ROOF MOUNT SOLAR PERMIT PACKAGE
MAUREEN MCOUAT
8.400KW DC GRID TIED PHOTOVOLTAIC SYSTEM
1011 SWEET RASPBERRY LN, LILLINGTON, NC 27546

BUILDING INFORMATION

1 STORY HOUSE	SINGLE FAMILY RESIDENCE
CONSTRUCTION TYPE: V-B	OCCUPANCY: R3/U
ROOF: COMP SHINGLE	APN: 1305180122

PV SYSTEM SUMMARY:

SYSTEM SIZE (DC)	:	STC: 400 x 21 = 8.400kW DC
	:	PTC: 374.9 x 21 = 7.8729kW DC
SYSTEM SIZE (AC)	:	6.090kW AC @ 240V
MODULES	:	(21) M SOLAR: TXI10-400108BB
MICRO-INVERTERS	:	ENPHASE: IQ8PLUS-72-2-US
MICRO-INVERTERS QTY	:	21
TILT	:	21°
AZIMUTH	:	182°
ROOF	:	COMP SHINGLE
RAFTER/TRUSS SIZE	:	2" X 4" RAFTER @ 24" O.C.
ATTACHMENT TYPE	:	UNIRAC FLASHLOC DUO WITH UNIRAC SOLARMOUNT LIGHT RAIL
MAIN SERVICE PANEL	:	EXISTING 200 AMPS MSP WITH 200 AMPS MAIN BREAKER ON TOP FED
INTERCONNECTION	:	PV BREAKER
OCPD RATING	:	40 AMPS
UTILITY	:	DUKE ENERGY

STRUCTURAL NOTES :
1. THESE PLANS ARE STAMPED FOR STRUCTURAL CODE COMPLIANCE OF THE ROOF FRAMING SUPPORTING THE PROPOSED PV INSTALLATION ONLY.
2. THESE PLANS ARE NOT STAMPED FOR WATER LEAKAGE.
3. PV MODULES, RACKING, AND ATTACHMENT COMPONENTS MUST FOLLOW MANUFACTURER GUIDELINES AND REQUIREMENTS.
4. PLEASE SEE THE ACCOMPANYING STRUCTURAL CALCULATIONS REPORT FOR ADDITIONAL INFORMATION.
5. PRIOR TO THE COMMENCEMENT OF WORK, THE SOLAR INSTALLER SHALL VERIFY THE ROOF FRAMING INFORMATION BEFORE INSTALLATION AND NOTIFY THE E.O.R. IF THERE IS ANY INCONSISTENCY BETWEEN SITE VERIFICATION AND THE FOLLOWING: 2x4 RAFTERS @ 24" OC SPACING WITH A MAX UNSUPPORTED SPAN EQUAL TO OR LESS THAN 10 FT.

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 2020 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 INTERNATIONAL BUILDING CODE
2018 INTERNATIONAL ENERGY CONSERVATION CODE
2018 INTERNATIONAL EXISTING BUILDING CODE
2018 INTERNATIONAL FUEL GAS CODE
2018 INTERNATIONAL FIRE CODE
2018 INTERNATIONAL MECHANICAL CODE
2018 INTERNATIONAL PLUMBING CODE
2018 INTERNATIONAL RESIDENTIAL CODE
2020 NATIONAL ELECTRICAL CODE

AHJ: HARNETT COUNTY

AERIAL VIEW

VICINITY VIEW

SHEET INDEX

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PV-6.0	BOM
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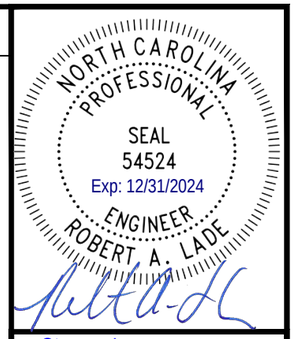
PV-8.0	SIGNAGE
PV-8.1	PLACARD
PV-9.0	MICROINVERTER CHART
PV-10.0	SAFETY PLAN
PV-11.0	SAFETY PLAN
PV-12.0+	SPEC. SHEETS



Stamped 08/23/2023

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

Beam SOLAR CO.

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1231 SHIELDS RD STE 5,
KERNERSVILLE,
NC 27284

Solar Individual Permit Package

MAUREEN MCOUAT

8.400KW Grid Tied Photovoltaic System

1011 SWEET RASPBERRY LN, LILLINGTON, NC 27546

Rev	Description	Date
A	INITIAL DESIGN	8/24/2023

OPPORTUNITY	MAUREEN MCOUAT
PROJECT #	N/A
DATE DRAWN	8/24/2023
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.

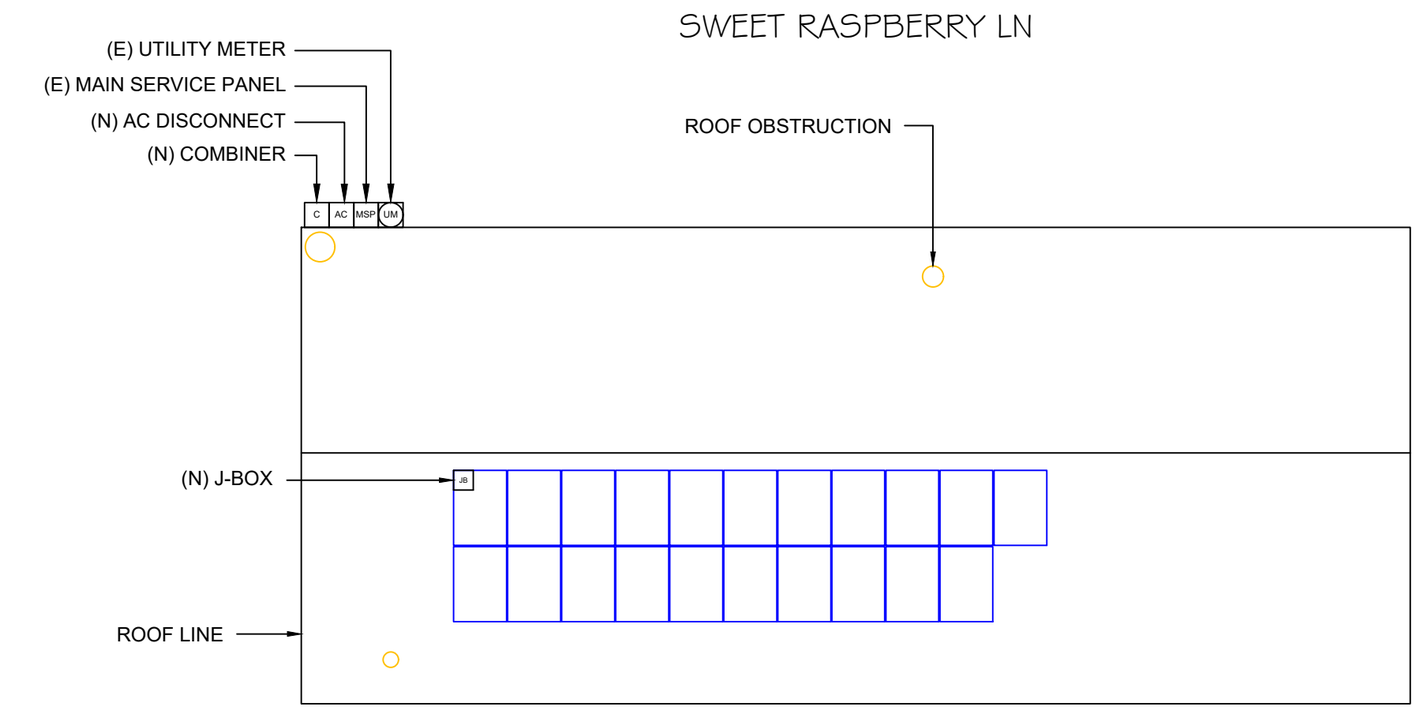
R324.6.4 EMERGENCY ESCAPE AND RESCUE OPENING: PANELS AND MODULES INSTALLED ON DWELLINGS SHALL NOT BE PLACED THE PORTION OF A ROOF THAT IS BELOW AN EMERGENCY ESCAPE AND RESCUE OPENING. A 36-INCH-WIDE PATHWAY SHALL BE PROVIDED TO THE EMERGENCY ESCAPE AND RESCUE OPENING.

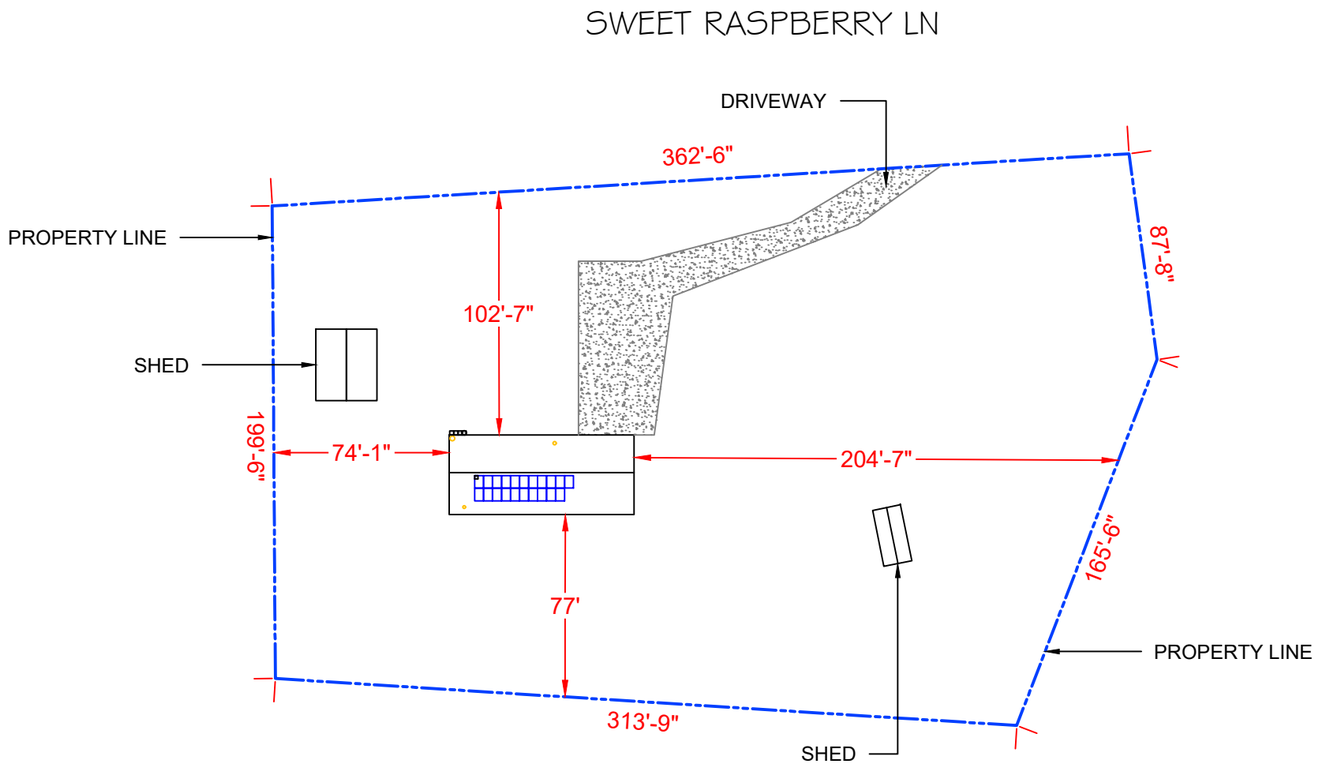
NOTES:

1. MINOR FIELD ADJUSTMENTS ALLOWED BASED ON ACTUAL SITE CONDITION AND MEASUREMENTS.
2. THE 30 SECOND SHUTDOWN REQUIREMENT IS INCORPORATED INTO THE 2020 NEC AND UL STANDARD 1741.
3. EXISTING ROOF VENT SHOULD NOT BE COVERED.

NOTE:
NO FENCES OR GATES SURROUND THE PROPERTY

ENLARGED VIEW





1 SITE PLAN

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

LEGEND

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

NORTH CAROLINA PROFESSIONAL SEAL 54524 Exp: 12/31/2024 ENGINEER ROBERT A. LADE

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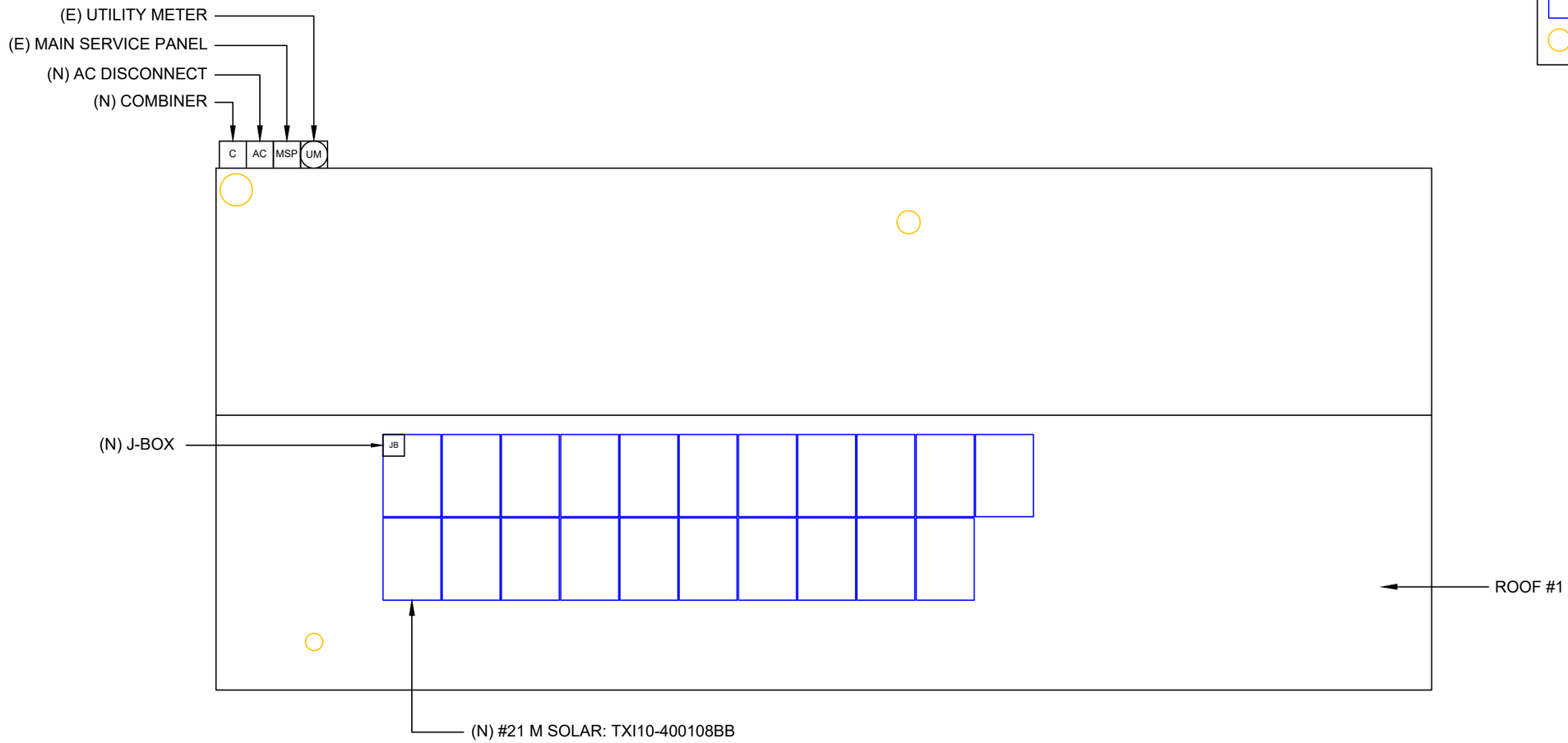
TITLE
SITE PLAN

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	182	21	17.66	441.42	2617	16.87	16.87

SWEET RASPBERRY LN



2 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

NORTH CAROLINA PROFESSIONAL SEAL 54524 Exp: 12/31/2024 ENGINEER ROBERT A. LADE

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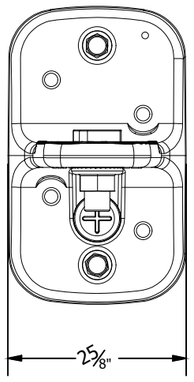
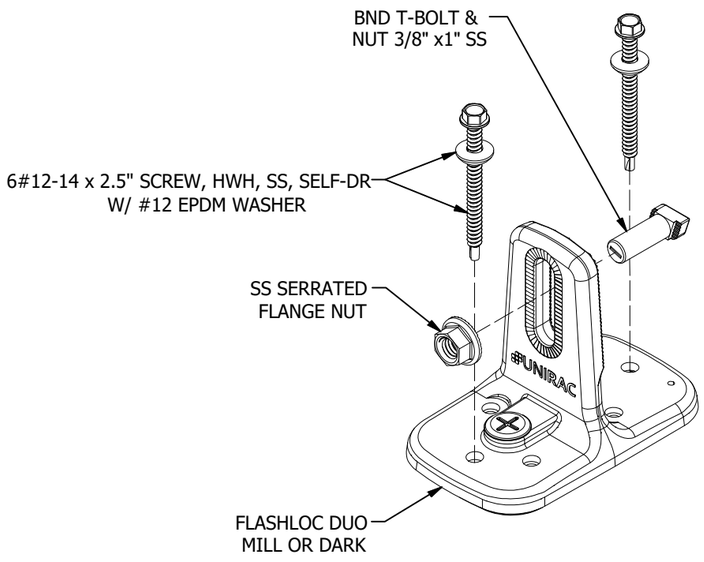
TITLE

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	21	COMP SHINGLE	UNIRAC FLASHLOC DUO	1	RAFTER	2" X 4"	24"	STAGGERED	48"	24"





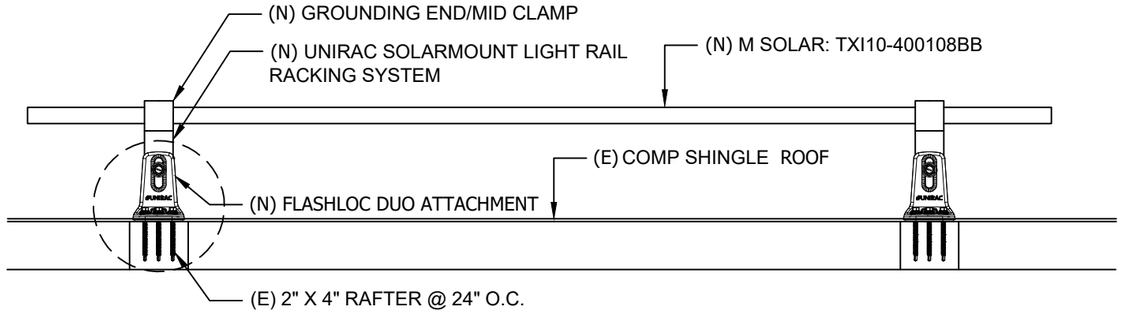
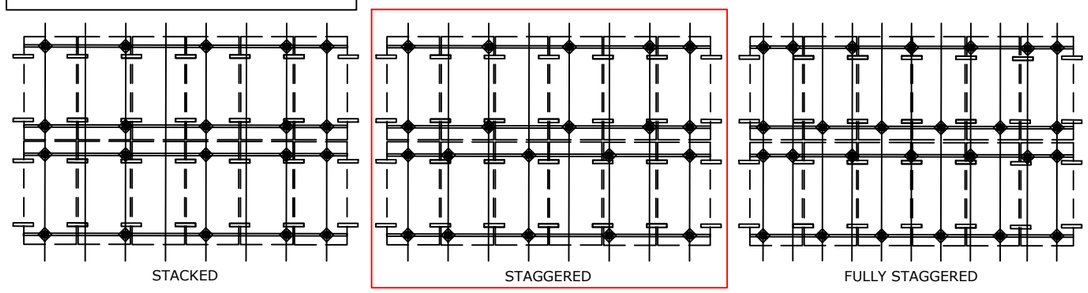


TABLE : PENETRATION GUIDE FOR INSTALL

TWO OR MORE ROW OF PANELS



ONE ROW OF PANELS

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SHEET #	PV-3.0

TITLE

STRUCTURAL

BACKFEED BREAKER SIZING

MAX. CONTINUOUS OUTPUT 1.21A @ 240V

25.41 X 1.25 = 31.76AMPS 40A BREAKER - OK

SEE 705.12 OF 2020 NEC

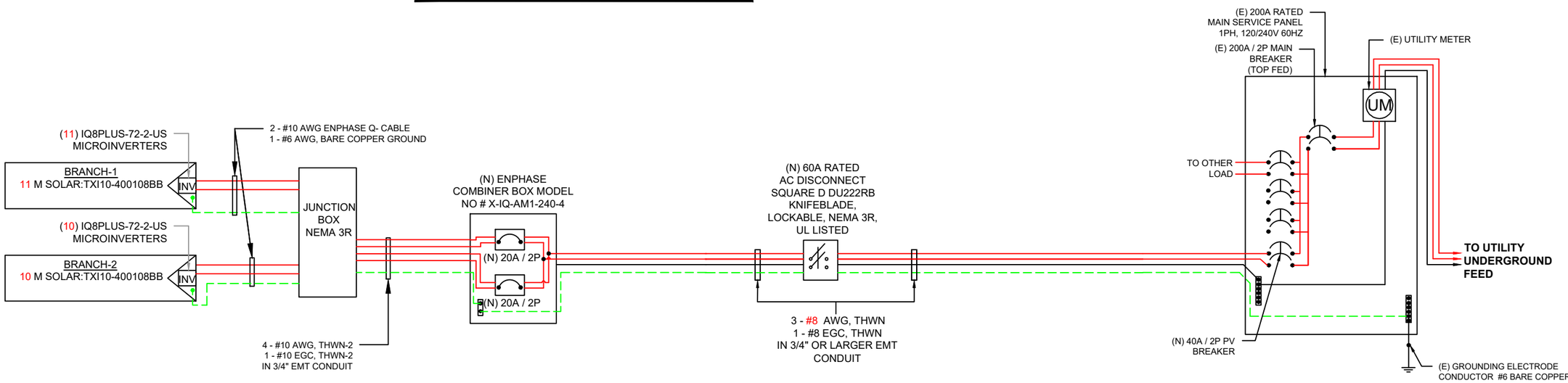
200 X 1.20 = 240

240 - 200 = 40A ALLOWABLE BACKFEED

INVERTER SPECIFICATION	
MANUFACTURER & MODEL NO.	ENPHASE IQ8PLUS-72-2-US
MAX DC VOLT RATING	60V
MAX POWER AT 240W	290WATT
NOMINAL AC VOLTAGE	240V
MAX AC CURRENT	1.21 A
MAX EFFICIENCY	97.0%
MAX OCPD RATING	20 A
MAX PANELS/CIRCUIT	13
MAXIMUM DC SHORT CIRCUIT CURRENT	15AMPS

PER NEC 2020 230.85: ALL SERVICE CONDUCTORS SHALL TERMINATE IN DISCONNECTING MEANS HAVING A SHORT-CIRCUIT CURRENT RATING EQUAL TO OR GREATER THAN THE AVAILABLE FAULT CURRENT, INSTALLED IN A READILY ACCESSIBLE OUTDOOR LOCATION.

SURGE PROTECTOR TO BE INSTALLED PER 2020 NEC.



MODULE INFO	
MAKE/MODEL	M SOLAR: TXI10-400108BB
VOC	37.07V
VMP	31.01V
ISC	13.97A
IMP	12.90A
STC RATING	400 W
PTC RATING	374.9 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°	13.97	0.96	1	38.40	17.46
2	AC	MICROINVERTER	TO	JUNCTION BOX	ROOF/FREE-AIR	2	10	40	90°	13.31	0.96	1	38.40	16.64
3	AC	JUNCTION BOX	TO	COMBINER	EXTERIOR WALL	4	10	40	90°	13.31	0.96	0.8	30.72	16.64
4	AC	COMBINER	TO	AC DISCONNECT	EXTERIOR WALL	3	8	50	75°	25.41	0.96	1	48.00	31.76
5	AC	AC DISCONNECT	TO	POI	EXTERIOR WALL	3	8	50	75°	25.41	0.96	1	48.00	31.76

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SHEET #	PV-4.0

TITLE

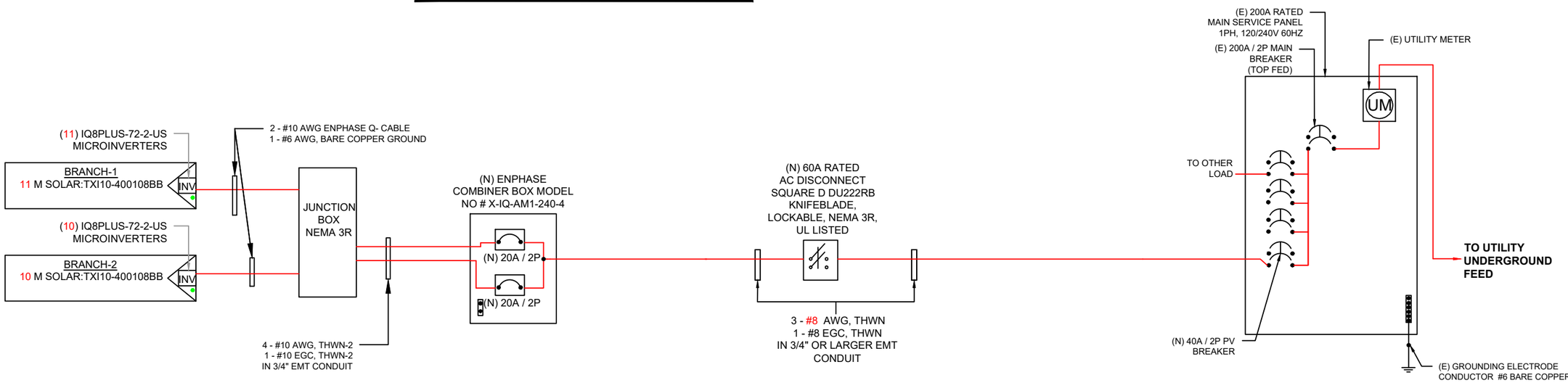
ELECTRICAL 3LD

BACKFEED BREAKER SIZING					
MAX. CONTINUOUS OUTPUT 1.21A @ 240V					
25.41	X	1.25	=	31.76AMPS	40A BREAKER - OK
SEE 705.12 OF 2020 NEC					
200	X	1.20	=	240	
240	-	200	=	40A ALLOWABLE BACKFEED	

INVERTER SPECIFICATION	
MANUFACTURER & MODEL NO.	ENPHASE IQ8PLUS-72-2-US
MAX DC VOLT RATING	60V
MAX POWER AT 240W	290WATT
NOMINAL AC VOLTAGE	240V
MAX AC CURRENT	1.21 A
MAX EFFICIENCY	97.0%
MAX OCPD RATING	20 A
MAX PANELS/CIRCUIT	13
MAXIMUM DC SHORT CIRCUIT CURRENT	15AMPS

PER NEC 2020 230.85: ALL SERVICE CONDUCTORS SHALL TERMINATE IN DISCONNECTING MEANS HAVING A SHORT-CIRCUIT CURRENT RATING EQUAL TO OR GREATER THAN THE AVAILABLE FAULT CURRENT, INSTALLED IN A READILY ACCESSIBLE OUTDOOR LOCATION.

SURGE PROTECTOR TO BE INSTALLED PER 2020 NEC.



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SHEET #	PV-5.0

TITLE

ELECTRICAL SLD

MATERIAL LIST

ELECTRICAL EQUIPMENTS

QTY.	PART	PART #	DESCRIPTION
21	MODULE	TXI10-400108BB	M SOLAR: TXI10-400108BB
1	JUNCTION BOX	480-276	600VDC NEMA 3R UL LISTED JUNCTION BOX
21	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
1	SURGE PROTECTOR	N/A	SURGE PROTECTIVE DEVICE(SPD)

BREAKER AND FUSES

QTY.	PART	PART #	DESCRIPTION
1	BREAKER	40A 2-POLE BREAKER(S)	GENERAL 40A 2-POLE BREAKER(S)
2	COMBINER BREAKER	20A 2-POLE BREAKER(S)	GENERAL 20A 2-POLE BREAKER(S)

RACKING

QTY.	PART	PART #	DESCRIPTION
4	RAIL 1	315168M	SM LIGHT RAIL 168" MILL
16	RAIL 2	315208M	SM LIGHT RAIL 208" MILL
16	SPLICE	303019M	BND SPLICE BAR PRO SERIES MILL
38	MID CLAMP	302030M	SM PRO SERIES MID - MILL
8	END CLAMP	302035M	SM PRO SERIES UNIV END - MILL
3	GROUNDING LUG	008009P	ILSCO LAY IN LUG (GBL4DBT)
52	ATTACHMENT	004275M	FLASHLOC DUO MILL
21	MICROINVERTER MOUNTING	008013S	MICRO MNT BND T-BOLT 1/4IN X 3/4IN SS

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

Beam SOLAR CO.

BEAM SOLAR CO.
1231 SHIELDS RD STE 5,
KERNERSVILLE,
NC 27284

Solar Individual Permit Package

MAUREEN MCOUAT

8.400KW Grid Tied Photovoltaic System

1011 SWEET RASPBERRY LN, LILLINGTON, NC 27546

Rev	Description	Date
A	INITIAL DESIGN	8/24/2023

OPPORTUNITY	MAUREEN MCOUAT
PROJECT #	N/A
DATE DRAWN	8/24/2023
DRAWN BY	E.R
SHEET #	PV-6.0

TITLE

BOM

EXISTING SERVICE PANEL PHOTOS

Current Renewables Engineering

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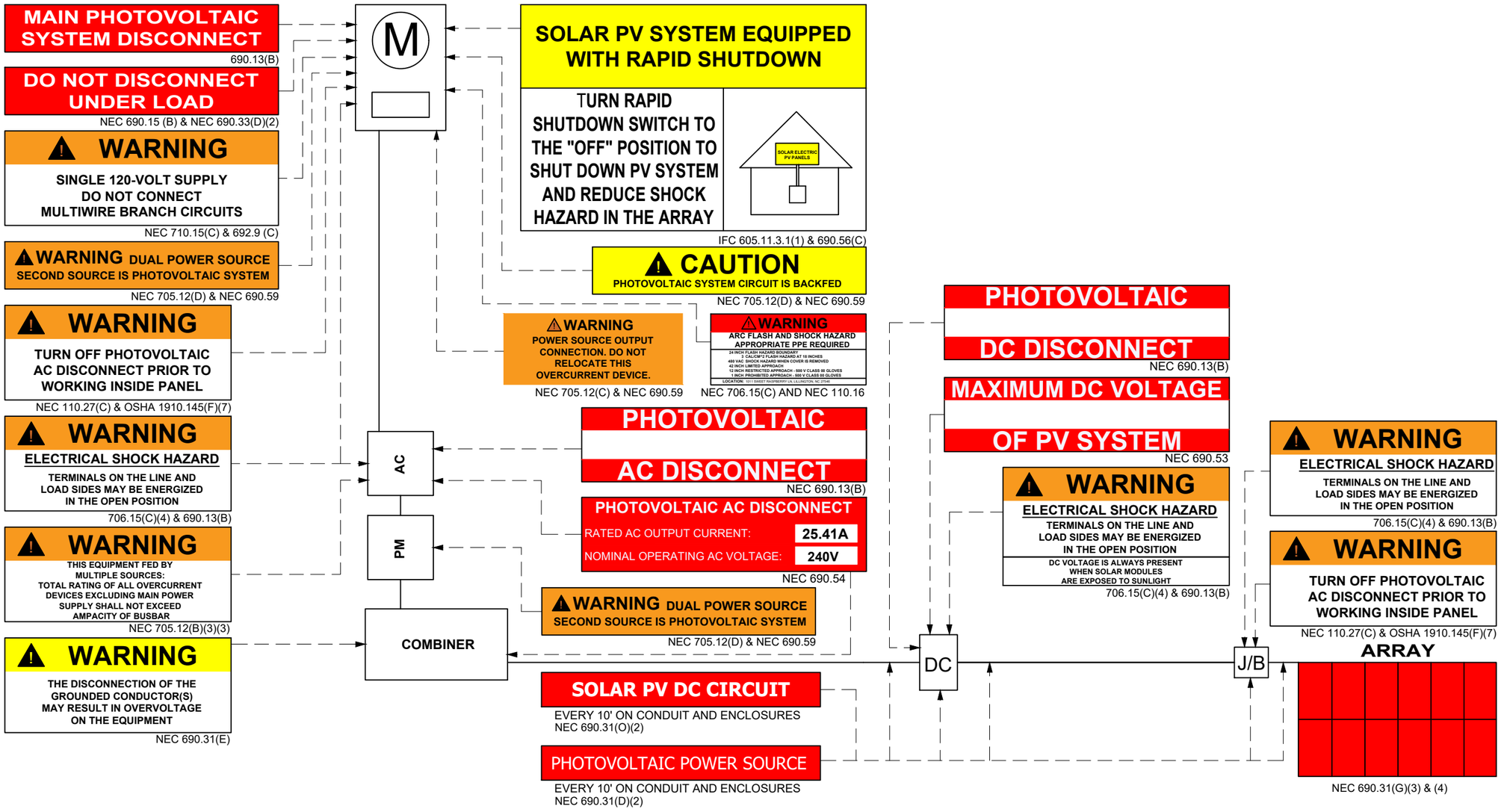
SHEET #	PV-7.0

TITLE

ELECTRICAL PHOTOS



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.

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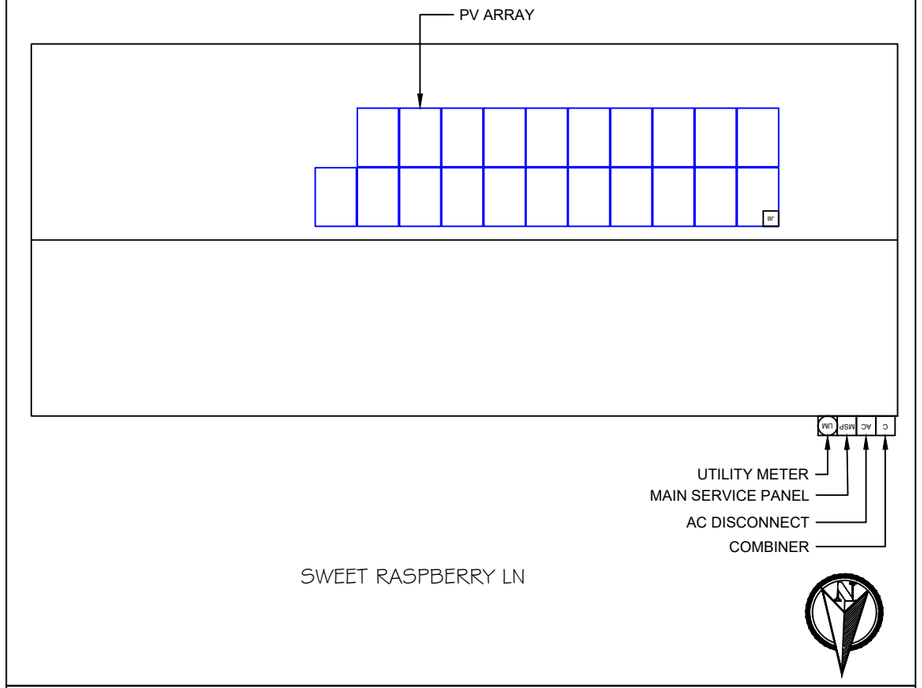
DATE DRAWN	8/24/2023
DRAWN BY	E.R
SHEET #	PV-8.0

TITLE

SIGNAGE

CAUTION

REMOTELY LOCATED DISCONNECT
SWITCH AND METER



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

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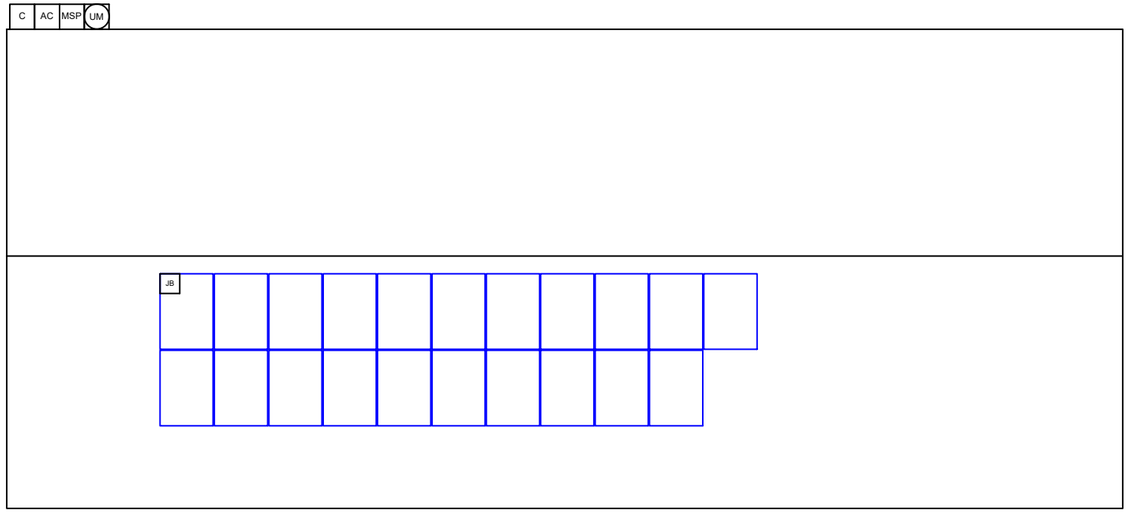
DATE DRAWN	8/24/2023
DRAWN BY	E.R
SHEET #	PV-8.1

TITLE

PLACARD

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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DATE DRAWN	8/24/2023
DRAWN BY	E.R
SHEET #	PV-9.0

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

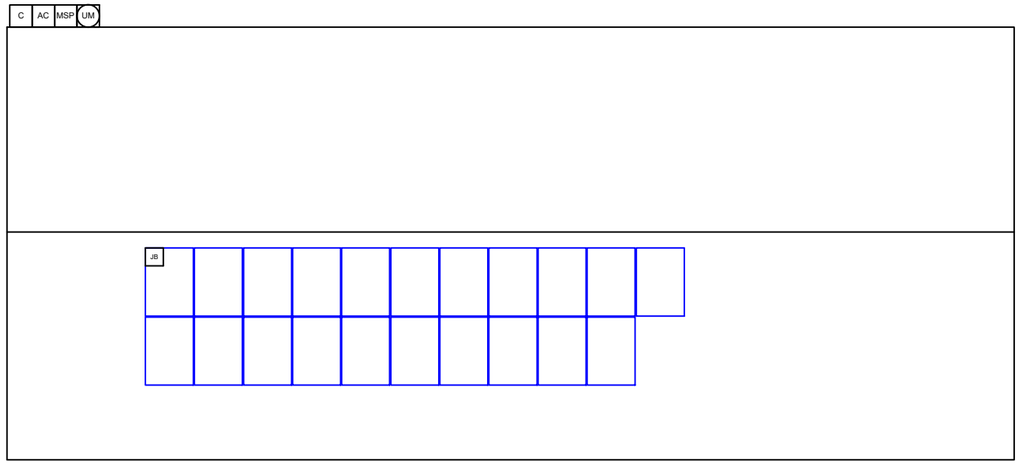
NAME: _____

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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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:
Define the Hazard:	Method/steps to prevent incident:
Define the Hazard:	Method/steps to prevent incident:

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DRAWN BY	E.R
SHEET #	PV-11.0

TITLE

SAFETY PLAN

INXEPTION

mSolar 108BB 400W HC Series

mSolar 10BB Half-Cell Black Monocrystalline PERC PV Module

Excellent efficiency
10 busbar technology increases power by decreasing the distance between busbars and the finger grid line

Improved weak illumination response
More power output even in lower light conditions such as overcast days or off-peak sunlight hours

Anti PID
Panels rigorously tested to limit power degradation caused by 'stray' currents

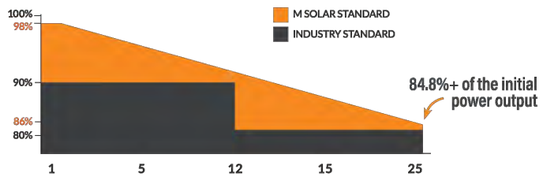
High wind and snow resistance
5,400Pa Snow Load
2,400Pa Wind Load

25-year warranty
M Solar modules are guaranteed to retain at least 84.3% of the initial power output

Appealing Aesthetics
Fully black module creates a sleek, uniform array

25-year product warranty, 25-year output warranty
Warranty backed by Mission Solar Energy

0.5% annual degradation over 25 years



CEC | TUV SUD | CSA

UL 61730 | IEC 61215 | IEC 61730
ISO9001, ISO14001, ISO45001

energy.inxception.com
888-852-4783

108BB 400W HC Series | mSolar 10BB Half-Cell, All-Black Monocrystalline PERC PV Module

mSolar

Electrical Characteristics | STC*

Module Type	TXI10-395108BB	TXI10-400108BB	TXI10-405108BB
Nominal Power Watt Pmax (W)*	395	400	405
Power Output Tolerance Pmax (W)	0~+5	0~+5	0~+5
Maximum Power Voltage Vmp (V)	30.84	31.01	31.21
Maximum Power Current Imp (A)	12.81	12.90	12.98
Open Circuit Voltage (V)	36.98	37.07	37.23
Short Circuit Current Isc (A)	13.70	13.97	13.87
Module Efficiency (%)	20.23	20.48	20.74

*STC (Standard Test Condition): Irradiance 1000W/m², Module Temperature 25°C, AM 1.5
*Measuring tolerance: ±

Electrical Characteristics | NMOT*

Maximum Power Watt Pmax (Wp)	298	270	274
Maximum Power Voltage Vmpp (V)	29.08	29.26	29.47
Maximum Power Current Impp (A)	10.25	10.32	10.38
Open Circuit Voltage Voc (V)	34.75	34.88	35.12
Short Circuit Current Isc (A)	10.96	11.03	11.10

*NMOT(Nominal module operating temperature): Irradiance 800W/m². Ambient Temperature 20°C, AM 1.5, Wind Speed 1m/s

Mechanical Data

Solar Cells	Mono PERC, 182mm half cells
Cells orientation	108 (6x9+6x9)
Module dimension	67.80x44.65x1.38 in. (1,722x1,134x35 mm)
Weight	46.30 lb (21.00 kg)
Glass	3.2mm, High Transmission, Low Iron & Semi-Tempered Glass
Junction Box	IP 68, 3 Diodes
Cables	1,200mm
Connectors	MC4 EVO2

Temperature Ratings

NOCT	42°C±2°C
Temperature coefficient of Pmax	-0.350%/°C
Temperature coefficient of Voc	-0.275%/°C
Temperature coefficient of Isc	+0.045%/°C

Working Conditions

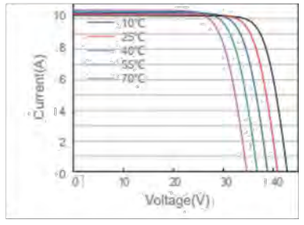
Maximum System Voltage	1500VDC
Operating Temperature	-40°C ~+85°C
Maximum Series Fuse	25A
Maximum Load (Snow/Wind)	5,400Pa / 2,400Pa
Fire Rating	UL Type 1**

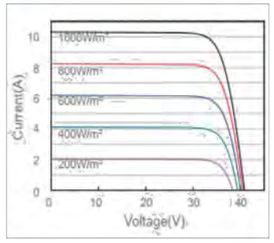
* Do not connect Fuse in Combiner Box with two or more strings in parallel connection

* Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.

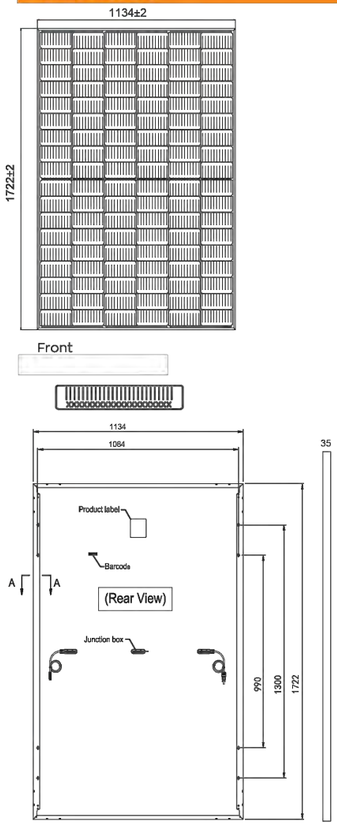
** Please note, the 'Fire Class' Rating is designated for the full installed PV system, which includes, but is not limited to, the module, the type of mounting used, pitch and roof composition.

I-V Curves of PV Module (365W)

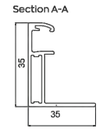




Dimensions (MM)



Tolerance:
Length: ±2mm
Width: ±2mm
Height: ±1mm
Pitch-row: ±1mm



Packaging Details

31 Panels per pallet	Pallet Stack Weight	Truck Weight
26 Pallets per truck	2,934 lbs. (1341.98 kg)	38,461.2 lbs. (17,445.7 kg)

INXEPTION
energy.inxception.com | 888-852-4783

Current Renewables Engineering

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SHEET #	PV-12.0

TITLE
MODULE SPEC

ENPHASE.

DATA SHEET

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.

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 Shutdown Equipment and conform with various regulations, when installed according to manufacturer's instructions.

*Only when installed with IQ System Controller 2, meets UL 1741.
**IQ8 and IQ8Plus support split-phase, 240V installations only.

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 3rd 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)		IQ8-60-2-US	IQ8PLUS-72-2-US
Commonly used module pairings[1]	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_{sc}	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)		**IQ8-60-2-US**	**IQ8PLUS-72-2-US**
Peak output power	VA	245	300
Max. continuous output power	VA	240	290
Nominal (L-L) voltage / range[2]	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[3]		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		MC4	
Dimensions (H x W x D)		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, IEEE 1547:2018 (UL 1741-SB 3rd 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.

IQ8SP-12A-DS-0067-03-EN-US-2022-12-27

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CONTRACTOR INFO

Beam SOLAR CO.

BEAM SOLAR CO.
1231 SHIELDS RD STE 5,
KERNERSVILLE,
NC 27284

Solar Individual Permit Package

MAUREEN MCOUAT

8.400KW Grid Tied Photovoltaic System

1011 SWEET RASPBERRY LN,
LILLINGTON, NC 27546

Rev	Description	Date
A	INITIAL DESIGN	8/24/2023

OPPORTUNITY	MAUREEN MCOUAT
PROJECT #	N/A
DATE DRAWN	8/24/2023
DRAWN BY	E.R
SHEET #	PV-12.1

TITLE
MICROINVERTER 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

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
Envoy breaker	10A or 15A rating GE/Siemens/Eaton 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

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE.

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Solar Individual Permit Package

MAUREEN MCOUAT

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1011 SWEET RASPBERRY LN,
LILLINGTON, NC 27546

Rev	Description	Date
A	INITIAL DESIGN	8/24/2023

OPPORTUNITY	MAUREEN MCOUAT
PROJECT #	N/A
DATE DRAWN	8/24/2023
DRAWN BY	E.R
SHEET #	PV-12.2

TITLE
COMBINER SPEC

SOLARMOUNT

UNIRAC

SOLARMOUNT defined the standard in solar racking. Features are designed to get installers off the roof faster. Our grounding & bonding process eliminates copper wire and grounding straps to reduce costs. Systems can be configured with standard or light rail to meet your design requirements at the lowest cost possible. The superior aesthetics package provides a streamlined clean edge for enhanced curb appeal, with no special brackets required for installation.

Now Featuring:

THE NEW FACE OF SOLAR RACKING

Superior Aesthetics Package

LOSE ALL OF THE COPPER & LUGS
System grounding through Enphase microinverters and trunk cables

SMALL IS THE NEXT NEW BIG THING
Light Rail is Fully Compatible with all SM Components

ENHANCED DESIGN & LAYOUT TOOLS
Featuring Google Map Capabilities within U-Builder

FAST INSTALLATION. SUPERIOR AESTHETICS

OPTIMIZED COMPONENTS • VERSATILITY • DESIGN TOOLS • QUALITY PROVIDER

SOLARMOUNT

UNIRAC

OPTIMIZED COMPONENTS

INTEGRATED BONDING & PRE-ASSEMBLED PARTS

Components are pre-assembled and optimized to reduce installation steps and save labor time. Our new grounding & bonding process eliminates copper wire and grounding straps or bonding jumpers to reduce costs. Utilize the microinverter mount with a wire management clip for an easier installation.

VERSATILITY

ONE PRODUCT - MANY APPLICATIONS

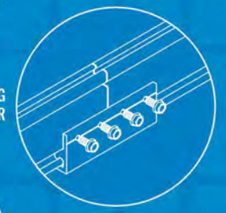
Quickly set modules flush to the roof or at a desired tilt angle. Change module orientation to portrait or landscape while securing a large variety of framed modules on flat, low slope or steep pitched roofs. Available in mill, clear and dark anodized finishes to outperform your projects financial and aesthetic aspirations.

AUTOMATED DESIGN TOOL

DESIGN PLATFORM AT YOUR SERVICE

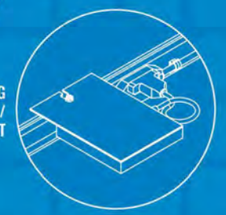
Creating a bill of materials is just a few clicks away with U-Builder, a powerful online tool that streamlines the process of designing a code compliant solar mounting system. Save time by creating a user profile, and recall preferences and projects automatically when you log in. You will enjoy the ability to share projects with customers: there's no need to print results and send to a distributor, just click and share.

INTEGRATED BONDING MIDCLAMP



INTEGRATED BONDING SPLICE BAR

INTEGRATED BONDING L-FOOT w/ T-BOLT



INTEGRATED BONDING MICROINVERTER MOUNT w/ WIRE MANAGEMENT

LISTED **UL2703** BONDING & GROUNDING MECHANICAL LOADING SYSTEM FIRE CLASSIFICATION

UNIRAC CUSTOMER SERVICE MEANS THE HIGHEST LEVEL OF PRODUCT SUPPORT

UNMATCHED EXPERIENCE | CERTIFIED QUALITY | ENGINEERING EXCELLENCE | BANKABLE WARRANTY | DESIGN TOOLS | PERMIT DOCUMENTATION

TECHNICAL SUPPORT

Unirac's technical support team is dedicated to answering questions & addressing issues in real time. An online library of documents including engineering reports, stamped letters and technical data sheets greatly simplifies your permitting and project planning process.

CERTIFIED QUALITY PROVIDER

Unirac is the only PV mounting vendor with ISO certifications for 9001:2015, 14001:2015 and OHSAS 18001:2007, which means we deliver the highest standards for fit, form, and function. These certifications demonstrate our excellence and commitment to first class business practices.

BANKABLE WARRANTY

Don't leave your project to chance. Unirac has the financial strength to back our products and reduce your risk. Have peace of mind knowing you are receiving products of exceptional quality. SOLARMOUNT is covered by a twenty five (25) year limited product warranty and a five (5) year limited finish warranty.

PROTECT YOUR REPUTATION WITH QUALITY RACKING SOLUTIONS BACKED BY ENGINEERING EXCELLENCE AND A SUPERIOR SUPPLY CHAIN

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Solar Individual Permit Package

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Rev	Description	Date
A	INITIAL DESIGN	8/24/2023

OPPORTUNITY	MAUREEN MCOUAT
PROJECT #	N/A
DATE DRAWN	8/24/2023
DRAWN BY	E.R
SHEET #	PV-12.3

TITLE

RAIL SPEC

FLASHLOC™ DUO

THE MOST VERSATILE DIRECT TO DECK ATTACHMENT

UNIRAC
BETTER SOLAR STARTS HERE

FLASHLOC™ **DUO** is the most versatile direct to deck and rafter attachment for composition shingle and rolled comp roofs. The all-in-one mount installs fast — no kneeling on hot roofs to install flashing, no prying or cutting shingles, no pulling nails. Simply drive the required number of screws to secure the mount and inject sealant into the base. **FLASH**LOC's patented TRIPLE SEAL technology preserves the roof and protects the penetration with a permanent pressure seal. Kitted with two rafter screws, sealant and hardware for maximum convenience (deck screws sold separately). Don't just divert water, **LOC it out!**

PROTECT THE ROOF

Install a high-strength waterproof attachment without lifting, prying or damaging shingles.

LOC OUT WATER

With an outer shield 1 contour-conforming gasket 2 and pressurized sealant chamber 3 the Triple Seal technology delivers a 100% waperproof connection.

HIGH-SPEED INSTALL

Simply drive the required number of screws and inject sealant into the port 4 to create a permanent pressure seal.

APRIL2021_FLASHLOCDUO_V1

FASTER INSTALLATION. 25-YEAR WARRANTY.

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702

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FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702

FLASHLOC™ DUO

INSTALLATION GUIDE

UNIRAC
BETTER SOLAR STARTS HERE

PRE-INSTALL: CLEAN SURFACE AND MARK LOCATION

Ensure existing roof structure is capable of supporting the roof attachment point loads stated in the racking system engineering specifications. Clean roof surface of dirt, debris, snow and ice.

Snap chalk lines for attachment rows. On shingle roofs, snap lines 1/4" below upslope edge of shingle coarse. This line will be used to align the upper edge of the mount.

NOTE: Space mounts per racking system installation specifications.

STEP ONE: SECURE

ATTACHING TO A RAFTER: Place FLASHLOC DUO over rafter location with sealant port on up-slope side and align upper edge of mount with horizontal chalk line. Secure mount with the two (2) provided rafter screws. BACKFILL ALL PILOT HOLES WITH SEALANT.

ATTACHING TO SHEATHING: Place FLASHLOC DUO over desired location with sealant port on up-slope side and align upper edge of mount with horizontal chalk line. Secure mount with the two (2) provided rafter screws. Next, secure mount with four (4) deck screws by drilling through the FLASHLOC DUO deck mount hole locations. Unirac recommends using a drill as opposed to an impact gun to prevent over-tightening or stripping roof sheathing.

IMPORTANT: SECURELY ATTACH MOUNT BUT DO NOT OVERTIGHTEN SCREWS.

STEP TWO: SEAL

Insert tip of UNIRAC approved sealant into port and inject until sealant exits vent. Follow sealant manufacturer's instructions. Follow sealant manufacturer's cold weather application guidelines, if applicable.

NOTE: When FLASHLOC DUO is installed over gap between shingle tabs or vertical joints, fill gap/joint with sealant between mount and upslope edge of shingle course.

CUT SHINGLES AS REQUIRED: DO NOT INSTALL THE FLASHLOC SLIDER ACCROSS THICKNESS VARIATIONS GREATER THAN 1/8" SUCH AS THOSE FOUND IN HIGH DEFINITION SHINGLES.

NOTE: If an exploratory hole falls outside of the area covered by the sealant, flash hole accordingly.
NOTE: Read and comply with the Flashloc Duo Design & Engineering Guide prior to design and installation of the system.

USE ONLY UNIRAC APPROVED SEALANTS. PLEASE CONTACT UNIRAC FOR FULL LIST OF COMPATIBLE SEALANTS.

Continue array installation. Refer to SOLARMOUNT or NXT HORIZON Installation Guide for the remaining system installation.

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OPPORTUNITY	MAUREEN MCOUAT
PROJECT #	N/A
DATE DRAWN	8/24/2023
DRAWN BY	E.R
SHEET #	PV-12.4

TITLE
ATTACHMENT SPEC