

# GENERAL NOTES

- 1.1.1 **PROJECT NOTES:**
- 1.1.2 THIS PHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC) ARTICLE 690, ALL MANUFACTURERS'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION'S (AHJ) APPLICABLE CODES.
- 1.1.3 THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION
- 1.1.4 GROUND FAULT DETECTION AND INTERRUPTION (GFDI) DEVICE IS INTEGRATED WITH THE MICROINVERTER IN ACCORDANCE WITH NEC 690.41(B)
- 1.1.5 ALL PV SYSTEM COMPONENTS; MODULES, UTILITY-INTERACTIVE INVERTERS, AND SOURCE CIRCUIT COMBINER BOXES ARE IDENTIFIED AND LISTED FOR USE IN PHOTOVOLTAIC SYSTEMS AS REQUIRED BY NEC 690.4:  
 PV MODULES: UL1703, IEC61730, AND IEC61215, AND NFPA 70 CLASS C FIRE  
 INVERTERS: UL 1741 CERTIFIED, IEEE 1547, 929, 519  
 COMBINER BOX(ES): UL 1703 OR UL 1741 ACCESSORY
- 1.1.6 MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT FOR VOC. IF UNAVAILABLE, MAX DC VOLTAGE CALCULATED ACCORDING TO NEC 690.7.
- 1.1.7 ALL INVERTERS, PHOTOVOLTAIC MODULES, PHOTOVOLTAIC PANELS, AND SOURCE CIRCUIT COMBINERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER 690.4 (D). SHALL BE INSTALLED ACCORDING TO ANY INSTRUCTIONS FROM LISTING OR LABELING [NEC 110.3].
- 1.1.8 ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.

- 1.2.1 **SCOPE OF WORK:**
- 1.2.2 PRIME CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND SPECIFICATIONS OF THE GRID-TIED PHOTOVOLTAIC SYSTEM RETROFIT. PRIME CONTRACTOR WILL BE RESPONSIBLE FOR COLLECTING EXISTING ONSITE REQUIREMENTS TO DESIGN, SPECIFY, AND INSTALL THE EXTERIOR ROOF-MOUNTED PORTION OF THE PHOTOVOLTAIC SYSTEMS DETAILED IN THIS DOCUMENT.

- 1.3.1 **WORK INCLUDES:**
- 1.3.2 PV ROOF ATTACHMENTS - PEGASUS SOLAR SPCR-CH
- 1.3.3 PV RACKING SYSTEM INSTALLATION - SUNPOWER INVISIMOUNT
- 1.3.4 PV MODULE AND INVERTER INSTALLATION - SUNPOWER SPR-E20-327-E-AC / ENPHASE IQ7XS-96-ACM-US INTEGRATED MICROINVERTER
- 1.3.5 PV EQUIPMENT GROUNDING
- 1.3.6 PV SYSTEM WIRING TO A ROOF-MOUNTED JUNCTION BOX
- 1.3.7 PV LOAD CENTERS (IF INCLUDED)
- 1.3.8 PV METERING/MONITORING (IF INCLUDED)
- 1.3.9 PV DISCONNECTS
- 1.3.10 PV GROUNDING ELECTRODE & BONDING TO (E) GEC
- 1.3.11 PV FINAL COMMISSIONING
- 1.3.12 (E) ELECTRICAL EQUIPMENT RETROFIT FOR PV
- 1.3.13 SIGNAGE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE

**SCOPE OF WORK**

SYSTEM SIZE: STC: 20 X 327W = 6.540kW  
 PTC: 20 X 302.9W = 6.058kW  
 (20) SUNPOWER SPR-E20-327-E-AC  
 (20) ENPHASE IQ7XS-96-ACM-US INTEGRATED MICROINVERTER  
 (1) TESLA POWERWALL 2AC  
 (1) TESLA BACKUP GATEWAY 2

ATTACHMENT TYPE: PEGASUS SOLAR SPCR-CH

MSP UPGRADE: NO

# NEW PV SYSTEM: 6.540 kWp

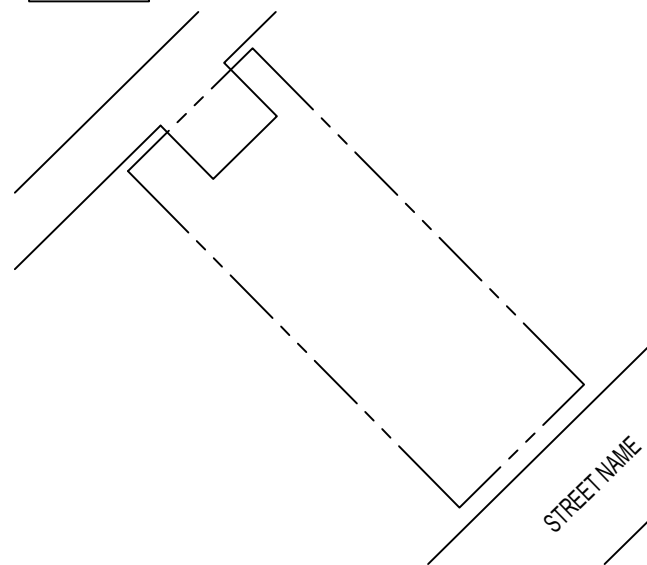
## OWNER NAME RESIDENCE

HOME FULL ADDRESS

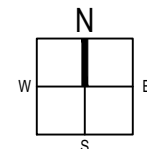
ASSESSOR'S #: \_\_\_\_\_



01 AERIAL PHOTO  
NOT TO SCALE



02 PLAT MAP  
NOT TO SCALE



SHEET LIST	
SHEET NUMBER	SHEET TITLE
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G-001	NOTES
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R-003	RESOURCE DOCUMENT
R-004	RESOURCE DOCUMENT
R-005	RESOURCE DOCUMENT
R-006	RESOURCE DOCUMENT
R-007	RESOURCE DOCUMENT

### PROJECT INFORMATION

**OWNER**  
 NAME: \_\_\_\_\_ OWNER NAME

**PROJECT MANAGER**  
 NAME: \_\_\_\_\_  
 PHONE: (XXX) XXX-XXXX

**CONTRACTOR**  
 NAME: \_\_\_\_\_ YOUR COMPANY NAME  
 PHONE: (XXX) XXX-XXXX

**AUTHORITIES HAVING JURISDICTION**  
 BUILDING: \_\_\_\_\_  
 ZONING: \_\_\_\_\_  
 UTILITY: \_\_\_\_\_

**DESIGN SPECIFICATIONS**  
 OCCUPANCY: II  
 CONSTRUCTION: SINGLE-FAMILY  
 ZONING: RESIDENTIAL GRID-TIED  
 GROUND SNOW LOAD: 10 PSF  
 WIND EXPOSURE: B  
 WIND SPEED: 115 MPH

**APPLICABLE CODES & STANDARDS**  
 BUILDING: NCSBC 2018 NCSRC 2018  
 ELECTRICAL: NEC 2017  
 FIRE: NCSFC 2018

### CONTRACTOR

YOUR COMPANY NAME

PHONE: (XXX) XXX-XX-XX  
 ADDRESS: \_\_\_\_\_  
 LIC. NO.: \_\_\_\_\_  
 HIC. NO.: \_\_\_\_\_  
 ELE. NO.: \_\_\_\_\_

UNAUTHORIZED USE OF THIS DRAWING SET WITHOUT WRITTEN PERMISSION FROM CONTRACTOR IS IN VIOLATION OF U.S. COPYRIGHT LAWS AND WILL BE SUBJECT TO CIVIL DAMAGES AND PROSECUTIONS.

NEW PV SYSTEM: 6.540 kWp

## OWNER NAME RESIDENCE

HOME FULL ADDRESS  
 APN: \_\_\_\_\_

### ENGINEER OF RECORD

PAPER SIZE: 11" x 17" (ANSI B)

### COVER PAGE

DATE: XX.XX.XXXX  
 DESIGN BY: X.X.  
 CHECKED BY: X.X.

REVISIONS

T-001.00  
(SHEET 1)

	A	B	C	D	E	F	G	H
1	2.1.1	<b>SITE NOTES:</b>			2.5.1	<b>GROUNDING NOTES:</b>		
	2.1.2	A LADDER WILL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.			2.5.2	GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVICES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH USE.		
	2.1.3	THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY INTERACTIVE SYSTEM WITH STORAGE BATTERIES.			2.5.3	PV EQUIPMENT SHALL BE GROUNDED ACCORDING TO NEC 690.43 AND MINIMUM NEC TABLE 250.122.		
	2.1.4	THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.			2.5.4	METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND ENCLOSURES CONSIDERED GROUNDED IN ACCORD WITH 250.134 AND 250.136(A).		
	2.1.5	PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER SECTION NEC 110.26.			2.5.5	EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED ACCORDING TO NEC 690.45 AND MICROINVERTER MANUFACTURERS' INSTRUCTIONS.		
2	2.1.6	ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THIS CODE AND THE APPROVED MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERING SERVES TO PROTECT THE BUILDING OR STRUCTURE.			2.5.6	EACH MODULE WILL BE GROUNDED USING WEEB GROUNDING CLIPS AS SHOWN IN MANUFACTURER DOCUMENTATION AND APPROVED BY THE AHJ. IF WEEBS ARE NOT USED, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE SPECIFIED GROUNDING LUG HOLES PER THE MANUFACTURERS' INSTALLATION REQUIREMENTS.		
	2.2.1	<b>EQUIPMENT LOCATIONS:</b>			2.5.7	THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OF A MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE.		
	2.2.2	ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY NEC 110.26.			2.5.8	GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLORED GREEN OR MARKED GREEN IF #4 AWG OR LARGER [NEC 250.119]		
	2.2.3	WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY NEC 690.31 (A),(C) AND NEC TABLES 310.15 (B)(2)(A) AND 310.15 (B)(3)(C).			2.5.9	THE GROUNDING ELECTRODE SYSTEM COMPLIES WITH NEC 690.47 AND NEC 250.50 THROUGH 250.106. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, A GROUNDING ELECTRODE SYSTEM PROVIDED ACCORDING TO NEC 250, NEC 690.47 AND AHJ.		
	2.2.4	JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV MODULES ACCORDING TO NEC 690.34.			2.5.10	GROUND-FAULT DETECTION SHALL COMPLY WITH NEC 690.41(B)(1) AND (2) TO REDUCE FIRE HAZARDS		
	2.2.5	ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE INVERTER IS NOT WITHIN SIGHT OF THE AC SERVICING DISCONNECT.						
3	2.2.6	ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL ACCORDING TO NEC APPLICABLE CODES.						
	2.2.7	ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.			2.6.1	<b>DISCONNECTION AND OVER-CURRENT PROTECTION NOTES:</b>		
	2.3.1	<b>STRUCTURAL NOTES:</b>			2.6.2	DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS).		
	2.3.2	RACKING SYSTEM & PV ARRAY WILL BE INSTALLED ACCORDING TO CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUST ALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY, ACCORDING TO RAI MANUFACTURER'S INSTRUCTIONS.			2.6.3	DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH		
	2.3.3	JUNCTION BOX WILL BE INSTALLED PER MANUFACTURERS' SPECIFICATIONS. IF ROOF-PENETRATING TYPE, IT SHALL BE FLASHED & SEALED PER LOCAL REQUIREMENTS.			2.6.4	PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION TO REDUCE SHOCK HAZARD FOR EMERGENCY RESPONDERS IN ACCORDANCE WITH 690.12(A) THROUGH (D).		
4	2.3.4	ROOFTOP PENETRATIONS FOR PV RACEWAY WILL BE COMPLETED AND SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.			2.6.5	ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING TO NEC 690.8, 690.9, AND 240.		
	2.3.5	ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER.			2.6.6	MICROINVERTER BRANCHES CONNECTED TO A SINGLE BREAKER OR GROUPED FUSES IN ACCORDANCE WITH NEC 110.3(B).		
	2.3.6	WHEN POSSIBLE, ALL PV RELATED RACKING ATTACHMENTS WILL BE STAGGERED AMONGST THE ROOF FRAMING MEMBERS.			2.6.7	IF REQUIRED BY AHJ, SYSTEM WILL INCLUDE ARC-FAULT CIRCUIT PROTECTION ACCORDING TO NEC 690.11 AND UL1699B.		
	2.4.1	<b>WIRING &amp; CONDUIT NOTES:</b>			2.7.1	<b>INTERCONNECTION NOTES:</b>		
	2.4.2	ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.			2.7.2	LOAD-SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH [NEC 705.12 (B)]		
5	2.4.3	CONDUCTORS SIZED ACCORDING TO NEC 690.8, NEC 690.7.			2.7.3	THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS OUTPUT MAY NOT EXCEED 120% OF BUSBAR RATING [NEC 705.12(D)(2)(3)].		
	2.4.4	VOLTAGE DROP LIMITED TO 1.5%.			2.7.4	THE SUM OF 125 PERCENT OF THE POWER SOURCE(S) OUTPUT CIRCUIT CURRENT AND THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE BUSBAR SHALL NOT EXCEED 120 PERCENT OF THE AMPACITY OF THE BUSBAR, PV DEDICATED BACKFEED BREAKERS MUST BE LOCATED OPPOSITE END OF THE BUS FROM THE UTILITY SOURCE OCPD [NEC 705.12(B)(2)(3)].		
	2.4.5	DC WIRING LIMITED TO MODULE FOOTPRINT. MICROINVERTER WIRING SYSTEMS SHALL BE LOCATED AND SECURED UNDER THE ARRAY W/ SUITABLE WIRING CLIPS.			2.7.5	AT MULTIPLE ELECTRIC POWER SOURCES OUTPUT COMBINER PANEL, TOTAL RATING OF ALL OVERCURRENT DEVICES SHALL NOT EXCEED AMPACITY OF BUSBAR. HOWEVER, THE COMBINED OVERCURRENT DEVICE MAY BE EXCLUDED ACCORDING TO NEC 705.12 (B)(2)(3)(C).		
	2.4.6	AC CONDUCTORS COLORED OR MARKED AS FOLLOWS:			2.7.6	FEEDER TAP INTERCONNECTION (LOAD SIDE) ACCORDING TO NEC 705.12 (B)(2)(1)		
		PHASE A OR L1- BLACK			2.7.7	SUPPLY SIDE TAP INTERCONNECTION ACCORDING TO NEC 705.12 (A) WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.42		
		PHASE B OR L2- RED, OR OTHER CONVENTION IF THREE PHASE			2.7.8	BACKFEEDING BREAKER FOR ELECTRIC POWER SOURCES OUTPUT IS EXEMPT FROM ADDITIONAL FASTENING [NEC 705.12 (B)(5)].		
		PHASE C OR L3- BLUE, YELLOW, ORANGE**, OR OTHER CONVENTION						
6		NEUTRAL- WHITE OR GREY						
		IN 4-WIRE DELTA CONNECTED SYSTEMS THE PHASE WITH HIGHER VOLTAGE TO BE MARKED ORANGE [NEC 110.15].						

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**CONTRACTOR**

---

YOUR COMPANY NAME

---

PHONE: (XXX) XXX-XX-XX  
ADDRESS: \_\_\_\_\_  
\_\_\_\_\_

---

LIC. NO.: \_\_\_\_\_  
HIC. NO.: \_\_\_\_\_  
ELE. NO.: \_\_\_\_\_

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NEW PV SYSTEM: 6.540 kWp

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**OWNER NAME**

---

**RESIDENCE**

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HOME FULL ADDRESS  
APN: \_\_\_\_\_

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**ENGINEER OF RECORD**

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PAPER SIZE: 11" x 17" (ANSI B)

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**NOTES**

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**G-001.00**  
(SHEET 2)

# GENERAL NOTES

1. FIELD VERIFY ALL MEASUREMENTS
2. ITEMS BELOW MAY NOT BE ON THIS PAGE

----- PROPERTY LINE

## CONTRACTOR

YOUR COMPANY NAME

PHONE: (XXX) XXX-XX-XX

ADDRESS: \_\_\_\_\_

LIC. NO.: \_\_\_\_\_

HIC. NO.: \_\_\_\_\_

ELE. NO.: \_\_\_\_\_

UNAUTHORIZED USE OF THIS DRAWING SET WITHOUT WRITTEN PERMISSION FROM CONTRACTOR IS IN VIOLATION OF U.S. COPYRIGHT LAWS AND WILL BE SUBJECT TO CIVIL DAMAGES AND PROSECUTIONS.

NEW PV SYSTEM: 6.540 kWp

## OWNER NAME

## RESIDENCE

HOME FULL ADDRESS

APN: \_\_\_\_\_

## ENGINEER OF RECORD

PAPER SIZE: 11" x 17" (ANSI B)

## SITE PLAN

DATE: XX.XX.XXXX

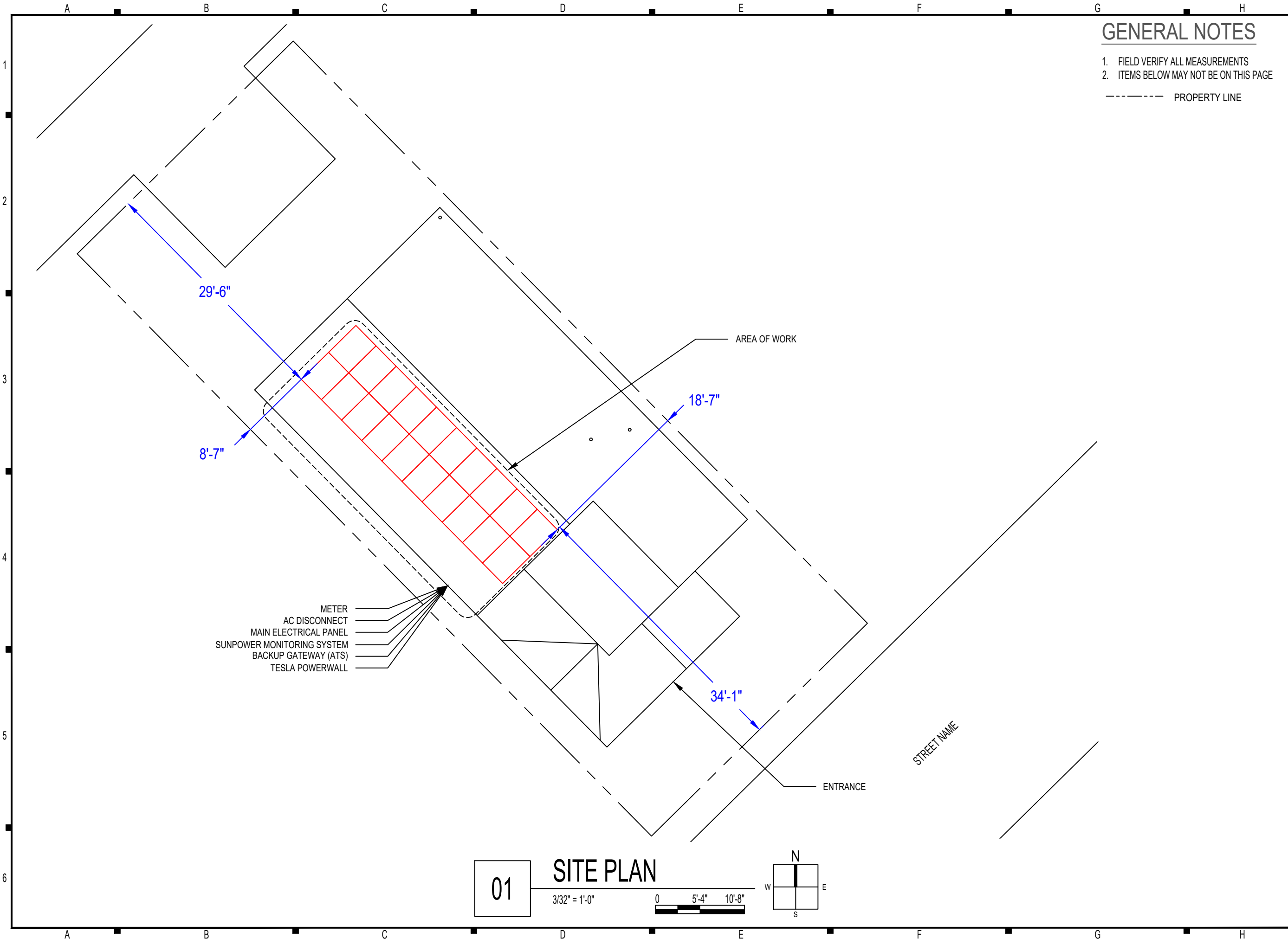
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CHECKED BY: X.X.

REVISIONS

**A-101.00**

(SHEET 3)

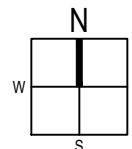


01

## SITE PLAN

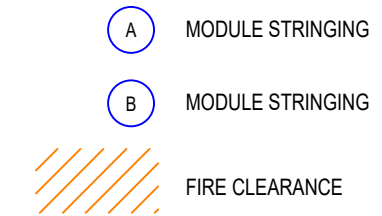
3/32" = 1'-0"

0 5'-4" 10'-8"



# GENERAL NOTES

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ARRAY 1 - 6.540 kW  
 [x20] (N) MODULES  
 TILT: 26 DEGREES  
 ROOF PITCH: 6:12  
 AZIMUTH: 225 DEGREES

(N) (1) JUNCTION BOX

18" FIRE ACCESS PATH

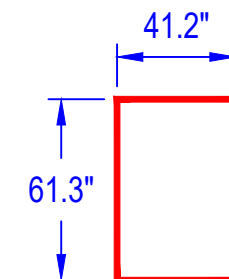
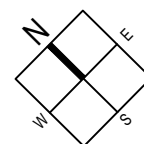
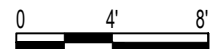
3' FIRE ACCESS PATH

- EXTERIOR PV EQUIPMENT
- (E) (1) METER
  - (N) (1) AC DISCONNECT
  - (E) (1) MAIN ELECTRICAL PANEL
  - (N) (1) SUNPOWER MONITORING SYSTEM
  - (N) (1) BACKUP GATEWAY (ATS)
  - (N) (1) TESLA POWERWALL

01

## ELECTRICAL PLAN

1/8" = 1'



MODULE:  
 SUNPOWER  
 SPR-E20-327-E-AC  
 327 WATTS

### CONTRACTOR

YOUR COMPANY NAME

PHONE: (XXX) XXX-XX-XX

ADDRESS: \_\_\_\_\_

LIC. NO.: \_\_\_\_\_

HIC. NO.: \_\_\_\_\_

ELE. NO.: \_\_\_\_\_

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NEW PV SYSTEM: 6.540 kWp

### OWNER NAME

### RESIDENCE

HOME FULL ADDRESS

APN: \_\_\_\_\_

### ENGINEER OF RECORD

PAPER SIZE: 11" x 17" (ANSI B)

### ELECTRICAL PLAN

DATE: XX.XX.XXXX

DESIGN BY: X.X.

CHECKED BY: X.X.

REVISIONS

A-102.00

(SHEET 4)

# GENERAL NOTES

1. FIELD VERIFY ALL MEASUREMENTS
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--- ROOF RAFTERS

## CONTRACTOR

YOUR COMPANY NAME

PHONE: (XXX) XXX-XX-XX

ADDRESS: \_\_\_\_\_

LIC. NO.: \_\_\_\_\_

HIC. NO.: \_\_\_\_\_

ELE. NO.: \_\_\_\_\_

UNAUTHORIZED USE OF THIS DRAWING SET WITHOUT WRITTEN PERMISSION FROM CONTRACTOR IS IN VIOLATION OF U.S. COPYRIGHT LAWS AND WILL BE SUBJECT TO CIVIL DAMAGES AND PROSECUTIONS.

NEW PV SYSTEM: 6.540 kWp

## OWNER NAME

## RESIDENCE

HOME FULL ADDRESS

APN: \_\_\_\_\_

## ENGINEER OF RECORD

PAPER SIZE: 11" x 17" (ANSI B)

## SOLAR ATTACHMENT PLAN

DATE: XX.XX.XXXX

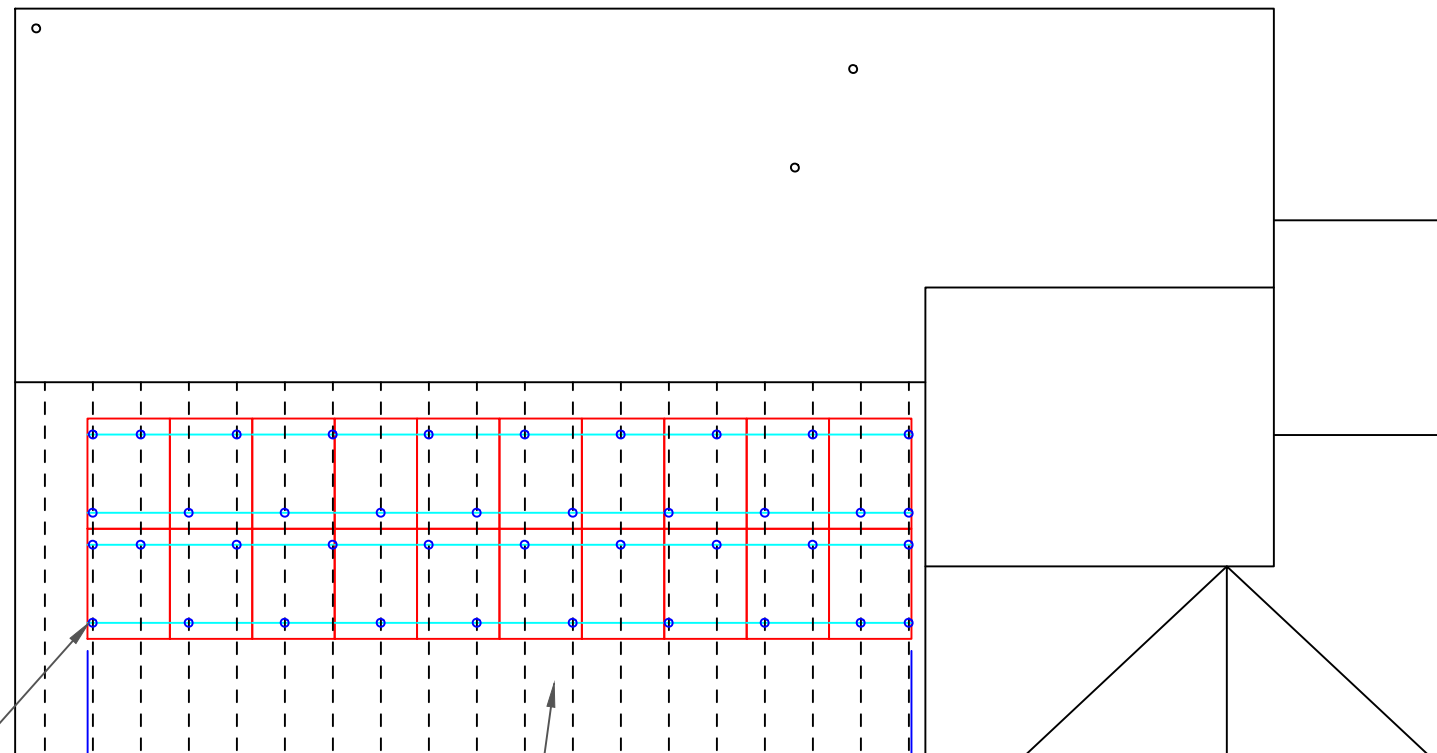
DESIGN BY: X.X.

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REVISIONS

A-103.00

(SHEET 5)



FLUSH MOUNT SOLAR MODULES ATTACHED TO ROOF SURFACE (SEE SHEET S-501 FOR MOUNTING DETAILS)

ROOF MATERIAL IS 1 LAYER ASPHALT SHINGLE

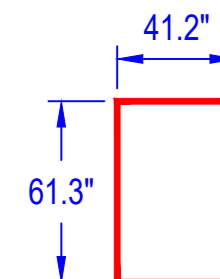
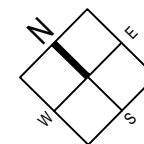
34'-4"

01

## SOLAR ATTACHMENT PLAN

1/8" = 1'

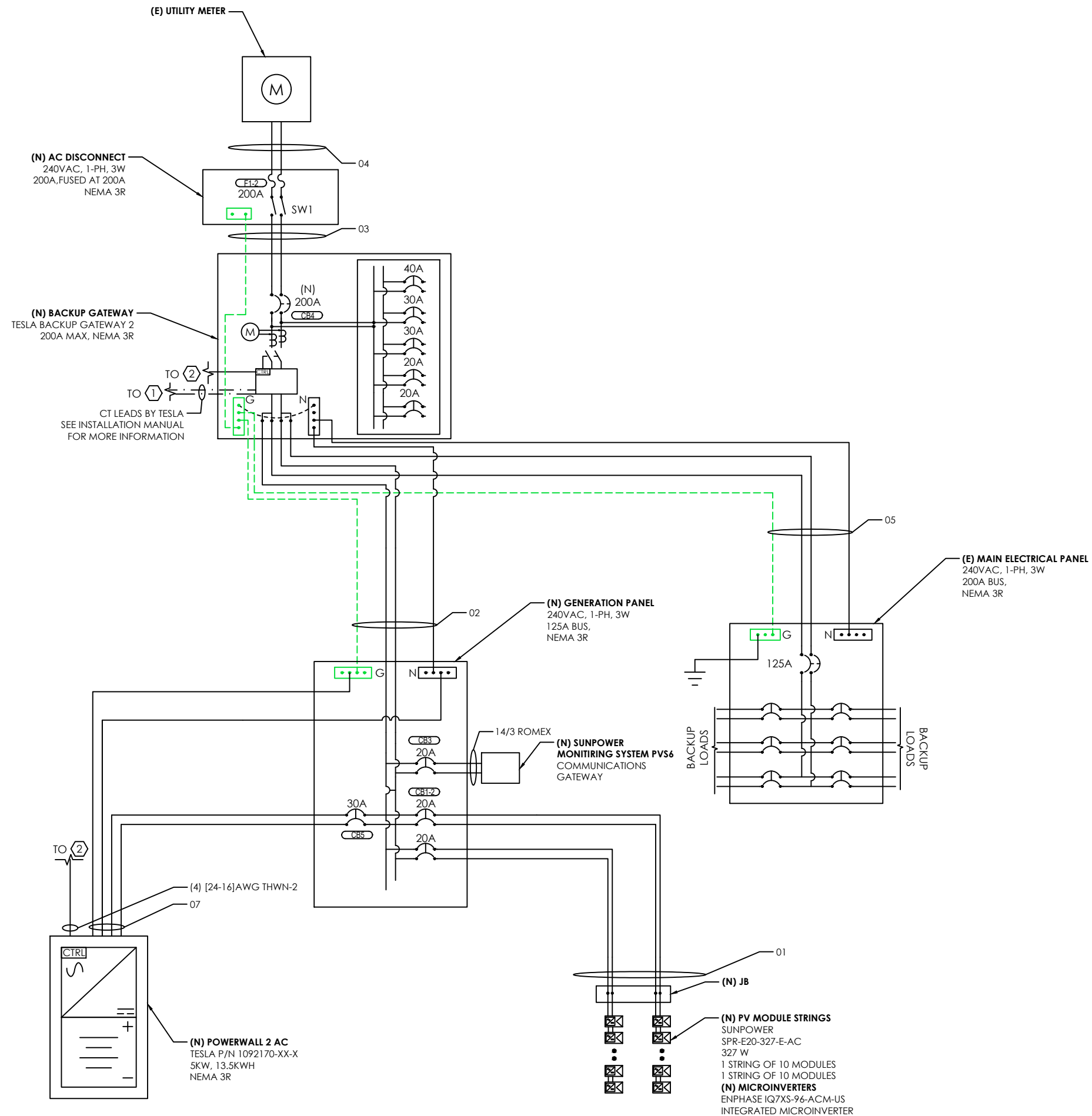
0 4' 8'



MODULE:  
SUNPOWER  
SPR-E20-327-E-AC  
327 WATTS

- PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN
- SYSTEM COMPLIANT WITH NEC 690.13.

MARKING IS REQUIRED ON INTERIOR AND EXTERIOR DIRECT-CURRENT (DC) CONDUIT, ENCLOSURES, RACEWAYS, CABLE ASSEMBLIES, JUNCTION BOXES, COMBINER BOXES AND DISCONNECTS



**CONTRACTOR**

YOUR COMPANY NAME

PHONE: (XXX) XXX-XX-XX

ADDRESS: \_\_\_\_\_

LIC. NO.: \_\_\_\_\_

HIC. NO.: \_\_\_\_\_

ELE. NO.: \_\_\_\_\_

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NEW PV SYSTEM: 6.540 kWp

**OWNER NAME**

**RESIDENCE**

HOME FULL ADDRESS

APN: \_\_\_\_\_

**ENGINEER OF RECORD**

PAPER SIZE: 11" x 17" (ANSI B)

**LINE DIAGRAM**

DATE: XX.XX.XXXX

DESIGN BY: X.X.

CHECKED BY: X.X.

REVISIONS

**E-601.00**

(SHEET 6)

1  
2  
3  
4  
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6

SYSTEM SUMMARY		
	BRANCH #1	BRANCH #2
INVERTERS PER BRANCH	10	10
MAX AC CURRENT	13.1A	13.1A
MAX AC OUTPUT POWER	3,200W	3,200W
ARRAY STC POWER	6,540W	
ARRAY PTC POWER	6,058W	
MAX AC CURRENT	26.2A	
MAX AC POWER	6,400W	
DERATED (CEC) AC POWER	5,907W	

MODULES											
REF.	QTY.	MAKE AND MODEL	P <sub>MAX</sub>	PTC	ISC	IMP	VOC	VMP	TEMP. COEFF. OF VOC	FUSE RATING	
PM1-20	20	SUNPOWER SPR-E20-327-E-AC	327W	302.9W	0A	0A	0V	0V	0V/°C (0%/°C)	20A	

INVERTERS											
REF.	QTY.	MAKE AND MODEL	AC VOLTAGE	GROUND	OC <sub>PD</sub> RATING	RATED POWER	MAX OUTPUT CURRENT	MAX INPUT CURRENT	MAX INPUT VOLTAGE	CEC WEIGHTED EFFICIENCY	
I1-20	20	ENPHASE IQ7XS-96-ACM-US	240V	FLOATING	20A	315W	1.31A	10A	80V	97.5%	

DISCONNECTS				
REF.	QTY.	MAKE AND MODEL	RATED CURRENT	MAX RATED VOLTAGE
SW1	1	EATON DG224NRB OR EQUIV.	200A	240VAC

OCPDS			
REF.	QTY.	RATED CURRENT	MAX VOLTAGE
CB1-3	3	20A	240VAC
CB4	1	200A	240VAC
CB5	1	30A	240VAC
F1-2	2	200A	240VAC

ASHRAE EXTREME LOW	-13.4°C (7.9°F), SOURCE: CHARLOTTE/DOUGLAS (35.21°; -80.94°)
ASHRAE 2% HIGH	34.9°C (94.8°F), SOURCE: CHARLOTTE/DOUGLAS (35.21°; -80.94°)

CONDUCTOR AND CONDUIT SCHEDULE W/ELECTRICAL CALCULATIONS

ID	TYPICAL	CONDUCTOR	CONDUIT	CURRENT-CARRYING CONDUCTORS IN CONDUIT	OC <sub>PD</sub>	EGC	TEMP. CORR. FACTOR	CONDUIT FILL FACTOR	CONT. CURRENT	MAX. CURRENT (125%)	BASE AMP.	DERATED AMP.	TERM. TEMP. RATING	AMP. @ TERMINAL
01	1	10/2 ROMEX	0.75" DIA PVC-40	4	20A	10/2 ROMEX	0.96 (34.9 °C)	0.8	13.1A	16.38A	40A	30.72A	75°C	35A
02	1	1 AWG THWN-2, COPPER	1.5" DIA PVC-40	3	200A	1 AWG THWN-2, COPPER	0.96 (34.9 °C)	1	-	200A	145A	139.2A	75°C	130A
04	1	4/0 AWG THWN-2, ALUMINUM	2" DIA PVC-40	3	N/A	4/0 AWG THWN-2, ALUMINUM	0.96 (34.9 °C)	1	-	200A	205A	196.8A	75°C	180A
05	1	4/0 AWG THWN-2, ALUMINUM	2" DIA PVC-40	2	200A	4/0 AWG THWN-2, ALUMINUM	0.96 (34.9 °C)	1	-	200A	205A	196.8A	75°C	180A
06	1	4/0 AWG THWN-2, ALUMINUM	2" DIA PVC-40	2	N/A	4/0 AWG THWN-2, ALUMINUM	0.96 (34.9 °C)	1	-	200A	205A	196.8A	75°C	180A
07	1	10/3 ROMEX	0.75" DIA PVC-40	3	30A	10/3 ROMEX	0.96 (34.9 °C)	1	-	30A	40A	30.72A	75°C	35A

5  
6

**CONTRACTOR**

YOUR COMPANY NAME

PHONE: (XXX) XXX-XX-XX

ADDRESS: \_\_\_\_\_

LIC. NO.: \_\_\_\_\_

HIC. NO.: \_\_\_\_\_

ELE. NO.: \_\_\_\_\_

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NEW PV SYSTEM: 6.540 kWp

**OWNER NAME**

**RESIDENCE**

HOME FULL ADDRESS

APN: \_\_\_\_\_

**ENGINEER OF RECORD**

PAPER SIZE: 11" x 17" (ANSI B)

**DESIGN TABLES**

DATE: XX.XX.XXXX

DESIGN BY: X.X.

CHECKED BY: X.X.

REVISIONS

**E-602.00**

(SHEET 7)

**LABELING NOTES**

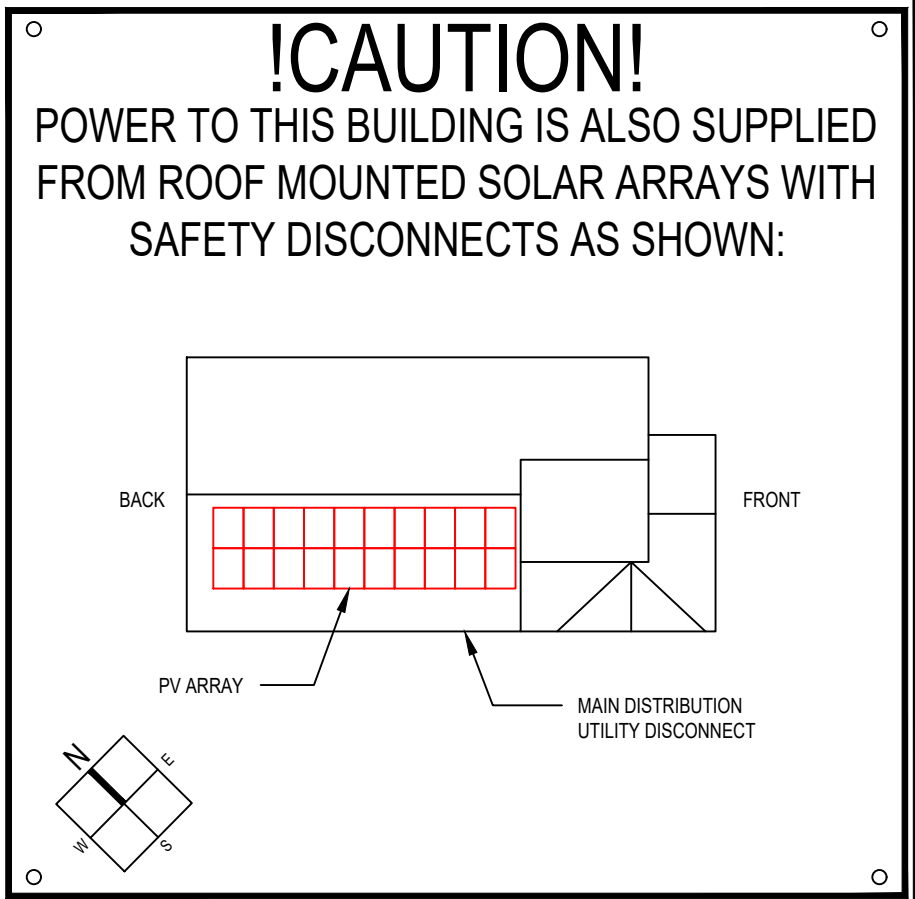
- 1.1 LABELING REQUIREMENTS BASED ON THE 2017 NATIONAL ELECTRICAL CODE, INTERNATIONAL FIRE CODE 605.11, OSHA STANDARD 1910.145, ANSI Z535
- 1.2 MATERIAL BASED ON THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
- 1.3 LABELS TO BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.
- 1.4 LABELS TO BE A MINIMUM LETTER HEIGHT OF 3/8" AND PERMANENTLY AFFIXED.
- 1.5 ALERTING WORDS TO BE COLOR CODED. "DANGER" WILL HAVE RED BACKGROUND; "WARNING" WILL HAVE ORANGE BACKGROUND; "CAUTION" WILL HAVE YELLOW BACKGROUND. [ANSI Z535]

**WARNING**  
ELECTRICAL SHOCK HAZARD  
TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

**RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM**

INTERACTIVE PHOTOVOLTAIC SYSTEM CONNECTED  
PHOTOVOLTAIC SYSTEM DISCONNECT LOCATED SW SIDE OF THE HOUSE

**DIRECTORY**  
PERMANENT PLAQUE OR DIRECTORY PROVIDING THE LOCATION OF THE SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS IF NOT IN THE SAME LOCATION (5 3/4" X 1 1/8"). [NEC 690.56(B)]  
WHERE THE PV SYSTEMS ARE REMOTELY LOCATED FROM EACH OTHER, A DIRECTORY IN ACCORDANCE WITH 705.10 SHALL BE PROVIDED AT EACH PV SYSTEM DISCONNECTING MEANS. PV SYSTEM EQUIPMENT AND DISCONNECTING MEANS SHALL NOT BE INSTALLED IN BATHROOMS [NEC 690.4(D),(E)]



**LABEL 1**  
AT EACH DISCONNECTING MEANS FOR PHOTOVOLTAIC EQUIPMENT (2" X 4"). [NEC 690.13].

**LABEL 5**  
AT RAPID SHUTDOWN DISCONNECT SWITCH (5 1/4" X 2"). [NEC 690.56(C)(3)].

**WARNING**  
POWER SOURCE OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE

**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 ARRAY

**WARNING: PHOTOVOLTAIC POWER SOURCE**

**LABEL 2**  
AT POINT OF INTERCONNECTION OVERCURRENT DEVICE (2" X 4"). [NEC 705.12(B)(2)(3)(B)].

**LABEL 9**  
AT EXPOSED RACEWAYS, CABLE TRAYS, AND OTHER WIRING METHODS; SPACED AT MAXIMUM 10 FT SECTION OR WHERE SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS (5 3/4" X 1 1/8"). [NEC 690.31(G)]  
LETTERS AT LEAST 3/8 INCH; WHITE ON RED BACKGROUND; REFLECTIVE [IFC 605.11.1.1]

**PHOTOVOLTAIC SYSTEM AC DISCONNECT**

RATED AC OUTPUT CURRENT **26.2** A  
NOMINAL OPERATING AC VOLTAGE **240** V

**CAUTION**  
**SOLAR ELECTRIC SYSTEM CONNECTED**

**LABEL 3**  
AT POINT OF INTERCONNECTION, MARKED AT DISCONNECTING MEANS (4" X 2"). [NEC 690.54]

**LABEL 6**  
AT RAPID SHUTDOWN SYSTEM (3 3/4" X 5 1/4"). [NEC 690.56(C)(1)(A)].

**PHOTOVOLTAIC SOLAR AC DISCONNECT**

**WARNING**  
DUAL POWER SUPPLY  
SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

**WARNING**  
SOLAR ELECTRIC CIRCUIT BREAKER IS BACKFED

**LABEL 10**  
AT UTILITY METER (5 3/4" X 1 1/8") [NEC 690.56(B)]

**LABEL 4**  
AT EACH AC DISCONNECTING MEANS (4" X 1"). [NEC 690.13(B)].

**LABEL 7**  
AT POINT OF INTERCONNECTION (2 3/4" X 1 5/8"). [NEC 705.12(B)(3)]

**LABEL 8**  
AT POINT OF INTERCONNECTION (2" X 1"). [NEC 705.12(B)(3)]

**CONTRACTOR**

YOUR COMPANY NAME

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NEW PV SYSTEM: 6.540 kWp

**OWNER NAME**

**RESIDENCE**

HOME FULL ADDRESS

APN: \_\_\_\_\_

**ENGINEER OF RECORD**

PAPER SIZE: 11" x 17" (ANSI B)

**PLACARDS**

DATE: XX.XX.XXXX

DESIGN BY: X.X.

CHECKED BY: X.X.

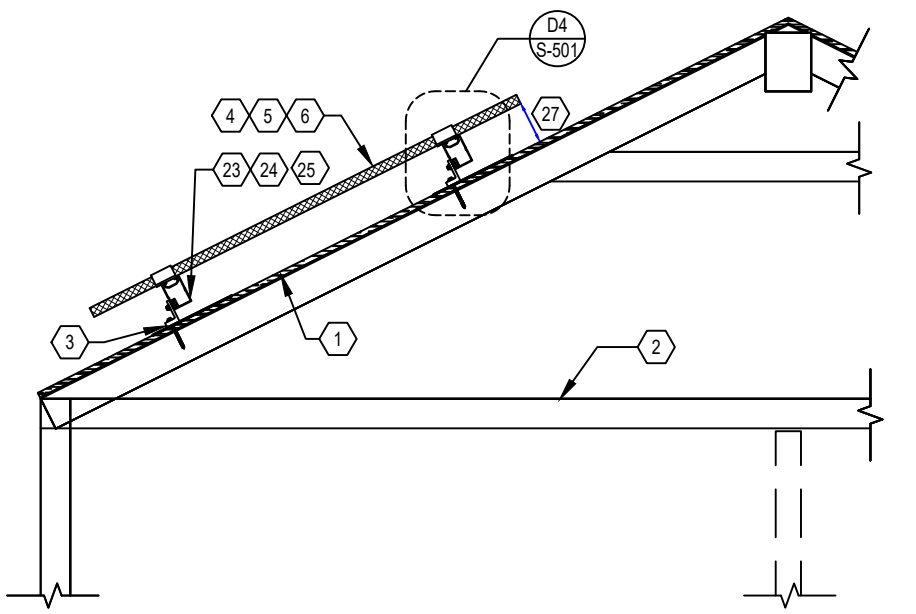
REVISIONS

**E-603.00**

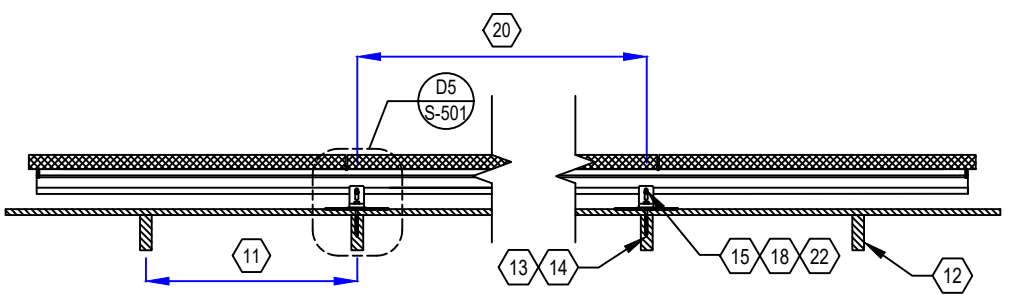
(SHEET 8)



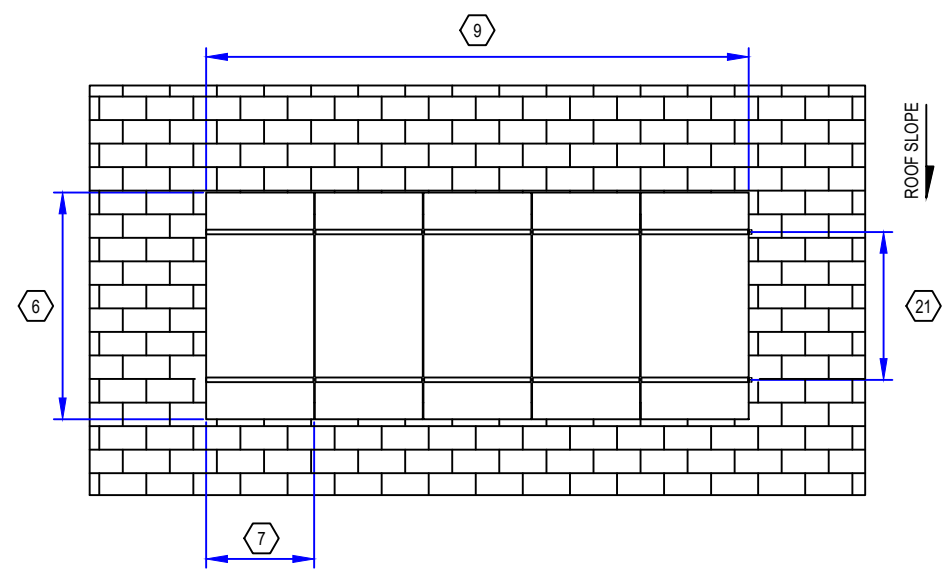
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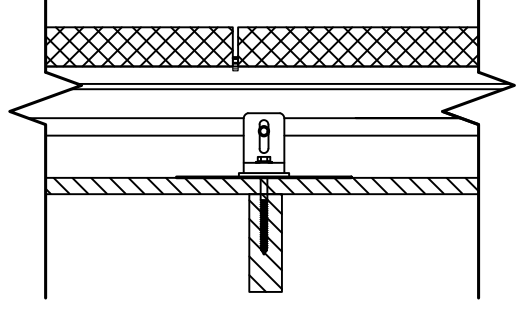
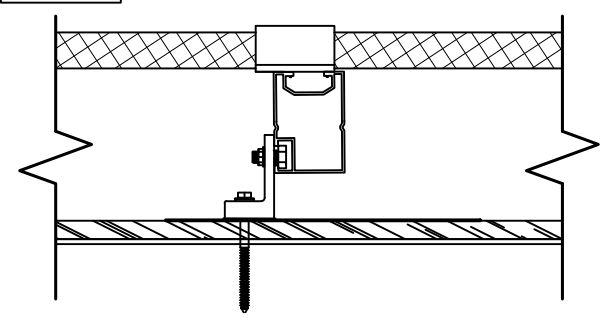
**D1** RACKING DETAIL (TRANSVERSE)  
NOT TO SCALE



**D2** RACKING DETAIL (LONGITUDINAL)  
NOT TO SCALE



**D3** RACKING DETAIL (TOP)  
NOT TO SCALE



**D4** DETAIL (TRANSVERSE)  
NOT TO SCALE

**D5** DETAIL (LONGITUDINAL)  
NOT TO SCALE

**GENERAL NOTES**

1. FIELD VERIFY ALL MEASUREMENTS

**SHEET KEYNOTES**

1. ROOF MATERIAL: ASPHALT SHINGLE
2. ROOF STRUCTURE: COLLAR TIE
3. ATTACHMENT TYPE: PEGASUS SOLAR SPCR-CH
4. MODULE MANUFACTURER: SUNPOWER
5. MODULE MODEL: SPR-E20-327-E-AC
6. MODULE LENGTH: 61.3"
7. MODULE WIDTH: 41.2"
8. MODULE WEIGHT: 42.9 LBS.
9. SEE SHEET A-103 FOR DIMENSION(S)
10. MIN. FIRE OFFSET: 18" FROM RIDGE, 36" FROM EDGE
11. RAFTER SPACING: 24 IN. O.C.
12. RAFTER SIZE: 2X6 NOMINAL
13. LAG BOLT DIAMETER: 5/16 IN.
14. LAG BOLT EMBEDMENT: 2 -1/2 IN.
15. TOTAL # OF ATTACHMENTS: 40
16. TOTAL AREA: 350.77 SQ. FT.
17. TOTAL WEIGHT: 982.85 LBS.
18. WEIGHT PER ATTACHMENT: 24.57 LBS.
19. DISTRIBUTED LOAD: 2.8 PSF
20. MAX. HORIZONTAL STANDOFF: 48 IN.
21. MAX. VERTICAL STANDOFF:  
LANDSCAPE: 26 IN., PORTRAIT: 33 IN.
22. STANDOFF STAGGERING: YES
23. RAIL MANUFACTURER (OR EQUIV.): SUNPOWER
24. RAIL MODEL (OR EQUIVALENT): INVISIMOUNT
25. RAIL WEIGHT: 0.5625 PLF.
26. MAX. RAFTER SPAN: N/A.
27. MODULE CLEARANCE: 3 IN. MIN., 6 IN. MAX.

**CONTRACTOR**

YOUR COMPANY NAME

PHONE: (XXX) XXX-XX-XX

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NEW PV SYSTEM: 6.540 kWp

**OWNER NAME**

**RESIDENCE**

HOME FULL ADDRESS

APN: \_\_\_\_\_

**ENGINEER OF RECORD**

PAPER SIZE: 11" x 17" (ANSI B)

**ASSEMBLY DETAILS**

DATE: XX.XX.XXXX

DESIGN BY: X.X.

CHECKED BY: X.X.

REVISIONS

**S-501.00**

(SHEET 9)

A B C D E F G H

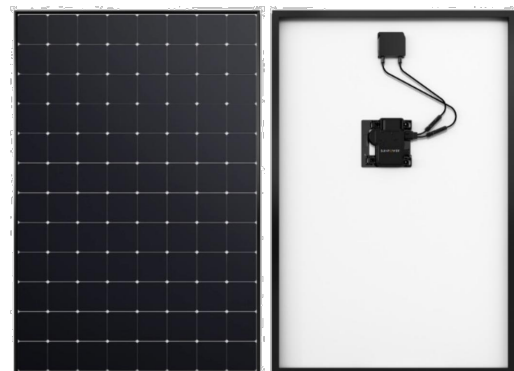


# SUNPOWER®

## SunPower® E-Series: E20-327 | E19-320

# SunPower® Residential AC Module

Built specifically for use with the SunPower Equinox™ system, the only fully integrated solution designed, engineered, and warranted by one manufacturer.



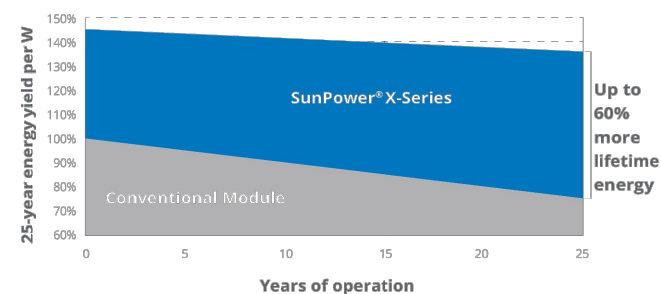
### Maximum Power. Minimalist Design.

Industry-leading efficiency means more power and savings per available space. With fewer modules required and hidden microinverters, less is truly more.



### Highest Lifetime Energy and Savings.

Designed to deliver 60% more energy over 25 years in real-world conditions like partial shade and high temperatures.<sup>1</sup>

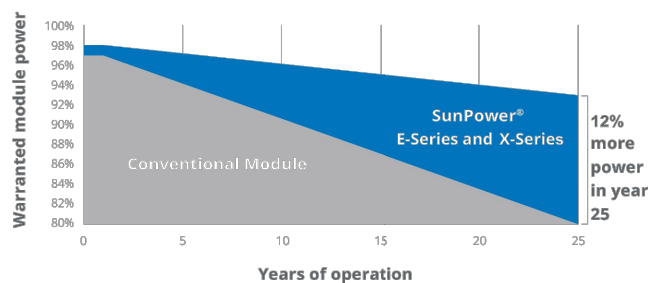


Up to 60% more lifetime energy



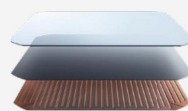
### Best Reliability. Best Warranty.

With more than 25 million modules deployed around the world, SunPower technology is proven to last. That's why we stand behind our module and microinverter with the industry's best 25-year Combined Power and Product Warranty, including the highest Power Warranty in solar.



12% more power in year 25

### Fundamentally Different. And Better.



The SunPower® Moxeon® Solar Cell

- Enables highest-efficiency modules available.<sup>2</sup>
- Unmatched reliability<sup>3</sup>
- Patented solid metal foundation prevents breakage and corrosion



Factory-integrated Microinverter

- Simpler, faster installation
- Integrated wire management, rapid shutdown
- Engineered and calibrated by SunPower for SunPower modules

## E-Series: E20-327 | E19-320 SunPower® Residential AC Module

AC Electrical Data		
	@240 VAC	@208 VAC
Inverter Model: Enphase IQ 7XS (IQ7XS-96-ACM-US)		
Peak Output Power	320 VA	320 VA
Max. Continuous Output Power	315 VA	315 VA
Nom. (L-L) Voltage/Range <sup>2</sup> (V)	240 / 211–264	208 / 183–229
Max. Continuous Output Current (A)	1.31	1.51
Max. Units per 20 A (LL) Branch Circuit <sup>3</sup>	12 (single phase)	10 (two pole) wye
CEC Weighted Efficiency	97.5%	97.0%
Nom. Frequency		60 Hz
Extended Frequency Range		47–68 Hz
AC Short Circuit Fault Current Over 3 Cycles		5.8 A rms
Overtoltage Class AC Port		III
AC Port Backfeed Current		18 mA
Power Factor Setting		1.0
Power Factor (adjustable)		0.7 lead. / 0.7 lag.

No active phase balancing for three-phase installations

DC Power Data		
	SPR-E20-327-E-AC	SPR-E19-320-E-AC
Nom. Power <sup>5</sup> (P <sub>nom</sub> )	327 W	320 W
Power Tol.	+5/-0%	+5/-0%
Module Efficiency	20.4%	19.9%
Temp. Coef. (Power)	-0.35%/°C	-0.35%/°C
Shade Tol.	<ul style="list-style-type: none"> <li>• Three bypass diodes</li> <li>• Integrated module-level maximum power point tracking</li> </ul>	

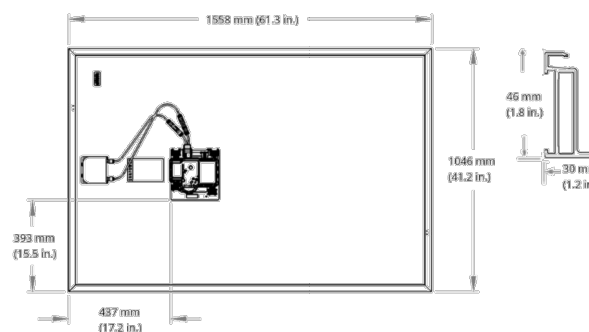
Tested Operating Conditions	
Operating Temp.	-40°F to +185°F (-40°C to +85°C)
Max. Ambient Temp.	122°F (50°C)
Max. Load	Wind: 62 psf, 3000 Pa, 305 kg/m <sup>2</sup> front & back Snow: 125 psf, 6000 Pa, 611 kg/m <sup>2</sup> front
Impact Resistance	1 inch (25 mm) diameter hail at 52 mph (23 m/s)

Mechanical Data	
Solar Cells	96 Monocrystalline Moxeon Gen III
Front Glass	High-transmission tempered glass with anti-reflective coating
Environmental Rating	Outdoor rated
Frame	Class 1 black anodized (highest AAMA rating)
Weight	42.9 lbs (19.5 kg)
Recommended Max. Module Spacing	1.3 in. (33 mm)

<sup>1</sup> SunPower 360 W compared to a conventional module on same-sized arrays (260 W, 16% efficient, approx. 1.6 m<sup>2</sup>), 4% more energy per watt (based on third-party module characterization and PVSIM), 0.75%/yr slower degradation (Campeau, Z. et al. "SunPower Module Degradation Rate," SunPower white paper, 2013).  
<sup>2</sup> Based on search of datasheet values from websites of top 10 manufacturers per IHS, as of January 2017.  
<sup>3</sup> #1 rank in "Fraunhofer PV Durability Initiative for Solar Modules: Part 3," PV Tech Power Magazine, 2015. Campeau, Z. et al. "SunPower Module Degradation Rate," SunPower white paper, 2013.  
<sup>4</sup> Factory set to 1547a-2014 default settings. CA Rule 21 default settings profile set during commissioning. See the Equinox Installation Guide #518101 for more information.  
<sup>5</sup> Standard Test Conditions (1000 W/m<sup>2</sup> irradiance, AM 1.5, 25°C), NREL calibration standard: SOMS current, LACCS FF and voltage. All DC voltage is fully contained within the module.  
<sup>6</sup> This product is UL Listed as PVSE and conforms with NEC 2014 and NEC 2017 690.12; and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors; when installed according to manufacturer's instructions.

See [www.sunpower.com/facts](http://www.sunpower.com/facts) for more reference information. For more details, see extended datasheet [www.sunpower.com/datasheets](http://www.sunpower.com/datasheets). Specifications included in this datasheet are subject to change without notice. ©2018 SunPower Corporation. All Rights Reserved. SUNPOWER, the SUNPOWER logo and MAXEON are registered trademarks of SunPower Corporation in the U.S. and other countries as well. 1-800-SUNPOWER.

Warranties, Certifications, and Compliance	
Warranties	<ul style="list-style-type: none"> <li>• 25-year limited power warranty</li> <li>• 25-year limited product warranty</li> </ul>
Certifications and Compliance	<ul style="list-style-type: none"> <li>• UL 1703</li> <li>• UL 1741 / IEEE-1547</li> <li>• UL 1741 AC Module (Type 2 fire rated)</li> <li>• UL 62109-1 / IEC 62109-2</li> <li>• FCC Part 15 Class B</li> <li>• ICES-0003 Class B</li> <li>• CAN/CSA-C22.2 NO. 107.1-01</li> <li>• CA Rule 21 (UL 1741 SA)<sup>4</sup> (includes Volt/Var and Reactive Power Priority)</li> <li>• UL Listed PV Rapid Shutdown Equipment<sup>6</sup></li> </ul>
	Enables installation in accordance with: <ul style="list-style-type: none"> <li>• NEC 690.6 (AC module)</li> <li>• NEC 690.12 Rapid Shutdown (inside and outside the array)</li> <li>• NEC 690.15 AC Connectors, 690.33(A)-(E)(1)</li> </ul>
	When used with InvisiMount racking and InvisiMount accessories (UL 2703): <ul style="list-style-type: none"> <li>• Module grounding and bonding through InvisiMount</li> <li>• Class A fire rated</li> </ul>
	When used with AC module Q Cables and accessories (UL 6703 and UL 2238) <sup>5</sup> : <ul style="list-style-type: none"> <li>• Rated for load break disconnect</li> </ul>
PID Test	Potential-induced degradation free



Please read the Safety and Installation Instructions for details.

# SUNPOWER®

531948 RevA

## CONTRACTOR

YOUR COMPANY NAME

PHONE: (XXX) XXX-XX-XX

ADDRESS: \_\_\_\_\_

LIC. NO.: \_\_\_\_\_

HIC. NO.: \_\_\_\_\_

ELE. NO.: \_\_\_\_\_

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NEW PV SYSTEM: 6.540 kWp

## OWNER NAME

## RESIDENCE

HOME FULL ADDRESS

APN: \_\_\_\_\_

## ENGINEER OF RECORD

PAPER SIZE: 11" x 17" (ANSI B)

## RESOURCE DOCUMENT

DATE: XX.XX.XXXX

DESIGN BY: X.X.

CHECKED BY: X.X.

REVISIONS

# R-001.00

(SHEET 10)

31.01.2018

QIJW.E341165 - Photovoltaic Rapid Shutdown System Equipment



### QIJW.E341165 Photovoltaic Rapid Shutdown System Equipment

[Page Bottom](#)

### Photovoltaic Rapid Shutdown System Equipment

[See General Information for Photovoltaic Rapid Shutdown System Equipment](#)

**ENPHASE ENERGY INC**  
1420 N McDowell Blvd  
Petaluma, CA 94954-6515 USA

E341165

Cat. No.	Function	Ratings
<b>Photovoltaic rapid shutdown system equipment</b>		
M190-60, -72	Inverter/AC Attenuator	Input: 16-48VDC Output: 120/208 or 120/240, 190W
M210-84	Inverter/AC Attenuator	Input: 16-48VDC Output: 120/208 or 120/240, 210 W
M215-60	Inverter/AC Attenuator	Input: 16-48VDC Output: 120/208 or 120/240, 215W
M250-60, -72	Inverter/AC Attenuator	Input: 16-48VDC Output: 120/208 or 120/240, 250W
S230-60-LL-X-US	Inverter/AC Attenuator	Input: 22-48VDC Output: 208 or 240, 220W
S280-60-LL-X-US	Inverter/AC Attenuator	Input: 22-48VDC Output: 208 or 240, 270W
IQ6PLUS-72-X-US*(a)(b) IQ6PLUS-72-ACM*(b)	Inverter/AC Attenuator	Input: 16-62VDC Output: 208 or 240, 280W
IQ6-60-X-US*(a)(b) IQ6-60-ACM-US*(b)	Inverter/AC Attenuator	Input: 16-62VDC Output: 208 or 240, 230W
IQ7PLUS-72-X-US*(a)(b) IQ7PLUS-72-ACM*(b)	Inverter/AC Attenuator	Input: 16-62VDC Output: 208 or 240, 290W
IQ7-60-X-US*(a)(b) IQ7-60-ACM-US*(b)	Inverter/AC Attenuator	Input: 16-48VDC Output: 208 or 240, 240W

(a) - Where X may be 2 or 5

(b) - Where \* may be any combination of letters or numbers or hyphen or none

[Last Updated](#) on 2017-12-28

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#### CONTRACTOR

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HIC. NO.: \_\_\_\_\_

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NEW PV SYSTEM: 6.540 kWp

#### OWNER NAME

#### RESIDENCE

HOME FULL ADDRESS

APN: \_\_\_\_\_

#### ENGINEER OF RECORD

PAPER SIZE: 11" x 17" (ANSI B)

#### RESOURCE DOCUMENT

DATE: XX.XX.XXXX

DESIGN BY: X.X.

CHECKED BY: X.X.

REVISIONS

# R-002.00

(SHEET 11)



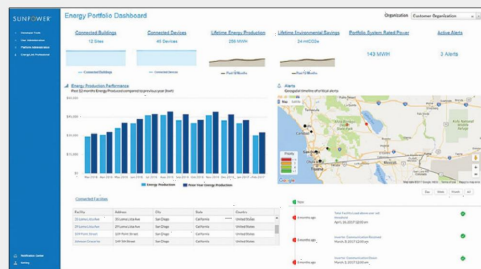
# SunPower® EnergyLink™ | Residential and Commercial PVS6

## SunPower® EnergyLink™ | Residential and Commercial PVS6

### Improve Support, Reduce Maintenance Costs

An intuitive monitoring website enables you to:

- See a visual map of customer sites
- Remotely manage hundreds of sites
- Receive elective system reports
- Locate system issues and remotely diagnose
- Diagnose issues online
- Drill down for the status of individual devices



### Add Value for Customers

With the SunPower Monitoring System customers can:

- See what their solar system produces each day, month, or year
- Optimize their solar investment and save on energy expenses
- See their energy use and estimated bill savings
- See their solar system's performance using the SunPower monitoring website or mobile app



### SunPower EnergyLink—Plug-and-Play Installation

This complete solution for residential and commercial monitoring and control includes the SunPower® PV Supervisor 6 (PVS6) which improves the installation process, overall system reliability, and customer experience.

- Compact footprint for improved aesthetics
- Robust cloud connectivity and comprehensive local connectivity
- Flexible configuration of devices during installation
- Consumption metering
- Revenue-grade production metering (pending)
- Web-based commissioning
- Remote diagnostics of PVS6 and inverters
- Durable UL Type 3R enclosure reduces maintenance costs
- Easy integration with SunPower eBOS

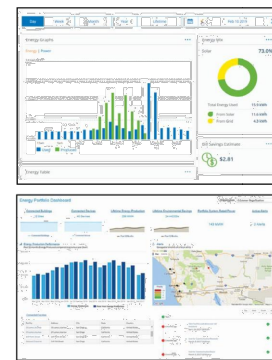


### Robust Cloud Connectivity

Multiple options to maintain optimal connectivity:

- Hardwired Ethernet
- Wi-Fi
- Cellular backup

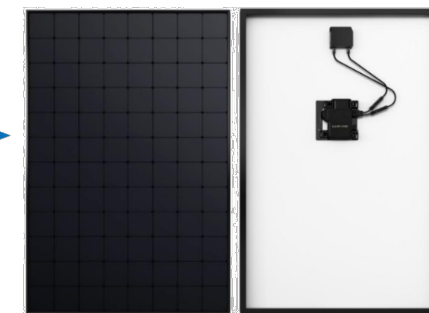
### SunPower Monitoring Websites



### PVS6



### SunPower AC Modules



Multiple communication options include Ethernet, Wi-Fi, and cellular.

Site Requirements	
Number of SunPower AC modules supported per PVS6	85
Internet access	High-speed Internet access via accessible router or switch
Power	<ul style="list-style-type: none"> <li>• 100-240 VAC (L-N), 50 or 60 Hz</li> <li>• 208 VAC (L-L in 3-phase), 60 Hz</li> </ul>

Operating Conditions	
Temperature	-22°F to +140°F (-30°C to +60°C)
Humidity (maximum)	95%, non-condensing

Mechanical	
Weight	5.5 lbs (2.5 kg)
Dimensions	11.8 x 8.0 x 4.2 in. (30.5 x 20.5 x 10.8 cm)
Enclosure rating	UL50E Type 3R

Communication	
RS-485	Inverters and meters
Integrated Metering	<ul style="list-style-type: none"> <li>• One channel of revenue-grade production metering</li> <li>• Two channels of consumption metering</li> </ul>
Ethernet	1 LAN (or optional WAN) port
PLC	PLC for SunPower AC modules
Wi-Fi	802.11b/g/n 2.4 GHz and 5 GHz
Cellular	LTE Cat-M1/3G UMTS
ZigBee	IEEE 802.15.4 MAC, 2.4GHz ISM band
Data Storage	60 days
Upgrades	Automatic firmware upgrades

Web and Mobile Device Support	
Customer site	<a href="http://monitor.us.sunpower.com">monitor.us.sunpower.com</a>
Partner site	<a href="http://psmgmt.us.sunpower.com">psmgmt.us.sunpower.com</a>
Browsers	Firefox, Safari, and Chrome
Mobile devices	iPhone®, iPad®, and Android™
Customer app	<ol style="list-style-type: none"> <li>1. Create account online at: <a href="http://monitor.us.sunpower.com">monitor.us.sunpower.com</a></li> <li>2. On a mobile device, download the SunPower Monitoring app from Apple App Store™ or Google Play™ store.</li> <li>3. Sign in using account email and password.</li> </ol>

Warranty and Certifications	
Warranty	10-year Limited Warranty
Certifications	UL, cUL, CE, UL 61010-1 and -2, FCC Part 15 (Class B)



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530536 RevC

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NEW PV SYSTEM: 6.540 kWp

### OWNER NAME

### RESIDENCE

HOME FULL ADDRESS \_\_\_\_\_

APN: \_\_\_\_\_

### ENGINEER OF RECORD

PAPER SIZE: 11" x 17" (ANSI B)

### RESOURCE DOCUMENT

DATE: XX.XX.XXXX

DESIGN BY: X.X.

CHECKED BY: X.X.

REVISIONS \_\_\_\_\_

### R-003.00

(SHEET 12)

# POWERWALL 2 AC



The Tesla Powerwall is a fully-integrated AC battery system for residential or light commercial use. Its rechargeable lithium-ion battery pack provides energy storage for solar self-consumption, load shifting and backup power.

Powerwall's electrical interface provides a simple connection to any home or building. Its revolutionary compact design achieves market-leading energy density and is easy to install, enabling owners to quickly realize the benefits of reliable, clean power.

## PERFORMANCE SPECIFICATIONS

AC Voltage (Nominal)	208 V, 220 V, 230 V, 277 V, 100/200 V, 120/240 V
Feed-In Type	Single & Split-Phase
Grid Frequency	50 and 60 Hz
AC Energy <sup>1</sup>	13.2 kWh
Real Power, max continuous <sup>2</sup>	5 kW (charge and discharge)
Real Power, peak (10s) <sup>2</sup>	7 kW (discharge only)
Apparent Power, max continuous <sup>2</sup>	5.8 kVA (charge and discharge)
Apparent Power, peak (10s) <sup>2</sup>	7.2 kVA (discharge only)
Imbalance for Single-Phase Loads	100%
Power Factor Output Range	+/- 1.0 adjustable
Power Factor (full-rated power)	+/- 0.85
Depth of Discharge	100%
Internal Battery DC Voltage	50 V
Round Trip Efficiency <sup>1,3</sup>	89.0%
Warranty	10 years

<sup>1</sup>Values provided for 25°C (77°F), 3.3 kW charge/discharge power.  
<sup>2</sup>Values region-dependent.  
<sup>3</sup>AC to battery to AC, at beginning of life.

## ENERGY GATEWAY SPECIFICATIONS

User Interface	Tesla App
Connectivity	Wi-Fi, Ethernet, 3G
AC Meter	Revenue grade
Operating Modes	Support for wide range of usage scenarios
Backup Operation	Optional automatic disconnect switch
Modularity	Supports up to 9 AC-coupled Powerwalls

## ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Storage Temperature	-30°C to 60°C (-22°F to 140°F)
Operating Humidity (RH)	Up to 100%, condensing
Maximum Altitude	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R
Ingress Rating	IP67 (Battery & Power Electronics) IP56 (Wiring)
Noise Level @ 1m	<40 dBA at 30°C (86°F)

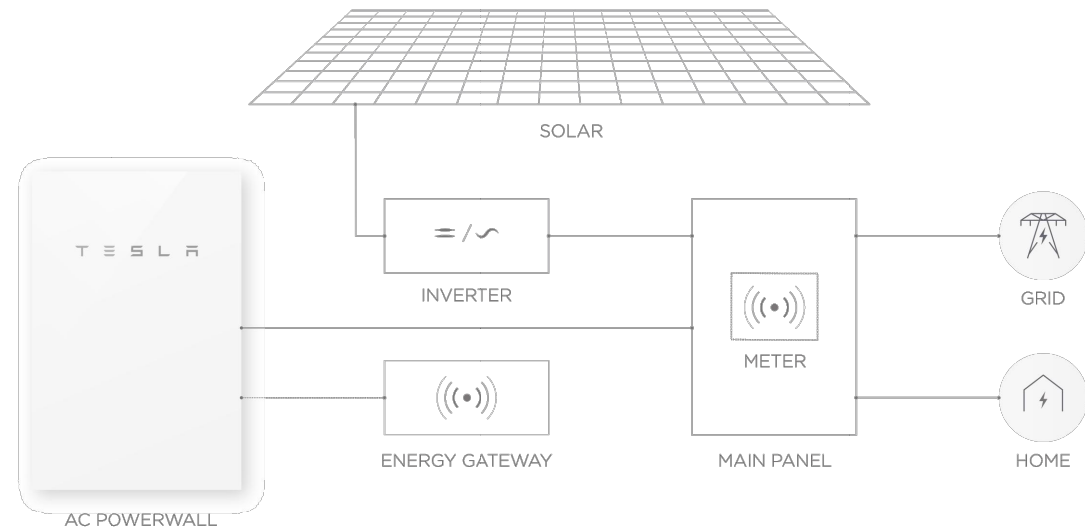
## MECHANICAL SPECIFICATIONS

Dimensions	1150 mm x 755 mm x 155 mm (45.3 in x 29.7 in x 6.1 in)
Weight	122 kg (269 lbs)
Mounting options	Floor or wall mount

## COMPLIANCE INFORMATION

Safety	UL 1642, UL 1741, UL 1973, UL 9540, UN 38.3, IEC 62109-1, IEC 62619, CSA C22.2.107.1
Grid Standards	Worldwide Compatibility
Emissions	FCC Part 15 Class B, ICES 003, EN 61000 Class B
Environmental	RoHS Directive 2011/65/EU, WEEE Directive 2012/19/EU, 2006/66/EC
Seismic	AC156, IEEE 693-2005 (high)

# TYPICAL SYSTEM LAYOUT



## CONTRACTOR

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NEW PV SYSTEM: 6.540 kWp

## OWNER NAME

## RESIDENCE

HOME FULL ADDRESS

APN: \_\_\_\_\_

## ENGINEER OF RECORD

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## RESOURCE DOCUMENT

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(SHEET 13)

## POWERWALL

### Backup Gateway 2

The Backup Gateway 2 for Tesla Powerwall provides energy management and monitoring for solar self-consumption, time-based control, and backup.

The Backup Gateway 2 controls connection to the grid, automatically detecting outages and providing a seamless transition to backup power. When equipped with a main circuit breaker, the Backup Gateway 2 can be installed at the service entrance. When the optional internal panelboard is installed, the Backup Gateway 2 can also function as a load center.

The Backup Gateway 2 communicates directly with Powerwall, allowing you to monitor energy use and manage backup energy reserves from any mobile device with the Tesla app.



#### PERFORMANCE SPECIFICATIONS

<b>AC Voltage (Nominal)</b>	120/240V
<b>Feed-In Type</b>	Split Phase
<b>Grid Frequency</b>	60 Hz
<b>Current Rating</b>	200 A
<b>Maximum Input Short Circuit Current</b>	10 kA <sup>1</sup>
<b>Overcurrent Protection Device</b>	100-200A; Service Entrance Rated <sup>1</sup>
<b>Overvoltage Category</b>	Category IV
<b>AC Meter</b>	Revenue accurate (+/- 0.2 %)
<b>Primary Connectivity</b>	Ethernet, Wi-Fi
<b>Secondary Connectivity</b>	Cellular (3G, LTE/4G) <sup>2</sup>
<b>User Interface</b>	Tesla App
<b>Operating Modes</b>	Support for solar self-consumption, time-based control, and backup
<b>Backup Transition</b>	Automatic disconnect for seamless backup
<b>Modularity</b>	Supports up to 10 AC-coupled Powerwalls
<b>Optional Internal Panelboard</b>	200A 6-space / 12 circuit Eaton BR Circuit Breakers
<b>Warranty</b>	10 years

<sup>1</sup>When protected by Class J fuses, Backup Gateway 2 is suitable for use in circuits capable of delivering not more than 22kA symmetrical amperes.

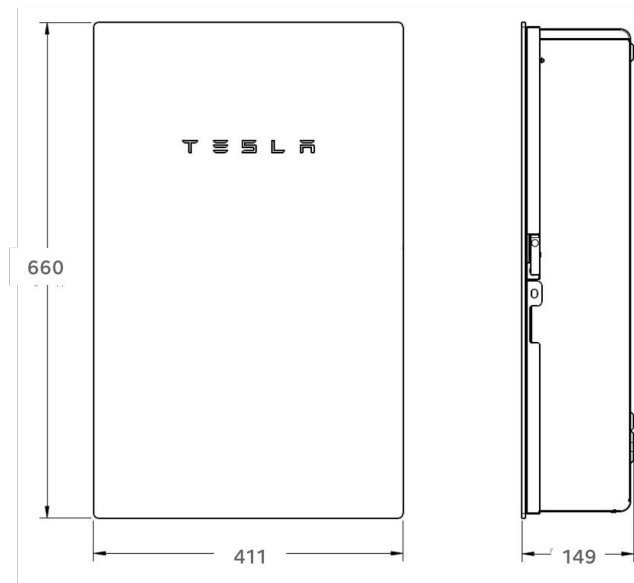
<sup>2</sup>The customer is expected to provide internet connectivity for Backup Gateway 2; cellular should not be used as the primary mode of connectivity. Cellular connectivity subject to network operator service coverage and signal strength.

#### COMPLIANCE INFORMATION

<b>Certifications</b>	UL 67, UL 869A, UL 916, UL 1741 PCS CSA 22.2 0.19, CSA 22.2 205
<b>Emissions</b>	FCC Part 15, ICES 003

#### MECHANICAL SPECIFICATIONS

<b>Dimensions</b>	660 mm x 411 mm x 149 mm (26 in x 16 in x 6 in)
<b>Weight</b>	20.4 kg (45 lb)
<b>Mounting options</b>	Wall mount, Semi-flush mount



#### ENVIRONMENTAL SPECIFICATIONS

<b>Operating Temperature</b>	-20°C to 50°C (-4°F to 122°F)
<b>Operating Humidity (RH)</b>	Up to 100%, condensing
<b>Maximum Elevation</b>	3000 m (9843 ft)
<b>Environment</b>	Indoor and outdoor rated
<b>Enclosure Type</b>	NEMA 3R

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(SHEET 14)



## SunPower® InvisiMount™ | Residential Mounting System

## SunPower® InvisiMount™ | Residential Mounting System

### Simple and Fast Installation

- Integrated module-to-rail grounding
- Pre-assembled mid and end clamps
- Levitating mid clamp for easy placement
- Mid clamp width facilitates even module spacing
- Simple, pre-drilled rail splice
- UL 2703 Listed integrated grounding

### Flexible Design

- Addresses nearly all sloped residential roofs
- Design in landscape and portrait
- Rails enable easy obstacle management

### Customer-Preferred Aesthetics

- #1 module and #1 mounting aesthetics
- Best-in-class system aesthetics
- Premium, low-profile design
- Black anodized components
- Hidden mid clamps and end clamps hardware, and capped, flush rails

### Part of Superior System

- Built for use with SunPower DC and AC modules
- Best-in-class system reliability and aesthetics
- Combine with SunPower modules and monitoring app



### Elegant Simplicity

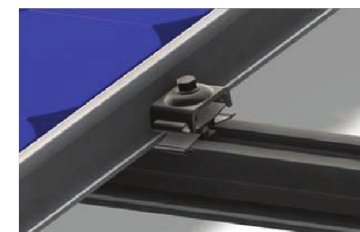
SunPower® InvisiMount™ is a SunPower-designed rail-based mounting system. The InvisiMount system addresses residential sloped roofs and combines faster installation time, design flexibility, and superior aesthetics. The InvisiMount product was specifically envisioned and engineered to pair with SunPower modules. The resulting system-level approach will amplify the aesthetic and installation benefits for both homeowners and installers.

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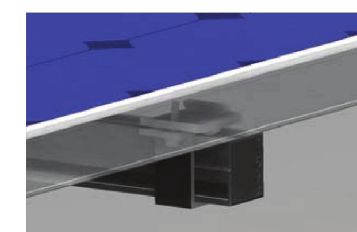


### InvisiMount Component Images

Module\* / Mid Clamp and Rail



Module\* / End Clamp and Rail



Mid Clamp



End Clamp



Rail & Rail Splice



Ground Lug Assembly



End Cap



InvisiMount Component Details		
Component	Material	Weight
Mid Clamp	Black oxide stainless steel AISI 304	63 g (2.2 oz)
End Clamp	Black anodized aluminum alloy 6063-T6	110 g (3.88 oz)
Rail	Black anodized aluminum alloy 6005-T6	830 g/m (9 oz/ft)
Rail Splice	Aluminum alloy 6005-T5	830 g/m (9 oz/ft)
Ground Lug Assembly	304 stainless (A2-70 bolt; tin-plated copper lug)	106.5 g/m (3.75 oz)
End Cap	Black acetal (POM) copolymer	10.4 g (0.37 oz)

Roof Attachment Hardware Supported by InvisiMount System Design Tool	
Application	<ul style="list-style-type: none"> <li>• Composition Shingle Rafter Attachment</li> <li>• Composition Shingle Roof Decking Attachment</li> <li>• Curved and Flat Tile Roof Attachment</li> <li>• Universal Interface for Other Roof Attachments</li> </ul>

InvisiMount Operating Conditions	
Temperature	-40° C to 90° C (-40° F to 194° F)
Max. Load	2400 Pa uplift 5400 Pa downforce

InvisiMount Warranties And Certifications	
Warranties	25-year product warranty 5-year finish warranty
Certifications	UL 2703 Listed Class A fire rating when distance between roof surface and bottom of SunPower module frame is ≤ 3.5"

Roof Attachment Hardware Warranties	
Refer to roof attachment hardware manufacturer's documentation	

\*Module frame that is compatible with the InvisiMount system required for hardware interoperability.

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NEW PV SYSTEM: 6.540 kWp

### OWNER NAME

### RESIDENCE

HOME FULL ADDRESS

APN: \_\_\_\_\_

### ENGINEER OF RECORD

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(SHEET 15)

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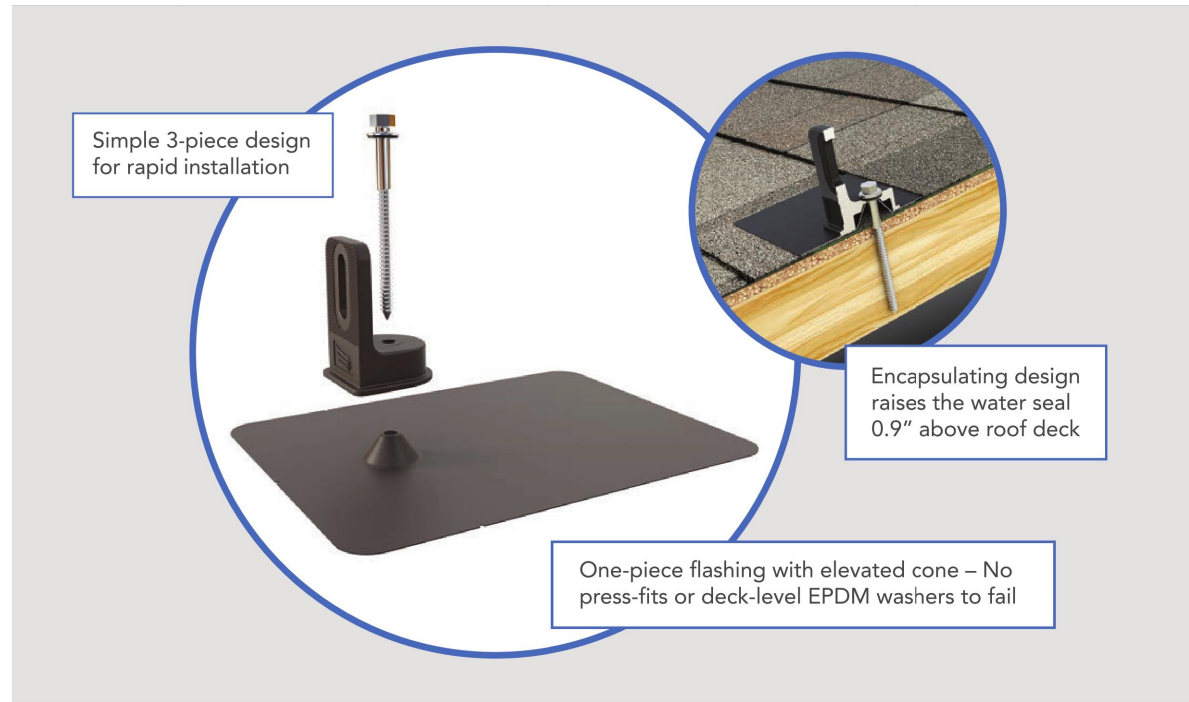
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A BETTER DAY ON THE JOB

## COMP MOUNT

## COMP MOUNT



### WATERTIGHT FOR LIFE

Pegasus Solar's Comp Mount is a cost effective, high-quality option for rail installations on composition shingle roofs. Designed to last decades, the one-piece flashing with elevated cone means there is simply nothing to fail.



#### 25-year Warranty

Manufactured with advanced materials and coatings to outlast the roof itself



#### Superior Waterproofing

Tested to AC286 without sealant 0.9" elevated water seal



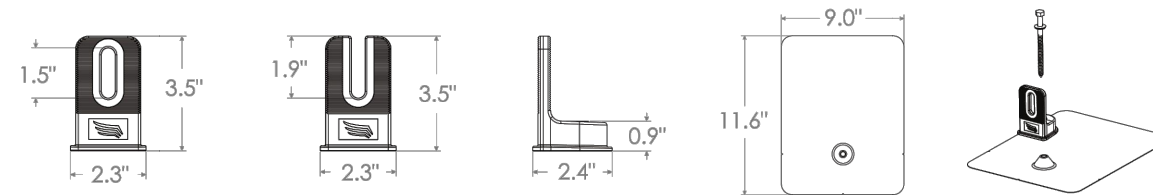
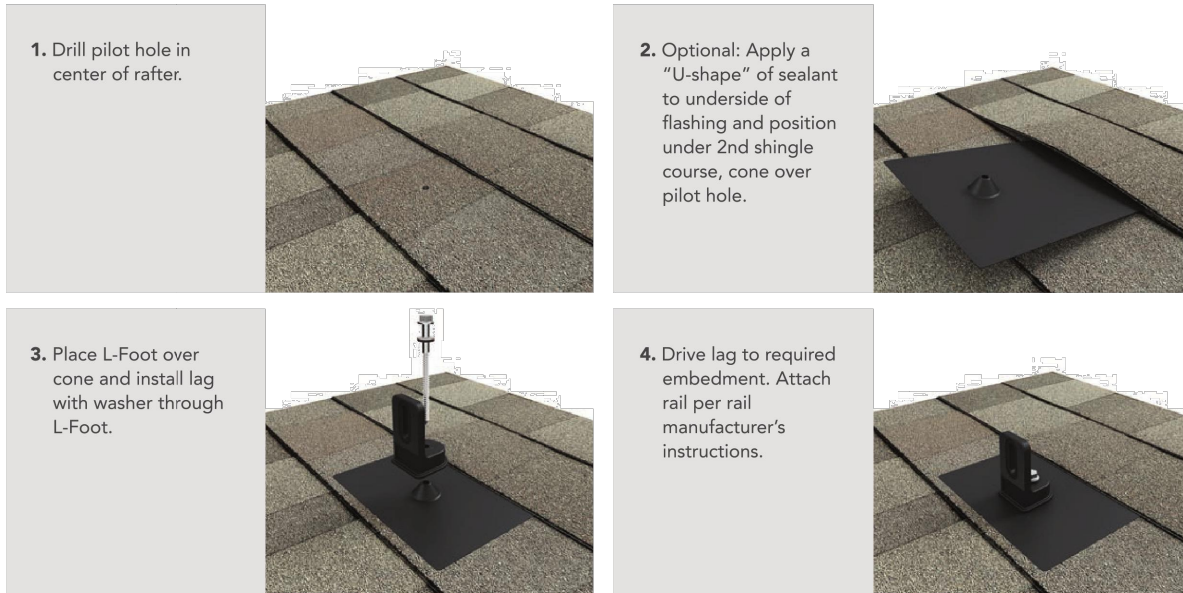
#### Code Compliant

Fully IBC/CBC Code Compliant Exceeds ASCE 7-10 Standards



#### All-In-One Kit Packaging

Flashings, L-feet and SS lags with bonded EPDM washers are included in each 24-pack



Specifications	Comp Mount Install Kit		
SKU	PSCR-C0	PSCR-U0	SPCR-CH
L-foot Type	Closed Slot	Open Slot	Closed Slot
Kit Contents	L-Foot, Flashing, 5/16" SS Lag w/ EPDM washer	L-Foot, Flashing, 5/16" SS Lag w/ EPDM washer	L-Foot, Flashing, 5/16" SS Lag w/ EPDM washer, M10 Hex Bolt
Finish	Black (L-foot and Flashing)		
Roof Type	Composition Shingle		
Certifications	IBC, ASCE/SEI 7-10, AC286		
Install Application	Railed Systems		
Compatible Rail	All		
Flashing Material	Painted Galvalume Plus		
L-Foot Material	Aluminum		
Kit Quantity	24		
Boxes Per Pallet	72		

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