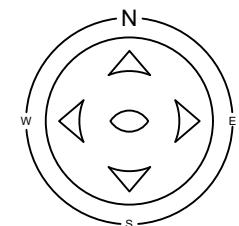


AZIMUTH AND TILT ANGLE						
	ROOF					
AZIMUTH	ROOF A:	ROOF B:	ROOF C:	ROOF D:	ROOF E:	ROOF F:
	185°	181°				
TILT ANGLE	5/12	5/12				
MODULE COUNT	3	8				
SOLAR ACCESS						
TSFR AVERAGE						
INVERTERS	SOLAR EDGE SE3800H - USMN	1				
OPTIMIZERS	SOLAREDGE S440	11				
	MODULE #1:	COUNT:	MODULE #2:	COUNT:	TOTAL COUNT:	
	HANWHA Q-CELLS Q-PEAK DUO BLK ML-G10+ 410	11			11	



SYMBOL LEGEND	
□ = MECHANICAL VENT	
○ = FLUE / PLUMBING VENT	



1 MAIN SERVICE PANEL

2 UTILITY METER

3 AC DISCONNECT

4 NOT USED

4.1 NOT USED

5 INVERTER & INTEGRATED DC DISCONNECT

5.1 NOT USED

6 OPTIMIZER (TYPICAL FOR EACH MODULE)

7 JUNCTION BOX ON ROOF (SIZE DETERMINED IN FIELD)

8 PV MODULES

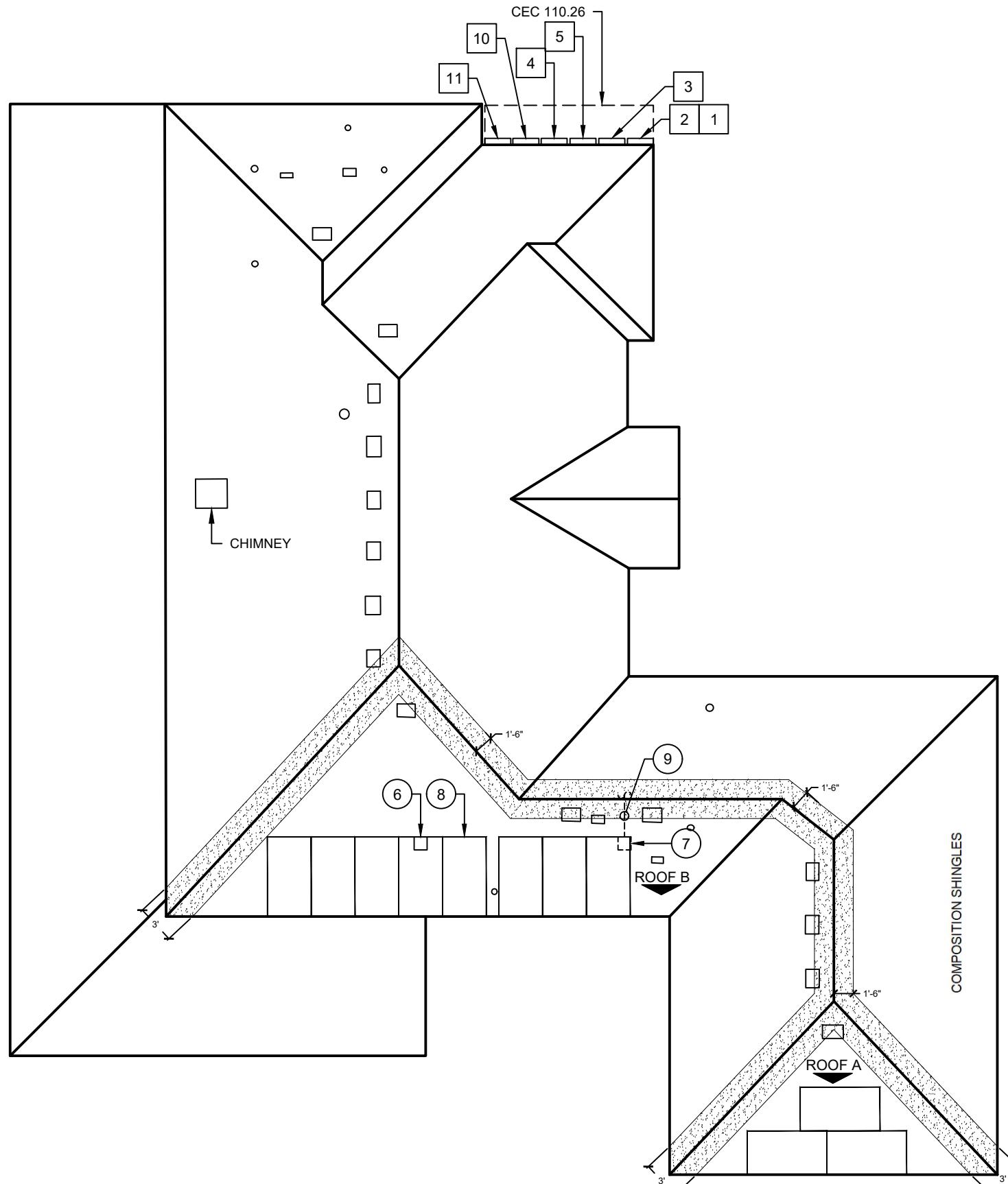
9 CONDUIT RUN IS SURFACE MOUNTED (ACTUAL CONDUIT RUNS TO BE DETERMINED IN THE FIELD)

10 ENERGY BANK BATTERY PACK

11 BACKUP INTERFACE

ROOF CALCULATIONS:

TOTAL AREA OF ARRAY(S) = 232.54 SQ. FT.
TOTAL AREA OF ROOF = 4611 SQ. FT.
% OF TOTAL ROOF COVERED = 5.0%
TOTAL WEIGHT OF ARRAY(S) = 533.50



SIGNATURE:
Adam G.

CONTRACTOR LICENSE:
C-10#1020761
DATE: 3/5/2025 6:43:27 AM

PROJECT #	BPNI34200		REV	DATE	DESCRIPTION
SYSTEM SIZE	4.51kW/DC	3.8kW/AC	---	---	
DATE:	3/5/2025 6:43:27 AM		---	---	
DESIGNER:	VERONICA BERMUDEZ		---	---	
			---	---	

KAREN MADRIGAL
33017 GLOBE DR,
SPRINGVILLE, CA, 93265

ROOF/SITE PLAN
PV2

⚠️ WARNING ⚠️

POWER SOURCE OUTPUT CONNECTION DO NOT
RELOCATE THIS OVERCURRENT DEVICE

OPTIMIZER SPECIFICATIONS			
MAKE AND MODEL	SOLAREDGE S440	INPUTS	OUTPUTS
MAX INPUT VOLTAGE AT VOC/MIN	60 [V]	60	MAX OUTPUT VOLTAGE
MAX SHORT CIRCUIT CURRENT (Isc)	14.5 [A]	15	MAX OUTPUT CURRENT
RATED INPUT DC POWER	440 [W/V]	380	ACTUAL STRING OUTPUT VOLTAGE
NOTE 1: OPTIMIZERS TO BE GROUNDED USING 1/4" HEX HEAD BOLT, WASHER, NUT, FOR TOP RAIL MOUNT. SUPPLIED 5ST STAR WASHER.			

MAKE AND MODEL	HANWHA Q-CELLS Q-PEAK DUO BLK ML-G10+ 410	TEMP ADJUSTED VALUES
MAX POWER-POINT CURRENT (I _{MP})	[A] 10.89	
MAX POWER-POINT VOLTAGE (V _{MP})	[V] 37.64	31.9
OPEN CIRCUIT VOLTAGE (V _{OC})	[V] 45.37	48.6
SHORT CIRCUIT CURRENT (I _{SC})	[A] 11.2	
MAX SERIES FUSE (OCPD)	[A] 20	
MAX POWER (P _{Max})	[W] 410	
MAX VOLTAGE (V _{Dc})	[V] 1000	

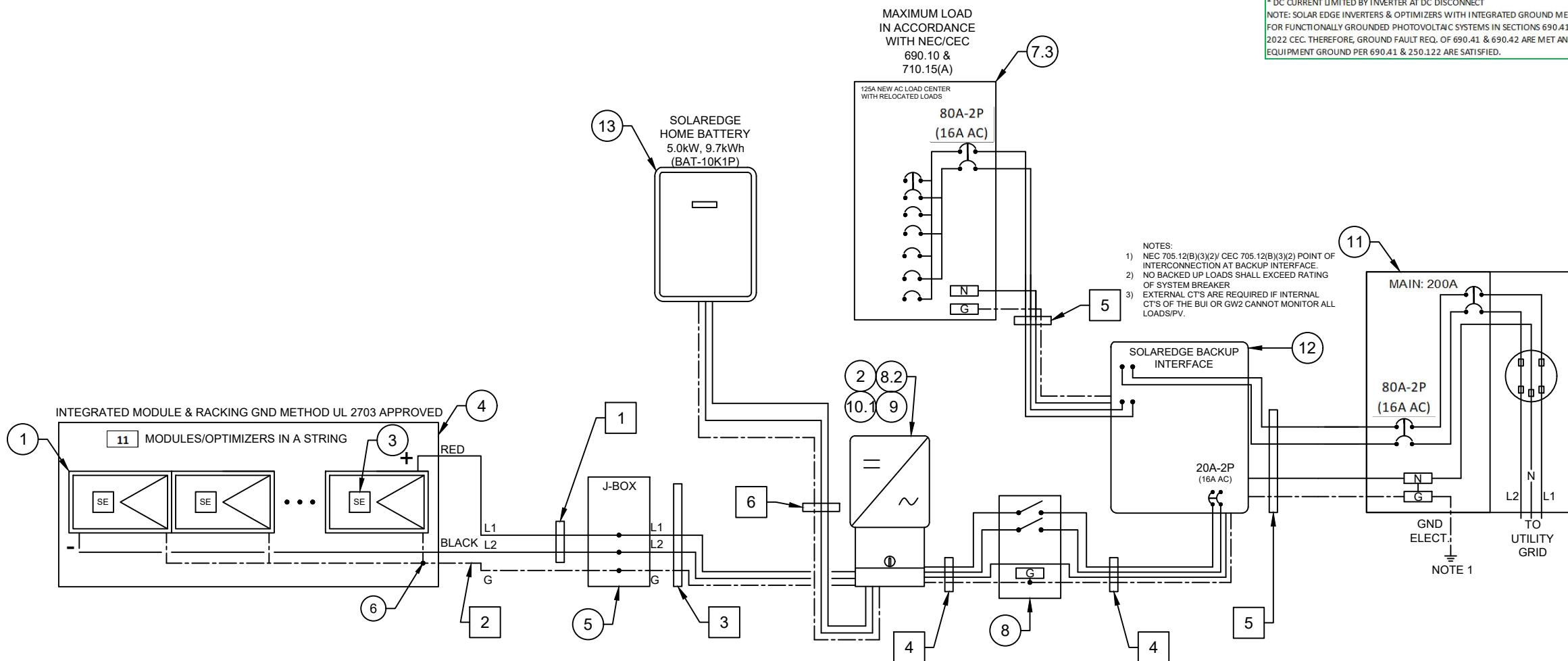
MANUFACTURER AND MODEL	SOLAR EDGE SE3800H - USMN
MAX DC INPUT VOLTAGE	[V] 480
MAX OUTPUT POWER	[W] 3800
NOMINAL DC INPUT VOLTAGE	[V] 380
NOMINAL AC OUTPUT VOLTAGE	[V] 240
MAX CONTINUOUS OUTPUT CURRENT	[A] 16
OVERCURRENT PROTECTION DEVICE RATING	[A] 20
MAX DC INPUT CURRENT *	[A] 10.5

* DC CURRENT LIMITED BY INVERTER AT DC DISCONNECT
NOTE: SOLAR EDGE INVERTERS & OPTIMIZERS WITH INTEGRATED GROUND MEET THE REQUIREMENTS FOR FUNCTIONALLY GROUNDED PHOTOVOLTAIC SYSTEMS IN SECTIONS 690.41 & 690.42 OF THE 2022 CEC. THEREFORE, GROUND FAULT REQ. OF 690.41 & 690.42 ARE MET AND SIZING OF EQUIPMENT GROUND PER 690.41 & 250.122 ARE SATISFIED.

EXISTING MAIN SERVICE PANEL	EXISTING
MANUFACTURER:	0
PANEL MODEL NUMBER:	0
VOLTAGE:	240v [V]
PHASES:	1 Ø
BOX/BUSS RATING:	200 [A]
MAIN BREAKER:	200 [A]
MINIMUM PV SYSTEM BREAKER SIZE	20 [A]
#OF SPARE BREAKER	2
CALCS: BUS MAX	
200 * 1.2 = 240	
MCB + (1.25 * TOTAL OUTPUT CURRENT)	
200 + (1.25 * 16) = 220	

CEC 705.12(B)(3)(2)

NOTE 1: IF THE EXISTING MAIN SERVICE PANEL DOES NOT HAVE VERIFIABLE GROUNDING ELECTRODE, IT IS THE PV CONTRACTOR'S RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE.
NOTE 2: ENSURE G.E.C. INSTALLED AS PER 690.47 & 250.64.
NOTE 3: ALL NEW EQUIPMENT INSTALLED SHALL BE RATED TO MATCH THE EXISTING EQUIPMENTS AVAILABLE FAULT CURRENT 110.9



STRING CALCULATIONS				
1 CIRCUIT WITH 11 - SOLAREDGE S440 OPTIMIZERS IN SERIES				
4510W	/	380V	ACTUAL STRING CURRENT	11.87A
380V	/	11	ACTUAL VOLTAGE PER OPTIMIZER	34.5V
1	X	380V	MAX SYSTEM VOLTAGE	380V
1	X	15A	MAX SYSTEM CURRENT	15A
11	X	410W	<---ACTUAL MAX POWER DC-->	4510W

EQUIPMENT SCHEDULE				
TAG	DESCRIPTION	MANUFACTURER	PART NUMBER	NOTES
1	SOLAR PV MODULE #1	HANWHA Q-CELLS Q-PEAK DUO BLK ML-G10+ 410	HANWHA Q-CELLS Q-PEAK DUO BLK ML-G10+ 410	QUANTITY 11
2	INVERTER #1	SOLAR EDGE SE3800H - USMN	SOLAR EDGE SE3800H - USMN	QUANTITY 1
3	OPTIMIZERS	SOLAREDGE S440	SOLAREDGE S440	11
4	RACKING	SNAPRACK	SNAPRACK ULTRA	SEE RACKING SPECIFICATIONS SELECTED IN FIELD
5	J-BOX	SNAPRACK	SNAPRACK ULTRA	MODULE TO RAIL/RAIL TO J-BOX
6	GROUNDS	SNAPRACK		
7.3	ESSENTIAL LOADS PANEL	SQUARE D OR EQUAL	BUS SIZE:125A / OCPD:80A	
8	AC (UTILITY) DISCONNECT	SQUARE D OR EQUAL	DU222RB,240V,60A,2P,3R	NEMA 3R
8.2	INTERGRATED DC DISCONNECT	SOLAR EDGE		INTEGRAL TO INVERTER
9	RAPID SHUTDOWN	SOLAR EDGE		INTEGRAL TO INVERTER
10.1	INTERGRATED REVENUE METER	SOLAR EDGE		INTEGRAL TO INVERTER
11	EXISTING MAIN SERVICE PANEL	EXISTING		
12	BACKUP INTERFACE/BUI	SOLAREDGE	BI-N	QUANTITY 1
13	ENERGY STORAGE	SOLAREDGE	SOLAREDGE ENERGY BANK	# OF 9.7kWH BATTERIES: 1

CONDUIT AND CONDUCTOR SCHEDULE					
TAG	DESCRIPTION OF CONDUCTOR TYPE	CONDUCTOR SIZE (AWG)	# OF CONDUCTORS	CONDUIT TYPE	CONDUIT SIZE
1	PV WIRE	#10	2	IN FREE AIR	
2	EGC/GEC	#6	1	IN FREE AIR	SOLID BARE
3	THWN-2	#10 & #6	2 & (1)G	EMT	3/4"
4	THWN	#10 & #8	3 & (1)G	EMT	3/4"
5	THWN	#4 & #8	3 & (1)G	EMT	1"
6	THWN	#10 & #8	2 & (1)G	EMT	3/4"
CONDUCTOR CALCULATIONS:					
3)	690.8(B)(1) 15 x 1.25 = 18.75a	4)	16 x 1.25 = 20a	1.	ALL CONDUCTORS ARE DESIGNED FOR LESS THAN 2% VOLTAGE DROP.
	240.4(D)(7) #10AWG = 30a		#10AWG = 30a	2.	ALL EXTERIOR CONDUITS SHALL HAVE WATERPROOF FITTINGS.
	Amb. Temp. Max = 1°C		Amb. Temp. Max = 37°C	3.	ALL CONDUCTORS ARE COPPER
	T310.15(B)(1) 18.75a / 0.91 = 20.60a		20.60a / 0.88 = 22.73a		
			22.73a < 30a		

BRIGHT PLANET SOLAR 103A MILLBURY ST, AUBURN MA 01501 888-997-4469	SIGNATURE:	PROJECT #	BPN134200	REV	DATE	DESCRIPTION	KAREN MADRIGAL 33017 GLOBE DR, SPRINGVILLE, CA, 93265	ELECTRICAL LINE DIAGRAM/ DETAILS PV3
	CONTRACTOR LICENSE: C-10#1020761	SYSTEM SIZE	4.51kW/DC 3.8kW/AC	--	--			
	DATE: 3/5/2025 6:43:29 AM	DESIGNER:	VERONICA BERMUDEZ	--				
	DATE: 3/5/2025 6:43:29 AM			--				
				--				
				--				

NOTE: PLAQUES SHALL BE ATTACHED TO THE SERVICE EQUIPMENT WITH NON CORROSIVE, POP-RIVETS, SCREWS, OR APPROVED ADHESIVE.

1 LOCATION: MAIN SERVICE PANEL & AC DISCONNECT

⚠️ WARNING

ELECTRIC SHOCK HAZARD

DO NOT TOUCH TERMINALS
TERMINALS ON BOTH THE LINE AND
LOAD SIDES MAY BE ENERGIZED
IN THE OPEN POSITION

PHOTOVOLTAIC MODULES PRODUCE DC VOLTAGE
WHENEVER THEY ARE EXPOSED TO SUNLIGHT

2 LOCATION: MAIN SERVICE PANEL PV BACK-FED BREAKER

⚠️ WARNING

INVERTER OUTPUT CONNECTION

DO NOT RELOCATE THIS
OVERCURRENT DEVICE

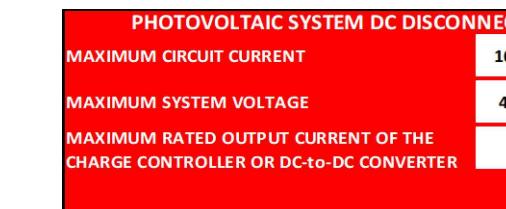
6 CONDUIT, RACEWAYS & ENCLOSURES

11 LOCATION: MAIN PANEL

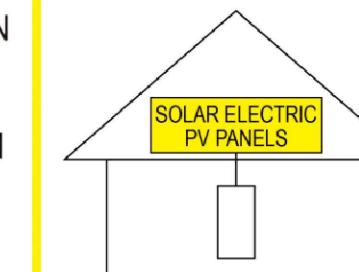
WARNING: PHOTOVOLTAIC POWER SOURCE

7 LOCATION: DC DISCONNECT/INVERTER #1

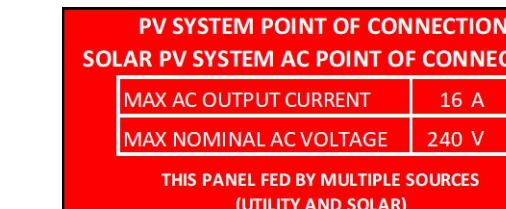
SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN



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



8 LOCATION: MAIN SERVICE PANEL



9 LOCATION: MAIN SERVICE PANEL

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

10 LOCATION: INVERTER

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

14 LOCATION: AC DISCONNECT

PHOTOVOLTAIC AC DISCONNECT

2 LOCATION: MAIN SERVICE PANEL PV BACK-FED BREAKER

⚠️ WARNING ⚠️

POWER SOURCE OUTPUT CONNECTION DO NOT
RELOCATE THIS OVERCURRENT DEVICE

4 LOCATION: UTILITY METER

⚠️ WARNING ⚠️

THIS SERVICE METER
IS ALSO SERVED BY A
PHOTOVOLTAIC SYSTEM

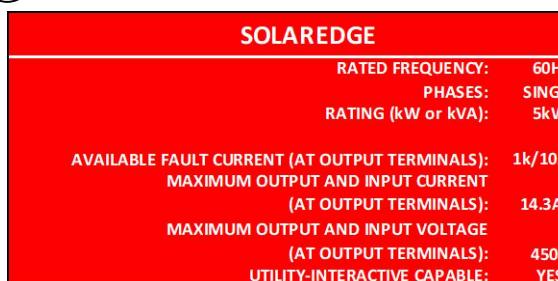
5 LOCATION: PV SUB PANEL (IF USED)

⚠️ WARNING ⚠️

PHOTOVOLTAIC SYSTEM COMBINER PANEL

DO NOT ADD LOADS

16 LOCATION: ENERGY STORAGE



5.1 LOCATION: BATTERY DISCONNECT

⚠️ WARNING ⚠️

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

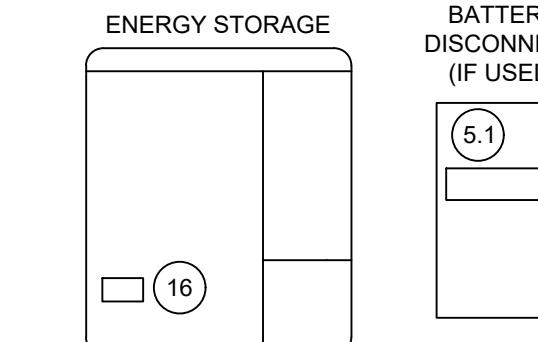
15 LOCATION: MAIN SERVICE PANEL

⚠️ WARNING ⚠️

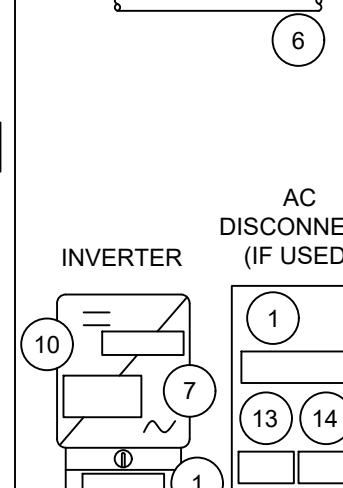
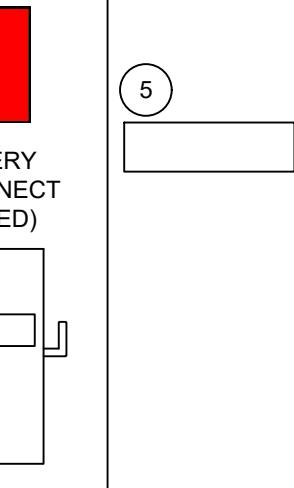
THREE POWER SOURCES
SOURCES: UTILITY GRID, BATTERY
AND PV SOLAR ELECTRIC SYSTEM

14 LOCATION: ESS DISCONNECT

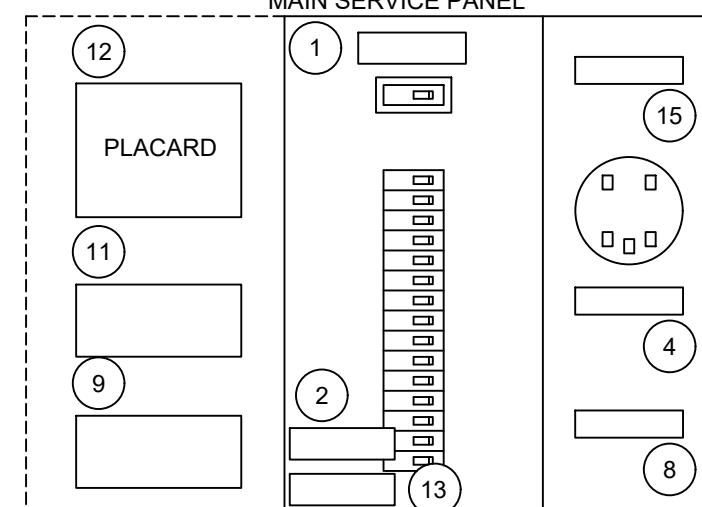
ENERGY STORAGE SYSTEM DISCONNECT



PV SUB PANEL (IF USED) CONDUITS/RACEWAYS



FOR ILLUSTRATION ONLY (NOT ACTUAL MSP)
MAIN SERVICE PANEL



BRIGHT PLANET SOLAR
103A MILLBURY ST,
AUBURN MA 01501
888-997-4469

SIGNATURE:


CONTRACTOR LICENSE:
C-10#1020761
DATE: 3/5/2025 6:43:31 AM

PROJECT #	BPN134200		REV	DATE	DESCRIPTION
SYSTEM SIZE	4.51kW/DC 3.8kW/AC		---	---	
DATE:	3/5/2025 6:43:31 AM		---	---	
DESIGNER:	VERONICA BERMUDEZ		---	---	
			---	---	

KAREN MADRIGAL
33017 GLOBE DR,
SPRINGVILLE, CA, 93265

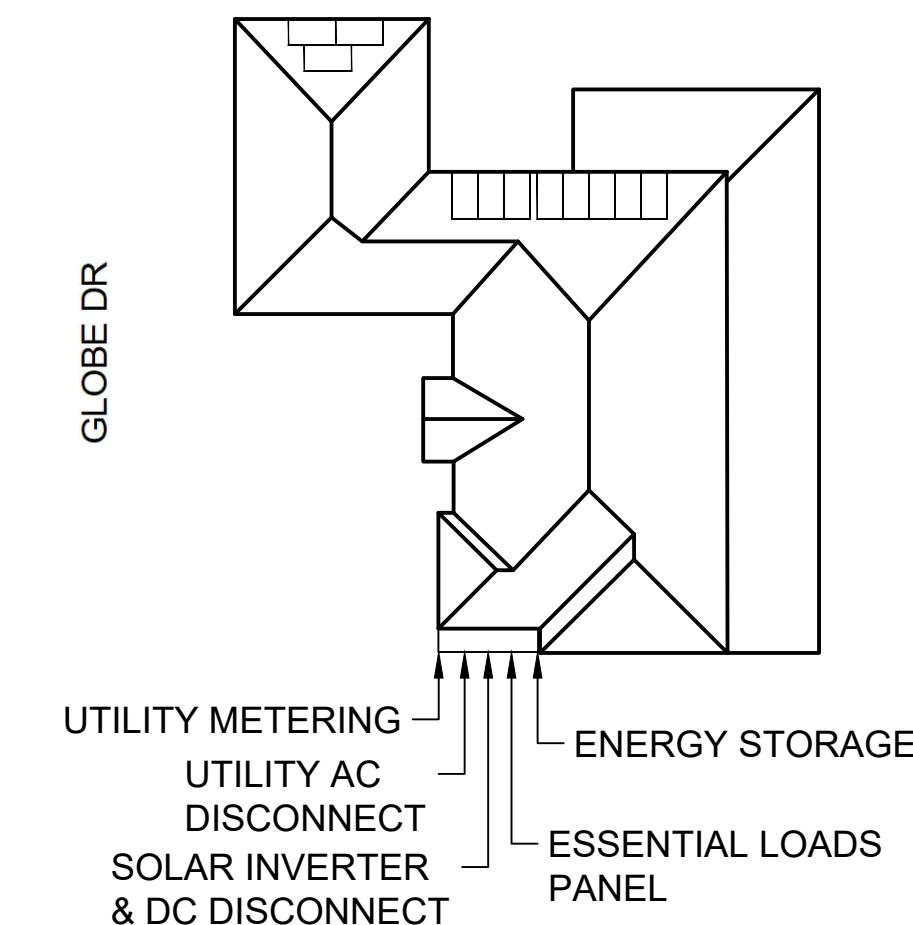
EQUIPMENT LABELS

PV4

(12) PLACARD

CAUTION:

MULTIPLE SOURCES OF POWER



PROJECT #	BPNI34200		REV	DATE	DESCRIPTION
SYSTEM SIZE	4.51kW/DC	3.8kW/AC	---	---	
DATE:	3/5/2025 6:43:32 AM		---	---	
DESIGNER:	VERONICA BERMUDEZ		---	---	
			---	---	

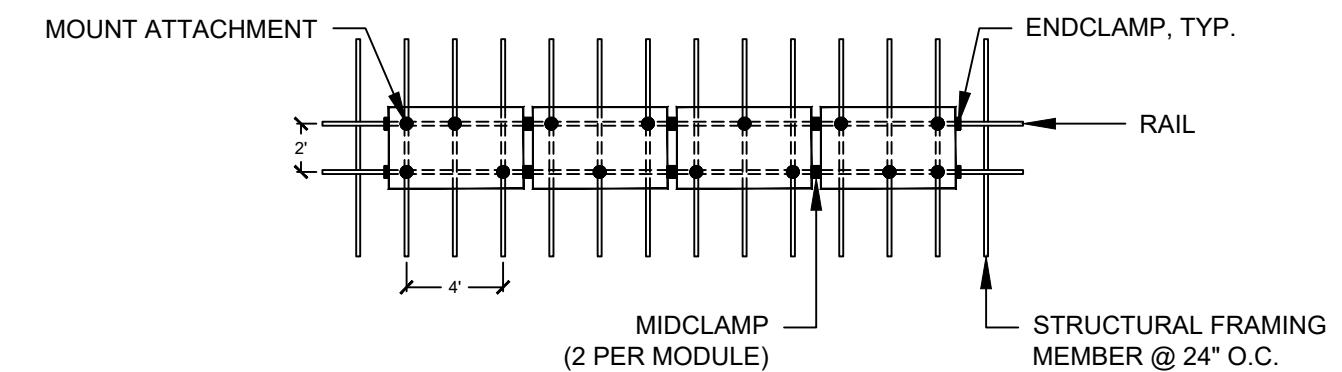
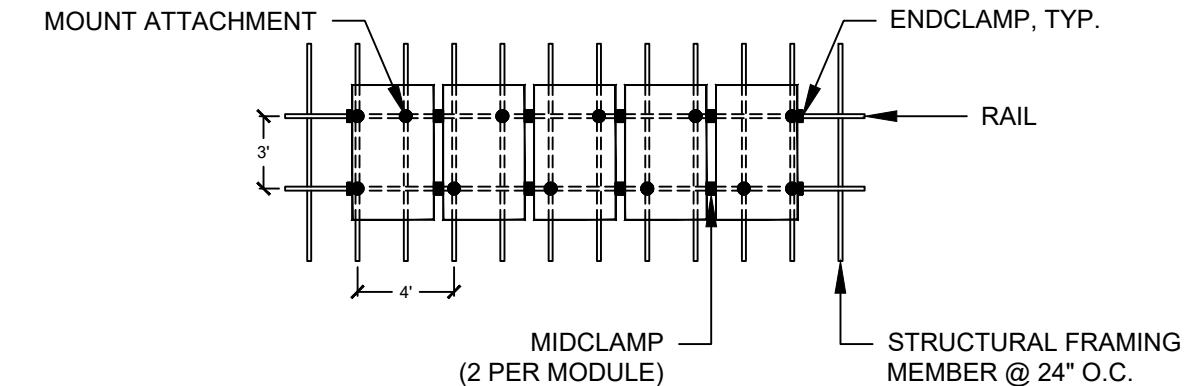
● = MOUNT ATTACHMENT LOCATION
 MAXIMUM OVERHANG (CANTILEVER) IS 19
 MAXIMUM SPACING OF ANCHORS (FOOTINGS) IS 48 IN. O.C.
 FIELD VERIFY EXACT LOCATION OF STRUCTURE MEMBERS.

ROOF A:
PHOTOVOLTAIC DEAD LOAD STATEMENT

TOTAL AREA OF ARRAY = 63.42 SQ. FT.
 ARRAY GROSS WEIGHT = 145.5 LBS
 DEAD LOAD RATING = 2.8 LBS/SQ.FT.
 EXISTING STRUCTURAL FRAMING = 2x4 @ 24 IN. O.C.

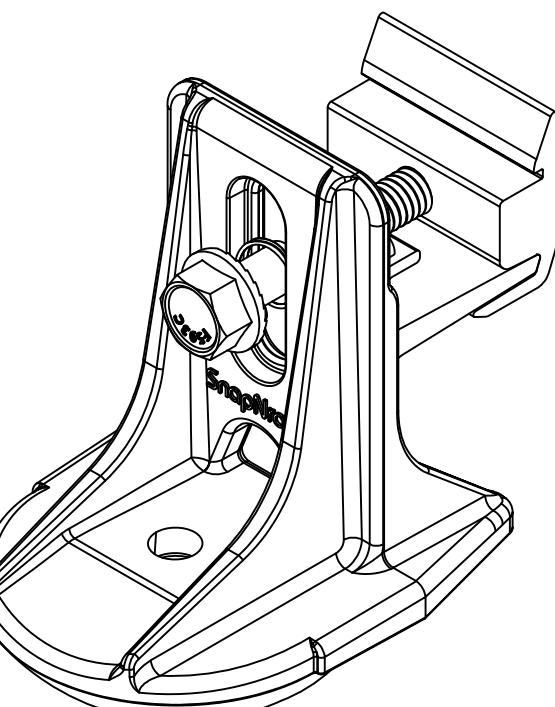
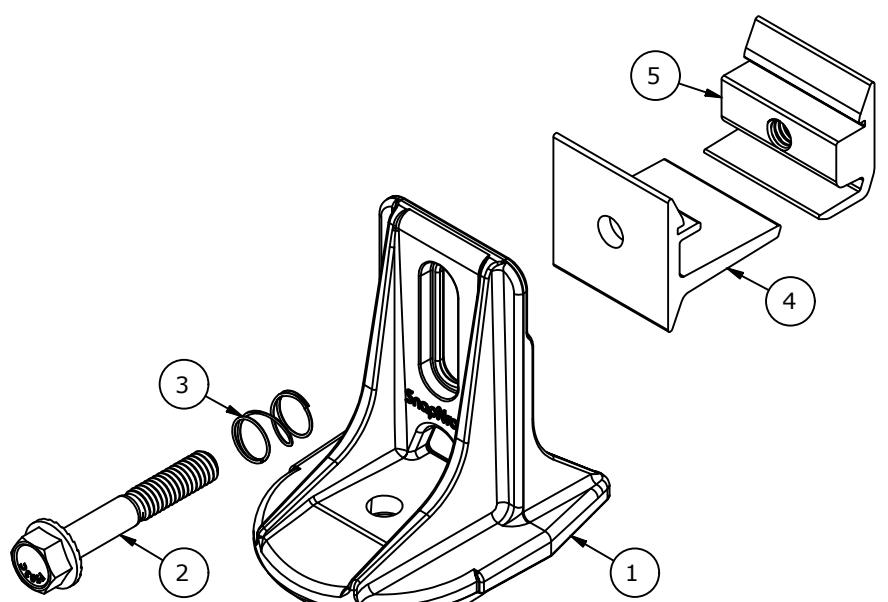
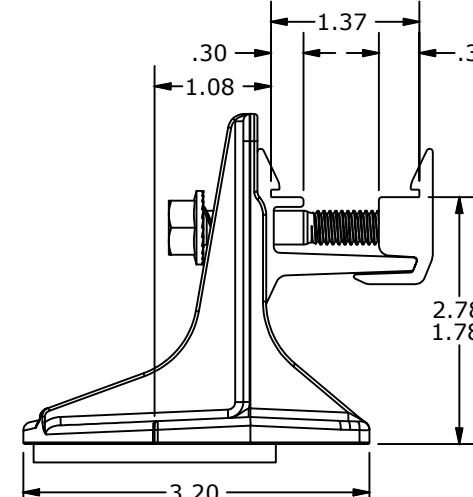
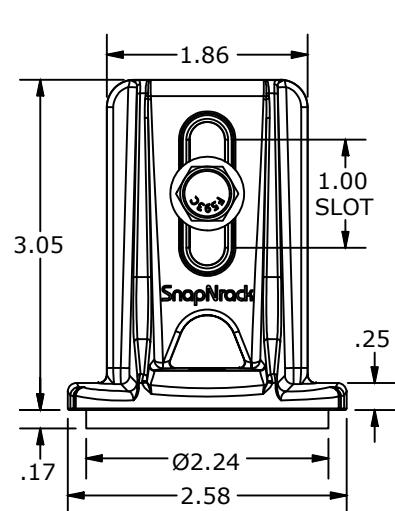
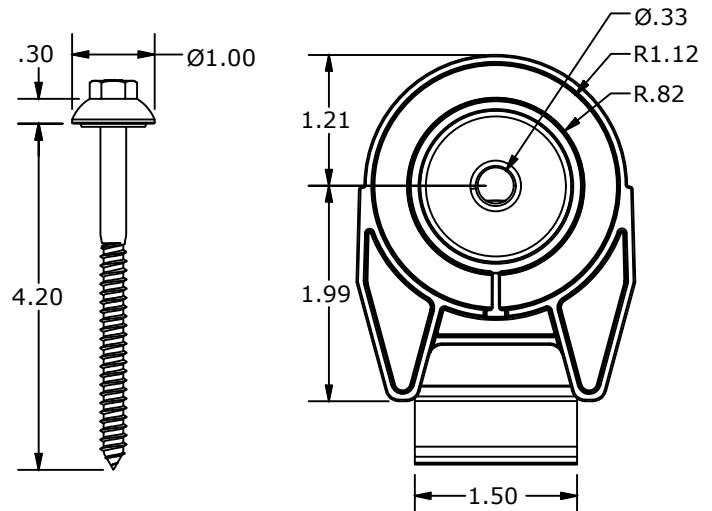
ROOF B:
PHOTOVOLTAIC DEAD LOAD STATEMENT

TOTAL AREA OF ARRAY = 169.12 SQ. FT.
 ARRAY GROSS WEIGHT = 388 LBS
 DEAD LOAD RATING = 2.8 LBS/SQ.FT.
 EXISTING STRUCTURAL FRAMING = 2x4 @ 24 IN. O.C.



PROJECT #	BPN134200		REV	DATE	DESCRIPTION
SYSTEM SIZE	4.51kW/DC 3.8kW/AC		---	---	
DATE:	3/5/2025 6:43:33 AM		---	---	
DESIGNER:	VERONICA BERMUDEZ		---	---	
			---	---	

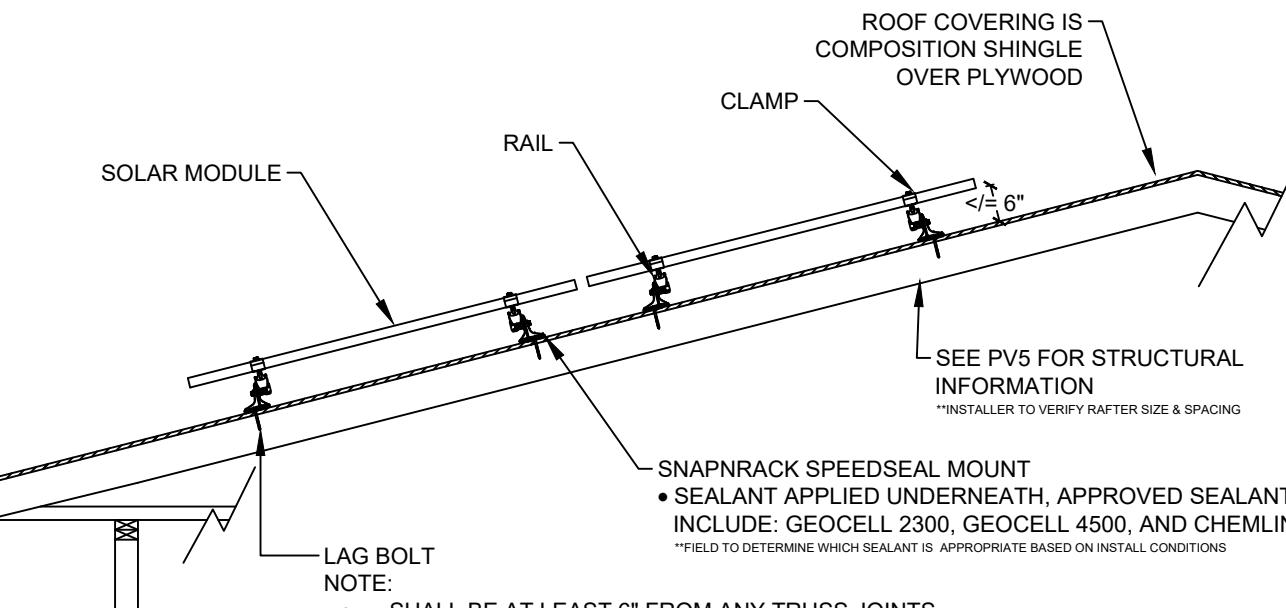
ALL DIMENSIONS IN INCHES



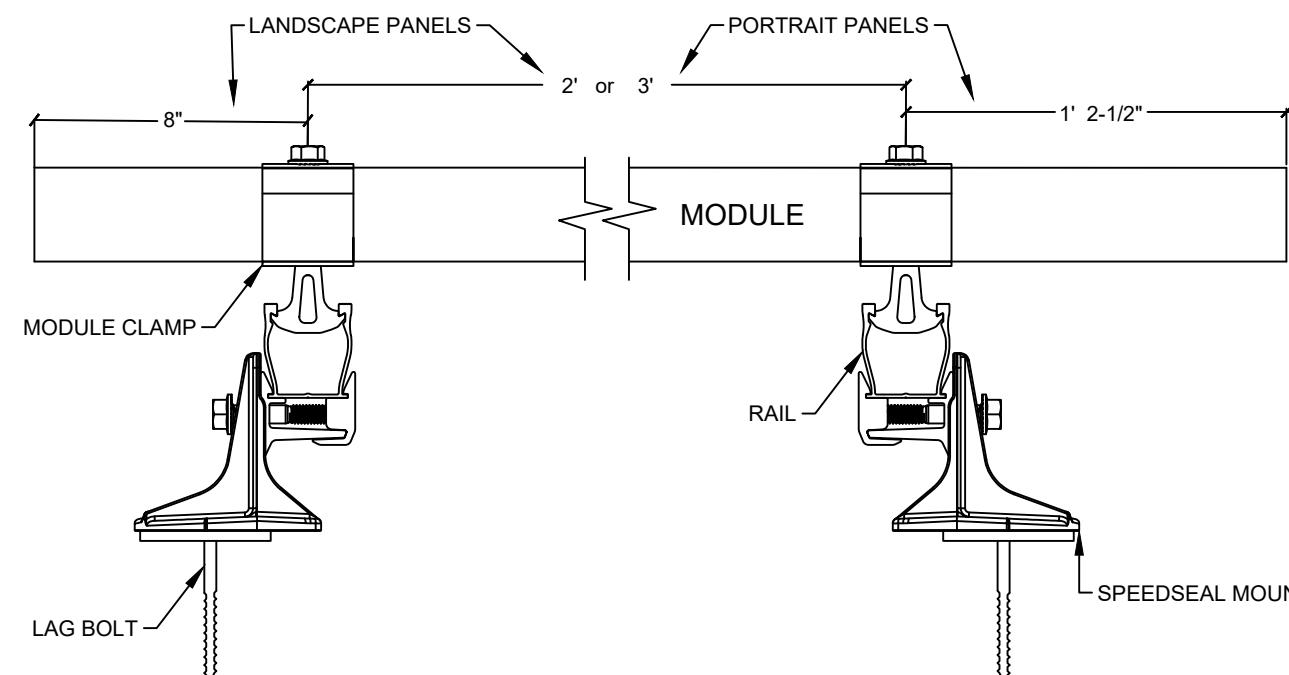
PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	SNAPNRACK, SPEEDSEAL FOOT, BASE, SEALING, SILVER / BLACK
2	1	BOLT, FLANGE, SERRATED, 5/16IN-18 X 2IN, SS
3	1	SNAPNRACK, RL UNIVERSAL, MOUNT SPRING, SS
4	1	SNAPNRACK, ULTRA RAIL MOUNT THRU PRC, CLEAR / BLACK
5	1	SNAPNRACK, ULTRA RAIL MOUNT TAPPED PRC, CLEAR / BLACK

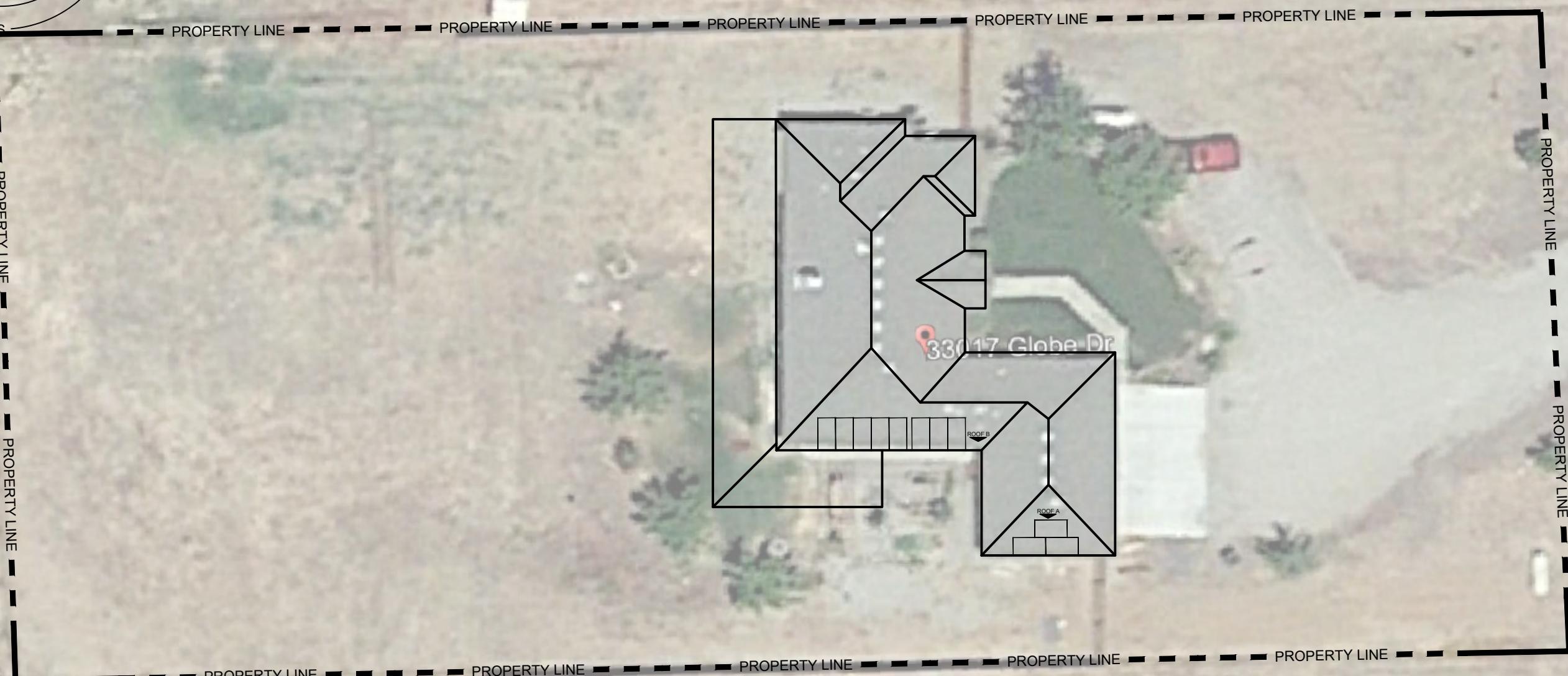
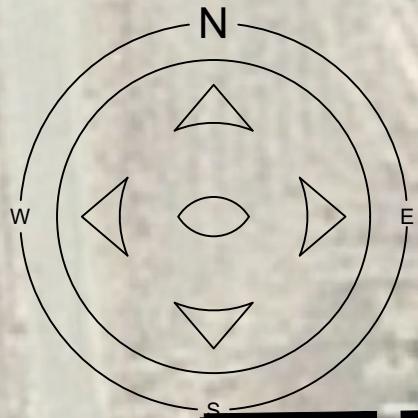
SNAPNRACK ROOF MOUNT SYSTEM

SNOW/CRITTER GUARD TO BE INSTALLED, IF REQUIRED



OPTIMAL SPACING FROM EDGE AND IN BETWEEN CLAMPS





90 ft



BRIGHT PLANET SOLAR
103A MILLBURY ST,
AUBURN MA 01501
888-997-4469

SIGNATURE:
Adam G.

CONTRACTOR LICENSE:
C-10#1020761
DATE: 3/5/2025 6:43:35 AM

PROJECT #	BPNI34200		REV	DATE	DESCRIPTION
SYSTEM SIZE	4.51kW/DC 3.8kW/AC		---	---	
DATE:	3/5/2025 6:43:35 AM		---	---	
DESIGNER:	VERONICA BERMUDEZ		---	---	
			---	---	

KAREN MADRIGAL
33017 GLOBE DR,
SPRINGVILLE, CA, 93265

PROPERTY LINES

PV7

A grid of 40 numbered empty boxes for drawing. The boxes are arranged in five rows and eight columns. Each box contains a single digit from 1 to 40, representing a drawing space. The numbers are: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40.

MAPPING INSTRUCTION

1. REMOVE THE 'SQUARE' OPTIMIZER STICKER AND PLACE NEATLY ON THE APPROPRIATE NUMBERED SPACE.

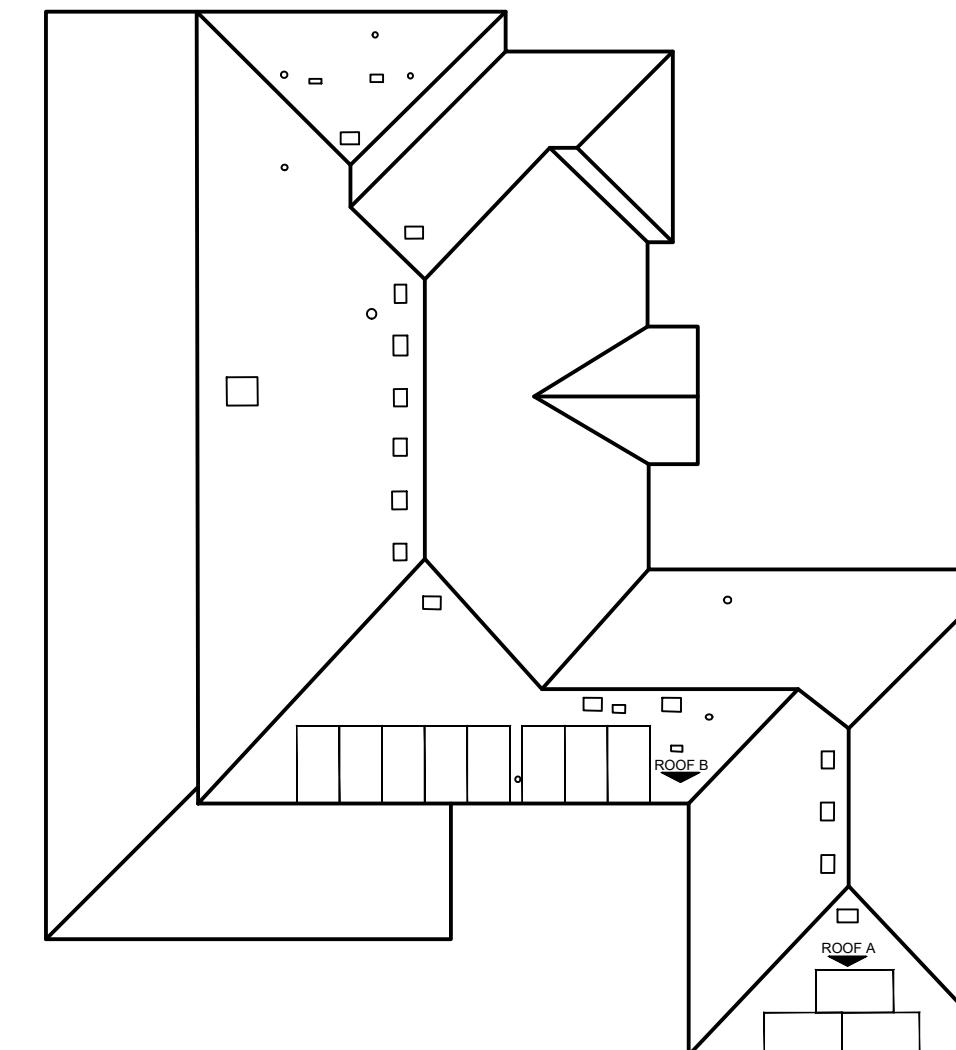
2. WRITE THE CORRESPONDING NUMBER ON THE APPROPRIATE MODULE WITHIN THE ARRAY.

AZIMUTH AND TILT ANGLE						
	ROOF					
	ROOF A:	ROOF B:	ROOF C:	ROOF D:	ROOF E:	ROOF F:
AZIMUTH	185°	181°				
TILT ANGLE	5/12	5/12				
MODULE COUNT	3	8				
SOLAR ACCESS						
TSF AVG/EAVE AGE						
INVERTERS	SOLAR EDGE SE3800H - USMN	1				
OPTIMIZERS	SOLAREDGE S40	11				
	MODULE #1:	COUNT:	MODULE #2:	COUNT:	TOTAL COUNT:	
	HANWHA Q CELLS Q PEAK DUO BLK M. G10+ A10	11			11	

INVERTER(S) SERIAL NUMBERS

#

- DO NOT MAKE ANY TIE IN CHANGES UNLESS APPROVED AND DOCUMENTED BY BPS DESIGN TEAM
 - MAXIMUM WATTAGE ALLOWED IN CIRCUIT/STRING IS 6000W FOR SOLAREDGE INVERTERS 7600-11400
 - MAXIMUM WATTAGE ALLOWED IN CIRCUIT/STRING IS 5700W FOR SOLAREDGE INVERTERS 3000-6000
 - MINIMUM OPTIMIZERS IN CIRCUIT/STRING = 8 (6 WITH P405/P505)



BRIGHT PLANET SOLAR
103A MILLBURY ST,
AUBURN MA 01501
888-997-4469

SIGNATURE:


CONTRACTOR LICENSE:
C-10#1020761
DATE: 3/5/2025 6:43:36 AM

PROJECT #	BPN134200	REV	DATE	DESCRIPTION	KAREN MADRIGAL 33017 GLOBE DR, SPRINGVILLE, CA, 93265	OPTIMIZER TRACKING PV8
SYSTEM SIZE	4.51kW/DC 3.8kW/AC		---			
DATE:	3/5/2025 6:43:36 AM		---			
DESIGNER:	VERONICA BERMUDEZ		---			

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SIGNATURE:

CONTRACTOR LICENSE:
C-10#1020761
DATE: 3/5/2025 6:43:36 AM

PROJECT #	BPN134200		REV	DATE	DESCRIPTION
SYSTEM SIZE	4.51kW/DC	3.8kW/AC	--		
DATE:	3/5/2025 6:43:36 AM		--		
DESIGNER:	VERONICA BERMUDEZ		--		
			--		

KAREN MADRIGAL
33017 GLOBE DR,
SPRINGVILLE, CA, 93265

LEGEND / LEYENDA

JOB HAZARD ANALYSIS / ANALISIS DE RIESGOS LABORALES

 EXCLUSION ZONE/
ZONA
RESTRINGIDA

xxxxxxxxxxxx
ELECTRICAL ZONE/
ZONA ELECTRICA

 LADDER/
ESCALERA

 ANCHOR/
ANCLAJE

 ANCHOR
WORK ANGLES/
ANCLAJE
TRABAJADO EN
ANGULOS

 VEHICLES/
VEHICULOS

 HAZARD NUMBER
& EXPLAIN/
RIESGOS
NUMERADOS
Y EXPLICADOS

 TREE / ARBOL

 HOME
ENTRANCES/
ENTRADA DE LA
CASA

SITE NOTES (INCLUDE ANY HAZARD, NUMBERED AND EXPLAINED):
**NOTAS DEL LUGAR (INCLUYE CUALQUIER RIESGO, NUMERADO
Y EXPLICADO):**

CLOSEST URGENT CARE / MEDICAL FACILITY:
SALA DE EMERGENCIA / HOSPITAL MAS CERCANO:

PUBLIC PROTECTION / PROTECCION PUBLICA:
 EXCLUSION ZONES / ZONA RESTRINGIDA
 MARKED ENTRYWAYS / ENTRADA MARCADA

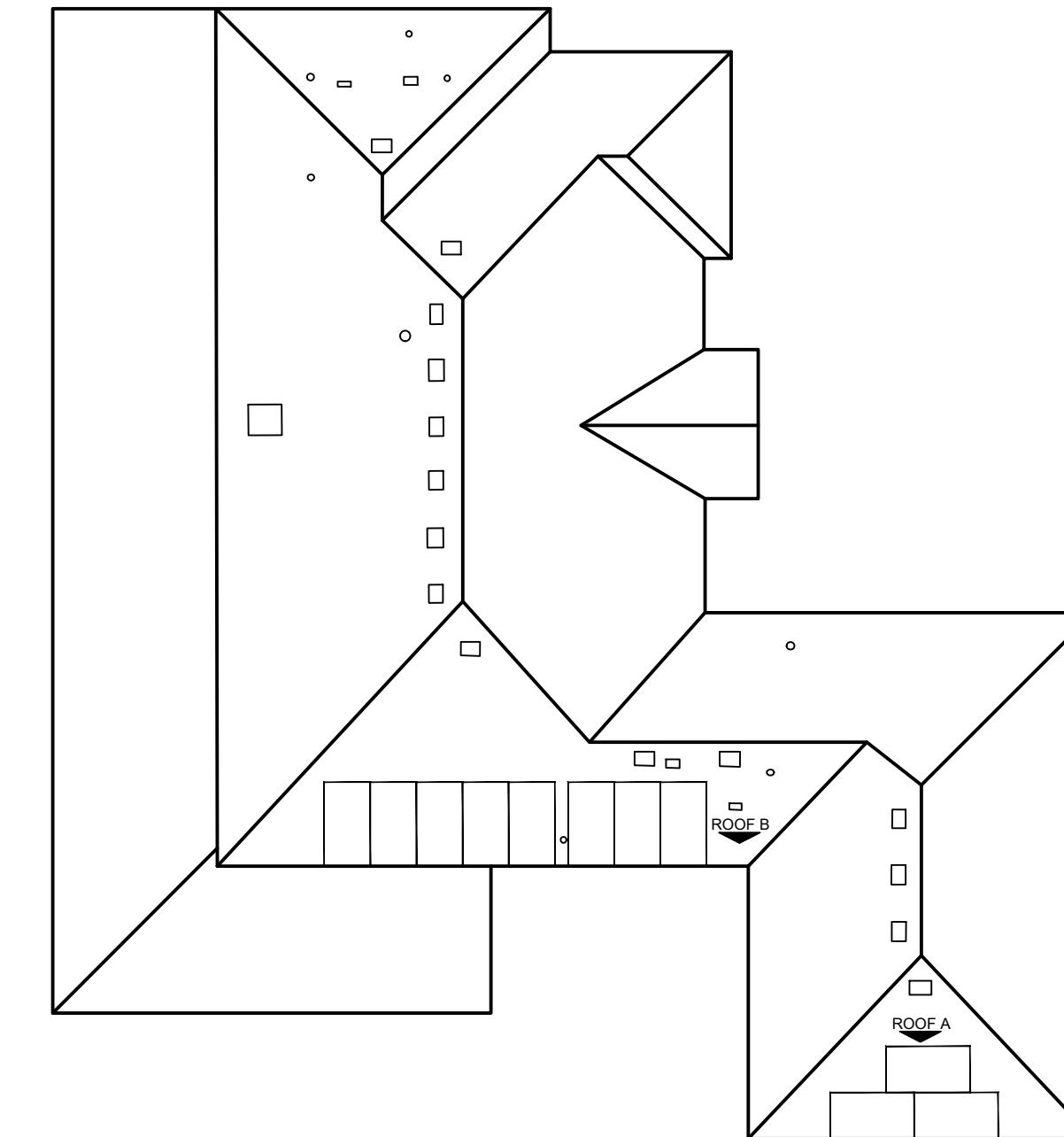
FALL PROTECTION / PROTECCION DE CAIDAS:
 ANCHORS / ANCLAJE
 ROPES / CARABINERS & ROPE GRAB / SOGAS CARABINERO
 Y AGARRE DE SOGA
 HARNESS / ARNES
 LANYARDS / SOGA

PPE / EPP:
 SAFETY GLASSES / GAFAS DE SEGURIDAD
 GLOVES/GUANTES
 HARD HATS/CASCO DE SEGURIDAD
 ARC FLASH SUIT / HOT GLOVES / TRAJE AISLANTE/GUANTES
 PARA ELECTRICIDAD
 FIRST AID KIT / KIT DE PRIMEROS AUXILIOS
 COVID-19 PPE ON SITE / EPP POR COVID EN EL LUGAR
 CREW ADHERING TO BPS COVID-19 PLAN / AJUSTE EN EL GRUPO
 AL PLAN POR COVID-19 DE BPS

DATE / FECHA:

CREW LEAD / LIDER DE GRUPO:

CREW MEMBERS / MIEMBROS DEL GRUPO:



GLOBE DR

PICKED BY:

RECEIVED BY:



BRIGHT PLANET SOLAR
103A MILLBURY ST,
AUBURN MA 01501
888-997-4469

SIGNATURE:


PROJECT #	BPN134200	REV	DATE	DESCRIPTION
SYSTEM SIZE	4.51kW/DC 3.8kW/AC		---	
DATE:	3/5/2025 6:43:38 AM		---	
DESIGNER:	VERONICA BERMUDEZ		---	

KAREN MADRIGAL
33017 GLOBE DR,
SPRINGVILLE, CA 92326

BOM SHEET

PV10



March 5, 2025

Structural Letter: Residential Solar Array Installation

Project #:

BPN134200

Project Name / Address:

Karen Madrigal
33017 Globe Dr,
Springville, CA, 93265

Dear Permitting Personnel,

The purpose of this document is to present criteria provided by the Solar Permitting Guide of California; the above mentioned project meets the necessary requirements that qualify for expedited structural permitting.

Based on the supplemented structural check list along with the solar modules manufacturer and support data, reasonable assurance is given that the design of this residential solar array complies with the structural provisions of the 2022 California Building code (CBC) and 2022 California Residential code (CRC).

Existing Structure and Array Attachments:

See attached Structural Criteria for Residential Flush Mounted Solar Arrays

Regional and Site Criteria:

Ground Snow Load: 0 PSF

Design Wind Exposure: Category C
(Per ASCE 7-16, Sec. 26.7.3)

Design Wind Speed: 100 MPH
(Per ASCE 7-16, 3-sec gust)

Topographical Effects: N/A
(Per ASCE 7-16, Sec. 26.8)
(Not on a hill with grade steeper than 5%)

Solar Array Information:

Module Type: HANWHA Q-CELLS Q.PEAK DUO BLK ML-G10+ 410

Module Weight: 2.29 PSF

Module Support: SnapNrack U-40 Rail / Speed Seal Flush Mount

Limitations:

Installation of the solar panels must be performed in accordance with manufacturer recommendations. All work performed must be in accordance with accepted industry-wide methods and applicable safety standards. The contractor must notify the Bright Planet Solar should any damage, deterioration, or discrepancies between the structural checklist and the existing conditions occur.

Connections to existing roof framing must be staggered, except at array ends, so as not to overload any existing structural member. The use of the attached documents to this letter is matched to the above described project only. The design of the solar panel racking (mounts, rails, etc.) and electrical engineering is the responsibility of others.

Regards,

Jordan Sewell

Structural Designer

CC: lsair@brightplanetsolar.com

STRUCTURAL CRITERIA FOR RESIDENTIAL FLUSH-MOUNTED SOLAR ARRAYS

1. ROOF CHECKS

A. Visual Review/Contractor's Site Audit of Existing Conditions:

- 1) Is the roof a single roof without a reroof overlay? Y N
- 2) Does the roof structure appear structurally sound, without signs of alterations or significant structural deterioration or sagging, as illustrated in Figure 1? Y N

B. Roof Structure Data:

- 1) Measured roof slope (e.g. 6:12): $\frac{5/12}{24}$ inch
- 2) Measured rafter spacing (center-to-center):
- 3) Type of roof framing (rafter or manufactured truss):

Rafter
 Trusses

2. SOLAR ARRAY CHECKS

A. Flush-mounted Solar Array:

- 1) Is the plane of the modules (panels) parallel to the plane of the roof? Y N
- 2) Is there a 2" to 10" gap between underside of module and the roof surface? Y N
- 3) Modules do not overhang any roof edges (ridges, hips, gable ends, eaves)? Y N

B. Do the modules plus support components weigh no more than:

- 4 psf for photovoltaic arrays or 5 psf for solar thermal arrays?

Y N

C. Does the array cover no more than half of the total roof area (all roof planes)?

Y N

D. Are solar support component manufacturer's project-specific completed worksheets, tables with relevant cells circled, or web-based calculator results attached?

Y N

E. Is a roof plan of the module and anchor layout attached? (see Figure 2)

F. Downward Load Check (Anchor Layout Check):

- 1) Proposed anchor horizontal spacing (see Figure 2): $4' 0"$ ft-incl
- 2) Horizontal anchor spacing per Table 1: $4' 0"$ ft-incl

- 3) Is proposed anchor horizontal spacing equal to or less than Table 1 spacing? Y N

G. Wind Uplift Check (Anchor Fastener Check):

- 1) Anchor fastener data (see Figure 3):

a. Diameter of lag screw, hanger bolt, or self-drilling screw: $5/16$ inch

$5/16$ inch

b. Embedment depth of rafter: $2-1/2"$ inch

$2-1/2"$ inch

c. Number of screws per anchor (typically one): 1

1

d. Are $5/16$ "diameter lag screws with 2.5" embedment into the rafter used, OR does the anchor fastener meet the manufacturer's guidelines? Y N

3. SUMMARY

A. All items above are checked YES. No additional calculations are required.

B. One or more items are checked NO. Attach project-specific drawings and calculations stamped and signed by a California-licensed civil or structural engineer.

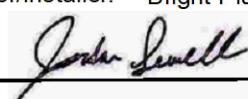
Job Address: Karren Madrigal
33017 Globe Dr,
Springville, CA, 93265

Permit #:

Contractor/Installer: Bright Planet Solar

License # & Class:

Signat:



Phone #:



January 31, 2023

SnapNrack
775 Fiero Lane, Ste. 200
San Luis Obispo, CA 93401
TEL: (877) 732-2860

Attn.: SnapNrack - Engineering Department

Re: SnapNrack pre-engineered PV racking systems:

- RL Universal System (Report # 2019-02916A.01 and B.01)
- S200 Ground Mount System (Report # 2017-00240-D.02)
- UR40 Railed System (Report # 2017-03227.11)
- UR60 Railed System (Report # 2018-11940.03)
- TopSpeed Deck Mount System (Report # 2022-021411)

Subject: Engineering certification for the State of California.

PZSE, Inc. - Structural Engineers has provided engineering and span tables as presented in the above referenced reports. All information, data, and analysis therein are based on, and comply with, the following building codes and typical specifications:

Building Codes:

1. ASCE/SEI 7-10 & 7-16, Minimum Design Loads for Buildings and Other Structures, by American Society of Civil Engineers
2. 2016, 2019 & 2022 California Building Code, by California Building Standards Commission
3. 2016, 2019 & 2022 California Residential Code, by California Building Standards Commission
4. AC428 Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012, by ICC-ES
5. Aluminum Design manual 2015 & 2020, by The Aluminum Association, Inc.
6. ANSI/AWC NDS-2018, National Design Specification for Wood Construction, by the American Wood Council

This letter certifies that the design criteria and design methodology for the SnapNrack product span tables are in compliance with the above codes. Please refer to the system specific Engineering Certification Reports (listed above) for system specific design criteria and limitations.

If you have any questions on the above, do not hesitate to call.

Prepared by:
PZSE, Inc. — Structural Engineers
Roseville, CA



1478 Stone Point Drive, Suite 190, Roseville, CA 95661

T 916.961.3960 F 916.961.3965 W www.pzse.com

Experience | Integrity | Empowerment

NOTE: SITE SPECIFIC CRITERIA: SNOW LOAD: 0, WIND SPEED: 100, WIND EXPOSURE: C , ROOF PITCH: 4/12

Maximum Rail Spans (Inches)				SnapNrack UR-40 Rail Flush-Mount on 0 to 30 Foot Roof -- Bin 8 -- 72-Cell								
Ground Snow Load	Exposure Category	Panel Angle	Wind Speed ->	95 mph	100 mph	105 mph	110 mph	115 mph	120 mph	125 mph	130 mph	
			Roof Zone ->	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	1 / 2 / 3	
0 psf	C	0 to 7	Array Interior	75 / 67 / 57	79 / 71 / 62	72 / 65 / 54	70 / 61 / 52	68 / 59 / 49	66 / 56 / 47	63 / 54 / 45	60 / 51 / 45	
			Array Edge	64 / 55 / 46	69 / 60 / 50	61 / 52 / 48	58 / 50 / 42	55 / 47 / 40	53 / 45 / 38	51 / 43 / 36	51 / 43 / 36	
		7 to 20	Array Interior	71 / 59 / 53	75 / 64 / 58	68 / 56 / 51	66 / 53 / 48	63 / 51 / 46	60 / 49 / 44	58 / 47 / 42	55 / 45 / 41	
			Array Edge	59 / 48 / 43	64 / 52 / 47	56 / 45 / 41	53 / 43 / 39	51 / 41 / 37	49 / 39 / 36	47 / 38 / 34	45 / 36 / 33	
		20 to 27	Array Interior	78 / 65 / 62	83 / 69 / 67	76 / 61 / 59	73 / 59 / 56	71 / 56 / 54	69 / 53 / 51	67 / 51 / 49	64 / 49 / 47	
			Array Edge	68 / 52 / 50	72 / 57 / 55	65 / 50 / 48	62 / 47 / 45	59 / 45 / 43	56 / 43 / 42	54 / 41 / 40	52 / 40 / 38	
		27 to 45	Array Interior	73 / 70 / 64	77 / 74 / 69	70 / 60 / 61	68 / 66 / 58	66 / 62 / 56	63 / 60 / 53	61 / 57 / 51	58 / 55 / 49	
			Array Edge	62 / 52 / 52	67 / 64 / 57	59 / 56 / 49	56 / 53 / 47	53 / 51 / 45	51 / 48 / 43	49 / 46 / 41	47 / 45 / 40	
		45 to 90	Array Interior	82 / 79 / 79	86 / 84 / 84	81 / 76 / 76	79 / 74 / 74	77 / 72 / 72	75 / 70 / 70	73 / 68 / 68	71 / 66 / 66	
			Array Edge	74 / 69 / 69	78 / 73 / 73	71 / 66 / 66	69 / 63 / 63	67 / 61 / 61	64 / 58 / 58	62 / 56 / 56	59 / 53 / 53	
20 psf	C	0 to 7	Array Interior	59 / 59 / 59	59 / 59 / 57	59 / 59 / 54	59 / 59 / 52	59 / 59 / 49	59 / 56 / 47	59 / 54 / 45	59 / 51 / 43	
			Array Edge	59 / 58 / 49	59 / 55 / 46	59 / 52 / 44	58 / 50 / 42	55 / 47 / 40	53 / 45 / 38	51 / 43 / 36	49 / 42 / 35	
		7 to 20	Array Interior	67 / 62 / 56	67 / 59 / 53	67 / 56 / 51	66 / 53 / 48	63 / 51 / 46	60 / 49 / 44	58 / 47 / 42	55 / 45 / 41	
			Array Edge	62 / 50 / 46	59 / 48 / 43	56 / 45 / 41	53 / 43 / 39	51 / 41 / 37	49 / 39 / 36	47 / 38 / 34	45 / 36 / 33	
		20 to 27	Array Interior	69 / 68 / 66	69 / 65 / 62	69 / 61 / 59	69 / 59 / 56	69 / 56 / 54	69 / 53 / 51	67 / 51 / 49	64 / 49 / 47	
			Array Edge	69 / 55 / 53	68 / 52 / 50	65 / 50 / 48	62 / 47 / 43	59 / 45 / 43	56 / 43 / 42	54 / 41 / 40	52 / 40 / 38	
		27 to 45	Array Interior	76 / 73 / 67	73 / 70 / 64	70 / 68 / 58	68 / 65 / 58	66 / 62 / 56	63 / 60 / 53	61 / 57 / 51	58 / 55 / 49	
			Array Edge	65 / 62 / 55	62 / 58 / 52	59 / 53 / 47	56 / 53 / 47	53 / 51 / 45	51 / 48 / 43	49 / 46 / 41	47 / 45 / 40	
		45 to 90	Array Interior	82 / 82 / 82	82 / 79 / 79	81 / 76 / 76	79 / 74 / 74	77 / 72 / 72	75 / 70 / 70	73 / 68 / 68	71 / 66 / 66	
			Array Edge	76 / 71 / 71	74 / 69 / 69	71 / 66 / 66	69 / 63 / 63	67 / 61 / 61	64 / 58 / 58	62 / 56 / 56	59 / 53 / 53	