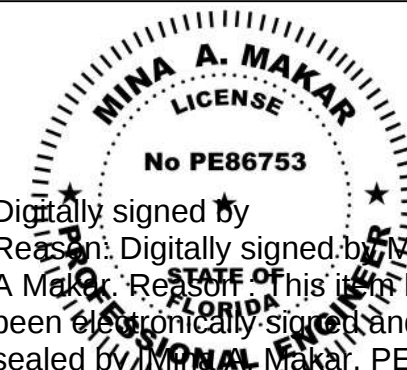


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SOLAR CONTRACTOR

CAMERON CHRISTENSEN
CERTIFIED SOLAR CONTRACTOR LICENSE NUMBER: CVC57036
MOMENTUM SOLAR
5728 MAJOR BLVD. SUITE 307, ORLANDO FL. 32819

CUSTOMER INFORMATION

JOHNNY TRAN - MS132176
586 NORTHWEST OAKMONT WAY
LAKE CITY, FL 32055
6787335731

PV SYSTEM INFORMATION

SYSTEM SIZE (DC): 6.4 KW
16 MODULES: HANWHA Q.PEAK DUO BLK
ML-G10+ 400
16 INVERTERS: ENPHASE
IQ8PLUS-72-2-US

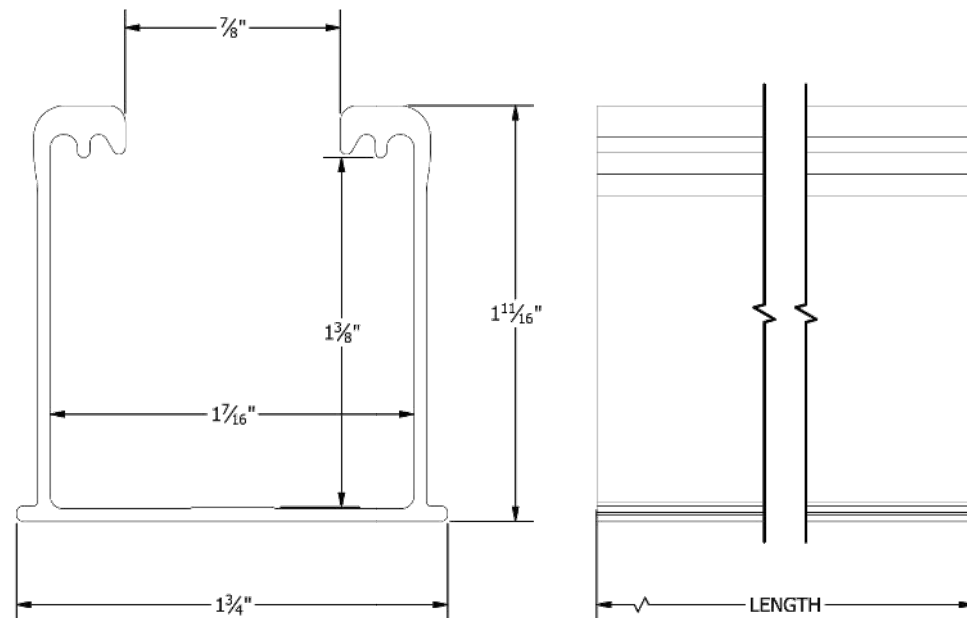
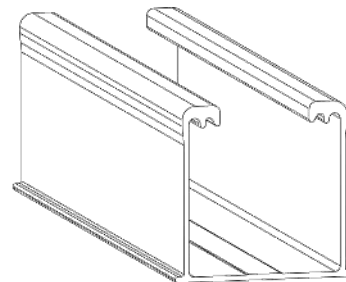
PROJECT INFORMATION

INITIAL	DATE: 7/19/2023	DESIGNER: JT
REV:	DATE:	DESIGNER:
REV:	DATE:	DESIGNER:

ATTACHMENT DETAIL

PV-1.1

PART # TABLE		
P/N	DESCRIPTION	LENGTH
084RLM1	NXT HORIZON RAIL 84" MILL	84"
084RLD1	NXT HORIZON RAIL 84" DARK	84"
168RLM1	NXT HORIZON RAIL 168" MILL	168"
168RLD1	NXT HORIZON RAIL 168" DARK	168"
208RLM1	NXT HORIZON RAIL 208" MILL	208"
208RLD1	NXT HORIZON RAIL 208" DARK	208"
246RLM1	NXT HORIZON RAIL 246" MILL	246"
246RLD1	NXT HORIZON RAIL 246" DARK	246"




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

PRODUCT LINE: NXT HORIZON
DRAWING TYPE: PART DETAIL
DESCRIPTION: RAIL
REVISION DATE: 9/13/2021

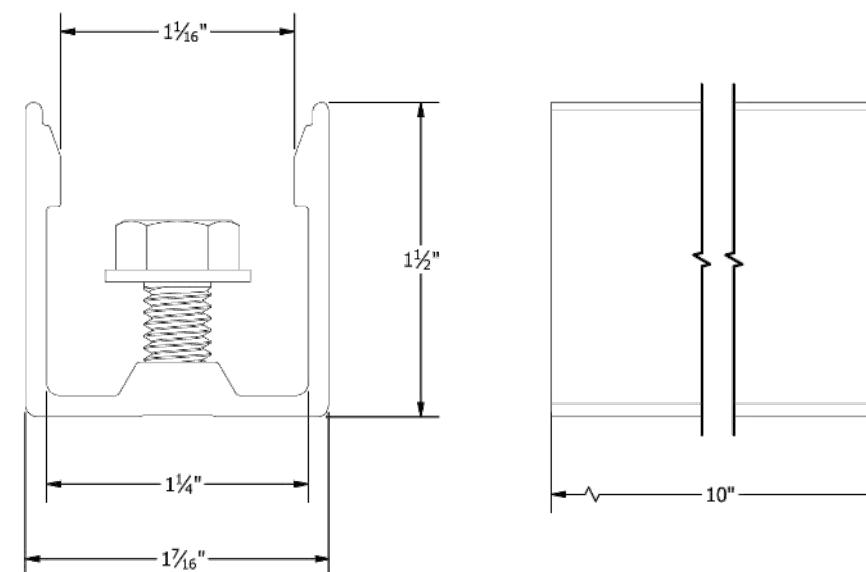
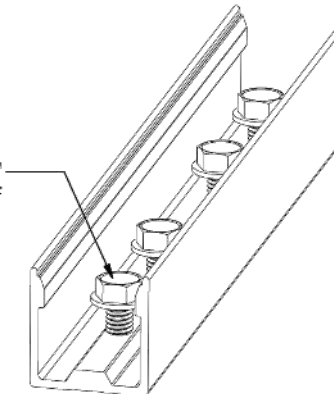
DRAWING NOT TO SCALE
ALL DIMENSIONS ARE
NOMINAL
PRODUCT PROTECTED BY
ONE OR MORE US PATENTS
LEGAL NOTICE

NH-P01

SHEET

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 TYPE: PART DETAIL
DESCRIPTION: RAIL SPLICE
REVISION DATE: 9/22/2021

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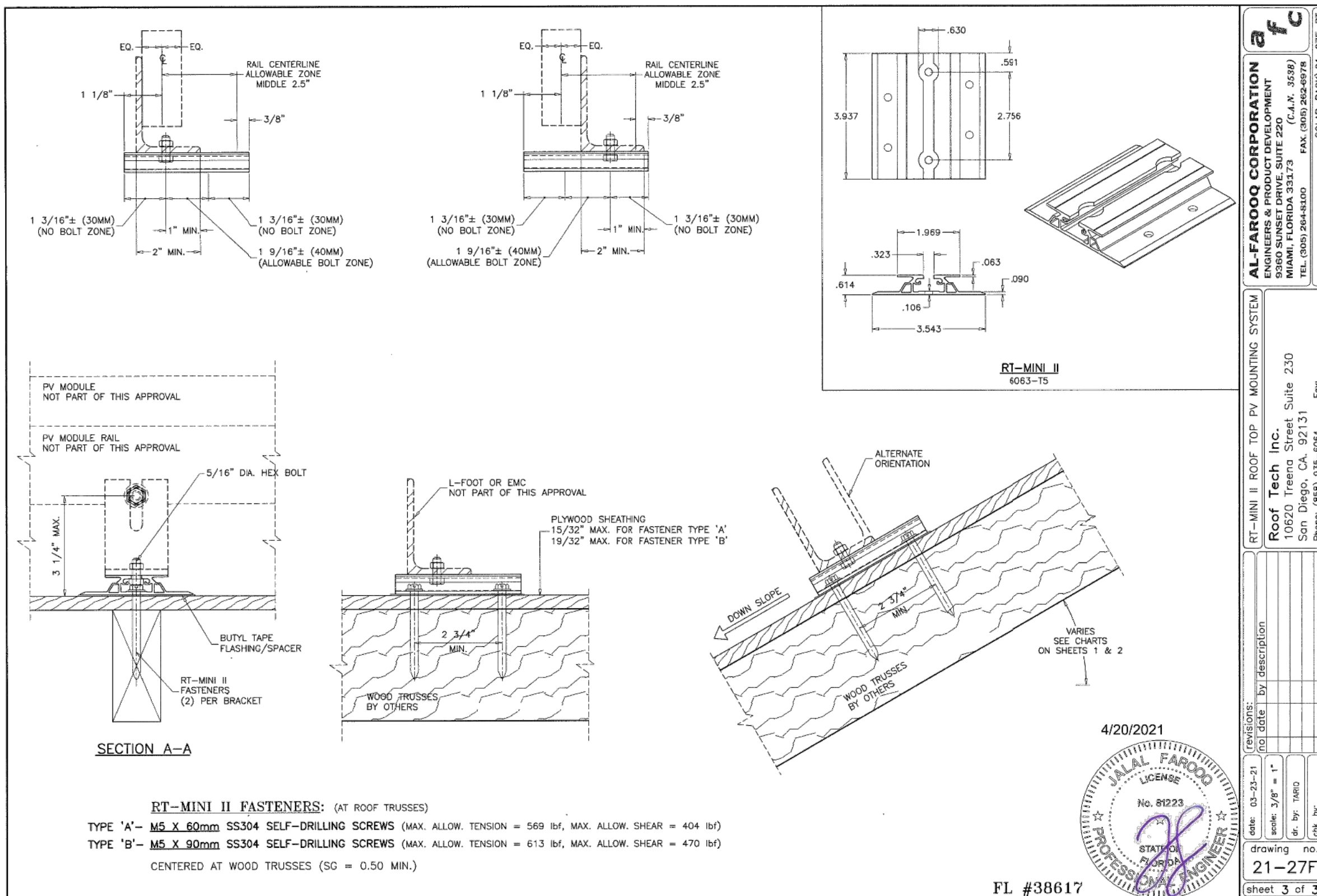
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6787335731

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REV:	DATE:	DESIGNER:
REV:	DATE:	DESIGNER:

PV-1.2



ATTACHMENT DETAIL FOR SHINGLE ROOF

SCALE: 3/32" = 1'-0"

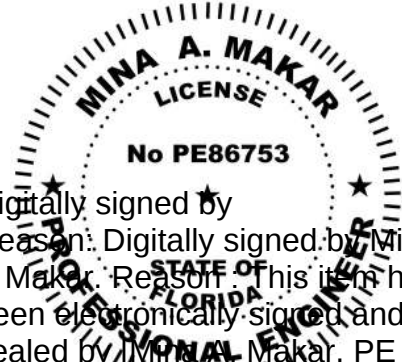


ROOF	PANEL COUNT	TILT	AZIMUTH	SHADING	LANDSCAPE MAX SPAN (ROOF AREA 1/2/3)	PORTRAIT MAX SPAN (ROOF AREA 1/2/3)	LANDSCAPE MAX CANTILEVER	PORTRAIT MAX CANTILEVER
R1	11	25°	179°	100%	48 /32 /32	48 /32 /32	16 /10 /10	16 /10 /10
R2	5	25°	269°	100%	48 /32 /32	48 /32 /32	16 /10 /10	16 /10 /10



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6787335731

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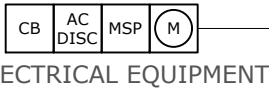
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ML-G10+ 400
16 INVERTERS: ENPHASE
IQ8PLUS-72-2-US

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REV:	DATE:	DESIGNER:
REV:	DATE:	DESIGNER:

ROOF LAYOUT

PV-2



RAFTER SPACING
24" O.C. (TYP)

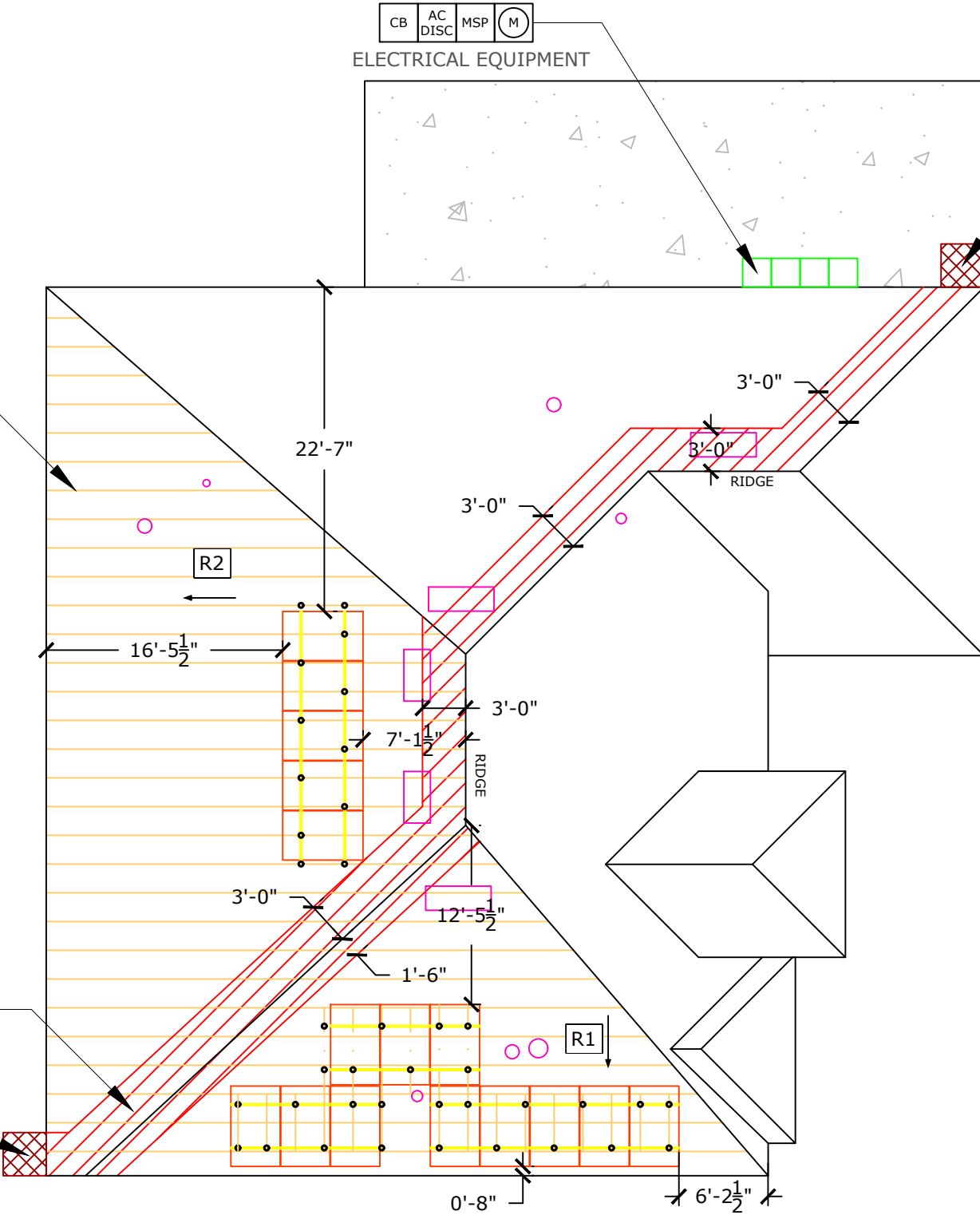
FIRE SETBACK
(36",18" VENTILATION,
36" ROOF ACCESS) (TYP)

GROUND ACCESS
(TYP)

CLAMPING MAX SPACING IN ZONE 1 72" O.C
AND IN ZONE 2 AND ZONE 3 48" O.C

NOTE:

1. ROOF COVERING MATERIAL IS COMPOSED OF SINGLE LAYER ASPHALT COMPOSITE SHINGLE.
2. REFER TO LAYOUT DETAIL DRAWING PV-3 FOR ALL ROOFTOP DIMENSIONS.



GROUND ACCESS
(TYP)

DRIVEWAY

FRONT OF RESIDENCE
NORTHWEST
OAKMONT WAY

SOLAR INSTALLER NOTES:
R1 HAS HORIZONTAL RAFTERS

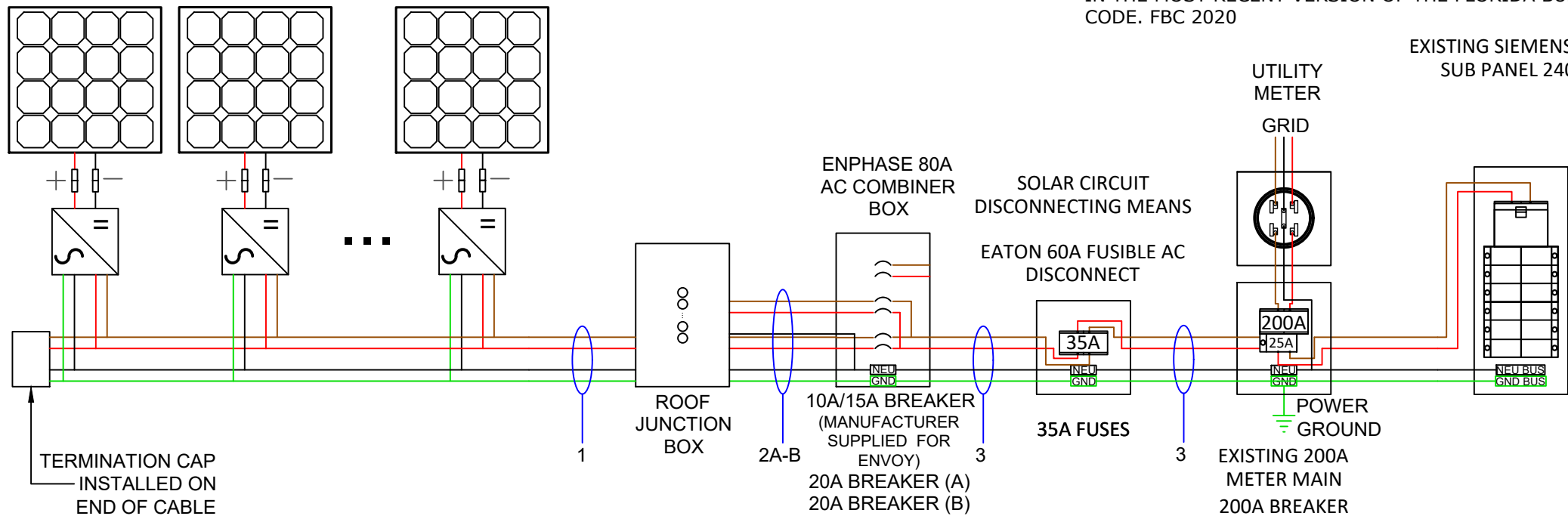
TOTAL SQUARE FOOTAGE OF ROOF: 3958 SQFT
SQUARE FOOTAGE OF SOLAR ARRAY:337.94 SQFT
PERCENTAGE OF SOLAR ROOF COVERAGE: 8.54%
18" RIDGE SETBACK SHALL BE REQUIRED

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		MIN 3'x3' GROUND ACCESS POINT
	MODULE		PITCH DIRECTION
			WIND PRESSURE ZONE LINES. REFER TO PV-2.2 FOR ADDITIONAL INFO

PV MODULE RATINGS			INVERTER RATINGS		VOLTAGE DROP CALCULATIONS								
MODULE MAKE		HANWHA	INVERTER MAKE		ENPHASE	FORMULA USED PER NEC HANDBOOK 215.2(A)(4) WHERE APPLICABLE							
MODEL		Q.PEAK DUO BLK ML-G10+ 400	MODEL		IQ8PLUS-72-2-US	WIRE RUN	V _{mp}	I _{mp}	R	L (FT)	V _o	% V _o	WIRE SIZE
MAX POWER		400W	MAX OUTPUT POWER		290W	BRANCH TO J-BOX	240.00	9.68	1.98	52.67	2.019	0.84%	12 AWG
OPEN CIRCUIT VOLTAGE		45.3V	OPEN DC VOLTAGE		60V	J-BOX TO LOAD CENTER	240.00	19.36	1.24	50.00	2.401	1.00%	10 AWG
MPP VOLTAGE		37.13V	NOMINAL AC VOLTAGE		240V	LOAD CENTER TO AC DISCONNECT	240.00	24.2	0.778	3.00	0.113	0.05%	08 AWG
SHORT CIRCUIT CURRENT		11.14A	MAX AC CURRENT		1.21A	AC DISCONNECT TO INTERCONNECTION	240.00	24.2	0.778	10.00	0.377	0.16%	08 AWG
MPP CURRENT		10.77A	CEC INVERTER EFFICIENCY		97%	NEC 705.12(B)(2)(3)(b) 120% RULE (1.25 x INVERTER OUTPUT) + MAIN OCPD ≤ BUS RATING x 1.20 (1.25 x 19.36) + 200 ≤ 200 x 1.20 IEEE CERTIFICATION STATEMENT							
NUMBER OF MODULES		16	NUMBER OF INVERTERS		16								
UL1703 COMPLIANT		YES	UL1703 COMPLIANT		YES								
SUB PANEL BREAKER SIZE	# OF MODULES	PV BREAKER PER BRANCH	THIS SOLAR PHOTOVOLTAIC SYSTEM COMPLIES WITH THE 2020 FLORIDA BUILDING CODE AND THE 2017 NATIONAL ELECTRICAL CODE										
	UP TO 16	20A											

16 HANWHA Q.PEAK DUO BLK ML-G10+ 400 400W MODULES PAIRED WITH
16 ENPHASE IQ8PLUS-72-2-US MICRO-INVERTERS



NEC 705.12(B)(2)(3)(b) 120% RULE
 $(1.25 \times \text{INVERTER OUTPUT}) + \text{MAIN OCPD} \leq \text{BUS RATING} \times 1.20$
 $(1.25 \times 19.36) + 200 \leq 200 \times 1.20$

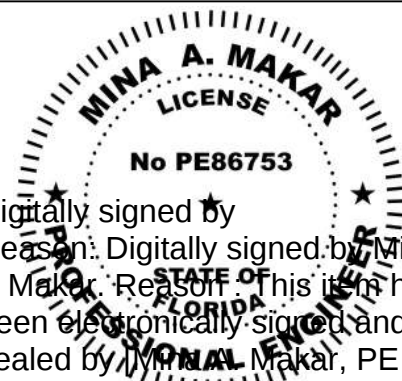
FSEC CERTIFICATION STATEMENT:

PER FL. STATUE 377.705 , I, MINA A. MAKAR PE# 86753,
 CERTIFICATE OF AUTHORIZATION #33404, AN ENGINEER
 LICENSED PURSUANT TO CHAPTER 471,CERTIFY THAT THE PV
 ELECTRICAL SYSTEM AND ELECTRICAL COMPONENTS ARE
 DESIGNED AND APPROVED USING THE STANDARDS CONTAINED
 IN THE MOST RECENT VERSION OF THE FLORIDA BUILDING
 CODE. FBC 2020



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ML-G10+ 400
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REV:	DATE:	DESIGNER:
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THREE LINE DIAGRAM

PV-3

[illegible]

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

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). THE GROUND IS CARRIED AWAY FROM THE GROUNDING LUG USING #6 BARE COPPER WIRE OR #8 THWN-2 COPPER WIRE.
3. THIS SYSTEM COMPLIES WITH NEC 2017
4. BRANCH CIRCUIT CALCULATION FOR WIRE TAG 1 DISPLAYS THE LARGEST BRANCH CIRCUIT IN SYSTEM. OTHER BRANCH CIRCUITS SHALL HAVE LOWER DESIGN CURRENT THAN THE ONE SHOWN. IN ADDITION, VOLTAGE DROP CALCULATIONS FROM PANELS TO THE COMBINER BOX SHALL BE SHOWN IN A SIMILAR FASHION
5. ALL CONDUCTORS ARE SIZED BASED ON NEC 2017 ARTICLE 310
6. ALL EQUIPMENT INSTALLED IS RATED AT 75°C
7. INVERTER NOC (NOMINAL OPEN CURRENT) OBTAINED FROM EQUIPMENT DATASHEET
8. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL LOCAL AND NATIONAL CODE REQUIREMENTS.
9. EACH MODULE MUST BE GROUNDED ACCORDING TO USER INSTRUCTIONS
10. ALL EQUIPMENT SHALL BE LISTED PER NEC 690.4(B)
11. PER NEC 690.13, 690.15, PROVIDE A WARNING SIGN AT ALL LOCATIONS WHERE TERMINALS OF THE DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION> SIGN SHALL READ *WARNING - ELECTRIC SHOCK HAZARD - DO NOT TOUCH TERMINALS - OR EQUIVALENT.
12. PER NEC 705.10, PROVIDE A PERMANENT PLAQUE OR DIRECTORY SHOWING ALL ELECTRIC POWER SOURCES ON THE PREMISES AT SERVICE ENTRANCE.
13. INTERCONNECTION METHOD SHALL COMPLY WITH NEC 705.12
14. AND OPTION FOR A SINGLE CIRCUIT BRANCH TO BE SPLIT INTO TWO SUB-CIRCUIT BRANCHES IS ACCEPTABLE.
15. ALL CONDUCTORS MUST BE COPPER.
16. NEUTRAL AND EQUIPMENT GROUNDING CONDUCTOR BONDED AS PER NEC 250.24(C).
17. EQUIPMENT GROUNDING CONDUCTOR IS CONNECTED TO A GROUNDING ELECTRODE SYSTEM PER 250.54(D).
18. FUSES FOR PV DISCONNECT HAVE AIC RATINGS OF 200KA AC AND 20KA DC.
19. SUPPLY SIDE CONNECTION SHALL BE MADE USING ILSKO INSULATION PIERCING CONNECTORS (IPC). MAKE, MODEL, AND RATING OF INTERCONNECTION CAN BE SEEN ON TABLE 1 BELOW.
20. METHOD OF INTERCONNECTION CAN BE SEEN IN FIGURE 1.
21. UTILITY HAS 24-HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE.

22. WORKING CLEARANCES AROUND THE EXISTING AND NEW ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH NEC ARTICLE 110.26.
23. CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC ARTICLE 300.6 (C)(1) AND ARTICLE 310.8 (D).
24. CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC ARTICLE 310.10 (C).
25. TOTAL AREA OF ALL CONDUCTORS, SPLICES, AND TAPS INSTALLED AT ANY CROSS SECTION OF THE WIRING DOES NOT EXCEED 75% OF THE CROSS SECTIONAL AREA OF THE SPACE. NEC 312.8(A)(2).
26. SYSTEM IS CONSIDERED AN AC MODULE SYSTEM. NO DC CONDUCTORS ARE PRESENT IN CONDUIT, COMBINER, JUNCTION BOX, DISCONNECT. AND COMPLIES WITH 690.6 - NO DC DISCONNECT AND ASSOCIATED DC LABELING ARE REQUIRED.
27. SYSTEM COMPLIES WITH 690.12 RAPID SHUTDOWN AND ASSOCIATED LABELING AS PER 690.56(C). AC VOLTAGE AND SYSTEM OPERATING CURRENT SHALL BE PROVIDED 690.52.
28. CONDUCTORS IN CONDUIT ARE AC CONDUCTORS BRANCH CIRCUITS AND NOT PV SOURCE CIRCUITS. 690.6.
29. ALL GROUNDING SHALL COMPLY WITH 690.47(A) IN THAT THE AC MODULES WILL COMPLY WITH 250.64.
30. NO TERMINALS SHALL BE ENERGIZED IN THE OPEN POSITION IN THIS AC MODULE SYSTEM 690.13, 690.15, 690.6.
31. WHERE APPLICABLE: INTERCONNECTION SHALL COMPLY WITH 705.12(A) OR 705.12(B)
32. ALL WARNING SIGN(S) OR LABEL(S) SHALL COMPLY WITH 2017 NEC ARTICLE 110.21(B). LABEL WARNINGS SHALL ADEQUATELY WARN OF THE HAZARD. LABELS SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT, AND LABELS REQUIRED SHALL BE SUITABLE FOR THE ENVIRONMENT.
33. PV POWER CIRCUIT LABELS SHALL APPEAR ON EVERY SECTION OF THE WIRING SYSTEM THAT IS SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS.

TABLE 1:

MAKE	MODEL	VOLTAGE RATING	CONDUCTOR RANGE MAIN	CONDUCTOR RANGE TAP
ILSCO	IPC 4006	600 V	4/0-4 AWG	6-14 AWG
ILSCO	IPC 4020	600 V	4/0-2 AWG	2/0-6 AWG

INSTRUCTIONS FOR LINE TAPS

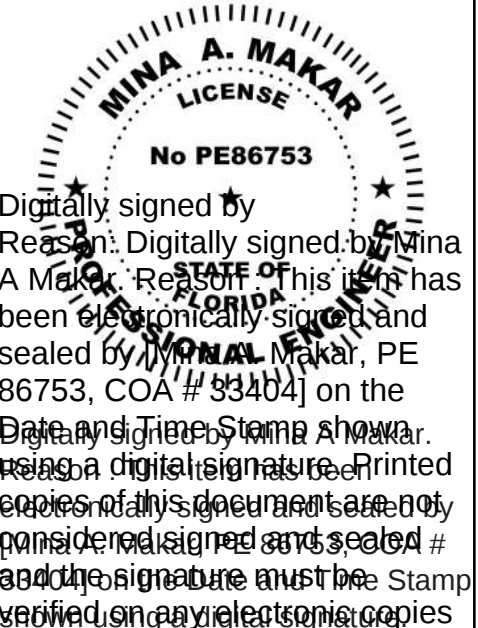
FIGURE 1:

1. ADJUST THE CONNECTOR NUT TO SUITABLE LOCATION
2. PUT THE BRANCH WIRE INTO THE CAP SHEATH FULLY
3. INSERT THE MAIN WIRE, IF THERE ARE TWO LAYS OF INSULATED LAY IN THE MAIN CABLE, SHOULD STRIP A CERTAIN LENGTH OF THE FIRST INSULATED LAY FROM INSERTED END
4. TURN THE NUT BY HAND, AND FIX THE CONNECTOR IN SUITABLE LOCATION.
5. SCREW THE NUT WITH THE SLEEVE SPANNER.
6. SCREW THE NUT CONTINUALLY UNTIL THE TOP PART IS CRACKED AND DROPPED DOWN



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ELECTRICAL CONT.

PV-3.1

