ENDSLEY RESIDENCE

16.590 kW DC - 12.180 kW AC PV SYSTEM

262 SW BLOOMINGTON TERRACE, LAKE CITY, FL 32025

PROJECT DESCRIPTION:

42x395 CANADIAN SOLAR: CS3N-395MS (395W) MODULES
ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES

SYSTEM SIZE: 16.590 kW DC - 12.180 kW AC
ARRAY AREA #1: 503.97 SQ FT.
ARRAY AREA #2: 43.82 SQ FT.
ARRAY AREA #3: 372.50 SQ FT.

EQUIPMENT SUMMARY
42 CANADIAN SOLAR: CS3N-395MS (395W) MODULES
42 ENPHASE: IQ8PLUS-72-2-US MICROINVERTERS

RACKING: UNIRAC LIGHT RAIL
ATTACHMENT: UNIRAC FLASHLOC

DESIGN CRITERIA:

WIND SPEED (ULT):	120 MPH
WIND SPEED (ASD):	93 MPH
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 (FBC)
FLORIDA MECHANICAL CODE, 7TH EDITION 2020 (FMC)
NATIONAL ELECTRICAL CODE 2017 (NEC)
ASCE 7-16
FLORIDA FIRE PREVENTION CODE, 7TH EDITION 2020 (FFPC)

OWNER

ENDSLEY

INSTALLER

ADT SOLAR
4492 Eagle Falls Place,
Tampa, FL 33619
PH: (866) 450-1012

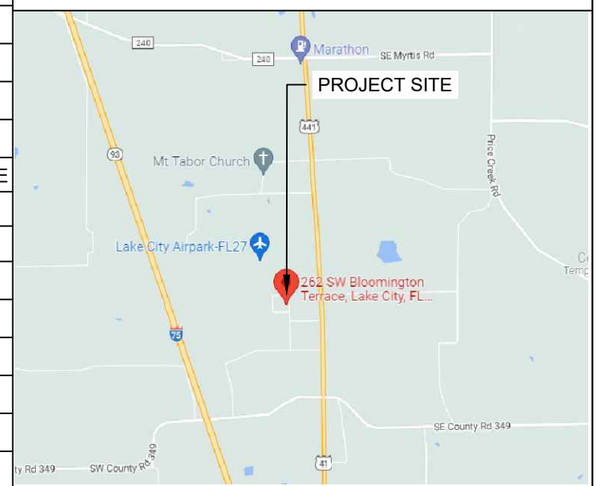
ENGINEER

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

SHEET INDEX

HOUSE PHOTO

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 7th ED., 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, THE NEC 2017, AND THOSE SET FORTH BY THE FLORIDA SOLAR ENERGY CENTER CERTIFICATION.

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

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

ADT Solar

Signature with Seal
Digitally signed by: Ermocrates E Castillo
Date: 2022.10.10 16:07:39

PROJECT NAME
ENDSLEY RESIDENCE
262 SW BLOOMINGTON TERRACE, LAKE CITY, FL 32025

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

AC 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
ACD	AC Disconnect
APPROX	Approximate
AWG	American Wire Gauge
BAT	Battery
CB	Combiner Box
DC	Direct Current
DISC	Disconnect
(E)	Existing
EL	Elevation
EQ	Equal
GP	Generation Panel
JB	Junction Box
MCB	Main Combiner Box
MFR	Manufacturer
MID	Microgrid Interconnect Device
MIN	Minimum
MISC	Miscellaneous
MDP	Main Distribution Panel
(N)	New
NAVD	North American Vertical datum
OCPD	OverCurrent Protection Device
POCC	Point Of Common Coupling
PV	Photovoltaic
SF	Squarefoot/feet
STC	Standard Test Conditions
SD	Soladeck
TBD	To Be Determined
TYP	Typical
UNO	Unless Noted Otherwise
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 42x395 CANADIAN SOLAR: CS3N-395MS (395W) Modules with a combined STC rated dc output power of 16,590W. The modules are connected into 42 ENPHASE: IQ8PLUS-72-2-US Microinverters 12,180W AC. 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 Electrical 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.

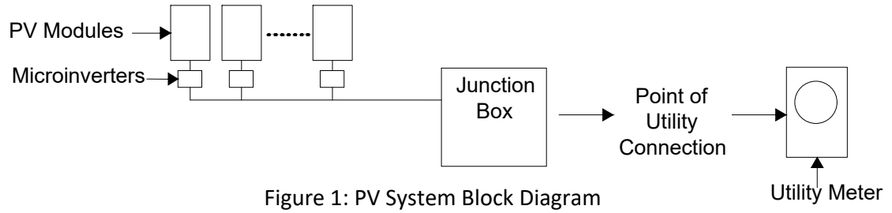


Figure 1: PV System Block Diagram

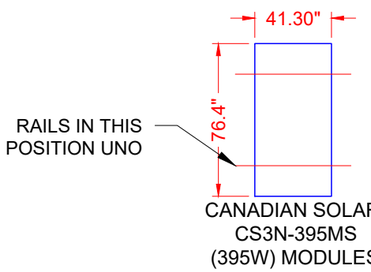
The inverter meets the requirements of IEEE 1547 and UL 1741.

FALL PROTECTION:
ANCHORAGES USED FOR ATTACHMENT OF PERSONAL FALL ARREST EQUIPMENT MUST BE INDEPENDENT OF ANY ANCHORAGE BEING USED TO SUPPORT OR SUSPEND PLATFORMS, AND CAPABLE OF SUPPORTING AT LEAST 5,000 POUNDS PER EMPLOYEE ATTACHED, OR MUST BE DESIGNED AND USED AS FOLLOWS:

- AS PART OF A COMPLETE PERSONAL FALL ARREST SYSTEM WHICH MAINTAINS A SAFETY FACTOR OF AT LEAST TWO.
- UNDER THE SUPERVISION OF A QUALIFIED PERSON

ADDITIONAL INFORMATION

- 29 CFR 1926 SUBPART M, FALL PROTECTION. OSHA STANDARD.
- 1926.502, FALL PROTECTION SYSTEMS CRITERIA AND PRACTICES
  - 1926.502(D)(15)



CANADIAN SOLAR: CS3N-395MS (395W) MODULES

ALLOWABLE/DESIGN PRESSURE	PSF
DOWN PRESSURE	104.4
UPLIFT PRESSURE, 2 RAILS	76

MODULE RAILING MAY BE INSTALLED IN LANDSCAPE ORIENTATION FOR MODULES WITH WEIGHTED PRESSURES BELOW 33 PSF

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ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

ADT Solar

Signature with Seal
Digitally signed by: Ermocrates E Castillo
Date: 2022.10.10 16:07:39

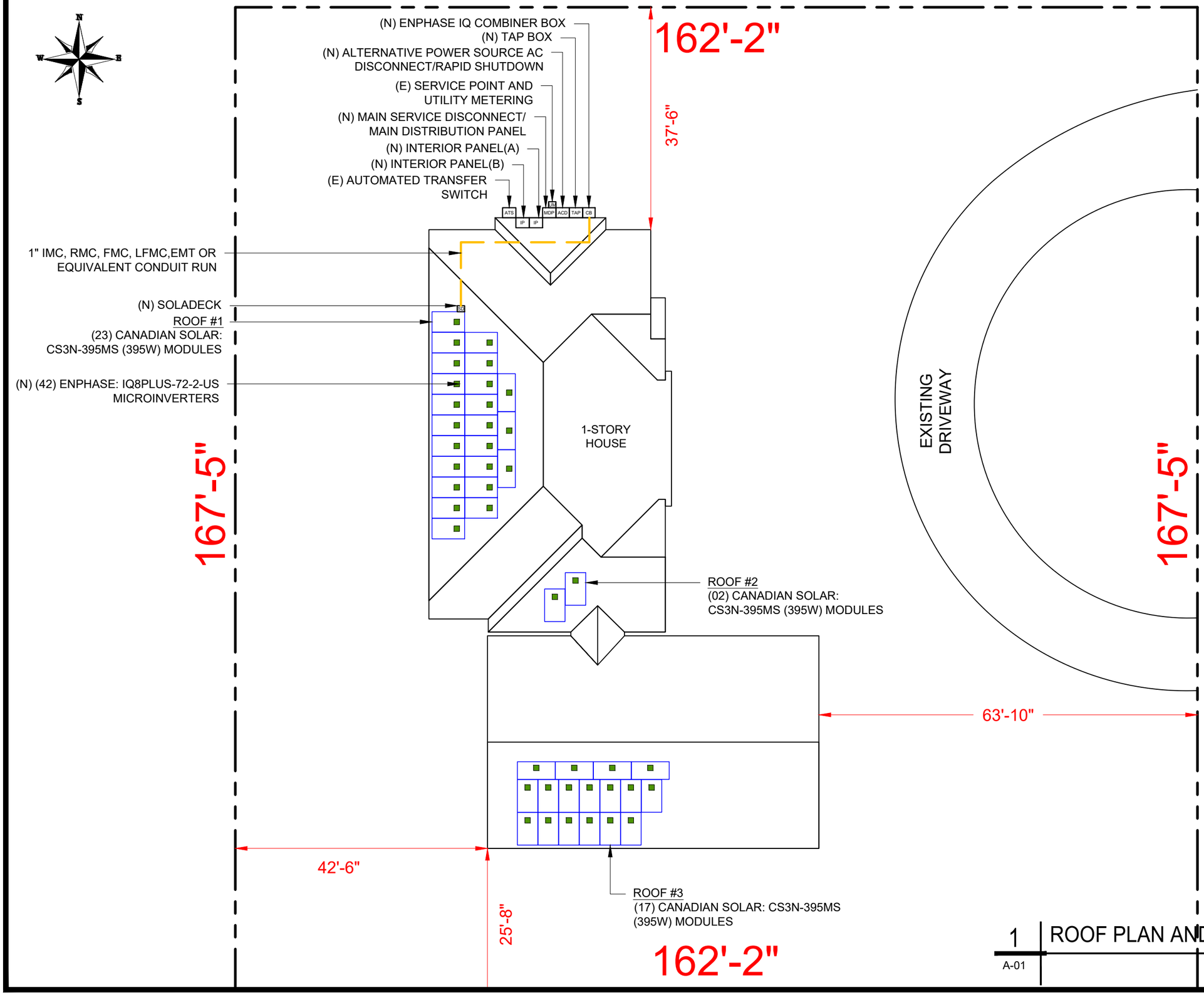
PROJECT NAME

ENDSLEY RESIDENCE
262 SW BLOOMINGTON TERRACE,
LAKE CITY, FL 32025

SHEET NAME
NOTES AND DESCRIPTION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
A-00



1 ROOF PLAN AND PROPERTY LINES
A-01
SCALE: 1/16" = 1'-0"

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ENDSLEY RESIDENCE
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LAKE CITY, FL 32025

SHEET NAME
ROOF PLAN

SHEET SIZE
ANSI B
11" X 17"

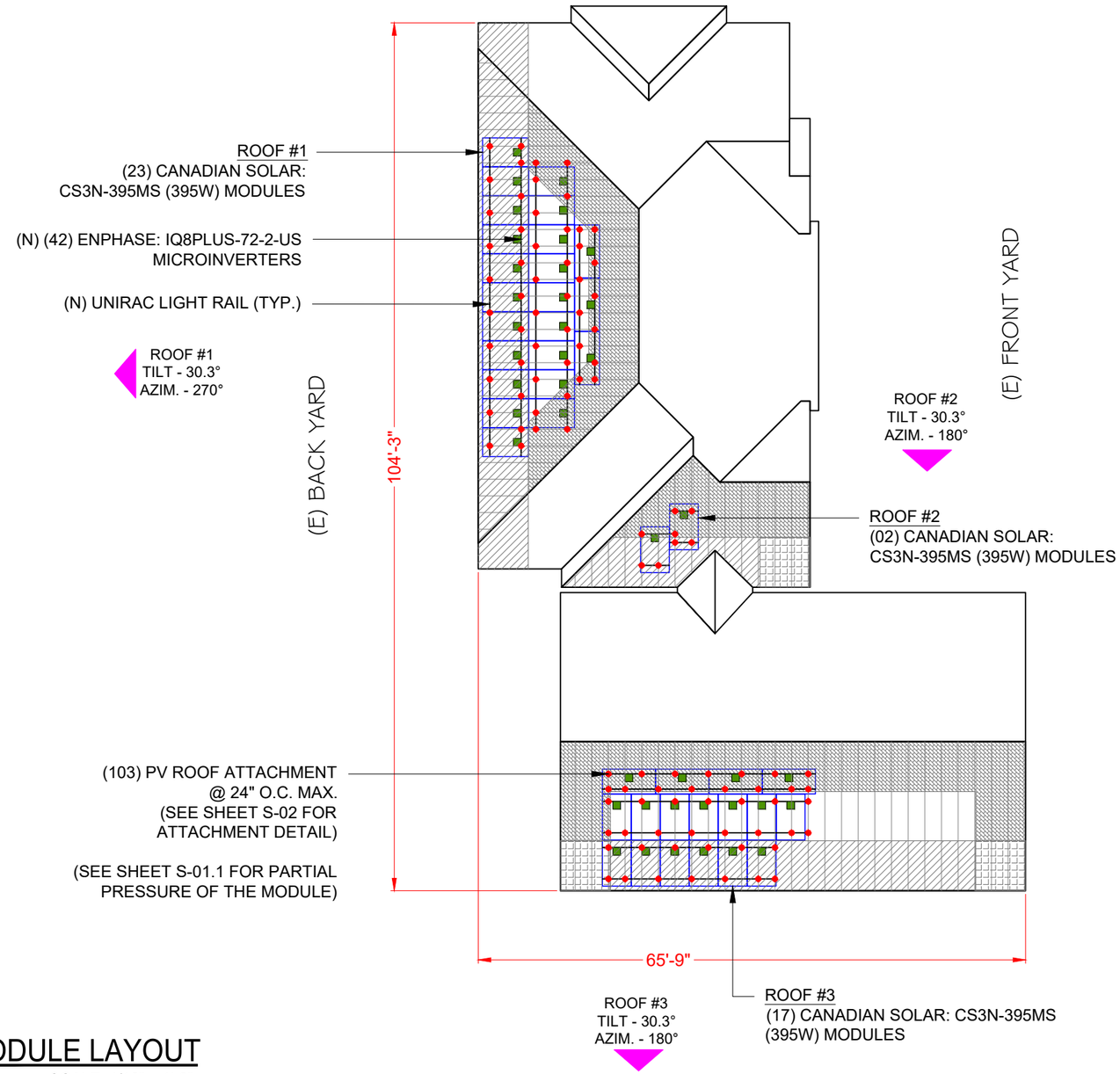
SHEET NUMBER
A-01

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 42 MODULES
MODULE TYPE = CANADIAN SOLAR: CS3N-395MS (395W) MODULES
MODULE WEIGHT = 51.59 LBS / 23.4 KG.
MODULE DIMENSIONS = 76.4" x 41.30" = 21.91 SF
UNIT WEIGHT OF ARRAY = 2.35 PSF

ARRAY AREA & ROOF AREA CALC'S

ROOF	ROOF TYPE	ARRAY AREA (sq.Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)	TILT	AZIMUTH	TRUSS SIZE	TRUSS SPACING
#1	ASPHALT SHINGLE	503.97	774.11	65.10	30.3°	270°	2"X4"	24" O.C.
#2	ASPHALT SHINGLE	43.82	287.26	15.26	30.3°	180°	2"X4"	24" O.C.
#3	ASPHALT SHINGLE	372.50	1000.53	37.23	30.3°	180°	2"X4"	24" O.C.
TOTAL PLAN VIEW		920.30	4719.28	19.50				



1 MODULE LAYOUT
S-01 SCALE: 1/16" = 1'-0"

GENERAL INSTALLATION PLAN NOTES:

1) STRUCTURE PROPERTIES
- ROOF FINISH: SHINGLE ROOF
- MEAN ROOF HEIGHT: 15 FT
- ROOF SLOPES: 30.3
- PRE-ENGINEERED TRUSSES
- WOOD SPECIES: SYP
- TRUSS SIZE: 2"X4"
- TRUSS SPACING: 24" O.C.
- ROOF SHEATHING: 7/16" OSB

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

FOR HIP ROOF

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

SEE SHEET S-02.1 FOR SUPPORTING CALCULATIONS.

3) THE EXISTING ROOF AND STRUCTURE IS IN GOOD CONDITION AND WILL NOT BE ADVERSELY AFFECTED BY THE ADDITIONAL LOADS IMPOSED BY THE PV INSTALLATION. THE INSTALLER OR CONTRACTOR IS TO FIELD VERIFY AND REPORT TO THE ENGINEER IF THERE ARE ANY DISCREPANCIES BETWEEN THE PLANS AND IN FIELD CONDITIONS

4. FIRE SETBACK TO BE 3' FROM RIDGES AND EDGES, AND 18" EACH WAY FROM HIPS AND VALLEYS PER NFPA 1, 11.12.2.

* I CERTIFY THAT THE INSTALLATION OF THE MODULES IS IN COMPLIANCE WITH FBC 2020: RESIDENTIAL WILL SAFELY ACCOMMODATE WIND LATERAL AND UPLIFT FORCES, SNOW LOADS, AND EQUIPMENT DEAD LOADS.*

LEGEND

- 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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REVISIONS

DESCRIPTION	DATE	REV

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ADT Solar

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Date: 2022.10.10 16:07:40

PROJECT NAME

ENDSLEY RESIDENCE
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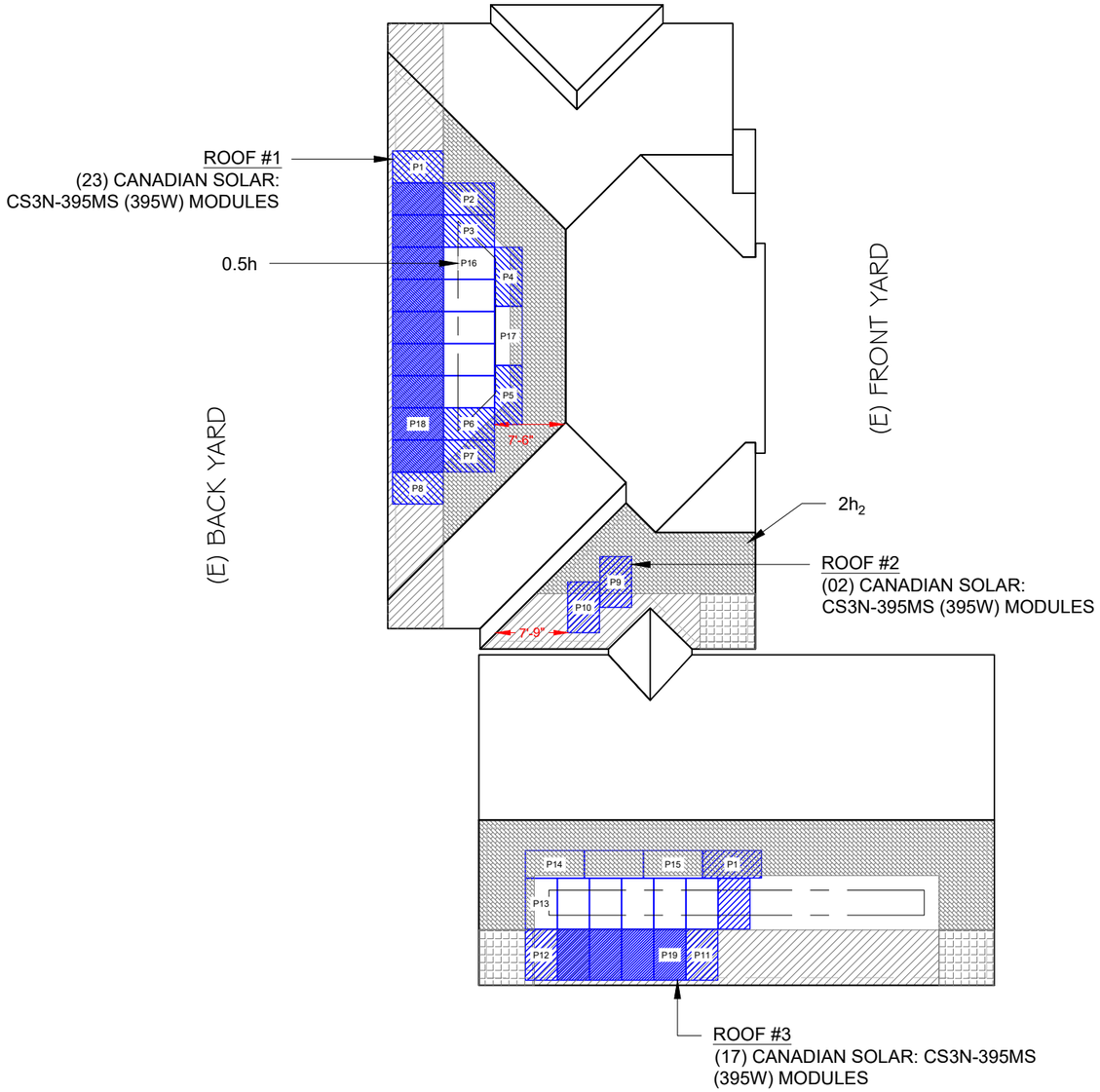
LAKE CITY, FL 32025

SHEET NAME
MODULE LAYOUT

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
S-01



FOR EXPOSED MODULES

1	1'	2e	2n	2r	3e	3r
18	0	24.8	0	28.1	33	0

Module Size	21.91	Sq ft.

Exposed modules								Partial
	1	1'	2e	2n	2r	3e	3r	Pressure
P1	21.85	0	0	0	0.06	0	0	16.05
P2	5.64	0	0	0	16.27	0	0	23.50
P3	18.77	0	0	0	3.14	0	0	17.45
P4	12.24	0	0	0	9.67	0	0	20.46
P5	8.77	0	0	0	13.14	0	0	22.06
P6	17.82	0	0	0	4.08	0	0	17.89
P7	4.52	0	0	0	17.39	0	0	24.02
P8	15.99	0	5.92	0	0	0	0	18.38
P9	5.03	0	16.88	0	0	0	0	21.78
P10	0.21	0	21.70	0	0	0	0	24.72
P11	0.15	0	15.66	0	0.06	6.05	0	27.01

FOR NON-EXPOSED MODULES

1	1'	2e	2n	2r	3e	3r
18	0	18.6	0	17.4	22	0

Module Size	21.91	Sq ft.

Non-Exposed modules								Partial
	1	1'	2e	2n	2r	3e	3r	Pressure
P12	15.80	0	0	0	6.11	0	0	16.39
P14	1.73	0	0	0	20.18	0	0	17.29
P15	2.04	0	0	0	19.87	0	0	17.27
P16	21.91	0	0	0	0	0	0	16.00
P17	12.42	0	0	0	9.49	0	0	16.61

FOR EDGE MODULES

1	1'	2e	2n	2r	3e	3r
18	0	24.8	0	28.1	33	0

Module Size	21.91	Sq ft.

Edge Modules								Partial
	1	1'	2e	2n	2r	3e	3r	Pressure
P18	0.06	0	21.85	0	0	0	0	24.78
P19	0.06	0	21.85	0	0	0	0	24.78
P20	0.21	0	21.70	0	0	0	0	24.72

ALLOWABLE MODULE UPLIFT PRESSURE 2 RAILS: 76 PSF

$2h_2$ DISTANCE : 0' - 10"
0.5h DISTANCE : 7' - 6"

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. MODULE EDGE DISTANCE LINE
- MODULE EXPOSURE LINE
- WIND ZONE 1 (TYP)
- WIND ZONE 2e (TYP)
- WIND ZONE 2n (TYP)
- WIND ZONE 2r (TYP)
- WIND ZONE 3r (TYP)
- WIND ZONE 3e (TYP)

1 PARTIAL PRESSURE AND MODULES EXPOSURE
S-01.1 SCALE: 1/16" = 1'-0"

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ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

ADT Solar

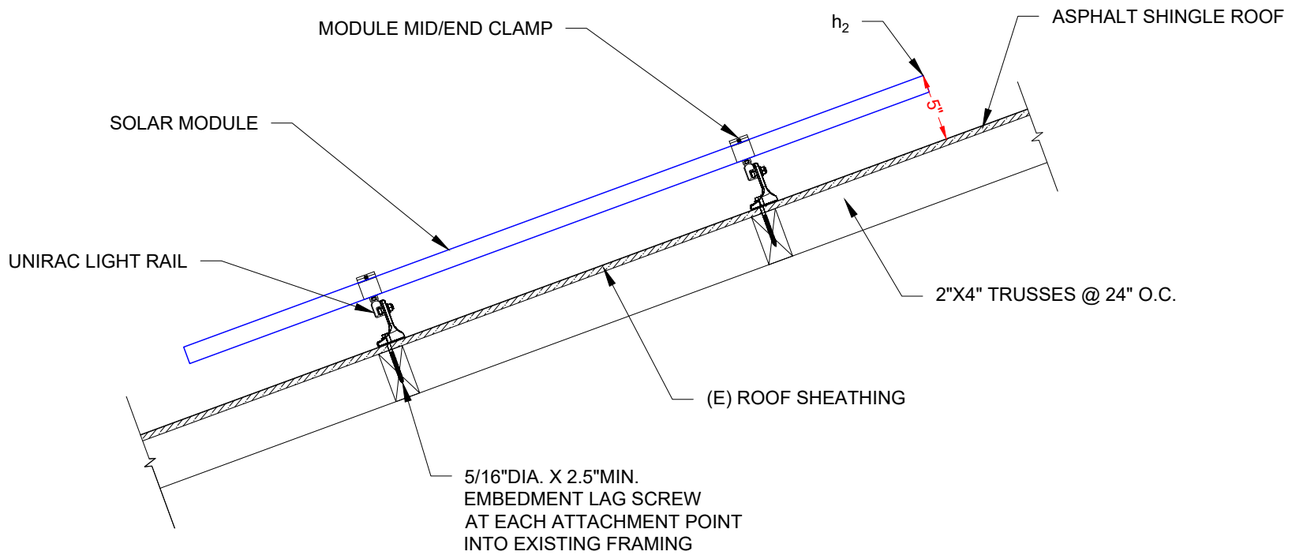
Signature with Seal
Digitally signed by: Ermocrates E Castillo
Date: 2022.10.10 16:07:40

PROJECT NAME
ENDSLEY RESIDENCE
262 SW BLOOMINGTON TERRACE,
LAKE CITY, FL 32025

SHEET NAME
PARTIAL PRESSURE AND MODULES EXPOSURE

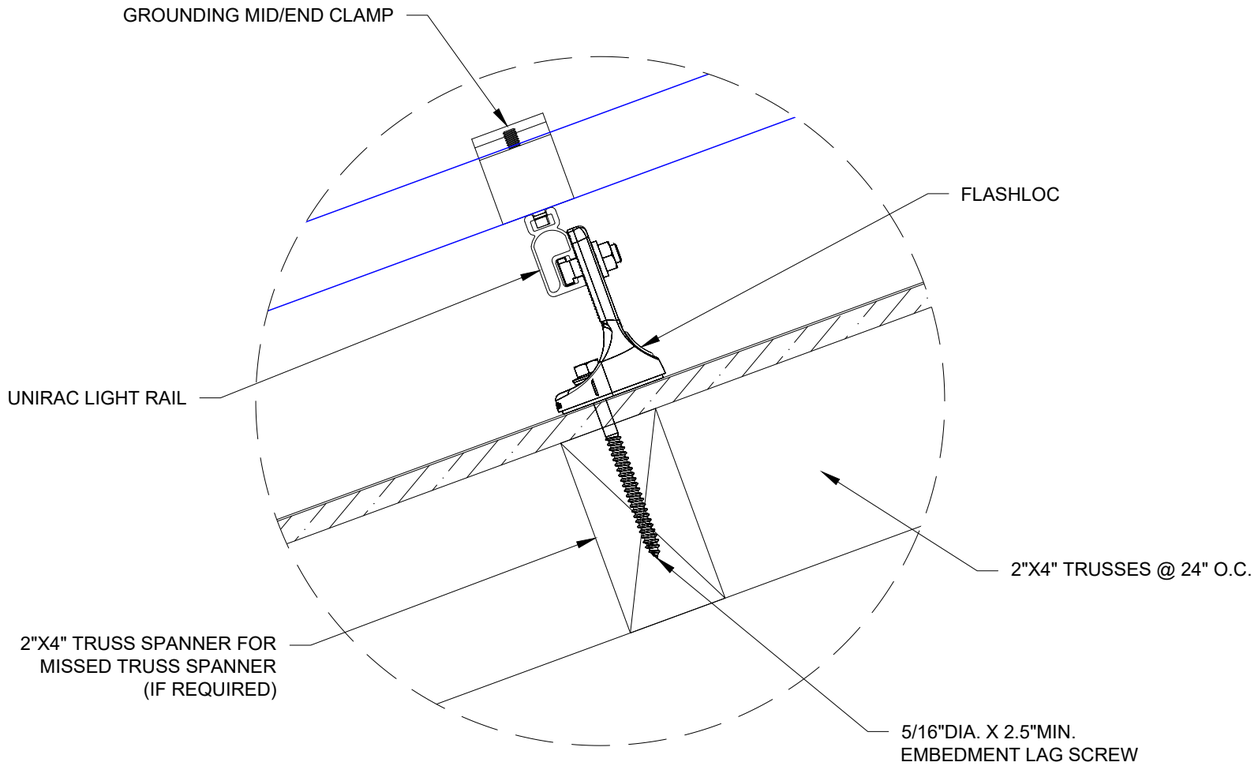
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
S-01.1



1 ATTACHMENT DETAIL

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



2 ATTACHMENT DETAIL (ENLARGED VIEW)

S-02 SCALE: 4" = 1'-0"

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ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

ADT Solar

Signature with Digitally signed by: Ermocrates E Castillo
Date: 2022.10.10 16:07:41

PROJECT NAME

ENDSLEY RESIDENCE

262 SW BLOOMINGTON TERRACE,
LAKE CITY, FL 32025

SHEET NAME

ATTACHMENT DETAIL

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

S-02

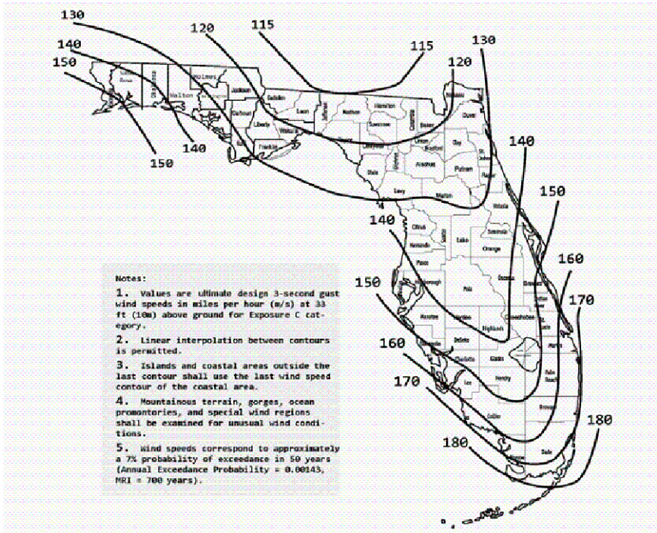

FIGURE 1609.3(1)
ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR RISK CATEGORY II BUILDINGS AND OTHER STRUCTURES

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)	104.3	ROOF SLOPE	7 /12		
ROOF WIDTH (ft)	65.9	ROOF SLOPE (°)	30.3		
PARAPET HEIGHT (ft)	0.0	ROOF TYPE	HIP		
MODULE LENGTH (in)	76.4	ULTIMATE WIND SPEED	120	mph	
MODULE WIDTH (in)	41.3	NOMINAL WIND SPEED	93	mph	
MODULE ORIENTATION	PORTRAIT	EXPOSURE FACTOR (C_e)	1.000		
MODULE AREA (sq. ft.)	21.91	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)	21.9	K_{ZT}	1.000		
GROUND ELEVATION (ft)	119.0	Ke	0.996		
HVHZ	YES	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	65.9' * 10%	=	6.59'	ZONE WIDTH A	6 FT
	15' * 40%	=	6'	ZONE 2 WIDTH	N/A (FOR (°) < 7°)
				ZONE 3 WIDTH	N/A (FOR (°) < 7°)

EXTERNAL PRESSURE COEFFICIENT	ZONE 1	0.560	-1.340
	ZONE 1'	0.560	X
	ZONE 2e	0.560	-2.319
	ZONE 2n	0.560	X
	ZONE 2r	0.560	-2.439
	ZONE 3e	0.560	-3.079
	ZONE 3r	0.560	X
INTERNAL PRESSURE COEFFICIENT (+/-)		0	

DESIGN PRESSURES

ROOF ZONE	DOWN	UP				
1	16.0	-14.4	psf			
1'	16.0	X	psf			
2e	16.0	-24.9	psf	Module allowable uplift pressure for 2 rails	76	psf
2n	16.0	X	psf	Module allowable down pressure	104.4	psf
2r	16.0	-26.2	psf			
3e	16.0	-33.1	psf			
3r	16.0	X	psf			

ARRAY FACTORS

ARRAY EDGE FACTOR (EXPOSED)	1.5	SOLAR PANEL PRESSURE EQUALIZATION FACTOR	0.66373
ARRAY EDGE FACTOR (NON-EXPOSED)	1		

ADJUSTED DESIGN PRESSURES

ROOF ZONE	DOWN	UP (Exposed)	UP (N. Exposed)	
1	16.0	-16.0	-16.0	psf
1'	16.0	X	X	psf
2e	16.0	-24.8	-16.6	psf
2n	16.0	X	X	psf
2r	16.0	-26.1	-17.4	psf
3e	16.0	-33.0	-22.0	psf
3r	16.0	X	X	psf

ATTACHMENTS USED

ATTACHMENT MODEL	flashloc	
ATTACHMENT STRENGTH	476	lbs

MAX DESIGN LOADS ALLOWABLE

LIMIT MAX SPAN TO		48	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	203.7	203.7	203.7	lbs	48 in		48 in
1'	0.0	X	X	lbs	X in		X in
2e	203.7	316.3	210.9	lbs	48 in		48 in
2n	0.0	X	X	lbs	X in		X in
2r	203.7	332.7	221.8	lbs	48 in		48 in
3e	203.7	419.9	279.9	lbs	48 in		48 in
3r	0.0	X	X	lbs	X in		X in

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REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

ADT Solar

Signature with Digital ID
Digitally signed by: Ermocrates E Castillo
Date: 2022.10.10 16:07:41

PROJECT NAME

ENDSLEY RESIDENCE
262 SW BLOOMINGTON TERRACE,
LAKE CITY, FL 32025

SHEET NAME
STRUCTURE CALCULATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
S-02.1

SOLAR ARRAY (16.590 kW DC STC - 12.180 kW AC)

(42) CANADIAN SOLAR: CS3N-395MS (395W) MODULES
(02) BRANCHES OF 11 MODULES &
(02) BRANCH OF 10 MODULES

NOTE:

1. SUBJECT PV SYSTEMS HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE NEC 2017, AND THOSE SET FORTH BY THE FLORIDA SOLAR ENERGY CENTER CERTIFICATION, INCLUDING MAXIMUM NUMBER OF MODULE STRINGS, MAXIMUM NUMBER OF MODULES PER STRING, MAXIMUM OUTPUT, MODULE MANUFACTURER AND MODEL NUMBER, INVERTER MANUFACTURER AND MODEL NUMBER, AS APPLICABLE.
2. PROVIDE TAP BOX IN COMPLIANCE WITH 312.8 IF PANEL GUTTER SPACE IS INADEQUATE.
3. ALL PANELS DOWNSTREAM OF FEEDER TAP TO BE PROTECTED BY PREEXISTING OR ADDITIONAL OCPD PER NEC 408.36.
4. FEEDER TAP PER NEC 705.12(B)(2)(1)(B)
5. REFER SHEET DS-07 FOR LOAD CALCULATION.
6. DO NOT USE THESE CIRCUITS DUE TO SOLAR BACK-FEED, FAILURE TO COMPLY MAY RESULT IN AN ELECTRICAL HAZARD.

Q CABLES

ENPHASE: IQ8PLUS-72-2-US MICROINVERTERS

PV MODULES

#6 BARE CU WIRE PROTECTED PER NEC 250.64(B)

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

(4) #10 AWG THWN-2 – RED
(4) #10 AWG THWN-2 – BLACK
EGC #10 AWG THWN-2 GND
IN 1" IMC, RMC, FMC, LFMC,
EMT OR EQUIVALENT
CONDUIT RUN

FACTORY INSTALLED 10A OR 15A BREAKER FOR THE ENVOY

(N) 125A ENPHASE IQ COMBINER 4/4C
(X-IQ-AM1-240-4) OR (X-IQ-AM1-240-4C) [WITH UPTO (4) 2-POLE BREAKERS, IQ GATEWAY AND INTEGRATED LTE-M1 CELL MODEM]

(4) #10 AWG THWN-2-RED
(4) #10AWG THWN-2-BLACK
EGC #10 AWG THWN-2 GND
IN 1" IMC, RMC, FMC, LFMC,
EMT OR EQUIVALENT
CONDUIT RUN

20A/2P
20A/2P
20A/2P
20A/2P

(N) ALTERNATIVE POWER SOURCE AC DISCONNECT/ RAPID SHUTDOWN: 240V, 100AMP RATED, NEMA 3R, UL LISTED, LOCKABLE & FUSIBLE, WITH 70A FUSES

(3) #4 AWG THWN-2
(1) #8 AWG THWN-2 GND
IN 1-1/2" PVC, IMC, RMC,
LFMC, RTRC, LFNC, EMT
OR FMT CONDUIT RUN

TO UTILITY GRID

NO LOADS BREAKERS TO BE ADDED TO THIS PANEL

BI-DIRECTIONAL
SERVICE POINT AND
UTILITY METERING
1-PHASE, 240V

FEEDER TAP USING INSULATION PIERCING PER NEC 705.12 (B)(2)(2), NEC 705.12 (B)(2)(3)(b) AND NEC 240.21 (B)

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

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

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

EXISTING GROUNDING
ELECTRODE SYSTEM

(E) INTERIOR PANEL (A)
200A RATED, 240V

POLARIS LUGS

(3) 2/0 AWG THWN-2
(1) #6 AWG THWN-2 GND
IN 1-1/2" PVC, IMC, RMC,
LFMC, RTRC, LFNC, EMT
OR FMT CONDUIT RUN

(N) TAP BOX
240V, 200A RATED,
MINIMUM SIZE OF
12"X12"X6"

(3) 2/0 AWG THWN-2
(1) #6 AWG THWN-2 GND
IN 1-1/2" PVC, IMC, RMC,
LFMC, RTRC, LFNC, EMT
OR FMT CONDUIT RUN
SIZED PER NEC 310.15(B)(7)

(E) ATS 200A
RATED, 240V.

200A

(E) INTERIOR PANEL (B)
200A RATED, 240V

TO
GENERATOR

EXISTING WIRE AND
CONDUIT

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

REVISIONS

DESCRIPTION	DATE	REV

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ADT Solar

Signature with Seal

Digitally signed by: Ermocrates E Castillo
Date: 2022.10.10 16:07:41

PROJECT NAME

ENDSLEY RESIDENCE

262 SW BLOOMINGTON TERRACE,
LAKE CITY, FL 32025

SHEET NAME

ELECTRICAL
LINE DIAGRAM

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

E-01

ELECTRICAL CALCULATION

Module Manufacturer	Canadian Solar
Module Model	CS3N-395MS
Inverter Manufacturer	Enphase
Inverter Model	Enphase IQ 8 Plus
Modules/Branch Circuit 1	11
Modules/Branch Circuit 2	11
Modules/Branch Circuit 3	10
Modules/Branch Circuit 4	10
Total Array Power (kW)	16.590
System AC Voltage	240V 1-Phase

Module Properties			
Voc	44.3	Isc	11.44
Vmpp	37	Imp	10.68
TC Voc	-0.26%/ °C	TC Vmp	-0.34%/ °C
Pmp	395.0	NOCT	45 °C

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

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

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	13.3	16.6	#10	40	130	0.76	8	0.7	21.28	20 A
Circuit 2	13.3	16.6	#10	40	130	0.76	8	0.7	21.28	20 A
Circuit 3	12.1	15.1	#10	40	130	0.76	8	0.7	21.28	20 A
Circuit 4	12.1	15.1	#10	40	130	0.76	8	0.7	21.28	20 A
AC Combiner Panel Output	50.75	63.4	#4	95	95	0.96	3	1	91.2	70 A

Maximum Circuit Voltage Drop	2%

Voltage Drop Calculations

Circuit	AWG	Circular Mills	I	V	Max Length
Circuit 1	#10	10380	13.3	240	145 Feet
Circuit 2	#10	10380	13.3	240	145 Feet
Circuit 3	#10	10380	12.1	240	160 Feet
Circuit 4	#10	10380	12.1	240	160 Feet
Combiner Panel Output	#4	41740	50.8	240	153 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

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).
17. THIS SYSTEM IS EQUIPPED WITH RAPID SHUTDOWN OF PV CONDUCTORS IN COMPLIANCE WITH NEC 690.12.
18. LABELING IN COMPLIANCE WITH NEC 690.12 AND 690.56(C) IS SHOWN ON SHEET E-03.
19. ALL CONDUITS TO BE INSTALLED A MIN OF 7/8" ABOVE THE ROOF SURFACE.

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, THE NEC 2017, AND THOSE SET FORTH BY THE FLORIDA SOLAR ENERGY CENTER CERTIFICATION.

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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ADT Solar

Signature with Digital ID
Digitally signed by: Ermocrates E Castillo
Date: 2022.10.10 16:07:42

PROJECT NAME

ENDSLEY RESIDENCE
262 SW BLOOMINGTON TERRACE, LAKE CITY, FL 32025

SHEET NAME

WIRING CALCULATIONS

SHEET SIZE

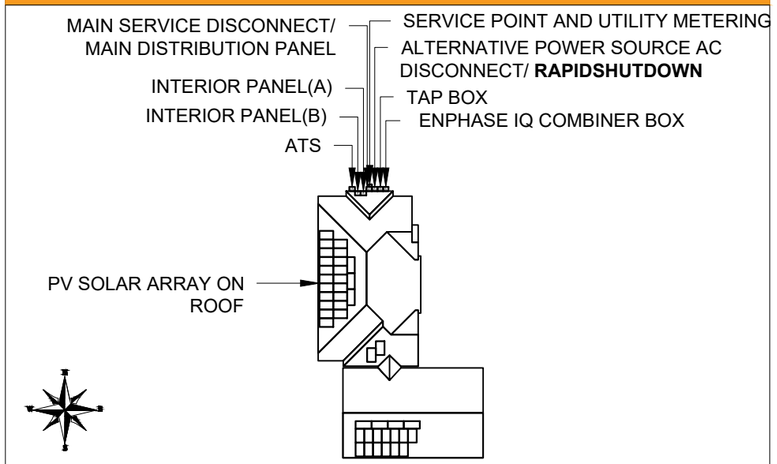
ANSI B
11" X 17"

SHEET NUMBER

E-02

CAUTION!

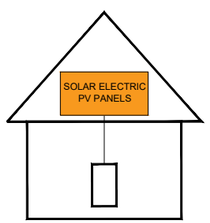
POWER TO THIS BUILDING
SUPPLIED FROM MULTIPLE SOURCES



LABEL LOCATION:
MAIN SERVICE DISCONNECT / MAIN DISTRIBUTION PANEL, PV DISCONNECT
LOCATED NO MORE THAN 3FT (1M) FROM THE SERVICE DISCONNECT
(TEXT HEIGHT SHOULD BE A MINIMUM OF 3/8")
PER CODE NEC 705.10

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 1204.5.1

⚠ 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))

PHOTOVOLTAIC SYSTEM AC DISCONNECT

RATED AC OPERATING CURRENT 50.75 AMPS
AC NOMINAL OPERATING VOLTAGE 240 VOLTS

LABEL LOCATION:
AC DISCONNECT, POINT OF INTERCONNECTION
(PER CODE: NEC 690.54)

WARNING:

POWER SOURCE 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: NEC 690.52)

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

LABEL LOCATION:
INVERTER
(PER CODE: NEC 690.52)

AC COMBINER BOX

LABEL LOCATION:
COMBINER BOX
(PER CODE: NEC 690.52)

AC DISCONNECT

LABEL LOCATION:
AC DISCONNECT, POINT OF INTERCONNECTION
(PER CODE: NEC 690.54)

SOLAR CONNECTION
LINE SIDE TAP

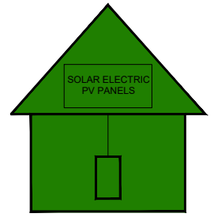
LABEL LOCATION:
POINT OF INTERCONNECTION
(PER CODE: NEC 705.12(A))

EMERGENCY RESPONDER
THIS SOLAR PV SYSTEM IS EQUIPPED WITH RAPID SHUTDOWN.

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN ENTIRE PV SYSTEM

- SECTIONS OF THE PV SYSTEM THAT ARE SHUT DOWN WHEN THE RAPID SHUTDOWN SWITCH IS OPERATED.

-SECTIONS OF THE PV SYSTEM THAT ARE NOT SHUT DOWN WHEN THE RAPID SHUTDOWN SWITCH IS OPERATED.



LABEL LOCATION:
AC DISCONNECT
(TEXT HEIGHT SHOULD BE A MINIMUM OF 3/8")
(PER CODE: NFPA 1,11.12.2.1.1)

ADT SOLAR

⚠ EMERGENCY CONTACT: ⚠
PH. NO. : (866) 450-1012

LABEL LOCATION:
MAIN DISCONNECT
(PER CODE: NFPA - 1, 11.12.2.1.5)

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL LOCATION:
AC DISCONNECT
(PER CODE: NEC 690.56(C)(3))

16.590 KW SOLAR DISCONNECT LOCATED

LABEL LOCATION:
AC DISCONNECT, POINT OF INTERCONNECTION
(PER CODE: NEC 690.54)

WARNING:

NO LOADS BREAKERS TO BE ADDED TO THIS PANEL

LABEL LOCATION:
MAIN DISTRIBUTION PANEL (4)

WARNING:

DO NOT USE THESE CIRCUITS DUE TO SOLAR BACK-FEED, FAILURE TO COMPLY MAY RESULT IN AN ELECTRICAL HAZARD

LABEL LOCATION:
MAIN DISTRIBUTION PANEL (5)

ADHESIVE FASTENED SIGNS:
- THE LABEL SHALL BE VISIBLE, REFLECTIVE AND SUITABLE FOR THE ENVIRONMENT WHERE IT IS INSTALLED [NFPA 1, 11.12.2.1]
- 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]

Castillo Engineering
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PROJECT NAME

ENDSLEY RESIDENCE
262 SW BLOOMINGTON TERRACE, LAKE CITY, FL 32025

SHEET NAME

SYSTEM LABELING

SHEET SIZE

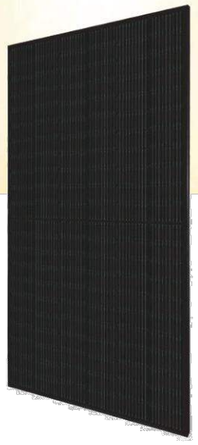
ANSI B
11" X 17"

SHEET NUMBER

E-03

NEW

CanadianSolar



HiKuBlack Mono PERC

BLACK FRAME ON BLACK BACKSHEET

F23 Frame

380 W ~ 405 W

CS3N-380|385|390|395|400|405MS

MORE POWER

- Module power up to 405 W
  Module efficiency up to 19.9 %
- Lower LCOE & BOS cost
- Comprehensive LID / LeTID mitigation technology, up to 50% lower degradation
- Better shading tolerance

MORE RELIABLE

- Minimizes micro-crack impacts
- Heavy snow load up to 8100 Pa, enhanced wind load up to 6000 Pa*

* For detailed information, please refer to Installation Manual.

25 Years **Industry Leading Product Warranty on Materials and Workmanship***

25 Years **Linear Power Performance Warranty***

1st year power degradation no more than 2%
Subsequent annual power degradation no more than 0.55%

*Subject to the terms and conditions contained in the applicable Canadian Solar Limited Warranty Statement. Also this 25-year limited product warranty is available only for products installed and operating on residential rooftops in certain regions.

MANAGEMENT SYSTEM CERTIFICATES*

ISO 9001: 2015 / Quality management system
ISO 14001: 2015 / Standards for environmental management system
ISO 45001: 2018 / International standards for occupational health & safety

PRODUCT CERTIFICATES*

IEC 61215 / IEC 61730 / CE
FSEC (US Florida) / UL 61730 / IEC 61701 / IEC 62716

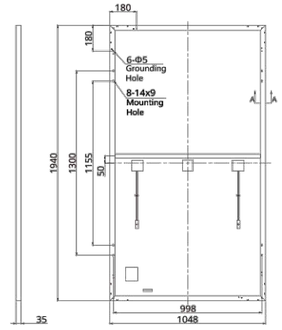
* The specific certificates applicable to different module types and markets will vary, and therefore not all of the certifications listed herein will simultaneously apply to the products you order or use. Please contact your local Canadian Solar sales representative to confirm the specific certificates available for your Product and applicable in the regions in which the products will be used.

CSI SOLAR (USA) CO., LTD. is committed to providing high quality solar photovoltaic modules, solar energy and battery storage solutions to customers. The company was recognized as the No. 1 module supplier for quality and performance/price ratio in the IHS Module Customer Insight Survey. Over the past 20 years, it has successfully delivered over 63 GW of premium-quality solar modules across the world.

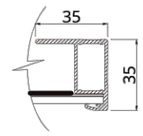
CSI SOLAR (USA) CO., LTD.
1350 Treat Blvd. Suite 500, Walnut Creek, CA 94598, USA | www.csisolar.com/na | service.ca@csisolar.com

ENGINEERING DRAWING (mm)

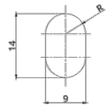
Rear View



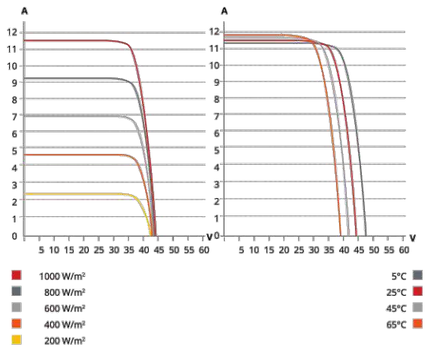
Frame Cross Section
A - A



Mounting Hole



CS3N-400MS / I-V CURVES



ELECTRICAL DATA | STC*

CS3N	380MS	385MS	390MS	395MS	400MS	405MS
Nominal Max. Power (Pmax)	380 W	385 W	390 W	395 W	400 W	405 W
Opt. Operating Voltage (Vmp)	36.4 V	36.6 V	36.8 V	37.0 V	37.2 V	37.4 V
Opt. Operating Current (Imp)	10.44 A	10.52 A	10.60 A	10.68 A	10.76 A	10.83 A
Open Circuit Voltage (Voc)	43.7 V	43.9 V	44.1 V	44.3 V	44.5 V	44.7 V
Short Circuit Current (Isc)	11.26 A	11.32 A	11.38 A	11.44 A	11.50 A	11.56 A
Module Efficiency	18.7%	18.9%	19.2%	19.4%	19.7%	19.9%
Operating Temperature	-40°C ~ +85°C					
Max. System Voltage	1000V (UL)					
Module Fire Performance	TYPE 2 (UL 61730 1000V)					
Max. Series Fuse Rating	20 A					
Application Classification	Class A					
Power Tolerance	0 ~ + 10 W					

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

ELECTRICAL DATA | NMOT*

CS3N	380MS	385MS	390MS	395MS	400MS	405MS
Nominal Max. Power (Pmax)	284 W	288 W	291 W	295 W	299 W	303 W
Opt. Operating Voltage (Vmp)	34.0 V	34.2 V	34.4 V	34.6 V	34.7 V	34.9 V
Opt. Operating Current (Imp)	8.35 A	8.42 A	8.48 A	8.54 A	8.60 A	8.66 A
Open Circuit Voltage (Voc)	41.2 V	41.4 V	41.6 V	41.8 V	41.9 V	42.1 V
Short Circuit Current (Isc)	9.08 A	9.13 A	9.18 A	9.23 A	9.28 A	9.33 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m² spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

MECHANICAL DATA

Specification	Data
Cell Type	Mono-crystalline
Cell Arrangement	132 [2 X (11 X 6)]
Dimensions	1940 X 1048 X 35 mm (76.4 X 41.3 X 1.38 in)
Weight	23.4 kg (51.6 lbs)
Front Cover	3.2 mm tempered glass
Frame	Anodized aluminium alloy
J-Box	IP68, 3 bypass diodes
Cable	12 AWG (UL)
Cable Length (Including Connector)	Portrait: 400 mm (15.7 in) (+) / 280 mm (11.0 in) (-) (supply additional cable jumper: 2 lines/pallet); landscape: 1250 mm (49.2 in)*
Connector	T4 or MC4 series
Per Pallet	30 pieces
Per Container (40' HQ)	720 pieces

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.34 % / °C
Temperature Coefficient (Voc)	-0.26 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	42 ± 3°C

PARTNER SECTION

* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. CSI Solar Co., Ltd. reserves the right to make necessary adjustment to the information described herein at any time without further notice. Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

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

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

ADT Solar

Signature with Seal
Digitally signed by: Ermocrates E Castillo
Date: 2022.10.10 16:07:42

PROJECT NAME

ENDSLEY RESIDENCE
262 SW BLOOMINGTON TERRACE,
LAKE CITY, FL 32025

SHEET NAME
DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
DS-01

ENPHASE

DATA SHEET

IQ8 and IQ8+ Microinverters

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

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

Enphase 25 year limited warranty

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

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

UL CERTIFIED SAFETY

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

IQ8SP-DS-0002-01-EN-US-2021-10-19

Easy to install

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

High productivity and reliability

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

Microgrid-forming

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

IQ8 and IQ8+ Microinverters

INPUT DATA (DC)		IQ8-60-2-US	IQ8PLUS-72-2-US
Commonly used module pairings[1]	W	235 – 350	235 – 440
Module compatibility		60-cell/120 half-cell	60-cell/120 half-cell and 72-cell/144 half-cell
MPPT voltage range	V	27 – 37	29 – 45
Operating range	V	25 – 48	25 – 58
Min/max start voltage	V	30 / 48	30 / 58
Max input DC voltage	V	50	60
Max DC current[2] [module Isc]	A	15	
Overvoltage class DC port		II	
DC port backfeed current	mA	0	
PV array configuration		1x1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	
OUTPUT DATA (AC)		**IQ8-60-2-US**	**IQ8PLUS-72-2-US**
Peak output power	VA	245	300
Max continuous output power	VA	240	290
Nominal (L-L) voltage/range[3]	V	240 / 211 – 264	
Max continuous output current	A	1.0	1.21
Nominal frequency	Hz	60	
Extended frequency range	Hz	50 – 68	
Max units per 20 A (L-L) branch circuit[4]		16	13
Total harmonic distortion		<5%	
Overvoltage class AC port		III	
AC port backfeed current	mA	30	
Power factor setting		1.0	
Grid-tied power factor (adjustable)		0.85 leading – 0.85 lagging	
Peak efficiency	%	97.5	97.6
CEC weighted efficiency	%	97	97
Night-time power consumption	mW	60	
MECHANICAL DATA			
Ambient temperature range		-40°C to +60°C (-40°F to +140°F)	
Relative humidity range		4% to 100% (condensing)	
DC Connector type		MC4	
Dimensions (HxWxD)		212 mm (8.3") x 175 mm (6.9") x 30.2 mm (1.2")	
Weight		1.08 kg (2.38 lbs)	
Cooling		Natural convection – no fans	
Approved for wet locations		Yes	
Acoustic noise at 1 m		<60 dBA	
Pollution degree		PD3	
Enclosure		Class II double-insulated, corrosion resistant polymeric enclosure	
Environ. category / UV exposure rating		NEMA Type 6 / outdoor	
COMPLIANCE			
Certifications		CA Rule 21 (UL 1741-SA), UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01 This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.	

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

IQ8SP-DS-0002-01-EN-US-2021-10-19

Castillo Engineering
SOLAR DONE RIGHT®
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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

ADT Solar

Signature with Seal
Digitally signed by: Ermocrates E Castillo
Date: 2022.10.10 16:07:43

PROJECT NAME

ENDSLEY RESIDENCE
262 SW BLOOMINGTON TERRACE,
LAKE CITY, FL 32025

SHEET NAME

DATA SHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

DS-02

Data Sheet
Enphase Networking

Enphase IQ Combiner 4/4C

X-IQ-AM1-240-4
X-IQ-AM1-240-4C

X-IQ-AM1-240-4C

X-IQ-AM1-240-4

The **Enphase IQ Combiner 4/4C** with Enphase IQ Gateway and integrated LTE-M1 cell modem (included only with IQ Combiner 4C) consolidates interconnection equipment into a single enclosure and streamlines IQ microinverters 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 Gateway for communication and control
- Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), included only with IQ Combiner 4C
- Includes solar shield to match Enphase IQ Battery aesthetics and deflect heat
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Optional AC receptacle available for PLC bridge
- Provides production metering and consumption monitoring

Simple

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

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year limited warranty
- Two years labor reimbursement program coverage included for both the IQ Combiner SKU's
- UL listed

UL LISTED

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

ENPHASE

Enphase IQ Combiner 4/4C

MODEL NUMBER	
IQ Combiner 4 (X-IQ-AM1-240-4)	IQ Combiner 4 with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes a silver solar shield to match the IQ Battery system and IQ System Controller 2 and to deflect heat.
IQ Combiner 4C (X-IQ-AM1-240-4C)	IQ Combiner 4C with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), a plug-and-play industrial-grade cell modem 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.) Includes a silver solar shield to match the IQ Battery and IQ System Controller and to deflect heat.
ACCESSORIES AND REPLACEMENT PARTS	**(not included, order separately)**
Ensemble Communications Kit COMMS-CELLMODEM-M1-06 CELLMODEM-M1-06-SP-05 CELLMODEM-M1-06-AT-05	- Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with 5-year Sprint data plan for Ensemble sites - 4G based LTE-M1 cellular modem with 5-year Sprint data plan - 4G based LTE-M1 cellular modem with 5-year AT&T data plan
Circuit Breakers BRK-10A-2-240V BRK-15A-2-240V BRK-20A-2P-240V BRK-15A-2P-240V-B BRK-20A-2P-240V-B	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 Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support Circuit breaker, 2 pole, 20A, Eaton BR220B with hold down kit support
EPLC-01	Power line carrier (communication bridge pair), quantity - one pair
XA-SOLARSHIELD-ES	Replacement solar shield for IQ Combiner 4/4C
XA-PLUG-120-3	Accessory receptacle for Power Line Carrier in IQ Combiner 4/4C (required for EPLC-01)
XA-ENV-PCBA-3	Replacement IQ Gateway printed circuit board (PCB) for Combiner 4/4C
X-IQ-NA-HD-125A	Hold down kit for Eaton circuit breaker with screws.
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating	65 A
Max. continuous current rating (input from PV/storage)	64 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. total branch circuit breaker rating (input)	80A of distributed generation / 95A with IQ Gateway breaker included
Production metering CT	200 A solid core pre-installed and wired to IQ Gateway
Consumption monitoring CT (CT-200-SPLIT)	A pair of 200 A split core current transformers
MECHANICAL DATA	
Dimensions (WxHxD)	37.5 x 49.5 x 16.8 cm (14.75" x 19.5" 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
Cellular	CELLMODEM-M1-06-SP-05, CELLMODEM-M1-06-AT-05 (4G based LTE-M1 cellular modem). Note that an Enphase Mobile Connect cellular modem is required for all Ensemble installations.
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)
COMPLIANCE	
Compliance, IQ 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) Consumption metering: accuracy class 2.5
Compliance, IQ Gateway	UL 60601-1/CANCSA 22.2 No. 61010-1

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

ENPHASE

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ERMOCRATES E. CASTILLO - FL PE 52590

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262 SW BLOOMINGTON TERRACE,
LAKE CITY, FL 32025

SHEET NAME

DATA SHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

DS-03

SOLARMOUNT

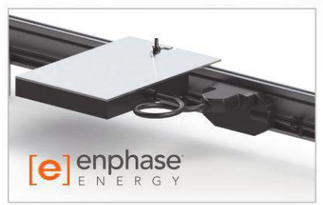
UNIRAC

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

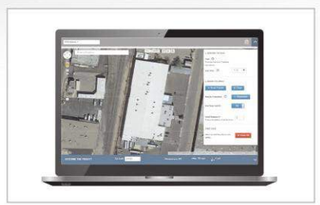


LOSE ALL OF THE COPPER & LUGS

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

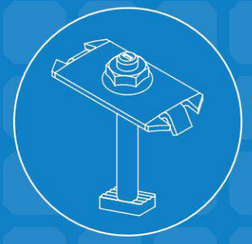
ONE PRODUCT - MANY APPLICATIONS

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.

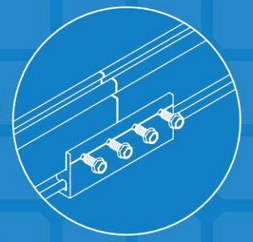
AUTOMATED DESIGN TOOL

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.

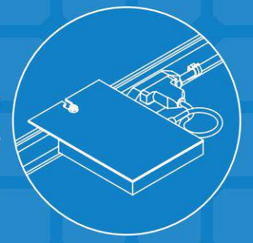


INTEGRATED BONDING MIDCLAMP



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

PUB2017FEB28-PRINTED

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ERMOCRATES E. CASTILLO - FL PE 52590

REVISIONS

DESCRIPTION	DATE	REV

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ADT Solar

Signature with Seal

Digitally signed by: Ermocrates E Castillo
Date: 2022.10.10 16:07:43

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262 SW BLOOMINGTON TERRACE,
LAKE CITY, FL 32025

SHEET NAME

DATA SHEET

SHEET SIZE

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SHEET NUMBER

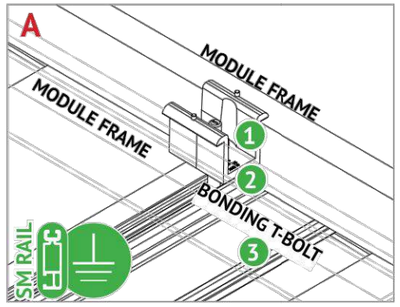
DS-04

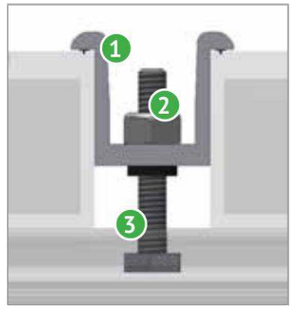
SM SOLAR MOUNT

BONDING CONNECTION GROUND PATHS

INSTALLATION GUIDE

0 PAGE

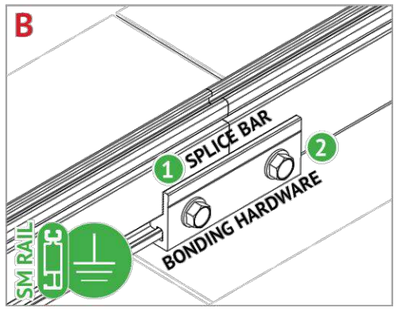




BONDING MIDCLAMP ASSEMBLY

BONDING MIDCLAMP ASSEMBLY

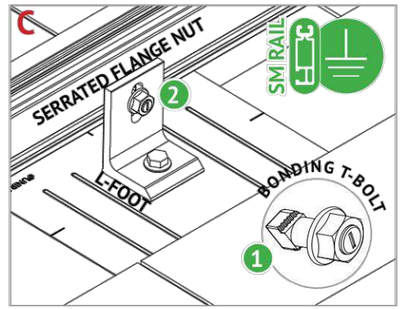
1. Aluminum mid clamp with stainless steel bonding pins that pierce module frame anodization to bond module to module through clamp
2. Stainless steel nut bonds aluminum clamp to stainless steel T-bolt
3. Serrated T-bolt head penetrates rail anodization to bond T-bolt, nut, clamp, and modules to SM rail



BONDING RAIL SPLICE BAR

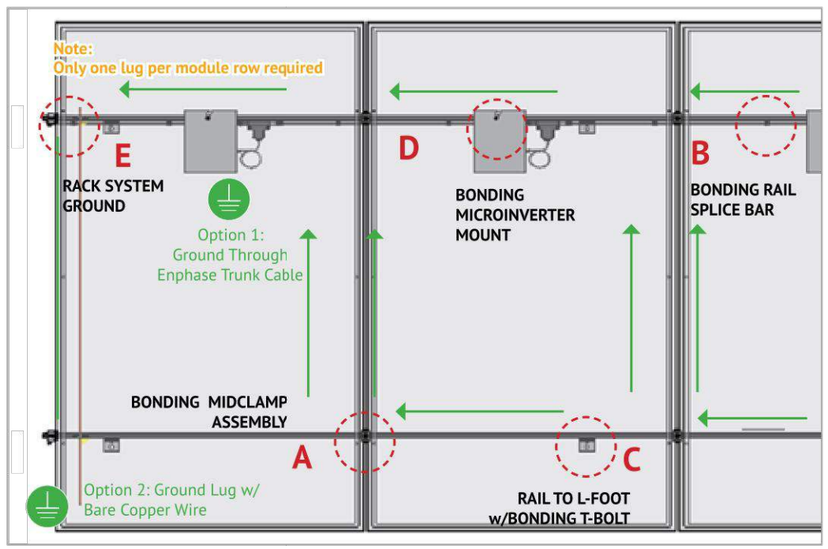
1. Bonding Hardware creates bond between splice bar and each rail section
2. Aluminum splice bar spans across rail gap to create rail to rail bond. Rail on at least one side of splice will be grounded.

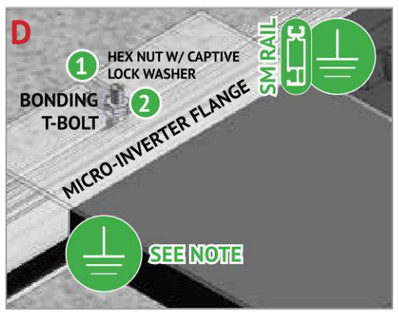
Note: Splice bar and bolted connection are non-structural. The splice bar function is rail alignment and bonding.



RAIL TO L-FOOT w/BONDING T-BOLT

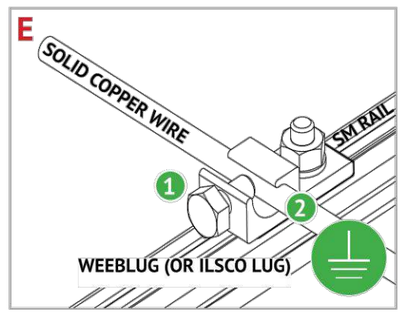
1. Serrated flange nut removes L-foot anodization to bond L-Foot to stainless steel T-bolt
2. Serrated T-bolt head penetrates rail anodization to bond T-bolt, nut, and L-foot to grounded SM rail





BONDING MICROINVERTER MOUNT

1. Hex nut with captive lock washer bonds metal microinverter flange to stainless steel T-bolt
2. Serrated T-bolt head penetrates rail anodization to bond T-bolt, nut, and L-foot to grounded SM rail **System ground including racking and modules may be achieved through the trunk cable of approved microinverter systems. See page J for details**



RACK SYSTEM GROUND

1. WEEB washer dimples pierce anodized rail to create bond between rail and lug
2. Solid copper wire connected to lug is routed to provide final system ground connection.
   NOTE: Ilsco lug can also be used when secured to the side of the rail. See page K for details

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

REVISIONS

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262 SW BLOOMINGTON TERRACE,
LAKE CITY, FL 32025

SHEET NAME

DATA SHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

DS-05

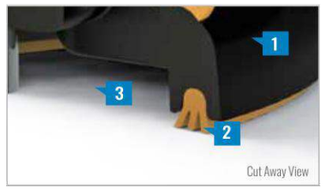
FLASH LOC

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

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

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LAKE CITY, FL 32025

SHEET NAME

DATA SHEET

SHEET SIZE

ANSI B
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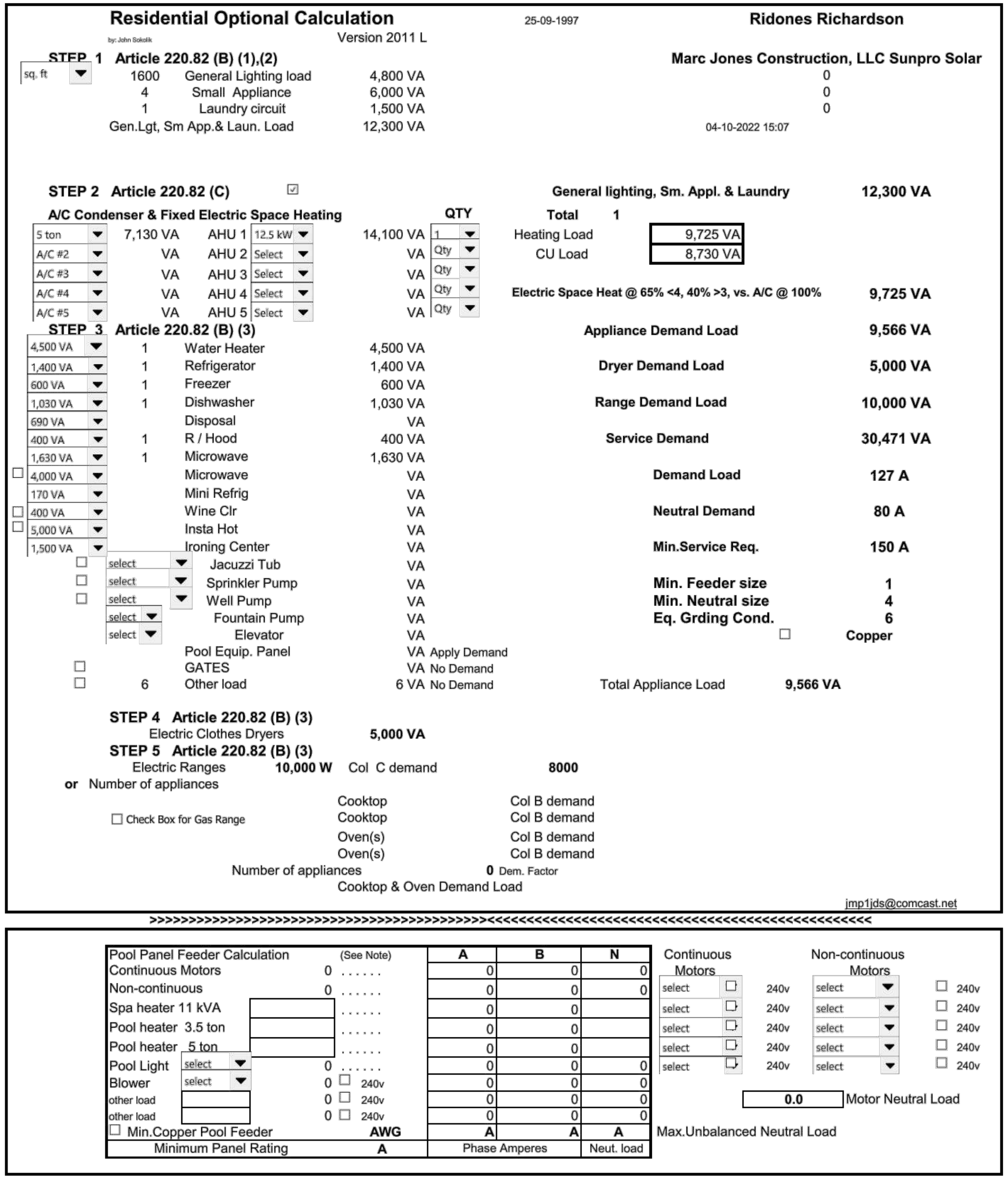
SHEET NUMBER

DS-06



Residential Optional Calculation

by: John Sokolik

Version 2011 L

25-09-1997

Ridones Richardson

Marc Jones Construction, LLC Sunpro Solar

0

0

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04-10-2022 15:07

STEP 1 Article 220.82 (B) (1),(2)

sq. ft ▾	1600	General Lighting load	4,800 VA
	4	Small Appliance	6,000 VA
	1	Laundry circuit	1,500 VA
		Gen.Lgt, Sm App.& Laun. Load	12,300 VA

STEP 2 Article 220.82 (C) ☑

A/C Condenser & Fixed Electric Space Heating

					QTY
5 ton ▾	7,130 VA	AHU 1	12.5 kW ▾	14,100 VA	1 ▾
A/C #2 ▾	VA	AHU 2	Select ▾	VA	Qty ▾
A/C #3 ▾	VA	AHU 3	Select ▾	VA	Qty ▾
A/C #4 ▾	VA	AHU 4	Select ▾	VA	Qty ▾
A/C #5 ▾	VA	AHU 5	Select ▾	VA	Qty ▾

STEP 3 Article 220.82 (B) (3)

	4,500 VA ▾	1	Water Heater	4,500 VA
	1,400 VA ▾	1	Refrigerator	1,400 VA
	600 VA ▾	1	Freezer	600 VA
	1,030 VA ▾	1	Dishwasher	1,030 VA
	690 VA ▾		Disposal	VA
	400 VA ▾	1	R / Hood	400 VA
	1,630 VA ▾	1	Microwave	1,630 VA
☐	4,000 VA ▾		Microwave	VA
	170 VA ▾		Mini Refrig	VA
☐	400 VA ▾		Wine Clr	VA
☐	5,000 VA ▾		Insta Hot	VA
	1,500 VA ▾		Ironing Center	VA
☐	select ▾		Jacuzzi Tub	VA
☐	select ▾		Sprinkler Pump	VA
☐	select ▾		Well Pump	VA
	select ▾		Fountain Pump	VA
	select ▾		Elevator	VA
			Pool Equip. Panel	VA Apply Demand
☐			GATES	VA No Demand
☐		6	Other load	6 VA No Demand

General lighting, Sm. Appl. & Laundry	**12,300 VA**
Total	**1**
Heating Load	9,725 VA
CU Load	8,730 VA
Electric Space Heat @ 65% <4, 40% >3, vs. A/C @ 100%	**9,725 VA**
Appliance Demand Load	**9,566 VA**
Dryer Demand Load	**5,000 VA**
Range Demand Load	**10,000 VA**
Service Demand	**30,471 VA**
Demand Load	**127 A**
Neutral Demand	**80 A**
Min.Service Req.	**150 A**
Min. Feeder size	**1**
Min. Neutral size	**4**
Eq. Grding Cond.	**6**
☐	**Copper**
Total Appliance Load	**9,566 VA**

STEP 4 Article 220.82 (B) (3)

Electric Clothes Dryers **5,000 VA**

STEP 5 Article 220.82 (B) (3)

Electric Ranges **10,000 W** Col C demand **8000**

or Number of appliances

☐ Check Box for Gas Range

Cooktop	Col B demand
Cooktop	Col B demand
Oven(s)	Col B demand
Oven(s)	Col B demand

Number of appliances **0** Dem. Factor

Cooktop & Oven Demand Load

jmp1jds@comcast.net

>><<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

Pool Panel Feeder Calculation		(See Note)	A	B	N
Continuous Motors	0	......	0	0	0
Non-continuous	0	......	0	0	0
Spa heater 11 kVA		......	0	0	
Pool heater 3.5 ton		......	0	0	
Pool heater 5 ton		......	0	0	
Pool Light select ▾	0	......	0	0	0
Blower select ▾	0	☐ 240v	0	0	0
other load	0	☐ 240v	0	0	0
other load	0	☐ 240v	0	0	0
☐ Min.Copper Pool Feeder		**AWG**	**A**	**A**	**A**
Minimum Panel Rating		**A**	Phase Amperes		Neut. load

Continuous Motors			Non-continuous Motors		
select	☐	240v	select ▾	☐	240v
select	☐	240v	select ▾	☐	240v
select	☐	240v	select ▾	☐	240v
select	☐	240v	select ▾	☐	240v
select	☐	240v	select ▾	☐	240v

0.0 Motor Neutral Load

Max.Unbalanced Neutral Load

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

REVISIONS		
DESCRIPTION	DATE	REV

PROJECT INSTALLER

ADT Solar

No. 52590

Signature with Seal

Digitally signed by: Ermocrates E Castillo
Date: 2022.10.10 16:07:44

PROJECT NAME

ENDSLEY RESIDENCE

262 SW BLOOMINGTON TERRACE,
LAKE CITY, FL 32025

SHEET NAME

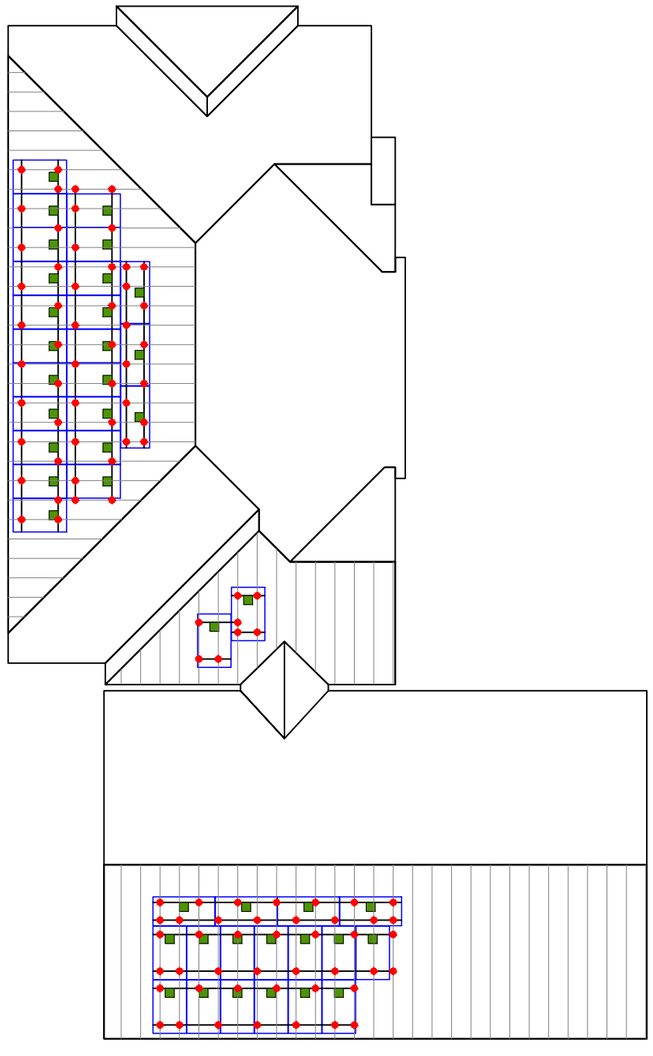
DATA SHEET

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

DS-07



ITEM	COUNT	DESCRIPTION
PV MODULES	42	Canadian Solar CS3N-395MS
MICRO-INVERTER	42	IQ8PLUS-72-2-US
MICROINVERTER T-BOLT	42	MICROINVERTER T-BOLT
Q-CABLE CLIP	84	EN-Q-CLIP-100
Q-CABLE	10FT	Q-12-RAW-300
TRUNK CABLE	51	EN-Q-12-10-240
TRUNK BRANCH TERMINATOR	4	EN-Q-TERM-01
TRUNK WATER TIGHT COVER	20	EN-Q-SEAL-01
AC COMBINER BOX	1	EN-X-IQ-AM1-240-4
SOLADECK	3	JUNCTION BOX
RAIL	27	Unirac Light Rail
SPLICE BAR	27	UNI-303019M
ROOF ATTACHMENT	103	Unirac Flashloc
RAIL T BOLT	103	UNI-009020S
END CLAMP	32	UNI-302022D
MID CLAMP	68	UNI-302045D
WEEB LUGS	16	WEEBLUGS-6.7
TERMINAL BLOCKS	15	IMO ER10BEIGE
TERM BLOCK N CAPS	6	SP2.5-10BEIGE
NPT GLANDS	6	NPT CABLE GLAND
CONDUIT LOCKNUT	6	LOCKNUT FOR CABLE GLAND
ROOFING BOOT	3	OATEY 8" x 8"
ROOF REPAIR FABRIC	1	ROOF REPAIR FABRIC
ROOF CEMENT	2	ROOF CEMENT
SPLIT CORE TRANSFORMER	2	EN-CT-200-SPLIT
TP LINK	1	TP AV600

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

REVISIONS

DESCRIPTION	DATE	REV

PROJECT INSTALLER

ADT Solar

Signature with Digital ID

Digitally signed by: Ermocrates E Castillo
Date: 2022.10.10 16:07:45

PROJECT NAME

ENDSLEY RESIDENCE
262 SW BLOOMINGTON TERRACE,
LAKE CITY, FL 32025

SHEET NAME

BILL OF MATERIALS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

BOM