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December 19, 2024

BYLD Better  
1213 W Moorehead Street Suite 500  
Charlotte, NC 28208

Re: Engineering Services  
Morales Residence  
144 Smoketree Drive, Fuquay-Varina, NC  
8.000 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:** Assumed prefabricated wood trusses at 24" on center. All truss members are constructed of 2x4 dimensional lumber.

**Roof Framing:** Assumed 2x6 dimensional lumber at 24" on center with knee wall supports.

**Roof Material:** Composite Asphalt Shingles

**Roof Slope:** 17 and 20 degrees

**Attic Access:** Inaccessible

**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 = 115 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 2018 North Carolina Residential Code, 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.*

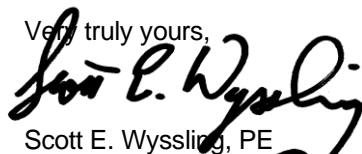
**D. Solar Panel Anchorage**

1. The solar panels shall be mounted in accordance with the most recent Pegasus 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 system utilizes the Pegasus SkipRail racking system. Please reference the stamped plan set for rail and mounting locations.
3. The maximum allowable withdrawal force for a 5/16" lag screw is 229 lbs per inch of penetration as identified in the National Design Standards (NDS) of timber construction specifications. Based on a minimum penetration depth of 2½", 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 5/16" diameter lag screws with a minimum of 2½" embedment will be adequate and will include a sufficient factor of safety.
4. 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 center.

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 2018 North Carolina Residential Code, 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  
North Carolina COA P-2308

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

Signed 12/19/2024

# NEW PV SYSTEM DESIGN

20 MODULES - 8.000 kW DC, 5.900 kW AC SYSTEM SIZE

MORALES RESIDENCE - 144 SMOKETREE DRIVE, FUQUAY-VARINA, NC 27526

DESIGN ENGINEER



**76 N. MEADOWBROOK DRIVE  
ALPINE UT 84004**  
swyssling@wysslingconsulting.com  
(201) 874-3483  
COA NO. P-2308

SOLAR COMPANY/CLIENT

**BYLD BETTER**

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1213 W MOOREHEAD STREET SUITE 500  
CHARLOTTE, NC

**MORALES  
RESIDENCE**

144 SMOKETREE DRIVE  
FUQUAY-VARINA, NC 27526  
COORDINATES: 35.496882, -78.812846

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**COVER PAGE**



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NC LICENSE NO 46546

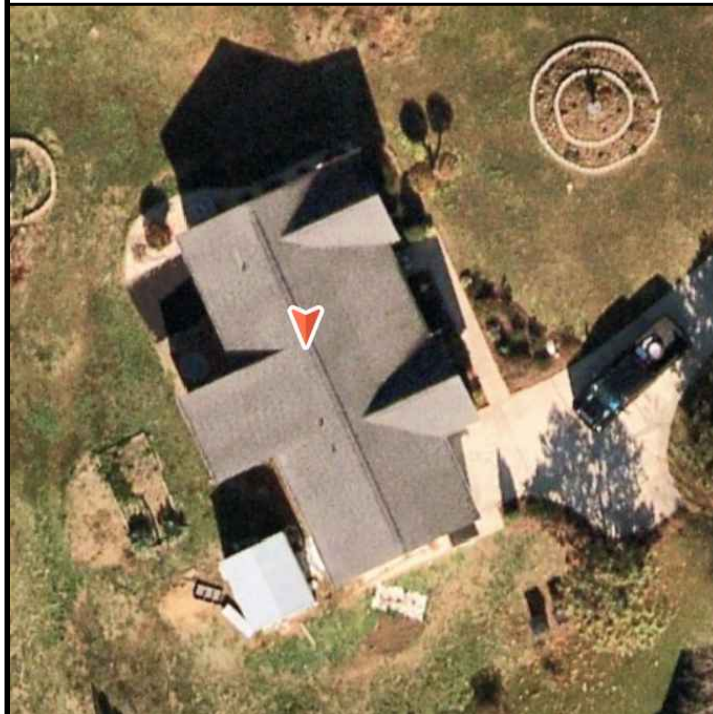
DC SYSTEM SIZE: 8.000kW  
AC SYSTEM SIZE: 5.900kW

**PV-1**

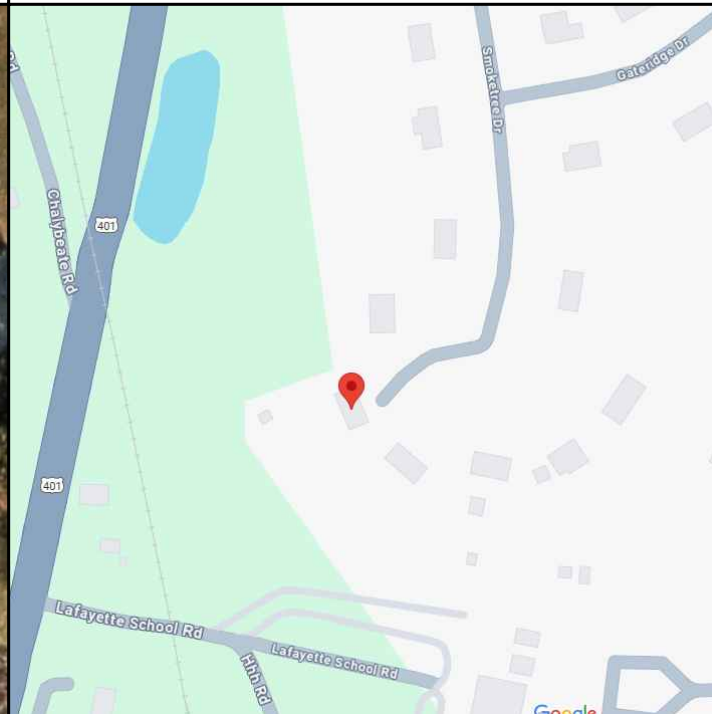
AHJ: FUQUAY VARINA  
UTILITY: DUKE

DRAWN BY: AIA  
INITIAL DESIGN DATE: 12/18/2024

**AERIAL MAP**  
NTS

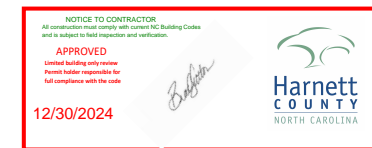


**VICINITY MAP**  
NTS



**SHEET INDEX**

PV-1	COVER PAGE
PV-2	SITE PLAN
PV-3	PROPERTY PLAN
PV-4	ATTACHMENT PLAN
PV-5	MOUNTING DETAILS
EE-1	STRING PLAN
EE-2	THREE LINE DIAGRAM
EE-3	ELECTRICAL NOTES
EE-4	LABELS
EE-5	PLACARD
PV-6	DESIGN NOTES
PV-7	SITE PHOTOS
SPEC	SPECIFICATION SHEETS



**SCOPE OF WORK**

SYSTEM SIZE: 8.000kW DC / 5.900kW AC SYSTEM SIZE  
PV MODULE: (20) LONGI LR5-54HABB-400M (BLACK ON BLACK)  
INVERTER: (10) NEP BDM-600X [240V]  
COMBINER: (1) MINIMUM 125A LOAD CENTER  
MONITORING: (1) BDG-356 NEP MONITORING  
AC DISCONNECT: (1) 60A NON-FUSED AC DISCONNECT

ROOF STORIES: 1  
ROOF TYPE(S): COMP SHINGLE  
MOUNTING(S) & RACKING(S): PEGASUS INSTAFLASH WITH SKIPRAIL WITH PEGASUS RAIL  
FLASHING: PEGASUS INSTAFLASH FLASHING  
ROOF BEING REPLACED: NO  
ROOF CONDITION: GOOD  
ROOF HEIGHT: 15 FEET  
ROOF CONSTRUCTION: GABLE

INTERCONNECTION: LOAD BREAKER  
MAIN SERVICE PANEL RATING: (E) 200A  
MAIN BREAKER RATING: (E) 200A  
OCPD: 40A PV BREAKER

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ARRAY	TILT	AZIMUTH
1	20°	245°
2	17°	245°

**GOVERNING CODES**

- 2020 NATIONAL ELECTRIC CODE
- 2018 NORTH CAROLINA BUILDING CODE
- 2018 NORTH CAROLINA RESIDENTIAL CODE
- 2018 NORTH CAROLINA FIRE PREVENTION CODE
- 2018 NORTH CAROLINA FUEL GAS CODE
- 2018 NORTH CAROLINA EXISTING BUILDING CODE
- 2018 NORTH CAROLINA ENERGY CONSERVATION CODE
- 2018 NORTH CAROLINA MECHANICAL CODE
- 2018 NORTH CAROLINA PLUMBING CODE

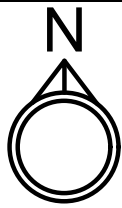
AS ADOPTED BY FUQUAY VARINA INCLUDING ANY AMENDMENTS OR ADDITIONAL LISTED REQUIREMENTS. DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF DUKE ENERGY UTILITY.

EQUIPMENT IS COMPATIBLE WITH UL2703, UL1741, AND UL1703 AS APPLICABLE

**DESIGN CRITERIA**

- WIND SPEED: 115 MPH
- GROUND SNOW LOAD: 15 PSF
- ASCE: 7-10
- EXPOSURE CATEGORY: C
- BUILDING OCCUPANCY: R-3
- CONSTRUCTION TYPE: TYPE V-B
- SPRINKLERS: NO

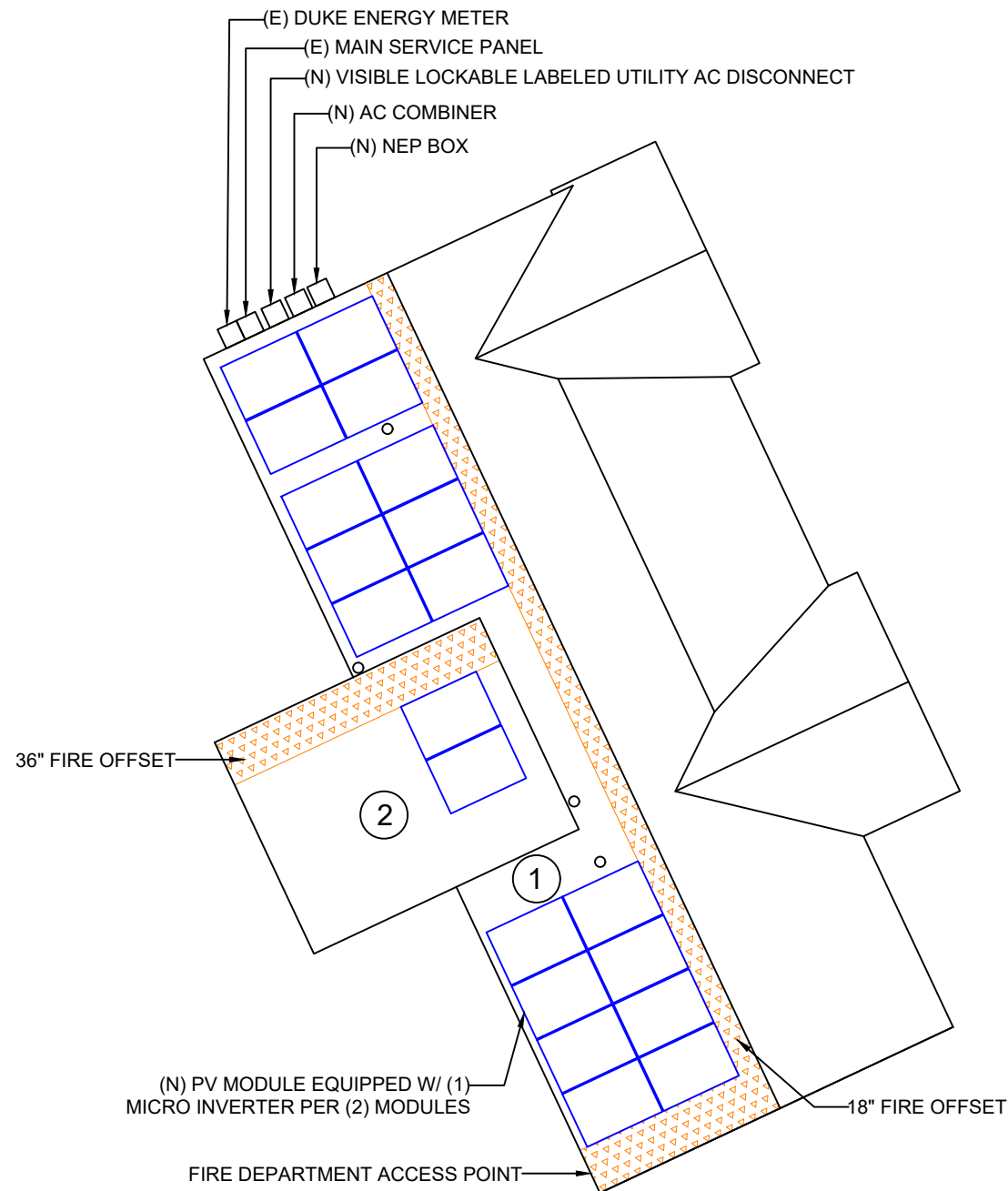
DATE	REVISION



ROOF DESCRIPTION								
ROOF #	ROOF TYPE	TILT	AZIMUTH	ROOF FRAMING	MODULE COUNT	ARRAY SQ. FT.	ATTACHMENT	MIN EMBEDMENT
1	COMP SHINGLE	20°	245°	2X4@24"O.C. PREFABRICATED TRUSSES	18	378	(1) 5/16"X 4"LAG SCREW	2.5"
2	COMP SHINGLE	17°	245°	2X6@24"O.C. RAFTERS	2	42	(1) 5/16"X 4"LAG SCREW	2.5"
TOTAL ROOF AREA SQ. FT.		1950		TOTAL ARRAY SQ. FT.		420	ROOF COVER %	21.56

SYSTEM INFORMATION	
MODULE COUNT/TYPE	(20) LONGI LR5-54HABB-400M (BLACK ON BLACK)
INVERTER COUNT/TYPE	(10) NEP BDM-600X [240V]
MODULE WEIGHT	49.6 LBS
MODULE DIMENSIONS	67.8" x 44.65"
UNIT WEIGHT OF ARRAY	2.36 PSF

LEGEND	
ROOF VENT (TYP.)	□
PLUMBING VENT (TYP.)	○
A/C UNIT	A/C
SATELLITE DISH	⌒
ELECTRICAL MAST	⌚
CHIMNEY	◻
FIRECODE PATHWAY	▨



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### SITE PLAN NOTES

1. ALL OBSTRUCTIONS MUST BE VERIFIED BEFORE WORK COMMENCES
2. CONDUIT TO BE RUN IN ATTIC IF POSSIBLE
3. VISIBLE LOCKABLE LABELED UTILITY AC DISCONNECT WILL BE INSTALLED WITHIN 5' OF DUKE ENERGY METER.
4. AC DISCONNECT SHALL BE READILY ACCESSIBLE 24/7
5. REQUIRED ELECTRICAL CLEARANCE TO BE MAINTAINED

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

DESIGN ENGINEER



76 N. MEADOWBROOK DRIVE  
ALPINE UT 84004

swyssling@wysslingconsulting.com  
(201) 874-3483  
COA NO. P-2308

SOLAR COMPANY/CLIENT

**BYLD BETTER**

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CHARLOTTE, NC

MORALES  
RESIDENCE

144 SMOKETREE DRIVE  
FUQUAY-VARINA, NC 27526  
COORDINATES: 35.496882, -78.812846

inoemorales1977@gmail.com  
9192980858

**SITE PLAN**



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76 N Meadowbrook Drive Alpine UT 84004  
North Carolina COA # P-2308

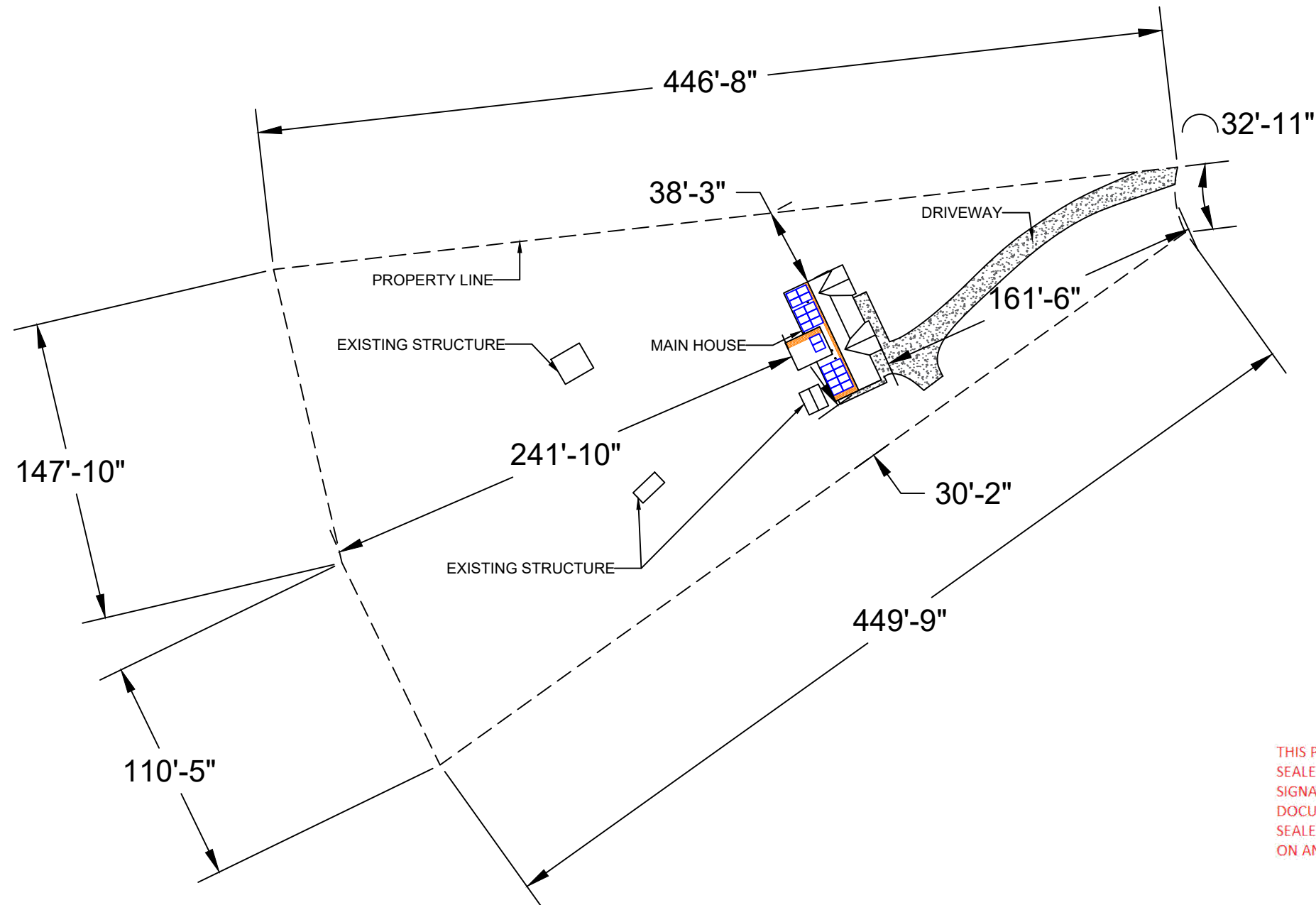
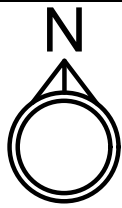
Signed 12/19/2024  
**SCOTT E WYSSLING, PE**  
NC LICENSE NO 46546

DC SYSTEM SIZE: 8.000kW  
AC SYSTEM SIZE: 5.900kW

**PV-2**

AHJ: FUQUAY VARINA  
UTILITY: DUKE

DRAWN BY: AIA  
INITIAL DESIGN DATE: 12/18/2024



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SCALE: 1/64" = 1'-0"

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**PROPERTY PLAN**



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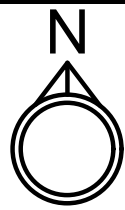
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NC LICENSE NO 46546

DC SYSTEM SIZE: 8.000kW  
AC SYSTEM SIZE: 5.900kW

**PV-3**

AHJ: FUQUAY VARINA  
UTILITY: DUKE

DRAWN BY: AIA  
INITIAL DESIGN DATE: 12/18/2024



ATTACHMENT DESCRIPTION								
ROOF #	ROOF TYPE	TILT	ARRAY TILT	AZIMUTH	ROOF FRAMING	TOTAL POINTS	MAX SPACING	MAX CANTILEVER
1	COMP SHINGLE	20°	20°	245°	2X4@24"O.C. PREFABRICATED TRUSSES	36	48"	16"
2	COMP SHINGLE	17°	17°	245°	2X6@24"O.C. RAFTERS	6	48"	16"

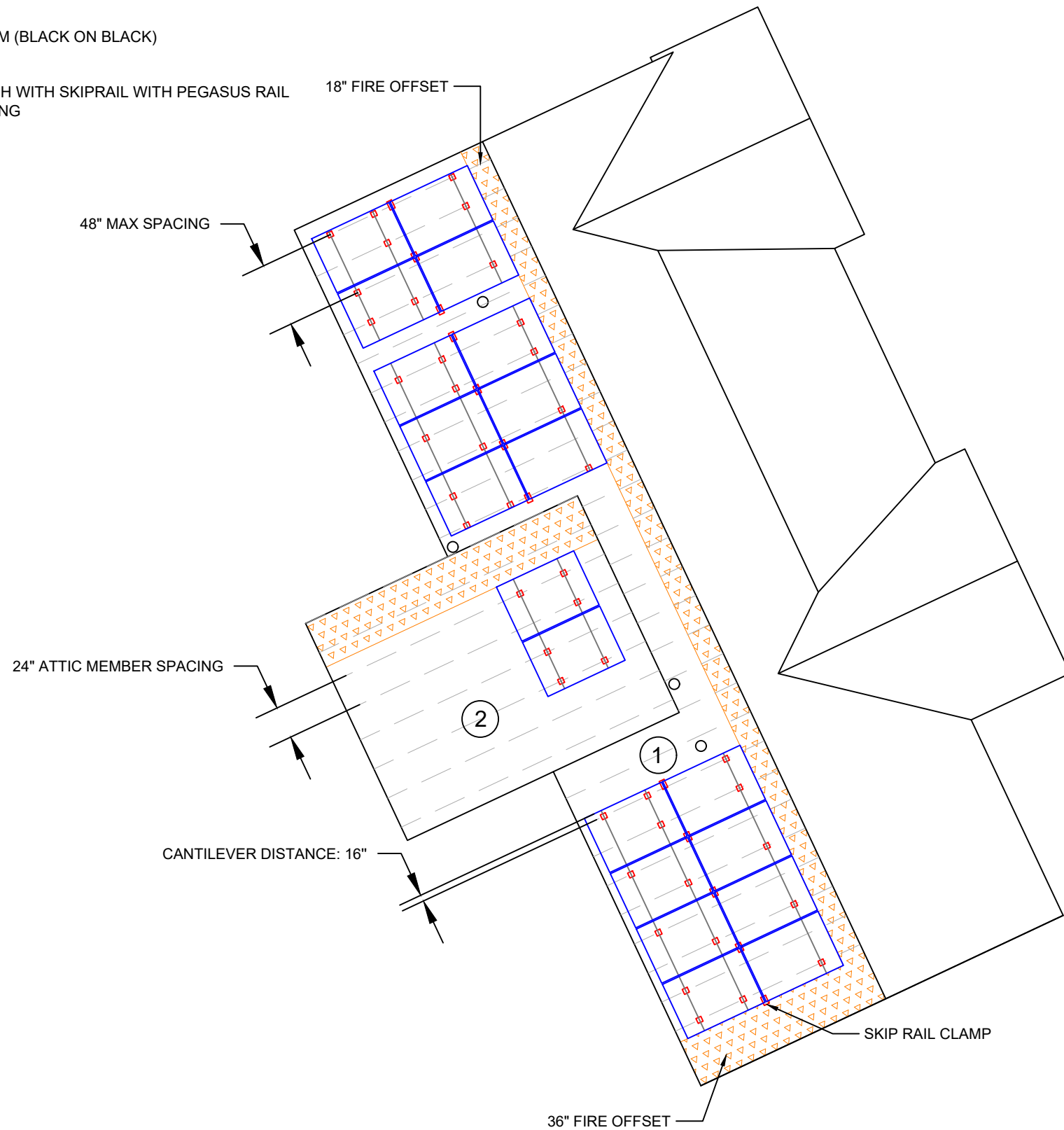
DESIGN ENGINEER

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ALPINE UT 84004**  
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COA NO. P-2308

PV MODULES: (20) LONGI LR5-54HABB-400M (BLACK ON BLACK)  
ROOF TYPE(S): COMP SHINGLE  
ROOF CONDITION: GOOD  
MOUNTING TYPE(S): PEGASUS INSTAFLASH WITH SKIPRAIL WITH PEGASUS RAIL  
FLASHING: PEGASUS INSTAFLASH FLASHING  
ROOF HEIGHT: 15'  
ROOF FRAMING MATERIAL: WOOD  
DECKING THICKNESS: 1/2'

TOTAL ATTACHMENTS: 42



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EXACT LOCATION OF ROOF FRAMING MAY VARY; INSTALLER TO FOLLOW ENGINEER (WHERE APPLICABLE) AND MANUFACTURER INSTRUCTIONS/GUIDELINES WHEN INSTALLING.

SCALE: 1/8" = 1'-0"

SOLAR COMPANY/CLIENT

**BYLD BETTER**

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1213 W MOOREHEAD STREET SUITE 500  
CHARLOTTE, NC

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**ATTACHMENT PLAN**



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North Carolina COA # P-2308  
Signed 12/19/2024  
**SCOTT E WYSSLING, PE**  
NC LICENSE NO 46546

DC SYSTEM SIZE: 8.000kW  
AC SYSTEM SIZE: 5.900kW

**PV-4**

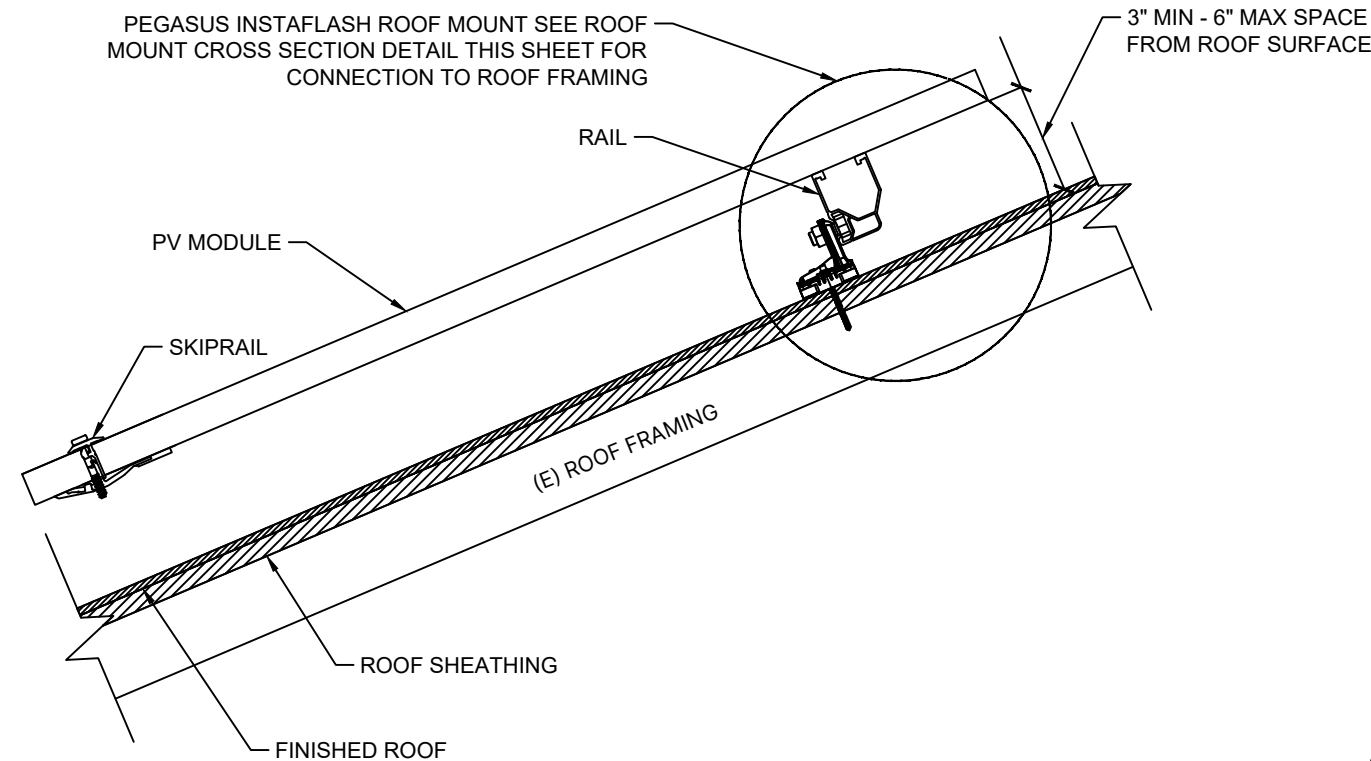
AHJ: FUQUAY VARINA  
UTILITY: DUKE

DRAWN BY: AIA  
INITIAL DESIGN DATE: 12/18/2024

ROOF SECTIONS	R1, R2	WIND SPEED: 115 MPH	GROUND SNOW LOAD: 15 PSF	ROOF TYPE: COMP SHINGLE	ROOF LAYERS (IF APPLICABLE): 1
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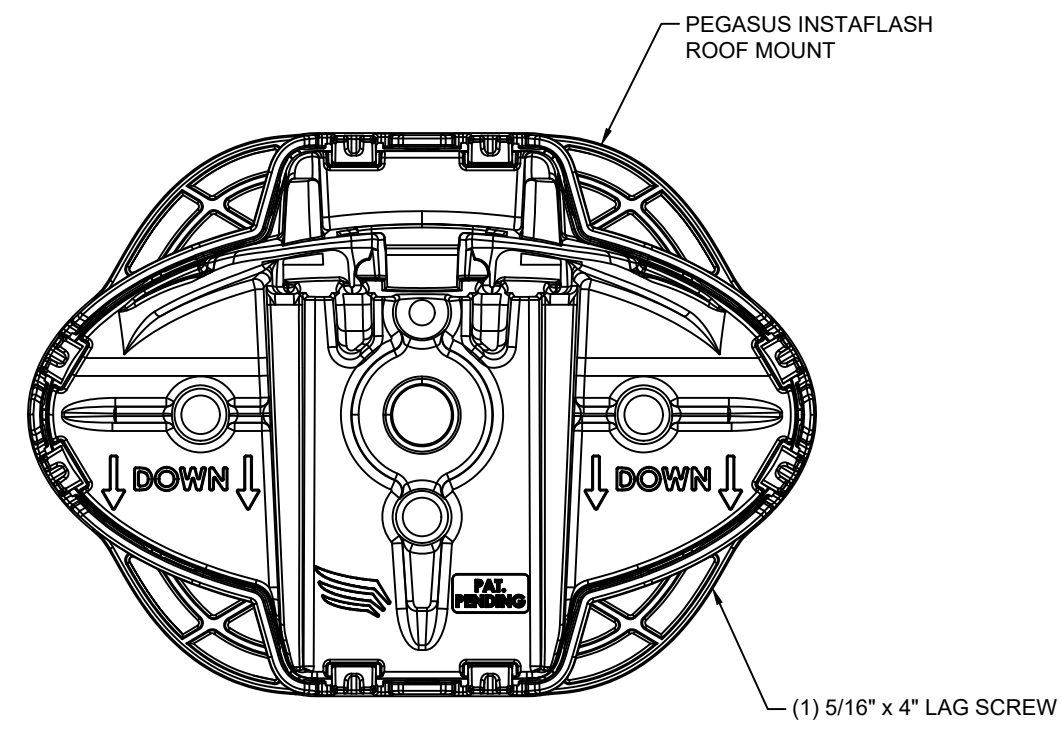
**GENERAL ROOF MOUNT DETAIL**

NTS

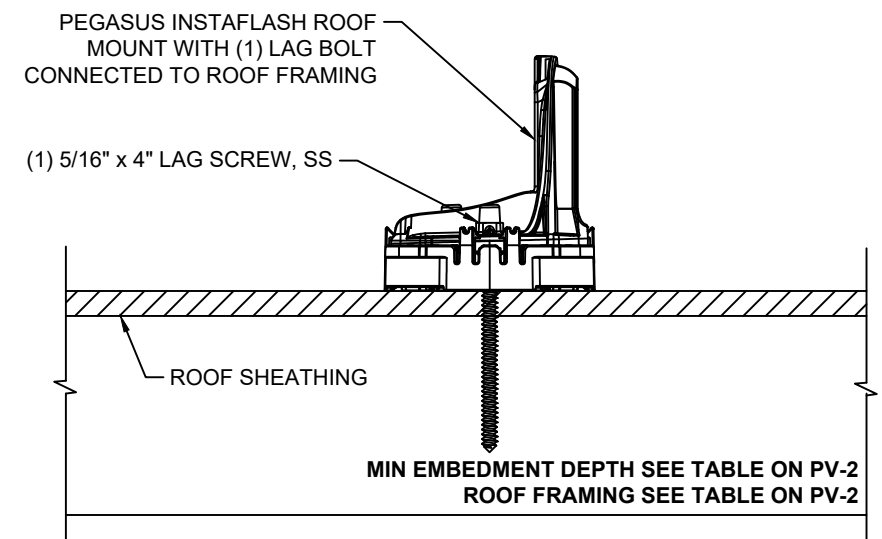


**ROOF MOUNT PLAN VIEW DETAIL**

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**ROOF MOUNT CROSS SECTION DETAIL**

NTS

DESIGN ENGINEER



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COA NO. P-2308

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**MOUNTING DETAILS**



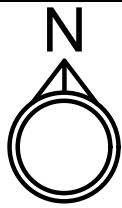
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DC SYSTEM SIZE: 8.000kW  
AC SYSTEM SIZE: 5.900kW



**PV-5**

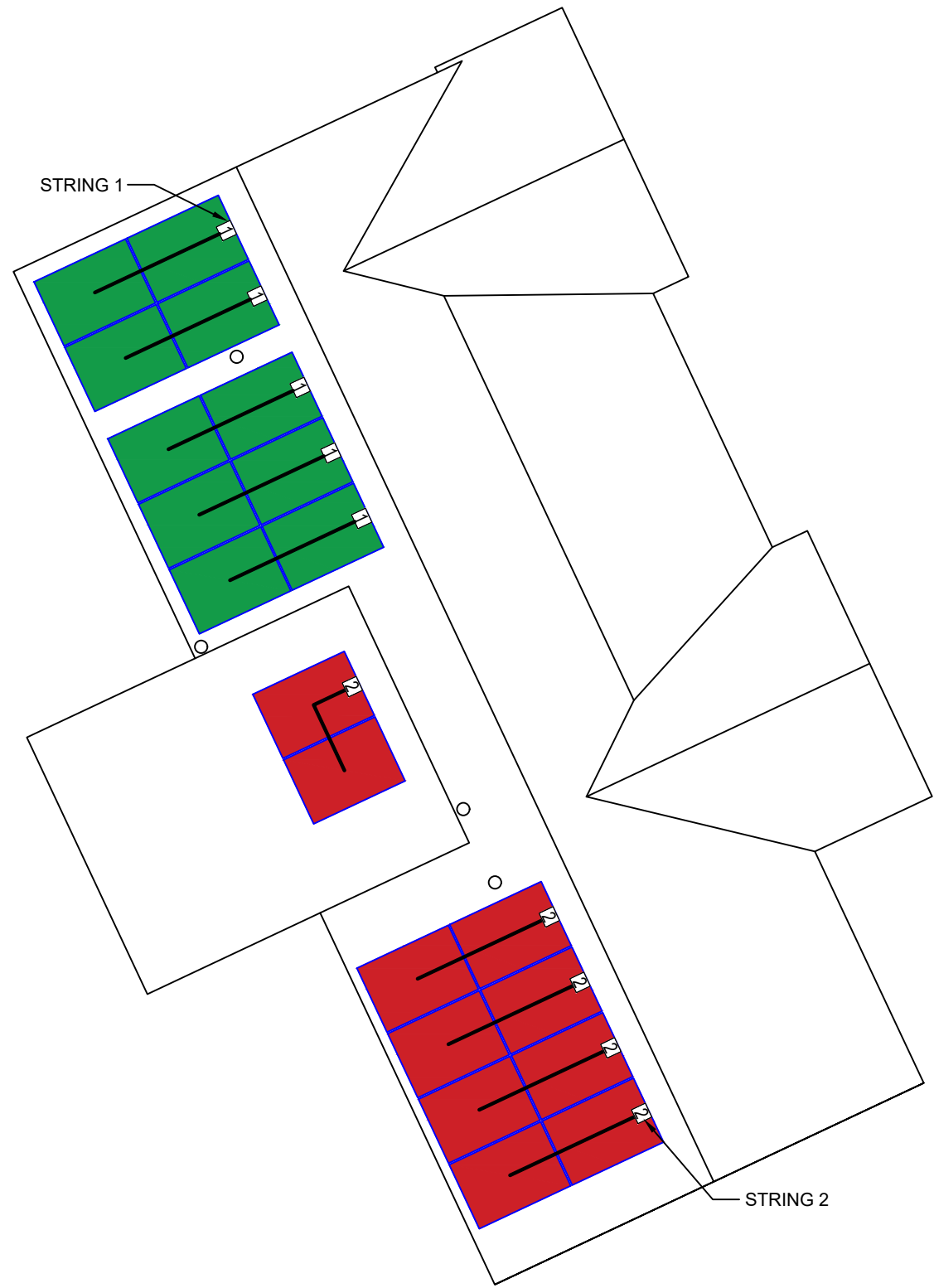
AHJ: FUQUAY VARINA  
UTILITY: DUKE

DRAWN BY: AIA  
INITIAL DESIGN DATE: 12/18/2024



MODULE: (20) LONGI LR5-54HABB-400M (BLACK ON BLACK)  
INVERTER: (10) NEP BDM-600X [240V]  
COMBINER: (1) MINIMUM 125A LOAD CENTER

STRING 1: (10) MODULES   
STRING 2: (10) MODULES 



SCALE: 1/8" = 1'-0"

DESIGN ENGINEER



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**STRING PLAN**

DC SYSTEM SIZE: 8.000kW  
AC SYSTEM SIZE: 5.900kW

**EE-1**

AHJ: FUQUAY VARINA  
UTILITY: DUKE

DRAWN BY: AIA  
INITIAL DESIGN DATE: 12/18/2024



MODULE TYPE: (20) LONGI LR5-54HABB-400M (BLACK ON BLACK)  
 INVERTER TYPE: (10) NEP BDM-600X [240V] 240V  
 DC SYSTEM SIZE: MODULE WATTAGE: 400W X 20 MODULES = 8.000KW  
 AC SYSTEM SIZE: INVERTER WATTAGE: 590W X 10 INVERTERS = 5.900KW

CONDUCTOR SCHEDULE										
TAG	# WIRES IN CONDUIT	MINIMUM WIRE SIZE	TYPE, MATERIAL	MINIMUM GROUND WIRE SIZE	GROUND TYPE, MATERIAL	CONDUIT	AMPS (BEFORE 125% SAFETY FACTOR)	TOTAL AMPS	WIRE AMPERAGE RATING TABLE 310.15(B)(16)	MINIMUM OCPD
A	3	#10 AWG	THWN-2, CU	#6 AWG	BARE CU	3/4 EMT	12.3	15.38	35	20
B	3	#10 AWG	THWN-2, CU	#12 AWG	THWN-2, CU	3/4 EMT	12.3	15.38	35	20
C	4	#8 AWG	THWN-2, CU	#10 AWG	THWN-2, CU	3/4 EMT	24.6	30.75	50	40

DESIGN ENGINEER



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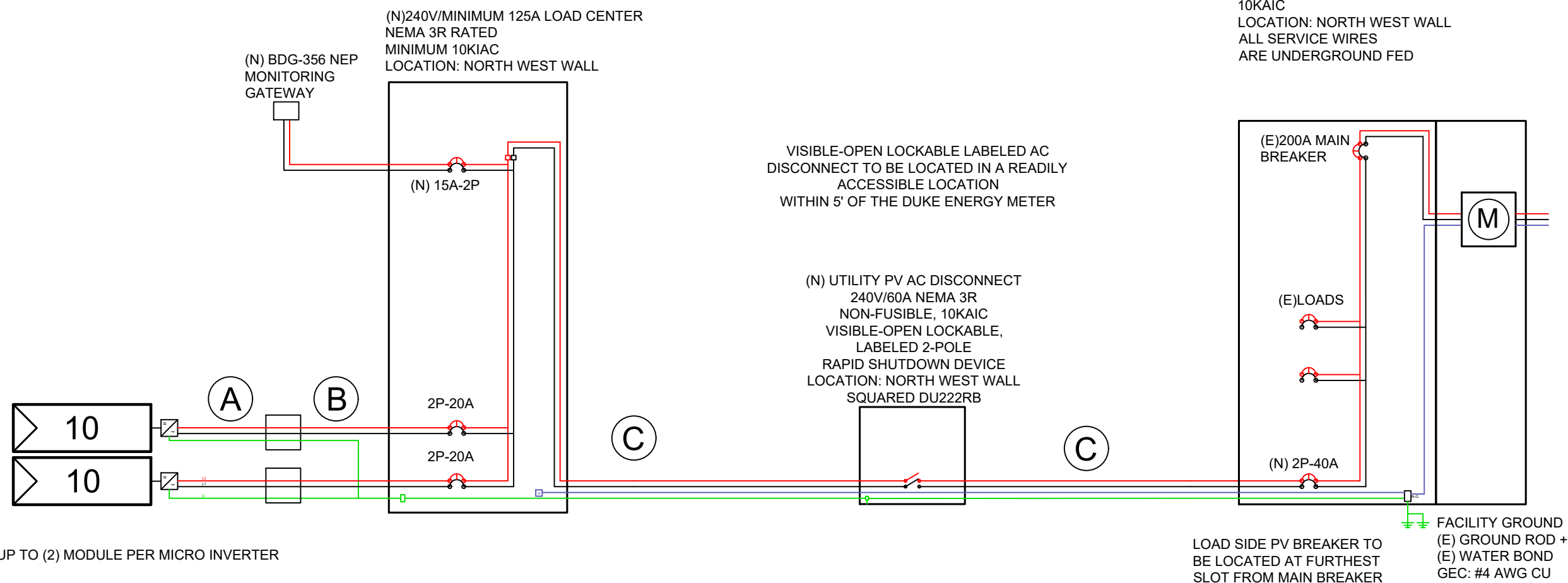


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 9192980858

**THREE LINE DIAGRAM**



DC SYSTEM SIZE: 8.000kW  
 AC SYSTEM SIZE: 5.900kW

**EE-2**

AHJ: FUQUAY VARINA  
 UTILITY: DUKE

DRAWN BY: AIA  
 INITIAL DESIGN DATE: 12/18/2024

PV MODULE		INVERTER	
MODEL	LONGI LR5-54HABB-400M (BLACK ON BLACK)	MODEL	NEP BDM-600X [240V]
P <sub>MAX</sub>	400W	MAX INPUT DC VOLTAGE	60V
V <sub>OC</sub>	37.05V	MAX DC CURRENT	40A
V <sub>MPP</sub>	30.94V	MAX OUTPUT POWER	590W
I <sub>MPP</sub>	12.93A	MAXIMUM CONT. OUTPUT CURRENT	2.46A
I <sub>SC</sub>	13.72A	CEC EFFICIENCY	0.955
		NOMINAL AC VOLTAGE	240V

INTERCONNECTION PER NEC 705.12 (B) "120% RULE"	
MSP RATING	200A
MAIN DISCONNECT RATING	200A
TOTAL BACK FEED REQUIRED	30.75A
OCPD RATING	40A
(MSP RATING * 1.2)- MAIN DISCONNECT	(200A * 1.2)-200 >=30.75A, GOOD

DESIGN ENGINEER



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**ELECTRICAL NOTES**

**ELECTRICAL CALCULATIONS**

**TAG A**  
FROM MODULES TO JUNCTION BOX

LARGEST STRING: 10 MODULES  
 NUMBER OF INVERTERS: 5  
 AMPS PER INVERTER: 2.46  
 $5 * 2.46A = 12.3A * 1.25 = 15.38A$  TOTAL AMPS

CONDUCTOR SIZE: #10 AWG  
 CONDUCTOR MAX: 35A, GOOD  
 OCPD: 20A, GOOD

**TAG B**  
FROM JUNCTION BOX TO AC COMBINER

LARGEST STRING: 10 MODULES  
 NUMBER OF INVERTERS: 5  
 AMPS PER INVERTER: 2.46  
 $5 * 2.46A = 12.3A * 1.25 = 15.38A$  TOTAL AMPS

CONDUCTOR SIZE: #10 AWG  
 CONDUCTOR MAX: 35A, GOOD  
 OCPD: 20A, GOOD

**TAG C**  
FROM AC COMBINER TO INTERCONNECTION

TOTAL MODULES: 20  
 TOTAL INVERTERS: 10  
 AMPS PER INVERTER: 2.46A  
 $10 * 2.46A = 24.6A * 1.25 = 30.75A$  TOTAL AMPS

CONDUCTOR SIZE: #8 AWG  
 CONDUCTOR MAX: 50A, GOOD  
 OCPD: 40A, GOOD

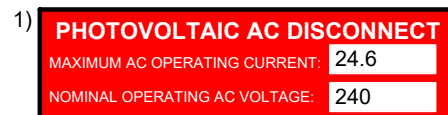
TEMPERATURE CORRECTED VOC				
MODULE VOC	VOC COEFFICIENT	COLDEST TEMPERATURE	ADJUSTED VOC	INVERTER MAX
37.05	-0.265	-39	43.33	60, GOOD

DC SYSTEM SIZE: 8.000kW  
 AC SYSTEM SIZE: 5.900kW

**EE-3**

AHJ: FUQUAY VARINA  
 UTILITY: DUKE

DRAWN BY: AIA  
 INITIAL DESIGN DATE: 12/18/2024



AT POINT OF INTERCONNECTION, MARKED AT DISCONNECTING MEANS [NEC 690.56]



AT POINT OF INTERCONNECTION [NEC 705.12(C), 690.59]



EACH PV SYSTEM DISCONNECTING MEANS SHALL PLAINLY INDICATE WHETHER IN THE OPEN (OFF) OR CLOSED (ON) POSITION AND BE PERMANENTLY MARKED [NEC 690.13(B)]



AT EACH DC DISCONNECTING MEANS [NEC 690.13(B)]



AT EACH AC DISCONNECTING MEANS [NEC 690.13(B)]



AT EXPOSED RACEWAYS, CABLE TRAYS, AND OTHER WIRING METHODS; SPACED AT MAXIMUM 10 FT SECTION OR WHERE SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS [NEC 690.31(D)(2)]



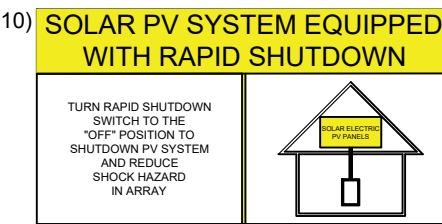
AT BUILDING OR STRUCTURE MAIN DISCONNECTING MEANS [NEC 690.12(E), NEC 690.13(B)]



AT AC COMBINER PANEL [NEC 690.13(B)]



A PERMANENT WARNING LABEL SHALL BE APPLIED TO THE DISTRIBUTION EQUIPMENT ADJACENT TO THE BACK-FED BREAKER FROM THE INVERTER [NEC 705.12(B)(2)] (BREAKER INTERCONNECTION ONLY)



FOR PV SYSTEMS THAT SHUT DOWN THE ARRAY AND CONDUCTORS LEAVING THE ARRAY: THE TITLE "SOLAR PV SYSTEM IS EQUIPPED WITH RAPID SHUTDOWN" SHALL UTILIZED CAPITALIZED CHARACTERS WITH A MINIMUM HEIGHT OF 3/8 IN. IN BLACK ON YELLOW BACKGROUND, AND THE REMAINING CHARACTERS SHALL BE CAPITALIZED WITH A MINIMUM HEIGHT OF 3/16 IN. IN BLACK ON WHITE BACKGROUND [NEC 690.12(D)]



A RAPID SHUTDOWN SWITCH SHALL HAVE A LABELED LOCATED ON OR NO MORE THAN 8 FT FROM THE SWITCH THAT INCLUDES THIS WORDING. THE LABEL SHALL BE REFLECTIVE, WITH ALL LETTERS CAPITALIZED AND HAVING A MINIMUM HEIGHT OF 3/8 IN., IN WHITE ON RED BACKGROUND [NEC 690.12(D)(2)]

**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 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] THEY SHALL BE PERMANENTLY ATTACHED, WEATHER/SUNLIGHT RESISTANT, AND SHALL NOT BE HAND WRITTEN PER NEC 110.21(B)
5. APPLICABLE LABELS TO BE A MINIMUM LETTER HEIGHT OF 3/8", WHITE ON RED BACKGROUND; REFLECTIVE, AND PERMANENTLY AFFIXED [IFC 605.11.1.1]

DESIGN ENGINEER



76 N. MEADOWBROOK DRIVE  
ALPINE UT 84004  
swyssling@wysslingconsulting.com  
(201) 874-3483  
COA NO. P-2308

SOLAR COMPANY/CLIENT



BYLD BETTER  
1213 W MOOREHEAD STREET SUITE 500  
CHARLOTTE, NC

MORALES RESIDENCE

144 SMOKETREE DRIVE  
FUQUAY-VARINA, NC 27526  
COORDINATES: 35.496882, -78.812846

inoemorales1977@gmail.com  
9192980858

**LABELS**

DC SYSTEM SIZE: 8.000kW  
AC SYSTEM SIZE: 5.900kW

**EE-4**

AHJ: FUQUAY VARINA  
UTILITY: DUKE

DRAWN BY: AIA  
INITIAL DESIGN DATE: 12/18/2024

# CAUTION

**MULTIPLE SOURCES OF POWER  
POWER IS SUPPLIED TO THIS BUILDING  
FROM THE FOLLOWING SOURCES WITH  
DISCONNECTS AS SHOWN.**

**144 SMOKETREE DRIVE FUQUAY-VARINA, NC 27526**

LOCATION: MSP  
NEC 705.10

DESIGN ENGINEER



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inoemoraes1977@gmail.com  
9192980858

**PLACARD**

DC SYSTEM SIZE: 8.000kW  
AC SYSTEM SIZE: 5.900kW

**EE-5**

AHJ: FUQUAY VARINA  
UTILITY: DUKE

DRAWN BY: AIA  
INITIAL DESIGN DATE: 12/18/2024

## GENERAL NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND REVIEW ALL MANUFACTURER INSTALLATION DOCUMENTS PRIOR TO INITIATING CONSTRUCTION.
2. ALL COMPONENTS SHALL BE NEW AND LISTED BY A RECOGNIZED ELECTRICAL TESTING LABORATORY AND LISTED FOR THEIR SPECIFIC APPLICATION.
3. OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED OR BETTER.
4. ACCESS TO ELECTRICAL COMPONENTS OVER 150 VOLTS TO GROUND SHALL BE RESTRICTED TO QUALIFIED PERSONNEL.
5. CONTRACTOR SHALL OBTAIN ELECTRICAL PERMITS PRIOR TO INSTALLATION AND SHALL COORDINATE ALL INSPECTIONS, TESTING COMMISSIONING, AND ACCEPTANCE WITH THE HOMEOWNER, UTILITY CO. AND CITY INSPECTORS AS NEEDED.
6. EACH MODULE TO BE GROUNDED USING THE SUPPLIED CONNECTION POINT PER THE MANUFACTURER'S REQUIREMENTS. ALL PV MODULES, EQUIPMENT, AND METALLIC COMPONENTS ARE TO BE BONDED. IF THE EXISTING GROUNDING ELECTRODE SYSTEM CANNOT BE VERIFIED OR IS ONLY METALLIC WATER PIPING, IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE.
7. DC CONDUCTORS SHALL BE RUN IN EMT AND/OR MC (METAL CLAD CABLE) AND SHALL BE LABELED.
8. EXPOSED NON-CURRENT CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH APPLICABLE NEC.
9. CONFIRM LINE SIDE VOLTAGE AT THE ELECTRIC UTILITY SERVICE PRIOR TO CONNECTING INVERTER. VERIFY SERVICE VOLTAGE IS WITHIN INVERTER VOLTAGE OPERATIONAL RANGE.
10. ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER CODE.
11. ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE, AND FOR ROOF-MOUNTED SYSTEMS, WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF OF THE ROOF SURFACE.
12. ALL ROOF PENETRATIONS MUST BE SEALED OR FLASHED.
13. EQUIPMENT MAY BE SUBSTITUTED FOR SIMILAR EQUIPMENT BASED ON AVAILABILITY, SUBSTITUTED EQUIPMENT SHALL COMPLY WITH DESIGN CRITERIA.
14. REMOVAL OF AN INTERACTIVE INVERTER OR OTHER EQUIPMENT SHALL NOT DISCONNECT THE BONDING CONNECTION BETWEEN THE GROUNDING ELECTRODE CONDUCTOR AND THE PHOTOVOLTAIC SOURCE AND/OR OUTPUT CIRCUIT GROUNDED CONDUCTORS.
15. WHENEVER A DISCREPANCY IN THE QUALITY OF EQUIPMENT ARISES ON THE DRAWING OR SPECIFICATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL MATERIAL AND SERVICES REQUIRED BY THE STRICTEST CONDITIONS NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS TO ENSURE COMPLETE COMPLIANCE AND LONGEVITY OF THE OPERABLE SYSTEM REQUIRED BY THE ENGINEERS.
16. AC DISCONNECT SHALL BE LOCATED WITHIN 5' OF DUKE ENERGY METER. AC DISCONNECT SHALL BE LOCATED ON SAME WALL OF HOUSE WHERE POSSIBLE. IF AC DISCONNECT CANNOT BE WITHIN 5' OF METER, THEN PHOTOS SHALL BE PROVIDED OF THE OBSTRUCTION FOR REVIEW.
17. IF APPLICABLE, ENERGY STORAGE SYSTEM (ESS) CAN BE USED DURING ON-GRID OPERATION TO SHIFT GENERATION FOR TIME OF USE (TOU) AND WILL NOT OPERATE OFF GRID.

## GENERAL ELECTRICAL NOTES

1. CONDUIT A AND B AMPS EQUAL TO LARGEST STRING ON TAG.
2. CONDUIT A SHALL BE RUN THROUGH ATTIC IF POSSIBLE.
3. EQUIPMENT MAY BE SUBSTITUTED FOR SIMILAR EQUIPMENT BASED ON AVAILABILITY, SUBSTITUTED EQUIPMENT SHALL COMPLY WITH DESIGN CRITERIA. WIRE SIZES ARE BASED ON MINIMUMS AND ARE NOT MEANT TO LIMIT UPSIZING AS REQUIRED BY FIELD CONDITIONS/AVAILABILITY.
4. WIRING SHALL COMPLY WITH MAXIMUM CONTINUOUS CURRENT OUTPUT AT 25°C AND MAXIMUM VOLTAGE AT 600V; WIRE SHALL BE WET RATED AT 90°C.
5. EXPOSED PHOTOVOLTAIC SYSTEM CONDUCTORS ON THE ROOF WILL BE TYPE 2 OR PV-TYPE WIRE.
6. PHOTOVOLTAIC SYSTEM CONDUCTORS SHALL BE IDENTIFIED AND GROUPED. THE MEANS OF IDENTIFICATION SHALL BE PERMITTED BY SEPERATE COLOR-CODING, MARKING TAPE, TAGGING OR OTHER APPROVED MEANS.
7. ALL CONDUCTORS AND TERMINATIONS SHALL BE RATED FOR INSTALL LOCATION
8. ALL EXTERIOR CONDUIT, FITTINGS, AND BOXES SHALL BE RAIN-TIGHT AND APPROVED FOR USE IN WET LOCATIONS.
9. ALL METALLIC RACEWAYS AND EQUIPMENT SHALL BE BONDED AND ELECTRICALLY CONTINUOUS.
10. WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, CONTRACTOR SHALL SIZE THEM ACCORDING TO APPLICABLE CODES.
11. REMOVAL OF A UTILITY-INTERACTIVE INVERTER OR OTHER EQUIPMENT SHALL NOT DISCONNECT THE BUILDING CONNECTION BETWEEN THE GROUNDING ELECTRODE CONDUCTOR AND THE PV SOURCE AND/OR OUTPUT CIRCUIT GROUNDED CONDUCTOR.
12. FOR GROUNDED SYSTEMS, THE PHOTOVOLTAIC SOURCE AND OUTPUT CIRCUITS SHALL BE PROVIDED WITH A GROUND-FAULT PROTECTION DEVICE OR SYSTEM THAT DETECTS A GROUND FAULT, INDICATES THAT FAULT HAS OCCURRED, AND AUTOMATICALLY DISCONNECTS ALL CONDUCTORS OR CAUSES THE INVERTER TO AUTOMATICALLY CEASE SUPPLYING POWER TO OUTPUT CIRCUITS.
13. FOR UNGROUNDED SYSTEMS, THE INVERTER IS EQUIPPED WITH GROUND FAULT PROTECTION AND A GFI FUSE PORT FOR GROUND FAULT INDICATION.
14. PV MODULE FRAMES SHALL BE BONDED TO RACKING RAIL OR BARE COPPER GEC/GEC PER THE MODULE MANUFACTURER'S LISTED INSTRUCTION SHEET.
15. PV MODULE RACKING RAIL SHALL BE BONDED TO BARE COPPER GEC VIA WEEB LUG, IL SCO GBL-4DBT LAY IN LUG, OR EQUIVALENT LISTED LUG.
16. THE PHOTOVOLTAIC INVERTER WILL BE LISTED AS AUL 1741 COMPLIANT.
17. RACKING AND BONDING SYSTEM TO BE UL2703 RATED.
18. ANY REQUIRED GROUNDING ELECTRODE CONDUCTOR WILL BE CONTINUOUS, EXCEPT FOR SPLICES OR JOINTS AS BUSBARS WITHIN LISTED EQUIPMENT
19. WHEN BACKFEED BREAKER IS THE METHOD OF UTILITY INTERCONNECTION, THE BREAKERS SHALL NOT READ "LINE AND LOAD."
20. WHEN APPLYING THE 120% RULE, THE SOLAR BREAKER TO BE POSITIONED AT THE OPPOSITE END OF THE BUSBAR FROM THE MAIN BREAKER.
21. THE WORKING CLEARANCE AROUND THE EXISTING ELECTRICAL EQUIPMENT AS WELL AS THE NEW ELECTRICAL EQUIPMENT WILL BE MAINTAINED.
22. LISTED CONDUIT AND CONDUCTOR SIZES ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UPSIZING AS REQUIRED BY FIELD CONDITIONS/AVAILABILITY.
23. NEP BDM-600X [240V] INVERTERS HAVE INTEGRATED GROUND AND DOUBLE INSULATION. NO GEG OR EGC IS REQUIRED. THE DC CIRCUIT IS ISOLATED AND INSULATED FROM GROUND AND MEETS THE REQUIREMENTS OF NEC.
24. CALCULATIONS ARE BASED ON A) ASHRAE 2# AVERAGE HIGH = 32°C B)NEC TABLE 310.15(B)2(a) 75° DERATE FACTOR = 0.96 C) NEC TABLE NEC 310.15(B)(16) 75°C.
25. SUPPLEMENTAL GROUNDING ELECTRODE TO BE INSTALLED NO CLOSER THAN 6' FROM EXISTING WHEN REQUIRED. NEC 250.53(A)(2) DOES NOT REQUIRE IT IF CONTRACTOR CAN PROVE THAT A SINGLE ROD HAS A RESISTANCE TO EARTH OF 25 OHMS OR LESS.
26. WHEN CABLE, INCLUDING PV CABLE(S), IS RUN BETWEEN ARRAYS OR TO JUNCTION BOXES IT SHALL BE ENCLOSED IN CONDUIT. [NEC 300.4, 690.31(A) AND (C)]
27. THE CABLE CONNECTORS USED ON THE OUTPUT SIDE OF THE OPTIMIZER OR MICROINVERTER TOGETHER WITH THE ARRAY CABLE USED BETWEEN THEM ARE OF THE SAME MANUFACTURER OR ARE LISTED FOR COMPATIBILITY. [NEC 690.33(C)]
28. SOME WIRE CONNECTORS SUPPLY INSTRUCTIONS FOR THE PRELIMINARY PREPARATION OF CONDUCTORS, SUCH AS USE OF CONDUCTOR TERMINATION COMPOUND (ANTIOXIDANT COMPOUND). SOME CONNECTORS ARE SHIPPED PRE-FILLED WITH CONDUCTOR TERMINATION COMPOUND (ANTIOXIDANT COMPOUND). FOR NON-PREFILLED CONNECTORS, CONDUCTOR TERMINATION COMPOUND MAY BE USED IF RECOMMENDED BY THE CONNECTOR MANUFACTURER AS PRELIMINARY PREPARATION OF THE CONDUCTOR.

DESIGN ENGINEER



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SOLAR COMPANY/CLIENT



BYLD BETTER

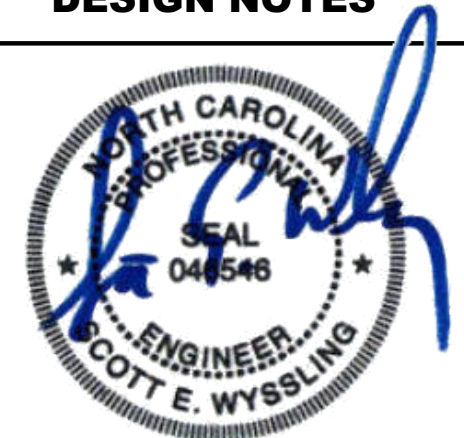
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RESIDENCE

144 SMOKETREE DRIVE  
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COORDINATES: 35.496882, -78.812846

inoemorales1977@gmail.com  
9192980858

## DESIGN NOTES



THIS PLAN HAS BEEN ELECTRONICALLY SIGNED AND SEALED BY SCOTT WYSSLING, PE USING A DIGITAL SIGNATURE AND DATE. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES

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

Signed 12/19/2024

**SCOTT E WYSSLING, PE**  
NC LICENSE NO 46546

DC SYSTEM SIZE: 8.000kW  
AC SYSTEM SIZE: 5.900kW

**PV-6**

AHJ: FUQUAY VARINA  
UTILITY: DUKE

DRAWN BY: AIA  
INITIAL DESIGN DATE: 12/18/2024



DESIGN ENGINEER



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**BYLD BETTER**

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9192980858

**SITE PHOTOS**

DC SYSTEM SIZE: 8.000kW  
AC SYSTEM SIZE: 5.900kW

**PV-7**

AHJ: FUQUAY VARINA  
UTILITY: DUKE

DRAWN BY: AIA  
INITIAL DESIGN DATE: 12/18/2024

# Hi-MO 5

## LR5-54HABB 390~415M

- Suitable for distributed projects
- Advanced module technology delivers superior module efficiency
  - M10 Gallium-doped Wafer
  - Integrated Segmented Ribbons
  - 9-busbar Half-cut Cell
- Globally validated bifacial energy yield
- High module quality ensures long-term reliability

**25** 25-year Warranty for Materials and Processing

**30** 30-year Warranty for Extra Linear Power Output

### Complete System and Product Certifications

IEC 61215, IEC 61730, UL 61730  
 ISO9001:2015: ISO Quality Management System  
 ISO14001: 2015: ISO Environment Management System  
 ISO45001: 2018: Occupational Health and Safety  
 IEC62941: Guideline for module design qualification and type approval



DESIGN ENGINEER



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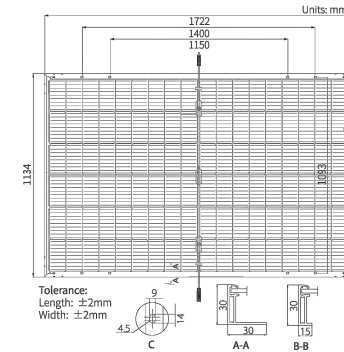
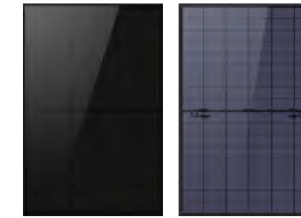
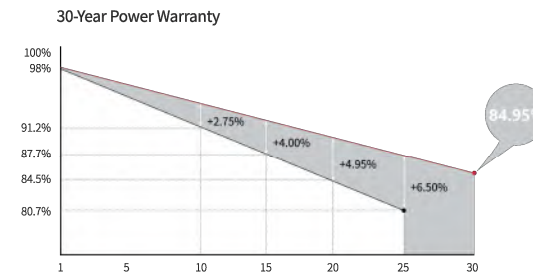
## Hi-MO 5

**21.3%** MAX MODULE EFFICIENCY  
**0~3%** POWER TOLERANCE  
**<2%** FIRST YEAR POWER DEGRADATION  
**0.45%** YEAR 2-30 POWER DEGRADATION

## LR5-54HABB 390~415M

**HALF-CELL**  
 Lower operating temperature

### Additional Value



### Mechanical Parameters

Cell Orientation	108 (6×18)
Junction Box	IP68, three diodes
Output Cable	4mm <sup>2</sup> , ±1200mm length can be customized
Glass	Dual glass, 2.0+1.6mm heat strengthened glass
Frame	Anodized aluminum alloy frame
Weight	22.5kg
Dimension	1722×1134×30mm
Packaging	36pcs per pallet / 216pcs per 20' GP / 936pcs or 792pcs(Only for USA) per 40' HC

### Electrical Characteristics

STC: AM1.5 1000W/m<sup>2</sup> 25°C NOCT: AM1.5 800W/m<sup>2</sup> 20°C 1m/s Test uncertainty for Pmax: ±3%

Module Type	LR5-54HABB-390M		LR5-54HABB-395M		LR5-54HABB-400M		LR5-54HABB-405M		LR5-54HABB-410M		LR5-54HABB-415M	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax/W)	390	291.5	395	295.2	400	299.0	405	302.7	410	306.5	415	310.2
Open Circuit Voltage (Voc/V)	36.58	34.39	36.81	34.61	37.05	34.84	37.29	35.06	37.53	35.29	37.77	35.51
Short Circuit Current (Isc/A)	13.57	10.95	13.65	11.01	13.72	11.07	13.79	11.13	13.87	11.19	13.94	11.25
Voltage at Maximum Power (Vmp/V)	30.47	28.43	30.70	28.64	30.94	28.86	31.18	29.09	31.42	29.31	31.66	29.54
Current at Maximum Power (Imp/A)	12.80	10.26	12.87	10.31	12.93	10.36	12.99	10.41	13.05	10.45	13.11	10.50
Module Efficiency(%)	20.0		20.2		20.5		20.7		21.0		21.3	

### Electrical characteristics with different rear side power gain (reference to 400W front)

Pmax /W	Voc/V	Isc /A	Vmp/V	Imp /A	Pmax gain
420	37.05	14.41	30.94	13.58	5%
440	37.05	15.09	30.94	14.22	10%
460	37.15	15.78	31.04	14.87	15%
480	37.15	16.46	31.04	15.52	20%
500	37.15	17.15	31.04	16.16	25%

### Operating Parameters

Operational Temperature	-40°C ~ +85°C
Power Output Tolerance	0 ~ 3%
Voc and Isc Tolerance	±3%
Maximum System Voltage	DC1500V (IEC/UL)
Maximum Series Fuse Rating	30A
Nominal Operating Cell Temperature	45±2°C
Protection Class	Class II
Bifaciality	70±5%
Fire Rating	UL Similar type 38 * IEC Class C

\*Reference Standard: UL61730 Second Edition, Dated October 28, 2022

### Mechanical Loading

Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Hailstone Test	25mm Hailstone at the speed of 23m/s

### Temperature Ratings (STC)

Temperature Coefficient of Isc	+0.050%/°C
Temperature Coefficient of Voc	-0.265%/°C
Temperature Coefficient of Pmax	-0.340%/°C



No.8369 Shangyuan Road, Xi'an Economic And Technological Development Zone, Xi'an, Shaanxi, China.  
 Web: www.longi.com

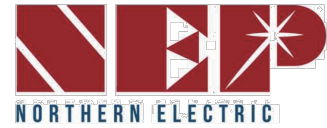
Specifications included in this datasheet are subject to change without notice. LONGI reserves the right of final interpretation.  
 (20230112DraftV02) Only for North America

MODULE



**76 N. MEADOWBROOK DRIVE  
ALPINE UT 84004**  
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(201) 874-3483

**PRODUCT DATASHEET**



**BDM-500/(300x2)600X MICROINVERTER**

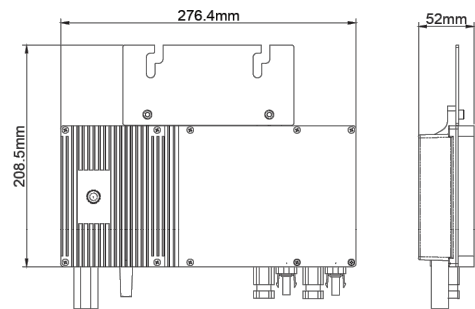
CEC Listing as Utility Interactive Grid Support Inverter

(NC0141, NC0142)



**STANDARD DIMENSIONS**

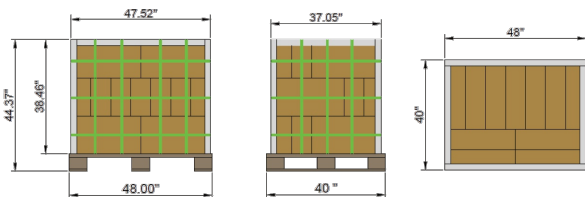
(mm)



Weight: 3.9 kg

**Certifications**

UL 1741, CSA C22.2, NO. 107.1, IEC/EN 62109-1, IEC/EN 62109-2, IEEE 1547, VDE-AR-N 4105\*, VDE V 0126-1-1/A1, G83/2, CEI 21, AS 4777.2, AS 4777.3, EN50438, ABNT NBR 16149/16150



Per box: 5 pcs  
Boxes per layer: 8  
Layers: 3

Pallet Qty: 120 pcs  
Pallet weight: 473 kg

**SPECIFICATIONS**

Model	BDM-500	BDM-300x2 (BDM-600X)
<b>Input (DC)</b>		
Recommended Max PV Power:	375 W x 2	450 W x 2
Max DC Open Circuit Voltage:	60 Vdc	60 Vdc
Max DC Input Current:	20 A x 2	20 A x 2
MPPT Tracking Accuracy:	> 99.5%	> 99.5%
MPPT Tracking Range:	22 – 55 Vdc	22 – 55 Vdc
ISC PV (Absolute Maximum):	20 A x 2	20 A x 2
Maximum Backfeed Current to Array:	0 A	0 A
<b>Output (AC)</b>		
Peak AC Output Power:	500 W	600 W
Max Continuous Output Power(240V):	500 W	590 W
Max Continuous Output Power(208V):	476 W	590 W
Nominal Power Grid Voltage:	1φ: 240 Vac	
	3φ: 208 Vac	
Allowable Power Grid Voltage:	1φ: 211-264 Vac (adjustable)	
	3φ: 183-228 Vac (adjustable)	
Rated Output Current:	1φ: 2.08A	1φ: 2.46 A
	3φ: 2.29 A	3φ: 2.84 A
Maximum Units Per Branch (20A): <i>(All NEC adjustment factors considered)</i>	1φ: 7 units	1φ: 6 units
	3φ: 7 units	3φ: 5 units
Allowable Power Grid Frequency:	59.3 - 60.5 Hz (adjustable)	
THD:	< 5% (at rated power)	
Power Factor:	-0.9~0.9	
Current (inrush) (Peak and Duration):	9.4 A, 15 US	
Nominal Frequency:	60 Hz	
Max Output Fault Current:	2.4 Arms for 3 cycles	
Max Output Overcurrent Protection:	10 A	
<b>System Efficiency</b>		
Weighted Average Efficiency (CEC):	95.5%	
Nighttime Tare Loss:	0.2 W	
<b>Protection Function</b>		
Over/Under Voltage Protection:	Yes	
Over/Under Frequency Protection:	Yes	
Anti-Islanding Protection:	Yes	
Over Current Protection:	Yes	
Reverse DC Polarity Protection:	Yes	
Overload Protection:	Yes	
Protection Degree:	NEMA-6 / IP-66 / IP-67	
Ambient Temperature:	-40°F to +149°F (-40°C to +65°C)	
Operating Temperature:	-40°F to +185°F (-40°C to +85°C)	
Display:	LED Light	
Communications:	Power line Communications / WiFi	
Environment Category:	Indoor and outdoor	
Wet Location:	Suitable	
Pollution Degree:	PD 3	
Over Voltage Category:	II(PV), III (AC MAINS)	

All NEC required adjustment factors have been considered for AC outputs. AC current outputs will not exceed stated values for Rated output AC Current.

**COMPLIANCE**

- NEC 2023 Section 690.11 DC Arc-Fault Circuit Protection
- NEC 2023 Section 690.12 Rapid Shutdown of PV Systems on Buildings
- NEC 2023 Section 690.33 Mating Connectors
- NEC 2023 Section 705.12 Point of Connection (AC Arc-Fault Protection)





**76 N. MEADOWBROOK DRIVE  
ALPINE UT 84004**  
swyssling@wysslingconsulting.com  
(201) 874-3483



# BDG-256 Monitoring Gateway



## Features

### Convenient

- WiFi, Ethernet, or Cell
- Easy to configure web portal
- Touch screen for easy Configuration and Troubleshooting
- Supports dual voltage (100/240) and dual frequency (50/60 Hz)

### Safe and reliable

- Supports local monitoring without internet

### Globally Certified

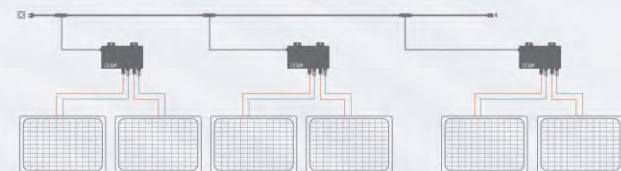
- UL 60950-1 2nd edition, CSA C22.2 2nd edition, FCC Part 15 Class B  
AS/NZS 60950.1:2011 Inc A1, AS/NZS CISPR 22: 2009+A1:2010
- EN 60950-1:2006+A11:2009+A1:2010
- Revenue Grade Production Monitoring ANSI C12.20 +/- 0.5%



**More efficiency** | Maximum 3.5W

**Certification global** | UL 60950-1 2<sup>nd</sup> edition  
CSA C22.2 2<sup>nd</sup> edition  
FCC Part 15 Class B

**More reliability** | IP30



[northernep.com](http://northernep.com)

Ver No.: BDG-256-05232024

## Model

BDG-256

Communications interface	BDM-256
Communication with Microinverter	PLC
Ethernet	10/100 auto-sensing, auto-negotiation
USB	USB 2.0 interface, auto-sensing, auto-negotiation
Wi-Fi	Support
Monitoring Capability	255 devices (depending on power grid interference)
Human interface	
Display	LCD touch screen
Power requirements	
AC input	100-240 Vac, 50/60Hz, 60mA
Power Consumption	3.5 Watts maximum
Revenue Grade Production Monitoring	
Accessory required	ANSI C12.20 +/-0.5% accuracy
Mechanical data	
Dimensions	6.69" x 4.33" x 1.46" (170mm x 110 mm x 37 mm)
Weight	5.29 oz (150g)
Ambient temperature range	40°C to +55°C (-40°F to 131°F) -40°C to +49°C (-40°F to 120°F) if installed in an enclosure
Cooling	Natural convection - no fans
Environmental Rating	IP30. For installation indoors or in an NRTL-certified NEMA type 3R enclosure
Characteristics	
Standard warranty term	5 year
Compliance	UL 60950-1 2nd Edition Rev Dec 19, 2011 CSA C22.2 2nd Edition Rev Dec 19, 2011 FCC Part 15 Class B AS/NZS 60950.1:2011 Inc A1 AS/NZS CISPR 22: 2009+A1:2010 EN 60950-1:2006+A11:2009+A1:2010 +A12:2011 EN 55022:201 EN 61000-3-2:2006+A1:2009+A2:2009 EN 61000-3-3:2008 EN 55024:2010 EMC Directive 2004/108/EC

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**MONITORING  
GATEWAY**



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# Product data sheet

Specifications



Safety switch, general duty, non fusible, 60A, 2 pole, 10hp, 240VAC, NEMA 3R, bolt on provision

DU222RB

Product availability: Stock - Normally stocked in distribution facility

Price\*: 353.00 USD

## Main

Product	Single Throw Safety Switch
Duty Rating	General duty
Device Application	Residential
Disconnect Type	Non-fusible disconnect switch
Factory Installed Neutral	None
Phase	1 phase
Number Of Poles	2
Current Rating	60 A
Voltage Rating	240 V AC
Enclosure Rating Nema	NEMA 3R
Motor Power Hp	10 hp at 240 V AC 60 Hz for 1 phase motors

## Complementary

Mounting Type	Surface
Electrical Connection	Lugs
Wiring Configuration	2 wires
Wire Size	AWG 12...AWG 3 aluminium AWG 14...AWG 3 copper
Tightening Torque	35 lbf.in (3.95 N.m) 0.00...0.01 in <sup>2</sup> (2.08...5.26 mm <sup>2</sup> ) (AWG 14...AWG 10) 35 lbf.in (3.95 N.m) (AWG 14...AWG 10) 45 lbf.in (5.08 N.m) 0.01 in <sup>2</sup> (8.37 mm <sup>2</sup> ) (AWG 8) 45 lbf.in (5.08 N.m) 0.02...0.03 in <sup>2</sup> (12.3...21.12 mm <sup>2</sup> ) (AWG 6...AWG 4) 50 lbf.in (5.65 N.m) 0.04 in <sup>2</sup> (26.67 mm <sup>2</sup> ) (AWG 3)
Depth	3.75 in (95.25 mm)
Width	7.75 in (196.85 mm)
Height	9.63 in (244.60 mm)
Net Weight	16.98 lb(US) (7.7 kg)

## Environment

Certifications	UL listed file E2875
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## Ordering and shipping details

Price is "List Price" and may be subject to a trade discount – check with your local distributor or retailer for actual price.

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

Category	US1DE1A00106
Discount Schedule	DE1A
Gtin	785901491491
Returnability	Yes
Country Of Origin	MX

## Packing Units

Unit Type Of Package 1	PCE
Number Of Units In Package 1	1
Package 1 Height	5.30 in (13.462 cm)
Package 1 Width	7.20 in (18.288 cm)
Package 1 Length	10.00 in (25.4 cm)
Package 1 Weight	4.65 lb(US) (2.109 kg)
Unit Type Of Package 2	PAL
Number Of Units In Package 2	120
Package 2 Height	36.50 in (92.71 cm)
Package 2 Width	40.00 in (101.6 cm)
Package 2 Length	48.00 in (121.92 cm)
Package 2 Weight	610.00 lb(US) (276.691 kg)
Unit Type Of Package 3	CAR
Number Of Units In Package 3	5
Package 3 Height	10.70 in (27.178 cm)
Package 3 Width	10.20 in (25.908 cm)
Package 3 Length	23.50 in (59.69 cm)
Package 3 Weight	24.60 lb(US) (11.158 kg)

## Contractual warranty

Warranty	18 months
----------	-----------



# INSTAFLASH™

## Never Deal With Caulking Again!

Factory-installed, non-hardening sealant



**Before InstaFlash Installed:**  
Sealant is contained above roof surface by a protective cage.

**After InstaFlash Installed:**  
Sealant is compressed to fill all holes and voids.

**Protective Cage**  
Prevents sealant from getting on hands or roof. Collapses upon lag installation.

## Effortless Lifetime Roof Protection

The non-hardening sealant completely fills any missed pilot holes, shingle rips, voids, or other potential water ingress points under the entire footprint of the 4.6" wide base.



### 25-Year Warranty

Manufactured with advanced materials and coatings to outlast the roof itself



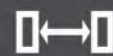
### Code Compliant

Fully IBC/CBC Code Compliant Exceeds ASCE 7-16 Standards FL Cert of Approval FL41396 UL2703 Certified



### Self-Healing

The proprietary non-hardening sealant will flex and reseal over years of thermal expansion and contraction



### Larger Spans

The extra-large L-foot and proprietary lag screw result in larger spans between mounts

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# INSTAFLASH™

**1**  
Drill pilot hole in the center of the rafter using a 7/32" bit.



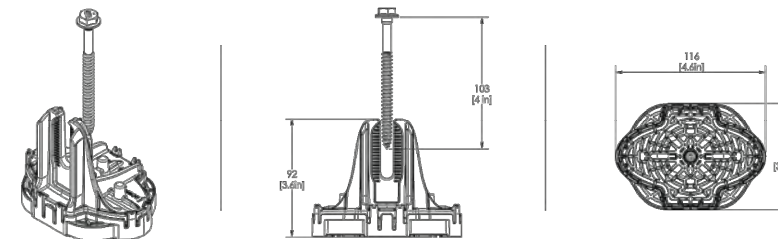
**2**  
Place the InstaFlash over the pilot hole. **Note:** the direction of the InstaFlash Down arrows should point down the roof.



**3**  
Insert the lag screw through the center hole into the pilot hole.



**4**  
Drive the lag until the InstaFlash is fully seated to the roof.



SPECIFICATIONS	INSTAFLASH KITS				
	PIF-RB0	PIF-RBDT	PIF-RBSH	PIF-RM0	PIF-RMDT
Finish	Black			Mill	
Kit Contents	Black InstaFlash, 5/16" x 4.0" SS Lag	Black InstaFlash, 5/16" x 4.0" SS Lag, Dovetail T-bolt w/ Nut	Black InstaFlash, 5/16" x 4.0" SS Lag, M10 Hex Bolt w/ Nut	Mill Insta-Flash, 5/16" x 4.0" SS Lag	Mill InstaFlash, 5/16" x 4.0" SS Lag, Dovetail T-bolt w/ Nut
Attachment Type	Rafter Attached				
Roof Type	Sloped Roof: Composition Shingle, Rolled Asphalt   Flat roof: Modified Bitumen Roof, Built-Up Roof				
Sealant Application	Factory Installed				
Installation Temperature	0°F to 170° F				
Cure Time	Instantly Waterproof; Non-hardening				
Service Temperature	-40°F to 195° F				
Certifications	IBC, ASCE/SEI 7-16, FL Cert of Approval FL41396, TAS 100(A), UL2703				
Install Application	Most Railed Systems, Pegasus Tilt Leg Kit				
Kit Quantity	24				
Boxes per Pallet	36				

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SCAN FOR INSTALLATION VIDEO



SCAN FOR FREE TRIAL

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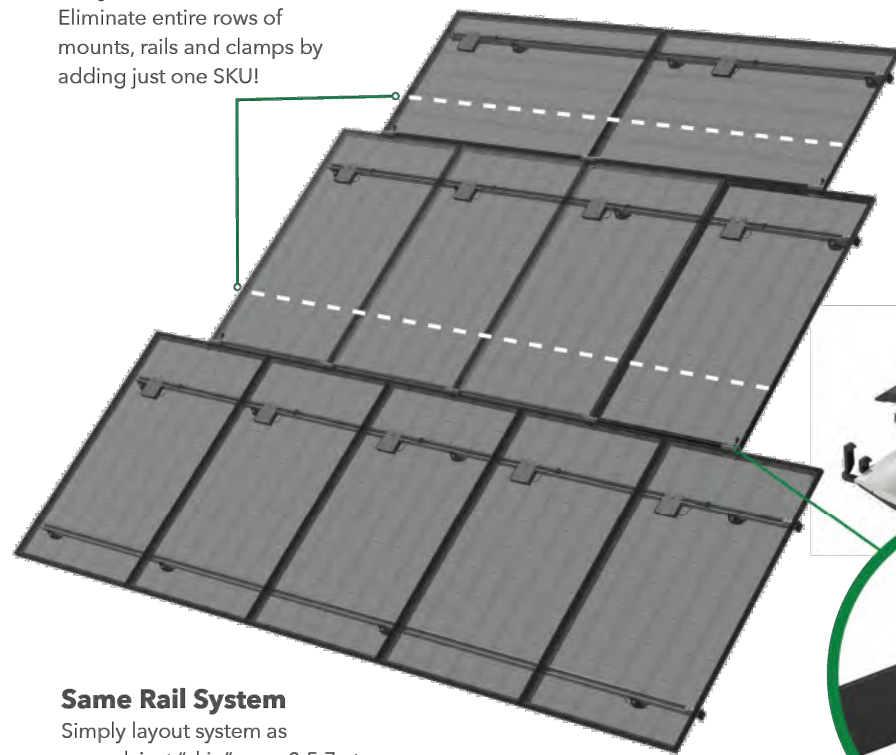
ATTACHMENT



# SK·PRAIL

### Skip Rows!

Eliminate entire rows of mounts, rails and clamps by adding just one SKU!



### SkipRail Clamp

Structurally connects and bonds modules row-to-row  
Eliminate leveling rails: aligns module rows to be in-plane



### Same Rail System

Simply layout system as normal, just "skip" rows 3,5,7,etc. of attachments, rails, and clamps

## A Revolution in Solar Installations

Lower your costs and provide your crews a faster system by eliminating entire rows of mounts, rails and clamps with just one SKU.



#### Dramatically Lower Costs

25% fewer rails and clamps  
15% fewer roof penetrations  
3500 lbs less per MW to ship, warehouse, pack, and load



#### Recruit the Best Crews

Less work = happier crews  
300 lbs less per week to haul  
Faster install  
Auto-levels modules



#### Easy to Implement

Minimal to no training  
Same layout as standard rail  
Same open-channel wire management



#### Universal to Any Roof

Comp, Tile, Metal, other.  
Low slope, steep slopes  
Easily work around roof obstructions  
Mixed portrait / landscape

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# SK·PRAIL

**SkipRail SAVINGS** | 18% fewer attachments • 32% fewer feet of rails  
22% fewer pounds to ship & warehouse

**SkipRail SAVINGS** | 21% fewer attachments • 30% fewer feet of rails  
21% fewer pounds to ship & warehouse

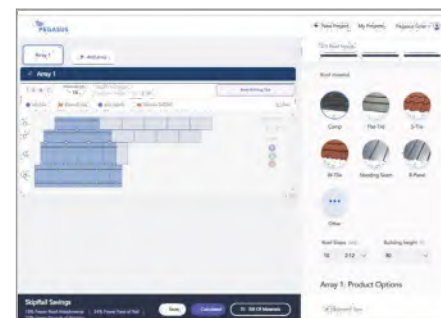


Example of Comp Roof Array

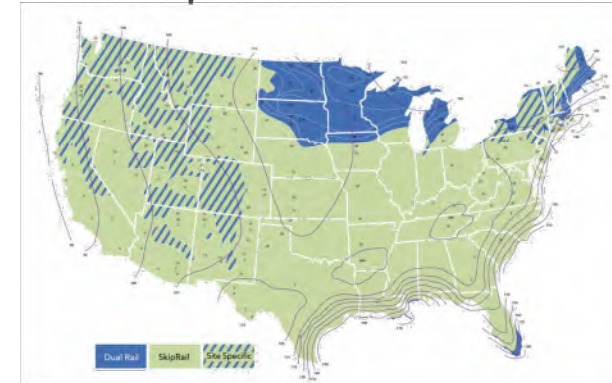


Example of Tile Roof Array

**Free Design Tool:**  
[pegasussolar.com/portal](http://pegasussolar.com/portal)



### Where SkipRail Works



Specifications	SkipRail Kits	
	PSR-SRC	PSR-SRCK
SKU	PSR-SRC	PSR-SRCK
Type	Floating Clamp	Extra support with Kickstand
Finish	Black	
PV module frames	30, 32, 35, 40mm	
Certifications	ASCE 7-16, IBC, CBC, UL2703	
Applicable Roof Types	Any	
Compatible Rail Systems	Pegasus Rail System	
Kit Contents	Pegasus SkipRail Clamp	Pegasus SkipRail Clamp with Kickstand
Kit Quantity	20	30



SCAN FOR VIDEO



SCAN FOR FREE TRIAL

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ATTACHMENT



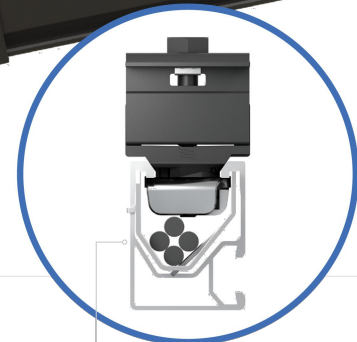
# RAIL SYSTEM

## One Clamp Anywhere

The Multi-Clamp works as mid- or end-clamp, and fits standard 30-40mm frames.

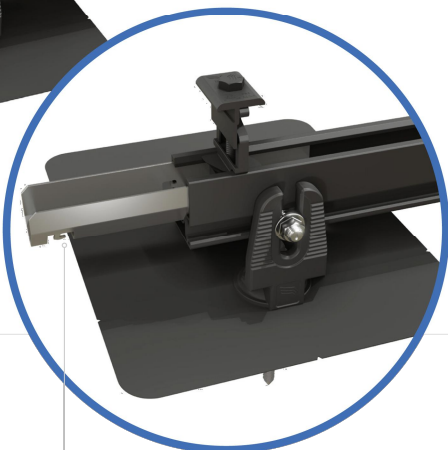
## Instant Bonding

The N-S Bonding Jumper bonds row to row with no tools.



## Lifetime Wire Management

Open rail channel holds and protects wires. Clamps won't pinch wires after tightening.



## Bonding Structural Splice

Connect rails instantly, without tools, interference or limitations.

## Next-Level Solar Mounting

A complete system for hassle-free rooftop installation, from watertight mounts to lifetime wire management.



### Simplicity

1/2" socket for everything. One clamp for mid or end. No tool splicing and bonding. Easy wire management.



### Code Compliant

UL 2703 listed LTR-AE-001-2012 listed Class A fire rating for any slope ASCE 7-16 PE Certified



### Premium Aesthetics

The narrowest panel gap available. Optional Hidden End Clamps and End Caps provide a flush look on the edge of the array.



### Watertight for Life

Secured on industry-leading Pegasus Mounts, for composite shingle and tile roofs. Backed by a 25-year warranty.

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# RAIL SYSTEM



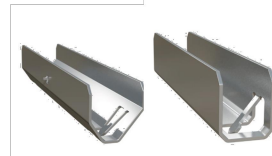
Pegasus Rail

Available in 14' and 7' lengths for easy layout and shipping. Open-channel design holds MC4 connectors, PV wire and trunk cables. Black and Mill finish.



Pegasus Max Rail

Maximum-strength design. Meets specifications for high snow-load and hurricane zones. Black and Mill finish.



Splice and Max Splice

Installs by hand. Works over mounts. Structurally connects and bonds rails automatically; UL2703 listed as reusable.



Dovetail T-bolt

Dovetail shape for extra strength. Uses 1/2" socket.



Multi-Clamp

Fits 30-40mm PV frames, as mid- or end-clamp. Twist-locks into position; doesn't pinch wires in rail. Bonds modules to rail; UL2703 listed as reusable.



Hidden End Clamp

Offers premium edge appearance. Preinstalled pull-tab grips rail edge, allowing easy, one-hand installation. Tucks away for reuse.



Ground Lug

Holds 6 or 8 AWG wire. Mounts on top or side of rail. Assembled on MLPE Mount. UL2703 listed as reusable.



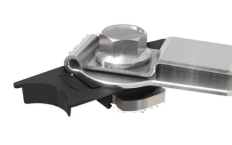
N-S Bonding Jumper

Installs by hand, eliminates row-to-row copper wire. UL2703 listed as reusable only with Pegasus Rail.



MLPE Mount

Secures and bonds most micro-inverters and optimizers to rail. Connectors and wires easily route underneath after installation. UL2703 listed as reusable.



Cable Grip

Secures four PV wires or two trunk cables. Stainless-steel backing provides durable grip. Eliminates sagging wires.



Wire Clip

Hand operable. Holds wires in channel. Won't slip.



End Cap and Max End Cap

Fits flush to PV module and hides raw or angled cuts. Hidden drain quickly clears water from rail.

- Certifications:**
- UL 2703, Edition 1
  - LTR-AE-001-2012
  - ASCE 7-16 PE certified
  - Class A fire rating for any slope roof



Quickly calculate the most efficient layout, spans and materials needed to suit your job. Visit the Pegasus Customer Portal. [pegassolar.com/portal](http://pegassolar.com/portal)

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LOAD	SPAN	SPAN			
		32"	4'	6'	8'
0	SNOW (PSF)				
	WIND (MPH)	120	160	190	
15	SNOW (PSF)				
	WIND (MPH)	140	160	190	
30	SNOW (PSF)				
	WIND (MPH)	160	190		
45	SNOW (PSF)				
	WIND (MPH)	190			
70	SNOW (PSF)				
	WIND (MPH)	190			
110	SNOW (PSF)				
	WIND (MPH)	190			

For reference only. Spans above are calculated using ASCE 7-16 for a Gable Roof, Exposure Category B, 7-20deg roof angle, 30ft mean roof height with non-exposed modules. For PE certified span tables, visit [www.pegassolar.com/spans](http://www.pegassolar.com/spans).

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RAIL