

PHOTOVOLTAIC ROOF MOUNT SYSTEM

21 MODULES-ROOF MOUNTED - 8.190 kW DC, 7.600 kW AC

143 DECOY SPREAD PL, LILLINGTON, NC 27546



TOP TIER SOLAR SOLUTIONS

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

| REVISIONS | | |
|----------------|------------|-----|
| DESCRIPTION | DATE | REV |
| INITIAL DESIGN | 07/24/2024 | |
| | | |

STRUCTURAL ONLY
07/24/2024

PROJECT NAME & ADDRESS

JUANA HULL
RESIDENCE

143 DECOY SPREAD PL,
LILLINGTON, NC 27546

DRAWN BY
ESR

SHEET NAME
COVER SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-1

PROJECT DATA

PROJECT ADDRESS: 143 DECOY SPREAD PL, LILLINGTON, NC 27546

OWNER: JUANA HULL

DESIGNER: ESR

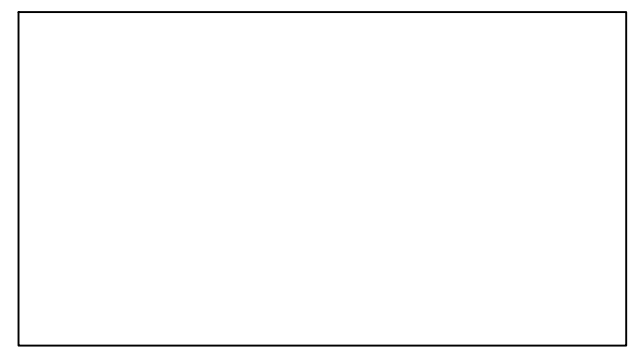
SCOPE: 8.190 kW DC ROOF MOUNT SOLAR PV SYSTEM WITH 21 JINKO SOLAR: JKM390M-72HBL-V 390W PV MODULES WITH 21 SOLAREEDGE: S440 POWER OPTIMIZERS AND 01 SOLAREEDGE: SE7600H-US (240V/7600W) INVERTER

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

SHEET INDEX

- PV-1 COVER SHEET
- PV-2 SITE PLAN
- PV-3 ROOF PLAN & MODULES
- PV-4 ELECTRICAL PLAN
- PV-5 STRUCTURAL DETAIL
- PV-6 ELECTRICAL LINE DIAGRAM
- PV-7 WIRING CALCULATIONS
- PV-8 LABELS
- PV-9+ EQUIPMENT SPECIFICATIONS

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

PROJECT DESCRIPTION:

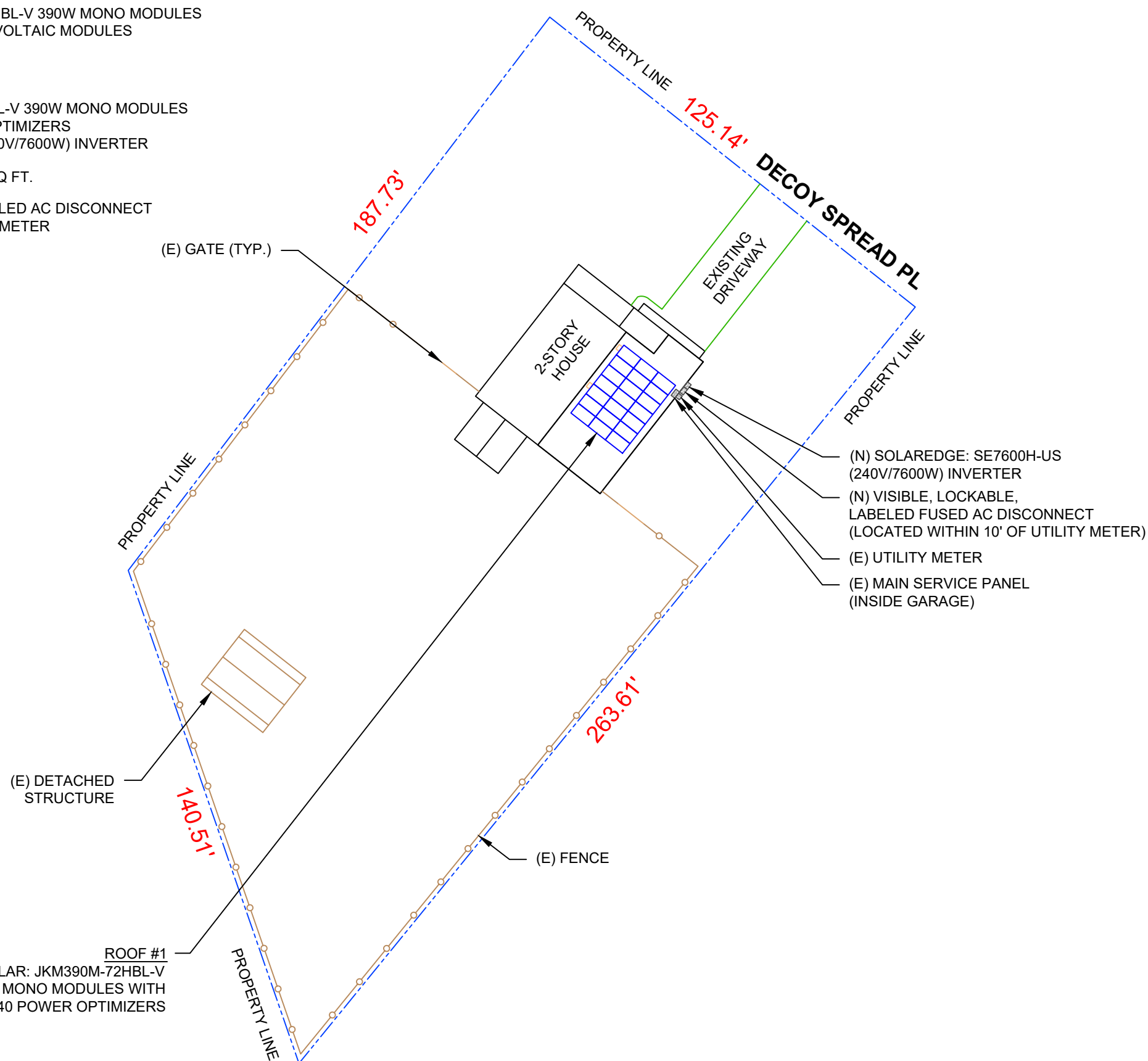
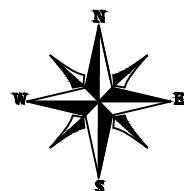
21 X JINKO SOLAR: JKM390M-72HBL-V 390W MONO MODULES
 ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES
 DC SYSTEM SIZE: 8.190 kW DC
 AC SYSTEM SIZE: 7.600 kW AC

EQUIPMENT SUMMARY

21 JINKO SOLAR: JKM390M-72HBL-V 390W MONO MODULES
 21 SOLAREEDGE: S440 POWER OPTIMIZERS
 01 SOLAREEDGE: SE7600H-US (240V/7600W) INVERTER

ROOF ARRAY AREA #1:- 454.86 SQ FT.

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



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 UNITED STATES

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| | | |

NORTH CAROLINA
 PROFESSIONAL
 SEAL
 056324
 ENGINEER
 TREVOR JONES

STRUCTURAL ONLY
 07/24/2024

PROJECT NAME & ADDRESS

JUANA HULL
 RESIDENCE

143 DECOY SPREAD PL,
 LILLINGTON, NC 27546

DRAWN BY
ESR

SHEET NAME
SITE PLAN

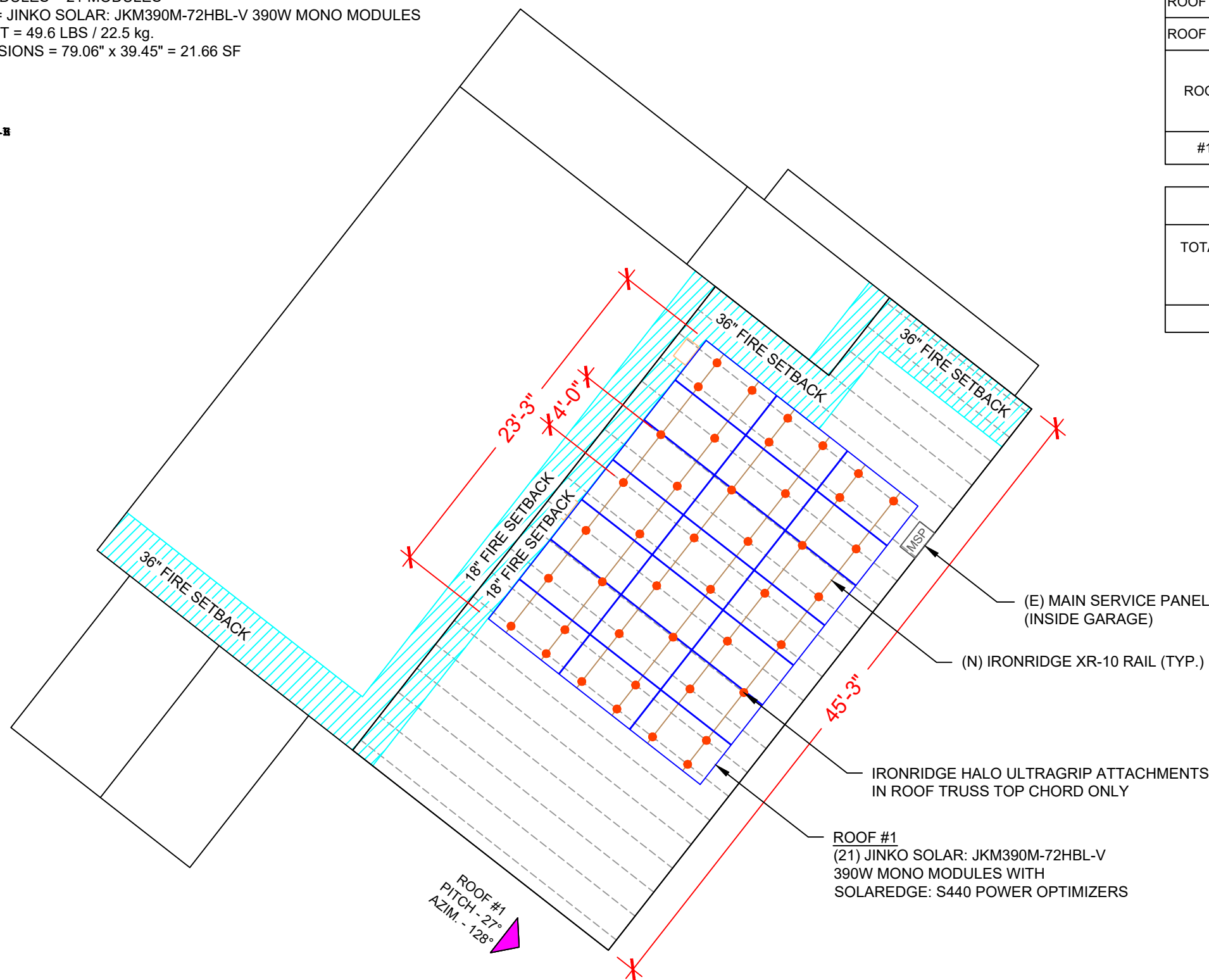
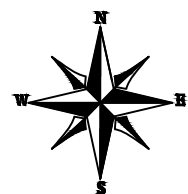
SHEET SIZE
**ANSI B
 11" X 17"**

SHEET NUMBER
PV-2

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

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 21 MODULES
 MODULE TYPE = JINKO SOLAR: JKM390M-72HBL-V 390W MONO MODULES
 MODULE WEIGHT = 49.6 LBS / 22.5 kg.
 MODULE DIMENSIONS = 79.06" x 39.45" = 21.66 SF



| ROOF DESCRIPTION | | | | | |
|------------------|--------------|------------|-----------------|------------|---------------|
| ROOF TYPE | | | ASPHALT SHINGLE | | |
| ROOF LAYER | | | 1 LAYER | | |
| ROOF | # OF MODULES | ROOF PITCH | AZIMUTH | TRUSS SIZE | TRUSS SPACING |
| #1 | 21 | 27° | 128° | 2"X4" | 24" |

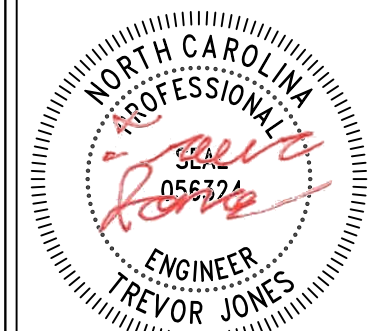
| ARRAY AREA & ROOF AREA CALC'S | | |
|-------------------------------|---------------------------|--------------------------------|
| TOTAL PV ARRAY AREA (SQ. FT.) | TOTAL ROOF AREA (Sq. Ft.) | ROOF AREA COVERED BY ARRAY (%) |
| 454.86 | 2158.12 | 21 |



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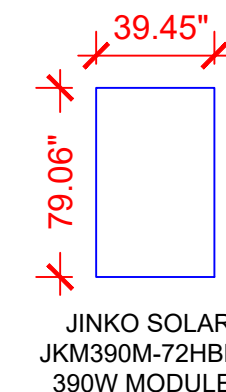
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LEGEND

- 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"

DRAWN BY

ESR

SHEET NAME
**ROOF PLAN &
 MODULES**

SHEET SIZE

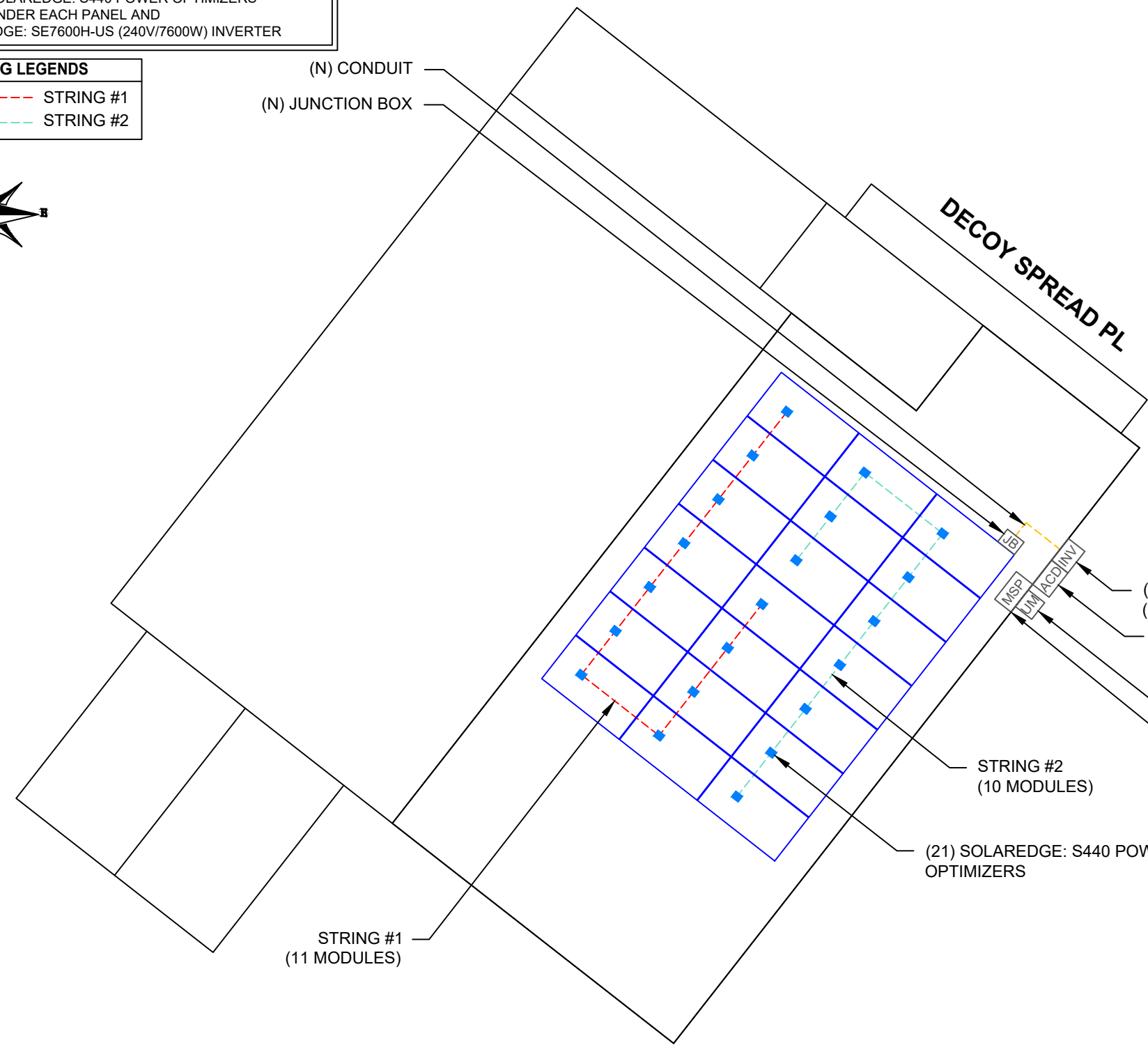
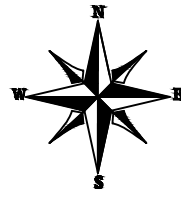
**ANSI B
 11" X 17"**

SHEET NUMBER

PV-3

DC SYSTEM SIZE: 8.190 kW DC
 AC SYSTEM SIZE: 7.600 kW AC
 (21) JINKO SOLAR: JKM390M-72HBL-V 390W MONO MODULES
 WITH (21) SOLAREEDGE: S440 POWER OPTIMIZERS
 LOCATED UNDER EACH PANEL AND
 01 SOLAREEDGE: SE7600H-US (240V/7600W) INVERTER

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



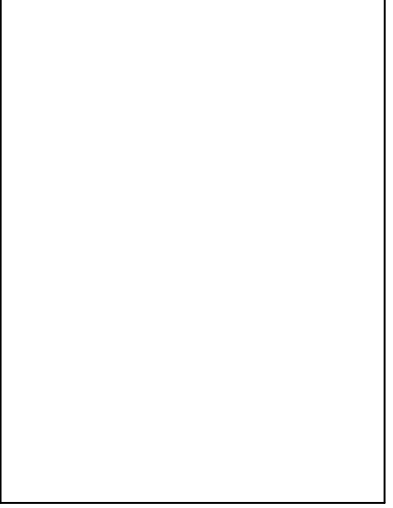
| BILL OF MATERIALS | |
|--|-----|
| EQUIPMENT DESCRIPTION | QTY |
| SOLAR PV MODULES: JINKO SOLAR: JKM390M-72HBL-V 390W MODULE | 21 |
| OPTIMIZERS: SOLAREEDGE: S440 POWER OPTIMIZERS | 21 |
| INVERTER: SOLAREEDGE: SE7600H-US (240V/7600W) INVERTER | 01 |
| JUNCTION BOX: JUNCTION BOX UL 1741, NEMA 3R CSA 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) | 12 |
| BONDED SPLICE, XR10 (XR10-BOSS-01-M1) | 6 |
| UNIVERSAL MODULE CLAMP, CLEAR (UFO-CL-01-A1) | 48 |
| STOPPER SLEEVE, 40MM, MILL (UFO-STP-40MM-M1) | 12 |
| GROUNDING LUG (XR-LUG-03-A1) | 3 |
| IRONRIDGE HALO ULTRAGRIP ATTACHMENTS (QM-HUG-01-M1) | 39 |
| RD STRUCTURAL SCREW,3.0L (HW-RD1430-01-M1) | 78 |
| T-BOLT BONDING HARDWARE (BHW-TB-02-A1) (PRODUCT CODE 590-0116) | 39 |
| OPTIMIZER BONDING HARDWARE T-BOLT (BHW-MI-01-A1) (PRODUCT CODE 270-0152) | 21 |

TOP TIER
 SOLAR SOLUTIONS

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SHEET NAME
ELECTRICAL PLAN

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

SHEET NUMBER
PV-4

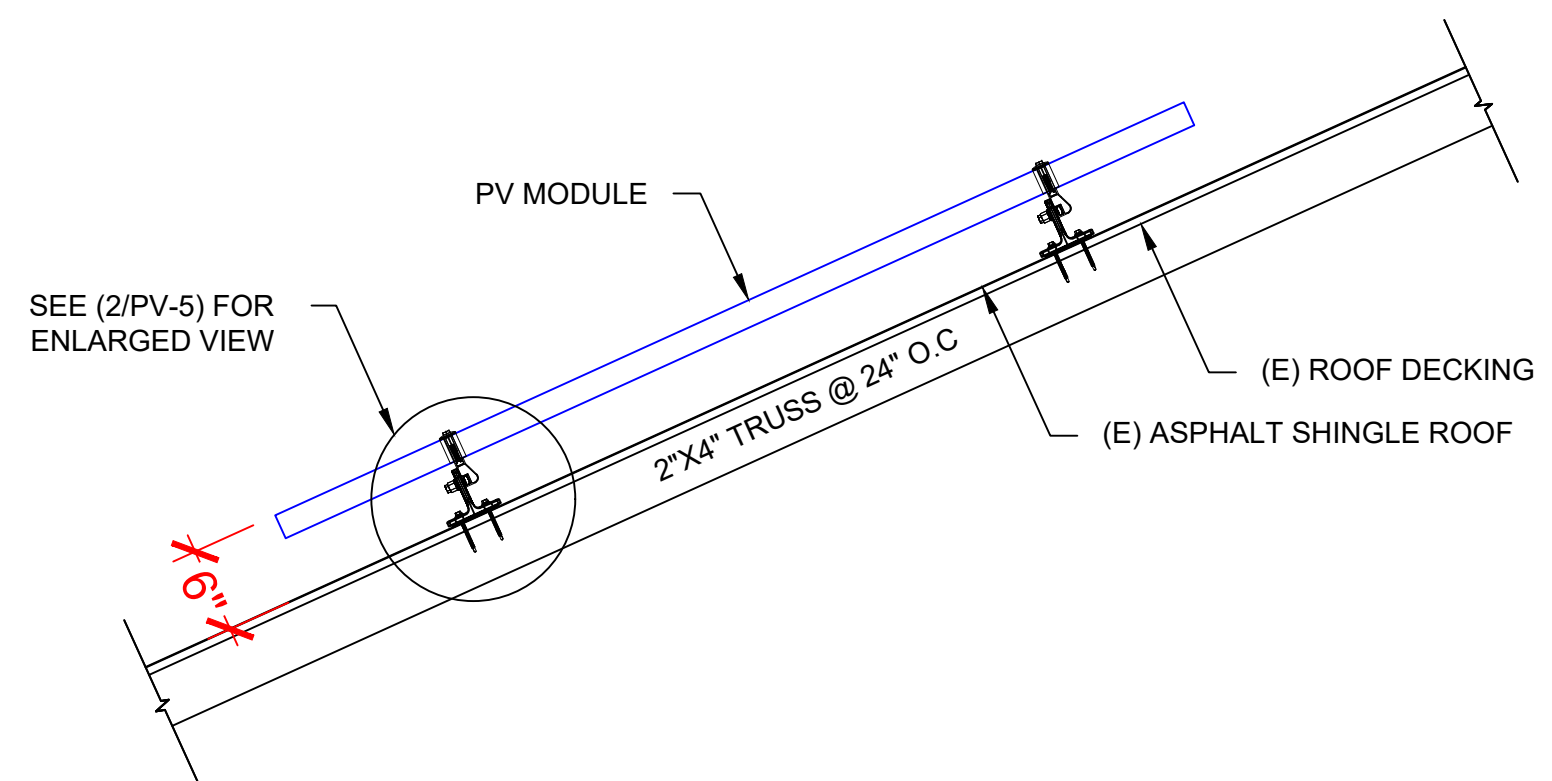
LEGEND

| | |
|---|--------------------------------------|
| 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 |

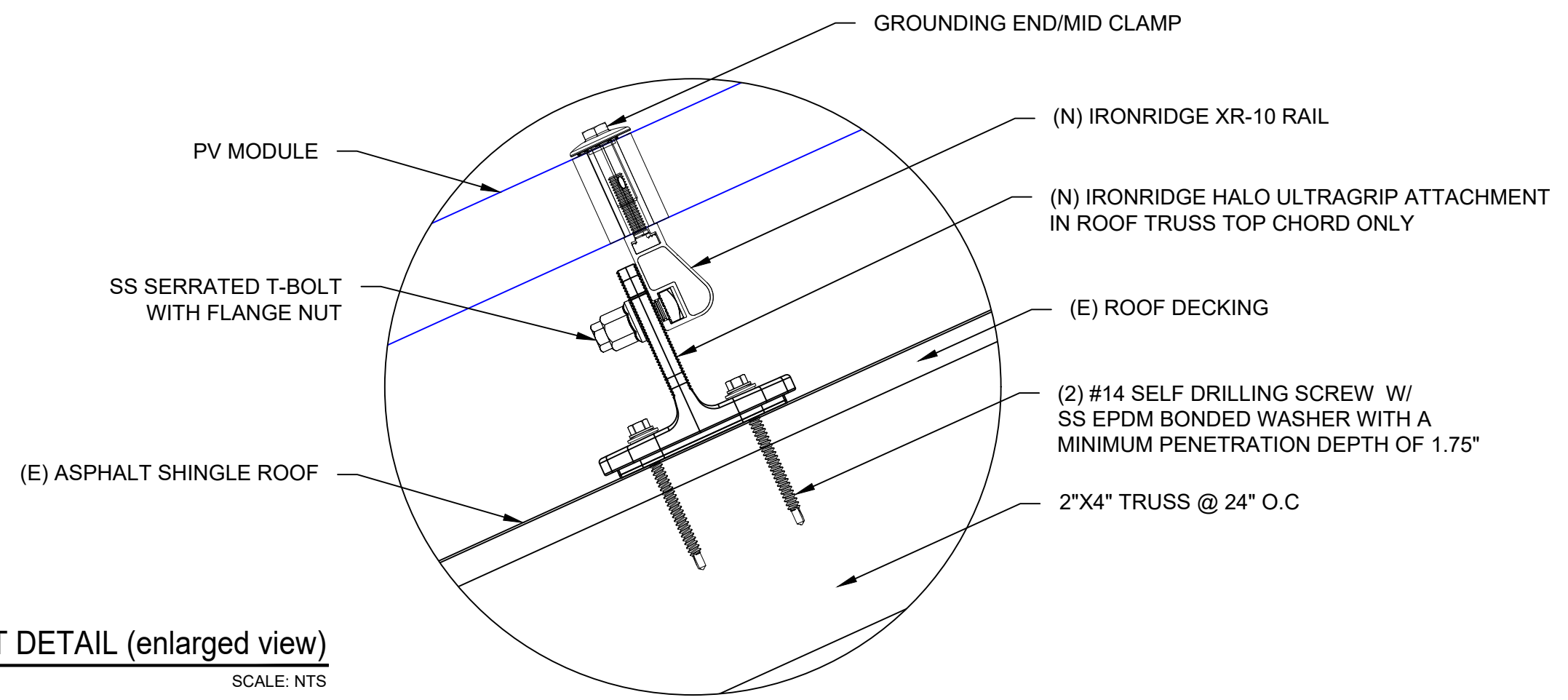


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1 | **STRUCTURAL ATTACHMENT (Side view)**
 PV-5 | SCALE: N.T.S



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

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SHEET NAME
STRUCTURAL DETAIL

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

SHEET NUMBER
PV-5

DC SYSTEM SIZE: 8.190 kW DC
AC SYSTEM SIZE: 7.600 kW AC

(21) JINKO SOLAR: JKM390M-72HBL-V 390W MONO MODULES WITH (21) SOLAREEDGE: S440 POWER OPTIMIZERS LOCATED UNDER EACH PANEL (240V) AND (01) SOLAREEDGE: SE7600H-US (240V/7600W) INVERTER (01) STRING OF 11 MODULES AND (01) STRING OF 10 MODULES ARE CONNECTED IN SERIES

BACKFEED BREAKER CALCULATION (120% RULE):
(MAIN BUS X 1.2 - MAIN BREAKER) >= (PV BREAKER)
(200A X 1.2 - 200A) >= (40A)
(40A) >= (40A) HENCE OK

INTERCONNECTION NOTES:

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

DISCONNECT NOTES:

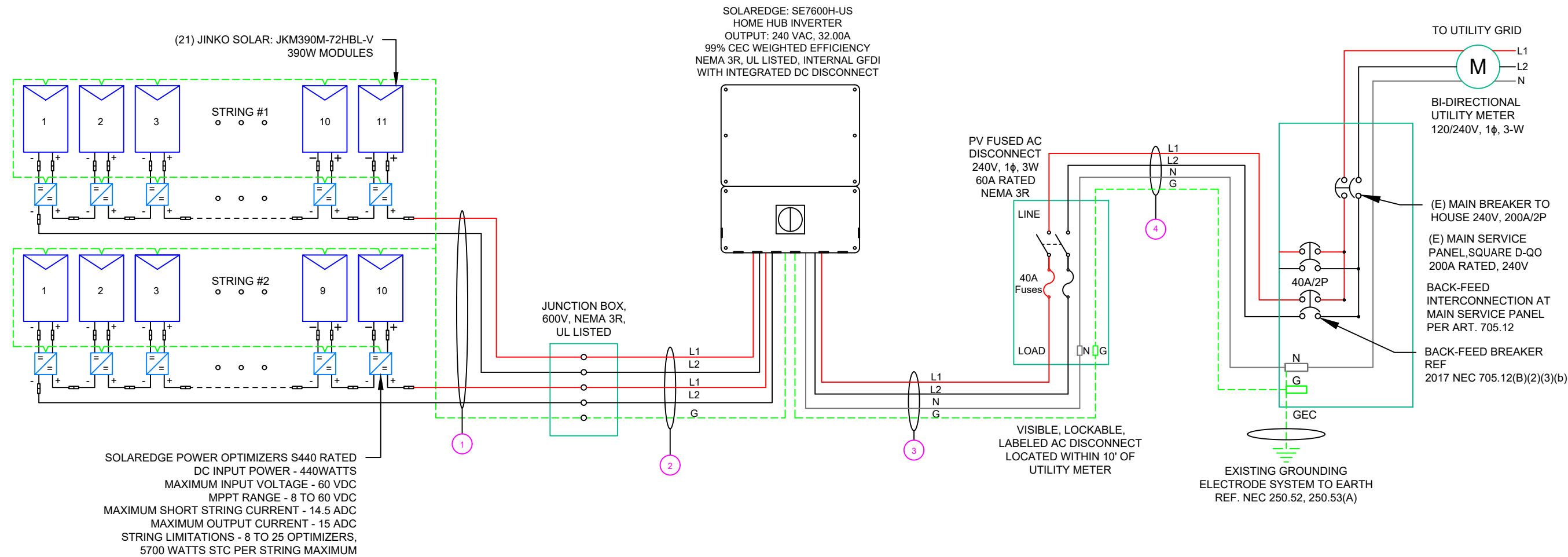
1. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING LIVE ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS)
2. AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
3.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

GROUNDING & GENERAL NOTES:

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

RACKING NOTE:

1. BOND EVERY OTHER RAIL WITH #6 BARE COPPER



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

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 (2) | #8AWG - | CU, THWN-2 | EMT, LFMC OR PVC | 3/4" |
| (1) | #8AWG - | CU, THWN-2 N | | |
| ④ (1) | #10AWG - | CU, THWN-2 GND | EMT, LFMC OR PVC | 3/4" |
| (2) | #8AWG - | CU, THWN-2 | | |
| (1) | #8AWG - | CU, THWN-2 N | | |
| (1) | #10AWG - | CU, THWN-2 GND | | |

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ESR

SHEET NAME
ELECTRICAL LINE DIAGRAM

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

SHEET NUMBER
PV-6

| SOLAR MODULE SPECIFICATIONS | |
|-----------------------------|--|
| MANUFACTURER / MODEL # | JINKO SOLAR: JKM390M-72HBL-V 390W MODULE |
| VMP | 39.64V |
| IMP | 9.84A |
| VOC | 48.60V |
| ISC | 10.46A |
| TEMP. COEFF. VOC | -0.29%/°C |
| MODULE DIMENSION | 79.06"L x 39.45"W x 1.57"D (In Inch) |

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

| AMBIENT TEMPERATURE SPECS | |
|---------------------------------------|-----------|
| AMBIENT TEMP (HIGH TEMP 2%) | 38° |
| RECORD LOW TEMPERATURE | -9° |
| MODULE TEMPERATURE COEFFICIENT OF Voc | -0.29%/°C |

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

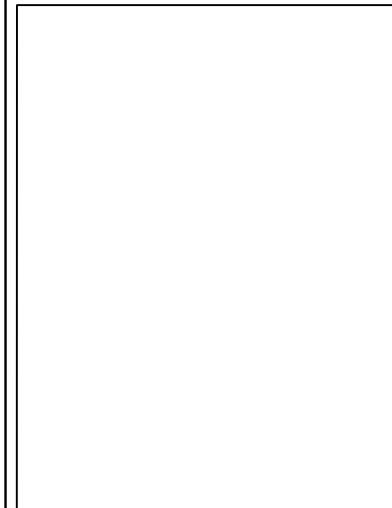
| DC FEEDER CALCULATIONS | | | | | | | | | | | | | | | | | | | | | |
|------------------------|---------------------|-------------|--------------------------|--------------|---------------|--------------------|----------------|-------------------|-------------------|--------------------|--------------------------------|-------------------|---|--|---------------------------|-------------------|----------------------|--------------------------------|-------------------------|--------------|------------------|
| CIRCUIT ORIGIN | CIRCUIT DESTINATION | VOLTAGE (V) | FULL LOAD AMPS "FLA" (A) | FLA*1.25 (A) | OCPD SIZE (A) | GROUND SIZE | CONDUCTOR SIZE | 75°C AMPACITY (A) | AMPACITY CHECK #1 | AMBIENT TEMP. (°C) | TOTAL CC CONDUCTORS IN RACEWAY | 90°C AMPACITY (A) | DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a) | DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a) | 90°C AMPACITY DERATED (A) | AMPACITY CHECK #2 | FEEDER LENGTH (FEET) | CONDUCTOR RESISTANCE (OHM/KFT) | VOLTAGE DROP AT FLA (%) | CONDUIT SIZE | CONDUIT FILL (%) |
| STRING 1 | JUNCTION BOX | 380 | 15.00 | 18.75 | 20 | BARE COPPER #6 AWG | CU #10 AWG | 35 | PASS | 38 | 2 | 40 | 0.91 | 1 | 36.4 | PASS | 5 | 1.24 | 0.049 | N/A | #N/A |
| STRING 2 | JUNCTION BOX | 380 | 15.00 | 18.75 | 20 | BARE COPPER #6 AWG | CU #10 AWG | 35 | PASS | 38 | 2 | 40 | 0.91 | 1 | 36.4 | PASS | 5 | 1.24 | 0.049 | N/A | #N/A |
| JUNCTION BOX | INVERTER | 380 | 15.00 | 18.75 | 20 | CU #10 AWG | CU #10 AWG | 35 | PASS | 38 | 4 | 40 | 0.91 | 0.8 | 29.12 | PASS | 25 | 1.24 | 0.245 | 3/4" EMT | 19.79362 |
| | | | | | | | | | | | | | | | | | | | String 1 Voltage Drop | | 0.294 |
| | | | | | | | | | | | | | | | | | | | String 2 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 | 24.5591 |
| 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 DROP | | 0.207 | |



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

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| DESCRIPTION | DATE | REV |
| INITIAL DESIGN | 07/24/2024 | |
| | | |



PROJECT NAME & ADDRESS

**JUANA HULL
 RESIDENCE**

143 DECOY SPREAD PL,
 LILLINGTON, NC 27546

DRAWN BY
ESR

SHEET NAME
WIRING CALCULATIONS

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

SHEET NUMBER
PV-7

ELECTRICAL NOTES

- ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
- WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
- WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
- WHERE SIZES OF JUNCTION BOX, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
- MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSKO GBL-4DBT LAY-IN LUG.
- TEMPERATURE RATINGS OF ALL CONDUCTORS, TERMINATIONS, BREAKERS, OR OTHER DEVICES ASSOCIATED WITH THE SOLAR PV SYSTEM SHALL BE RATED FOR AT LEAST 75 DEGREE C.

PHOTOVOLTAIC POWER SOURCE

EVERY 10' ON CONDUIT & ENCLOSURES

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

⚠ WARNING

ELECTRIC SHOCK HAZARD

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

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

⚠ WARNING

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

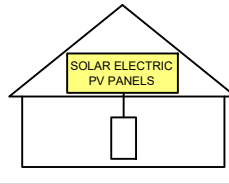
⚠ WARNING

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 **40.00 A**

MAXIMUM RATED OUTPUT
CURRENT OF THE CHARGE
CONTROLLER OR DC-TO-DC
CONVERTER (IF INSTALLED)

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

TOP TIER

SOLAR SOLUTIONS

TOP TIER SOLAR SOLUTIONS

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| | | |

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143 DECOY SPREAD PL,
LILLINGTON, NC 27546

DRAWN BY

ESR

SHEET NAME

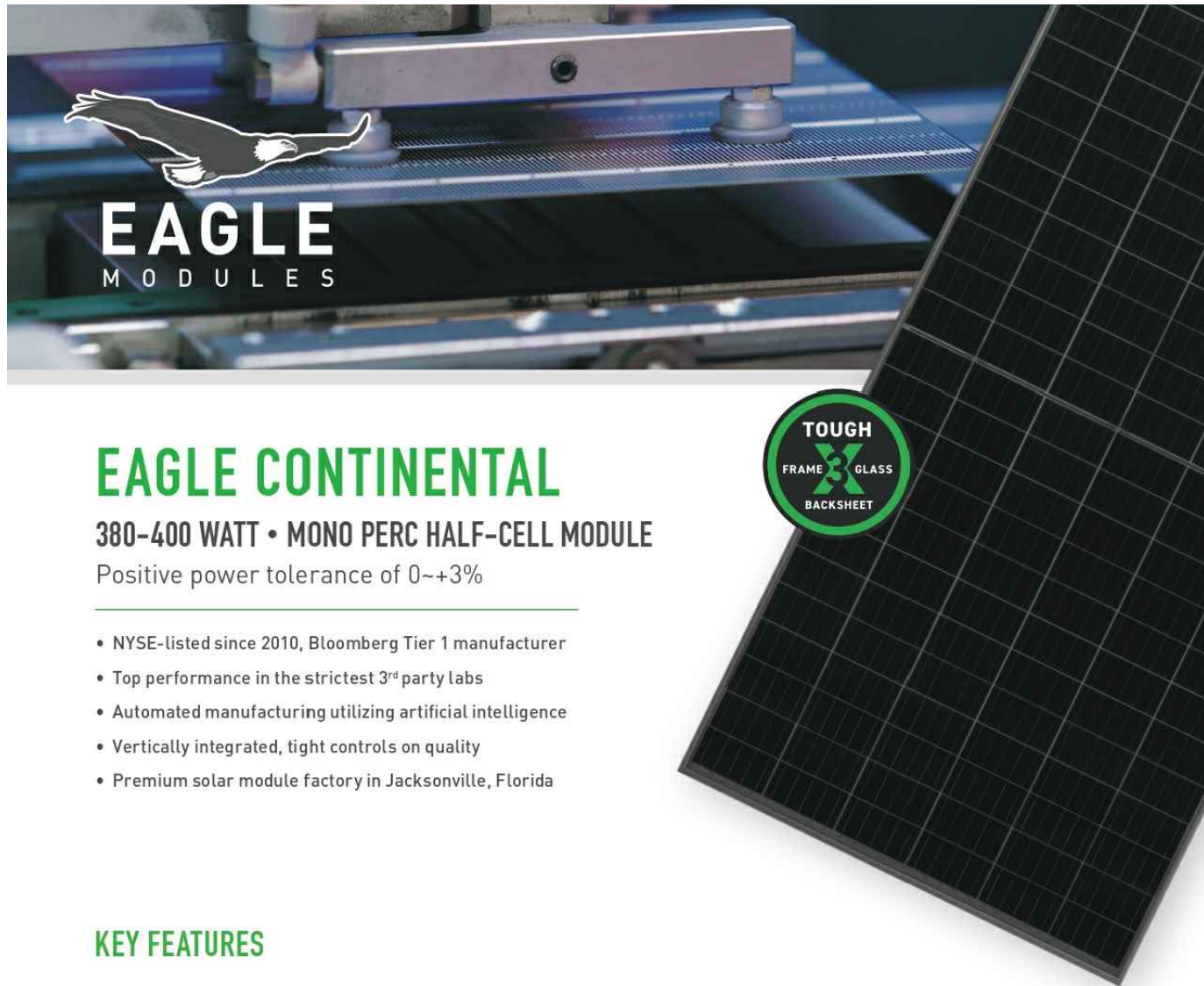
LABELS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-8



EAGLE CONTINENTAL

380-400 WATT • MONO PERC HALF-CELL MODULE

Positive power tolerance of 0~+3%

- NYSE-listed since 2010, Bloomberg Tier 1 manufacturer
- Top performance in the strictest 3rd party labs
- Automated manufacturing utilizing artificial intelligence
- Vertically integrated, tight controls on quality
- Premium solar module factory in Jacksonville, Florida

KEY FEATURES

- Superior Aesthetics**
Black backsheet and black frame create ideal look for residential applications.
- Diamond Half-Cell Technology**
World-record breaking efficient mono PERC half-cells deliver high power in a small footprint.
- Thick and Tough**
Fire Type 1 rated module engineered with a thick frame, 3.2mm front side glass, and thick backsheet for added durability.
- Shade Tolerant**
Twin array design allows continued performance even with shading by trees or debris.
- Protected Against All Environments**
Certified to withstand humidity, heat, rain, marine environments, wind, hailstorms, and packed snow.
- Warranty**
25-year product and 25-year linear power warranty.

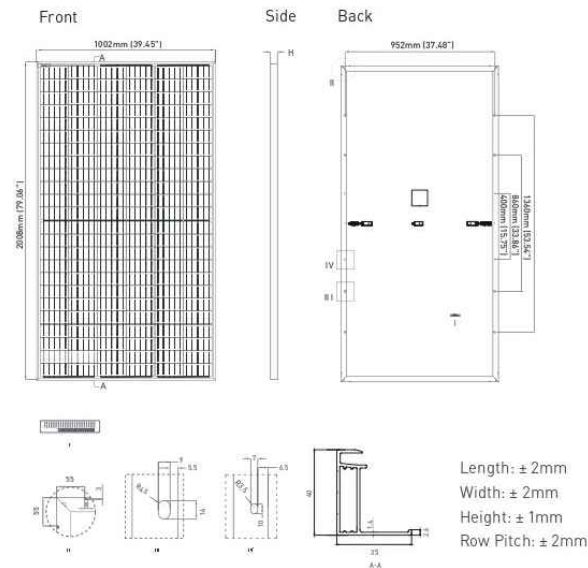
ASSEMBLED IN THE USA
From foreign components

- ISO9001:2008 Quality Standards
- ISO14001:2004 Environmental Standards
- IEC61215, IEC61730 certified
- ISO 45001 2018 Occupational Health & Safety Standards
- UL1703/61730 certified

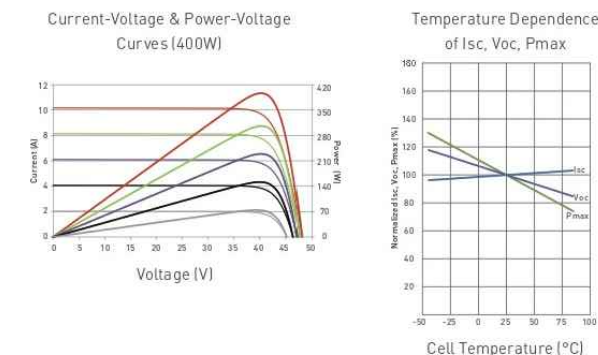
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ENGINEERING DRAWINGS



ELECTRICAL PERFORMANCE & TEMPERATURE DEPENDENCE



ELECTRICAL CHARACTERISTICS

| Module Type | JKM380M-72HBL-V | | JKM385M-72HBL-V | | JKM390M-72HBL-V | | JKM395M-72HBL-V | | JKM400M-72HBL-V | |
|-----------------------------|-----------------|-------|-----------------|-------|-----------------|-------|-----------------|-------|-----------------|-------|
| | STC | NOCT | STC | NOCT | STC | NOCT | STC | NOCT | STC | NOCT |
| Maximum Power (Pmax) | 380Wp | 280Wp | 385Wp | 283Wp | 390Wp | 287Wp | 395Wp | 291Wp | 400Wp | 294Wp |
| Maximum Power Voltage (Vmp) | 39.10V | 36.5V | 39.37V | 36.8V | 39.64V | 37.0V | 39.90V | 37.4V | 40.16V | 37.6V |
| Maximum Power Current (Imp) | 9.72A | 7.67A | 9.78A | 7.71A | 9.84A | 7.75A | 9.90A | 7.77A | 9.96A | 7.82A |
| Open-circuit Voltage (Voc) | 48.2V | 45.4V | 48.4V | 45.6V | 48.6V | 45.8V | 48.8V | 46.0V | 49.1V | 46.2V |
| Short-circuit Current (Isc) | 10.30A | 8.32A | 10.38A | 8.38A | 10.46A | 8.45A | 10.54A | 8.51A | 10.61A | 8.57A |
| Module Efficiency STC (%) | 18.89% | | 19.13% | | 19.38% | | 19.63% | | 19.88% | |

*STC: ☀ Irradiance 1000W/m² 🌡 Cell Temperature 25°C
 NOCT: ☀ Irradiance 800W/m² 🌡 Ambient Temperature 20°C
 ☁ AM = 1.5 🌬 Wind Speed 1m/s

*Power measurement tolerance: ±3%

The company reserves the final right for explanation on any of the information presented hereby. JKM380-400M-72HBL-V-F1-US

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MECHANICAL CHARACTERISTICS

| | |
|-------------------|---|
| Cells | Mono PERC Diamond Cell (158.75 x 158.75mm) |
| No. of Half Cells | 144 (6 x 24) |
| Dimensions | 2008 x 1002 x 40mm (79.06 x 39.45 x 1.57in) |
| Weight | 22.5kg (49.6lbs) |
| Front Glass | 3.2mm, Anti-Reflection Coating High Transmission, Low Iron, Tempered Glass |
| Frame | Anodized Aluminum Alloy |
| Junction Box | IP68 Rated |
| Output Cables | 12 AWG, 1400mm (55.12in) |
| Connector | Staubli MC4 Series |
| Fire Type | Type 1 |
| Pressure Rating | 5400Pa (Snow) & 2400Pa (Wind) |
| Hailstone Test | 50mm Hailstones at 35m/s |

TEMPERATURE CHARACTERISTICS

| | |
|---|-----------|
| Temperature Coefficients of Pmax | -0.35%/°C |
| Temperature Coefficients of Voc | -0.29%/°C |
| Temperature Coefficients of Isc | 0.048%/°C |
| Nominal Operating Cell Temperature (NOCT) | 45±2°C |

MAXIMUM RATINGS

| | |
|----------------------------|----------------------|
| Operating Temperature (°C) | -40°C~+85°C |
| Maximum System Voltage | 1500VDC (UL and IEC) |
| Maximum Series Fuse Rating | 20A |

PACKAGING CONFIGURATION

(Two pallets = One stack)
 27pcs/pallet, 54pcs/stack, 594pcs/40'HQ Container

WARRANTY

25-year product and 25-year linear power warranty
 1st year degradation not to exceed 2.5%, each subsequent year not to exceed 0.6%, minimum power at year 25 is 83.1% or greater.

TOP TIER
SOLAR SOLUTIONS

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ESR

SHEET NAME
**EQUIPMENT
 SPECIFICATION**

SHEET SIZE

ANSI B
 11" X 17"

SHEET NUMBER

PV-9

CERTIFICATE OF COMPLIANCE

Certificate Number E362479
Report Reference E362479-20200410
Date 2023-July-16

Issued to: JINKO SOLAR CO LTD
 No.1, Yingbin Road, Economic Development Zone
 Shangrao Jiangxi Sheng 334100 CN

This is to certify that representative samples of PHOTOVOLTAIC MODULES AND PANELS WITH SYSTEM VOLTAGE RATINGS OVER 600 VOLTS
 See Addendum Page for Product Designation(s).
 Have been evaluated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 61730-1 - Standard for Photovoltaic (PV) Module Safety Qualification - Part 1: Requirements for Construction, Edition 2, Issue Date 10/28/2022 and UL 61730-2, Photovoltaic (PV) Module Safety Qualification - Part 2: Requirements for Testing, Edition 2, Revision Date 04/25/2023 and CSA C22.2 No. 61730-1:19 December 2019, Photovoltaic (PV) module safety qualification — Part 1: Requirements for construction and CSA C22.2 No. 61730-2:19 December 2019, Photovoltaic (PV) module safety qualification — Part 2: Requirements for testing.

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

This Certificate of Compliance indicates that representative samples of the product described in the certification report have met the requirements for UL certification. It does not provide authorization to apply the UL Mark. Only the Authorization Page that references the Follow-Up Services Procedure for ongoing surveillance provides authorization to apply the UL Mark.

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

Look for the UL Certification Mark on the product.

Deborah Jennings-Conner
 Deborah Jennings-Conner, VP Regulatory Services
 UL LLC



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CERTIFICATE OF COMPLIANCE

Certificate Number E362479
Report Reference E362479-20200410
Date 2023-July-16

JKM525N-72HL4-V, JKM530N-72HL4-V, JKM535N-72HL4-V, JKM540N-72HL4-V, JKM545N-72HL4-V, JKM550N-72HL4-V, JKM555N-72HL4-V, JKM560N-72HL4-V, JKM565N-72HL4-V, JKM570N-72HL4-V, JKM575N-72HL4-V.

JKM480N-66HL4-V, JKM485N-66HL4-V, JKM490N-66HL4-V, JKM495N-66HL4-V, JKM500N-66HL4-V, JKM505N-66HL4-V, JKM510N-66HL4-V, JKM515N-66HL4-V, JKM520N-66HL4-V, JKM525N-66HL4-V

JKM435N-60HL4-V, JKM440N-60HL4-V, JKM445N-60HL4-V, JKM450N-60HL4-V, JKM455N-60HL4-V, JKM460N-60HL4-V, JKM465N-60HL4-V, JKM470N-60HL4-V, JKM475N-60HL4-V, JKM480N-60HL4-V.

JKM395N-54HL4-V, JKM400N-54HL4-V, JKM405N-54HL4-V, JKM410N-54HL4-V, JKM415N-54HL4-V, JKM420N-54HL4-V, JKM425N-54HL4-V, JKM430N-54HL4-V.

JKM565M-78HL4-V, JKM570M-78HL4-V, JKM575M-78HL4-V, JKM580M-78HL4-V, JKM585M-78HL4-V, JKM590M-78HL4-V, JKM595M-78HL4-V, JKM600M-78HL4-V, JKM605M-78HL4-V

JKM370M-72HBL-V, JKM375M-72HBL-V, JKM380M-72HBL-V, JKM385M-72HBL-V, **JKM390M-72HBL-V**, JKM395M-72HBL-V, JKM400M-72HBL-V, JKM405M-72HBL-V, JKM410M-72HBL-V, JKM415M-72HBL-V, JKM420M-72HBL-V.

JKM330M-60HBL-V, JKM335M-60HBL-V, JKM340M-60HBL-V, JKM345M-60HBL-V, JKM350M-60HBL-V.

JKM515N-72HL4-B-V, JKM520N-72HL4-B-V, JKM525N-72HL4-B-V, JKM530N-72HL4-B-V, JKM535N-72HL4-B-V, JKM540N-72HL4-B-V, JKM545N-72HL4-B-V, JKM550N-72HL4-B-V, JKM555N-72HL4-B-V, JKM560N-72HL4-B-V, JKM565N-72HL4-B-V, JKM570N-72HL4-B-V.

JKM475N-66HL4-B-V, JKM480N-66HL4-B-V, JKM485N-66HL4-B-V, JKM490N-66HL4-B-V, JKM495N-66HL4-B-V, JKM500N-66HL4-B-V, JKM505N-66HL4-B-V, JKM510N-66HL4-B-V, JKM515N-66HL4-B-V, JKM520N-66HL4-B-V.

JKM430N-60HL4-B-V, JKM435N-60HL4-B-V, JKM440N-60HL4-B-V, JKM445N-60HL4-B-V, JKM450N-60HL4-B-V, JKM455N-60HL4-B-V, JKM460N-60HL4-B-V, JKM465N-60HL4-B-V, JKM470N-60HL4-B-V.

JKM385N-54HL4-B-V, JKM390N-54HL4-B-V, JKM395N-54HL4-B-V, JKM400N-54HL4-B-V, JKM405N-54HL4-B-V, JKM410N-54HL4-B-V, JKM415N-54HL4-B-V, JKM420N-54HL4-B-V, JKM425N-54HL4-B-V, JKM430N-54HL4-B-V, JKM435N-54HL4-B-V, JKM440N-54HL4-B-V.

JKM585N-78HL4R-V, JKM590N-78HL4R-V, JKM595N-78HL4R-V, JKM600N-78HL4R-V, JKM605N-78HL4R-V, JKM610N-78HL4R-V, JKM615N-78HL4R-V, JKM620N-78HL4R-V, JKM625N-78HL4R-V, JKM630N-78HL4R-V, JKM635N-78HL4R-V, JKM640N-78HL4R-V, JKM645N-78HL4R-V, JKM650N-78HL4R-V

Deborah Jennings-Conner
 Deborah Jennings-Conner, VP Regulatory Services
 UL LLC

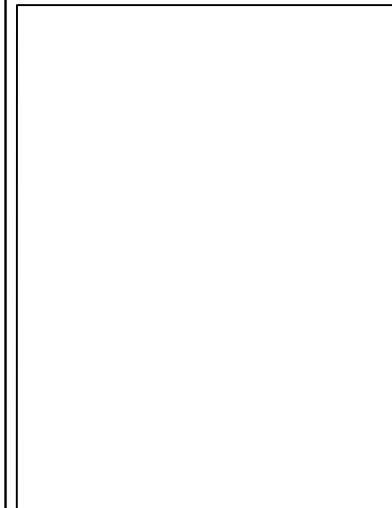


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 SPECIFICATION**

SHEET SIZE
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SHEET NUMBER
PV-10

Power Optimizer For Residential Installations

S440 / S500 / S500B / S650B



POWER OPTIMIZER

Enabling PV power optimization at the module level

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

*Functionality subject to inverter model and firmware version

solaredge.com



Power Optimizer For Residential Installations

S440 / S500 / S500B / S650B

| | S440 | S500 | S500B | S650B | UNIT |
|---|--|--------------------|----------------|-----------|------|
| INPUT | | | | | |
| Rated Input DC Power ⁽¹⁾ | 440 | 500 | | 650 | W |
| Absolute Maximum Input Voltage (Voc) | 60 | | 125 | 85 | Vdc |
| MPPT Operating Range | 8 – 60 | | 12.5 – 105 | 12.5 – 85 | Vdc |
| Maximum Short Circuit Current (Isc) of Connected PV Module | 14.5 | | 15 | | Adc |
| Maximum Efficiency | | 99.5 | | | % |
| Weighted Efficiency | | 98.6 | | | % |
| Overvoltage Category | | II | | | |
| OUTPUT DURING OPERATION | | | | | |
| Maximum Output Current | | 15 | | | Adc |
| Maximum Output Voltage | 60 | | 80 | | Vdc |
| OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF) | | | | | |
| Safety Output Voltage per Power Optimizer | | 1 ± 0.1 | | | Vdc |
| STANDARD COMPLIANCE⁽²⁾ | | | | | |
| EMC | FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3, CISPR11, EN-55011 | | | | |
| Safety | IEC62109-1 (class II safety), UL1741 | | | | |
| Material | UL94 V-0, UV Resistant | | | | |
| RoHS | Yes | | | | |
| Fire Safety | VDE-AR-E 2100-712:2018-12 | | | | |
| INSTALLATION SPECIFICATIONS | | | | | |
| Maximum Allowed System Voltage | | 1000 | | | Vdc |
| Dimensions (W x L x H) | 129 x 155 x 30 | | 129 x 165 x 45 | | mm |
| Weight | 720 | | 790 | | gr |
| Input Connector | | MC4 ⁽³⁾ | | | |
| Input Wire Length | | 0.1 | | | m |
| Output Connector | | MC4 | | | |
| Output Wire Length | | (+) 2.3, (-) 0.10 | | | m |
| Operating Temperature Range ⁽⁴⁾ | | -40 to +85 | | | °C |
| Protection Rating | | IP68 | | | |
| Relative Humidity | | 0 – 100 | | | % |

(1) Rated power of the module at STC will not exceed the Power Optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed.

(2) For details about CE compliance, see [Declaration of Conformity - CE](#).

(3) For other connector types please contact SolarEdge.

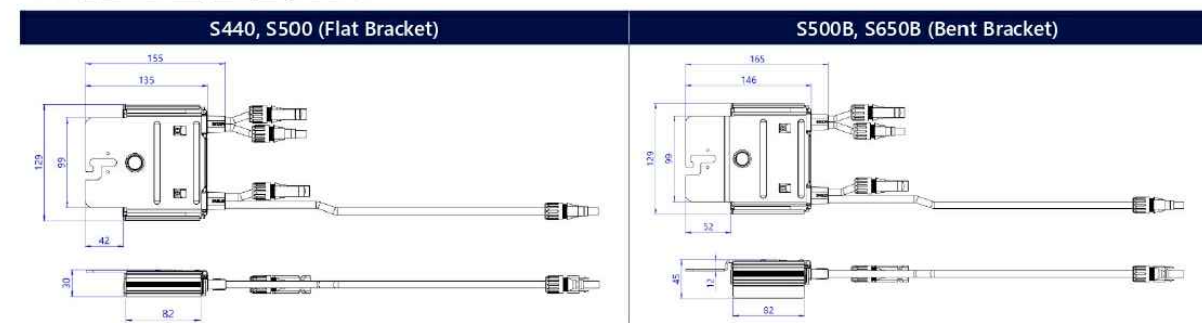
(4) Power de-rating is applied for ambient temperatures above +85°C for S440 and S500, and for ambient temperatures above +75°C for S500B. Refer to the [Power Optimizers Temperature De-Rating Technical Note](#) for details.

| PV System Design Using a SolarEdge Inverter ⁽⁵⁾ | SolarEdge Home Wave Inverter Single Phase | SolarEdge Home Short String Inverter Three Phase | Three Phase for 230/400V Grid | Three Phase for 277/480V Grid | |
|---|---|--|-------------------------------|-------------------------------|---|
| Minimum String Length (Power Optimizers) | S440, S500: 8 S500B, S650B: 6 | 9 8 | 16 | 18 | |
| Maximum String Length (Power Optimizers) | 25 | 20 | 50 | 14 | |
| Maximum Continuous Power per String | 5700 | 5625 | 11250 | 12750 | W |
| Maximum Allowed Connected Power per String (In multiple string designs, the maximum is permitted only when the difference in connected power between strings is 2,000W or less) | See ⁽⁶⁾ | See ⁽⁶⁾ | 13500 | 15000 | W |
| Parallel Strings of Different Lengths or Orientations | Yes | | | | |

(5) It is not allowed to mix S-series and P-series Power Optimizers in new installations in the same string.

(6) If the inverter's rated AC power ≤ maximum nominal power per string, then the maximum power per string will be able to reach up to the inverter's maximum input DC power.

Refer to [Application Note: Single String Design Guidelines](#).



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CE RoHS

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11" X 17"

SHEET NUMBER

PV-11

SolarEdge Home Hub Inverter

Single Phase, for North America

For Inverters Assembled in the USA

SE3800H-US / SE5700H-US / **SE7600H-US** / SE10000H-US / SE11400H-US



HOME BACKUP

Single phase inverter for storage and backup applications

- The ultimate home energy manager in charge of PV production, battery storage, backup operation during a power outage*, EV Charging, and smart energy devices
- Record-breaking 99% weighted efficiency with up to 300% DC oversizing
- Supports LRA – can provide the required energy for HVAC systems starting during backup operation
- Integrates seamlessly with the complete SolarEdge Home Smart Energy Ecosystem, through SolarEdge Home Network
- Module-level monitoring and visibility of battery status, PV production, and self-consumption data
- Fast and easy installation – small and lightweight, with reduced commissioning time
- A scalable solution that supports future homeowner needs through easy connection to a growing ecosystem of products
- Advanced safety features with integrated arc fault protection and rapid shutdown for 690.11 and 690.12
- Advanced reliability with automotive-grade components
- Embedded revenue grade production data, ANSI C12.20 Class 0.5
- IP65-rated, for indoor and outdoor installations

*Requires additional hardware and firmware version upgrade.

solaredge.com



/ SolarEdge Home Hub Inverter

Single Phase, for North America

SE3800H-US / SE5700H-US / **SE7600H-US** / SE10000H-US / SE11400H-US

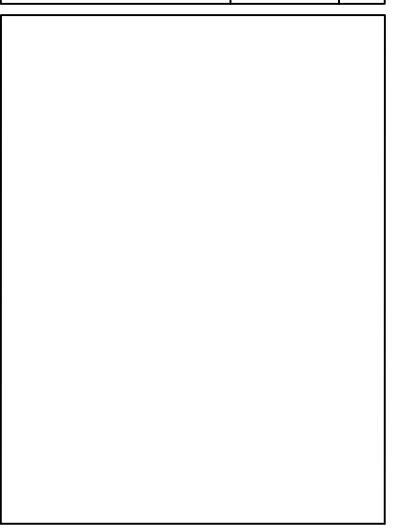
| Model Number ⁽¹⁾⁽²⁾ | SE3800H-US | SE5700H-US | SE7600H-US | SE10000H-US | SE11400H-US | Units |
|---|---------------------------------|----------------------------|-------------------|-------------|--------------------------------|-----------------|
| OUTPUT – AC ON GRID | | | | | | |
| Rated AC Power | 3800 @ 240V 3300 @ 208V | 5760 @ 240V 5000 @ 208V | 7600 | 10000 | 11,400 @ 240V 10,000 @ 208V | W |
| Maximum AC Power Output | 3800 @ 240V 3300 @ 208V | 5760 @ 240V 5000 @ 208V | 7600 | 10000 | 11,400 @ 240V 10,000 @ 208V | W |
| AC Output Voltage (Nominal) | 208 / 240 | | | | | Vac |
| AC Output Voltage (Range) | 183 – 264 | | | | | Vac |
| AC Frequency Range (min - nom - max) | 59.3 – 60 – 60.5 ⁽³⁾ | | | | | Hz |
| Maximum Continuous Output Current | 16 | 24 | 32 | 42 | 48 | A |
| GFDI Threshold | 1 | | | | | A |
| Total Harmonic Distortion (THD) | < 3 | | | | | % |
| Power Factor | 1, adjustable -0.85 to 0.85 | | | | | |
| Utility Monitoring, Islanding Protection, Country Configurable Thresholds | Yes | | | | | |
| Charge Battery from AC (if allowed) | Yes | | | | | |
| Typical Nighttime Power Consumption | < 2.5 | | | | | W |
| OUTPUT – AC STAND-ALONE (BACKUP)⁽⁴⁾⁽⁵⁾ | | | | | | |
| Rated AC Power in Stand-alone Operation | 11,400 ⁽⁶⁾ | | | | | W |
| Maximum Stand-alone Capacity | 11,400 | | | | | W |
| AC L-L Output Voltage Range in Stand-alone Operation | 211 – 264 | | | | | Vac |
| AC L-N Output Voltage Range in Stand-alone Operation | 105 – 132 | | | | | Vac |
| AC Frequency Range in Stand-alone (min - nom - max) | 55 – 60 – 65 | | | | | Hz |
| Maximum Continuous Output Current in Stand-alone Operation | 48 | | | | | A |
| GFDI | 1 | | | | | A |
| THD | < 5 | | | | | % |
| OUTPUT – SOLAREEDGE HOME EV CHARGER AC | | | | | | |
| Rated AC Power | 9600 | | | | | W |
| AC Output Voltage Range | 211 – 264 | | | | | Vac |
| On-Grid AC Frequency Range (min - nom - max) | 59.3 – 60 – 60.5 | | | | | Hz |
| Maximum Continuous Output Current @240V (grid, PV and battery) | 40 | | | | | Aac |
| INPUT – DC (PV AND BATTERY) | | | | | | |
| Transformer-less, Ungrounded | Yes | | | | | |
| Max Input Voltage | 480 | | | | | Vdc |
| Nom DC Input Voltage | 380 | | | | | Vdc |
| Reverse-Polarity Protection | Yes | | | | | |
| Ground-Fault Isolation Detection | 600kΩ Sensitivity | | | | | |
| INPUT – DC (PV) | | | | | | |
| Maximum DC Power @ 240V | 11,400 | 11,520 | 15,200 | 20,000 | 22,800 | W |
| Maximum DC Power @ 208V | 6600 | 10,000 | - | - | 20,000 | W |
| Maximum Input Current ⁽⁷⁾ @ 240V | 20 | 30.5 | 40 | 53 | 60 | A _{dc} |
| Maximum Input Current ⁽⁷⁾ @ 208V | 17.5 | 27 | - | - | 53 | A _{dc} |
| Maximum Input Short Circuit Current | 45 | | | | | A _{dc} |
| Maximum Inverter Efficiency | 99.2 | | | | | % |
| CEC Weighted Efficiency | 98.5 | | 99 | | 99 @ 240V 98.5 @ 208V | % |
| 2-pole Disconnection | Yes | | | | | |

(1) These specifications apply to inverters with part numbers SExxxxH-USMNUxxx5 and SExxxxH-USMNFxxx5 and connection unit model number DCD-1PH-US-PxH-F-x.
 (2) Inverters with part number SExxxxH-USMNFxxx5 are intended for upgrade installations only, as part of the "Re-Energize" program. Use on non-upgrade installations will revoke the product warranty.
 (3) For other regional settings please refer to the [SolarEdge Inverters, Power Control Options Application Note](#).
 (4) Not designed for non-grid connected applications and requires AC for commissioning. Stand-alone (backup) functionality is only supported for the 240V grid.
 (5) For LRA (Locked Rotor Amperage) values please refer to the [LRA for NAM Application Note](#).
 (6) For models SE7600H-US and below, the rated AC stand-alone power is configurable between 7600W or 11,400W from CPU version 4.20.xx.
 (7) A higher current source may be used. The inverter will limit its input current to the values stated.



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

| REVISIONS | | |
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| DESCRIPTION | DATE | REV |
| INITIAL DESIGN | 07/24/2024 | |
| | | |



PROJECT NAME & ADDRESS

**JUANA HULL
RESIDENCE**

**143 DECOY SPREAD PL,
LILLINGTON, NC 27546**

DRAWN BY
ESR

SHEET NAME
**EQUIPMENT
SPECIFICATION**

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

SHEET NUMBER
PV-12

/ SolarEdge Home Hub Inverter

Single Phase, for North America

SE3800H-US / SE5700H-US / **SE7600H-US** / SE10000H-US / SE11400H-US

| Model Number ⁽¹⁾⁽²⁾ | SE3800H-US | SE5700H-US | SE7600H-US | SE10000H-US | SE11400H-US | Units |
|---|--|------------------------------|-------------------|--------------------------------|-------------|-------|
| OUTPUT – DC (BATTERY) | | | | | | |
| Supported Battery Types | SolarEdge Home Battery, LG RESU Prime | | | | | |
| Number of Batteries per Inverter | Up to 3 SolarEdge Home Battery, up to 2 LG RESU Prime | | | | | |
| Continuous Power ⁽⁸⁾ | 11,400 @ 240V 3800 @ 208V | 11,400 @ 240V 5000 @ 208V | 11400 @240V | 11,400 @ 240V 10,000 @ 208V | | W |
| Peak Power ⁽⁸⁾ | 11,400 @ 240V 3800 @ 208V | 11,400 @ 240V 5000 @ 208V | 11400 @240V | 11,400 @ 240V 10,000 @ 208V | | W |
| Maximum Input Current | 30 | | | | | |
| 2-pole Disconnection | Up to the inverter's rated stand-alone power | | | | | |
| SMART ENERGY CAPABILITIES | | | | | | |
| Consumption Metering | Built-in ⁽⁹⁾ | | | | | |
| Stand-alone & Battery Storage | With Backup Interface (purchased separately) for service up to 200A; up to 3 inverters | | | | | |
| EV Charging | Direct connection to the SolarEdge Home EV Charger | | | | | |
| ADDITIONAL FEATURES | | | | | | |
| Supported Communication Interfaces | RS485, Ethernet, Cellular ⁽¹⁰⁾ , Wi-Fi (optional), SolarEdge Home Network (optional) | | | | | |
| Revenue Grade Metering, ANSI C12.20 | Built-in ⁽⁹⁾ | | | | | |
| Integrated AC, DC and Communication Connection Unit | Yes | | | | | |
| Inverter Commissioning | With the SetApp mobile application using built-in Wi-Fi Access Point for local connection | | | | | |
| DC Voltage Rapid Shutdown (PV and Battery) | Yes, NEC 690.12 | | | | | |
| STANDARD COMPLIANCE | | | | | | |
| Safety | UL 1741, UL 1741SA, UL 1741SB, UL 1699B, CSA 22.2#107.1, C22.2#330, C22.3#9, ANSI/CAN/UL 9540 | | | | | |
| Grid Connection Standards | IEEE1547 and IEEE-1547.1, Rule 21, Rule 14H | | | | | |
| Emissions | FCC Part 15 Class B | | | | | |
| INSTALLATION SPECIFICATIONS | | | | | | |
| AC Terminals | L1, L2, N terminal blocks, PE busbar for inverter connection L1, L2 terminal blocks, PE busbar for EV Charger AC connection | | | | | |
| DC Terminals | 4 x terminal block pairs for PV input; 1 x terminal block pair for battery input | | | | | |
| AC Output and EV AC Output Conduit Size / AWG Range | 1" maximum / 14-4 AWG | | | | | |
| DC Input (PV and Battery) Conduit Size / AWG Range | 1" maximum / 14-6 AWG | | | | | |
| Dimensions with Connection Unit (H x W x D) | 21.06 x 14.6 x 8.2 / 535 x 370 x 208 | | | | | |
| Weight with Connection Unit | 44.9 / 20.3 | | | | | |
| Noise | < 50 | | | | | |
| Cooling | Natural Convection | | | | | |
| Operating Temperature Range | -40 to +140 / -40 to +60 ⁽¹¹⁾ | | | | | |
| Protection Rating | NEMA 4X | | | | | |

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

(9) For consumption metering current transformers should be ordered separately: SECT-SPL-225A-T-20 or SEACT1250-400NA-20. Revenue grade metering is only for production metering.

(10) Information concerning the data plan terms & conditions is available in [SolarEdge Communication Plan Terms and Conditions](#).

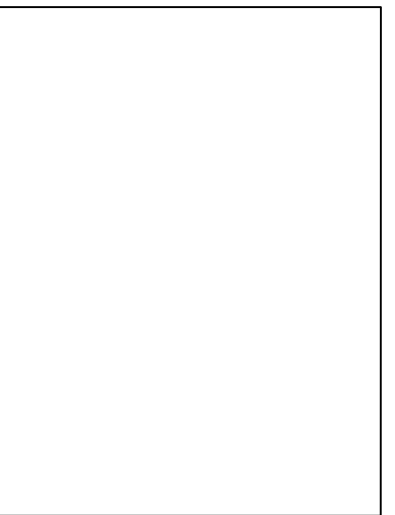
(11) Full power up to at least 50°C / 122°F; for power derating information refer to the [Temperature Derating Technical Note for North America](#).



TOP TIER SOLAR SOLUTIONS

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PROJECT NAME & ADDRESS

**JUANA HULL
RESIDENCE**

143 DECOY SPREAD PL,
LILLINGTON, NC 27546

DRAWN BY

ESR

SHEET NAME
**EQUIPMENT
SPECIFICATION**

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

SHEET NUMBER
PV-13



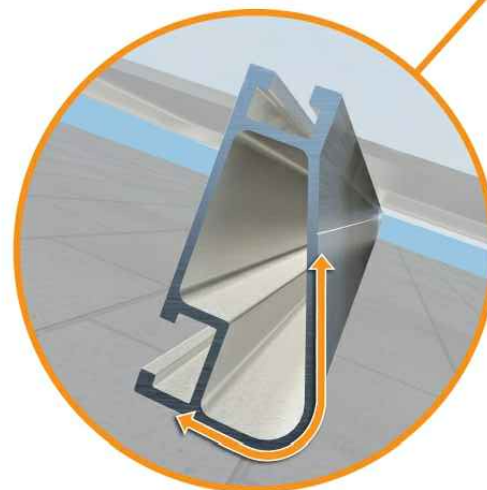
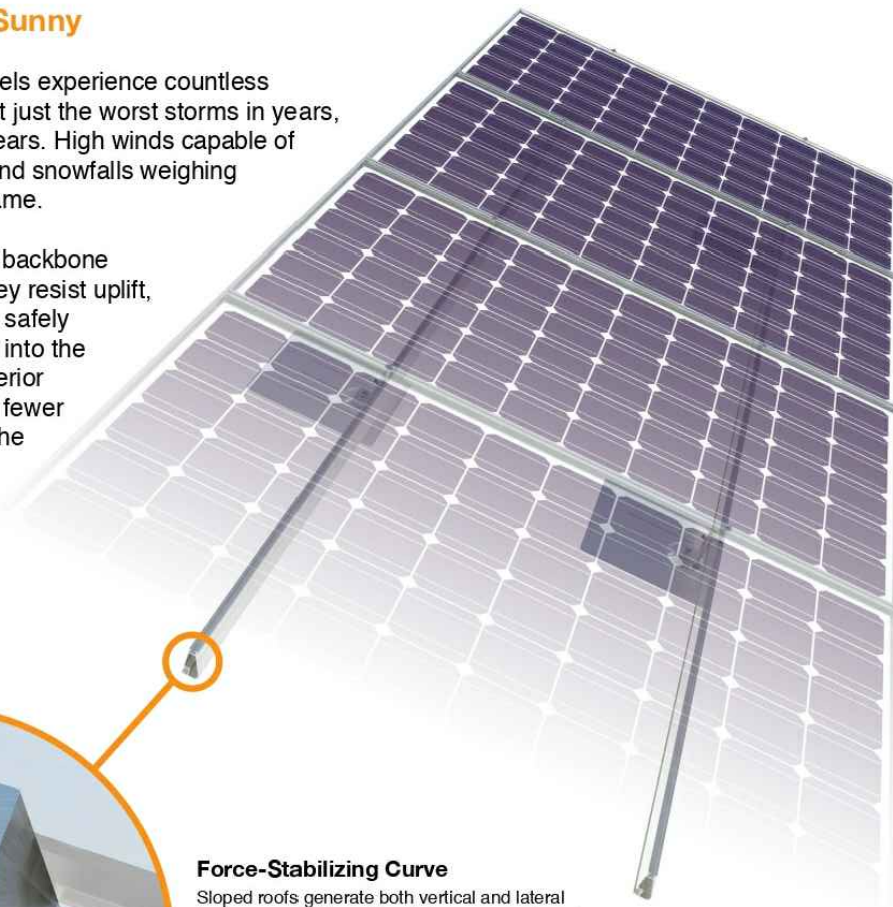


XR Rail® Family

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.



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 | | | | | | |
| | 120 | | | | | | |
| | 140 | XR10 | | XR100 | | XR1000 | |
| | 160 | | | | | | |
| 20 | 90 | | | | | | |
| | 120 | | | | | | |
| | 140 | | | | | | |
| | 160 | | | | | | |
| 30 | 90 | | | | | | |
| | 160 | | | | | | |
| 40 | 90 | | | | | | |
| | 160 | | | | | | |
| 80 | 160 | | | | | | |
| | 160 | | | | | | |
| 120 | 160 | | | | | | |
| | 160 | | | | | | |

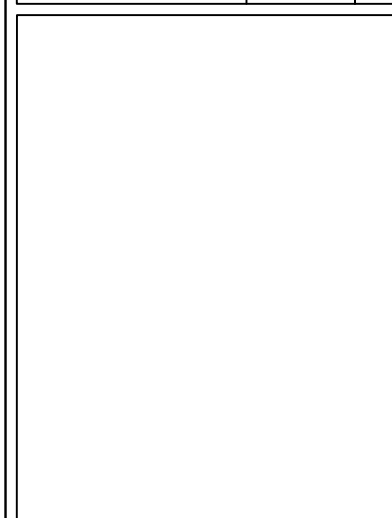
*Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification letters for actual design guidance.



TOP TIER SOLAR SOLUTIONS

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| PROJECT NAME & ADDRESS | |
|-------------------------|--|
| JUANA HULL RESIDENCE | 143 DECOY SPREAD PL, LILLINGTON, NC 27546 |

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

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

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

| |
|------------------------------|
| SHEET NUMBER PV-14 |
|------------------------------|



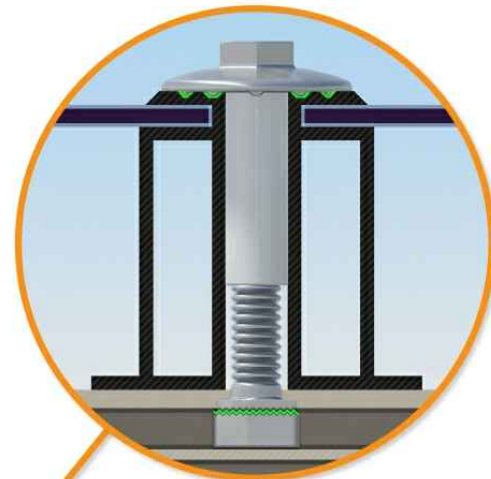
UFO® Family of Components

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.

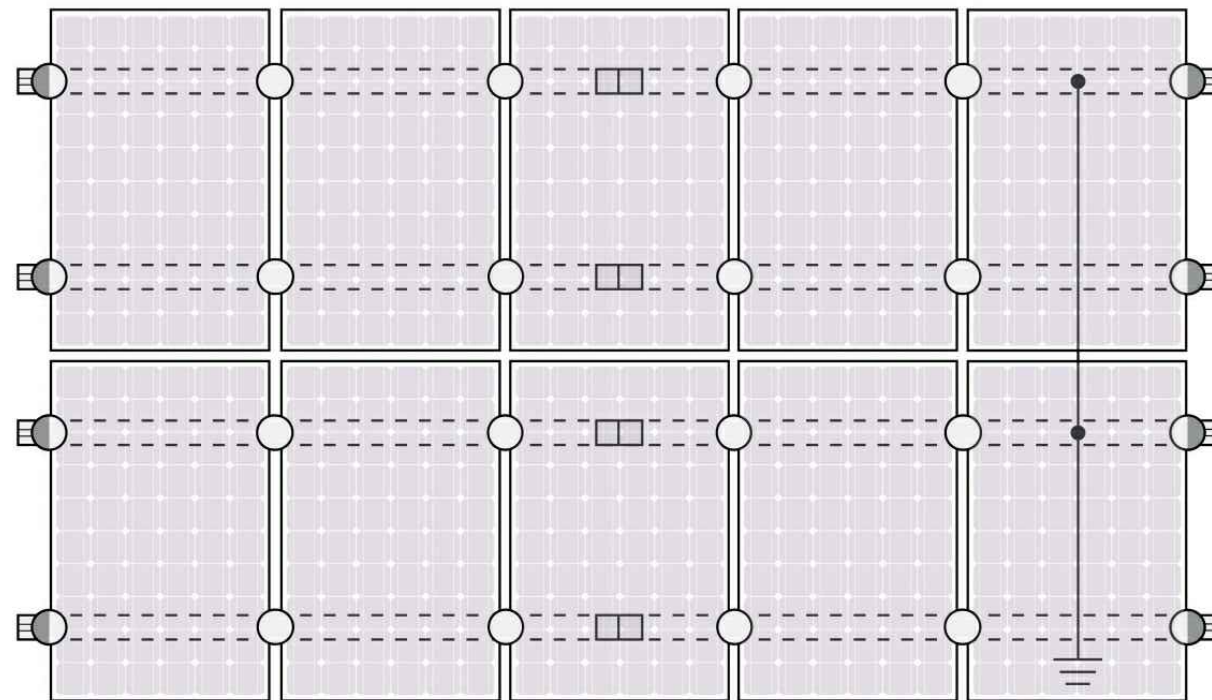
UFO® hardware forms secure electrical bonds with both the module and the rail, resulting in many parallel grounding paths throughout the system. This leads to safer and more reliable installations.

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.

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](http://IronRidge.com/UFO)

| Feature | Cross-System Compatibility | | |
|-----------------------------------|--|------------|----------------|
| | 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. | | |



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.



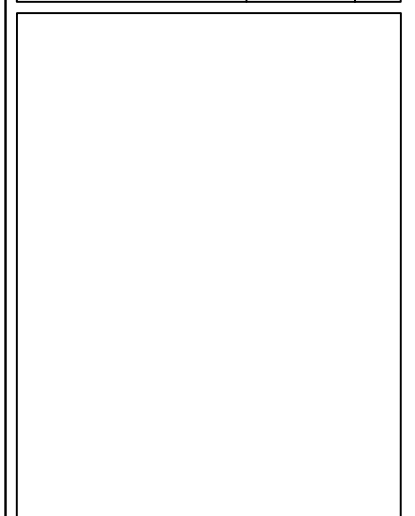
Bonded Attachments
The bonding bolt attaches and bonds the L-foot® to the rail. It is installed with the same socket as the rest of the system.



TOP TIER SOLAR SOLUTIONS

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PROJECT NAME & ADDRESS

JUANA HULL
RESIDENCE
143 DECOY SPREAD PL,
LILLINGTON, NC 27546

DRAWN BY
ESR

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-15

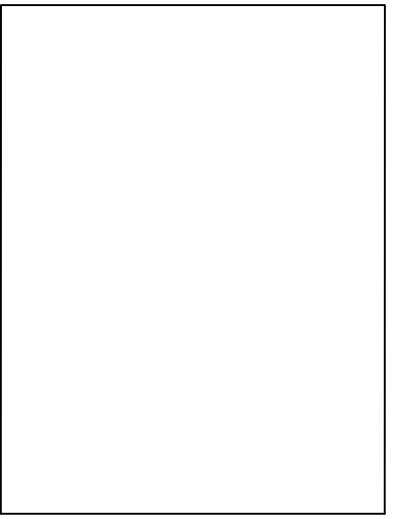
| ITEM NO | DESCRIPTION | QTY IN KIT |
|---------|----------------------------------|------------|
| 1 | QM Halo UltraGrip(Mill or Black) | 1 |

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

1. Halo UltraGrip

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

| REVISIONS | | |
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143 DECOY SPREAD PL,
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ESR

SHEET NAME
**EQUIPMENT
SPECIFICATION**

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

SHEET NUMBER
PV-16



QuickMount® RD Structural Screw



TOP TIER SOLAR SOLUTIONS

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

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

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

1. Self Drilling Screw, #14, Wood Tip

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

2. Washer, EPDM Backed

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

PROJECT NAME & ADDRESS

**JUANA HULL
RESIDENCE**

143 DECOY SPREAD PL,
LILLINGTON, NC 27546

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SHEET NAME
**EQUIPMENT
SPECIFICATION**

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

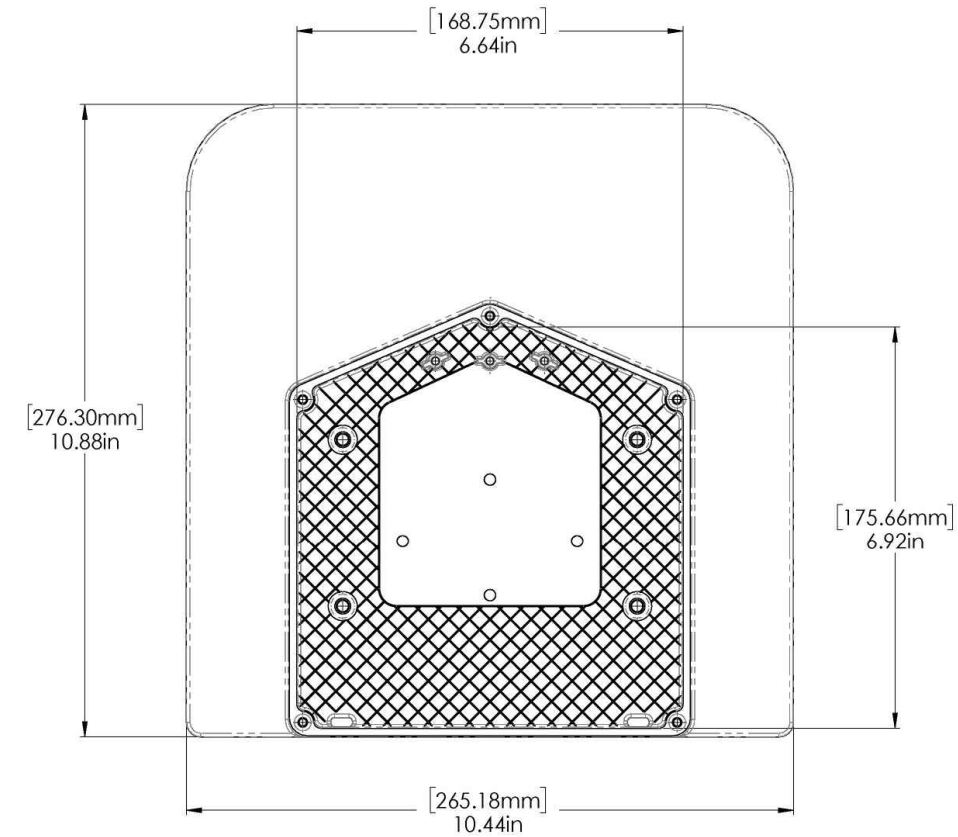
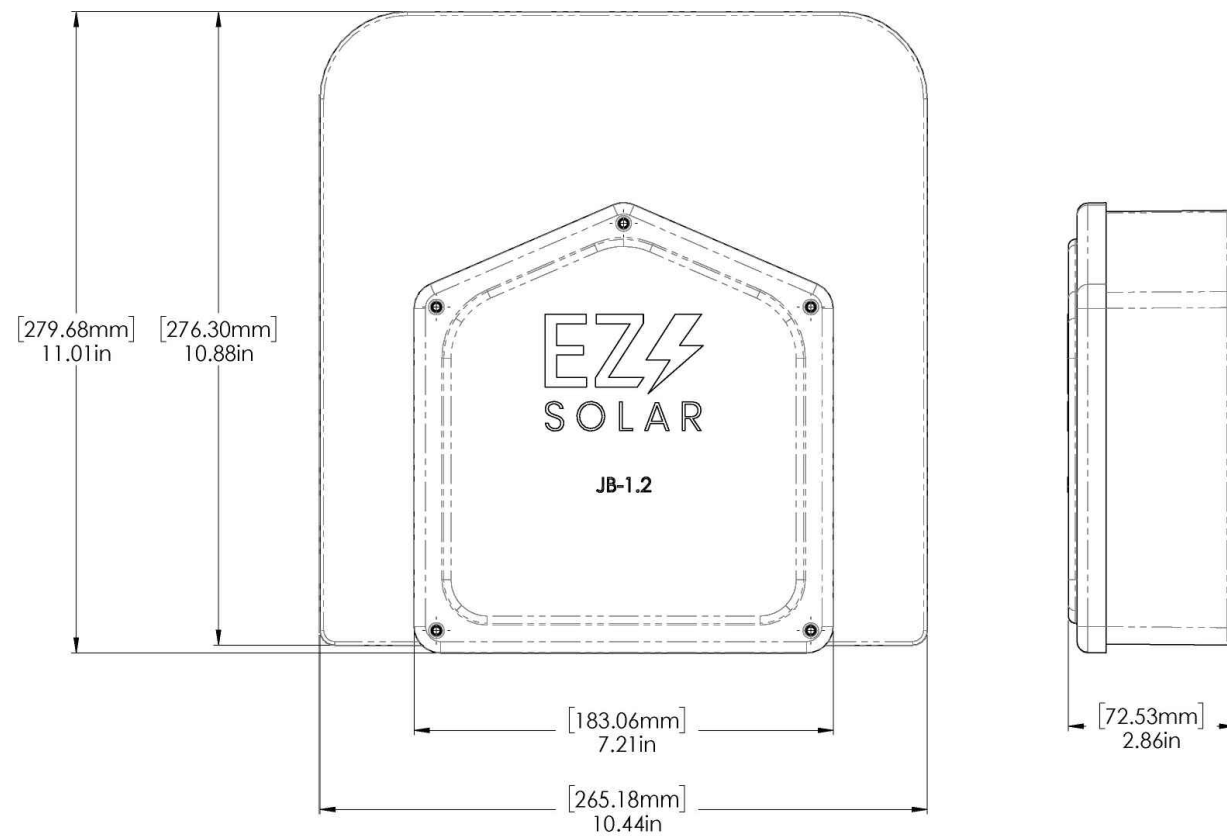
SHEET NUMBER
PV-17

| 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 |

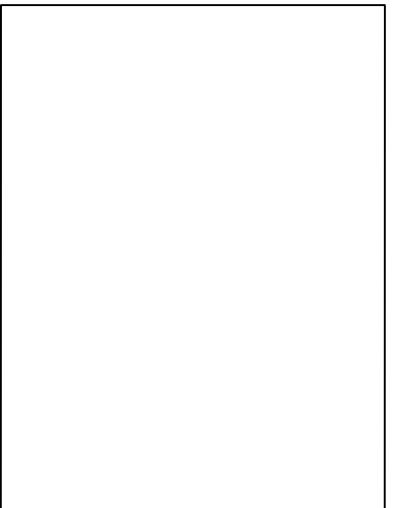
| | | |
|------------|------------------|--------------|
| SIZE | DWG. NO. | REV |
| B | JB-1.2 | |
| SCALE: 1:2 | WEIGHT: 1.45 LBS | SHEET 1 OF 3 |

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

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



| REVISIONS | | |
|----------------|------------|-----|
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| PROJECT NAME & ADDRESS | |
|-------------------------|--|
| JUANA HULL RESIDENCE | 143 DECOY SPREAD PL, LILLINGTON, NC 27546 |

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|------------------------|
| DRAWN BY ESR |
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|--|
| SHEET NAME EQUIPMENT SPECIFICATION |
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| |
|---|
| SHEET SIZE ANSI B 11" X 17" |
|---|

| |
|------------------------------|
| SHEET NUMBER PV-18 |
|------------------------------|