SANTIAGO RESIDENCE

7.92kW PV SYSTEM

556 NW HIGH POINT DR
LAKE CITY, FL 32055

PROJECT DESCRIPTION:

24x330 PANASONIC: VBHN330SA17 (330W) MODULES
ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES

SYSTEM SIZE: 7.92 kW DC STC
ARRAY AREA #1: 432.96 SQ FT.

EQUIPMENT SUMMARY
24 PANASONIC: VBHN330SA17 (330W) MODULES
24 ENPHASE IQ7X-96-2-US MICROINVERTERS

RACKING: UNIRAC LIGHT RAIL
ATTACHMENT: FLASHKIT PRO

DESIGN FACTORS:

WIND SPEED (ULT):	120
WIND SPEED (ASD):	93
RISK CATEGORY:	II
EXPOSURE:	B

CODES AND STANDARDS

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)
NATIONAL ELECTRICAL CODE 2017 (NEC)

OWNER

SANTIAGO, JERRY

INSTALLER

UNICITY
612 FLORIDA AVE
PALM HARBOR, FL 34683
PH: (727) 945-6060

ENGINEER

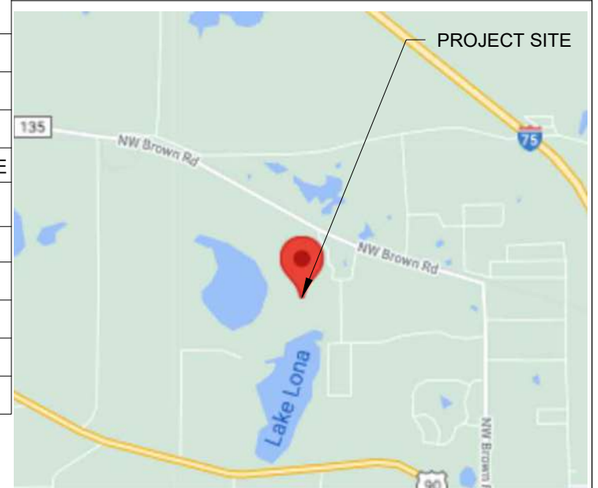
Castillo Engineering Services LLC
620 N. Wymore Road, Suite 250,Maitland, FL 32751
TEL: (407) 289-2575
Ermocrates E. Castillo
License#: FL PE 52590

HOUSE PHOTO

SHEET INDEX

SHEET #	SHEET DESCRIPTION
G-01	COVER SHEET
A-00	NOTES AND DESCRIPTION
A-01	ROOF PLAN
S-01	MODULE LAYOUT
S-01.1	PARTIAL PRESSURE AND MODULES EXPOSURE
S-02	ATTACHMENT DETAIL
S-02.1	STRUCTURE CALCULATION
E-01	ELECTRICAL LINE DIAGRAM
E-02	WIRING CALCULATIONS
E-03	SYSTEM LABELING
DS-01-06	DATA SHEETS

VICINITY MAP



STRUCTURAL CERTIFICATION:

I ERMOCRATES CASTILLO PE# 52590 AN ENGINEER LICENSED PURSUANT TO CHAPTER 471, CERTIFY THAT THE INSTALLATION OF THE MODULES IS IN COMPLIANCE WITH FBC: RESIDENTIAL 2020, CHAPTER 3. BUILDING STRUCTURE WILL SAFELY ACCOMMODATE WIND LATERAL AND UPLIFT FORCES, AND EQUIPMENT DEAD LOADS.

ELECTRICAL CERTIFICATION:

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.

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CASTILLO ENGINEERING SERVICES, LLC
COA # 28345
620 N. WYMORE ROAD,
SUITE 250,
MAITLAND, FL 32751
TEL: (407) 289-2575
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REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

Unicity Solar Energy

ERMOCRATES E. CASTILLO LICENSE No. 52590 STATE OF FLORIDA PROFESSIONAL ENGINEER
Digitally Signature with Seal
Signed by: Ermocrates E Castillo
Date: 2021.04.22 13:31:49

PROJECT NAME

SANTIAGO RESIDENCE
556 NW HIGH POINT DR
LAKE CITY, FL 32055

SHEET NAME
COVER SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
G-01

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

ACD Disconnect ..... ACD

Main Distribution Panel ..... MDP

Fuse .....

Overcurrent Breaker ..

Inverter .....

Transformer .....

Automatic ..... Transfer Switch ATS

Vent, Attic fan (Roof obstruction)

PV Roof Attachment

Trusses

Conduit

Fire Access

Abbreviations:

AC	Alternating Current
APPROX	Approximate
AWG	American Wire Gauge
BAT	Tesla Powerwall
CB	Combiner Box
DC	Direct Current
ACD	AC DISCONNECT
DISC	Disconnect
(E)	Existing
EL	Elevation
EQ	Equal
GP	Generation Panel
JB	Junction Box
MCB	Main Combiner Box
MFR	Manufacturer
MIN	Minimum
MISC	Miscellaneous
MDP	Main Distribution Panel
(N)	New
NVAD	North American Vertical datum
OCPD	OverCurrent Protection Device
POCC	Point Of Common Coupling
PV	Photovoltaic
SF	Squarefoot/feet
STC	Standard Test Conditions
SD	Soladeck
TEG	Tesla Backup Gateway 2
TBD	To Be Determined
TYP	Typical
UNO	Unless Otherwise Notified
UM	Utility meter
VIF	Verify In Field
WP	Weather Proof

System Description

This system is a grid-tied, PV system, with PV generation consisting of 24 PANASONIC: VBHN330SA17 (330W) MODULES with a combined STC rated dc output power of 7920 W. The modules are connected into 24 ENPHASE IQ7X-96-2-US MICROINVERTERS . The inverters has electronic 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 *National Electric 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.

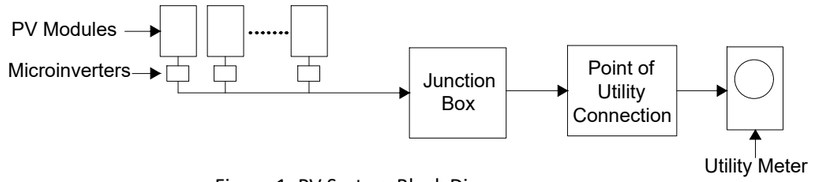
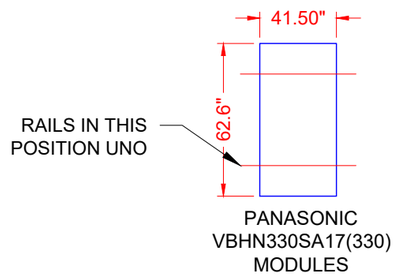


Figure 1: PV System Block Diagram

The inverter meets the requirements of IEEE 1547 and UL 1741.

Approximate system output: 10,384 kWh per year.



ALLOWABLE DESIGN PRESSURE	PSF
DOWN PRESSURE	75
UPLIFT PRESSURE, 2 RAILS	75

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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

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REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

Unicity Solar Energy

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Date: 2021.04.22 13:31:49

PROJECT NAME

SANTIAGO RESIDENCE

556 NW HIGH POINT DR
LAKE CITY, FL 32055

SHEET NAME

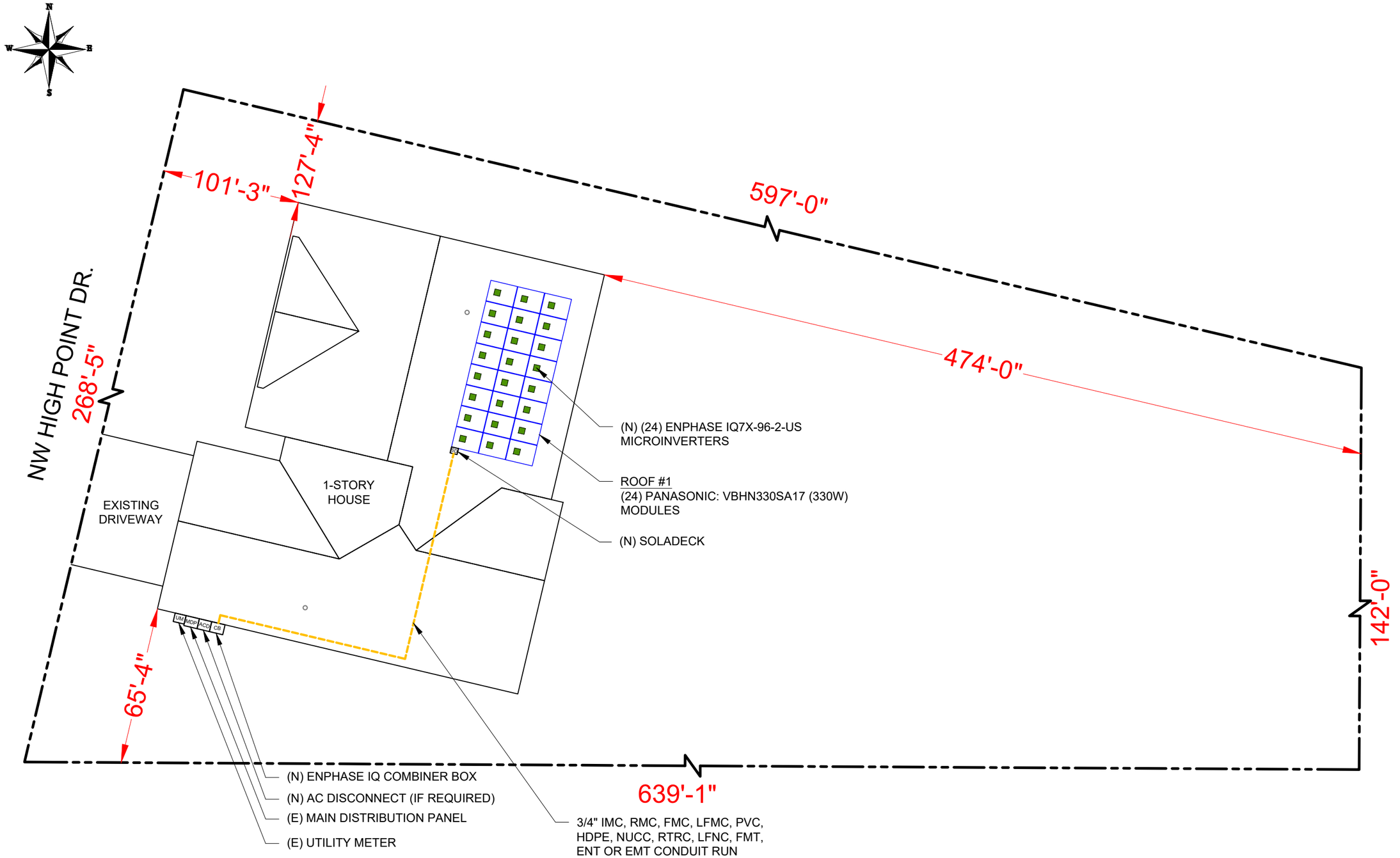
NOTES AND DESCRIPTION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

A-00



1 A-01 ROOF PLAN WITH FIRE SETBACKS AND PROPERTY LINES

SCALE: 1/16" = 1'-0"

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COA # 28345
620 N. WYMORE ROAD,
SUITE 250,
MAITLAND, FL 32751
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E. CASTILLO LICENSE No. 52590 STATE OF FLORIDA PROFESSIONAL ENGINEER

Signature with Seal

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SHEET NAME

ROOF PLAN

SHEET SIZE

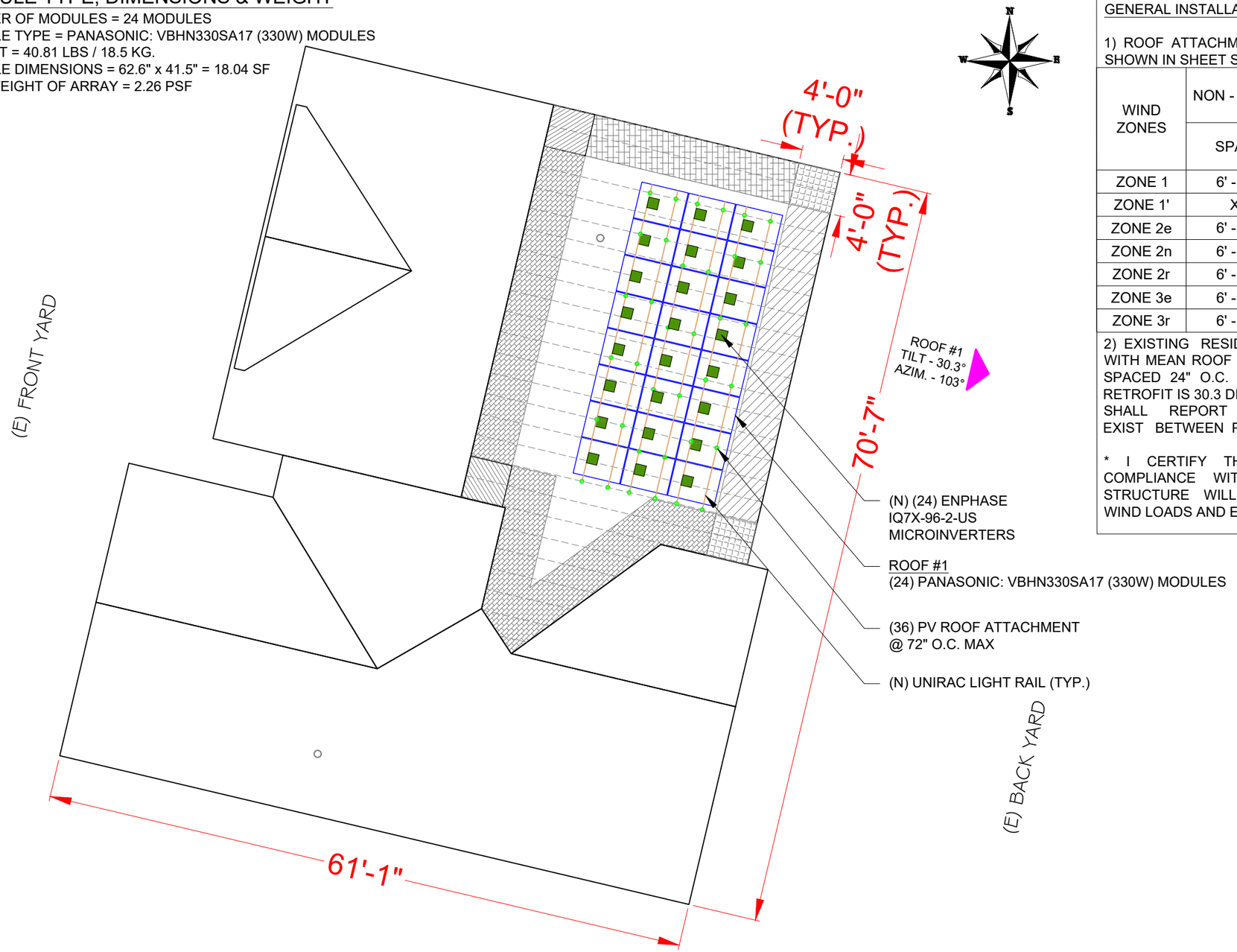
ANSI B
11" X 17"

SHEET NUMBER

A-01

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 24 MODULES
MODULE TYPE = PANASONIC: VBHN330SA17 (330W) MODULES
WEIGHT = 40.81 LBS / 18.5 KG.
MODULE DIMENSIONS = 62.6" x 41.5" = 18.04 SF
UNIT WEIGHT OF ARRAY = 2.26 PSF



GENERAL INSTALLATION PLAN NOTES:

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

WIND ZONES	NON - EXPOSED MODULES		EDGE / EXPOSED MODULES	
	SPAN	CANTILEVER	SPAN	CANTILEVER
ZONE 1	6' - 0"	1'-4"	6' - 0"	1'-4"
ZONE 1'	X	X	X	X
ZONE 2e	6' - 0"	1'-4"	6' - 0"	1'-4"
ZONE 2n	6' - 0"	1'-4"	6' - 0"	1'-4"
ZONE 2r	6' - 0"	1'-4"	6' - 0"	1'-4"
ZONE 3e	6' - 0"	1'-4"	6' - 0"	1'-4"
ZONE 3r	6' - 0"	1'-4"	6' - 0"	1'-4"

2) EXISTING RESIDENTIAL BUILDING IS AN ASPHALT SHINGLE ROOF WITH MEAN ROOF HEIGHT IS 15 FT AND SYP 2"X4" ROOF TRUSSES SPACED 24" O.C. EXISTING ROOF SLOPE FOR SOLAR SYSTEM RETROFIT IS 30.3 DEGREES. CONTRACTOR TO FIELD VERIFY 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. *

LEGEND

- EDGE MODULE
- EXPOSED MODULE
- NON- EXPOSED MODULE
- MISSING MODULE
- MIN. MODULE EDGE DISTANCE LINE
- MODULE EXPOSURE LINE
- WIND ZONE 1' (TYP)
- WIND ZONE 1 (TYP)
- WIND ZONE 2e (TYP)
- WIND ZONE 2n (TYP)
- WIND ZONE 2r (TYP)
- WIND ZONE 3r (TYP)
- WIND ZONE 3e (TYP)

TOTAL 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	432.96	1177.68	36.76	30.3°	103°	2"X4"	24" O.C.

1 MODULE LAYOUT
S-01 SCALE: 3/32" = 1'-0"

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SOLAR DONE RIGHT®
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

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ERMOCRATES E. CASTILLO LICENSE No. 52590 STATE OF FLORIDA PROFESSIONAL ENGINEER

Signature with seal

Digitally signed by: Ermocrates E Castillo
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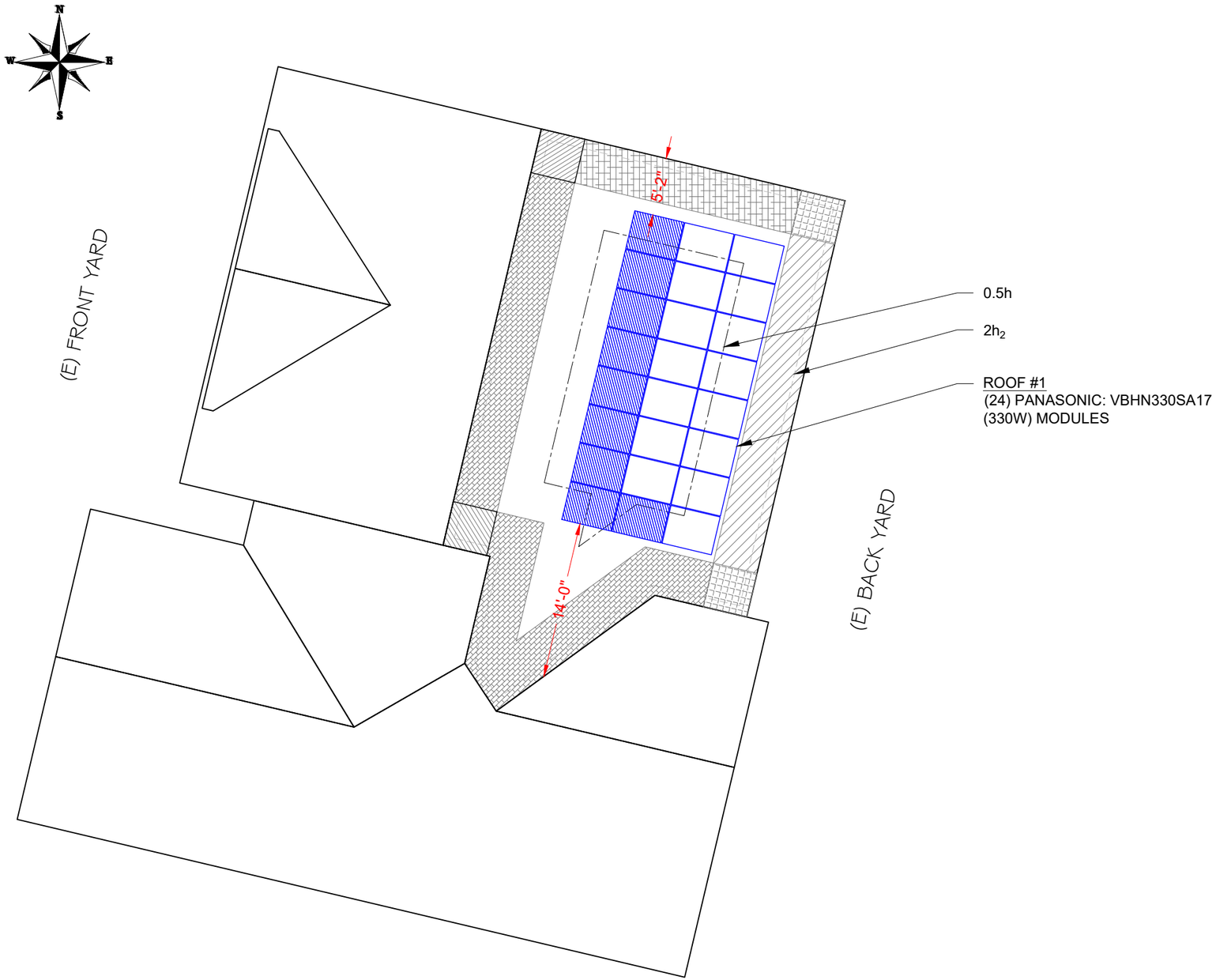
PROJECT NAME

SANTIAGO RESIDENCE
556 NW HIGH POINT DR
LAKE CITY, FL 32055

SHEET NAME
MODULE LAYOUT

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
S-01



1 PARTIAL PRESSURE AND MODULES EXPOSURE

S-01.1 SCALE: 3/32" = 1'-0"

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.

$2h_2$ DISTANCE : 10"
0.5h DISTANCE : 7' - 6"

LEGEND

- EDGE MODULE
- EXPOSED MODULE
- NON- EXPOSED MODULE
- MISSING MODULE
- MIN. MODULE EDGE DISTANCE LINE
- MODULE EXPOSURE LINE
- WIND ZONE 1' (TYP)
- WIND ZONE 1 (TYP)
- WIND ZONE 2e (TYP)
- WIND ZONE 2n (TYP)
- WIND ZONE 2r (TYP)
- WIND ZONE 3r (TYP)
- WIND ZONE 3e (TYP)

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556 NW HIGH POINT DR
LAKE CITY, FL 32055

SHEET NAME

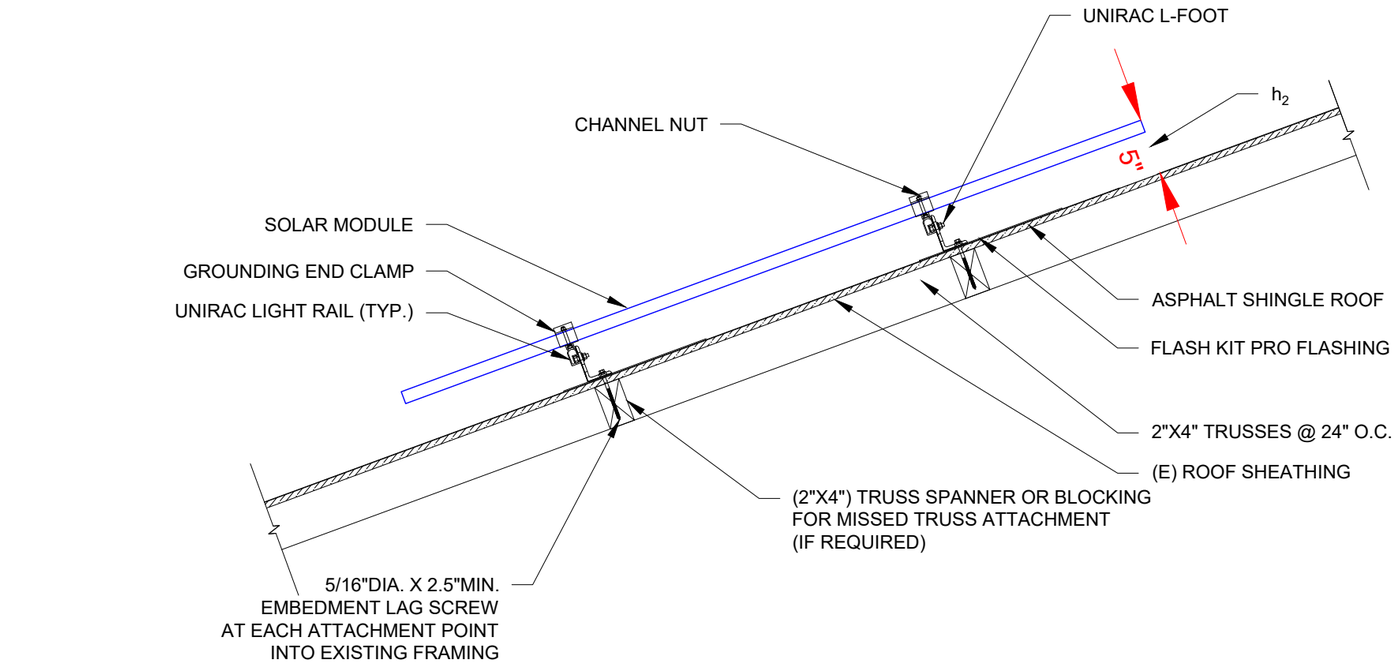
PARTIAL PRESSURE AND MODULES EXPOSURE

SHEET SIZE

ANSI B
11" X 17"

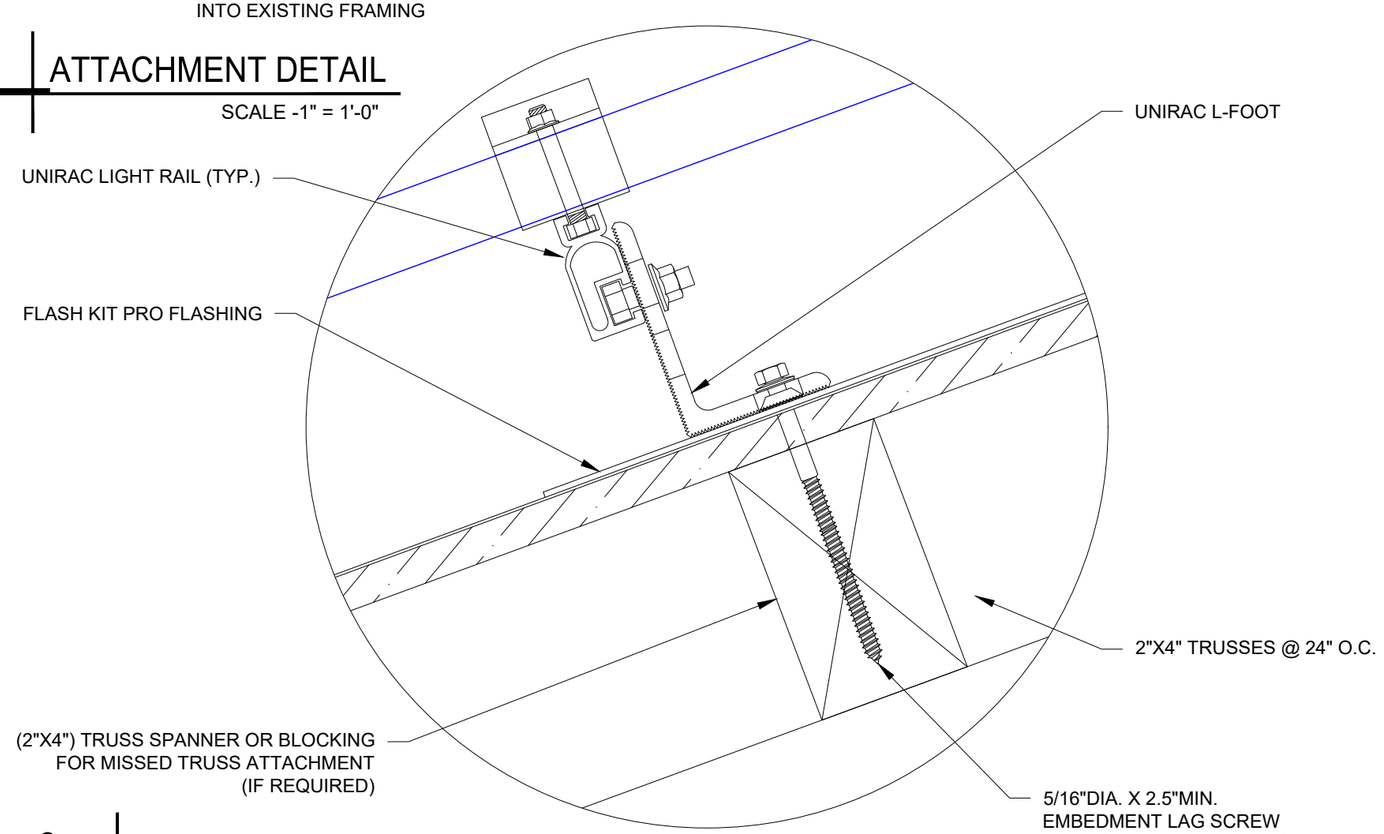
SHEET NUMBER

S-01.1



1 ATTACHMENT DETAIL

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



2 ATTACHMENT DETAIL (ENLARGED VIEW)

S-02 SCALE: 1" = 2"

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COA # 28345
620 N. WYMORE ROAD,
SUITE 250,
MAITLAND, FL 32751
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PROJECT NAME

SANTIAGO RESIDENCE

556 NW HIGH POINT DR
LAKE CITY, FL 32055

SHEET NAME

ATTACHMENT DETAIL

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

S-02

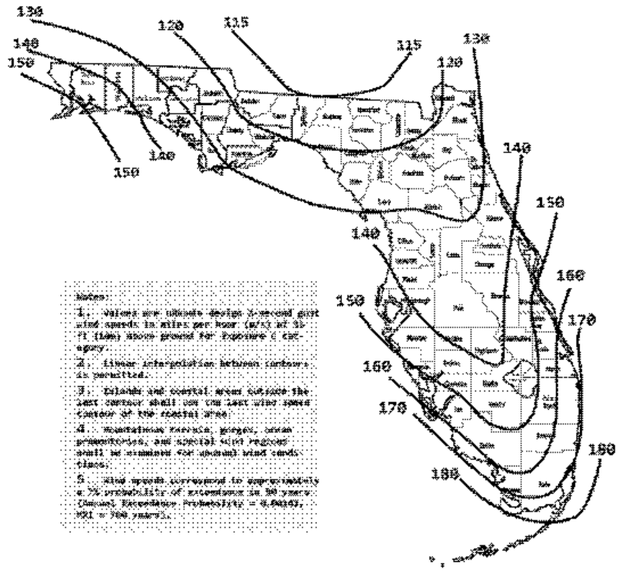

FIGURE 1609.3(1)
ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR RISK CATEGORY II BUILDINGS AND OTHER STRUCTURES

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	B	
ROOF LENGTH (ft)	70.7	ROOF SLOPE	7 /12	
ROOF WIDTH (ft)	61.1	ROOF SLOPE (°)	30.3	
PARAPET HEIGHT (ft)	0.0	ROOF TYPE	GABLE	
MODULE LENGTH (in)	62.6	ULTIMATE WIND SPEED	120	mph
MODULE WIDTH (in)	41.50	NOMINAL WIND SPEED	93	mph
MODULE ORIENTATION	PORTRAIT	EXPOSURE FACTOR (C_e)	1.000	
MODULE AREA (sq. ft.)	18.04	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)	18.0	K_{ZT}	1.000	
GROUND ELEVATION (ft)	95.0	K_e	0.997	
HVHZ	NO	K_z	0.575	

DESIGN CALCULATIONS

VELOCITY PRESSURE (q) = $.00256*K_zK_ZTK_DV^2$
VELOCITY PRESSURE(ASD) 10.8 psf

WIDTH OF PRESSURE COEFFICIENT	61.1' * 10%	=	6.11'	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	0.797	-1.544
	ZONE 1'	X	X
	ZONE 2e	0.797	-1.544
	ZONE 2n	0.797	-1.803
	ZONE 2r	0.797	-1.544
	ZONE 3e	0.797	-2.234
	ZONE 3r	0.797	-1.248

INTERNAL PRESSURE COEFFICIENT (+/-) 0.18

DESIGN PRESSURES

ROOF ZONE	DOWN	UP				
1	16.0	-18.6	psf			
1'	X	X	psf			
2e	16.0	-18.6	psf	Module allowable uplift pressure	75	psf
2n	16.0	-21.4	psf	Module allowable down pressur	75	psf
2r	16.0	-18.6	psf			
3e	16.0	-26.0	psf			
3r	16.0	-15.4	psf			

ARRAY FACTORS

ARRAY EDGE FACTOR (EXPOSED)	1.5	SOLAR PANEL PRESSURE EQUALIZATION FACTOR	0.6975
ARRAY EDGE FACTOR (NON-EXPOSED)	1		

ADJUSTED DESIGN PRESSURES

ROOF ZONE	DOWN	UP (Exposed)	UP (N. Exposed)	
1	16.0	-19.4	-16.0	psf
1'	X	X	X	psf
2e	16.0	-19.4	-16.0	psf
2n	16.0	-22.3	-16.0	psf
2r	16.0	-19.4	-16.0	psf
3e	16.0	-27.2	-18.1	psf
3r	16.0	-16.1	-16.0	psf

ATTACHMENTS USED

ATTACHMENT MODEL	Lag Bolts- Shingle	
ATTACHMENT STRENGTH	476	lbs

MAX DESIGN LOADS ALLOWABLE

LIMIT MAX SPAN TO		N/A	in			
RAFTER/SEAM SPACING		24	in	NO. OF RAILS	Exposed: 2	Non. Exp: 2
ROOF ZONE	DOWN	UP (Exposed)	UP (N. Exposed)		SPANS (E)	SPANS (N.E)
1	250.4	303.9	250.4	lbs	72 in	72 in
1'	X	X	X	lbs	X in	X in
2e	250.4	303.9	250.4	lbs	72 in	72 in
2n	250.4	349.6	250.4	lbs	72 in	72 in
2r	250.4	303.9	250.4	lbs	72 in	72 in
3e	250.4	425.7	283.8	lbs	72 in	72 in
3r	250.4	251.9	250.4	lbs	72 in	72 in

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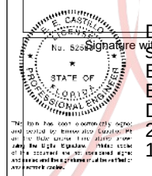
REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

Unicity Solar Energy



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Date: 2021.04.22 13:31:51
Signature with Seal

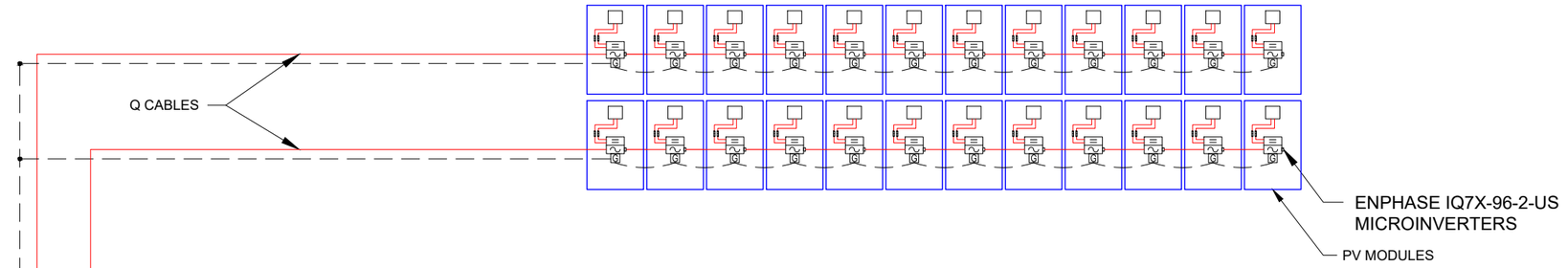
PROJECT NAME

SANTIAGO RESIDENCE
556 NW HIGH POINT DR
LAKE CITY, FL 32055

SHEET NAME
STRUCTURE CALCULATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
S-02.1



SOLAR ARRAY (7.92 KW-DC STC) TOTAL

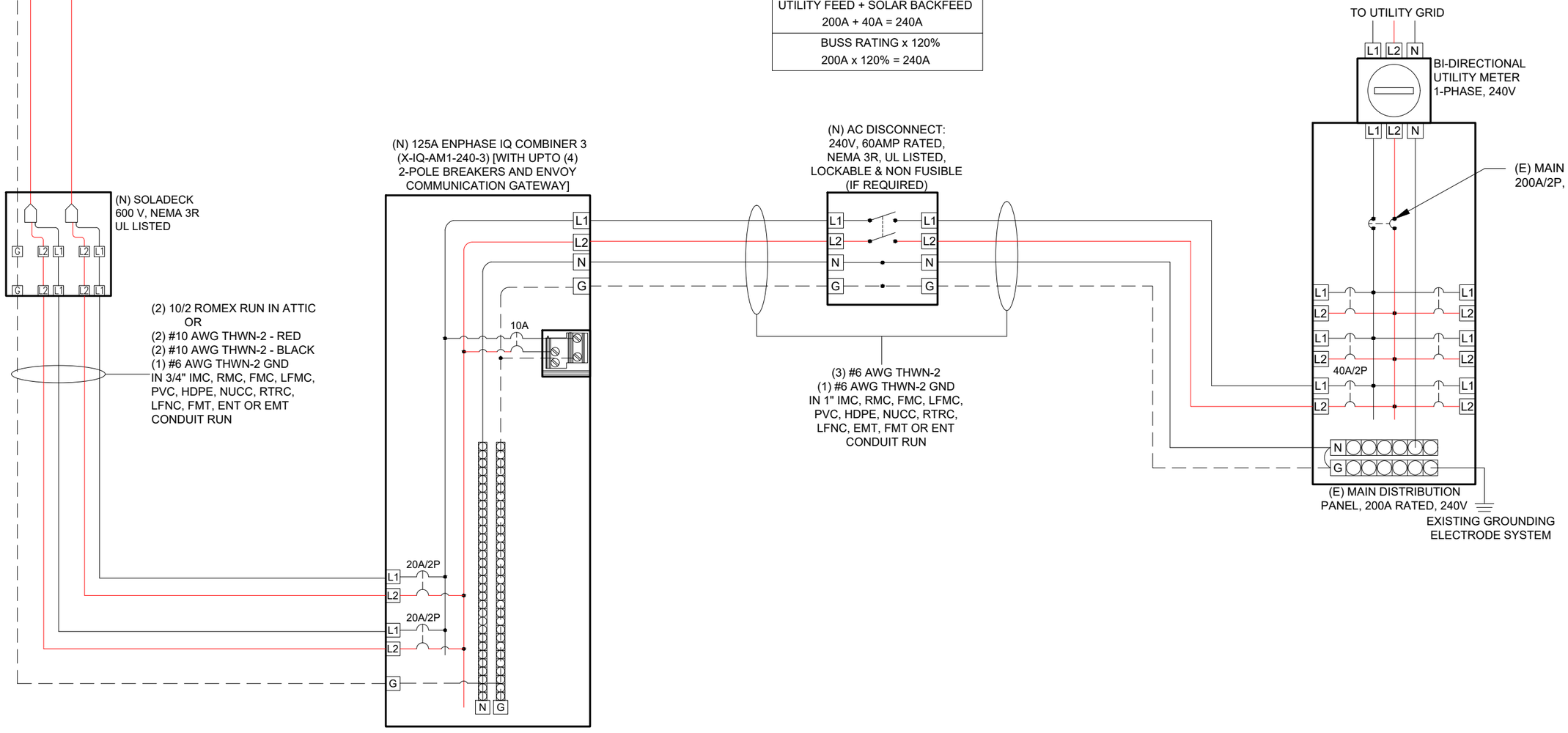
(24) PANASONIC VBHN330SA17 330 W MODULES
(02) STRINGS OF 12 MODULES

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.

INTERCONNECTION
120% RULE - NEC 705.12(B)(2)(3)(b)

UTILITY FEED + SOLAR BACKFEED 200A + 40A = 240A
BUSS RATING x 120% 200A x 120% = 240A



1 | ELECTRICAL LINE DIAGRAM

E-01 | SCALE: NTS

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SUITE 250,
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Digitally Signature with Seal
Signed by: Ermocrates E Castillo
Date: 2021.04.22 13:31:51

PROJECT NAME

SANTIAGO RESIDENCE

556 NW HIGH POINT DR
LAKE CITY, FL 32055

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	Panasonic
Module Model	VBHN330SA17
Inverter Manufacturer	Enphase
Inverter Model	Enphase IQ 7 X
Modules/Branch Circuit 1	12
Modules/Branch Circuit 2	12
Total Array Power (kW)	7.92
System ac Voltage	240V 1-Phase

Design Temperature	
Min. Ambient Temp. °F	32
Max. Ambient Temp. °F	117
Calculated Max. Voc	75
Calculated Min Vmp	46
Conduit Fill	
Number of conduits	1

Ampacity Calcultions

Circuit	Max Amps	1.25 x Max Amps	AWG	90 °C Ampacity	Ambient Temp °F	Temp Derate	Conduit Fill	Fill Derate	Derated Ampacity	Maximum Circuit Breaker
Circuit 1	15.8	19.7	#10	40	130	0.76	4	0.8	24.32	20 A
Circuit 2	15.8	19.7	#10	40	130	0.76	4	0.8	24.32	20 A
AC Combiner Panel Output	31.5	39.4	#6	75	95	0.96	3	1	72	40 A

Maximum Circuit Voltage Drop	2%

Voltage Drop Calculations

Circuit	AWG	Circular Mills	I	V	Max Length
Circuit 1	#10	10380	15.8	240	123 Feet
Circuit 2	#10	10380	15.8	240	123 Feet
Combiner Panel Output	#6	26240	31.5	240	155 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	69.7	Isc	6.07
Vmpp	58	Imp	5.7
TC Voc	-0.23%/ °C	TC Vmp	-0.258%/°C
Pmp	330.0	NOCT	45 °C

Inverter Properties	
Output Voltage	240 L-L 1-PH
Max Input dc Voltag	80 Vdc
Operating Range	25 - 80 Vdc
MPPT Voltage Range	53 - 64 Vdc
Start Voltage	30 Vdc
Max Input Power	460 Wdc
Continuous AC Powe	315 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 DEGREES 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 IQ7X-96-2-US MICROINVERTER		
Input Data (DC)		
	Recommended Input Power (STC)	320-460W +
	Maximum Input DC Voltage	79.5V
	Peak Power Tracking Voltage	53V-64V
	Operating Range	25V-79.5V
	Min. / Max. Start Voltage	33V / 79.5V
	Max DC Short Circuit Current	10A
Output Data (AC)		
	Maximum Output Power	320W
	Nominal Output Current	1.31A
	Nominal Voltage / Range	240V/211-264V
	Nominal Frequency / Range	60 Hz
	Extended Frequency / Range	47-68 Hz
	Power Factor at rated power	1.0
	Maximum unit per 20A Branch Circuit	12 (240 VAC)

Castillo Engineering
SOLAR DONE RIGHT®
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

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REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

Unicity Solar Energy

ERMOCRATES E. CASTILLO No. 52590 STATE OF FLORIDA PROFESSIONAL ENGINEER

Digitally Signed by: Ermocrates E Castillo
Date: 2021.04.22 13:31:51

PROJECT NAME

SANTIAGO RESIDENCE

556 NW HIGH POINT DR
LAKE CITY, FL 32055

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))

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

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 31.5 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))

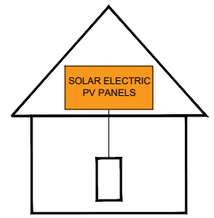
DATA PER PANEL

NOMINAL OPERATING AC VOLTAGE -	240	**V**
NOMINAL OPERATING AC FREQUENCY-	60	**Hz**
MAXIMUM AC POWER-	315	**VA**
MAXIMUM AC CURRENT-	1.31	**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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COA # 28345
620 N. WYMORE ROAD,
SUITE 250,
MAITLAND, FL 32751
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REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

Unicity Solar Energy

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Date: 2021.04.22 13:31:52
Signature with Seal

PROJECT NAME

SANTIAGO RESIDENCE

556 NW HIGH POINT DR
LAKE CITY, FL 32055

SHEET NAME

SYSTEM LABELING

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

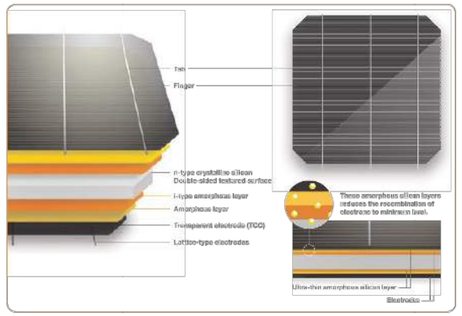
E-03

HIT® Photovoltaic Module

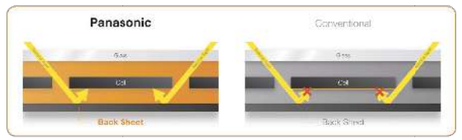
Panasonic

N330/N325

Panasonic's unique heterojunction technology uses ultra-thin amorphous silicon layers. These thin dual layers reduce losses, resulting in higher energy output than conventional panels.



Advanced bifacial cell designed for increased energy output. The cell utilizes sunlight reflected back from the rear side material which captures more light and converted into energy.



Our competitive advantages

High Efficiency at High Temperatures
As temperature increases, HIT® continues to perform at high levels due to the industry leading temperature coefficient of -0.258% /ºC. No other module even comes close to our temperature characteristics. That means more energy throughout the day.

25 Year Product and Performance Warranty**
Industry leading 25 year product workmanship and performance warranty is backed by a century old company- Panasonic. Power output is guaranteed to 90.76% after 25 years, far greater than other companies.

Quality and Reliability
Panasonic's vertical integration, 20 years of experience manufacturing HIT® and 20 internal tests beyond those mandated by current standards provides extreme quality assurance.

Higher Efficiency 19.7%
Enables higher power output and greater energy yields. HIT® provides maximum production for your limited roof space.

Low Degradation
HIT "N-type" cells result in extremely Low Light Induced Degradation (LID) and zero Potential Induced Degradation (PID) which supports reliability and longevity. This technology reduces annual degradation to 0.26% compare to 0.70% in conventional panels, guaranteeing more power for the long haul.

Enhanced Frame Design
A new 40 mm frame increases durability and strength being able to handle loads of up to 5400 Pa. Also, the water drainage system give rain, water and snow melt a place to go, reducing water stains and soiling on the panel. Less dirt on the panel means more sunlight getting through to generate power.

HIT® is a registered trademark of Panasonic Group

HIT® Photovoltaic Module

Panasonic

N330/N325

ELECTRICAL SPECIFICATIONS

Model	VBHN330SA17	VBHN325SA17
Rated Power (Pmax)[1]	330W	325W
Maximum Power Voltage (Vpm)	58.0V	57.6V
Maximum Power Current (Ipm)	5.70A	5.65A
Open Circuit Voltage (Voc)	69.7V	69.6V
Short Circuit Current (Isc)	6.07A	6.03A
Temperature Coefficient (Pmax)	-0.258%/°C	-0.258%/°C
Temperature Coefficient (Voc)	-0.16V/°C	-0.16V/°C
Temperature Coefficient (Isc)	3.34mA/°C	3.34mA/°C
NOCT	44.0°C	44.0°C
CEC PTC Rating (Tentative)	307.1W	302.3W
Cell Efficiency	22.09%	21.76%
Module Efficiency	19.7%	19.4%
Watts per Ft.²	18.3W	18.0W
Maximum System Voltage	600V	600V
Series Fuse Rating	15A	15A
Warranted Tolerance (-/+)	+10%/-0%*	+10%/-0%*

MECHANICAL SPECIFICATIONS

Model	VBHN330SA17, VBHN325SA17
Internal Bypass Diodes	4 Bypass Diodes
Module Area	18.02 Ft.² (1.67m²)
Weight	40.81 Lbs. (18.5kg)
Dimensions LxWxH	62.6x41.5x1.6 in. (1590x1053x40 mm)
Cable Length +Male/-Female	40.2/40.2 in. (1020/1020 mm)
Cable Size / Type	No. 12 AWG / PV Cable
Connector Type[2]	Multi-Contact® Type IV (MC4[+])
Static Wind / Snow Load	112 PSF (5400Pa)****
Pallet Dimensions LxWxH	63.7x42.2x46.4 in.
Quantity per Pallet / Pallet Weight	24 pcs./1049 Lbs. (476 kg)
Quantity per 40' Container	672 pcs.
Quantity per 20' Container	288 pcs.

OPERATING CONDITIONS & SAFETY RATINGS

Model	VBHN330SA17, VBHN325SA17
Operating Temperature	-40°F to 185°F (-40°C to 85°C)
Hail Safety Impact Velocity	1" hailstone (25mm) at 52 mph (23m/s)
Safety & Rating Certifications	UL 1703, cUL, CEC
UL 1703 Fire Classification	Type 2
Limited Warranty	25** Yrs Workmanship and Power Output (Linear)***

NOTE: Standard Test Conditions: Air mass 1.5; irradiance = 1000W/m²; cell temp. 25°C

* Maximum power at delivery. For guarantee conditions, please check our guarantee document.

** Installation need to be registered through our website **www.panasonicusahitwarranty.com** within 60 days in order to receive twenty-five (25) year Product workmanship. Otherwise, Product Workmanship will be only fifteen (15) years.

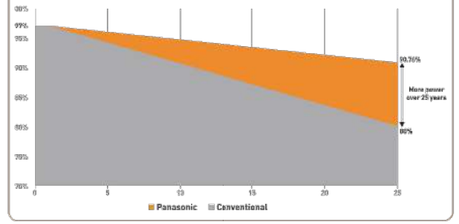
*** 1st year 97%, after 2nd year 0.26% annual degradation to year 25.

[1] STC: Cell temp. 25°C, AM 1.5, 1000W/m²

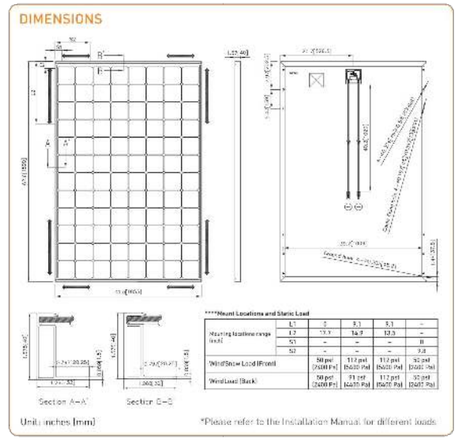
[2] Safety locking clip (PV-SSH4) is not supplied with the module.

NOTE: Specifications and information above may change without notice.

PERFORMANCE WARRANTY

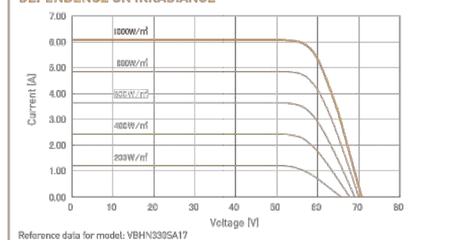


DIMENSIONS



*Please refer to the Installation Manual for different loads

DEPENDENCE ON IRRADIANCE



Reference data for model: VBHN330SA17
(Cell temperature: 25°C)

⚠ CAUTION! Please read the installation manual carefully before using the products.

Used electrical and electronic products must not be mixed with general household waste. For proper treatment, recovery and recycling of old products, please take them to applicable collection points in accordance with your national legislation.

Panasonic

Panasonic Eco Solutions of North America
Two Riverfront Plaza, 5th Floor, Newark, NJ 07102
panasonicHIT@us.panasonic.com
business.panasonic.com/solarpanels

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CASTILLO ENGINEERING SERVICES, LLC
COA # 28345
620 N. WYMORE ROAD,
SUITE 250,
MAITLAND, FL 32751
TEL: (407) 289-2575
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REVISIONS

DESCRIPTION	DATE	REV

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Unicity Solar Energy

E. CASTILLO No. 52590 STATE OF FLORIDA PROFESSIONAL ENGINEER

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SANTIAGO RESIDENCE

556 NW HIGH POINT DR
LAKE CITY, FL 32055

SHEET NAME

DATA SHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

DS-01

Data Sheet
Enphase Microinverters
Region: AMERICAS

Enphase IQ 7X Microinverter

The high-powered smart grid-ready **Enphase IQ 7X Micro**™ dramatically simplifies the installation process while achieving the highest system efficiency for systems with 96-cell modules.

Part of the Enphase IQ System, the IQ 7X Micro integrates with the Enphase IQ Envoy™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

The 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)

Efficient and Reliable

- Optimized for high powered 96-cell* modules
- Highest CEC efficiency of 97.5%
- 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 7X is required to support 96-cell modules.

UL CERTIFIED SAFETY US-CA E341165

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

ENPHASE.

Enphase IQ 7X Microinverter

INPUT DATA (DC)	IQ7X-96-2-US	
Commonly used module pairings[1]	320 W - 460 W +	
Module compatibility	96-cell PV modules	
Maximum input DC voltage	79.5 V	
Peak power tracking voltage	53 V - 64 V	
Operating range	25 V - 79.5 V	
Min/Max start voltage	33 V / 79.5 V	
Max DC short circuit current (module Isc)	10 A	
Overvoltage class DC port	II	
DC port backfeed current	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)	**@ 240 VAC**	**@ 208 VAC**
Peak output power	320 VA	
Maximum continuous output power	315 VA	
Nominal (L-L) voltage/range[2]	240 V / 211-264 V	208 V / 183-229 V
Maximum continuous output current	1.31 A (240 VAC)	1.51 A (208 VAC)
Nominal frequency	60 Hz	
Extended frequency range	47 - 68 Hz	
AC short circuit fault current over 3 cycles	5.8 Arms	
Maximum units per 20 A (L-L) branch circuit[3]	12 (240 VAC)	10 (208 VAC)
Overvoltage class AC port	III	
AC port backfeed current	18 mA	
Power factor setting	1.0	
Power factor (adjustable)	0.85 leading ... 0.85 lagging	
EFFICIENCY	**@240 VAC**	**@208 VAC**
CEC weighted efficiency	97.5 %	97.0 %
MECHANICAL DATA		
Ambient temperature range	-40°C to +60°C	
Relative humidity range	4% to 100% (condensing)	
Connector type (IQ7X-96-2-US)	MC4 (or Amphenol H4 UTX with optional 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 Compatible with 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.

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2019-3-26

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COA # 28345
620 N. WYMORE ROAD,
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REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

Unicity Solar Energy

E. CASTILLO LICENSE No. 52590 STATE OF FLORIDA PROFESSIONAL ENGINEER

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Date: 2021.04.22 13:31:53

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SANTIAGO RESIDENCE
556 NW HIGH POINT DR
LAKE CITY, FL 32055

SHEET NAME
DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

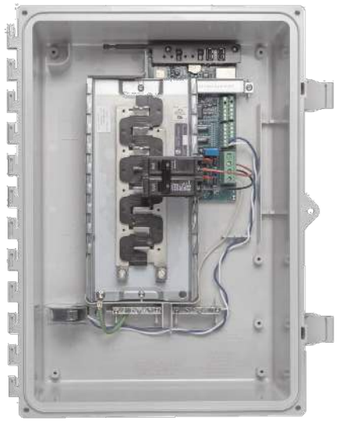
SHEET NUMBER
DS-03

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 ground: 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**

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2018-09-13

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Castillo Engineering
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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

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REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

Unicity Solar Energy

E. CASTILLO No. 52590 STATE OF FLORIDA PROFESSIONAL ENGINEER

Digitally Signed by: Ermocrates E Castillo
Date: 2021.04.22 13:31:53
Signature with Seal

PROJECT NAME

SANTIAGO RESIDENCE
556 NW HIGH POINT DR
LAKE CITY, FL 32055

SHEET NAME
DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
DS-04

SOLARMOUNT

UNIRAC

SOLARMOUNT defined the standard in solar racking. Features are designed to get installers off the roof faster. Our grounding & bonding process eliminates copper wire and grounding straps to reduce costs. Systems can be configured with standard or light rail to meet your design requirements at the lowest cost possible. The superior aesthetics package provides a streamlined clean edge for enhanced curb appeal, with no special brackets required for installation.

Now Featuring:

THE NEW FACE OF SOLAR RACKING

Superior Aesthetics Package

LOSE ALL OF THE COPPER & LUGS
System grounding through Enphase microinverters and trunk cables

SMALL IS THE NEXT NEW BIG THING
Light Rail is Fully Compatible with all SM Components

ENHANCED DESIGN & LAYOUT TOOLS
Featuring Google Map Capabilities within U-Builder

FAST INSTALLATION. SUPERIOR AESTHETICS

OPTIMIZED COMPONENTS • VERSATILITY • DESIGN TOOLS • QUALITY PROVIDER

SOLARMOUNT

UNIRAC

OPTIMIZED COMPONENTS

INTEGRATED BONDING & PRE-ASSEMBLED PARTS

Components are pre-assembled and optimized to reduce installation steps and save labor time. Our new grounding & bonding process eliminates copper wire and grounding straps or bonding jumpers to reduce costs. Utilize the microinverter mount with a wire management clip for an easier installation.

VERSATILITY

ONE PRODUCT - MANY APPLICATIONS

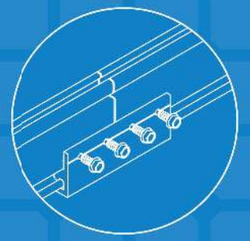
Quickly set modules flush to the roof or at a desired tilt angle. Change module orientation to portrait or landscape while securing a large variety of framed modules on flat, low slope or steep pitched roofs. Available in mill, clear and dark anodized finishes to outperform your projects financial and aesthetic aspirations.

AUTOMATED DESIGN TOOL

DESIGN PLATFORM AT YOUR SERVICE

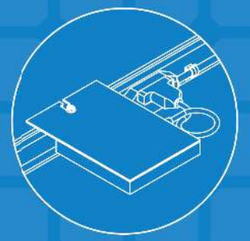
Creating a bill of materials is just a few clicks away with U-Builder, a powerful online tool that streamlines the process of designing a code compliant solar mounting system. Save time by creating a user profile, and recall preferences and projects automatically when you log in. You will enjoy the ability to share projects with customers: there's no need to print results and send to a distributor, just click and share.

INTEGRATED BONDING MIDCLAMP



INTEGRATED BONDING SPLICE BAR

INTEGRATED BONDING L-FOOT w/ T-BOLT



INTEGRATED BONDING MICROINVERTER MOUNT w/ WIRE MANAGEMENT

LISTED **UL2703** BONDING & GROUNDING MECHANICAL LOADING SYSTEM FIRE CLASSIFICATION

UNIRAC CUSTOMER SERVICE MEANS THE HIGHEST LEVEL OF PRODUCT SUPPORT

UNMATCHED EXPERIENCE | CERTIFIED QUALITY | ENGINEERING EXCELLENCE | BANKABLE WARRANTY | DESIGN TOOLS | PERMIT DOCUMENTATION

TECHNICAL SUPPORT

Unirac's technical support team is dedicated to answering questions & addressing issues in real time. An online library of documents including engineering reports, stamped letters and technical data sheets greatly simplifies your permitting and project planning process.

CERTIFIED QUALITY PROVIDER

Unirac is the only PV mounting vendor with ISO certifications for 9001:2015, 14001:2015 and OHSAS 18001:2007, which means we deliver the highest standards for fit, form, and function. These certifications demonstrate our excellence and commitment to first class business practices.

BANKABLE WARRANTY

Don't leave your project to chance. Unirac has the financial strength to back our products and reduce your risk. Have peace of mind knowing you are receiving products of exceptional quality. SOLARMOUNT is covered by a twenty five (25) year limited product warranty and a five (5) year limited finish warranty.

PROTECT YOUR REPUTATION WITH QUALITY RACKING SOLUTIONS BACKED BY ENGINEERING EXCELLENCE AND A SUPERIOR SUPPLY CHAIN

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Castillo Engineering
SOLAR DONE RIGHT®
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COA # 28345
620 N. WYMORE ROAD,
SUITE 250,
MAITLAND, FL 32751
TEL: (407) 289-2575
ERMOCRATES E. CASTILLO - FL PE 52590

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ANSI B
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SHEET NUMBER

DS-05

FLASHKIT PRO

UNIRAC
FEATURING SHED & SEAL TECHNOLOGY

FLASHKIT PRO is the complete attachment solution for composition shingle roofs. Featuring Unirac's patented **SHED & SEAL** technology, a weather proof system which provides the ultimate protection against roof leaks. Kitted in 10 packs for maximum convenience, flashings and hardware are available in Mill or Dark finishes. With **FLASH**KIT pro, you have everything you need for a quick, professional installation.

UNIRAC 25 YEAR FULL SYSTEM WARRANTY

TRUSTED WATER SEAL FLASHINGS
FEATURING SHED & SEAL TECHNOLOGY

YOUR COMPLETE SOLUTION
Flashings, lags, continuous slot L-Feet and hardware

CONVENIENT 10 PACKS
Packaged for speed and ease of handling

FLASHKIT PRO

INSTALLATION GUIDE

UNIRAC
FEATURING SHED & SEAL TECHNOLOGY

FLASHKIT PRO IS THE COMPLETE FLASHING AND ATTACHMENT SOLUTION FOR COMPOSITION ROOFS.

INSTALL **FLASH**KIT PRO FLASHNG

INSTALL L-FOOT

ATTACH L-FOOT TO RAIL

PRE-INSTALL

- Locate roof rafters and snap chalk lines to mark the installation point for each roof attachment.
- Drill a 7/32" pilot hole at each roof attachment. Fill each pilot hole with sealant.

STEP 1 INSTALL **FLASH**KIT PRO FLASHING

- Add a U-shaped bead of roof sealant to the underside of the flashing with the open side of the U pointing down the roof slope. Slide the aluminum flashing underneath the row of shingles directly up slope from the pilot hole as shown. Align the indicator marks on the lower end of the flashing with the chalk lines on the roof to center the raised hole in the flashing over the pilot hole in the roof. When installed correctly, the flashing will extend under the two courses of shingles above the pilot hole.

STEP 2 INSTALL L-FOOT

- Fasten L-foot and Flashing into place by passing the included lag bolt and pre-installed stainless steel-backed EPDM washer through the L-foot EPDM grommet, and the raised hole in the flashing, into the pilot hole in the roof rafter.
- Drive the lag bolt down until the L-foot is held firmly in place. It is normal for the EPDM on the underside of the stainless steel backed EPDM washer to compress and expand beyond the outside edge of the steel washer when the proper torque is applied.

TIP:

- Use caution to avoid over-torqueing the lag bolt if using an impact driver.
- Repeat Steps 1 and 2 at each roof attachment point.

STEP 3 ATTACH L-FOOT TO RAIL

- Insert the included 3/8"-16 T-bolts into the lower slot on the Rail (sold separately), spacing the bolts to match the spacing between the roof attachments.
- Position the Rail against the L-Foot and insert the threaded end of the T-Bolt through the continuous slot in the L-Foot. Apply anti-seize to bolt threads to prevent galling of the T-bolt and included 3/8" serrated flange nut. Place the 3/8" flange nut on the T-bolt and finger tighten. Repeat STEP 3 until all L-Feet are secured to the Rail with a T-bolt. Adjust the level and height of the Rail and torque each bolt to 30ft-lbs.

THE COMPLETE ROOF ATTACHMENT SOLUTION

FOR QUESTIONS CR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702

FASTER INSTALLATION. 25-YEAR WARRANTY.

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SHEET NAME
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