

PLAN KEY	
PV-1	COVER PAGE
PV-1.1	ATTACHMENT DETAILS
PV-2	PANEL LAYOUT
PV-3	ELECTRICAL
PV-4	EQUIPMENT LABELS

SYSTEM INFORMATION	
MODULE	HANWHA Q.TRON BLK M-G2+ 430
INVERTER	ENPHASE IQ8HC-72-M-DOM-US
RACKING	UNIRAC SM LIGHT RAIL SYSTEM W/ SOLAR MOUNT
SYSTEM SIZE (DC)	10.75 KW
LOCATION	40.7632943, -74.2493986

*X= 2 OR M DEPENDING ON MANUFACTURER'S AVAILABILITY. SAME ELECTRICAL CHARACTERISTICS WITH DIFFERENT DC CONNECTOR. SEE SPECS FOR DETAILS.



HANWHA Q.TRON BLK M-G2+ 430
430 WATT MODULE
67.8" X 44.6" X 1.18"
(SEE DATASHEET)

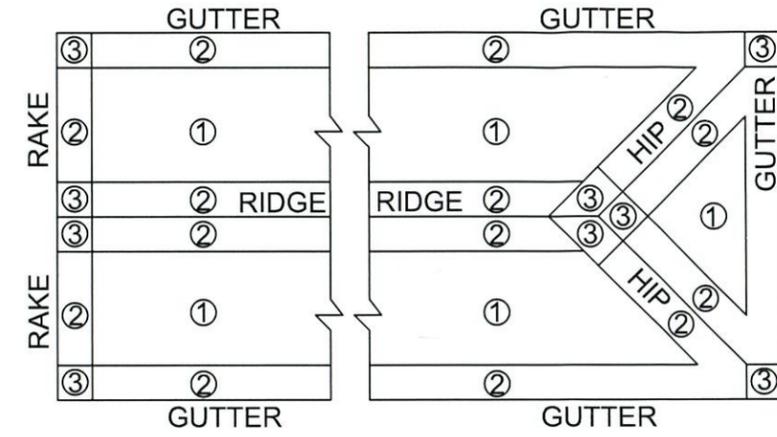


PRO CUSTOM SOLAR LLC D.B.A. MOMENTUM SOLAR
3096 HAMILTON BLVD, SOUTH PLAINFIELD, NJ 07080
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PROFESSIONAL ENGINEERING

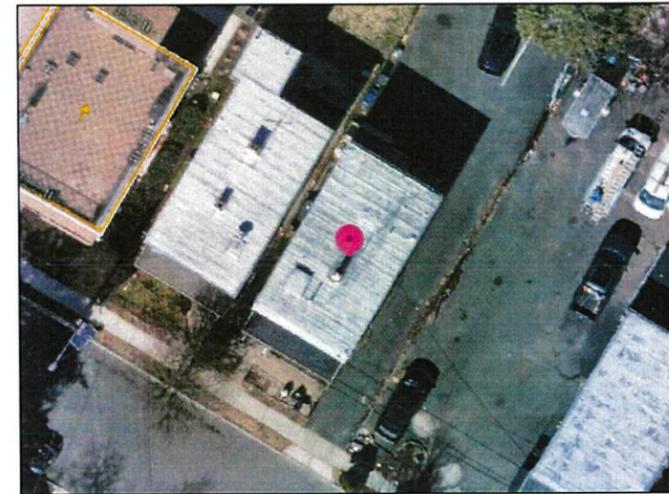
MICHAEL REZK
LICENSE # GE56261
ENGINEERING LETTER ATTACHED HAS SPECIFICATIONS FOR WIND AND LOAD CALCULATIONS FOR SOLAR INSTALLATION SPANS & ATTACHMENTS TO MEET LOCAL AND STATE BUILDING CODE COMPLIANCE. WARNING THAT IT IS A VIOLATION OF THE LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT, TO ALTER AN ITEM IN ANY WAY.

- ALL WIND DESIGN CRITERIA ARE FOR LOW SLOPE ROOFS, GABLE AND HIP ROOFS CONSIDERED FROM AN ANGLE OF MIN. 9.5° ($\frac{2}{12}$) TO MAX. 45° ($\frac{12}{12}$) NOT TO EXCEED 30' MEAN ROOF HEIGHT ATTACHED WITH FASTENERS AS SPECIFIED BY THE MANUFACTURER.
- SPAN TABLES ARE DERIVED FROM MECHANICAL LOAD TESTS PERFORMED BY THE MANUFACTURERS INDEPENDENT TESTING AGENCIES ON BEHALF OF THE MANUFACTURER.
- ROOF SEALANTS SHALL CONFORM TO ASTM C920 AND ASTM 6511
- ALL ATTACHMENTS SHALL BE INSTALLED IN STRICT COMPLIANCE WITH MANUFACTURERS PRINTED INSTRUCTIONS.



ROOF WIND ZONES AS PER IRC R301.2(7)
ROOF ZONES 2 & 3 ARE 48" FROM OUTER ROOF EDGES, RIDGES, HIPs, RAKES, AND GUTTER EDGES FOR STRUCTURES BELOW 30'-0" MEAN ROOF HT.

VICINITY MAP



GENERAL NOTES:

THIS PV SYSTEM HAS BEEN DESIGNED TO MEET THE MINIMUM DESIGN STANDARDS FOR BUILDING AND OTHER STRUCTURES OF THE 2021 NEW JERSEY STATE UNIFORM CODE, ALL ASPECTS OF THE INSTALLATION SHALL COMPLY WITH THE 2021 INTERNATIONAL RESIDENTIAL CODE (2021IRC). WITH ALL NEW JERSEY AMENDMENTS, ASCE 7-16, NEC 2020 (NFPA 70), ALL LOCAL GOVERNING COUNTY AND MUNICIPAL ORDINANCES ADOPTED BY REFERENCE OR ENACTED BY LAW, ALL INSTALLATION INSTRUCTIONS PREPARED BY THE MANUFACTURER.

FASTENER:

REFER TO STRUCTURAL CERTIFICATION LETTER FOR ALL STRUCTURAL INFORMATION OF EXISTING BUILDING STRUCTURE.
ATTACHMENT SPACING NOT EXCEED MANUFACTURERS SPECIFICATIONS FOR WIND LOADS AS PER ASCE 07-16. RISK CATEGORY II TOPOGRAPHIC EFFECTS B,C, & D AND ROOF WIND ZONES 1,2,& 3. ROOF ZONES 2 & 3 ARE WITHIN 48" OF ANY OUTER EDGE, HIP, RIDGE, OR GUTTER LINE FOR STRUCTURES 30'- 0" OR LESS MEAN ROOF HEIGHT.



CUSTOMER INFORMATION

OLUTOSSIN OLUGBENGA
591 CHRISTOPHER ST
ORANGE, NJ 07050
9084257385

FLOOR 1 / METER# 1416656

PV SYSTEM INFORMATION

SYSTEM SIZE (DC): 10.75 KW
SYSTEM DESIGN CAPACITY (AC): 9.5 KVA
25 MODULES: HANWHA Q.TRON BLK M-G2+ 430
25 INVERTERS: ENPHASE IQ8HC-72-M-DOM-US

PROJECT INFORMATION - MS168553		
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COVER PAGE

PV-1

BILL OF MATERIALS			
NON SH MODULES	25	SH MODULES	0
INVERTERS	25	TRUNK CABLE	30
FOOT ATTACHMENT W/ SOLAR MOU	71	WIRE CLIP	25
ENPHASE COMBINER	1	INVERTER CLIP	25
50A OCPD	1	168 RAILS	11
SOLAR AC DISCO	1		
125A LINE TAPS	2		

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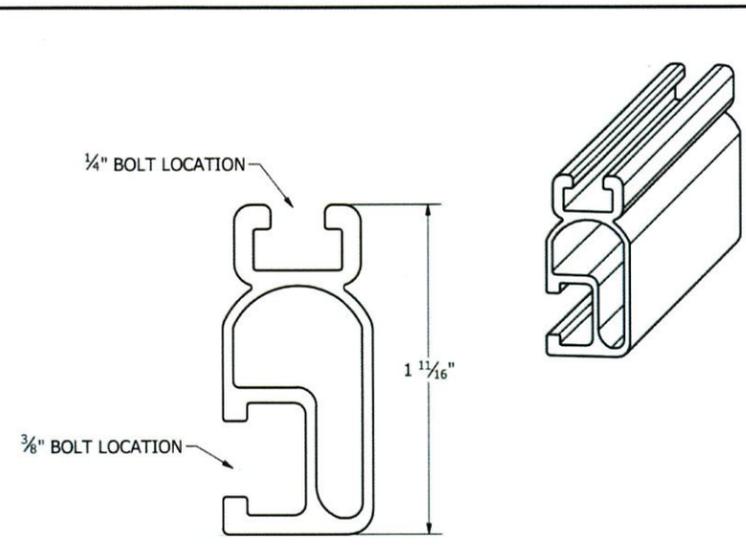
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ATTACHMENT DETAILS

PV-1.1



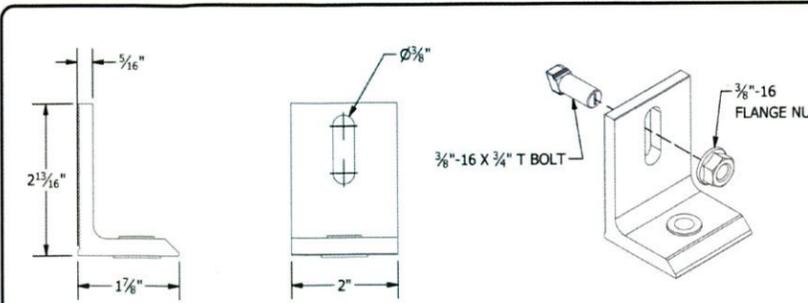
1/4" BOLT LOCATION
3/8" BOLT LOCATION
1 11/16"

PART # TABLE		
P/N	DESCRIPTION	LENGTH
315168M	SM LIGHT RAIL 168" MILL	168"
315168D	SM LIGHT RAIL 168" DRK	168"
315240M	SM LIGHT RAIL 240" MILL	240"
315240D	SM LIGHT RAIL 240" DRK	240"

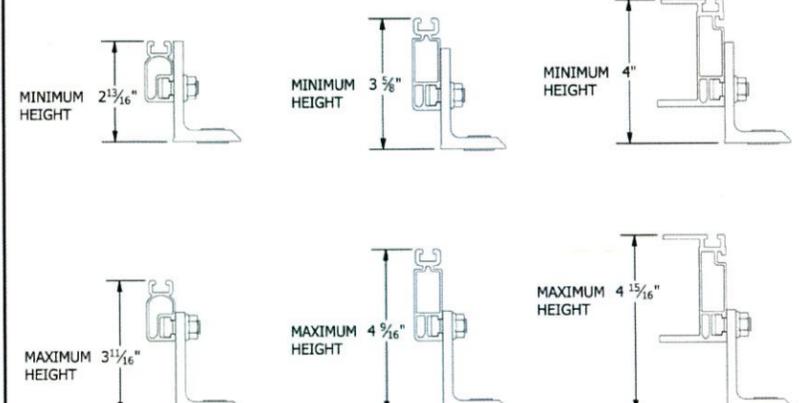


1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE: SOLARMOUNT	DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL	SM-P02 SHEET
DRAWING TYPE: PART DETAIL	PRODUCT PROTECTED BY ONE OR MORE US PATENTS	
DESCRIPTION: LIGHT RAIL	LEGAL NOTICE	
REVISION DATE: 9/11/2017		



1/16"
2 13/16"
1 7/16"
Ø 3/8"
3/8"-16 X 3/4" T BOLT
3/8"-16 FLANGE NUT
L-FOOT

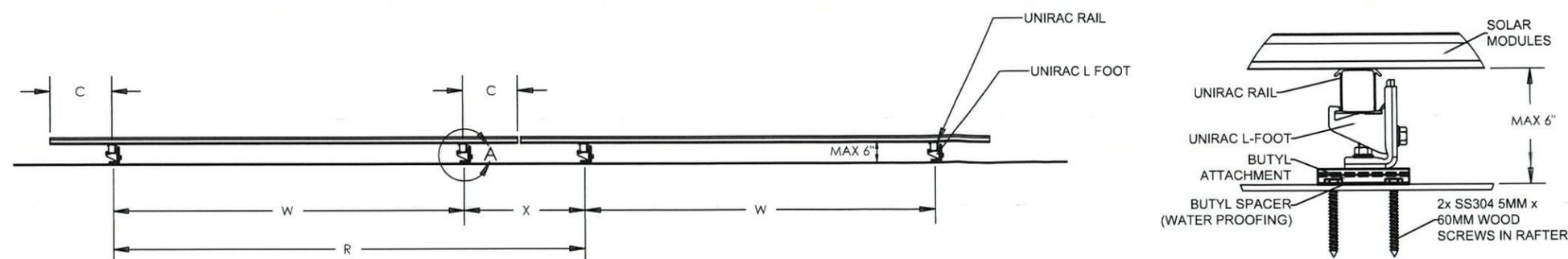


MINIMUM HEIGHT 2 13/16"
MINIMUM HEIGHT 3 5/8"
MINIMUM HEIGHT 4"
MAXIMUM HEIGHT 3 11/16"
MAXIMUM HEIGHT 4 9/16"
MAXIMUM HEIGHT 4 15/16"
SOLARMOUNT LIGHT ON L-FOOT
SOLARMOUNT STANDARD ON L-FOOT
SOLARMOUNT HD ON L-FOOT



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ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE: SOLARMOUNT	DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL	SM-A11 SHEET
DRAWING TYPE: PART & ASSEMBLY	PRODUCT PROTECTED BY ONE OR MORE US PATENTS	
DESCRIPTION: L-FOOT	LEGAL NOTICE	
REVISION DATE: 11/19/2018		



ROOF	MODULE COUNT	AZIMUTH	TILT	SHADING	LANDSCAPE ATTACHMENT MAX SPAN (ROOF AREA 1/2/3)	PORTRAIT ATTACHMENT MAX SPAN (ROOF AREA 1/2/3)
R1	25	31°	7°	94%	80/72/72	80/72/72



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9084257385

FLOOR 1 / METER# 1416656

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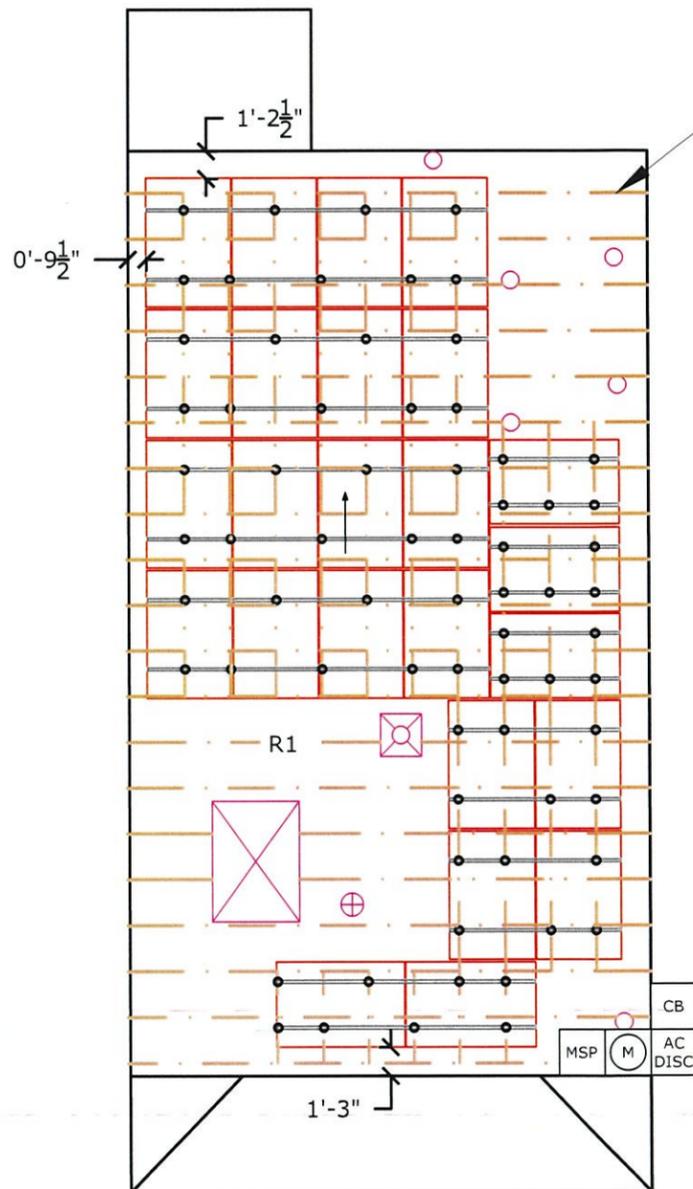
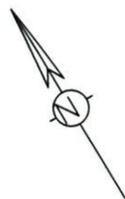
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PANEL LAYOUT

PV-2



EXISTING FRAMING TYPE: FLAT ROOF
ROOF MATERIALS: ROLLED COMPOSITE ASPHALT
EXISTING ROOF STRUCTURE: 2"x6" @24"O.C.

**SOLAR INSTALLER NOTES:
ADD 100A MAIN BREAKER REQUIRED**

ELECTRICAL EQUIPMENT

FRONT OF RESIDENCE

CHRISTOPHER ST

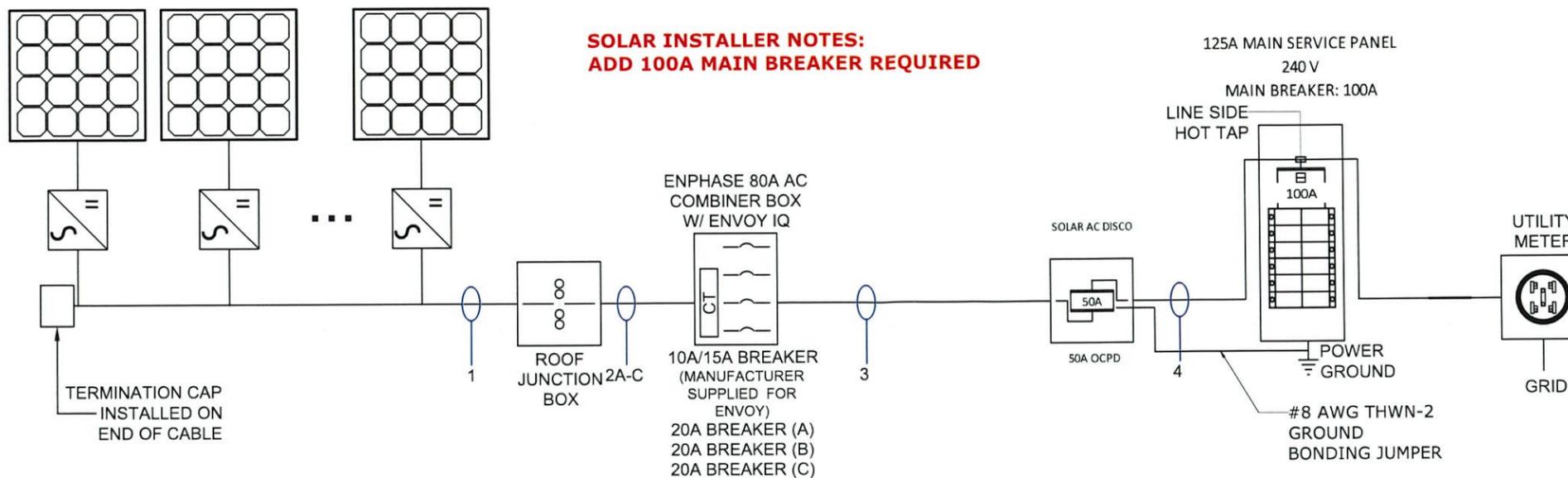
SYMBOL LEGEND

MSP	MAIN SERVICE PANEL		CHIMNEY
SP	SUB-PANEL		SKYLIGHT
M	UTILITY METER		VENT
AC DISC	AC DISCONNECT		PIPE VENT
UDC	UTILITY DISCONNECT		FAN
LC	LOAD CENTER		SATELLITE DISH
N3R	NEMA 3R BOX W/ ENVOY-S		FIRE SETBACKS
CB	COMBINER BOX		GROUND ACCESS
PF	PERFORMANCE METER		PITCH DIRECTION
	MODULE		

SITE PLAN
SCALE: 1/8" = 1'-0"

25 HANWHA Q.TRON BLK M-G2+ 430 430W MODULES PAIRED WITH
25 ENPHASE IQ8HC-72-M-DOM-US MICRO-INVERTERS

BRANCH CIRCUIT A
10 MICRO-INVERTERS
BRANCH CIRCUIT B
10 MICRO-INVERTERS
BRANCH CIRCUIT C
5 MICRO-INVERTERS



ELECTRICAL NOTES:

1. ALL CALCULATIONS FOR VOC, VMAX, IMP AND ISC HAVE BEEN CALCULATED USING THE MANUFACTURED STRING CALCULATOR BASED ON ASHRAE 2% HIGH AND EXTREME MINIMUM TEMPERATURE COEFFICIENTS.
2. THE ENTIRE ARRAY IS BONDED ACCORDING TO (NEC 690.46 - 250.120 PARAGRAPH C).
3. THIS SYSTEM COMPLIES WITH NEC 2020
4. BRANCH CIRCUIT CALCULATION FOR WIRE TAG 1 DISPLAYS THE LARGEST BRANCH CIRCUIT IN SYSTEM. OTHER BRANCH CIRCUITS WILL HAVE LOWER DESIGN CURRENT THAN THE ONE SHOWN.
5. ALL CONDUCTORS ARE SIZED BASED ON NEC 2020 ARTICLE 310

6. ALL EQUIPMENT INSTALLED IS RATED AT 75°C UNLESS NOTED
7. INVERTER NOC (NOMINAL OPEN CURRENT) OBTAINED FROM EQUIPMENT DATA SHEET
8. SYSTEM IS CONSIDERED AN AC MODULE SYSTEM. NO DC CONDUCTORS ARE PRESENT IN CONDUIT, COMBINER, JUNCTION BOX, DISCONNECT. AND COMPILES WITH 690.6- NO DC. DISCONNECT AND ASSOCIATED DC CABLING ARE REQUIRED.
9. CONDUCTORS IN CONDUIT ARE AC CONDUCTORS - BRANCH CIRCUITS AND NOT PV SOURCE CIRCUITS 690.6.

10. SYSTEM COMPLIES WITH 690.12 RAPID SHUTDOWN AND ASSOCIATED LABELING AS PER 690.56(C). AC VOLTAGE AND SYSTEM OPERATING CURRENT SHALL BE PROVIDED AS PER 690.52.
11. ALL GROUNDING SHALL COMPLY WITH 690.47(A) IN THAT THE AC MODULES SHALL COMPLY WITH 250.64.
12. NO TERMINALS WILL BE ENERGIZED IN THE OPEN POSITION IN THIS AC MODULE SYSTEM 690.6, 690.15.
13. WHERE APPLICABLE, INTERCONNECTION SHALL COMPLY WITH 705.12(B)(2)(3)(b), 705.12(A) AS PERMITTED BY 230.86(6)
14. WHERE APPLICABLE, SOLAR OVERCURRENT PROTECTION FOR SUPPLY SIDE CONNECTION SHALL BE LOCATED WITHIN 10FT OF THE INTERCONNECTION POINT.

PERMANENT LABEL & LOCATION

CUSTOMER OWNED PARALLEL GENERATION
LABELS ARE WEATHER UV RATED RED PLASTIC WITH WHITE LETTERS

- (A) LOAD CENTER: WARNING DUAL POWER SOURCE.
SECOND SOURCE IS PV SYSTEM.
- (B) WARNING INVERTER OUTPUT CONNECTION.
DO NOT RELOCATE THIS OVERCURRENT BACKFED DEVICE

- (C) AC DISCONNECT: PV AC DISCONNECT 690.15
- (D) WARNING ELECTRIC SHOCK HAZARD.
DO NOT TOUCH TERMINALS. TERMINALS ON BOTH LINE & LOADSIDES MAY BE ENERGIZED IN THE OPEN POSITION.
- (E) INVERTER: WARNING ELECTRICAL SHOCK HAZARD.
IF A GROUND FAULT IS INDICATED, NORMALLY GROUNDED CONDUCTORS MAY BE UN-GROUNDED AND ENERGIZED.

- (F) JUNCTION BOX: WARNING ELECTRICAL SHOCK HAZARD.
THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED
- (G) CONDUIT/CABLE EVERY 10 FEET:
CAUTION: SOLAR CIRCUIT

Wire Tag	Conduit	Wire Qty	Wire Gauge	Wire Type	Temp. Rating	Wire Ampacity (A)	Temp. Derate	Conduit Fill Derate	Derated Ampacity (A)	Inverter Qty	NOC (A)	NEC Correction	Design Current (A)	Ground Size	Ground Wire Type
1	OPEN AIR	2	12 AWG	Trunk Cable	90°C	30	0.96	1	28.80	10	1.58	1.25	19.75	08 AWG	THWN-2
2A	3/4" PVC	2	10 AWG	THWN-2	90°C	40	0.96	0.8	30.72	10	1.58	1.25	19.75	08 AWG	THWN-2
2B	3/4" PVC	2	10 AWG	THWN-2	90°C	40	0.96	0.8	30.72	10	1.58	1.25	19.75	08 AWG	THWN-2
2C	3/4" PVC	2	10 AWG	THWN-2	90°C	40	0.96	0.8	30.72	5	1.58	1.25	9.88	08 AWG	THWN-2
3	3/4" PVC	3 + G	06 AWG	THWN-2	75°C	65	0.96	1	62.40	25	1.58	1.25	49.38	08 AWG	THWN-2
4	3/4" PVC	3	06 AWG	THWN-2	75°C	65	0.96	1	62.40	25	1.58	1.25	49.38		THWN-2

NOTE: LETTER "G" IN WIRE QTY TAB STANDS FOR GROUNDING CONDUCTOR.



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ELECTRICIAN

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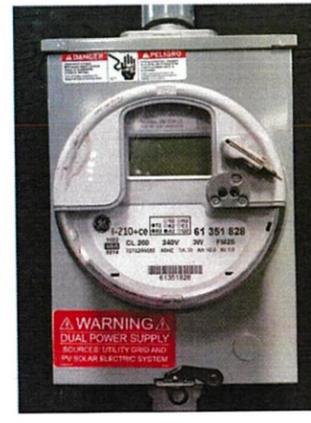
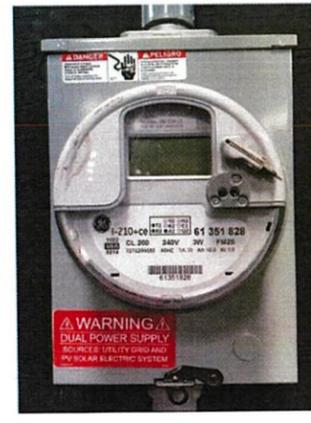
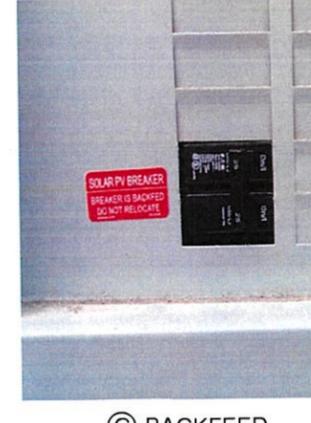
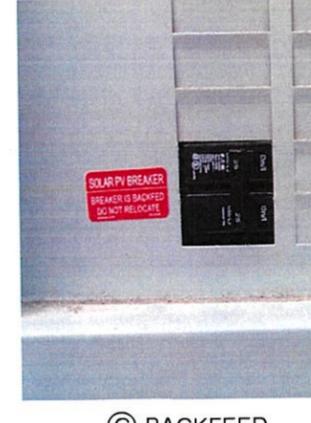
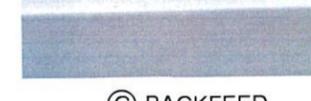
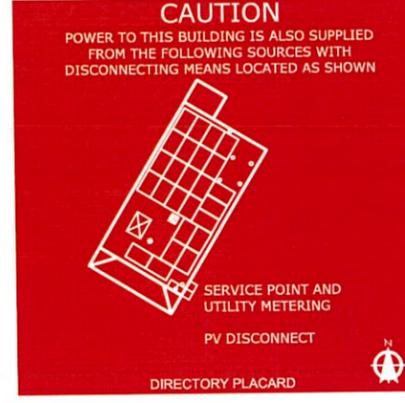
**ELECTRICAL
PV-3**

TAG	LABEL	QUANTITY	LOCATION	NOTE
(A)	CAUTION: AC SOLAR VOLTAGE	12	AC CONDUITS	1 AT EVERY SEPARATION BY ENCLOSURES / WALLS / PARTITIONS / CEILINGS / FLOORS OR NO MORE THAN 10'
(B)	! WARNING PHOTOVOLTAIC POWER SOURCE	1	COMBINER BOX	1 AT ANY COMBINER BOX
(C)	! WARNING ELECTRICAL SHOCK HAZARD TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION	1	JUNCTION BOX	1 AT ANY JUNCTION BOX
(D)	<p>PV SYSTEM AC DISCONNECT RATED AC OUTPUT CURRENT 39.5A NOMINAL OPERATING AC VOLTAGE 240 V</p> <p>! CAUTION POWER TO THIS SERVICE IS ALSO SUPPLIED FROM ON-SITE SOLAR GENERATION AC SYSTEM DISCONNECT</p>	1	AC DISCONNECT	1 OF EACH AT FUSED AC DISCONNECT COMPLETE VOLTAGE AND CURRENT VALUES ON DISCONNECT LABEL
(E)	PV METER	1	PV METER SOCKET	1 AT PV METER SOCKET AND ONE DIRECTORY PLACARD
(F)	! WARNING DUAL POWER SOURCE SECOND SOURCE IS PHOTOVOLTAIC SYSTEM	1	UTILITY METER	1 AT UTILITY METER AND ONE DIRECTORY PLACARD
(G)	<p>SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN</p> <p>TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUTDOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN ARRAY</p> <p>! WARNING DUAL POWER SOURCE SECOND SOURCE IS PHOTOVOLTAIC SYSTEM</p>	1	INTERCONNECTION POINT	1 OF EACH AT BUILDING INTERCONNECTION POINT AND ONE DIRECTORY PLACARD
	WARNING: INVERTER OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE	1	BACKFEED PANEL	1 OF EACH AT BUILDING INTERCONNECTION POINT AND ONE DIRECTORY PLACARD
(H)	<p>NOMINAL OPERATING AC VOLTAGE : 240V NOMINAL OPERATING AC FREQUENCY : 60HZ MAXIMUM AC POWER : 230VA MAXIMUM AC CURRENT : 39.5A MAXIMUM OVERCURRENT DEVICE RATING FOR AC MODULE PROTECTION : 20A</p>	1	AC CURRENT PV MODULES	

EXAMPLES






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EQUIPMENT LABELS

PV-4