed by 510, 515, 520, 525, 530,535, 540 or 545 followed by /MR/1000V,<br>JAM54S31-followed by 385, 390, 395, 400 or 405 followed by /MR/1000V,<br>JAM72S17-followed by 390, 395, 400 or 405 followed by /MR,<br>JAM72S17-followed by 390, 395, 400 or 405 followed by /MR/1000V,<br>JAM78S30- followed by 580, 585, 590, 595, 600 or 605 followed by /MR,JAM72S30-followed by 555, 560, 565, 570, 575, 580 followed by /LR,<br>JAM54S30-followed by 415, 420, 425, 430, 435 followed by /LR,<br>JAM54S31-followed by 415, 420 followed by /LR,<br>JAM54S30-followed by 385, 390, 395, 400, 405, 410 followed by /MB,<br>JAM54S31-followed by 385, 390, 395, 400, 405 followed by /MB,<br>JAM54S30-followed by 410, 415, 420, 425 followed by /LB,<br>JAM54S31-followed by 410, 415 followed by /LB ,<br>JAM72S30-followed by 535, 540, 545, 550 followed by /MB,<br>JAM72S31-followed by 525, 530, 535, 540 followed by /MB. |



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DRAWN BY
ESR

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-10

# Residential Power Optimizer

## For North America

S440 / S500B / S650B


POWER OPTIMIZER

## 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 wire management and easy assembly using a single bolt
- Flexible system design for maximum space utilization
- Compatible with bifacial PV modules
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)

solaredge.com

solaredge


# Residential Power Optimizer

## For North America

S440 / S500B / S650B


| | S440 | S500B | S650B | |
|---|---|---|---|---|
| **INPUT** | | | | |
| Rated Input DC Power(1) | 440(2) | 500(3) | 650 | W |
| Absolute Maximum Input Voltage (Voc) | 60 | 125 | 85 | Vdc |
| MPPT Operating Range | 8 – 60 | 12.5 – 105 | 12.5 – 85 | Vdc |
| Maximum Input Current (Maximum Isc of Connected PV Module)(2) | 14.5 | 15 | | Adc |
| Maximum Input Short Circuit Current(4) | 18.75 | | | Adc |
| Maximum Efficiency | 99.5 | | | % |
| Weighted Efficiency | 98.6 | | | % |
| Overvoltage Category | II | | | |
| **OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)** | | | | |
| Maximum Output Current | 15 | | | Adc |
| Maximum Output Voltage | 60 | 80 | | Vdc |
| **OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR INVERTER OFF)** | | | | |
| Safety Output Voltage per Power Optimizer | 1 ± 0.1 | | | Vdc |
| **STANDARD COMPLIANCE** | | | | |
| Photovoltaic Rapid Shutdown System | CSA C22.2#330, NEC 2014 – 2023 | | | |
| EMC | FCC Part 15 Class B; IEC 61000-6-2; IEC 61000-6-3 | | | |
| Safety | CSA C22.2#107.1; IEC 62109-1 (Class II Safety); UL 1741 | | | |
| Material | UL 94 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 / 5.07 x 6.10 x 1.18 | 129 x 165 x 45 / 5.07 x 6.49 x 1.77 | | mm / in |
| Weight | 720 / 1.6 | 790 / 1.74 | | gr / lb |
| Input Connector | MC4 | | | |
| Input Wire Length | 0.1 / 0.32 | | | m / ft |
| Output Connector | MC4 | | | |
| Output Wire Length | (+) 2.3, (-) 0.10 / (+) 7.54, (-) 0.32 | | | m / ft |
| Operating Temperature Range(5) | -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 S440 with part number S440-1GM4MRMP, the Rated Input DC Power is 650W, and the Maximum Input Current is 15A.
(3) For installations after Aug 1st, 2024, the Rated Input DC Power for S500B is 650W.
(4) The Maximum Input Short Circuit Current is adjusted for worst case conditions of ambient temperature, irradiance, bifacial gain, and so on, in accordance with NEC and CSA.
(5) Power derating is applied for ambient temperatures above +85°C / +185°F for S440, and for ambient temperatures above +75°C / 167°F for S500B and S650B. Refer to the Power Optimizers Temperature Derating technical note for more details.

| PV System Design Using a SolarEdge Inverter(6) | | SolarEdge Home Wave/Hub Single Phase | Three Phase for 208V Grid | Three Phase for 277/480V Grid | |
|---|---|---|---|---|---|
| Minimum String Length (Power Optimizers) | S440 | 8 | 10 | 18 | |
| | S500B, S650B | 6 | 8 | 14 | |
| Maximum String Length (Power Optimizers) | | 25 | | 50(7) | |
| Maximum Usable Power Delivered per String | | 5700 | 6000 | 12,750 | W |
| Maximum Allowed Connected Power per String(8)(10) | Inverters with Rated AC Power ≤ 5700W | Per the inverter's maximum input DC power(8) | One string: 7200<br>Two strings or more: 7800 | 15,000 | W |
| | Inverters with Rated AC Power of 6000W | 5700 | | | |
| | Inverters with Rated AC Power ≥ 7600W | 6800, only when connected to at least two strings | | | |
| Parallel Strings of Different Lengths or Orientations | | Yes | | | |

(6) It is not allowed to mix S-series and P-series Power Optimizers in new installations in the same string.
(7) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement.
(8) Refer to the Single String Design Guidelines application note for details.
(9) For the 208V grid, the maximum is permitted only when the difference in connected power between strings is 1,000W or less.
(10) For the 240V or 277/480V grids, the maximum is permitted only when the difference in connected power between strings 2,000W or less.



Intertek 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 | 05/09/2025 | |
| REVISION | 05/20/2025 | A |
| | | |

PROJECT NAME & ADDRESS

CAROL EDWARDS RESIDENCE

555 NORTHVIEW DR,
SANFORD, NC 27332

DRAWN BY
ESR

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-11

# SolarEdge Home Wave Inverter

## For North America

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

INVERTERS


## Optimized installation with HD-Wave technology

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

solaredge.com

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# SolarEdge Home Wave Inverter

## For North America

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

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

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

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PROJECT NAME & ADDRESS

CAROL EDWARDS RESIDENCE

555 NORTHVIEW DR,
SANFORD, NC 27332

DRAWN BY
ESR

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-12

# SolarEdge Home Wave Inverter

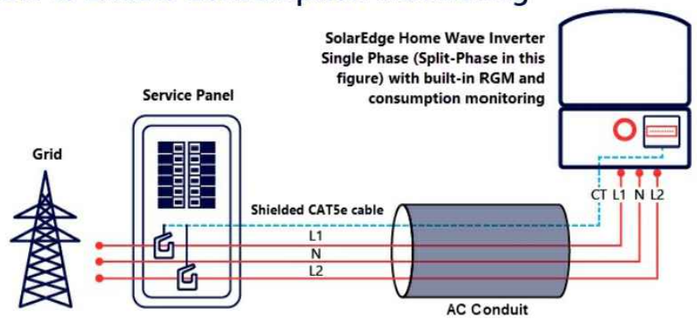
## For North America

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

| Applicable to inverters with part number | SExxxxH-xxxxxBxx4 | | | | | SE11400H-xxxxxBxx5 | |
|---|---|---|---|---|---|---|---|
| | SE3800H-US | SE5000H-US | SE6000H-US | SE7600H-US | SE10000H-US | SE11400H-US | |
| **ADDITIONAL FEATURES** | | | | | | | |
| Supported Communication Interfaces | RS485, Ethernet, ZigBee (optional), wireless SolarEdge Home Network (optional)[3], Wi-Fi (optional), Cellular (optional) | | | | | | |
| Revenue Grade Metering, ANSI C12.20 | Optional[4] | | | | | | |
| Consumption Metering | | | | | | | |
| Inverter Commissioning | With the SetApp mobile application using Built-in Wi-Fi Access Point for Local Connection | | | | | | |
| Rapid Shutdown - NEC 2014-2023 per articles 690.11 and 690.12 | Automatic Rapid Shutdown upon AC Grid Disconnect | | | | | | |
| **STANDARD COMPLIANCE** | | | | | | | |
| Safety | UL1741, UL1741 SA, UL1741 SB, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07 | | | | | | |
| Grid Connection Standards | IEEE1547-2018, Rule 21, Rule 14 (HI), CSA C22.3 No. 9 | | | | | | |
| Emissions | FCC Part 15 Class B | | | | | | |
| **INSTALLATION SPECIFICATIONS** | | | | | | | |
| AC Output Conduit Size / AWG Range | 1" Maximum / 14 – 6 AWG | | | | 1" Maximum / 14 – 4 AWG | | |
| DC Input Conduit Size / # of Strings / AWG Range | 1" Maximum / 1 – 2 strings / 14 – 6 AWG | | | | 1" Maximum / 1 – 3 strings / 14 – 6 AWG | | |
| Dimensions with Safety Switch (H x W x D) | 17.7 x 14.6 x 6.8 / 450 x 370 x 174 | | | | 21.06 x 14.6 x 7.3 / 535 x 370 x 185 | 21.06 x 14.6 x 8.2 / 535 x 370 x 208[5] | in / mm |
| Weight with Safety Switch | 22 / 10 | 25.1 / 11.4 | 26.2 / 11.9 | | 38.8 / 17.6 | 44.9 / 20.4[5] | lb / kg |
| Noise | < 25 | | | <50 | | | dBA |
| Cooling | Natural Convection | | | | | | |
| Operating Temperature Range | -40 to +140 / -40 to +60[6] | | | | | | °F / °C |
| Protection Rating | NEMA 4X (Inverter with Safety Switch) | | | | | | |

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

## How to Enable Consumption Monitoring




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



CE

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TOP TIER SOLAR SOLUTIONS

TOP TIER SOLAR SOLUTIONS
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555 NORTHVIEW DR, SANFORD, NC 27332

DRAWN BY
ESR

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EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-13

Tech Brief

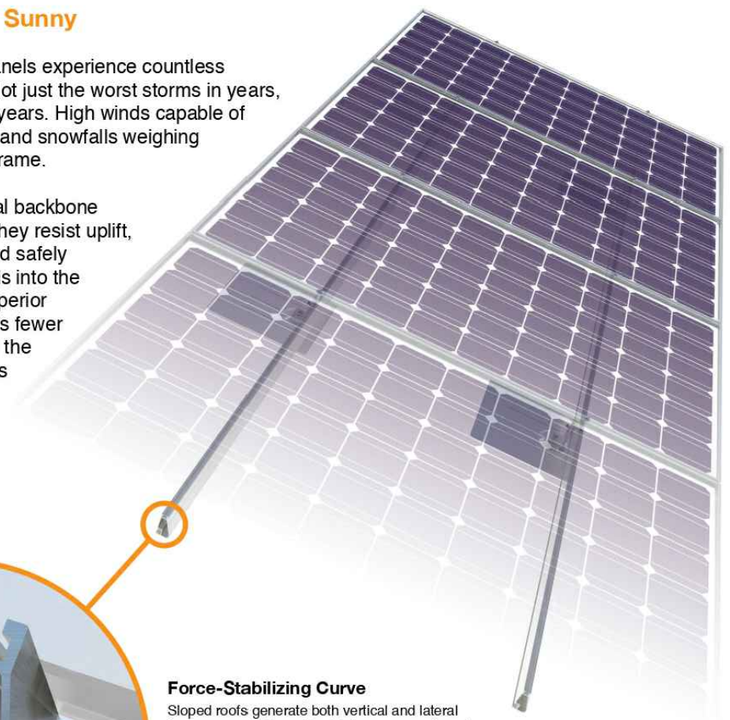
IRONRIDGE

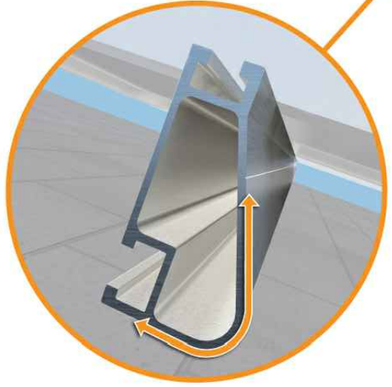
# XR Rail® Family

## Solar Is Not Always Sunny

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

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





### Force-Stabilizing Curve

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

### Compatible with Flat & Pitched Roofs

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

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

### Corrosion-Resistant Materials

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

Tech Brief

## XR Rail® Family

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

**XR10**

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

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

**XR100**

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

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

**XR1000**

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

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

## Rail Selection

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

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

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



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ESR

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-14

Tech Brief

IRONRIDGE

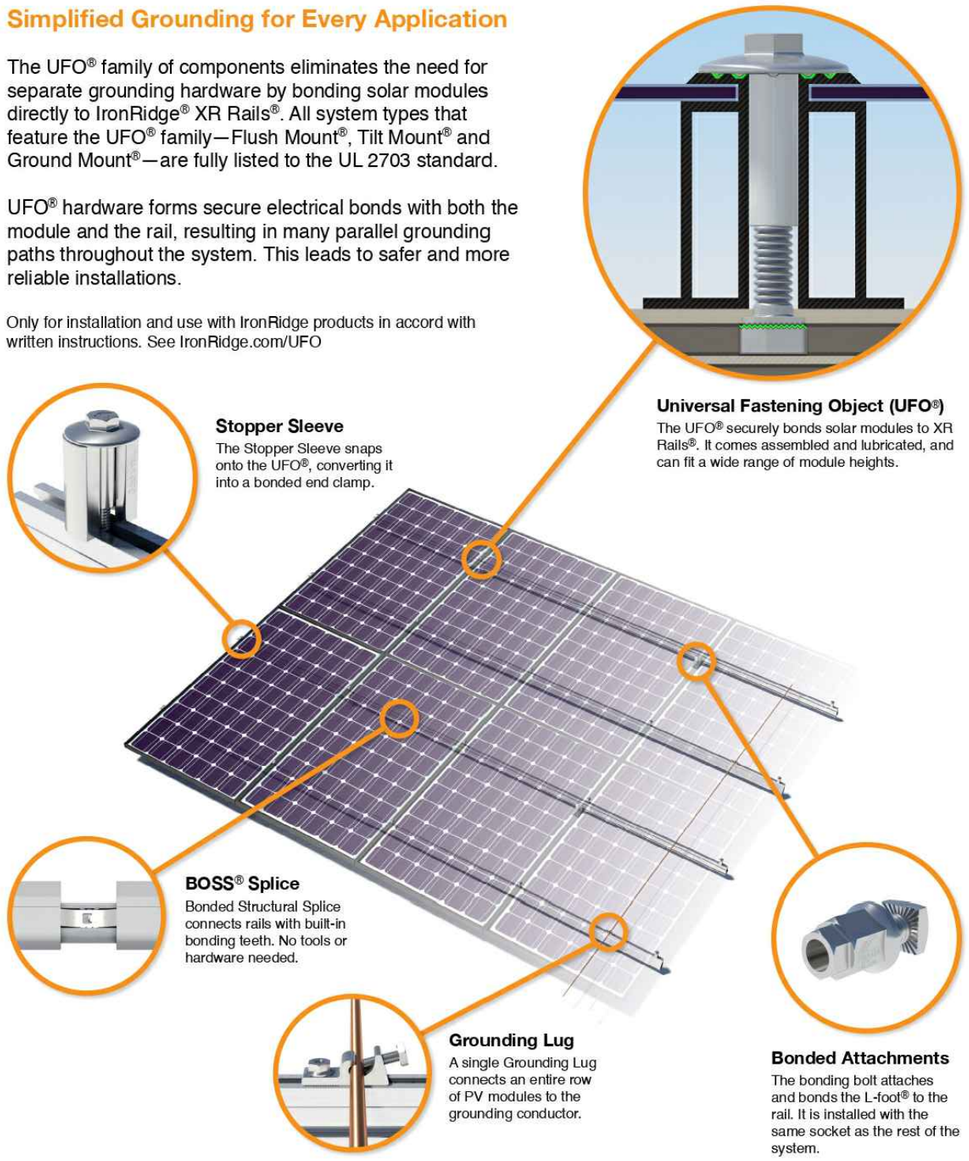
# UFO® Family of Components

## Simplified Grounding for Every Application

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

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

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



**Universal Fastening Object (UFO®)**
The UFO® securely bonds solar modules to XR Rails®. It comes assembled and lubricated, and can fit a wide range of module heights.

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

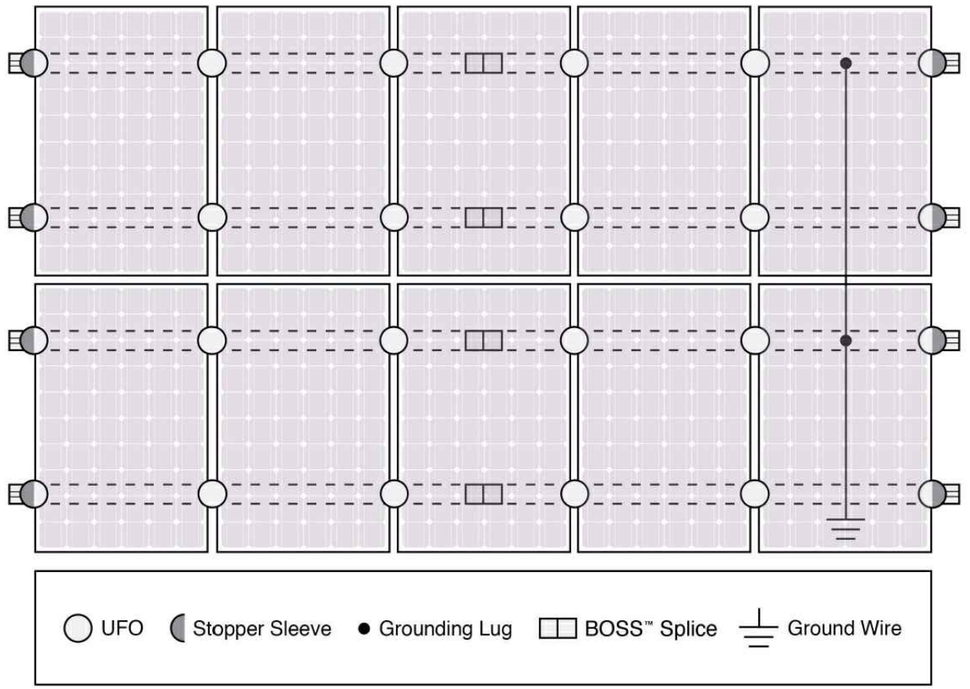
**BOSS® Splice**
Bonded Structural Splice connects rails with built-in bonding teeth. No tools or hardware needed.

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

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

Tech Brief

## System Diagram




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

## UL Certification

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

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

Go to IronRidge.com/UFO

**Cross-System Compatibility**

| Feature | Flush Mount | Tilt Mount | Ground Mount |
|---|---|---|---|
| XR Rails® | ✔ | ✔ | XR100 & XR1000 |
| UFO®/Stopper | ✔ | ✔ | ✔ |
| BOSS® Splice | ✔ | ✔ | N/A |
| Grounding Lugs | 1 per Row | 1 per Row | 1 per Array |
| Microinverters & Power Optimizers | Compatible with most MLPE manufacturers. Refer to system installation manual. | | |
| Fire Rating | Class A | Class A | N/A |
| Modules | Tested or Evaluated with over 400 Framed Modules Refer to installation manuals for a detailed list. | | |



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SHEET NAME
EQUIPMENT SPECIFICATION

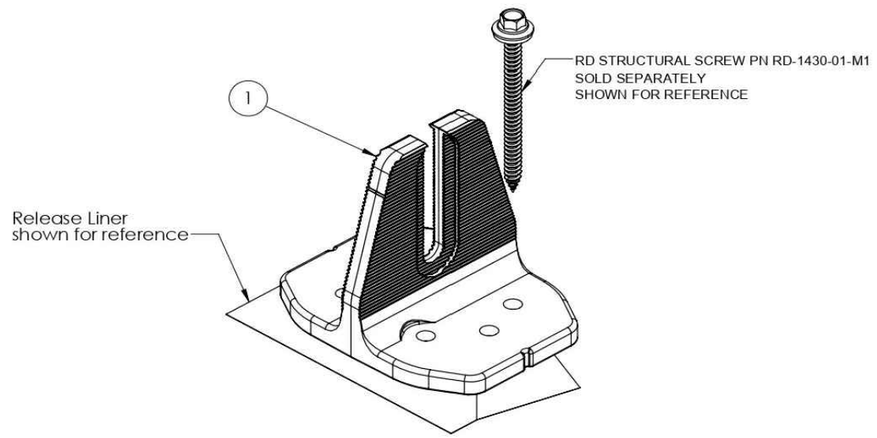
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-15

Cut Sheet

IRONRIDGE

# QuickMount® Halo UltraGrip




| ITEM NO | DESCRIPTION | QTY IN KIT |
|---|---|---|
| 1 | QM Halo UltraGrip(Mill or Black) | 1 |

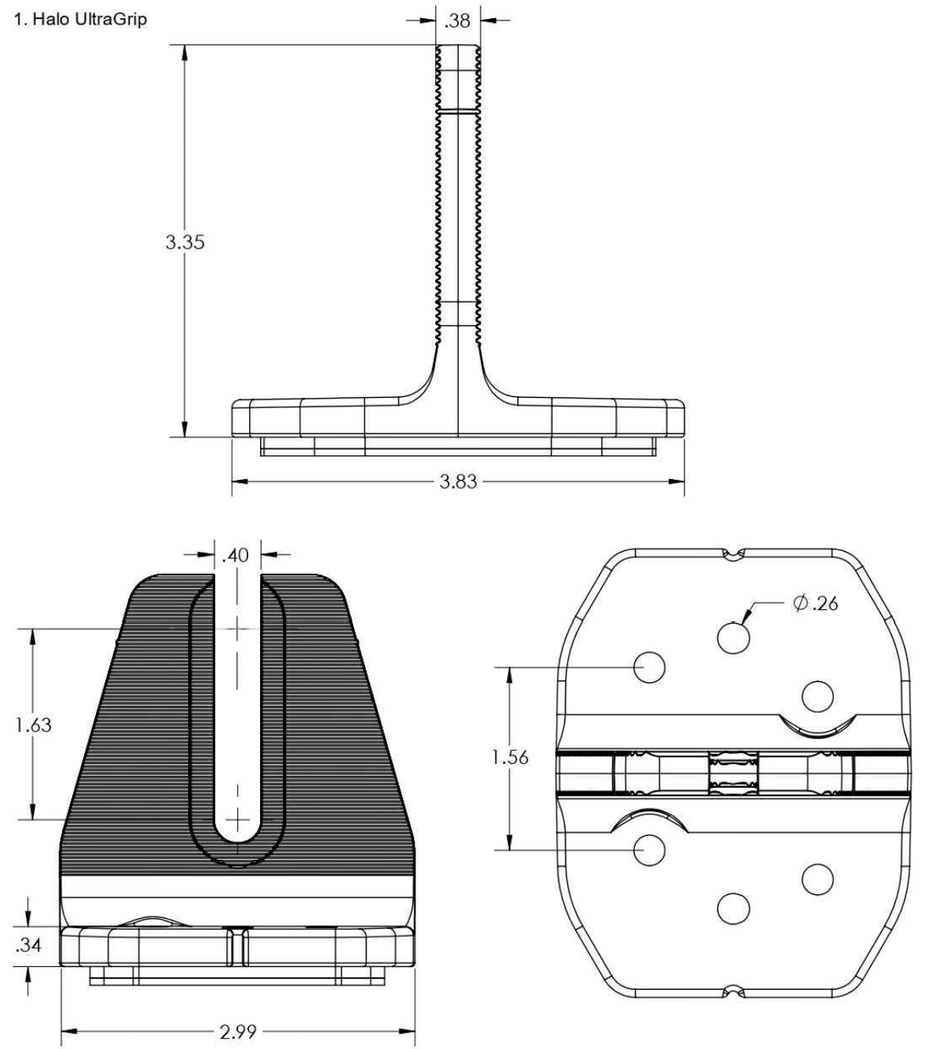
| PART NUMBER | DESCRIPTION |
|---|---|
| QM-HUG-01-M1 | Halo UltraGrip - Mill |
| QM-HUG-01-B1 | Halo UltraGrip - Black |





Cut Sheet

1. Halo UltraGrip




| Property | Value |
|---|---|
| Material | 3000 Series Aluminium |
| Finish | Mill or Black |

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

TOP TIER SOLAR SOLUTIONS

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ESR

SHEET NAME

EQUIPMENT SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

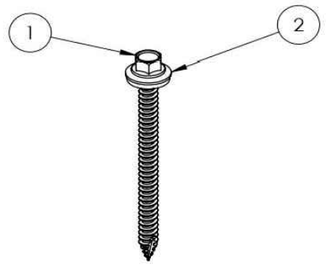
SHEET NUMBER

PV-16

Cut Sheet

IRONRIDGE

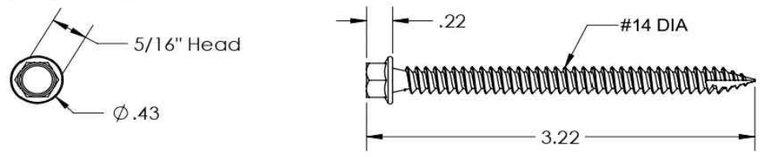
# QuickMount® RD Structural Screw




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

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

1. Self Drilling Screw, #14, Wood Tip




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

2. Washer, EPDM Backed


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



QM-RD-1430-01-M1 Cut Sheet Rev 1.0

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ESR

SHEET NAME

EQUIPMENT SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-17

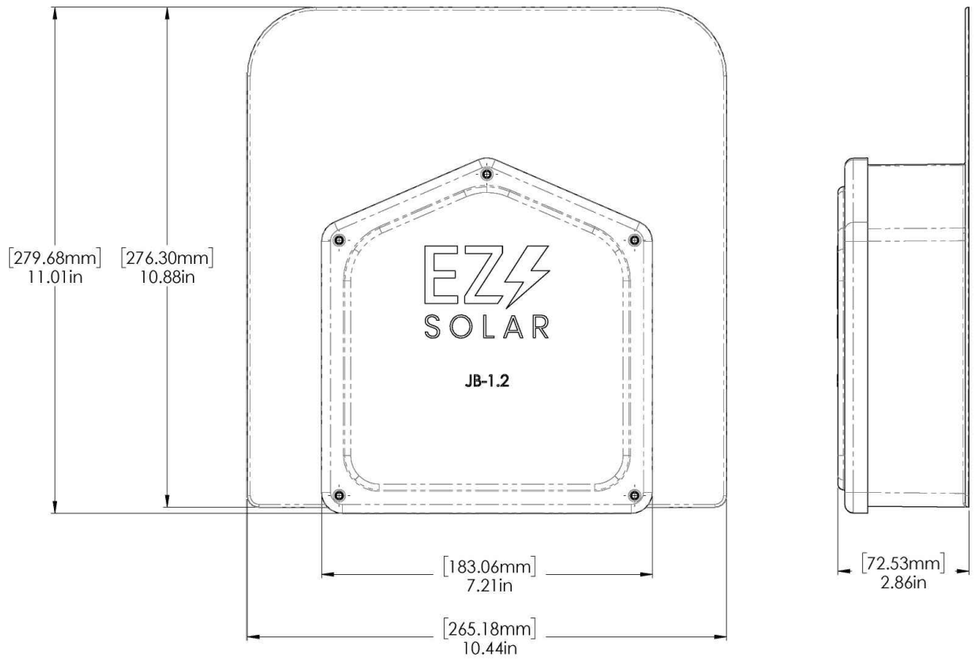
EZ SOLAR
making solar simple.

PHONE: 385-202-4150
WWW.EZSOLARPRODUCTS.COM

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

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

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






Intertek 5015705

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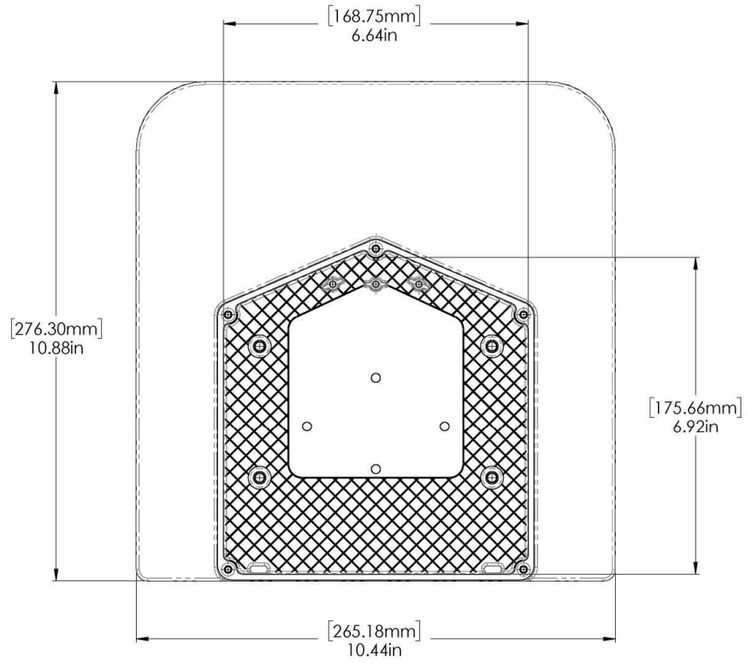
| SIZE | DWG. NO. | REV |
|---|---|---|
| B | JB-1.2 | |
| SCALE: 1:2 | WEIGHT: 1.45 LBS | SHEET 2 OF 3 |

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ESR

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ANSI B
11" X 17"

SHEET NUMBER
PV-18