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March 30, 2022

Parker Schram
365 Solar
3524 Bost Street
Charlotte, NC 28208

Re: Engineering Services
Wilson-Gardner Residence
50 Winfield Court, Lillington, NC
7.600 kW System

To Whom It May Concern:

We have received information regarding solar panel installation on the roof of the above referenced structure. Our evaluation of the structure is to verify the existing capacity of the roof system and its ability to support the additional loads imposed by the proposed solar system.

A. Site Assessment Information

1. Site visit documentation identifying attic information including size and spacing of framing for the existing roof structure.
2. Design drawings of the proposed system including a site plan, roof plan and connection details for the solar panels. This information will be utilized for approval and construction of the proposed system.

B. Description of Structure:

Roof Framing: Prefabricated wood trusses at 24" on center. All truss members are constructed of 2x4 dimensional lumber.

Roof Material: Composite Asphalt Shingles

Roof Slope: 33 degrees

Attic Access: Accessible

Foundation: Permanent

C. Loading Criteria Used

- **Dead Load**
 - Existing Roofing and framing = 7 psf
 - New Solar Panels and Racking = 3 psf
 - TOTAL = 10 PSF
- **Live Load** = 20 psf (reducible) – 0 psf at locations of solar panels
- **Ground Snow Load** = 15 psf
- **Wind Load** based on ASCE 7-10
 - Ultimate Wind Speed = 120 mph (based on Risk Category II)
 - Exposure Category C

Analysis performed of the existing roof structure utilizing the above loading criteria is in accordance with the North Carolina Residential Code (2018), including provisions allowing existing structures to not require strengthening if the new loads do not exceed existing design loads by 105% for gravity elements and 110% for seismic elements. This analysis indicates that the existing framing will support the additional panel loading without damage, if installed correctly.

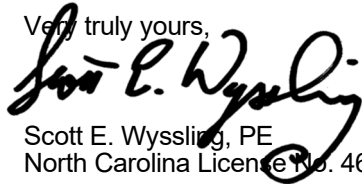
D. Solar Panel Anchorage

1. The solar panels shall be mounted in accordance with the most recent Ironridge installation manual. If during solar panel installation, the roof framing members appear unstable or deflect non-uniformly, our office should be notified before proceeding with the installation.
2. The maximum allowable withdrawal force for a $\frac{5}{16}$ " lag screw is 235 lbs per inch of penetration as identified in the National Design Standards (NDS) of timber construction specifications. Based on a minimum penetration depth of $2\frac{1}{2}$ ", the allowable capacity per connection is greater than the design withdrawal force (demand). Considering the variable factors for the existing roof framing and installation tolerances, the connection using one $\frac{5}{16}$ " diameter lag screw with a minimum of $2\frac{1}{2}$ " embedment will be adequate and will include a sufficient factor of safety.
3. Considering the wind speed, roof slopes, size and spacing of framing members, and condition of the roof, the panel supports shall be placed no greater than 48" on centers.
4. Panel supports connections shall be staggered to distribute load to adjacent framing members.

Based on the above evaluation, this office certifies that with the racking and mounting specified, the existing roof system will adequately support the additional loading imposed by the solar system. This evaluation is in conformance with the North Carolina Residential Code (2018) current industry standards, and is based on information supplied to us at the time of this report.

Should you have any questions regarding the above or if you require further information do not hesitate to contact me.

Very truly yours,



Scott E. Wyssling, PE
North Carolina License No. 46546



Wyssling Consulting, PLLC
76 N Meadowbrook Drive
Alpine UT 84004 COA # P-2308

PROJECT DESCRIPTION:

22 x MISSION SOLAR: MSE345SX5T 345W MONO MODULES
 ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES
 DC SYSTEM SIZE: 7.590kW DC
 AC SYSTEM SIZE: 7.600kW AC

EQUIPMENT SUMMARY

- 22 MISSION SOLAR: MSE345SX5T 345W MODULES
- 22 GENERAC SNAPRS801
- 03 GENERAC PV LINK S2502 POWER OPTIMIZERS
- 01 GENERAC PWRCELL: X7602 7600W INVERTER
- 01 GENERAC PWRCELL 9kW (18kWh) BATTERY

ROOF ARRAY AREA #1:- 436.26 SQ FT.

AUTHORITIES HAVING JURISDICTION

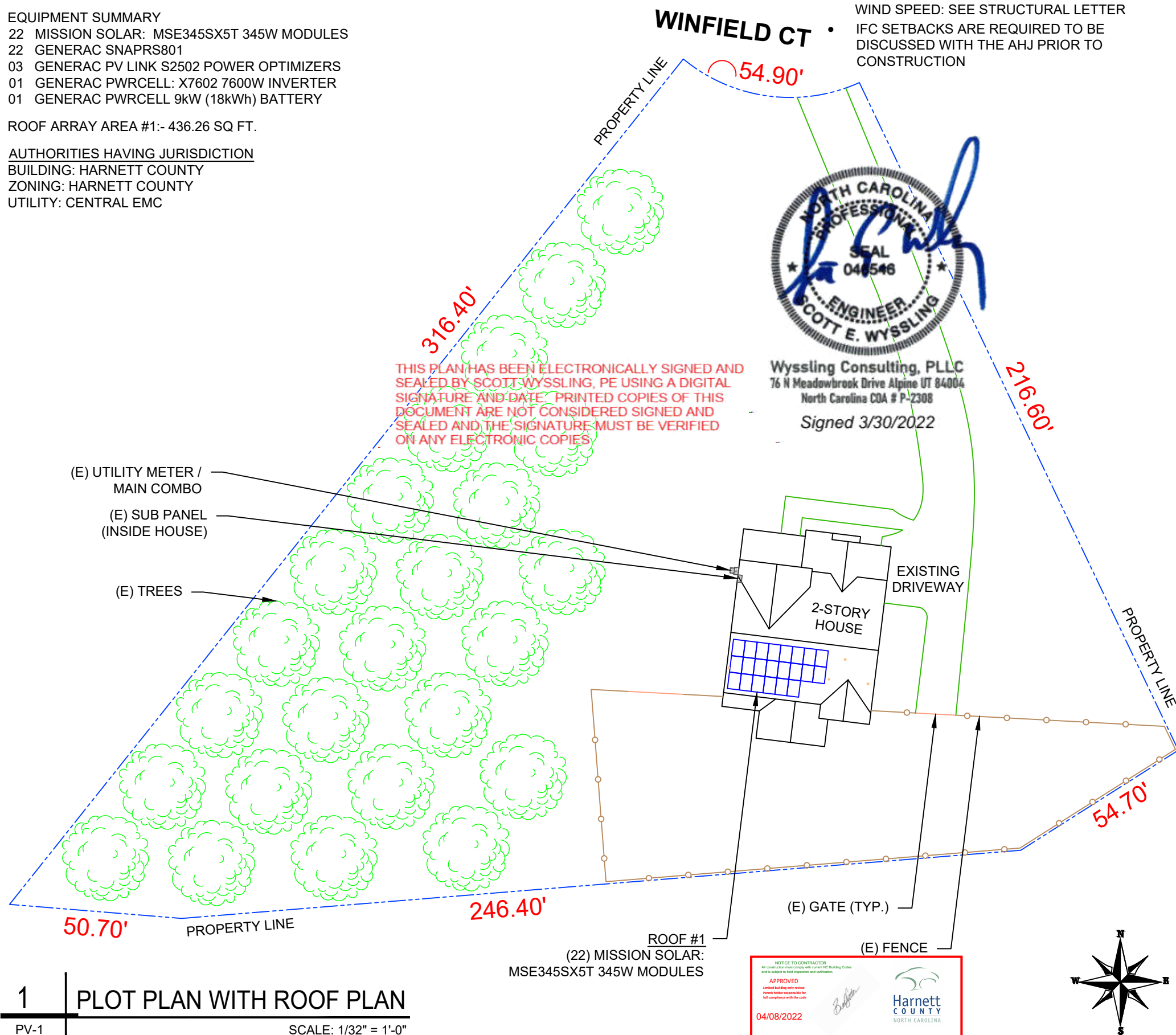
- BUILDING: HARNETT COUNTY
- ZONING: HARNETT COUNTY
- UTILITY: CENTRAL EMC

APPLICABLE CODES & STANDARDS

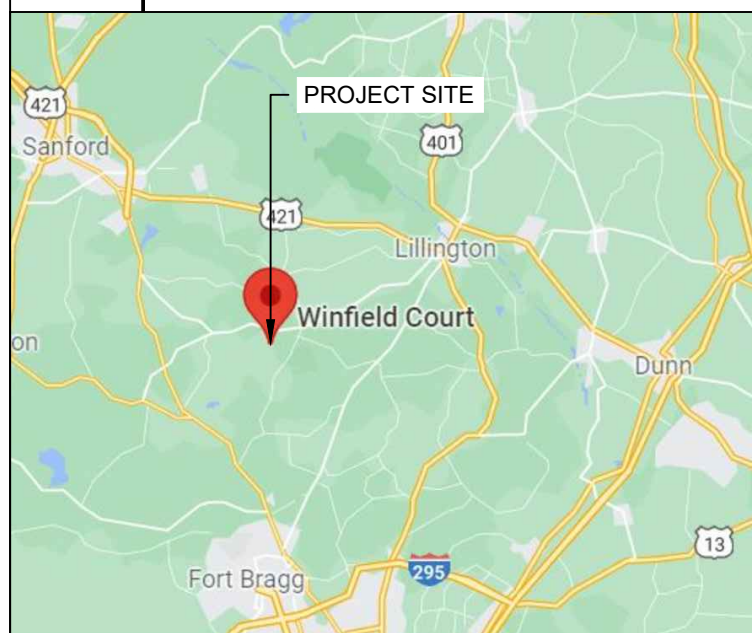
NCBC 2018
 NEC 2017

DESIGN SPECIFICATIONS

OCCUPANCY: II
 CONSTRUCTION: SINGLE-FAMILY
 ZONING: RESIDENTIAL
 GROUND SNOW LOAD: SEE STRUCTURAL LETTER
 WIND EXPOSURE: SEE STRUCTURAL LETTER
 WIND SPEED: SEE STRUCTURAL LETTER
 IFC SETBACKS ARE REQUIRED TO BE DISCUSSED WITH THE AHJ PRIOR TO CONSTRUCTION



2 HOUSE PHOTO SCALE: NTS



3 VICINITY MAP SCALE: NTS

SHEET INDEX

| | |
|-------|--------------------------|
| PV-1 | PLOT PLAN & VICINITY MAP |
| PV-2 | ROOF PLAN & MODULES |
| PV-2A | STRING LAYOUT |
| PV-3 | ATTACHMENT DETAIL |
| PV-4 | ELECTRICAL LINE DIAGRAM |
| PV-5 | WIRING CALCULATIONS |
| PV-6 | LABELS |
| PV-7 | PLACARD |
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| PV-9+ | EQUIPMENT SPECIFICATIONS |



REVISIONS

| DESCRIPTION | DATE | REV |
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| INITIAL | 02/22/2022 | |
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SIGNATURE WITH SEAL

DATE: 02/22/2022

PROJECT NAME & ADDRESS

NICOLE WILSON-GARDNER RESIDENCE
 50 WINFIELD CT
 LILLINGTON, NC 27546

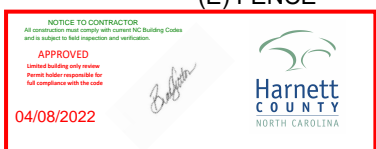
DC SIZE: 7.590 KW
 AC SIZE: 7.600 KW

SHEET NAME
PLOT PLAN & VICINITY MAP

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

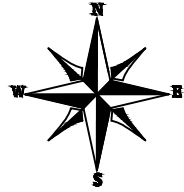
SHEET NUMBER
PV-1

1 PLOT PLAN WITH ROOF PLAN SCALE: 1/32" = 1'-0"



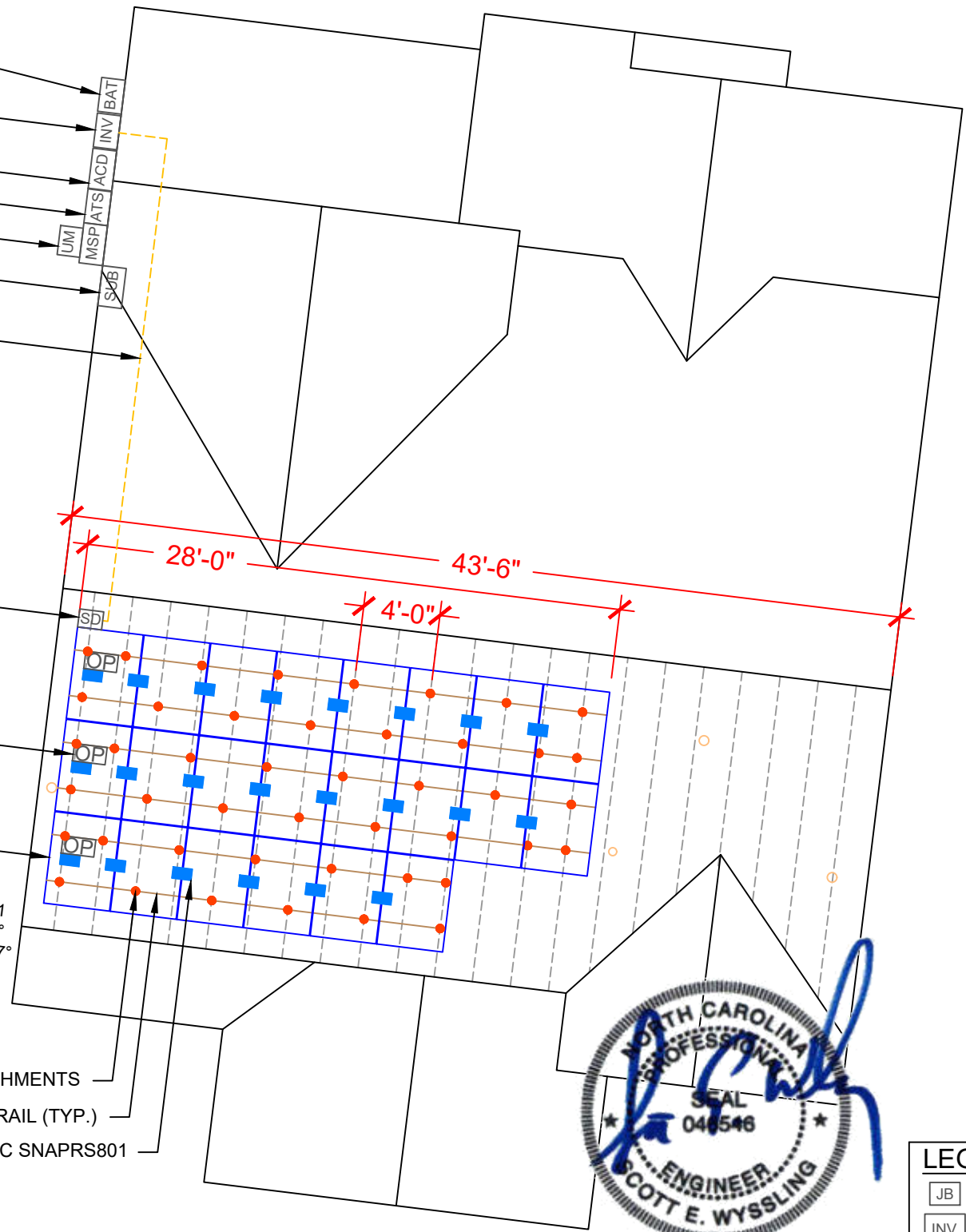
MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 22 MODULES
 MODULE TYPE = MISSION SOLAR: MSE345SX5T 345W MODULES
 MODULE WEIGHT = 44.80 LBS / 20.3KG.
 MODULE DIMENSIONS = 68.8"x 41.5" = 19.83 SF



- (N) GENERAC PWRCELL 9kW (18kWh) BATTERY (OUTSIDE)
- (N) GENERAC PWRCELL: X7602 7600W INVERTER
- (N) FUSED AC DISCONNECT
- (N) AUTOMATIC TRANSFER SWITCH
- (E) UTILITY METER / MAIN COMBO
- (E) SUB PANEL (INSIDE HOUSE)
- 3/4" EMT/LFMC CONDUIT RUN

- (N) SOLADECK
- (3) GENERAC PV LINK S2502 POWER OPTIMIZERS
- ROOF #1 (22) MISSION SOLAR: MSE345SX5T 345W MODULES
- ROOF #1 TILT - 33° AZIM. - 187°
- (45) IRONRIDGE FLASH FOOT 2 ATTACHMENTS
- (N) IRONRIDGE XR10 RAIL (TYP.)
- (22) GENERAC SNAPRS801



| ROOF DESCRIPTION | | | | |
|------------------|-----------|-------------------|------------|---------------|
| ROOF TYPE | | COMPOSITE SHINGLE | | |
| ROOF LAYER | | 1 LAYER | | |
| ROOF | ROOF TILT | AZIMUTH | TRUSS SIZE | TRUSS SPACING |
| #1 | 33° | 187° | 2X4 | 24" |

| ARRAY AREA & ROOF AREA CALC'S | | | | |
|-------------------------------|--------------|----------------------|---------------------|--------------------------------|
| ROOF | # OF MODULES | ARRAY AREA (Sq. Ft.) | ROOF AREA (Sq. Ft.) | ROOF AREA COVERED BY ARRAY (%) |
| #1 | 22 | 436.26 | 714.47 | 61 |



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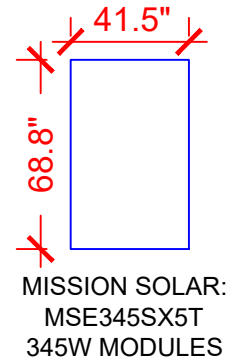
NICOLE WILSON-GARDNER RESIDENCE
 50 WINFIELD CT
 LILLINGTON, NC 27546

DC SIZE: 7.590 KW
 AC SIZE: 7.600 KW

SHEET NAME
ROOF PLAN & MODULES

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

SHEET NUMBER
PV-2



Wyssling Consulting, PLLC
 76 N Meadowbrook Drive Alpine UT 84004
 North Carolina COA # P-2308
 Signed 3/30/2022

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| LEGEND | |
|----------------------|--------------------------------------|
| JB | - JUNCTION BOX |
| INV | - INVERTER |
| ACD | - AC DISCONNECT |
| MSP | - MAIN SERVICE PANEL |
| BAT | - BATTERY |
| OP | - PV LINK -S2502 |
| ATS | - AUTO TRANSFER SWITCH |
| [Blue Square] | - SNAPRS801 |
| [Orange Square] | - VENT, ATTIC FAN (ROOF OBSTRUCTION) |
| [Red Circle] | - ROOF ATTACHMENT |
| [Dashed Line] | - truss |
| [Yellow Dashed Line] | - CONDUIT |

| STRING LEGENDS | |
|----------------|-----------|
| | STRING #1 |
| | STRING #2 |
| | STRING #3 |



- STRING #1
(PV LINK OPTIMIZER -1 :
8 MODULES)
- STRING #2
(PV LINK OPTIMIZER -2 :
8 MODULES)
- STRING #3
(PV LINK OPTIMIZER -3 :
6 MODULES)

| BILL OF MATERIALS | | |
|-------------------|-----|--|
| EQUIPMENT | QTY | DESCRIPTION |
| SOLAR PV MODULE | 22 | MISSION SOLAR: MSE345SX5T 345W MODULES |
| SNAPRS | 22 | GENERAC SNAPRS801 |
| OPTIMIZER | 3 | GENERAC PV LINK S2502 POWER OPTIMIZERS |
| INVERTER | 1 | GENERAC PWRCELL: X7602 7600W INVERTER |
| BATTERY | 1 | GENERAC PWRCELL 9kW (18kWh) BATTERY |
| AC DISCONNECT | 1 | 60A FUSED AC DISCONNECT, (2) 40A FUSES, 240V NEMA 3R, UL LISTED |
| SOLADECK | 1 | SOLADECK 600V,NEMA 3R, UL LISTED |
| ATTACHMENT | 45 | IRONRIDGE FLASH FOOT 2 ATTACHMENT |
| SQUARE-BOLT | 45 | SQUARE-BOLT BONDING ATTACHMENT HARDWARE |
| RAILS | 11 | IRONRIDGE XR10 RAIL-168" (14 FEET) BLACK |
| BONDED SPLICE | 6 | SPLICE KIT |
| MODULE CLAMPS | 38 | UNIVERSAL MODULE CLAMPS |
| END CLAMPS | 12 | END CLAMPS / STOPPER SLEEVE |
| GROUNDING LUG | 3 | IRONRIDGE GROUNDING LUG |



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PROJECT NAME & ADDRESS

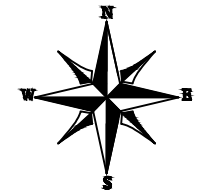
NICOLE
WILSON-GARDNER
RESIDENCE
50 WINFIELD CT
LILLINGTON, NC 27546

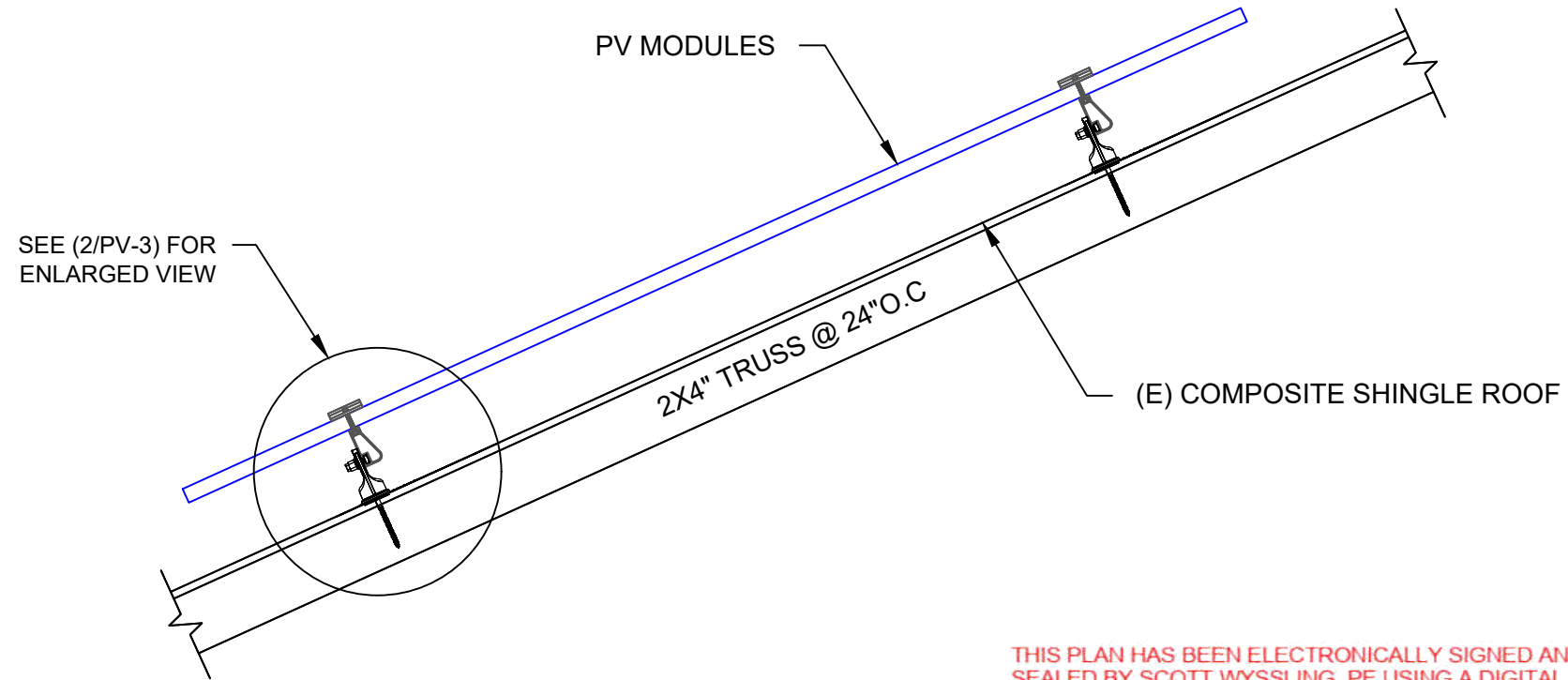
DC SIZE: 7.590 KW
AC SIZE: 7.600 KW

SHEET NAME
STRING
LAYOUT

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-2A





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 North Carolina COA # P-2308
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1 ATTACHMENT DETAIL

PV-3 SCALE: NTS

PROJECT NAME & ADDRESS

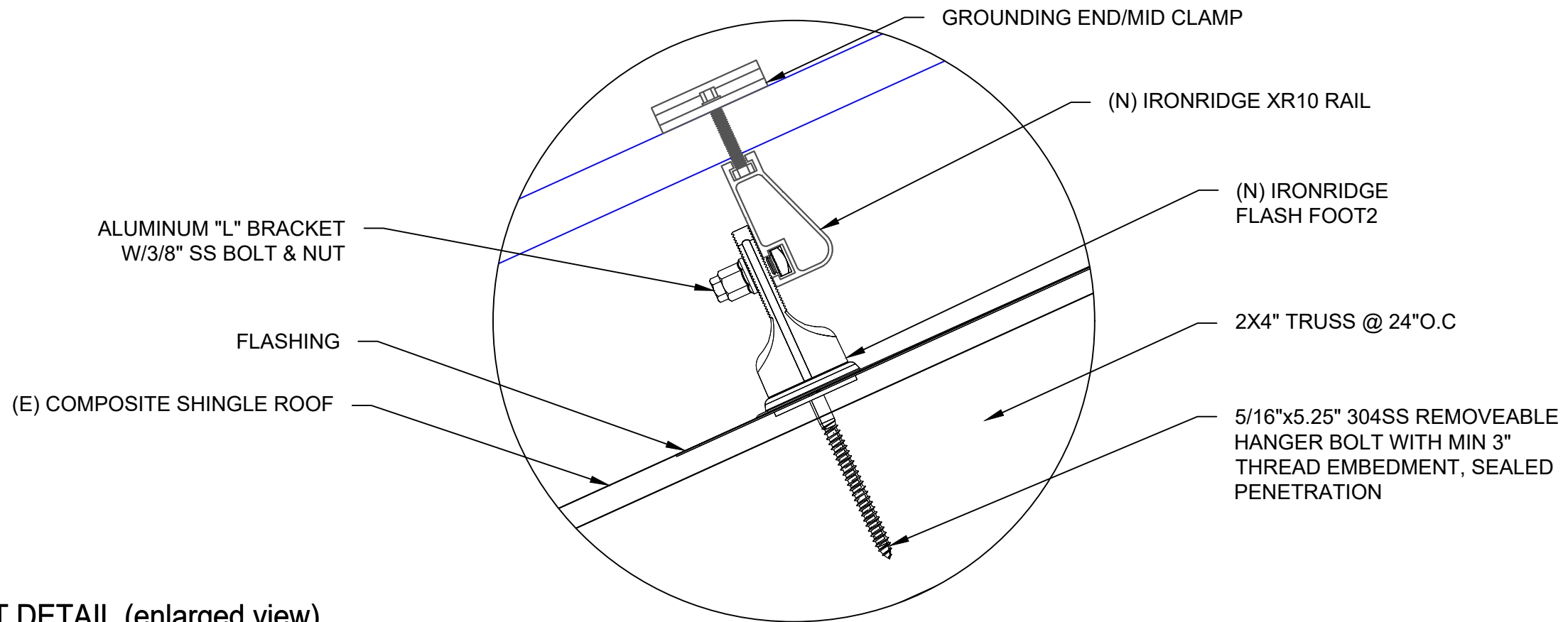
NICOLE
 WILSON-GARDNER
 RESIDENCE
 50 WINFIELD CT
 LILLINGTON, NC 27546

DC SIZE: 7.590 KW
 AC SIZE: 7.600 KW

SHEET NAME
**ATTACHMENT
 DETAIL**

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

SHEET NUMBER
PV-3



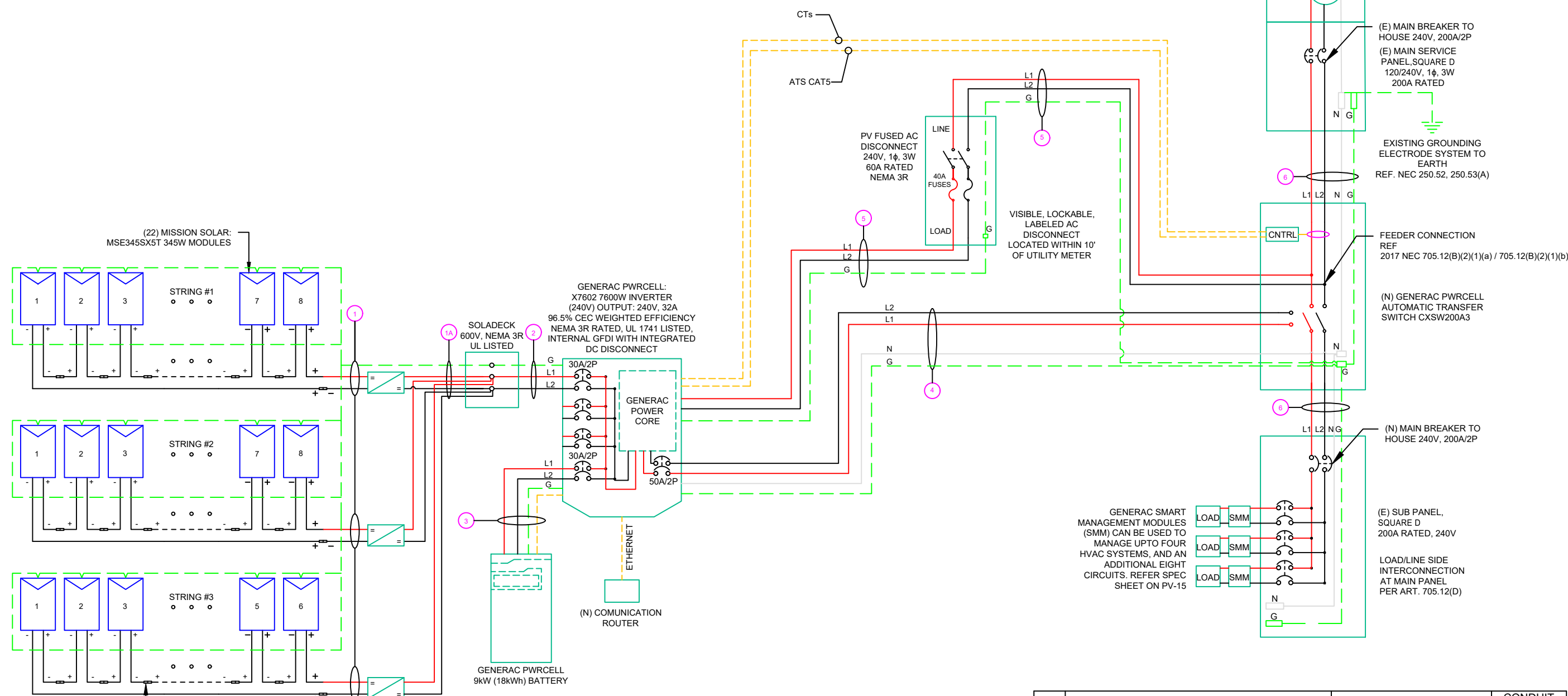
2 ATTACHMENT DETAIL (enlarged view)

PV-3 SCALE: NTS

DC SYSTEM SIZE: 7.590 kW DC
 AC SYSTEM SIZE: 7.600 kW AC

(22) MISSION SOLAR: MSE345SX5T 345W MODULES WITH (22) GENERAC SNAPRS801
 (2) STRINGS OF 8 MODULES AND
 (1) STRING OF 6 MODULES CONNECTED IN SERIES

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



SNAP RS (RS801)
 MAX INPUT CURRENT - 13 A
 UL 1741 LISTED
 MODULE LEVEL RAPID
 SHUTDOWN (PVRSS)
 COMPLIANT
 NEMA 6P RATED

PV LINK SUBSTRING OPTIMIZER (S2502)
 RATED POWER : 2500W
 MPPT VOLTAGE RANGE: 60 TO 360 V
 MAX OUTPUT VOLTAGE: 420V
 MAX OUTPUT CURRENT: 8A
 RAPID SHUTDOWN COMPLIANT
 GROUND-FAULT PROTECTION COMPLIANT

SERVICE INFO

UTILITY PROVIDER: **CENTRAL EMC**
 MAIN SERVICE VOLTAGE: 240V
 MAIN PANEL BRAND: **SQUARE D**
 MAIN SERVICE PANEL: 200A
 MAIN STRING BREAKER RATING: 200A
 MAIN SERVICE LOCATION: NORTH-WEST
 SERVICE FEED SOURCE: UNDERGROUND

| QTY | CONDUCTOR INFORMATION | CONDUIT TYPE | CONDUIT SIZE |
|-----|-----------------------------------|--------------|--------------|
| (6) | CU#10AWG - PV WIRE/USE-2 | N/A | N/A |
| (1) | CU#6AWG - BARE COPPER IN FREE AIR | N/A | N/A |
| (6) | CU#10AWG - PV WIRE/USE-2 | N/A | N/A |
| (1) | CU#6AWG - BARE COPPER IN FREE AIR | N/A | N/A |
| (2) | CU#10AWG - THWN-2 (L1,L2) | EMT OR LFMC | 3/4" |
| (1) | CU#10AWG - THWN-2 GND | EMT OR LFMC | 3/4" |
| (2) | CU#10AWG - THWN-2 (L1,L2) | EMT OR LFMC | 3/4" |
| (1) | CU#10AWG - THWN-2 GND | EMT OR LFMC | 3/4" |
| (2) | CU#8AWG - THWN-2 (L1,L2) | EMT OR LFMC | 3/4" |
| (1) | CU#8AWG - THWN-2 NEUTRAL | EMT OR LFMC | 3/4" |
| (1) | CU#10AWG - THWN-2 GND | EMT OR LFMC | 3/4" |
| (2) | CU#6AWG - THWN-2 (L1,L2) | EMT OR LFMC | 3/4" |
| (1) | CU#6AWG - THWN-2 GND | EMT OR LFMC | 3/4" |
| (2) | CU#2/0AWG - THWN-2 (L1,L2) | EMT OR LFMC | 2" |
| (1) | CU#1/0AWG - THWN-2 NEUTRAL | EMT OR LFMC | 2" |
| (1) | CU#6AWG - THWN-2 GND | EMT OR LFMC | 2" |

1 ELECTRICAL LINE DIAGRAM
 PV-4 SCALE: NTS



REVISIONS

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DATE: 02/22/2022

PROJECT NAME & ADDRESS

NICOLE WILSON-GARDNER RESIDENCE
 50 WINFIELD CT
 LILLINGTON, NC 27546

DC SIZE: 7.590 KW
 AC SIZE: 7.600 KW

SHEET NAME
ELECTRICAL LINE DIAGRAM

SHEET SIZE
ANSI B 11" X 17"

SHEET NUMBER
PV-4

| SOLAR MODULE SPECIFICATIONS | |
|-----------------------------|--|
| MANUFACTURER / MODEL # | MISSION SOLAR: MSE345SX5T 345W MODULES |
| VMP | 33.37V |
| IMP | 10.34A |
| VOC | 41.00V |
| ISC | 10.92A |
| TEMP. COEFF. VOC | -0.262%/°C |
| MODULE DIMENSION | 68.8"L x 41.5"W x 1.60"D (In Inch) |

| POWER OPTIMIZER (GENERAC PV LINK S2502 POWER OPTIMIZERS) | |
|--|-----------|
| RATED POWER | 2500W |
| MAXIMUM INPUT VOLTAGE | 420Voc |
| MPPT VOLTAGE RANGE | 60-360Vmp |
| NOMINAL OUTPUT | 380Vdc |
| MAXIMUM OUTPUT | 420Adc |
| MAXIMUM OUTPUT CURRENT | 8A |
| MAXIMUM SHORT CIRCUIT CURRENT | 18A |

| AMBIENT TEMPERATURE SPECS | |
|---------------------------------------|------------|
| RECORD LOW TEMP | -10° |
| AMBIENT TEMP (HIGH TEMP 2%) | 36° |
| MODULE TEMPERATURE COEFFICIENT OF Voc | -0.262%/°C |

| INVERTER SPECIFICATIONS | |
|-------------------------|---------------------------------------|
| MANUFACTURER / MODEL # | GENERAC PWRCELL: X7602 7600W INVERTER |
| NOMINAL AC POWER | 7.600 KW |
| NOMINAL OUTPUT VOLTAGE | 240 VAC |
| NOMINAL OUTPUT CURRENT | 32A |

| PERCENT OF VALUES | NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT |
|-------------------|--|
| 0.80 | 4-6 |
| 0.70 | 7-9 |
| 0.50 | 10-20 |

DC FEEDER CALCULATIONS

| CIRCUIT ORIGIN | CIRCUIT DESTINATION | VOLTAGE (V) | FULL LOAD AMPS "FLA" (A) | FLA*1.25 (A) | OC PD SIZE (A) | GROUND SIZE | CONDUCTOR SIZE | 75°C AMPACITY (A) | AMPACITY CHECK #1 | AMBIENT TEMP. (°C) | TOTAL CC CONDUCTORS IN RACEWAY | 90°C AMPACITY (A) | DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a) | DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a) | 90°C AMPACITY DERATED (A) | AMPACITY CHECK #2 | FEEDER LENGTH (FEET) | CONDUCTOR RESISTANCE (OHM/KFT) | VOLTAGE DROP AT FLA (%) | CONDUIT SIZE | CONDUIT FILL (%) |
|----------------|---------------------|-------------|--------------------------|--------------|----------------|--------------------|----------------|-------------------|-------------------|--------------------|--------------------------------|-------------------|---|--|---------------------------|-------------------|----------------------|--------------------------------|-------------------------|--------------|------------------|
| STRING 1 | SOLADECK | 380 | 8.00 | 10.00 | 20 | BARE COPPER #6 AWG | CU #10 AWG | 35 | PASS | 36 | 2 | 40 | 0.91 | 1 | 36.4 | PASS | 5 | 1.24 | 0.026 | N/A | #N/A |
| STRING 2 | SOLADECK | 380 | 8.00 | 10.00 | 20 | BARE COPPER #6 AWG | CU #10 AWG | 35 | PASS | 36 | 2 | 40 | 0.91 | 1 | 36.4 | PASS | 5 | 1.24 | 0.026 | N/A | #N/A |
| STRING 3 | SOLADECK | 380 | 8.00 | 10.00 | 20 | BARE COPPER #6 AWG | CU #10 AWG | 35 | PASS | 36 | 2 | 40 | 0.91 | 1 | 36.4 | PASS | 5 | 1.24 | 0.026 | N/A | #N/A |
| SOLADECK | INVERTER | 380 | 24.00 | 30.00 | 30 | CU #10 AWG | CU #10 AWG | 35 | PASS | 36 | 2 | 40 | 0.91 | 1 | 36.4 | PASS | 40 | 1.24 | 0.627 | 3/4" EMT | 11.87617 |

| | |
|-----------------------|-------|
| String 1 Voltage Drop | 0.653 |
| String 2 Voltage Drop | 0.653 |
| String 3 Voltage Drop | 0.653 |

AC FEEDER CALCULATIONS

| CIRCUIT ORIGIN | CIRCUIT DESTINATION | VOLTAGE (V) | FULL LOAD AMPS "FLA" (A) | FLA*1.25 (A) | OC PD SIZE (A) | NEUTRAL SIZE | GROUND SIZE | CONDUCTOR SIZE | 75°C AMPACITY (A) | AMPACITY CHECK #1 | AMBIENT TEMP. (°C) | TOTAL CC CONDUCTORS IN RACEWAY | 90°C AMPACITY (A) | DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a) | DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a) | 90°C AMPACITY DERATED (A) | AMPACITY CHECK #2 | FEEDER LENGTH (FEET) | CONDUCTOR RESISTANCE (OHM/KFT) | VOLTAGE DROP AT FLA (%) | CONDUIT SIZE | CONDUIT FILL (%) |
|----------------|---------------------|-------------|--------------------------|--------------|----------------|--------------|-------------|----------------|-------------------|-------------------|--------------------|--------------------------------|-------------------|---|--|---------------------------|-------------------|----------------------|--------------------------------|-------------------------|--------------|------------------|
| INVERTER 1 | AC DISCONNECT | 240 | 32 | 40 | 40 | N/A | CU #6 AWG | CU #6 AWG | 65 | PASS | 36 | 2 | 75 | 0.91 | 1 | 68.25 | PASS | 5 | 0.491 | 0.065 | 3/4" EMT | 28.5366 |
| AC DISCONNECT | POI | 240 | 32 | 40 | 40 | N/A | CU #6 AWG | CU #6 AWG | 65 | PASS | 36 | 2 | 75 | 0.91 | 1 | 68.25 | PASS | 5 | 0.491 | 0.065 | 3/4" EMT | 28.5366 |

| | |
|-------------------------|------|
| CUMULATIVE VOLTAGE DROP | 0.13 |
|-------------------------|------|

REVISIONS

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DATE: 02/22/2022

PROJECT NAME & ADDRESS

NICOLE WILSON-GARDNER RESIDENCE
 50 WINFIELD CT
 LILLINGTON, NC 27546

DC SIZE: 7.590 KW
 AC SIZE: 7.600 KW

SHEET NAME
WIRING CALCULATIONS

SHEET SIZE
ANSI B 11" X 17"

SHEET NUMBER
PV-5

ELECTRICAL NOTES

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



**CAUTION:
AUTHORIZED SOLAR
PERSONNEL ONLY!**

LABEL-1:
LABEL LOCATION:
AC DISCONNECT

**WARNING: PHOTOVOLTAIC
POWER SOURCE**

EVERY 10' ON CONDUIT & ENCLOSURES

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

WARNING
ELECTRICAL SHOCK HAZARD
TERMINALS ON THE LINE AND LOAD SIDES MAY
BE ENERGIZED IN THE OPEN POSITION

LABEL- 3:
LABEL LOCATION:
AC DISCONNECT
INVERTER
MAIN SERVICE PANEL
SUBPANEL
MAIN SERVICE DISCONNECT
CODE REF: NEC 690.13(B)

**WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM**

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

WARNING
**TURN OFF PHOTOVOLTAIC AC
DISCONNECT PRIOR TO
WORKING INSIDE PANEL**

LABEL- 5:
LABEL LOCATION:
MAIN SERVICE PANEL
SUBPANEL
MAIN SERVICE DISCONNECT
CODE REF: NEC 110.27(C) & OSHA 1910.145 (f) (7)

CAUTION
**PHOTOVOLTAIC SYSTEM CIRCUIT IS
BACKFEED**

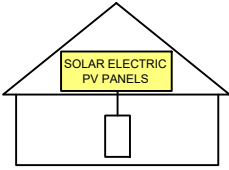
LABEL- 6:
LABEL LOCATION:
MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)
SUBPANEL (ONLY IF SOLAR IS BACK-FED)
CODE REF: NEC 705.12(D) & NEC 690.59

WARNING
POWER SOURCE OUTPUT
CONNECTION. DO NOT
RELOCATE THIS
OVERCURRENT DEVICE

LABEL- 7:
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- 8:
LABEL LOCATION:
AC DISCONNECT
CODE REF: IFC 605.11.3.1(1) & NEC 690.56(C)

**RAPID SHUTDOWN SWITCH
FOR SOLAR PV SYSTEM**

LABEL- 9:
LABEL LOCATION:
AC DISCONNECT
CODE REF: NEC 690.56(C)(2)

**PHOTOVOLTAIC
AC DISCONNECT**

LABEL- 10:
LABEL LOCATION:
AC DISCONNECT
CODE REF: NEC 690.13(B)

**PHOTOVOLTAIC
DC DISCONNECT**

LABEL- 11:
LABEL LOCATION:
INVERTER
CODE REF: NEC 690.13(B)

**PHOTOVOLTAIC
AC DISCONNECT**
NOMINAL OPERATING AC VOLATGE **240 V**
RATED AC OUTPUT CURRENT **32.00 A**

LABEL- 12:
LABEL LOCATION:
MAIN SERVICE PANEL
SUBPANEL
AC DISCONNECT
CODE REF: NEC 690.54

**INVERTER
AC DISCONNECT**
NOMINAL OPERATING AC VOLATGE **240 V**
RATED AC OUTPUT CURRENT **32.00 A**

LABEL- 13:
LABEL LOCATION:
INVERTER
CODE REF: NEC 690.54

MAXIMUM VOLTAGE **380 V**
MAXIMUM CIRCUIT CURRENT **30 A**
**MAXIMUM RATED OUTPUT
CURRENT OF THE CHARGE
CONTROLLER OR DC-TO-DC
CONVERTER (IF INSTALLED)**

LABEL- 14:
LABEL LOCATION:
INVERTER
CODE REF: NEC 690.53

**MAIN PHOTOVOLTAIC
SYSTEM DISCONNECT**

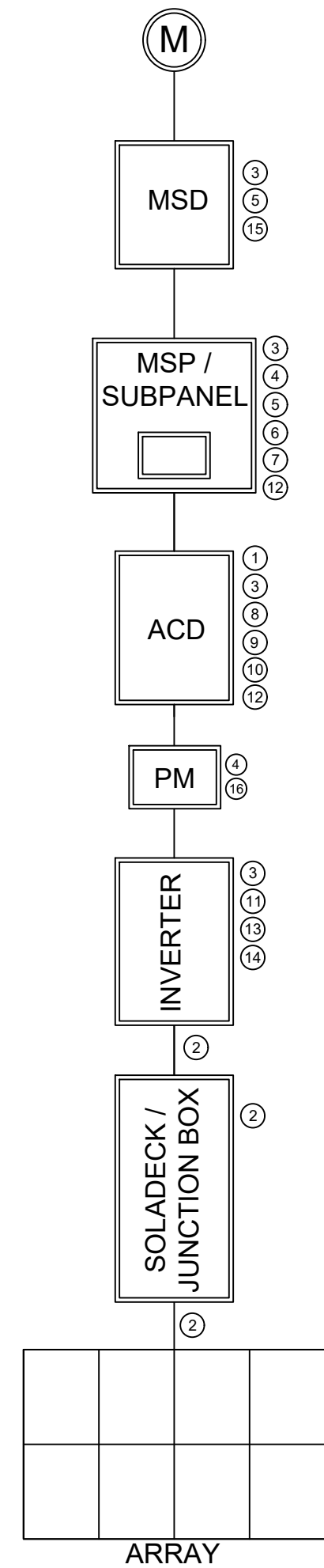
LABEL- 15:
LABEL LOCATION:
MAIN SERVICE DISCONNECT (ONLY IF MAIN SERVICE DISCONNECT IS PRESENT)
CODE REF: NEC 690.13(B)

PRODUCTION METER

LABEL- 16:
LABEL LOCATION:
PRODUCTION METER (ONLY IF PRODUCTION METER IS USED)

NOTE:

** ELECTRICAL DIAGRAM SHOWN IS FOR LABELING PURPOSES ONLY. NOT AN ACTUAL REPRESENTATION OF EQUIPMENT AND CONNECTIONS TO BE INSTALLED. LABEL LOCATIONS PRESENTED MAY VARY DEPENDING ON TYPE OF INTERCONNECTION METHOD AND LOCATION PRESENTED ELECTRICAL DIAGRAM PAGE. **



| REVISIONS | | |
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DATE: 02/22/2022

PROJECT NAME & ADDRESS

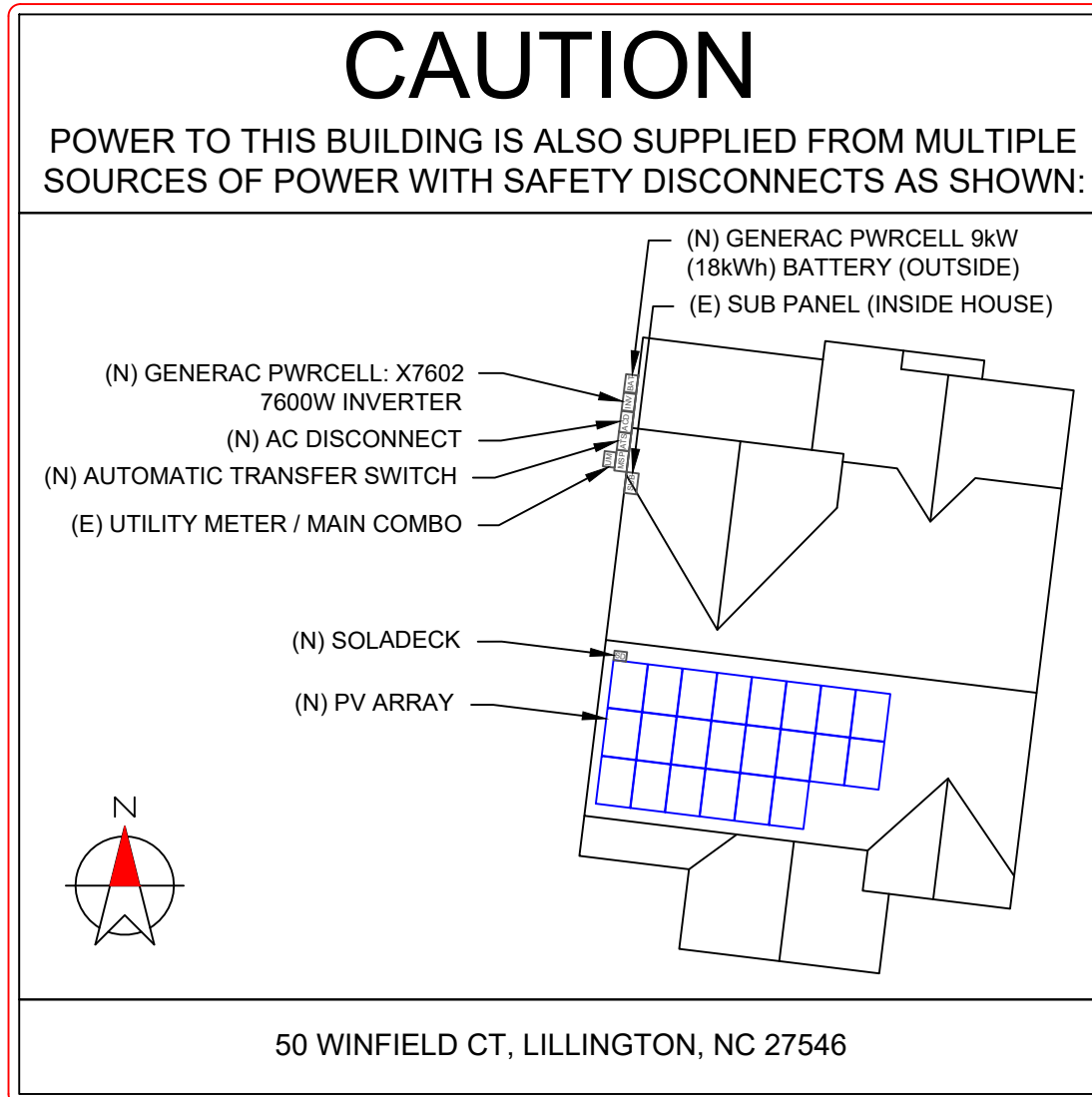
**NICOLE
WILSON-GARDNER
RESIDENCE**
50 WINFIELD CT
LILLINGTON, NC 27546

DC SIZE: 7.590 KW
AC SIZE: 7.600 KW

SHEET NAME
LABELS

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

SHEET NUMBER
PV-6



DIRECTORY

PERMANENT PLAQUE OR DIRECTORY PROVIDING THE LOCATION OF THE SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC SYSTEM.

(ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS OUTLINED WITHIN: NEC 690.56(B)&(C), [NEC 705.10])

LABELING NOTES:

1. LABELS CALLED OUT ACCORDING TO ALL COMMON CONFIGURATIONS. ELECTRICIAN TO DETERMINE EXACT REQUIREMENTS IN THE FIELD PER CURRENT NEC AND LOCAL CODES AND MAKE APPROPRIATE ADJUSTMENTS.
2. LABELING REQUIREMENTS BASED ON THE 2017 NATIONAL ELECTRIC CODE, OSHA STANDARD 19010.145, ANSI Z535.
3. MATERIAL BASED ON THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
4. LABELS TO BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED [NEC 110.21]
5. LABELS TO BE A MINIMUM LETTER HEIGHT OF 3/8", WHITE ON RED BACKGROUND; REFLECTIVE, AND PERMANENTLY AFFIXED [IFC 605.11.1.1]

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DATE: 02/22/2022

PROJECT NAME & ADDRESS

**NICOLE
WILSON-GARDNER
RESIDENCE**
 50 WINFIELD CT
 LILLINGTON, NC 27546

DC SIZE: 7.590 KW
AC SIZE: 7.600 KW

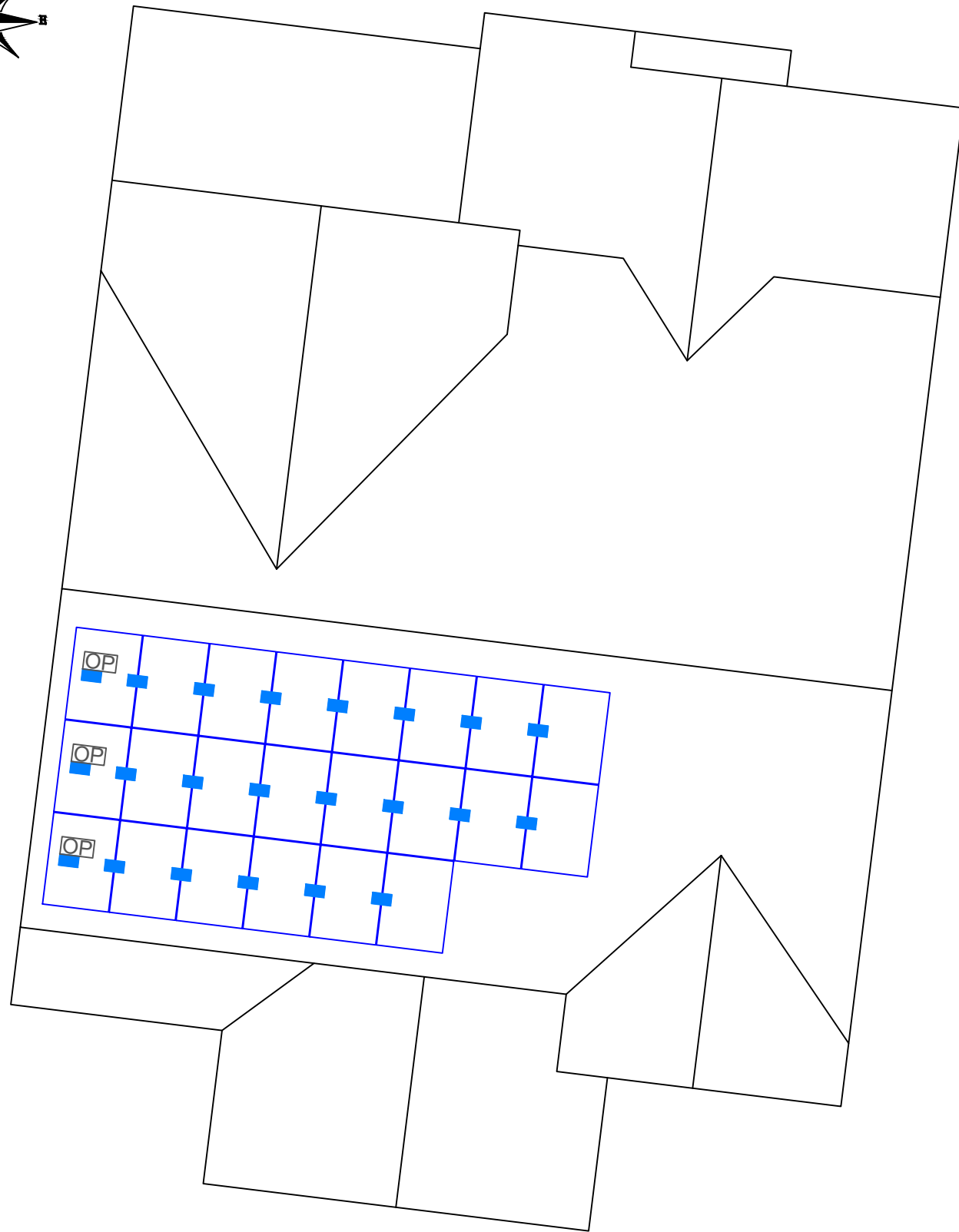
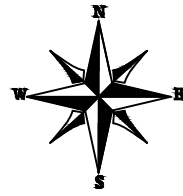
SHEET NAME
PLACARD

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

SHEET NUMBER
PV-7

1-10 11-20 21-30 31-40 41-50 51-60

POWER OPTIMIZER CHART



1
2
3
4
5
6
7
8
9
10



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DATE: 02/22/2022

PROJECT NAME & ADDRESS

NICOLE
WILSON-GARDNER
RESIDENCE
50 WINFIELD CT
LILLINGTON, NC 27546

DC SIZE: 7.590 KW
AC SIZE: 7.600 KW

SHEET NAME
POWER
OPTIMIZER CHART

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-8

MSE PERC 60

MISSION SOLAR ENERGY

345W

Class leading power output -0 to +3%

Positive Power Tolerance

True American Quality True American Brand

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

Demand the best. Demand Mission Solar Energy.



Certified Reliability

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



Advanced Technology

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



Extreme Weather Resilience

- Up to 5,600 Pa front load & 5,631 Pa back load
- Tested load to UL 61730
- 40 mm frame



BAA Compliant for Government Projects

- Buy American Act
- American Recovery & Reinvestment Act

FRAME-TO-FRAME WARRANTY

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

CERTIFICATIONS

CEC



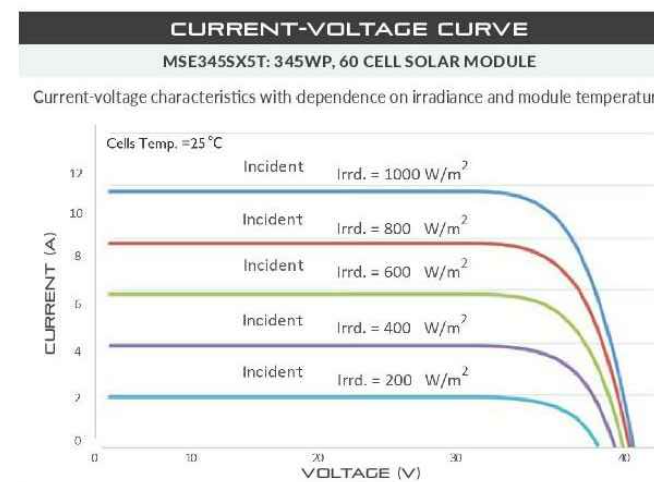
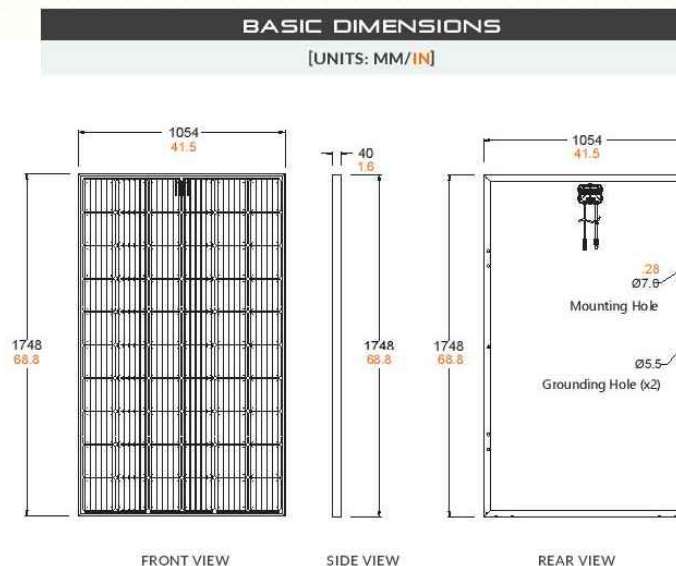
UL 61730 / IEC 61215 / IEC 61730 / IEC 61701

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



Class Leading
340-350W

MSE PERC 60



CERTIFICATIONS AND TESTS

| | |
|-----|---------------------|
| IEC | 61215, 61730, 61701 |
| UL | 61730 |



CEC



Mission Solar Energy

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

ELECTRICAL SPECIFICATION

| PRODUCT TYPE | MSE345SX5T (xxx = P _{max}) | 340 | 345 | 350 |
|-----------------------|--------------------------------------|-------|-------|-------|
| Power Output | P _{max} W _p | 340 | 345 | 350 |
| Module Efficiency | % | 18.5 | 18.7 | 19.0 |
| Tolerance | % | 0/+3 | 0/+3 | 0/+3 |
| Short Circuit Current | I _{sc} V | 10.86 | 10.92 | 10.97 |
| Open Circuit Voltage | V _{oc} A | 40.82 | 41.00 | 41.18 |
| Rated Current | I _{mp} V | 10.24 | 10.34 | 10.44 |
| Rated Voltage | V _{mp} V | 33.20 | 33.37 | 33.52 |
| Fuse Rating | A | 20 | 20 | 20 |
| System Voltage | V | 1,000 | 1,000 | 1,000 |

TEMPERATURE COEFFICIENTS

| | |
|---|-----------------|
| Normal Operating Cell Temperature (NOCT) | 44.43°C (±3.7%) |
| Temperature Coefficient of P _{max} | -0.361%/°C |
| Temperature Coefficient of V _{oc} | -0.262%/°C |
| Temperature Coefficient of I _{sc} | 0.039%/°C |

OPERATING CONDITIONS

| | |
|---------------------------------|---|
| Maximum System Voltage | 1,000Vdc |
| Operating Temperature Range | -40°C (-40°F) to +85°C (185°F) |
| Maximum Series Fuse Rating | 20A |
| Fire Safety Classification | Type 1 |
| Front & Back Load (UL Standard) | Up to 5,600 Pa front and 5,631 Pa back load, Tested to UL 61730 |
| Hail Safety Impact Velocity | 25mm at 23 m/s |

MECHANICAL DATA

| | |
|------------------|--|
| Solar Cells | P-type mono-crystalline silicon |
| Cell Orientation | 60 cells (6x10) |
| Module Dimension | 1748mm x 1054mm x 40mm |
| Weight | 20.3 kg (44.8 lbs.) |
| Front Glass | 3.2mm, tempered, low-iron, anti-reflective |
| Frame | Anodized |
| Encapsulant | Ethylene vinyl acetate (EVA) |
| Junction Box | Protection class IP67 with 3 bypass-diodes |
| Cable | 1.0m, Wire 4mm ² (12AWG) |
| Connector | Staubli PV-KBT4/6II-UR and PV-KST4/6II-UR, MC4, Renhe 05-8 |

SHIPPING INFORMATION

| Container Feet | Ship To | Pallet | Panels | 345 W Bin |
|----------------|-------------|--------|--------|-----------|
| 53' | Most States | 34 | 884 | 304.98 kW |
| Double Stack | CA | 28 | 728 | 251.16 kW |

PALLET [26 PANELS]

| | | | |
|--------------------|---------------------|-------------------|----------------------|
| Weight | Height | Width | Length |
| 1263 lbs. (573 kg) | 47.5 in (120.65 cm) | 46 in (116.84 cm) | 70.25 in (178.43 cm) |



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DATE: 02/22/2022

PROJECT NAME & ADDRESS

NICOLE
WILSON-GARDNER
RESIDENCE
50 WINFIELD CT
LILLINGTON, NC 27546

DC SIZE: 7.590 KW
AC SIZE: 7.600 KW

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-9

GENERAC

SnapRS™

Inline Disconnect Switch
Model: APKE00011



Generac SnapRS are a simple way to satisfy rapid shutdown compliance for solar + storage systems. Generac SnapRS are NEC 2017/2020 690.12 compliant, don't require any extra hardware to mount, and need no pairing or fussy digital communications

FEATURES & BENEFITS

- Fast, easy, and simple to install
- One SnapRS device per PV module
- Achieves PVRSS Compliance
- Low cost, high efficiency solution

SYSTEM DESIGN

Snap a Generac SnapRS disconnect device (RS) to the negative lead (-) of each module in the solar array for simple module-level rapid shutdown compliance. SnapRS devices isolate array voltage when a rapid shutdown command is given by a connected PWRcell™ Inverter. When signaled by the inverter, SnapRS units isolate each PV module in the array, reducing array voltage to <80V in seconds.

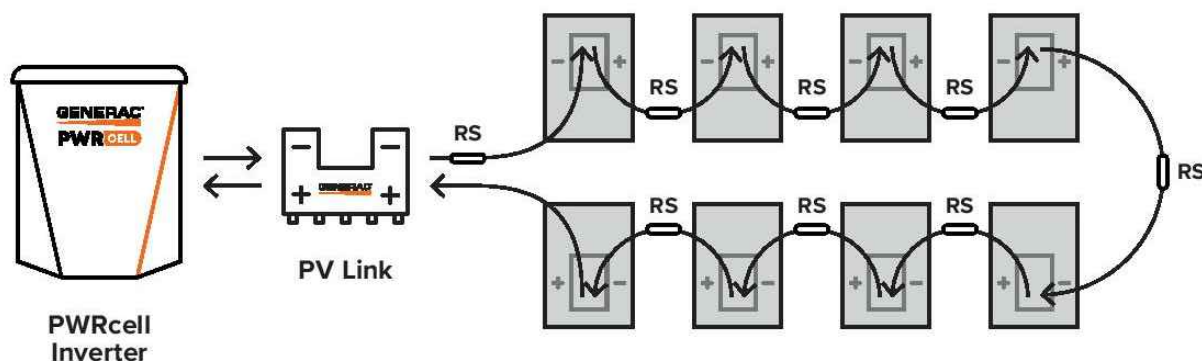


Diagram is applicable for most 60 cell PV modules. Modules with higher cell count may require a different arrangement. Contact Generac for more details.

Specifications

| SnapRS™ (APKE00011) | |
|---|------------------------------------|
| PV MODULE MAX VOC: | 75 V |
| EFFICIENCY: | 99.8%* |
| MAX INPUT CURRENT: | 13 A |
| SHUTDOWN TIME: | < 10 Seconds |
| ENCLOSURE RATING: | NEMA 6P |
| OPERATING TEMPERATURE - FAHRENHEIT (CELSIUS): | -40 to 158 °F (-40 to 70 °C) |
| CERTIFICATIONS: | UL1741 |
| WEIGHT - LB (KG): | 0.17 (0.08) |
| DIMENSIONS, L x W x H - IN (MM): | 7" x 1" x 1" (177.8 x 25.4 x 25.4) |
| WARRANTY: | 25 Years |

*When used with a 50V panel

Connect one SnapRS device to the negative lead of each PV module in the PV Link controlled array for complete PV Rapid shutdown performance



Generac Power Systems, Inc.
S45 W29290 Hwy. 59, Waukesha, WI 53189
www.Generac.com | 888-GENERAC (436-3722)

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DATE: 02/22/2022

PROJECT NAME & ADDRESS

NICOLE
WILSON-GARDNER
RESIDENCE
50 WINFIELD CT
LILLINGTON, NC 27546

DC SIZE: 7.590 KW
AC SIZE: 7.600 KW

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-10

GENERAC

PV Link™

2500W MPPT Substring Optimizer
Model: APKE00010



PV Link is the simple solar optimizer for quick installation and long-lasting performance. Connect PV modules to each PV Link to overcome shading and challenging roof lines.

FEATURES & BENEFITS

- Fast, simple installation
- Lower failure risk than module-level optimizers
- NEC 2017 rapid shutdown compliant with SnapRS™
- Quick connections with MC4 connectors
- Exports up to 2500W
- Compatible with PWRcell™ Inverters
- Cost-effective solution for high-performance PV
- Ground-fault protection

SINGLE-STRING PV ARRAY WITH SnapRS DEVICES

Where PV module-level rapid shutdown is required (NEC 690.12), a SnapRS device (RS) is installed to negative (-) lead of each PV module.

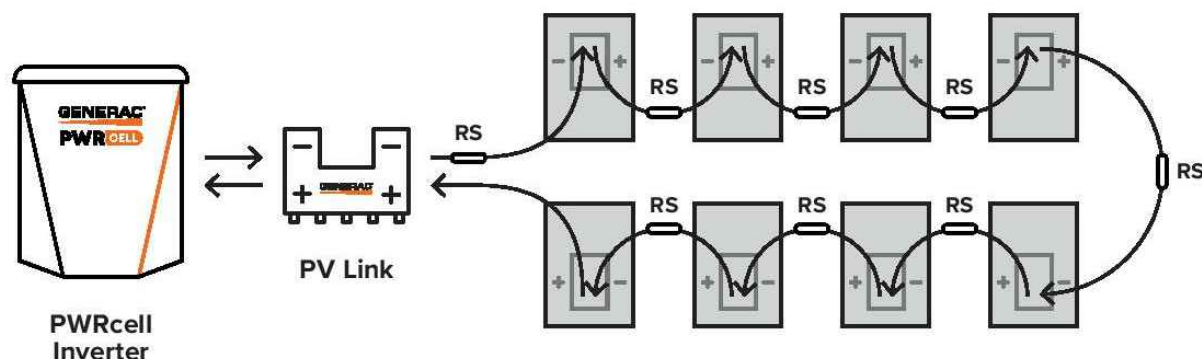


Diagram is applicable for most 60 cell PV modules. Modules with higher cell count may require a different arrangement. Contact Generac for more details.

Specifications

| PV Link™ (APKE00010) | |
|---|--|
| RATED POWER ¹ : | 2500W |
| PEAK EFFICIENCY: | 99% |
| MPPT VOLTAGE RANGE: | 60-360 VMP |
| MAX INPUT VOLTAGE: | 420 VOC; max when cold |
| MAX OUTPUT: | 420 VOC |
| NOMINAL OUTPUT (REBUS™): | 380 VDC |
| MAX OUTPUT CURRENT (CONTINUOUS): | 8 A |
| MAX OUTPUT CURRENT (FAULT): | 10 A |
| MAX INPUT CURRENT (CONTINUOUS): | 13 A @ 50°C, 10 A @ 70°C |
| MAX INPUT SHORT CIRCUIT CURRENT (ISC): | 18 A |
| STANDBY POWER: | <1 W |
| PROTECTIONS: | Ground-fault, Arc-fault (Arc-fault Type 1 AFCI, Integrated), PVRSE |
| MAX OPERATING TEMP: FAHRENHEIT (CELSIUS): | 158 °F (70 °C) |
| SYSTEM MONITORING: | PWRview™ Web Portal and Mobile App |
| ENCLOSURE: | Type 3R |
| WEIGHT - LB (KG): | 7.3 lb (3.3 kg) |
| DIMENSIONS, L x W x H - IN (MM): | 15.4" x 2" x 9.6" (391.2 x 50.8 x 243.8) |
| COMPLIANCE: | UL 1741, CSA 22.2 |
| WARRANTY: | 25 Years |

¹PV Link can tolerate higher than rated power at its input if Max Input Voltage and Short Circuit Current specifications are not exceeded



Generac Power Systems, Inc.
S45 W29290 Hwy. 59, Waukesha, WI 53189
www.Generac.com | 888-GENERAC (436-3722)

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DATE: 02/22/2022

PROJECT NAME & ADDRESS

NICOLE
WILSON-GARDNER
RESIDENCE
50 WINFIELD CT
LILLINGTON, NC 27546

DC SIZE: 7.590 KW
AC SIZE: 7.600 KW

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-11

GENERAC[®] PWRCELL

7.6kW 1Ø PWRcell Inverter with CTs
Model #: X7602 (Ordering SKU: APKE00014)
11.4 kW 3Ø PWRcell Inverter with CTs
Model #: X11402 (Ordering SKU: APKE00013)



Solar + storage is simple with the Generac PWRcell™ Inverter. This bi-directional, REbus™-powered inverter offers a simple, efficient design for integrating smart batteries with solar. Ideal for self-supply, backup power, zero-export and energy cost management, the PWRcell Inverter is the industry's most feature-rich line of inverters, available in single-phase and three-phase models.

FEATURES & BENEFITS

- Single inverter for grid-tied solar with smart battery integration
- Simplified system design: No autotransformer or battery inverter needed
- User-selectable modes for backup power, self-supply, time-of-use, zero-import and export limiting
- Free system monitoring included via PWRview™ Web Portal and Mobile App

| AC OUTPUT/GRID-TIE | MODEL X7602 | MODEL X11402 |
|--|-----------------|-----------------|
| CONT. GRID-TIED AC POWER @ 50°C (122°F): | 7600 W | 11400 W |
| AC OUTPUT VOLTAGE: | 120/240, 1Ø VAC | 120/208, 3Ø VAC |
| AC FREQUENCY: | 60 Hz | |
| MAXIMUM CONTINUOUS OUTPUT CURRENT: | 32 A, RMS | |
| GROUND-FAULT ISOLATION DETECTION: | Included | |
| CHARGE BATTERY FROM AC: | Yes | |
| THD (CURRENT): | < 2% | |
| TYPICAL NIGHTTIME POWER CONSUMPTION: | < 7 W | |

| AC OUTPUT/ISLANDED | MODEL X7602 | MODEL X11402 |
|--|-----------------|-----------------|
| MAX. CONT. ISLANDED AC POWER WITHOUT AN EXTERNAL TRANSFER SWITCH ¹ : | | 7600 W |
| MAX. CONT. ISLANDED AC POWER W/ EXTERNAL TRANSFER SWITCH AND SINGLE 6 MODULE BATTERY CABINET ² : | | 9000 W |
| MAX. CONT. ISLANDED AC POWER W/ EXTERNAL TRANSFER SWITCH AND 2 BATTERY CABINETS (8 MODULES MINIMUM) ³ : | 11000 W | 9600 W-11000 W* |
| PEAK MOTOR STARTING CURRENT (2 SEC): | 50 A, RMS | |
| AC BACKUP OUTPUT VOLTAGE: | 120/240, 1Ø VAC | 120/208, 1Ø VAC |
| AC FREQUENCY: | 60 Hz | |
| THD (VOLTAGE): | < 2% | |
| ALLOWABLE SPLIT PHASE IMBALANCE: | | Up to 30% |

| DC INPUT | MODEL X7602 | MODEL X11402 |
|--------------------------------------|-------------|--------------|
| DC INPUT VOLTAGE RANGE: | | 360-420 VDC |
| NOMINAL DC BUS VOLTAGE: | | 380 VDC |
| DC DISTRIBUTION INPUT BREAKERS: | | 4 x 2P30 A |
| MAX INPUT CURRENT PER DC INPUT: | | 30 A |
| REVERSE-POLARITY PROTECTION: | | Yes |
| TRANSFORMERLESS, UNGROUNDED: | | Yes |
| TYPICAL NIGHTTIME POWER CONSUMPTION: | | < 7 W |
| DC BUS EXPORT FUSES (+/-): | | 40 A |
| 2-POLE DISCONNECTION: | | Yes |

| EFFICIENCY | MODEL X7602 | MODEL X11402 |
|--------------------------|-------------|--------------|
| PEAK EFFICIENCY: | 97.3% | 97.7% |
| CEC WEIGHTED EFFICIENCY: | 96.5% | 97.5% |

¹When islanded, continuous power output is restricted to 7.6kW unless backup power is routed through an external transfer switch.
²Peak performance, values provided for 40°C (104°F).
³In Island mode X11402 protected loads only supply 2 phases 120 VAC L-N, 208 L-L which results in lower power than in grid tied 3 phase mode. The low value of the range is for full L-L loading while high value of the range is full L-N loading

Specifications

| FEATURES AND MODES | |
|---------------------------------------|-----|
| ISLANDING ³ : | Yes |
| GRID SELL: | Yes |
| SELF CONSUMPTION: | Yes |
| PRIORITIZED CHARGING FROM RENEWABLES: | Yes |
| GRID SUPPORT - ZERO EXPORT: | Yes |

| ADDITIONAL FEATURES | |
|--|---|
| SUPPORTED COMMUNICATION INTERFACES: | REbus™, CANbus, RS485 ⁴ , Ethernet |
| SYSTEM MONITORING: | PWRview™ Web Portal and Mobile App |
| BACKUP LOADS DISCONNECT ⁵ : | Yes |
| MANUAL INVERTER BYPASS SWITCH: | Automatic |
| WARRANTY: | 10 Years |

| STANDARDS COMPLIANCE | |
|----------------------------|-----------------------------------|
| SAFETY: | UL1741 SA, CSA 22.2 |
| GRID CONNECTION STANDARDS: | IEEE1547, Rule 21, Rule 14H, CSIP |
| EMISSIONS: | FCC Part 15 Class B |

| DIMENSIONS AND INSTALLATION SPECIFICATIONS | |
|---|--|
| ENCLOSURE KNOCKOUTS - QTY, SIZE - IN (MM): | 6 x Combo 3/4" x 1" (19 x 25.4) 7 x Combo 1/2" x 3/4" (12.7 x 19) |
| DIMENSIONS L x W x H - IN (MM): | 24.5" x 19.25" x 8" (622.3 x 488.9 x 203.2) |
| WEIGHT - LB (KG): | 62.7 (28.4) |
| COOLING: | Forced convection |
| NOISE: | < 40 dBA |
| OPERATING TEMPERATURE - FAHRENHEIT (CELSIUS): | -4 to 122 °F (-20 to 50 °C) ⁵ |
| PROTECTION RATING: | NEMA 3R |

| INSTALLATION GUIDELINES | |
|---|--|
| BATTERY TYPES SUPPORTED: | PWRcell™ Battery |
| MODULE STRING SIZE PER PV LINK OPTIMIZER: | Varies, refer to PV Link Installation Manual |
| MAXIMUM RECOMMENDED DC POWER FROM PV: | 10kW (1Ø), 15kW (3Ø) |
| PWRcell BATTERIES PER INVERTER: | Up to 2 |

³3Ø inverters offer islanding for 1Ø loads
⁴Modbus
⁵Reduced power at extreme temperatures

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| REVISIONS | | |
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| INITIAL | 02/22/2022 | |
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SIGNATURE WITH SEAL

DATE: 02/22/2022

PROJECT NAME & ADDRESS

NICOLE
WILSON-GARDNER
RESIDENCE
50 WINFIELD CT
LILLINGTON, NC 27546

DC SIZE: 7.590 KW
AC SIZE: 7.600 KW

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-12

GENERAC PWRCELL

OUTDOOR RATED BATTERY

PWRcell Outdoor Rated Battery Cabinet (Ordering SKU: APKE00028)
 3.0kWh PWRcell DCB Battery Module
 Model #: BJ-DCB05ZKBG (Ordering SKU: G0080040)
 3.0kWh PWRcell EX Battery Module
 Model #: G0080001

The PWRcell™ Outdoor Rated (OR) Battery Cabinet is a Type 3R smart battery enclosure that allows for a range of configurations to suit any need, small or large, indoor or outdoor. No other smart battery offers the power and flexibility of PWRcell.



Specifications

| PWRcell™ BATTERY CONFIGURATIONS | | | | |
|--|---|-----------|-----------|-----------|
| BATTERY MODULE SERIES: | 3.0 kWh DCB / 3.0 kWh EX | | | |
| BATTERY MODULES: | 3 | 4 | 5 | 6 |
| USABLE ENERGY: | 9 kWh | 12 kWh | 15 kWh | 18 kWh |
| NOMINAL CONT. AC POWER ¹ : | 3.4 kW | 4.5 kW | 5.6 kW | 6.7 kW |
| MAX. CONT. AC POWER ² : | 4.5 kW | 6 kW | 7.5 kW | 9 kW |
| NOMINAL CONT. DC (CHARGE/DISCHARGE) - A: | 11.6 | 15.5 | 19.4 | 23.3 |
| PEAK MOTOR STARTING CURRENT (2 SEC) - A, RMS: | 25 | 33 | 42 | 50 |
| REbus™ VOLTAGE - INPUT/OUTPUT: | 360-420 VDC | | | |
| NOMINAL VOLTAGE: | 380 VDC | | | |
| DC-DC ROUND-TRIP EFFICIENCY: | 96.5% | | | |
| MAXIMUM AMBIENT OPERATING TEMPERATURE: | 14 TO 122 °F (-10 TO 50 °C) | | | |
| OPTIMAL AMBIENT OPERATING TEMPERATURE: | 41 to 104 °F (5 to 40 °C) | | | |
| MAXIMUM INSTALLATION ALTITUDE - FT (M): | 9834 (3000) | | | |
| DIMENSIONS, L x W x H - IN (MM): | 22" x 10" x 68" (559 x 254 x 1727) | | | |
| WEIGHT, ENCLOSURE - LB (KG): | 115 (52) | | | |
| WEIGHT, INSTALLED W/ DCB MODULES - LB (KG): | 280 (127) | 335 (152) | 390 (177) | 445 (202) |
| WEIGHT, INSTALLED W/ EX MODULES - LB (KG): | 287 (130) | 344 (156) | 401 (182) | 459 (208) |
| WEIGHT, ACCESSORY MOUNTING HARDWARE - LB (KG): | 21 (10) | | | |
| ENCLOSURE TYPE: | Type 3R | | | |
| WARRANTY - LI-ION MODULES: | 10 Years, (7.56MWh) | | | |
| WARRANTY - ELECTRONICS AND ENCLOSURE: | 10 Years | | | |
| COMMUNICATION PROTOCOL: | REbus™ DC Nanogrid™ | | | |
| SEISMIC RATING: | IEEE 693-2018 (HIGH) | | | |
| COMPLIANCE: | UL 9540, UL 1973, UL 1642, CSA 22.2 #1071 | | | |

¹Average AC power over a complete discharge cycle. ²Peak Performance, values provided for 40°C (104°F).
 Note: Charge/discharge rate may be reduced at temperature extremes

PWRcell ACCESSORIES

Inside of the PWRcell Battery Cabinet, battery modules are stacked two deep on three levels, allowing for up to six modules to be connected in series. You can upgrade an existing PWRcell Battery Cabinet by adding Battery Modules and a Module Spacer (APKE00008). A Module Spacer is only required for battery configurations with an odd number of modules (i.e. 3 or 5).

Generac offers a convenient PWRcell Battery Upgrade Kit (APKE00009) to help replace lost or misplaced hardware.

Note: When adding modules, be sure all modules within an individual cabinet are of the same series type (i.e., EX or DCB).

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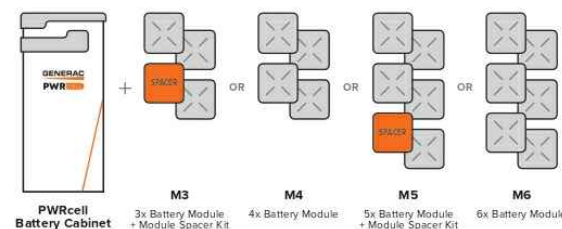
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PWRcell MODEL BUILDER

| PRODUCT SERIES | ENCLOSURE TYPE | # OF MODULES | BATTERY SERIES |
|----------------|---|--|----------------|
| PWRcell | OR | M3 | DCB |
| | IR (Indoor Rated) OR (Outdoor Rated) | 3 Modules 4 Modules 5 Modules 6 Modules | DCB EX |

Sample Model Name: PWRcell OR M3 DCB

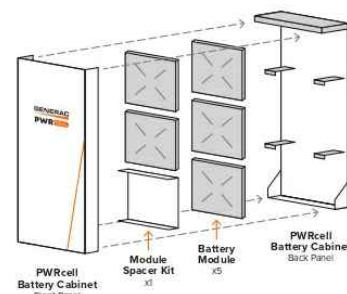
BATTERY CONFIGURATION GUIDE



FEATURES & BENEFITS

- Connect 2 PWRcell Battery Cabinets to a single PWRcell Inverter for up to 36kWh of storage
- Best-in-class battery backup power
- Plug-and-play with PWRcell Inverter and PV Link™
- Time-of-use (TOU) and zero-export ready
- Residential and commercial application ready.
- 3R-rated cabinet allows for outdoor or indoor installation
- Additional mounting hardware for outdoor installations comes standard to provide additional ground clearance and support

BATTERY CABINET ASSEMBLY



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 LILLINGTON, NC 27546

DC SIZE: 7.590 KW
 AC SIZE: 7.600 KW

SHEET NAME
 EQUIPMENT
 SPECIFICATION

SHEET SIZE

ANSI B
 11" X 17"

SHEET NUMBER

PV-13





Specifications

| SPECIFICATIONS | CXSC100A3 | CXSW100A3 | CXSW200A3 |
|----------------------------------|-----------------|-------------------------------|-------------------------------|
| AMPS: | 100 | 100 | 200 |
| VOLTAGE | 120/240 1Ø | 120/240 1Ø | 120/240 1Ø |
| LOAD TRANSITION TYPE (AUTOMATIC) | OPEN TRANSITION | OPEN TRANSITION SERVICE RATED | OPEN TRANSITION SERVICE RATED |
| ENCLOSURE TYPE | NEMA 3R | NEMA 3R | NEMA 3R |
| COMPLIANCE | UL 1008 | UL 1008 | UL 1008 |
| WITHSTAND RATING (AMPS) | 10,000 | 10,000 | 20,000 |
| LUG RANGE | 1/0 - #14 | 1/0 - #14 | 250 MCM - #6 |

| DIMENSIONS | | CXSC100A3 | CXSW100A3 | CXSW200A3 |
|-----------------|----|-------------|-------------|-------------|
| HEIGHT (IN/MM) | H1 | 17.24/437.9 | 17.24/437.9 | 26.75/679.4 |
| | H2 | 20/508 | 20/508 | 30/762 |
| WIDTH (IN/MM) | W1 | 12.5/317.5 | 12.5/317.5 | 10.5/266.7 |
| | W2 | 14.6/370.8 | 14.6/370.8 | 13.5/342.9 |
| DEPTH (IN/MM) | | 7.09/180.1 | 7.09/180.1 | 6.3/160.1 |
| WEIGHT (LBS/KG) | | 20/9.07 | 22.5/10.21 | 39/17.69 |

GENERAC[®]

PWRCELL

AUTOMATIC TRANSFER SWITCH

100A Non-Service Entrance Rated
Model #: CXSC100A3
UPC #: 696471081701

100A Service Entrance Rated
Model #: CXSW100A3
UPC #: 696471081718

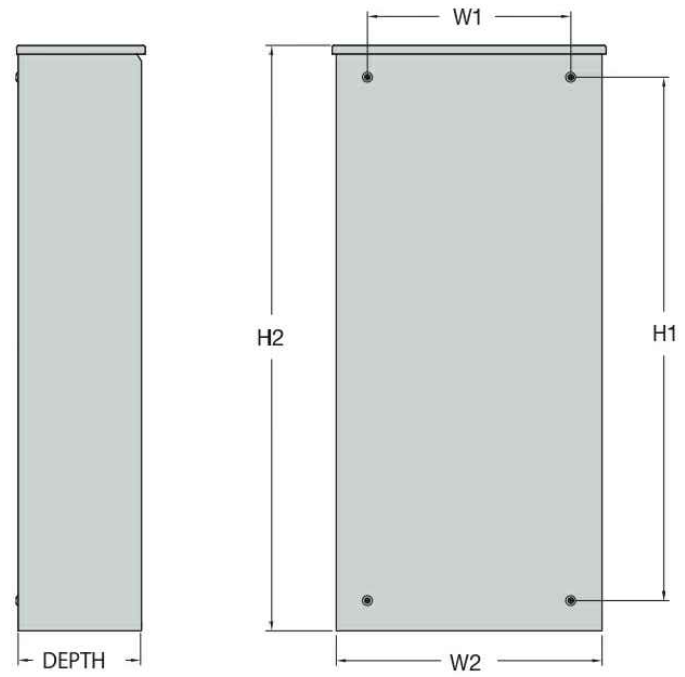
200A Service Entrance Rated
Model #: CXSW200A3
UPC #: 696471081725



An integrated solar + storage system with load management for whole home coverage is made easy with the PWRcell™ Automatic Transfer Switch (ATS). Power the entire home and manage up to four individual HVAC (24 Vac controlled) loads with the PWRcell ATS. This built-in capability requires no additional hardware. When used in tandem with Generac Smart Management Modules (SMM) up to eight additional circuits can be controlled by the PWRcell Inverter. Make the most of your Generac solar + storage system with this comprehensive load management solution.

FEATURES & BENEFITS

- Unlock whole home backup power capability for PWRcell solar + storage systems
- Manage up to four HVAC systems, and an additional eight circuits with optional Smart Management Modules (SMMs)
- Aluminum type 3R enclosure with durable finish for indoor or outdoor installation
- Heavy Duty Generac Contactor is an ETL recognized device, designed for years of service and reliability



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LILLINGTON, NC 27546

DC SIZE: 7.590 KW
AC SIZE: 7.600 KW

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-14



GENERAC®

SMART MANAGEMENT MODULES

50A Smart Management Module
Model #: G0070000
UPC: 696471070002

100A Smart Management Module
Model #: G0070060
UPC: 696471077520

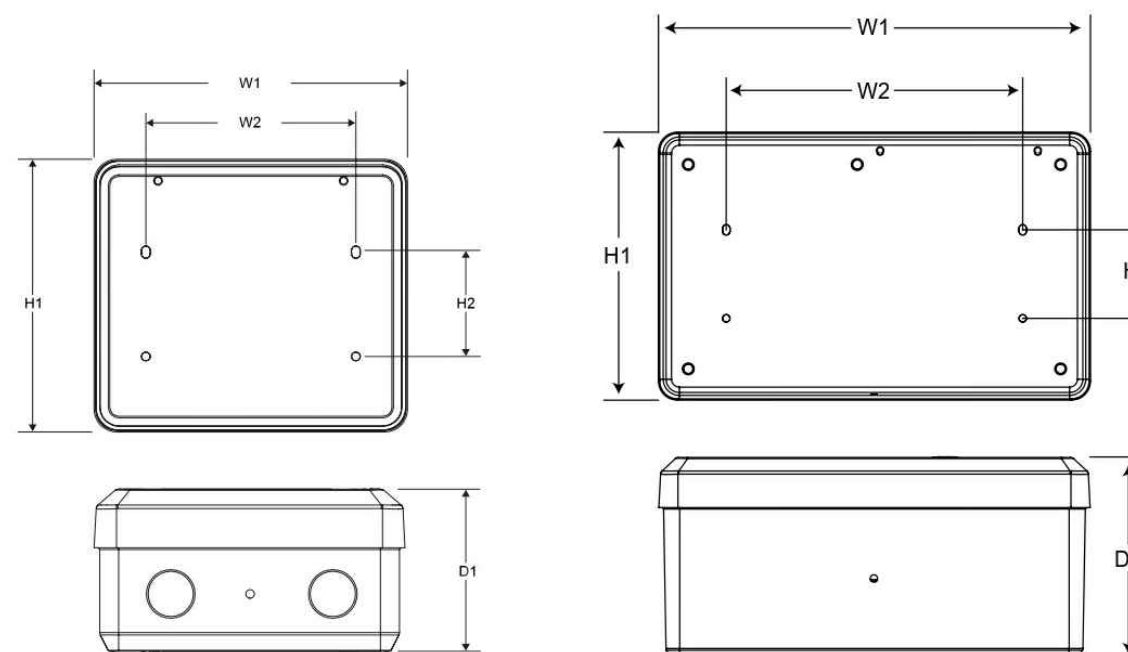


Specifications

| SPECIFICATIONS | 50 AMP (G0070000) | 100 AMP (G0070060) |
|---------------------|---------------------------|---------------------------|
| POWER SUPPLY SOURCE | 240 VAC (FROM LINE INPUT) | 240 VAC (FROM LINE INPUT) |
| CONTACTOR VOLTAGES | 220/240 VAC | 220/240 VAC |
| RESISTIVE AMPS | 50 | 100 |

FOR COMPLETE PRODUCT SPECIFICATIONS, REFER TO EACH INDIVIDUAL MODULE'S SPEC SHEET

| DIMENSIONS | 50 AMP (G0070000) | 100 AMP (G0070060) |
|-----------------|-------------------|--------------------|
| HEIGHT (IN/MM) | H1 | 6.17 / 156.8 |
| | H2 | 2.36 / 60 |
| WIDTH (IN/MM) | W1 | 7.06 / 179.4 |
| | W2 | 4.72 / 120 |
| DEPTH (IN/MM) | 3.7 / 94 | 5.3 / 136.9 |
| WEIGHT (LBS/KG) | 2.06 / 0.94 | 5.3 / 2.4 |



Generac's Smart Management Modules (SMMs) allow PWRcell™ to make the most of its leading backup power and capacity by helping to manage power usage and to prevent overload. A PWRcell system can be augmented with up to eight individual Smart Management Modules. SMMs do not require additional control devices for operation.

SMMs function by monitoring inverter power frequency (Hz). When loads demand more power than the inverter can produce, the PWRcell inverter will change frequency, signaling SMMs to shed loads and allow the inverter to recover.

The modules can be set to a load priority between 1-8 or be set in a lock-out mode for loads that do not need to run in an outage.

FEATURES & BENEFITS

- Integrate into a PWRcell solar + storage system for automatic power management
- Type 3R enclosure for indoor or outdoor installation
- Lock-out feature prevents loads from operating when system is operating under backup power
- Intelligently manage up to 12 loads when used in conjunction with the PWRcell Automatic Transfer Switch

*It is recommended to size the system with appropriate excess capacity to allow starting of the largest managed loads (i.e. loads with highest starting currents). Each managed load of the PWRcell Automatic Transfer Switch and SMM must be assigned a unique priority setting, so no two managed loads attempt to start simultaneously.

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WILSON-GARDNER
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LILLINGTON, NC 27546

DC SIZE: 7.590 KW
AC SIZE: 7.600 KW

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-15



Flush Mount System

Datasheet



Built for solar's toughest roofs.

IronRidge builds the strongest mounting system for pitched roofs in solar. Our components have been tested to the limit and proven in extreme environments, including Florida's high-velocity hurricane zones.

Our rigorous approach has led to unique structural features, such as curved rails and reinforced flashings, and is also why our products are fully certified, code compliant and backed by a 25-year warranty.

Strength Tested
 All components evaluated for superior structural performance.

PE Certified
 Pre-stamped engineering letters available in most states.

Class A Fire Rating
 Certified to maintain the fire resistance rating of the existing roof.

Design Assistant
 Online software makes it simple to create, share, and price projects.

UL 2703 Listed System
 Entire system and components meet newest effective UL 2703 standard.

25-Year Warranty
 Products guaranteed to be free of impairing defects.

XR Rails

XR10 Rail



A low-profile mounting rail for regions with light snow.

- 6' spanning capability
- Moderate load capability
- Clear and black finish

XR100 Rail



The ultimate residential solar mounting rail.

- 8' spanning capability
- Heavy load capability
- Clear and black finish

XR1000 Rail



A heavyweight mounting rail for commercial projects.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish

Bonded Splices



All rails use internal splices for seamless connections.

- Self-drilling screws
- Varying versions for rails
- Forms secure bonding

Clamps & Grounding

UFOs



Universal Fastening Objects bond modules to rails.

- Fully assembled & lubed
- Single, universal size
- Clear and black finish

Stopper Sleeves



Snap onto the UFO to turn into a bonded end clamp.

- Bonds modules to rails
- Sized to match modules
- Clear and black finish

CAMO



Bond modules to rails while staying completely hidden.

- Universal end-cam clamp
- Tool-less installation
- Fully assembled

Bonding Hardware



Bond and attach XR Rails to roof attachments.

- T & Square Bolt options
- Nut uses 7/16" socket
- Assembled and lubricated

Attachments

FlashFoot2



Flash and mount XR Rails with superior waterproofing.

- Twist-on Cap eases install
- Wind-driven rain tested
- Mill and black finish

Conduit Mount



Flash and mount conduit, strut, or junction boxes.

- Twist-on Cap eases install
- Wind-driven rain tested
- Secures 3/4" or 1" conduit

Knockout Tile



Replace tiles and ensure superior waterproofing.

- Flat, S, & W tile profiles
- Form-fit compression seal
- Single-lag universal base

All Tile Hook



Mount on tile roofs with a simple, adjustable hook.

- Works on flat, S, & W tiles
- Single-socket installation
- Optional deck flashing

Resources



Design Assistant
 Go from rough layout to fully engineered system. For free.
[Go to IronRidge.com/design](https://www.ironridge.com/design)



Endorsed by FL Building Commission
 Flush Mount is the first mounting system to receive Florida Product approval for 2017 Florida Building Code compliance.
[Learn More at bit.ly/floridacert](https://bit.ly/floridacert)



Datasheet

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 AC SIZE: 7.600 KW

SHEET NAME
 EQUIPMENT
 SPECIFICATION

SHEET SIZE
 ANSI B
 11" X 17"

SHEET NUMBER
 PV-16



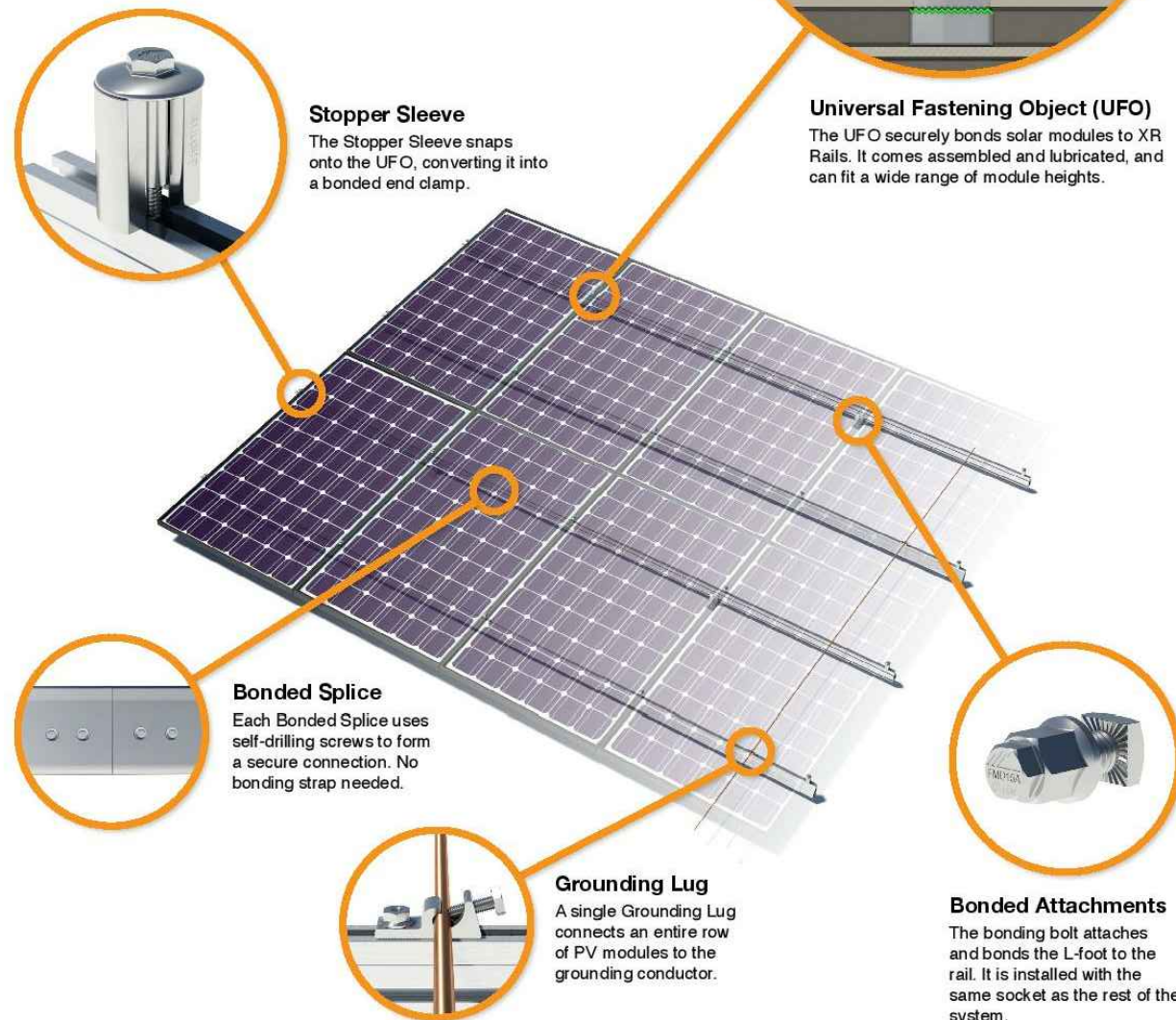
UFO Family of Components

Tech Brief

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.



Stopper Sleeve

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

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.

Bonded Splice

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

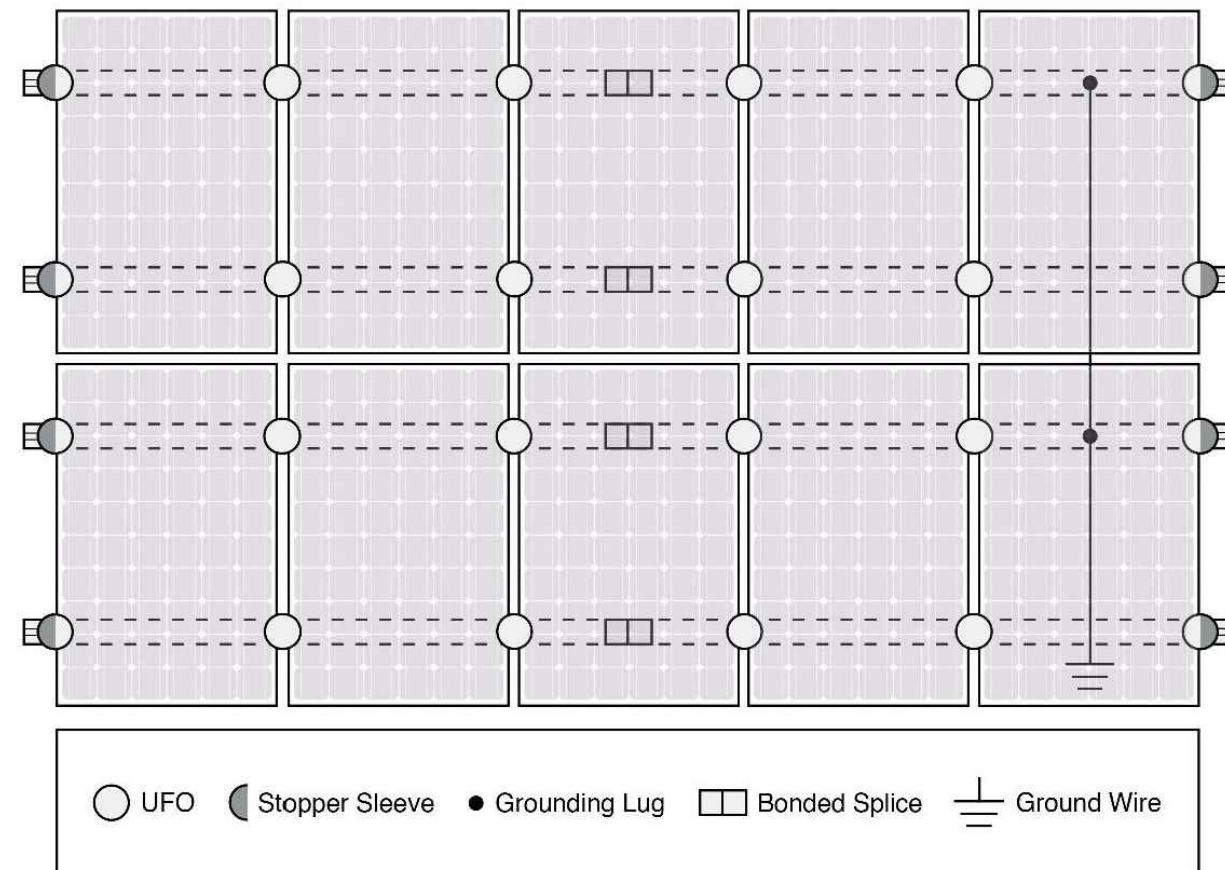
Grounding Lug

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

Bonded Attachments

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

System Diagram



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

UL Certification

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

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

[Go to IronRidge.com/UFO](https://www.ironridge.com/UFO)

Cross-System Compatibility

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

Tech Brief



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ANSI B
11" X 17"

SHEET NUMBER

PV-17

SolaDeck

FLASHED PV ROOF-MOUNT COMBINER/ENCLOSURE

Basic Features

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



SolaDeck Model SD 0783



SolaDeck UL50 Type 3R Enclosures

Available Models:

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



SolaDeck UL 1741 Combiner/Enclosures

Models SD 0783-41 and SD 0786-41 are labeled and ETL listed UL STD 1741 according to the UL STD 1741 for photovoltaic combiner enclosures.

Max Rated - 600VDC, 120AMPS

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

**Typical System Configuration

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

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

**Typical System Configuration

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

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



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



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



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

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



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