230202
1/20/23 ELM Contracts

OCALA ELECTRIC UTILITY
OCALA, FLORIDA

FIRST REVISED SHEET NO. 19.0
CANCELS ORIGINAL SHEET NO. 19.0

APPLICATION FOR INTERCONNECTION OF CUSTOMER-OWNED RENEWABLE GENERATION SYSTEMS

TIER 1 - Ten (10) kW or Less
TIER 2 - Greater than 10 kW and Less Than or Equal to 100 kW
TIER 3 - Greater than 100 kW and Less Than or Equal to Two (2) MW

Note: These customer-owned renewable generation system size limits may be subject to a cumulative enrollment limit on net-metering customers located in the area served by the City of Ocala Electric Utility. Please refer to the Ocala Electric Utility Net-Metering Rate Schedule.

Ocala Electric Utility customers who install customer-owned renewable generation systems (RGS) and desire to interconnect those facilities with the Ocala Electric Utility system are required to complete this application. When the completed application and fees are returned to Ocala Electric Utility, the process of completing the appropriate Tier 1, Tier 2 or Tier 3 Interconnection Agreement can begin. This application and copies of the Interconnection Agreements may be obtained at Ocala Electric Utility, located at 201 SE 3rd Street, Ocala, Florida 34471, or may be requested by email from OEU@ocalafl.org.

1. Customer Information

Name: MICHAEL J. MORRIS

Mailing Address: 2720 SW 18TH AVE

City: Ocala State: Fl Zip Code: 34471

Phone Number: 757-574-9001 Alternate Phone Number: _____

Email Address: morrismj82@gmail.com Fax Number: _____

Ocala Electric Utility Customer Account Number: 520745 - 240263

2. RGS Facility Information

Facility Location: 2720 SW 18TH AVE

Ocala Electric Utility Customer Account Number: 520745 - 240263

RGS Manufacturer: Mission Solar Energy

Manufacturer's Address: 8303 S. New Braunfels Ave., San Antonio, TX 78235

Reference or Model Number: MSE Perc 72 430W

Serial Number: _____

(Continued on Sheet No.19.1)

3. Facility Rating Information

Gross Power Rating: 12.48 kWAC ("Gross power rating" means the total manufacturer's AC nameplate generating capacity of an on-site customer-owned renewable generation system that will be interconnected to and operate in parallel with Ocala Electric Utility's distribution facilities. For inverter-based systems, the AC nameplate generating capacity shall be calculated by multiplying the total installed DC nameplate generating capacity by 0.85 in order to account for losses during the conversion from DC to AC.)

Fuel or Energy Source: solar

Anticipated In- Service Date: 12/28/22

4. Application Fee

The application fee is based on the Gross Power Rating and must be submitted with this application. The non-refundable application fee is $375 for Tier 2 and $750 for Tier 3 installations. There is no application fee for Tier 1 installations.

5. Interconnection Study Fee

For Tier 3 installations, a deposit in the amount of the estimated costs of the study (to be determined at time of application) must be paid along with this application in addition to the application fee referenced in Article 4 above. This deposit will be applied toward the cost of an interconnection study. The customer will be responsible for the actual costs of the study. Should the actual cost of the study be less than the deposit, the difference will be refunded to the customer. Customer agrees to comply with all interconnection requirements identified in the interconnection study report.

6. Required Documentation

Prior to completion of the Interconnection Agreement, the following information must be provided to the Ocala Electric Utility by the customer.

A. Documentation demonstrating that the installation complies with (or most current version at time of inspection approval):

1. IEEE 1547 (2018) Standard for Interconnecting Distributed Resources with Electric Power Systems.
2. IEEE 1547.1 (2005) Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems.
3. UL 1741 (2010) Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources.

(Continued on Sheet No. 19.2)

B. Documentation that the customer-owned renewable generation has been inspected and approved by local code officials prior to its operation in parallel with the Ocala Electric Utility system to ensure compliance with applicable local codes. OEU will also require proof of commission testing by a qualified 3rd party testing company (not affiliated in any way with the manufacturer, vendor or installation contractor), for compliance with all required and applicable codes, standards, and interconnection study requirements, prior to setting of OEU metering equipment.

C. Proof of insurance in the amount of:
Tier 1 - $100,000.00
Tier 2 - $1,000,000.00
Tier 3 - $2,000,000.00

Customer

By: MICHAEL J. MORRIS Date: 30AUG 22 SIGN HERE
(Print Name)

(Signature)

PHOTOVOLTAIC ROOF MOUNT SYSTEM

35 MODULES-ROOF MOUNTED - 14.53 kWDC, 13.30 kWAC

2720 SW 18TH AVENUE, OCALA, FL 34471 USA

SYSTEM SUMMARY:

(N) 35 - MISSION SOLAR MSE415SX6W (415W) MODULES
(N) 35 - ENPHASE ENERGY IQ8H-240-72-2-US MICRO-INVERTERS
(N) JUNCTION BOX
(E) 200A MAIN SERVICE PANEL WITH (E) 200A MAIN BREAKER
(N) 100A FUSED AC DISCONNECT
(N) 125A SOLAR LOAD CENTER
(N) PRODUCTION METER

DESIGN CRITERIA:

ROOF TYPE: - COMP SHINGLE
NUMBER OF LAYERS: - 01
ROOF FRAME: - 2"X4" RAFTERS @24" O.C.
STORY: - TWO STORY
SNOW LOAD : - 0 PSF
WIND SPEED :- 130 MPH
WIND EXPOSURE:- C

GOVERNING CODES:

2020 7TH EDITION FLORIDA BUILDING CODE : BUILDING
2020 7TH EDITION FLORIDA BUILDING CODE : RESIDENTIAL
2020 7TH EDITION FLORIDA BUILDING CODE : MECHANICAL
2020 7TH EDITION FLORIDA BUILDING CODE : PLUMBING
2020 7TH EDITION FLORIDA BUILDING CODE : FUEL GAS
2020 7TH EDITION FLORIDA BUILDING CODE : ENERGY CONSERVATION
2020 7TH EDITION FLORIDA BUILDING CODE : EXISTING BUILDING
2020 7TH EDITION FLORIDA BUILDING CODE : ACCESSIBILITY
2020 7TH EDITION FLORIDA FIRE PREVENTION CODE (NFPA)
2017 NATIONAL ELECTRIC CODE (NEC)

SHEET INDEX

GENERAL NOTES

- ALL ELECTRICAL WORK SHALL BE PERFORMED BY A QUALIFIED LICENSED ELECTRICIAN AND/OR APPRENTICES WORKING UNDER THE DIRECT SUPERVISION OF THE LICENSED CONTRACTOR.
- ALL WORK CARRIED OUT SHALL COMPLY WITH THE SPECIFICATIONS, APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS.
- PRIOR TO COMMENCEMENT OF ANY WORK, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF AN DISCREPANCIES NOTED AMONG SITE CONDITIONS, MANUFACTURER RECOMMENDATIONS, OR AUTHORITY HAVING JURISDICTION. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER OF RECORD A WRITTEN "RFI"(REQUEST FOR INFORMATION) PROPOSING AN ALTERNATIVE OR SEEKING CLARIFICATION.
- THE CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, ACCESSORIES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.
- WHEN INSTALLING IN FIRE RATED AREAS, SEAL ALL PENETRATIONS WITH UL LISTED MATERIALS APPROVED BY LOCAL JURISDICTION. CONTRACTOR SHALL KEEP AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS.
- CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION. ALL DEBRIS AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.
- THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES NOT PART OF THE SCOPE OF WORK AS IDENTIFIED IN THESE PLANS.
- DUE TO THE FACT THAT PV MODULES ARE ENERGIZED WHENEVER THEY ARE EXPOSED TO LIGHT, CONTRACTOR SHALL DISABLE THE ARRAY DURING INSTALLATION AND SERVICE BY SHORT CIRCUITING, OPEN CIRCUITING, OR COVERING ARRAY WITH AN OPAQUE COVER ACCORDING TO MANUFACTURER'S INSTRUCTION.

1 AERIAL PHOTO
PV-0 SCALE: NTS

2 VICINITY MAP
PV-0 SCALE: NTS

SOLAR LIGHT & MORE
5640 SW 6TH PLACE, SUITE 400,
OCALA, FL 34474 USA
CSLB# CVC56750
PHONE:3522664661
EMAIL: Kathy@solarlightsinc.com

VERSION

DESCRIPTION	DATE	REV
INITIAL RELEASE	07/19/2022	UR

PROJECT NAME

MIKE MORRIS
2720 SW 18TH AVENUE,
OCALA, FL 34471 USA
APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME

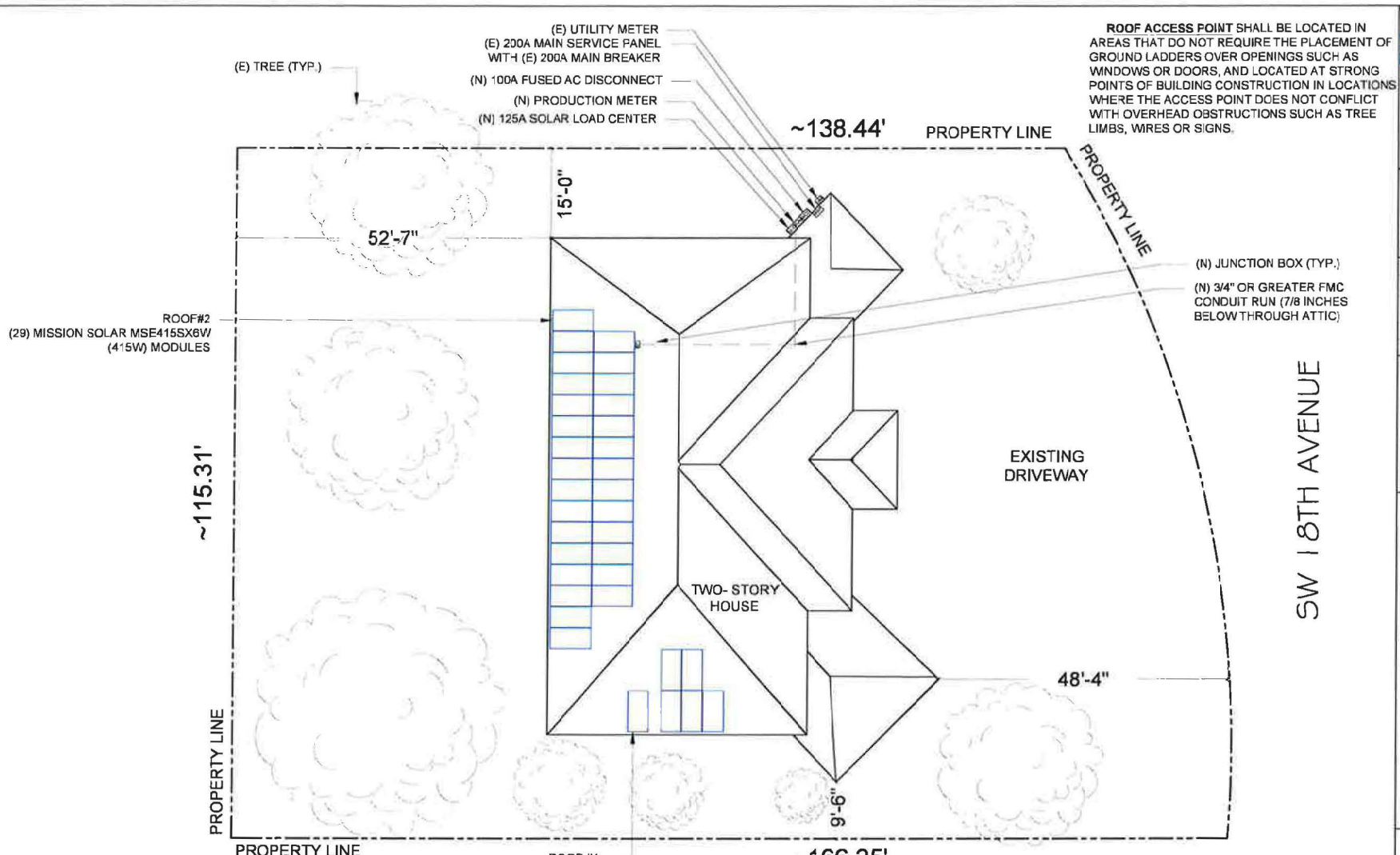
COVER SHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-0



ROOF ACCESS POINT SHALL BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS OR DOORS, AND LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION IN LOCATIONS WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREE LIMBS, WIRES OR SIGNS.

BILL OF MATERIALS

EQUIPMENT	QTY	DESCRIPTION
RAIL	13	RAIL
SPLICE	10	SPLICE
MID CLAMP	50	MID CLAMP-UFO
END CLAMP	12	END CLAMP-STOPPER SLEEVES
ATTACHMENT	66	UNIRAC SFM INFINITY
GROUNDING LUG	06	XR-LUG

NOTE:
A. ALL ELECTRICAL EQUIPMENT, INVERTERS, DISCONNECTS, MAIN SERVICE PANELS, ETC. SHALL NOT BE INSTALLED WITHIN 3' OF THE GAS METERS' SUPPLY OR DEMAND PIPING.

1 SITE PLAN WITH ROOF PLAN
SCALE: 1/16" = 1'-0"

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OCALA, FL 34474 USA
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PHONE:3522664661
EMAIL: Kathy@solarlightsinc.com

VERSION

DESCRIPTION	DATE	REV
INITIAL RELEASE	07/10/2022	UR

PROJECT NAME
MIKE MORRIS
2720 SW 18TH AVENUE,
OCALA, FL 34471 USA
APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME
SITE PLAN WITH
ROOF PLAN

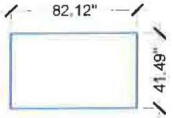
SHEET SIZE
ANSI B
11" X 17"

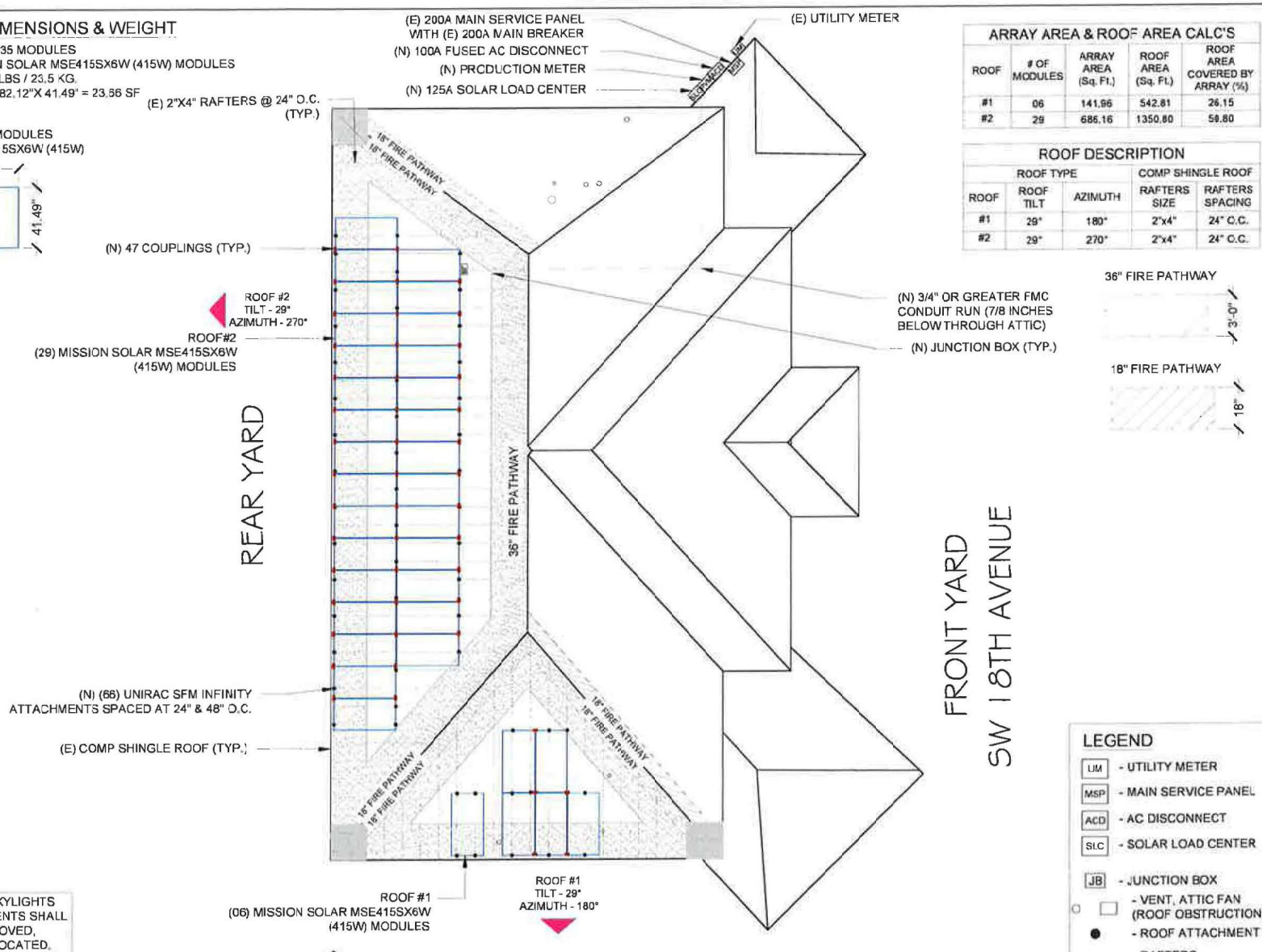
SHEET NUMBER
PV-1

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 35 MODULES
MODULE TYPE = MISSION SOLAR MSE415SX6W (415W) MODULES
MODULE WEIGHT = 51.6 LBS / 23.5 KG.
MODULE DIMENSIONS = 82.12"X 41.49" = 23.66 SF

PHOTOVOLTAIC MODULES
MISSION SOLAR MSE415SX6W (415W)





36" FIRE PATHWAY

18" FIRE PATHWAY

ARRAY AREA & ROOF AREA CALC'S

ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	06	141.96	542.81	26.15
#2	29	686.16	1350.80	50.80

ROOF DESCRIPTION

ROOF	ROOF TYPE		COMP SHINGLE ROOF	
	ROOF TILT	AZIMUTH	RAFTERS SIZE	RAFTERS SPACING
#1	29°	180°	2"x4"	24" O.C.
#2	29°	270°	2"x4"	24" O.C.

LEGEND

- UM - UTILITY METER
- MSP - MAIN SERVICE PANEL
- ACD - AC DISCONNECT
- SLC - SOLAR LOAD CENTER
- JB - JUNCTION BOX
- VENT, ATTIC FAN (ROOF OBSTRUCTION)
- ROOF ATTACHMENT
- RAFTERS
- CONDUIT
- FIRE PATHWAY

- PLUMBING VENTS, SKYLIGHTS AND MECHANICAL VENTS SHALL NOT BE COVERED, MOVED, RE-ROUTED OR RE-LOCATED.

1 ROOF PLAN WITH MODULES

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

SOLAR LIGHT & MORE
564C SW 6TH PLACE, SUITE 400,
OCALA, FL 34474 USA
CSLB# CVC56750
PHONE 3522664661
EMAIL: Kathy@solarlightsinc.com

VERSION		
DESCRIPTION	DATE	REV
INITIAL RELEASE	07/10/2022	UR

PROJECT NAME

MIKE MORRIS
2720 SW 18TH AVENUE,
OCALA, FL 34471 USA
APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME
GROUND PLAN WITH MODULES

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-2

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 35 MODULES
MODULE TYPE = MISSION SOLAR MSE415SX6W (415W) MODULES
MODULE WEIGHT = 51.6 LBS / 23.5 KG.
MODULE DIMENSIONS = 82.12"X 41.49" = 23.66 SF
UNIT WEIGHT OF ARRAY = 2.18 PSF

ROOF LAYOUT NOTE
ROOFSOLAR PANEL LAYOUT IS CONCEPTUAL, BUT AS PROVIDED, CONFORMS WITH THE REQUIREMENTS SET IN SHEET PV-3 CONTRACTOR MAY ADJUST PANEL LOCATION, SOLID CORNERS (4'X4') SHOWN THE PLAN IS WIND ZONE 3. SEE 2020 FLORIDA RESIDENTIAL CODE (7TH EDITION) FOR MORE DETAILS

APPLICABLE CODE: 2020 FLORIDA BUILDING CODE (7TH EDITION) & ASCE 7-16 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

LAG SCREW DIAMETER AND EMBEDMENT LENGTHS ARE DESIGNED PER 2020 FLORIDA BUILDING CODE (7TH EDITION) REQUIREMENTS.ALL BOLT CAPACITIES ARE BASED ON A SOUTHER YELLOW PINE (SYP) RESIDENTIAL WOOD ROOF RAFTERS AS EMBEDMENT MATERIAL.

ALL WIND DESIGN CRITERIA AND PARAMETERS ARE FOR HIP AND GABLE RESIDENTIAL ROOFS, CONSIDERING FROM A7° TO A MAXIMUM 23° (7/12 TO A MAXIMUM 7/12 PITCH) ROOF IN SCHEDULE. CONTRACTOR TO FIELD VERIFY THAT MEAN ROOF HEIGHT DOES NOT EXCEED 30'-0".

ROOF SEALANTS SHALL CONFORM TO ASTM C920 AND ASTM 6511, AND IS THE RESPONSIBILITY OF THE CONTRACTOR TO PILOT DRILL AND FILL ALL HOLES.

ALL DISSIMILAR MATERIALS SHALL BE SEPARATED WITH NEOPRENE WASHERS, PADS, ETC OR SIMILAR.

ALL ALUMINUM COMPONENTS SHALL BE ANODIZED ALUMINUM 6105-T5 UNLESS OTHERWISE NOTED.

ALL LAG SCREW SHALL BE ASTM A276 STAINLESS STEEL UNLESS OTHERWISE NOTED.

ALL SOLAR RAILING AND MODULES SHALL BE INSTALLED PER MANUFACTURER INSTRUCTIONS.

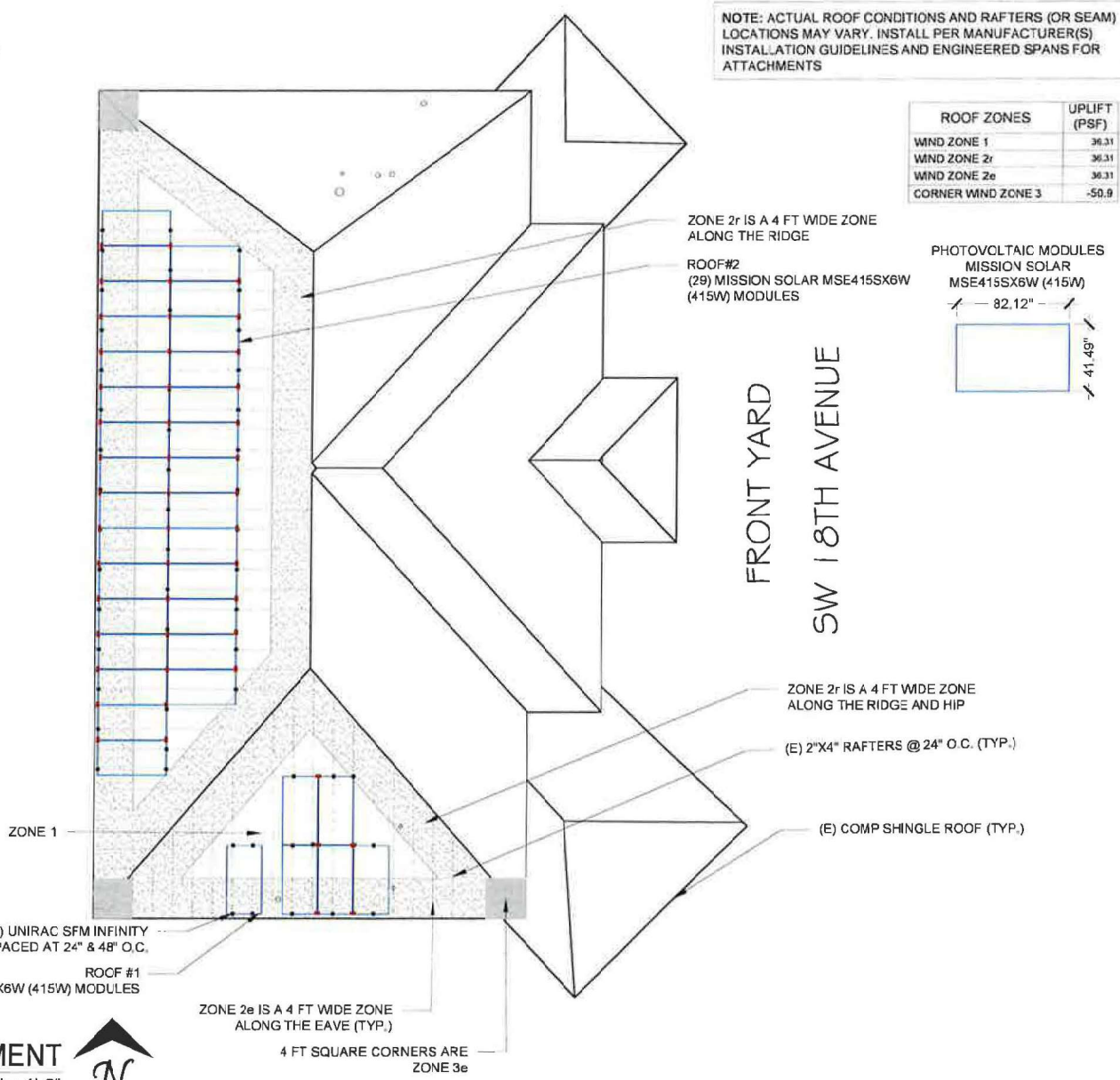
CONTRACTOR SHALL ENSURE ALL ROOF PENETRATIONS TO BE INSTALLED AND SEALED PER 2020 FLORIDA BUILDING CODE (7TH EDITION) OR LOCAL GOVERNING CODE.

NOTE TO INSTALLER:
NOTE FIELD ADJUSTMENTS CAN BE MADE TO THE LAYOUT OF THE ARRAY.

PLUMBING VENTS, SKYLIGHTS AND MECHANICAL VENTS SHALL NOT BE COVERED, MOVED, RE-ROUTED OR RE-LOCATED.

NOTE: ACTUAL ROOF CONDITIONS AND RAFTERS (OR SEAM) LOCATIONS MAY VARY. INSTALL PER MANUFACTURER(S) INSTALLATION GUIDELINES AND ENGINEERED SPANS FOR ATTACHMENTS

ROOF ZONES	UPLIFT (PSF)
WIND ZONE 1	36.31
WIND ZONE 2r	36.31
WIND ZONE 2e	36.31
CORNER WIND ZONE 3	-50.9



1 ROOF ZONING AND ATTACHMENT
SCALE: 3/32" = 1'-0"

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OCALA, FL 34474 USA
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VERSION

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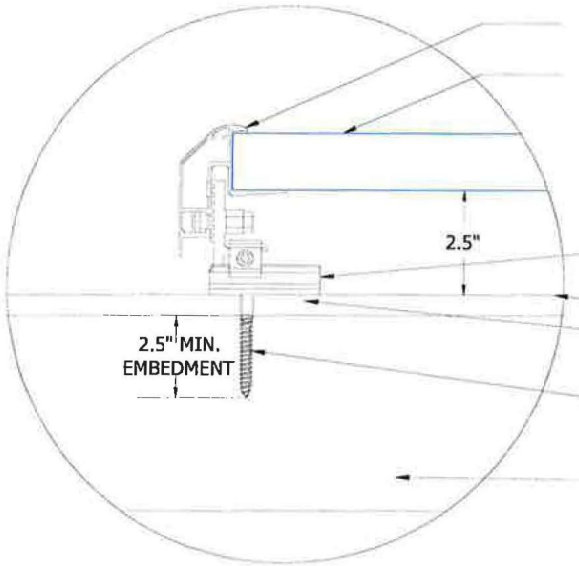
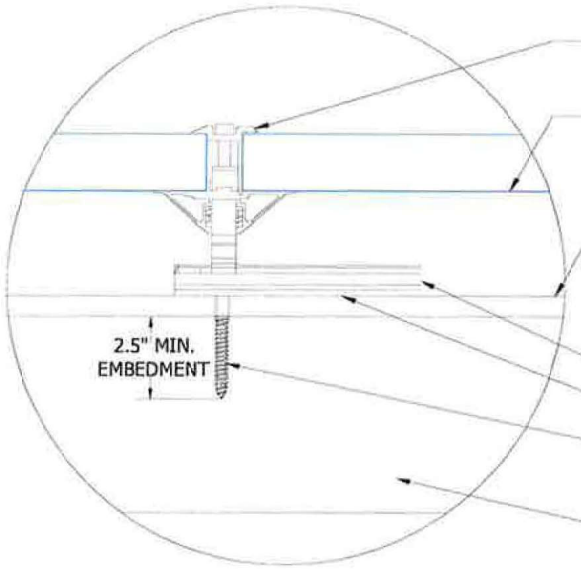
PROJECT NAME
MIKE MORRIS
2720 SW 18TH AVENUE,
OCALA, FL 34471 USA
APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME
ROOF PLAN ZONING AND ATTACHMENT PLAN

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-3.1

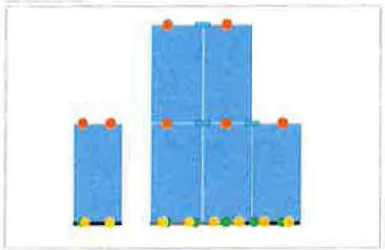




ROOF MOUNTING DETAILS

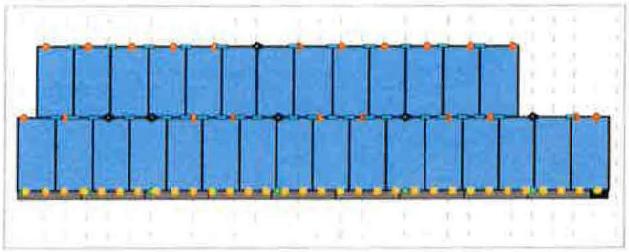
SCALE: NTS.

ROOF#1



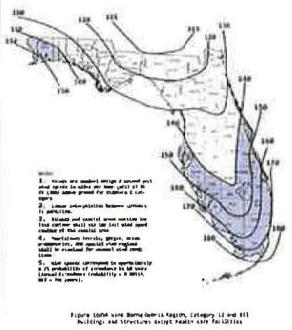
MAX ATTACHMENT SPAN - 24" & 48" O.C. STAGGERED

ROOF#2



MAX ATTACHMENT SPAN - 24" & 48" O.C. STAGGERED

LEGAND



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EMAIL: Kathy@solarlightsinc.com

VERSION

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PROJECT NAME

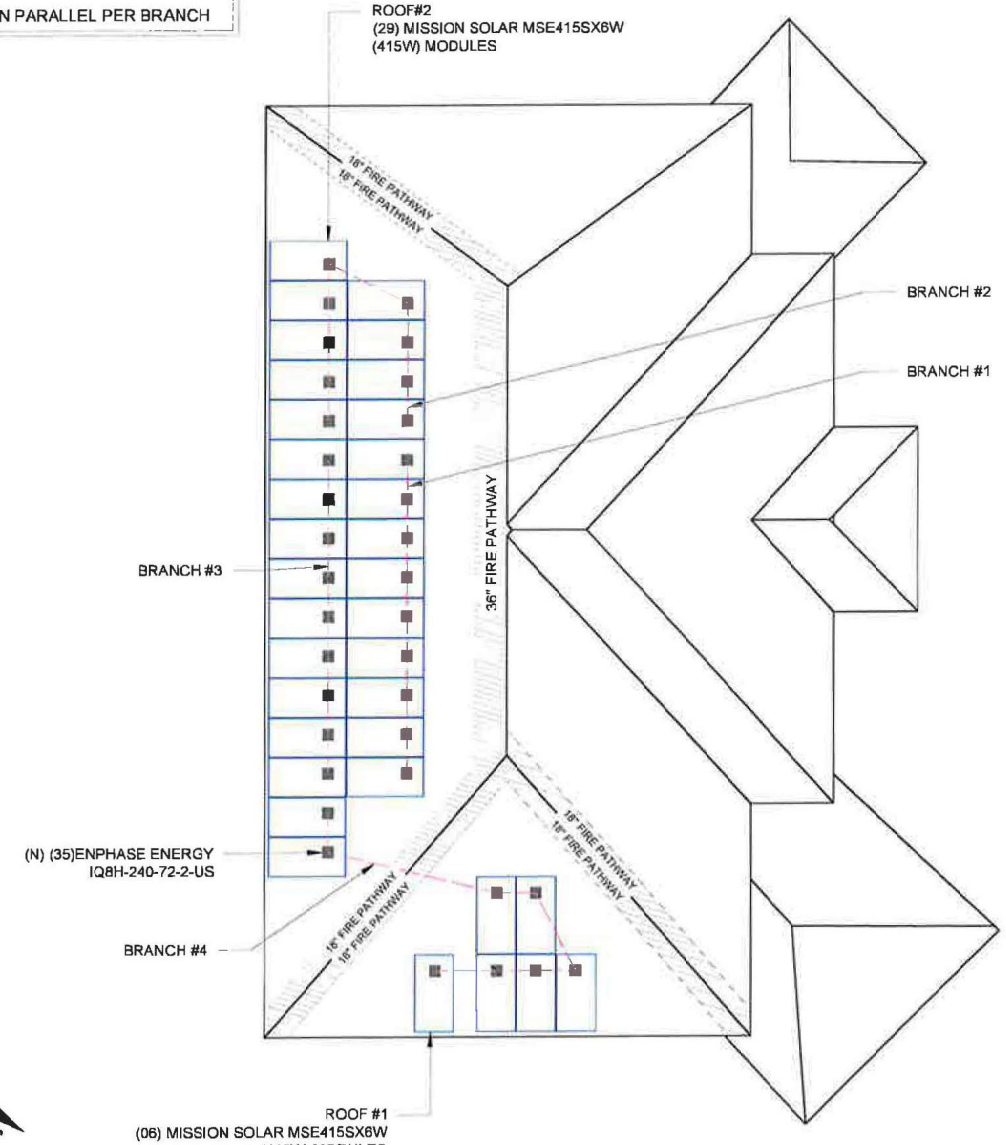
MIKE MORRIS
2720 SW 18TH AVENUE,
OCALA, FL 34471 USA
APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME
ATTACHMENT DETAIL

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-3

(35) MISSION SOLAR MSE415SX6W (415W) MODULES
(35) ENPHASE ENERGY IQ8H-240-72-2-US MICRO-INVERTER
(08) BRANCH OF 08 MODULES &
(03) BRANCHES OF 09 MODULES CONNECTED IN PARALLEL PER BRANCH

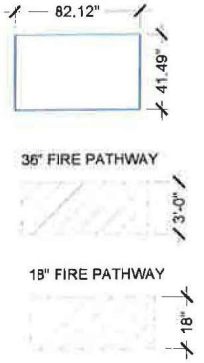


REAR YARD

FRONT YARD

SW 18TH AVENUE

PHOTOVOLTAIC MODULES
MISSION SOLAR MSE415SX6W (415W)



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

N

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OCALA, FL 34474 USA
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2720 SW 18TH AVENUE,
OCALA, FL 34471 USA
APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME
BRANCH LAYOUT

SHEET SIZE
ANSI B
11" X 17"

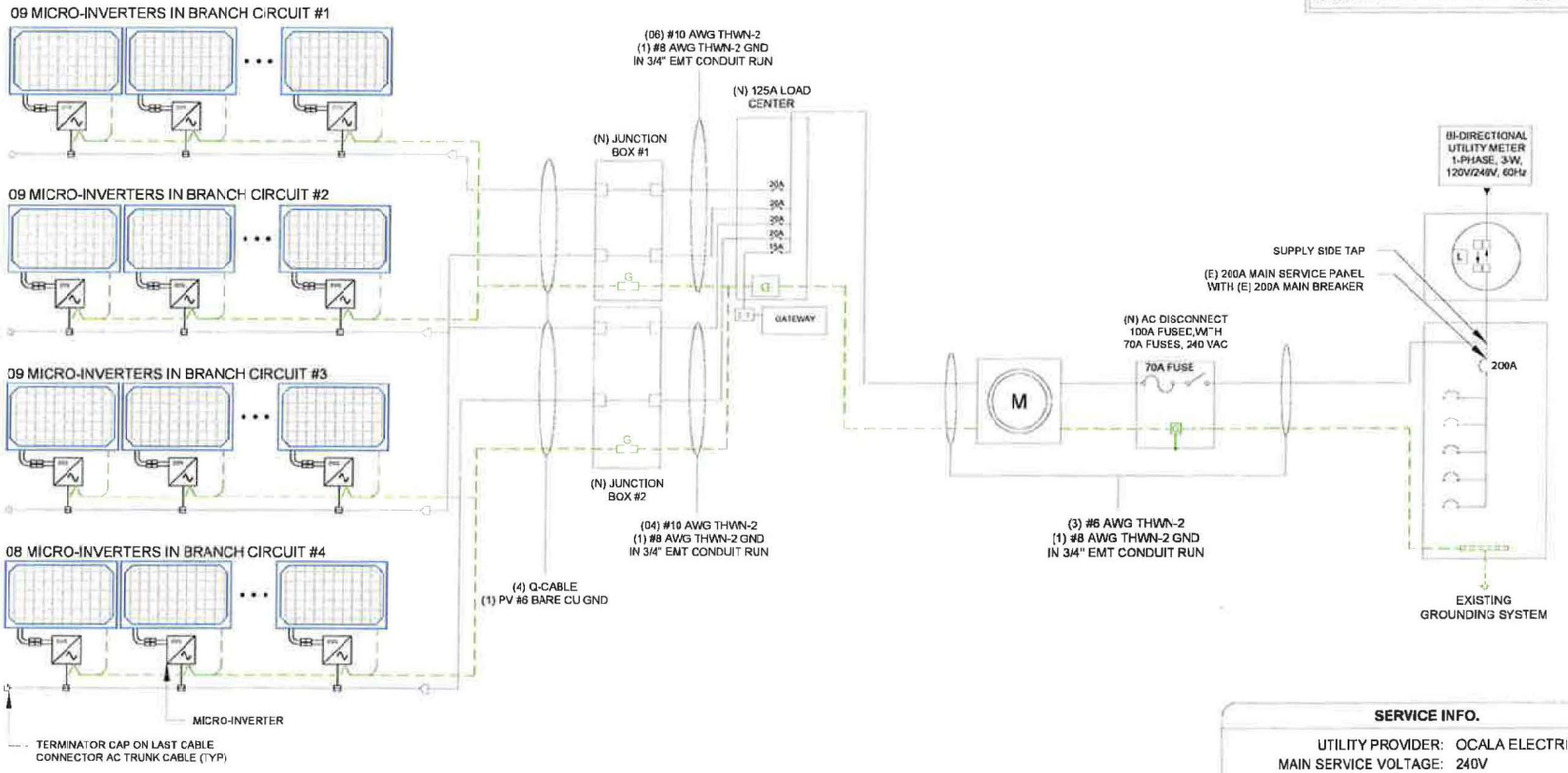
SHEET NUMBER
PV-4

(35) MISSION SOLAR MSE415SX6W (415W) MODULES
(35) ENPHASE ENERGY IQ8H-240-72-2-US MICRO-INVERTER
(01) BRANCH OF 08 MODULES &
(03) BRANCHES OF 09 MODULES CONNECTED IN PARALLEL PER BRANCH

BILL OF MATERIALS

EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULE	35	MISSION SOLAR MSE415SX6W (415W) MODULES
INVERTER	35	ENPHASE ENERGY IQ8H-240-72-2-US MICRO-INVERTERS
JUNCTION BOX	02	600V, 55A MAX, 4 INPUTS, MOUNTED ON GROUND ARRAY FOR WIRE & CONDUIT TRANSITION
SOLAR LOAD CENTER	1	125A SOLAR LOAD CENTER
AC DISCONNECT	1	240VAC, 100A FUSED, NEMA 3R, UL LISTED
PRODUCTION METER	1	PRODUCTION METER

SYSTEM SIZE:- 35 x 415W = 14.53 kWDC
SYSTEM SIZE:- 35 x 380W = 13.30 kWAC



1 ELECTRICAL LINE DIAGRAM

SCALE: NTS

SERVICE INFO.

UTILITY PROVIDER:	OCALA ELECTRIC
MAIN SERVICE VOLTAGE:	240V
MAIN PANEL BRAND:	N/A
MAIN SERVICE PANEL:	(E) 200A
MAIN CIRCUIT BREAKER RATING:	(E) 200A
MAIN SERVICE LOCATION:	SOUTH

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PROJECT NAME

MIKE MORRIS
2720 SW 18TH AVENUE,
OCALA, FL 34471 USA
APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME
ELECTRICAL LINE DIAGRAM

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-5

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	MISSION SOLAR MSE415SX6W (415W) MODULES
VMP	39.93
IMP	10.39
VOC	48.92
ISC	10.99
MODULE DIMENSION	82.12"L x 41.49"W x 1.57"D

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	ENPHASE ENERGY IQ8H-240-72-2-US
NOMINAL OUTPUT VOLTAGE	240 VAC
NOMINAL OUTPUT CURRENT	1.58A

AMBIENT TEMPERATURE SPECS WEATHER STATION: OCALA MUNI (AWOS)	
RECORD LOW TEMP	-6°
AMBIENT TEMP (HIGH TEMP 2%)	34°
CONDUCTOR TEMPERATURE RATE	90°
MODULE TEMPERATURE COEFFICIENT OF Voc	-0.261%/°C

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT
.80	4-5
.70	7-9
.50	10-20

AC CONDUCTOR AMPACITY CALCULATIONS: FROM JUNCTION BOX TO COMBINER BOX 3:

EXPECTED WIRE TEMP (°C): 34°
TEMP CORRECTION PER TABLE 310.15(B)(2)(a): 0.96
OF CURRENT CARRYING CONDUCTORS: 8
CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a): 0.70
CIRCUIT CONDUCTOR SIZE: 10 AWG
CIRCUIT CONDUCTOR AMPACITY: 40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B):
1.25 X # MICRO-INVERTERS (MAX. BRANCH LENGTH) X MAX OUTPUT CURRENT
1.25 X 09 X 1.58A = 18.00A

DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC TABLE 310.15(B)(2)(a)
TEMP CORR. PER NEC TABLE 310.15(B)(2)(a) X
CONDUIT FILL CORR. PER NEC 310.15(B)(3)(a) X
CIRCUIT CONDUCTOR AMPACITY =
0.96 X 0.70 X 40 = 26.88A

RESULT SHOULD BE GREATER THAN 18.00A OTHERWISE LESS THE ENTRY FOR CIRCUIT CONDUCTOR SIZE AND AMPACITY

AC CONDUCTOR AMPACITY CALCULATIONS: FROM COMBINER BOX TO INTERCONNECTION:

OF INVERTERS: 35
EXPECTED WIRE TEMP (°C): 34°
TEMP CORRECTION PER TABLE 310.15(B)(2)(a): 0.96
OF CURRENT CARRYING CONDUCTORS: 3
CONDUIT FILL PER NEC 310.15(B)(3)(a): 1.0
CIRCUIT CONDUCTOR SIZE: 6 AWG
CIRCUIT CONDUCTOR AMPACITY: 75A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(B):
1.25 X # MICRO-INVERTERS X MAX OUTPUT CURRENT =
1.25 X 1.58 X 35 = 69.13A

DERATED AMPACITY OF CIRCUIT CONDUCTORS PER NEC TABLE 310.16:
TEMP CORR. PER NEC TABLE 310.15(B)(2)(a) X
CONDUIT FILL CORR. PER NEC 310.15(B)(3)(a) X
CIRCUIT CONDUCTOR AMPACITY =
0.96 X 1.0 X 75 = 72.00A

RESULT SHOULD BE GREATER THAN 69.13A OTHERWISE LESS THE ENTRY FOR CIRCUIT CONDUCTOR SIZE AND AMPACITY

ELECTRICAL NOTES

1.) ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
2.) ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
3.) 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.
4.) WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
5.) DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
6.) WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
7.) ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
8.) MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
9.) MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
10.) THE POLARITY OF THE GROUNDED CONDUCTORS IS NEGATIVE

1 ELECTRICAL CALCULATION
SCALE: NTS

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5640 SW 6TH PLACE, SUITE 400,
OCALA, FL 34474 USA
CSLB# CVC56750
PHONE:3522664661
EMAIL: Kathy@solarlightsinc.com

VERSION

DESCRIPTION	DATE	REV
INITIAL RELEASE	07/10/2022	UR

PROJECT NAME

MIKE MORRIS
2720 SW 18TH AVENUE,
OCALA, FL 34471 USA
APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME
ELECTRICAL CALCULATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-6

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

LABEL LOCATION:
AC & DC DISCONNECT AND SUB PANEL
(PER CODE: NEC 690.13(B))

⚠ WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION:
MAIN SERVICE PANEL & NET METER
(PER CODE: NEC 705.12(D)(3), NEC 705.12(B)(3-4) & NEC 690.59)

PHOTOVOLTAIC
AC DISCONNECT

LABEL LOCATION:
AC DISCONNECT
NEC 690.13(B)

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL LOCATION:
RAPID SHUTDOWN
(PER CODE: NEC 690.56(C)(3)

PHOTOVOLTAIC SYSTEM AC DISCONNECT
RATED AC OPERATING CURRENT 55.3 AMPS
AC NOMINAL OPERATING VOLTAGE 240 VOLTS

LABEL LOCATION:
AC DISCONNECT & INVERTER
(PER CODE: NEC690.54)

⚠ WARNING
POWER SOURCE OUTPUT CONNECTION
DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL LOCATION:
SERVICE PANEL IF SUM OF BREAKERS EXCEEDS PANEL RATING
(PER CODE: NEC 705.12 (B)(2)(3)(b)

WARNING:PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION:
EMT / CONDUIT RACEWAYS
(PER CODE: NEC 690.31(G)(3)

MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

LABEL LOCATION:
MAIN SERVICE DISCONNECT / UTILITY METER
(PER CODE: NEC 690.13(B))

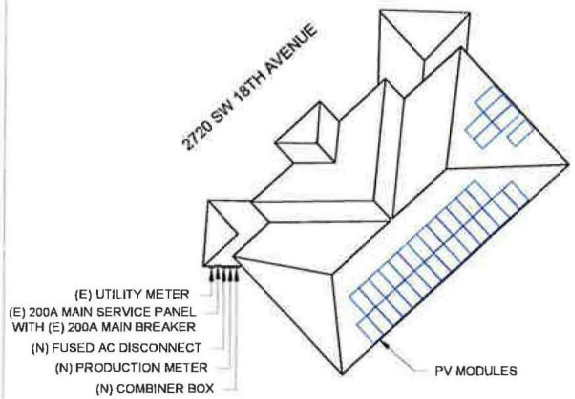
SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

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

LABEL LOCATION:
AC DISCONNECT, DC DISCONNECT, POINT OF INTERCONNECTION
(PER CODE: 605.11.3.1(1) & 690.56(C)(1)(a))

CAUTION !

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN AT: MAIN SERVICE PANEL & UTILITY METER, AC DISCONNECT & LOAD CENTER, PRODUCTION METER



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SOLAR LIGHT & MORE
5640 SW 6TH PLACE, SUITE 400
OCALA, FL 34474 USA
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VERSION

DESCRIPTION	DATE	REV
INITIAL RELEASE	07/10/2022	UR

PROJECT NAME
MIKE MORRIS
2720 SW 18TH AVENUE,
OCALA, FL 34471 USA
APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME
WARNING LABELS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-7

1. EACH MODULE TO BE GROUNDED USING THE SUPPLIED CONNECTION POINT PER MANUFACTURER'S REQUIREMENTS. ALL SOLAR MODULES, EQUIPMENT, AND METALLIC COMPONENTS ARE TO BE BONDED. IF THE EXISTING GROUNDING ELECTRODE SYSTEM CAN NOT BE VERIFIED OR IS ONLY METALLIC WATER PIPING, IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE.

2. ALL PLAQUES AND SIGNAGE REQUIRED BY THE LATEST EDITION OF NATIONAL ELECTRICAL CODE. LABEL SHALL BE METALLIC OR PLASTIC, ENGRAVED OR MACHINE PRINTED IN A CONTRASTING COLOR TO THE PLAQUE. PLAQUE SHALL BE UV RESISTANT IF EXPOSED TO SUNLIGHT.

3. DC CONDUCTORS SHALL BE RUN IN EMT AND SHALL BE LABELED, "CAUTION DC CIRCUIT" OR EQUIV. EVERY 5 FT.

4. EXPOSED NON-CURRENT CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH 250.134 OR 250.136(A).

5. CONFIRM LINE SIDE VOLTAGE AT ELECTRIC UTILITY SERVICE PRIOR TO CONNECTING INVERTER. VERIFY SERVICE VOLTAGE IS WITHIN INVERTER VOLTAGE OPERATIONAL RANGE.

6. OUTDOOR EQUIPMENT SHALL BE NEMA-3R RATED OR BETTER.

7. ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.

8. ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE, AND FOR GROUND-MOUNTED SYSTEMS, WIRING MUST BE PERMANENTLY AND COMPLETELY HELP OFF OF THE GROUND. NEC 110.2 - 110.4 / 300.4

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VERSION

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PROJECT NAME

MIKE MORRIS
2720 SW 18TH AVENUE,
OCALA, FL 34471 USA
APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME

ADDITIONAL NOTES

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-8

AMERICA'S MODULE COMPANY ™

MISSION SOLAR ENERGY

MSE PERC 72

PERC 72
CLASS-LEADING 405-425 W

CLASS LEADING POWER OUTPUT
420 W

POSITIVE POWER TOLERANCE
-0 - +3 %

The True American Brand
Mission Solar Energy is headquartered in San Antonio, Texas, where we manufacture our modules. We produce American, high quality solar modules ensuring the highest in class power output and best in-class reliability. Our product line is tailored for residential, commercial and utility applications. Every Mission Solar Energy solar module is certified and surpasses industry standard regulations, proving excellent performance over the long-term. Demand the best, demand Mission Solar Energy.

CERTIFIED RELIABILITY
- Tested to UL 61730 & IEC standards
- PID resistant
- Resistance to salt mist corrosion

ADVANCED TECHNOLOGY
- PERC and 6 busbar drive 19.1% module efficiency
- Ideal for all applications

EXTREME WEATHER RESILIENCE
- 5400 Pa front and 3600 Pa back load
- Tested to UL 61730
- 40mm frame

BAA COMPLIANT FOR GOVERNMENT PROJECTS
- Buy American Act
- American Recovery & Reinvestment Act

25 YEAR WARRANTY

MADE IN THE USA

FRAME-TO-FRAME WARRANTY
Degradation guaranteed not to exceed 2% in year one and 0.58% annually from years two to 30 with 84.08% guaranteed in year 25.

CERTIFICATIONS

UL 61730
IEC 61215 - IEC 61730
IEC 61701

c UL us LISTED CEC TÜV

Please contact Mission Solar Energy if you have questions or concerns about certification of our products in your area.

*Standard 12-year product warranty extendable to 25 years with registration: www.missionsolar.com/warranty/

ELECTRICAL SPECIFICATION

Product Type	MSE×××SX6W (×××=P_{max})						
Power Output	P_{max}	W_p	405	410	415	420	425
Module Efficiency		%	18.4	18.6	18.9	19.1	19.3
Tolerance		%	0/-3	0/+3	0/+3	0/+3	0/+3
Short Circuit Current	I_{sc}	A	10.39	10.93	10.99	11.05	11.09
Open Circuit Voltage	V_{oc}	V	48.36	48.71	48.92	49.14	49.28
Rated Current	I_{mp}	A	10.23	10.32	10.39	10.46	10.55
Rated Voltage	V_{mp}	V	39.59	39.73	39.93	40.14	40.27
Fuse Rating		A	20	20	20	20	20
System Voltage		V	1500	1500	1500	1500	1500

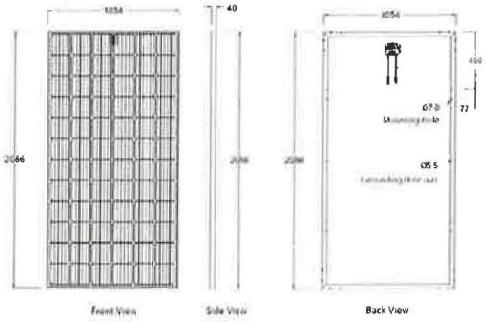
TEMPERATURE COEFFICIENTS

Normal Operating Cell Temperature (NOCT)	44.69°C (±3.7%)
Temperature Coefficient of P_{max}	-0.359%/°C
Temperature Coefficient of V_{oc}	-0.261%/°C
Temperature Coefficient of I_{sc}	0.044%/°C

OPERATING CONDITIONS

Maximum System Voltage	1,500Vdc
Operating Temperature Range	-40°C (-40°F) to +85°C (185°F)
Maximum Series Fuse Rating	20A
Fire Safety Classification	Type 1
Front & Back Load (UL Standard)	5400 Pa front and 3600 Pa back load Tested to UL 61730
Hail Safety Impact Velocity	25mm at 23 m/s

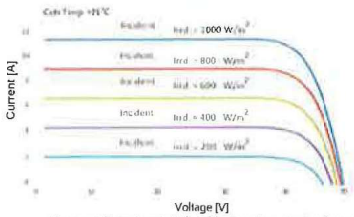
BASIC DIMENSIONS (UNITS: mm)



MECHANICAL DATA

Solar Cells	P-type mono-crystalline silicon
Cell Orientation	72 cells (6x12)
Module	2086mm x 1054mm x 40mm
Weight	23.4 kg (51.6 lbs)
Front Glass	3.2mm, tempered, low-iron, anti-reflective
Frame	Anodized
Encapsulant	Ethylene vinyl acetate (EVA)
Junction Box	Protection class IP67 with 3 bypass-diodes
Cables	1.2m, Wire 4mm² 12AWG)
Connector	Renhe 05-8

MSE415SX6W: 415WP, 72 CELL SOLAR MODULE CURRENT - VOLTAGE CURVE



Current-voltage characteristics with dependence on irradiance and module temperature

CERTIFICATIONS & TESTS

IEC 61215, 61730, 61701
UL 61730

c UL us LISTED CEC TÜV

SHIPPING INFORMATION

Container FT		Pallets	Panels	420 W Bin
53'	Most states	28	728	305.76 kW
Double Stack	California	25	650	273.00 kW

Pallet [26 Panels]

Weight	Height	Width	Length
1450 lbs (657 kg)	47.5 in (120.65 cm)	46 in (116.84 cm)	83.75 in (212.72 cm)

Mission Solar Energy | 8303 S. New Braunfels Ave. San Antonio, Texas 78235
www.missionsolar.com | info@missionsolar.com

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MIKE MORRIS
2720 SW 18TH AVENUE,
OCALA, FL 34471 USA
APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME
SPEC SHEETS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-9

ENPHASE

DATA SHEET

IQ8 Series Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, software-defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. The brain of the semiconductor-based microinverter is our proprietary application-specific integrated circuit (ASIC) which enables the microinverter to operate in grid-tied or off-grid modes. This chip is built in advanced 55nm technology with high speed digital logic and has super-fast response times to changing loads and grid events, alleviating constraints on battery sizing for home energy systems.

Part of the Enphase Energy System, IQ8 Series Microinverters integrate with the Enphase IQ Battery, Enphase IQ Gateway, and the Enphase App monitoring and analysis software.

IQ8 Series Microinverters redefine reliability standards with more than one million cumulative hours of power-on testing, enabling an industry-leading limited warranty of up to 25 years.

Connect PV modules quickly and easily to IQ8 Series Microinverters using the included Q-DCC-2 adapter cable with plug-n-play MC4 connectors.

IQ8 Series Microinverters are UL Listed as PV Rapid Shut Down Equipment and conform with various regulations, when installed according to manufacturer's instructions.

Easy to install

- Lightweight and compact with plug-n-play connectors
- Power Line Communication (PLC) between components
- Faster installation with simple two-wire cabling

High productivity and reliability

- Produce power even when the grid is down
- More than one million cumulative hours of testing
- Class II double-insulated enclosure
- Optimized for the latest high-powered PV modules

Microgrid-forming

- Complies with the latest advanced grid support
- Remote automatic updates for the latest grid requirements
- Configurable to support a wide range of grid profiles
- Meets CA Rule 21 (UL 1741-SA) requirements

IQ8SE-DS-0001-01-EN-US-2021-10-19

IQ8 Series Microinverters

INPUT DATA (DC)		IQ8-60-2-US	IQ8PLUS-72-2-US	IQ8M-72-2-US	IQ8A-72-2-US	IQ8H-240-72-2-US	IQ8H-208-72-2-US
Commonly used module pairings[2]	W	235 – 350	235 – 440	280 – 460	295 – 500	320 – 540+	295 – 500+
Module compatibility		60-cell/120 half-cell		60-cell/120 half-cell and 72-cell/144 half-cell			
MPPT voltage range	V	27 – 37	29 – 45	33 – 45	36 – 45	38 – 45	38 – 45
Operating range	V	25 – 48			25 – 58		
Min/max start voltage	V	30 / 48			30 / 58		
Max input DC voltage	V	50			50		
Max DC current[3] (module Isc)	A			15			
Overvoltage class DC port				II			
DC port backfeed current	mA			0			
PV array configuration		1x1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit					

OUTPUT DATA (AC)		IQ8-60-2-US	IQ8PLUS-72-2-US	IQ8M-72-2-US	IQ8A-72-2-US	IQ8H-240-72-2-US	IQ8H-208-72-2-US
Peak output power	VA	245	300	330	366	384	366
Max continuous output power	VA	240	290	325	349	380	360
Nominal (L-L) voltage/range[4]	V			240 / 211 – 264			208 / 183 – 250
Max continuous output current	A	1.0	1.21	1.35	1.45	1.58	1.73
Nominal frequency	Hz			60			
Extended frequency range	Hz			50 – 68			
Max units per 20 A (L-L) branch circuit[5]		16	13	11	11	10	9
Total harmonic distortion				<5%			
Overvoltage class AC port				III			
AC port backfeed current	mA			30			
Power factor setting				1.0			
Grid-tied power factor (adjustable)				0.85 leading – 0.85 lagging			
Peak efficiency	%	97.5	97.6	97.6	97.6	97.6	97.4
CEC weighted efficiency	%	97	97	97	97.5	97	97
Night-time power consumption	mW			60			

MECHANICAL DATA	
Ambient temperature range	-40°C to +60°C (-40°F to +140°F)
Relative humidity range	4% to 100% (condensing)
DC Connector type	MC4
Dimensions (HxWxD)	212 mm (8.3") x 175 mm (6.9") x 30.2 mm (1.2")
Weight	1.08 kg (2.38 lbs)
Cooling	Natural convection - no fans
Approved for wet locations	Yes
Acoustic noise at 1 m	<60 dBA
Pollution degree	PD3
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure
Environ. category / UV exposure rating	NEMA Type 6 / outdoor

COMPLIANCE	
Certifications	CA Rule 21 (UL 1741-SA), UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.

(1) The IQ8H-208 variant will be operating in grid-tied mode only at 208V AC. (2) No enforced DC/AC ratio. See the compatibility calculator at https://link.enphase.com/module-compatibility (3) Maximum continuous input DC current is 10.6A (4) Nominal voltage range can be extended beyond nominal if required by the utility. (5) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

IQ8SE-DS-0001-01-EN-US-2021-10-19

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AHJ: MARION COUNTY

SHEET NAME

SPEC SHEETS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-10

Enphase Q Cable Accessories

Enphase Q Cable Accessories

The Enphase Q Cable™ and accessories are part of the latest generation Enphase IQ System™. These accessories provide simplicity, reliability, and faster installation times.

Enphase Q Cable

- Two-wire, double-insulated Enphase Q Cable is 50% lighter than the previous generation Enphase cable
- New cable numbering aid plug and play connectors speed up installation and simplify wire management
- Link connectors eliminate cable waste

Field-Wireable Connectors

- Easily connect Q cables on the roof without complex wiring
- Make connections from any open connector and center feed any section of cable within branch limits
- Available in male and female connector types

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE

Enphase Q Cable Accessories

CONDUCTOR SPECIFICATIONS	
Certification	UL3003 (raw cable), UL 9703 (cable assemblies), DG cable
Flame test rating	FT4
Compliance	RoHS, OIL RES I, CE, UV Resistant, combined UL for Canada and United States
Conductor type	THHN/THWN-2 dry/wet
Disconnecting means	The AC and DC bulkhead connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.

Q CABLE TYPES / ORDERING OPTIONS				
Connectorized Models	Size / Max Nominal Voltage	Connector Spacing	PV Module Orientation	Connector Count per Box
Q-12-10-240	12 AWG / 277 VAC	1.3 m (4.2 ft)	Portrait	240
Q-12-17-240	12 AWG / 277 VAC	2.0 m (6.5 ft)	Landscape (60-cell)	240
Q-12-20-200	12 AWG / 277 VAC	2.3 m (7.5 ft)	Landscape (72-cell)	200

ENPHASE Q CABLE ACCESSORIES		
Name	Model Number	Description
Raw Q Cable	Q-12-RAW-300	300 meters of 12 AWG cable with no connectors
Field-wireable connector (male)	Q-CONN-10M	Make connections from any open connector
Field-wireable connector (female)	Q-CONN-10F	Make connections from any Q Cable open connector
Cable Clip	Q-CLIP-100	Used to fasten cabling to the racking or to secure looped cabling
Disconnect tool	Q-DISC-10	Disconnect tool for Q Cable connectors, DC connectors, and AC module mount
Q Cable sealing caps (female)	Q-SEAL-10	One needed to cover each unused connector on the cabling
Terminator	Q-TERM-10	Terminator cap for unused cable ends
Enphase EN4 to MC4 adaptor[1]	ECA-EN4-S22	Connect PV module using MC4 connectors to IQ micros with EN4 (TE PV4-S SOLARLOK). 150mm/5.9" to MC4.
Enphase EN4 non-terminated adaptor[1]	ECA-EN4-FW	For field wiring of UL certified DC connectors. EN4 (TE PV4-S SOLARLOK) to non-terminated cable. 150mm/5.9"
Enphase EN4 to MC4 adaptor (long)[1]	ECA-EN4-S22-L	Longer adapter cable for EN4 (TE PV4-S SOLARLOK) to MC4. Use with split cell modules or PV modules with short DC cable. 600mm/23.6"
Replacement DC Adaptor (MC4)	Q-DCC-2	DC adaptor to MC4 (max voltage 100 VDC)
Replacement DC Adaptor (UTX)	Q-DCC-5	DC adaptor to UTX (max voltage 100 VDC)

1. Qualified per UL subject 9703

TERMINATOR
Terminator cap for unused cable ends, sold in packs of ten (Q-TERM-10)

SEALING CAPS
Sealing caps for unused aggregator and cable connections (Q-EA-CAP-10 and Q-SEAL-10)

DISCONNECT TOOL
Plan to use at least one per installation, sold in packs of ten (Q-DISC-10)

CABLE CLIP
Used to fasten cabling to the racking or to secure looped cabling, sold in packs of one hundred (Q-CLIP-100)

To learn more about Enphase offerings, visit **enphase.com**

ENPHASE

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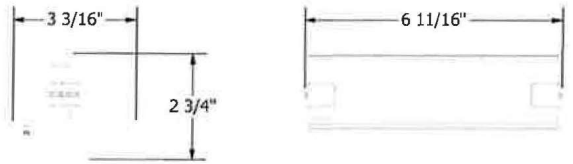
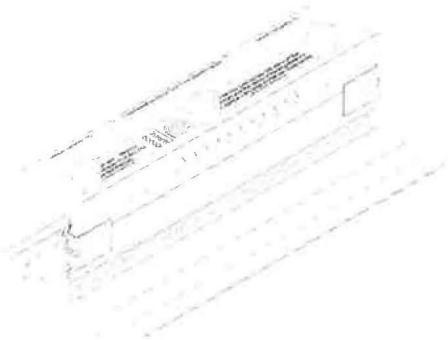
SHEET NAME
SPEC SHEETS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-11

PART # TABLE	
P/N	DESCRIPTION
250010U	SFM SPLICE 6.5"





SFM SPLICE 6.5"

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

PRODUCT LINE:	SFM INFINITY
DRAWING TYPE:	PARTS ASSEMBLY
DESCRIPTION:	SPLICE 6.5"
REVISION DATE:	4/22/2019

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

SFM-A06
SHEET

PART # TABLE	
P/N	DESCRIPTION
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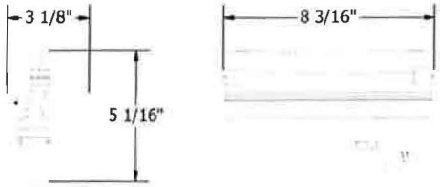

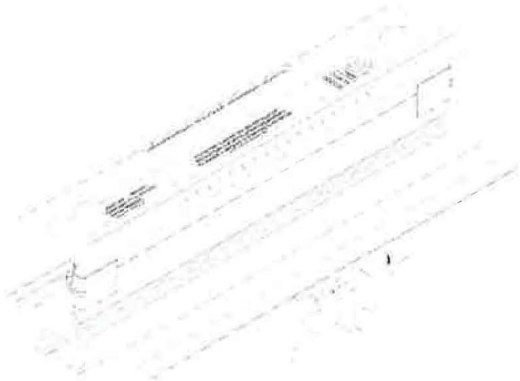

SFM ATTACHED SPLICE 8"

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

PRODUCT LINE:	SFM INFINITY
DRAWING TYPE:	PARTS ASSEMBLY
DESCRIPTION:	ATT SPLICE 8"
REVISION DATE:	4/22/2019

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

SFM-A03
SHEET

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OCALA, FL 34474 USA
CSLB# CVC56750
PHONE:3522664661
EMAIL: Kathy@solarlightsinc.com

VERSION

DESCRIPTION	DATE	REV
INITIAL RELEASE	07/10/2022	UR

PROJECT NAME

MIKE MORRIS
2720 SW 18TH AVENUE,
OCALA, FL 34471 USA
APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME
SPEC SHEETS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-12

PART # TABLE	
P/N	DESCRIPTION
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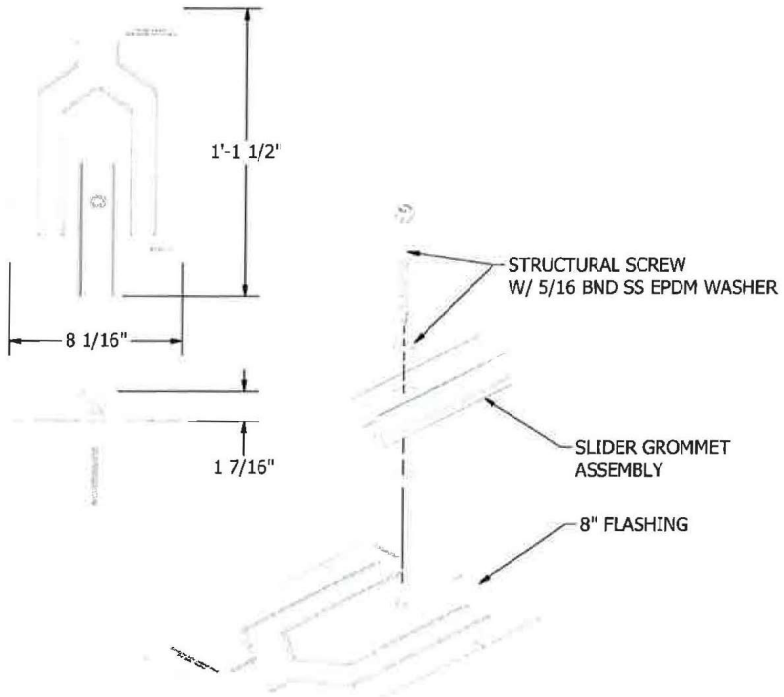

FLASHKIT SFM SLIDER

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

PRODUCT LINE:	SFM INFINITY
DRAWING TYPE:	PARTS ASSEMBLY
DESCRIPTION:	FLASHKIT SLIDER
REVISION DATE:	4/22/2019

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE OR MORE US PATENTS
LEGAL NOTICE

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SHEET

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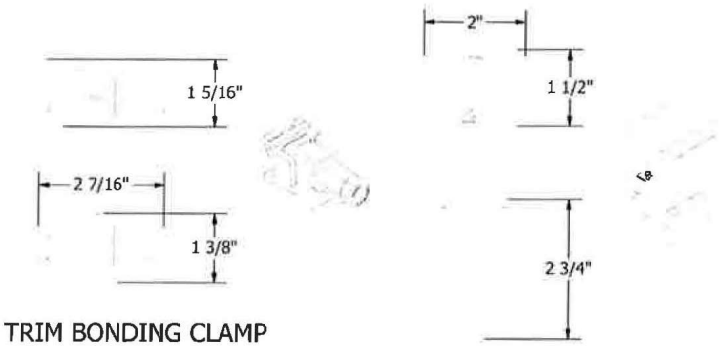
2720 SW 18TH AVENUE,
OCALA, FL 34471 USA
APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME
SPEC SHEETS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-13

PART # TABLE	
P/N	DESCRIPTION
008000U	SFM N/S BONDING CLAMP
008015S	SFM WIRE BONDING CLIP
008100U	SFM TRIM BONDING CLAMP



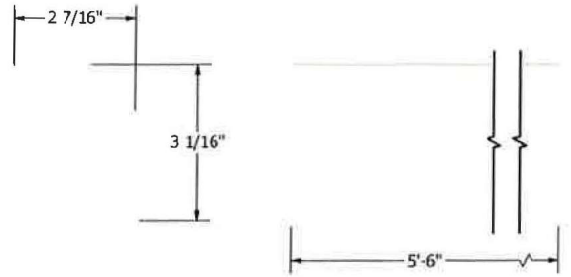
TRIM BONDING CLAMP

N/S BONDING CLAMP

WIRE BONDING CLIP

UNIRAC			
1411 BROADWAY BLVD. NE ALBUQUERQUE, NM 87102 USA PHONE: 505.242.6411 WWW.UNIRAC.COM	PRODUCT LINE: SFM INFINITY DRAWING TYPE: PARTS ASSEMBLY DESCRIPTION: BONDING ASSEMBLIES REVISION DATE: 4/22/2019	DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL PRODUCT PROTECTED BY ONE OR MORE US PATENTS LEGAL NOTICE	SFM-A12 SHEET

PART # TABLE	
P/N	DESCRIPTION
250100U	SFM TRIMRAIL UNIV DARK



SFM TRIMRAIL UNIV

UNIRAC			
1411 BROADWAY BLVD. NE ALBUQUERQUE, NM 87102 USA PHONE: 505.242.6411 WWW.UNIRAC.COM	PRODUCT LINE: SFM INFINITY DRAWING TYPE: PART DESCRIPTION: TRIMRAIL UNIV REVISION DATE: 4/22/2019	DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL PRODUCT PROTECTED BY ONE OR MORE US PATENTS LEGAL NOTICE	SFM-P01 SHEET

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OCALA, FL 34474 USA
CS_B# CVC56750
PHONE:3522664661
EMAIL: Kathy@solarlightsinc.com

VERSION

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INITIAL RELEASE	07/10/2022	UR

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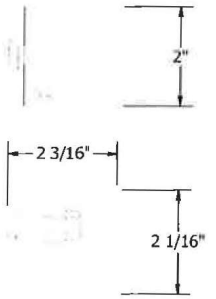
2720 SW 18TH AVENUE,
OCALA, FL 34471 USA
APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME
SPEC SHEETS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-14

PART # TABLE	
P/N	DESCRIPTION
250110U	SFM UNIV TRIMRAIL CLIP DARK



UNIV TRIMRAIL CLIP

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

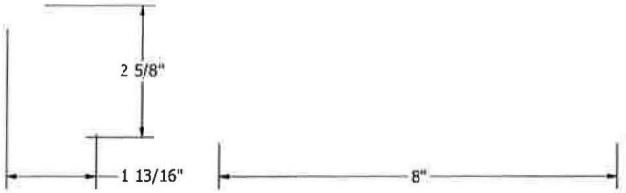
PRODUCT LINE:	SFM INFINITY
DRAWING TYPE:	PARTS ASSEMBLY
DESCRIPTION:	UNIV TRIMRAIL CLIP
REVISION DATE:	4/22/2019

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE OR MORE US PATENTS
LEGAL NOTICE

SFM-A09
SHEET

PART # TABLE	
P/N	DESCRIPTION
250120U	SFM TRIM SPLICE ASSEMBLY DARK



SFM TRIMRAIL SPLICE

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

PRODUCT LINE:	SFM INFINITY
DRAWING TYPE:	PARTS ASSEMBLY
DESCRIPTION:	TRIMRAIL SPLICE
REVISION DATE:	4/22/2019

DRAWING NOT TO SCALE
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LEGAL NOTICE

SFM-A10
SHEET

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OCALA, FL 34474 USA
CSLB# CVC56750
PHONE:3522664661
EMAIL: Kathy@solarlightsinc.com

VERSION

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INITIAL RELEASE	07/10/2022	UR

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OCALA, FL 34471 USA
APN# R2358003021
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AHJ: MARION COUNTY

SHEET NAME
SPEC SHEETS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-15

SFM SUN FRAME MICRORAIL™ INSTALLATION GUIDE

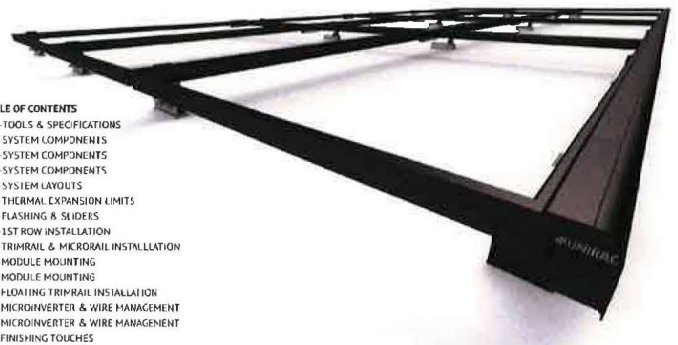


TABLE OF CONTENTS

PUBJ020AUG05

SFM SUN FRAME MICRORAIL™ TOOLS & SPECIFICATIONS INSTALLATION GUIDE A PAGE

TECHNICAL SPECIFICATIONS:

Material Types
All extruded components:
6005A-T61 or 6061-T6 Aluminum

Hardware: Stainless Steel

Bonding and Grounding: Integrated in Microrail™ (Trimrail™ and row to row bonding require additional components)

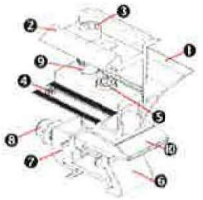
TOOLS REQUIRED OR RECOMMENDED FOR LAYOUT, FLASHINGS & ROOF ATTACHMENTS:
- Hammer
- Marker / crayon
- Measuring tape
- Drill
- Pilot drill bit
- Pry bar
- String line

TOOLS FOR MODULE INSTALL:
- Drill and socket adapter or socket wrench
- 1/4" hex driver
- Torque wrench
- 1/2" socket (optional)

SAFETY:
All applicable OSHA safety guidelines should be observed when working on a PV installation job site. The installation and handling of PV solar modules, electrical installation and PV racking systems involves handling components with potentially sharp metal edges. Rules regarding the use of gloves and other personal protective equipment should be observed.

TORQUE SPECIFICATIONS:	
All SFM Hardware	20 ft-lbs (unless otherwise noted)
Grounding lugs	Per Page 'Q'

SFM SUN FRAME MICRORAIL™ SYSTEM COMPONENTS INSTALLATION GUIDE B PAGE

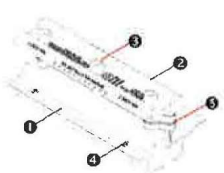


SUNFRAME Microrail™ - 2"

Sub-Components:
1 Base
2 Cap
3 Clamp Socket Head Cap Screw
4 Bonding Pin
5 Height Adjustment Feature
6 Tower
7 Dovetail Lock
8 Dovetail Socket Head Cap Screw
9 Spring Clip
10 Anti-rotation Clip

Functions:
- 1 or 2 module support to roof attachment

Features:
- Arrives on site pre-assembled and ready for installation
- Cap indicates module height compatibility
  - Supports discrete module thicknesses from 30mm to 46mm
- Receiving feature that allows simple module placement, tightening of fasteners and eliminates working over modules

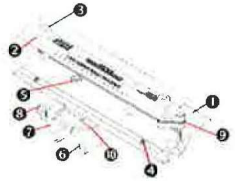


SUNFRAME Microrail™ 6.5" Splice

Sub-Components:
1 Base
2 Cap
3 (3) Clamp Socket Head Cap Screws
4 Bonding Pins
5 (2) Spring Clips

Functions:
- 2,3 or 4 module support & connection
- E/W module to module bonding

Features:
- Arrives on site pre-assembled and ready for installation
- Cap indicates module height compatibility
  - Supports discrete module thicknesses from 30mm to 46mm
- Receiving feature that allows simple module placement, tightening of fasteners and eliminates working over modules
- Does not require attachment to roof



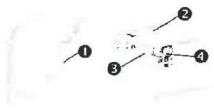
SUNFRAME Microrail™ 8" Attached Splice

Sub-Components:
1 Base
2 Cap
3 (2) Clamp Socket Head Cap Screws
4 (2) Bonding Pins
5 Height Adjustment Feature
6 Tower
7 Dovetail Lock
8 Dovetail Socket Head Cap Screw
9 (2) Spring Clip
10 Anti-Rotation Clip

Functions:
- 2, 3, or 4 module support to roof attachment (where a splice is necessary or desired)
- E/W module to module bonding

Features:
- Arrives on site pre-assembled and ready for installation
- Cap indicates module height compatibility
  - Supports discrete module thicknesses from 32mm to 46mm
- Receiving feature that allows simple module placement, tightening of fasteners and eliminates working over modules

SFM SUN FRAME MICRORAIL™ SYSTEM COMPONENTS INSTALLATION GUIDE C PAGE



Trimrail™ and Module Clips

Sub-Components:
1 Rail Nut
2 Mounted Clip
3 T-Bolt
4 Tri-Drive Nut

Trimrail™

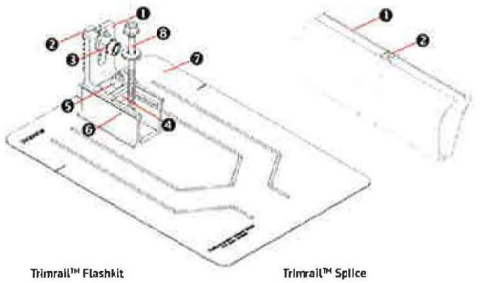
Functions:
- Required front row structural support (with module clips)
- Module mounting
- Installation aid
- Aesthetic trim

Features:
- Mounts directly to L-feet
- Aligns and captures module leading edge
  - Supports discrete module thicknesses from 30, 35, 35, 38 and 46mm

Module Clips

Functions:
- Required front row structural support (with Trimrail)
- Module mounting

Features:
- Mounts to Trimrail™ via T-bolt and nut (drive nut)
- Manually adjustable to fit module thicknesses 32, 35, 35, 38 and 46mm



Trimrail™ Flashkit

Sub-Components:
1 L-Foot
2 Hex Bolt
3 T-Drive Nut
4 Channel Nut
5 Socket Head Cap Screw
6 L-Channel/Slot per engagement
7 Flashing
8 Structural Screw & SS EPDM Washer

Functions:
- Attach Trimrail™ to roof attachment / flashing
- Patented roof sealing technology at roof attachment points

Features:
- Slot provides vertical adjustments to level array
- Slide provides north/south adjustment along the slope of the roof
- Shed and Seal Technology

Trimrail™ Splice

Sub-Components:
1 Structural Splice Extrusion
2 Bonding Clip

Functions:
- Front row structural supports
- Installation aid
- Structurally connects 2 pieces of Trimrail™
- Electrically bonds 2 pieces of Trimrail™

Features:
- Aligns and connects Trimrail™ pieces
- Tool less installation

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EMAIL: Kathy@solarlightsinc.com

VERSION

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2720 SW 18TH AVENUE,
OCALA, FL 34471 USA
APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME

SPEC SHEETS

SHEET SIZE

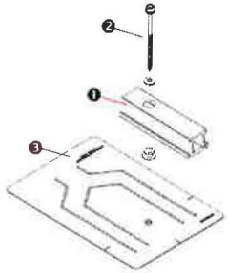
ANSI B
11" X 17"

SHEET NUMBER

PV-16

SFM SUN FRAME MICRORAIL™

SYSTEM COMPONENTS
INSTALLATION GUIDE | D PAGE

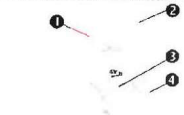


SFM Slider Flashkit

Sub-Components:
1. Slider w/grommet
2. Structural Screw & SS EPDM Washer
3. Flashing

Functions:
- Patented Shed & Seal roof-sealing technology at roof attachment point
- For use with compatible 2" Microrail or 8" Attached Splices

Features:
- Slider provides north/south adjustment along the slope of the roof
- Shed and Seal Technology



Module-to-Module N-S Bonding

Sub-Components:
1. Clamp
2. Bonding Post (2)
3. 5/16" Socket Head Cap Screw
4. Clamp Base

Functions/ Features:
- Row to row bonding
- Single Use Only
- Fits module sizes 32-40mm

Trim -to- Module Bonding Clamp and Floating Trim Clamp

Sub-Components:
1. Wedge
2. Bonding Pin
3. T-Bolt
4. Nut
5. Cap/ Base

Functions/ Features:
- Module to Trimrail™ bonding - single use only
- Attaches Trimrail™ to module with fewer than 2 rafter attachment points are available
- Fits module sizes 32-40mm
- Fits module sizes 32-40mm

Wire Bonding Clip w/ BAWG

Functions:
- Row to row bonding
- Module to Trimrail™ bonding
- Single Use Only

Features:
- Tool less installation

MLPE Mounting Assembly

Sub-Components:
1. MLPE Mount Base
2. 5/16" Socket Head Cap Screw
3. Bonding Pin

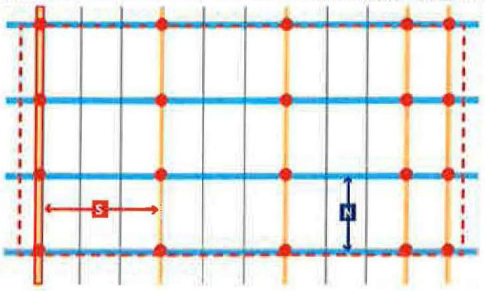
Functions:
- Securely mounts MLPE to module frames
- MLPE to module bonding

Features:
- Mounts easily to typical module flange
- UL2703 Recognized

MLPE = Module Level Power Electronics
e.g. microinverter or power optimizer

SFM SUN FRAME MICRORAIL™

SYSTEM LAYOUT
INSTALLATION GUIDE | E PAGE



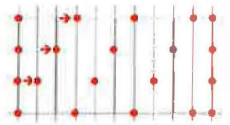
1. Determine appropriate array location on roof [illegible]
2. Select starting course of shingles (for tiles)
3. Mark next row of attachments and repeat for remaining rows

N - NS distance equals module width + 1"

4. Locate 1st rafter closest to array edge (and inside array footprint) and mark
5. Find next rafter for attachment based on appropriate span
   - Continue to end of array
   - Mark last rafter before end of array

S - Span

6. Mark attachment points on rafters along each NS module grid line
7. Refer to Unirac SFM D&E Guide and U-Builder for allowable spans and cantilevers

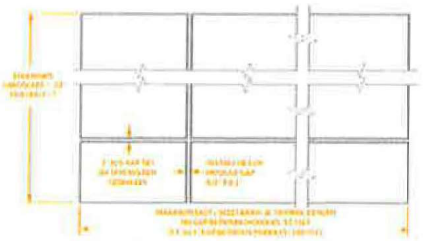


TO STAGGER ATTACHMENTS: Shift each subsequent row of attachments one rafter over.

See the Design and Engineering Guide for details on regional max spans and overhang.

SFM SUN FRAME MICRORAIL™

THERMAL EXPANSION LIMITS
INSTALLATION GUIDE | F PAGE

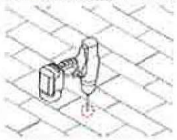


NORTH-SOUTH THERMAL EXPANSION LIMITS:
- 12 Rows of modules - Landscape orientation
- 7 Rows of modules - Portrait Orientation

EAST-WEST THERMAL EXPANSION LIMITS:
- 33ft. with no module gap (butted modules)
- 100ft. with a minimum module gap of 1/8"

SFM SUN FRAME MICRORAIL™

FLASHING & SLIDERS
INSTALLATION GUIDE | G PAGE



PILOT HOLES:
Drill pilot holes for lag screws or structural screws (as necessary) at marked attachement points

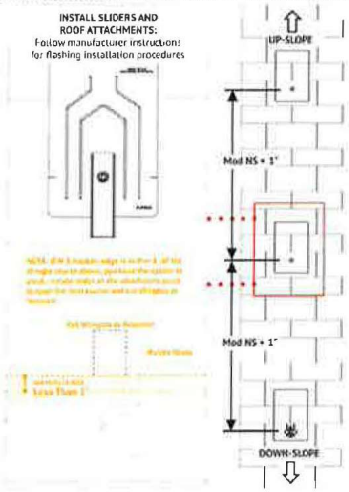
FLASHINGS:
Place flashings

INSTALL SLIDERS AND TRIMRAIL ROOF ATTACHMENTS:
- Insert flashings per manufacturer instructions

NOTE: Use lag screws or structural fasteners with a minimum diameter of 5/16"

- Attach sliders to rafters
- Verify proper row to row spacing for module size (Mod NS + 1")
- Ensure that TrimrailTM roof attachments in each row have sufficient engagement with slider dovetails for proper attachment.

INSTALL SLIDERS AND ROOF ATTACHMENTS:
Follow manufacturer instructions for flashing installation procedures



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SPEC SHEETS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-17

1ST ROW INSTALLATION

SFM SUN FRAME MICRORAIL™ — INSTALLATION GUIDE — H PAGE

ALIGN FRONT ROW:
Align front row Trimrail™ roof attachments with string line.

TIGHTEN SLIDER:
Tighten front row lag screw and Trimrail™ roof attachment channel clamp socket head cap screw.

TRIMRAIL PREPARATION:
Determine overall length of Trimrail™ for front row. Determine splice locations (if any) and Trimrail™ lengths required. When 2 or less attachment points are available at front of module edge, a Floating Trim Clamp may be required, see page I L) for details.

INSTALL TRIMRAIL SPLICE:
Place Trimrail™ with front side up and firmly insert splice into Trimrail™, until it contacts vertical stop tab of steel bonding clip.

JOIN TRIMRAIL SECTIONS AT SPLICE:
While holding Trimrail™ sections in alignment, join sections together with splice centered at joint and vertical stop tab in contact with both trimrail sections.

VERIFY SPLICE INSTALLATION:
Verify full engagement of splice clip at top of trim rail. Bonding between trim sections occurs through the splice.

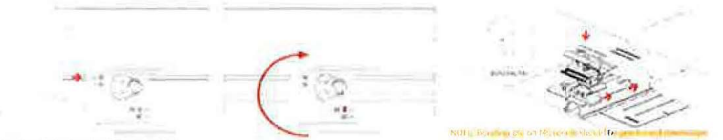
See the Design and Engineering Guide for details on regional max spans and overhang.

TRIMRAIL + MICRORAIL INSTALLATION

SFM SUN FRAME MICRORAIL™ — INSTALLATION GUIDE — I PAGE

ATTACH TRIMRAIL TO ROOF ATTACHMENT:
Attach rail using 3/8" hex bolt & Tri drive or serrated flange nuts. Make sure Trimrail™ is level across all Trimrail™ roof attachments. After rail is level, tighten channel clamp bolts to secure Trimrail™ roof attachments to channels.

INSTALL MODULE CLIPS ON TRIMRAIL:
Attach module clips to Trimrail using 3/8" T-bolts and Tri drive or serrated flange nuts. A minimum of two clips are required per module. Refer to SFM D&E guide and U-builder for required position and quantity of module clips.



POSITION MODULE CLIPS ACCORDING TO MODULE THICKNESS:
Align notch in module clip with bottom rib according to module thickness (identified in mm on faces of module clips). Rotate clip to position as required location.

INSTALL MICRORAILS:
Install Microrail™ at marked attachment points. Click Microrail™ into sliders and push Microrail™ to top of slider. Ensure that cap remains in upper most (40mm) position.

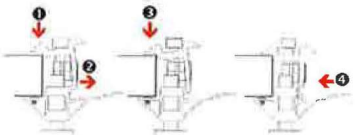
MODULE MOUNTING

SFM SUN FRAME MICRORAIL™ — INSTALLATION GUIDE — J PAGE

LAY IN MODULE(S):
Install first two (2) modules on bottom row. Install downhill end of module in to the Trimrail™ and module clips first and then position uphill 2" microrails to support modules.

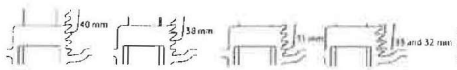
LAY IN MODULE(S):
Module should slide into catch features of the Trimrail™ and module clips.

SEAT MODULE(S):
Ensure that modules are properly seated in cap and base.



ADJUST MICRORAIL CAP DOWN TO ENGAGE WITH MODULE:
With microrail pressed against module 1. Apply downward pressure to module side of cap which will. 2. separate cap from base on capture side and allow cap to 3. contact module and 4. simultaneously re-engage to have at corresponding module height location.

IMPORTANT: Microrail caps and splices must be installed with at least 2" engagement with module.

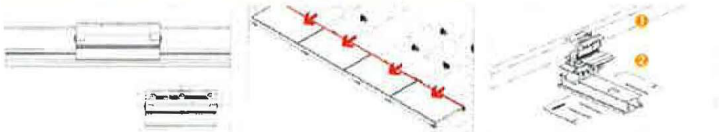


VERIFY CORRECT POSITION OF CAP:
Check position and verify cap on down slope side is tight with no gap between cap and module after tightening bolt.

MODULE MOUNTING

SFM SUN FRAME MICRORAIL™ — INSTALLATION GUIDE — K PAGE

Wire management is performed after each row of modules is installed. Refer to wire management section (pp. I, J, M) for detailed instructions.



ATTACH SPLICE:
Attach splice at intersection of two (2) modules
- Use attached splice if required per SFM D&E Guide.
- Ensure minimum module engagement using indicator marks.

FASTEN MODULES:
Finish installing modules along row and tighten fastening bolts on microrails and splices to 20 ft lbs after entire row is installed.

TIGHTEN FASTENERS:
Tighten fasteners to 20 ft lbs.

NOTE: Tighten components following order:
1. Module clamp socket head cap screw/nuts
2. Bonded splice/bonding lug screw

ATTACHED SPLICE ADJUSTMENT:
Tower and height adjustment feature may be located to alternate position as required to achieve minimum module engagement.

1. With 1/4" hex drive tool, rotate height adjustment feature clockwise until head clears thru-hole in base. 2. slide tower to alternate position and align.

height adjustment feature head with clearance hole. 3. Rotate height adjustment feature counter-clockwise until head enters clearance hole.

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PHONE:3522664661
EMAIL: Kathy@solarlightsinc.com

VERSION

DESCRIPTION	DATE	REV
INITIAL RELEASE	07/10/2022	UR

PROJECT NAME

MIKE MORRIS
2720 SW 18TH AVENUE,
OCALA, FL 34471 USA
APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

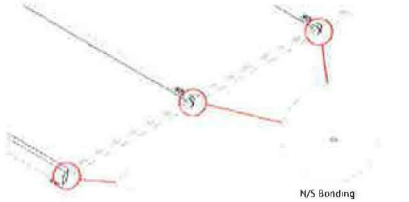
SHEET NAME
SPEC SHEETS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-18

SFM SUN FRAME MICRORAIL

FINISHING TOUCHES
INSTALLATION GUIDE | P PAGE



TRIMRAIL™ Bonding

N/S Bonding

N/S Bonding Clamp:
Insert clamp between modules
Torque to 20 ft-lbs

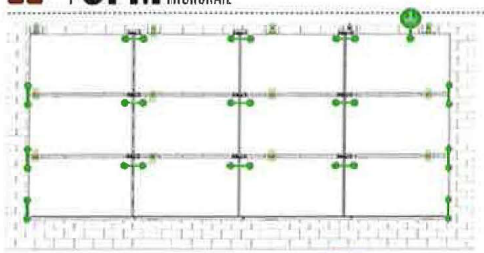
TRIMRAIL™ Bonding:
Insert clamp and Tbolt into trimrail slot.
Tighten to drive nut until bonding pin contacts module.
Torque to 20 ft. lbs.

Trimrail Bonding Alternate Method
Attach a bonding clip from the Trimrail™ to an adjacent module. Fully seat bonding clip into radius portion of the Trimrail™ mating surface and module flange.

N/S Bonding Alternate Method
Fully seat bonding clip on each module flange to provide bond across N/S module gap

SFM SUN FRAME MICRORAIL

SYSTEM BONDING & GROUNDING
INSTALLATION GUIDE | Q PAGE



LUG DETAIL & TORQUE INFO
Ilsco Lay-In Lug (GBL-4DBT)
- 10-32 mounting hardware
- Torque = 5 ft lb
- AWG 4-14 - Solid or Stranded

LUG DETAIL & TORQUE INFO
Ilsco Flange Lug(SGB-4)
- 1/4" mounting hardware
- Torque = 75 in lb
- AWG 4-14 - Solid or Stranded

LUG DETAIL & TORQUE INFO
Wiley WEEBLug (6.7)
- 1/4" mounting hardware
- Torque = 10 ft lb
- AWG 6-14 - Solid or Stranded

NOTE: ISOLATE COPPER FROM ALUMINUM CONTACT TO PREVENT CORROSION

System bonding is accomplished through modules. System grounding accomplished by attaching a ground lug to any module at a location on the module specified by the module manufacturer.

E-W BONDING PATH:
E-W module to module bonding is accomplished with 2 pre-installed bonding pins which engage on the secure side of the MicroRailTM and splice.

N-S BONDING PATH:
N-S module to module bonding is accomplished with bonding clamp with 2 integral bonding pins.

TRIMRAIL BONDING PATH:
Trimrail to module bonding is accomplished with bonding clamp with integral bonding pin and bonding T-bolt.

SFM SUN FRAME MICRORAIL

UL CODE COMPLIANCE NOTES
INSTALLATION GUIDE | R PAGE

SYSTEM LEVEL FIRE CLASSIFICATION

The system fire class rating requires installation in the manner specified in the SUNFRAME MICRORAIL (SFM) Installation Guide. SFM has been classified to the system level fire portion of UL 1703. This UL 1703 classification has been incorporated into the UL 2703 product certification. SFM has achieved Class A, B & C system level performance for low slope & steep sloped roofs when used in conjunction with type 1 and type 2 modules. Class A, B & C system level fire performance is inherent in the SFM design, and no additional mitigation measures are required. The fire classification rating is valid for any roof pitch. There is no required minimum or maximum height limitation above the roof deck to maintain the Class A, B & C fire rating for SFM. SUNFRAME MICRORAIL™ components shall be mounted over a fire resistant roof covering rated for the application.

Module Type	Roof Slope	System Level Fire Rating	Microrail Direction	Module Orientation	Mitigation Required
Type 1 and Type 2	Steep Slope & Low Slope	Class A, B & C	East-West	Landscape OR Portrait	None Required

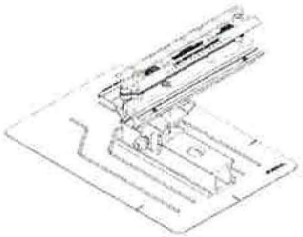
UL 2703 TEST MODULES

See page 'S' for a list of modules that were electrically and mechanically tested or qualified with the SUNFRAME MICRORAIL (SFM) components outlined within this Installation Guide.

- Maximum Area of Module = 22.3 sqft
- UL2703 Design Load Ratings:
  - a) Downward Pressure – 113 PSF / 5400 Pa
  - b) Upward Pressure – 50 PSF / 2400 Pa
  - c) Down-Slope Load – 30 PSF / 1400 Pa
- Tested Loads:
  - a) Downward Pressure – 170 PSF / 8000 Pa
  - b) Upward Pressure – 75 PSF / 3500 Pa
  - c) Down-Slope Load – 45 PSF / 2100 Pa
- Maximum Span – 6ft
- Use with a maximum over current protection device OCPD of 30A
- System conforms to UL Std 2703, certified to LTR AE-001-2012
- Rated for a design load of 2400 Pa / 5400 Pa with 24 inch span

LABEL MARKINGS

- System fire class rating: See installation instructions for installation requirements to achieve a specified system fire class rating with Unirac.
- Unirac SUNFRAME MICRORAIL™ is Listed to UL 2703
- All splices within a system are shipped with marking indicating date and location of manufacture



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EMAIL: Kathy@solarlightsnc.com

VERSION

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2720 SW 18TH AVENUE,
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APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME

SPEC SHEETS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-19

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AUTHORIZATION TO MARK

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listee model(s) identified on the correlation page of the Listing Report.

This document is the property of Intertek Testing Services and is not transferable. The certification mark(s) may be applied only at the location of the Party Authorized To Apply Mark.

Applicant:	Unirac, Inc	**Manufacturer:**	
Address:	1411 Broadway Blvd NE Albuquerque, NM 87102	**Address:**	
Country:	USA	**Country:**	
Contact:	Klaus Nicolaedis Todd Ganshaw	**Contact:**	
Phone:	505-462-2190 505-843-1418	**Phone:**	
FAX:	NA	**FAX:**	
Email:	klaus.nicolaedis@unirac.com toddg@unirac.com	**Email:**	

Party Authorized To Apply Mark: Same as Manufacturer
Report Issuing Office: Lake Forest, CA

Control Number: 5003705 **Authorized by:** Claudia Ladynski
for L. Matthew Snyder, Certification Manager

C ETL US
Intertek

This document supersedes all previous Authorizations to Mark for the noted Report Number.

Intertek Testing Services NA Inc.
545 East Algonquin Road, Arlington Heights, IL 60005
Telephone 800-345-3851 or 847-439-5667 Fax 312-283-1672

Standard(s):	Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels [UL 2703: 2015 Ed.1] Photovoltaic Module Racking Systems [CSA LTR AE-001:2012 Ed.2012/10/23]
Product:	Photovoltaic Mounting System, Sun Frame Microrail Installation Guide, PUB2020MAY04
Brand Name:	Unirac
Models:	Unirac SFM

intertek
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FAX:	NA	**FAX:**	
Email:	klaus.nicolaedis@unirac.com toddg@unirac.com	**Email:**	

Party Authorized To Apply Mark: Same as Manufacturer
Report Issuing Office: Lake Forest, CA

Control Number: 5014989 **Authorized by:** Claudia Ladynski
for L. Matthew Snyder, Certification Manager

C ETL US
Intertek

This document supersedes all previous Authorizations to Mark for the noted Report Number.

This Authorization to Mark is for the exclusive use of Intertek's Client and is provided pursuant to the Certification agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client, in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Authorization to Mark. Only the Client is authorized to permit copying or distribution of this Authorization to Mark and then only in its entirety. Use of Intertek's Certification mark is restricted to the conditions laid out in the agreement and in this Authorization to Mark. Any further use of the Intertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. Initial Factory Assessments and Follow-up Services are for the purpose of assuring appropriate usage of the Certification mark in accordance with the agreement; they are not for the purposes of production quality control and do not relieve the Client of their obligations in this respect.

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545 East Algonquin Road, Arlington Heights, IL 60005
Telephone 800-345-3851 or 847-439-5667 Fax 312-283-1672

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Product:	Photovoltaic Mounting System, Sun Frame Microrail Installation Guide, PUB2020MAY04
Brand Name:	Unirac
Models:	Unirac SFM

ATM for Report 102393982LAX-002 Page 2 of 2 ATM Issued: 2-Jun-2020
ED 16.3.15 (20 Apr 17) Mandatory

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EMAIL: Kathy@solarlightsinc.com

VERSION

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INITIAL RELEASE	07/10/2022	UR

PROJECT NAME

MIKE MORRIS
2720 SW 18TH AVENUE,
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APN# R2358003021
UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME
SPEC SHEETS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-20

Certificate of Compliance

Certificate: 70131735 **Master Contract:** 266909

Project: 80111014 **Date Issued:** 2022-02-28

Issued To: Unirac
1411 Broadway NE
Albuquerque, New Mexico, 87102
United States

Attention: Klaus Nicolaedis

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.

Issued by: Michael Hoffnagle
Michael Hoffnagle

C US

PRODUCTS

CLASS - C531302 - POWER SUPPLIES - PHOTOVOLTAICS-PV Racking and clamping systems
CLASS - C531382 - POWER SUPPLIES - PHOTOVOLTAICS-PV Racking and clamping systems - Certified to US Standards

Models:	SM	-	SOLARMOUNT Flush-to-Roof is an extruded aluminum rail PV racking system that is installed parallel to the roof in landscape or portrait orientations.

	ULA	-	Unirac Large Array is a ground mount system using the SolarMount (SM) platform for the bonding and grounding of PV modules.

Solarmount

The system listed is designed to provide bonding/grounding, and mechanical stability for photovoltaic modules. The system is secured to the roof with the L-Foot components through the roofing material to building structure. Modules are secured to the racking system with stainless steel or aluminum mid clamps and Aluminum end clamps. The modules are bonded to the racking system with the stainless-steel bonding mid clamps with piercing points. The system is grounded with 10 AWG copper wire to bonding/grounding lugs. Fire ratings of Class A with Type 1, 2, 3 (with metallic frame), 10(with metallic frame), 19, 22, 25, 29, or 30 for steep slope. Tested at 5" interstitial gap which allows installation at any stand-off height.

The grounding of the system is intended to comply with the latest edition of the National Electrical Code, to include NEC 250 & 690. Local codes compliance is required, in addition to national codes. All grounding/bonding connections are to be torqued in accordance with the Installation Manual and the settings used during the certification testing for the current edition of the project report.

The system may employ optimizers/micro-inverters and used for grounding when installed per installation instructions.

UL 2703 Mechanical Load ratings:

Downward Design Load (lb/ft²)	113.5
Upward Design Load (lb/ft²)	50.7
Down-Slope Load (lb/ft²)	16.13

Test Loads:

Downward Load (lb/ft²)	170.20
Upward Load (lb/ft²)	76.07
Down-Slope Load (lb/ft²)	24.2

Unirac Large Array

ULA is a ground mount system using the SolarMount (SM) platform for the bonding and grounding of PV modules. ULA aluminum components merge with SM rails and installer-supplied steel pipe. The SM rail system is secured to the horizontal Pipe using the Rail Bracket components. The Rear and Front cap secures the horizontal Pipe to the vertical Pipe. The Front cap is also used to secure the Cross brace. A Slider is attached to the vertical Pipe to secure the Cross brace. The SM rails, caps, slider, rail brackets, and cross braces materials are

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EMAIL: Kathy@solarlightsinc.com

VERSION

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2720 SW 18TH AVENUE,
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UTILITY: OCALA ELECTRIC
AHJ: MARION COUNTY

SHEET NAME
SPEC SHEETS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-21

December 31, 2020

Unirac
1411 Broadway Blvd. NE
Albuquerque, NM 87102

Attn.: Unirac - Engineering Department

Re: Engineering Certification for the Unirac Sunframe Microrail, SFM Infinity U-builder Software Version 1.0

PZSE, Inc. - Structural Engineers has reviewed the Unirac's Sunframe Microrail, proprietary mounting system constructed from modular parts which is intended for rooftop installation of solar photovoltaic (PV) panels; and has reviewed the U-builder Online tool. This U-Builder software includes analysis for the 2" Microrail, 8" Attached Splice, 6" splice, and front trimrail. All information, data and analysis contained within are based on, and comply with the following codes and typical specifications:

1. Minimum Design Loads for Buildings and other Structures, ASCE/SEI 7-05, ASCE/SEI 7-10, ASCE/SEI 7-16
2. 2020 Florida Building Code, by Florida Building Commission
3. 2006-2018 International Building Code, by International Code Council, Inc. w/ Provisions from SEAOC PV-2 2017.
4. 2006-2018 International Residential Code, by International Code Council, Inc. w/ Provisions from SEAOC PV-2 2017.
5. AC428, Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012 by ICC-ES.

Following are typical specifications to meet the above code requirements:

Design Criteria:	Ground Snow Load = 0 - 100 (psf) Basic Wind Speed = 90 - 180 (mph) Roof Mean Height = 0 - 60 (ft) Roof Pitch = 0 - 45 (degrees) Exposure Category = B, C & D
Attachment Spacing:	Per U-builder Engineering report.
Cantilever:	Maximum cantilever length is L/3, where "L" is the span noted in the U-Builder online tool.
Clearance:	2" to 10" clear from top of roof to top of PV panel.
Tolerance(s):	1.0" tolerance for any specified dimension in this report is allowed for installation.
Installation Orientation:	See SFM Installation Guide. Landscape - PV Panel long dimension is parallel to ridge/eave line of roof and the PV panel is mounted on the long side. Portrait - PV Panel short dimension is parallel to ridge/eave line of roof and the PV panel is mounted on the short side. Attachment shall be staggered where ground snow load exceeds 10 PSF.
Testing:	Values were based on UTR-299 testing provided by Unirac.

Components and Cladding Roof Zones:
The Components and Cladding Roof Zones shall be determined based on ASCE 7-05, ASCE 7-10 & 7-16 Component and Cladding design.

Notes:
1) U-builder Online tool analysis is only for Unirac SFM Sunframe Microrail system only and do not include roof capacity check.
2) Risk Category II per ASCE 7-16.
3) Topographic factor, kzt is 1.0.
4) Array Edge Factor γ_E = 1.5
5) Average parapet height is 0.0 ft.
6) Wind speeds are LRFD values.
7) Attachment spacing(s) apply to a seismic design category E or less.

Design Responsibility:
The U-Builder design software is intended to be used under the responsible charge of a registered design professional where required by the authority having jurisdiction. In all cases, this U-builder software should be used under the direction of a design professional with sufficient structural engineering knowledge and experience to be able to:

- Evaluate whether the U-Builder Software is applicable to the project, and
- Understand and determine the appropriate values for all input parameters of the U-Builder software.

This letter certifies that the Unirac SFM Sunframe Microrail, when installed according to the U-Builder engineering report and the manufacture specifications, is in compliance with the above codes and loading criteria.

This certification excludes evaluation of the following components:
1) The structure to support the loads imposed on the building by the array, including, but not limited to: strength and deflection of structural framing members, fastening and/or strength of roofing materials, and/or the effects of snow accumulation on the structure.
2) The attachment of the SFM 2" Microrail or 8" Attached Splice to the existing structure.
3) The capacity of the solar module frame to resist the loads.

This requires additional knowledge of the building and is outside the scope of the certification of this racking system.

If you have any questions on the above, do not hesitate to call.

Prepared by:
PZSE, Inc. – Structural Engineers
Roseville, CA

THIS ITEM HAS BEEN ELECTRONICALLY SIGNED AND SEALED BY PAUL K. ZACHER, PE ON 12/31/2020 USING A SHA-1 AUTHENTICATION CODE.

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SHA-1 AUTHENTICATION CODE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

DIGITAL SIGNATURE

PAUL K. ZACHER LICENSE No. 73522 STATE OF FLORIDA PROFESSIONAL ENGINEER

12/31/2020

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SHEET NAME
SPEC SHEETS

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ANSI B
11" X 17"

SHEET NUMBER
PV-22

Tier 2
Standard Interconnection Agreement
Customer-Owned Renewable Generation System

This **Agreement** is made and entered into this 30 day of August, 2022, by and between MICHAEL J. MORRIS, (hereinafter called "**Customer**"), located at 2720 SW 18TH AVE in Ocala, Florida, and the City of Ocala doing business as Ocala Electric Utility (hereafter called "**OEU**"), a body politic. Customer and OEU shall collectively be called the "**Parties**". The physical location/premise where the interconnection is taking place: 2720 SW 18TH AVE, Ocala, Fl. 34471.

WITNESSETH

Whereas, a Tier 2 Renewable Generation System (RGS) is an electric generating system that uses one or of more of the following fuels or energy sources: hydrogen, biomass, solar energy, geothermal energy, wind energy, ocean energy, waste heat, or hydroelectric power as defined in Section 377.803, Florida Statutes, rated at more than 10 kilowatts (10 kW) but not greater than 100 kilowatts (100 kW) alternating current (AC) power output and is primarily intended to offset part or all of the customer's current electric requirements; and

Whereas, OEU operates an electric system serving parts of the City of Ocala and Marion County; and

Whereas, Customer has made a written Application to OEU, a copy being attached hereto, to interconnect its RGS with OEU's electrical supply grid at the location indentified above; and

Whereas, the City of Ocala and the Florida Municipal Power Agency (hereinafter called "FMPA") have entered into the All-Requirements Power Supply Contract pursuant to which OEU has agreed to purchase and receive, and FMPA has agreed to sell and supply OEU with all energy and capacity necessary to operate OEU's electric system, which limits OEU's ability to directly purchase excess energy from customer-owned renewable generation; and

Whereas, in order to promote the development of small customer-owned renewable generation by permitting OEU to allow its customers to interconnect with OEU's electric system and to allow OEU customers to offset their electric consumption with customer-owned renewable generation, FMPA, in accordance with the terms and conditions of this agreement, has agreed to purchase excess customer-owned generation from OEU customers interconnected to OEU's electric system; and

Whereas, OEU desires to provide interconnection of a RGS under conditions which will insure the safety of OEU customers and employees, reliability and integrity of its distribution system;

(Continued on Sheet No. 22.1)

NOW, THEREFORE, for and in consideration of the mutual covenants and agreements herein set forth, the parties hereto covenant and agree as follows:

1. The Customer shall be required to enter into a Tri-Party Net-Metering Purchase Power Agreement with FMPA and OEU.

2. "Gross power rating" (GPR) means the total manufacturer's AC nameplate generating capacity of an on-site customer-owned renewable generation system that will be interconnected to and operate in parallel with OEU distribution facilities. For inverter-based systems, the GPR shall be calculated by multiplying the total installed DC nameplate generating capacity by 0.85 in order to account for losses during the conversion from DC to AC.

3. This agreement is strictly limited to cover a Tier 2 RGS as defined above. It is the Customer's responsibility to notify OEU of any change to the GPR of the RGS by submitting a new application for interconnection specifying the modifications at least 30 days prior to making the modifications. In no case should modifications to the RGS be made such that the GPR increases above the 100 kilowatts (100 kW) limit.

4. The RGS GPR must not exceed 90 percent (90%) of the Customer's OEU calculated distribution service rating at the Customer's location (including shared electric facilities). If the GPR does exceed the 90 percent (90%) limit, the Customer shall be responsible to pay the cost of upgrades to the distribution facilities required to accommodate the GPR capacity and ensure the 90 percent (90%) threshold is not breached. OEU will not allow a RGS GPR greater than required to offset the customer's annual kWh energy consumption (based on customer's historical consumption data or by means of estimated usage of similar type of service as determined by OEU).

5. The Customer shall be required to pay a non-refundable application fee of $375 for the review and processing of the application.

6. The Customer shall fully comply with OEU's Rules and Regulations and Electric Service Specifications as those documents may be amended or revised by OEU from time to time.

7. The Customer certifies that its installation, its operation and its maintenance shall be in compliance with the following standards (or most current version at time of inspection approval):
   a. IEEE-1547 (2018) Standard for Interconnecting Distributed Resources with Electric Power System;
   b. IEEE-1547.1 (2005) Standard Conformance Test Procedures for Equipment Interconnection Distributed Resources with Electric Power Systems;
   c. UL-1741 (2010) Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed *Energy Resources.*

(Continued on Sheet No. 22.2)

d. The National Electric Code, state and/or local building codes, mechanical codes and/or electrical codes;
e. The manufacturer's installation, operation and maintenance instructions.

8. The Customer is not precluded from contracting for the lease, operation or maintenance of the RGS with a third party. Such lease may not provide terms or conditions that provide for any payments under the agreement to any way indicate or reflect the purchase of energy produced by the RGS. Customer shall not enter into any lease agreement that results in the retail purchase of electricity; or the retail sale of electricity from the customer-owned renewable generation. Notwithstanding this restriction, in the event that Customer is determined to have engaged in the retail purchase of electricity from a party other than OEU, then Customer shall be in breach of this Agreement and may be subject to the jurisdiction of the Florida Public Service Commission and to fines/penalties.

9. The Customer shall provide a copy of the manufacturer's installation, operation and maintenance instructions to OEU. If the RGS is leased to the Customer by a third party, or if the operation or maintenance of the RGS is to be performed by a third party, the lease and/or maintenance agreements and any pertinent documents related to these agreements shall be provided to OEU.

10. Prior to commencing parallel operation with OEU's electric system, Customer shall have the RGS inspected and approved by the appropriate code authorities having jurisdiction. Customer shall provide a copy of this inspection and approval to OEU.

11. The Customer agrees to permit OEU, if it should so choose, to inspect the RGS and its component equipment and the documents necessary to ensure compliance with this Agreement both before and after the RGS goes into service and to witness the initial testing of the RGS equipment and protective apparatus. OEU will provide Customer with as much notice as reasonably possible, either in writing, email, facsimile or by phone as to when OEU may conduct inspections and or document review. Upon reasonable notice, or at any time without notice in the event of an emergency or hazardous condition, Customer agrees to provide OEU access to the Customer's premises for any purpose in connection with the performance of the obligations required by this Agreement or, if necessary, to meet OEU's legal obligation to provide service to its customers. At least ten (10) business days prior to initially placing the customer-owned renewable generation system in service, Customer shall provide written notification to OEU advising OEU of the date and time at which Customer intends to place the system in service, and OEU shall have the right to have personnel present on the in-service date in order to ensure compliance with the requirements of this Agreement.

(Continued on Sheet No. 22.3)

12. The Customer's RGS must have an appropriately sized grid-tie inverter system that includes applicable protective systems. Customer certifies that the RGS equipment includes a utility-interactive inverter or interconnection system equipment that ceases to interconnect with the OEU system upon a loss of OEU power. The inverter shall be considered certified for interconnected operation if it has been submitted by a manufacturer to a nationally recognized testing laboratory (NRTL) to comply with UL 1741. The NRTL shall be approved by the Occupational Safety & Health Administration (OSHA).

13. If Customer adds another RGS which (i) utilizes the same utility-interactive inverter for both systems; or (ii) utilizes a separate utility-interactive inverter for each system, then Customer shall provide OEU with sixty (60) days advance written notice of the addition.

14. The Customer shall not energize the OEU system when OEU's system is deenergized. The Customer shall cease to energize the OEU system during a faulted condition on the OEU system and/or upon any notice from OEU that the deenergizing of Customer's RGS equipment is necessary. The Customer shall cease to energize the OEU system prior to automatic or non-automatic reclosing of OEU's protective devices. There shall be no intentional islanding, as described in IEEE 1547, between the Customer's and OEU's systems.

15. The Customer is responsible for the protection of its generation equipment, inverters, protection devices, and other system components from damage from the normal and abnormal operations that occur on OEU's electric system in delivering and restoring system power. Customer agrees that any damage to any of its property, including, without limitation, all components and related accessories of its RGS system, due to the normal or abnormal operation of OEU's electric system, is at Customer's sole risk and expense. Customer is also responsible for ensuring that the customer-owned renewable generation equipment is inspected, maintained, and tested regularly in accordance with the manufacturer's instructions to ensure that it is operating correctly and safely.

16. The Customer must install, at their expense, a manual disconnect switch of the visible load break type to provide a separation point between the AC power output of the customer-owned renewable generation system and any Customer wiring connected to OEU's electric system such that back feed from the customer-owned renewable generation system to OEU's electric system cannot occur when the switch is in the open position. The manual disconnect switch shall be mounted separate from the meter socket on an exterior surface adjacent to the meter. The switch shall be readily accessible to OEU and capable of being locked in the open position with an OEU padlock. When locked and tagged in the open position by OEU, this switch will be under the control of OEU.

(Continued on Sheet No. 22.4)

17. Subject to an approved inspection, including installation of acceptable disconnect switch, this Agreement shall be executed by OEU within thirty (30) calendar days of receipt of a completed application. Customer must execute this Agreement and return it to OEU at least thirty (30) calendar days prior to beginning parallel operations with OEU's electric system, subject to the requirements of Sections 18 and 19, below, and within one (1) year after OEU executes this Agreement.

18. Once OEU has received Customer's written documentation that the requirements of this Agreement have been met, all agreements and documentation have been received and the correct operation of the manual switch has been demonstrated to an OEU representative, OEU will, within fifteen (15) business days, send written notice that parallel operation of the RGS may commence.

19. OEU requires the Customer to maintain general liability insurance for personal injury and property damage in the amount of not less than one million dollars ($1,000,000.00).

20. OEU will furnish, install, own and maintain metering equipment capable of measuring the flow of kilowatt-hours (kWh) of energy. The Customer's service associated with the RGS will be metered to measure the energy delivered by OEU to Customer, and also measure the energy delivered by Customer to OEU. Customer agrees to provide safe and reasonable access to the premises for installation, maintenance and reading of the metering and related equipment. The Customer shall not be responsible for the cost of the installation and maintenance of the metering equipment necessary to measure the energy delivered by the Customer to OEU.

21. The Customer shall be solely responsible for all legal and financial obligations arising from the design, construction, installation, operation, maintenance and ownership of the RGS.

22. The Customer must obtain all permits, inspections and approvals required by applicable jurisdictions with respect to the generating system and must use a licensed, bonded and insured contractor to design and install the generating system. The Customer agrees to provide OEU with a copy of the local building code official inspection and certification of installation. The certification shall reflect that the local code official has inspected and certified that the installation was permitted, has been approved, and has met all electrical and mechanical qualifications.

23. In no event shall any statement, representation, or lack thereof, either express or implied, by OEU, relieve the Customer of exclusive responsibility for the Customer's system. Specifically, any OUS inspection of the RGS shall not be construed as confirming or endorsing the system design or its operating or maintenance procedures or as a warranty or guarantee as to the safety, reliability, or durability of the RGS. OEU's inspection, acceptance, or its failure to inspect shall not be deemed an endorsement of any RGS equipment or procedure. Further, as set forth in Sections 15 and 26 of this Agreement, Customer shall remain solely responsible for any and all losses, claims, damages and/or expenses related in any way to the operation or misoperation of its RGS equipment.

(Continued on Sheet No. 22.5)

24. Notwithstanding any other provision of this Interconnection Agreement, OEU, at its sole and absolute discretion, may isolate the Customer's system from the distribution grid by whatever means necessary, without prior notice to the Customer. To the extent practical, however, prior notice shall be given. The system will be reconnected as soon as practical once the conditions causing the disconnection cease to exist. OEU shall have no obligation to compensate the Customer for any loss of energy during any and all periods when Customer's RGS is operating at reduced capacity or is disconnected from OEU's electrical distribution system pursuant to this Interconnection Agreement. Typical conditions which may require the disconnection of the Customer's system include, but are not limited to, the following:

a. OEU utility system emergencies, forced outages, uncontrollable forces or compliance with prudent electric utility practice.
b. When necessary to investigate, inspect, construct, install, maintain, repair, replace or remove any OEU equipment, any part of OEU's electrical distribution system or Customer's generating system.
c. Hazardous conditions existing on OEU's utility system due to the operation of the Customer's generation or protective equipment as determined by OEU.
d. Adverse electrical effects (such as power quality problems) on the electrical equipment of OEU's other electric consumers caused by the Customer's generation as determined by OEU
e. When Customer is in breach of any of its obligations under this Interconnection Agreement or any other applicable policies and procedures of OEU.
f. When the Customer fails to make any payments due to OEU by the due date thereof.

25. Upon termination of services pursuant to this Agreement, OEU shall open and padlock the manual disconnect switch and remove any additional metering equipment related to this Agreement. At the Customer's expense, within thirty (30) working days following the termination, the Customer shall permanently isolate the RGS and any associated equipment from OEU's electric supply system, notify OEU that the isolation is complete, and coordinate with OEU for return of OEU's lock.

26. To the fullest extent permitted by law, and in return for adequate, separate consideration, Customer shall indemnify, defend and hold harmless OEU, any and all of their members of its governing bodies, and its officers, agents, and employees for, from and against any and all claims, demands, suits, costs of defense, attorneys' fees, witness fees of any type, losses, damages, expenses, and liabilities, whether direct, indirect or consequential, related to, arising from, or in any way connected with:

a. Customer's design, construction, installation, inspection, maintenance, testing or operation of Customer's generating system or equipment used in connection with this Interconnection Agreement, irrespective of any fault on the part of OEU.

(Continued on Sheet No. 22.6)

b. The interconnection of Customer's generating system with, and delivery of energy from the generating system to, OEU's electrical distribution system, irrespective of any fault on the part of OEU.
c. The performance or nonperformance of Customer's obligations under this Interconnection Agreement or the obligations of any and all of the members of Customer's governing bodies and its officers, contractors (and any subcontractor or material supplier thereof), agents and employees.

Customer's obligations under this Section shall survive the termination of this Interconnection Agreement.

27. Customer shall not have the right to assign its benefits or obligations under this Agreement without OEU's prior written consent and such consent shall not be unreasonably withheld. If there is a change in ownership of the RGS, Customer shall provide written notice to OEU at least thirty (30) days prior to the change in ownership. The new owner will be required to assume, in writing, the Customer's rights and duties under this Agreement, or execute a new Standard Interconnection Agreement. The new owner shall not be permitted to net meter or begin parallel operations until the new owner assumes this Agreement or executes a new Agreement.

28. This Agreement supersedes all previous agreements and representations either written or verbal heretofore made between OEU and Customer with respect to matters herein contained. This Agreement, when duly executed, constitutes the only Agreement between parties hereto relative to the matters herein described. This Agreement shall continue in effect from year to year until either party gives sixty (60) days notice of its intent to terminate this Agreement.

29. This Agreement shall be governed by and construed and enforced in accordance with the laws, rules and regulations of the State of Florida and OEU's tariff as it may be modified, changed, or amended from time to time, including any amendments modification or changes to OEU's Net-Metering Service Rate Schedule, the schedule applicable to this Agreement. The Customer and OEU agree that any action, suit, or proceeding arising out of or relating to this Interconnection Agreement shall be initiated and prosecuted in the state court of competent jurisdiction located in Marion County, Florida, and OEU and the Customer irrevocably submit to the jurisdiction and venue of such court. To the fullest extent permitted by law, each Party hereby irrevocably waives any and all rights to a trial by jury and covenants and agrees that it will not request a trial by jury with respect to any legal proceeding arising out of or relating to this Interconnection Agreement.

None of the provisions of this Interconnection Agreement shall be considered waived by either Party except when such waiver is given in writing. No waiver by either Party of any one or more defaults in the performance of the provisions of this Interconnection Agreement shall operate or be construed as a waiver of any other existing or future default or defaults. If any one or more of the provisions of this Interconnection Agreement or the applicability of any provision to a

(Continued on Sheet No. 22.7)

specific situation is held invalid or unenforceable, the provision shall be modified to the minimum extent necessary to make it or its application valid and enforceable, and the validity and enforceability of all other provisions of this Interconnection and all other applications of such provisions shall not be affected by any such invalidity or unenforceability. This Interconnection Agreement does not govern the terms and conditions for the delivery of power and energy to non-generating retail customers of OEU's electrical distribution system.

30. This Agreement incorporates by reference the terms of the tariff filed with the Florida Public Service Commission by OEU, including OEU's Net-Metering Service Rate Schedule, and associated technical terms and abbreviations, general rules and regulations and standard electric service requirements (as may be applicable) are incorporated by reference, as amended from time to time. To the extent of any conflict between this Agreement and such tariff, the tariff shall control.

31. OEU and Customer recognize that the Florida Statutes and/or the Florida Public Service Commission Rules, including those directly addressing the subject of this Agreement, may be amended from time to time. In the event that such statutes and/or rules are amended that affect the terms and conditions of this Agreement, OEU and Customer agree to supersede and replace this Agreement with a new Interconnection Agreement which complies with the amended statutes/rules.

32. Customer acknowledges that its provision of electricity to OEU hereunder is on a first-offered first-accepted basis and subject to diminution and/or rejection in the event the total amount of electricity delivered to OEU pursuant to the OEU's Net-Metering Service Rate Schedule (as filed with the Florida Public Service Commission), from all participating OEU customers, exceeds 2.5 percent (%) of the aggregate customer peak demand on OEU's electric system.

33. This Agreement is solely for the benefit of OEU and Customer and no right nor any cause of action shall accrue upon or by reason, to or for the benefit of any third party not a formal party to this Agreement. Nothing in this Agreement, expressed or implied, is intended or shall be construed to confer upon any person or corporation other than OEU or Customer, any right, remedy, or claim under or by reason of this Agreement or any of the provisions or conditions of this Agreement; and, all provisions, representations, covenants, and conditions contained in this Agreement shall inure to the sole benefit of and be binding upon OEU and Customer and their respective representatives, successors, and assigns. Further, no term or condition contained in this Agreement shall be construed in any way as a waiver by OEU of the sovereign immunity applicable to OEU as established by Florida Statutes, 768.28.

(Continued on Sheet No. 22.8)

IN WITNESS WHEREOF, Customer and OEU have executed this Agreement the day and year first above written.

OUS:

By: Ken Whitehead

Title: Ken Whitehead

Date: 01 / 30 / 2023

Customer:

By: MICHAEL J. MORRIS
(Print Name)

(Signature)

SIGN HERE

Date: 30 AUG 22

City of Ocala Electric Utility Account Number:
520745 - 240263

Approved as to form and legality:
William E. Sexton
~~Robert W. Batsel, Jr.~~ William E. Sexton
~~Assistant~~ City Attorney

Tri-Party Net-Metering Power Purchase Agreement

This Tri-Party Net-Metering Power Purchase Agreement (this "Agreement") is entered into this 30 day of August, 20 22, by and between the Florida Municipal Power Agency, a governmental joint action agency created and existing under the laws of the State of Florida (hereinafter "FMPA"), the City of Ocala doing business as Ocala Electric Utility, a body politic (hereinafter "OEU"), and MICHAEL J. MORRIS, a retail electric customer of OEU (hereinafter "Customer").

Section 1. Recitals

1.01. OEU and Customer have executed OEU's Standard Interconnection Agreement for a Customer-Owned Renewable Generation System (RGS) pursuant to which OEU has agreed to permit interconnection of Customer's renewable generation to OEU's electric system at Customer's presently-metered location, and Customer has agreed to deliver excess electric energy generated by Customer's Renewable Generation System to OEU's electric distribution system;

1.02. The City of Ocala and FMPA have entered into the All-Requirements Power Supply Contract, dated as of May 1, 1986, (hereinafter the "ARP Contract") pursuant to which the City of Ocala has agreed to purchase and receive, and FMPA has agreed to sell and supply OEU with all energy and capacity necessary to operate the OEU electric system, which limits OEU's ability to directly purchase excess energy from customer-owned renewable generation.

1.03. In order to promote the development of small customer-owned renewable generation by permitting OEU to allow its customers to interconnect with OEU's electric system and to allow OEU's electric customers to offset their electric consumption with customer-owned renewable generation, FMPA, in accordance with the terms and conditions of this agreement, has agreed to purchase excess customer-owned generation from OEU's electric customers interconnected to OEU's electric system.

NOW THEREFORE, for and in consideration of the mutual covenants and agreements set forth herein, the Parties covenant and agree as follows:

Section 2. Interconnection

2.01. Customer shall not begin parallel operations with the OEU electric distribution system until Customer has executed OEU's electric Standard Interconnection Agreement for Small Customer-Owned Renewable Generation and is in compliance with all terms and conditions

OEU requires that the customer install and operate the RGS in accordance with all applicable safety codes and standards. OEU shall establish and enforce terms and conditions of operation and disconnection of all interconnected customer-owned renewable generation as it relates to the effect of the RGS on OEU's electric distribution system.

(Continued on Sheet No. 20.1)

Section 3. Metering

3.01 In accordance with the OEU's Standard Interconnection Agreement for Customer-Owned Renewable Generation, OEU shall install metering equipment at the point of delivery capable of recording two separate kWh meter readings: (1) the flow of electricity from OEU to the Customer (Delivered), and (2) the flow of excess electricity from the Customer to OEU. OEU shall take meter readings on the same cycle as the otherwise applicable rate schedule.

Section 4. Purchase of Excess Customer-Owned Renewable Generation

4.01. Customer-owned renewable generation shall be first used for Customer's own load and shall offset Customer's demand for OEU's electricity. All electric power and energy delivered by OEU to Customer shall be received and paid for by Customer to OEU (Received) pursuant to the terms, conditions and rates of the OEU otherwise applicable rate schedule.

4.02. Excess customer-owned renewable generation shall be delivered to the OEU Electric distribution system. For purposes of this Agreement, the term "excess customer-owned renewable generation" means any kWh of electrical energy produced by the customer-owned renewable generation system that is not consumed by Customer and is delivered to the OEU electric distribution system. FMPA agrees to purchase and receive, and Customer agrees to sell and deliver, all excess customer-owned renewable generation at the energy rate established by FMPA, which shall be calculated in accordance with Schedule A. Excess customer-owned renewable generation shall be purchased in the form of a credit on Customer's monthly energy consumption bill from OEU.

4.03. In the event that a given monthly credit for excess customer-owned renewable generation exceeds the total billed amount for Customer's consumption in any corresponding month, then the excess credit shall be applied to the subsequent month's bill. Excess energy credits produced pursuant to the preceding sentence shall accumulate and be used to offset Customer's energy consumption bill for a period of not more than twelve (12) months. At the end of each calendar year, any unused excess energy credits shall be paid by OEU to the Customer in accordance with the OEU Electric Net-Metering Service Rate Schedule.

(Continued on Sheet No. 20.2)

4.04. FMPA and OEU shall not be required to purchase or receive excess customer-owned renewable generation, and may require Customer to interrupt or reduce production of customer-owned renewable generation, (a) when necessary in order to construct, install, maintain, repair, replace, remove, investigate, or inspect any OEU equipment or part of OEU's system; or (b) if either FMPA or OEU determine, in their sole judgment, that curtailment, interruption, or reduction is necessary because of emergencies, forced outages, force majeure, or compliance with any applicable electric code or standard.

4.05. Customer acknowledges that its provision of electricity to OEU hereunder is on a first-offered, first-accepted basis and subject to diminution and/or rejection in the event the total amount of electricity delivered to OEU pursuant to the Net-Metering Service Rate Schedule (as filed with the Florida Public Service Commission), from all participating OEU customers, exceeds two and one-half percent (2.5%) of the aggregate customer peak demand on the OEU electric system.

Section 5. Renewable Energy Credits

5.01. Customer shall offer FMPA a first right of refusal before selling or granting to any third party the right to the Green Attributes associated with its customer-owned renewable generation that is interconnected to OEU electric distribution system. The term "Green Attributes" shall include any and all credits, certificates, benefits, environmental attributes, emissions reductions, offsets, and allowances, however entitled, attributable to the generation of electricity from the customer-owned-renewable generation and its displacement of conventional energy generation.

5.02. Any additional meter(s) installed to measure total renewable electricity generated by the Customer for the purposes of measuring Green Attributes, including and renewable energy certificates (or similarly titled credits for renewable energy generated), shall be installed at the expense of the Customer, unless determined otherwise during negotiations for the sale of the Customer's credits to FMPA.

Section 6. Term and Termination

6.01. This Agreement shall become effective upon execution by all Parties, and shall remain in effect thereafter on a month-to-month basis until terminated by any Party upon thirty (30) days written notice to all other Parties.

6.02. This Agreement shall terminate immediately and without notice upon: (a) termination of the electric distribution service by OEU or (b) failure by Customer to comply with any of the terms and conditions of this Agreement or OEU's Standard Interconnection Agreement for Customer-Owned Renewable Generation.

(Continued on Sheet No. 20.3)

Section 7. Miscellaneous Provisions

7.01. Assignment. It is understood and agreed that no party may transfer, sell, mortgage, pledge, hypothecate, convey, designate, or otherwise assign this Agreement, or any interest herein or any rights or obligations hereunder, in whole or in part, either voluntarily or by operation of law, (including, without limitation, by merger, consolidation, or otherwise), without the express written consent of the other parties (and any such attempt shall be void), which consent shall not be unreasonably withheld. Subject to the foregoing, this Agreement shall inure to the benefit of and be binding upon the parties and their respective successors and permitted assigns.

7.02 Amendment. It is understood and agreed that FMPA and OEU reserve the right, on no less than an annual basis, to change any of the terms and conditions, including pricing, in this Agreement on sixty (60) days advance written notice. FMPA and OEU may make such changes on an immediate basis in the event any applicable law, rule, regulation or court order requires them. In such event, FMPA and OEU will give Customer as much notice as reasonably possible under the circumstances.

7.03. Indemnification. To the fullest extent permitted by laws and regulations, and in return for adequate, separate consideration, Customer shall defend, indemnify, and hold harmless FMPA and OEU, their officers, directors, agents, guests, invitees, and employees from and against all claims, damages, losses to persons or property, whether direct, indirect, or consequential (including but not limited to fees and charges of attorneys, and other professionals and court and arbitration costs) arising out of, resulting from, occasioned by, or otherwise caused by the operation or misoperation of the customer-owned renewable generation, or the acts or omissions of any other person or organization directly or indirectly employed by the Customer to install, furnish, repair, replace or maintain the customer-owned renewable generation system, or anyone for whose acts any of them may be liable.

7.04. Governing Law. The validity and interpretation of this Agreement and the rights and obligations of the parties shall be governed and construed in accordance with the laws of the State of Florida without regard for any conflicts of law provisions that might cause the law of other jurisdictions to apply. All controversies, claims, or disputes arising out of or related to this Agreement or any agreement, instrument, or document contemplated hereby, shall be brought exclusively in the County or Circuit Court for Marion County, Florida, or the United States District Court sitting in Marion County, Florida, as appropriate.

(Continued on Sheet No. 20.4)

7.05. Enforcement of Agreement. In the event that either party is required to enforce this Agreement by court proceedings or otherwise, the prevailing party shall be entitled to recover all fees and costs incurred, including reasonable attorney's fees and costs for trial, alternative dispute resolution, and/or appellate proceedings.

7.06. Severability. To the extent any provision of this Agreement is prohibited by or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provision or the remaining provisions of this Agreement.

7.07. Third Party Beneficiaries and Sovereign Immunity. This Agreement is solely for the benefit of FMPA, OEU, and Customer and no right nor shall any cause of action accrue upon or by reason, to or for the benefit of any third party not a formal party to this Agreement. Nothing in this Agreement, expressed or implied, is intended or shall be construed to confer upon any person or corporation other than FMPA, OEU, or Customer, any right, remedy, or claim under or by reason of this Agreement or any of the provisions or conditions of this Agreement; and, all provisions, representations, covenants, and conditions contained in this Agreement shall inure to the sole benefit of and be binding upon FMPA, OEU, and Customer and their respective representatives, successors, and assigns. Further, no term or condition contained in this Agreement shall be construed in any way as a waiver by either FMPA or OEU of the sovereign immunity applicable to either or both of them as established by Florida Statutes, 768.28.

(Continued on Sheet No. 20.5)

IN WITNESS WHEREOF, Customer and OEU have executed this Agreement the day and year first above written.

City of Ocala Electric Utility
By: Ken Whitehead
Title: Asst. City Manager
Date: 01 / 30 / 2023

Florida Municipal Power Agency
By: [signature]
Title: Bus Dev & Sys Ops Director
Date: 01 / 30 / 2023

Customer
By: MICHAEL J. MORRIS Date: 30 AUG 22
(Print Name)
[signature]
(Signature)
SIGN HERE

Customer's City of Ocala Electric Utility Account Number: 520745 - 240263

Approved as to form and legality:

William E. Sexton
~~Robert W. Batsel, Jr.~~ **William E. Sexton**
~~Assistant~~ City Attorney

(Continued on Sheet No. 20.6)

Tri-Party Net-Metering Power Purchase Agreement
Schedule A

I. All-Requirements Project Calculation of Excess Customer-Owned Renewable Generation Credit

a) FMPA shall pay OEU for the excess kWh energy delivered by customer-owned renewable generation to OEU's electric system. Every month, OEU shall determine the total kWh of customer-owned renewable generation that is delivered to OEU's electric system, and shall send the information to FMPA as soon as it becomes available, but no later than the second working day of every month. FMPA will then provide a monthly payment to OEU in the form of a credit on the ARP power bill for the excess energy delivered to the distribution grid. The ARP Renewable Generation Credit will be calculated as follows:

ARP Renewable Generation Credit = Quarterly Energy Rate * Monthly kWh of excess customer-owned renewable generation

Quarterly Energy Rate = 3 month average of ARP energy rate. FMPA will update the Quarterly Energy Rate every April 1, July 1, October 1 and January 1.

b) As part of the monthly bill adjustment, FMPA will also increase OEU's kWh billing amount by the same kWh amount as the customer-owned renewable generation purchased by FMPA. This adjustment is necessary because excess customer generation that flows onto OEU's electric system has been purchased by FMPA, but will remain on OEU's electric system and be used by OEU to meet its other customers' electric needs. As a result, OEU's monthly ARP bill will be adjusted accordingly to reflect FMPA's subsequent sale of this energy to OEU.

II. Payment for Unused Excess Energy Credits

a) Monthly excess energy credits shall accumulate and be used to offset the Customer's following month energy consumption bill for a period of not more than twelve (12) months.

b) At the end of each calendar year, OEU shall pay the Customer for any unused excess energy credits in accordance with the OEU Electric Net-Metering Service Rate Schedule.

American Strategic Insurance Corp
1 ASI Way
St. Petersburg, FL 33702
Phone: (727) 374-2502

PROGRESSIVE UMBRELLA

Premises Only Liability Declarations Page

Agent:
Brightway Insurance
P.O. Box 5700
Jacksonville, FL 32247

Agent Code: 414286
For Policy Service, Call: (888)254-5014

Total Policy Premium: $202
Policy Number: FLU143546
Plan Type: UMB

Policy Period: From: 05/29/2022 To: 05/29/2023
(At 12:01 AM Standard Time at the residence premises)

Effective Date of This Transaction: 05/29/2022
Transaction Type: New Business

Named Insured:
MICHAEL MORRIS
2720 SW 18TH AVE
OCALA, FL 34471

Premises Location(s):
2720 SW 18TH AVE , OCALA, FL 34471-7793

Coverage Limit: $ 1,000,000

Coverages	Limit	Premium
Liability Base Premium	$ 1,000,000	$200.00

Surcharges & Discounts	Premium
Desired Coverage Limit	$0.00
Increased Underlying Property Liability	$0.00
Territory Factor (UIM)	$0.00
Premises Only Credit	($59.00)
Swimming Pool/Spas	$40.00
Minimum Limit Premium Adjustment	$0.00
Managing General Agent Fee	$25.00
Florida Insurance Guaranty Association Fee	$1.23
e-Policy Discount	($5.00)
TOTAL POLICY PREMIUM:	**$202.00**

All Insureds:
Michael Morris

Policy Forms:

Amendment of Policy Provisions - Florida	ASI PUP FL SP 10 20
Premises Liability	ASI PUP 005 09 99
Auto Liability Exclusion - Florida	ASI PUP FL ALE 10 20
Public Or Livery Conveyance Exclusion - Florida	ASI PUP FL PCE 10 20
Personal Umbrella Liability Policy	DL 98 01 06 98

Additional Interest:

Countersigned by Authorized Representative St. Petersburg, FL Date: 05/28/2022

Required Retained Limits

All Automobiles, Motorcycles, Motorhomes, Mopeds, and All Road Licensed Vehicles:

Required Retained Limits *(Does not apply for Premises Only Liability policies)*

$250,000 / $500,000 / $100,000 or $300,000 CSL for policies with any drivers age 22-79

$500,000 / $500,000 / $500,000 or $500,000 CSL for policies with any drivers 21 and younger or 80 and older *

All Automobiles and Motorhomes Requesting UM Coverage:

Required Retained Limits

UM: $250,000 / $500,000 / $100,000 or $300,000 CSL for policies with any drivers age 22-79

UM: $500,000 / $500,000 / $500,000 or $500,000 CSL for policies with any drivers 21 and younger or 80 and older

Comprehensive Personal Liability, Homeowners, or Farm Comprehensive Personal Liability:

Required Retained Limits

$300,000

Residential Rental Properties Covered Under the Dwelling Fire Policy for 1-4 Family Residences:

Required Retained Limits

$300,000

Personal Injury Coverage Endorsed to the Homeowners Policy (whenever available):

Required Retained Limits *(Does not apply for Premises Only Liability policies)*

$300,000

All Recreational Vehicles Including Golf Carts, Utility Vehicles, Trail Bikes or Other Vehicles Not Required to be Licensed:

Required Retained Limits *(Does not apply for Premises Only Liability policies)*

$250,000 / $500,000 / $100,000 or $300,000 CSL

Watercraft:

Required Retained Limits *(Does not apply for Premises Only Liability policies)*

$250,000 / $500,000 / $100,000 or $300,000 CSL

* Required Retained Limits are reduced to $250,000/$500,000/$100,000 or $300,000 CSL when the Underlying Automobile Surcharge is applied.

Detailed Schedule

Automobiles

Make	Model
N/A	N/A

Motorcycles and Mopeds

Make	Model
N/A	N/A

Watercraft

Make	Model	Length (ft)	MPH
N/A	N/A	N/A	N/A

Golf Carts, Utility Vehicles or Recreational Vehicles

Make	Model
N/A	N/A

Motorhomes

Make	Model
N/A	N/A

Policyholder: MICHAEL MORRIS **Policy ID:** **FLU143546**

Important Message(s):

1. **Failure to maintain the Required Retained Limits may prevent this policy from providing coverage. The Required Retained Limits shall apply regardless of any applicable sublimit or reduced limits for specified occurrences.**
2. You must notify us of any change in your retained limits or coverage.
3. Your underlying insurance carrier must have an AM Best rating of B+ or better or a Demotech rating of A or better.

Notes:

Dropbox Sign

Audit trail

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