

# ROOF MOUNT PHOTOVOLTAIC SYSTEM

## CODES:

THIS PROPOSED INSTALLATION COMPLIES WITH THE FOLLOWING:  
 2018 NORTH CAROLINA BUILDING CODE  
 2018 NORTH CAROLINA RESIDENTIAL CODE  
 2018 NORTH CAROLINA PLUMBING CODE  
 2018 NORTH CAROLINA MECHANICAL CODE  
 2018 NORTH CAROLINA FUEL GAS CODE  
 2020 NATIONAL ELECTRICAL CODE  
 AS ADOPTED BY COUNTY OF HARNETT

## CONSTRUCTION NOTES:

CONDUIT AND CONDUCTOR SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING AS REQUIRED BY FIELD CONDITIONS.

ALL SOLAR ENERGY SYSTEM EQUIPMENT SHALL BE SCREENED TO THE MAXIMUM EXTENT POSSIBLE AND SHALL BE PAINTED A COLOR SIMILAR TO THE SURFACE UPON WHICH THEY ARE MOUNTED.

MODULES SHALL BE TESTED, LISTED AND IDENTIFIED WITH FIRE CLASSIFICATION IN ACCORDANCE WITH UL 2703. SMOKE AND CARBON MONOXIDE ALARMS ARE REQUIRED PER SECTION R314 AND 315 TO BE VERIFIED AND INSPECTED BY INSPECTOR IN THE FIELD.

DIG ALERT (811) TO BE CONTACTED AND COMPLIANCE WITH EXCAVATION SAFETY PRIOR TO ANY EXCAVATION TAKING PLACE

PHOTOVOLTAIC SYSTEM GROUND WILL BE TIED INTO EXISTING GROUND AT MAIN SERVICE FROM DC DISCONNECT/INVERTER AS PER 2020 NEC SEC 250.166(A).

SOLAR PHOTOVOLTAIC SYSTEM EQUIPMENT WILL BE INSTALLED IN ACCORDANCE WITH REQUIREMENTS OF ART. 690 OF THE 2020 NEC

THE MAIN SERVICE PANEL WILL BE EQUIPPED WITH A GROUND ROD OR UFER

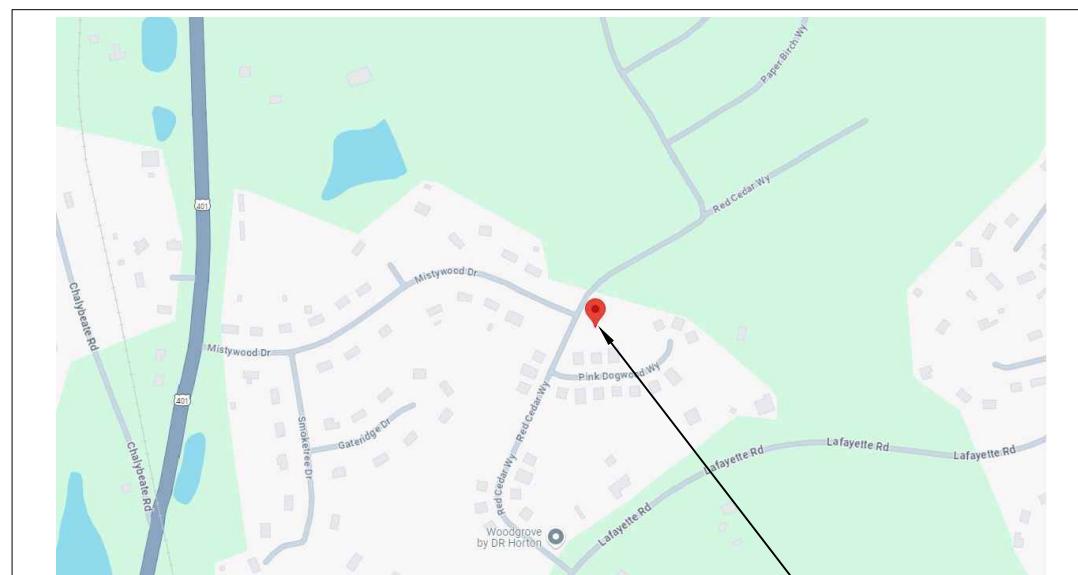
UTILITY COMPANY WILL BE NOTIFIED PRIOR TO ACTIVATION OF THE SOLAR PV SYSTEM

INSTALL CREW TO VERIFY ROOF STRUCTURE PRIOR TO COMMENCING WORK. EMT CONDUIT ATTACHED TO THE ROOF USING CONDUIT MOUNT.

### THIS SYSTEM DESIGNED WITH:

WIND SPEED: 130  
 WIND EXPOSURE: B  
 SNOW LOAD: 15

## VICINITY MAP:



SITE LOCATION

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APPENDIX	MANUFACTURER SPECIFICATION SHEETS

**CLIENT:**  
 SAMUEL NGWAMUKIE  
 236 RED CEDAR WAY, FUQUAY-VARINA, NC 27526  
 AHJ: COUNTY OF HARNETT  
 UTILITY: DUKE ENERGY  
 METER: 343838926  
 APN: 080653 0007 94  
 EMAIL: NGWAMUKIES@GMAIL.COM  
 FINANCE: MOSAIC

**SYSTEM:**  
 SYSTEM SIZE (DC): 8 X 430 = 3.440 kW  
 SYSTEM SIZE (AC): 2.320 kW @ 240V  
 MODULES: 8 X SILFAB SOLAR: SIL-430QD  
 INVERTER: ENPHASE IQ8PLUS-72-M-US

**EXISTING SYSTEM:**  
 SYSTEM SIZE (DC): 9 X 420 = 3.780 kW  
 SYSTEM SIZE (AC): 2.610 kW @ 240V

REVISIONS		
NO.	REVISED BY	DATE
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-	-	-
-	-	-



**FREEDOM FOREVER LLC**  
 415 INDUSTRIAL CT., GREER, SC 29651  
 Tel: (800) 385-1075

**GREG ALBRIGHT**

**CONTRACTOR LICENSE:**  
 ELECTRICAL CONTRACTOR U.34043

### PROJECT DETAILS

JOB NO:	DATE:	DESIGNED BY:	SHEET:
500462	9/19/2024	A.M.	PV-1

**LEGEND:**

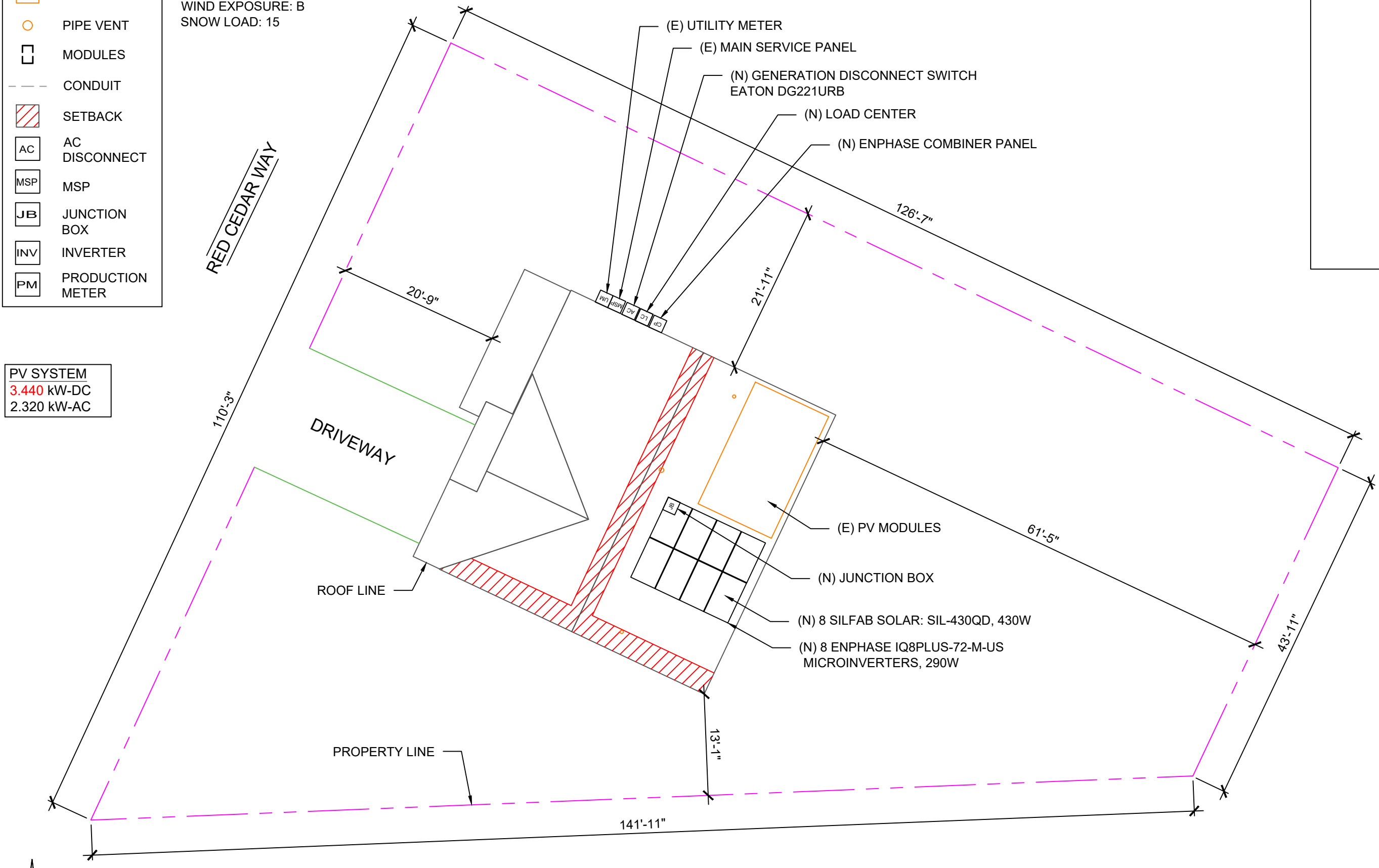
- OBSTRUCTION
- PIPE VENT
- MODULES
- CONDUIT
- SETBACK
- AC AC DISCONNECT
- MSP MSP
- JB JUNCTION BOX
- INV INVERTER
- PM PRODUCTION METER

BOS WILL BE AS CLOSE AS POSSIBLE TO MSP WITHIN 10'

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 SNOW LOAD: 15

**PV SYSTEM**  
 3.440 kW-DC  
 2.320 kW-AC



ROOF AREA: 1861.55 SQ FT

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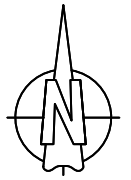
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**SITE PLAN**  
 SCALE: 2/25" = 1'-0"

1

SITE PLAN

JOB NO: 500462	DATE: 9/19/2024	DESIGNED BY: A.M.	SHEET: PV-2
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**LEGEND:**

- OBSTRUCTION
- PIPE VENT
- MODULES
- CONDUIT
- SETBACK
- AC AC DISCONNECT
- MSP MSP
- JB JUNCTION BOX
- INV INVERTER
- PM PRODUCTION METER

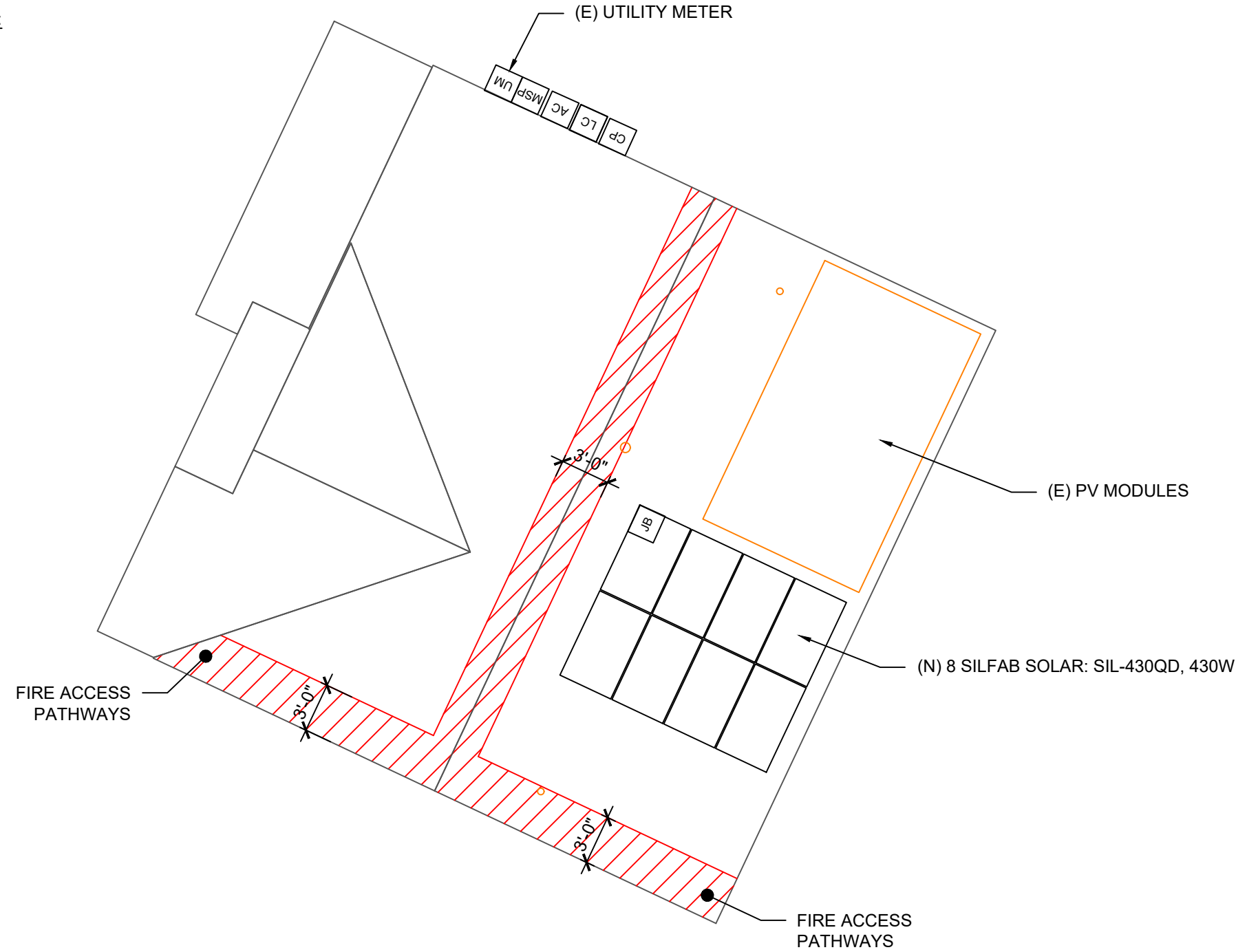
**MODIFIED SETBACKS PROPOSED AT RIDGE:**  
 TOTAL ARRAY AREA = 167.91 SF  
 TOTAL ROOF AREA = 1861.55 SF  
 TOTAL ARRAY AREA AS A % TO ROOF AREA = 9.02%  
 9.02% < 33%

BOS WILL BE AS CLOSE AS POSSIBLE TO MSP WITHIN 10'

**THIS SYSTEM DESIGNED WITH:**  
 WIND SPEED: 130  
 WIND EXPOSURE: B  
 SNOW LOAD: 15

**PV SYSTEM**  
 3.440 kW-DC  
 2.320 kW-AC

TOTAL ROOF AREA: 1861.55 SQ FT  
 TOTAL ARRAY AREA: 167.91 SQ FT  
 ARRAY COVERAGE: 19.12%  
 SYSTEM DISTRIBUTED WEIGHT: 2.71 LBS  
 ROCKIT SMART SLIDE POINT-LOAD: 19.5 LBS



ROOF AREA: 1861.55 SQ FT

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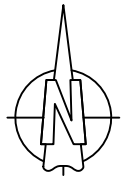


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- NOTES:**
- EMT CONDUIT ATTACHED TO THE ROOF USING CONDUIT MOUNTS
  - ATTACHED CLAMPS AT 25% FROM THE EDGE AND 50% FROM THE CENTER OF THE MODULES
  - JUNCTION BOX IS MOUNTED TO THE RAIL.



**ROOF PLAN**  
 SCALE: 1/8" = 1'-0"

1

ROOF PLAN WITH MODULES LAYOUT

JOB NO: 500462	DATE: 9/19/2024	DESIGNED BY: A.M.	SHEET: PV-2A
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# ROOF DETAILS:

TOTAL ROOF AREA: 1861.55 SQ FT  
 TOTAL ARRAY AREA: 167.91 SQFT  
 ARRAY COVERAGE: 19.12%  
 SYSTEM DISTRIBUTED WEIGHT: 2.71 LBS  
 ROCKIT SMART SLIDE POINT-LOAD: 19.5 LBS

ROOF AREA STATEMENT						
ROOF	MODULE QUANTITY	ROOF PITCH	ARRAY PITCH	AZIMUTH	ROOF AREA	ARRAY AREA
ROOF 1	8	24	24	115.2	818.63 SQ FT	167.91 SQ FT
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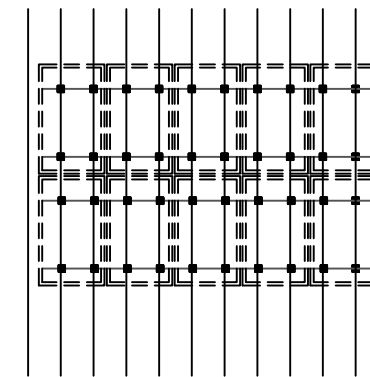
**CONTRACTOR LICENSE:**  
 ELECTRICAL CONTRACTOR U.34043

ARRAY DETAILS			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
500462	9/19/2024	A.M.	PV-2B

TABLE 1 – ARRAY INSTALLATION

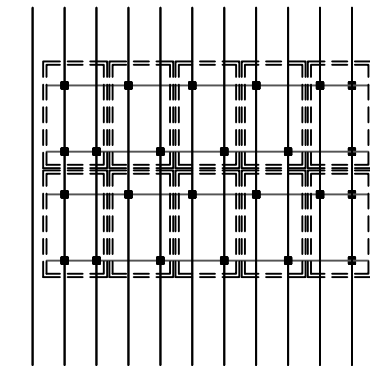
	ROOF PITCH	ROOFING TYPE	ATTACHMENT TYPE	FRAMING TYPE	MAX UNBRACED LENGTH(FT.)	STRUCTURAL ANALYSIS RESULT	PENETRATION PATTERN	MAX ATTACHMENT SPACING (IN.)	MAX RAIL OVERHANG(IN. N.)
ROOF 1	24	Comp Shingle	Ecofasten Rockit Smart Slide	2x4 @ 24" O.C.	7	PASS	STAGGERED	48	16

1. CONTRACTOR TO VERIFY FRAMING TYPE AND MAX UNBRACED LENGTH PRIOR TO INSTALLATION. IF THE ABOVE INFORMATION DOES NOT MATCH FIELD CONDITIONS, NOTIFY ENGINEER OF RECORD IMMEDIATELY.
2. WHERE COLLAR TIES OR RAFTER SUPPORTS EXIST, CONTRACTOR SHALL USE RAFTERS WITH COLLAR TIES AS ATTACHMENT POINTS.
3. MAX RAIL OVERHANG APPLICABLE FOR RAILED ATTACHMENT INSTALLATIONS.



STACKED DETAIL

For Illustration purposes only



STAGGERED DETAIL

For Illustration purposes only

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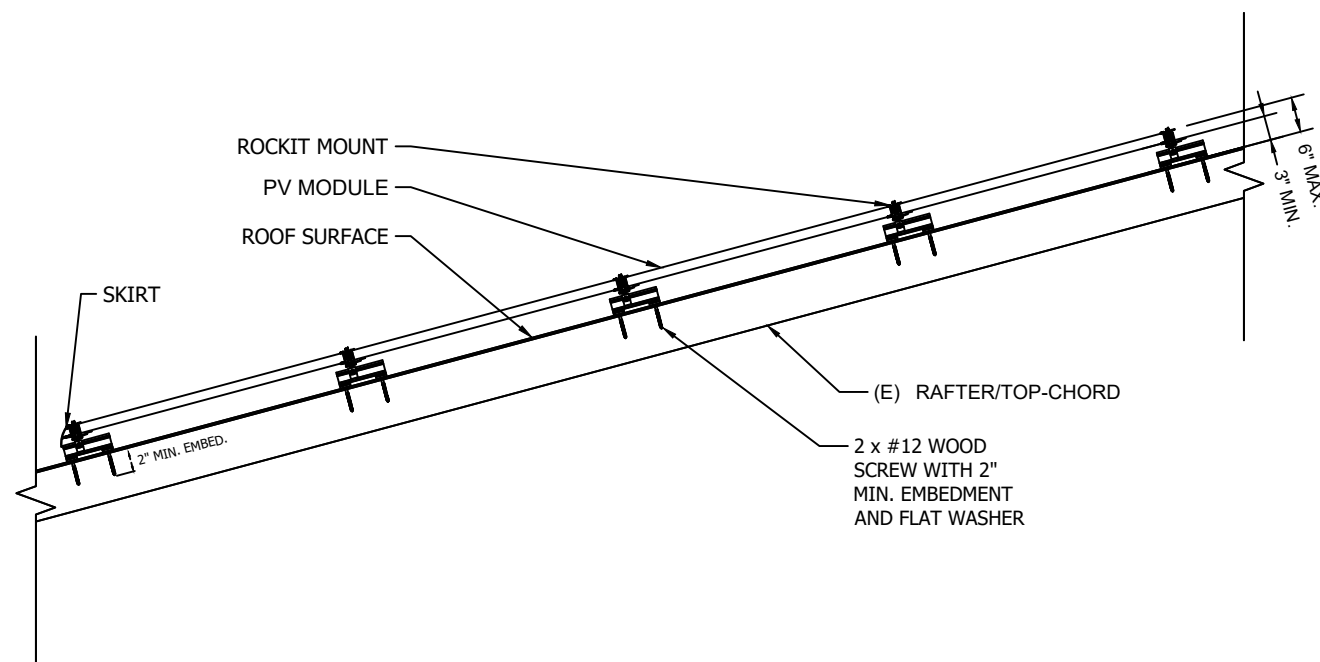


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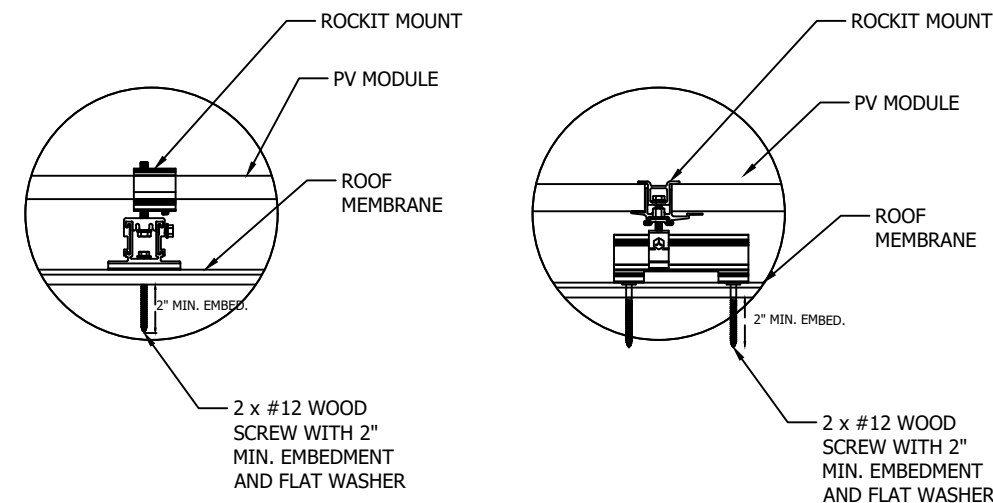
MOUNTING DETAILS

JOB NO: 500462	DATE: 9/19/2024	DESIGNED BY: A.M.	SHEET: PV-3
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SOLAR PV ARRAY SECTION VIEW

Scale: NTS



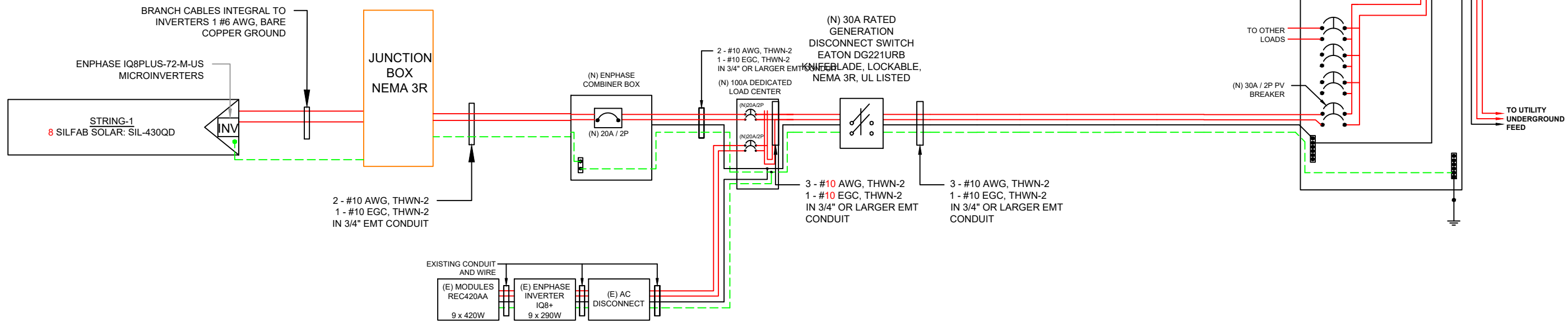
ATTACHMENT DETAIL

Scale: NTS

BACKFEED BREAKER/FUSE SIZING						
(TOTAL) MAX. CONTINUOUS OUTPUT 20.56A @ 240V						
NEW	9.68	X	1.25	=	12.1AMPS	20A BREAKER - OK
EXISTING	10.88	X	1.25	=	13.59AMPS	20A BREAKER - OK
TOTAL	12.10	+	13.60	=	25.7AMPS	30A FUSES - OK

PV SYSTEM  
**3.440 kW-DC**  
**2.320 kW-AC**

430W MODULES  
 290W MICROINVERTERS



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THREE LINE DIAGRAM

JOB NO: 500462	DATE: 9/19/2024	DESIGNED BY: A.M.	SHEET: PV-4
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**MODULE INFO**

MAKE/MODEL: SILFAB SOLAR: SIL-430QD

Voc: 38.91 V

Vmp: 33.25 V

Isc: 13.87 A

Imp: 12.93 A

STC RATING: 430 W

PTC RATING: 405.8 W

MAX DC CURRENT:  $I_{max} = 1.25 \times (\text{OPTIMIZER OUTPUT CURRENT}) = 1.25 \times 15 = 18.75\text{A}$   
 MAX AC CURRENT:  $I_{max} = 1.25 \times (\text{SUM OF MAX CONTINUOUS OUTPUT CURRENT FROM INVERTERS}) = 1.25 \times (20.56) = 25.70\text{A}$

**WIRE SCHEDULE**

RACEWAY #	DC/AC	EQUIPMENT	CONDUCTOR QTY.	AWG WIRE SIZE	STARTING ALLOWABLE AMPACITY @ 90°C 310.15(B)(16)	STARTING CURRENT APPLIED TO CONDUCTORS IN RACEWAY	TEMPERATURE CORRECTION FACTOR 310.15(B)(2)(a)	ADJUSTMENT FACTOR FOR MORE THAN 3 CONDUCTORS 310.15(B)(3)(a)	ADJUSTED CONDUCTOR AMPACITY @ 90°C	MAXIMUM CURRENT APPLIED TO CONDUCTORS IN RACEWAY
1	DC	MODULE TO MICROINVERTER	2	10	40	17.34	0.91	1	36.40	21.67
2	AC	MICROINVERTER TO JUNCTION BOX	2	10	40	9.68	0.91	1	36.40	12.10
3	AC	JUNCTION BOX TO ENPHASE COMBINER PANEL	2	10	40	9.68	0.91	1	36.40	12.10
4	AC	ENPHASE COMBINER PANEL TO DEDICATED LOAD CENTER	3	10	40	20.56	0.91	1	36.40	25.69
5	AC	EXISTING INVERTER 1 TO DEDICATED LOAD CENTER	3	10	40	10.88	0.91	1	36.40	13.59
6	AC	DEDICATED LOAD CENTER TO AC DISCONNECT	3	10	40	20.56	0.91	1	36.40	25.69
7	AC	AC DISCONNECT TO POI	3	10	40	20.56	0.91	1	36.40	25.69
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**CONDUCTOR CALCULATIONS**

JOB NO:	DATE:	DESIGNED BY:	SHEET:
500462	9/19/2024	A.M.	PV-5

CONDUCTOR AMPACITY CALCULATIONS IN ACCORDANCE WITH NEC 690.8.





**MAIN PHOTOVOLTAIC SYSTEM DISCONNECT**  
690.13(B)

**DO NOT DISCONNECT UNDER LOAD**  
NEC 690.15 (B) & NEC 690.33(D)(2)

**WARNING**  
SINGLE 120-VOLT SUPPLY DO NOT CONNECT MULTIWIRE BRANCH CIRCUITS  
NEC 710.15(C) & 692.9 (C)

**WARNING DUAL POWER SOURCE**  
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM  
NEC 705.12(D) & NEC 690.59

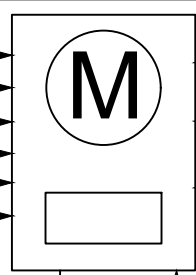
**WARNING**  
TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL  
NEC 110.27(C) & OSHA 1910.145(F)(7)

**WARNING**  
ELECTRICAL SHOCK HAZARD  
TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION  
706.15(C)(4) & 690.13(B)

**WARNING**  
THIS EQUIPMENT FED BY MULTIPLE SOURCES: TOTAL RATING OF ALL OVERCURRENT DEVICES EXCLUDING MAIN POWER SUPPLY SHALL NOT EXCEED AMPACITY OF BUSBAR  
NEC 705.12(B)(3)(3)

**WARNING**  
THE DISCONNECTION OF THE GROUNDED CONDUCTOR(S) MAY RESULT IN OVERVOLTAGE ON THE EQUIPMENT  
NEC 690.31(E)

**RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM**  
690.56(C)(3)



**SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN**

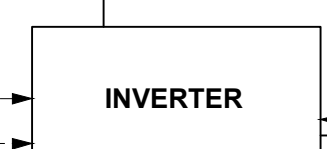
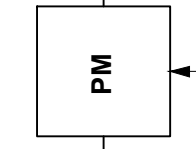
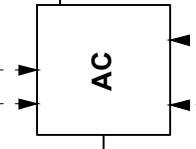
TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY

IFC 605.11.3.1(1) & 690.56(C)

**CAUTION**  
PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED  
NEC 705.12(D) & NEC 690.59

**WARNING**  
POWER SOURCE OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE.  
NEC 705.12(C) & NEC 690.59

**WARNING**  
ARC FLASH AND SHOCK HAZARD APPROPRIATE PPE REQUIRED  
24 INCH FLASH HAZARD BOUNDARY  
3 CALCMF2 FLASH HAZARD AT 18 INCHES  
480 VAC SHOCK HAZARD WHEN COVER IS REMOVED  
42 INCH LIMITED APPROACH  
12 INCH RESTRICTED APPROACH - 500 V CLASS 00 GLOVES  
1 INCH PROHIBITED APPROACH - 500 V CLASS 00 GLOVES  
LOCATION: 236 RED CEDAR WAY FUQUAY-VARINA, NC 27526



**PHOTOVOLTAIC AC DISCONNECT**  
NEC 690.13(B)

**PHOTOVOLTAIC AC DISCONNECT**  
RATED AC OUTPUT CURRENT: **20.56A**  
NOMINAL OPERATING AC VOLTAGE: **240V**  
NEC 690.54

**WARNING DUAL POWER SOURCE**  
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM  
NEC 705.12(D) & NEC 690.59

**SOLAR PV DC CIRCUIT**  
EVERY 10' ON CONDUIT AND ENCLOSURES  
NEC 690.31

**PHOTOVOLTAIC POWER SOURCE**  
EVERY 10' ON CONDUIT AND ENCLOSURES  
NEC 690.31(D)(2)

MAXIMUM VOLTAGE **60** V  
MAXIMUM CIRCUIT CURRENT **N/A** A  
MAX DC-DC CONVERTER OUTPUT CURRENT **15** A

**NOTES:**

- NEC ARTICLES 690 AND 705 AND IRC SECTION R324 MARKINGS SHOWN HEREON.
- ALL MARKING SHALL CONSIST OF THE FOLLOWING:
  - UV RESISTANT SIGN MATERIAL WITH ENGRAVED OR MACHINE PRINTED LETTERS OR ELECTRO-PLATING.
  - RED BACKGROUND COLOR WHITE TEXT AND LINE WORK.
  - ARIAL FONT.
- ALL SIGNS SHALL BE SIZED APPROPRIATELY AND PLACED IN THE LOCATIONS SPECIFIED. SIGNAGE CANNOT BE HAND-WRITTEN.
- SIGNS SHALL BE ATTACHED TO THE SERVICE EQUIPMENT WITH POP-RIVETS OR SCREWS

**PHOTOVOLTAIC DC DISCONNECT**  
NEC 690.13(B)

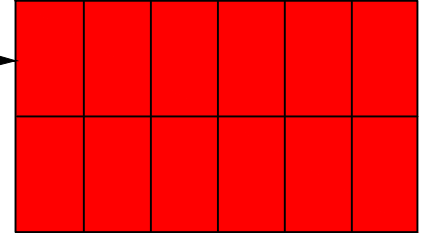
**MAXIMUM DC VOLTAGE OF PV SYSTEM**  
NEC 690.53

**WARNING**  
ELECTRICAL SHOCK HAZARD  
TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION  
DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR MODULES ARE EXPOSED TO SUNLIGHT  
706.15(C)(4) & 690.13(B)

**WARNING**  
ELECTRICAL SHOCK HAZARD  
TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION  
706.15(C)(4) & 690.13(B)

**WARNING**  
TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL  
NEC 110.27(C) & OSHA 1910.145(F)(7)

**ARRAY**



NEC 690.31(G)(3) & (4)

CLIENT:  
SAMUEL NGWAMUKIE  
236 RED CEDAR WAY, FUQUAY-VARINA, NC 27526  
AHJ: COUNTY OF HARNETT  
UTILITY: DUKE ENERGY  
METER: 343838926  
APN: 080653 0007 94  
EMAIL: NGWAMUKIES@GMAIL.COM  
FINANCE: MOSAIC

SYSTEM:  
SYSTEM SIZE (DC): 8 X 430 = 3.440 kW  
SYSTEM SIZE (AC): 2.320 kW @ 240V  
MODULES: 8 X SILFAB SOLAR: SIL-430QD  
INVERTER: ENPHASE IQ8PLUS-72-M-US

EXISTING SYSTEM:  
SYSTEM SIZE (DC): 9 X 420 = 3.780 kW  
SYSTEM SIZE (AC): 2.610 kW @ 240V

REVISIONS		
NO.	REVISED BY	DATE
-	-	-
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FREEDOM FOREVER LLC  
415 INDUSTRIAL CT., GREER, SC 29651  
Tel: (800) 385-1075

GREG ALBRIGHT

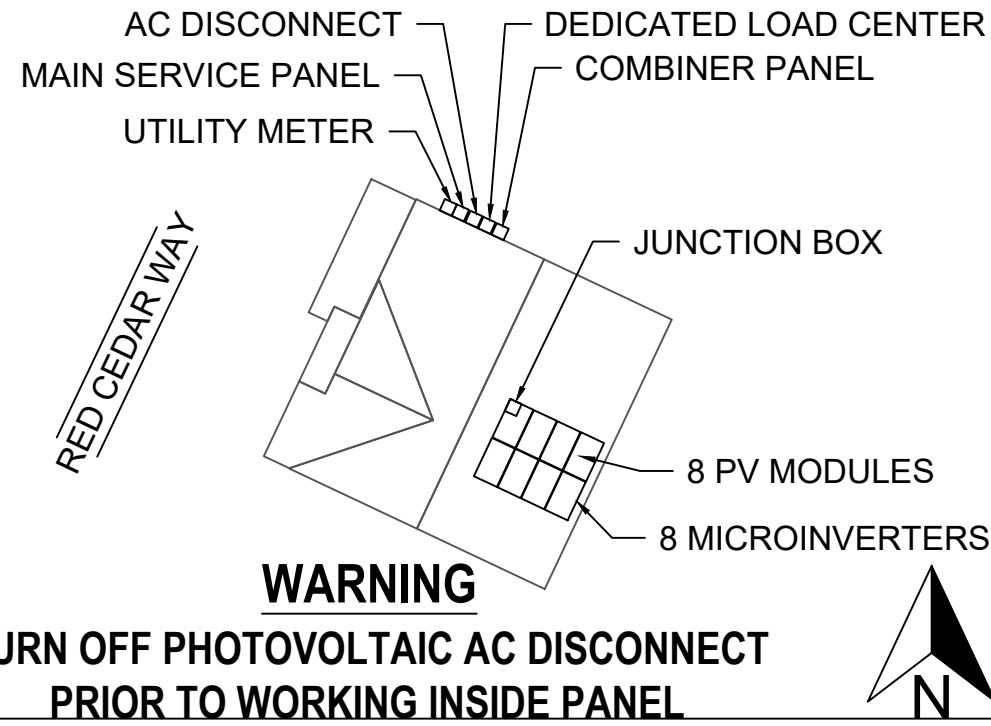
CONTRACTOR LICENSE:  
ELECTRICAL CONTRACTOR U.34043

LABELS

JOB NO: 500462	DATE: 9/19/2024	DESIGNED BY: A.M.	SHEET: PV-7
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# CAUTION:

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS AS SHOWN



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**GREG ALBRIGHT**

*Greg Albright*

**CONTRACTOR LICENSE:**  
 ELECTRICAL CONTRACTOR U.34043

**SITE PLACARD**

JOB NO: 500462	DATE: 9/19/2024	DESIGNED BY: A.M.	SHEET: PV-7A
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**NOTES:**

1. NEC ARTICLES 690 AND 705 AND IRC SECTION R324 MARKINGS SHOWN HEREON.
2. ALL MARKING SHALL CONSIST OF THE FOLLOWING:
  - A. UV RESISTANT SIGN MATERIAL WITH ENGRAVED OR MACHINE PRINTED LETTERS OR ELECTRO-PLATING.
  - B. RED BACKGROUND COLOR WHITE TEXT AND LINE WORK.
  - C. AERIAL FONT.
3. ALL SIGNS SHALL BE SIZED APPROPRIATELY AND PLACED IN THE LOCATIONS SPECIFIED. SIGNAGE CANNOT BE HAND-WRITTEN.
4. SIGNS SHALL BE ATTACHED TO THE SERVICE EQUIPMENT WITH POP-RIVETS OR SCREWS.

1-20

21-40

41-60

# ENPHASE MICROINVERTER CHART

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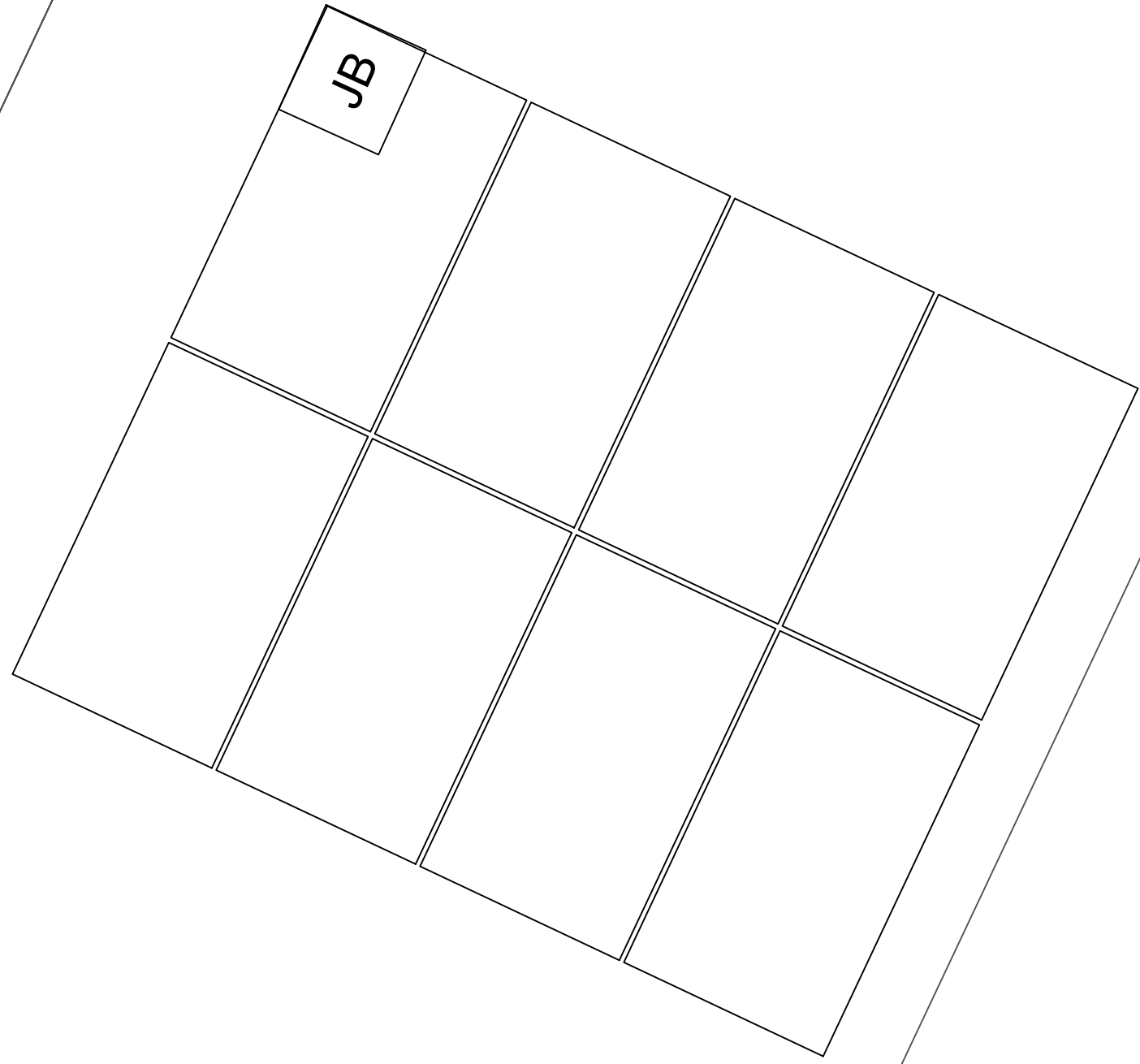
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**MICROINVERTER CHART**

<b>JOB NO:</b> 500462	<b>DATE:</b> 9/19/2024	<b>DESIGNED BY:</b> A.M.	<b>SHEET:</b> PV-8
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# JOB HAZARD ANALYSIS

Crew leader to fill out all sections below, hold a pre-job safety meeting with all personnel, and upload this completed document and the Safety Plan to Site Capture

## Ladder Access

- Ladders must be inspected before each use.
  - Extension ladders must be set up on a firm and level surface at a 4-to-1 rise to run angle (or 75 degrees) and the top must be secured to the structure. Extension style ladders placed on uneven, loose or slippery surfaces must additionally have the base firmly anchored or lashed so the base will not slip out.
  - Extension ladders must be used with walk-through devices or the ladder must extend 36" above the stepping off point.
  - A-frame ladders must only be climbed with the ladder spreader bars locked in the open position; A-frame ladders shall not be climbed while in the closed position (ex, closed and used while leaned against a structure).
- Additional notes:

## Mobile Equipment

- Only Qualified operators will operate equipment; operators must maintain a certification on their person for the equipment being operated.
  - Type(s) of mobile equipment (Type/Make/Model):
- 
- Qualified operator(s):

## Material Handling and Storage

- Materials will be staged/stored in a way that does not present a hazard to client, personnel or public. Materials stored on the roof will be physically protect from failing or sliding off.

## Fall Protection

- A site-specific plan for fall prevention and protection is required prior to starting work and must remain onsite at all times until work is complete; a fall rescue plan must be outlined and discussed among the crew prior to work start.
- First-person-Up (FPU) must install their anchor and connect before any other task, including installing other anchors. The Last-Person-Down (LPD) must be the only person on a roof uninstalling fall protection.

- FPCP (name and title):
- FPU and LPD (name and title):

## Electrical Safety

- The Electrical Qualified Person (EQP) is required onsite to perform electrical work.
  - All electrical work will be performed with equipment in an electrically safe condition (de-energized) unless approval has been granted prior to work.
  - Service drops and overhead electrical hazards will be identified and protected from contact, as necessary.
- EQP (name and title):

## Public Protection

- The safety of the Client and Public must be maintained at all times.
- The Client and the Public shall be prevented from entering the work zone through the use of barriers and/or signage, as required.
- Company, Client and Public property shall be protected from falling objects.
- Pets (including dogs) shall be secured by their owners prior to work start.
- The Client should not leave pets, family members, or others in charge or care of Employees, Contractors, or Temporary Workers.

- Crew leader responsible for communication with the client:
- Client and public is excluded from work area by barricades (N/A, Yes, No):

## Training and Pre-Job Safety Briefing

- All employees onsite shall be made aware of the specific hazards of this project and review this HJA during a pre-job briefing, and their signature indicates awareness of site conditions and the plan to eliminate any hazards identified prior to and during the project.

- Crew leader (name/title):
- Crew member (name/title):
- Crew member (name/title):
- Crew member (name/title):
- Crew member (name/title):
- Crew member (name/title):

## Airborne Contaminants:

- Asbestos-containing (Transite) piping (ACP) - Do not disturb (move, drill, cut fracture, etc.)
- Asbestos-containing thermal insulation (ACI) and Asbestos-containing duct wrapping (ACW) - do not disturb, no attic or crawlspace access is allowed if work to be performed could cause exposure to personnel, client or public.

- If yes, list specific tasks and protection in place:

## Weather and Environment

- The site supervisor shall forecast the weather conditions at the job site, prior to crew arrival, in order to mitigate any hazards associated with inclement weather (heat, cold, wind, rain, etc.)
- The site supervisor will utilized a portable wind meter (anemometer) to verify actual onsite wind conditions, by checking at the ground and on any elevated work surface (ex, rooftop) prior to work start, at midday and prior to solar panel staging on a roof.
- Elevated work involving the moving or maneuvering of solar panels shall cease at 25mph (sustained wind) until wind subsides.

- Forecasted weather maximum temp (degrees f):

## Heat Related Illness Prevention

- Employees shall have access to potable drinking water that is fresh, pure, and suitably cool. The water shall be located as close as practicable to the areas where employees are working. Water shall be supplied in sufficient quantity at the beginning of the work shift to provide at least one quart per employee per hour for drinking for the entire shift. Employees may begin the shift with smaller quantities of water if they identify the location and have effective means for replenishment during the shift to allow employees to drink on quart or more per hour. The frequent drinking of water shall be encouraged.
- Shade shall be present when temperature exceeds 80 degrees Fahrenheit. When the outdoor temperature in the work exceeds 80 degrees Fahrenheit, employees shall have and maintain one or more areas with shade at all times.
- New employees must be acclimatized. New employees will be monitored by their Crew Leader (site supervisor) for the first two (2) weeks of employment or longer when necessary.
- Employees will be allowed and encouraged to implement scheduled breaks during each shift. Employees must take cool-down breaks in the shade any time they feel the need to do so to protect them from overheating. Supervisors are REQUIRED to allow employees any break period they need during high heat conditions.
- Cool Vests are encouraged for all employees at all times during periods of high heat.
- Identify the location of the closet Occupational/Industrial Clinic or Hospital in case a crew member becomes ill.

What is the specific plan to provide and replenish sufficient water for all employees on site?

- If offsite replenish is necessary, where will you go to replenish water (location/address):
- Who will replenish the drinking water (name):

## Restroom facilities

- Employees shall have access to restroom facilities with hand-washing stations. Use of onsite restroom is at the client's discretion (location is annotated below). If client does not give permission, location of suitable restroom facilities with hand-washing stations offsite will be provided. The onsite supervisor will identify location and make arrangements to ensure all employees have access at any point.

- Restroom facilities will be (circle one): Onsite - Offsite
- If Offsite, add location name and address:

## Incident Reporting Procedure

- Contact your Site Supervisor
- Name:
- Phone:
- 
- Contact your Manager
- Name:
- Phone:
- 
- Contact your Site Supervisor
- Name:
- Phone:

With: Your full name, phone number, office location, brief description of what happen and when.

## NOTE ADDITIONAL HAZARDS NOT ADDRESSED ABOVE

(add as many as necessary by using additional sheets)

Define the Hazard:	Method/steps to prevent incident:
Define the Hazard:	Method/steps to prevent incident:
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**GREG ALBRIGHT**

**CONTRACTOR LICENSE:**  
 ELECTRICAL CONTRACTOR U.34043

SAFETY PLAN			
JOB NO:	DATE:	DESIGNED BY:	SHEET:
500462	9/19/2024	A.M.	PV-10

FOR INSTALLATION REFERENCE ONLY

SCAN QR CODE TO ACCESS REFERENCE LINK

**FREEDOM REFERENCES**



INSTALL HOTLINE

**PV INSTALLATION REFERENCES**



ENPHASE



SOLAREEDGE



TESLA

**BATTERY INSTALLATION REFERENCES**



Enphase Storage Systems



SOLAREEDGE Storage Systems



TESLA Storage Systems



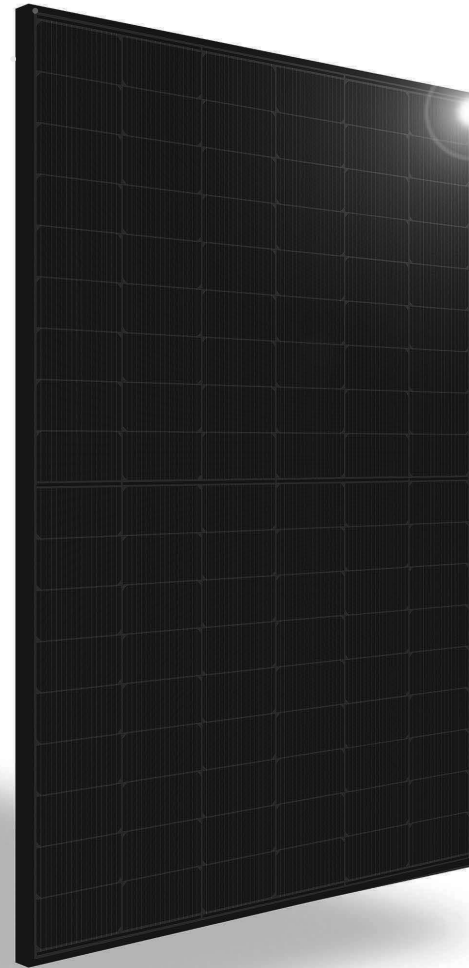
NON-BACKUP Battery Systems



Misc. Quick Guide

# SILFAB PRIME NTC

SIL-430 QD



## INTRODUCING NEXT-GENERATION N-TYPE CELL TECHNOLOGY

- Improved Shade Tolerance
- Improved Low-Light Performance
- Increased Performance in High Temperatures
- Enhanced Durability
- Reduced Degradation Rate
- Industry-Leading Warranty



SILFABSOLAR.COM



ELECTRICAL SPECIFICATIONS		430	
Test Conditions		STC	NOCT
Module Power (Pmax)	Wp	430	321
Maximum power voltage (Vpmax)	V	33.25	31.02
Maximum power current (Ipmax)	A	12.93	10.33
Open circuit voltage (Voc)	V	38.91	36.58
Short circuit current (Isc)	A	13.87	11.15
Module efficiency	%	22.1%	20.6%
Maximum system voltage (VDC)	V		1000
Series fuse rating	A		25
Power Tolerance	Wp		0 to +10

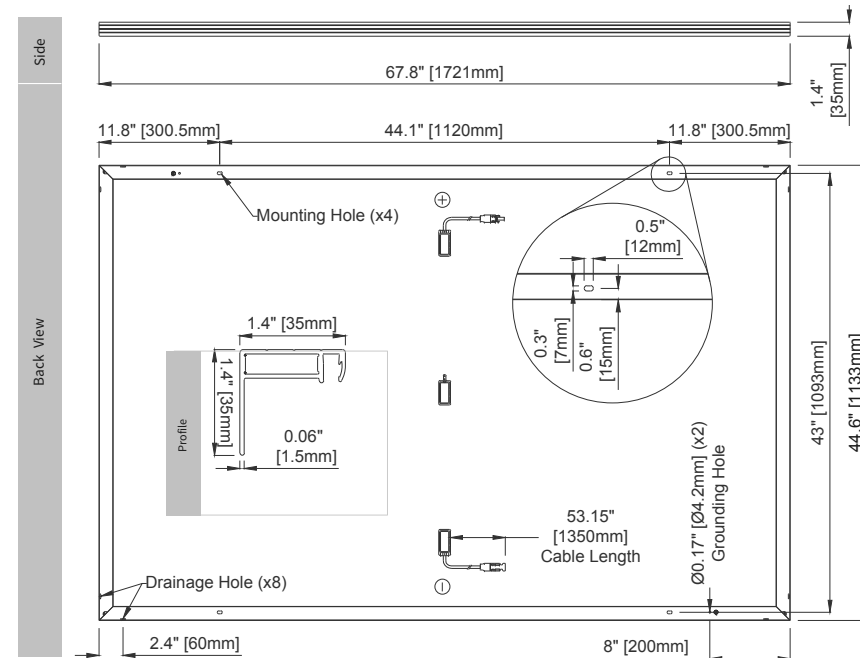
Measurement conditions: STC 1000 W/m<sup>2</sup> • AM 1.5 • Temperature 25 °C • NOCT 800 W/m<sup>2</sup> • AM 1.5 • Measurement uncertainty ≤ 3%  
Sun simulator calibration reference modules from Fraunhofer Institute. Electrical characteristics may vary by ±5% and power by 0 to +10 W.

MECHANICAL PROPERTIES / COMPONENTS	METRIC	IMPERIAL
Module weight	21 kg ± 0.2 kg	46.3 lbs ± 0.4 lbs
Dimensions (H x L x D)	1721 mm x 1133 mm x 35 mm	67.8 in x 44.6 in x 1.37 in
Maximum surface load (wind/snow)*	4000 Pa rear load / 5400 Pa front load	83.5 lb/ft <sup>2</sup> rear load / 112.8 lb/ft <sup>2</sup> front load
Hail impact resistance	ø 25 mm at 83 km/h	ø 1 in at 51.6 mph
Cells	108 Half cells - N-Type Silicon solar cell 182 mm x 91 mm	108 Half cells - N-Type Silicon solar cell 7.16 in x 3.58 in
Glass	3.2 mm high transmittance, tempered, antireflective coating	0.126 in high transmittance, tempered, antireflective coating
Cables and connectors (refer to installation manual)	1350 mm, ø 5.7 mm, MC4 from Staubli	53.1 in, ø 0.22 in (12 AWG), MC4 from Staubli
Backsheet	High durability, superior hydrolysis and UV resistance, multi-layer dielectric film, fluorine-free PV backsheet	
Frame	Anodized aluminum (Black)	
Junction Box	UL 3730 Certified, IEC 62790 Certified, IP68 rated, 3 diodes	

TEMPERATURE RATINGS		WARRANTIES	
Temperature Coefficient Isc	0.04 %/°C	Module product workmanship warranty	25 years**
Temperature Coefficient Voc	-0.24 %/°C	Linear power performance guarantee	30 years
Temperature Coefficient Pmax	-0.29 %/°C		≥ 98% end 1st yr ≥ 94.7% end 12th yr ≥ 90.8% end 25th yr ≥ 89.3% end 30th yr
NOCT (± 2 °C)	45 °C		
Operating temperature	-40/+85 °C		

CERTIFICATIONS		SHIPPING SPECS	
Product	UL 61215, UL 61730, CSA C22.2#61730, IEC 61215, IEC 61730, IEC 61701 (Salt Mist Corrosion), IEC 62716 (Ammonia Corrosion), CEC Listed, UL Fire Rating: Type 2	Modules Per Pallet:	26 or 26 (California)
Factory	ISO9001:2015	Pallets Per Truck	32 or 30 (California)
		Modules Per Truck	832 or 780 (California)

\* ⚠ Warning. Read the Safety and Installation Manual for mounting specifications and before handling, installing and operating modules.  
\*\* 12 year extendable to 25 years subject to registration and conditions outlined under "Warranty" at silfabsolar.com.  
PAN files generated from 3rd party performance data are available for download at: silfabsolar.com/downloads.



### SILFAB SOLAR INC.

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Mississauga ON L5T 2Y3 Canada  
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# IQ8 and IQ8+ Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, software defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. The brain of the semiconductor-based microinverter is our proprietary application specific integrated circuit (ASIC) which enables the microinverter to operate in grid-tied or off-grid modes. This chip is built in advanced 55nm technology with high speed digital logic and has superfast response times to changing loads and grid events, alleviating constraints on battery sizing for home energy systems.



Part of the Enphase Energy System, IQ8 Series Microinverters integrate with the IQ Battery, IQ Gateway, and the Enphase App monitoring and analysis software.



IQ8 Series Microinverters redefine reliability standards with more than one million cumulative hours of power-on testing, enabling an industry-leading limited warranty of up to 25 years.



Connect PV modules quickly and easily to the IQ8 Series Microinverters that has integrated MC4 connectors.



IQ8 Series Microinverters are UL listed as PV Rapid Shutdown Equipment and conform with various regulations, when installed according to manufacturer's instructions.

### Easy to install

- Lightweight and compact with plug-n-play connectors
- Power Line Communication (PLC) between components
- Faster installation with simple two-wire cabling

### High productivity and reliability

- Produce power even when the grid is down\*
- More than one million cumulative hours of testing
- Class II double-insulated enclosure
- Optimized for the latest high-powered PV modules

### Microgrid-forming

- Complies with the latest advanced grid support\*\*
- Remote automatic updates for the latest grid requirements
- Configurable to support a wide range of grid profiles
- Meets CA Rule 21 (UL 1741-SA) and IEEE 1547:2018 (UL 1741-SB 3<sup>rd</sup> Ed.)

### Note:

IQ8 Microinverters cannot be mixed together with previous generations of Enphase microinverters (IQ7 Series, IQ6 Series, etc) in the same system.

# IQ8 and IQ8+ Microinverters

INPUT DATA (DC)		IQ8-60-M-US	IQ8PLUS-72-M-US
Commonly used module pairings <sup>1</sup>	W	235 – 350	235 – 440
Module compatibility		60-cell / 120 half-cell	54-cell / 108 half-cell, 60-cell / 120 half-cell, 66-cell / 132 half-cell and 72-cell / 144 half-cell
MPPT voltage range	V	27 – 37	27 – 45
Operating range	V	16 – 48	16 – 58
Min. / Max. start voltage	V	22 / 48	22 / 58
Max. input DC voltage	V	50	60
Max. continuous input DC current	A	10	12
Max. input DC short-circuit current	A		25
Max. module I <sub>sc</sub>	A		20
Overvoltage class DC port			II
DC port backfeed current	mA		0
PV array configuration		1 x 1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	

OUTPUT DATA (AC)		IQ8-60-M-US	IQ8PLUS-72-M-US
Peak output power	VA	245	300
Max. continuous output power	VA	240	290
Nominal (L-L) voltage / range <sup>2</sup>	V		240 / 211 – 264
Max. continuous output current	A	1.0	1.21
Nominal frequency	Hz		60
Extended frequency range	Hz		47 – 68
AC short circuit fault current over 3 cycles	Arms		2
Max. units per 20 A (L-L) branch circuit <sup>3</sup>		16	13
Total harmonic distortion			<5%
Overvoltage class AC port			III
AC port backfeed current	mA		30
Power factor setting			1.0
Grid-tied power factor (adjustable)			0.85 leading – 0.85 lagging
Peak efficiency	%		97.7
CEC weighted efficiency	%		97
Night-time power consumption	mW		60

MECHANICAL DATA	
Ambient temperature range	-40°C to +60°C (-40°F to +140°F)
Relative humidity range	4% to 100% (condensing)
DC Connector type	Stäubli MC4
Dimensions (H x W x D)	212 mm (8.3") x 175 mm (6.9") x 30.2 mm (1.2")
Weight	1.1 kg (2.43 lbs)
Cooling	Natural convection – no fans
Approved for wet locations	Yes
Pollution degree	PD3
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure
Environ. category / UV exposure rating	NEMA Type 6 / outdoor

COMPLIANCE	
Certifications	CA Rule 21 (UL 1741-SA), UL 62109-1, IEEE 1547:2018 (UL 1741-SB 3 <sup>rd</sup> Ed.), FCC Part 15 Class B, ICES-0003 Class B, CAN / CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shutdown Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.

(1) Pairing PV modules with wattage above the limit may result in additional clipping losses. See the compatibility calculator at <https://link.enphase.com/module-compatibility>. (2) Nominal voltage range can be extended beyond nominal if required by the utility. (3) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.



# IQ Combiner 4/4C



X-IQ-AM1-240-4C  
X2-IQ-AM1-240-4C (IEEE 1547:2018)

X-IQ-AM1-240-4  
X2-IQ-AM1-240-4 (IEEE 1547:2018)

The **IQ Combiner 4/4C** with IQ Gateway and integrated LTE-M1 cell modem (included only with IQ Combiner 4C) consolidates interconnection equipment into a single enclosure. It streamlines IQ Microinverters and storage installations by providing a consistent, pre-wired solution for residential applications. It offers up to four 2-pole input circuits and Eaton BR series busbar assembly.

## Smart

- Includes IQ Gateway for communication and control
- Includes Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), included only with IQ Combiner 4C
- Includes solar shield to match Enphase IQ Battery aesthetics and deflect heat
- Supports Wi-Fi, Ethernet, or cellular connectivity
- Optional AC receptacle available for PLC bridge
- Provides production metering and consumption monitoring

## Simple

- Mounts on single stud with centered brackets
- Supports bottom, back and side conduit entry
- Allows up to four 2-pole branch circuits for 240VAC plug-in breakers (not included)
- 80A total PV or storage branch circuits

## Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year limited warranty
- Two years labor reimbursement program coverage included for both the IQ Combiner SKU's
- UL listed
- X2-IQ-AM1-240-4 and X2-IQ-AM1-240-4C comply with IEEE 1547:2018 (UL 1741-SB, 3<sup>rd</sup> Ed.)

# IQ Combiner 4/4C

MODEL NUMBER	
IQ Combiner 4 X-IQ-AM1-240-4 X2-IQ-AM1-240-4 (IEEE 1547:2018)	IQ Combiner 4 with IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 ± 0.5%) and consumption monitoring (± 2.5%). Includes a silver solar shield to match the IQ Battery and IQ System Controller 2 and to deflect heat.
IQ Combiner 4C X-IQ-AM1-240-4C X2-IQ-AM1-240-4C (IEEE 1547:2018)	IQ Combiner 4C with IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 ± 0.5%) and consumption monitoring (± 2.5%). Includes Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), a plug-and-play industrial-grade cell modem for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.) Includes a silver solar shield to match the IQ Battery and IQ System Controller and to deflect heat.
ACCESSORIES AND REPLACEMENT PARTS (not included, order separately)	
Supported microinverters	IQ6, IQ7, and IQ8. (Do not mix IQ6/7 Microinverters with IQ8)
Communications Kit COMMS-CELLMODEM-M1-06 CELLMODEM-M1-06-SP-05 CELLMODEM-M1-06-AT-05	- Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with 5-year Sprint data plan - 4G based LTE-M1 cellular modem with 5-year Sprint data plan - 4G based LTE-M1 cellular modem with 5-year AT&T data plan
Circuit Breakers BRK-10A-2-240V BRK-15A-2-240V BRK-20A-2P-240V BRK-15A-2P-240V-B BRK-20A-2P-240V-B	Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers. Circuit breaker, 2 pole, 10A, Eaton BR210 Circuit breaker, 2 pole, 15A, Eaton BR215 Circuit breaker, 2 pole, 20A, Eaton BR220 Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support Circuit breaker, 2 pole, 20A, Eaton BR220B with hold down kit support
XA-SOLARSHIELD-ES	Replacement solar shield for IQ Combiner 4/4C
XA-PLUG-120-3	Accessory receptacle for Power Line Carrier in IQ Combiner 4/4C (required for EPLC-01)
X-IQ-NA-HD-125A	Hold-down kit for Eaton circuit breaker with screws
Consumption monitoring CT (CT-200-SPLIT/CT-200-CLAMP)	A pair of 200A split core current transformers
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	120/240VAC, 60 Hz
Eaton BR series busbar rating	125A
Max. continuous current rating	65A
Max. continuous current rating (input from PV/storage)	64A
Max. fuse/circuit rating (output)	90A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. total branch circuit breaker rating (input)	80A of distributed generation/95A with IQ Gateway breaker included
IQ Gateway breaker	10A or 15A rating GE/Siemens/Eaton included
Production metering CT	200A solid core pre-installed and wired to IQ Gateway
MECHANICAL DATA	
Dimensions (WxHxD)	37.5 cm x 49.5 cm x 16.8 cm (14.75 in x 19.5 in x 6.63 in). Height is 53.5 cm (21.06 in) with mounting brackets.
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40°C to +46°C (-40°F to 115°F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	• 20A to 50A breaker inputs: 14 to 4 AWG copper conductors • 60A breaker branch input: 4 to 1/0 AWG copper conductors • Main lug combined output: 10 to 2/0 AWG copper conductors • Neutral and ground: 14 to 1/0 copper conductors • Always follow local code requirements for conductor sizing.
Altitude	Up to 3,000 meters (9,842 feet)
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	IEEE 802.11b/g/n
Cellular	CELLMODEM-M1-06-SP-05, CELLMODEM-M1-06-AT-05 (4G based LTE-M1 cellular modem). Note that an Mobile Connect cellular modem is required for all Enphase Energy System installations.
Ethernet	Optional, IEEE 802.3, Cat5E (or Cat6) UTP Ethernet cable (not included)
COMPLIANCE	
Compliance, IQ Combiner	CA Rule 21 (UL 1741-SA) IEEE 1547:2018 - UL 1741-SB, 3 <sup>rd</sup> Ed. (X2-IQ-AM1-240-4 and X2-IQ-AM1-240-4C) CAN/CSA C22.2 No. 107.1, Title 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production) Consumption metering: accuracy class 2.5
Compliance, IQ Gateway	UL 60601-1/CANCSA 22.2 No. 61010-1



To learn more about Enphase offerings, visit [enphase.com](http://enphase.com)  
IQ-C-4-4C-DS-0103-EN-US-12-29-2022



## Product specifications

# Eaton DG221URB

Catalog Number: DG221URB

Eaton General duty non-fusible safety switch, single-throw, 30 A, 240 V, NEMA 3R, Rainproof, Painted galvanized steel, Two-pole, Two-wire

## General specifications

Product Name	Catalog Number
Eaton general duty non-fusible safety switch	DG221URB
	UPC
	782113120232
Product Length/Depth	Product Height
6.88 in	10.81 in
Product Width	Product Weight
6.38 in	6 lb
Warranty	Certifications
Eaton Selling Policy 25-000, one (1) year from the date of installation of the Product or eighteen (18) months from the date of shipment of the Product, whichever occurs first.	UL Listed
	Catalog Notes
	WARNING! Switch is not approved for service entrance unless a neutral kit is installed.



## Product specifications

Product Category
General duty safety switch
Enclosure material
Painted galvanized steel
Type
Non-fusible, single-throw
Fuse configuration
Non-fusible
Number of wires
2
Enclosure
NEMA 3R
Voltage rating
240V
Amperage Rating
30A
Number Of Poles
Two-pole

## Resources

Catalogs
Eaton's Volume 2—Commercial Distribution
Multimedia
Double Up on Safety
Switching Devices Flex Center
Specifications and datasheets
Eaton Specification Sheet - DG221URB



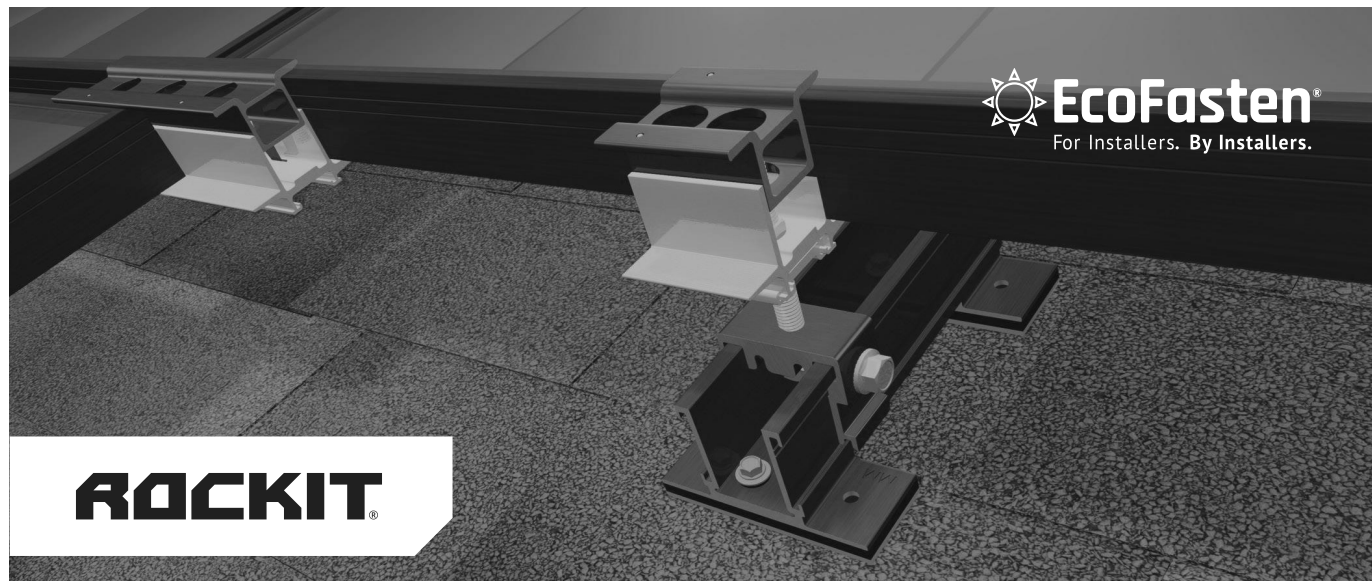
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Dublin 4, Ireland  
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**ROCKIT**

## INTRODUCING ROCKIT SMART SLIDE!

Introducing EcoFasten’s patent pending RockIt Smart Slide, our simple solution for quickly installing the popular RockIt rail-less racking system to composition shingle roofs.

### Features & Benefits

- Eliminates the need to pry up shingle courses and install a metal flashing
- Multiple opportunities to find the rafter
- No need for additional material when architectural shingles are not level
- Longer 6.75” slide avoids overlaps in shingle courses
- Integrated flashing utilizes UltraGrip Technology™ to create a watertight seal



ROCKIT SMART SLIDE

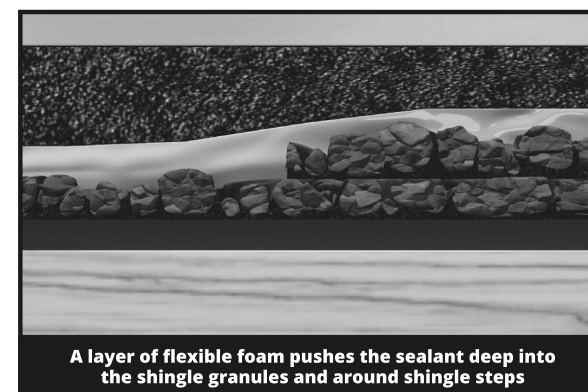
### Required Components:

Part Number:	Description:
2011024	RI SMART SLIDE BLK 6.75"
2011025	RI SMART SCRW #12X3" W/BW

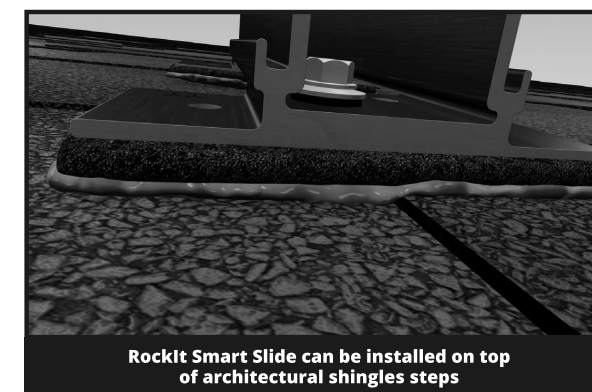
# ROCKIT SMART SLIDE

## Integrated UltraGrip Technology™

Pre-installed sealing pads are compatible with all composition shingle roofs. The compression achieved when fastened to the roof creates a super strong watertight seal. In most cases, the slide can be mounted to the deck without the need for sealant. A layer of flexible foam provides cushioning, which allows the waterproofing sealant to embed deep into the granules of the shingle as well as to flexibly conform over the steps found on architectural-style shingles.



A layer of flexible foam pushes the sealant deep into the shingle granules and around shingle steps



RockIt Smart Slide can be installed on top of architectural shingles steps

## Testing & Documentation

- [UL441 Rain Report](#)
- [TAS 100 \(A\)-95 Wind and Wind Driven Rain Resistance](#)
- [Mechanical Load Test/Structural Capacity Certification](#)
- [Florida Product Approval](#)
- [RockIt Installation Manual](#)
- [RockIt CutSheets](#)



# RI SMART SLIDE BLK 6.75"

PART NUMBER	DESCRIPTION
2011024	RI SMART SLIDE BLK 6.75"

ITEM NO.	DESCRIPTION
1	ROCKIT SMART SLIDE ASSEMBLY

1) ROCKIT FLASHLESS SLIDE ASSEMBLY

MATERIAL	DESCRIPTION
ALUMINUM, EPDM, ADHESIVE, TREATED PAPER	
FINISH	DESCRIPTION
BLACK	

Rev: CS-3

# RI SMART SCREW #12X3" W/BW

PART NUMBER	DESCRIPTION
2011025	RI SMART SCREW #12X3" W/BW

ITEM NO.	DESCRIPTION
1	SELF TAPPING SCREW #12 WITH SEALING WASHER ASSEMBLY

MATERIAL	DESCRIPTION
STAINLESS STEEL, EPDM RUBBER	
FINISH	DESCRIPTION
MILL, BLACK	

Rev: CS-2



## ROCKIT®

### COMPLETE RAIL-LESS RACKING SYSTEM

The RockIt system is the industry's premier rail-less PV racking system for composition shingle, tile, and metal roofs. Designed in conjunction with the needs of installers, RockIt quickly & easily installs with a single tool. Featuring an easy-to-position alignment slide and a top-down leveling system, RockIt is logistically intelligent with no need to ship or transport long rails. Components are available in a black finish that complements both commercial and residential applications. Conforms to UL 2703.

### FEATURES & BENEFITS

- Patented watertight technology
- Fully integrated bonding
- Top-down leveling system
- North-South adjustability
- Single tool install
- Florida Product Approved for composition shingle roofs

### STREAMLINED INSTALLATION WITH MINIMAL ROOF PENETRATIONS



## ROCKIT

### ROCKIT COUPLING

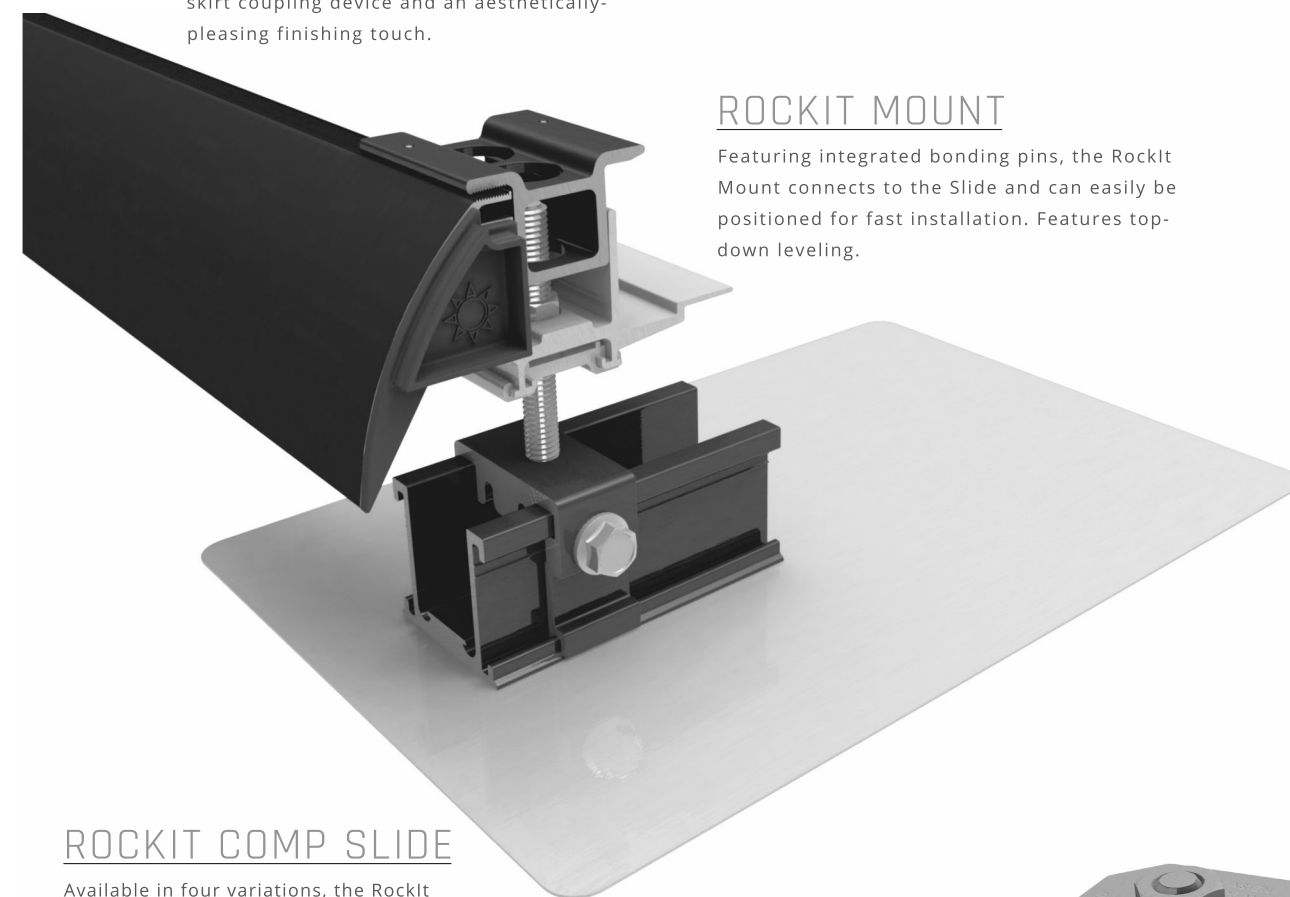
The fast installing RockIt Coupling easily attaches to the module frame to bridge the gaps between modules.

### SKIRT

The sleek black Skirt installs first and acts as an alignment guide for the entire array. The Skirt End Cap does double duty as a skirt coupling device and an aesthetically-pleasing finishing touch.

### ROCKIT MOUNT

Featuring integrated bonding pins, the RockIt Mount connects to the Slide and can easily be positioned for fast installation. Features top-down leveling.

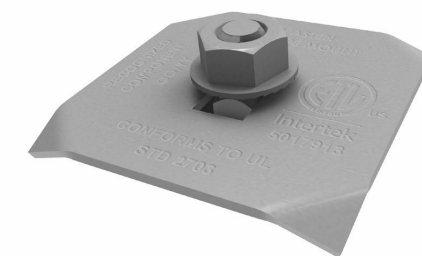


### ROCKIT COMP SLIDE

Available in four variations, the RockIt Slide allows installation on composition shingle, tile, and metal roofs.

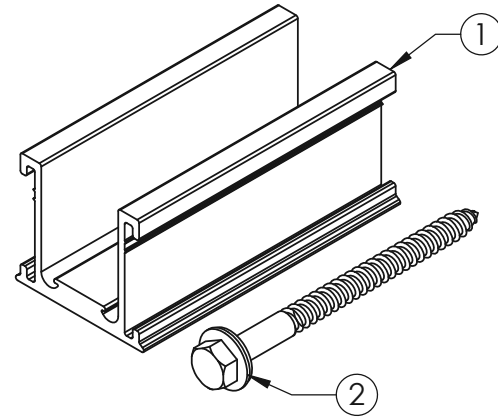
### FRAME MLPE MOUNT

Attaches and fully bonds MLPE's (Module Level Power Electronics) to the module frame with a single bolt clip.



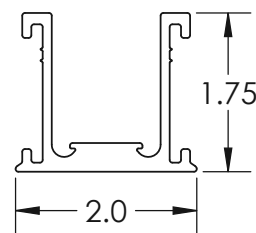
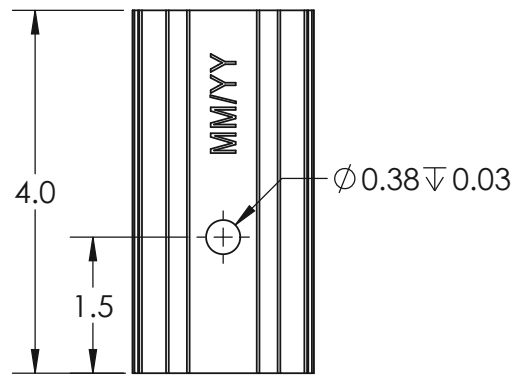
# RI COMP SLIDE AL BLK

PART NUMBER	DESCRIPTION
2011013	RI COMP SLIDE AL BLK



ITEM NO.	DESCRIPTION
1	ROCKIT V3 SLIDECOMP
2	LAG SCREW, 5/16-4", THREAD 3", EPDM BACKED WASHER

1) ROCKIT V3 SLIDECOMP

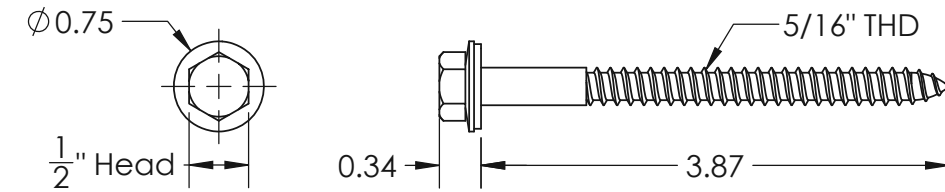


Material	Aluminum
Finish	Black

REV.- CS1

# RI COMP SLIDE AL BLK

2) LAG SCREW, 5/16-4", THREAD 3", EPDM BACKED WASHER

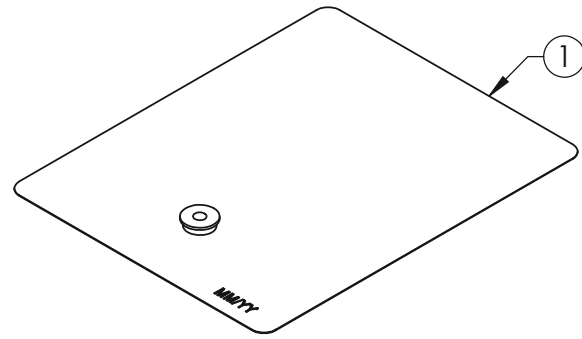


Material	Stainless Steel
Finish	Mill

REV.- CS1

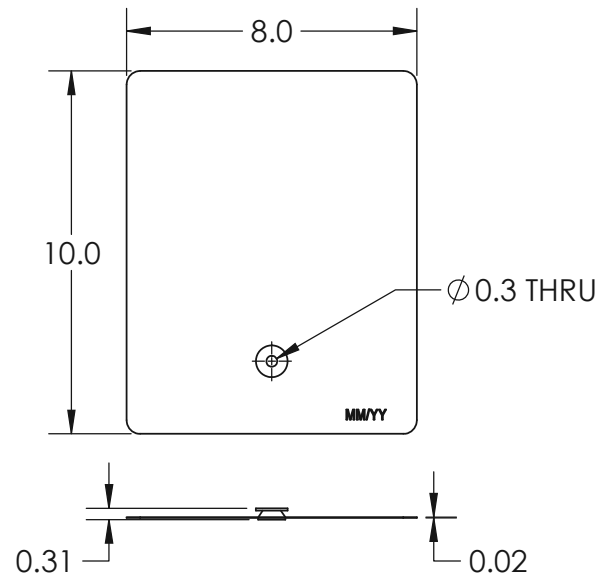
# GF-1 FLASHING GLV BLK 8X10"

PART NUMBER	DESCRIPTION
3012020	GF-1 FLASHING GLV BLK 8X10"



ITEM NO.	DESCRIPTION
1	GF1M-GAL-BLK-810 W/O WASHER ASSEMBLY

1) GF1M-GAL-BLK-810 W/O WASHER ASSEMBLY



Material	Corrosion Resistant Steel
Finish	Black

REV.- CS1





ECOFASTEN SOLAR LLC  
4141 W. VAN BUREN ST., SUITE 2  
PHOENIX, AZ 85009

877-859-3947  
INFO@ECOFASTENSOLAR.COM

April 8<sup>th</sup>, 2024

EcoFasten  
4141 West Van Buren St.  
Phoenix, AZ 85009

Attn.: EcoFasten Solar Engineering Department

**Re:** Report # 7.16-RockIt\_CS-SS EcoFasten RockIt System, with Comp Slide or Smart Slide,  
Certification for Gable and Hip roofs.

This letter certifies the loading criteria and design basis used for the structural analysis of the EcoFasten - RockIt System as shown in Report # 7.16-RockIt\_CS-SS "Engineering Certification for the EcoFasten - RockIt System with Comp or Smart Slide for Gable and Hip Roofs". All information, data, and analysis therein are based on, and comply with, the following building codes and typical specifications. The Span Tables provided in the referenced report may be used when all assumptions listed therein are met.

Building Codes:

1. ASCE/SEI 7-16, Minimum Design Loads for Buildings and Other Structures, by American Society of Civil Engineers
2. 2021 International Building Code (IBC)
3. 2021 International Residential Code (IRC)
4. SEAOC (Structural Engineer Association of California) report PV2-2017 Wind Design for Solar Arrays
5. AC428, Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012 by ICC-ES
6. Aluminum Design Manual 2020, by The Aluminum Association, Inc.
7. ANSI/AWC NDS-2018, National Design Specification for Wood Construction, by the American Wood Council

Please note our evaluation only applies to EcoFasten products and excludes the structural adequacy of the chosen roof attachments, PV modules, or underlying roof supporting members. It shall be the responsibility of the installer or system designer to verify the structural capacity and adequacy of the referenced system components with respect to the applied or resultant loads of the chosen array configuration.

Sincerely,



Matthew S Kuzila, P.E.

Sealed 04.08.2024  
Expires 12.31.2024