PROJECT DESCRIPTION:

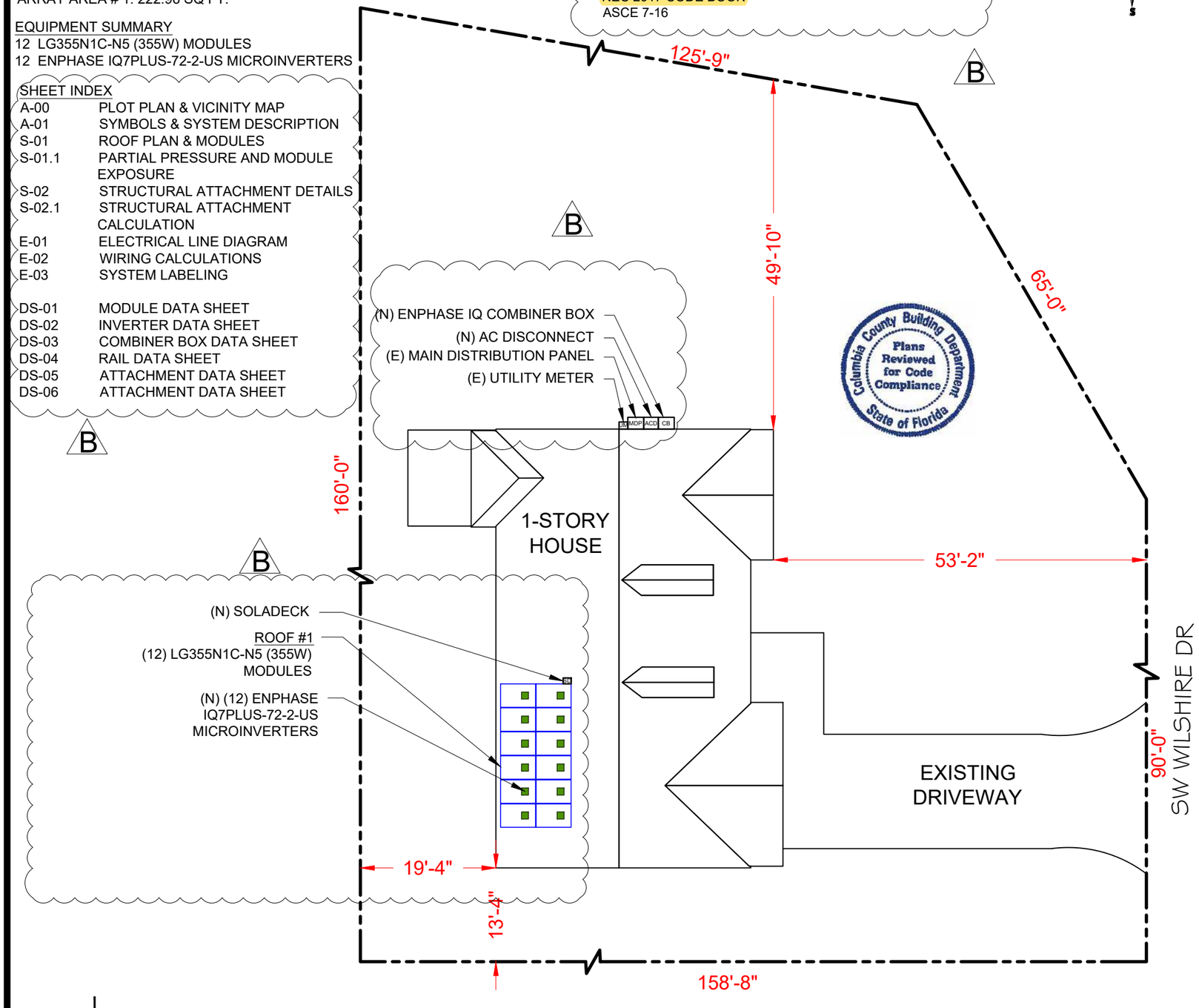
12X355 LG355N1C-N5 (355W) MODULES
ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES

SYSTEM SIZE: 4.26 kW DC STC
ARRAY AREA # 1: 222.96 SQ FT.

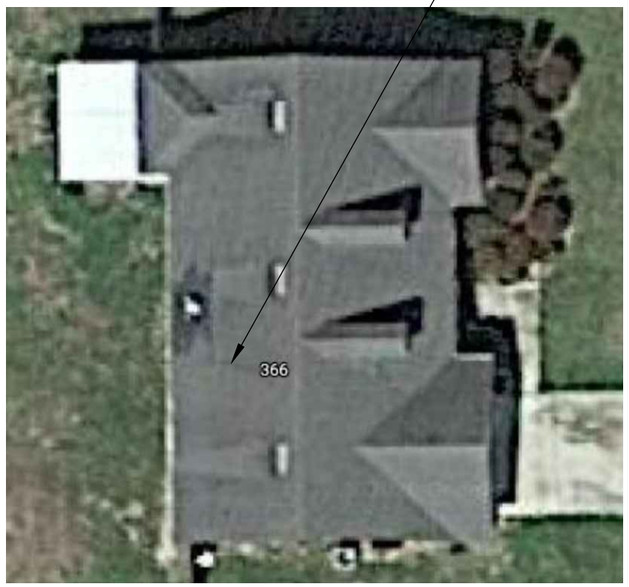
EQUIPMENT SUMMARY
12 LG355N1C-N5 (355W) MODULES
12 ENPHASE IQ7PLUS-72-2-US MICROINVERTERS

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: 1/16" = 1'-0"



PROJECT SITE

2 HOUSE PHOTO
A-00 SCALE: NTS

3 VICINITY MAP
A-00 SCALE: NTS

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CASTILLO ENGINEERING SERVICES, LLC
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620 N. WYMORE ROAD, SUITE 250,
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TEL: (407) 289-2575
ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV
REVISION	01/26/2021	B

PROJECT INSTALLER
SUNPRO

Digitally signed by Ermocrates E Castillo
Date: 2021.01.28 08:45:11 -05'00'

PROJECT NAME
GONZALEZ RESIDENCE
366 SW WILSHIRE DR, LAKE CITY, FL 32024

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 .....

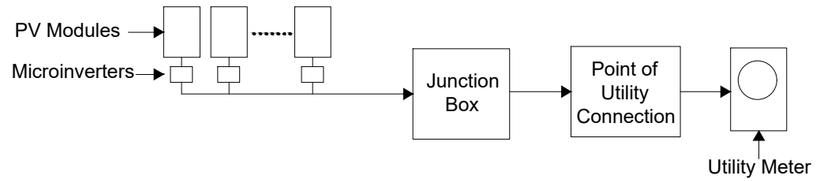
Automatic ..... Transfer Switch ATS

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 12 LG355N1C-N5 (355W) MODULES with a combined STC rated dc output power of 4,260W. The modules are connected into 12 ENPHASE IQ7PLUS-72-2-US MICROINVERTERS. The inverter 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.

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 14.34 kWh per day on site.

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ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

SUNPRO

Signature with Seal

Digitally signed by Ermocrates E Castillo
Date: 2021.01.28 08:45:18 -05'00'

PROJECT NAME

GONZALEZ RESIDENCE

366 SW WILSHIRE DR,
LAKE CITY, FL 32024

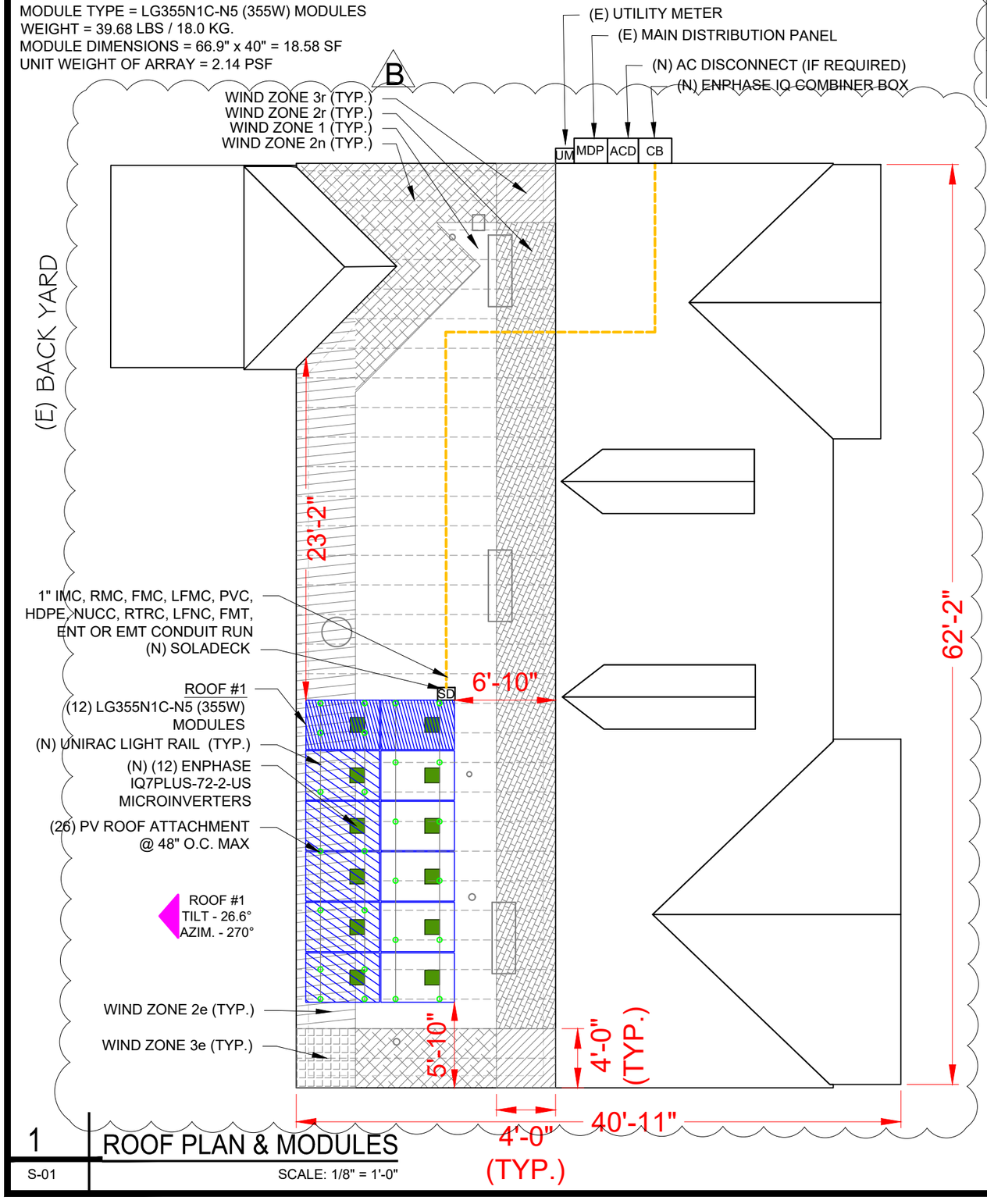
SHEET NAME
SYMBOLS & SYSTEM DESCRIPTION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
A-01

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 12 MODULES
MODULE TYPE = LG355N1C-N5 (355W) MODULES
WEIGHT = 39.68 LBS / 18.0 KG.
MODULE DIMENSIONS = 66.9" x 40" = 18.58 SF
UNIT WEIGHT OF ARRAY = 2.14 PSF



1 ROOF PLAN & MODULES
S-01 SCALE: 1/8" = 1'-0"

ROOF	ROOF TYPE	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)	TILT	AZIMUTH	TRUSS SIZE	SEAM SPACING
#1	ASPHALT SHINGLE ROOF	222.96	1050.36	21.23	26.6°	270°	2"X4"	24" O.C.

GENERAL INSTALLATION PLAN NOTES:

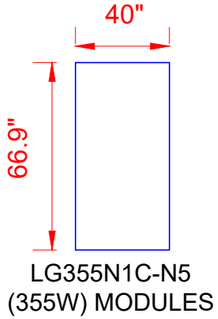
1) ROOF ATTACHMENTS TO SYP TRUSSES SHALL BE INSTALLED AS SHOWN IN SHEET S-02 AND AS FOLLOWS FOR EACH WIND ZONE:

FOR 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 SPAN4-0" O.C. - MAX CANTILEVER : 1'-4"
WIND ZONE 2r: MAX SPAN 4'-0" O.C. - MAX CANTILEVER : 1'-4"
WIND ZONE 3e: MAX SPAN4-0" O.C. - MAX CANTILEVER : 1'-4"
WIND ZONE 3r: MAX SPAN2-0" O.C. - MAX CANTILEVER : 1'-4"

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 4'-0" O.C. - MAX CANTILEVER : 1'-4"
WIND ZONE 2r: MAX SPAN 4'-0" O.C. - MAX CANTILEVER : 1'-4"
WIND ZONE 3e: MAX SPAN 4'-0" O.C. - MAX CANTILEVER : 1'-4"
WIND ZONE 3r: MAX SPAN 4'-0" O.C. - MAX CANTILEVER : 1'-4"
SEE SHEET S-02.1 FOR SUPPORTING CALCULATIONS.

2) EXISTING RESIDENTIAL BUILDING IS A METAL ROOF WITH MEAN ROOF HEIGHT 15 FT AND SYP WOOD TRUSSES SPACED 24" O.C. EXISTING ROOF SLOPE FOR SOLAR SYSTEM RETROFIT IS 26.6 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. *



LG355N1C-N5
(355W) MODULES

LEGEND

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

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REVISIONS

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REVISION	01/26/2021	B

PROJECT INSTALLER

SUNPRO

Signature with Seal

Digitally signed by Ermocrates E Castillo
Date: 2021.01.28 08:45:27 05'00'

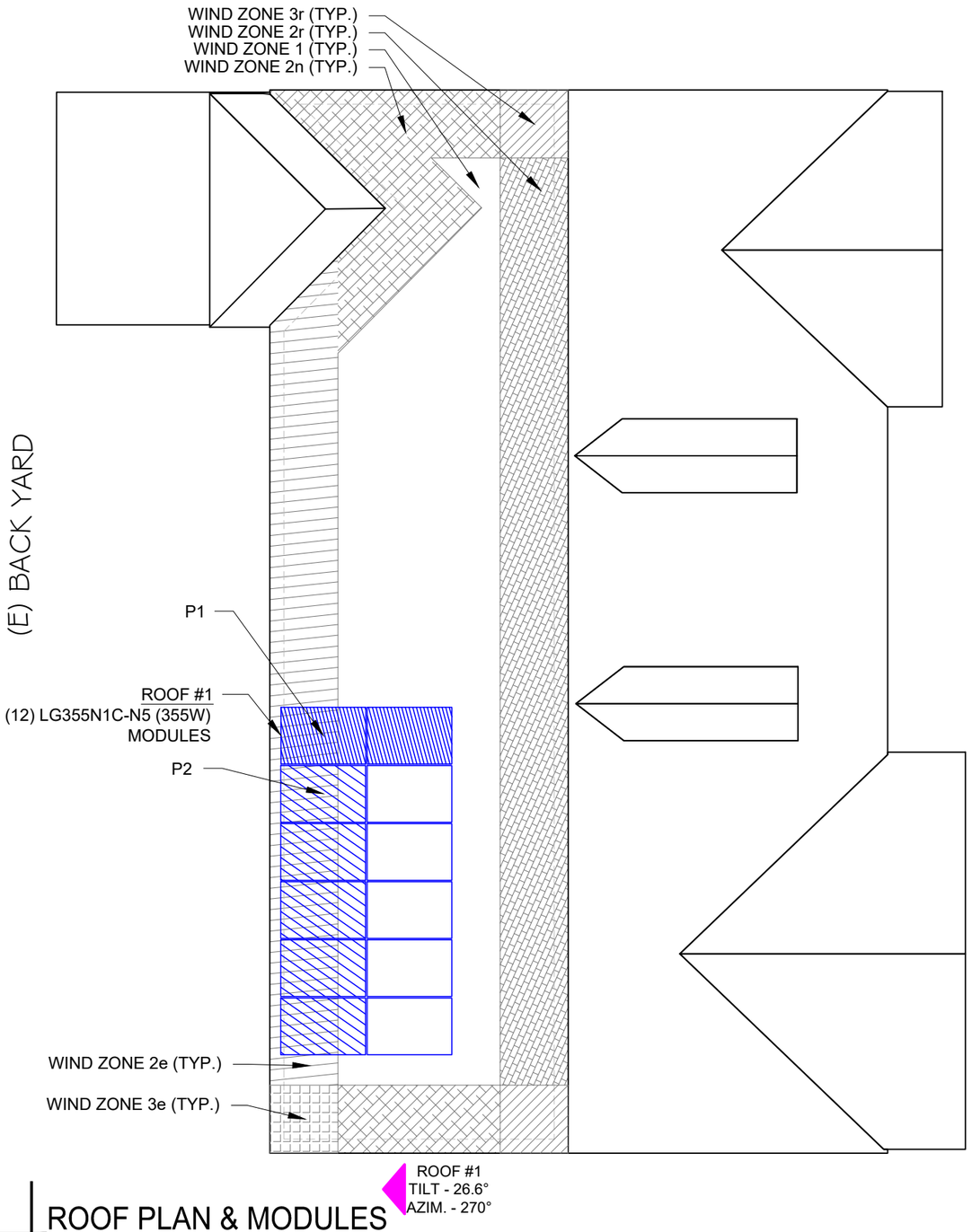
PROJECT NAME

GONZALEZ RESIDENCE
366 SW WILSHIRE DR,
LAKE CITY, FL 32024

SHEET NAME
ROOF PLAN & MODULES

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
S-01



1 ROOF PLAN & MODULES

S-01 SCALE: 1/8" = 1'-0"

1	1'	2e	2n	2r	3e	3r
27.5	0	27.5	38.6	38.6	38.6	43.5

Module Size	18.58	sq.ft.

Exposed modules								Partial
	1	1'	2e	2n	2r	3e	3r	Pressure
P1	5.4628	0	13.1205	0	0	0	0	27.50

ALLOWABLE PRESSURE OF MODULE : 76PSF

1	1'	2e	2n	2r	3e	3r
27.5	0	27.5	38.6	38.6	38.6	43.5

Module Size	18.58	sq.ft.

Edge modules								Partial
	1	1'	2e	2n	2r	3e	3r	Pressure
P2	5.4628	0	13.1205	0	0	0	0	27.50

ALLOWABLE PRESSURE OF MODULE : 76PSF

B

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 MODULE
- EDGE MODULE
- NON-EXPOSED MODULE
- MISSING MODULE
- MIN PANEL EDGE DISTANCE LINE

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PROJECT NAME

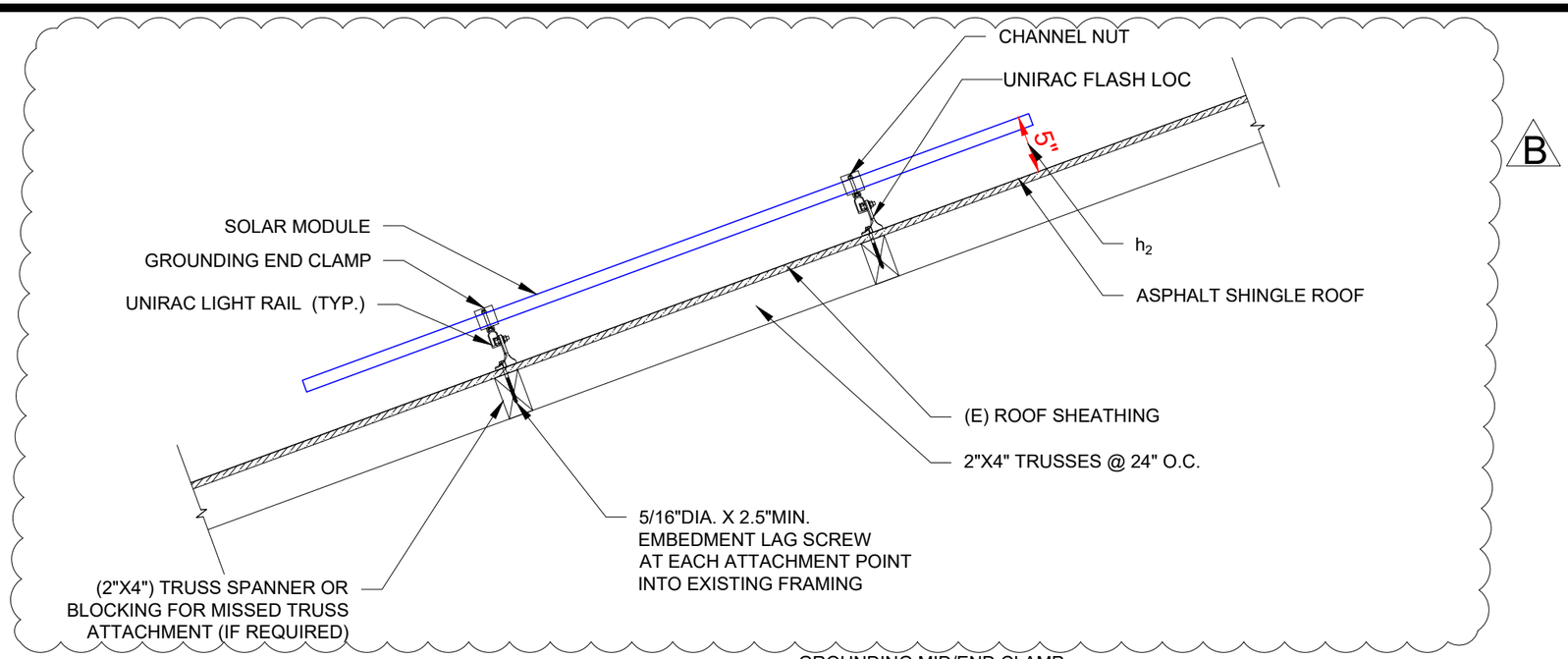
GONZALEZ RESIDENCE

366 SW WILSHIRE DR,
LAKE CITY, FL 32024

SHEET NAME
ROOF PLAN & MODULES

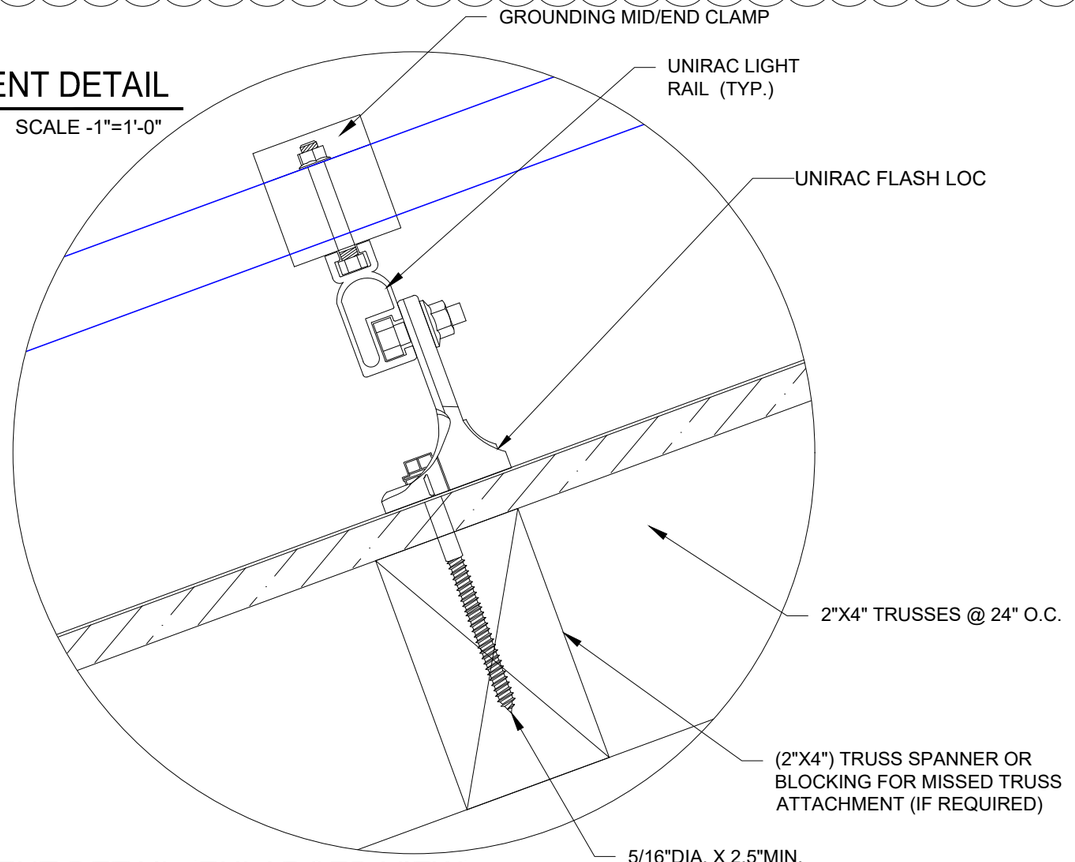
SHEET SIZE
ANSI B
11" X 17"

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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Date: 2021.01.28 08:46:16 -05'00'

PROJECT NAME

GONZALEZ RESIDENCE

366 SW WILSHIRE DR,
LAKE CITY, FL 32024

SHEET NAME
STRUCTURAL ATTACHMENT DETAILS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
S-02

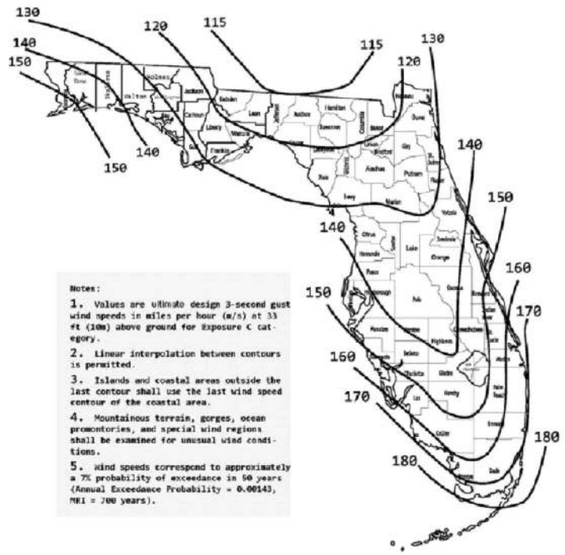

FIGURE 1609.3(1)
ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR RISK CATEGORY II BUILDINGS AND OTHER STRUCTURES

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	B
ROOF LENGTH (ft)	63.0	ROOF SLOPE	6 /12
ROOF WIDTH (ft)	41.0	ROOF SLOPE (°)	26.6
PARAPET HEIGHT (ft)	0.0	ROOF TYPE	GABLE
MODULE LENGTH (in)	66.93	ULTIMATE WIND SPEED	120 mph
MODULE WIDTH (in)	40.00	NOMINAL WIND SPEED	93 mph
MODULE ORIENTATION	PORTRAIT	EXPOSURE FACTOR (C_e)	1.000
MODULE AREA (sq. ft.)	18.59	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)	18.6	K_{ZT}	1.000
GROUND ELEVATION (ft)	10.0	K_h	1.000
HVHZ	NO	K_z	0.575

DESIGN CALCULATIONS

VELOCITY PRESSURE (q) = $.00256*K_E K_Z K_{ZT} K_D V^2$
VELOCITY PRESSURE(ASD) 10.8 psf

WIDTH OF PRESSURE COEFFICIENT	41' * 10%	=	4.1'	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	0.472	-1.519
	ZONE 1'	0.472	X
	ZONE 2e	0.472	-1.519
	ZONE 2n	0.472	-2.202
	ZONE 2r	0.472	-2.202
	ZONE 3e	0.472	-2.202
	ZONE 3r	0.472	-2.505
INTERNAL PRESSURE COEFFICIENT (+/-)		0.18	

DESIGN PRESSURES

ROOF ZONE	DOWN	UP				
1	16.0	-18.3	psf			
1'	16.0	X	psf			
2e	16.0	-18.3	psf	Module allowable uplift pressur	76	psf
2n	16.0	-25.7	psf	Module allowable down pressur	76	psf
2r	16.0	-25.7	psf			
3e	16.0	-25.7	psf			
3r	16.0	-29.0	psf			

ARRAY FACTORS

ARRAY EDGE FACTOR (EXPOSED)	1.5	SOLAR PANEL PRESSURE EQUALIZATION FACTOR	0.6823
ARRAY EDGE FACTOR (NON-EXPOSED)	1		

ADJUSTED DESIGN PRESSURES

ROOF ZONE	DOWN	UP (Exposed)	UP (N. Exposed)	
1	16.0	-27.5	-18.3	psf
1'	16.0	X	X	psf
2e	16.0	-27.5	-18.3	psf
2n	16.0	-38.6	-25.7	psf
2r	16.0	-38.6	-25.7	psf
3e	16.0	-38.6	-25.7	psf
3r	16.0	-43.5	-29.0	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**	**NO. OF RAILS**	**Exposed: 2**	**Non. Exp: 2**	
ROOF ZONE	DOWN	UP (Exposed)	UP (N. Exposed)		SPANS (F)	SPANS (N F)	
1	178.5	307.0	204.7	psf	48 in	48 in	
1'	0.0	X	X	psf	X in	X in	
2e	178.5	307.0	204.7	psf	48 in	48 in	
2n	178.5	430.6	287.0	psf	48 in	48 in	
2r	178.5	430.6	287.0	psf	48 in	48 in	
3e	178.5	430.6	287.0	psf	48 in	48 in	
3r	178.5	242.6	323.5	psf	24 in	48 in	

B

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366 SW WILSHIRE DR,
LAKE CITY, FL 32024

SHEET NAME
STRUCTURAL ATTACHMENT DETAILS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
S-02 .1

Q CABLE

ENPHASE IQ7PLUS-72-2-US
MICROINVERTERS

PV MODULES

SOLAR ARRAY (4.26 KW-DC STC) TOTAL
(12) LG355N1C-N5 (355W) MODULES
(01) STRING OF 12 MODULES

B

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 + 20A = 220A
BUSS RATING x 120% 200A x 120% = 240A

B

(N) SOLADECK
600 V, NEMA 3R
UL LISTED

(N) 125A ENPHASE IQ COMBINER
3 (X-IQ-AM1-240-3) [WITH UPTO (4)
2-POLE BREAKERS AND ENVOY
COMMUNICATION GATEWAY]

(N) AC DISCONNECT:
240V, 60AMP
NEMA 3R, UL LISTED
LOCKABLE AND NON
FUSIBLE
(IF REQUIRED)

TO UTILITY GRID

BI-DIRECTIONAL
UTILITY METER
1-PHASE, 240V

(E) MAIN DISTRIBUTION
PANEL, 200A, RATED, 240V.

(E) MAIN BREAKER
200A/2P, 240V

(1) 12/2 ROMEX RUN IN
ATTIC
OR
(1) #12 AWG THWN-2 - RED
(1) #6 AWG THWN-2 GND
IN 1" IMC, RMC, FMC, LFMC,
PVC, HDPE, NUCC, RTRC,
LFNC, FMT, ENT OR EMT
CONDUIT RUN

(2) #10 AWG THWN-2
(1) #6 AWG THWN-2 GND
IN 1" IMC, RMC, FMC, LFMC,
PVC, HDPE, NUCC, RTRC,
LFNC, FMT, ENT OR EMT
CONDUIT RUN

(1) #12 AWG THWN-2
(1) #6 AWG THWN-2 GND
IN 1" IMC, RMC, FMC, LFMC,
PVC, HDPE, NUCC,RTRC,
LFNC, FMT, ENT OR EMT
CONDUIT RUN

(N) JUNCTION BOX
600 V, NEMA 3
UL LISTED

10A

20A/2P

20A/2P

EXISTING GROUNDING
ELECTRODE SYSTEM

1 ELECTRICAL LINE DIAGRAM

E-01

SCALE: NTS

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Digitally signed by Ermocrates E Castillo
Date: 2021.01.28 08:46:35 05'00'

PROJECT NAME

GONZALEZ RESIDENCE
366 SW WILSHIRE DR,
LAKE CITY, FL 32024

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	LG
Module Model	LG355N1C-N5
Inverter Manufacturer	Enphase
Inverter Model	Enphase IQ 7 Plus
Modules/Branch Circuit 1	12
Total Array Power (kW)	4.26
System ac Voltage	240V 1-Phase

Design Temperature	
Min. Ambient Temp. °F	32
Max. Ambient Temp. °F	117
Calculated Max. Voc	45
Calculated Min Vmp	27
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	14.5	18.1	#12	30	95	0.96	2	1	28.8	20 A
AC Combiner Panel Output	14.5	18.1	#10	40	95	0.96	3	1	38.4	20 A

Maximum Circuit Voltage Drop	2%

Voltage Drop Calculations

Circuit	AWG	Circular Mills	I	V	Max Length
Circuit 1	#12	6530	14.5	240	84 Feet
Combiner Panel Output	#10	10380	14.5	240	133 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	41.5	Isc	10.8
Vmpp	34.7	Imp	10.25
TC Voc	-0.26%/ °C	TC Vmp	-0.34%/ °C
Pmp	355.0	NOCT	45 °C

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

A

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)	235-400W +
	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	1.21A
	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	13 (240 VAC)

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SUITE 250,
MAITLAND, FL 32751
TEL: (407) 289-2575
ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

SUNPRO

Signature with Seal

Digitally signed by Ermocrates E Castillo
Date: 2021.01.28 08:46:52 -05'00'

PROJECT NAME

GONZALEZ RESIDENCE

366 SW WILSHIRE DR,
LAKE CITY, FL 32024

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: PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION:
CONDUIT, COMBINER BOX
(ADDITIONAL EQUIPMENT THAT CONTAINS PV SOURCE WIRES
(PER CODE: NEC690.31(G)(3))

⚠ 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]

SOLAR BREAKER

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

SOLAR CONNECTION LINE SIDE TAP

LABEL LOCATION:
POINT OF INTERCONNECTION
(PER CODE: NEC 705.12(A))

AC COMBINER BOX

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

PHOTOVOLTAIC SYSTEM AC DISCONNECT
RATED AC OPERATING CURRENT 14.52 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)

AC DISCONNECT

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

PHOTOVOLTAIC SYSTEM MICROINVERTERS LOCATED UNDER EACH PV MODULE IN ROOF TOP ARRAY

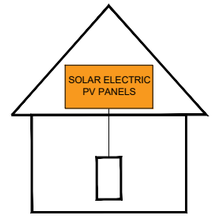
LABEL LOCATION:
INVERTER
(PER CODE: NEC690.52)

4.26 KW SOLAR DISCONNECT LOCATED

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

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)

B

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

REVISIONS

DESCRIPTION	DATE	REV
REVISION	01/26/2021	B

PROJECT INSTALLER

SUNPRO

Sign ature with Seal
Digitally signed by Ermocrates E Castillo
Date: 2021.01.28 08:47:23 -05'00'

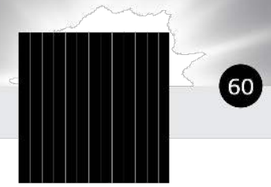
PROJECT NAME
GONZALEZ RESIDENCE
366 SW WILSHIRE DR,
LAKE CITY, FL 32024

SHEET NAME
SYSTEM LABELING

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
E-03

LG NeON®2



360W | 355W | 350W

The LG NeON® 2 is one of the most powerful and versatile modules on the market today. Featuring LG's Cello Technology in monocrystalline n-type solar cells, the LG NeON® 2 increases power output. Now includes a 25 years product and 90.1% performance warranty for higher performance and reliability.
The new LG NeON® 2 has been designed with aesthetics in mind using new cell design.

Feature

Enhanced Performance Warranty

LG NeON® 2 has an enhanced performance warranty. After 25 years, LG NeON® 2 is guaranteed to perform at minimum 90.1% of initial performance.

Enhanced Product warranty

LG has extended the warranty of the NeON® 2 to 25 years, which is among the top of industry standards.

About LG Electronics

LG Electronics is a global big player, committed to expanding its operations with the solar market. The company first embarked on a solar energy source research program in 1985, supported by LG Group's vast experience in the semi-conductor, LCD, chemistry and materials industries. In 2010, LG Solar successfully released its first MonoX® series to the market, which is now available in 32 countries. The NeON® (previous. MonoX® NeON), NeON®2, NeON®2 BiFacial won the "Intersolar AWARD" in 2013, 2015 and 2016, which demonstrates LG Solar's lead, innovation and commitment to the industry.

LG NeON®2

LG360N1C-N5 | **LG355N1C-N5** | LG350N1C-N5

General Data

Cell Properties(Material / Type)	Monocrystalline / N-type
Cell Maker	LG
Cell Configuration	60 Cells (6 x 10)
Number of Busbars	12EA
Module Dimensions (L x W x H)	1,700mm x 1,016mm x 40 mm
Weight	18.0 kg
Glass(Material)	Tempered Glass with AR Coating
Backsheet(Color)	White
Frame(Material)	Anodized Aluminium
Junction Box(Protection Degree)	IP 68 with 3 Bypass Diodes
Cables(Length)	1,000 mm x 2EA
Connector(Type / Maker)	MC 4 / MC

Certifications and Warranty

Certifications	IEC 61215-1/-1-1/2:2016, IEC 61730-1/2:2016
	ISO 9001, ISO 14001, ISO 50001
	OHSAS 18001
Salt Mist Corrosion Test	IEC 61701:2012 Severity 6
Ammonia Corrosion Test	IEC 62716 : 2013
Hail Test	25mm (1") diameter at 23 m/s (52 mph)
Fire Rating	Class C (UL 790)
Solar Module Product Warranty	25 Years
Solar Module Output Warranty	Linear Warranty*

* 1) First year : 98% 2) After 1st year : 0.33% annual degradation, 3) 90.1% for 25 years

Temperature Characteristics

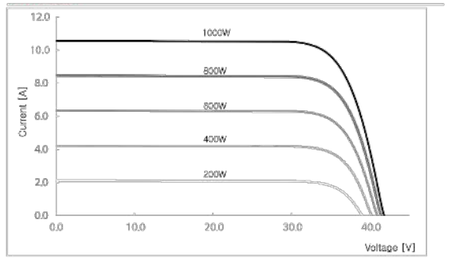
NMOT*	[°C]	42±3
Pmax	[%/°C]	-0.34
Voc	[%/°C]	-0.26
Isc	[%/°C]	0.03

* NMOT (Nominal Module Operating Temperature): Irradiance 800 W/m², Ambient temperature 20 °C, Wind speed 1 m/s, Spectrum AM 1.5

Electrical Properties (NMOT)

Model		LG360N1C-N5	LG355N1C-N5	LG350N1C-N5
Maximum Power (Pmax)	[W]	270	266	263
MPP Voltage (Vmpp)	[V]	33.0	32.6	32.2
MPP Current (Impp)	[A]	8.20	8.17	8.15
Open Circuit Voltage (Voc)	[V]	39.2	39.1	39.0
Short Circuit Current (Isc)	[A]	8.71	8.68	8.64

I-V Curves



Electrical Properties (STC*)

Model		LG360N1C-N5	LG355N1C-N5	LG350N1C-N5
Maximum Power (Pmax)	[W]	360	355	350
MPP Voltage (Vmpp)	[V]	35.1	34.7	34.3
MPP Current (Impp)	[A]	10.28	10.25	10.22
Open Circuit Voltage(Voc, ±5%)	[V]	41.6	41.5	41.4
Short Circuit Current(Isc, ±5%)	[A]	10.84	10.80	10.76
Module Efficiency	[%]	20.8	20.6	20.3
Power Tolerance	[%]	0 ~ +3		

* STC (Standard Test Condition): Irradiance 1000 W/m², Cell temperature 25 °C, AM 1.5, Measurement Tolerance of Pmax : ± 3%

Operating Conditions

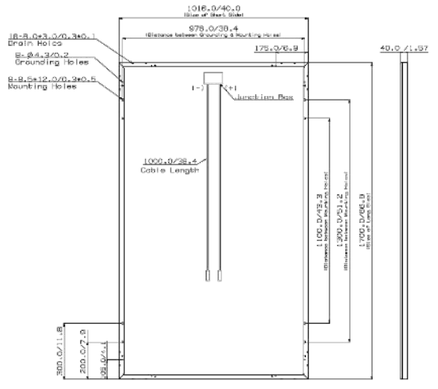
Operating Temperature	[°C]	-40 ~ +90
Maximum System Voltage	[V]	1000(IEC)
Maximum Series Fuse Rating	[A]	20
Mechanical Test Load* (Front)	[Pa / psf]	5,400 / 113
Mechanical Test Load* (Rear)	[Pa / psf]	4,000 / 84

* Based on IEC 61215-2 : 2016 (Test Load = Design Load x Safety Factor(1.5))
※ Mechanical Test Loads 6,000Pa / 5,400Pa based on IEC 61215:2005

Packaging Configuration

Number of Modules per Pallet	[EA]	25
Number of Modules per 40ft HQ Container	[EA]	650
Packaging Box Dimensions (L x W x H)	[mm]	1,750 x 1,120 x 1,221
Packaging Box Gross Weight	[kg]	464

Dimensions (mm / inch)



LG Life's Good

LG Electronics Inc.
Energy Business Division
LG Twin Towers, 128 Yeoui-daero, Yeongdeungpo-gu, Seoul 07336, Korea
www.lg-solar.com

Product specifications are subject to change without notice.
DS-N5-60-C-G-F-EN-200507

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

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

SUNPRO

Signature with Seal

PROJECT NAME

GONZALEZ RESIDENCE
366 SW WILSHIRE DR,
LAKE CITY, FL 32024

SHEET NAME
MODULE DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
DS-01

LG Electronics Inc.
128, Yeoui-daero, Yeongdeungpo-gu
Seoul, Republic of Korea

Jul 08, 2020

To whom it may concern,

RE: Confirmation letter for Mechanical Load

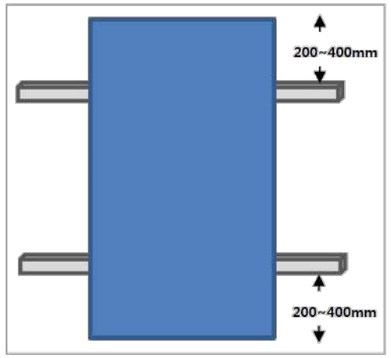
This letter hereby states that LG Electronics Inc. ("LGE") confirms ***the following 2 cases***.

1. 2 Rail Mounting system

LG supports and provides warranty for the referenced LG modules which have been mounted by **the 2 Rail Mounting system refer to the installation scene (Fig.1)** for **the test load of 6,000 Pa downforce and 5,400 Pa uplift** under the test conditions based on **IEC 61215:2005**.

System	Installation Scene(Picture)	
	Down force	Uplift
2 Rail Mounting	6,000 Pa	5,400 Pa

- *Under the test conditions based on IEC 61215-2:2016, the test load may be different.*



<Fig.1>

The following LG Solar modules are approved for warranty:

LG Model Number	LG Model Number
LGxxxN1C-V5	LGxxxN1K-V5
LGxxxQ1C-V5	LGxxxQ1K-V5
LGxxxN1C-N5	LGxxxN1K-L5

Our warranty provides all the terms and conditions underlying our obligations and the warranty. Although this Letter serves as an authorization to employ **the 2 Rail Mounting System**, the original warranty terms for the modules would be rescinded in the event of:

- Misuse, abuse, neglect, or accident such as micro crack to the cells or glass damages;
- Alteration, improper installation or application;
- Non-observation of LG Electronics' installation and maintenance instructions;
- Repair or modifications by someone other than an approved an approved technician of LG;
- Power failure surges, lightening, fire or other event outside LG Electronics' control;
- Defect or Power drop due to the incline load;

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

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

SUNPRO

Signature with Seal

PROJECT NAME

GONZALEZ RESIDENCE
366 SW WILSHIRE DR,
LAKE CITY, FL 32024

SHEET NAME
WARRANTY LETTER
DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
DS-01.1

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

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

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

SUNPRO

Signature with Seal

PROJECT NAME

GONZALEZ RESIDENCE
366 SW WILSHIRE DR,
LAKE CITY, FL 32024

SHEET NAME
INVERTER DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

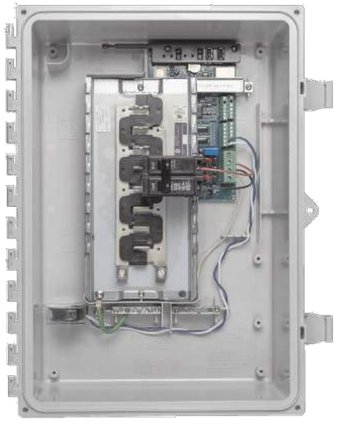
SHEET NUMBER
DS-02

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 (6,560 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.

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ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

SUNPRO

Signature with Seal

PROJECT NAME

GONZALEZ RESIDENCE
366 SW WILSHIRE DR,
LAKE CITY, FL 32024

SHEET NAME
COMBINER BOX DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
DS-03

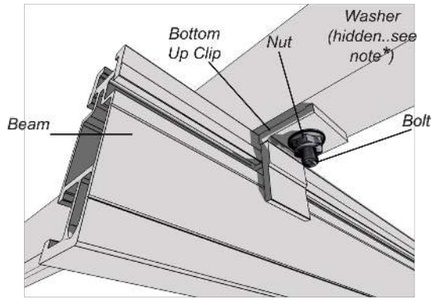
SolarMount Technical Datasheet

Pub 100602-1td V1.0 June 2010

SolarMount Module Connection Hardware

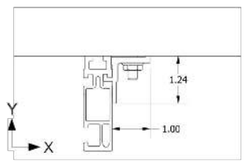
SolarMount Bottom Up Module Clip

Part No. 321001, 321002



- **Bottom Up Clip material:** One of the following extruded aluminum alloys: 6005-T5, 6105-T5, 6061-T6
- **Ultimate tensile:** 38ksi, Yield: 35 ksi
- **Finish:** Clear Anodized
- **Bottom Up Clip weight:** ~0.031 lbs (14g)
- Allowable and design loads are valid when components are assembled with SolarMount series beams according to authorized UNIRAC documents
- Assemble with one ¼"-20 ASTM F593 bolt, one ¼"-20 ASTM F594 serrated flange nut, and one ¼" flat washer
- Use anti-seize and tighten to 10 ft-lbs of torque
- Resistance factors and safety factors are determined according to part 1 section 9 of the 2005 Aluminum Design Manual and third-party test results from an IAS accredited laboratory
- Module edge must be fully supported by the beam

* **NOTE ON WASHER:** Install washer on bolt head side of assembly. **DO NOT** install washer under serrated flange nut



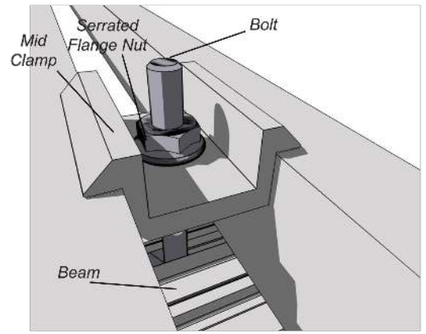
Dimensions specified in inches unless noted

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load lbs (N)	Safety Factor, FS	Design Load lbs (N)	Resistance Factor, Φ
Tension, Y+	1566 (6967)	686 (3052)	2.28	1038 (4615)	0.662
Transverse, X±	1128 (5019)	329 (1463)	3.43	497 (2213)	0.441
Sliding, Z±	66 (292)	27 (119)	2.44	41 (181)	0.619

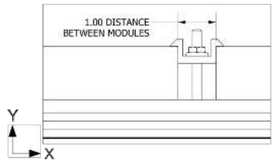
SOLARMOUNT Technical Datasheets

SolarMount Mid Clamp

Part No. 320008, 320009, 320019, 320020, 320021, 320084, 320085, 320086, 320087, 320120, 320122



- **Mid clamp material:** One of the following extruded aluminum alloys: 6005-T5, 6105-T5, 6061-T6
- **Ultimate tensile:** 38ksi, Yield: 35 ksi
- **Finish:** Clear or Dark Anodized
- **Mid clamp weight:** 0.050 lbs (23g)
- Allowable and design loads are valid when components are assembled according to authorized UNIRAC documents
- Values represent the allowable and design load capacity of a single mid clamp assembly when used with a SolarMount series beam to retain a module in the direction indicated
- Assemble mid clamp with one Unirac ¼"-20 T-bolt and one ¼"-20 ASTM F594 serrated flange nut
- Use anti-seize and tighten to 10 ft-lbs of torque
- Resistance factors and safety factors are determined according to part 1 section 9 of the 2005 Aluminum Design Manual and third-party test results from an IAS accredited laboratory

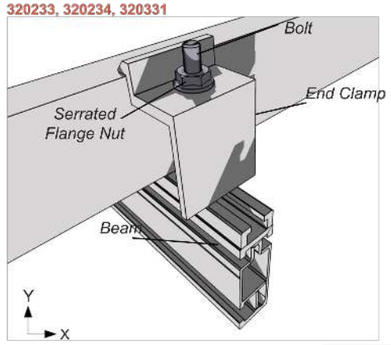


Dimensions specified in inches unless noted

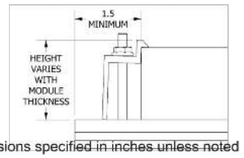
Applied Load Direction	Average Ultimate lbs (N)	Allowable Load lbs (N)	Safety Factor, FS	Design Load lbs (N)	Resistance Factor, Φ
Tension, Y+	2020 (8987)	891 (3963)	2.27	1348 (5994)	0.667
Transverse, Z±	520 (2313)	229 (1017)	2.27	346 (1539)	0.665
Sliding, X±	1194 (5312)	490 (2179)	2.44	741 (3295)	0.620

SolarMount End Clamp

Part No. 320002, 320003, 320004, 320005, 320006, 320012, 320013, 320014, 320015, 320016, 320017, 320079, 320080, 320081, 320082, 320083, 320117, 320118, 320123, 320124, 320173, 320185, 320220, 320233, 320234, 320331



- **End clamp material:** One of the following extruded aluminum alloys: 6005-T5, 6105-T5, 6061-T6
- **Ultimate tensile:** 38ksi, Yield: 35 ksi
- **Finish:** Clear or Dark Anodized
- **End clamp weight:** varies based on height: ~0.058 lbs (26g)
- Allowable and design loads are valid when components are assembled according to authorized UNIRAC documents
- Values represent the allowable and design load capacity of a single end clamp assembly when used with a SolarMount series beam to retain a module in the direction indicated
- Assemble with one Unirac ¼"-20 T-bolt and one ¼"-20 ASTM F594 serrated flange nut
- Use anti-seize and tighten to 10 ft-lbs of torque
- Resistance factors and safety factors are determined according to part 1 section 9 of the 2005 Aluminum Design Manual and third-party test results from an IAS accredited laboratory
- Modules must be installed at least 1.5 in from either end of a beam



Dimensions specified in inches unless noted

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load lbs (N)	Safety Factor, FS	Design Loads lbs (N)	Resistance Factor, Φ
Tension, Y+	1321 (5876)	529 (2352)	2.50	800 (3557)	0.605
Transverse, Z±	63 (279)	14 (61)	4.58	21 (92)	0.330
Sliding, X±	142 (630)	52 (231)	2.72	79 (349)	0.555

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ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

SUNPRO

Signature with Seal

PROJECT NAME

GONZALEZ RESIDENCE

366 SW WILSHIRE DR,
LAKE CITY, FL 32024

SHEET NAME
RAIL DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
DS-04

FLASH LOC

UNIRAC
BETTER SOLAR STARTS HERE

FLASHLOC is the ultimate attachment for composition shingle and rolled comp roofs. The all-in-one mount installs fast — no kneeling on hot roofs to install flashing, no prying or cutting shingles, no pulling nails. Simply drive the lag bolt and inject sealant into the base. **FLASH**LOC's patented TRIPLE SEAL technology preserves the roof and protects the penetration with a permanent pressure seal. Kitted with lag bolts, sealant, and hardware for maximum convenience. Don't just divert water, **LOC it out!**

PROTECT THE ROOF

Install a high-strength waterproof attachment without lifting, prying or damaging shingles.

LOC OUT WATER

With an outer shield 1 contour-conforming gasket 2 and pressurized sealant chamber 3 the Triple Seal technology delivers a 100% waterproof connection.

HIGH-SPEED INSTALL

Simply drive lag bolt and inject sealant into the port 4 to create a permanent pressure seal.

FASTER INSTALLATION. 25-YEAR WARRANTY.

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

FLASH LOC

INSTALLATION GUIDE

UNIRAC
BETTER SOLAR STARTS HERE

PRE-INSTALL

Snap chalk lines for attachment rows. On shingle roofs, snap lines 1-3/4" below upslope edge of shingle course. Locate rafters and mark attachment locations.

At each location, drill a 7/32" pilot hole. Clean roof surface of dirt, debris, snow, and ice. Next, BACKFILL ALL PILOT HOLES WITH SEALANT.

NOTE: Space mounts per racking system install specifications.

STEP 1: SECURE

Place **FLASH**LOC over pilot hole with lag on down-slope side. Align indicator marks on sides of mount with chalk line. Pass included lag bolt and sealing washer through **FLASH**LOC into pilot hole. Drive lag bolt until mount is held firmly in place.

NOTE: The EPDM in the sealing washer will expand beyond the edge of the metal washer when proper torque is applied.

STEP 2: SEAL

Insert tip of UNIRAC provided sealant into port. Inject until sealant exits both vents.

Continue array installation, attaching rails to mounts with provided T-bolts.

NOTE: When **FLASH**LOC is installed over gap between shingle tabs or vertical joints, fill gap/joint with sealant between mount and upslope edge of shingle course.

NOTE: When installing included rail attachment hardware, torque nut to 30 ft/lbs.

USE ONLY UNIRAC APPROVED SEALANTS: Chemlink Duralink 50 (included in kit) or Chemlink M-1

FASTER INSTALLATION. 25-YEAR WARRANTY.

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ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

SUNPRO

Signature with Seal

PROJECT NAME

GONZALEZ RESIDENCE
366 SW WILSHIRE DR,
LAKE CITY, FL 32024

SHEET NAME
ATTACHMENT DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
DS-05