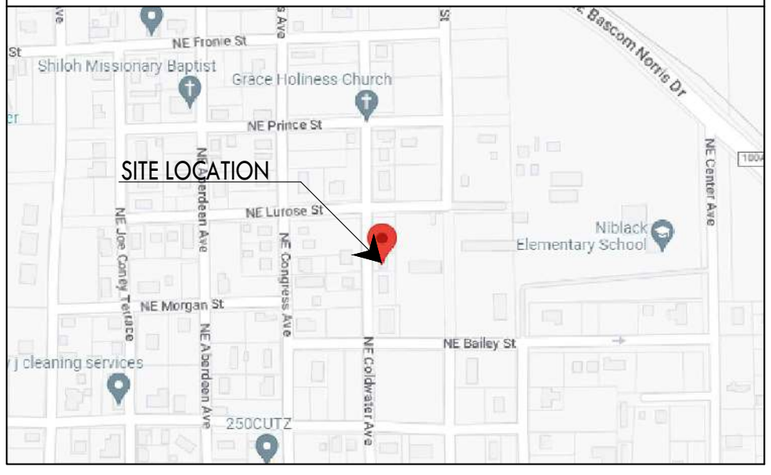
SYSTEM DESIGN	
SYSTEM TYPE	UTILITY GRID INTERACTIVE
RATED DC POWER	5950 W
RATED AC POWER	5917 W
PV MODULE	LONGI 350 W x (17)
INVERTER(S)	DURACELL D700-M2 x (8), D350-M1 x (1)
ENERGY STORAGE SYSTEM	NONE
STORAGE CAPACITY	N/A
EXISTING ELECTRICAL	120/240 VAC, 1ϕ

GOVERNING CODES & STANDARDS
2020 FLORIDA BUILDING CODE (7TH EDITION)
2020 FLORIDA RESIDENTIAL CODE (7TH EDITION)
2017 NATIONAL ELECTRIC CODE (NFPA 70)
SEI/ASCE 7-16
UNDERWRITERS LABORATORIES STANDARDS (UL)

SITE SPECIFICATIONS	
WIND SPEED (Vult)	120 MPH
WIND EXPOSURE	B
RISK CATEGORY	II
GROUND SNOW LOAD	0 PSF
MOUNTING METHOD	ROOF-MOUNTED (FLUSH)

SITE LOCATION MAP



A SOLAR PV SYSTEM IMPROVEMENT FOR:
ROBERSON RESIDENCE

SOLAR IMPROVEMENT CONSTRUCTION DOCUMENTS FOR THE EXISTING RESIDENTIAL GRID TIED ELECTRICAL SYSTEM

BILL OF MATERIALS	
17	LONGI 350 W MODULES
0	DURACELL D1500-M4 MICROINVERTERS
8	DURACELL D700-M2 MICROINVERTERS
1	DURACELL D350-M1 MICROINVERTERS
9	DURACELL CABLE CONNECTORS
2	DURACELL AC BUS CABLE
2	DURACELL END CAPS
9	IRONRIDGE MICROINVERTER MOUNTING KITS
2	IRONRIDGE XR-100 RAILS - 17 FT.
6	IRONRIDGE XR-100 RAILS - 14 FT.
0	IRONRIDGE XR-100 RAILS - 11 FT.
4	IRONRIDGE XR-100 SPLICE KITS
8	IRONRIDGE XR-100 END CAPS
8	IRONRIDGE UFO END SLEEVES
38	IRONRIDGE UFO CLAMPS
22	S-5! PROTEA BRACKET
2	GROUND LUGS
1	NEMA 3R ROOF JUNCTION BOX

PLAN SHEET DESCRIPTION	
PV.0	COVER SHEET
PV.1	PHOTOVOLTAIC MODULE LAYOUT & ROOF PLAN
PV.2	STRUCTURAL ATTACHMENT DETAILS - PITCHED
PV.3	ELECTRICAL DIAGRAM & SCHEDULES
PV.4	ELECTRICAL NOTES & WARNING LABELS

Columbia County Building Department
Plans Reviewed for Code Compliance
State of Florida

Digitally signed by John L Antonelli
Date: 2023.04.12 '09:06:54 -04'00

UMA SOLAR
950 SUNSHINE LN, ALTAMONTE SPRINGS, FL
WWW.UMASOLAR.COM
ENGINEERING@UMASOLAR.COM

REV	DATE	REMARK	BY

PROJECT:
PHOTOVOLTAIC SOLAR ENERGY SYSTEM
PROJECT NAME: ROBERSON RESIDENCE
PROJECT ADDRESS: 861 NE COLDWATER AVE.
LAKE CITY, FL 32055

DATE	4/11/23
DRAWN BY:	JLL
CHECKED BY:	JLA
REC. NO. #	29127
SCALE	AS NOTED

DRAWING #
PV.0
SHEET 1 OF 5

JOHN LOUIS ANTONELLI LICENSE No. 81305 STATE OF FLORIDA PROFESSIONAL ENGINEER

This item has been electronically signed and sealed by John Louis Antonelli PE using a Digital Signature and date. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

ICON LEGEND

M	ELECTRIC METER		INVERTER
MSP	MAIN SERVICE PANEL		ROOF WIND ZONE 3
LC	LOAD CENTER		ROOF OBSTACLE
PLP	PROTECTED LOADS PANEL		FIRE SETBACK ZONE
CBP	COMBINER PANEL		MOUNTING RAIL
	JUNCTION BOX		MOUNTING POINT
	AC DISCONNECT		CONDUIT
	TRANSFER SWITCH		MIN. ROOF EDGE DIST.
3	WIND ZONE LABEL		MODULE EXPOSURE LINE
	WIND ZONE BOUNDARY	X	EXPOSED MODULE LABEL

EXISTING ROOF NOTES

1. EXISTING ROOF IS CORRUGATED METAL ROOFING OVER WOOD DECKING & MINIMUM 2X4 S.Y.P. WOOD TRUSSES.
   - NOTE: ROOF CONSTRUCTION IS BASED ON INFORMATION PROVIDED TO THE DESIGNER. ALL ROOF PENETRATIONS SHALL BE FLASHED AND/OR SEALED USING APPROVED PRODUCTS & METHODS PER LOCAL GOVERNING CODE.
2. ROOFTOP SOLAR COMPONENTS REPRESENT A GRAVITY LOAD OF 3 PSF.
   - PV MODULES = 2.5 PSF
   - MOUNTING EQUIPMENT = 0.25 PSF
   - MISCELLANEOUS ACCESSORIES = 0.25 PSF
3. EXISTING ROOF IS ASSUMED TO BE DESIGNED FOR A MINIMUM LIVE LOAD OF 20 PSF. PER FBC 1607.12.5.1 ROOF SURFACES COVERED BY SOLAR PV MODULES SHALL BE CONSIDERED INACCESSIBLE AND, THUS, THE LOAD IMPOSED BY THE SOLAR PV MODULES WOULD BE LESS THAN THE LIVE LOAD RATING & ABLE TO SUSTAIN THE ADDITIONAL GRAVITY LOAD IMPOSED BY THE SOLAR PV MODULES AND ASSOCIATED ATTACHMENTS.
4. MODULE LOCATION ON ROOF MAY BE ALTERED IN THE FIELD SO LONG AS EQUIPMENT IS MOUNTED AS SHOWN ON SHEET PV.2.

2020 FRC R324.6 ROOF ACCESS REQUIREMENTS

R324.6 ROOF ACCESS AND PATHWAYS
EXCEPTIONS:

1. DETACHED, NON-HABITABLE STRUCTURES SHALL NOT BE REQUIRED TO PROVIDE ROOF ACCESS.
2. ROOF ACCESS, PATHWAYS, & SETBACKS NEED NOT BE PROVIDED WHERE THE CODE OFFICIAL HAS DETERMINED THAT ROOFTOP OPERATIONS WILL NOT BE EMPLOYED.
3. THESE REQUIREMENTS SHALL NOT APPLY TO ROOFS WITH SLOPES OF 2:12 (17% SLOPE) OR LESS.

R324.6.1 PATHWAYS

1. (2) OR MORE 36" PATHWAYS ON SEPARATE ROOF PLANES FROM EAVE TO RIDGE.
2. (1) OR MORE 36" PATHWAYS ON ROOF PLANES ADJACENT TO THE STREET OR DRIVEWAY.
3. (1) OR MORE 36" PATHWAYS ON ROOF PLANES WITH PV ARRAYS EITHER ON, ADJACENT TO, OR STRADDLING THE SAME & ADJACENT ROOF PLANES FROM EAVE TO RIDGE.

R324.6.2 SETBACK AT RIDGE

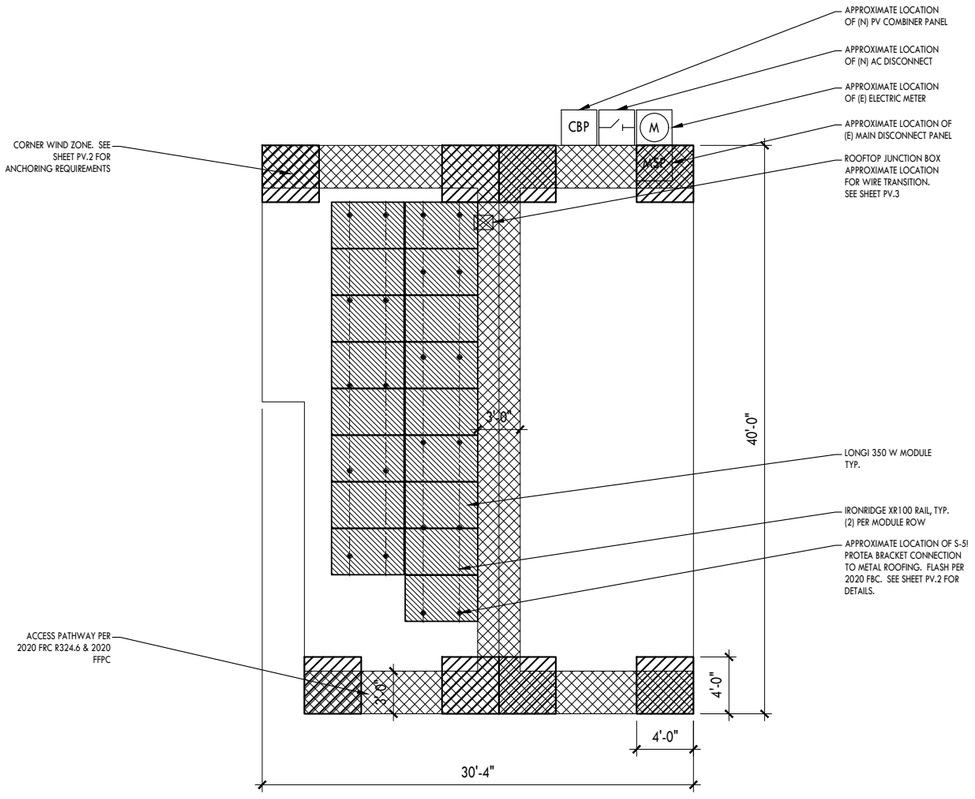
FOR PV ARRAYS OCCUPYING < 33% OF THE PLAN VIEW TOTAL ROOF AREA, A MIN. 18" CLEAR SETBACK IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE. FOR PV ARRAYS OCCUPYING > 33% OF THE PLAN VIEW TOTAL ROOF AREA, A MIN. 36" CLEAR SETBACK IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE.

R324.6.2.2 EMERGENCY ESCAPE AND RESCUE OPENING

PANELS AND MODULES INSTALLED ON DWELLINGS SHALL NOT BE PLACED ON THE PORTION OF A ROOF THAT IS BELOW AN EMERGENCY ESCAPE AND RESCUE OPENING. A MIN. 36" PATHWAY SHALL BE PROVIDED TO THE EMERGENCY ESCAPE AND RESCUE OPENING.

ROOF LAYOUT NOTES

ROOF LAYOUT SHOWN MAY BE ADJUSTED IN THE FIELD BY THE INSTALLER TO ACCOUNT FOR ISSUES CAUSED BY ROOF OBSTACLES, TRUSS ALIGNMENT, OR SHADING. SO LONG AS THE MODULES ARE MOUNTED AND SECURED TO THE ROOF AS SHOWN ON PV.2 THE LAYOUT MAY BE ALTERED AND ALL ROOF ORIENTATIONS MAY BE UTILIZED.



PHOTOVOLTAIC MODULE LAYOUT & ROOF PLAN

SCALE: $\frac{3}{32}$" = 1'-0"

1 / PV.1

STRUCTURAL CERTIFICATION STATEMENT

THE INSTALLATION OF THE MODULES IS IN COMPLIANCE WITH FBC: RESIDENTIAL 2020 7th ED., CHAPTER 3 AND FBC: BUILDING 2020 7TH ED., CHAPTER 16 (WHICHEVER GOVERNS). BUILDING STRUCTURE WILL SAFELY ACCOMMODATE WIND LATERAL AND UPLIFT FORCES, AND EQUIPMENT DEAD LOADS.

UMA SOLAR
950 SUNSHINE LN, ALTAMONTE SPRINGS, FL
WWW.UMASOLAR.COM
ENGINEERING@UMASOLAR.COM

REV	DATE	REMARK	BY

PROJECT:

PHOTOVOLTAIC SOLAR ENERGY SYSTEM
PROJECT NAME: ROBERSON RESIDENCE
PROJECT ADDRESS: 861 NE COLDWATER AVE.
LAKE CITY, FL 32055

DATE	4/11/23
DRAWN BY:	JLL
CHECKED BY:	JLA
REC. NO. #	29127
SCALE	AS NOTED

DRAWING #
PV.1
SHEET 2 OF 5

N

Digitally signed by John L Antonelli
Date: 2023.04.12 '09:07:10 -04'00

JOHN LOUIS ANTONELLI LICENSE No. 81305 STATE OF FLORIDA PROFESSIONAL ENGINEER

LI, P.E.

This item has been electronically signed and sealed by John Louis Antonelli PE using a Digital Signature and date. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

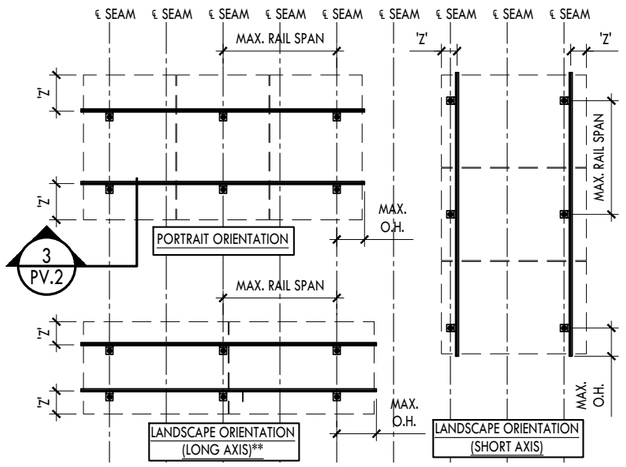
PHOTOVOLTAIC MODULE GENERAL NOTES:

1. APPLICABLE CODES & STANDARDS:
   - 2020 FLORIDA BUILDING CODE (7TH EDITION)
   - 2020 FLORIDA RESIDENTIAL CODE (7TH EDITION)
   - ASCE-7-16 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.
2. ALL FASTENERS & ANCHOR BOLTS THIS SHEET SHALL BE STAINLESS STEEL OR OTHERWISE CORROSION-RESISTANT.
3. ROOF SEALANTS SHALL CONFORM TO ASTM C920 AND ASTM 6511, AND IS THE RESPONSIBILITY OF THE CONTRACTOR TO PILOT FILL ALL HOLES. CONTRACTOR SHALL ENSURE ALL ROOF PENETRATIONS TO BE INSTALLED AND SEALED PER 2020 FLORIDA RESIDENTIAL CODE (7TH EDITION) OR LOCAL GOVERNING CODE.
4. THIS SHEET REFLECTS STRUCTURAL CONNECTIONS ONLY.
5. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER INSTRUCTIONS.

SITE, MODULE, & ANCHOR INFORMATION								
Vult	120 MPH	ROOF		MODULE		ANCHOR TYP.	S-5! PROTEA BRACKET TO ROOF TYP.
V	93 MPH	MEAN HEIGHT	15'-0"	WIDTH	40.94"		
RISK CAT.	I	TYP.	GABLE	LNGTH	69.09"		
EXP.	B	PITCH	5/12	MOUNTING	SHORT-SIDE		

WIND LOAD & RAIL SPAN INFORMATION								
ZONE	NON-EXPOSED MODULES				EXPOSED MODULES			
	WIND LOAD (PSF)		SPAN	OVERHANG	WIND LOAD (PSF)		SPAN	OVERHANG
	(+)	(-)			(+)	(-)		
1'	---	---	---	---	---	---	---	---
1	16.0	-16.0	94.2"	37.7"	16.0	-17.2	92.5"	37"
2	---	---	---	---	---	---	---	---
2e	16.0	-16.0	94.2"	37.7"	16.0	-17.2	92.5"	37"
2n	16.0	-16.0	93.1"	37.3"	16.0	-24.9	75.2"	30.1"
2r	16.0	-16.0	93.1"	37.3"	16.0	-24.9	75.2"	30.1"
3	---	---	---	---	---	---	---	---
3e	16.0	-18.9	90.4"	36.2"	16.0	-26.8	66.4"	26.5"
3r	16.0	-16.0	93.1"	37.3"	16.0	-24.9	75.2"	30.1"

- PLUS AND MINUS SIGNS SIGNIFY PRESSURES ACTING TOWARD AND AWAY FROM SURFACES, RESPECTIVELY.
- SEE DETAIL BELOW FOR WIND ZONE LOCATIONS. "---" IN TABLE INDICATE CONDITIONS WHERE INSTALLATION IS NOT ALLOWABLE OR NOT RELEVANT TO THE ROOF TYPE IN QUESTION.
- EXPOSED MODULES ARE THOSE DEFINED BY ASCE 7-16 29.4.4. SEE SHEET PV.1 FOR ALL EXPOSED MODULE LOCATIONS, IF THEY EXIST.
- SCHEDULE REFLECTS COMPONENTS AND CLADDING (C&C) NOMINAL WIND PRESSURES WITH EXPOSURE AS NOTED, RISK CATEGORY II, ENCLOSED BUILDING AND h < 60'-0" PER ASCE 7-16 AND 2020 FLORIDA BUILDING CODE.
-FOR LAG BOLTS, DEPTH REQUIRED IN WOOD MEMBER SHALL EXCLUDE ANY ROOF DECKING THICKNESS.

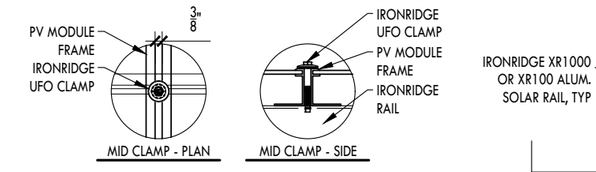


NOTES:
1. SEE SCHEDULE THIS SHEET FOR MAXIMUM RAIL SPAN.
2. SEE SCHEDULE THIS SHEET FOR MAX. RAIL OVERHANG. MAX. O.H. IS RAIL SPAN X 0.40.
3. 'Z' IS ALLOWABLE DISTANCE BETWEEN RAIL AND MODULE EDGE PER MODULE MANUFACTURER.
** LONG AXIS MOUNTING NOT ALLOWED FOR ALL MODULES. CHECK MANUFACTURER REQUIREMENTS.

TYPICAL PHOTOVOLTAIC MODULE MOUNTING PLANS

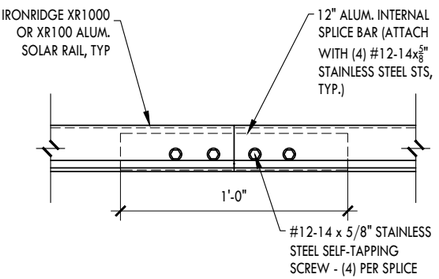
SCALE: $\frac{3}{16}$"=1'-0"

2 PV.2



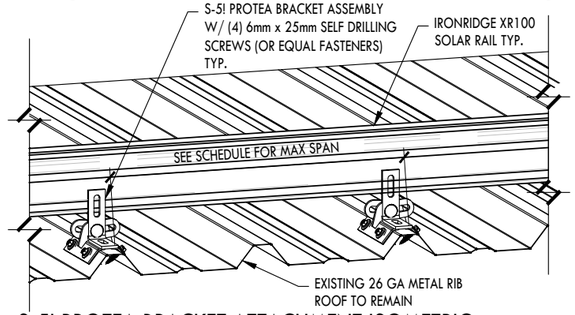
END & MID CLAMP CONNECTION DETAILS

SCALE: 1 $\frac{1}{2}$"=1'-0"



TYPICAL SOLAR RAIL BEAM SPLICE DETAIL

SCALE: 1 $\frac{1}{2}$"=1'-0"

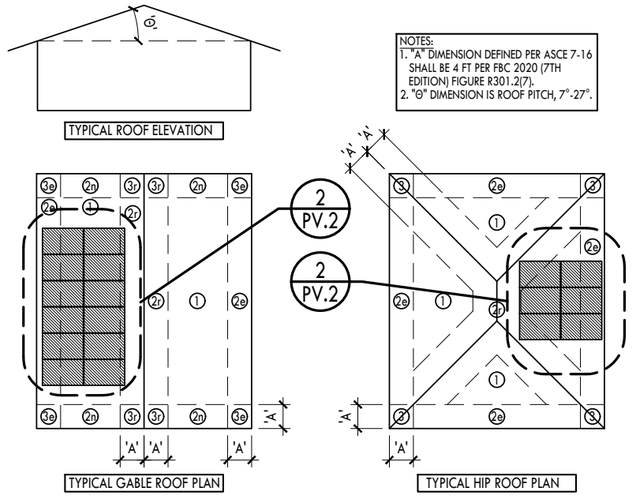


S-5! PROTEA BRACKET ATTACHMENT ISOMETRIC

SCALE: N.T.S.

SEE DETAILS THIS SHEET FOR APPROVED MOUNTING HARDWARE

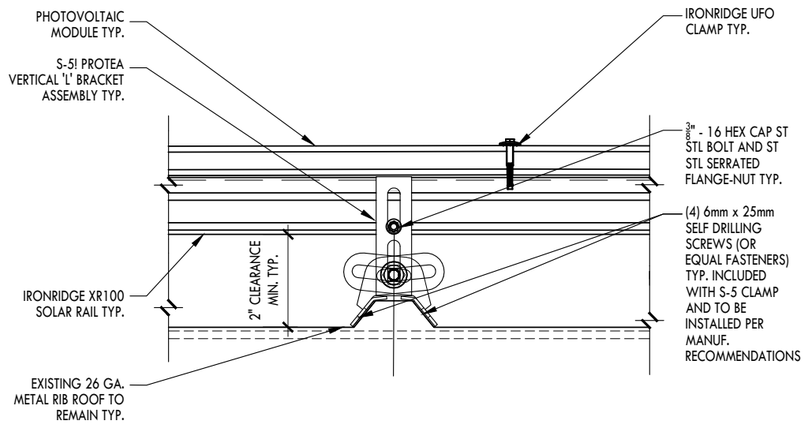
SEE DETAILS THIS SHEET FOR APPROVED MOUNTING HARDWARE



TYPICAL PHOTOVOLTAIC MODULE LAYOUT - HIP & GABLE ROOFS - ROOF WIND ZONE PLAN

SCALE: N.T.S.

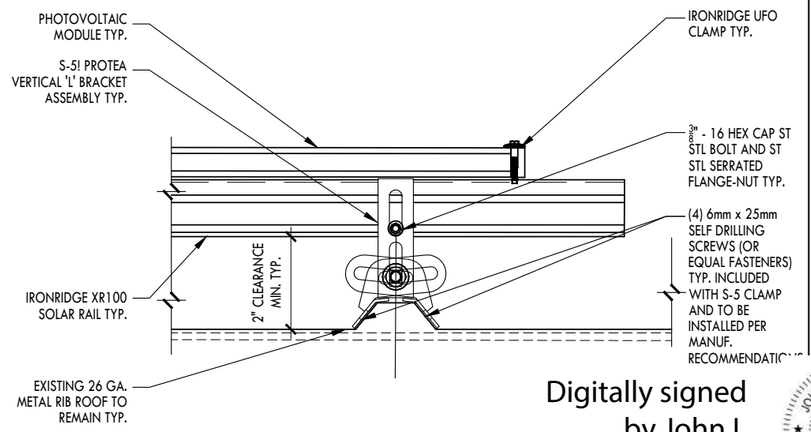
1 PV.2



TYPICAL PV RAIL INTERMEDIATE CONNECTION DETAIL

SCALE: 1 $\frac{1}{2}$"=1'-0"

3 PV.2



TYPICAL PV RAIL END CONNECTION DETAIL

SCALE: 1 $\frac{1}{2}$"=1'-0"

4 PV.2

UMA SOLAR
950 SUNSHINE LN, ALTAMONTE SPRINGS, FL
WWW.UMASOLAR.COM
ENGINEERING@UMASOLAR.COM

REV	DATE	REMARK	BY

PROJECT:

PHOTOVOLTAIC SOLAR ENERGY SYSTEM
PROJECT NAME: ROBERSON RESIDENCE
PROJECT ADDRESS: 861 NE COLDWATER AVE.
LAKE CITY, FL 32055

DATE	4/11/23
DRAWN BY:	JLL
CHECKED BY:	JLA
REC. NO. #	29127
SCALE	AS NOTED

DRAWING #
PV.2
SHEET 3 OF 5

Digitally signed by John L Antonelli
Date: 2023.04.12 '09:07:28 -04'00

JOHN LOUIS ANTONELLI LICENSE No. 81305 STATE OF FLORIDA PROFESSIONAL ENGINEER

This item has been electronically signed and sealed by John Louis Antonelli PE using a Digital Signature and date. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

PHOTOVOLTAIC SYSTEM POWER TABLE								
DC-SIDE	PV MODULE	DC-INPUT	AC-SIDE	MICROINVERTER 'A'	MICROINVERTER 'B'	BRANCH NO. 1	BRANCH NO. 2	HOME RUN
MODULE QTY.	1	1	QTY.	1	1	4 'A' / 1 'B'	4 'A'	17
SERIES	1	1	MODEL	D700-M2	D350-M1	---	---	---
PARALLEL	1	1	MANUFACTURER	DURACELL	DURACELL	---	---	---
MANUFACTURER	LONGi SOLAR	---	CONT. POWER	696 W	349 W	3133 W	2784 W	5917 W
MODEL	LR4-60HPB-350M	---	VOLTAGE	240 VAC	240 VAC	240 VAC	240 VAC	240 VAC
RATED POWER	350 W	350 W	CONT. CURRENT	2.90 A AC	1.45 A AC	13.05 A AC	11.60 A AC	24.65 A AC
Voc	40.40 VDC	40.40 VDC	FREQUENCY	60 HZ	60 HZ	60 HZ	60 HZ	60 HZ
Isc	11.16 ADC	11.16 ADC	MODULE QTY.	2	1	9	8	17
Vmpp	34.40 VDC	34.40 VDC	MAX. BRANCH	8	16	---	---	---
Impp	10.18 ADC	10.18 ADC	OCPD RATING	---	---	20 A	20 A	40 A

** MODULE CHARACTERISTICS AT STC: CELL TEMPERATURE @ 25° C, SPECTRUM AM1.5, IRRADIANCE @ 1000 W/M²

WIRE & CONDUIT SCHEDULE									
CIRCUIT	TYPE	MIN. CONDUIT SIZE	PHASE CONDUCTOR		NEUTRAL CONDUCTOR		GROUND CONDUCTOR		MAX. CIRCUIT LENGTH
			QTY.	SIZE (AWG)	QTY.	SIZE (AWG)	QTY.	SIZE (AWG)	
1	AC	---	2/BRANCH	#10	---	---	1	#10	121'
2	AC	3/4"	4	#10	---	---	1	#8	121'
3	AC	3/4"	2	#8	1	#8	1	#8	140'
4	AC	3/4"	2	#8	1	#8	---	---	140'

1. CONDUCTOR & CONDUIT SIZES SHOWN ARE MINIMUM REQUIRED. LARGER SIZES MAY BE USED.
2. ALL CONDUCTORS SHALL BE THHN OR THWN-2 UNLESS OTHERWISE NOTED.
3. MAXIMUM CIRCUIT LENGTHS ARE BASED ON A MAXIMUM 2% VOLTAGE DROP.
4. MICROINVERTER OUTPUT CIRCUIT MAY BE ROMEX, UF CABLE, ETC. IF RUN INDOORS. ADHERE TO WIRE SIZE SHOWN.

NOTES:
1. REFER TO SHEET PV.4 FOR ALL APPLICABLE ELECTRICAL NOTES.
2. SYSTEM MEETS REQUIREMENTS OF NEC 2017 690.12 FOR RAPID SHUTDOWN. INSTALL PER MANUFACTURER INSTRUCTIONS.
3. ALL CONDUCTORS SHALL BE COPPER UNLESS NOTED OTHERWISE. MINIMUM CONDUCTOR SIZES SHOWN THIS SHEET.
4. THIS SHEET IS DIAGRAMMATIC IN NATURE AND MAY NOT DEPICT ALL REQUIRED COMPONENTS OR CIRCUITS AS THEY MAY EXIST. THE PURPOSE OF THIS DIAGRAM IS TO SHOW THE MAJOR POWER SYSTEM COMPONENTS AND CIRCUITS. CONSULT EQUIPMENT MANUFACTURERS' INSTALLATION MANUALS PRIOR TO INSTALLATION AND COMMISSIONING.

SUPPLY SIDE TAP NOTES:
1. CONNECTION SHALL BE MADE USING ILSCO INSULATION PIERCING CONNECTORS (IPC), OR EQUAL APPROVED COMPONENTS. MAKE, MODEL, AND RATING OF INTERCONNECTION SHALL BE EQUAL TO, OR GREATER THAN, OUTPUT RATING OF PV SYSTEM.
2. THE 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(2).
3. SUPPLY SIDE TAPS ARE NOT PERMISSIBLE ON METER/MAIN COMBINATION PANELS.

NOTE: INSTALL & WIRE ALL ENPHASE EQUIPMENT PER MANUFACTURER INSTALLATION REQUIREMENTS.

BRANCH NO. 1
(9) MODULES & (5) MICROINVERTERS

BRANCH NO. 2
(8) MODULES & (4) MICROINVERTERS

DURACELL D700-M2 MICROINVERTER
DURACELL D350-M1 MICROINVERTER
DURACELL BRANCH CABLE SEGMENT
TERMINATOR CAP INSTALLED ON END OF DURACELL BUS CABLE SYSTEM
1 DURACELL BUS CABLE TYP.
2
(N) JUNCTION BOX NEMA 3R ENCLOSURE
(N) 125 A SOLAR COMBINER PANEL - NEMA 3R ENCLOSURE
20A/2P
3
4
(N) MIN. 60 A FUSED AC DISCONNECT WITH 40 A FUSES (LOCKABLE PER NEC 705.22). LOCATE IN ACCESSIBLE LOCATION AS SHOWN ON SHEET PV.1
TO UTILITY/GRID
SUPPLY SIDE TAP COMPLY WITH NEC 705.12(A)
METER
(E) MAIN DISTRIUBTION PANEL (V.I.F.)
(E) 100 A MAIN BREAKER (V.I.F.)
EXISTING EARTH GROUND GROUNDING ELECTRODE

#6 AWG SOLID CU EQUIPMENT GROUND CONDUCTOR CONT. RUN TO GROUND LUG ON RACKING SYSTEM. ALL ROOFTOP COMPONENTS BONDED TO RACKING SYSTEM PER NEC 690.43. MICROINVERTERS CONTAIN INTEGRATED EQUIPMENT GROUNDING.

Digitally signed by John L Antonelli
Date: 2023.04.12 09:07:43 -04'00'

UMA SOLAR
950 SUNSHINE LN, ALTAMONTE SPRINGS, FL
WWW.UMASOLAR.COM
ENGINEERING@UMASOLAR.COM

REV	DATE	REMARK	BY

PROJECT:
PHOTOVOLTAIC SOLAR ENERGY SYSTEM
PROJECT NAME: ROBERSON RESIDENCE
PROJECT ADDRESS: 861 NE COLDWATER AVE.
LAKE CITY, FL 32055

DATE	4/11/23
DRAWN BY:	JLL
CHECKED BY:	JLA
REC. NO. #	29127
SCALE	AS NOTED

DRAWING #
PV.3
SHEET 4 OF 5

JOHN LOUIS ANTONELLI LICENSE No. 81305 STATE OF FLORIDA PROFESSIONAL ENGINEER

This item has been electronically signed and sealed by John Louis Antonelli PE using a Digital Signature and date. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

PV ELECTRICAL NOTES:

GENERAL

1. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL LOCAL AND NATIONAL CODE REQUIREMENTS.
2. OBTAIN ALL PERMITS AND APPROVALS FROM GOVERNING AGENCIES PRIOR TO THE COMMENCEMENT OF WORK.
3. EQUIPMENT SHALL BE INSTALLED PER THE 2017 NATIONAL ELECTRICAL CODE (NEC), ALL APPLICABLE OR GOVERNING CODES, MANUFACTURER REQUIREMENTS, AND PER THE GOVERNING UTILITY COMPANY.
4. METALLIC CONDUIT OR TYPE MC METAL CLAD CABLE SHALL BE USED WITHIN THE BUILDING FOOTPRINT PER NEC 2017 690.31(G).

WIRING & CONNECTIONS

1. ALL CONDUCTORS SHALL BE COPPER AND ARE SIZED BASED ON NEC 2017 310.
2. TO PREVENT AN INCREASE IN AC VOLTAGE LEVEL AND AVOID ANY NUISANCE FAULTS, IT IS RECOMMENDED TO SIZE CONDUCTOR FOR A TOTAL VOLTAGE DROP OF 2% OR LESS PER INVERTER MANUFACTURER.
3. ALL EQUIPMENT SHALL BE LISTED PER NEC 2017 690.4(B).
4. THE 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).
4. INTERCONNECTION METHOD SHALL COMPLY WITH NEC 705.12.
5. FOR LOAD SIDE CONNECTION: GRID-INTERACTIVE PV SYSTEM CURRENT PLUS MAIN BREAKER RATING MUST BE LESS THAN, OR EQUAL TO, 120% OF MAIN SERVICE BUS RATING AND BREAKERS MUST BE MOUNTED AT OPPOSITE END OF MAIN BREAKER PER NEC 705.12(B)(2)(3)(b). IF EXISTING EQUIPMENT DOES NOT ALLOW FOR THIS A SUPPLY SIDE CONNECTION MAY BE USED PER NEC 705.12(A).
6. FOR SUPPLY SIDE CONNECTION: CONNECTION SHALL BE MADE USING ILSCO INSULATION PIERCING CONNECTORS (IPC), OR EQUAL APPROVED COMPONENTS. MAKE, MODEL, AND RATING OF INTERCONNECTION SHALL BE EQUAL TO, OR GREATER THAN, OUTPUT RATING OF PV SYSTEM.
7. ALL OVERCURRENT PROTECTION DEVICES ARE SIZED PER NEC 2017 240.4(B) & 210.19(A)(1).
8. CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC 2017 300.6 (C)(1) AND 310.10(D).
9. SYSTEM COMPLIES WITH 690.12 RAPID SHUTDOWN AND ASSOCIATED LABELING AS PER NEC 690.56(C).

GROUNDING & BONDING

1. 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.
2. EACH MODULE IS BONDED TO THE MOUNTING SYSTEM USING BONDING CLAMPS. MOUNTING SYSTEM COMPLIES WITH UL 2703.
3. NEUTRAL AND EQUIPMENT GROUNDING CONDUCTOR BONDED AS PER NEC 2017 250.24(C).
4. EQUIPMENT GROUNDING CONDUCTOR IS CONNECTED TO A GROUNDING ELECTRODE SYSTEM PER NEC 250.54.
5. AC SYSTEM GROUNDING ELECTRODE CONDUCTOR (GEC) SHALL BE A MINIMUM SIZE #8 AWG WHEN INSULATED, #6 AWG IF BARE COPPER.
6. EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED ACCORDING TO NEC 2017 690.45, 250.120(C), AND 250.122 & BE A MINIMUM OF #10 AWG WHEN NOT EXPOSED TO DAMAGE, AND #6 AWG SHALL BE USED WHEN EXPOSED TO DAMAGE.

LABELING

1. ALL WARNING SIGN(S) OR LABEL(S) SHALL COMPLY WITH 2017 NEC ARTICLE 110.21(B).
2. 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.
3. PV POWER CIRCUIT LABELS SHALL APPEAR ON EVERY SECTION OF THE WIRING SYSTEM THAT IS SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS.
4. PER NEC 690.13, 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”.
5. PER NEC 2017 705.10, PROVIDE A PERMANENT PLAQUE OR DIRECTORY SHOWING ALL ELECTRIC POWER SOURCES ON THE PREMISES AT SERVICE ENTRANCE.

MICROINVERTER SYSTEMS

1. SYSTEM IS CONSIDERED AN AC MODULE SYSTEM. NO DC CONDUCTORS ARE PRESENT IN CONDUIT, COMBINER, JUNCTION BOX, DISCONNECT. AND COMPLIES WITH NEC 2017 690.6 - NO DC DISCONNECT AND ASSOCIATED DC LABELING ARE REQUIRED.
2. NO TERMINALS SHALL BE ENERGIZED IN THE OPEN POSITION IN THIS AC MODULE SYSTEM, NEC 690.13, 690.6.
3. WHERE APPLICABLE: INTERCONNECTION SHALL COMPLY WITH NEC 2017 705.12(A) AS PERMITTED BY NEC 230.82(6).
4. CONDUCTORS IN CONDUIT ARE AC CONDUCTORS BRANCH CIRCUITS AND NOT PV SOURCE CIRCUIT PER NEC 2017 690.6.
5. ALL GROUNDING SHALL COMPLY WITH NEC 2017 690.47(A) IN THAT THE AC MODULES WILL COMPLY WITH NEC 250.64.
6. MICROINVERTER BUS CABLE SYSTEM MUST BE A MINIMUM OF 2 IN. ABOVE THE ROOF SURFACE.

⚠ WARNING
ELECTRIC SHOCK HAZARD
IF GROUND FAULT IS INDICATED ALL NORMALLY GROUNDED CONDUCTORS MAY BE UNGROUNDED AND ENERGIZED

REQ'D BY: NEC 690.41(B) — 1
APPLY TO:
INVERTER(S), IF NOT APPLIED BY MANUFACTURER

SOLAR AC DISCONNECT

REQ'D BY: NEC 690.4(B) — 2
APPLY TO:
AC DISCONNECT SWITCHES

⚠ WARNING
ELECTRIC SHOCK HAZARD
TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

REQ'D BY: NEC 690.13(B) — 3
APPLY TO: DISCONNECTS, AC COMBINER PANELS, OTHER MEANS OF PV SYSTEM DISCONNECTION

⚠ WARNING
DUAL POWER SUPPLY
SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

REQ'D BY: NEC 705.12(B)(3) — 4
APPLY TO:
ANY/ALL ELECTRICAL PANELS CONNECTED TO MULTIPLE POWER SOURCES

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

REQ'D BY: NEC 690.56(C)(3) — 5
APPLY TO:
PV SYSTEM MAIN AC DISCONNECT

PHOTOVOLTAIC SYSTEM DISCONNECT
AC CURRENT: 24.65 A
VOLTAGE: 240 VAC

REQ'D BY: NEC 690.54 — 6
APPLY TO:
PV SYSTEM MAIN AC DISCONNECT

⚠ WARNING
THIS EQUIPMENT IS FED BY MULTIPLE SOURCES. TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OCPD, SHALL NOT EXCEED AMPACITY OF BUSBAR.

REQ'D BY: NEC 705.12(B)(2)(3)(c) — 7
APPLY TO:
AC COMBINER PANEL

⚠ CAUTION ⚠
DO NOT INSTALL ADDITIONAL LOADS IN THIS PANEL

REQ'D BY: NEC 690.4(B) — 8
APPLY TO:
AC COMBINER PANEL

⚠ WARNING
ARC FLASH HAZARD
APPROPRIATE PPE REQUIRED. FAILURE TO COMPLY CAN RESULT IN INJURY OR DEATH. REFER TO NFPA 70E.

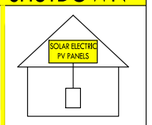
REQ'D BY: NEC 110.16, NFPA 70E — 9
APPLY TO:
AC COMBINER PANEL, MAIN SERVICE DISCONNECT

⚠ WARNING
POWER SOURCE OUTPUT CONNECTION DO NOT RELOCATE OVERCURRENT DEVICE

REQ'D BY: NEC NEC 705.12(B)(2)(3)(b) — 10
APPLY TO:
ALL BACKFED CIRCUIT BREAKER(S)

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY



REQ'D BY: NEC 690.56(C)(1)(a) — 11
APPLY TO:
PV SYSTEM MAIN AC DISCONNECT

SIGNAGE REQUIREMENTS
1.) RED BACKGROUND W/ WHITE LETTERING, OR:
2.) WHITE BACKGROUND W/ BLACK LETTERING
3.) MIN. 3/8" LETTER HEIGHT
4.) ALL CAPITAL LETTERS
5.) ARIAL OR SIMILAR FONT
6.) WEATHER RESISTANT MATERIAL, PER UL 969

UMA SOLAR
950 SUNSHINE LN, ALTAMONTE SPRINGS, FL
WWW.UMASOLAR.COM
ENGINEERING@UMASOLAR.COM

REV	DATE	REMARK	BY

PROJECT:
PHOTOVOLTAIC SOLAR ENERGY SYSTEM
PROJECT NAME: ROBERSON RESIDENCE
PROJECT ADDRESS: 861 NE COLDWATER AVE.
LAKE CITY, FL 32055

DATE	4/11/23
DRAWN BY:	JLL
CHECKED BY:	JLA
REC. NO. #	29127
SCALE	AS NOTED

DRAWING #
PV.4
SHEET 5 OF 5

Digitally signed by John L Antonelli
Date: 2023.04.12 '09:07:59 -04'00

JOHN LOUIS ANTONELLI LICENSE No. 81305 STATE OF FLORIDA PROFESSIONAL ENGINEER P.E.
This item has been electronically signed and sealed by John Louis Antonelli PE using a Digital Signature and date. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.