
## PV MATERIAL SUMMARY: DISTRIBUTOR

| | |
|---|---|
| Q.PEAK DUO BLK ML-G10+400 | 42 |
| P401 | 42 |
| SE7600H-US000BNI4 | 1 |
| SE7600H-US000BNU4 | 1 |
| SE-WFGW-B-S1-NA | 1 |
| SECT-SPL-225A-T-20 | 2 |
| XR-10-168B | 12 |
| XR-10-204B | 12 |
| XR10-BOSS-01-M1 | 8 |
| UFO-CL-01-B1 | 104 |
| UFO-STP-32MM-B1 | 40 |
| XR-LUG-03-A1 | 12 |
| 4 IN QB1 | 84 |
| QB DECK MOUNT 16317 | 18 |
| GC66803 Geocel Sealant | 6 |
| SOLADECK 0799-5B | 3 |

NC SOLAR NOW

NORTH CAROLINA PROFESSIONAL SEAL 035699 ENGINEER ANDREW W. KING 1/7/22

## CLIENT INFO

EDWARD LILE ROHN
186 SMITHWOOD DRIVE
FUQUAY-VARINA,NC 27526

## PROJECT INFO

| | |
|---|---|
| DC INPUT: | 16.800 kW |
| AC EXPORT: | 15.200 kW |
| DOI INSPT. METHOD: | OPTION 2 |

## CODE REFERENCES

NATION ELECTRICAL CODE v. 2017
NC FIRE PROTECTION CODE v. 2018
NC BUILDING CODE v. 2018
NC RESIDENTIAL CODE v. 2018
ACSE v. 7-10

## SITE CONDITIONS

| | |
|---|---|
| WIND SPEED: | 115 MPH |
| RISK CATEGORY: | II |
| EXPOSURE: | B |
| SNOW: | 15 PSF |

## SHEET INDEX

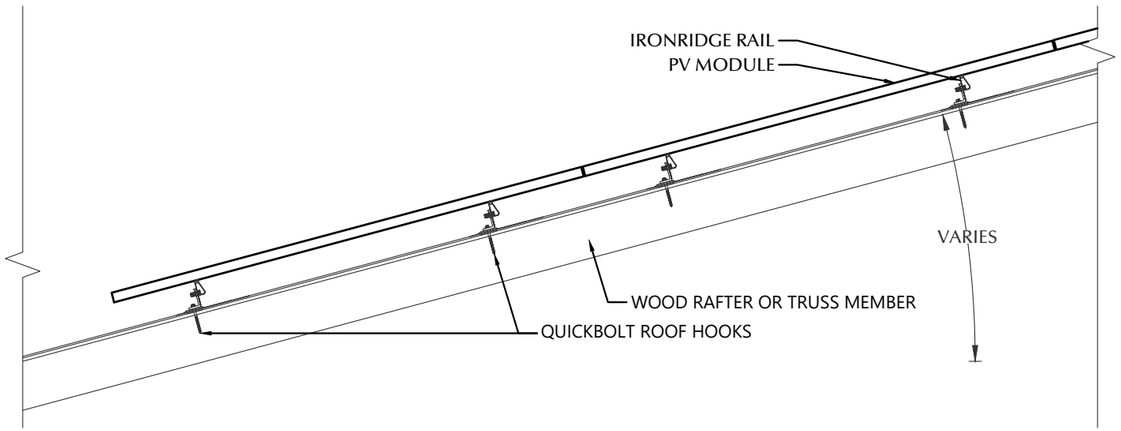


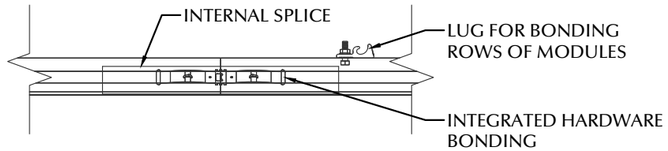
## DESIGNER INFO

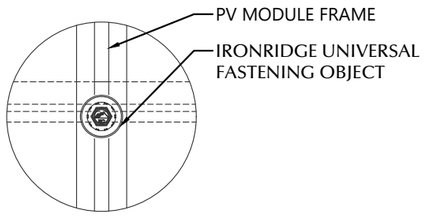
| | |
|---|---|
| DESIGNER | JAM |
| ENGINEER | AWK |
| DATE | 11/23/2021 |
| VERSION | P1 |

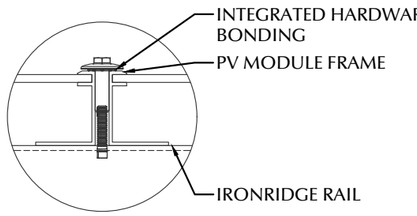
PV SYSTEM COVER PAGE

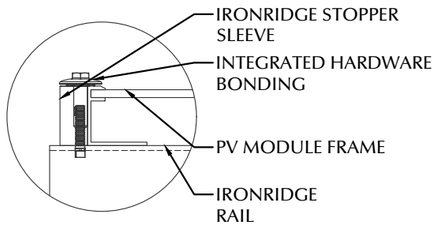
# PV-1.1

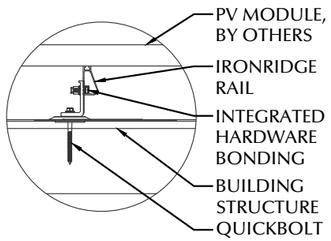


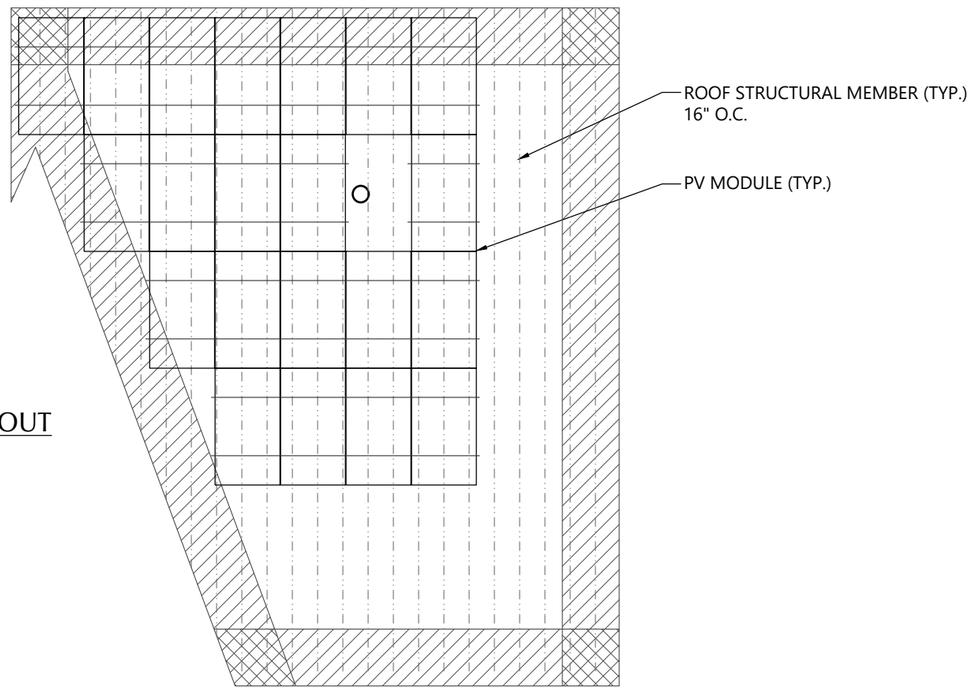




1 ROOF FASTENER DETAIL
NOT TO SCALE




2 ARRAY LAYOUT
1/8" = 1'-0"

## STATEMENT OF STRUCTURAL COMPLIANCE

THE EXISTING ROOF STRUCTURE HAS BEEN DESIGNED TO SUPPORT THE ADDITIONAL LOADS OF THE PROPOSED PV SYSTEM. IN ADDITION, THE RACKING AND FASTENING SYSTEM SHALL BE CAPABLE OF SECURING THE SYSTEM TO THE STRUCTURE UNDER DESIGN CONDITIONS WHEN INSTALLED PROPERLY AND IN ACCORDANCE WITH THE RACKING AND FASTENING ARRANGEMENT DETAILED WITHIN THESE DRAWINGS.

NAME: ANDREW W. KING, PE

SIGNED:

## PV MODULES

| | |
|---|---|
| MAKE | HANWHA |
| MODEL | Q.PEAK DUO BLK ML-G10+400 |
| WIDTH | 41.10 IN |
| LENGTH | 74.00 IN |
| THICKNESS | 32 MM |
| WEIGHT | 48.50 LBS. |
| ARRAY AREA | 444 SQFT. |
| ARRAY WEIGHT | 1109 LBS. |

## ROOF SUMMARY

| | |
|---|---|
| STRUCTURE: | |
| TYPE | RAFTERS |
| MATERIAL | SOUTHERN PINE #2 |
| SIZE | 2 X 6 |
| SPACING | 16 IN O.C. |
| EFFECTIVE SPAN | 137 IN |
| PITCH | 3/12 |
| DENSITY | 30 LBS./CU.FT. |
| DECKING: | |
| TYPE | OSB |
| MATERIAL | COMPOSITE |
| THICKNESS | 7/16 IN |
| WEIGHT | 1.60 LBS/SQFT |
| ROOFING: | |
| TYPE | ASPHALT SHINGLE |
| MATERIAL | ASPHALT |
| WEIGHT | 2.30 LBS./SQFT. |

## ROOF MOUNT SUMMARY

| MAXIMUM (IN) | MOUNT SPACING | RAIL OVERHANG |
|---|---|---|
| WIND ZONE 1 | 64 IN | 19 IN |
| WIND ZONE 2 | 32 IN | 18 IN |
| WIND ZONE 3 | 16 IN | 11 IN |

## ROOF LOADING

| | |
|---|---|
| GROUND SNOW LOAD: | 15 LBS./SQFT. |
| LIVE LOAD | 20 LBS./SQFT. |
| DEAD LOAD | |
| ROOFING | 3.9 LBS/SQFT. |
| PV ARRAY | 2.5 LBS./SQFT. |
| TOTAL | 6.4 LBS./SQFT. |
| WIND LOAD: | |
| UPLIFT ZONE 1 | -23.0 LBS./SQFT. |
| UPLIFT ZONE 2 | -38.0 LBS./SQFT. |
| UPLIFT ZONE 3 | -57.1 LBS./SQFT. |
| DOWNWARD | 13.6 LBS./SQFT. |
| FASTENER LOAD: | |
| UPLIFT ZONE 1 | -376 LBS. |
| UPLIFT ZONE 2 | -310 LBS. |
| UPLIFT ZONE 3 | -233 LBS. |
| DOWNWARD | 222 LBS. |

## ROOF MOUNT & FASTENER

| | |
|---|---|
| ROOF MOUNT: | |
| MAKE | QUICKBOLT |
| MODEL | 4 IN QB1 |
| MATERIAL | STAINLESS / EPDM |
| FASTENER: | |
| MAKE | QUICK SCREWS |
| MODEL | HANGER BOLT |
| MATERIAL | 304 SS |
| SIZE | 5/16-18 X 5-1/4" |
| GENERAL: | |
| WEIGHT | 0.56 LBS. |
| FASTENERS PER MOUNT | 1 |
| MAX. PULL-OUT FORCE | 960.0 LBS. |
| SAFETY FACTOR | 2 |
| DESIGN PULL-OUT FORCE | 480.0 LBS. |

## MOUNTING RAILS

| | |
|---|---|
| MAKE | IRONRIDGE |
| MODEL | XR10 |
| MATERIAL | ALUMINUM |
| WEIGHT | 0.425 LBS/IN |
| SPACING | 37 IN |

NC SOLAR NOW

NORTH CAROLINA PROFESSIONAL SEAL 035699 ENGINEER ANDREW W. KING
1/7/22

## CLIENT INFO

EDWARD LILE ROHN
186 SMITHWOOD DRIVE
FUQUAY-VARINA,NC 27526

## PROJECT INFO

| | |
|---|---|
| DC INPUT: | 16.800 kW |
| AC EXPORT: | 15.200 kW |
| DOI INSPT. METHOD: | OPTION 2 |

## CODE REFERENCES

NATION ELECTRICAL CODE v. 2017
NC FIRE PROTECTION CODE v. 2018
NC BUILDING CODE v. 2018
NC RESIDENTIAL CODE v. 2018
ACSE v. 7-10

## SITE CONDITIONS

| | |
|---|---|
| WIND SPEED: | 115 MPH |
| RISK CATEGORY: | II |
| EXPOSURE: | B |
| SNOW: | 15 PSF |

## SHEET INDEX

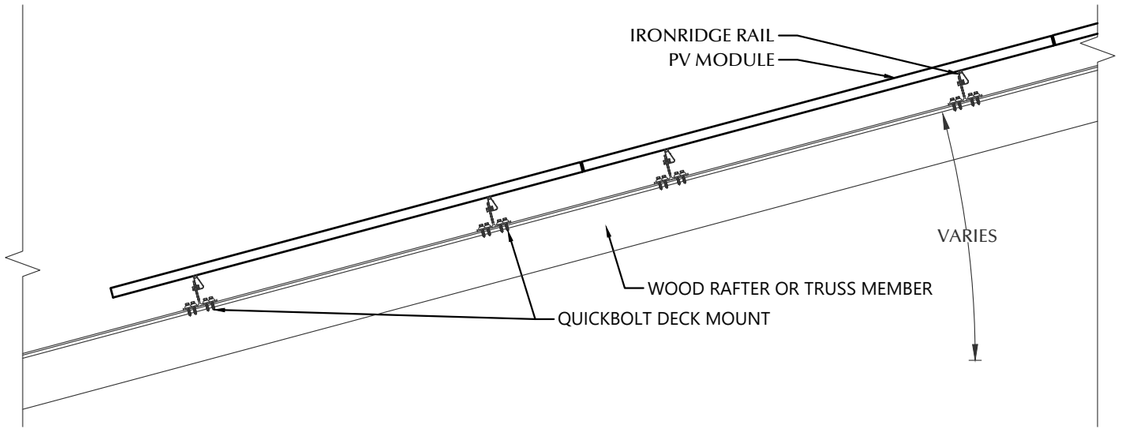


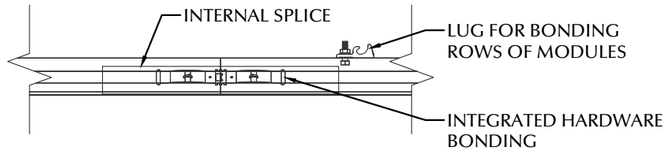
## DESIGNER INFO

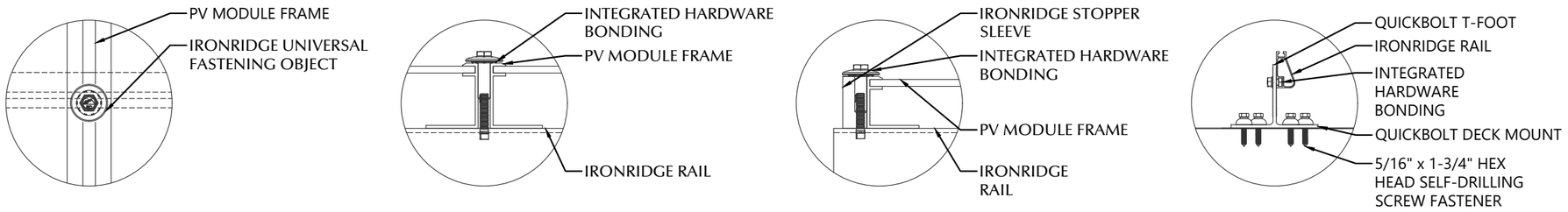
| | |
|---|---|
| DESIGNER | JAM |
| ENGINEER | AWK |
| DATE | 11/23/2021 |
| VERSION | P1 |

PV SYSTEM STRUCTURAL

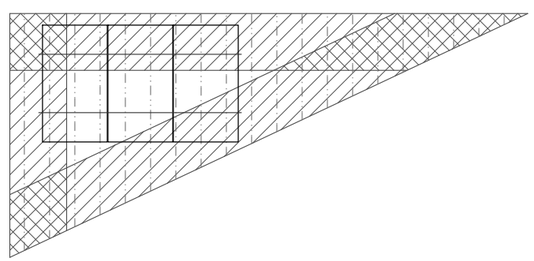
# PV-2.1




1 ROOF FASTENER DETAIL
NOT TO SCALE



2 ARRAY LAYOUT
1/8" = 1'-0"

## STATEMENT OF STRUCTURAL COMPLIANCE

THE EXISTING ROOF STRUCTURE HAS BEEN DESIGNED TO SUPPORT THE ADDITIONAL LOADS OF THE PROPOSED PV SYSTEM. IN ADDITION, THE RACKING AND FASTENING SYSTEM SHALL BE CAPABLE OF SECURING THE SYSTEM TO THE STRUCTURE UNDER DESIGN CONDITIONS WHEN INSTALLED PROPERLY AND IN ACCORDANCE WITH THE RACKING AND FASTENING ARRANGEMENT DETAILED WITHIN THESE DRAWINGS.

NAME: ANDREW W. KING, PE

SIGNED:

## PV MODULES

| | |
|---|---|
| MAKE | HANWHA |
| MODEL | Q.PEAK DUO BLK ML-G10+400 |
| WIDTH | 41.10 IN |
| LENGTH | 74.00 IN |
| THICKNESS | 32 MM |
| WEIGHT | 48.50 LBS. |
| ARRAY AREA | 63 SQFT. |
| ARRAY WEIGHT | 158 LBS. |

## ROOF SUMMARY

| | |
|---|---|
| STRUCTURE: | |
| TYPE | RAFTERS |
| MATERIAL | SOUTHERN PINE #2 |
| SIZE | 2 X 6 |
| SPACING | 16 IN O.C. |
| EFFECTIVE SPAN | 110 IN |
| PITCH | 8/12 |
| DENSITY | 30 LBS./CU.FT. |
| DECKING: | |
| TYPE | OSB |
| MATERIAL | COMPOSITE |
| THICKNESS | 7/16 IN |
| WEIGHT | 1.60 LBS/SQFT |
| ROOFING: | |
| TYPE | ASPHALT SHINGLE |
| MATERIAL | ASPHALT |
| WEIGHT | 2.30 LBS./SQFT. |

## ROOF MOUNT SUMMARY

| MAXIMUM (IN) | MOUNT SPACING | RAIL OVERHANG |
|---|---|---|
| WIND ZONE 1 | 37 IN | 15 IN |
| WIND ZONE 2 | 28 IN | 12 IN |
| WIND ZONE 3 | 26 IN | 11 IN |

## ROOF LOADING

| | |
|---|---|
| GROUND SNOW LOAD: | 15 LBS./SQFT. |
| LIVE LOAD | 20 LBS./SQFT. |
| DEAD LOAD | |
| ROOFING | 3.9 LBS/SQFT. |
| PV ARRAY | 2.5 LBS./SQFT. |
| TOTAL | 6.4 LBS./SQFT. |
| WIND LOAD: | |
| UPLIFT ZONE 1 | -24.6 LBS./SQFT. |
| UPLIFT ZONE 2 | -29.0 LBS./SQFT. |
| UPLIFT ZONE 3 | -29.0 LBS./SQFT. |
| DOWNWARD | 23.0 LBS./SQFT. |
| FASTENER LOAD: | |
| UPLIFT ZONE 1 | -232 LBS. |
| UPLIFT ZONE 2 | -207 LBS |
| UPLIFT ZONE 3 | -193 LBS |
| DOWNWARD | 217 LBS |

## ROOF MOUNT & FASTENER

| | |
|---|---|
| ROOF MOUNT: | |
| MAKE | QUICKBOLT |
| MODEL | QB DECK MOUNT 16317 |
| MATERIAL | STAINLESS / EPDM |
| FASTENER: | |
| MAKE | QUICK SCREWS |
| MODEL | HEX LAG PN# 16318 |
| MATERIAL | 304 SS |
| SIZE | 5/16" X 1-3/4" |
| GENERAL: | |
| WEIGHT | 0.88 LBS. |
| FASTENERS PER MOUNT | 4 |
| MAX. PULL-OUT FORCE | 705.0 LBS. |
| SAFETY FACTOR | 3 |
| DESIGN PULL-OUT FORCE | 235.0 LBS. |

## MOUNTING RAILS

| | |
|---|---|
| MAKE | IRONRIDGE |
| MODEL | XR10 |
| MATERIAL | ALUMINUM |
| WEIGHT | 0.425 LBS/IN |
| SPACING | 37 IN |

NC SOLAR NOW

NORTH CAROLINA PROFESSIONAL SEAL 035699 ENGINEER ANDREW W. KING
1/7/22

## CLIENT INFO

EDWARD LILE ROHN
186 SMITHWOOD DRIVE
FUQUAY-VARINA,NC 27526

## PROJECT INFO

| | |
|---|---|
| DC INPUT: | 16.800 kW |
| AC EXPORT: | 15.200 kW |
| DOI INSPT. METHOD: | OPTION 2 |

## CODE REFERENCES

NATION ELECTRICAL CODE v. 2017
NC FIRE PROTECTION CODE v. 2018
NC BUILDING CODE v. 2018
NC RESIDENTIAL CODE v. 2018
ACSE v. 7-10

## SITE CONDITIONS

| | |
|---|---|
| WIND SPEED: | 115 MPH |
| RISK CATEGORY: | II |
| EXPOSURE: | B |
| SNOW: | 15 PSF |

## SHEET INDEX

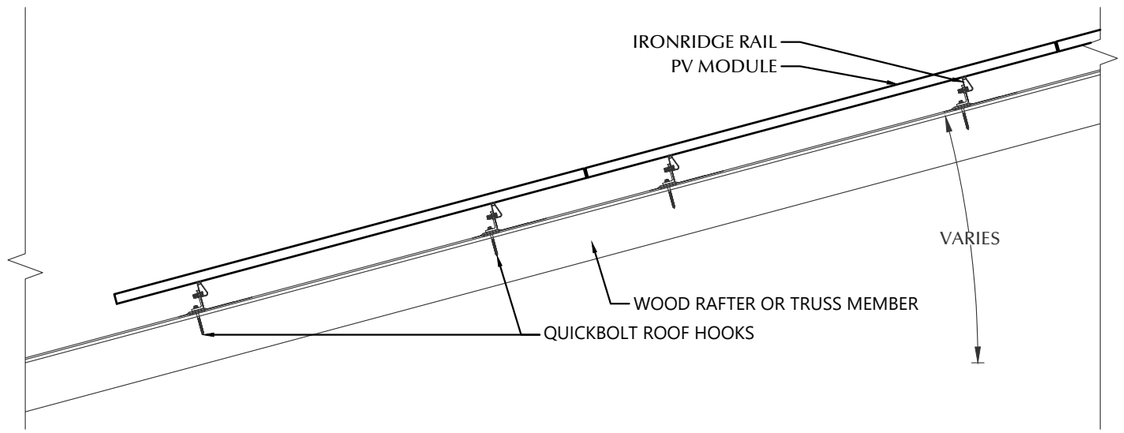


## DESIGNER INFO

| | |
|---|---|
| DESIGNER | JAM |
| ENGINEER | AWK |
| DATE | 11/23/2021 |
| VERSION | P1 |

PV SYSTEM STRUCTURAL

# PV-2.2

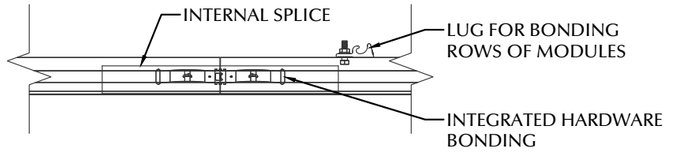



## STATEMENT OF STRUCTURAL COMPLIANCE

THE EXISTING ROOF STRUCTURE HAS BEEN DESIGNED TO SUPPORT THE ADDITIONAL LOADS OF THE PROPOSED PV SYSTEM. IN ADDITION, THE RACKING AND FASTENING SYSTEM SHALL BE CAPABLE OF SECURING THE SYSTEM TO THE STRUCTURE UNDER DESIGN CONDITIONS WHEN INSTALLED PROPERLY AND IN ACCORDANCE WITH THE RACKING AND FASTENING ARRANGEMENT DETAILED WITHIN THESE DRAWINGS.

NAME: ANDREW W. KING, PE

SIGNED:




## PV MODULES

| | |
|---|---|
| MAKE | HANWHA |
| MODEL | Q.PEAK DUO BLK ML-G10+400 |
| WIDTH | 41.10 IN |
| LENGTH | 74.00 IN |
| THICKNESS | 32 MM |
| WEIGHT | 48.50 LBS. |
| ARRAY AREA | 380 SQFT. |
| ARRAY WEIGHT | 950 LBS. |

## ROOF SUMMARY

| | |
|---|---|
| STRUCTURE: | |
| TYPE | RAFTERS |
| MATERIAL | SOUTHERN PINE #2 |
| SIZE | 2 X 6 |
| SPACING | 16 IN O.C. |
| EFFECTIVE SPAN | 90 IN |
| PITCH | 8/12 |
| DENSITY | 30 LBS./CU.FT. |
| DECKING: | |
| TYPE | OSB |
| MATERIAL | COMPOSITE |
| THICKNESS | 7/16 IN |
| WEIGHT | 1.60 LBS/SQFT |
| ROOFING: | |
| TYPE | ASPHALT SHINGLE |
| MATERIAL | ASPHALT |
| WEIGHT | 2.30 LBS./SQFT. |

## ROOF MOUNT SUMMARY

| MAXIMUM (IN) | MOUNT SPACING | RAIL OVERHANG |
|---|---|---|
| WIND ZONE 1 | PORT 64 LAND 64 | 28 IN |
| WIND ZONE 2 | PORT 48 LAND 64 | 23 IN |
| WIND ZONE 3 | PORT 48 LAND 64 | 20 IN |

## ROOF LOADING

| | |
|---|---|
| GROUND SNOW LOAD: | 15 LBS./SQFT. |
| LIVE LOAD | 20 LBS./SQFT. |
| DEAD LOAD | |
| ROOFING | 3.9 LBS/SQFT. |
| PV ARRAY | 2.5 LBS./SQFT. |
| TOTAL | 6.4 LBS./SQFT. |
| WIND LOAD: | |
| UPLIFT ZONE 1 | -24.6 LBS./SQFT. |
| UPLIFT ZONE 2 | -29.0 LBS./SQFT. |
| UPLIFT ZONE 3 | -29.0 LBS./SQFT. |
| DOWNWARD | 23.0 LBS./SQFT. |
| FASTENER LOAD: | |
| UPLIFT ZONE 1 | -329 LBS. |
| UPLIFT ZONE 2 | -388 LBS |
| UPLIFT ZONE 3 | -388 LBS |
| DOWNWARD | 308 LBS |

## ROOF MOUNT & FASTENER

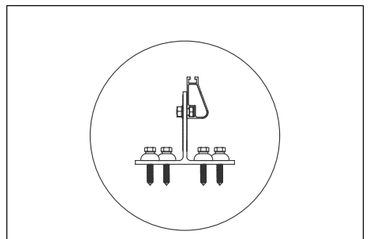
| | |
|---|---|
| ROOF MOUNT: | |
| MAKE | QUICKBOLT |
| MODEL | 4 IN QB1 |
| MATERIAL | STAINLESS / EPDM |
| FASTENER: | |
| MAKE | QUICK SCREWS |
| MODEL | HANGER BOLT |
| MATERIAL | 304 SS |
| SIZE | 5/16-18 X 5-1/4" |
| GENERAL: | |
| WEIGHT | 0.56 LBS. |
| FASTENERS PER MOUNT | 1 |
| MAX. PULL-OUT FORCE | 960.0 LBS. |
| SAFETY FACTOR | 2 |
| DESIGN PULL-OUT FORCE | 480.0 LBS. |

## MOUNTING RAILS

| | |
|---|---|
| MAKE | IRONRIDGE |
| MODEL | XR10 |
| MATERIAL | ALUMINUM |
| WEIGHT | 0.425 LBS/IN |
| SPACING | 37 IN |

ALTERNATIVE ATTACHMENT:

MAY BE USED WHERE STRUCTURAL MEMBERS ARE NOT ACCESSIBLE



## ROOF MOUNT & FASTENER

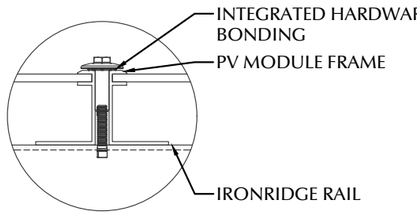
| | |
|---|---|
| ROOF MOUNT: | |
| MAKE | QUICKBOLT |
| MODEL | QB DECK MOUNT 16317 |
| MATERIAL | STAINLESS / EPDM |
| FASTENER: | |
| MAKE | QUICK SCREWS |
| MODEL | HEX LAG PN# 16318 |
| MATERIAL | 304 SS |
| SIZE | 5/16" X 1-3/4" |
| GENERAL: | |
| WEIGHT | 0.8819 |
| FASTENERS PER MOUNT | 4 |
| MAX. PULL-OUT FORCE | 705.0 LBS. |
| SAFETY FACTOR | 3 |
| DESIGN PULL-OUT FORCE | 235.0 LBS. |

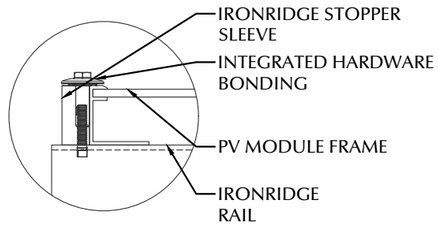
## ROOF MOUNT SUMMARY

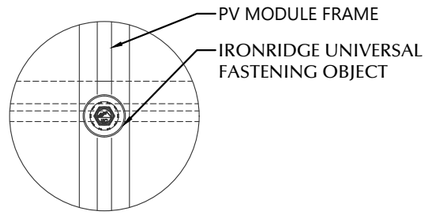
| MAXIMUM (IN) | MOUNT SPACING | RAIL OVERHANG |
|---|---|---|
| WIND ZONE 1 | PORT 37 LAND 67 | 15 IN |
| WIND ZONE 2 | PORT 28 LAND 51 | 11 IN |
| WIND ZONE 3 | PORT 25 LAND 45 | 10 IN |

## ROOF LOADING

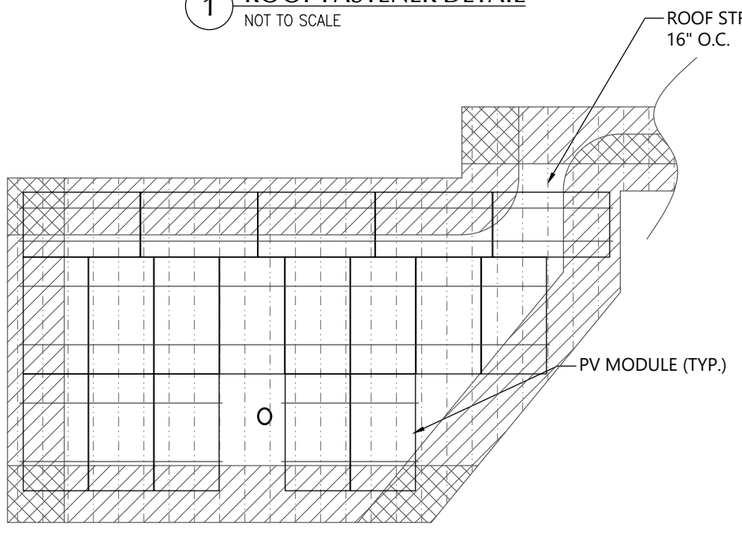
| | |
|---|---|
| FASTENER LOAD: | |
| UPLIFT ZONE 1 | -231 LBS. |
| UPLIFT ZONE 2 | -212 LBS. |
| UPLIFT ZONE 3 | -194 LBS. |
| DOWNWARD | 216 LBS. |

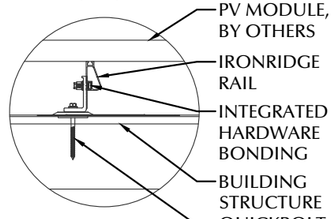


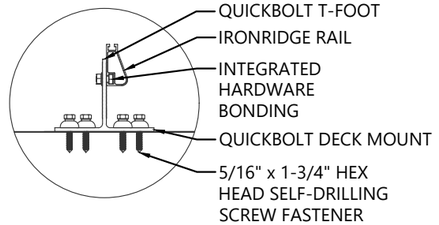




1 ROOF FASTENER DETAIL
NOT TO SCALE

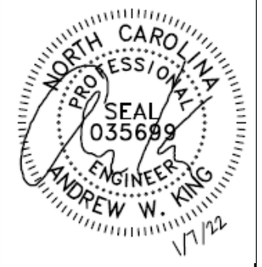



2 ARRAY LAYOUT
1/8" = 1'-0"

NC SOLAR NOW




## CLIENT INFO

EDWARD LILE ROHN
186 SMITHWOOD DRIVE
FUQUAY-VARINA,NC 27526

## PROJECT INFO

| | |
|---|---|
| DC INPUT: | 16.800 kW |
| AC EXPORT: | 15.200 kW |
| DOI INSPT. METHOD: | OPTION 2 |

## CODE REFERENCES

NATION ELECTRICAL CODE v. 2017
NC FIRE PROTECTION CODE v. 2018
NC BUILDING CODE v. 2018
NC RESIDENTIAL CODE v. 2018
ACSE v. 7-10

## SITE CONDITIONS

| | |
|---|---|
| WIND SPEED: | 115 MPH |
| RISK CATEGORY: | II |
| EXPOSURE: | B |
| SNOW: | 15 PSF |

## SHEET INDEX



## DESIGNER INFO

| | |
|---|---|
| DESIGNER | JAM |
| ENGINEER | AWK |
| DATE | 11/23/2021 |
| VERSION | P1 |

PV SYSTEM STRUCTURAL

# PV-2.3

## CONDUCTOR SCHEDULE

| TAG | CURRENT CARRYING CONDUCTORS | | | GROUNDING CONDUCTORS | | | CONDUIT/RACEWAY | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | QTY. | SIZE | INSULATION | QTY. | SIZE | INSULATION | QTY. | SIZE | LOCATION | |
| C1 | 8 | 10 AWG | PV WIRE | 1 | 6 AWG | BARE | - | - | FREE AIR | 1 |
| C2 | 4 | 10 AWG | THWN | 1 | 10 AWG | THWN | 1 | 3/4" | EXT/INT | 2,4 |
| C3 | 3 | 8 AWG | THWN | 1 | 10 AWG | THWN | 1 | 3/4" | EXTERIOR | 2,4 |
| C4 | 3 | 4 AWG | THWN | 1 | 8 AWG | THWN | 1 | 1" | EXTERIOR | 2,4 |
| C5 | 3 | 4 AWG | THWN | - | - | - | 1 | 3/4" | EXTERIOR | 2,4 |
| XC | - | - | - | - | - | - | - | - | - | 3 |

NOTES:

1. MANUFACTURER PROVIDED, UL LISTED WIRING HARNESS FOR USE ON EXPOSED ROOFS
2. CONDUIT SIZE SHOWN IS CODE MINIMUM. LARGER SIZES ARE ALLOWED.
3. EXISTING CONDUCTORS, FIELD VERIFY
4. EQUIPMENT TERMINAL RATING SHALL BE A MINIMUM OF 75°C AT BOTH END OF CONDUCTOR
5. PLEASE REFERENCE NOTES ON PV-4 FOR ADDITIONAL DETAIL

## PV MODULE

| MAKE | HANWHA |
|---|---|
| MODEL | Q.PEAK DUO BLK ML-G10+400 |
| NOM. POWER (PNOM) | 400 WATTS |
| NOM. VOLT. (VMPP) | 37.1 VOLTS |
| O.C. VOLT (VOC) | 45.3 VOLTS |
| MAX. SYS. VOLT. | 1000 VOLTS |
| NOM. CURR. (IMPP) | 10.8 AMPS |
| S.C. CURR. (ISC) | 11.1 AMPS |
| TEMP. COEF. (PMPP) | -0.34 %/C |
| TEMP. COEF. (Voc) | -0.27 %/C |
| MAX SERIES FUSE | 20 AMPS |

## PV COMBINER PANEL

| MAKE | GENERIC |
|---|---|
| MODEL | NA |
| ENCL. RATING | NEMA 3R |
| VOLT. RATING | 240 VOLTS |
| BUS RATING | 125 AMPS |
| UL LIST. (Y/N) | YES |
| MAIN BREAKER (Y/N) | NO |
| MAIN BREAKER RATING | N/A |

- PROVIDE WITH LABEL THAT READS, "PV COMBINER PANEL, DO NOT ADD ADDITIONAL LOADS."

## MODULE OPTIMIZER

| MAKE | SOLAREDGE |
|---|---|
| MODEL | P401 |
| DC INPUT: | |
| NOM. POWER | 400 WATTS |
| VOLT. RANGE | 8 to 60 |
| MAX. CURR. | 11.8 AMPS |
| DC OUTPUT: | |
| NOM. POWER | 400 WATTS |
| MAX. VOLT. | 60 VOLTS |
| MAX. CURR. | 15 AMPS |
| MIN-MAX STRING | 8-25 OPTIMIZERS |
| UL LIST. (Y/N) | YES |

## JUNCTION BOX

| MAKE | SOLADECK |
|---|---|
| PROTECT. RATING | NEMA TYPE 3R |
| UL LIST. (Y/N) | YES |

## MD PANEL (EXISTING)

| MAKE | GENERIC |
|---|---|
| MODEL | N/A |
| ENCL. RATING | NEMA 3R |
| VOLT. RATING | 240 |
| BUS RATING | 200 AMPS |
| UL LIST. (Y/N) | YES |
| MAIN BREAKER (Y/N) | YES |
| MAIN BREAKER RATING | 200 AMPS |

- BACK-FEED SOLAR OUTPUT VIA SUPPLY SIDE TAP INSIDE OF MD PANEL

## DC / AC INVERTER

| MAKE | SOLAREDGE |
|---|---|
| MODEL | SE7600H-US000BNI4 |
| DC INPUT: | |
| MAX POWER | 11800 WATTS |
| VOLT. RANGE | 400-480 |
| NOM. VOLT. | 400 VOLTS |
| MAX. CURRENT | 20 AMPS |
| STRING INPUTS | 2 STRINGS |
| AC OUTPUT: | |
| MAX. POWER | 7600 WATTS |
| NOM. POWER | 7600 WATTS |
| NOM. VOLT. | 211-240-264 |
| MAX. CURR. | 32.00 AMPS |
| DC DISC. (Y/N) | YES |
| RAPID SHUTDOWN (Y/N) | YES |
| PROTECT. RATING | NEMA TYPE 4X |
| UL LIST. (Y/N) | YES |
| CONSUMPTION MONITOR | YES |

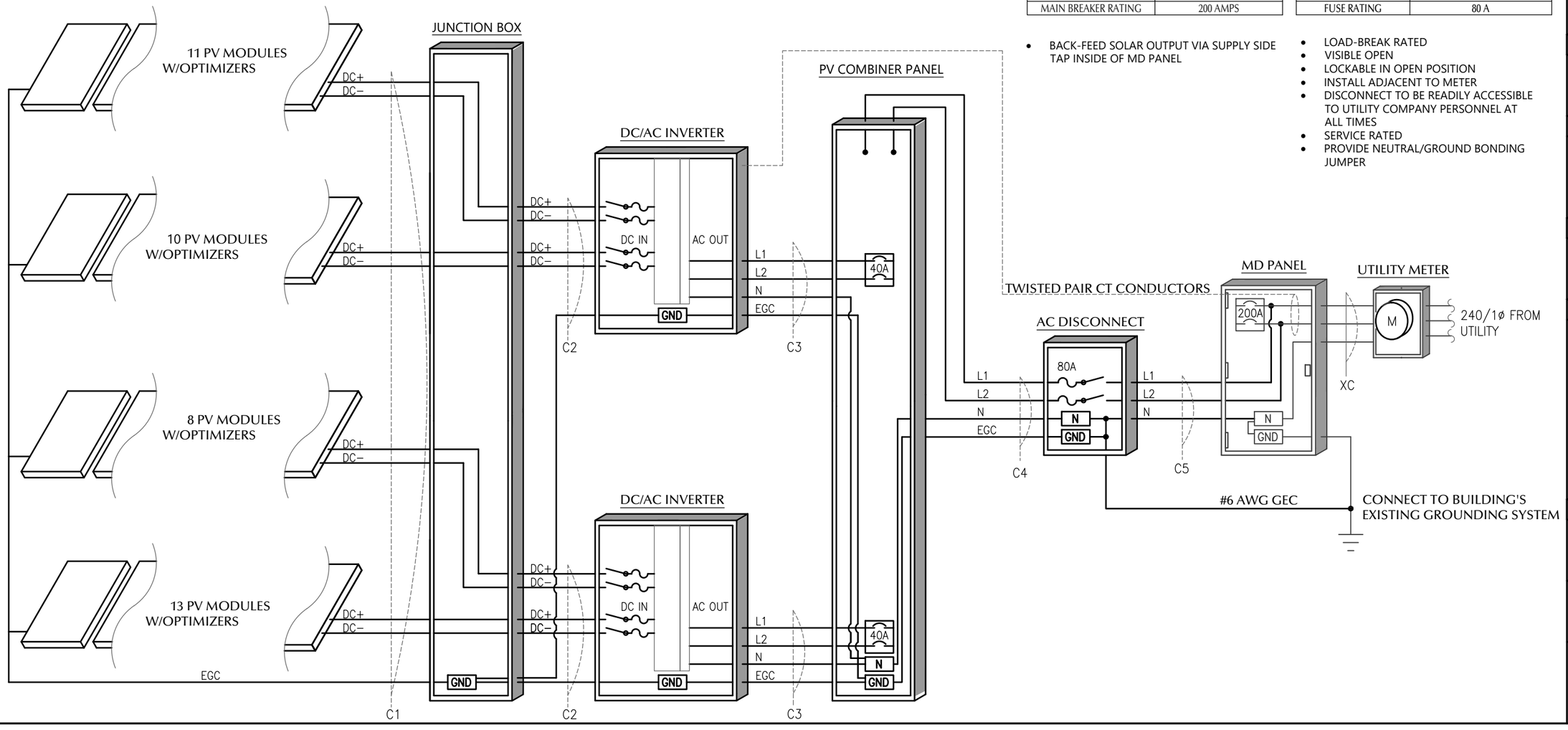
## AC DISCONNECT

| MAKE | GENERIC |
|---|---|
| MODEL | NA |
| ENCL. RATING | NEMA 3R |
| VOLT. RATING | 240 VOLTS |
| AMP RATING | 100 AMPS |
| UL LIST. (Y/N) | YES |
| FUSED (Y/N) | YES |
| FUSE RATING | 80 A |

- LOAD-BREAK RATED
- VISIBLE OPEN
- LOCKABLE IN OPEN POSITION
- INSTALL ADJACENT TO METER
- DISCONNECT TO BE READILY ACCESSIBLE TO UTILITY COMPANY PERSONNEL AT ALL TIMES
- SERVICE RATED
- PROVIDE NEUTRAL/GROUND BONDING JUMPER

## 1 ELECTRICAL SCHEMATIC

NTS




NC SOLAR NOW

NORTH CAROLINA PROFESSIONAL SEAL 035699 ENGINEER ANDREW W. KING 1/7/22

## CLIENT INFO

EDWARD LILE ROHN
186 SMITHWOOD DRIVE
FUQUAY-VARINA,NC 27526

## PROJECT INFO

| | |
|---|---|
| DC INPUT: | 16.800 kW |
| AC EXPORT: | 15.200 kW |
| DOI INSPT. METHOD: | OPTION 2 |

## CODE REFERENCES

NATION ELECTRICAL CODE v. 2017
NC FIRE PROTECTION CODE v. 2018
NC BUILDING CODE v. 2018
NC RESIDENTIAL CODE v. 2018
ACSE v. 7-10

## SITE CONDITIONS

| | |
|---|---|
| WIND SPEED: | 115 MPH |
| RISK CATEGORY: | II |
| EXPOSURE: | B |
| SNOW: | 15 PSF |

## SHEET INDEX



## DESIGNER INFO

| | |
|---|---|
| DESIGNER | JAM |
| ENGINEER | AWK |
| DATE | 11/23/2021 |
| VERSION | P1 |

PV SYSTEM ELECTRICAL

# PV-3.1

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

NEC 690.13 (B)
PLACE ON PV SYSTEM DISCONNECTING MEANS.

**⚠WARNING**
POWER SOURCE OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE

NEC 705.12 (B)(2)(3)(b)
PLACE ADJACENT TO BACK-FED BREAKER

**⚠WARNING**
DUAL POWER SUPPLY
SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

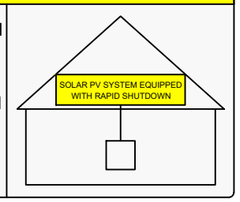
NEC 705.12 (B)(3)
PLACE ON ALL EQUIPMENT THAT IS SUPPLIED BY BOTH POWER SOURCES

WARNING: PHOTOVOLTAIC POWER SOURCE

NEC 690.31 (G)(3)&(4)
PLACE ON ALL JUNCTION BOXES, EXPOSED RACEWAYS, AND OTHER WIRING METHODS EVERY 10' AND ON EVERY SECTION SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS.

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




NEC 690.56 (C)(1)(a)
PLACE WITHIN 3FT OF SERVICE DISCONNECTING MEANS TO WHICH THE PV SYSTEMS ARE CONNECTED AND SHALL INDICATE THE LOCATIONS OF RAPID SHUTDOWN SWITCHES

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

NEC 690.56 (C)(3)
PLACE ON RAPID SHUTDOWN SWITCH OR EQUIPMENT WITH INTEGRATED RAPID SHUTDOWN *REFLECTIVE*

PV SYSTEM DISCONNECT

NEC 690.13 (B)
PLACE ON PV SYSTEM DISCONNECTING MEANS.

PHOTOVOLTAIC POWER SOURCE
OPERATING AC VOLTAGE 240 V
MAXIMUM OPERATING AC OUTPUT CURRENT 64.0 A

NEC 690.54
PLACE ON INTERCONNECTION DISCONNECTING MEANS

DIRECT CURRENT
PHOTOVOLTAIC POWER SOURCE
MAXIMUM VOLTAGE 600 VDC
MAX CIRCUIT CURRENT 30.0 AMPS

NEC 690.53
PLACE ON ALL DC DISCONNECTING MEANS

**⚠WARNING**
THIS EQUIPMENT FED BY MULTIPLE SOURCES. TOTAL RATING OF ALL OVERCURRENT DEVICES EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE SHALL NOT EXCEED AMPACITY OF BUSBAR.

NEC 705.12 (B)(2)(3)(c)
PLACE ON PV COMBINER PANEL.

SERVICE DISCONNECT LOCATED:
SOUTH SIDE OF HOUSE

PV DISCONNECT LOCATED:
SOUTH SIDE OF HOUSE

NEC 705.10
PLACE AT SERVICE EQUIPMENT AND PV SYSTEM DISCONNECTING MEANS. FIELD VERIFY EQUIPMENT LOCATIONS AND LABEL ACCORDINGLY.

## LABEL NOTES

1. LABELS SHOWN ARE HALF THEIR ACTUAL REQUIRED SIZE.
2. LABEL MATERIAL SHALL BE SUITABLE FOR THE EQUIPMENT ENVIRONMENT.
3. DC CONDUIT SHALL BE MARKED WITH REQUIRED LABEL EVERY 10 FEET.
4. LABELS WILL BE APPLIED IN ACCORDANCE WITH THE NEC. SOME LABELS MAY NOT BE NECESSARY.

## DC WIRING NOTES

1. CONDUCTORS SHALL BE COPPER, RATED AT NOT LESS THAN 600 VOLTS FOR RESIDENTIAL CONSTRUCTION AND NOT LESS THAN 1000 VOLTS FOR COMMERCIAL CONSTRUCTION.
2. MINIMUM SIZE SHALL BE #10 AWG UNLESS OTHERWISE NOTED ON THE DRAWINGS.
3. EXPOSED WIRING CONDUCTOR INSULATION SHALL BE TYPE PV WIRE, USE-2, OR RHW-2 WHERE THE OUTER LAYER OF THE INSULATION IS UV, SUNLIGHT, AND MOISTURE RESISTANT.
6. EXTERIOR WIRING CONDUCTOR INSULATION SHALL BE TYPE THWN-2 AND INSTALLED IN ELECTRICAL METALLIC TUBING(EMT) OR RIGID POLYVINYL CHLORIDE CONDUIT(PVC). ALTERNATIVELY, METAL CLAD CABLE(MC) CAN BE USED AS WELL WHEN RATED FOR USE IN WET LOCATIONS.
7. INTERIOR WIRING CONDUCTOR INSULATION SHALL BE TYPE THHN-2 AND INSTALLED IN ELECTRICAL METALLIC TUBING(EMT), FLEXIBLE METAL CONDUIT(FMC), OR METAL CLAD CABLE(MC).
6. USE SCHEDULE 40 PVC OUTDOORS WHERE NOT SUBJECT TO PHYSICAL DAMAGE OR BELOW FLOOR SLAB. USE SCHEDULE 80 PVC OUTDOORS WHERE SUBJECT TO PHYSICAL DAMMAGE
7. MINIMUM CONDUIT SIZE TO BE 1/2".
8. WIRING METHODS TO CONFORM TO ARTICLES 330, 334, 348, 350, 352, 356, AND 358 OF THE 2017 NEC.

## AC WIRING NOTES

1. CONDUCTORS SHALL BE COPPER RATED AT NOT LESS THAN 600 VOLTS.
2. MINIMUM SIZE SHALL BE #14 AWG UNLESS OTHERWISE NOTED ON THE DRAWINGS.
3. EXTERIOR WIRING CONDUCTOR INSULATION SHALL BE TYPE THWN AND INSTALLED IN ELECTRICAL METALLIC TUBING(EMT), RIGID POLYVINYL CHLORIDE CONDUIT(PVC), LIQUID-TIGHT FLEXIBLE METAL CONDUIT(LFMC), OR LIQUID-TIGHT FLEXIBLE NON-METALLIC CONDUIT(LFNC) . ALTERNATIVELY, METAL CLAD CABLE(MC) CAN BE USED AS WELL WHEN RATED FOR USE IN WET LOCATIONS.
4. INTERIOR WIRING CONDUCTOR INSULATION SHALL BE TYPE THHN AND INSTALLED IN ELECTRICAL METALLIC TUBING(EMT), FLEXIBLE METAL CONDUIT(FMC), METAL CLAD CABLE(MC), OR ROMEX.
5. USE SCHEDULE 40 PVC OUTDOORS WHERE NOT SUBJECT TO PHYSICAL DAMAGE OR BELOW FLOOR SLAB. USE SCHEDULE 80 PVC OUTDOORS WHERE SUBJECT TO PHYSICAL DAMMAGE
6. MINIMUM CONDUIT SIZE TO BE 1/2".
7. WIRING METHODS TO CONFORM TO ARTICLES 330, 334, 348, 350, 352, 356, AND 358 OF THE 2017 NEC.

## CONSTRUCTION NOTES

1. ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH THE NEC, STATE, AND LOCAL APPLICABLE CODES.
2. FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS, BEST PRACTICES, AND SPECIFICATIONS.
3. ENSURE REQUIRED MAINTENANCE ACCESS AND CLEARANCES ARE MAINTAINED.
4. WIRES SHALL BE RATED AND LABELED "SUNLIGHT RESISTANT" WHERE EXPOSED TO AMBIENT CONDITIONS.
5. FUSES 0 - 600 AMPS SHALL BE UL CLASS "RK-1" LOW PEAK DUAL ELEMENT TIME DELAY WITH 200,000 AMPERE INTERRUPTING RATING AS MANUFACTURED BY BUSSMANN, UNLESS NOTED OTHERWISE.
6. ALL TERMINALS/LUGS SHALL BE 75° RATED. ALL TERMINALS, SPLICING CONNECTORS, LUGS, ETC SHALL BE IDENTIFIED FOR USE WITH THE MATERIAL (CU/AL) OF THE CONDUCTOR AND SHALL BE PROPERLY INSTALLED.
7. PROVIDE A PULLWIRE IN ALL EMPTY CONDUITS.
8. ALL PENETRATIONS THROUGH EXTERIOR ROOFS SHALL BE FLASHED IN A WATERPROOF MANNER.
9. ALL PENETRATIONS THROUGH ATTIC FIRE BARRIERS SHALL BE SEALED WITH FIRE-BARRIER SEALANT CAULK.
10. SUPPORT ALL CONDUIT AND EQUIPMENT IN ACCORDANCE W/ NEC. ANY SUSPENDED MATERIALS SHALL BE DIRECTLY SUPPORTED BY THE BUILDING STRUCTURE.
11. METAL CONDUIT COUPLINGS CAN BE COMPRESSION TYPE, THREADED, OR BE SET-SCREW TYPE. PLASTIC CONDUIT COUPLINGS TO BE SOCKET GLUED TYPE.
12. A COMPLETE GROUNDING SYSTEM SHALL BE PRESENT OR PROVIDED AND INSTALLED IN ACCORDANCE WITH ARTICLE 250 OF THE NEC, AND AS SHOWN ON THE DRAWINGS.
13. EACH ELECTRICAL APPLIANCE SHALL BE PROVIDED WITH A NAMEPLATE GIVING THE IDENTIFYING NAME AND THE RATING IN VOLTS AND AMPERES, OR VOLTS AND WATTS. IF THE APPLIANCE IS TO BE USED ON A SPECIFIC FREQUENCY OR FREQUENCIES, IT SHALL BE SO MARKED. WHERE MOTOR OVERLOAD PROTECTION EXTERNAL TO THE APPLIANCES IS REQUIRED, THE APPLIANCE SHALL BE SO MARKED.
14. WHERE APPLICABLE, GROUNDING ELECTRODE CONDUCTOR TO BE CONTINUOUS. GROUNDING CRIMPS TO BE IRREVERSIBLE.
15. PHOTOVOLTAIC SYSTEMS SHALL BE PERMANENTLY MARKED AT VARIOUS EQUIPMENT LOCATIONS TO IDENTIFY THAT A PHOTOVOLTAIC SYSTEM IS INSTALLED AND THAT VARIOUS DANGERS ARE PRESENT.
16. EACH PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS SHALL BE PERMANENTLY MARKED TO IDENTIFY IT AS A PHOTOVOLTAIC SYSTEM DISCONNECT.
17. WHERE ALL TERMINALS OF A DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION, A WARNING SIGN SHALL BE MOUNTED ON OR ADJACENT TO THE DISCONNECT.
18. A PERMANENT LABEL FOR THE DIRECT-CURRENT PHOTOVOLTAIC POWER SOURCE SHALL BE PROVIDED AT THE DC DISCONNECT MEANS.
19. A PERMANENT PLAQUE OR DIRECTORY, DENOTING ALL ELECTRIC POWER SOURCES SERVING THE PREMISES, SHALL BE INSTALLED AT EACH SERVICE EQUIPMENT LOCATION AND AT LOCATIONS OF ALL POWER PRODUCTION SOURCES.
20. ALL MODULE GROUND CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH NEC SECTION 690.4 (C)
21. A NORTH CAROLINA REGISTERED DESIGN PROFESSIONAL WILL BE REQUIRED TO SEAL THE STRUCTURAL DESIGN AT THE TIME OF PERMIT APPLICATION IF ANY OF THE FOLLOWING EXIST AND ARE ATTESTED TO BY THE APPLICANT:
    I. THE WEIGHT OF THE PV SYSTEM EXCEEDS THREE (3) POUNDS PER SQUARE FOOT(PSF)
    II. THE ROOF POSSESSES MORE THAN ONE (1) LAYER OF ASPHALT SHINGLES
    III. THE ROOFING MATERIAL CONSISTS OF A TYPE OTHER THAN ASPHALT SHINGLES OR METAL
    IV. THE ROOF IS LOCATED IN A 140 MPH OR GREATER WIND ZONE

NC SOLAR NOW

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## CLIENT INFO

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## SITE CONDITIONS

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|---|---|
| WIND SPEED: | 115 MPH |
| RISK CATEGORY: | II |
| EXPOSURE: | B |
| SNOW: | 15 PSF |

## SHEET INDEX

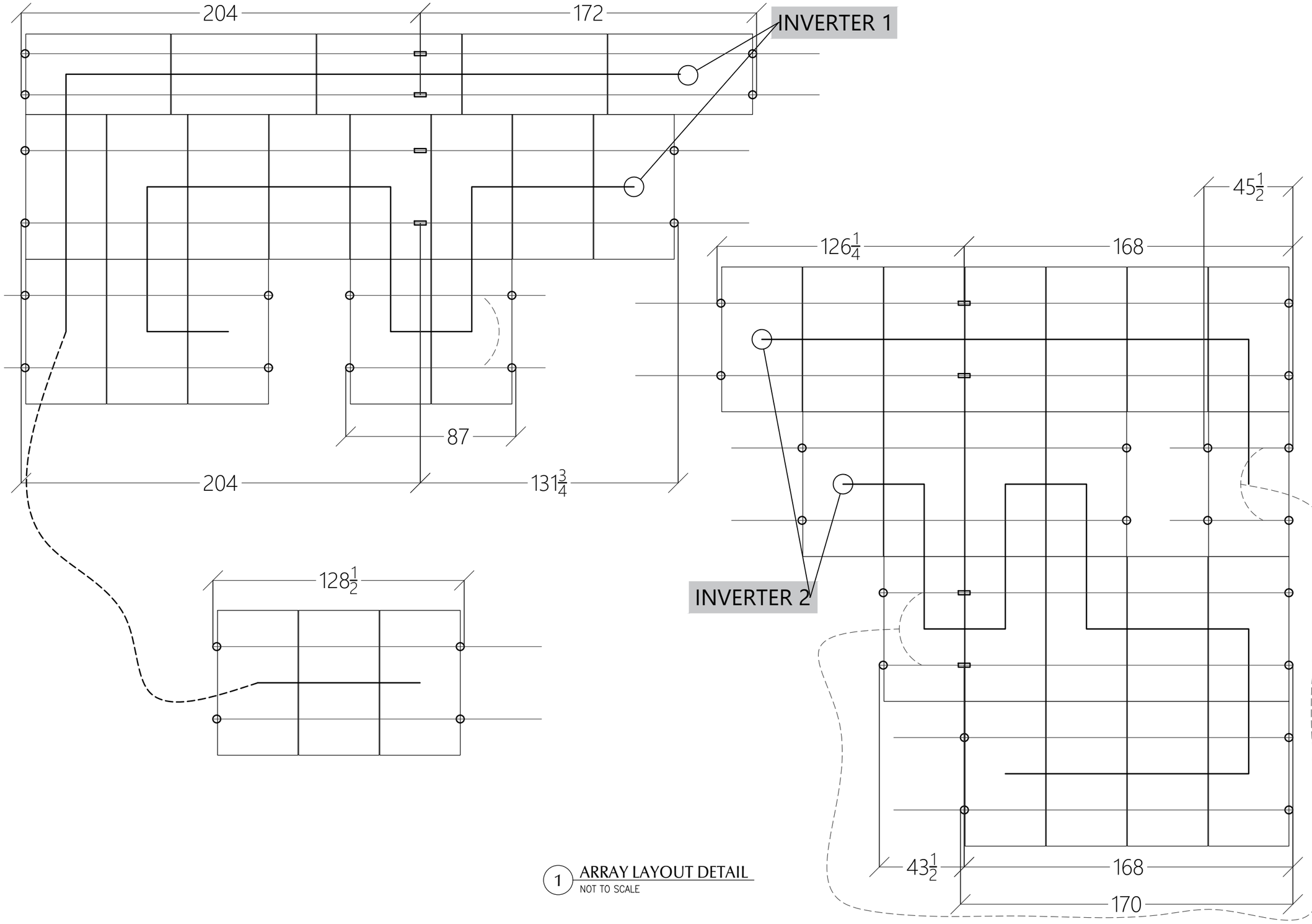


## DESIGNER INFO

| | |
|---|---|
| DESIGNER | JAM |
| ENGINEER | AWK |
| DATE | 11/23/2021 |
| VERSION | P1 |

PV SYSTEM EQUIPMENT LABELS

# PV-4.1




1 ARRAY LAYOUT DETAIL
NOT TO SCALE

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## DESIGNER INFO

| | |
|---|---|
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| ENGINEER | AWK |
| DATE | 11/23/2021 |
| VERSION | P1 |

PV SYSTEM INSTALL GUIDE

# PV-5.1