NEC Standard Load Calculation for Single Family Dwellings

For Service Ratings of 120/240V, 200A Max

Address: 238 ANGEL OAK DR, BUNNLEVEL, NC 28323 **Owner:** **KRISTEN KENYON**

General Lighting/Power Load				
	Total square footage of building	1588	1	1588
	Kitchen appliance Branch Circuits (min 2)	2	1500	3000
	Laundry Circuit (min 1)	1	1500	1500
Appliances & Equipment Except Air conditioner(s) use rating label or 80% of dedicated breaker				
	Description of Load	**QTY**	**(Watts) Volt-Amps Used**	
	RANGE	1	7680	7680
	SUB PANEL	1	19200	19200
	Dish Washer	0	0	0
	Disposal	0		0
	Electric Oven	0		0
	Electric Range	0		0
	Induction Range	0		0
	Electric Clothes Dryer	0		0
	Electric Clothes Washer	0		0
	Electric Tankless Water Heater	1	11520	11520
	Electric Water Heater	0		0
	Pool or Spa	0		0
	Evaporator Cooler	0		0
	other	0		0
	other	0		0
	other	0		0
	other	0		0
	other	0		0
	other	0		0
Required in some states (Cal) on New Homes				
	Electric Vehicle Supply Equipment (EVSE)	0	0	0
			TOTAL EVERYTHING	44488
			-10,000	34488
			NUMBER ABOVE (BALANCE) X 0.40	13795.2
			PLUS 10,000	10000
			SUB TOTAL BEFORE HVAC	23795.2
HEATING AND AIR-CONDITIONING (INCLUDE THE LARGEST OF THE FOLLOWING):				
			AC & COOLING (100% NAMEPLATE) =	4800
			HEATING (100% NP)=	9600
			HEAT PUMP W/ SUPP. ELEC HEAT (100%NP + 65%)	0
			ELEC SPACE HEAT, 4 SEPARATE UNITS (65% NP)	0
			ELEC SPACE HEAT, > 4 UNITS (40% NP =)	0
			ELEC THERMAL STORAGE & OTHER 100% NP =	0
			SUB TOTAL LARGEST HVAC	9600
			GRAND TOTAL	**33395.2**
			TOTAL DIVIDED BY 240V =	139.15
			TOTAL MINIMUM SIZE (AMPS) REQUIRED FOR MAIN SERVICE DISCONNECT =	**139.15**
			RATING OF EXISTING/PROPOSED ELECTRICAL SERVICE MAIN BREAKER (AMPS) =	175
			LOAD CALC PASS/FAIL?	PASS

ROOF MOUNT SOLAR PERMIT PACKAGE
KRISTEN KENYON
10.800KW DC GRID TIED PHOTOVOLTAIC SYSTEM
238 ANGEL OAK DR, BUNNLEVEL, NC 28323

BUILDING INFORMATION

1 STORY HOUSE	SINGLE FAMILY RESIDENCE
CONSTRUCTION TYPE: V-B	OCCUPANCY: R3/U
ROOF: COMP SHINGLE	APN: 01053608 0028 33

PV SYSTEM SUMMARY:

SYSTEM SIZE (DC)	:	STC: 400 x 27 = 10.800kW DC
	:	PTC: 372.3 x 27 = 10.0521kW DC
SYSTEM SIZE (AC)	:	7.830kW AC @ 240V
MODULES	:	(27) FREEDOM FOREVER: FF-MP-BBB-400
MICRO-INVERTERS	:	ENPHASE: IQ8PLUS-72-2-US
MICRO-INVERTERS QTY	:	27
TILT	:	25°, 25°
AZIMUTH	:	132°, 222°
ROOF	:	COMP SHINGLE
RAFTER/TRUSS SIZE	:	2" X 6" TRUSS @ 24" O.C.
ATTACHMENT TYPE	:	ECOFASTEN ROCKIT SMART SLIDE RAILLESS
MAIN SERVICE PANEL	:	EXISTING 200 AMPS MSP WITH NEW 175 AMPS MAIN BREAKER ON TOP FED
INTERCONNECTION	:	PV BREAKER
OCPD RATING	:	50 AMPS
UTILITY	:	SOUTH RIVER EMC

NOTICE TO CONTRACTOR
All construction must comply with current NC Building Codes and is subject to field inspection and verification.
APPROVED
Limited building only review
Permit holder responsible for full compliance with the code
03/28/2023
Harnett COUNTY NORTH CAROLINA

GENERAL NOTES:

1. LOCAL UTILITY PROVIDER SHALL BE NOTIFIED PRIOR TO USE AND ACTIVATION OF ANY SOLAR PHOTOVOLTAIC INSTALLATION ·
2. THIS PROJECT SHALL COMPLY WITH LOCAL ORDINANCES ·
3. PROPER ACCESS AND WORKING CLEARANCE WILL BE PROVIDED ·
4. ALL ELECTRICAL WORK SHOWN ON THESE PLANS WILL BE COMPLETED BY THE UNDERSIGNED ·
5. ALL APPLICABLE PV EQUIPMENT LISTED AND COMPLIANT WITH UL2703, UL1741 AND UL1703
6. ALL ROOF PENETRATIONS TO BE SEALED WITH A HIGH PERFORMANCE ROOF SEALANT SUCH AS GeoCel 2300 CLEAR SEALANT ·
7. THE SYSTEM WILL NOT BE INTERCONNECTED UNTIL APPROVAL FROM THE LOCAL JURISDICTION AND THE UTILITY IS OBTAINED ·
8. THE SOLAR PHOTOVOLTAIC INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS ·
9. IF THE EXISTING MAIN PANEL DOES NOT HAVE VERIFIABLE GROUNDING ELECTRODE, IT IS THE NECESSARY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE ·
10. EACH MODULE WILL BE GROUNDED UL 2703 OR UL 1703 APPROVED USING THE SUPPLIED CONNECTION POINTS IDENTIFIED ON THE MODULE AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS" ·
11. A LADDER SHALL BE IN PLACE FOR THE INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS ·
12. MAX HEIGHT OF MODULES OFF OF ROOF FACE : <6" ·
13. PHOTOVOLTAIC SYSTEM WILL COMPLY WITH 2017 NEC. ·
14. PHOTOVOLTAIC SYSTEM INVERTER IS UNGROUNDED. NO CONDUCTORS ARE SOLIDLY GROUNDED IN THE INVERTER, AND SYSTEM COMPLIES WITH 690.35. ·
15. MODULES CONFORM TO AND ARE LISTED UNDER UL 1703. ·
16. INVERTER CONFORMS TO AND IS LISTED UNDER UL 1741. ·
17. ELECTRICAL EQUIPMENT AND MATERIAL TO BE LISTED, LABELED, AND INSTALLED PER THE NEC, THE INSTALLATION STANDARDS/MANUFACTURER'S RECOMMENDATIONS AND IF REQUIRED A RECOGNIZED ELECTRICAL TESTING LABORATORY. ·
18. CONDUITS EXPOSED TO SUNLIGHT ON ROOF SHALL BE LOCATED NOT LESS THAN 7/8" ABOVE ROOF SURFACE.
19. IN EXPOSED LOCATIONS, WIRING AND CABLING SHALL BE IN CONDUIT OR CABLE SHALL BE RATED FOR EXPOSURE; TYPE NM CABLE ALLOWED IN PROTECTED LOCATIONS. WITHIN ATTIC SPACES, ALLOWED TO RUN TYPE NM (ROMEX) 10/3 OR 12/3 CONDUCTORS THROUGH OPEN SPACE OR TYPE THHN IN MINIMUM 3/4" ALUMINUM CONDUIT
20. MATERIALS, EQUIPMENT AND INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS, STANDARDS, RULES AND REGULATIONS OF THE FOLLOWING AND BE MOST SUITABLE TO THE PURPOSE INTENDED:

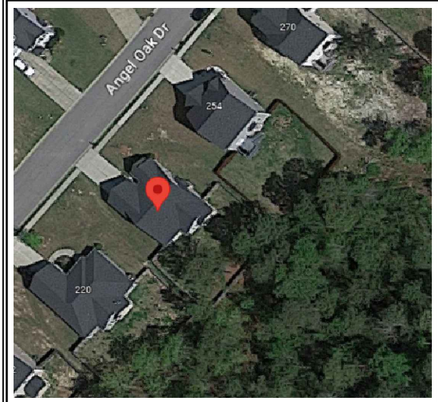
CODE INFORMATION

THE INSTALLATION OF SOLAR ARRAYS AND PHOTOVOLTAIC POWER SYSTEMS SHALL COMPLY WITH THE FOLLOWING CODES:

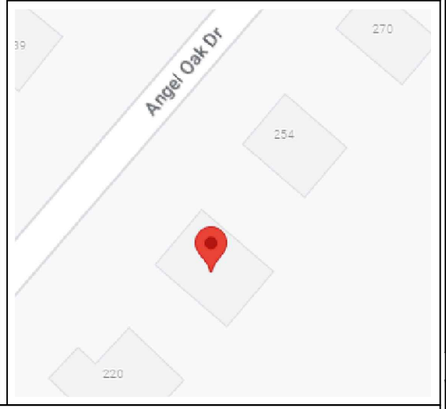
2018 NORTH CAROLINA BUILDING CODE
2018 NORTH CAROLINA RESIDENTIAL CODE
2018 NORTH CAROLINA PLUMBING CODE
2018 NORTH CAROLINA MECHANICAL CODE
2018 NORTH CAROLINA FUEL GAS CODE
2017 NATIONAL ELECTRICAL CODE

AHJ: HARNETT COUNTY

AERIAL VIEW



VICINITY VIEW



SHEET INDEX

Current Renewables Engineering

CURRENT RENEWABLES ENGINEERING INC.
1760 CHICAGO AVE SUITE
J-13, RIVERSIDE CA 92507
PHONE: (951)-405-1733
WWW.CRENG.CO

CONTRACTOR INFO

freedom FOREVER

GREG ALBRIGHT

FREEDOM FOREVER NORTH CAROLINA LLC

2626 GLENWOOD AVE STE 550
RALEIGH,27608

NC,UNITED STATES
ELECTRICAL CONTRACTOR U.34043
GENERAL CONTRACTOR 84951

Solar Individual Permit Package

KRISTEN KENYON

10.800KW Grid Tied Photovoltaic System

238 ANGEL OAK DR, BUNNLEVEL, NC 28323

Rev	Description	Date
A	INITIAL DESIGN	2/25/2023

OPPORTUNITY	KRISTEN KENYON
PROJECT #	296198
DATE DRAWN	2/25/2023
DRAWN BY	E.R
SHEET #	PV-1.0

TITLE

COVER PAGE

R324.6.1 PATHWAYS:
NOT LESS THAN TWO MINIMUM 36-INCH WIDE PATHWAYS ON SEPARATE ROOF PLANES,
FROM LOWEST ROOF EDGE TO RIDGE, SHALL BE PROVIDED ON ALL BUILDINGS.
AT LEAST ONE PATHWAY SHALL BE PROVIDED ON THE STREET OR DRIVEWAY SIDE OF THE ROOF.
FOR EACH ROOF PLANE WITH A PHOTOVOLTAIC ARRAY,A MINIMUM 36 INCH-WIDE PATHWAY FROM THE LOWEST ROOF EDGE TO RIDGE SHALL BE PROVIDED ON THE SAME ROOF PLANE OR STRADDLING THE SAME AND ADJACENT ROOF PLANES.PATHWAYS SHALL BE OVER AREAS CAPABLE OF SUPPORTING FIRE FIGHTERS ACCESSING THE ROOF.PATHWAYS SHALL BE LOCATED IN AREAS WITH MINIMAL OBSTRUCTIONS SUCH AS VENT PIPES,CONDUIT , OR MECHANICAL EQUIPMENT.

R324.6.2 SETBACK AT RIDGE:
FOR PHOTOVOLTAIC ARRAYS OCCUPYING NOT MORE THAN 33 PERCENT OF THE PLAN VIEW TOTAL ROOF AREA,NOT LESS THAN AN 18 INCH CLEAR SET BACK IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE.
FOR PHOTOVOLTAIC ARRAYS OCCUPYING MORE THAN 33 PERCENT OF THE PLAN VIEW TOTAL ROOF AREA,NOT LESS THAN A 36-INCH CLEAR SET BACK IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE.

R324.6.4 EMERGENCY ESCAPE AND RESCUE OPENING: PANELS AND MODULES INSTALLED ON DWELLINGS SHALL NOT BE PLACED THE PORTION OF A ROOF THAT IS BELOW AN EMERGENCY ESCAPE AND RESCUE OPENING. A 36-INCH-WIDE PATHWAY SHALL BE PROVIDED TO THE EMERGENCY ESCAPE AND RESCUE OPENING.

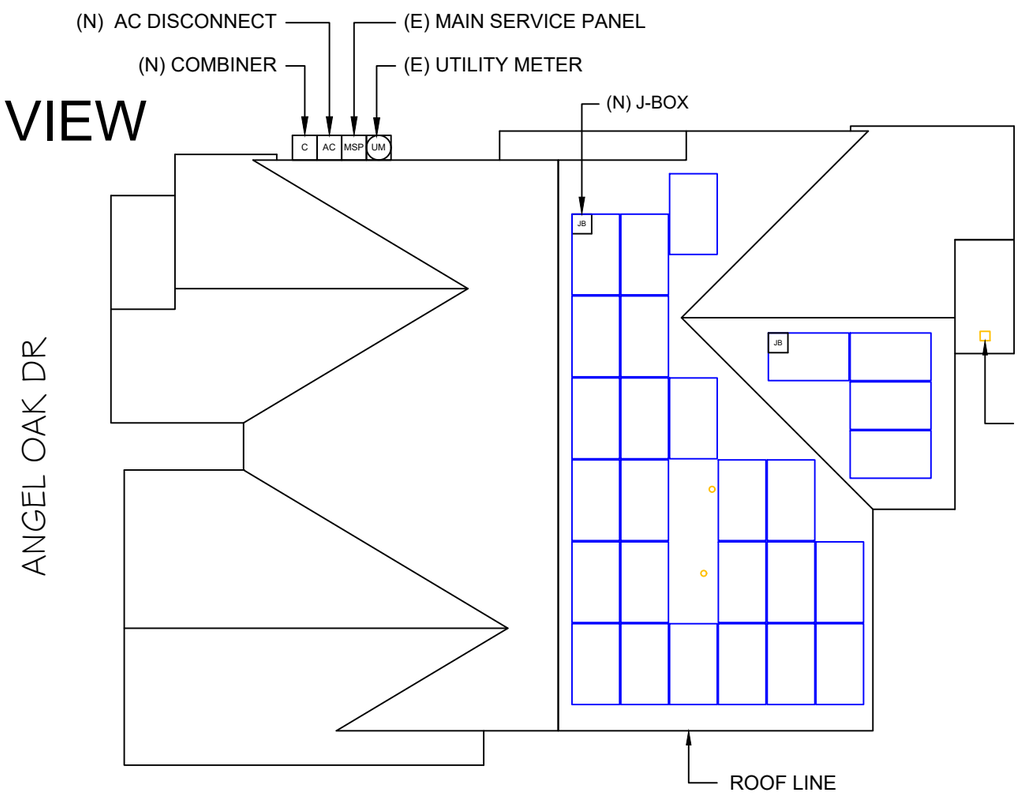
A - PATHWAY ON STREET OR DRIVEWAY SIDE OF ROOF
B - FIRE ACCESS POINT

36" ACCESS PATHWAYS

18" ACCESS PATHWAYS

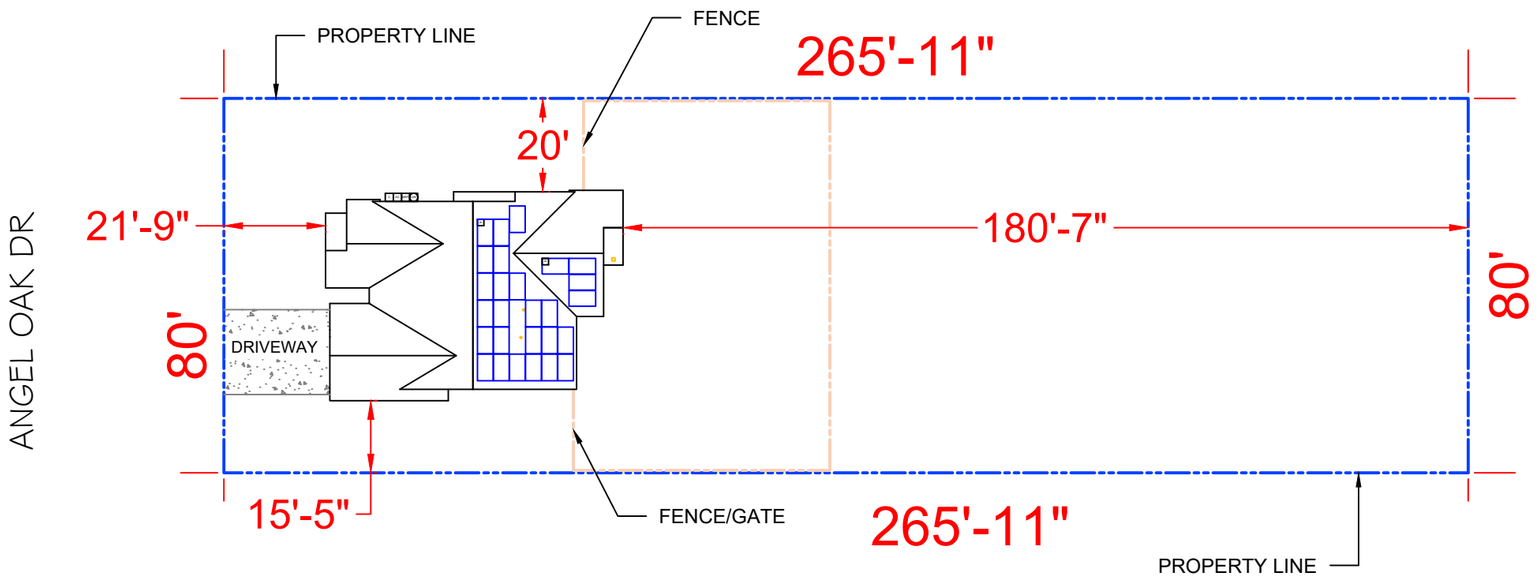
NOTES:
1. MINOR FIELD ADJUSTMENTS ALLOWED BASED ON ACTUAL SITE CONDITION AND MEASUREMENTS.
2. CONDUIT SHALL BE PAINTED TO MACH EXTERIOR WALL.
3. THE 30 SECOND SHUTDOWN REQUIREMENT IS INCORPORATED INTO THE 2017 NEC AND UL STANDARD 1741.
4. 4. EXISTING ROOF VENT SHOULD NOT BE COVERED.

ENLARGE VIEW



LEGEND

UM	UTILITY METER
MSP	MAIN SERVICE PANEL
AC	AC DISCONNECT
C	COMBINER
JB	JUNCTION BOX
	MODULE
	ROOF OBSTRUCTIONS



1 SITE PLAN

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

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GENERAL CONTRACTOR 84951

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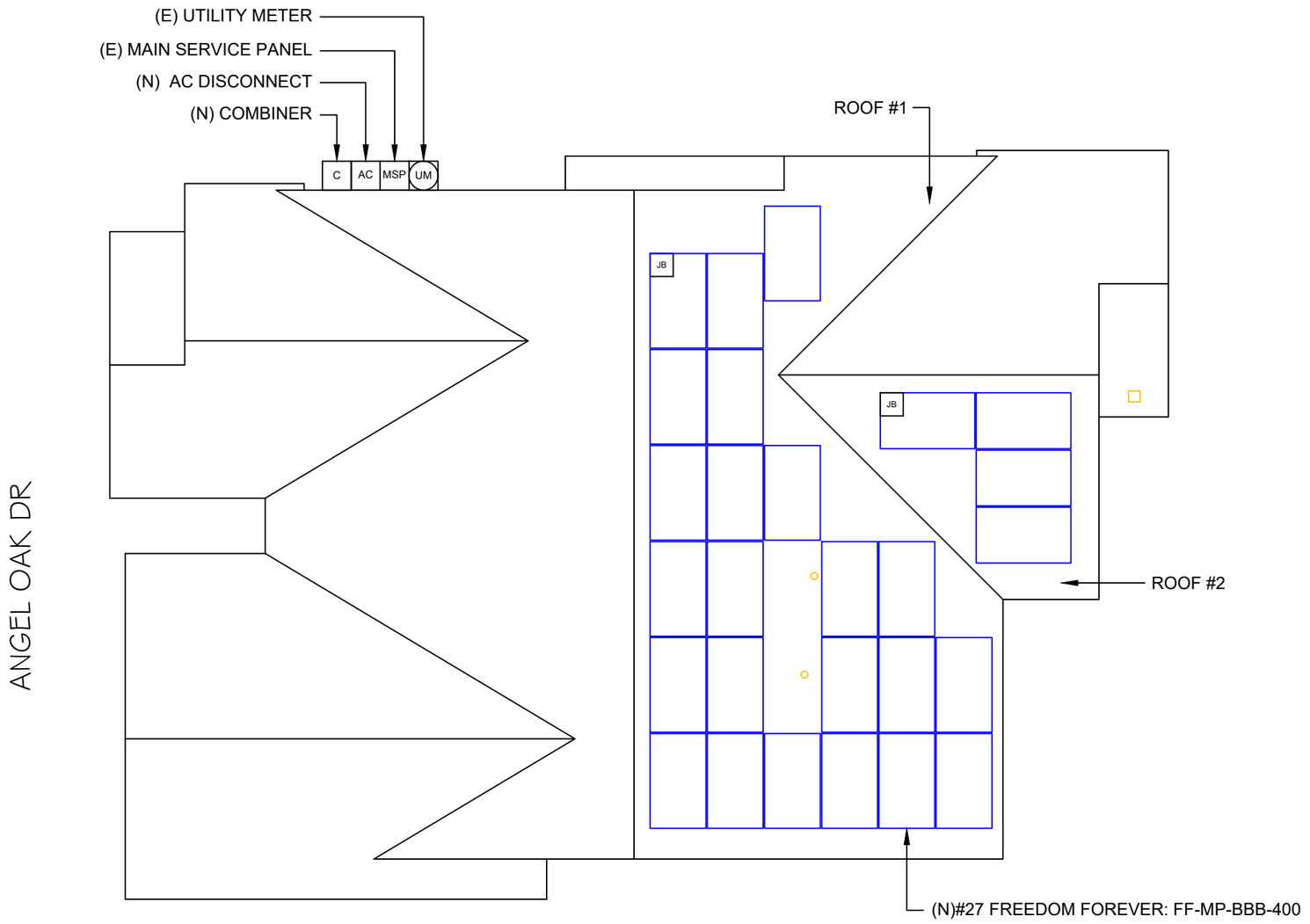
SHEET #	PV-2.0

TITLE
SITE PLAN

ARRAY AREA								
ROOF	ROOF TYPE	AZIMUTH	# OF MODULES	EAVE TO RIDGE DIMENSION (Ft.)	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)	TOTAL AREA COVERED BY ARRAY (%)
#1	COMP SHINGLE	132	23	24.05	413.31	1588	26.03	30.55
#2	COMP SHINGLE	222	4	14.83	71.88	1588	4.53	



1 ROOF PLAN

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

LEGEND

- UM — UTILITY METER
- MSP — MAIN SERVICE PANEL
- AC — AC DISCONNECT
- C — COMBINER
- JB — JUNCTION BOX
- MODULE
- ROOF OBSTRUCTIONS

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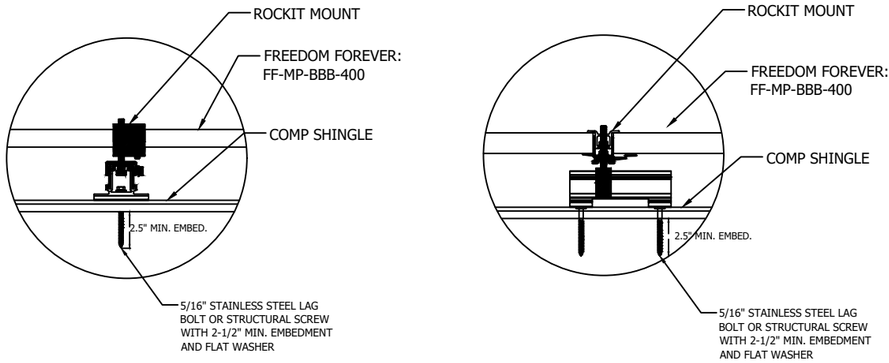
SHEET #	PV-3.0

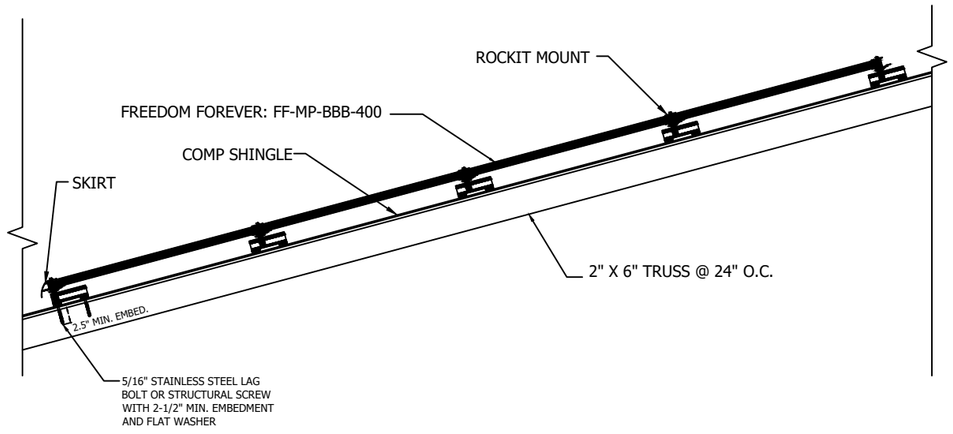
TITLE

ROOF PLAN

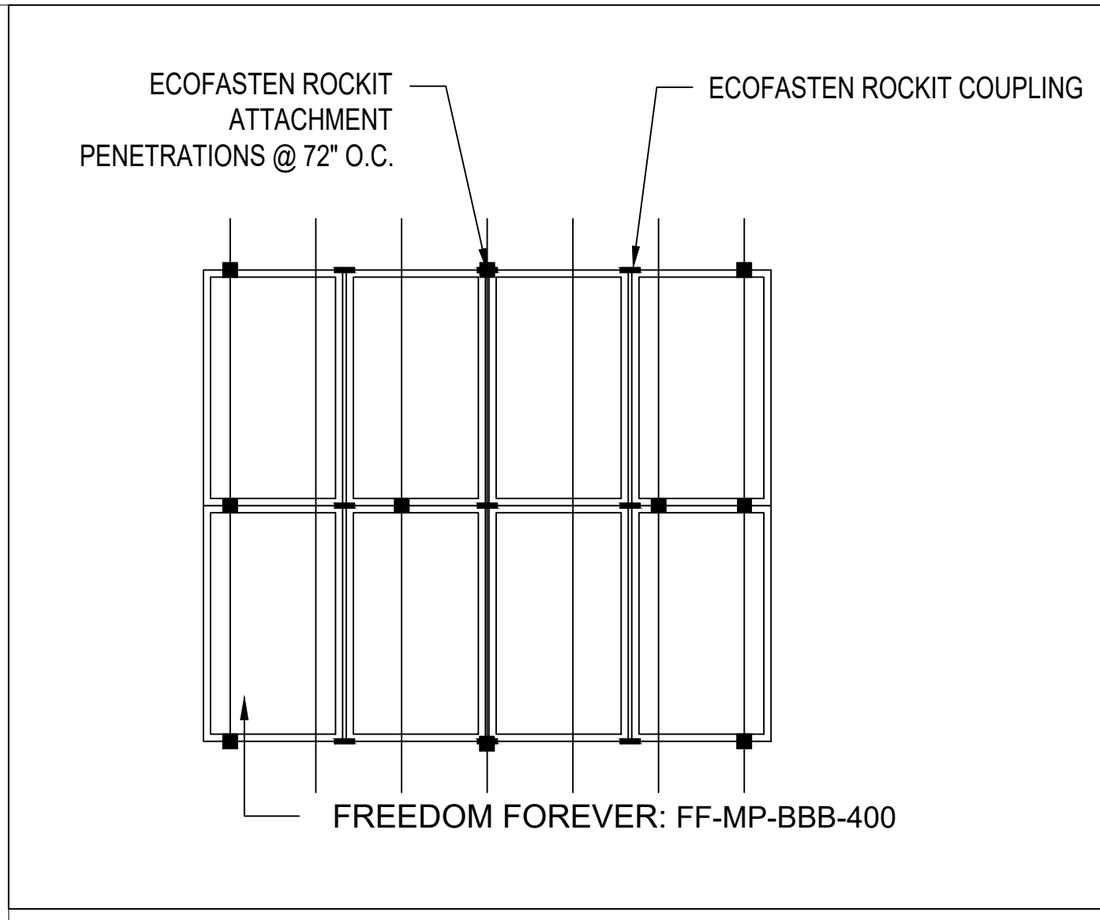
ROOF NO	ROOF TILT	ROOFING TYPE	ATTACHMENT TYPE	NO. OF STORIES	FRAMING TYPE	FRAMING SIZE	OC SPACING	PENETRATION PATTERN	MAX PENETRATION SPACING	MAX OVERHANG
ROOF 1	25	COMP SHINGLE	ECOFASTEN ROCKIT SMART SLIDE RAILLESS	1	TRUSS	2" X 6"	24"	STAGGERED	72"	24"
ROOF 2	25	COMP SHINGLE	ECOFASTEN ROCKIT SMART SLIDE RAILLESS	1	TRUSS	2" X 6"	24"	STAGGERED	72"	



1 ATTACHMENT DETAIL
Scale: NTS



2 SOLAR PV ARRAY SECTION VIEW
Scale: NTS



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PROJECT #	296198
DATE DRAWN	2/25/2023
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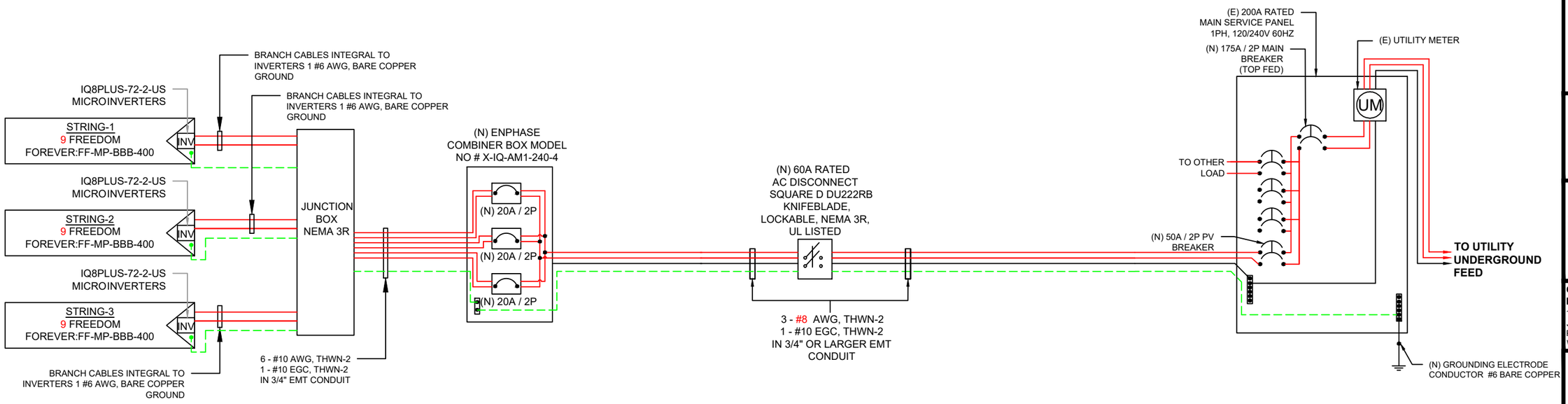
SHEET #	PV-4.0

TITLE

STRUCTURAL

BACKFEED BREAKER SIZING				
MAX. CONTINUOUS OUTPUT 1.21A @ 240V				
32.67	X	1.25	=	40.84AMPS 50A BREAKER - OK
SEE 705.12 OF 2017 NEC				
200	X	1.20	=	240
240	-	175	=	65A ALLOWABLE BACKFEED

NOTE: MAIN BREAKER NEED TO BE DERATED FROM 200A TO 175A



MODULE INFO	
MAKE/MODEL	FREEDOM FOREVER: FF-MP-BBB-400
VOC	37.07V
VMP	31.01V
ISC	13.79A
IMP	12.90A
STC RATING	400 W
PTC RATING	372.3 W

NOTE:
1)CONDUIT AND CONDUCTORS SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING AS REQUIRED BY FIELD CONDITIONS.
2)ALL CONDUCTORS NOT UNDER ARRAY ARE TO BE IN CONDUIT MINIMUM 7/8" ABOVE ROOF WITH PROPER JUNCTION BOX AT EACH END PER 690.31A

WIRE SCHEDULE

RACEWAY #	EQUIPMENT				WIRE LOCATION	CONDUCTOR QTY.	AWG WIRE SIZE	STARTING ALLOWABLE AMPACITY 310.15(B)(16)	TEMPERATURE RATING (°C)	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	MAXIMUM CURRENT APPLIED TO CONDUCTORS IN RACEWAY
1	DC	MODULE	TO	MICROINVERTER	ROOF/FREE-AIR	2	10	40	90°	13.79	0.91	1	36.40	17.24
2	AC	MICROINVERTER	TO	JUNCTION BOX	ROOF/FREE-AIR	2	10	40	90°	10.89	0.91	1	36.40	13.61
3	AC	JUNCTION BOX	TO	COMBINER	EXTERIOR WALL	6	10	40	90°	10.89	0.91	0.8	29.12	13.61
4	AC	COMBINER	TO	AC DISCONNECT	EXTERIOR WALL	3	8	50	75°	32.67	0.91	1	45.50	40.84
5	AC	AC DISCONNECT	TO	POI	EXTERIOR WALL	3	8	50	75°	32.67	0.91	1	45.50	40.84

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DRAWN BY	E.R
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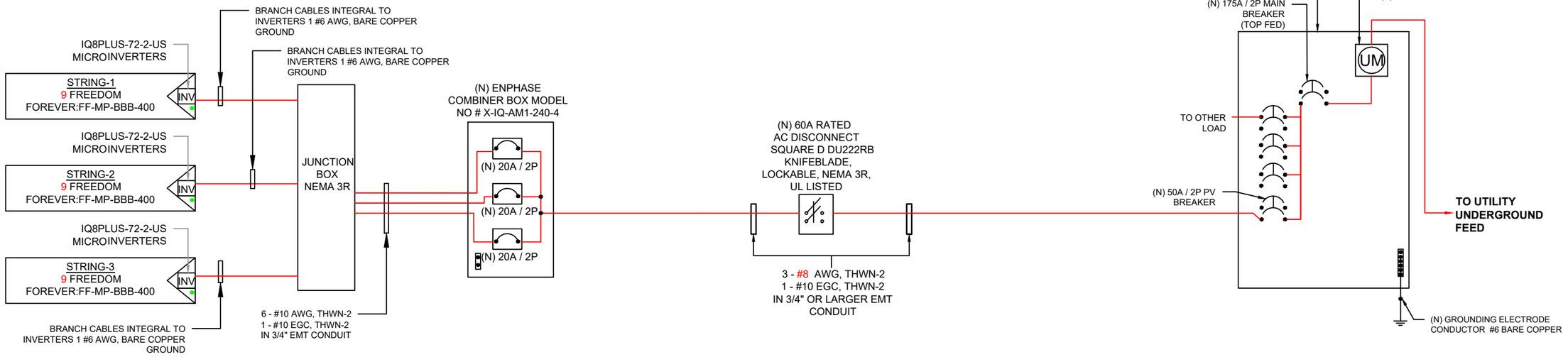
TITLE

ELECTRICAL 3LD

BACKFEED BREAKER SIZING					
MAX. CONTINUOUS OUTPUT 1.21A @ 240V					
32.67	X	1.25	=	40.84AMPS	50A BREAKER - OK
SEE 705.12 OF 2017 NEC					
200	X	1.20	=	240	
240	-	175	=	65A ALLOWABLE BACKFEED	



NOTE: MAIN BREAKER NEED TO BE DERATED FROM 200A TO 175A

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1	DC	MODULE	TO	MICROINVERTER	ROOF/FREE-AIR	2	10	40	90°	13.79	0.91	1	36.40	17.24
2	AC	MICROINVERTER	TO	JUNCTION BOX	ROOF/FREE-AIR	2	10	40	90°	10.89	0.91	1	36.40	13.61
3	AC	JUNCTION BOX	TO	COMBINER	EXTERIOR WALL	6	10	40	90°	10.89	0.91	0.8	29.12	13.61
4	AC	COMBINER	TO	AC DISCONNECT	EXTERIOR WALL	3	8	50	75°	32.67	0.91	1	45.50	40.84
5	AC	AC DISCONNECT	TO	POI	EXTERIOR WALL	3	8	50	75°	32.67	0.91	1	45.50	40.84

Current Renewables Engineering

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DRAWN BY	E.R
SHEET #	PV-6.0

TITLE

ELECTRICAL SLD

MATERIAL LIST

ELECTRICAL EQUIPMENTS

QTY.	PART	PART #	DESCRIPTION
27	MODULE	FF-MP-BBB-400	FREEDOM FOREVER: FF-MP-BBB-400
2	JUNCTION BOX	480-276	600VDC NEMA 3R UL LISTED JUNCTION BOX
27	MICROINVERTER	IQ8PLUS-72-2-US	ENPHASE IQ8PLUS-72-2-US 240V
1	AC DISCONNECT	DU222RB	60A RATED 240VAC NEMA 3R UL LISTED
1	COMBINER	X-IQ-AM1-240-4	ENPHASE COMBINER BOX X-IQ-AM1-240-4

BREAKER AND FUSES

QTY.	PART	PART #	DESCRIPTION
1	BREAKER	50A 2-POLE BREAKER(S)	GENERAL 50A 2-POLE BREAKER(S)
3	COMBINER BREAKER	20A 2-POLE BREAKER(S)	GENERAL 20A 2-POLE BREAKER(S)

RACKING

QTY.	PART	PART #	DESCRIPTION
24	COUPLING	2011025	RI COUPLING AL LBK
57	SLIDE	2011024	RI COM SLIDE AL BLK
57	MOUNT	2011020	RI MOUNT AL BLK
57	FLASHING	2011024	GF-1 FLASHING GLV BLK 8X10
9	SKIRT	2099013	ARRAY SKIRT IN 35MM
2	LUG	N/A	GROUNDING LUGS

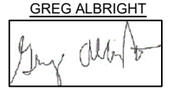
Current Renewables Engineering

CURRENT RENEWABLES ENGINEERING INC.
1760 CHICAGO AVE SUITE
J-13, RIVERSIDE CA 92507
PHONE: (951)-405-1733
WWW.CRENG.CO

CONTRACTOR INFO

freedom FOREVER

GREG ALBRIGHT



FREEDOM FOREVER NORTH CAROLINA LLC

2626 GLENWOOD AVE STE 550
RALEIGH,27608

NC,UNITED STATES
ELECTRICAL CONTRACTOR U.34043
GENERAL CONTRACTOR 84951

Solar Individual Permit Package

KRISTEN KENYON

10.800KW Grid Tied Photovoltaic System

238 ANGEL OAK DR,
BUNNLEVEL, NC 28323

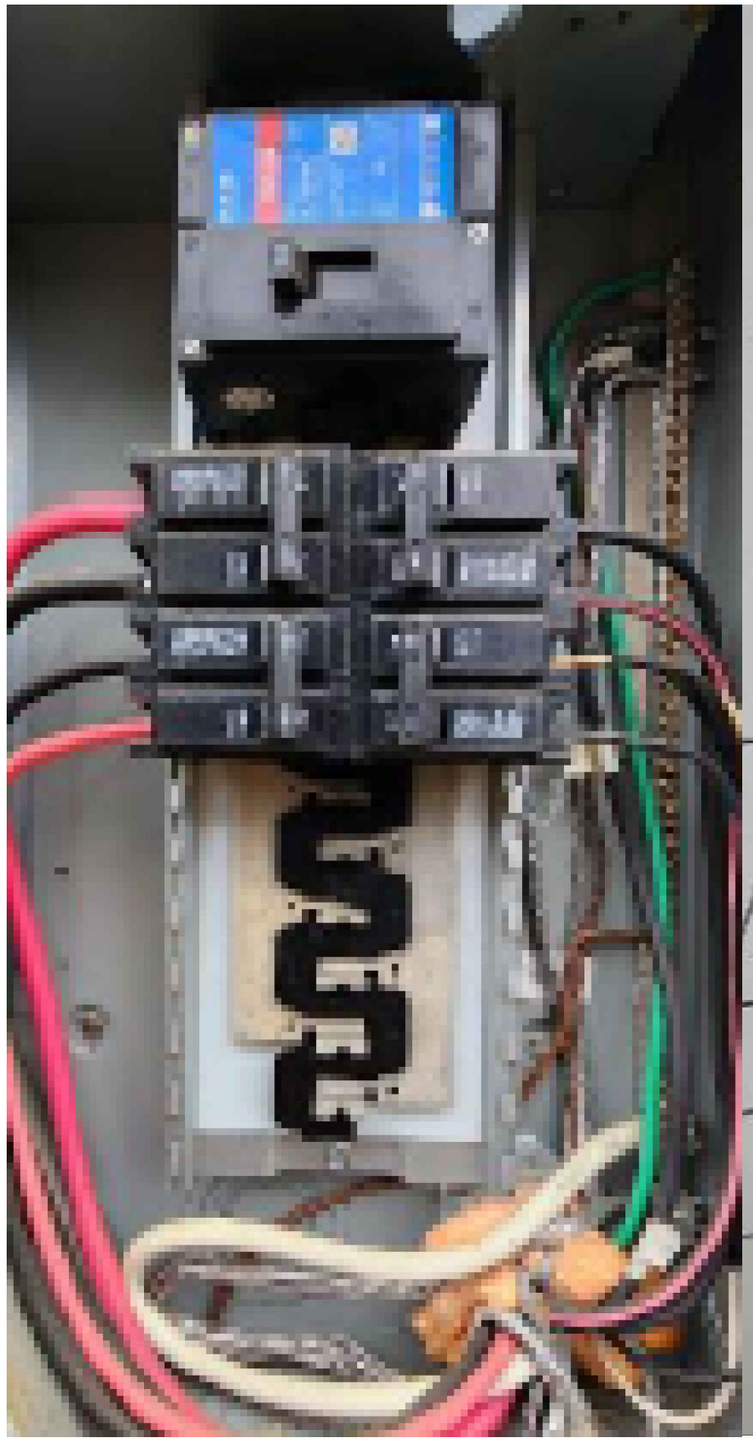
Rev	Description	Date
A	INITIAL DESIGN	2/25/2023

OPPORTUNITY	KRISTEN KENYON
PROJECT #	296198
DATE DRAWN	2/25/2023
DRAWN BY	E.R
SHEET #	PV-7.0

TITLE

BOM

EXISTING SERVICE PANEL PHOTOS



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SHEET #	PV-8.0

TITLE

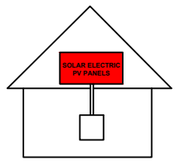
ELECTRICAL PHOTOS

PHOTOVOLTAIC SYSTEM,
EQUIPPED WITH RAPID SHUTDOWN

690.12

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



690.56(C)(1)(B)

M

AC

PV SYSTEM AC DISCONNECT
RATED AC OUTPUT CURRENT - **32.67** AMPS
AC NORMAL OPERATING VOLTAGE - 240 VOLTS

690.14, 690.15, 690.54

PM

"WARNING"
DUAL POWER SOURCES
SECOND SOURCE IS PHOTO- VOLTAIC SYSTEM
RATED AC OUTPUT CURRENT - **32.67** AMPS
AC NORMAL OPERATING VOLTAGE - 240 VOLTS

690.54

OPTIONAL SOLAR LOAD CENTER

ARRAY

J/B

"WARNING"
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE THIS
OVERCURRENT DEVICE

(UNLESS BUSBAR IS FULLY RATED)
705.12(D)(2)

NEC 690.31(G)(3) & (4), CRC R324.7

"WARNING"
PHOTOVOLTAIC POWER SOURCE

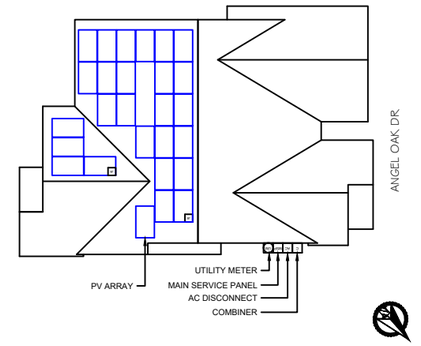
EVERY 10' ON CONDUIT AND ENCLOSURES

NOTES:

1. NEC ARTICLES 690 AND 705 AND NEC 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.

CAUTION

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



PHOTOVOLTAIC BACK-FED CIRCUIT BREAKER IN MAIN ELECTRICAL PANEL IS AC DISCONNECT PER NEC690.17

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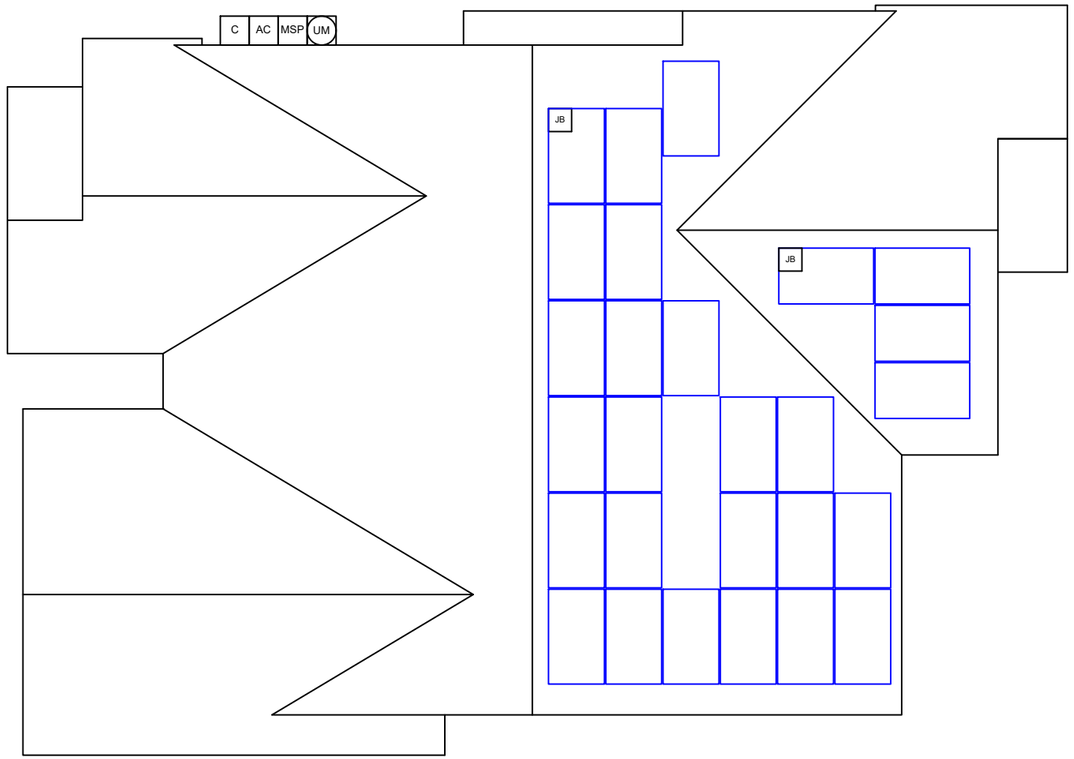
DRAWN BY	E.R
SHEET #	PV-9.0

TITLE

SIGNAGE

MICROINVERTER CHART

	1-10	11-20	21-30	31-40	41-50	51-60
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						



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DRAWN BY	E.R
SHEET #	PV-10.0

TITLE

MICROINVERTER CHART

SAFETY PLAN

INSTRUCTIONS:

1. USE SYMBOLS IN KEY TO MARK UP THIS SHEET.
2. SAFETY PLAN MUST BE MARKED BEFORE JOB STARTS AS PART OF THE PRE-PLAN
3. DOCUMENT ALL ADDITIONAL HAZARDS ON THIS PAGE & MAKE NOTES ON THE JHA SHEET

IN CASE OF EMERGENCY

NEAREST HOSPITAL OR OCCUPATIONAL/INDUSTRIAL CLINIC

NAME: _____

ADDRESS: _____

SAFETY COACH CONTACT INFORMATION

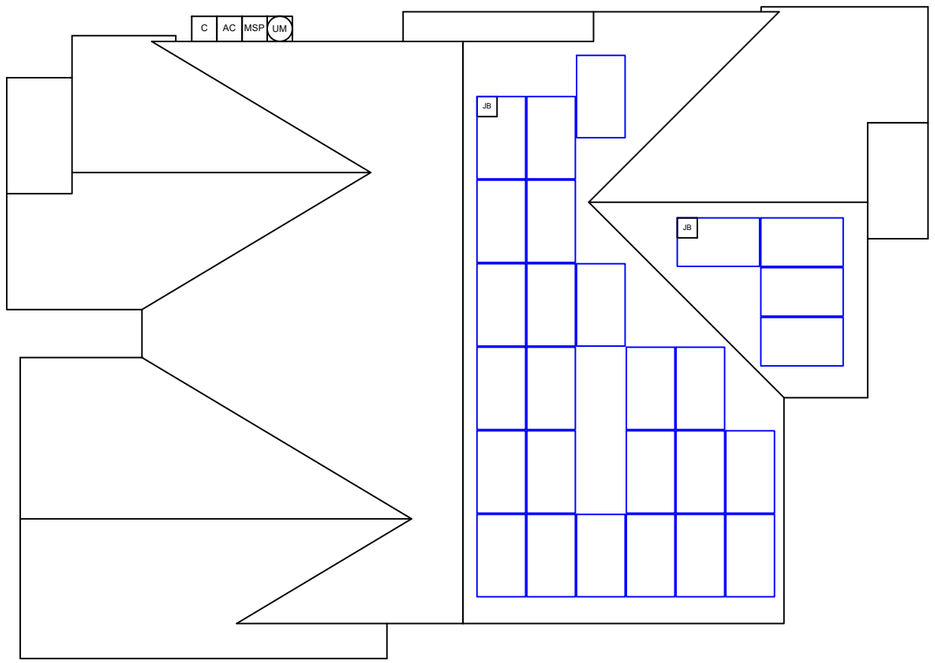
NAME: _____

ADDRESS: _____

ALL EMPLOYEES ON SITE SHALL BE MADE AWARE OF THE SAFETY PLAN AND SIGN INDICATING THAT THEY ARE AWARE OF THE HAZARDS ON-SITE AND THE PLAN FOR WORKING SAFELY.

NAME	SIGNATURE

DATE: _____ TIME:_____



MARK UP KEY

- C — COMBINER
- AC — AC DISCONNECT
- MSP — MAIN SERVICE PANEL
- UM — UTILITY METER
- P — PERMANENT ANCHOR
- JB — JUNCTION BOX
- T — TEMPORARY ANCHOR
- IL — INSTALLER LADDER
- S — STUB-OUT
- SKYLIGHT
- NO LADDER ACCESS (STEEP GRADE OR GROUND LEVEL OBSTRUCTIONS)
- RESTRICTED ACCESS
- CONDUIT
- GAS — GAS SHUT OFF
- H2O — WATER SHUT OFF
- 7 — SERVICE DROP
- Z — POWER LINES

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DRAWN BY	E.R
SHEET #	PV-11.0

TITLE

SAFETY PLAN

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 indentified and protected from contact, as neccessary.

· EQP (name and tile):

Public Protection

- The safety of the Client and the 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 protect 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 the 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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Current Renewables Engineering

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CONTRACTOR INFO

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KRISTEN KENYON

10.800KW Grid Tied Photovoltaic System

238 ANGEL OAK DR,
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DRAWN BY	E.R
SHEET #	PV-12.0

TITLE

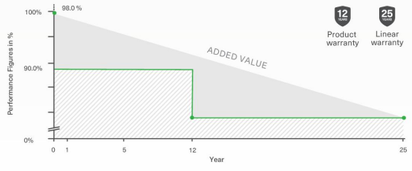
SAFETY PLAN

freedom FOREVER

MACH 2
400W MODULE

FF-MP-BBB-400

- High module conversion efficiency up to 20.48%
- Excellent weak light performance
- Withstanding harsh environment
- Lower operating temperature
- Extreme weather loading
- 12-year material & workmanship
- 25-year linear power output



MODULE SPECIFICATIONS

ELECTRICAL CHARACTERISTICS

Characteristics	FF-MP-BBB-400
Maximum Power (Pmax)	400W
Maximum Power Voltage (Vmp)	31.01V
Maximum Power Current (Imp)[A]	12.90A
Open Circuit Voltage (Voc)[V]	37.07V
Short Circuit Current (Isc)[A]	13.79A
Module Efficiency	20.48%
Power Tolerance	0/+5W
STC	Irradiance of 1000W/m², AM1.5, cell Temperature 25°C

MECHANICAL CHARACTERISTICS

Cell Type	Mono perc, 182 mm-half cells, 108 (6x9+6x9)
Weight	22.1 kgs (48.7 lbs)
Dimension	1722 x 1134 x 35 mm (67.80 x 44.65 x 1.38)
Front Glass	3.2 mm (.13 in), High Transmission, Low Iron & Semi-Tempered Glass
Junction Box	IP68 (3 Bypass Diodes)
Output Cables	1200 mm (47 in)
Connector	Staubli EVO2
Frame & Installation	Anodized aluminum profile

OPERATIONS CHARACTERISTICS

Operational Temperature	-40°C~+85°
Max System Voltage	1500V
Max Series Fuse Rating	25A
Safety Class	Class II
Fire Rating	Type 1

MECHANICAL LOADING

Snow Load	5,400Pa (113lb/ft2)
Rear Side Design Load	2,400Pa (50lb/ft2)

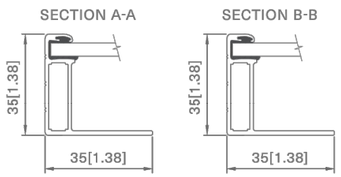
PACKAGING INFORMATION

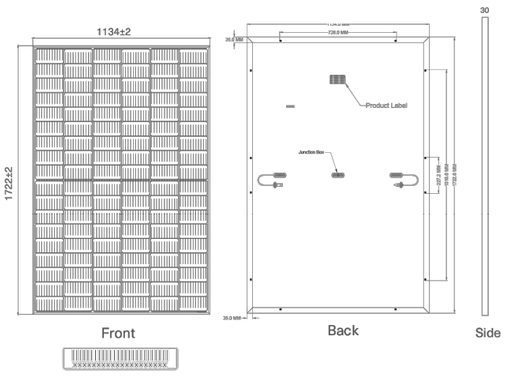
Container	20' GP	40' HC
Pallets per Container	6	26
Panels per Container	186	806

TEMPERATURE RATINGS

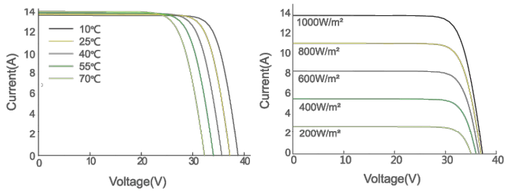
Temperature Coefficient of P_{max}	-0.350%/°C
Temperature Coefficient of V_{oc}	-0.275%/°C
Temperature Coefficient of I_{sc}	+0.045%/°C
Nominal Operating cell Temperature (NOCT)	42°C±2°C

FRAME PROFILE





CURRENT-VOLTAGE CURVE



CERTIFICATIONS AND STANDARDS PENDING

Intertek

UL 61730 | UL 61215 | ISO 9001 | ISO 14001

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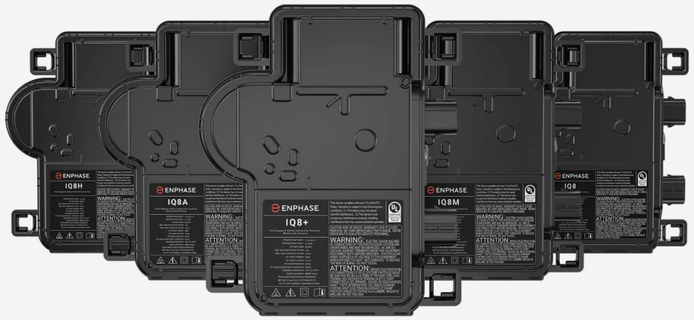
DRAWN BY	E.R
SHEET #	PV-13.0

TITLE
MODULE SPEC

ENPHASE.

DATA SHEET



IQ8 Series 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 super-fast 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 Enphase IQ Battery, Enphase IQ Gateway, and the Enphase App monitoring and analysis software.

Enphase 25 year limited warranty

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 IQ8 Series Microinverters using the included Q-DCC-2 adapter cable with plug-n-play MC4 connectors.

UL CERTIFIED SAFETY

IQ8 Series Microinverters are UL Listed as PV Rapid Shut Down 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) requirements

* Only when installed with IQ System Controller 2, meets UL 1741. IQ8H-208V operates only in grid-tied mode.
** IQ8 Series Microinverters supports split phase, 240V. IQ8H-208 supports split phase, 208V only.

IQ8 Series Microinverters

INPUT DATA (DC)		IQ8-60-2-US	IQ8PLUS-72-2-US	IQ8M-72-2-US	IQ8A-72-2-US	IQ8H-240-72-2-US	IQ8H-208-72-2-US[1]
Commonly used module pairings[2]	W	235 – 350	235 – 440	260 – 460	295 – 500	320 – 540+	295 – 500+
Module compatibility		60-cell/120 half-cell	60-cell/120 half-cell, 66-cell/132 half-cell and 72-cell/144 half-cell				
MPPT voltage range	V	27 – 37	29 – 45	33 – 45	36 – 45	38 – 45	38 – 45
Operating range	V	25 – 48	25 – 58				
Min/max start voltage	V	30 / 48	30 / 58				
Max input DC voltage	V	50	60				
Max DC current[3] [module Isc]	A	15					
Overvoltage class DC port		II					
DC port backfeed current	mA	0					
PV array configuration		1x1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit					
OUTPUT DATA (AC)		**IQ8-60-2-US**	**IQ8PLUS-72-2-US**	**IQ8M-72-2-US**	**IQ8A-72-2-US**	**IQ8H-240-72-2-US**	**IQ8H-208-72-2-US[1]**
Peak output power	VA	245	300	330	366	384	366
Max continuous output power	VA	240	290	325	349	380	360
Nominal (L-L) voltage/range[4]	V	240 / 211 – 264					208 / 183 – 250
Max continuous output current	A	1.0	1.21	1.35	1.45	1.58	1.73
Nominal frequency	Hz	60					
Extended frequency range	Hz	50 – 68					
AC short circuit fault current over 3 cycles	Arms	2					4.4
Max units per 20 A (L-L) branch circuit[5]		16	13	11	11	10	9
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	%	97.5	97.6	97.6	97.6	97.6	97.4
CEC weighted efficiency	%	97	97	97	97.5	97	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		MC4					
Dimensions (HxWxD)		212 mm (8.3") x 175 mm (6.9") x 30.2 mm (1.2")					
Weight		1.08 kg (2.38 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, UL1741/IEEE1547, 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 Shut Down 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) The IQ8H-208 variant will be operating in grid-tied mode only at 208V AC. (2) No enforced DC/AC ratio. See the compatibility calculator at https://link.enphase.com/module-compatibility (3) Maximum continuous input DC current is 10.6A (4) Nominal voltage range can be extended beyond nominal if required by the utility. (5) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

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RALEIGH,27608

NC,UNITED STATES
ELECTRICAL CONTRACTOR U.34043
GENERAL CONTRACTOR 84951

Solar Individual Permit Package

KRISTEN KENYON

10.800KW Grid Tied Photovoltaic System

238 ANGEL OAK DR,
BUNNLEVEL, NC 28323

Rev	Description	Date
A	INITIAL DESIGN	2/25/2023

OPPORTUNITY	KRISTEN KENYON
PROJECT #	296198
DATE DRAWN	2/25/2023
DRAWN BY	E.R
SHEET #	PV-13.1

TITLE
INVERTER SPEC

Data Sheet
Enphase Networking

Enphase IQ Combiner 4/4C

X-IQ-AM1-240-4
X-IQ-AM1-240-4C

X-IQ-AM1-240-4C

X-IQ-AM1-240-4

The **Enphase IQ Combiner 4/4C** with Enphase IQ Gateway and integrated LTE-M1 cell modem (included only with IQ Combiner 4C) consolidates interconnection equipment into a single enclosure and 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 Enphase 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
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Optional AC receptacle available for PLC bridge
- Provides production metering and consumption monitoring

Simple

- Centered mounting brackets support single stud mounting
- Supports bottom, back and side conduit entry
- Up to four 2-pole branch circuits for 240 VAC 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

LISTED

To learn more about Enphase offerings, visit enphase.com

ENPHASE

Enphase IQ Combiner 4/4C

MODEL NUMBER	
IQ Combiner 4 (X-IQ-AM1-240-4)	IQ Combiner 4 with Enphase 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 system and IQ System Controller 2 and to deflect heat.
IQ Combiner 4C (X-IQ-AM1-240-4C)	**IQ Combiner 4C with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes Enphase 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)**
Ensemble 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 for Ensemble sites - 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
EPLC-01	Power line carrier (communication bridge pair), quantity - one pair
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)
XA-ENV-PCBA-3	Replacement IQ Gateway printed circuit board (PCB) for Combiner 4/4C
X-IQ-NA-HD-125A	Hold down kit for Eaton circuit breaker with screws.
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating	65 A
Max. continuous current rating (input from PV/storage)	64 A
Max. fuse/circuit rating (output)	90 A
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
Production metering CT	200 A solid core pre installed and wired to IQ Gateway
Consumption monitoring CT (CT-200-SPLIT)	A pair of 200 A split core current transformers
MECHANICAL DATA	
Dimensions (WxHxD)	37.5 x 49.5 x 16.8 cm (14.75" x 19.5" x 6.63"). Height is 21.06" (53.5 cm) with mounting brackets.
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40° C to +46° C (-40° to 115° F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	• 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors • 60 A 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	To 2000 meters (6,560 feet)
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Cellular	CELLMODEM-M1-06-SP-05, CELLMODEM-M1-06-AT-05 (4G based LTE-M1 cellular modem). Note that an Enphase Mobile Connect cellular modem is required for all Ensemble installations.
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)
COMPLIANCE	
Compliance, IQ Combiner	UL 1741, CAN/CSA C22.2 No. 107.1, 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

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ENPHASE

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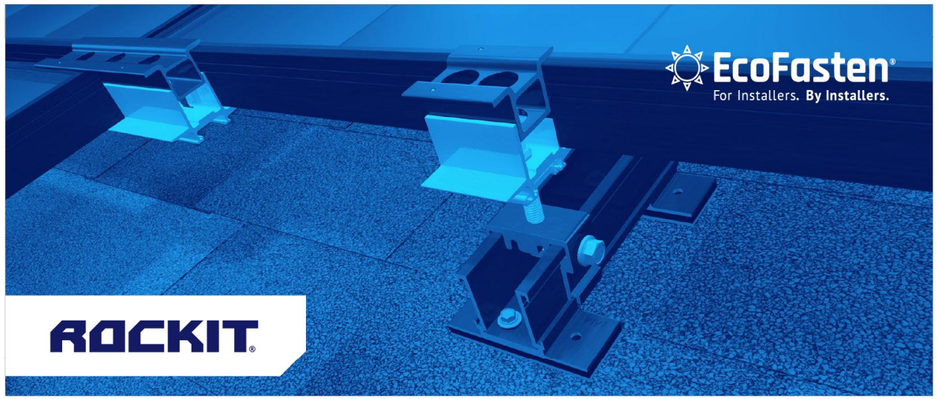
DRAWN BY	E.R
SHEET #	PV-13.2

TITLE
COMBINER SPEC



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

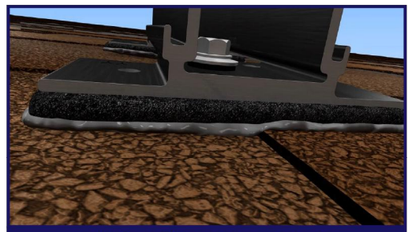
ECOFASTENSOLAR.COM

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

VERSION 1.1

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TITLE
ATTACHMENT SPEC