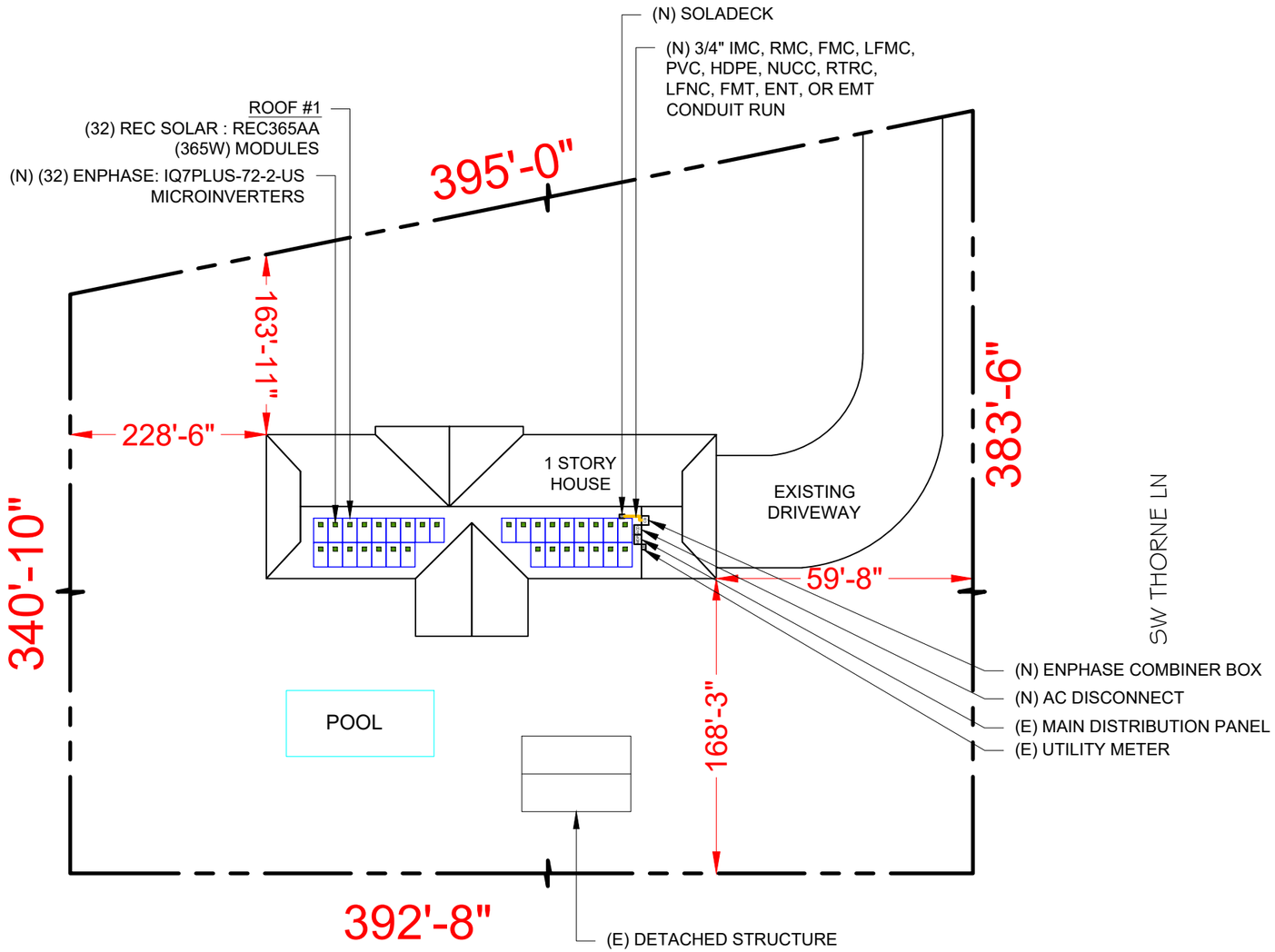
PROJECT DESCRIPTION:

32x365 REC SOLAR : REC365AA (365W) MODULES
ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES
SYSTEM SIZE: 11.680 kW DC STC
ARRAY AREA #1: 602.67 SQ FT.

EQUIPMENT SUMMARY
32 REC SOLAR : REC365AA (365W) MODULES
32 ENPHASE: IQ7PLUS-72-2-US MICROINVERTERS

GOVERNING CODES:
FLORIDA RESIDENTIAL CODE, 7th EDITION 2020 (FRC)
FLORIDA PLUMBING CODE, 7th EDITION 2020 (FPC)
FLORIDA BUILDING CODE, 7th EDITION 2020 EDITION (FBC)
FLORIDA MECHANICAL CODE, 7th EDITION 2020 (FMC)
NEC 2017 CODE BOOK
ASCE 7-16

SHEET INDEX

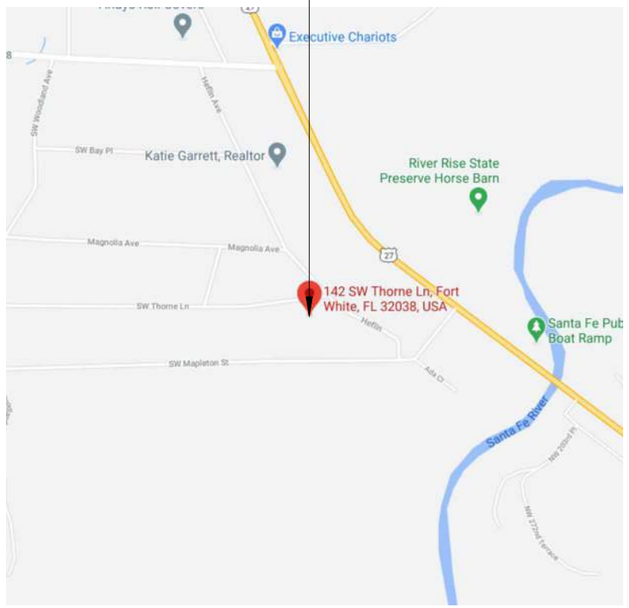


1 PLOT PLAN WITH ROOF PLAN
A-00 SCALE: 1/32" = 1'-0"

PROJECT SITES

2 HOUSE PHOTO
A-00 SCALE: NTS

PROJECT SITE



3 VICINITY MAP
A-00 SCALE: NTS

Castillo Engineering
DESIGNED TO PERMIT®
CASTILLO ENGINEERING SERVICES, LLC
COA # 28345
620 N. WYMORE ROAD,
SUITE 250,
MAITLAND, FL 32751
TEL: (407) 289-2575
ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER
POWER™ PRODUCTION MANAGEMENT, INC.

Signature with Seal
Digitally signed by Ermocrates E Castillo
Date: 2021.01.25 14:30:59 -05'00'

PROJECT NAME
REXFORD RESIDENCE
142 SW THORNE LN, FORT WHITE, FL 32038

SHEET NAME
PLOT PLAN & VICINITY MAP

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
A-00

Symbols:

Section..... X / X-XX — Sheet where section is located

Elevation ..... X / X-XX — Detail ID Letter; Sheet where section is located

Detail ..... X / X-XX — Detail ID Letter; Sheet where section is located

Detail ..... (Enlarged Plan) X / X-XX — Detail ID Letter; Area to be enlarged; Sheet where section is located

Keyed Notes ..... 1 — Keyed note designation on applicable sheet

Ground Terminal .....

Grounding Point/rod....

Solar Panel ..... or 00 — Module with Source Circuit number

Combiner Box ..... CB

DC Disconnect ..... DCD

Main Distribution Panel ..... MDP

Fuse .....

Overcurrent Breaker ..

Inverter .....

Transformer .....

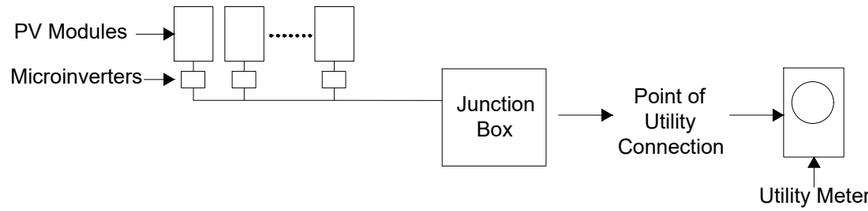
Automatic ..... Transfer Switch ATS

Abbreviations:

AC	Alternating Current
APPROX	Approximate
AWG	American Wire Gauge
CB	Combiner Box
DC	Direct Current
DCD	Direct Current Disconnect
DISC	Disconnect
(E)	Existing
EL	Elevation
EQ	Equal
JB	Junction Box
MCB	Main Combiner Box
MFR	Manufacturer
MIN	Minimum
MISC	Miscellaneous
(N)	New
OCPD	OverCurrent Protection Device
POCC	Point Of Common Coupling
PV	Photovoltaic
SF	Squarefoot/feet
STC	Standard Test Conditions
TBD	To Be Determined
TYP	Typical
VIF	Verify In Field
WP	Weather Proof

System Description

This system is a grid-tied, PV system, with PV generation consisting of 32 REC SOLAR REC365AA (365W) MODULES with a combined STC rated dc output power of 11680W. The modules are connected into 32 ENPHASE IQ7PLUS-72-2-US MICROINVERTERS. The inverter has electr nic maximum power point tracking to maximize energy captured by the PV modules. The inverter also has an internal ground fault detection and interruption device that is set to disconnect the array in the event that a ground fault that exceeds one ampere should occur. The inverter has DC and AC disconnect integrated system and labels are provided as required by the *NationalElectric Code*



When the sun is shining, power from the PV array is fed into the inverter, where it is converted from DC to AC. The inverter output is then used to contribute to the power requirements of the occupancy. If PV power meets the requirements of the loads of the occupancy, any remaining PV power is sold back to the utility. When utility power is available, but PV power is not available, building loads are supplied by the utility.

The inverter meets the requirements of IEEE 1547 and UL 1741. This means that if it detects a loss of utility power, it will automatically disconnect from the utility. When utility voltage is restored, the inverter automatically reconnects to the utility grid after verifying utility voltage and frequency stability.

On a day with average Florida sunshine, this system outputs 46.62 kWh per day on site.

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ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

POWER™ PRODUCTION MANAGEMENT, INC.

Signature with Seal

Digitally signed by Ermocrates E Castillo
Date: 2021.01.25 14:31:15 -05'00'

PROJECT NAME

REXFORD RESIDENCE

142 SW THORNE LN,
FORT WHITE, FL 32038

SHEET NAME
SYMBOLS & SYSTEM DESCRIPTION

SHEET SIZE
ANSI B
11" X 17"

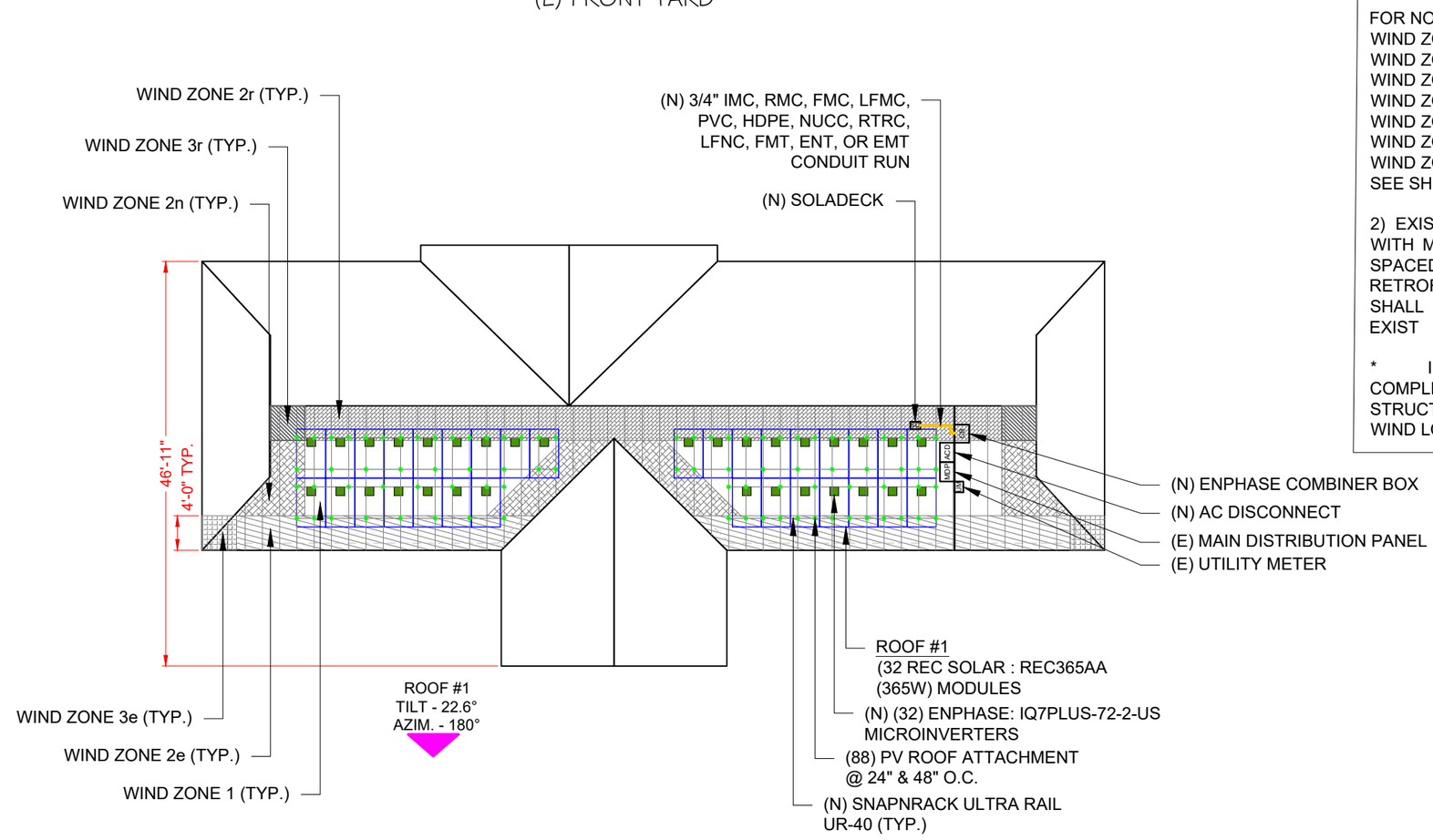
SHEET NUMBER
A-01

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 32 MODULES
MODULE TYPE = REC SOLAR : REC365AA (365W) MODULES
MODULE WEIGHT = 49.82 LBS / 22.6 KG.
MODULE DIMENSIONS = 67.8"x 40" = 18.83 SF
UNIT WEIGHT OF ARRAY = 2.65 PSF

ARRAY AREA & ROOF AREA CALC'S

ROOF	ROOF TYPE	ARRAY AREA (sq.Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)	TILT	AZIMUTH	TRUSS SIZE	TRUSS SPACING
#1	ASPHALT SHINGLE	602.67	1383.459	43.56	22.6°	180°	2x4	24" o.c.



1 ROOF PLAN & MODULES
S-01 SCALE: 1/16" = 1'-0"

GENERAL INSTALLATION PLAN NOTES:

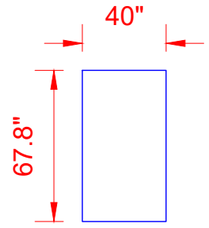
1) ROOF ATTACHMENTS TO TRUSSES SHALL BE INSTALLED AS SHOWN IN SHEET S-02 AND AS FOLLOWS FOR EACH WIND ZONE:

FOR EXPOSED MODULES:
WIND ZONE 1: MAX SPAN 2'-0" O.C. - MAX CANTILEVER : 0'-8"
WIND ZONE 1': N/A
WIND ZONE 2e: MAX SPAN 2'-0" O.C. - MAX CANTILEVER : 0'-8"
WIND ZONE 2n: MAX SPAN 2'-0" O.C. - MAX CANTILEVER : 0'-8"
WIND ZONE 2r: MAX SPAN 2'-0" O.C. - MAX CANTILEVER : 0'-8"
WIND ZONE 3e: MAX SPAN 2'-0" O.C. - MAX CANTILEVER : 0'-8"
WIND ZONE 3r : MAX SPAN 2'-0" O.C. - MAX CANTILEVER : 0'-8"

FOR NON-EXPOSED MODULES:
WIND ZONE 1: MAX SPAN 4'-0" O.C.- MAX CANTILEVER : 1'-4"
WIND ZONE 1': N/A
WIND ZONE 2e: MAX SPAN 4'-0" O.C.- MAX CANTILEVER : 1'-4"
WIND ZONE 2n: MAX SPAN 2'-0" O.C.- MAX CANTILEVER : 0'-8"
WIND ZONE 2r: MAX SPAN 2'-0" O.C. - MAX CANTILEVER : 0'-8"
WIND ZONE 3e: MAX SPAN 2'-0"O.C. - MAX CANTILEVER : 0'-8"
WIND ZONE 3r: MAX SPAN 2'-0"O.C. - MAX CANTILEVER : 0'-8"
SEE SHEET S-02.1 FOR SUPPORTING CALCULATIONS.

2) EXISTING RESIDENTIAL BUILDING IS AN ASPHALT SHINGLE ROOF WITH MEAN ROOF HEIGHT IS 15FT AND SYP 2X4 ROOF TRUSSES SPACED 24" O.C. EXISTING ROOF SLOPE FOR SOLAR SYSTEM RETROFIT IS 22.6° DEGREES. CONTRACTOR TO FIELD ERIFY AND SHALL REPORT TO THE ENGINEER IF ANY DISCREPANCIES EXIST BETWEEN PLANS AND IN FIELD CONDITIONS.

* I CERTIFY THAT THE INSTALLATION OF THE MODULES IS IN COMPLIANCE WITH FBC: RESIDENTIAL CHAPTER 3. BUILDING STRUCTURE WILL SAFELY ACCOMMODATE LATERAL AND UPLIFT WIND LOADS AND EQUIPMENT DEAD LOADS. *



REC SOLAR : REC365AA (365W) MODULES

LEGEND
UM - UTILITY METER
SD - SOLADECK
ACD - AC DISCONNECT
MDP - MAIN DISTRIBUTION PANEL
- VENT, ATTIC FAN (ROOF OBSTRUCTION)
- PV ROOF ATTACHMENT
- RAFTERS
- CONDUIT
CB - COMBINER BOX

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ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER
POWER PRODUCTION MANAGEMENT, INC.

Signature with Seal

PROJECT NAME
REXFORD RESIDENCE
142 SW THORNE LN,
FORT WHITE, FL 32038

SHEET NAME
ROOF PLAN & MODULES

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
S-01

FOR EXPOSED MODULES

1	1'	2e	2n	2r	3e	3r
47.5	0	47.5	66.6	66.6	66.6	75.0

Module Size	18.83	Sq.ft

	Exposed modules							Partial
	1	1'	2e	2n	2r	3e	3r	Pressure
P7	14.51	0	4.32	0	0	0	0	47.5
P8	14.49	0	0	0	4.34	0	0	51.90
P9	8.97	0	0	0	9.86	0	0	57.50
P10	7.21	0	0	0	11.62	0	0	59.29
P11	10.43	0	4.32	4.08	0	0	0	51.64

FOR NON-EXPOSED MODULES

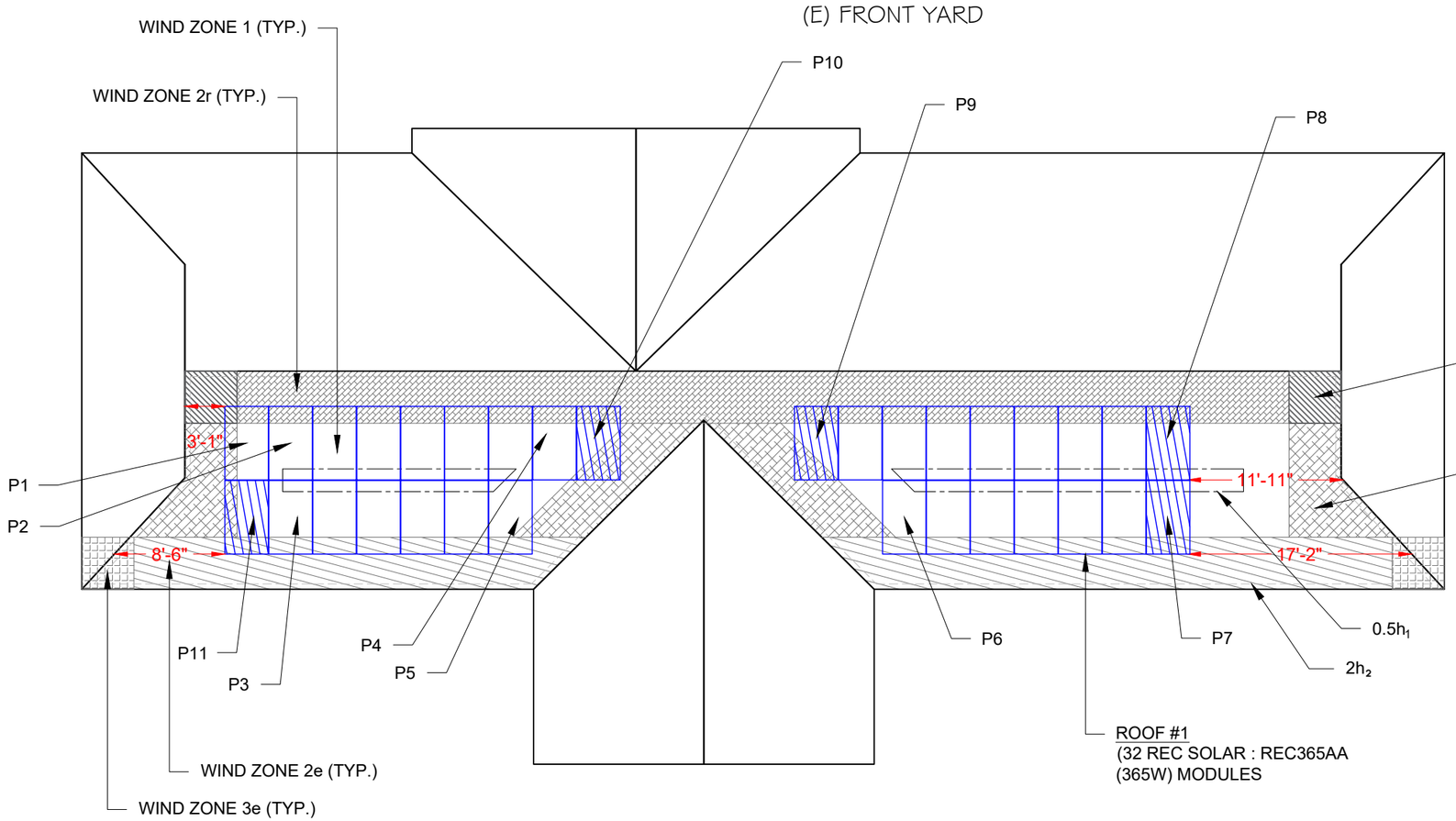
1	1'	2e	2n	2r	3e	3r
31.7	0	31.7	44.4	44.4	44.4	50.00

Module Size	18.83	Sq.ft

	Non-Exposed modules							Partial
	1	1'	2e	2n	2r	3e	3r	Pressure
P1	10.42	0	0	4.07	3.12	0	1.22	37.73
P2	14.49	0	0	0	4.34	0	0	34.63
P3	14.51	0	4.32	0.0	0	0	0	31.70
P4	14.51	0	0	0	4.32	0	0	34.61
P5	13.33	0	4.32	0	1.18	0	0	32.50
P6	15.00	0	4.32	0	0.51	0	0	33.73

ALLOWABLE MODULE UPLIFT PRESSURE 2 RAIL: 75 PSF

(E) FRONT YARD



(E) BACK YARD

NOTE : PARTIAL PRESSURES OF THE WIND ZONES ON ALL MODULES HAVE BEEN VERIFIED AND ARE WITHIN THE ALLOWABLE PER THE MANUFACTURER SPECIFICATION, INSTALLER SHOULD FOLLOW THE LAYOUT TO AVOID HIGHER ZONAL PARTIAL PRESSURES. ANY CHANGES IN LAYOUT SHOULD BE REPORTED BACK TO THE ENGINEER OF RECORD.

LEGEND

- EXPOSED PANEL
- NON- EXPOSED PANEL
- MISSING PANEL
- MIN. PANEL EDGE DISTANCE LINE
- PANEL EXPOSURE LINE

PARTIAL PRESSURE AND MODULES EXPOSURE

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

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ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

POWER™ PRODUCTION MANAGEMENT, INC.

Signature with Seal

Digitally signed by Ermocrates E Castillo
Date: 2021.01.25 14:31:25 05'00'

PROJECT NUMBER

REXFORD RESIDENCE

142 SW THORNE LN,
FORT WHITE, FL 32038

SHEET NAME

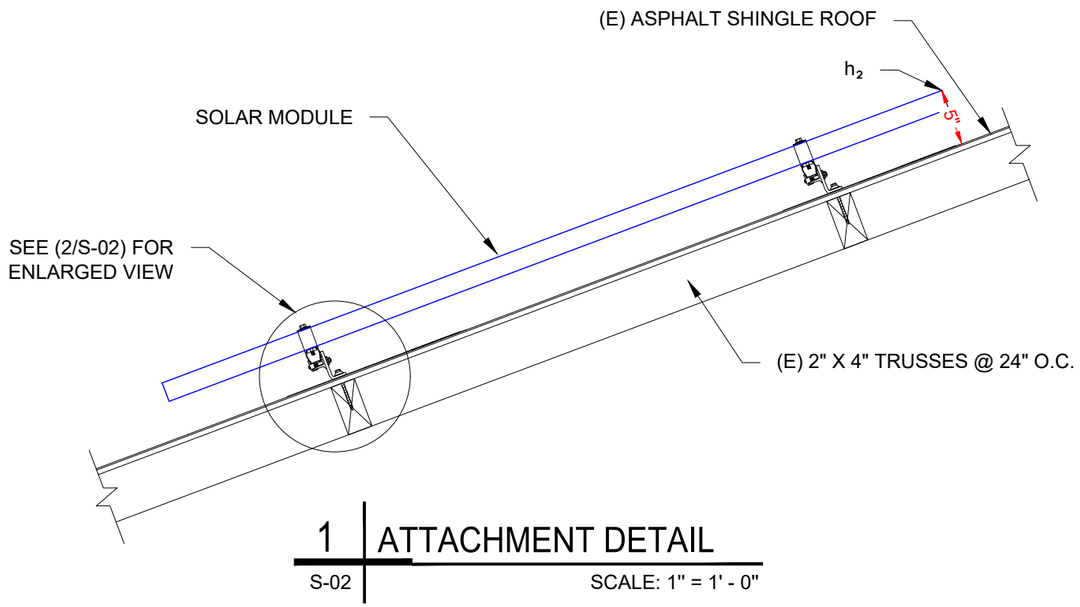
PARTIAL PRESSURE AND MODULES EXPOSURE

SHEET SIZE

ANSI B
11" X 17"

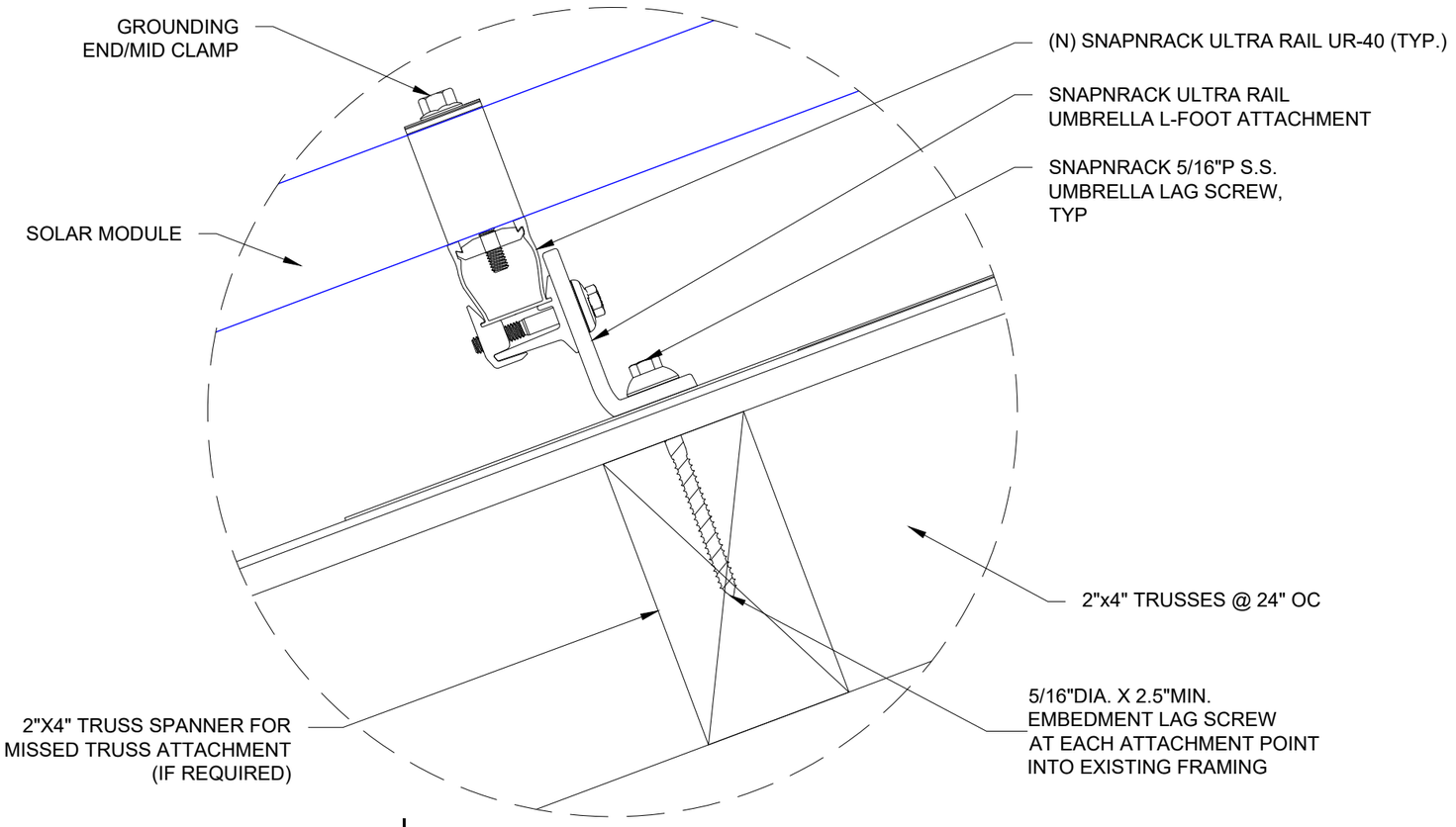
SHEET NUMBER

S-01.1



1 ATTACHMENT DETAIL

S-02 SCALE: 1" = 1' - 0"



2 ATTACHMENT DETAIL (ENLARGED SECTION VIEW)

S-02 SCALE: 1" = 2'

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MAITLAND, FL 32751
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ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

POWER PRODUCTION MANAGEMENT, INC.

Signature Not Verified
Digitally signed by Ermocrates E Castillo
Date: 2021.01.25 14:31:31 -05'00'

PROJECT NAME

REXFORD RESIDENCE

142 SW THORNE LN,
FORT WHITE, FL 32038

SHEET NAME
STRUCTURAL ATTACHMENT DETAILS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
S-02

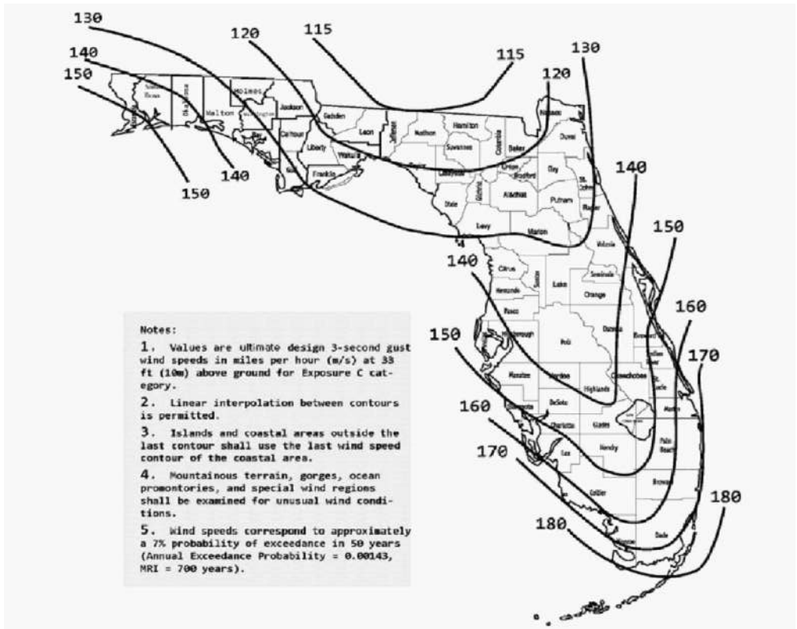

FIGURE 1609.3(1)
ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR RISK CATEGORY II BUILDINGS AND OTHER STRUCTURES

WIND LOAD CALCULATIONS FOR MODULES INSTALLED ON ROOFS WITH A HEIGHT LESS THAN 60'

SITE INFORMATION			
FBC VERSION	2020	RISK CATEGORY	II
MEAN ROOF HEIGHT (ft)	15.0	EXPOSURE CATEGORY	C
ROOF LENGTH (ft)	47.0	ROOF SLOPE	5 /12
ROOF WIDTH (ft)	105.0	ROOF SLOPE (°)	22.6
PARAPET HEIGHT (ft)	0.0	ROOF TYPE	GABLE
MODULE LENGTH (in)	67.8	ULTIMATE WIND SPEED	130 mph
MODULE WIDTH (in)	40.00	NOMINAL WIND SPEED	101 mph
MODULE ORIENTATION	PORTRAIT	EXPOSURE FACTOR (C_e)	1.000
MODULE AREA (sq. ft.)	18.83	TEMPERATURE FACTOR (C_t)	1.000
GROUND SNOW LOAD (psf)	0.0	IMPORTANCE FACTOR (I_s)	1.000
DEAD LOAD (psf)	3.0	SLOPE FACTOR (C_s)	0.910
SLOPED ROOF SNOW LOAD (psf)	0.0	K_D	0.850
EFFECTIVE WIND AREA (ft^2)	18.8	K_{ZT}	1.000
GROUND ELEVATION (ft)	67.0	K_e	0.998
HVHZ	NO	K_z	0.849

DESIGN CALCULATIONS

VELOCITY PRESSURE (q) = $.00256*K_E K_z K_{ZT} K_D V^2$
VELOCITY PRESSURE(ASD) 18.7 psf

WIDTH OF PRESSURE COEFFICIENT	47' * 10%	=	4.7'	ZONE WIDTH A	4 FT
	15' * 40%	=	6'	ZONE 2 WIDTH	N/A (FOR (°) < 7°)
				ZONE 3 WIDTH	N/A (FOR (°) < 7°)

EXTERNAL PRESSURE COEFFICIENT	ZONE 1	0.471	-1.516
	ZONE 1'	0.471	X
	ZONE 2e	0.471	-1.516
	ZONE 2n	0.471	-2.196
	ZONE 2r	0.471	-2.196
	ZONE 3e	0.471	-2.196
	ZONE 3r	0.471	-2.496
INTERNAL PRESSURE COEFFICIENT (+/-)		0.18	

DESIGN PRESSURES

ROOF ZONE	DOWN	UP				
1	16.0	-31.7	psf			
1'	16.0	X	psf			
2e	16.0	-31.7	psf	Module allowable uplift pressure	75	psf
2n	16.0	-44.4	psf	Module allowable down pressure	76	psf
2r	16.0	-44.4	psf			
3e	16.0	-44.4	psf			
3r	16.0	-50.0	psf			

ARRAY FACTORS

ARRAY EDGE FACTOR (EXPOSED)	1.5	SOLAR PANEL PRESSURE EQUALIZATION FACTOR	0.69
ARRAY EDGE FACTOR (NON-EXPOSED)	1		

ADJUSTED DESIGN PRESSURES

ROOF ZONE	DOWN	UP (Exposed)	UP (N. Exposed)	
1	16.0	-47.5	-31.7	psf
1'	16.0	X	X	psf
2e	16.0	-47.5	-31.7	psf
2n	16.0	-66.6	-44.4	psf
2r	16.0	-66.6	-44.4	psf
3e	16.0	-66.6	-44.4	psf
3r	16.0	-75.0	-50.0	psf

ATTACHMENTS USED

ATTACHMENT MODEL	Lag Bolts- Shingle	
ATTACHMENT STRENGTH	476	psf

MAX DESIGN LOADS ALLOWABLE

LIMIT MAX SPAN TO	N/A	in			
RAFTER/SEAM SPACING	24	in	NUMBER OF RAILS	2	

ROOF ZONE	DOWN	UP (Exposed)	UP (N. Exposed)		SPANS (E)	SPANS (N.E)
1	180.8	268.5	358.0	psf	24 in	48 in
1'	0.0	X	X	psf	X in	X in
2e	180.8	268.5	358.0	psf	24 in	48 in
2n	90.4	376.3	250.8	psf	24 in	24 in
2r	90.4	376.3	250.8	psf	24 in	24 in
3e	90.4	376.3	250.8	psf	24 in	24 in
3r	90.4	423.7	282.5	psf	24 in	24 in

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ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER
POWER PRODUCTION MANAGEMENT, INC.

Signature Digital

Digitally signed by Ermocrates E Castillo
Date: 2021.01.25 14:31:37 -05'00'

PROJECT NAME
REXFORD RESIDENCE
142 SW THORNE LN,
FORT WHITE, FL 32038

SHEET NAME
STRUCTURAL ATTACHMENT DETAILS

SHEET SIZE
ANSI B
11" X 17"

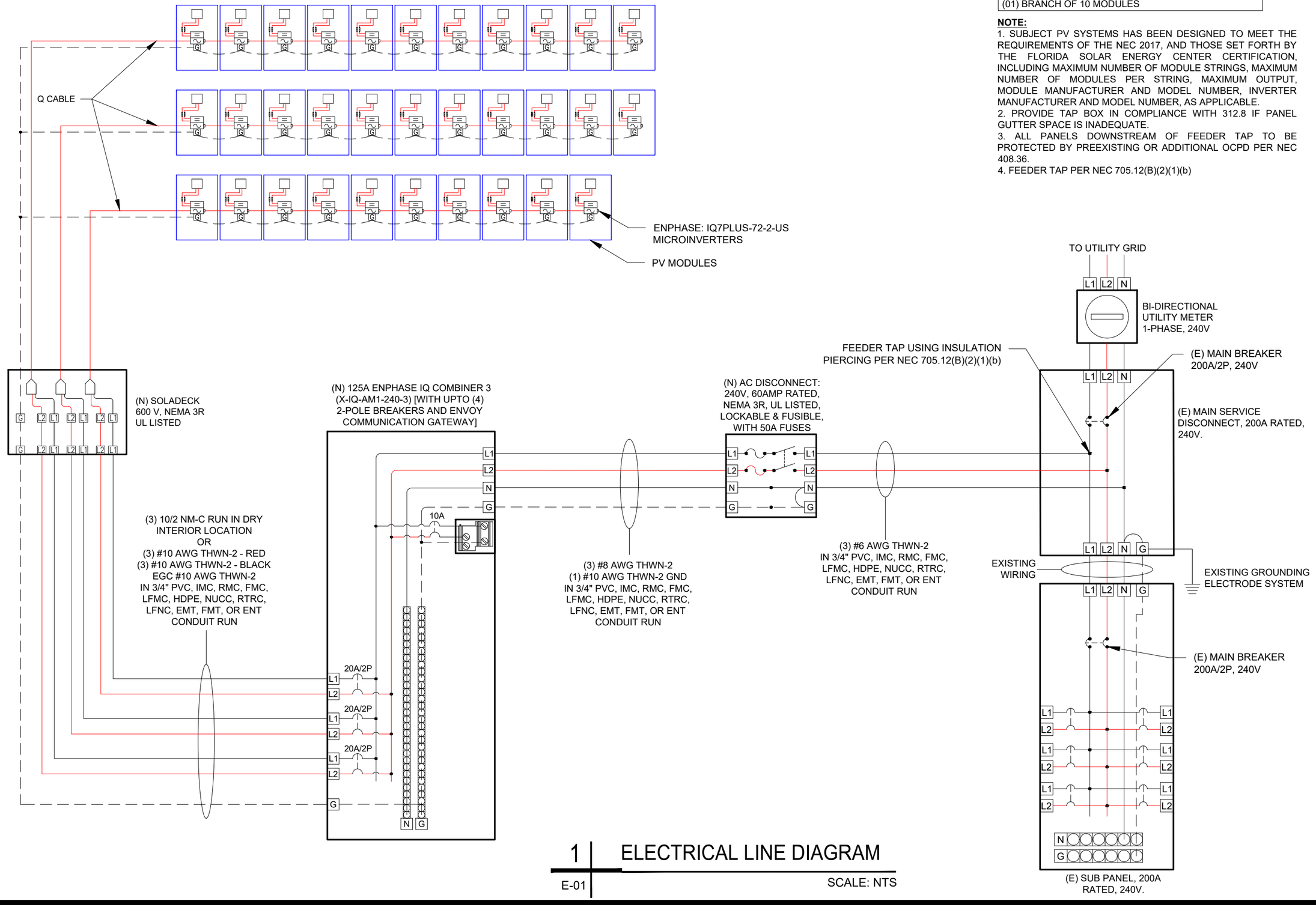
SHEET NUMBER
S-02.1

SOLAR ARRAY (11.680 kW-DC STC)

(32) REC SOLAR : REC365AA (365W) MODULES
(02) BRANCH OF 11 MODULES &
(01) BRANCH OF 10 MODULES

NOTE:

1. SUBJECT PV SYSTEMS HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE NEC 2017, AND THOSE SET FORTH BY THE FLORIDA SOLAR ENERGY CENTER CERTIFICATION, INCLUDING MAXIMUM NUMBER OF MODULE STRINGS, MAXIMUM NUMBER OF MODULES PER STRING, MAXIMUM OUTPUT, MODULE MANUFACTURER AND MODEL NUMBER, INVERTER MANUFACTURER AND MODEL NUMBER, AS APPLICABLE.
2. PROVIDE TAP BOX IN COMPLIANCE WITH 312.8 IF PANEL GUTTER SPACE IS INADEQUATE.
3. ALL PANELS DOWNSTREAM OF FEEDER TAP TO BE PROTECTED BY PREEXISTING OR ADDITIONAL OCPD PER NEC 408.36.
4. FEEDER TAP PER NEC 705.12(B)(2)(1)(b)



1 | ELECTRICAL LINE DIAGRAM

E-01 | SCALE: NTS

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POWER™ PRODUCTION MANAGEMENT, INC.

Signature with Seal

Digitally signed by Ermocrates E Castillo
Date: 2021.01.25 14:31:45 -05'00'

PROJECT NAME

REXFORD RESIDENCE

142 SW THORNE LN,
FORT WHITE, FL 32038

SHEET NAME

ELECTRICAL LINE DIAGRAM

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

E-01

AC CONDUCTOR AMPACITY CALCULATIONS: FROM ROOF TOP SOLADECK TO LOAD CENTER

Module Manufacturer	REC Solar
Module Model	REC365AA
Inverter Manufacturer	Enphase
Inverter Model	Enphase IQ 7 Plus
Modules/Branch Circuit 1	11
Modules/Branch Circuit 2	11
Modules/Branch Circuit 3	10
Total Array Power (kW)	11.68
System ac Voltage	240V 1-Phase

Design Temperature	
Min. Ambient Temp. °F	32
Max. Ambient Temp. °F	117
Calculated Max. Voc	48
Calculated Min Vmp	29
Conduit Fill	
Number of conduits	1

Ampacity Calcultions										
Circuit	Max Amps	1.25 x Max Amps	AWG	90 °C Ampacity	AmbientT emp °F	Temp Derate	Conduit Fill	Fill Derate	Derated Ampacity	Maximum Circuit Breaker
Circuit 1	13.3	16.6	#10	40	130	0.76	6	0.8	24.32	20 A
Circuit 2	13.3	16.6	#10	40	130	0.76	6	0.8	24.32	20 A
Circuit 3	12.1	15.1	#10	40	130	0.76	6	0.8	24.32	20 A
AC Combiner Panel Output	38.7	48.3	#8	55	95	0.96	3	1	52.8	50 A

Maximum Circuit Voltage Drop	2%

Voltage Drop Calculations					
Circuit	AWG	Circular Mills	I	V	Max Length
Circuit 1	#10	10380	13.3	240	145 Feet
Circuit 2	#10	10380	13.3	240	145 Feet
Circuit 3	#10	10380	12.1	240	160 Feet
Combiner Panel Output	#8	16510	38.7	240	79 Feet

Notes
Temp derate based on NEC Table 310.15(B)(2)(A)
Conduit fill derate based on NEC Table 310.15(B)(3)(A)
Maximum Voc calculated using module manufacture temperature coefficients per NEC 690.7(A)
Unless otherwise specified, all wiring must be THHN or THWN-2 Copper
All wire sizes listed are the minimum allowable
In any cell indicates that the system is safe and complies with NEC requirements
In any cell indicates a potentially unsafe condition
Information input by system designer
Informaton obtained from manufacturer datasheets

I ERMOCRATES CASTILLO PE# 52590 AN ENGINEER LICENSED PURSUANT TO CHAPTER 471, CERTIFY THAT THE PV ELECTRICAL SYSTEM AND ELECTRICAL COMPONENTS ARE DESIGNED AND APPROVED USING THE STANDARDS CONTAINED IN THE MOST RECENT VERSION OF THE FLORIDA BUILDING CODE. FBC 107.

AC CONDUCTOR AMPACITY CALCULATIONS: FROM AC COMBINER BOX TO MSP

Module Properties			
Voc	44	Isc	10.52
Vmpp	37.1	Imp	9.85
Tc Voc	-0.24%/ °C	Tc Vmp	-0.26%/ °C
Pmp	365.0	NOCT	45 °C

IQ7 Inverter Properties	
Output Voltage	240 L-L 1-PH
Max Input DC Voltage	60 Vdc
Operating Range	16 - 60 Vdc
MPPT Voltage Range	27 - 45 Vdc
Start Voltage	22 Vdc
Max Input Power	440 Wdc
Continuous AC Power	290 VA

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. THE TERMINALS ARE RATED FOR 75 DEGREE C.
3. THE WIRES ARE SIZED ACCORDING TO NEC 110.14.
4. 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.
5. WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
6. DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
7. WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
8. ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
9. MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
10. MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
11. THE POLARITY OF THE GROUNDED CONDUCTORS IS NEGATIVE .
12. UTILITY HAS 24-HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE.
13. MODULES CONFORM TO AND ARE LISTED UNDER UL 1703.
14. RACKING CONFORMS TO AND IS LISTED UNDER UL 2703.
15. CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC ARTICLE 300.6 (C) (1) AND ARTICLE 310.10 (D).
16. CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC ARTICLE 310.10 (C).

ENPHASE IQ7PLUS-72-2-US MICROINVERTER		
Input Data (DC)		
	Recommended Input Power (STC)	235-440W +
	Maximum Input DC Voltage	60V
	Peak Power Tracking Voltage	27V-45V
	Operating Range	16V-60V
	Min. / Max. Start Voltage	22V / 60V
	Max DC Short Circuit Current	15A
Output Data (AC)		
	Maximum Output Power	290W
	Nominal Output Current	240A
	Nominal Voltage / Range	240V/211-264V
	Nominal Frequency / Range	60 Hz
	Extended Frequency / Range	47-68 Hz
	Power Factor at rated power	1.21
	Maximum unit per 20A Branch Circuit	13 (240 VAC)

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MAITLAND, FL 32751
TEL: (407) 289-2575
ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

POWER PRODUCTION MANAGEMENT, INC.

Signature with Seal

Digitally signed by Ermocrates E Castillo
Date: 2021.01.25 14:31:54 -05'00'

PROJECT NAME

REXFORD RESIDENCE

142 SW THORNE LN,
FORT WHITE, FL 32038

SHEET NAME

WIRING CALCULATIONS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

E-02

⚠ WARNING

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

LABEL LOCATION:
AC DISCONNECT, POINT OF INTERCONNECTION
(PER CODE: NEC 690.13(B))

WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION:
POINT OF INTERCONNECTION
(PER CODE: NEC 705.12(B)(2)(3)(b))

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYTEM

LABEL LOCATION:
AC DISCONNECT
(PER CODE: NEC690.56(C)(3))

ADHESIVE FASTENED SIGNS:
- THE LABEL SHALL BE SUITABLE FOR THE ENVIRONMENT WHERE IT IS INSTALLED.
- WHERE REQUIRED ELSEWHERE IN THIS CODE, ALL FIELD APPLIED LABELS, WARNINGS, AND MARKINGS SHOULD COMPLY WITH ANSI Z535.4 [NEC 110.21(B) FIELD MARKING].
- ADHESIVE FASTENED SIGNS MAY BE ACCEPTABLE IF PROPERLY ADHERED. VINYL SIGNS SHALL BE WEATHER RESISTANT [IFC 605.11.1.3]

PHOTOVOLTAIC SYSTEM AC DISCONNECT
RATED AC OPERATING CURRENT 38.72 AMPS
AC NOMINAL OPERATING VOLTAGE 240 VOLTS

LABEL LOCATION:
AC DISCONNECT, POINT OF INTERCONNECTION
(PER CODE: NEC690.54)

WARNING
INVERTER OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL LOCATION:
POINT OF INTERCONNECTION
(PER CODE: NEC 705.12(B)(2)(3)(b))

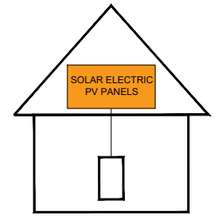
DATA PER PANEL

NOMINAL OPERATING AC VOLTAGE -	240	**V**
NOMINAL OPERATING AC FREQUENCY-	60	**Hz**
MAXIMUM AC POWER-	290	**VA**
MAXIMUM AC CURRENT-	1.21	**A**
MAXIMUM OVERCURRENT DEVICE RATING FOR AC MODULE PROTECTION PER CIRCUIT-	20	**A**

LABEL LOCATION:
COMBINER BOX
(PER CODE: NEC690.52)

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

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



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

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ERMOCRATES E. CASTILLO - FL PE 52590

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POWER PRODUCTION MANAGEMENT, INC.

Digitally signed by Ermocrates E Castillo
Date: 2021.01.25 14:32:05 -05'00'

PROJECT NAME

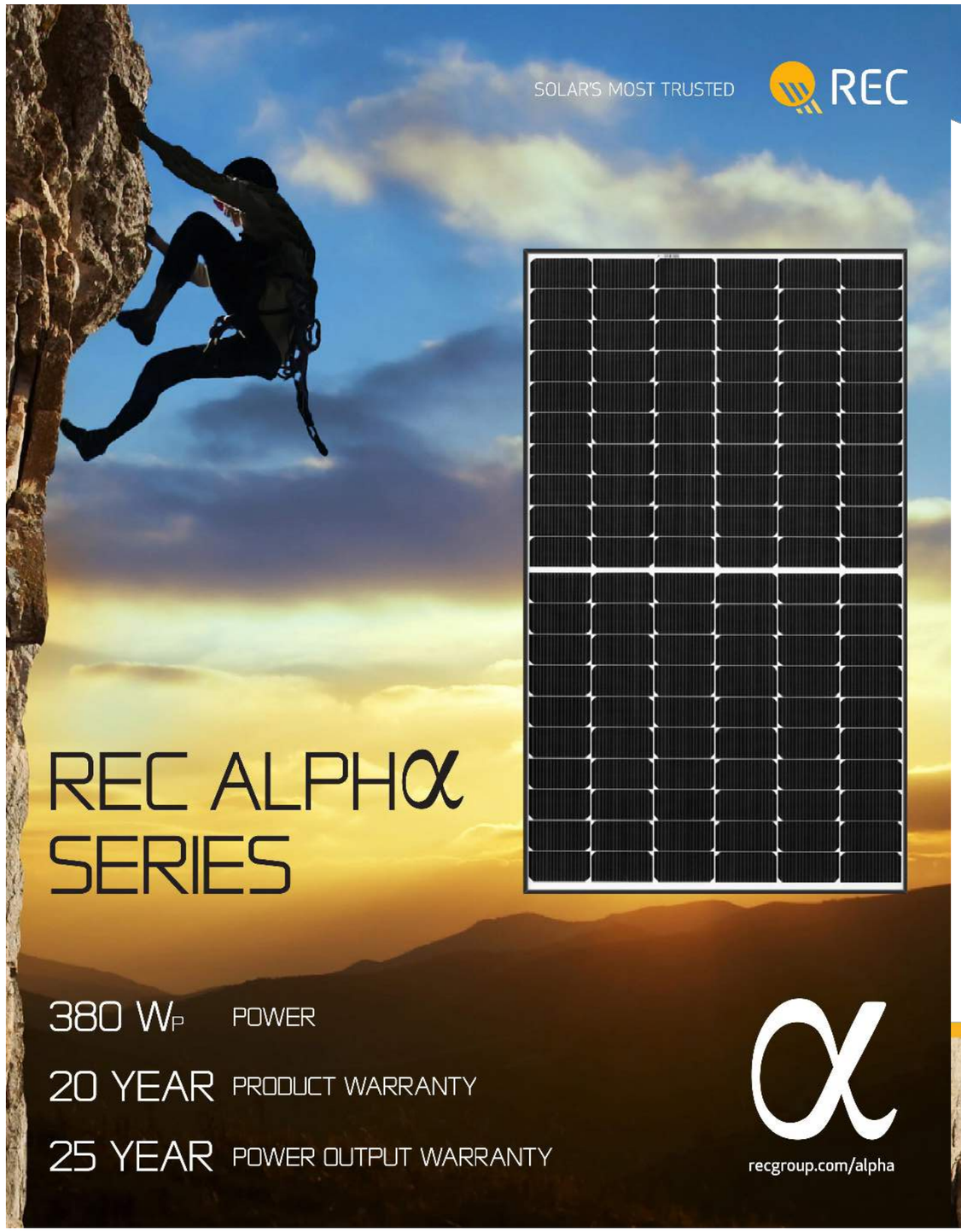
REXFORD RESIDENCE

142 SW THORNE LN,
FORT WHITE, FL 32038

SHEET NAME
SYSTEM LABELING

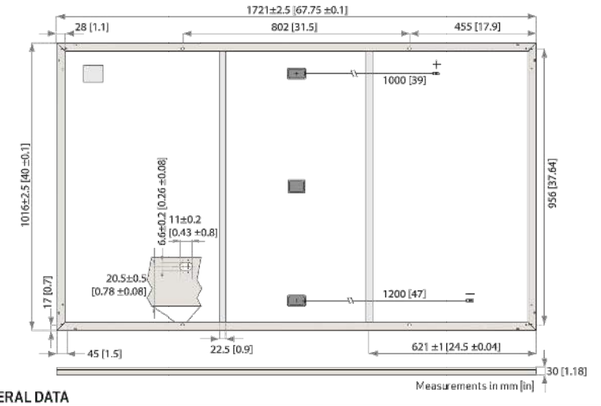
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
E-03



REC ALPHα SERIES

PRODUCT DATASHEET



GENERAL DATA

Cell type:	120 half-cut cells with REC heterojunction cell technology 6 strings of 20 cells in series	Junction box:	3-part 3 bypass diodes, IP67 rated in accordance with IEC 62790
Glass:	0.13 in (3.2 mm) solar glass with anti-reflection surface treatment	Cable:	12 AWG (4 mm²) PV wire, 39 + 47 in (1 + 1.2 m) in accordance with EN 50618
Backsheet:	Highly resistant polymeric construction	Connectors:	Stäubli MC4 PV-KBT4/KST4, 12 AWG (4 mm²) in accordance with IEC 62852 IP68 only when connected
Frame:	Anodized aluminum (black)	Origin:	Made in Singapore

ELECTRICAL DATA @ STC

Product Code*: RECxxxAA					
Nominal Power - P_{MPP} (Wp)	360	365	370	375	380
Watt Class Sorting - (W)	-0/+5	-0/+5	-0/+5	-0/+5	-0/+5
Nominal Power Voltage - V_{MPP} (V)	37.7	38.0	38.3	38.7	39.0
Nominal Power Current - I_{MPP} (A)	9.55	9.60	9.66	9.72	9.76
Open Circuit Voltage - V_{OC} (V)	44.1	44.3	44.5	44.6	44.7
Short Circuit Current - I_{SC} (A)	10.23	10.26	10.30	10.40	10.46
Panel Efficiency (%)	20.6	20.9	21.2	21.4	21.7

Values at standard test conditions (STC: air mass AM 1.5, irradiance 10.75 W/sq ft (1000 W/m²), temperature 77°F (25°C), based on a production spread with a tolerance of V_{OC} & I_{SC} ±3% within one watt class. * Where xxx indicates the nominal power class (P_{MPP}) at STC above.

ELECTRICAL DATA @ NMOT

Product Code*: RECxxxAA					
Nominal Power - P_{MPP} (Wp)	274	278	282	286	290
Nominal Power Voltage - V_{MPP} (V)	35.5	35.8	36.1	36.4	36.7
Nominal Power Current - I_{MPP} (A)	7.71	7.76	7.80	7.85	7.88
Open Circuit Voltage - V_{OC} (V)	41.6	41.7	41.9	42.0	42.1
Short Circuit Current - I_{SC} (A)	8.26	8.29	8.32	8.40	8.45

Nominal module operating temperature (NMOT: air mass AM 1.5, irradiance 800 W/m², temperature 68°F (20°C), windspeed 3.3 ft/s (1 m/s). * Where xxx indicates the nominal power class (P_{MPP}) at STC above.

CERTIFICATIONS

IEC 61215:2016, IEC 61730:2016, UL 1703, UL 61730	
IEC 62804	PID
IEC 61701	Salt Mist
IEC 62716	Ammonia Resistance
UL 1703	Fire Type Class 2
IEC 62782	Dynamic Mechanical Load
IEC 61215-2:2016	Hailstone (35mm)
AS4040.2 NCC 2016	Cyclic Wind Load
ISO 14001:2004, ISO 9001:2015, OHSAS 18001:2007	

WARRANTY

20 year product warranty
25 year linear power output warranty
Maximum annual power degression of 0.25% p.a.
Guarantees 92% of power after 25 years
See warranty conditions for further details.

MECHANICAL DATA

Dimensions:	67.8 x 40 x 1.2 in (1721 x 1016 x 30 mm)
Area:	18.8 sq ft (1.75 m²)
Weight:	43 lbs (19.5 kg)

MAXIMUM RATINGS

Operational temperature:	-40... +85°C
Maximum system voltage:	1000 V
Design load (+): snow Maximum test load (+):	4666 Pa (97.5 lbs/sq ft)* 7000 Pa (146 lbs/sq ft)*
Design load (-): wind Maximum test load (-):	2666 Pa (55.6 lbs/sq ft)* 4000 Pa (83.5 lbs/sq ft)*
Max series fuse rating:	25 A
Max reverse current:	25 A

* Calculated using a safety factor of 1.5
* See installation manual for mounting instructions

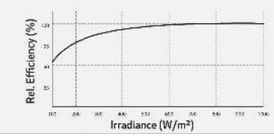
TEMPERATURE RATINGS*

Nominal Module Operating Temperature:	44°C (±2°C)
Temperature coefficient of P_{MPP}:	-0.26 %/°C
Temperature coefficient of V_{OC}:	-0.24 %/°C
Temperature coefficient of I_{SC}:	0.04 %/°C

*The temperature coefficients stated are linear values

LOW LIGHT BEHAVIOUR

Typical low irradiance performance of module at STC:



Specifications subject to change without notice.

Ref: PM-DS-12-01-Rev-B 08.19

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REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

POWER™ PRODUCTION MANAGEMENT, INC.

Signature with Seal

PROJECT NAME

REXFORD RESIDENCE

142 SW THORNE LN,
FORT WHITE, FL 32038

SHEET NAME

DATA SHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

DS-01

TEST REPORT: MECHANICAL LOAD TESTING OF REC ALPHA USING IRONRIDGE UFO SYSTEM DOWNFORCE LOAD: 3600 PA UPLIFT LOAD: -5400 PA

Tested Product Configuration

Product	Description	Model Number	Qty
Module	120 Half-cell Mono Silicon HJT PV Module	REC360AA	1

Client	**Company**	**REC Americas LLC** 3592 Sacramento Drive, Ste 170 San Luis Obispo, CA 93401
	Contact Person	**George McClellan** +1 805 704 3226 George.McClellan@recgroup.com

Test Site	**Company**	**Renewable Energy Test Center (RETC, LLC)** 46457 Landing Parkway, Fremont CA 94538
	Contact Person	**Lai Siason** Project Manager O: 510-226-1635 – F: 510-952-4351 **Email**: Lai@retc-ca.com

Performed by:	**Manny Siason** Director of Engineering and Operations	
Reviewed by:	**Cherif Kedir** President and CEO	
Date of Receipt of Samples:		03/05/2020
Date of Testing (Start/End):		03/10/2020-03/12/2020
Issuance Date:		3/18/2020

This report shall not be reproduced except in full, without written approval of the laboratory. The results were obtained by following standard laboratory procedures and per the international standards listed in the test plan. The results in this report are only representative of the samples as received by RETC.

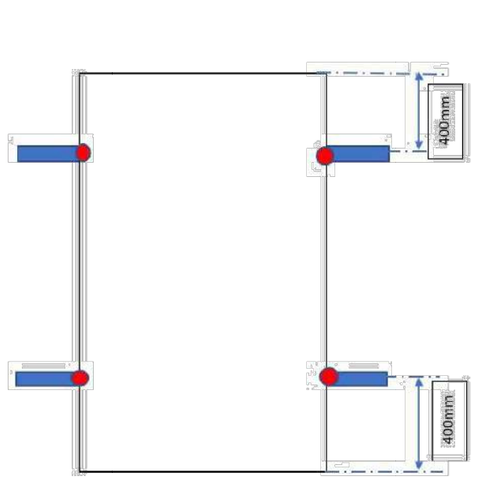
5.5. Mechanical Load

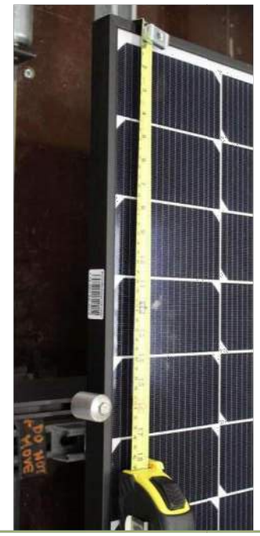
Sample	Applied Pressure (Pa)	Type/s of Loading	Remarks
RAL-043-B	Downforce: +3600 Uplift: -5400	*Three Cycle loading of downforce and uplift 1 hour per loading*	Visible bent of 0.5 mm on the frame, no loss of continuity during testing PASSED

Supplementary Information:
Orientation: Portrait
Torque:

- L-Foot to rail torque of 3/8" bonding hardware set to 250 in-lbs.
- UFO torque set to 80 in-lbs.

Clamp Used: Ironridge UFO Details (Qty, Position): 4, 400mm from short side





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POWER PRODUCTION MANAGEMENT, INC.

Signature with Seal

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REXFORD RESIDENCE
142 SW THORNE LN,
FORT WHITE, FL 32038

SHEET NAME
DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
DS-02

Data Sheet
Enphase Microinverters
Region: US

Enphase IQ 7 and IQ 7+ Microinverters

The high-powered smart grid-ready **Enphase IQ 7 Micro™** and **Enphase IQ 7+ Micro™** dramatically simplify the installation process while achieving the highest system efficiency.

Part of the Enphase IQ System, the IQ 7 and IQ 7+ Microinverters integrate seamlessly with the Enphase IQ Envoy™, Enphase Q Aggregator™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.

Easy to Install

- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014 & 2017)

Productive and Reliable

- Optimized for high powered 60-cell and 72-cell* modules
- More than a million hours of testing
- Class II double-insulated enclosure
- UL listed

Smart Grid Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

* The IQ 7+ Micro is required to support 72-cell modules.

UL CERTIFIED SAFETY US-CA E341165

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

ENPHASE.

Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)	IQ7-60-2-US	IQ7PLUS-72-2-US
Commonly used module pairings[1]	235 W - 350 W +	235 W - 440 W +
Module compatibility	60-cell PV modules only	60-cell and 72-cell PV modules
Maximum input DC voltage	48 V	60 V
Peak power tracking voltage	27 V - 37 V	27 V - 45 V
Operating range	16 V - 48 V	16 V - 60 V
Min/Max start voltage	22 V / 48 V	22 V / 60 V
Max DC short circuit current (module Isc)	15 A	15 A
Overvoltage class DC port	II	II
DC port backfeed current	0 A	0 A
PV array configuration	1 x 1 ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	

OUTPUT DATA (AC)	IQ 7 Microinverter		IQ 7+ Microinverter	
Peak output power	250 VA		295 VA	
Maximum continuous output power	240 VA		290 VA	
Nominal (L-L) voltage/range[2]	240 V / 211-264 V	208 V / 183-229 V	240 V / 211-264 V	208 V / 183-229 V
Maximum continuous output current	1.0 A	1.15 A	1.21 A	1.39 A
Nominal frequency	60 Hz		60 Hz	
Extended frequency range	47 - 68 Hz		47 - 68 Hz	
AC short circuit fault current over 3 cycles	5.8 Arms		5.8 Arms	
Maximum units per 20 A (L-L) branch circuit[3]	16 (240 VAC) 13 (208 VAC)		13 (240 VAC) 11 (208 VAC)	
Overvoltage class AC port	III		III	
AC port backfeed current	0 A		0 A	
Power factor setting	1.0		1.0	
Power factor (adjustable)	0.7 leading ... 0.7 lagging		0.7 leading ... 0.7 lagging	

EFFICIENCY	@240 V	@208 V	@240 V	@208 V
Peak CEC efficiency	97.6 %	97.6 %	97.5 %	97.3 %
CEC weighted efficiency	97.0 %	97.0 %	97.0 %	97.0 %

MECHANICAL DATA	IQ 7 Microinverter
Ambient temperature range	-40°C to +65°C
Relative humidity range	4% to 100% (condensing)
Connector type	MC4 (or Amphenol H4 UTX with additional Q-DCC-5 adapter)
Dimensions (WxHxD)	212 mm x 175 mm x 30.2 mm (without bracket)
Weight	1.08 kg (2.38 lbs)
Cooling	Natural convection - No fans
Approved for wet locations	Yes
Pollution degree	PD3
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure
Environmental category / UV exposure rating	NEMA Type 6 / outdoor

FEATURES	
Communication	Power Line Communication (PLC)
Monitoring	Enlighten Manager and MyEnlighten monitoring options. Both options require installation of an Enphase IQ Envoy.
Disconnecting means	The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.
Compliance	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 and NEC-2017 section 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according manufacturer's instructions.

1. No enforced DC/AC ratio. See the compatibility calculator at https://enphase.com/en-us/support/module-compatibility.
2. Nominal voltage range can be extended beyond nominal if required by the utility.
3. Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

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

ENPHASE.

2018-02-08

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FORT WHITE, FL 32038

SHEET NAME
DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

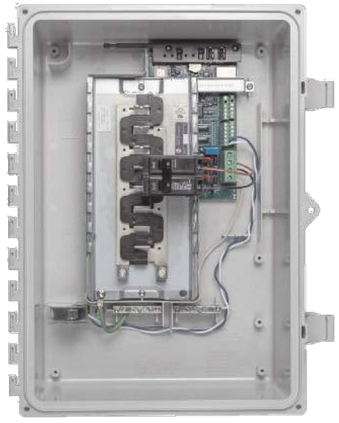
SHEET NUMBER
DS-03

Data Sheet
Enphase Networking

Enphase IQ Combiner 3

(X-IQ-AM1-240-3)

The **Enphase IQ Combiner 3™** with Enphase IQ Envoy™ consolidates interconnection equipment into a single enclosure and streamlines PV and storage installations by providing a consistent, pre-wired solution for residential applications. It offers up to four 2-pole input circuits and Eaton BR series busbar assembly.



Smart

- Includes IQ Envoy for communication and control
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Optional AC receptacle available for PLC bridge
- Provides production metering and optional consumption monitoring

Simple

- Reduced size from previous combiner
- Centered mounting brackets support single stud mounting
- Supports back and side conduit entry
- Up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80 A total PV or storage branch circuits

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year warranty
- UL listed

LISTED

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

ENPHASE.

Enphase IQ Combiner 3

MODEL NUMBER	
IQ Combiner 3 X-IQ-AM1-240-3	IQ Combiner 3 with Enphase IQ Envoy™ printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and optional* consumption monitoring (+/- 2.5%).
ACCESSORIES and **REPLACEMENT PARTS** (not included, order separately)	
Enphase Mobile Connect™ CELLMODEM-03 (4G / 12-year data plan) CELLMODEM-01 (3G / 5-year data plan) CELLMODEM-M1 (4G based LTE-M / 5-year data plan)	Plug and play industrial grade cellular modem with data plan for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.)
Consumption Monitoring* CT CT-200-SPLIT	Split core current transformers enable whole home consumption metering (+/- 2.5%).
Circuit Breakers BRK-10A-2-240 BRK-15A-2-240 BRK-20A-2P-240	Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers. Circuit breaker, 2 pole, 10A, Eaton BR210 Circuit breaker, 2 pole, 15A, Eaton BR215 Circuit breaker, 2 pole, 20A, Eaton BR220
EPLC-01	Power line carrier (communication bridge pair), quantity 2
XA-PLUG-120-3	Accessory receptacle for Power Line Carrier in IQ Combiner 3 (required for EPLC-01)
XA-ENV-PCBA-3	Replacement IQ Envoy printed circuit board (PCB) for Combiner 3
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating (output to grid)	65 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. continuous current rating (input from PV)	64 A
Max. total branch circuit breaker rating (input)	80A of distributed generation / 90A with IQ Envoy breaker included
Production Metering CT	200 A solid core pre-installed and wired to IQ Envoy
MECHANICAL DATA	
Dimensions (WxHxD)	49.5 x 37.5 x 16.8 cm (19.5" x 14.75" x 6.63"). Height is 21.06" (53.5 cm with mounting brackets).
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40° C to +46° C (-40° to 115° F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	• 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors • 60 A breaker branch input: 4 to 1/0 AWG copper conductors • Main lug combined output: 10 to 2/0 AWG copper conductors • Neutral and grcund: 14 to 1/0 copper conductors Always follow local code requirements for conductor sizing.
Altitude	To 2000 meters (5,560 feet)
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)
Cellular	Optional, CELLMODEM-01 (3G) or CELLMODEM-03 (4G) or CELLMODEM-M1 (4G based LTE-M) (not included)
COMPLIANCE	
Compliance, Combiner	UL 1741 CAN/CSA C22.2 No. 107.1 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production)
Compliance, IQ Envoy	UL 60601-1/CANCSA 22.2 No. 61010-1

* Consumption monitoring is required for Enphase Storage Systems.

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

2018-09-13

ENPHASE.

Castillo Engineering
DESIGNED TO PERMIT®
CASTILLO ENGINEERING SERVICES, LLC
COA # 28345
620 N. WYMORE ROAD,
SUITE 250,
MAITLAND, FL 32751
TEL: (407) 289-2575
ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

POWER™ PRODUCTION MANAGEMENT, INC.

Signature with Seal

PROJECT NAME

REXFORD RESIDENCE
142 SW THORNE LN,
FORT WHITE, FL 32038

SHEET NAME
DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
DS-04

SnapNrack
Solar Mounting Solutions

Ultra Rail

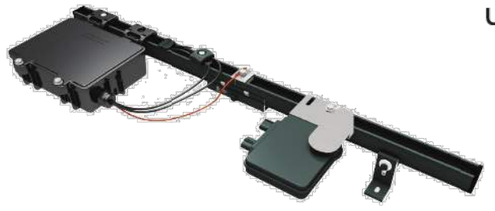
UR-40
UR-60

SnapNrack Ultra Rail System

A sleek, straightforward rail solution for mounting solar modules on all roof types. Ultra Rail features two rail profiles; UR-40 is a lightweight rail profile that is suitable for most geographic regions and maintains all the great features of SnapNrack rail, while UR-60 is a heavier duty rail profile that provides a larger rail channel and increased span capabilities. Both are compatible with all existing mounts, module clamps, and accessories for ease of install.

The Entire System is a Snap to Install

- New Ultra Rail Mounts include snap-in brackets for attaching rail
- Compatible with all the SnapNrack Mid Clamps and End Clamps customers love
- Universal End Clamps and snap-in End Caps provide a clean look to the array edge



Unparalleled Wire Management

- Open rail channel provides room for running wires resulting in a long-lasting quality install
- Industry best wire management offering includes Junction Boxes, Universal Wire Clamps, MLPE Attachment Kits, and Conduit Clamps
- System is fully bonded and listed to UL 2703 Standard

Heavy Duty UR-60 Rail

- UR-60 rail profile provides increased span capabilities for high wind speeds and snow loads
- Taller, stronger rail profile includes profile-specific rail splice and end cap
- All existing mounts, module clamps, and accessories are retained for the same great install experience

The Ultimate Value in Rooftop Solar

- Industry leading Wire Management Solutions
- Mounts available for all roof types
- Single Tool Installation
- All SnapNrack Module Clamps & Accessories are compatible with both rail profiles

Start Installing Ultra Rail Today

RESOURCES	snapnrack.com/resources
DESIGN	snapnrack.com/configurator
WHERE TO BUY	snapnrack.com/where-to-buy

Quality. Innovative. Superior.

SnapNrack Solar Mounting Solutions are engineered to optimize material use and labor resources and improve overall installation quality and safety.

877-732-2860 **www.snapnrack.com** **contact@snapnrack.com**

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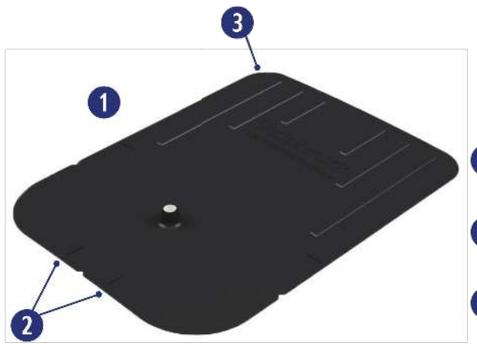
SnapNrack
Solar Mounting Solutions

snapnrack.com

snapnrack.com

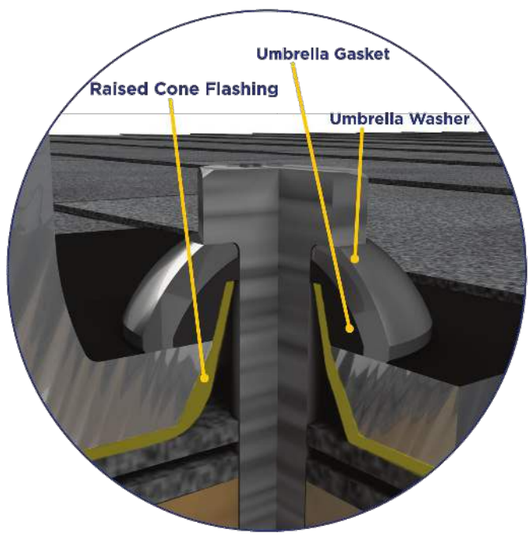
SnapNrack Umbrella Sealing Technology



Featuring New Innovative Flashing

1. Smaller 9”x12” size allows for easier insertion under shingles
2. Alignment markers make it easy to locate pilot holes
3. Rounded corners make for easier insertion & eliminate corner points from folding up

- **Innovative Flashing Elevates Protection.** New flashing uses a fully formed raised cone to prevent any potential water from getting into penetration. Feel secure as the flashing is one piece and doesn’t rely on multiple parts sealing together.
- **Mechanical Design Creates a Lifelong Seal.** Patented Umbrella technology utilizes unique Umbrella Washer to seal lag bolt, L Foot, and flashing and prevent any potential roof leaks. Technology passes UL 2582 Wind Driven Rain Test without a rubber seal, however rubber gasket is included for extra peace of mind.
- **Single Fastener Eliminates Extra Steps.** Utilize one lag bolt with Umbrella Washer to secure the entire mount assembly and flashing. No longer necessary to attach a base, then a flashing, then a mount as all are secured in one step.
- **Single Tool Installation.** SnapNrack was the first in the industry to develop a complete system that only requires a single tool. That tradition is continued as a ½” socket is still the only tool necessary to secure the mount as well as all other parts of the system.



Note: Flashing shown in yellow for illustration purposes only.

Industry Leading Spans for a Light Rail Solution

This table was prepared in compliance with applicable engineering codes and standards. Values are based on the following:

- ASCE 7-10
- Chapter 30 Wind Loads & Chapter 7 Snow Loads
- Roof Slope: 7 - 27 deg
- Roof Height: 0 - 30 ft
- Exposure: B
- Roof Zone: 1
- Module Orientation: Portrait
- Module Type: 60 Cell Modules
- Roof Type: Comp

System Span Key
6 ft Spans
4 ft Spans
2 ft Spans

Ultra Rail, UR-40 Rail System Spans

Snow (psf) \ Wind (mph)	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	190
0																
5																
10																
15																
20																
25																
30																
35																
40																
45																
50																
60																
70																
80																
90																
100																
110																
120																

Visit SnapNrack.com for detailed span tables and certifications.

Certifications

SnapNrack Ultra Rail system has been evaluated by Underwriters Laboratories (UL) and Listed to UL/ANSI Standard 2703 for Mechanical Loading and Fire. Additionally it is listed to UL 2582 for wind-driven rain.

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Solar Mounting Solutions

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