

# PROJECT DESCRIPTION:

31 X 320 HANWHA QCELL Q.PEAK DUO-G5 320 MODULES  
 ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES

SYSTEM SIZE: 9.92 kW DC STC  
 ARRAY AREA: ROOF#1 - 272.10 SQ FT  
 ARRAY AREA: ROOF#2 - 290.24 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

## EQUIPMENT SUMMARY

31 HANWHA QCELL Q.PEAK DUO-G5 320 MODULES  
 4 GENERAC PV LINK S2502 POWER OPTIMIZERS  
 01 GENERAC PWRCELL X7602 7600W INVERTERS

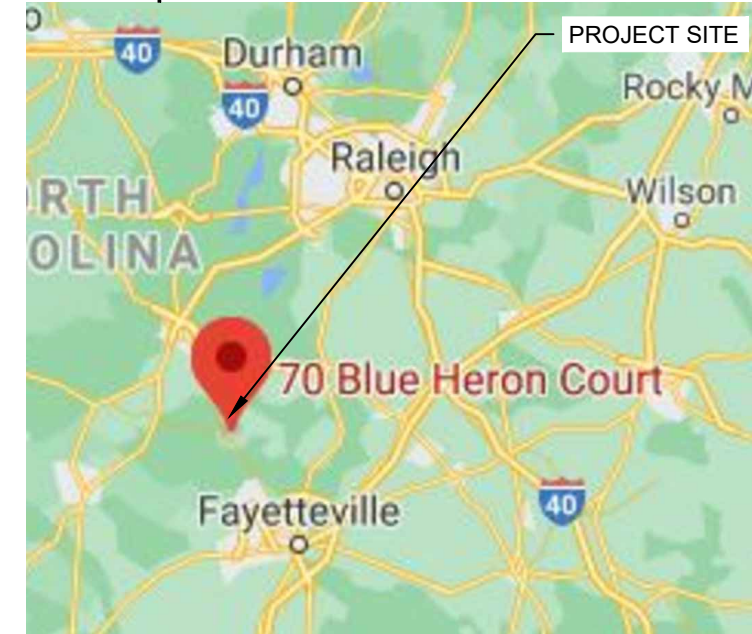
**NOTICE TO CONTRACTOR**  
 All construction must comply with current NC Building Codes and is subject to field inspection and verification.

**APPROVED**  
 Limited building only review  
 Permit holder responsible for full compliance with the code

01/11/2021




**2 HOUSE PHOTO**  
 PV-1 SCALE: NTS



**3 VICINITY MAP**  
 PV-1 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-5A	WIRING CALCULATIONS
PV-6 to 13	EQUIPMENT SPECIFICATIONS

**POWERHOME**

POWER HOME SOLAR, LLC  
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 919 N. MAIN ST.  
 MOORESVILLE, NC 28115  
 Phone: 704-800-6591 (OFFICE)  
 Email: info@powerhome.com  
 Web: www.powerhome.com

**REVISIONS**

DESCRIPTION	DATE	REV
PRELIM	11/02/2020	
PANEL COUNT	12/04/2020	A

Signature with Seal

DATE: 12/4/2020

**PROJECT NAME & ADDRESS**

KIRK RUSSELL  
 RESIDENCE  
 70 BLUE HERON CT.,  
 SANFORD, NC 27332

**SHEET NAME**

PLOT PLAN & VICINITY MAP

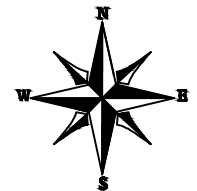
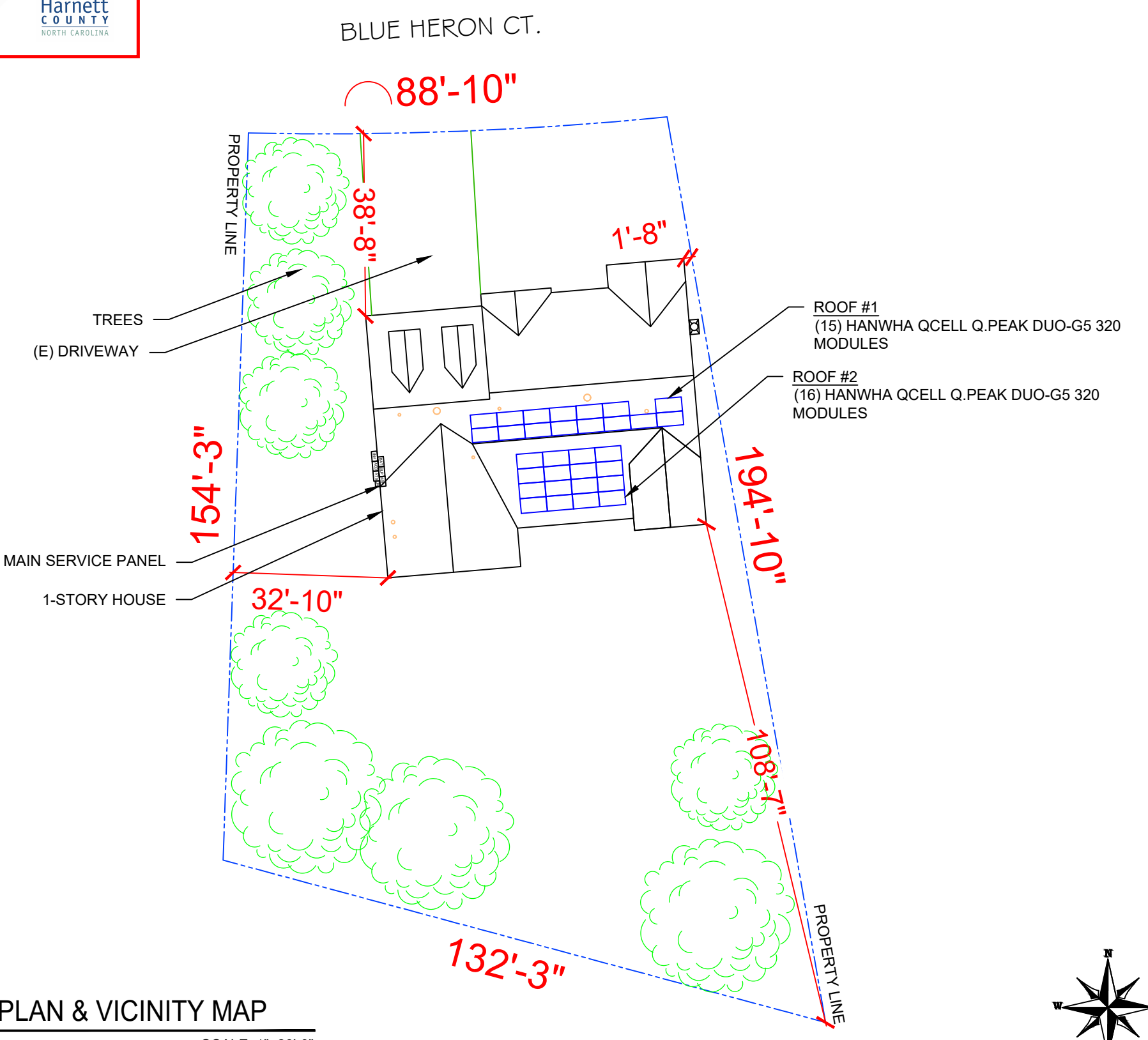
**SHEET SIZE**

ANSI B  
 11" X 17"

**SHEET NUMBER**

PV-1

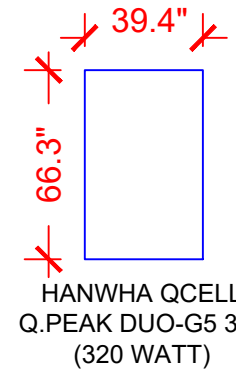
**1 PLOT PLAN & VICINITY MAP**  
 PV-1 SCALE: 1"=26'-0"



**MODULE TYPE, DIMENSIONS & WEIGHT**

NUMBER OF MODULES = 31 MODULES  
 MODULE TYPE = HANWHA QCELL Q.PEAK DUO-G5 320 MODULES  
 MODULE WEIGHT = 41.20 LBS / 18.7 KG.  
 MODULE DIMENSIONS = 66.3"x 39.4" = 18.14 SF  
 UNIT WEIGHT OF ARRAY = 2.27 PSF

BLUE HERON CT.  
 (E) FRONT OF RESIDENCE



ROOF DESCRIPTION				
ROOF TYPE			COMPOSITION	
ROOF	ROOF TILT	AZIMUTH	FRAMING SIZE	FRAMING SPACING
#1	26.57°	175°	SEE STRUCTURAL LETTER	
#2	18.43°	175°		

ARRAY AREA & ROOF AREA CALC'S				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	15	272	712.83	38
#2	16	290	561.63	52

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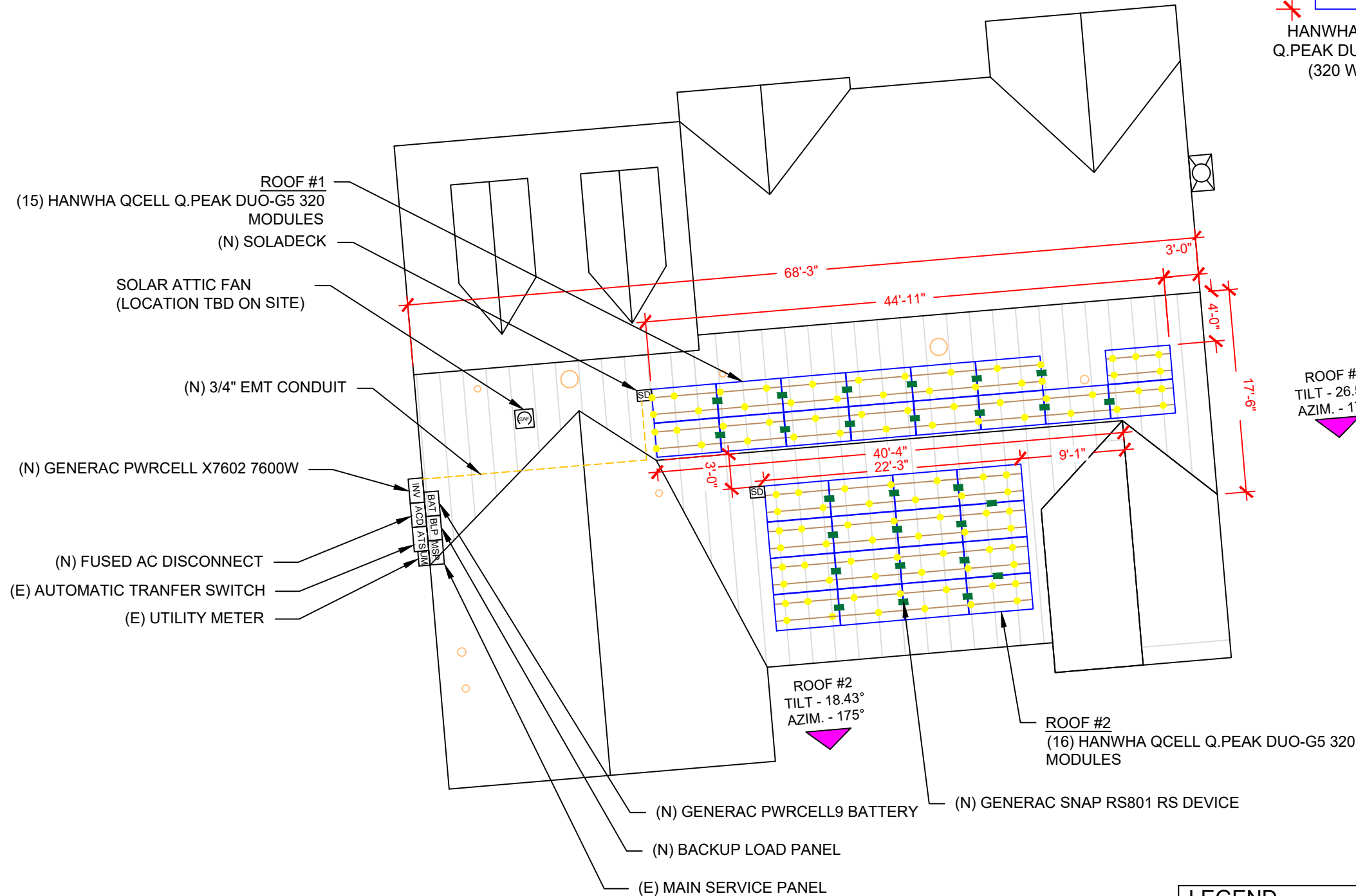
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PROJECT NAME & ADDRESS  
**KIRK RUSSELL  
 RESIDENCE**  
 70 BLUE HERON CT.,  
 SANFORD, NC 27332

SHEET NAME  
**ROOF PLAN & MODULES**

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

SHEET NUMBER  
**PV-2**



ROOF #1  
 TILT - 26.57°  
 AZIM. - 175°

ROOF #2  
 TILT - 18.43°  
 AZIM. - 175°

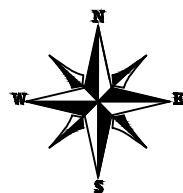
ROOF #2  
 (16) HANWHA QCELL Q.PEAK DUO-G5 320  
 MODULES

(SAF) SOLAR ATTIC FAN

- NOTES:**
- THE LOCATION OF THE SAF SHOULD BE DETERMINED ON SITE.
  - THE SAF SHOULD BE LOCATED 30"-36" FROM THE PEAK OF THE ROOF OR ABOUT 5 ROWS DOWN FROM THE RIDGE.
  - THE SAF SHOULD NOT BE MOUNTED ON ANY STRUCTURAL MEMBER LIKE TRUSS/RAFTER.
  - "CAN VENTS" CAN BE REPLACED BY SAF.
  - SAF CANNOT BE MOUNTED ON A METAL ROOF. PLEASE CARRY GABLE VENT FANS FOR METAL ROOF INSTALLATION (IF APPLICABLE).

**LEGEND**

- |       |                      |       |                                      |
|-------|----------------------|-------|--------------------------------------|
| (SD)  | - SOLADECK           | (ATS) | - AUTOMATIC TRANFER SWITCH           |
| (INV) | - INVERTER           | (CB)  | - COMBINER BOX                       |
| (ACD) | - AC DISCONNECT      | ○     | - VENT, ATTIC FAN (ROOF OBSTRUCTION) |
| (MSP) | - MAIN SERVICE PANEL | ●     | - ROOF ATTACHMENT                    |
| (BLP) | - BACKUP LOAD PANEL  | ---   | - RAFTERS                            |
| (BAT) | - BATTERY            | ---   | - CONDUIT                            |
| (OP)  | - PV LINK OPTIMIZER  | ■     | - RAPID SHUTDOWN                     |



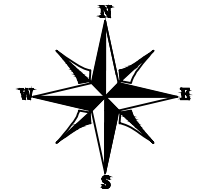
**1 ROOF PLAN & MODULES**

PV-2

SCALE: 3/32" = 1'-0"

(E) BACK OF RESIDENCE

BLUE HERON CT.  
(E) FRONT OF RESIDENCE



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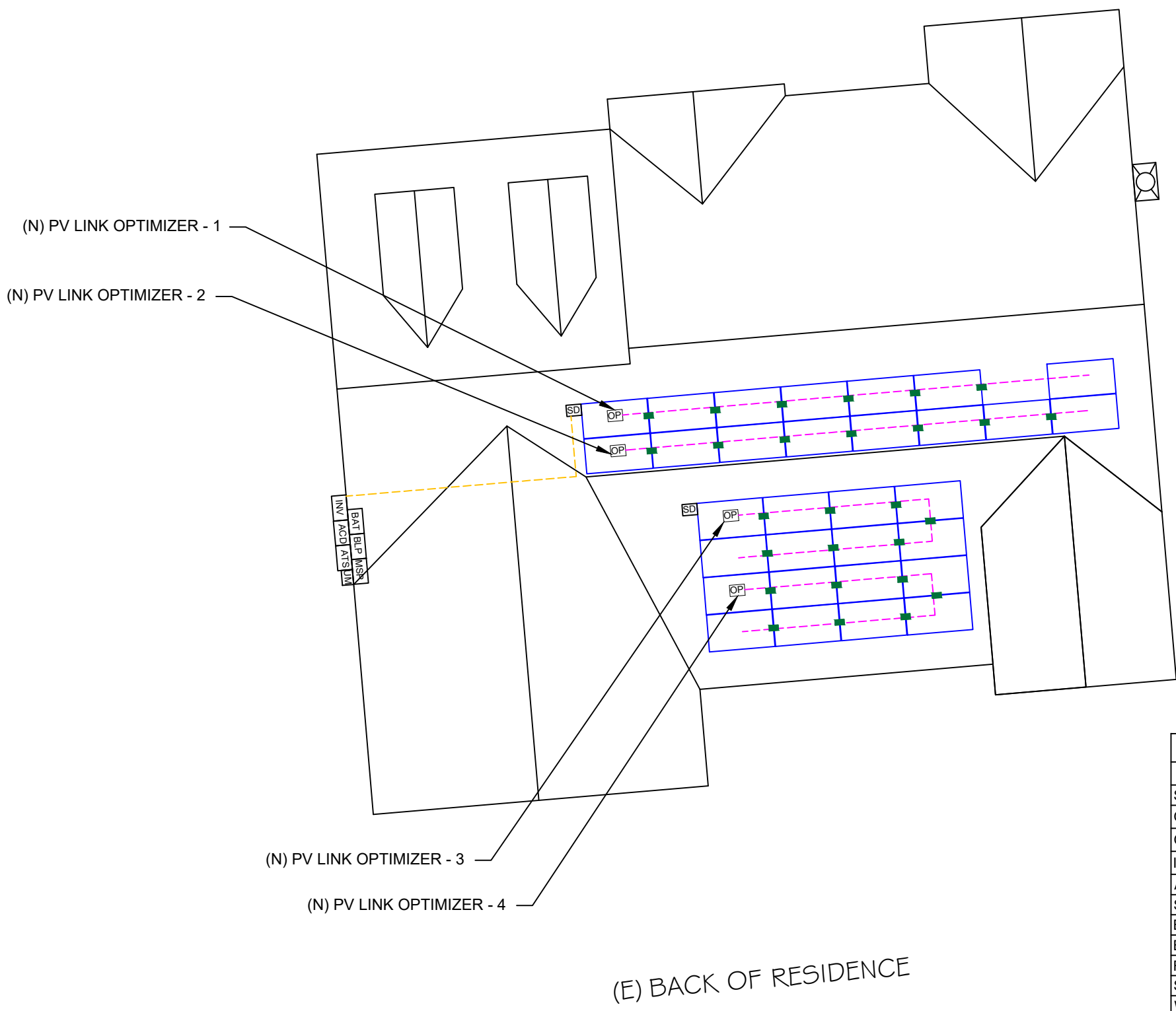
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PROJECT NAME & ADDRESS  
  
**KIRK RUSSELL  
RESIDENCE  
70 BLUE HERON CT.,  
SANFORD, NC 27332**

SHEET NAME  
**STRING  
LAYOUT**

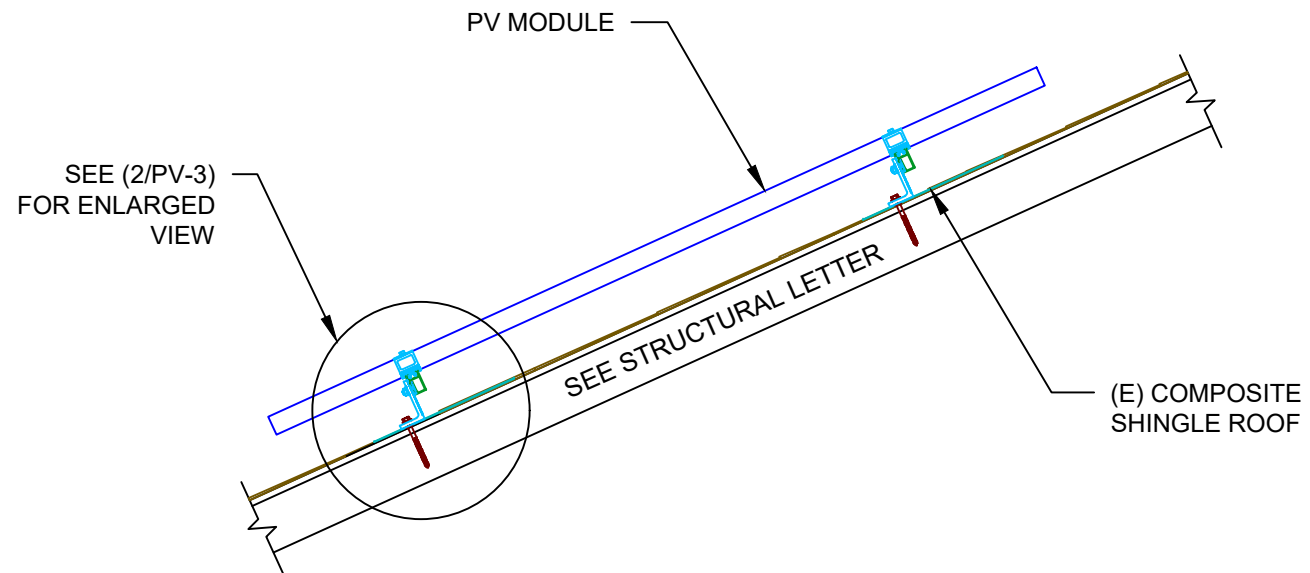
SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-2A**



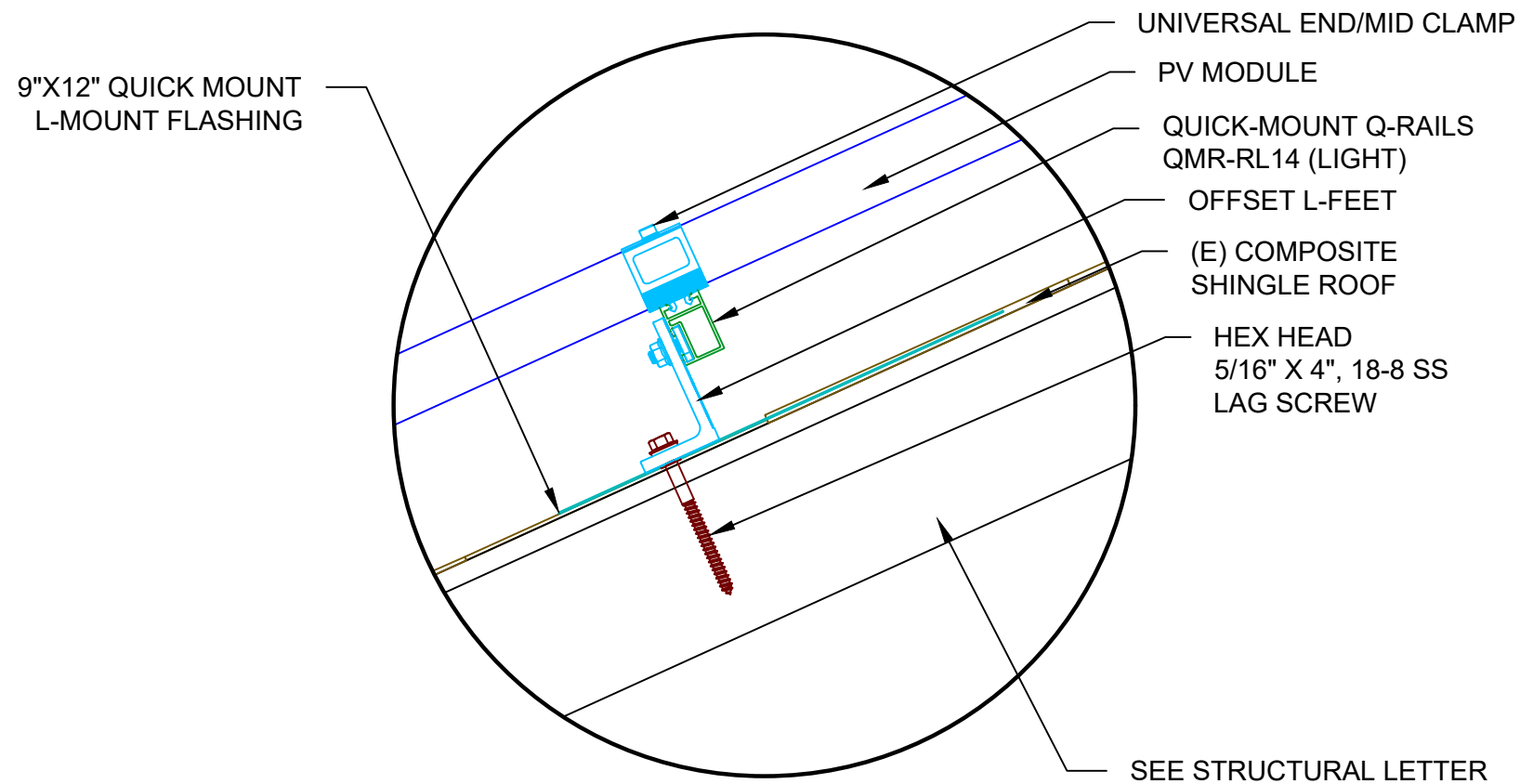
(E) BACK OF RESIDENCE

BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULE	31	HANWHA QCELL Q.PEAK DUO-G5 320 MODULES
OPTIMIZER	4	GENERAC PV LINK S2502 POWER OPTIMIZERS
GENERAC SNAP RS	31	GENERAC SNAPRS MODEL RS801
INVERTER	01	GENERAC PWRCELL X7602 7600W INVERTER
AC DISCONNECT	1	60A FUSED, (2) 80A FUSES, 240V, NEMA 3R, UL LISTED
SOLADECK	2	SOLADECKS 600 V, NEMA 3R, UL LISTED
BATTERY	1	GENERAC PWRCELL9 BATTERY
BACKUP PANEL	1	125A, BACKUP PANEL, 240V
RAILS	29	QRAIL LIGHT 14 FT. BLACK
SPLICE KIT	18	QSPLICE INTERNAL LIGHT
WEEB BMC	5	WEEB BMC MILL
MODULE CLAMPS	52	UNIVERSAL MID CLAMP
GROUNDING LUG	8	WEEB LUG W/ T-BOLT
END CLAMPS	31	UNIVERSAL END CLAMPS
ATTACHMENT	100	L-MOUNT ATTACHMENT (QUICKMOUNT)
T-BOLT	104	T-BOLT W/ NUT M8 X 20MM
MANUAL TRANSFER SWITCH	01	GENERAC MANUAL TRANSFER SWITCH, 125/250V



**1 ATTACHMENT DETAIL**

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



**2 ATTACHMENT DETAIL (enlarged view)**

PV-3 SCALE: NTS

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PROJECT NAME & ADDRESS

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 RESIDENCE  
 70 BLUE HERON CT.,  
 SANFORD, NC 27332**

SHEET NAME  
**ATTACHMENT  
 DETAIL**

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

SHEET NUMBER  
**PV-3**

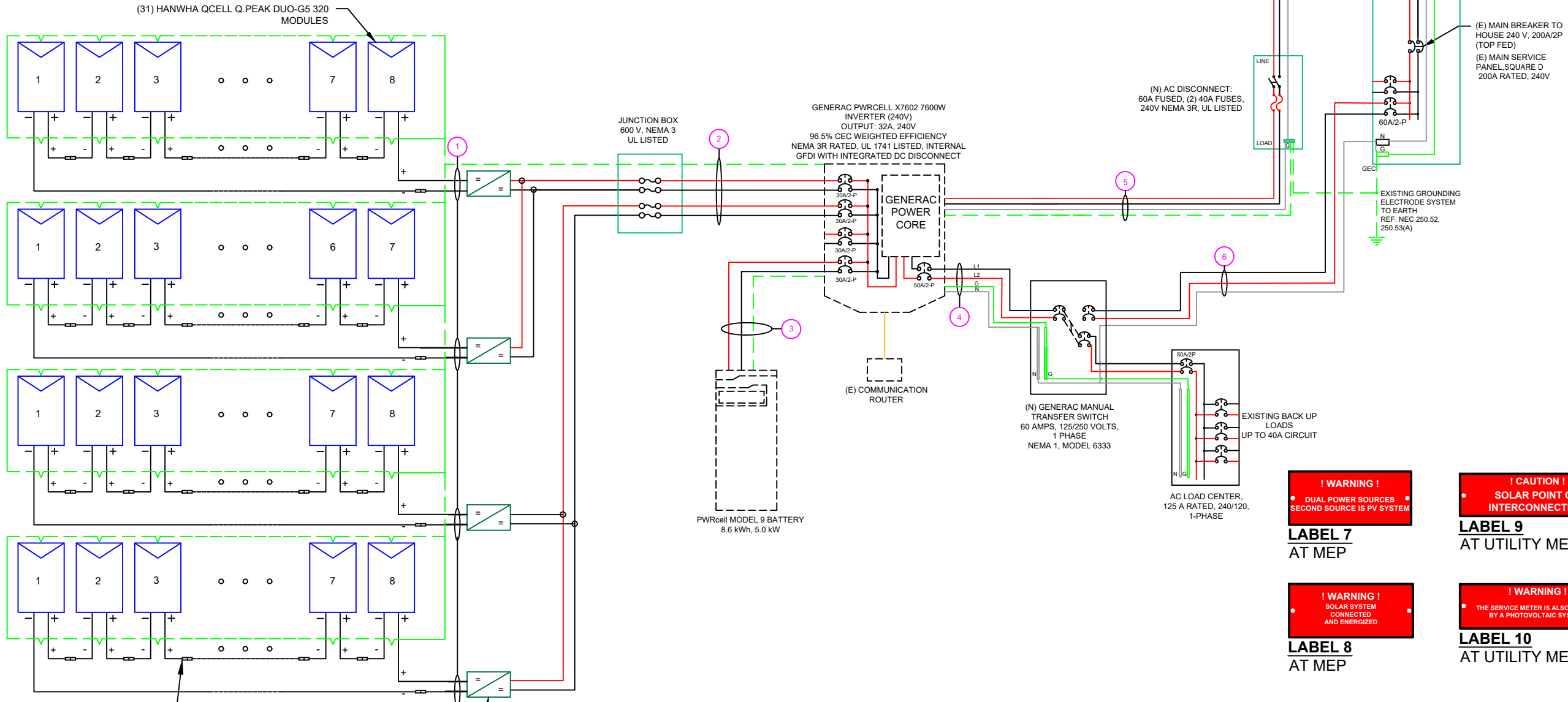
(31) HANWHA QCELL Q.PEAK DUO-G5 320 MODULES  
 (1) PV LINKS OF 7 MODULES &  
 (3) PV LINK OF 8 MODULES CONNECTED IN SERIES

**SERVICE INFO**

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

**WIRE LEGEND**

- PV ARRAY +VE CONDUCTOR AND L1
- PV ARRAY -VE CONDUCTOR AND L2
- NEUTRAL CONDUCTOR
- EGC AND GEC
- SINGLE TWISTED PAIR, CAT 5 WIRE



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

- LABEL 1**  
ON ALL CONDUITS  
SPACED AT MAX 10FT
- LABEL 2**  
AT INVERTER
- LABEL 3**  
AT INVERTER
- LABEL 4**  
AT EACH DC  
DISCONNECT
- LABEL 5**  
AT EACH AC  
DISCONNECT
- LABEL 6**  
AT EACH AC  
DISCONNECT

- LABEL 7**  
AT MEP
- LABEL 8**  
AT MEP
- LABEL 9**  
AT UTILITY METER
- LABEL 10**  
AT UTILITY METER

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

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 SANFORD, NC 27332

SHEET NAME  
**ELECTRICAL LINE  
 DIAGRAM**

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

SHEET NUMBER  
**PV-4**

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	HANWHA QCELL Q.PEAK DUO-G5 320
VMP	33.70V
IMP	9.80A
VOC	40.10V
ISC	10.40A
TEMP. COEFF. VOC	-0.28%/°C
PTC RATING	307.56W
MODULE DIMENSION	66.93"L x 39.37"W x 1.50"D (In Inch)

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	GENERAC PWRCELL X7602
AC POWER OUTPUT (LOADS/GRID)	7600VA
AC POWER OUTPUT (BACKUP)	8000VA
NOMINAL OUTPUT VOLTAGE	240 VAC
MAX OUTPUT CURRENT @240V (LOADS/GRID)	32A
MAX OUTPUT CURRENT @240V (BACKUP)	50A
NOMINAL DC INPUT VOLTAGE	380Vdc
MAX DC INPUT VOLTAGE	420Vdc
CEC WEIGHTED EFFICIENCY	96.5%
MAX DC POWER (PV)	10000W
MAX INPUT CURRENT (PV)	20Adc
CONT. PEAK POWER (BATTERY)	8000W

SERIES SUB STRING OPTIMIZER SPECIFICATIONS	
MANUFACTURER / MODEL #	PV LINK S2502
RATED POWER	2500W
MPPT VOLTAGE RANGE	60-360 Vmp
MAXIMUM INPUT VOLTAGE	420Voc
MAXIMUM OUTPUT	420 Adc
NOMINAL OUTPUT	380 Vdc
MAXIMUM OUTPUT CURRENT	8 A
MAXIMUM SHORT CIRCUIT CURRENT	18 A

BATTERY SPECIFICATIONS	
MANUFACTURER / MODEL #	GENERAC PWRCELL9 BATTERY
USABLE ENERGY	8.6kWH
RATED CONTINUOUS POWER	3.4kW
POWER: 60 MINUTES	4.2kW
POWER: 2 MINUTES	5.0kW
REBUS VOLTAGE: INPUT/ OUTPUT	360-420Vdc
MODULE VOLTAGE	46.8Vdc
ROUND-TRIP EFFICIENCY	96.5%

#### ELECTRICAL NOTES

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

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-19°
AMBIENT TEMP (HIGH TEMP 2%)	34°
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	56°

#### DC CONDUCTOR AMPACITY CALCULATIONS: ARRAY TO JUNCTION BOX:

EXPECTED WIRE TEMP (In Celsius)	56°
TEMP. CORRECTION PER NEC TABLE 310.15 (B)(2)(a)	0.71
NO. OF CURRENT CARRYING CONDUCTORS	8
CONDUIT FILL CORRECTION PER NEC TABLE 310.15(B)(3)(a)	0.7
CIRCUIT CONDUCTOR SIZE	10 AWG
CIRCUIT CONDUCTOR AMPACITY PER NEC TABLE 310.15(B)(16)	40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	10A
1.25 X I <sub>max</sub>	
DERATED AMPACITY OF CIRCUIT CONDUCTOR	19.88A
TEMP. CORRECTION PER TABLE 310.15 (B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY 310.15 (B)(16)	
Result should be greater than (10A) otherwise less the entry for circuit conductor size and ampacity	

#### FROM JUNCTION BOX TO INVERTER:

EXPECTED WIRE TEMP (In Celsius)	56°
TEMP. CORRECTION PER NEC TABLE 310.15 (B)(2)(a)	0.71
NO. OF CURRENT CARRYING CONDUCTORS	4
CONDUIT FILL CORRECTION PER NEC TABLE 310.15(B)(3)(a)	0.8
CIRCUIT CONDUCTOR SIZE	10 AWG
CIRCUIT CONDUCTOR AMPACITY PER NEC TABLE 310.15(B)(16)	40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	20A
1.25 X I <sub>max</sub> X # of PV LINKS	
DERATED AMPACITY OF CIRCUIT CONDUCTOR	22.72A
TEMP. CORRECTION PER TABLE 310.15 (B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY 310.15 (B)(16)	
Result should be greater than (20A) otherwise less the entry for circuit conductor size and ampacity	

#### FROM BATTERY TO INVERTER:

EXPECTED WIRE TEMP (In Celsius)	34°
TEMP. CORRECTION PER NEC TABLE 310.15 (B)(2)(a)	0.96
NO. OF CURRENT CARRYING CONDUCTORS	2
CONDUIT FILL CORRECTION PER NEC TABLE 310.15(B)(3)(a)	1
CIRCUIT CONDUCTOR SIZE	10 AWG
CIRCUIT CONDUCTOR AMPACITY PER NEC TABLE 310.15(B)(16)	40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	26.25A
1.25 X I <sub>max</sub>	
DERATED AMPACITY OF CIRCUIT CONDUCTOR	38.40A
TEMP. CORRECTION PER TABLE 310.15 (B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY 310.15 (B)(16)	
Result should be greater than (26.25A) otherwise less the entry for circuit conductor size and ampacity	

#### AC CONDUCTOR AMPACITY CALCULATIONS: FROM INVERTER TO BACK-UP PANEL:

No. OF INVERTER	1
EXPECTED WIRE TEMP (In Celsius)	34°
TEMP. CORRECTION PER NEC TABLE 310.15(B)(2)(a)	0.96
NO. OF CURRENT CARRYING CONDUCTORS	3
CONDUIT FILL CORRECTION PER NEC TABLE 310.15(B)(3)(a)	1
CIRCUIT CONDUCTOR SIZE	6 AWG
CIRCUIT CONDUCTOR AMPACITY PER NEC TABLE 310.15(B)(16)	75A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	42.5A
1.25 X INVERTER OUTPUT CURRENT (BACKUP POWER)	
DERATED AMPACITY OF CIRCUIT CONDUCTOR	72A
TEMP. CORRECTION PER TABLE 310.15 (B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY 310.15 (B)(16)	
Result should be greater than (42.5A) otherwise less the entry for circuit conductor size and ampacity	

#### AC CONDUCTOR AMPACITY CALCULATIONS: FROM INVERTER TO MEP:

No. OF INVERTER	1
EXPECTED WIRE TEMP (In Celsius)	34°
TEMP. CORRECTION PER NEC TABLE 310.15(B)(2)(a)	0.96
NO. OF CURRENT CARRYING CONDUCTORS	3
CONDUIT FILL CORRECTION PER NEC TABLE 310.15(B)(3)(a)	1
CIRCUIT CONDUCTOR SIZE	6 AWG
CIRCUIT CONDUCTOR AMPACITY PER NEC TABLE 310.15(B)(16)	75A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	40A
1.25 X MAX INVERTER OUTPUT CURRENT (LOADS/GRID)	
DERATED AMPACITY OF CIRCUIT CONDUCTOR	72A
TEMP. CORRECTION PER TABLE 310.15 (B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY 310.15 (B)(16)	
Result should be greater than (40A) otherwise less the entry for circuit conductor size and ampacity	



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RESIDENCE  
70 BLUE HERON CT.,  
SANFORD, NC 27332

SHEET NAME  
WIRING  
CALCULATIONS

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-5



# Q.PEAK DUO-G5 315-330

## Q.ANTUM SOLAR MODULE

The new Q.PEAK DUO-G5 solar module from Q CELLS impresses thanks to innovative Q.ANTUM DUO Technology, which enables particularly high performance on a small surface. Q.ANTUM's world-record-holding cell concept has now been combined with state-of-the-art circuitry half cells and a six-busbar design, thus achieving outstanding performance under real conditions - both with low-intensity solar radiation as well as on hot, clear summer days.

- Q.ANTUM TECHNOLOGY: LOW LEVELIZED COST OF ELECTRICITY**  
Higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 19.9%.
- INNOVATIVE ALL-WEATHER TECHNOLOGY**  
Optimal yields, whatever the weather with excellent low-light and temperature behavior.
- ENDURING HIGH PERFORMANCE**  
Long-term yield security with Anti LID and Anti PID Technology<sup>1</sup>, Hot-Spot Protect and Traceable Quality Tra.Q™.
- EXTREME WEATHER RATING**  
High-tech aluminum alloy frame, certified for high snow (5400Pa) and wind loads (4000Pa) regarding IEC.
- A RELIABLE INVESTMENT**  
Inclusive 12-year product warranty and 25-year linear performance guarantee<sup>2</sup>.
- STATE OF THE ART MODULE TECHNOLOGY**  
Q.ANTUM DUO combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology.

### THE IDEAL SOLUTION FOR:



Engineered in Germany

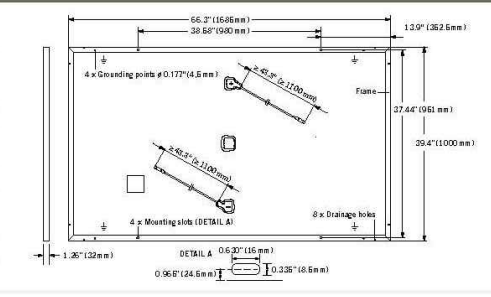


<sup>1</sup> APT test conditions according to IEC/TS 62804-1:2015, method B (-1500V, 168 h)  
<sup>2</sup> See data sheet on rear for further information.



### MECHANICAL SPECIFICATION

<b>Format</b>	66.3 in x 39.4 in x 1.26 in (including frame) (1685 mm x 1000 mm x 32 mm)
<b>Weight</b>	41.2 lbs (18.7 kg)
<b>Front Cover</b>	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
<b>Back Cover</b>	Composite film
<b>Frame</b>	Black anodized aluminum
<b>Cell</b>	6 x 20 monocrystalline Q.ANTUM solar half-cells
<b>Junction box</b>	2.76-3.35 in x 1.97-2.76 in x 0.51-0.83 in (70-85 mm x 50-70 mm x 13-21 mm), decentralized, IP67
<b>Cable</b>	4 mm <sup>2</sup> Solar cable; (+) ≥ 43.3 in (1100 mm), (-) ≥ 43.3 in (1100 mm)
<b>Connector</b>	Multi-Contact MC4, IP68

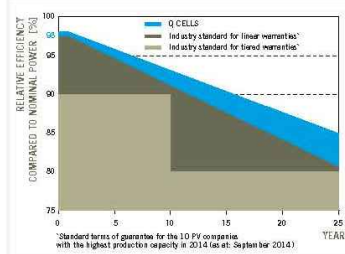


### ELECTRICAL CHARACTERISTICS

POWER CLASS		315	320	325	330	
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC <sup>1</sup> (POWER TOLERANCE +5 W / -0 W)						
Minimum	Power at MPP <sup>1</sup>	P <sub>MPP</sub> [W]	315	320	325	330
	Short Circuit Current <sup>1</sup>	I <sub>SC</sub> [A]	10.04	10.09	10.14	10.20
	Open Circuit Voltage <sup>1</sup>	V <sub>OC</sub> [V]	39.87	40.13	40.40	40.66
	Current at MPP <sup>1</sup>	I <sub>MPP</sub> [A]	9.55	9.60	9.66	9.71
	Voltage at MPP	V <sub>MPP</sub> [V]	32.98	33.32	33.65	33.98
	Efficiency <sup>1</sup>	η [%]	≥ 18.7	≥ 19.0	≥ 19.3	≥ 19.6
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT <sup>2</sup>						
Minimum	Power at MPP	P <sub>MPP</sub> [W]	235.3	239.0	242.8	246.5
	Short Circuit Current	I <sub>SC</sub> [A]	8.09	8.13	8.17	8.22
	Open Circuit Voltage	V <sub>OC</sub> [V]	37.52	37.77	38.02	38.27
	Current at MPP	I <sub>MPP</sub> [A]	7.52	7.56	7.60	7.64
	Voltage at MPP	V <sub>MPP</sub> [V]	31.30	31.62	31.94	32.25

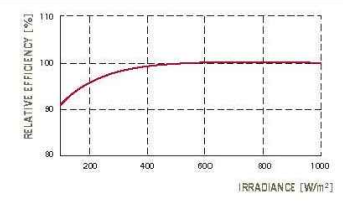
<sup>1</sup> Measurement tolerances P<sub>MPP</sub> ± 3%; I<sub>SC</sub>, V<sub>OC</sub> ± 5% at STC; 1000 W/m<sup>2</sup>, 25 ± 2°C, AM 1.5 G according to IEC 60904-3 - 2800 W/m<sup>2</sup>, NMOT, spectrum AM 1.5 G

### Q CELLS PERFORMANCE WARRANTY



At least 98% of nominal power during first year. Thereafter max. 0.54% degradation per year. At least 93.1% of nominal power up to 10 years. At least 85% of nominal power up to 25 years.

### PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25°C, 1000 W/m<sup>2</sup>).

### TEMPERATURE COEFFICIENTS

Temperature Coefficient of I <sub>SC</sub>	α [%/K]	+0.04	Temperature Coefficient of V <sub>OC</sub>	β [%/K]	-0.28
Temperature Coefficient of P <sub>MPP</sub>	γ [%/K]	-0.37	Normal Module Operating Temperature	NMOT [°F]	109 ± 5.4 (43 ± 3°C)

### PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V <sub>sys</sub>	[V]	1000 (IEC) / 1000 (UL)	Safety Class	II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating	C (IEC) / TYPE 1 (UL)
Max. Design Load, push <sup>1</sup>	[lbs/ft <sup>2</sup> ]	75 (3600 Pa) / 55 (2667 Pa)	Permitted module temperature on continuous duty	-40°F up to +185°F (-40°C up to +85°C)
Max. Test Load, Push / Pull <sup>2</sup>	[lbs/ft <sup>2</sup> ]	113 (5400 Pa) / 84 (4000 Pa)		<sup>2</sup> see installation manual

### QUALIFICATIONS AND CERTIFICATES

UL 1703; VDE Quality Tested; CE-compliant; IEC 61215:2016; IEC 61730:2011, application class A



### PACKAGING INFORMATION

Number of Modules per Pallet	32
Number of Pallets per 53' Trailer	30
Number of Pallets per 40' High Cube Container	26
Pallet Dimensions (L x W x H)	69.3 in x 45.3 in x 46.9 in (1760 mm x 1150 mm x 1190 mm)
Pallet Weight	1415 lbs (642 kg)

NOTE: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

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REVISIONS		
DESCRIPTION	DATE	REV
PRELIM	11/02/2020	
PANEL COUNT	12/04/2020	A

Signature with Seal

DATE: 12/4/2020

PROJECT NAME & ADDRESS

KIRK RUSSELL  
RESIDENCE  
70 BLUE HERON CT.,  
SANFORD, NC 27332

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-6

# GENERAC<sup>®</sup> 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
MAX. 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	60 Hz
MAXIMUM CONTINUOUS OUTPUT CURRENT:	32 A, RMS	32 A, RMS
GROUND-FAULT ISOLATION DETECTION:	Included	Included
CHARGE BATTERY FROM AC:	Yes	Yes
THD (CURRENT):	< 2%	< 2%
TYPICAL NIGHTTIME POWER CONSUMPTION:	< 7 W	< 7 W

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

AC OUTPUT/ISLANDED	MODEL X7602	MODEL X11402
MAX. CONT. AC POWER @ 40°C (104°F) W/ SINGLE 6 MODULE BATTERY CABINET:	9,000 W	9,000 W
MAX. CONT. AC POWER @ 40°C (104°F) WITH 2 BATTERY CABINETS (8 MODULES MINIMUM):	11,000 W	9,600-11,000 W <sup>2</sup>
MAX. CONT. AC POWER @ 50°C (122°F):	8,800 W	7,500-8,800 W <sup>2</sup>
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	60 Hz
THD (VOLTAGE):	< 2%	< 2%
AUTOMATIC SWITCHOVER TIME:	< 1 Seconds	< 1 Seconds

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

<sup>1</sup> Peak Performance

<sup>2</sup> In 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 <sup>3</sup> :	Yes
GRID SELL:	Yes
SELF CONSUMPTION:	Yes
PRIORITIZED CHARGING FROM RENEWABLES:	Yes
GRID SUPPORT - ZERO EXPORT:	Yes
ESS PCS OPERATION MODES (IMPORT ONLY, EXPORT ONLY):	Yes

### ADDITIONAL FEATURES

SUPPORTED COMMUNICATION INTERFACES:	REbus™, CANbus, Ethernet
SYSTEM MONITORING:	PWRview™ Web Portal and Mobile App
BACKUP LOADS DISCONNECT <sup>3</sup> :	Yes, 50 A Circuit Breaker
INVERTER BYPASS SWITCH:	Automatic
WARRANTY:	10 Years

### STANDARDS COMPLIANCE

SAFETY:	UL 1741 SA, CSA 22.2, UL 1998
GRID CONNECTION STANDARDS:	IEEE 1547, Rule 21, Rule 14H, CSIP, UL 1741 PCS CRD (Import Only, Export Only)
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
AUDIBLE NOISE:	< 40 dBA
OPERATING TEMPERATURE - FAHRENHEIT (CELSIUS):	-4 to 122 °F (-20 to 50 °C) <sup>4</sup>
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:	15 kW

<sup>3</sup> 3Ø inverters offer islanding for 1Ø loads.

<sup>4</sup> Includes ambient temperature rising from inverter operation. Reduced power at extreme temperatures.

Specifications listed in this document are achieved with firmware version 13310 or greater. Confirm inverter has latest firmware to ensure full performance.

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### REVISIONS

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DATE: 12/4/2020

### PROJECT NAME & ADDRESS

KIRK RUSSELL  
RESIDENCE  
70 BLUE HERON CT.,  
SANFORD, NC 27332

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-7



**GENERAC**

# SnapRS™

Inline Disconnect Switch  
Model: APKE00011  
Certification Model Reference: RS801



Generac SnapRS are a simple way to satisfy rapid shutdown compliance for solar + storage systems. Generac SnapRS are 2017/2020 NEC 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 is initiated at a PWRcell™ Inverter. When rapid shutdown is initiated, SnapRS units isolate each PV module in the array, reducing array voltage to <80V in seconds.

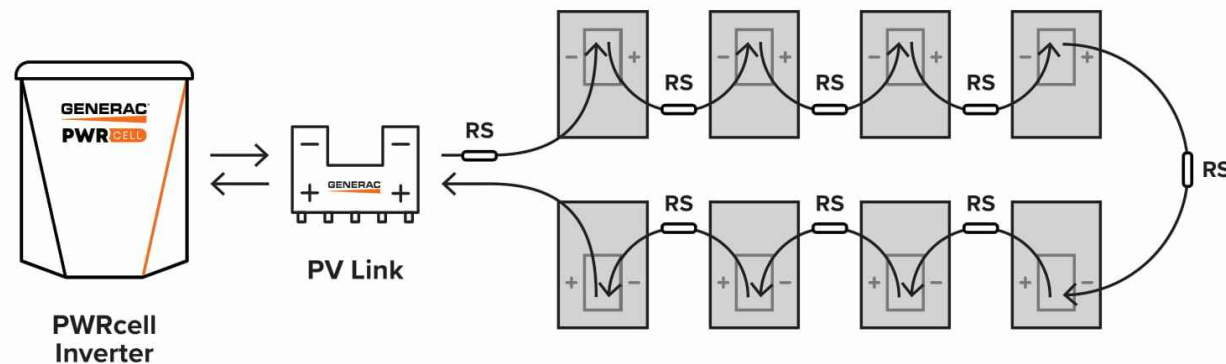


Diagram is applicable for most 60 cell PV modules. Modules with higher cell count may require a different arrangement. Contact Generac for more details.

## 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
PROTECTIONS:	PVRSE
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



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RESIDENCE  
70 BLUE HERON CT.,  
SANFORD, NC 27332

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-8

# GENERAC PWRCELL

PWRcell Battery Cabinet (Ordering SKU: APKE00007)  
2.85kWh PWRcell Battery Module  
Model #: BJ-DCB05ZKAX (Ordering SKU: A0000391219)  
PWRcell Battery Configuration Model #s:  
PWRcell 9, PWRcell 12, PWRcell 15, PWRcell 17  
PWRcell Spacer Kit (Ordering SKU: APKE00008)  
PWRcell Upgrade Kit (Ordering SKU: APKE00009)

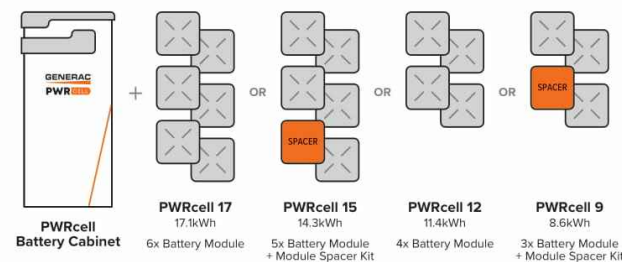
The PWRcell™ Battery Cabinet is a modular smart battery platform that allows for a range of configurations to suit any need, small or large. No other smart battery offers the power and flexibility of PWRcell. Whether for backup power or smart energy management, PWRcell has power and capacity options for every need, without sacrificing flexibility or function.



## PWRcell BATTERY CABINET DESIGN

The PWRcell Battery Cabinet allows system owners the flexibility to scale from the economical 8.6kWh PWRcell 9 to the massive 17.1kWh PWRcell 17 by installing additional battery modules to the PWRcell Battery Cabinet. When needs change, an existing PWRcell Battery Cabinet can be upgraded with additional modules. Use the graphic below and the chart on the back of this sheet to understand what components you need for your chosen PWRcell configuration.

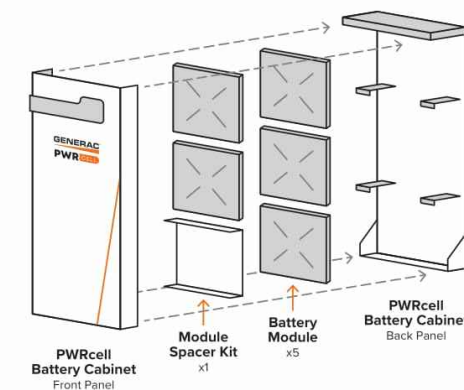
## BATTERY CONFIGURATION GUIDE



## FEATURES & BENEFITS

- Connect 2 PWRcell Battery Cabinets to a single PWRcell Inverter for 34.2kWh 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

## BATTERY CABINET ASSEMBLY



## Specifications

PWRcell™ BATTERY CONFIGURATIONS	9	12	15	17
BATTERY MODULES:	3	4	5	6
USABLE ENERGY:	8.6kWh	11.4kWh	14.3kWh	17.1kWh
POWER - RATED CONTINUOUS:	3.4kW	4.5kW	5.6kW	6.7kW
POWER - 60 MINUTES:	4.2kW	5.6kW	7.0kW	8.4kW
POWER - 2 MINUTES:	5.0kW	6.7kW	8.4kW	10.0kW
REBus™ VOLTAGE - INPUT/OUTPUT:	360-420 VDC			
MODULE VOLTAGE:	46.8 VDC			
ROUND-TRIP EFFICIENCY:	96.50%			
OPERATING TEMPERATURE - FAHRENHEIT (CELSIUS):	41 to 113 °F (5 to 45 °C)			
RECOMMENDED AMBIENT TEMPERATURE - FAHRENHEIT (CELSIUS):	55 to 86 °F (13 to 30 °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 - LB (KG):	280 (127)	335 (152)	390 (178)	445 (202)
WARRANTY - LI-ION MODULES:	10 Years, (7.56MWh)			
WARRANTY - ELECTRONICS AND ENCLOSURE:	10 Years			
COMMUNICATION PROTOCOL:	REBus™ DC Nanogrid™			
COMPLIANCE:	UL 9540, UL 1973, UL 1642, CSA 22.2			

## UPGRADING PWRcell

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) if required. PWRcell 9 and PWRcell 15 require a module spacer.

Generac offers a convenient PWRcell Battery Upgrade Kit (APKE00009) to help replace lost or misplaced hardware. A PWRcell Battery Upgrade Kit may be purchased from your Generac distributor.

Refer to the table to the right for material requirements related to upgrading the PWRcell Battery Cabinet.

## UPGRADE MATERIAL REQUIREMENTS

STARTING CONFIGURATION	ENDING CONFIGURATION		
	PWRcell 17	PWRcell 15	PWRcell 12
PWRcell 9	+ 3 x PWRCell Mod + 2 x APKE00009*	+ 2 x PWRCell Mod + 1 x APKE00009*	+ 1 x PWRCell Mod + 1 x APKE00009*
PWRcell 12	+ 2 x PWRCell Mod + 1 x APKE00009*	+ 1 x PWRCell Mod + 1 x APKE00008	
PWRcell 15	+ 1 x PWRCell Mod + 1 x APKE00009*		

\*APKE00009 (Upgrade kit) only required if original hardware is unavailable

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RESIDENCE  
70 BLUE HERON CT.,  
SANFORD, NC 27332

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-9

**GENERAC**

# PV Link™

2500W MPPT Substring Optimizer  
 Model: APKE00010  
 Certification Model Reference: S2502



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
- 2017/2020 NEC 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.

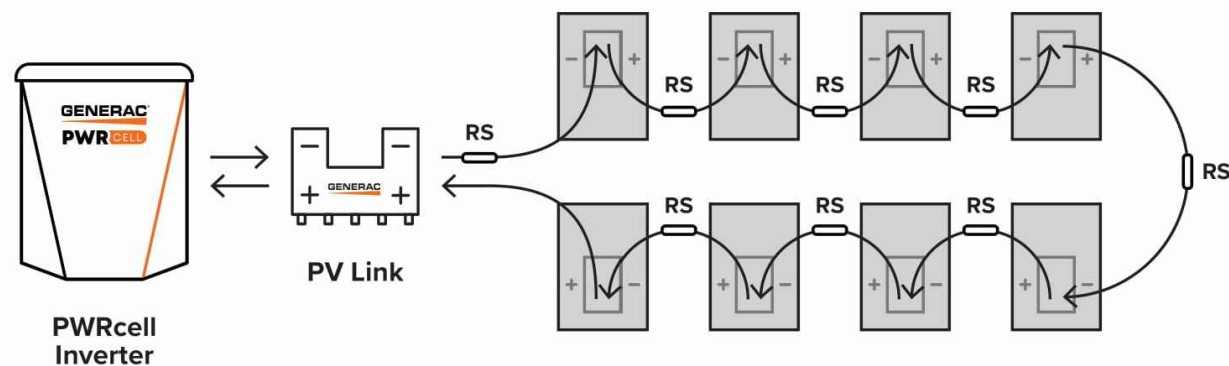


Diagram is applicable for most 60 cell PV modules. Modules with higher cell count may require a different arrangement. Contact Generac for more details.

## Specifications

PV Link™ (APKE00010)	
RATED POWER*:	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:	< 1W
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

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



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 RESIDENCE  
 70 BLUE HERON CT.,  
 SANFORD, NC 27332

SHEET NAME  
 EQUIPMENT  
 SPECIFICATION

SHEET SIZE

ANSI B  
 11" X 17"

SHEET NUMBER

PV-10

Single Load  
Manual Transfer  
Switches

**GENERAC**

**MANUAL TRANSFER SWITCHES  
For Portable Generators**

Manual Transfer Switches

Manual Transfer Switches

1 of 2 2 of 2

60–100 Amps, 125 / 250 Volts  
Models 6333 and 6334



**Description**

These Generac Manual Transfer Switches are designed to safely deliver power to a single load or sub panel during a power outage.

**Features**

- NEMA 1 enclosure (indoor rated)
- Use as a disconnect panel for a single 120/240V load or to feed a sub panel for multiple loads
- Suitable for service entrance equipment (includes bonding screw and label to convert switch to service entrance rating)

**60–100 Amps, 125 / 250 Volts**

**GENERAC**  
Manual Transfer Switches

**Specifications**

Model	6333	6334
UPC Code	696471063332	696471063349
Generator Main	60 Amps	100 Amps
Utility Main	60 Amps	100 Amps
Voltage	125 / 250, 1Ø	125 / 250, 1Ø
Rated AC Frequency	60 Hz	60 Hz
Required Main Breaker in Load Center (provided by installer)	60 Amp, 125 / 250V	100 Amp, 125 / 250V
Enclosure	Indoor (NEMA 1)	Indoor (NEMA 1)
NEMA Configuration of Inlet	—	—
Warranty	Two Year Limited	Two Year Limited

**Accessories**

Model	Product	Description	
6337	30A Power Inlet Box	Rain-tight resin (bottom connection), NEMA L14-30	
6338	50A Power Inlet Box	Rain-tight resin (bottom connection), NEMA CS6365	
6340 6341	30A Power Inlet Box 50A Power Inlet Box	Rain-tight resin with flip lid (bottom connection), NEMA L14-30 Rain-tight resin with flip lid (bottom connection), NEMA CS6365	
6343 6344	30A Power Inlet Box 50A Power Inlet Box	Rain-tight aluminum (bottom connection), NEMA L14-30 Rain-tight aluminum (bottom connection), NEMA CS6365	
6346 6347	30A Power Inlet Box 50A Power Inlet Box	Aluminum with flip lid (front connection), NEMA L14-30 Aluminum with flip lid (front connection), NEMA CS6365	
6327 6328 6329	10 ft (3 m) 30A Generator Cord 25 ft (3 m) 30A Generator Cord 50 ft (15.2 m) 30A Generator Cord	NEMA L14-30 ends	
6330 6389 6390	10 ft. (3 m) 50A Generator Cord 25 ft. (7.6 m) 50A Generator Cord 50 ft. (15.2 m) 50A Generator Cord	NEMA 14-50 male and locking CS6364 female	

**Dimensions and Weight**

Model	6333	6334
Product L x W x H (in / mm)	11 x 13 x 4 (279 x 330 x 102)	11 x 13 x 4 (279 x 330 x 102)
Product Weight (lb / kg)	10 (4.5)	10 (4.5)

**GENERAC**

Generac Power Systems, Inc. • S45 W29290 HWY. 59, Waukesha, WI 53189 • generac.com  
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**REVISIONS**

DESCRIPTION	DATE	REV
PRELIM	11/02/2020	
PANEL COUNT	12/04/2020	A

Signature with Seal

DATE: 12/4/2020

PROJECT NAME & ADDRESS

KIRK RUSSELL  
RESIDENCE  
70 BLUE HERON CT.,  
SANFORD, NC 27332

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-11



## QRail™ — Fully Integrated Mounting and Racking System

The QRail Series is a strong and versatile solar array mounting system that provides unrivaled benefits to solar designers and installers. Combined with Quick Mount PV's industry-leading waterproof mounts, QRail offers a complete racking solution for mounting solar modules on any roof.



Easily design array configurations with the QDesign software application. Generate complete engineering reports and calculate a precise bill of materials for all the mounting, racking and accessories needed for a complete solar array.

## Comprehensive, One-Source Solution

QRail, together with Quick Mount PV's waterproof mounting products, provides the benefit of a single-sourced, seamlessly integrated rooftop installation that works with all roof types — composition/asphalt shingles, flat or curved tile, metal shingle, shake, slate and low slope roofs. The QRail system also works with any roof attachment system for maximum flexibility.

## Superior Strength and Versatility

QRail is engineered for optimal structural performance. The system is certified to UL 2703, fully code compliant and backed by a 25-year warranty. QRail is available in Light, Standard and Heavy versions to match all geographic locations. QRail is compatible with virtually all modules and works on a wide range of pitched roof surfaces. Modules can be mounted in portrait or landscape orientation in standard or shared-rail configurations.

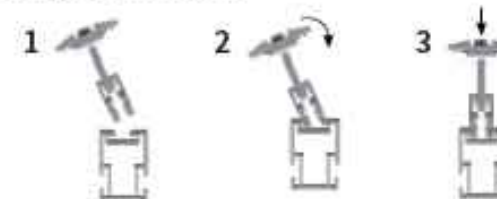


QRails come in two lengths — 168 inches (14 ft) and 208 inches (17.3 ft)  
Mill and Black Finish

## Fast, Simple Installation: It Just Clicks

### QClick Technology™

The universal mid and end clamps use QClick technology to simply "click" into the rail channel and remain upright, ready to accept the module. The pre-assembled clamps fit virtually all module frames and require no extra hardware, eliminating pre-loading and reducing installation time.



Installing is as easy as 1-2-3



**UNIVERSAL END CLAMP**  
2 clamps for modules from 30-45mm or 38-50mm thick



**UNIVERSAL BONDED MID CLAMP**  
2 clamps for modules from 30-45mm or 38-50mm thick

### QSplice™ Technology

QRail's innovative internal QSplice installs in seconds, requiring no tools or screws. Simply insert QSplice into the rail and slide the other rail on to create a fully structural, bonded splice. An external splice is also available.



Installs in seconds — no tools or hardware required

## Fully Integrated Electrical Bonding

The QRail system provides an integrated electrical bonding path, ensuring that all exposed metal parts and the solar module frames are electrically connected. All electrical bonds are created when the components are installed and tightened down.



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PRELIM	11/02/2020	
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DATE: 12/4/2020

PROJECT NAME & ADDRESS

KIRK RUSSELL  
RESIDENCE  
70 BLUE HERON CT.,  
SANFORD, NC 27332

SHEET NAME

EQUIPMENT  
SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-12

# QRail™ Configurations



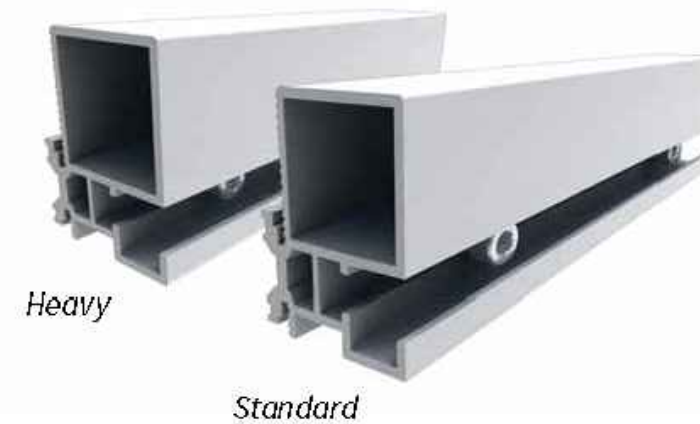
Item Code	Part Number	Description	Finish
QMR-RL14 A 60	800	QRail Light, 14 ft., 60 Pack	Mill
QMR-RL17.3 A 60	801	QRail Light, 17.3 ft., 60 Pack	Mill
QMR-RL14 B 60	805	QRail Light, 14 ft., 60 Pack	Black
QMR-RL17.3 B 60	806	QRail Light, 17.3 ft., 60 Pack	Black
QMR-RS14 A 60	810	QRail Standard, 14 ft., 60 Pack	Mill
QMR-RS17.3 A 60	811	QRail Standard, 17.3 ft., 60 Pack	Mill
QMR-RS14 B 60	815	QRail Standard, 14 ft., 60 Pack	Black
QMR-RS17.3 B 60	816	QRail Standard, 17.3 ft., 60 Pack	Black
QMR-RH14 A 60	820	QRail Heavy, 14 ft., 60 Pack	Mill
QMR-RH17.3 A 60	821	QRail Heavy, 17.3 ft., 60 Pack	Mill
QMR-RH14 B 60	825	QRail Heavy, 14 ft., 60 Pack	Black
QMR-RH17.3 B 60	826	QRail Heavy, 17.3 ft., 60 Pack	Black

# QSplice™ Internal Structural Splice



Item Code	Part Number	Description	Finish
QMR-ISL A 15	830	QSplice Internal, Light, 15 Pack	Mill
QMR-ISS A 15	831	QSplice Internal, Standard, 15 Pack	Mill
QMR-ISH A 15	832	QSplice Internal, Heavy, 15 Pack	Mill

# QSplice™ External Structural Splice



Item Code	Part Number	Description	Finish
QMR-ESS A 15	834	QSplice External, Standard, 15 Pack	Mill
QMR-ESH A 15	835	QSplice External, Heavy, 15 Pack	Mill



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RESIDENCE  
70 BLUE HERON CT.,  
SANFORD, NC 27332

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE  
ANSI B  
11" X 17"

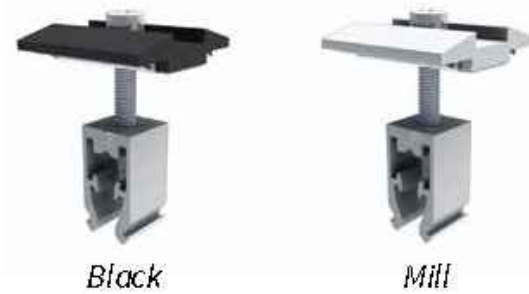
SHEET NUMBER  
PV-12A

## Universal End Clamp with QClick™ Technology



Item Code	Part Number	Description	Finish
QMR-UEC3045A 20	860	Universal End Clamp, 30-45mm, 20 Pack	Mill
QMR-UEC3850A 20	861	Universal End Clamp, 38-50mm, 20 Pack	Mill
QMR-UEC3045B 20	865	Universal End Clamp, 30-45mm, 20 Pack	Black
QMR-UEC3850B 20	866	Universal End Clamp, 38-50mm, 20 Pack	Black
QMR-UEC3045BP A 20	862	Universal End Clamp, 30-45mm, w/ Bonding, 20 Pack	Mill
QMR-UEC3850BP A 20	863	Universal End Clamp, 38-50mm, w/ Bonding, 20 Pack	Mill
QMR-UEC3045BP B 20	867	Universal End Clamp, 30-45mm, w/ Bonding, 20 Pack	Black
QMR-UEC3850BP B 20	868	Universal End Clamp, 38-50mm, w/ Bonding, 20 Pack	Black

## Mid Clamp with QClick™ Technology



Item Code	Part Number	Description	Finish
QMR-UMC3045BP 1.2 A 20	872	Universal Mid Clamp, 30-45mm, w/ Bonding, 20 Pack	Mill
QMR-UMC3850BP 1.2 A 20	873	Universal Mid Clamp, 38-50mm, w/ Bonding, 20 Pack	Mill
QMR-UMC3045BP 1.2 B 20	877	Universal Mid Clamp, 30-45mm, w/ Bonding, 20 Pack	Black
QMR-UMC3850BP 1.2 B 20	878	Universal Mid Clamp, 38-50mm, w/ Bonding, 20 Pack	Black

## Single-Slot L-Foot



Item Code	Part Number	Description	Finish
QMC-LF A 12	692	Single-slot L-foot, 12 Pack	Mill
QMC-LF B 12	693	Single-slot L-foot, 12 Pack	Black

## End Caps



Item Code	Part Number	Description	Finish
QMR-CPL B 50	885	End Cap Light, 50 Pack	Black
QMR-CPS B 50	886	End Cap Standard, 50 Pack	Black
QMR-CPH B 50	887	End Cap Heavy, 50 Pack	Black



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### PROJECT NAME & ADDRESS

KIRK RUSSELL  
 RESIDENCE  
 70 BLUE HERON CT.,  
 SANFORD, NC 27332

SHEET NAME  
**EQUIPMENT  
 SPECIFICATION**

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

SHEET NUMBER  
**PV-12B**

## T-Bolt



Item Code	Part Number	Description	Finish
QMR-TB A 300	880	T-Bolt w/ Nut, 300 Pack	stainless steel

## Grounding Lug



Item Code	Part Number	Description	Finish
QMR-GL A 50	890	WEEB Lug w/ T-Bolt, 50 Pack	n/a

## Wire Clip



*Works with both PV and Trunk Cabling*

Item Code	Part Number	Description	Finish
QMR-WCA 300	892	Trunk/PV Cable, 300 Pack	stainless steel

## WEEB BMC



Item Code	Part Number	Description	Finish
QMR-ECW A 50	891	WEEB BMC, 50 Pack	stainless steel



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KIRK RUSSELL  
 RESIDENCE  
 70 BLUE HERON CT.,  
 SANFORD, NC 27332

SHEET NAME  
 EQUIPMENT  
 SPECIFICATION

SHEET SIZE

ANSI B  
 11" X 17"

SHEET NUMBER

PV-12C



# L-Mount | QMLM / QMLM-ST

Elevated Water Seal Technology®

ITEM NO.	DESCRIPTION	QTY.
1	FLASHING, ROUNDED CORNERS, 9" X 12" X .040", .438" HOLE, 5052, MILL	1
2	L-FOOT, 2" X 3.30" FOR .438" O.D. FASTENER, 2-1/16" SLOT, 6061-T6/6005A-T61, MILL	1
3	WASHER, SEALING, 5/16" ID X 3/4" OD, EPDM BONDED SS	1
4	LAG SCREW, HEX HEAD, 5/16" x 4", 18-8 SS	1
*5	STRUCTURAL SCREW, QMPV, T-30 HEX WASHER HEAD, 5/16" X 4-1/2", 18-8SS	1

THIS EDGE TOWARDS ROOF RIDGE

QMLM

QMLM-ST

Quick Mount PV®

TITLE: QMLM & QMLM-ST: L-MOUNT, 2-1/16" SLOT

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONS ±.125 TWO PLACE DECIMAL ±.15 THREE PLACE DECIMAL ±.024

SCALE: 1:4 WEIGHT: 0.7565 SHEET 1 OF 1

SIZE: A DRAWN BY: AAP DATE: 4/4/2019 REV: 11

DO NOT SCALE DRAWING

PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF QUICK MOUNT PV. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF QUICK MOUNT PV IS PROHIBITED. COPYRIGHT © 2019 QUICK MOUNT PV

## L-Mount Installation Instructions

**Installation Tools Required:** tape measure, roofing bar, chalk line, stud finder, caulking gun, sealant compatible with roofing materials, drill with 7/32" or 1/8" bit, drill or impact gun with 1/2" socket.

**WARNING:** Quick Mount PV products are NOT designed for and should NOT be used to anchor fall protection equipment.

- Locate, choose, and mark centers of rafters to be mounted. Select the courses of shingles where mounts will be placed.
- Carefully lift composition roof shingle with roofing bar, just above placement of mount. Remove nails as required and backfill holes with approved sealant. See "Proper Flashing Placement" on next page.
- Insert flashing between 1st and 2nd course. Slide up so top edge of flashing is at least 3/4" higher than the butt-edge of the 3rd course and lower flashing edge is above the butt-edge of 1st course. Mark center for drilling.
- If attaching with lag bolt use a 7/32" bit (Lag). Use a 1/8" bit (ST) for attaching with the structural screw. Drill pilot hole into roof and rafter, taking care to drill square to the roof. Do not use mount as a drill guide. Drill a 2" deep hole into rafter.
- Clean off any sawdust, and fill hole with sealant compatible with roofing materials.
- Place L-foot onto elevated flange and rotate L-foot to desired orientation.
- Prepare lag bolt or structural screw with sealing washer. Using a 1/2-inch socket on an impact gun, drive prepared lag bolt through L-foot until L-foot can no longer easily rotate. **DO NOT over-torque.** NOTE: Structural screw can be driven with T-30 hex head bit.
- You are now ready for the rack of your choice. Follow all the directions of the rack manufacturer as well as the module manufacturer. NOTE: Make sure top of L-foot makes solid contact with racking.

Signature with Seal

DATE: 12/4/2020

PROJECT NAME & ADDRESS

KIRK RUSSELL RESIDENCE  
70 BLUE HERON CT.,  
SANFORD, NC 27332

All roofing manufacturers' written instructions must also be followed by anyone modifying a roof system. Consult the roof manufacturer's specs and instructions prior to working on the roof.

BI 7.2.3-44

Apr-2019 Rev 6

Quick Mount PV®  
RESPECT THE ROOF

**POWERHOME**

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DATE: 12/4/2020

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KIRK RUSSELL  
RESIDENCE  
70 BLUE HERON CT.,  
SANFORD, NC 27332

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-13