

SCOPE OF WORK
TO INSTALL A ROOF MOUNTED SOLAR PHOTOVOLTAIC SYSTEM AT THE OWNER RESIDENCE LOCATED AT 3312 DELANA WAY, ALVA, FL 33920, USA.
THE POWER GENERATED BY THE PV SYSTEM WILL BE INTERCONNECTED WITH THE UTILITY GRID THROUGH THE EXISTING ELECTRICAL SERVICE EQUIPMENT.
THE PV SYSTEM DOES NOT INCLUDE STORAGE BATTERIES.

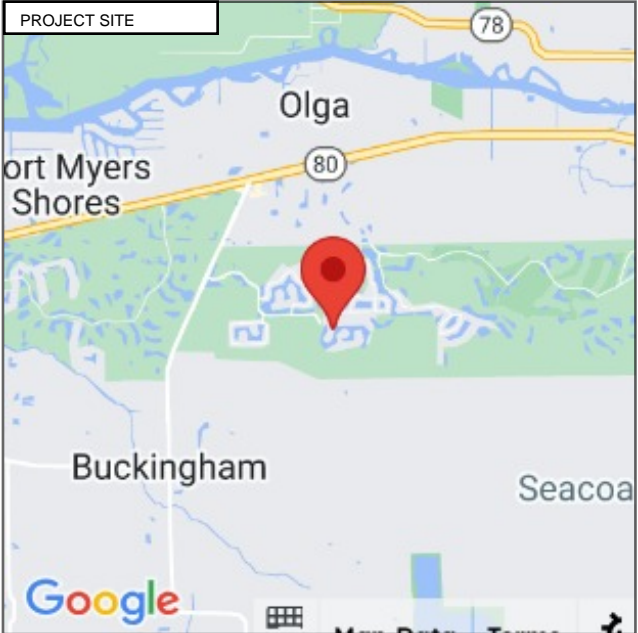
EQUIPMENT SUMMARY
14 URECO FBM445M7G-BB MODULES
29 EXISTING URECO FBM400MFG-BB MODULES
14 ENPHASE IQ8PLUS -72-2-US (240V) MICROINVERTERS
29 EXISTING ENPHASE IQ8PLUS -72-2-US (240V) MICROINVERTERS

- GENERAL NOTES**
- THESE CONSTRUCTION DOCUMENTS HAVE BEEN BASED ON FIELD INSPECTIONS AND OTHER INFORMATION AVAILABLE AT THE TIME. ACTUAL FIELD CONDITIONS MAY REQUIRE MODIFICATIONS
 - CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL, EQUIPMENT, TOOLS, OBTAIN ALL PERMITS, LICENSES AND PAY ALL REQUIRED FEES AND COMPLETE INSTALLATION.
 - CONTRACTOR SHALL OBTAIN BULDING PERMIT. NO WORK TO START UNLESS BUILDING PERMIT IS PROPERLY DISPLAYED.
 - ALL WORKMANSHIP AND MATERIALS SHALL BE OF FIRST QUALITY AND IN COMPLIANCE WITH THE REQUIREMENTS OF THE FLORIDA BUILDING CODE, THE DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ALL PERTINENT AGENCIES.
 - IT IS ESSENTIAL THAT ALL WORK PROCEED WITH THE MAXIMUM COOPERATION OF ALL PARTIES AND WITH MINIMUM INTERFERENCE TO THE OCCUPANTS WITHIN THE BUILDING. THE OWNER'S DIRECTIONS IN THIS REGARD SHALL BE FULLY COMPLIED WITH.
 - THE CONTRACTOR SHALL PERFORM THE WORK IN STRICT CONFORMANCE WITH THE LOCAL LAWS, REGULATIONS AND THE NATIONAL ELECTRIC CODE.
 - THE CONTRACTOR SHALL OBTAIN ALL PERMITS, APPROVALS, AFFIDAVITS, CERTIFICATIONS, ETC. AND PAY ALL FEES AS REQUIRED BY THE LOCAL AUTHORITIES.
 - CONTRACTORS SHALL OBTAIN FIRE CERTIF. UPON COMPLETION OF WORK.

- ELECTRICAL NOTES**
- ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
 - ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
 - WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
 - WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
 - WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
 - ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
 - MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURERS INSTRUCTION.
 - MODULE SUPPORT RAIL SHALL BE BONDED TO THE MODULE

GOVERNING CODES
2021 NFPA 1 (FIRE CODE) 2020 NATIONAL ELECTRICAL CODE 2023 FLORIDA BUILDING CODE (8TH EDITION) 2023 FLORIDA FIRE PREVENTION CODE (8TH EDITION) FLORIDA ADMINISTRATIVE CODE(FAC)
AHJ NAME : LEE COUNTY

- WIRING AND CONDUIT NOTES**
- ALL CONDUIT SIZES AND TYPES SHALL BE LISTED FOR ITS PURPOSE AND APPROVAL FOR THE SITE APPLICATIONS
 - ALL PV CABLES AND HOMERUN WIRES BE #10AWG *USE-2, PV WIRE, OR PROPRIETARY SOLAR CABLING SPECIFIED BY MFR, OR EQUIVALENT; ROUTED TO SOURCE CIRCUIT COMBINER BOXES AS REQUIRED
 - ALL PV DC CONDUCTORS IN CONDUIT EXPOSED TO SUNLIGHT SHALL BE DERATED ACCORDING TO AS PER LATEST NEC CODE.
 - EXPOSED ROOF PV DC CONDUCTORS SHALL BE USE-2, 90°C RATED, WET AND UV RESISTANT, AND UL LISTED RATED FOR 600V, UV RATED SPIRAL WRAP SHALL BE USED TO PROTECT WIRE FROM SHARP EDGES
 - PHASE AND NEUTRAL CONDUCTORS SHALL BE DUAL RATED THHN/THWN-2 INSULATED, 90°C RATED, WET AND UV RESISTANT, RATED FOR 1000V AS PER APPLICABLE NEC
 - 4-WIRE DELTA CONNECTED SYSTEMS HAVE THE PHASE WITH THE HIGHER VOLTAGE TO GROUND MARKED ORANGE OR IDENTIFIED BY OTHER EFFECTIVE MEANS
 - ALL SOURCE CIRCUITS SHALL HAVE INDIVIDUAL SOURCE CIRCUIT PROTECTION
 - VOLTAGE DROP LIMITED TO 2%
 - AC CONDUCTORS >4AWG COLOR CODED OR MARKED: PHASE A OR L1- BLACK, PHASE B OR L2- RED, PHASE C OR L3- BLUE, NEUTRAL- WHITE/GRAY



VICINITY MAP SCALE: NTS



HOUSE PHOTO SCALE: NTS

SYSTEM RATING	PHOTOVOLTAIC SYSTEM FIRE CLASSIFICATION LISTING IN ACCORDANCE WITH UL 1703 STANDARD.
6.230 kWDC	
4.060 kWAC	
SHEET INDEX	
PV1	COVER PAGE
PV2	SITE PLAN
PV3	ROOF PLAN
PV4	STRING LAYOUT & BOM
PV5-PV6	ATTACHMENT DETAILS
PV7	ELECTRICAL LINE & CALCS.
PV8	SPECIFICATIONS & NOTES
PV9-PV10	SIGNAGE
PV11-PV17	EQUIPMENT SPECIFICATIONS

INFENERGY



INFENERGY
5448 PROVINE PL,
ALEXANDRIA, LA 71303, USA
PH# : (850) 693-0167
72494

SYSTEM INFO
(14) URECO FBM445M7G-BB
(14) ENPHASE IQ8PLUS -72-2-US (240V)
DC SYSTEM SIZE: 6.230 kWDC
AC SYSTEM SIZE: 4.060 kWAC

REVISIONS		
DESCRIPTION	DATE	REV

PROJECT NAME & ADDRESS

AVA MORALES
RESIDENCE

3312 DELANA WAY, ALVA, FL 33920, USA
EMAIL ID: AVA.MORALESCARDENEZ@VA.GOV
PHONE NO. (615) 717-8056

DATE: 8/20/2024
SHEET NAME COVER PAGE
SHEET SIZE ANSI B 11" X 17"
SHEET NUMBER PV-1

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL	URECO FBM445M7G-BB
VMP	34.8 V
IMP	12.79 A
VOC	41.9 V
ISC	13.48 A
TEMP. COEFF. VOC	-0.27%/K
PTC RATING	415 W
MODULE DIMENSION	75.12"(L) x 44.65"(W)
PANEL WATTAGE	445 W

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL	ENPHASE IQ8PLUS -72-2-US (240V)
MAX DC SHORT CIRCUIT CURRENT	15 A
CONTINUOUS OUTPUT CURRENT	1.21 A

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	2°C
AMBIENT TEMP (HIGH TEMP 2%)	34°C
CONDUIT HEIGHT	7/8"
ROOF TOP TEMP	56°C
CONDUCTOR TEMPERATURE RATE	90°C
MODULE TEMPERATURE COEFFICIENT OF VOC	-0.27%/K

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT
0.80	4-6
0.70	7-9
0.50	10-20

VOLTAGE RISE IN Q CABLE FROM THE MICROINVERTERS TO THE JUNCTION BOX

FOR (E)BRANCH CIRCUIT #1 OF 13 IQ8PLUS MICROS, THE VOLTAGE RISE ON THE 240 VAC Q CABLE IS 0.76%
FOR (E)BRANCH CIRCUIT #2 OF 13 IQ8PLUS MICROS, THE VOLTAGE RISE ON THE 240 VAC Q CABLE IS 0.76%
FOR (E)BRANCH CIRCUIT #3 OF 4 IQ8PLUS MICROS, THE VOLTAGE RISE ON THE 240 VAC Q CABLE IS 0.08%

FOR (N)BRANCH CIRCUIT #4 OF 13 IQ8PLUS MICROS, THE VOLTAGE RISE ON THE 240 VAC Q CABLE IS 0.76%

VOLTAGE RISE FROM THE (N)JUNCTION BOX TO THE IQ COMBINER BOX 4C

VRise = (AMPS/INVERTER X NUMBER OF INVERTERS) X (RESISTANCE IN OHMS/FT.) X (2-WAY WIRE LENGTH IN FT.)
= (1.21 AMP X 13) X (0.00129 OHMS/FT) X (53 FT X 2)
= 15.73 AMPS X 0.00129 OHMS/FT) X 106 FT
= 2.15 VOLTS
%VRise = 2.15 VOLTS ÷ 240 VOLTS = 0.89%

THE VOLTAGE RISE FROM THE (N)JUNCTION BOX TO THE IQ COMBINER BOX 4C IS 0.89%

VOLTAGE RISE FROM THE IQ COMBINER BOX 4C TO THE NON FUSED AC DISCONNECT

VRise = (AMPS/INVERTER X NUMBER OF INVERTERS) X (RESISTANCE IN OHMS/FT.) X (2-WAY WIRE LENGTH IN FT.)
= [(1.21 AMP X 14)+(1.21 AMP X 29)] X (0.000321 OHMS/FT) X (5 FT X 2)
= 52.03 AMPS X 0.000321 OHMS/FT) X 10 FT
= 0.16 VOLTS
%VRise = 0.16 VOLTS ÷ 240 VOLTS = 0.06%

THE VOLTAGE RISE FROM THE IQ COMBINER BOX 4C TO THE NON FUSED AC DISCONNECT IS 0.06%

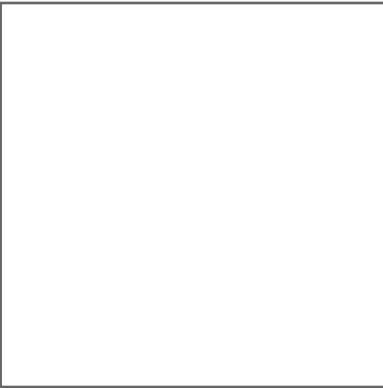
VOLTAGE RISE FROM THE NON FUSED AC DISCONNECT TO THE MSP

VRise = (AMPS/INVERTER X NUMBER OF INVERTERS) X (RESISTANCE IN OHMS/FT.) X (2-WAY WIRE LENGTH IN FT.)
= [(1.21 AMP X 14)+(1.21 AMP X 29)] X (0.000321 OHMS/FT) X (5 FT X 2)
= 0.16 AMPS X 0.000321 OHMS/FT) X 10 FT
= 0.16 VOLTS
%VRise = 0.16 VOLTS ÷ 240 VOLTS = 0.06%

THE VOLTAGE RISE FROM THE NON FUSED AC DISCONNECT TO THE MSP IS 0.06%

TOTAL SYSTEM VOLTAGE RISE FOR ALL WIRE SECTIONS

0.76% + 0.89% + 0.06% + 0.06% = 1.77%



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SHEET NAME
SPECIFICATIONS & NOTES

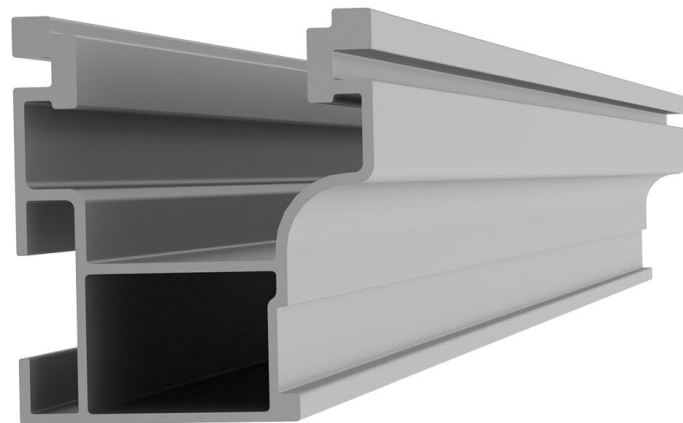
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-8

CrossRail 44-X



DATA SHEET



TECHNICAL DATA



Mechanical Properties

	CrossRail 44-X
Material	6000 Series Aluminum
Ultimate Tensile Strength	37.7 ksi (260 MPa)
Yield Strength	34.8 ksi (240 MPa)
Weight	.47 lbs/ft (0.699 kg/m)

Sectional Properties

	CrossRail 44-X
Sx	0.149 in ³ (0.3785 cm ³)
Sy	0.145 in ³ (0.3683 cm ³)
A (X-Section)	0.405 in ² (1.0287 cm ²)

LOAD		RAIL SPAN								
SNOW (psf)	WIND (mph)	32"	4'	64"	6'	80"	8'	112"	10'	12'
0	120									
0	140									
0	160									
10	120									
10	140									
10	160									
20	140									
20	160									
30	160									
40	160									
80	160									
100	160									

44X/MAX 48X 48XL CR80

Part Number	Description
4000019	CrossRail 44-X 166", Mill
4000020	CrossRail 44-X 166", Dark
4000021	CrossRail 44-X 180", Mill
4000022	CrossRail 44-X 180", Dark
4000719	CrossRail 44-X 172", Mill
4000720	CrossRail 44-X 172", Dark
4000721	CrossRail 44-X 185", Mill
4000722	CrossRail 44-X 185", Dark
4000143	SPO CrossRail 44-X 86", Mill

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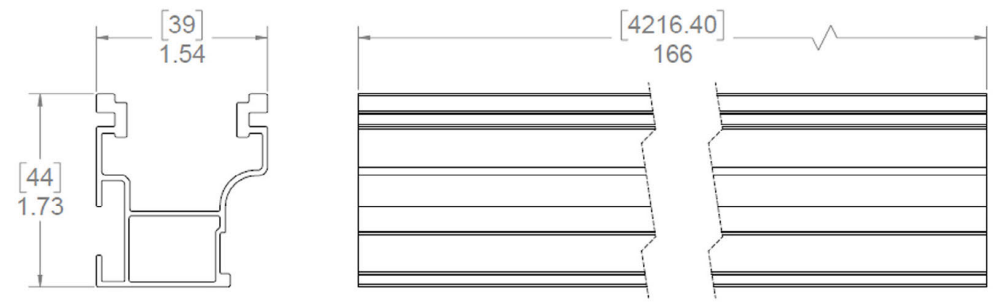
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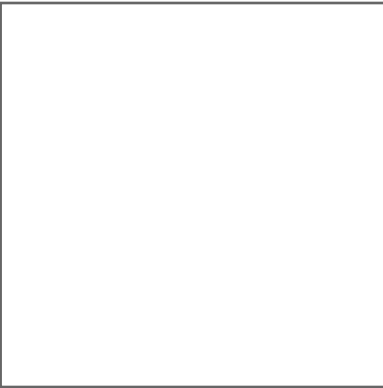
PV-16

Units: [mm] in



Notes:

- ▶ Structural values and span charts determined in accordance with Aluminum Design Manual and ASCE 7-16
- ▶ UL2703 Listed System for Fire and Bonding



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