PHOTOVOLTAIC GENERAL NOTES

1. ALL MATERIALS, EQUIPMENT, INSTALLATION AND WORK PERFORMED SHALL BE IN ACCORDANCE WITH THE FOLLOWING CODES:

- 2015 IBC
- 2015 IRC
- 2014 NEC
- 2015 UMC
- 2015 UPC
- 2015 IFC
- 2016 BUILDING ENERGY EFFICIENCY STANDARDS

2. EXISTING PLUMBING VENTS, SKYLIGHTS, EXHAUST OUTLETS, VENTILATION INTAKE AIR OPENINGS SHALL NOT BE COVERED BY THE SOLAR PHOTOVOLTAIC SYSTEM.

3. ALL EQUIPMENT SHALL BE LISTED AND LABELED BY A RECOGNIZED ELECTRICAL TESTING LABORATORY AND INSTALLED PER THE LISTING REQUIREMENTS AND THE MANUFACTURES INSTRUCTIONS.

4. ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED, INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES.

5. ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250.

6. ALL CIRCUITS CONNECTED TO MORE THAN ONE SOURCE SHALL HAVE OVERCURRENT DEVICES LOCATED SO AS TO PROVIDE OVERCURRENT PROTECTION FROM ALL SOURCES [NEC 690.9(A)]

7. AN INVERTER OR AN AC MODULE IN AN INTERACTIVE SOLAR PV SYSTEM SHALL AUTOMATICALLY DE-ENERGIZE ITS OUTPUT TO THE CONNECTED ELECTRICAL PRODUCTION AND DISTRIBUTION NETWORK UPON LOSS OF VOLTAGE IN THAT SYSTEM AND SHALL REMAIN IN THAT STATE UNTIL THE ELECTRICAL PRODUCTION AND DISTRIBUTION NETWORK VOLTAGE HAS BEEN RESTORED. [NEC 690.61]

8. DUE TO THE FACT THAT PV MODULES ARE ENERGIZED WHENEVER EXPOSED TO LIGHT, PV CONTRACTORS SHALL DISABLE THE ARRAY DURING INSTALLATION AND SERVICE BY SHORT-CIRCUITING, OPEN-CIRCUITING, OR COVERING THE ARRAY WITH OPAQUE COVERING [NEC 690.18]

9. PV EQUIPMENT, SYSTEMS AND ALL ASSOCIATED WIRING AND INTERCONNECTIONS SHALL ONLY BE INSTALLED BY QUALIFIED PERSONS [NEC 690.4(C)]

10. ALL CONDUCTORS EXPOSED TO WEATHER SHALL BE LISTED AND IDENTIFIED FOR USE IN DIRECT SUNLIGHT [NEC 690.31(C), NEC 310.10(D)]

11. THE MODULE CONDUCTORS MUST BE TYPE USE-2 OR LISTED FOR PHOTOVOLTAIC (PV) WIRE (UL 4703 & 854 LISTED) [NEC 690.31(C)]

12. ALL CONDUCTORS SHALL BE MARKED ON EACH END FOR UNIQUE IDENTIFICATION [NEC 690.31(B)]

13. ALL GROUNDED CONDUCTORS SHALL BE MARKED ON EACH END FOR UNIQUE IDENTIFICATION AND SHALL BE PROPERLY COLOR IDENTIFIED AS WHITE [NEC 200.6]

14. WORKING CLEARANCES AROUND THE EXISTING ELECTRICAL EQUIPMENT AS WELL AS THE NEW ELECTRICAL EQUIPMENT WILL BE MAINTAINED PER [NEC 110.26]

15. ALL PHOTOVOLTAIC SYSTEM CONDUCTORS WILL BE 90°C RATED PER NEC 690.31 (A), TABLE 310.15(B)(16), TABLE 310.15(B)(17).

16. ALL NEC REQUIRED WARNING SIGNS, MARKINGS, AND LABELS SHALL BE POSTED ON EQUIPMENT AND DISCONNECTS

17. PV SYSTEM CONNECTED ON THE LOAD SIDE OF THE SERVICE DISCONNECTING MEANS OF THE OTHER SERVICE(S) AT ANY DISTRIBUTION EQUIPMENT ON THE PREMISES SHALL MEET THE FOLLOWING [NEC 705.12(D)]:
A .
EACH SOURCE CONNECTION SHALL BE MADE AT A DEDICATED CIRCUIT BREAKER OR FUSIBLE DISCONNECTING MEANS [NEC 705.12(D)(1)]
B .
THE SUM OF AMPERE RATING OF THE OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO THE BUS-BAR OR CONDUCTOR SHALL NOT EXCEED 120% OF THE BUS-BAR RATING OR CONDUCTOR [NEC 705.12(D)(2)]
C .
THE INTERCONNECTION POINT SHALL BE ON THE LINE SIDE OF ALL GROUND-FAULT PROTECTION EQUIPMENT [NEC 705.12(D)(3)]
D .
EQUIPMENT CONTAINING OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO A BUS- BAR OR CONDUCTOR SHALL BE MARKED TO INDICATE THE PRESENCE OF ALL SOURCES [NEC 705.12(D)(4)]
E .
CIRCUIT BREAKER, IF BACK-FED, SHALL BE SUITABLE FOR SUCH OPERATION [NEC 705.12(D)(5)]
F .
THE PV POWER SOURCE CIRCUIT BREAKER SHALL BE LOCATED AT THE OPPOSITE END OF THE MAIN SERVICE DISCONNECT [NEC 705.12(D)(7)]

18. METALLIC RACEWAYS OR METALLIC ENCLOSURES ARE REQUIRED WIRING METHOD FOR INSIDE A BUILDING OR PV SYSTEM [NEC 690.31(G)]

19. FLEXIBLE, FINE-STRANDED CABLES SHALL BE TERMINATED ONLY WITH TERMINALS, LUGS, DEVICES OR CONNECTORS THAT ARE IDENTIFIED AND LISTED FOR SUCH USE [NEC 690.31(H) & 110.14(A)]

20. CONNECTORS SHALL BE OF LATCHING OR LOCKING TYPE. CONNECTORS THAT ARE READILY ACCESSIBLE AND OPERATING OVER 30 VOLTS SHALL REQUIRE A TOOL TO OPEN AND SHALL BE MARKED “DO NOT DISCONNECT UNDER LOAD” OR "NOT FOR CURRENT INTERRUPTING" [NEC 690.33(C), NEC 690.33(E)(2)]

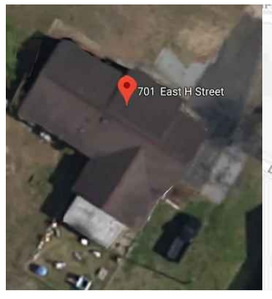
21. THE ROOF MOUNTED PHOTOVOLTAIC MODULES, PANELS OR SOLAR VOLTAIC ROLL ROOFING MATERIAL SHALL HAVE THE SAME OR BETTER LISTED FIRE-RESISTANCE RATING THAN THE BUILDING ROOF-COVERING MATERIAL

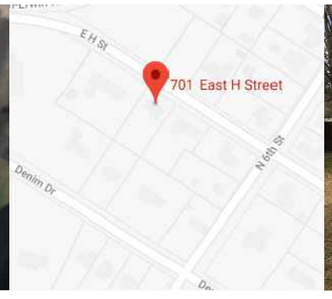
22. EQUIPMENT GROUNDING CONDUCTOR FOR PV MODULES SMALLER THAN 6 AWG SHALL BE PROTECTED FROM PHYSICAL DAMAGE BY A RACEWAY OR CABLE ARMOR [NEC 690.46 & 250.120(C)]

23. EQUIPMENT GROUNDING CONDUCTOR FOR PV SOURCE AND PV OUTPUT CIRCUITS SHALL BE SIZED IN ACCORDANCE WITH 250.122. WHERE NO OVERCURRENT PROTECTION DEVICE IS USED IN THE CIRCUIT, AN ASSUMED OVERCURRENT DEVICE RATED AT THE PV MAX CIRCUIT CURRENT SHALL BE USED WHEN APPLYING TABLE 250.122. INCREASED IN EQUIMPMENT GROUNDING CONDUCTOR SIZE TO ADDRESS VOLTAGE DROP CONSIDERATIONS SHALL NOT BE REQUIRED. [NEC 690.45]

24. FINE-STRANDED CABLES USED FOR BATTERY TERMINALS, DEVICES, AND CONNECTIONS REQUIRE LUGS AND TERMINALS LISTED AND MARKED FOR SUCH USE [NEC 690.74(A)]

25. ALL EXTERIOR CONDUIT, FITTINGS, AND BOXES SHALL BE RAIN TIGHT AND APPROVED FOR USE IN WET LOCATIONS (NEC 314.15)





PROJECT INFORMATION	
NAME:	RICHARDSON, MARY
ADDRESS:	701 EAST H STREET, ERWIN, NC 28339
APN:	0615070325
JURISDICTION:	ERWIN

CONTRACTOR INFORMATION	
CONTRACTOR:	GREEN NRG GROUP INC.
ADDRESS:	9421 WINNETKA AVE. UNIT G, CHATSWORTH, CA 91311
PHONE:	888 - 589 - 4006
LICENSE #/TYPE:	U.32659

SYSTEM INFORMATION		
SIZE(kw):	11.680	
MODULE TYPE:	32	JINKO SOLAR JKM365M-72H
INVERTERS(S):	1	SOLAREDGE SE11400H-US
	32	SOLAREDGE P370 OPTIMIZER
INVERTER TYPE:	TRANSFORMERLESS	

SCOPE OF WORK:

INSTALL
(32) ROOF MOUNTED PV SOLAR MODULES,
(1) SOLAREDGE SE11400H-US INVERTER(S)(240V).
(32)DC/DC OPTIMIZERS.

TABLE OF CONTENTS	
PAGE 1	COVER PAGE
PAGE 2	SITE PLAN
PAGE 3	PLOT PLAN
PAGE 4	SINGLE LINE DIAGRAM
PAGE 5	STRUCTURAL ATTACHMENT DETAIL
PAGE 6	LABELS AND WARNING SIGNAGE
PAGE 7	PV MODULE SPEC SHEET
PAGE 8	INVERTER SPEC SHEET
PAGE 9	UL LISTING
PAGE 10	GROUNDING
PAGE 11	RAPID SHUTDOWN

ROOFTOP-MOUNTED PHOTOVOLTAIC PANEL SYSTEMS INSTALLED ON OR ABOVE THE ROOF COVERING SHALL BE TESTED, LISTED AND IDENTIFIED WITH A FIRE CLASSIFICATION (CLASS C MINIMUM) IN ACCORDANCE WITH UL1703.

REVISIONS:
03.12.2019 R1 (MH)

Project Name
RICHARDSON, MARY
701 EAST H STREET
ERWIN, NC 28339
0615070325

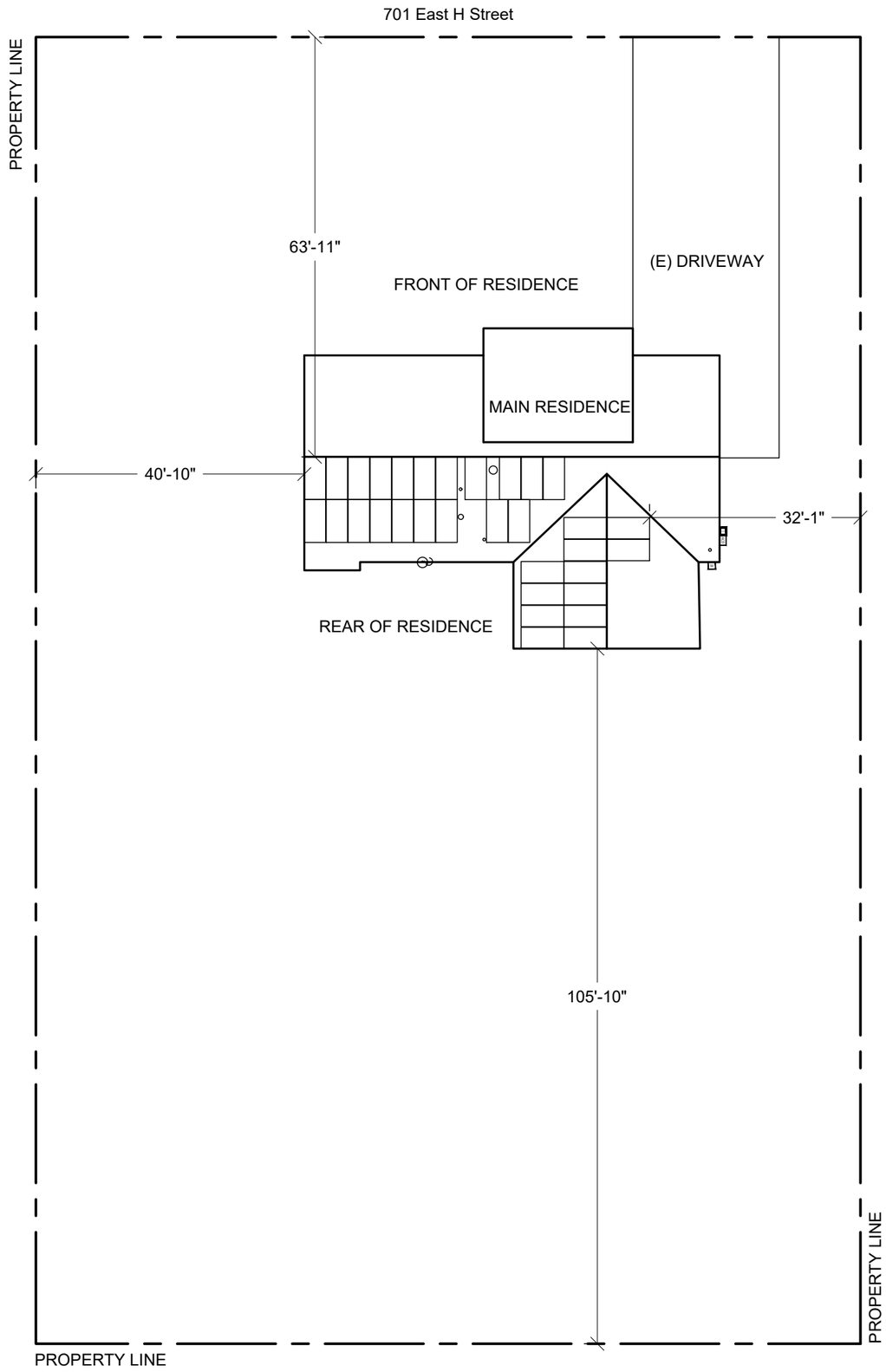
11.680 kW PHOTOVOLTAIC SYSTEM

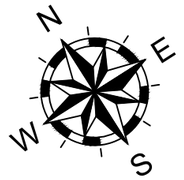
DATE: 03.11.2019

COVER PAGE

DRAWN BY: RD

GREEN NRG GROUP INC.
9421 WINNETKA AVE. UNIT G
CHATSWORTH, CA 91311
PHONE: 888 - 589 - 4006
U.32659
Contractors Signature:





Scale: 1" = 20'
(For 11x17 Print)

REVISIONS:
03.12.2019: R1 (MH)

Project Name
RICHARDSON, MARY
701 EAST H STREET
ERWIN, NC 28339
0615070325

11.680 kW PHOTOVOLTAIC SYSTEM

DATE: 03.11.2019

SITE PLAN

DRAWN BY: RD

GREEN NRG GROUP INC.
9421 WINNETKA AVE. UNIT G
CHATSWORTH, CA 91311
PHONE: 888 - 589 - 4006
U.32659
Contractors Signature:

SYSTEM SPECIFICATIONS

SIZE(kW):	11.680
MODULE:	(32) JINKO SOLAR JKM365M-72H
INVERTER(S):	(1)SOLAREDGE SE11400H-US
INVERTER TYPE:	TRANSFORMERLESS
STRING SCHEDULE:	2 STRING(S) OF 16 MODULES
SYSTEM WEIGHT(lbs)	1747.20
ARRAY AREA(sq.ft)	678.86
ARRAY AZIMUTH(°):	32°, 122°, 212°, 302°
LBS/SQ.FT	2.57

BUILDING SPECIFICATIONS

TYPE:	S.F.D
STORIES:	1
BUILDING HEIGHT:	12'
BUILDING SQ.FT.	1259 sq.ft
ROOF SLOPE(S):	4/12 , 3/12
ROOF FRAME MEMBER:	2X6 RAFTER
O.C. SPACING:	16"
MAX SPAN:	8'-1" BETWEEN SUPPORTS
MIN LAG BOLT EMBEDMENT:	2.5"

MOUNTING AND STANDOFF SPECIFICATIONS

ROOFING MATERIAL:	SINGLE LAYER COMP
RACKING SYSTEM:	IRONRIDGE
STANDOFF DISTANCE:	5'-4"
MOUNTING TYPE:	FLUSH MOUNT
TILT LEG HEIGHT (IN.)	N/A
HEIGHT OF PV MODULE ABOVE ROOF SURFACE:	3" TO 5"
MAX CANTILEVER:	24"

ROOF MOUNTED NOTES:

- SOLAR PHOTOVOLTAIC SYSTEM TO BE INSTALLED ON RESIDENTIAL STRUCTURE (GROUP R3 BUILDINGS).

-THIS SYSTEM WILL NOT BE INTERCONNECTED UNTIL APPROVAL FROM THE LOCAL JURISDICTION AND THE UTILITY IS OBTAINED.

-SOLAR PANELS SHALL BE INSTALLED WITH NO PORTION MORE THAN 18 INCHES ABOVE THE ROOF IMMEDIATELY BELOW.

-IF THE EXISTING MAIN SERVICE PANEL DOES NOT HAVE A VERIFIABLE GROUNDING ELECTRODE, IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE.

ADDITIONAL BUILDING DATA	
TOTAL ARRAY AREA (SQ. FT.):	678.86
TOTAL PLAN VIEW ROOF AREA (SQ. FT.):	1259
OCCUPYING PV PERCENTAGE:	53.92%
SPRINKLER SYSTEM INSTALLED (IFC 903.3.1.3)	NO

SYSTEM DETAILS:
2 STRINGS OF 16 MODULES
(32) MODULES TOTAL
(1) INVERTER
ROOF MOUNTED - FLUSH

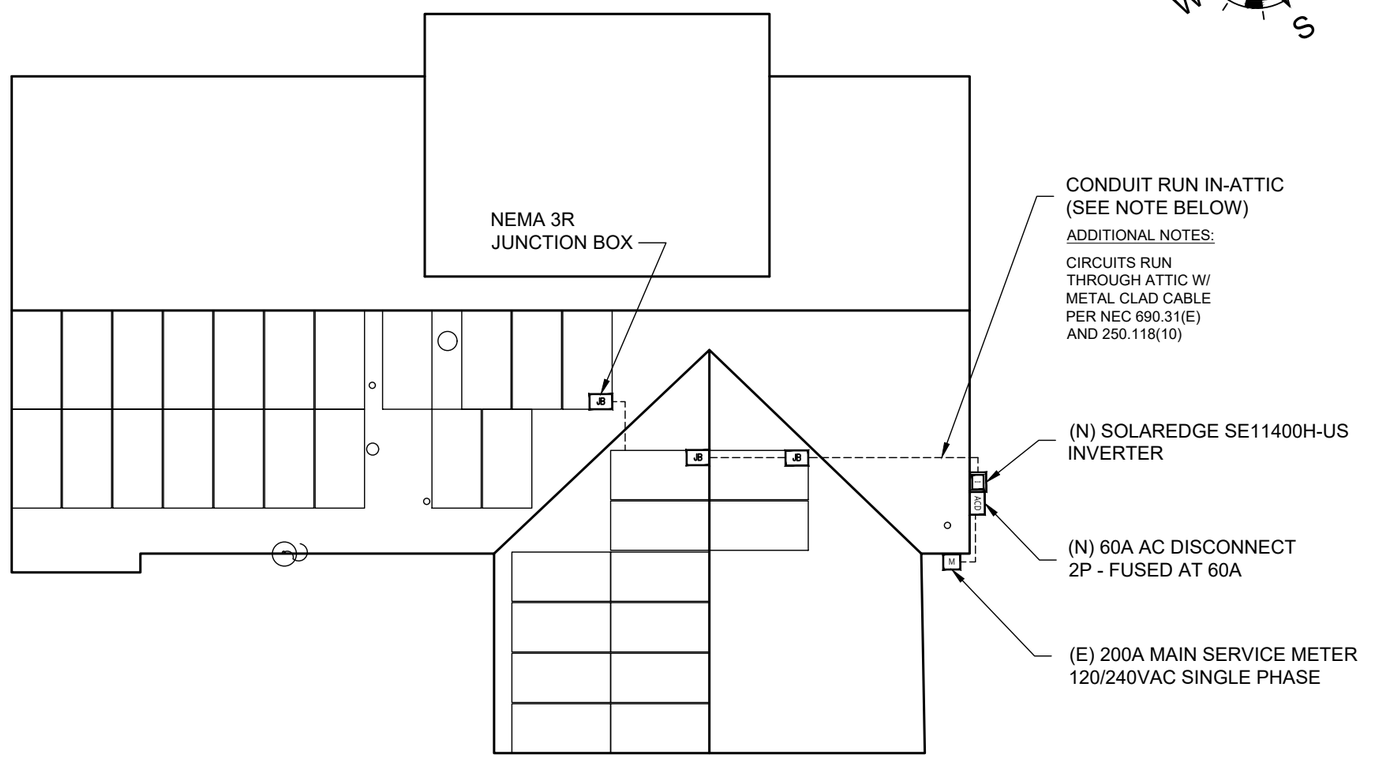
ROOF ACCESS POINTS PER
2016 CFC 2018 SUPPLEMENT R324 (IFC 1204)

Exceptions:
1. These requirements shall not apply to structures designed and constructed in accordance with the International Residential Code.
2. These requirements shall not apply to roofs with slopes of 2 units vertical in 12 units horizontal or less.

R324.6.1 Pathways: Not less than two minimum 36-inchwide pathways on separate roof planes, from lowest roof edge to ridge, shall be provided on all buildings. At least one pathway shall be provided on the street or driveway side of the roof. For each roof plane with a photovoltaic array, a minimum 36-inch-wide pathway from the lowest roof edge to ridge shall be provided on the same roof plane as the photovoltaic array, on an adjacent roof plane, or straddling the same and adjacent roof planes. Pathways shall be over areas capable of supporting fire fighters accessing the roof. Pathways shall be located in areas with minimal obstructions such as vent pipes, conduit, or mechanical equipment.

R324.6.2 Setback at ridge: For photovoltaic arrays occupying not more than 33 percent of the plan view total roof area, not less than an 18-inch clear set back is required on both sides of a horizontal ridge. For photovoltaic arrays occupying more than 33 percent of the plan view total roof area, not less than a 36-inch clear set back is required on both sides of a horizontal ridge

R324.6.2.1 Alternative setback at ridge: Where an automatic sprinkler system is installed within the dwelling in accordance with NFPA 13D setbacks at ridges shall conform with one of the following:
1. For photovoltaic arrays occupying 66 percent or less of the plan view total roof area, not less than an 18-inch clear setback is required on both sides of a horizontal ridge.
2. For photovoltaic arrays occupying more than 66 percent of the plan view total roof area, not less than a 36-inch clear setback is required on both sides of a horizontal ridge.



FIRE ACCESS POINTS

Scale: 1" = 10'
(For 11x17 Print)

REVISIONS:
03.12.2019 R1 (MH)

Project Name
RICHARDSON, MARY
701 EAST H STREET
ERWIN, NC 28339
0615070325

11.680 kW PHOTOVOLTAIC SYSTEM

PLOT PLAN

DATE: 03.11.2019

DRAWN BY: RD

GREEN NRG GROUP INC.
9421 WINNETKA AVE. UNIT G
CHATSWORTH, CA 91311
PHONE: 888 - 589 - 4006
U.32659
Contractors Signature:

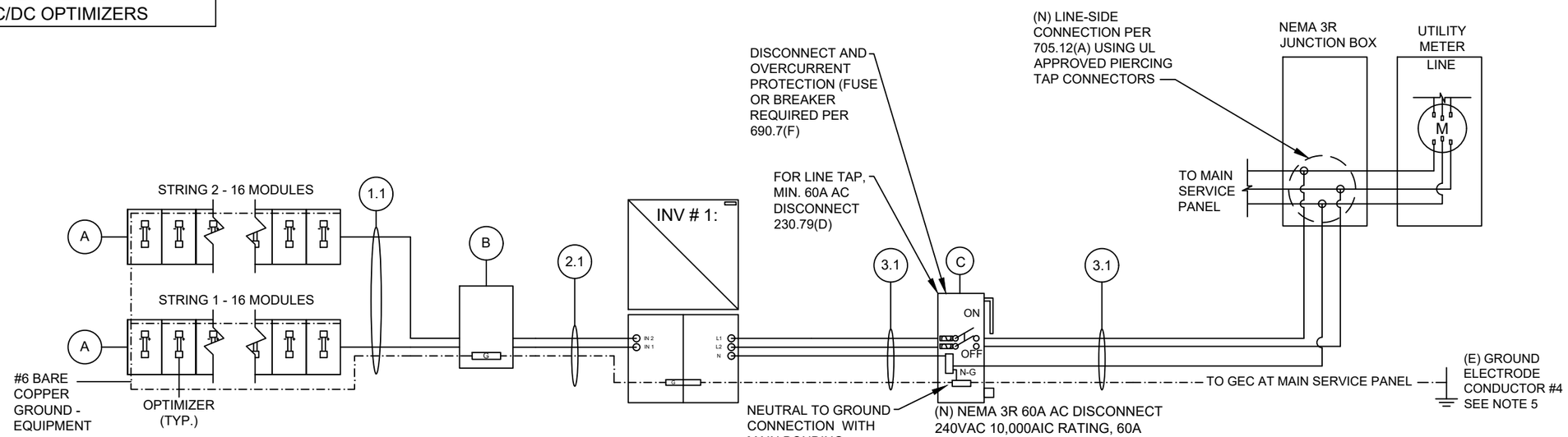
OPEN AIR TO JUNCTION BOX CALCULATION								
ITEM	MODULE SHORT CIRCUIT (A)	FAULT CURRENT	CONTINUOUS	TEMPERATURE CORRECTION	CORRECTED (A)	AWG NEEDED	NUMBER OF CONDUCTORS	CONDUIT
1.1	15.00	N/A	1.25	0.71	26.41	#10 PV WIRE	2+, 2-, G	FREE TO AIR

OPTIMIZER CALCS													
MODULE OUTPUT POWER	MODULES PER OPTIMIZER	OPTIMIZER MAX INPUT POWER	MODULE TOTAL OUTPUT VOLTAGE (Voc at Lowest temp)	OPTIMIZER MIN INPUT VOLTAGE	OPTIMIZER MAX INPUT VOLTAGE	MODULE SHORT CIRCUIT CURRENT (Isc)	OPTIMIZER MAX CONTINUOUS INPUT CURRENT (Isc)	OPTIMIZER MAX OUTPUT CURRENT	MAX POWER PER STRING	MIN OPTIMIZER PER STRING	MAX OPTIMIZER PER STRING	ACTUAL OPTIMIZERS USED PER STRING	ACTUAL POWER PER STRING
365	1	370	54.95V	8.00V	60V	9.57	11A	15.0A	6000W	8	16	16	5840W

COMBINER/J-BOX TO INVERTER#1 CALCULATION										
ITEM	ADJUSTED (A)	NOT ON ROOF	ADJUSTED (A) Ifc	# ENERGIZED CONDUCTORS IN RACEWAY	RACEWAY ADJUSTMENT FACTOR	ADJUSTED (A)	AWG NEEDED	NUMBER OF CONDUCTORS	EGC SIZE	CONDUIT
2.1	18.75	0.91	20.60	4	0.80	25.76	#10 THWN-2	2+, 2-, G	#8	3/4" EMT

INVERTER TO LOAD CENTER/MSP CALCULATION									
ITEM	INVERTER OUTPUT (A)	CONTINUOUS	RESULT (A)	TEMPERATURE CORRECTION	CORRECTED (A)	AWG NEEDED	NUMBER OF CONDUCTORS	EGC/GEC	CONDUIT
3.1	47.50	1.25	59.38	0.88	67.47	#4 THWN-2	L1, L2, N, G	#8	1" EMT

32 TOTAL MODULES
1 TOTAL INVERTERS
32 DC/DC OPTIMIZERS



EQUIPMENT LEGEND	
ITEM	DESCRIPTION
A	(N) JINKO SOLAR JKM365M-72H MODULE W/ SOLAREDGE P370 OPTIMIZER
B	(N) NEMA 3R JUNCTION BOX (4) TOTAL. SEE LAYOUT.
C	(N) NEMA 3R 60A AC DISCONNECT 240VAC 10,000AIC RATING, FUSED AT 60A , BLADE TYPE VISIBLE & LOCKABLE
INV #1:	(N) SOLAREDGE SE11400H-US INVERTER

PV MODULE RATINGS	
BRAND AND MODEL:	JINKO SOLAR JKM365M-72H
MAX POWER [Pmax] (w):	365
MAX POWER-POINT VOLTAGE [Vmp] (V):	39.7
OPEN CIRCUIT VOLTAGE [Voc] (V):	48.2
MAX POWER-POINT CURRENT [Imp] (A):	9.2
SHORT CIRCUIT CURRENT [Isc] (A):	9.57
MAX SERIES FUSE [OCPD] (A):	20
MAX SYSTEM VOLTAGE (V):	600

INVERTER VALUES:	
BRAND AND MODEL:	SOLAREDGE SE11400H-US
INVERTER TYPE:	TRANSFORMERLESS
MAX INPUT VOLTAGE (V):	480
MAX INPUT CURRENT (A):	30.5
NOMINAL OUTPUT VOLTAGE (V):	240
MAX CONT. OUTPUT CURRENT (A):	47.5
INVERTER OCPD (A):	60
MAX POWER AT 25ºC (W):	11400
AMBIENT TEMPERATURE ºF:	-40

SYSTEM RATINGS	
NOMINAL SYSTEM VOLTAGE (V):	240Vac
AC INVERTER OUTPUT (A):	47.50
OPERATING TEMP (ºC)	-7ºC TO 39ºC

MAXIMUM VOLTAGE & VOLTAGE CORRECTION FACTOR (DC SIDE) OPTIMIZER INPUT [CEC 690.7]		
LOWEST EXPECTED AMBIENT TEMPERATURE (ºC):	-7	ºC
VOLTAGE CORRECTION FACTOR:	1.14	
MODULE OPEN CIRCUIT VOLTAGE:	48.2	
MODULE PER DC OPTIMIZER	1	
ADJUSTED VOLTAGE:	54.95	
MAXIMUM VOLTAGE:	60	V

NOTES:

1- ALL METALLIC RACEWAYS AND EQUIPMENT SHALL BE BONDED AND ELECTRICALLY CONTINUOUS (NEC 250.90, 250.96).

2- GROUNDING BUSHINGS ARE REQUIRED AROUND PREPUNCHED CONCENTRIC KNOCKOUTS ON THE DC SIDE OF THE SYSTEM (NEC 250.97)

3- THE GROUNDING ELECTRODE CONDUCTOR WILL BE CONTINUOUS, EXCEPT FOR SPLICES OR JOINTS AT BUSBARS WITHIN LISTED EQUIPMENT. (NEC 250.64)

4- THE EQUIPMENT GROUNDING CONDUCTOR MAY BE USED AS A GROUNDING ELECTRODE CONDUCTOR. (NEC 250.121 EXCEPTION, INSTALLED PER 250.6(A), II, III, VI.)

5-INSTALLER TO IDENTIFY THE EXISTING GROUNDING ELECTRODE TYPE (I.E. DRIVEN ROD, UFER, WATER PIPE, OR COMBINATION OF SOME OR ALL OF THE PREVIOUSLY MENTIONED). IN EXISTING ELECTRICAL SYSTEMS THAT USE ONLY A WATER PIPING GROUNDING ELECTRODE SYSTEM, AN ADDITIONAL GROUNDING ELECTRODE (I.E DRIVEN ROD) SHALL BE PROVIDED. (NEC 250.50)

-PER NEC 250.53(2), A SINGLE ROD, PIPE OR PLATE ELECTRODE SHALL BE SUPPLEMENTED BY AN ADDITIONAL ELECTRODE OF TYPE SPECIFIED IN 250.52(A)(2) THROUGH (A)(8) SPACED NO LESS THAN 6FT APART.
EXCEPTION, IF A SINGLE ROD, PIPE OR PLATE GROUNDING ELECTRODE HAS A RESISTANCE TO EARTH OF 25 OHMS OR LESS, THE SUPPLEMENTAL ELECTRODE SHALL NOT BE REQUIRED.

-#4 AWG CU TO UNDERGROUND METAL WATER PIPE THAT IS A MINIMUM 10 FOOT BURIAL IN PIPE LENGTH. CONNECT GROUNDING ELECTRODE CONDUCTOR WITHIN FIVE FEET OF WHERE IT ENTERS BUILDING. 250.52(A)(1), 250.68(C).

-ADDITIONAL #4 AWG CONNECTION TO UFER IF AVAILABLE PER 250.66. IF UFER NOT AVAILABLE THEN TWO #6 AWG CU CONNECTIONS TO GROUND RODS SEPARATED BY AT LEAST 6 FT IS NEEDED 250.33.

REVISIONS:
03.12.2019 R1 (MH)

Project Name
RICHARDSON, MARY
701 EAST H STREET
ERWIN, NC 28339
0615070325

11.680 kW PHOTOVOLTAIC SYSTEM

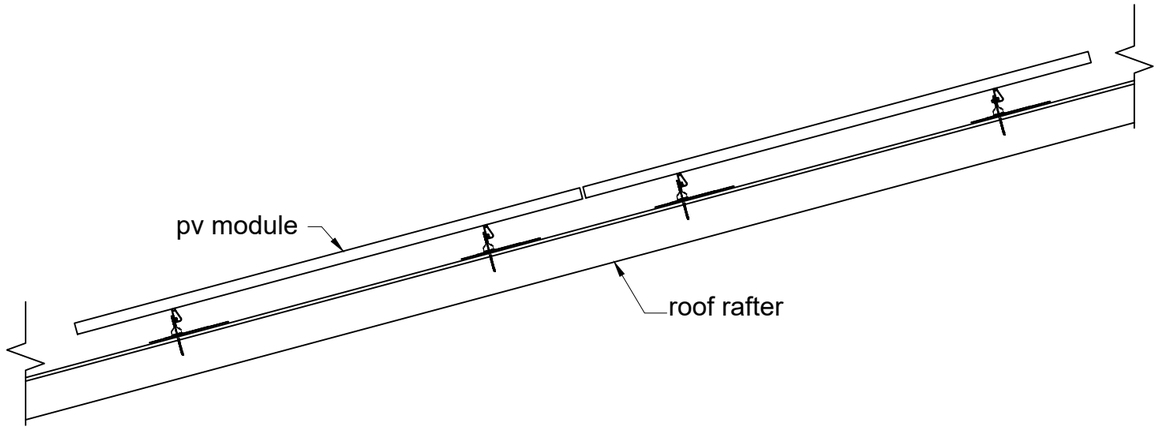
SINGLE LINE DIAGRAM

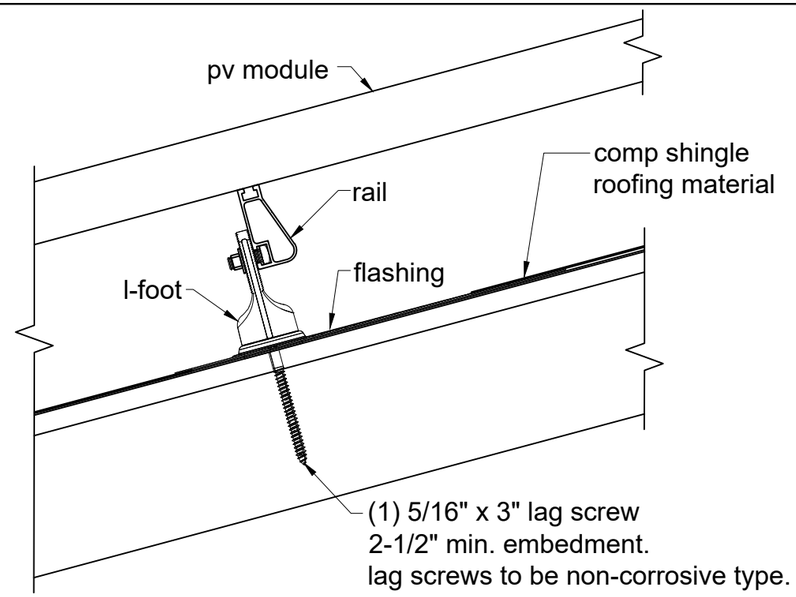
DATE: 03.11.2019

DRAWN BY: RD

GREEN NRG GROUP INC.
9421 WINNETKA AVE. UNIT G
CHATSWORTH, CA 91311
PHONE: 888 - 589 - 4006
U.32659

Contractors Signature:





Tech Brief

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 6 foot spans, while remaining light and economical.

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

XR100

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 8 feet.

- 8' 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 12 feet or more for commercial applications.

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

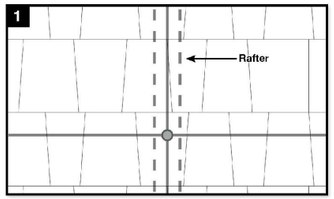
Rail Selection

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed span tables and certifications.

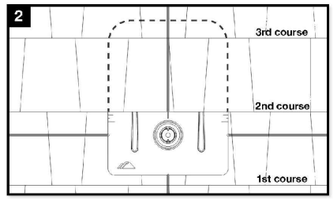
Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	100	XR10		XR100		XR1000	
	120						
	140						
	160						
10-20	100						
	120						
	140						
	160						
30	100						
	160						
40	100						
	160						
50-70	160						
80-90	160						

Installation

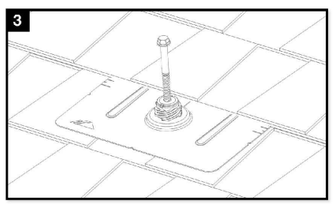
Tools Required: tape measure, chalk line, stud finder, roofing bar, caulking gun, driver with 1/4" bit and 7/16" hex socket.



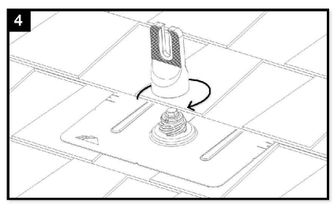
Locate rafters and snap vertical and horizontal lines to mark flashing locations. Drill 1/4" pilot holes, then fill with roofing manufacturer's approved sealant.



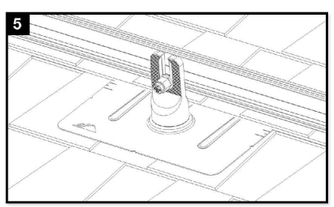
Slide flashing, between 1st and 2nd course, so the top is at least 3/4" above the edge of the 3rd course and the bottom is above the edge of the 1st course.



Line up pilot hole with flashing hole and insert lag bolt with bonded washer through flashing. Tighten lag bolt until fully seated.



Place Cap onto flashing in desired orientation for E/W or N/S rails and rotate 180 degrees. FlashFoot 2 is now installed and ready for IronRidge XR Rails.



Attach rails to either side of the open slot using bonding hardware. Level rail at desired height, then torque to 250 in-lbs (21 ft-lbs).

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 IronRidge Flush Mount Installation Manual for full ratings.

FM-FF2-MAN REV 1.10

MODULES TESTED AND EVALUATED FOR UL 2703

This racking system may be used to ground and/or mount a PV module complying with UL 1703 only when the specific module has been evaluated for grounding and/or mounting in compliance with the included instructions.

The following modules when used with the IronRidge Roof Mount System lead to a listing for bonding, grounding and mechanical loading under UL 2703.

Module Manufacturer	Model
Motech	IM and XS Series - 40, 45 and 50mm
Suntech	Wdb, Wde and Wd series - 35mm Vd series - 50mm
ET Solar	ET-P660xxxWB, ET-P660xxxWW, ET-P660xxxBB, ET-L660xxxWW, ET-M660xxxBB, ET-M660xxxWW, ET-P660xxxWBAC, ET-P660xxBAC, ET-672xxxWB, ET-P672xxxWW, ET-P672xxxBB, ET-L672xxxWW, ET-M672xxxBB, ET-M672xxxWW - 50mm
Hyundai	SG, MG, RG and TG series - 35mm MI, RI and TI series - 50mm
Yingli	Panda and YGE models - 35 and 40mm YGE models - 40, and 50mm
Kyocera	KD(xxx)GX-LPU, KD(xxx)GX-LFU, KD135SX-UPU, KD(xxx)GX-LFBS, KD(xxx)GX-LPB, KD(xxx)GX-LFB, KD(xxx)GX-LFB2, KD(xxx)GX-LPB2, KD135GX-LPS, KD140GX-LPS, KD140SX-UPU, KU(xxx)-3AC, KU(xxx)-4AC, KU(xxx)-5AC, KU(xxx)-3BC, KU(xxx)-4BC, KU(xxx)-5BC, KU(xxx)-6BC, KU(xxx)-8BC, KU(xxx)-3FC, KU(xxx)-4FC, KU(xxx)-5FC, KU(xxx)-6FC, KU(xxx)-4UC, KU(xxx)-5UC

The following modules when used with the IronRidge Roof Mount System lead to a classification for bonding and grounding under UL 2703.

Module Manufacturer	Model
Canadian Solar	CS6P-M, CS6P-P, CS6X-M, CS6X-P - 40mm
LG	LGxxxS1C-G3, LGxxxS1K-G3, LGxxxS1C-A3, LGxxxS1K-A3, LGxxxS1C-B3, LGxxxS1K-B3, LGxxxN1C-G3, LGxxxN1C-A3, LGxxxN1K-A3, LGxxxN1C-B3, LGxxxA1C-B3 - 35mm
Suniva	OPTxxx-60-4-100, OPTxxx-60-4-180, MVXxxx-60-5-701, MVXxxx-60-5-100 - 40 mm OPTxxx-72-4-100, MVXxxx-72-5-100 - 46 mm MVXxxx-72-5-701 - 50mm OPTxxx-72-4-100-B - 38mm
Hanwha	HSL72P6-PA-1-xxx - 50mm HSL72P6-PB-1-xxx, HSL60P6-PA-1-xxx - 45mm HSL60P6-PB-1-xxx - 40mm The model number can be followed with a "B"
Trina	TSM-xxxPA05, TSM-xxxPC05, TSM-xxx-PD05 - 35mm TSM-xxxPA05, TSM-xxxPD14, TSM-xxxPC14 - 40mm TSM-xxxPA14 - 46mm The model number can be followed by A and .05 or .08
SolarWorld	Sunmodule Plus SW-xxx, Sunmodule Protect SW-xxx, Sunmodule XL SW-xxx Mono or Poly with 31, 33, or 46 mm frame height
Phono Solar Modules	PSxxxP-20/U, PSxxxM-20/U, PSxxxP-24/T, PSxxxM-24/T - 40mm
SunEdison	SE-QxxxBCC-3Y, SE-MxxxBCC-3Y, SE-FxxxBCC-3Y, SE-PxxxBCC-3Y, SE-QxxxBMC-3Y, SE-MxxxBMC-3Y, SE-FxxxBMC-3Y, SE-DxxxBMC-3Y, SE-PxxxBMC-3Y - 50mm
Q CELLS	Q.PRO-G3-xx, Q.PRO-BFR-G3-xx - 35mm
Renesola	Mono and Virus II Modules
Sunpower	SPR-E-xx series and SPR-X-xx series with standard (G3) or InvisiMount (G5) - 46mm
Panasonic	VBHNxxxSA06, VBHNxxxSA06B, VBHNxxxSA11, VBHNxxxSA11B - 35mm

Notes:	**For 60 and 72 cell modules**
	For Black or Silver frames
	Where xxx is the module power rating

REVISIONS:
03.12.2019 R1 (MH)

Project Name
RICHARDSON, MARY
701 EAST H STREET
ERWIN, NC 28339
0615070325

11.680 kW PHOTOVOLTAIC SYSTEM

STRUCTURAL ATTACHMENT

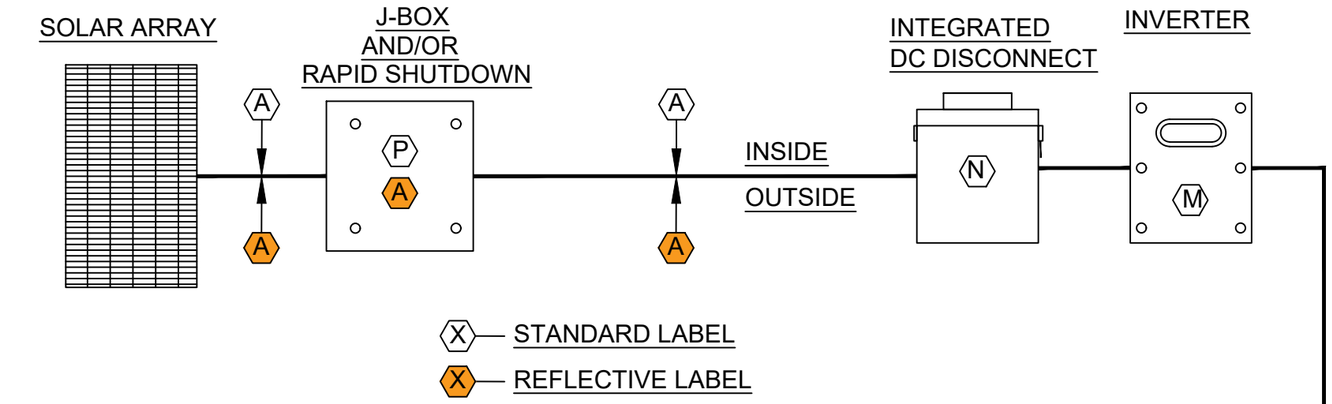
DATE: 03.11.2019

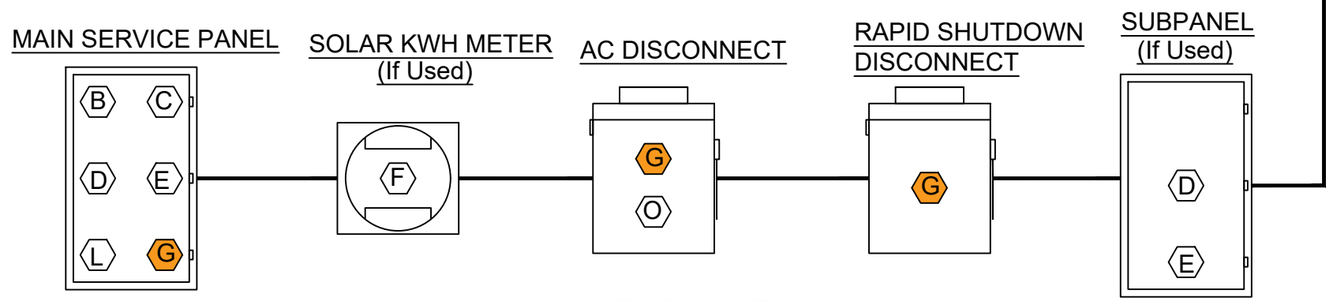
DRAWN BY: RD

GREEN NRG GROUP INC.
9421 WINNETKA AVE. UNIT G
CHATSWORTH, CA 91311
PHONE: 888 - 589 - 4006
U.32659

Contractors Signature:

Page
5 OF 11





NOTE: LABELS SHOWN ARE NOT TO SCALE

LABEL EVERY 10' 5.75" x 1.125" RED WITH WHITE LETTERS

A — WARNING: PHOTOVOLTAIC POWER SOURCE

(NEC 690.31(G)(3)(4))

LABEL 5.75" x 1.125" RED WITH WHITE LETTERS

B — CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED

(PER 2014 NEC 690.15, 705.12(D)(3))

LABEL 4 x 2" RED WITH WHITE LETTERS

C — WARNING

MULTI - POWER SUPPLY

SOURCES INCLUDE:
UTILITY GRID, PV SOLAR

(PER 2017 NEC 705.12(B)(3), 2014 NEC 705.12(D)(3))

LABEL 4 x 2" RED WITH WHITE LETTERS

D — WARNING

POWER SOURCE OUTPUT CONNECTION

DO NOT RELOCATE THIS OVERCURRENT DEVICE

(PER 2017 NEC 705.12(B)(2)(c), 2014 NEC 705.12(D)(2)(3)(b))

LABEL 4" x 1" RED WITH WHITE LETTERS

E — WARNING
SOLAR ELECTRIC BREAKER BACK FEED

(PER 2017 NEC 690.13(F)(1), 705.12(B)(4))
(2014 NEC 705.12(D)(4)

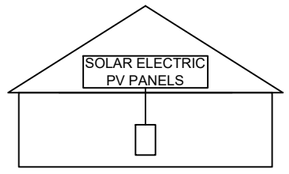
LABEL 4" x 1" RED WITH WHITE LETTERS

F — PHOTOVOLTAIC kWh METER

NOTE: THIS LABEL VARIES & IS FOR IDENTIFICATION PER 2017 NEC 705.12(B)(3), 2014 NEC 705.12(D)(3), 690.15

LABEL WITHIN 1 M (3.28FT)
3.75" x 5.25" YELLOW WITH WHITE LETTERS

G — SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN



THIS EQUIPMENT, TURN SWITCH TO "OFF" POSITION TO INITIATE RAPID SHUTDOWN OF PV SYTEM AND REDUCE SHOCK HAZARD IN THE ARRAY

LABEL WITHIN 1 M (3.28FT)
4" x 2" RED WITH WHITE LETTERS

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

(2017 NEC 690.56(C))

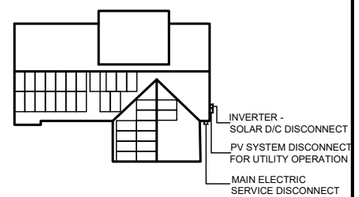
NOT USED

H I J K

PLACARD 5" x 4.75" RED WITH WHITE LETTERS

L — CAUTION

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



701 EAST H STREET, ERWIN, NC 28339

WARNING

ELECTRIC SHOCK HAZARD - DO NOT TOUCH TERMINALS

TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

Must show drawings of the property and equipment layout per NEC 690.56

PLACARD 4" x 4.5" RED WITH WHITE LETTERS

O — PHOTOVOLTAIC SYSTEM

AC DISCONNECT

OPERATING CURRENT: 47.50 A

OPERATING VOLTAGE: 240 V

WARNING

ELECTRIC SHOCK HAZARD - DO NOT TOUCH TERMINALS

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

(PER IFC 605.11.1, IFC 605.11.1.4, NEC 690.15 & NEC 690.14(C)(2))

DOUBLE J-BOX COVER

P — AC - JUNCTION BOX

WARNING

THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

(PER NEC 690.35(F))

PLACARD 4" x 3.5" RED WITH WHITE LETTERS

M — INVERTER 1

INPUT RATINGS

RATED MPP CURRENT:	33.37	A
RATED MPP VOLTAGE:	350	V
MAX SYSTEM VOLTAGE:	500	V
SHORT-CIRCUIT CURRENT:	30	A

OUTPUT RATINGS

OPERATING CURRENT:	47.50	A
OPERATING VOLTAGE:	240	V

PER NEC 690.5(C)

PLACARD 4" x 5" RED WITH WHITE LETTERS

N — PHOTOVOLTAIC SYSTEM

DC DISCONNECT

RATED MPP CURRENT:	33.37	A
RATED MPP VOLTAGE:	350	V
MAX SYSTEM VOLTAGE:	500	V
SHORT-CIRCUIT CURRENT:	30	A

WARNING

ELECTRIC SHOCK HAZARD - DO NOT TOUCH TERMINALS

THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

(PER NEC 690.53)

ALL SIGNAGE/LABELS SHALL BE IN THE FOLLOWING FORMAT:
1. WHITE LETTERING ON A RED BACKGROUND AND WEATHER RESISTANT
2. MINIMUM 3/8" LETTER HEIGHT
3. ALL LETTERS SHALL BE CAPITALIZED
4. ARIAL OR SIMILAR FONT, NON-BOLD
5. SHALL BE IN ACCORDANCE WITH APPROPRIATE SECTIONS, TABLES, AND ARTICLES OF THE NEC, IFC, AND AHJ.

REVISIONS:
03.12.2019 R1 (MH)

Project Name
RICHARDSON, MARY
701 EAST H STREET
ERWIN, NC 28339
0615070325

11.680 kW PHOTOVOLTAIC SYSTEM

DATE: 03.11.2019

SIGNAGE

DRAWN BY: RD

GREEN NRG GROUP INC.
9421 WINNETKA AVE. UNIT G
CHATSWORTH, CA 91311
PHONE: 888 - 589 - 4006
U.32659

Contractors Signature:

www.jinkosolar.com

Jinko Solar
Building Your Trust in Solar

Eagle HC 72M
365-385 Watt

MONO CRYSTALLINE MODULE

Positive power tolerance of 0~+3%

- Half Cell
- Mono PERC 72 Cell

PERC

KEY FEATURES

5 Busbar Solar Cell:
5 busbar solar cell adopts new technology to improve the efficiency of modules , offers a better aesthetic appearance, making it perfect for rooftop installation.

High Efficiency:
Higher module conversion efficiency(up to 19.53%) benefit from Half cells structure(low resistance characteristic)

PID RESISTANT:
Limited power degradation of Eagle module caused by PID effect is guaranteed under strict testing condition (85℃/85%RH,96hours) for mass production.

Low-light Performance:
Advanced glass and solar cell surface texturing allow for excellent performance in low-light environments.

Severe Weather Resilience:
Certified to withstand: wind load (2400 Pascal) and snow load (5400 Pascal).

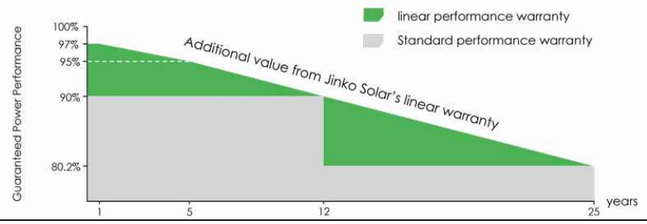
Durability against extreme environmental conditions:
High salt mist and ammonia resistance certified by TUV NORD.

PV CYCLE · TÜVRheinland CERTIFIED · CE · POSITIVE QUALITY™ Continuous Quality Assurance · CLEAN ENERGY COUNCIL MEMBER

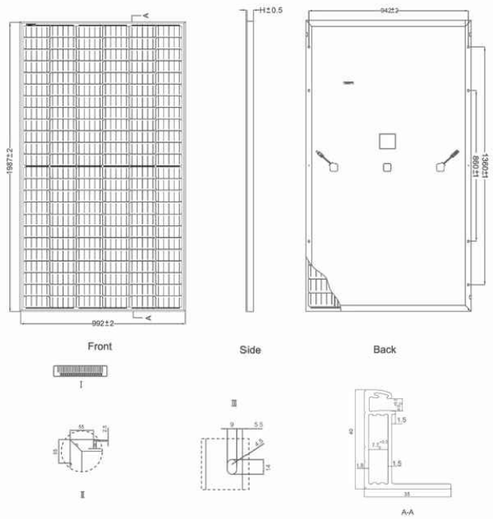
- ISO9001:2008、ISO14001:2004、OHSAS18001 certified factory.
- IEC61215、IEC61730 certified products

LINEAR PERFORMANCE WARRANTY

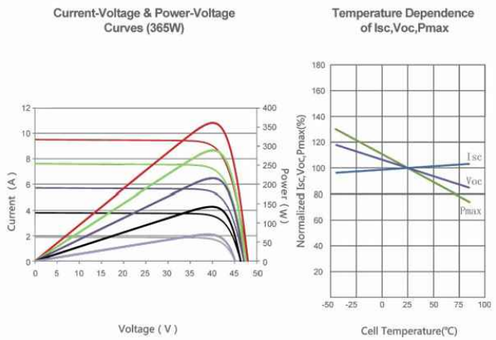
10 Year Product Warranty • 25 Year Linear Power Warranty



Engineering Drawings



Electrical Performance & Temperature Dependence



Packaging Configuration

(Two pallets =One stack)

26pcs/pallet , 52pcs/stack, 572 pcs/40'HQ Container

Mechanical Characteristics

Cell Type	Mono-crystalline PERC 156×156mm (6 inch)
No.of Half-cells	144 (12×12)
Dimensions	1987×992×40mm (78.23×39.05×1.57 inch)
Weight	22.5 kg (49.6 lbs)
Front Glass	3.2mm, Anti-Reflection Coating, High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP67 Rated
Output Cables	anode 290mm, cathode 145mm or Customized Length

SPECIFICATIONS

Module Type	JKM365M-72H		JKM370M-72H		JKM375M-72H		JKM380M-72H		JKM385M-72H	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	365Wp	274Wp	370Wp	278Wp	375Wp	282Wp	380Wp	286Wp	385Wp	290Wp
Maximum Power Voltage (Vmp)	39.7V	37.9V	39.9V	38.1V	40.2V	38.3V	40.5V	38.6V	40.8V	38.8V
Maximum Power Current (Imp)	9.20A	7.24A	9.28A	7.30A	9.33A	7.36A	9.39A	7.42A	9.44A	7.48A
Open-circuit Voltage (Voc)	48.2V	46.8V	48.5V	47.0V	48.7V	47.2V	48.9V	47.5V	49.1V	47.7V
Short-circuit Current (Isc)	9.57A	7.68A	9.61A	7.75A	9.68A	7.82A	9.75A	7.88A	9.92A	7.95A
Module Efficiency STC (%)	18.52%		18.77%		19.02%		19.28%		19.53%	
Operating Temperature(℃)	-40℃~+85℃									
Maximum system voltage	1000V DC (IEC)									
Maximum series fuse rating	20A									
Power tolerance	0~+3%									
Temperature coefficients of Pmax	-0.37%/℃									
Temperature coefficients of Voc	-0.29%/℃									
Temperature coefficients of Isc	0.048%/℃									
Nominal operating cell temperature (NOCT)	45±2℃									

STC: Irradiance 1000W/m² · Cell Temperature 25°C · AM=1.5

NOCT: Irradiance 800W/m² · Ambient Temperature 20°C · AM=1.5 · Wind Speed 1m/s

* Power measurement tolerance: ± 3%

REVISIONS:
03.12.2019 R1 (MH)

Project Name
RICHARDSON, MARY
701 EAST H STREET
ERWIN, NC 28339
0615070325

11.680 kW PHOTOVOLTAIC SYSTEM

DATE: 03.11.2019

MODULE SPECIFICATIONS

DRAWN BY: RD

GREEN NRG

GREEN NRG GROUP INC.
9421 WINNETKA AVE. UNIT G
CHATSWORTH, CA 91311
PHONE: 888 - 589 - 4006
U.32659
Contractors Signature:

Single Phase Inverter
with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US /
SE6000H-US/ SE7600H-US / SE10000H-US / SE11400H-US

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
OUTPUT								
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400	VA
Max. AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400	VA
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	✓	-	✓	-	-	-	Vac
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓	Vac
AC Frequency (Nominal)	59.3 - 60 - 60.5[1]							Hz
Maximum Continuous Output Current 208V	-	16	-	24	-	-	-	A
Maximum Continuous Output Current @240V	12.5	16	21	25	32	42	47.5	A
GFDI Threshold	1							A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes							
INPUT								
Maximum DC Power @240V	4650	5900	7750	9300	11800	15500	17650	W
Maximum DC Power @208V	-	5100	-	7750	-	-	-	
Transformer-less, Ungrounded	Yes							
Maximum Input Voltage	480							Vdc
Nominal DC Input Voltage	380					400		Vdc
Maximum Input Current 208V	-	9	-	13.5	-	-	-	
Maximum Input Current @240V	8.5	10.5	13.5	16.5	20	27	30.5	Adc
Max. Input Short Circuit Current	45							Adc
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600kΩ Sensitivity							
Maximum Inverter Efficiency	99	99.2						%
CEC Weighted Efficiency	99							%
Nighttime Power Consumption	< 2.5							W
ADDITIONAL FEATURES								
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)							
Revenue Grade Data, ANSI C12.20	Optional[2]							
Rapid Shutdown - NEC 2014 and 2017 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect							
STANDARD COMPLIANCE								
Safety	UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCI according to T.I.L. M-07							
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (HI)							
Emissions	FCC Part 15 Class B							
INSTALLATION SPECIFICATIONS								
AC Output Conduit Size / AWG Range	3/4" minimum / 14-6 AWG					3/4" minimum /14-4 AWG		
DC Input Conduit Size / # of Strings / AWG Range	3/4" minimum / 1-2 strings / 14-6 AWG					3/4" minimum / 1-3 strings / 14-6 AWG		
Dimensions with Safety Switch (HxWxD)	17.7 x 14.6 x 6.8 / 450 x 370 x 174					21.3 x 14.6 x 7.3 / 540 x 370 x 185		in / mm
Weight with Safety Switch	22 / 10	25.1 / 11.4		26.2 / 11.9		38.8 / 17.6		lb / kg
Noise	< 25					<50		dBA
Cooling	Natural Convection					Natural convection		
Operating Temperature Range	-13 to +140 / -25 to +60[3] (-40˚F / -40˚C option)[4]							˚F / ˚C
Protection Rating	NEMA 3R (Inverter with Safety Switch)							

[1] For other regional settings please contact SolarEdge support
[2] Revenue grade inverter P/N: SExxxxH-US000NNC2
[3] For power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf
[4] -40 version P/N: SExxxxH-US000NNU4

RoHS

SolarEdge Power Optimizer
Module Add-On for North America

P320 / P370 / P400 / P405 / P505

OPTIMIZER MODEL (typical module compatibility)	P320 (for high-power 60-cell modules)	P370 (for higher-power 60 and 72-cell modules)	P400 (for 72 & 96-cell modules)	P405 (for thin film modules)	P505 (for higher current modules)	
INPUT						
Rated Input DC Power[1]	320	370	400	405	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	48	60	80	125	83	Vdc
MPPT Operating Range	8 - 48	8 - 60	8 - 80	12.5 - 105	12.5 - 83	Vdc
Maximum Short Circuit Current (Isc)	11		10.1		14	Adc
Maximum DC Input Current	13.75		12.63		17.5	Adc
Maximum Efficiency	99.5					%
Weighted Efficiency	98.8				98.6	%
Overvoltage Category	II					
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)						
Maximum Output Current	15					Adc
Maximum Output Voltage	60			85		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR SOLAREDGE INVERTER OFF)						
Safety Output Voltage per Power Optimizer	1 ± 0.1					Vdc
STANDARD COMPLIANCE						
EMC	FCC Part15 Class B, IEC61000-6-2, IEC61000-6-3					
Safety	IEC62109-1 (class II safety), UL1741					
RoHS	Yes					
INSTALLATION SPECIFICATIONS						
Maximum Allowed System Voltage	1000					Vdc
Compatible inverters	All SolarEdge Single Phase and Three Phase inverters					
Dimensions (W x L x H)	128 x 152 x 28 / 5 x 5.97 x 1.1		128 x 152 x 36 / 5 x 5.97 x 1.42	128 x 152 x 50 / 5 x 5.97 x 1.96	128 x 152 x 59 / 5 x 5.97 x 2.32	mm / in
Weight (including cables)	630 / 1.4		750 / 1.7	845 / 1.9	1064 / 2.3	gr / lb
Input Connector	MC4[2]					
Output Wire Type / Connector	Double Insulated; MC4					
Output Wire Length	0.95 / 3.0	1.2 / 3.9				m / ft
Operating Temperature Range	-40 - +85 / -40 - +185					˚C / ˚F
Protection Rating	IP68 / NEMA6P					
Relative Humidity	0 - 100					%

[1] Rated STC power of the module. Module of up to +5% power tolerance allowed.
[2] For other connector types please contact SolarEdge

PV SYSTEM DESIGN USING A SOLAREDGE INVERTER[3][4]		SINGLE PHASE HD-WAVE	SINGLE PHASE	THREE PHASE 208V	THREE PHASE 480V	
Minimum String Length (Power Optimizers)	P320, P370, P400	8		10	18	
	P405 / P505	6		8	14	
Maximum String Length (Power Optimizers)		25		25	50[5]	
Maximum Power per String		5700 (6000 with SE7600H-US, SE10000H-US)	5250	6000	12750	W
Parallel Strings of Different Lengths or Orientations		Yes				

[3] For detailed string sizing information refer to: http://www.solaredge.com/sites/default/files/string_sizing_na.pdf.
[4] It is not allowed to mix P405/P505 with P320/P370/P400/P600/P700/P800 in one string.
[5] A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement

REVISIONS:
03.12.2019 R1 (MH)

Project Name
RICHARDSON, MARY
701 EAST H STREET
ERWIN, NC 28339
0615070325

11.680 kW PHOTOVOLTAIC SYSTEM

DATE: 03.11.2019

INVERTER SPECIFICATIONS

DRAWN BY: RD

GREEN NRG GROUP INC.
9421 WINNETKA AVE. UNIT G
CHATSWORTH, CA 91311
PHONE: 888 - 589 - 4006
U.32659

Contractors Signature:

CERTIFICATE OF COMPLIANCE

Certificate Number 20170424-E362479
Report Reference E362479-20130530
Issue Date 2017-APRIL-24

Issued to: JINKO SOLAR CO LTD
NO 1 JINKO RD
SHANGRAO ECONOMIC
DEVELOPMENT ZONE
SHANGRAO
JIANGXI 334100 CHINA

This is to certify that representative samples of PHOTOVOLTAIC MODULES AND PANELS WITH SYSTEM VOLTAGE RATINGS OVER 600 VOLTS
See Addendum Pages

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: "Standard for Safety for Flat-Plate Photovoltaic Modules and Panels", UL 1703
"Flat-Plate Photovoltaic Modules and Panels", ULC C1703-01

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Director North American Certification Program
UL LLC

CERTIFICATE OF COMPLIANCE

Certificate Number 20170424-E362479
Report Reference E362479-20130530
Issue Date 2017-APRIL-24

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

PRODUCT COVERED:

Photovoltaic (Solar) Modules,

USL/CNL – Models:

JKM250P-72, JKM255P-72, JKM260P-72, JKM265P-72, JKM270P-72, JKM275P-72, JKM280P-72, JKM285P-72, JKM290P-72, JKM295P-72, JKM300P-72, JKM305P-72, JKM310P-72, JKM315P-72, JKM320P-72, JKM325P-72, JKM330P-72, JKM335P-72, JKM340P-72, JKM345P-72, JKM350P-72.

JKM200P-60, JKM205P-60, JKM210P-60, JKM215P-60, JKM220P-60, JKM225P-60, JKM230P-60, JKM235P-60, JKM240P-60, JKM245P-60, JKM250P-60, JKM255P-60, JKM260P-60, JKM265P-60, JKM270P-60, JKM275P-60, JKM280P-60, JKM285P-60, JKM290P-60.

JKM250PP-72, JKM255PP-72, JKM260PP-72, JKM265PP-72, JKM270PP-72, JKM275PP-72, JKM280PP-72, JKM285PP-72, JKM290PP-72, JKM295PP-72, JKM300PP-72, JKM305PP-72, JKM310PP-72, JKM315PP-72, JKM320PP-72, JKM325PP-72, JKM330PP-72, JKM335PP-72, JKM340PP-72, JKM345PP-72, JKM350PP-72.

JKM250PP-72-W, JKM255PP-72-W, JKM260PP-72-W, JKM265PP-72-W, JKM270PP-72-W, JKM275PP-72-W, JKM280PP-72-W, JKM285PP-72-W, JKM290PP-72-W, JKM295PP-72-W, JKM300PP-72-W, JKM305PP-72-W, JKM310PP-72-W, JKM315PP-72-W, JKM320PP-72-W, JKM325PP-72-W, JKM330PP-72-W, JKM335PP-72-W, JKM340PP-72, JKM345PP-72-W, JKM350PP-72-W.

JKM200PP-60, JKM205PP-60, JKM210PP-60, JKM215PP-60, JKM220PP-60, JKM225PP-60, JKM230PP-60, JKM235PP-60, JKM240PP-60, JKM245PP-60, JKM250PP-60, JKM255PP-60, JKM260PP-60, JKM265PP-60, JKM270PP-60, JKM275PP-60, JKM280PP-60, JKM285PP-60, JKM290PP-60.

JKM200PP-60-W, JKM205PP-60-W, JKM210PP-60-W, JKM215PP-60-W, JKM220PP-60-W, JKM225PP-60-W, JKM230PP-60-W, JKM235PP-60-W, JKM240PP-60-W, JKM245PP-60-W, JKM250PP-60-W, JKM255PP-60-W, JKM260PP-60-W, JKM265PP-60-W, JKM270PP-60-W, JKM275PP-60-W, JKM280PP-60-W, JKM285PP-60-W, JKM290PP-60-W.

JKM250M-72, JKM255M-72, JKM260M-72, JKM265M-72, JKM270M-72, JKM275M-72, JKM280M-72, JKM285M-72, JKM290M-72, JKM295M-72, JKM300M-72, JKM305M-72, JKM310M-72, JKM315M-72, JKM320M-72, JKM325M-72, JKM330M-72, JKM335M-72, JKM340M-72, JKM345M-72, JKM350M-72, JKM355M-72, JKM360M-72, JKM365M-72

Bruce Mahrenholz, Director North American Certification Program
UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at http://ul.com/aboutul/locations/

Intertek

8431 Murphy Drive
Middleton, WI 53562 USA

Telephone: 608.836.4400
Facsimile: 608.831.9279
www.intertek.com

Test Verification of Conformity

In the basis of the tests undertaken, the sample(s) of the below product have been found to comply with the requirements of the referenced specifications at the time the tests were carried out.

Applicant Name & Address:	IronRidge, Inc. 1495 Zephyr Ave. Hayward, CA 94544 USA
Product Description:	XR Rails with Integrated Grounding.
Ratings & Principle Characteristics:	Fire Class Resistance Rating: -Flush Mount (Symmetrical). Class A Fire Rated for Low Slope applications when using Type 1, 2 and 3, listed photovoltaic modules. Class A Fire Rated for Steep Slope applications with Type1, 2 and 3, listed photovoltaic modules. Tested with a 5" gap (distance between the bottom the module frame and the roof covering), per the standard this system can be installed at any gap allowed by the manufacturers installation instructions. No perimeter guarding is required.
Models:	51-61GD-005, 51-61GD-005B, 51-5000-001 and 51-65-001
Brand Name:	IronRidge Roof Mount
Relevant Standards:	UL 2703 (Section 15.2 and 15.3) Standard for Safety Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels, First Edition dated Jan. 28, 2015 **Referencing** UL1703 Third Edition dated Nov. 18, 2014, (Section 31.2) Standard for Safety for Flat-Plate Photovoltaic Modules and Panels.
Verification Issuing Office:	Intertek Testing Services NA, Inc. 8431 Murphy Drive Middleton, WI 53562
Date of Tests:	08/27/2014 to 03/17/2015
Test Report Number(s):	101769343MID-001r1, 101769343MID-001a, 101915978MID-001 & 101999492MID-001ar1-cr1.

This verification is part of the full test report(s) and should be read in conjunction with them. This report does not automatically imply product certification.

Completed by:	Chad Naggs	**Reviewed by:**	Gregory Allen
Title:	Technician II, Fire Resistance	**Title:**	Engineering Team Lead, Fire Resistance
Signature:		**Signature:**	
Date:	03/30/2015	**Date:**	03/30/2015

GFT-OP-11a (24-MAR-2014)

REVISIONS:
03.12.2019 R1 (MH)

Project Name
RICHARDSON, MARY
701 EAST H STREET
ERWIN, NC 28339
0615070325

11.680 kW PHOTOVOLTAIC SYSTEM

DATE: 03.11.2019

UL LISTING

DRAWN BY: RD

GREEN NRG

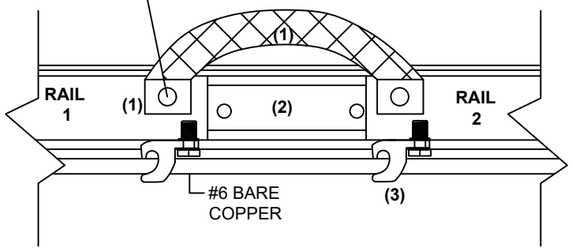
GREEN NRG GROUP INC.
9421 WINNETKA AVE. UNIT G
CHATSWORTH, CA 91311
PHONE: 888 - 589 - 4006
U.32659

Contractors Signature:

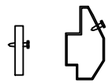
(C) RAIL SPLICE GROUNDING

EITHER METHOD 1-3 PER MANUFACTURERS INSTALL INSTRUCTIONS

(1) BOND STRIP GROUNDS RAIL TO RAIL SPLICES - STAR WASHERS USED TO BOND RAIL TO BONDING STRIP



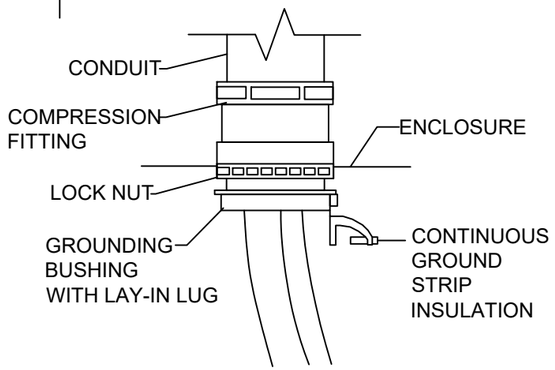
(2) SPLICE BAR, SELF-TAP SCREWS JOIN RAILS. BONDING STRIPS USED ON RAILS WITH GROUND LUGS.



IF SPLICE BAR HAS INTEGRATED GROUND, BONDING STRIP IS NOT NECESSARY.

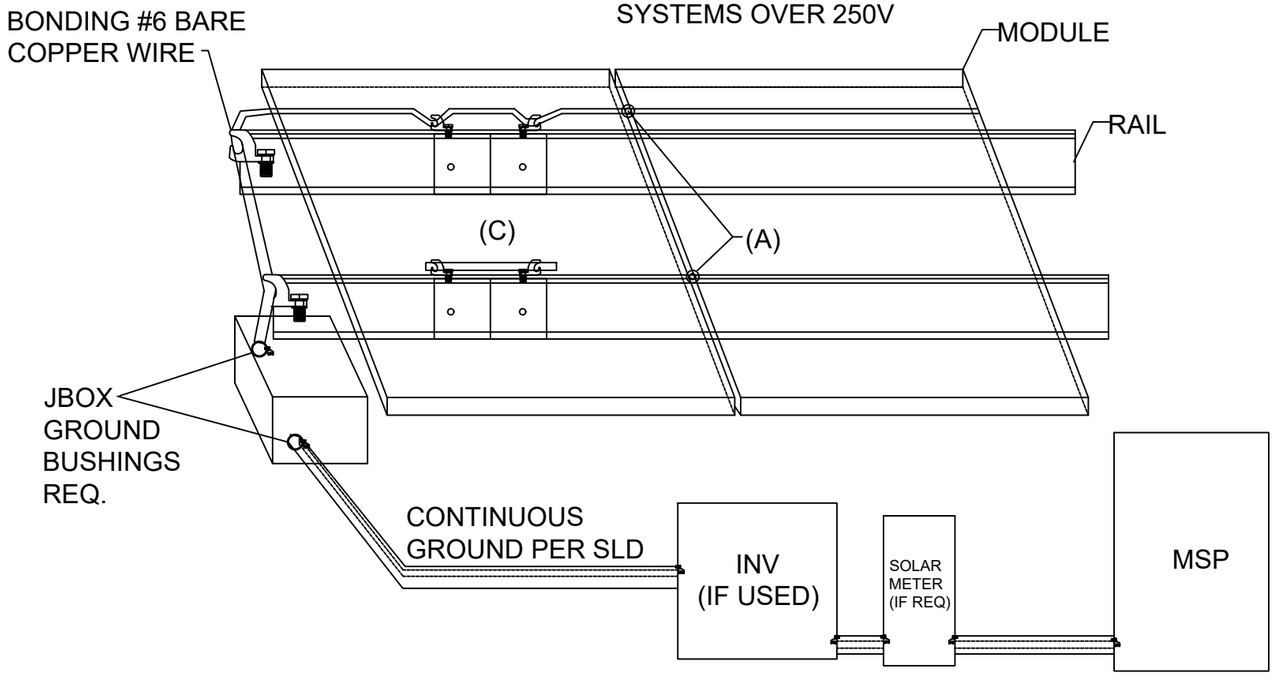
(3) WHERE NEITHER BONDING STRIP, INTEGRATED GROUNDING SPLICE BAR, OR INTEGRATED GROUNDING MIDCLAMP ARE USED, **UL 2703 APPROVED GROUND LUG WITH #6 BARE COPPER SHALL BE USED TO GROUND SPLICED RAILS.**

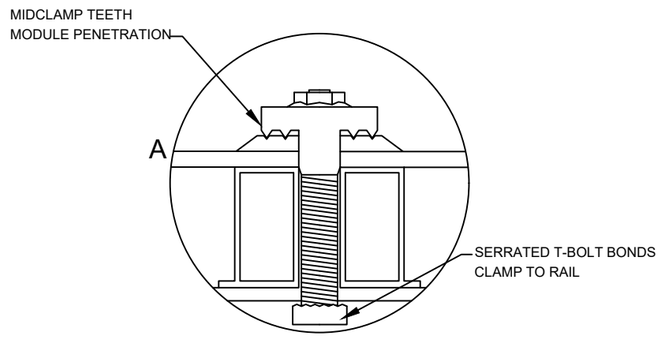
USE METHOD (2)



CONDUIT GROUNDING DETAIL

EQUIPMENT GROUND BUSHINGS REQ. FOR SYSTEMS OVER 250V





GROUNDING MID CLAMP

EACH GROUNDING MID CLAMP PIERCES THROUGH THE ANODIZED COATINGS OF BOTH THE MODULE FRAME AND THE MOUNTING RAIL TO FORM SECURE ELECTRICAL BONDS, WHICH ARE REPEATED THROUGHOUT THE ARRAY.

Tech Brief

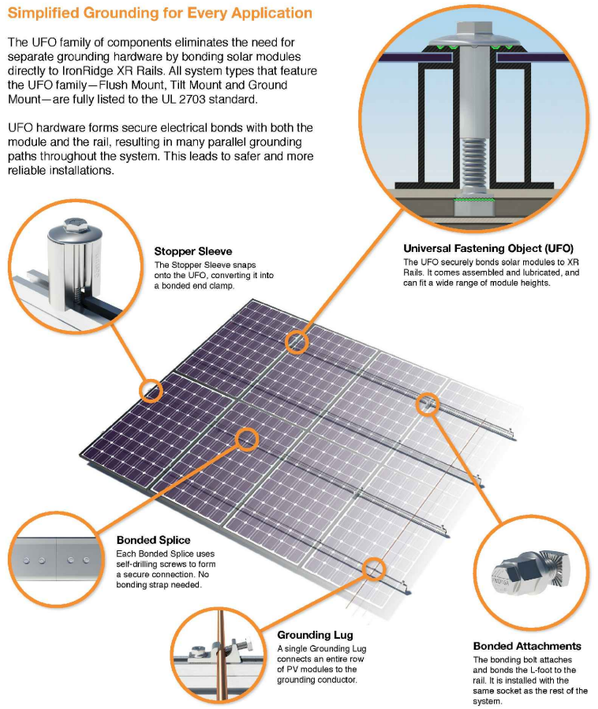
IRONRIDGE

UFO Family of Components

Simplified Grounding for Every Application

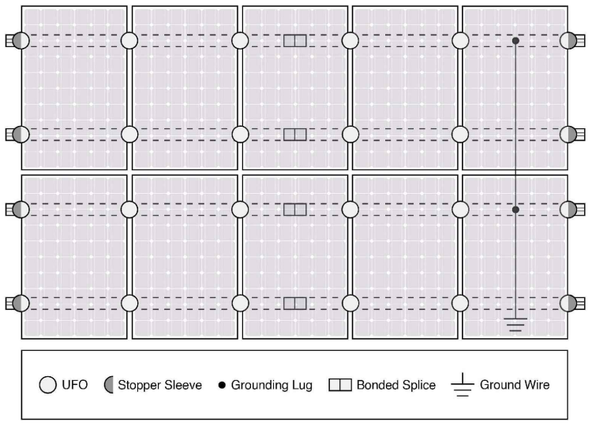
The UFO family of components eliminates the need for separate grounding hardware by bonding solar modules directly to IronRidge XR Rails. All system types that feature the UFO family—Flush Mount, Tilt Mount and Ground Mount—are fully listed to the UL 2703 standard.

UFO hardware forms secure electrical bonds with both the module and the rail, resulting in many parallel grounding paths throughout the system. This leads to safer and more reliable installations.



Tech Brief

System Diagram



Approved Enphase microinverters can provide equipment grounding of IronRidge systems, eliminating the need for grounding lugs and field installed equipment ground conductors (EGC). A minimum of two microinverters mounted to the same rail and connected to the same Engage cable is required. Refer to installation manuals for additional details.

UL Certification

The IronRidge Flush Mount, Tilt Mount, and Ground Mount Systems have been listed to UL 2703 by Intertek Group plc.

UL 2703 is the standard for evaluating solar mounting systems. It ensures these devices will maintain strong electrical and mechanical connections over an extended period of time in extreme outdoor environments.

Go to IronRidge.com/UFO

Cross-System Compatibility

Feature	Flush Mount	Tilt Mount	Ground Mount
XR Rails	✔	✔	XR1000 Only
UFO/Stopper	✔	✔	✔
Bonded Splice	✔	✔	N/A
Grounding Lugs	1 per Row	1 per Row	1 per Array
Microinverters & Power Optimizers	Enphase - M250-72, M250-60, M215-60, C250-72 Darfon - MIG240, MIG300, G320, G640 SolarEdge - P300, P320, P400, P405, P600, P700, P730		
Fire Rating	Class A	Class A	N/A
Modules	Tested or Evaluated with over 400 Framed Modules Refer to installation manuals for a detailed list.		

REVISIONS:
03.12.2019 R1 (MH)

Project Name
RICHARDSON, MARY
701 EAST H STREET
ERWIN, NC 28339
0615070325

11.680 kW PHOTOVOLTAIC SYSTEM

DATE: 03.11.2019

GROUNDING

DRAWN BY: RD

GREEN NRG GROUP INC.
9421 WINNETKA AVE. UNIT G
CHATSWORTH, CA 91311
PHONE: 888 - 589 - 4006
U.32659

Contractors Signature:

intertek
Total Quality. Assured.

Address: Intertek 3933 US 11
Cortland NY 13045

Telephone: 607-758-6516
www.intertek.com

Subject: ETL Evaluation of SolarEdge Products to NEC 2017 Rapid Shutdown Requirements

To, whom it may concern

This letter represents the testing results of the below listed products to the requirements contained in the following standards:

National Electric Code, 2017, Section 690.12 requirement for rapid shutdown.

UL 1741, UL 1741 CRD for rapid shutdown

The evaluation was done on the PV Rapid Shutdown System (PVRSS), and covers installations consisting of optimizers and inverters with part numbers listed below.

The testing done has verified that controlled conductors are limited to:

- Not more than 30 volts and 240 voltamperes within 30 seconds of rapid shutdown initiation outside the array.
- Not more than 80 volts and 240 voltamperes within 30 seconds of rapid shutdown initiation inside the array.

The rapid shutdown initiation is performed by either disconnecting the AC feed to the inverter, or – if the inverter DC Safety switch is readily accessible – by turning off the DC Safety switch.

Applicable products:

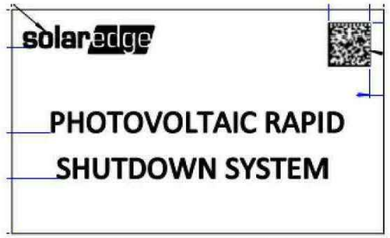
- Power optimizers:
  - PB followed by 001 to 350; followed by -AOB or -TFI.
    OP followed by 001 to 500; followed by -LV, -MV, -IV or -EV.
    P followed by 001 to 850.
    SP followed by 001 to 350.
    P400J
    *When optimizers are connected to 2 or more modules in series, the max input voltage may exceed 80V. Following the implementation of the NEC 2017 rapid shutdown value of 80V max inside of the array at the beginning of 2019 , modules exceeding this combined input max voltage will be required to use optimizers with parallel inputs.

intertek
Total Quality. Assured.

Address: Intertek 3933 US 11
Cortland NY 13045

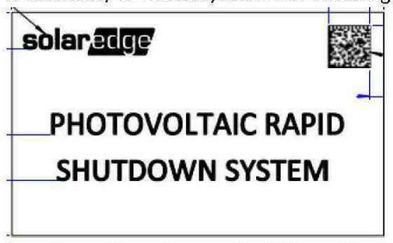
Telephone: 607-758-6516
www.intertek.com

- 1-ph Inverters:
  - SE3000A-US / SE3800A-US / SE5000A-US / SE6000A-US / SE7600A-US / SE10000A-US / SE11400A-US / SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US when the following label is labeled on the side of the inverter:



Inverter part number may be followed by a suffix

- 3-ph Inverters:
  - SE9KUS / SE10KUS / SE14.4KUS / SE20KUS / SE30KUS / SE33.3KUS /SE43.2KUS / SE66.6KUS / SE100KUS ; when the following label is labeled on the side of the inverter:



Inverter part number may be followed by a suffix

If there are any questions regarding the results contained in this report, or any of the other services offered by Intertek, please do not hesitate to contact the undersigned.

This information is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense, or damage occasioned by the use of this information. Any observations and results in this report are relevant only to the sample evaluated. Only the Client is authorized to copy and distribute this information and only then in its entirety.

REVISIONS:
03.12.2019 R1 (MH)

Project Name
RICHARDSON, MARY
701 EAST H STREET
ERWIN, NC 28339
0615070325

11.680 kW PHOTOVOLTAIC SYSTEM

RAPID SHUTDOWN

DATE: 03.11.2019

DRAWN BY: RD

GREEN NRG GROUP INC.
9421 WINNETKA AVE. UNIT G
CHATSWORTH, CA 91311
PHONE: 888 - 589 - 4006
U.32659

Contractors Signature: