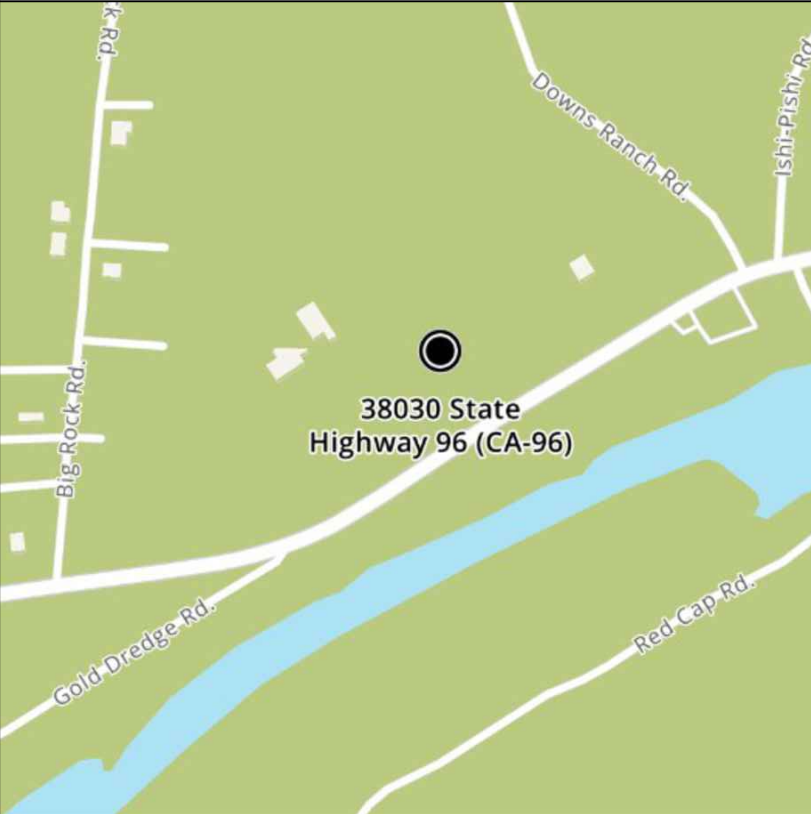
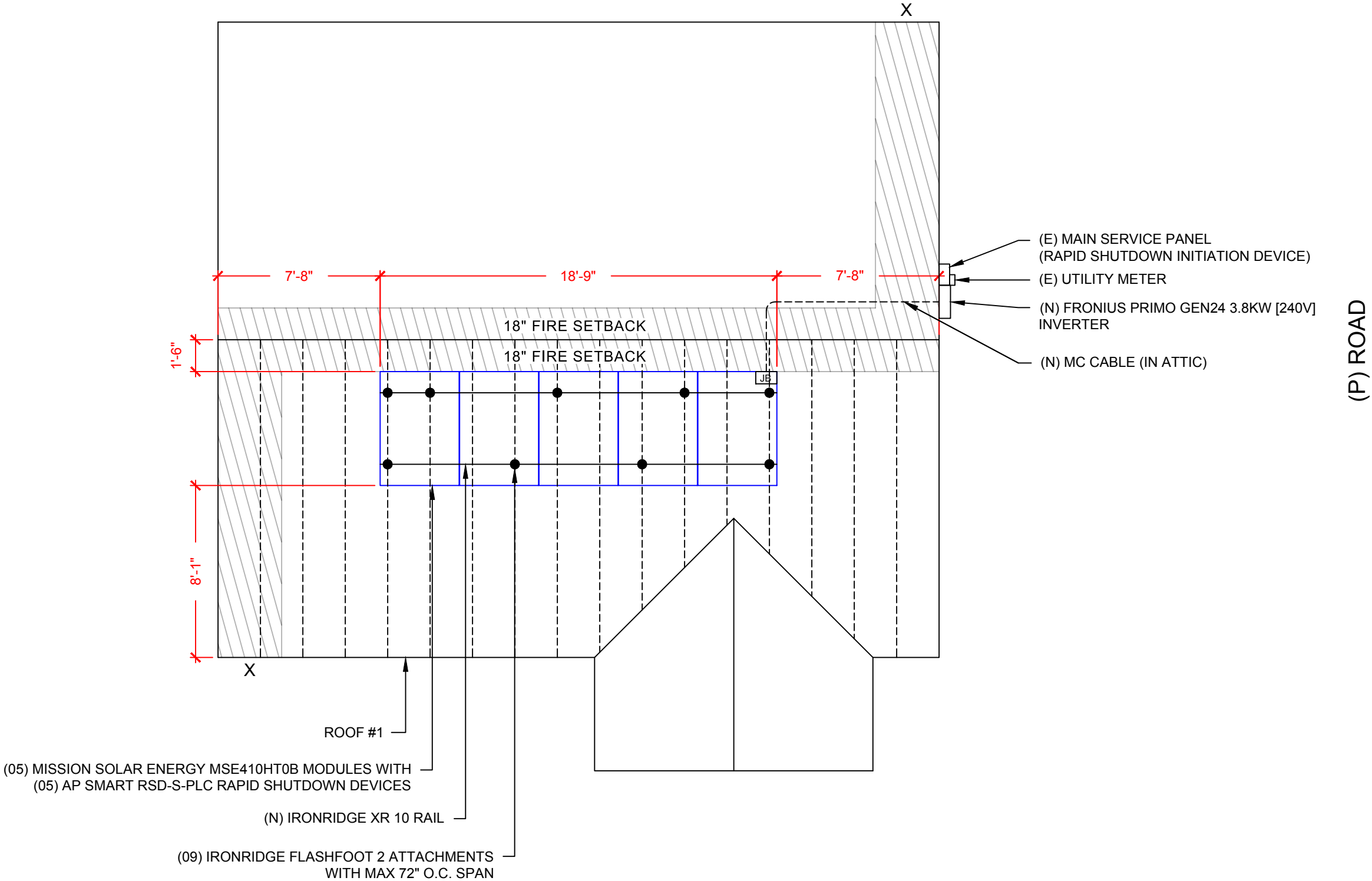


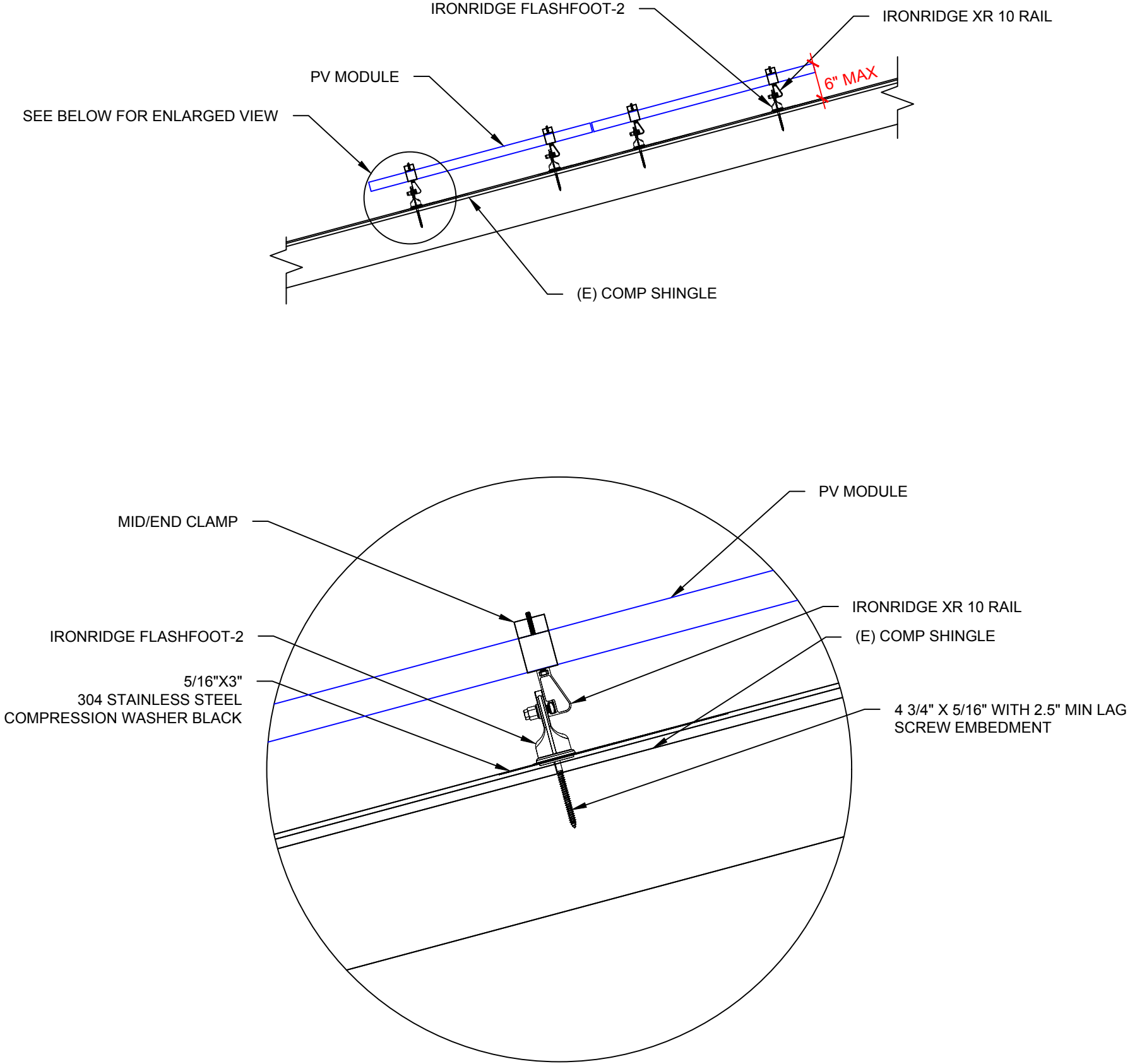
SCOPE OF WORK		GOVERNING CODES		SITE PLAN			
INSTALL A ROOF-MOUNTED PV SYSTEM: • (05) MISSION SOLAR ENERGY MSE410HT0B MODULES • (05) AP SMART RSD-S-PLC RAPID SHUTDOWN DEVICES • (01) FRONIUS PRIMO GEN24 3.8KW [240V] INVERTER TOTAL PV SIZE: 2.050 KW DC, 1.852 KW CEC AC		ALL WORK TO COMPLY WITH: • 2022 CALIFORNIA ELECTRICAL CODE • 2022 CALIFORNIA RESIDENTIAL CODE • 2022 CALIFORNIA FIRE CODE • 2022 CALIFORNIA BUILDING CODE		<div><div><div><div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div></div></div><div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div></div></div><div>PROPERTY LINE</div><div>FRONT OF HOUSE (P) ROAD</div></div></div></div>			
TABLE OF CONTENTS		GENERAL NOTES					
PV-1 COVER SHEET PV-2 ROOF PLAN & MODULES PV-3 ATTACHMENT DETAILS PV-4 SINGLE-LINE DIAGRAM PV-4A ELECTRICAL CALCULATIONS PV-5 LABELS & PLACARD PV-6+ EQUIPMENT DATASHEETS		<ul style="list-style-type: none">• ALL WORK SHALL CONFORM TO APPLICABLE BUILDING, ELECTRICAL CODE AND ANY LOCALLY ADOPTED ORDINANCES.• DRAWINGS ARE DIAGRAMMATIC, SITE CONDITIONS SHALL PREVAIL. IF NO SCALE IS GIVEN, DRAWINGS ARE NOT TO SCALE. ALL DIMENSIONS SHALL BE VERIFIED BY THE CONTRACTOR IN THE FIELD UPON COMMENCEMENT OF CONSTRUCTION.• ALL CONDUIT AND WIRE RUNS ARE DIAGRAMMATIC, SUBJECT TO FIELD CONDITIONS ROUTING OF RACEWAYS SHALL BE FINALIZED BY THE CONTRACTOR. IF THE DISTANCES FOR WIRE RUNS ARE DIFFERENT THAN AS SHOWN, THE CONTRACTOR SHALL NOTIFY THE DESIGN TEAM TO VALIDATE THE WIRE SIZE.• ALL EQUIPMENT SHALL BE LISTED AND LABELED BY A RECOGNIZED TESTING LABORATORY AND INSTALLED PER THE LISTING AND MANUFACTURER'S REQUIREMENTS.• ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH REQUIRED ACCESS AND WORKING CLEARANCES PER CEC ARTICLE 110.• ALL NEW MAIN SERVICE PANELS AND SUBPANELS WILL HAVE APPROPRIATE FIELD IDENTIFICATION PER CEC 408.4.• ALL NEW MAIN SERVICE PANELS AND SUBPANELS WILL HAVE APPROPRIATE FIELD IDENTIFICATION PER CEC 408.4.					
VICINITY MAP		SITE DETAILS		<div><div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div></div></div></div>			
		<div>ASHRAE MIN TEMP-3°C</div> <div>ASHRAE 2% HIGH TEMP18°C</div> <div>BUILDING OCCUPANCYR-3</div> <div>TYPE OF CONSTRUCTIONV-B</div> <div>SPRINKLERS SYSTEM PER NFPA 13DYES</div> <div># OF STORIES1</div> <div>WIND SPEED (ASCE 7-16)93 MPH</div> <div>WIND EXPOSUREB</div> <div>RISK CATEGORYII</div> <div>GROUND SNOW LOADN/A</div> <div>UTILITYPG&E</div>					
<div><div><div>TVCE</div><div><div>TRINITY VALLEY CONSULTING ENGINEERS</div><div>67 WALNUT WAY</div><div>WILLOW CREEK, CA 95573</div><div>530.629.3000</div></div></div></div>							

ROOF DESCRIPTION					
ROOF	ROOF TILT	AZIMUTH	ROOF MATERIAL	TRUSS SIZE	TRUSS SPACING
#1	18°	150°	COMP SHINGLE	2" X 4"	24" O.C.
PV ROOF COVERAGE					
(E) PV AREA [SQ FT]	(N) PV AREA [SQ FT]	TOTAL PV AREA [SQ FT]	TOTAL ROOF AREA [SQ FT]	PERCENTAGE COVERED BY PV	
0	100.53	100.53	1089.05	9%	

LEGEND	
<div><div>JB</div></div>	- JUNCTION BOX
<div><div>---</div></div>	- RAFTER OR TRUSS
<div><div>o</div><div></div></div>	- ROOF OBSTRUCTION
<div><div>●</div></div>	- ROOF ATTACHMENT
<div><div></div></div>	- 36" FIRE SETBACKS / PATHWAYS
<div><div>X</div></div>	- ACCESS POINT

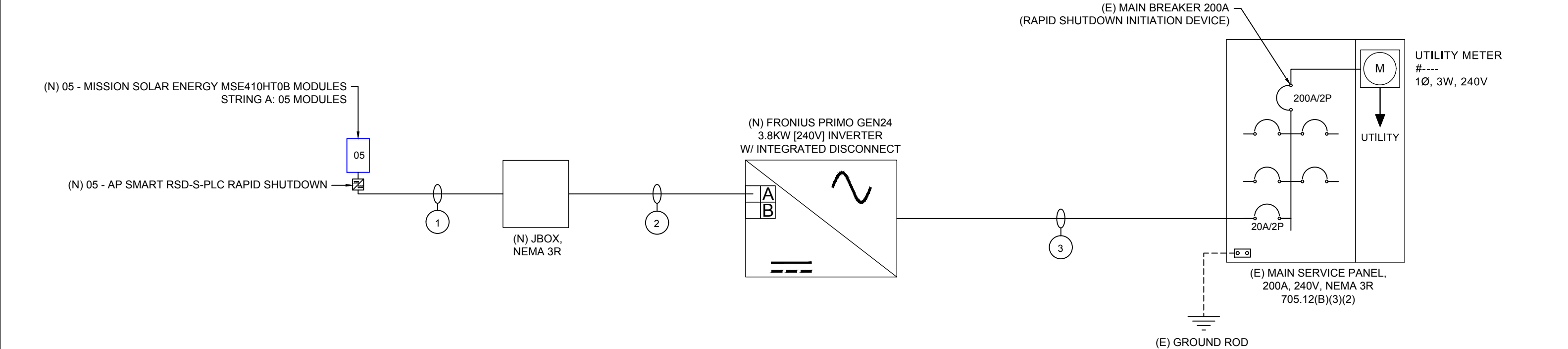


# OF SOLAR MODULES	5
# OF MICRO/OPTIMIZERS	5
POINTS OF CONNECTION	9
# OF SPACES BETWEEN MODULES	4
SOLAR MODULES WEIGHT	42.00 lbs
MICRO/OPTIMIZER WEIGHT	0.82 lbs
TOTAL RAIL LENGTH	56 ft
RAIL WEIGHT	0.40 lbs/LF
WEIGHT PER ATTACHMENT	1 lbs
MODULE LENGTH	67.80 in
MODULE WIDTH	44.68 in
INTERMODULE SPACING	0.25 in
SOLAR + MICRO/OPTIMIZER WEIGHT	43 lbs
TOTAL SOLAR + MICRO/OPTIMIZER WEIGHT	214 lbs
TOTAL RAIL WEIGHT	22 lbs
TOTAL ATTACHMENT WEIGHT	9 lbs
MOUNTING SYSTEM WEIGHT	31 lbs
TOTAL PANEL WEIGHT	246 lbs
POINT LOAD CALCULATION	27.28 lbs
SOLAR MODULE AREA	21.0 ft2
TOTAL SOALR MODULE AREA	105 ft2
TOTAL SPACING AREA	1 ft2
TOTAL PANEL AREA	106 ft2
DISTRIBUTED LOAD	2.31 lbs/ft2



ID	UNGROUND ED CONDUCTORS	NEUTRAL CONDUCTOR	EQUIPMENT GND CONDUCTOR	CONDUIT
1	(2) 10 AWG, PV WIRE, CU	N/A	(1) 6 AWG, SOLID BARE, CU	FREE AIR
2	(2) 10 AWG, MC CABLE, CU	N/A	(1) 10 AWG, MC CABLE, CU	N/A
3	(2) 10 AWG, THWN-2, CU	(1) 10 AWG, THWN-2, CU	(1) 10 AWG, THWN-2, CU	0.75" EMT


*CODE COMPLIANT WIRE/CONDUIT SUBSTITUTIONS MAY BE MADE TO THE ABOVE TABLE.
*SEE THE NEXT PAGE FOR ELECTRICAL CALCULATIONS AND ADDITIONAL ELECTRICAL NOTES.




THE MAIN BREAKER IN THE MAIN SERVICE PANEL WILL INITIATE RAPID SHUTDOWN AND MEET THE REQUIREMENTS OUTLINED IN CEC 690.12.

THE INTEGRATED DC DISCONENCT IN THE IVERTER MEET THE PV DISCONNECT REQUIREMENTS OUTLINED IN CEC 690.13. IT IS READILY ACCESSIBLE AND LOCKABLE.

THE DC MODULE CONNECTORS MEET THE ISOLATING DEVICE REQUIREMENTS OUTLINED IN CEC 690.15 AND 690.33.

 <div>TRINITY VALLEY CONSULTING ENGINEERS 67 WALNUT WAY WILLOW CREEK, CA 95573 530.629.3000</div>			SCALE: NTS	AHJ: HUMBOLDT COUNTY	KTHA ORLEANS 38030 STATE HIGHWAY-96 ORLEANS, CA 95556	PV-4 SINGLE-LINE DIAGRAM
			SHEET SIZE: 11" x 17"	APN: 529-111-007		
			TEMPLATE V2.0	DATE: 03/27/2025		

ID	STARTING LOCATION	FINAL LOCATION	UNGROUND ED CONDUCTORS	NEUTRAL CONDUCTOR	EQUIPMENT GND CONDUCTOR	CONTROL WIRE	TERM. TEMP.	# OF CCC	ASHARE 2% HIGH TEMP.	CCC ADJUSTMENT	AMBIENT TEMP CORR.	90°C RATING	DERATED AMP.	TERM. TEMP. RATING	OCPD	CONDUIT	CONDUIT FILL	LENGTH	LOAD	VOLTAGE	VOLTAGE DROP																																										
1	STRING	JUNCTION BOX	(2) 10 AWG, PV WIRE, CU	N/A	(1) 6 AWG, SOLID BARE, CU	--	75°C	2	18°C	N/A	x	N/A	x	N/A	=	N/A	30.0A	N/A	FREE AIR	N/A	15FT	13.1A	156.9V	0.32%																																							
2	JUNCTION BOX	INVERTER	(2) 10 AWG, MC CABLE, CU	N/A	(1) 10 AWG, MC CABLE, CU	--	75°C	2	18°C	1	x	1	x	40.0A	=	40.0A	35.0A	N/A	N/A	N/A	21FT	13.1A	156.9V	0.45%																																							
3	INVERTER	MAIN SERVICE PANEL	(2) 10 AWG, THWN-2, CU	(1) 10 AWG, THWN-2, CU	(1) 10 AWG, THWN-2, CU	--	75°C	2	18°C	1	x	1	x	40.0A	=	40.0A	35.0A	20A	0.75" EMT	15.27%	5FT	16.0A	240V	0.08%																																							
INVERTER OUTPUT CALCULATIONS & 705.12 COMPLIANCE									VOC CALCULATION PER CEC 690.7(A)(1)																																																						
<table><tr><td>INVERTER OUTPUT CIRCUIT</td><td>INVERTER OR ESS</td><td># OF INVERTERS / ESS</td><td>CONTINUOUS OUTPUT</td><td>125% SAFETY FACTOR</td><td>TOTAL BACKFEED</td><td>MINIMUM BREAKER SIZE</td></tr><tr><td>#1</td><td>PRIMO 3.8</td><td>1</td><td>15.83A</td><td>125%</td><td>19.79A</td><td>20A</td></tr></table> <table><tr><td>PANEL</td><td>705.12 COMPLIANCE</td><td>BUSBAR</td><td>OCPD PROTECTING PANEL</td><td>BUSBAR X 120%</td><td>MAX GENERATION BACKFEED</td></tr><tr><td>MSP</td><td>705.12(B)(3)(2)</td><td>200A</td><td>200A</td><td>240A</td><td>40A</td></tr></table>									INVERTER OUTPUT CIRCUIT	INVERTER OR ESS	# OF INVERTERS / ESS	CONTINUOUS OUTPUT	125% SAFETY FACTOR	TOTAL BACKFEED	MINIMUM BREAKER SIZE	#1	PRIMO 3.8	1	15.83A	125%	19.79A	20A	PANEL	705.12 COMPLIANCE	BUSBAR	OCPD PROTECTING PANEL	BUSBAR X 120%	MAX GENERATION BACKFEED	MSP	705.12(B)(3)(2)	200A	200A	240A	40A	<table><tr><td>MODULE</td><td>MSE410HT0B</td></tr><tr><td># OF MODULES LARGEST STRING</td><td>5</td></tr><tr><td>ASHRAE MIN TEMP [°C]</td><td>-3</td></tr><tr><td>VOC [V]</td><td>37.41</td></tr><tr><td>TEMP COEF VOC [%/°C]</td><td>-0.254</td></tr><tr><td>TEMP ADJ VOC [V]</td><td>40.07</td></tr><tr><td>VOLTAGE OF LARGEST STRING [V]</td><td>200.35</td></tr></table>									MODULE	MSE410HT0B	# OF MODULES LARGEST STRING	5	ASHRAE MIN TEMP [°C]	-3	VOC [V]	37.41	TEMP COEF VOC [%/°C]	-0.254	TEMP ADJ VOC [V]	40.07	VOLTAGE OF LARGEST STRING [V]	200.35						
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ELECTRICAL NOTES (APPLICABILITY BASED ON SCOPE OF WORK)																																																															
<p>AS-BUILT CHANGES TO THE ABOVE WIRING ARE PERMISSIBLE AS LONG AS SUBSTITUTIONS ARE CODE COMPLIANT. FOR EXAMPLE, APPROPRIATELY SIZED NM-B MAY BE USED FOR MICROINVERTER OUTPUT CIRCUITS IF INSTALLED IN ACCORDANCE WITH CEC ARTICLE 334, OR MC CABLE MAY BE USED FOR DC SOLAR STRINGS IF INSTALLED IN ACCORDANCE WITH CEC ARTICLE 330.</p> <p>ALL OUTDOOR EQUIPMENT SHALL BE RAIN-TIGHT & HOLD A MINIMUM NEMA 3R RATING, INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES. CONDUCTORS EXPOSED TO WET CONDITIONS SHALL BE SUITABLE FOR USE IN WET CONDITIONS PER CEC 310.10(C).</p> <p>ALL TERMINAL TEMPERATURES OF EQUIPMENT WILL BE VERIFIED TO BE RATED FOR 75°C, OR THE WIRE WILL NEED TO BE RESIZED USING THE 60°C TERMINAL TEMPERATURE RATINGS FOR 100A OR LESS.</p> <p>ALL NM-B SHALL BE INSTALLED AND PROTECTED PER CEC 334, AND ALL SER CABLE SHALL BE INSTALLED AND PROTECTED PER CEC 338.</p> <p>ALL ROOFTOP RACEWAYS AND CABLES EXPOSED TO DIRECT SUNLIGHT WILL BE INSTALLED >7/8" ABOVE THE ROOF.</p>									<p>ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250. A SUPPLEMENTAL GROUND ROD WILL BE DRIVEN IN ACCORDANCE WITH CEC 250.53(A)(3) IF THE EXISTING GROUND ROD HAS A RESISTANCE TO EARTH THAT IS GREATER THAN 25 OHMS.</p> <p>IF ANY EXISTING LOAD CONDUCTORS ARE EXTENDED BY MORE THAN 6', AFCI PROTECTION WILL BE PROVIDED PER CEC 210.12(D).</p> <p>PER CEC 690.47(A) PV SYSTEMS THAT ARE NOT SOLIDLY GROUNDED, THE EQUIPMENT GROUNDING CONDUCTOR FOR THE OUTPUT OF THE PV SYSTEMS SHALL BE PERMITTED TO BE THE CONNECTION TO GROUND FOR GROUND-FAULT PROTECTION AND EQUIPMENT GROUNDING OF THE PV ARRAY.</p> <p>THE ESS CIRCUIT BREAKER SHALL BE SECURED IN PLACE BY AN ADDITIONAL FASTENER PER CEC 408.36(D).</p> <p>NO SINGLE BACK-UP LOAD WILL BE LARGER THAN THE MAXIMUM CONTINUOUS OUTPUT OF THE ESS PER CEC 710.15(A).</p>																																																						
<div><div>TVCE</div><div></div></div> <div>TRINITY VALLEY CONSULTING ENGINEERS 67 WALNUT WAY WILLOW CREEK, CA 95573 530.629.3000</div>											SCALE: NTS			AHJ: HUMBOLDT COUNTY			<div><div>KTHA ORLEANS</div><div>38030 STATE HIGHWAY-96 ORLEANS, CA 95556</div></div>						<div><div>PV-4A</div><div>ELECTRICAL CALCULATIONS</div></div>																																								
						SHEET SIZE: 11" x 17"			APN: 529-111-007																																																						
						TEMPLATE V2.0			DATE: 03/27/2025																																																						

1

PHOTOVOLTAIC AC DISCONNECT

MAXIMUM AC OPERATING CURRENT: 15.8A
NOMINAL OPERATING AC VOLTAGE: 240V

LOCATED AT PV DISCONNECT.
CEC 690.56(B), 609.54, 705.20

2

WARNING

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

LOCATED AT PV DISCONNECT
CEC 690.13(B)

3

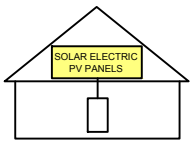
RAPID SHUTDOWN SWITCH
FOR SOLAR PV SYSTEM

LOCATED AT MAIN SERVICE PANEL.
CEC 690.56(C)(2)

4

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



LOCATED AT MAIN SERVICE PANEL.
CEC 690.56(C)

5

WARNING: PHOTOVOLTAIC
POWER SOURCE

LOCATED AT DC SOLAR CIRCUIT; CEC 690.31(D)(2)

6

PHOTOVOLTAIC SYSTEM DC DISCONNECT

OPERATING VOLTAGE 156.9V
OPERATING CURENT 13.1A
MAX SYSTEM VOLTAGE 200.3V
SHORT CIRCUIT CURRENT 13.9A

LOCATED AT PV DISCONNECT.
CEC 690.56(B), 609.54, 705.20

7

WARNING
INVERTER OUTPUT CONNECTION DO NOT
RELOCATE THIS OVERCURRENT DEVICE

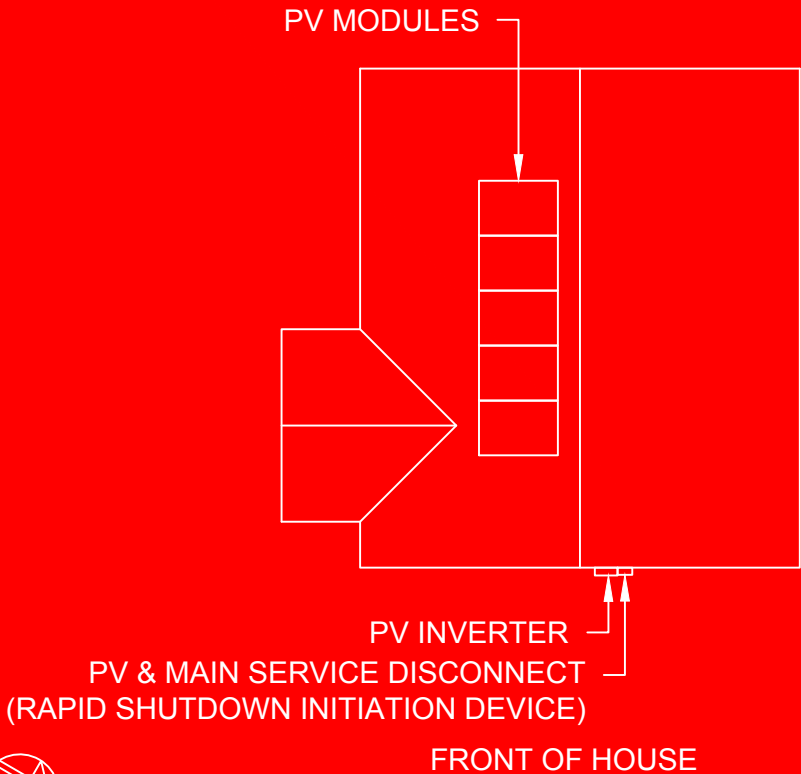
LOCATED AT POINT OF INTERCONNECTION.
CEC 705.12(B)(3)(2)

-THE LABELS/PLACARD SHALL BE PERMANENTLY AFFIXED TO THE
EQUIPMENT OR WIRING METHOD.
-ALL WARNING & HAZARD LABELS SHALL BE INSTALLED PER CEC
110.21(B).
-IF THERE IS EXISTING PV OR ESS, LABELS FOR EXISTING PV SYSTEMS
WILL BE TRANSFERRED OR REPLACED ON NEW EQUIPMENT.

LOCATED AT MAIN SERVICE PANEL. CEC 690.56(B), 690.4(D), 705.10

CAUTION

MULTIPLE SOURCES OF POWER WITH
DISCONNECTS LOCATED AS SHOWN:



TRINITY VALLEY CONSULTING ENGINEERS
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KTHA ORLEANS

38030 STATE HIGHWAY-96
ORLEANS, CA 95556

PV-5

LABELS &
PLACARD



FRAME-TO-FRAME WARRANTY
Degradation guaranteed not to exceed 2% in year 1 and .55% annually from years 2 to 25 with 84.8% capacity guaranteed in year 25.
For more information, visit www.missionsolar.com/warranty



If you have questions or concerns about certification of our products in your area, please contact Mission Solar Energy.



American Solar Built for the Long Haul

Mission Solar Energy is headquartered in San Antonio, Texas where we manufacture our modules. We produce American, high-quality solar modules ensuring the highest-in-class power output and best-in-class reliability. This product is tailored for residential and commercial applications. Every Mission Solar Energy solar module is certified and surpasses industry standard regulations, providing excellent performance over the long term.

America's Module Company®



Fair Trade Practices

- Free of forced labor at all stages of the supply chain
- Not subject to AD/CVD tariffs or investigations
- Polysilicon manufactured with sustainable hydroelectric power



Certified Reliability

- Tested to UL 61730 & IEC Standards
- PID resistant
- Resistance to salt mist corrosion



Advanced Technology

- M10 half-cut cell with 10 busbars
- Passivated Emitter Rear Contact
- Engineered for residential and commercial applications



Extreme Weather Resilience

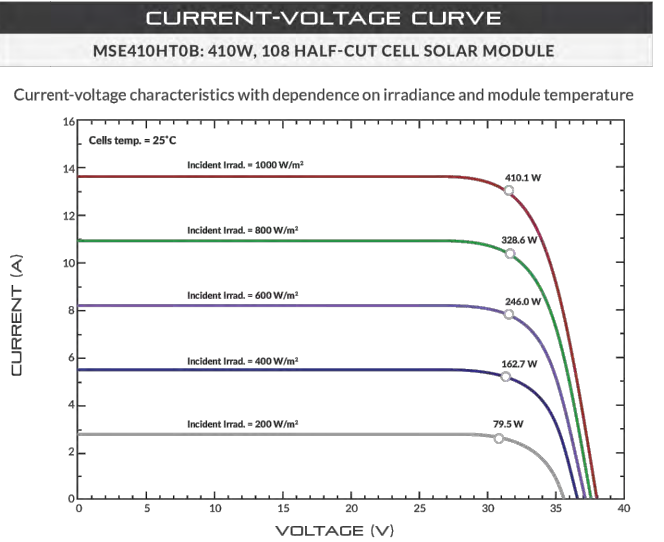
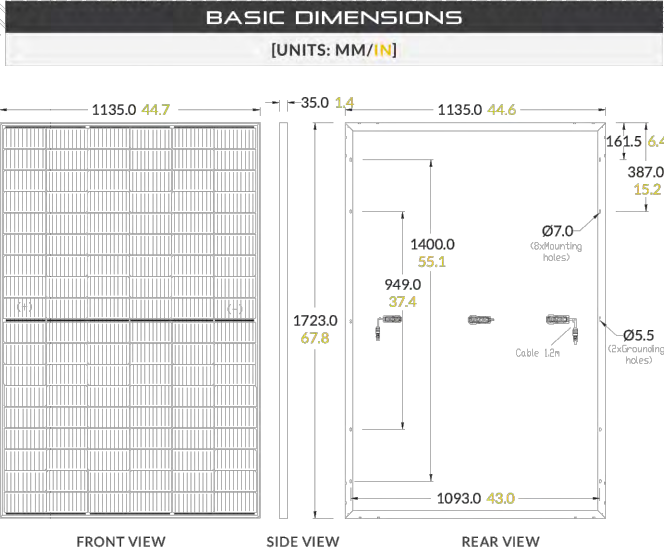
- Up to 5,400 Pa snow and wind load
- Third-party hail tests exceed 55 mm at 33.9 m/s



BAA Compliant for Government Projects

- Buy American Act
- American Recovery & Reinvestment Act

Class Leading 400-410W



CERTIFICATIONS AND TESTS	
IEC	61215, 61730, 61701
UL	61730



Mission Solar Energy
8303 S. New Braunfels Ave., San Antonio, Texas 78235
www.missionsolar.com | info@missionsolar.com

Mission Solar Energy reserves the right to make specification changes without notice.
C-MKTG-0033 VERSION: 4 VERSION DATE: 07/08/2024

MSE PERC 108HC

ELECTRICAL SPECIFICATION				
PRODUCT TYPE	MSExxxHT0B (xxx = P _{max})			
Power Output	P _{max}	W _p	400	405 410
Module Efficiency	%		20.5	20.7 21.0
Tolerance	%		0/+3	0/+3 0/+3
Short Circuit Current	I _{sc}	A	13.75	13.82 13.90
Open Circuit Voltage	V _{oc}	V	37.09	37.27 37.41
Rated Current	I _{mp}	A	12.92	13.00 13.07
Rated Voltage	V _{mp}	V	30.96	31.16 31.38
Fuse Rating	A		25A	25A 25A
System Voltage	V		1,000	1,000 1,000

TEMPERATURE COEFFICIENTS	
Normal Operating Cell Temperature (NOCT)	45.52°C (±3.7%)
Temperature Coefficient of P _{max}	-0.343%/°C
Temperature Coefficient of V _{oc}	-0.254%/°C
Temperature Coefficient of I _{sc}	-0.257%/°C

OPERATING CONDITIONS	
Maximum System Voltage	1,000Vdc
Operating Temperature Range	-40°F to 185°F (-40°C to +85°C)
Maximum Series Fuse Rating	25A
Fire Safety Classification	Type 1*
Front & Back Load (UL Standard)	Up to 5,400 Pa front and 5,400 Pa back load. Tested to UL 61730
Hail Safety Impact Velocity	50mm at 23 m/s

*Mission Solar Energy uses quality sourced materials that result in a Type 1 fire rating. Please note, the "Fire Class" Rating is designated for the fully-installed PV system, which includes, but is not limited to, the module, the type of mounting used, pitch and roof composition.

MECHANICAL DATA	
Solar Cells	P-PERC 182mm x 182mm
Cell Orientation	108 half-cut cells
Module Dimension	1723mm x 1135mm x 35mm
Weight	42 lbs. (19kg)
Front Glass	3.2mm tempered, low-iron, anti-reflective
Frame	35mm anodized interlocking
Encapsulant	Ethylene vinyl acetate (EVA)
Junction Box	Protection class IP68 with 3 bypass-diodes
Cable	1.2m, Wire 4mm² (12AWG)
Connector	MC4 Staubli PV-KBT4/6II-UR and PV-KST4/6II-UR

SHIPPING INFORMATION				
Container Feet	Ship To	Pallets	Modules	410W Bin
53'	Most States	26	806	330.46 kW
Double Stack: (Horizontal Orientation): 31 panels per pallet				
PALLET [31 MODULES]				
Weight	Height	Width	Length	
1,610 lbs. (730 kg)	51 in (129.5 cm)	47 in (119.4 cm)	70 in (119.4 cm)	

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KTHA ORLEANS
38030 STATE HIGHWAY-96
ORLEANS, CA 95556

PV-6
EQUIPMENT
DATASHEET



Designed to empower.



Fronius
Primo GEN24

Product advantages

- 01 Integrated shade management
- 02 Backup power right from the start
- 03 Built-in longevity
- 04 Flexibility for greater potential
- 05 Sustainably future-proof


Technical data
3.8/5.0/6.0 kW

3.8/5.0/6.0 kW			Primo GEN24 208-240										
			3.8			5.0			6.0				
Input data	Number of MPP trackers		2			2			2				
	DC input voltage range (U _{dc min} - U _{dc max})	V	65 - 600										
			208 V _{ac}	220 V _{ac}	240 V _{ac}	208 V _{ac}	220 V _{ac}	240 V _{ac}	208 V _{ac}	220 V _{ac}	240 V _{ac}		
	Nominal input voltage (U _{dc,r})	V	360	380	400	360	380	400	360	380	400		
	Feed-in start voltage (U _{dc start})	V	80			80			80				
	Usable MPP voltage range	V	65-530			65-530			65-350				
	MPP voltage range (at rated power)	V	200-480			200-480			200-480				
			MPPT1	MPPT2		MPPT1	MPPT2		MPPT1	MPPT2			
	Max. usable input current (I _{dc max})	A	22	12		22	12		22	12			
	Max. short circuit current per MPPT (I _{sc pv}) ¹	A	36	19		36	19		36	19			
Number of DC connections		2			2			2			2		
		MPPT1	MPPT2	Total	MPPT1	MPPT2	Total	MPPT1	MPPT2	Total			
Max. usable DC power	W	3,940	3,940	3,940	5,150	5,150	5,150	6,190	6,190	6,190			
Max. PV generator output	W _{peak}	5,700	5,700	5,700	7,500	6,800	7,500	8,000	6,800	9,000			

Output data			208 V _{ac}	220 V _{ac}	240 V _{ac}	208 V _{ac}	220 V _{ac}	240 V _{ac}	208 V _{ac}	220 V _{ac}	240 V _{ac}
	AC rated power (P _{ac,r})	W	3,800	3,800	3,800	5,000	5,000	5,000	5,740	6,000	6,000
	Apparent power	VA	3,800	3,800	3,800	5,000	5,000	5,000	5,740	6,000	6,000
	Max. Output power	VA	3,800	3,800	3,800	5,000	5,000	5,000	5,740	6,000	6,000
	Nom. AC output current	A	18.13	17.3	15.8	24	22.7	20.8	27.6	27.3	25
	Mains connection (U _{ac,r})	V	1~NPE 208 V / 220 V / 240 V (+ 10 % / - 12 %)								
	Frequency (frequency range f _{min} - f _{max})	Hz	50 Hz / 60 Hz (45 Hz - 66 Hz)								
	Distortion factor	%	< 3.5								
	Power factor (cos φ _{ac,r})		0.8 - 1 ind. / cap.								

Output data PV Point			120 V _{ac}	220 V _{ac}	240 V _{ac}	120 V _{ac}	220 V _{ac}	240 V _{ac}	120 V _{ac}	220 V _{ac}	240 V _{ac}
	Nom. Output power PV Point	VA	1,560	2,860	3,120	1,560	2,860	3,120	1,560	2,860	3,120
	Nominal AC voltage PV Point	V	1~NPE 120 V / 220 V / 240 V								
	Switching time	sec.	< 23								

The Fronius GEN24 can be upgraded to a Fronius GEN24 Plus hybrid inverter **in the future** through the UP.storage software upgrade. This upgrade activates battery functionality, enabling the possibility of a Full Backup power solution. However, external grid switching devices are required for this functionality. The technical specifications for battery operation and Full Backup operation are detailed below:

 Full Backup power and battery function only available with GEN24 Plus			Primo GEN24 208-240 Plus					
			3.8		5.0		6.0	
Output data Full Backup ²			220 V _{ac}	240 V _{ac}	220 V _{ac}	240 V _{ac}	220 V _{ac}	240 V _{ac}
	Nom. Output power Full Backup	VA	3,800	3,800	5,000	5,000	6,000	6,000
	Mains connection Full Backup	V	1-NPE 220 V / 240 V					
	Switching time	sec.	< 35					
Battery connection	Number of DC inputs		1					
	Max. Input current (I _{dc max})	A	22					
	DC input voltage range (U _{dc min} - U _{dc max}) ³	V	150–455					
	Connection technology DC battery		1x DC+ and 1x DC- spring-type terminals for solid: copper AWG 12-8					
	Max. Charging power with AC coupling ⁴	W	3,800		5,000		6,000	

¹ I_{sc} (STC) of the strings multiplied by 1.25 must be less or equal than ISC PV according to NEC 2023. This value needs to be divided by the amount of strings connected to the MPPT.
² For Full Backup, additional external components are required for grid separation.
³ AC power derating of the inverter occurs with a DC battery input voltage of 419.7 V and higher.
⁴ Depending on the connected battery.



Raising the bar in innovative
DC MLPE solar power systems



RSD-S-PLC

- Meets NEC 2017 & 2020 (690.12) requirements
- Executes rapid shutdown of system when Transmitter-PLC signal is absent
- Meets SunSpec requirements

RSD-S-PLC Technical Data

Model	RSD-S-PLC
Input Data (DC)	
Input Operating Voltage Range	8-80V
Maximum Cont. Input Current (Imax)	15A
Output Data (DC)	
Output Operating Voltage Range	8-80V
Maximum System Voltage	1000V/1500V
Mechanical Data	
Operating Ambient Temperature Range	-40 °F to +185 °F (-40 °C to + 85 °C)
Dimensions (without cable & connectors)	5" x 1.2" x 0.6"(129 mm x 30 mm x 16 mm)
Cable Length	Input 250mm/Output 1200mm
Cable Cross Section Size	TUV:4mm² /UL:12AWG
Connector	MC4 or Customize
Enclosure Rating	NEMA Type 6P/IP68
Over Temperature Protection	Yes
Features & Compliance	
Communication	PLC
Safety Compliance	NEC 2017 & 2020 (690.12); UL1741; CSA C22.2 No. 330-17; IEC/EN62109-1; 2PFG2305
EMC Compliance	FCC Part15; ICES-003;IEC/EN61000-6-1/-2/-3/-4

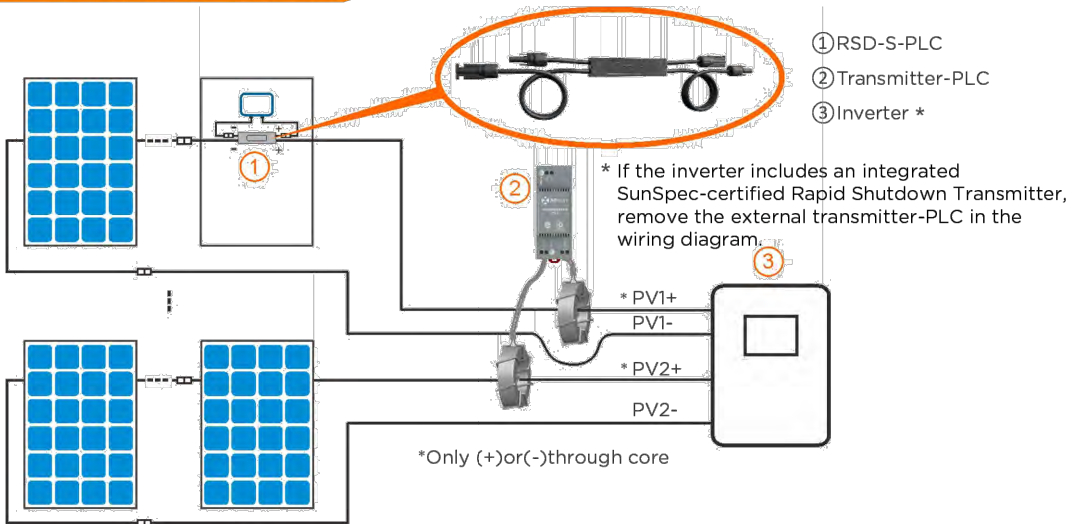
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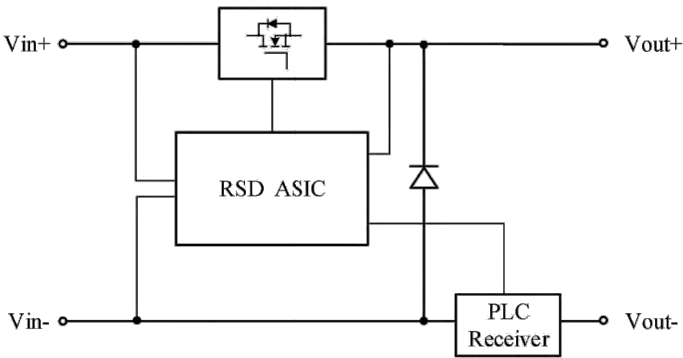


The RSD-S-PLC meets SunSpec requirements,maintaining normal function by continually receiving a heartbeat signal from the APsmart Transmitter. The RSD executes rapid system shutdown when the Transmitter signal is absent. Users can manually execute rapid shutdown using Transmitter breaker switch.

RSD-S-PLC Wiring Diagram



Working Schematic Diagram



ORDERING INFORMATION

415002	1500V UL/1000V TUV, 1.2m cable, MC4
415001	1000V UL/TUV, 1.2m cable, Customized connector



600 Ericksen Ave NE, Suite 200 Seattle, WA 98110 | +1-737-218-8486 | +1-866-374-8538 | support@APsmartGlobal.com | APsmartGlobal.com

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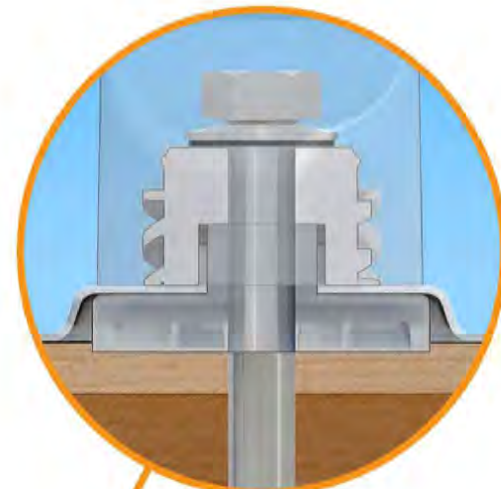
FlashFoot2

The Strongest Attachment in Solar

IronRidge FlashFoot2 raises the bar in solar roof protection. The unique water seal design is both elevated and encapsulated, delivering redundant layers of protection against water intrusion. In addition, the twist-on Cap perfectly aligns the rail attachment with the lag bolt to maximize mechanical strength.

Twist-On Cap

FlashFoot2's unique Cap design encapsulates the lag bolt and locks into place with a simple twist. The Cap helps FlashFoot2 deliver superior structural strength, by aligning the rail and lag bolt in a concentric load path.

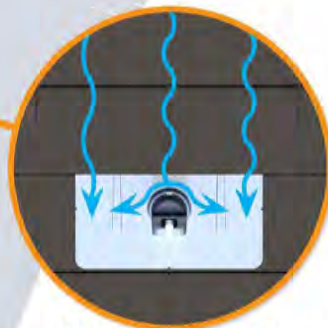


Three-Tier Water Seal

FlashFoot2's seal architecture utilizes three layers of protection. An elevated platform diverts water away, while a stack of rugged components raises the seal an entire inch. The seal is then fully-encapsulated by the Cap. FlashFoot2 is the first solar attachment to pass the TAS-100 Wind-Driven Rain Test.

Single Socket Size

A custom-design lag bolt allows you to install FlashFoot2 with the same 7/16" socket size used on other Flush Mount System components.



Water-Shedding Design

An elevated platform diverts water away from the water seal.

Installation Features



A Alignment Markers

Quickly align the flashing with chalk lines to find pilot holes.

B Rounded Corners

Makes it easier to handle and insert under the roof shingles.

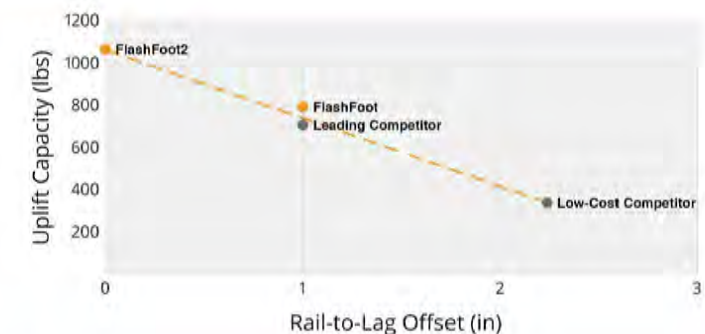
C Reinforcement Ribs

Help to stiffen the flashing and prevent any bending or crinkling during installation.

Benefits of Concentric Loading

Traditional solar attachments have a horizontal offset between the rail and lag bolt, which introduces leverage on the lag bolt and decreases uplift capacity.

FlashFoot2 is the only product to align the rail and lag bolt. This concentric loading design results in a stronger attachment for the system.



Testing & Certification

Structural Certification

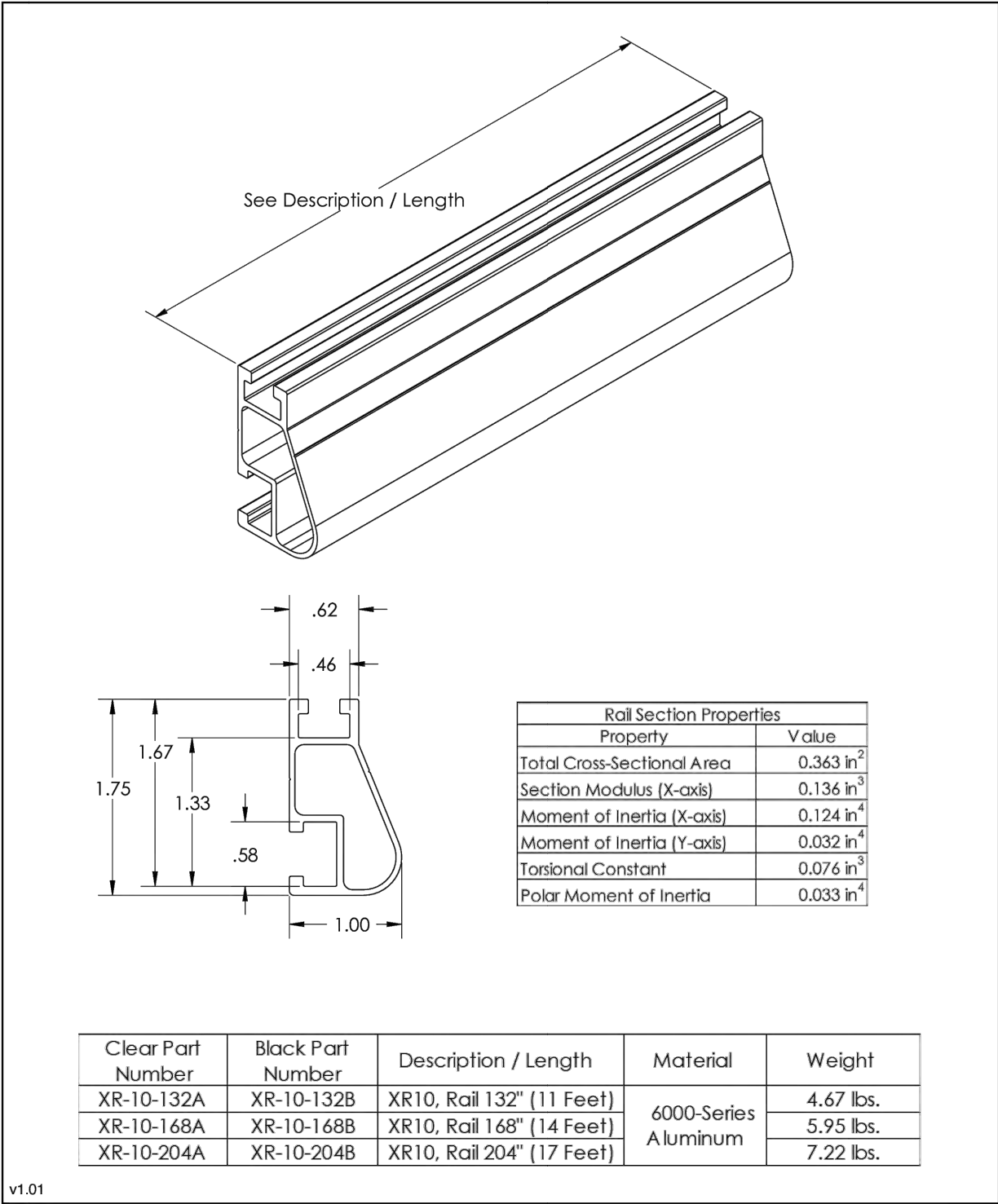
Designed and Certified for Compliance with the International Building Code & ASCE/SEI-7.

Water Seal Ratings

Water Sealing Tested to UL 441 Section 27 "Rain Test" and TAS 100-95 "Wind Driven Rain Test" by Intertek. Ratings applicable for composition shingle roofs having slopes between 2:12 and 12:12.

UL 2703

Conforms to UL 2703 Mechanical and Bonding Requirements. See Flush Mount Install Manual for full ratings.



XR Rail® Family

The XR Rail® Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail® to match.



XR10

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves spans up to 6 feet, while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Clear & black anodized finish
- Internal splices available



XR100

XR100 is a residential and commercial mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 10 feet.

- 10' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans up to 12 feet for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

Rail Selection

The table below was prepared in compliance with applicable engineering codes and standards.* Values are based on the following criteria: ASCE 7-16, Gable Roof Flush Mount, Roof Zones 1 & 2e, Exposure B, Roof Slope of 8 to 20 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed certification letters.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	90	XR10		XR100		XR1000	
	120						
	140						
	160						
20	90						
	120						
	140						
	160						
30	90						
	160						
40	90						
	160						
80	160						
120	160						

*Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification letters for actual design guidance.



Class A Fire Rating

Background

All roofing products are tested and classified for their ability to resist fire.

Recently, these fire resistance standards were expanded to include solar equipment as part of the roof system. Specifically, this requires the modules, mounting hardware and roof covering to be tested together as a system to ensure they achieve the same fire rating as the original roof covering.

These new requirements are being adopted throughout the country in 2016.

IronRidge Certification

IronRidge was the first company to receive a Class A Fire Rating—the highest possible rating—from Intertek Group plc., a Nationally Recognized Testing Laboratory.

IronRidge Flush Mount and Tilt Mount Systems were tested on sloped and flat roofs in accordance with the new UL 1703 & UL 2703 test standards. The testing evaluated the system’s ability to resist flame spread, burning material and structural damage to the roof.

Refer to the table below to determine the requirements for achieving a Class A Fire Rating on your next project.

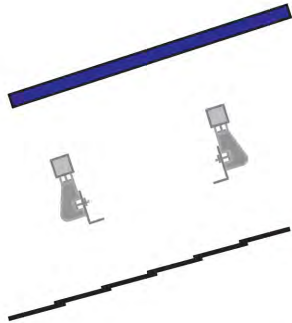
Fire Testing Process

Test Setup

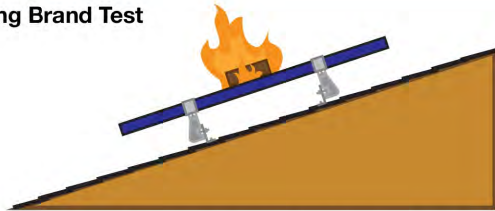
Solar Modules
Solar modules are given a Type classification based on their materials and construction.

Mounting System
Mounting is tested as part of a system that includes type-tested modules and fire-rated roof covering.

Roof Covering
Roof covering products are given a Fire Class Rating of A, B or C based on their tested fire resistance.

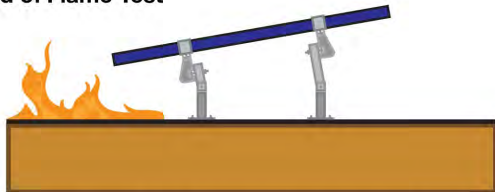


Burning Brand Test



A burning wooden block is placed on module as a fan blows at 12 mph. Flame cannot be seen on underside of roof within 90 minutes.

Spread of Flame Test



Flame at southern edge of roof is aimed up the roof as a fan blows at 12 mph. The flame cannot spread 6 feet or more in 10 minutes.

System	Roof Slope	Module	Fire Rating*
Flush Mount 	Any Slope	Type 1, 2, & 3	Class A
Tilt Mount 	≤ 9.5 Degrees	Type 1, 2, & 3	Class A

*Class A rated PV systems can be installed on Class A, B, and C roofs.

Frequently Asked Questions

What is a “module type”?

The new UL1703 standard introduces the concept of a PV module type, based on 4 construction parameters and 2 fire performance parameters. The purpose of this classification is to certify mounting systems without needing to test it with every module.

What roofing materials are covered?

All fire rated roofing materials are covered within this certification including composition shingle, clay and cement tile, metal, and membrane roofs.

What if I have a Class C roof, but the jurisdiction now requires Class A or B?

Generally, older roofs will typically be “grandfathered in”, and will not require re-roofing. However, if 50% or more of the roofing material is replaced for the solar installation the code requirement will be enforced.

Where is the new fire rating requirement code listed?

2012 IBC: 1509.7.2 Fire classification. Rooftop mounted photovoltaic systems shall have the same fire classification as the roof assembly required by Section 1505.

Where is a Class A Fire Rating required?

The general requirement for roofing systems in the IBC refers to a Class C fire rating. Class A or B is required for areas such as Wildland Urban Interface areas (WUI) and for very high fire severity areas. Many of these areas are found throughout the western United States. California has the most Class A and B roof fire rating requirements, due to wild fire concerns.

Are standard mid clamps covered?

Mid clamps and end clamps are considered part of the PV “system”, and are covered in the certification.

What attachments and flashings are deemed compatible with Class A?

Attachments and their respective flashings are not constituents of the rating at this time. All code-compliant flashing methods are acceptable from a fire rating standpoint.

What mounting height is acceptable?

UL fire testing was performed with a gap of 5”, which is considered worst case in the standard. Therefore, the rating is applicable to any module to roof gap.

Am I required to install skirting to meet the fire code?

No, IronRidge achieved a Class A fire rating without any additional racking components.

What determines Fire Classification?

Fire Classification refers to a fire-resistance rating system for roof covering materials based on their ability to withstand fire exposure.

*Class A - effective against severe fire exposure
Class B - effective against moderate fire exposure
Class C - effective against light fire exposure*

What if the roof covering is not Class A rated?

The IronRidge Class A rating will not diminish the fire rating of the roof, whether Class A, B, or C.

What tilts is the tilt mount system fire rated for?

The tilt mount system is rated for 1 degrees and up and any roof to module gap, or mounting height.

More Resources



Installation Manuals

Visit our website for manuals that include UL 2703 Listing and Fire Rating Classification.

[Go to IronRidge.com](#)



Engineering Certification Letters

We offer complete engineering resources and pre-stamped certification letters.

[Go to IronRidge.com](#)

