


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

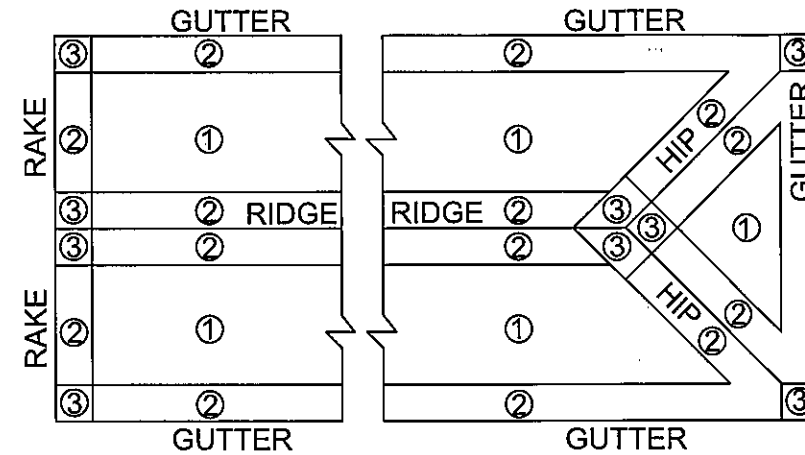
SYSTEM INFORMATION	
MODULE	HANWHA Q.PEAK DUO BLK ML-G10+ 410
INVERTER	ENPHASE IQ7PLUS-72-2-US
RACKING	ROOFTECH RT-MINI
SYSTEM SIZE (DC)	11.48 KW
LOCATION	40.7526504, -74.2408820

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



HANWHA Q.PEAK DUO BLK ML-G10+ 410
410 WATT MODULE
74" X 41.1" X 1.26"
(SEE DATASHEET)

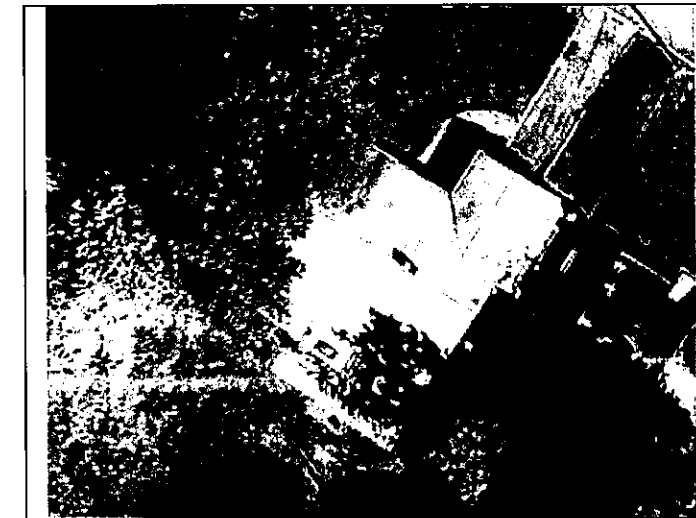
- ALL WIND DESIGN CRITERIA ARE FOR LOW SLOPE ROOFS, GABLE AND HIP ROOFS CONSIDERED FROM AN ANGLE OF MIN. 9.5° ($\frac{2}{12}$) TO MAX. 45° ($\frac{12}{12}$) NOT TO EXCEED 30' MEAN ROOF HEIGHT ATTACHED WITH FASTENERS AS SPECIFIED BY THE MANUFACTURER.
- SPAN TABLES ARE DERIVED FROM MECHANICAL LOAD TESTS 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.

BILL OF MATERIALS			
NON SH MODULES	28	SH MODULES	0
INVERTERS	28	TRUNK CABLE	34
L-FOOT ATTACHMENT	87	WIRE CLIP	28
ENPHASE COMBINER	1	INVERTER CLIP	28
50A OCPD	1	171" RAIL	13
SOLAR AC DISCO	1		
125A LINE TAPS	2		

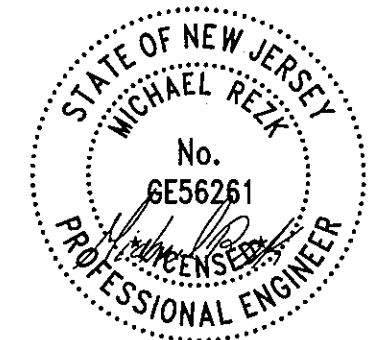


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PROFESSIONAL ENGINEERING

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.



CUSTOMER INFORMATION

SHAWN MATTISON
208 STIRLING AVE
ORANGE, NJ 07050
(516) 376-9999

PV SYSTEM INFORMATION

SYSTEM SIZE (DC): 11.48 KW
SYSTEM DESIGN CAPACITY (AC): 8.12 KVA
28 MODULES: HANWHA Q.PEAK DUO BLK ML-G10+ 410
28 INVERTERS: ENPHASE IQ7PLUS-72-2-US

PROJECT INFORMATION - MS149785

INITIAL	DATE: 4/19/2024	DESIGNER: KLB
REV:	DATE:	DESIGNER:
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COVER PAGE

PV-1

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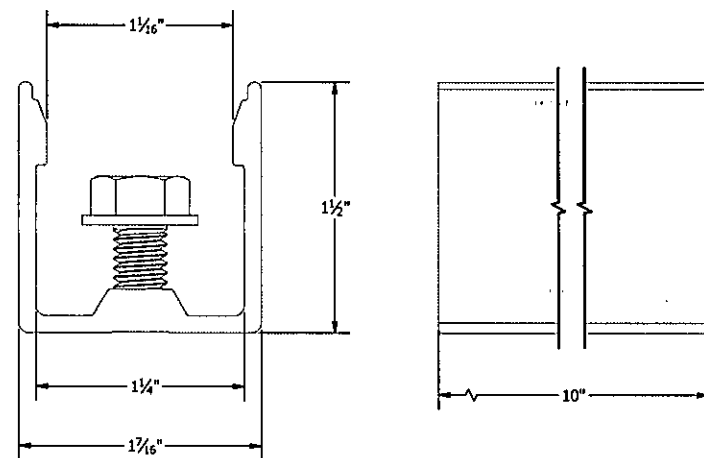
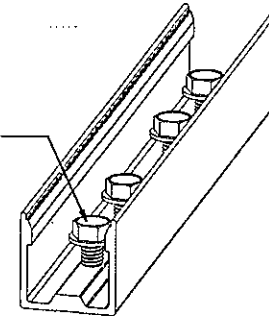
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ATTACHMENT DETAILS

PV-1.1

PART # TABLE		
P/N	DESCRIPTION	LENGTH
RLSPLCM1	NXT HORIZON RAIL SPLICE	10"

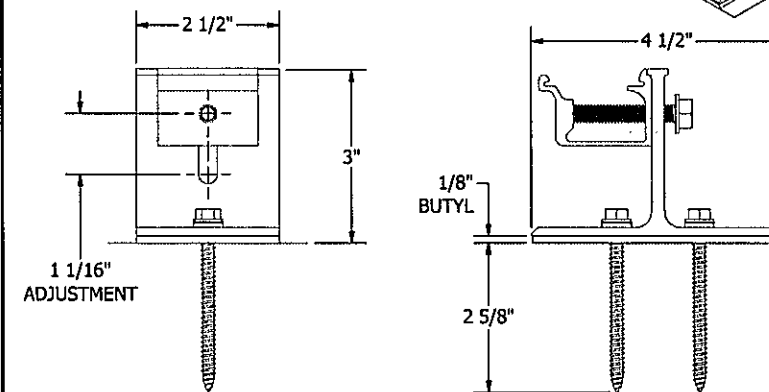
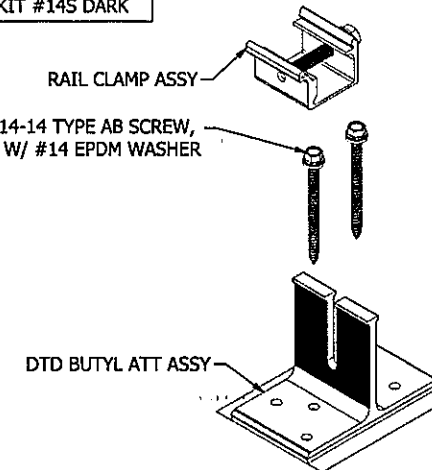
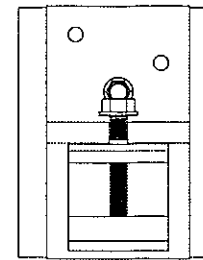
4X - 5/16"-18 x 5/8"
HEX FLANGE SCREW - TYPE F




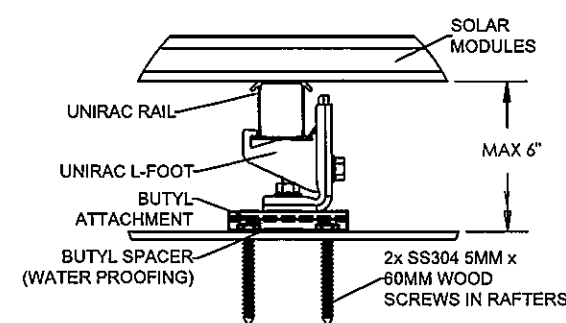
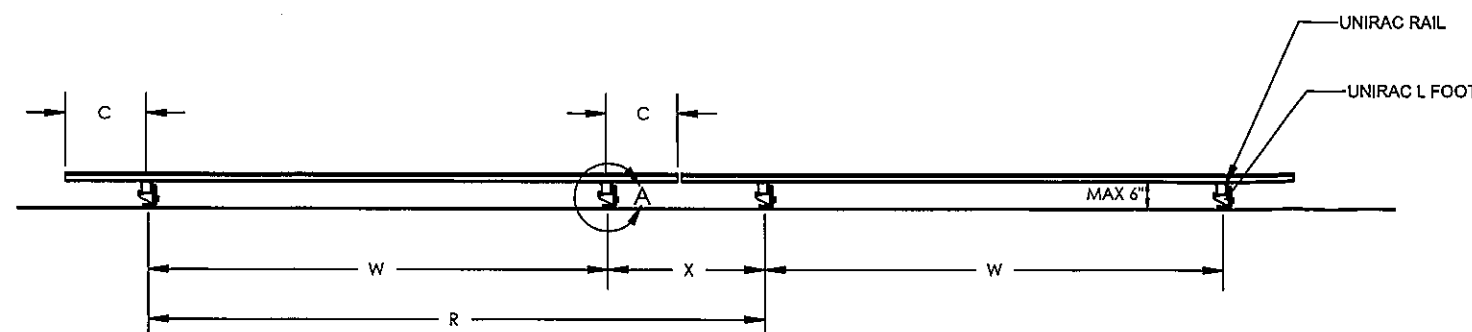
 1411 BROADWAY BLVD. NE ALBUQUERQUE, NM 87102 USA PHONE: 505.242.6411 WWW.UNIRAC.COM	PRODUCT LINE: NXT HORIZON	DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL PRODUCT PROTECTED BY ONE OR MORE US PATENTS LEGAL NOTICE	NH-P02 SHEET
	DRAWING TYPE: PART DETAIL		
	DESCRIPTION: RAIL SPLICE		
	REVISION DATE: 9/22/2021		

PART # TABLE	
P/N	DESCRIPTION
SHBUTYLM2	STRONGHOLD BUTYL ATT KIT #14S MILL
SHBUTYLD2	STRONGHOLD BUTYL ATT KIT #14S DARK

RAIL CLAMP ASSY
2X #14-14 TYPE AB SCREW,
HWH, SS W/ #14 EPDM WASHER



 1411 BROADWAY BLVD. NE ALBUQUERQUE, NM 87102 USA PHONE: 505.242.6411 WWW.UNIRAC.COM	PRODUCT LINE: NXT UMount	DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL PRODUCT PROTECTED BY ONE OR MORE US PATENTS LEGAL NOTICE	NU-A10-1 SHEET
	DRAWING TYPE: PARTS		
	DESCRIPTION: SH BUTYL ATTACHMENT		
	REVISION DATE: 7/14/2023		



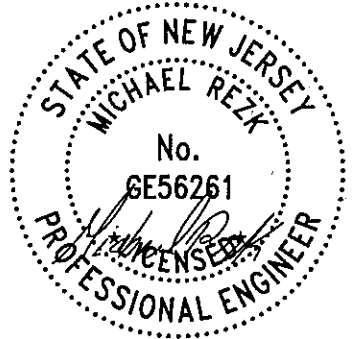
ROOF	MODULE COUNT	AZIMUTH	TILT	SHADING	LANDSCAPE ATTACHMENT MAX SPAN (ROOF AREA 1/2/3)	PORTRAIT ATTACHMENT MAX SPAN (ROOF AREA 1/2/3)
R1	28	212°	23°	61%	80/72/72	80/72/72



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PV SYSTEM INFORMATION

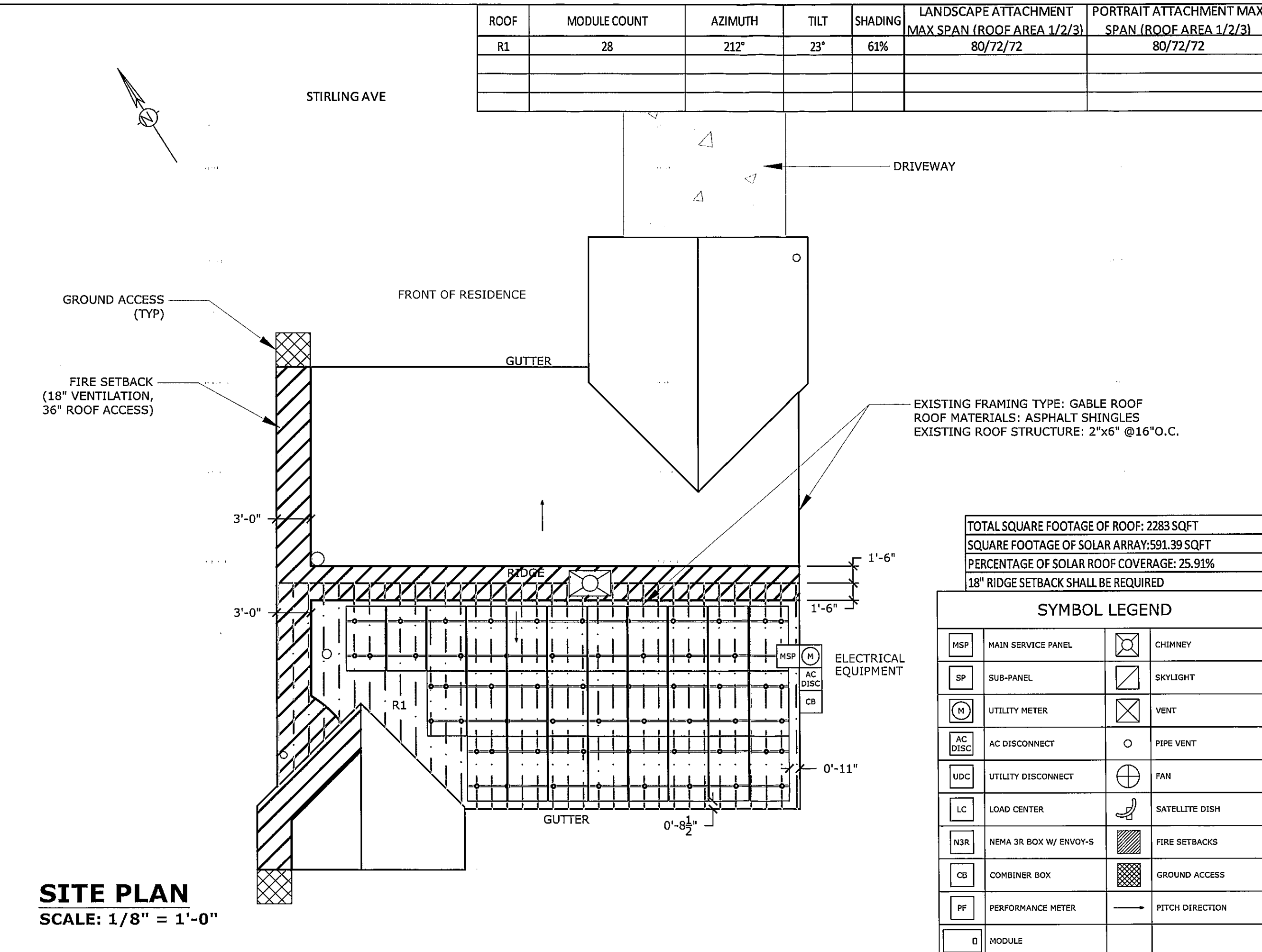
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PANEL LAYOUT

PV-2



EXISTING FRAMING TYPE: GABLE ROOF
ROOF MATERIALS: ASPHALT SHINGLES
EXISTING ROOF STRUCTURE: 2"x6" @16"O.C.

TOTAL SQUARE FOOTAGE OF ROOF: 2283 SQFT
SQUARE FOOTAGE OF SOLAR ARRAY: 591.39 SQFT
PERCENTAGE OF SOLAR ROOF COVERAGE: 25.91%
18" RIDGE SETBACK SHALL BE REQUIRED

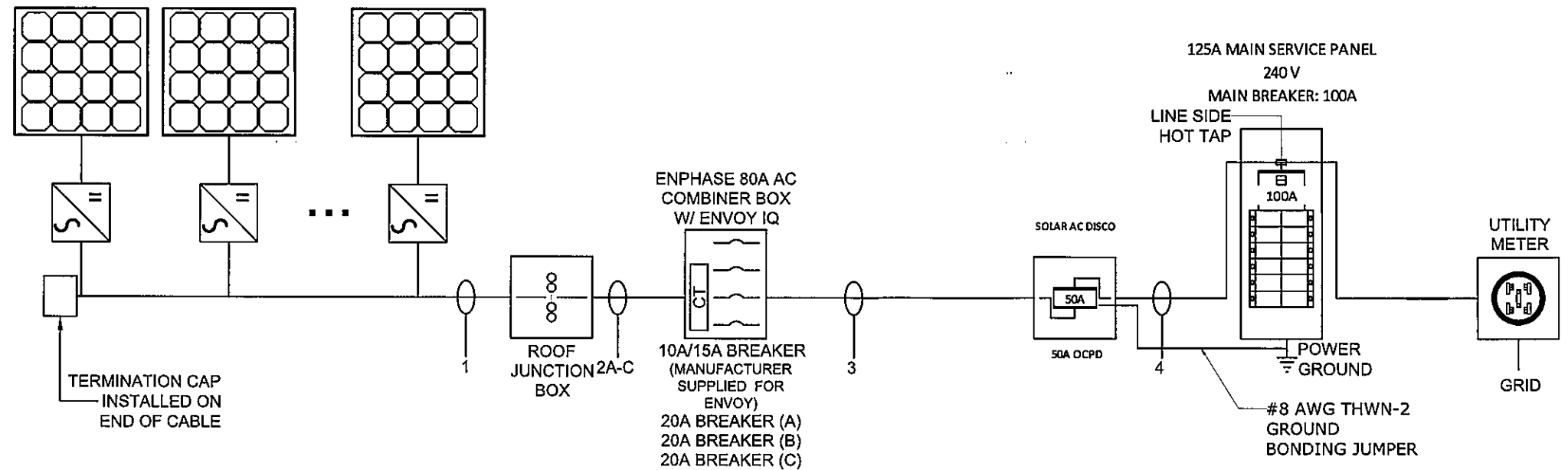
SYMBOL LEGEND

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"

28 HANWHA Q.PEAK DUO BLK ML-G10+ 410 410W MODULES PAIRED WITH
28 ENPHASE IQ7PLUS-72-2-US MICRO-INVERTERS

BRANCH CIRCUIT A
10 MICRO-INVERTERS
BRANCH CIRCUIT B
10 MICRO-INVERTERS
BRANCH CIRCUIT C
8 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	1.21	1.25	15.13	08 AWG	THWN-2
2A	3/4" PVC	2	10 AWG	THWN-2	90°C	40	0.96	0.8	30.72	10	1.21	1.25	15.13	08 AWG	THWN-2
2B	3/4" PVC	2	10 AWG	THWN-2	90°C	40	0.96	0.8	30.72	10	1.21	1.25	15.13	08 AWG	THWN-2
2C	3/4" PVC	2	10 AWG	THWN-2	90°C	40	0.96	0.8	30.72	8	1.21	1.25	12.10	08 AWG	THWN-2
3	3/4" PVC	3+G	06 AWG	THWN-2	75°C	65	0.96	1	62.40	28	1.21	1.25	42.35	08 AWG	THWN-2
4	3/4" PVC	3	06 AWG	THWN-2	75°C	65	0.96	1	62.40	28	1.21	1.25	42.35		THWN-2

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



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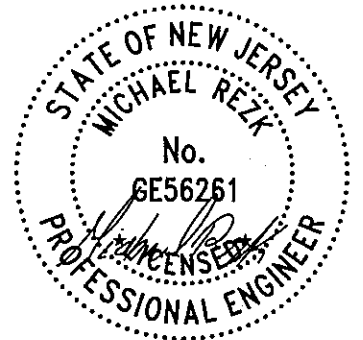
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ELECTRICIAN

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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)	PV SYSTEM AC DISCONNECT RATED AC OUTPUT CURRENT 33.88A NOMINAL OPERATING AC VOLTAGE 240 V ! CAUTION POWER TO THIS SERVICE IS ALSO SUPPLIED FROM ON-SITE SOLAR GENERATION AC SYSTEM DISCONNECT	1	AC DISCONNECT	1 OF EACH AT FUSED AC DISCONNECT COMPLETE VOLTAGE AND CURRENT VALUES ON DISCONNECT LABEL
(E)		1	PV METER SOCKET	1 AT PV METER SOCKET AND ONE DIRECTORY PLACARD
(F)	! WARNING DUAL POWER SOURCE IF GRID SOURCE IS PHOTOVOLTAIC SYSTEM	1	UTILITY METER	1 AT UTILITY METER AND ONE DIRECTORY PLACARD
(G)	SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUTDOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN ARRAY	1	INTERCONNECTION POINT	1 OF EACH AT BUILDING INTERCONNECTION POINT AND ONE DIRECTORY PLACARD
	WARNING: INVERTER OUTPUT CONNECTIONS DO NOT RELOCATE THE OVERCURRENT DEVICE	1	BACKFEED PANEL	1 OF EACH AT BUILDING INTERCONNECTION POINT AND ONE DIRECTORY PLACARD
(H)	NOMINAL OPERATING AC VOLTAGE : 240V NOMINAL OPERATING AC FREQUENCY : 60HZ MAXIMUM AC POWER : 230VA MAXIMUM AC CURRENT : 33.88A MAXIMUM OVERCURRENT DEVICE RATING FOR AC MODULE PROTECTION : 20A	1	AC CURRENT PV MODULES	

EXAMPLES




(A)



(B)



(C)



(D)



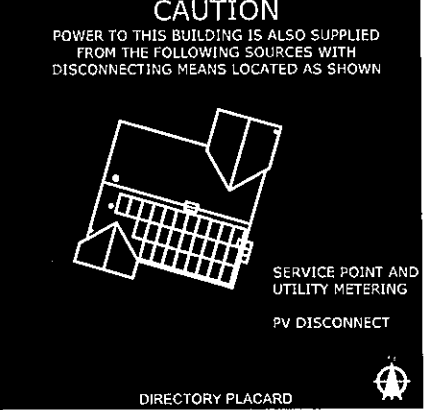
(E)




(F)



(G) BACKFEED



CAUTION
POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTING MEANS LOCATED AS SHOWN
SERVICE POINT AND UTILITY METERING
PV DISCONNECT
DIRECTORY PLACARD



momentum SOLAR

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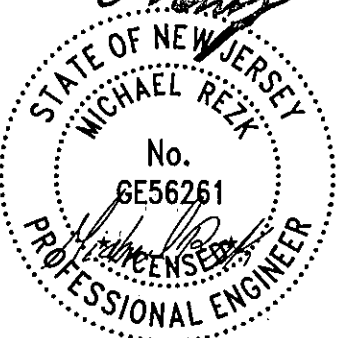
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EQUIPMENT LABELS

PV-4