

1011 N Causeway Blvd, Suite 19 ◆Mandeville, Louisiana 70471◆ Phone: 985.624.5001◆ Fax: 985.624.5303

Tuesday, January 10, 2023

Property Owner: JOHN GOODRUM

Property Address: 289 SW GRANITE CT, LAKE CITY, FL 32024

RE: Photovoltaic System Roof Installations

I have reviewed the existing structure referenced above to determine the adequacy of the existing structure support the proposed installation of an array of solar panels on the roof.

Based on my review, the existing structure meets or exceeds applicable codes listed below to support the proposed solar panel installation. This assessment is based on recent on-site inspection by solar inspectors and photographs of the existing structure. The photovoltaic system is designed to withstand uplift and downward forces; our assessment is regarding the structure's support of the array. Stresses induced by the introduction of individual mount loads on the rafters or truss top chord are within acceptable limits as shown on the attached calculations. The structural considerations used in our review and assessment include the following:

Evaluation Criteria:

Applied Codes: ASCE 7-16 FBC 2020 NEC 2017

Risk Category: II

Design Wind Speed (3-second gust): 118 mph

Wind Exposure Category: C Ground Snow Load: 0 PSF Seismic Design Category: D

Existing Structure:

Roof Material: Shingle

Roof Structure: 2x6 Truss Top Chord

Roof Slope: 5/12

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No. 71950

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PRINCIPAL ENGINEERING, INC.

1011 N. CAUSEWAY BLVD. STE 19

MANDEVILLE, LA 70471

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INFO@PI-AEC.COM

FLORIDA FIRM NO. 30649

PRINCIPAL Infrastructure®

Page 2 of 3

Effect of the Solar Array on Structure Loading:

Gravity Load:

Per IBC Section 1607, the areas of the roof where solar panels are located are considered inaccessible, and therefore not subject to roof live loading. Live load in these areas is replaced by the dead load of the solar array, 3 psf. The total gravity load on the structure is therefore reduced and the structure may remain unaltered. Connections of the mounts to the underlying structure are to be installed in a staggered pattern, except at the array ends, to distribute the loading evenly to the roof structure. The stresses within the rafters or truss top chord due to the introduction of discrete mount loads are within acceptable limits, as shown on the attached calculations.

Wind Load:

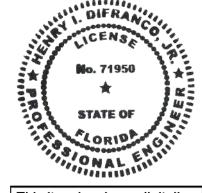
The solar panel array will be flush mounted (no more than 6" above the surrounding roof surface, and parallel to the roof surface. Any additional wind loading on the structure due to the presence of the array is negligible. The array structure is designed by the manufacturer to withstand uplift and downward forces resulting from wind and snow loads. The attached calculations verify the capacity of the connection of the solar array to the roof to resist uplift due to wind loads, the governing load case.

Snow Load:

The reduced friction of the glass surface of the solar panels allows for the lower slope factor (Cs) per Section 7.4 of ASCE 7.16 resulting in a reduced design snow load for the structure. This analysis conservatively considered the snow load to be unchanged.

Seismic Load:

Analysis shows that additional seismic loads due to the array installation will be small. Even conservatively neglecting the wall materials, the solar panel installation represents an increase in the total weight of the roof and corresponding seismic load of less than 10%. This magnitude of additional forces meets the requirements of the exception in Section 11B.4 of ASCE 7-16. The existing lateral force resisting system of the structure is therefore allowed to remain unaltered.



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Conclusion:

To the best of my professional knowledge and belief, the subject construction and photovoltaic system installation will be in compliance with all state and local building codes and guidelines in effect at the time of our review.

Limitations:

Engineer's assessment of the existing structure is based on recent field reports and current photographs of the elements of the structure that were readily accessible at the time of inspection. The design of the solar panel racking (mounts, rails, connectors, etc.), connections between the racking and panels, and electrical construction related to the installation are the responsibility of others. The photovoltaic system installation must be by competent personnel in accordance with manufacturer recommendations and specifications and should meet or exceed industry standards for quality. The contractor is responsible for ensuring that the solar array is installed according to the approved plans and must notify the engineer of any undocumented damage or deterioration of the structure, or of discrepancies between the conditions depicted in the approved plans and those discovered on site so that the project may be reevaluated and altered as required. Engineer does not assume any responsibility for improper installation of the proposed photovoltaic system.

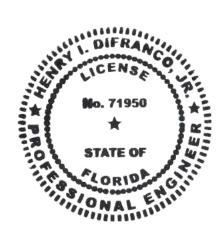


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Uplift and Wind Downforce Calculation Summary (ASCE 7-16) Mount, Rack, & Panel Proportioning Point Load Check and Rafter Stress Analysis

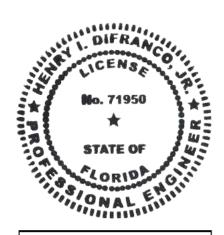
Property Owner:	JOHN GOODRUM	Max. Individual Panel Dimensions		
Project Address:	289 SW GRANITE CT	Length (in)	Width (in)	Area (sf)
City, State:	LAKE CITY, FL 32024	57.6	41.1	16.44

Building Characteristics, Design Input, and Adjustment Factors				
Roof Dimensions: Length:	75	Greater Dimension 75		
Width	65	Least Dimension: 65		
Roof Height (h):	15	Fig 30.4-1, valid under 60' ✓		
Pitch: 5 on 12 =	22.6°	Must be less than 45° ✓		
Roof Configuration	Hip			
Roof Structure	2x6 Truss Top	p Chord		
Roof Material	Plywood			
Risk Category:	Ш			
Basic Wind Speed:	118	From 26.5-1		
Exposure Category:	С	Fig. 26.7		
Topographic Factor (K _{zt})	1.21	Fig. 26.8-1		
Wind Pressure @ h=30, p _{net30}	See Table Bel	low Fig. 30.4-1		
Ht. & Exposure Adjustment (λ)	1.21	Fig. 30.4-1		
Adjusted Wind Pressures, p _{net}	See Table Bel	low Eq. 30.4-1		
Effective Wind Area (sf):	8.22	(Area per individual mount)		
Roof Zone Strip	(a), in ft, Fig. 30	0.4-1, Note 5		
1 - Least Roof Horizontal Dimension (L or W	') x 0.10	6.5		
2 - Roof Height x 0.4		6		
3 - Least Roof Horizontal Dimension (L or W	') x 0.04	2.6		
4 - Least of (1) and (2)		6		
5 - Greater of (3) and (4)		6		
6 - Greater of (5) and 3 feet		a= 6		



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	Net Design Pressures, p _{net} (Fig 30.4-1), Components & Cladding				
	Uplift (-psf)		Factored Pressure		
		P _{30net}	IK _{zt} P _{30net}	(0.6W, ASCE 7-16)	θ
. <u>a</u>	Zone 1				
ble /h /flat	Zone 1				0 2 7
gable /hip /flat	Zone 2				
- W	Zone 3				
	Zone 1 % Ze				-
	20116 211,21,315 Zana Ja				<u> </u>
	20110 01 7an a 1 2 7a				
Gable	Zone 2n 2x 3e				701 < 0 < 77
Ğ	Zone 3r				1
	Zone 1,2e,2r				
	Zone 2n & 3r				27° < 0 ≤ 45°
	Zone Se				
	Zone 1				7° < 0 ≤ 20° & h/D
	2008 28 % 3 =				≤ 0.5
	2011 <u>2</u> 2				
	7nne 2 = 8 3				7° < 0 ≤ 20° & h/D
	Zone 2r				208
Hip	Zone 1	35.3	51.7	31.0	20% + 0 < 27%
	Zone 2e,2r,3	48.7	71.4	42.8	20° < θ ≤ 27°
	Zone 1				
	Zone Ze				271 (0 (45)
	20110-21				



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Snow Load			
Ground Snow Load, p _g	0.0	From ASCE 7 or AHJ	
Terrain Category:	С	Para 6.5.6.3	
Exposure	Fully		
Exposure FactorCe	0.9	Table 7-2	
Thermal Factor, Ct	1.2	Table 7-3	
Importance Factor, I _s	1.0	Table 1.5.2	
Roof Configuration	Hip		
Roof Slope	22.6°		
Distance from Eave to Ridge	32.5		
p _m , Minimum required Snow Load	N/A	Para. 7.3.4	
pf, Calculated Snow Load	0.00	Eq. 7.3-1	
pf, Design Snow Load	0.00 psf		

Rail & Mount Selection			
Manufacturer:	Unirac	Allowable Mount Spacing by Uplift Pressure	
Model:	Flashloc Comp Kit	< 50 psf: 2 rails, mounts @ 4 ft. o.c.	
Substrate	Wood Rafters/Truss Top Chord	50 to 75 psf: 2 rails, mounts @ 2 ft. o.c.	
Connector:	5/16" x 4" Lag Screw	75 to 100 psf: 3 rails, mounts @ 4 ft. o.c.	
		100 to 150 psf: 3 rails, mounts @ 2 ft. o.c.	
Allowable Uplift:	480 lb., max.	150 to 200 psf: 4 rails, mounts @ 2 ft. o.c.	
		> 200 psf: Mount capacity exceeded	

Rail & Mount Layout by Zone			
Zone 1:	2 rails, mounts @ 4 ft. o.c.	Zone 2r:	2 rails, mounts @ 4 ft. o.c.
Zone 1':	N/A	Zone 3:	2 rails, mounts @ 4 ft. o.c.
Zone 2:	N/A	Zone 3e:	N/A
Zone 2e:	2 rails, mounts @ 4 ft. o.c.	Zone 3r:	N/A
Zone 2n:	N/A		
	(From rail analysis, allowable spacing and number of rails are controlled by individual mount pullout before rail bending)		



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NEW PHOTOVOLTAIC SYSTEM 5.93 KW DC 289 SW GRANITE CT, LAKE CITY, FL 32024





VICINITY MAP

SATELLITE VIEW

22171 MCH RD MANDEVILLE, LA 70471

PHONE: 9152011490

CONTRACTOR

Solar

PROJECT NAME & ADDRESS

JOHN GOODRUM

289 SW GRANITE CT, LAKE CITY, FL 32024

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 5.925 KW DC-(STC) AC SIZE: 4.350 KW AC



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SHEET TITLE

COVER PAGE

DRAWN DATE	1/10/2023
DRAWN BY	YP

SHEET NUMBER

G-001

GENERAL NOTES

1.1.1 PROJECT NOTES:

1.1.2 THIS PHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC) ARTICLE 690, ALL MANUFACTURERS'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION'S (AHJ) APPLICABLE CODES.

- 1.1.3 THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION
- 1.1.4 GROUND FAULT DETECTION AND INTERRUPTION (GFDI) DEVICE IS INTEGRATED WITH THE MICRO-INVERTER IN ACCORDANCE WITH NEC 690.41(B) 1.1.5 ALL PV SYSTEM COMPONENTS; MODULES, UTILITY-INTERACTIVE INVERTERS, AND SOURCE CIRCUIT COMBINER BOXES ARE IDENTIFIED AND LISTED FOR USE IN PHOTOVOLTAIC SYSTEMS AS REQUIRED BY NEC 690.4: PV MODULES: UL1703, IEC61730, AND IEC61215, AND NFPA 70 CLASS C FIRE INVERTERS: UL 1741 CERTIFIED, IEEE 1547, 929, 519 COMBINER BOX(ES): UL 1703 OR UL 1741 ACCESSORY
- 1.1.6 MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT FOR VOC. IF UNAVAILABLE, MAX DC VOLTAGE CALCULATED ACCORDING TO NEC 690.7.
- 1.1.7 ALL INVERTERS, PHOTOVOLTAIC MODULES, PHOTOVOLTAIC PANELS, AND SOURCE CIRCUIT COMBINERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER 690.4. SHALL BE INSTALLED ACCORDING TO ANY INSTRUCTIONS FROM LISTING OR LABELING [NEC 110.3].
- 1.1.8 ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.

1.2.1 SCOPE OF WORK:

1.2.2 PRIME CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND SPECIFICATIONS OF THE GRID-TIED PHOTOVOLTAIC SYSTEM RETROFIT. PRIME CONTRACTOR WILL BE RESPONSIBLE FOR COLLECTING EXISTING ONSITE REQUIREMENTS TO DESIGN, SPECIFY, AND INSTALL THE EXTERIOR ROOF-MOUNTED PORTION OF THE PHOTOVOLTAIC SYSTEMS DETAILED IN THIS DOCUMENT

1.3.1 WORK INCLUDES:

- 1.3.2 PV RACKING SYSTEM INSTALLATION UNIRAC SOLAR
- 1.3.3 PV MODULE AND INVERTER INSTALLATION CANADIAN SOLAR INC. CS3N-395MS / ENPHASE IQ8PLUS-72-2-US INVERTER
- 1.3.4 PV EQUIPMENT ROOF MOUNT
- 1.3.5 PV SYSTEM WIRING TO A ROOF-MOUNTED JUNCTION BOX
- 1.3.6 PV LOAD CENTERS (IF INCLUDED)
- 1.3.7 PV METERING/MONITORING (IF INCLUDED)
- 1.3.8 PV DISCONNECTS
- 1.3.9 PV GROUNDING ELECTRODE & BONDING TO (E) GEC
- 1.3.10 PV FINAL COMMISSIONING
- 1.3.11 (E) ELECTRICAL EQUIPMENT RETROFIT FOR PV
- 1.3.12 SIGNAGE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE

PROJECT INFORMATION

OWNER

NAME: JOHN GOODRUM

CONTRACTOR NAME

ADT SOLAR LLC PHONE: 5052180838

SCOPE OF WORK

SYSTEM SIZE: STC:15 X 395W= 5.93 kW DC

PTC: 15 x 372.75W = 5.59 kW DC

(15) CANADIAN SOLAR INC. CS3N-395MS

(15) ENPHASE IQ8PLUS-72-2-US

ATTACHMENT TYPE: ROOF MOUNT

MSP UPGRADE: NO

UTILITY METER UPGRADE: NO

AUTHORITIES HAVING JURISDICTION

BUILDING: COUNTY OF COLUMBIA ZONING: COUNTY OF COLUMBIA

UTILITY: CLAY ELECTRIC COOPERATIVE, INC

METER NO: 156 210 842

DESIGN SPECIFICATION

OCCUPANCY: II

CONSTRUCTION: SINGLE-FAMILY ZONING: RESIDENTIAL

GROUND SNOW LOAD: REFER STRUCTURAL LETTER WIND EXPOSURE: REFER STRUCTURAL LETTER

WIND SPEED: 118 MPH

APPLICABLE CODES & STANDARDS

BUILDING: IBC 2018, IRC 2018, FBC 2020 (7TH EDITION)

ELECTRICAL: NEC 2017 FIRE: IFC 2020

IPHASE IQ8PLUS-72-2-US

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2.1.1 SITE NOTES:

- 2.1.2 A LADDER WILL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
- 2.1.3 THE PV MODULESARECONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY INTERACTIVE SYSTEM WITH NO STORAGE BATTERIES.
- 2.1.4 THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING. MECHANICAL. OR BUILDING ROOF VENTS.
- 2.1.5 PROPERACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PERSECTION NEC 110.26.
- 2.1.6 ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THIS CODE AND THE APPROVED MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERING SERVES TO PROTECT THE BUILDING OR STRUCTURE.
- 2.2.1 EQUIPMENT LOCATIONS:
- 2.2.2 ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY 2.5.5 EQUIPMENT GROUNDING CONDUCTORS SHALLBE SIZED NEC 110.26.
- 2.2.3 WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED MANUFACTORERS' INSTRUCTIONS. FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY NEC 690.31 2.5.6 EACH MODULE WILL BE GROUNDED USING WEEB (A),(C) AND NEC TABLES 310.15 (B)(2)(A) AND 310.15 (B)(3)(C).
- 2.2.4 JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV MODULES ACCORDING TO NEC 690.34.
- 2.2.5 ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE INVERTER IS NOT WITHIN SIGHT OF THE AC SERVICING DISCONNECT. 2.2.6 ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL ACCORDING TO NEC APPLICABLE CODES.
- 2.2.7 ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.

2.3.1 STRUCTURAL NOTES:

- 2.3.2 RACKING SYSTEM & PV ARRAY WILL BE INSTALLED ACCORDING TO CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUSTALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY, ACCORDING TO RAI MANUFACTURER'S INSTRUCTIONS.
- 2.3.3 JUNCTION BOX WILL BE INSTALLED PER MANUFACTURERS' SPECIFICATIONS. IF ROOF-PENETRATING TYPE, IT SHALL BE FLASHED & SEALED PER LOCAL REQUIREMENTS.
- 2.3.4 ROOFTOP PENETRATIONS FOR PV RACEWAY WILLBE COMPLETED AND SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.
- 2.3.5 ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER.
- 2.3.6 WHEN POSSIBLE, ALL PV RELATED RACKING ATTACHMENTS WILL BE STAGGERED AMONGST THE ROOF FRAMING MEMBERS.

2.4.1 WIRING & CONDUIT NOTES:

- 2.4.2 ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE, CONDUIT AND WIRE SPECIFICATIONS AREBASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.
- 2.4.3 CONDUCTORS SIZED ACCORDING TO NEC 690.8, NEC 690.7.
- 2.4.4 VOLTAGE DROP LIMITED TO 1.5%.
- 2.4.5 DC WIRING LIMITED TO MODULE FOOTPRINT. MICROINVERTER WIRING SYSTEMS SHALL BE LOCATED AND SECURED UNDER THE ARRAY W/ SUITABLE WIRING CLIPS.

2.4.6 AC CONDUCTORS COLORED OR MARKED AS FOLLOWS: PHASE A OR L1- BLACK PHASE B OR L2- RED, OR OTHER CONVENTION IF THREE PHASE PHASE C OR L3-BLUE, YELLOW, ORANGE**, OR OTHER CONVENTION NEUTRAL-WHITE OR GREY IN 4-WIRE DELTA CONNECTED SYSTEMS THE PHASE WITH HIGHER VOLTAGE TO BE MARKED ORANGE INEC 110.15].

2.5.1 GROUNDING NOTES:

2.5.2 GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVISES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH USE.

2.5.3 PV EQUIPMENT SHALL BE GROUNDED ACCORDING TO NEC 690.43 AND MINIMUM NEC TABLE 250.122.

2.5.4 METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND ENCLOSURES CONSIDERED GROUNDED IN ACCORD WITH 250.134 AND 250.136(A).

ACCORDING TO NEC 690.45 AND MICROINVERTER

GROUNDING CLIPS AS SHOWN IN

MANUFACTURERDOCUMENTATION AND APPROVED BY THE AHJ. IF WEEBS ARE NOT USED, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE SPECIFIED GROUNDING LUG HOLES PER THE MANUFACTURERS' INSTALLATION REQUIREMENTS.

2.5.7 THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OFA MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE. 2.5.8 GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLORED GREEN OR MARKED GREEN IF #4 AWG OR LARGER [NEC 250.119]

2.5.9 THE GROUNDING ELECTRODE SYSTEM COMPLIES WITH NEC 690.47 AND NEC 250.50 THROUGH 250.106. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, A GROUNDING ELECTRODE SYSTEM PROVIDED ACCORDING TO NEC 250, NEC 690,47 AND

2.5.10 GROUND-FAULT DETECTION SHALL COMPLY WITH NEC 690.41(B)(1) AND (2) TO REDUCE FIRE HAZARDS

2.6.1 DISCONNECTION AND OVER-CURRENT PROTECTION NOTES:

2.6.2 DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHENTHE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARECONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS). 2.6.3 DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH 2.6.4 PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION TO REDUCE SHOCK HAZARD FOR EMERGENCY RESPONDERS IN ACCORDANCE WITH 690.12(A) THROUGH (D). 2.6.5 ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING

TO NEC 690.8, 690.9, AND 240.

2.6.6 MICROINVERTER BRANCHES CONNECTED TO A SINGLE BREAKER OR GROUPED FUSES IN ACCORDANCE WITH NEC 110.3(B).

2.6.7 IF REQUIRED BY AHJ, SYSTEM WILL INCLUDE ARC-FAULT CIRCUIT PROTECTION ACCORDING TO NEC 690.11 AND UL1699B.

2.7.1 INTERCONNECTION NOTES:

2.7.2 LOAD-SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH [NEC 705.12 (B)] 2.7.3 THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS OUTPUT MAY NOT EXCEED 120% OF BUSBAR RATING [NEC 705.12(B)(2)(3)(b)]. 2.7.4 THE SUM OF 125 PERCENT OF THE POWER SOURCE(S) OUTPUT CIRCUIT CURRENT AND THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE BUSBAR SHALL NOT EXCEED 120 PERCENT OF THE AMPACITY OF THE BUSBAR. PV DEDICATED BACKFEED BREAKERS MUST BE LOCATED OPPOSITE END OF THE BUS FROM THE UTILITY SOURCE OCPD [NEC 705.12(B)(2)(3)]. 2.7.5 AT MULTIPLE ELECTRIC POWER SOURCES OUTPUT

COMBINER PANEL, TOTAL RATING OF ALL OVERCURRENT DEVICES SHALL NOT EXCEED AMPACITY OF BUSBAR. HOWEVER, THE COMBINED OVERCURRENT DEVICE MAY BE EXCLUDED ACCORDING TO NEC 705.12 (B)(2)(3)(C). 2.7.6 FEEDER TAP INTERCONECTION (LOADSIDE) ACCORDING TO NEC 705.12 (B)(2)(1) 2.7.7 SUPPLY SIDE TAP INTERCONNECTION ACCORDING TO NEC 705.12 (A) WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.42 2.7.8BACKFEEDING BREAKER FOR ELECTRIC POWER SOURCES OUTPUT IS EXEMPT FROM ADDITIONAL FASTENING [NEC 705.12 (B)(5)].

CONTRACTOR



22171 MCH RD MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

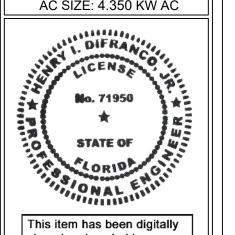
JOHN GOODRUM

289 **SW GRANITE CT,** LAKE CITY, FL 32024

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 5.925 KW DC-(STC) AC SIZE: 4.350 KW AC



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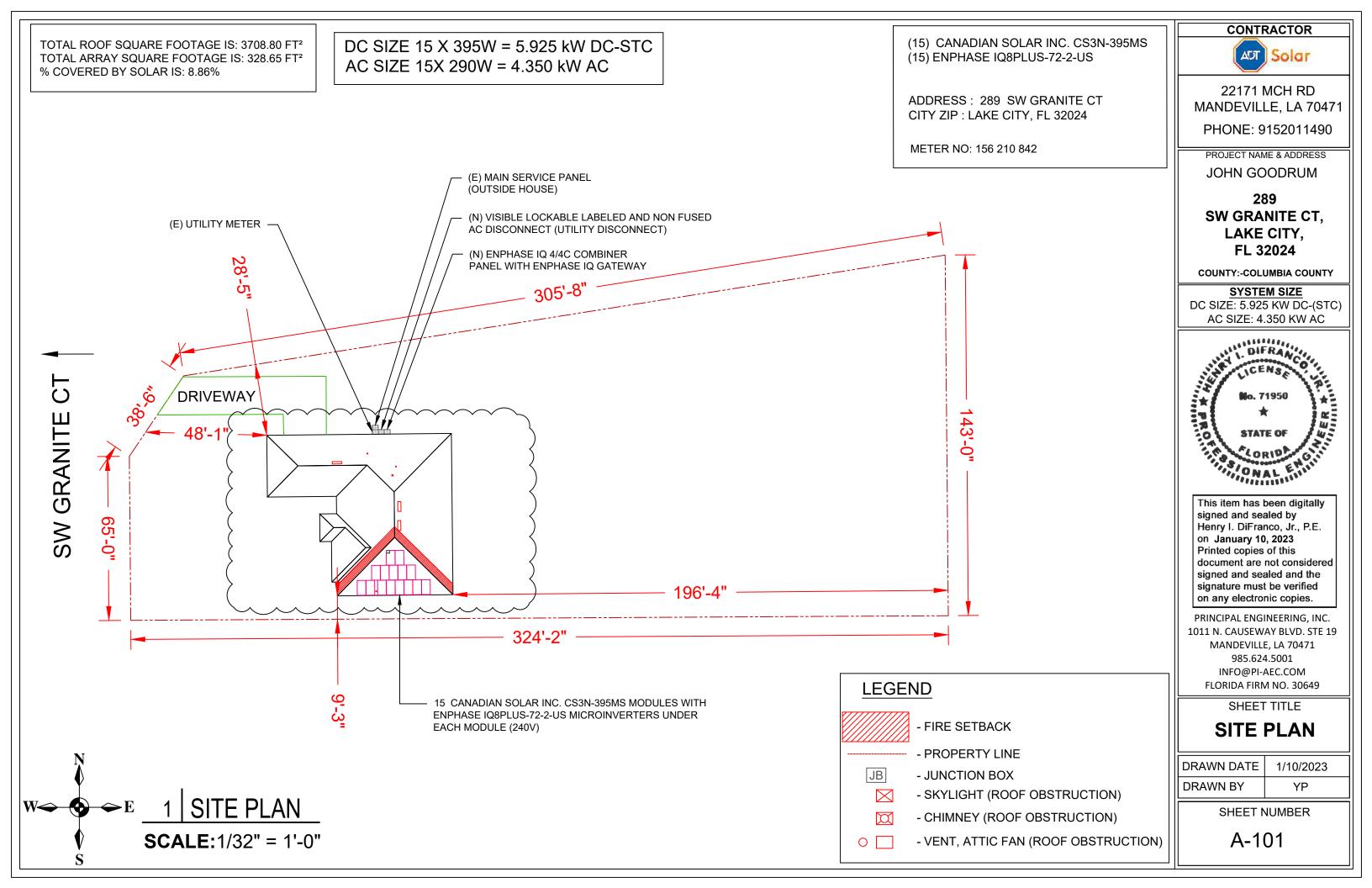
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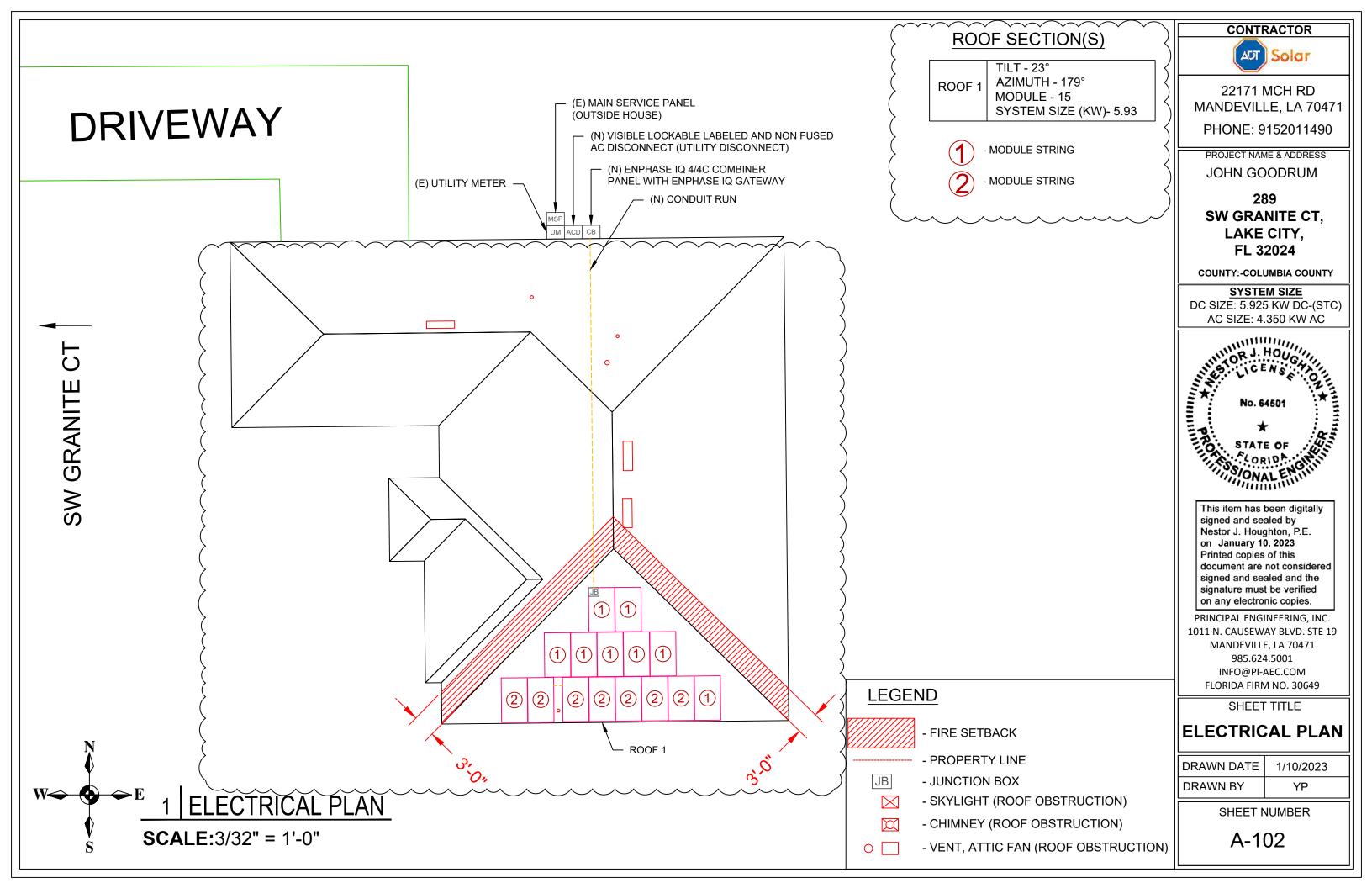
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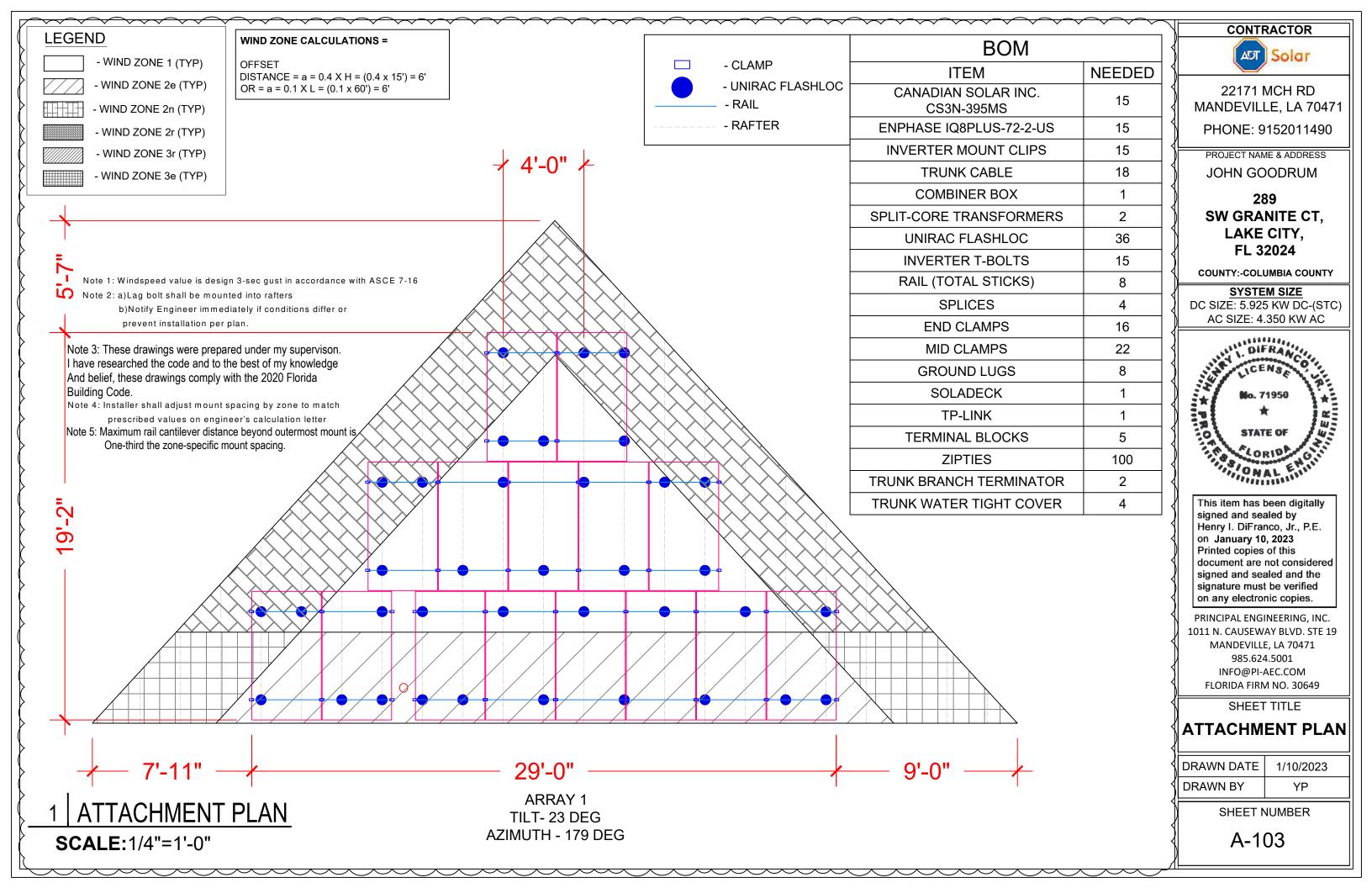
DRAWN DATE	1/10/2023
DRAWN BY	YP

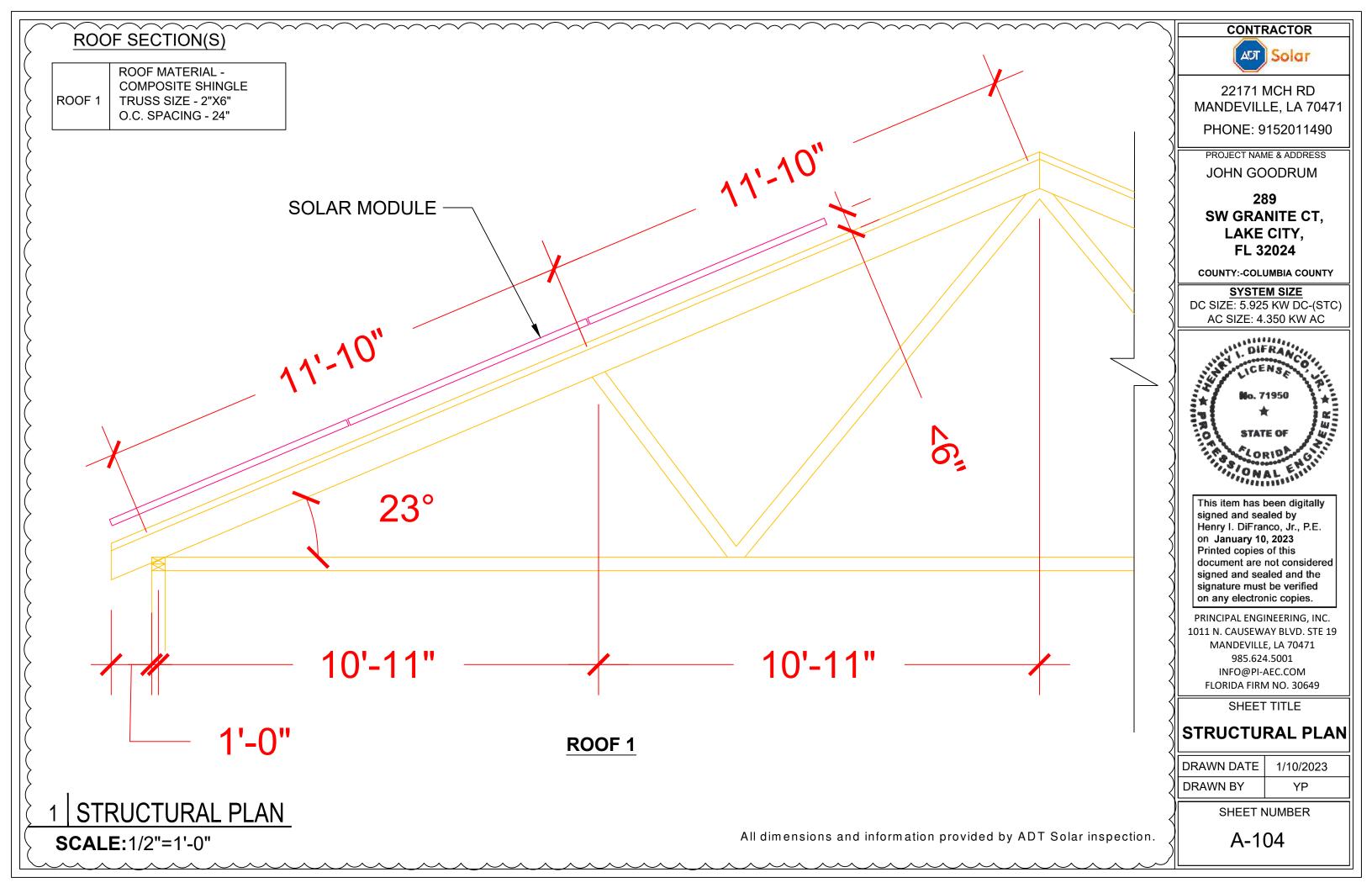
SHEET NUMBER

G-002









SOLAR MODULE SPECIFICATIONS		
MANUFACTURER / MODEL #	CANADIAN SOLAR INC. CS3N-395MS	
VMP	37V	
IMP	10.68A	
VOC	44.3V	
ISC	11.44A	
TEMP. COEFF. VOC	-0.26%/°C	
MODULE DIMENSION	76.4"L x 41.3"W x 1.4"D (In Inch)	

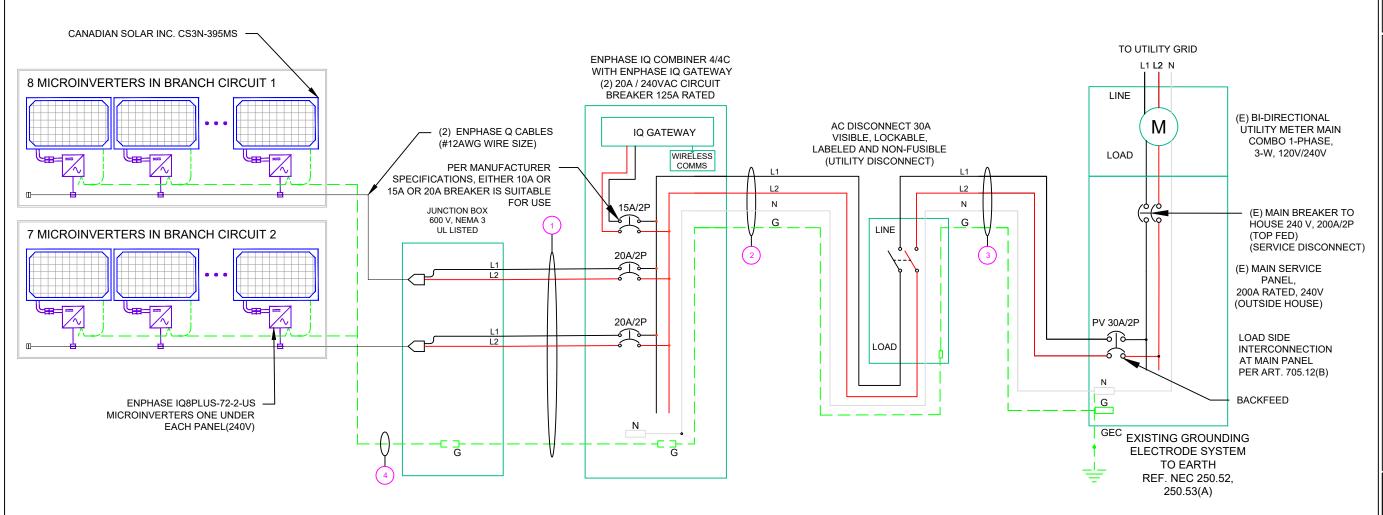
INVERTER SPECIFICATIONS		
MANUFACTURER / MODEL #	ENPHASE IQ8PLUS-72-2-US MICROINVERTER	
MIN/MAX DC VOLT RATING	30V MIN/ 58V MAX	
MAX INPUT POWER	235W-440W	
NOMINAL AC VOLTAGE RATING	240V/ 211-264V	
MAX AC CURRENT	1.21A	
MAX MODULES PER STRING	13 (SINGLE PHASE)	
MAX OUTPUT POWER	290 VA	

	WIRE /CONDUIT SCHEDULE		
TAG	DESCRIPTION		
1	(2)#10/2 ROMEX IN ATTIC/ (4)#10 THWN-2 ON EXTERIOR & (1)#10 THWN-2 GROUND / (GN)		
2	(3)#10 THWN-2 & (1)#10 THWN-2 GROUND / (GN)		
3	(3)#10 THWN-2 & (1)#10 THWN-2 GROUND / (GN)		
4	(1)#6 BARE GROUND		

DC SIZE 15 X 395W = 5.925 kW DC-STC AC SIZE 15X 290W = 4.350 kW AC

(GN) GENERAL CONDUIT NOTE:
CONDUIT TO BE UL LISTED FOR WET LOCATIONS AND UV
PROTECTED (EX. -EMT,SCH 80 PVC OR RMC)*FMC MAYBE
USED IN INDOOR APPLICATIONS WHERE PERMITTED BY
NEC ART .348

METER NO: 156 210 842



SOLAR BREAKER LOCATED AT THE FURTHEST END OF BUSBAR FROM THE MAIN BREAKER OR FEEDER UNIT

CONTRACTOR



22171 MCH RD MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

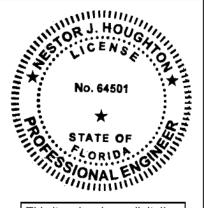
JOHN GOODRUM

289 SW GRANITE CT, LAKE CITY, FL 32024

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 5.925 KW DC-(STC) AC SIZE: 4.350 KW AC



This item has been digitally signed and sealed by Nestor J. Houghton, P.E. on January 10, 2023 Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

PRINCIPAL ENGINEERING, INC.

1011 N. CAUSEWAY BLVD. STE 19
MANDEVILLE, LA 70471
985.624.5001
INFO@PI-AEC.COM
FLORIDA FIRM NO. 30649

SHEET TITLE

LINE DIAGRAM

DRAWN DATE	1/10/2023
DRAWN BY	YP

SHEET NUMBER

E-601

AMBIENT TEMPERATURE SPECS		
RECORD LOW TEMP	-5°	
AMBIENT TEMP (HIGH TEMP 2%)	34°	
CONDUIT HEIGHT	0.5"	
CONDUCTOR TEMPERATURE RATE	90°	

	PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS
1	.80	4-6
1	.70	7-9
1	.50	10-20

CALCULATIONS:

- 1. CURRENT CARRYING CONDUCTOR
- (A) <u>BEFORE IQ COMBINER PANEL</u>
 AMBIENT TEMPERATURE (34)°C ...NEC 310.15(B)(3)(c)
 TEMPERATURE DERATE FACTOR 0.96 ...NEC
 310.15(B)(2)(a)
 GROUPING FACTOR 0.8...NEC 310.15(B)(3)(a)

CONDUCTOR AMPACITY

- $= (INV O/P CURRENT) \times 1.25 / A.T.F / G.F ...NEC 690.8(B)$
- $= [(8 \times 1.21) \times 1.25] / [0.96 \times 0.8]$
- = 15.76A

SELECTED CONDUCTOR - #10 THWN-2 ...NEC 310.15(B)(16)

(B) AFTER IQ COMBINER PANEL
TEMPERATURE DERATE FACTOR - 0.96
GROUPING FACTOR - 1

CONDUCTOR AMPACITY

- $= (TOTAL INV O/P CURRENT) \times 1.25 / 0.96 / 1 ... NEC 690.8(B)$
- $= [(15 \times 1.21) \times 1.25] / [0.96 \times 1]$
- = 23.63 A

SELECTED CONDUCTOR - #10 THWN-2 ...NEC 310.15(B)(16)

2. PV OVER CURRENT PROTECTION ...NEC 690.9(B)
= TOTAL INVERTER O/P CURRENT x 1.25
= (15 x 1.21) x 1.25 = 22.69 A
SELECTED OCPD = 30A ...NEC 240.6

3. <u>120% RULE FOR BACKFEED BREAKER</u> ...NEC 705.12(B)(2)(3)(b)

MCB + PV BREAKER <= (1.2 x BUS BAR RATING RATING)

(200 + 30) <= 1.2 x 200A

230.00 <= 240.00 HENCE OK

CONTRACTOR



22171 MCH RD MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

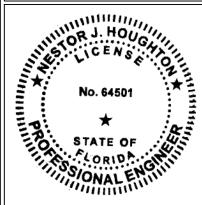
JOHN GOODRUM

289 SW GRANITE CT, LAKE CITY, FL 32024

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 5.925 KW DC-(STC) AC SIZE: 4.350 KW AC



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PRINCIPAL ENGINEERING, INC.

1011 N. CAUSEWAY BLVD. STE 19

MANDEVILLE, LA 70471

985.624.5001

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FLORIDA FIRM NO. 30649

SHEET TITLE ELECTRICAL CALCULATIONS

DRAWN DATE	1/10/2023
DRAWN BY	YP

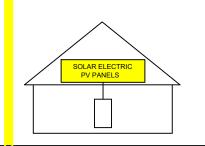
SHEET NUMBER

E-602

WARNING: PHOTOVOLTAIC POWER SOURCE

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



AC DISCONNECT

WARNING 🗥

ELECTRIC SHOCK HAZARD

DO NOT TOUCH TERMINALS.

TERMINALS ON BOTH LINE AND LOAD SIDES

MAY BE ENERGIZED IN THE OPEN POSITION

PHOTOVOLTAIC SYSTEM AC DISCONNECT /!

OPERATING VOLTAGE: 240 VOLTS
OPERATING CURRENT: 18.15 AMPS

SOLAR BREAKER

AC COMBINER BOX

PHOTOVOLTAIC
MICROINVERTERS
LOCATED UNDER
EACH PV MODULE IN
ROOFTOP ARRAY

PHOTOVOLTAIC SYSTEM
EQUIPPED WITH
RAPID SHUTDOWN

RATED AC OUTPUT CURRENT:____
NOM. OPERATING VOLTAGE:

WARNING DUAL POWER SOURCES

SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

____KW SOLAR DISCONNECT LOCATED

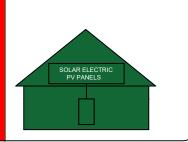




WARNING INVERTER OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE

EMERGENCY RESPONDER
THIS SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN

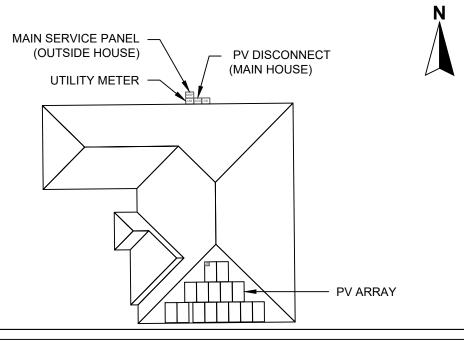
TURN RAPID SHUTDOWN SWITCH TO THE 'OFF' POSITION TO SHUTDOWN ENTIRE PV SYSTEM.



THE LABEL SHALL BE REFLECTIVE, WITH ALL LETTERS CAPITALIZED AND HAVING A MINIMUM HEIGHT OF 3/8 IN. (9.5 MM), IN WHITE ON A RED BACKGROUND.

CAUTION

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN:



CONTRACTOR



22171 MCH RD MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

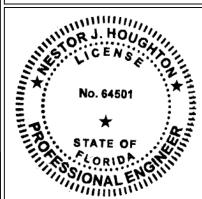
JOHN GOODRUM

289 SW GRANITE CT, LAKE CITY, FL 32024

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 5.925 KW DC-(STC) AC SIZE: 4.350 KW AC



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PRINCIPAL ENGINEERING, INC.

1011 N. CAUSEWAY BLVD. STE 19

MANDEVILLE, LA 70471

985.624.5001

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FLORIDA FIRM NO. 30649

SHEET TITLE

PLACARD

DRAWN DATE	1/10/2023
DRAWN BY	YP

SHEET NUMBER

E-603





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*



Industry Leading Product Warranty on Materials and Workmanship*



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 / :EC 62716





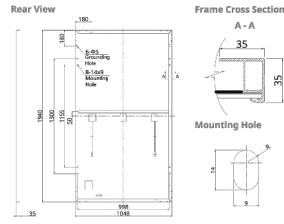
* The specific certificates applicable to different module types and markets will vary, and therefore not all of the certifications listed herein will simultaneously apply to the products you order or use. Please contact your local Canadian Solar sales representative to confirm the specific certificates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



ELECTRICAL DATA | STC*

				_				
CS3N	380MS	385MS	390N	S	395MS	400MS	405MS	
Nominal Max. Power (Pmax)	380 W	385 W	390 V	V	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	10.60	Α	10.68 A	10.76 A	10.83 A	
Open Circuit Voltage (Voc)	43.7 V	43.9 V	44.1	1	44.3 V	44.5 V	44.7 V	
Short Circuit Current (Isc)	11.26 A	11.32	11.38	Α	11.44 A	11.50 A	11.56 A	
Module Efficiency	18.7%	18.9%	19.29	6	19.4%	19.7%	19.9%	
Operating Temperature	-40°C ~	+85°C						
Max. System Voltage	1000V	(UL)						
Module Fire Performance	TYPE 2	(UL 617	30 10	00)V)			
Max. Series Fuse Rating	20 A							
Application Classification	Class A	ı						
Power Tolerance	0 ~ + 10) W						
* Under Standard Test Conditions (STC)	of irradia	nce of 100	0 W/m²,	sp	ectrum Al	vi 1.5 and	cell temperat	ure of

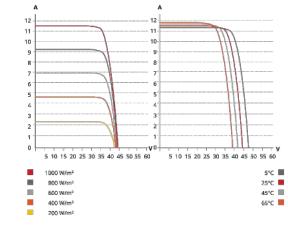
ELECTRICAL DATA | NMOT*

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
Attacks to the sale of the One continue To		(A14 (A)		- 5 000 1111	- 2	444 4 E bl

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

* 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.

CS3N-400MS / I-V CURVES



MECHANICAL DATA

Specification	Data
Cell Type	Mono-crystalline
Cell Arrangement	132 [2 X (11 X 6)]
Dimensions	1940 X 1048 X 35 mm
Dimensions	(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); land-scape: 1250 mm (49.2 in)*
Connector	T4 or MC4 series
Per Pallet	30 pieces
Per Container (40' HQ)	720 pieces
* For detailed information, ple	ease contact your local Canadian Solar sales and

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 Tempera	ature 42 ± 3°C

PARTNER SECTION

Jan. 2022 | All rights reserved | PV Module Product Datasheet v2.9C25_F23_J3_NA

RESOURCE DOCUMENT

DRAWN DATE	1/10/2023
DRAWN BY	YP

SHEET NUMBER

SHEET TITLE

CONTRACTOR

22171 MCH RD MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

JOHN GOODRUM

289 SW GRANITE CT, LAKE CITY, FL 32024

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 5.925 KW DC-(STC)

AC SIZE: 4.350 KW AC

Solar

AUT

R-001

CSI SOLAR (USA) CO., LTD.

^{*} For detailed information, please refer to Installation Manual.







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.



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



of up to 25 years.

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

IQ8 Series Microinverters redefine reliability

standards with more than one million

cumulative hours of power-on testing, enabling an industry-leading limited warranty

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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 highpowered 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

(1) No enforced DC/AC ratio. See the compatibility calculator at https://link.enphase.com/

local requirements to define the number of microinverters per branch in your area.

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

Commonly used module pairings ¹	NO DESCRIPTION		
	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	٧	27 – 37	29 - 45
Operating range	V	25 - 48	25 - 58
Min/max start voltage	٧	30 / 48	30 / 58
Max input DC voltage	V	50	60
Max DC current ² [module lsc]	A		15
Overvoltage class DC port			I .
DC port backfeed current	mA		0
PV array configuration		1x1 Ungrounded array; No additional DC side pr	otection required; AC side protection requires max 20A per branch circuit
DUTPUT DATA (AC)		108-60-2-US	IQ8PLUS-72-2-US
Peak output power	VA	245	300
Max continuous output power	VA	240	290
Nominal (L-L) voltage/range ³	٧		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	H ⁴	16	13
Total harmonic distortion			<5%
Overvoltage class AC port			Ш
AC port backfeed current	mA		30
Power factor setting			10
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	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 1m			<60 dBA
Pollution degree			PD3
Enclosure		Class II double-insu	ulated, corrosion resistant polymeric enclosure
Environ. category / UV exposure rating	9		NEMA Type 6 / outdoor
COMPLIANCE			

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

690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to

CONTRACTOR



22171 MCH RD MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

JOHN GOODRUM

289 SW GRANITE CT, LAKE CITY, FL 32024

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 5.925 KW DC-(STC) AC SIZE: 4.350 KW AC

SHEET TITLE
RESOURCE
DOCUMENT

DRAWN DATE 1/10/2023
DRAWN BY YP

SHEET NUMBER

Data Sheet Enphase Networking

Enphase IQ Combiner 4/4C

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



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

⊖ 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 (AN C12.20 +/-0.5%) and consumption monitoring (+/-2.5%). Includes a silver solar shield to match the IQ Battery system at 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 Riico, and the US Virgin Islands, where is a dequate cellular service in the installation area,) Includes a silver solar shield to match the IQ Battery and IQ System Controller and to deflect her
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-52A-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 BR215 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 soliid 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	903 11h (m /m
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

To learn more about Enphase offerings, visit enphase.com

Compliance, IQ Gateway

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UL 60601-1/CANCSA 22.2 No. 61010-1



CONTRACTOR



22171 MCH RD MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

JOHN GOODRUM

289 SW GRANITE CT, LAKE CITY, FL 32024

COUNTY:-COLUMBIA COUNTY

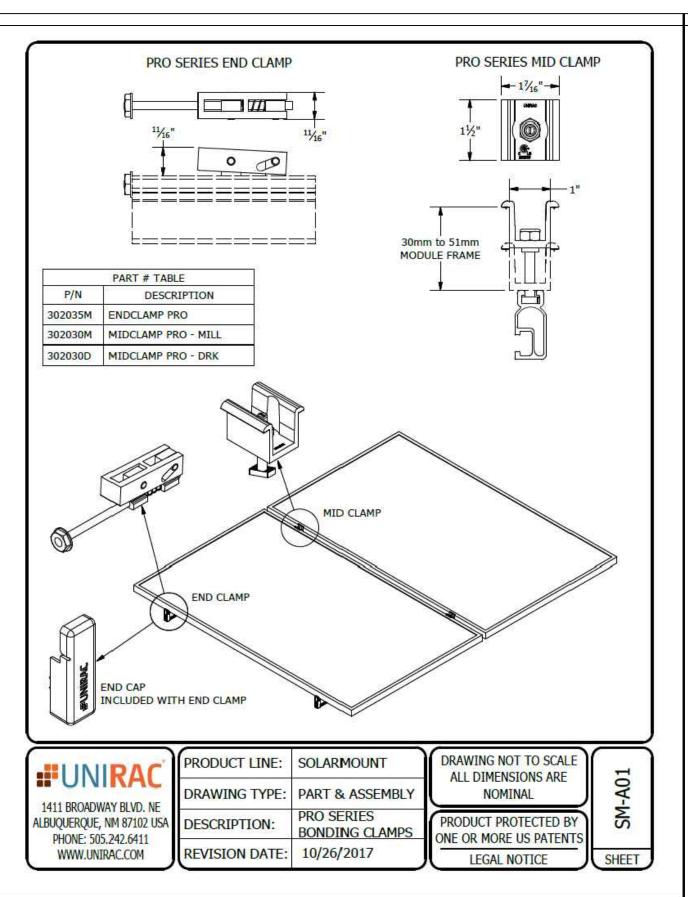
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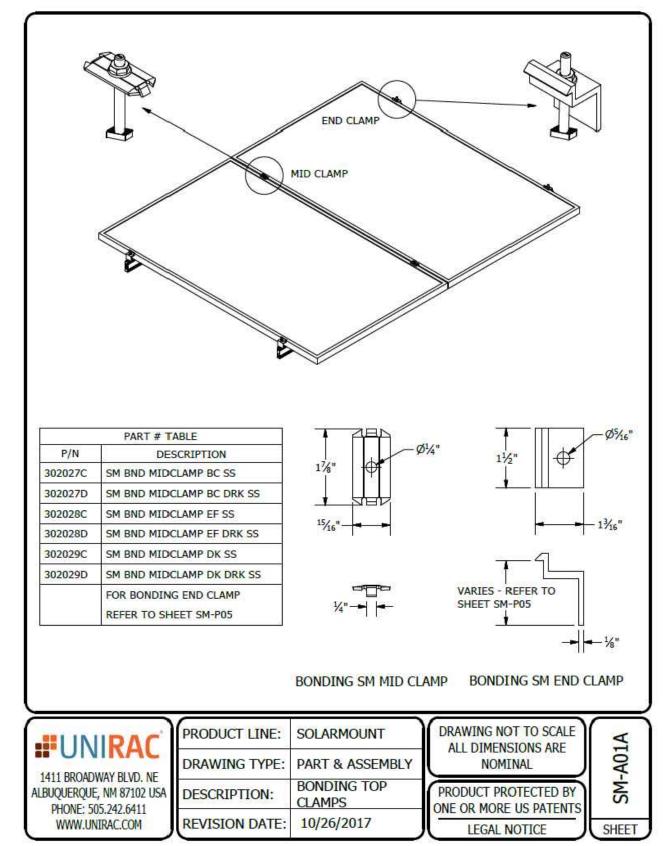
DC SIZE: 5.925 KW DC-(STC) AC SIZE: 4.350 KW AC

SHEET TITLE
RESOURCE
DOCUMENT

DRAWN DATE 1/10/2023
DRAWN BY YP

SHEET NUMBER





CONTRACTOR

22171 MCH RD MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

JOHN GOODRUM

289 SW GRANITE CT,

> LAKE CITY, FL 32024

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 5.925 KW DC-(STC)

AC SIZE: 4.350 KW AC

SHEET TITLE

RESOURCE

DOCUMENT

SHEET NUMBER

R-004

1/10/2023

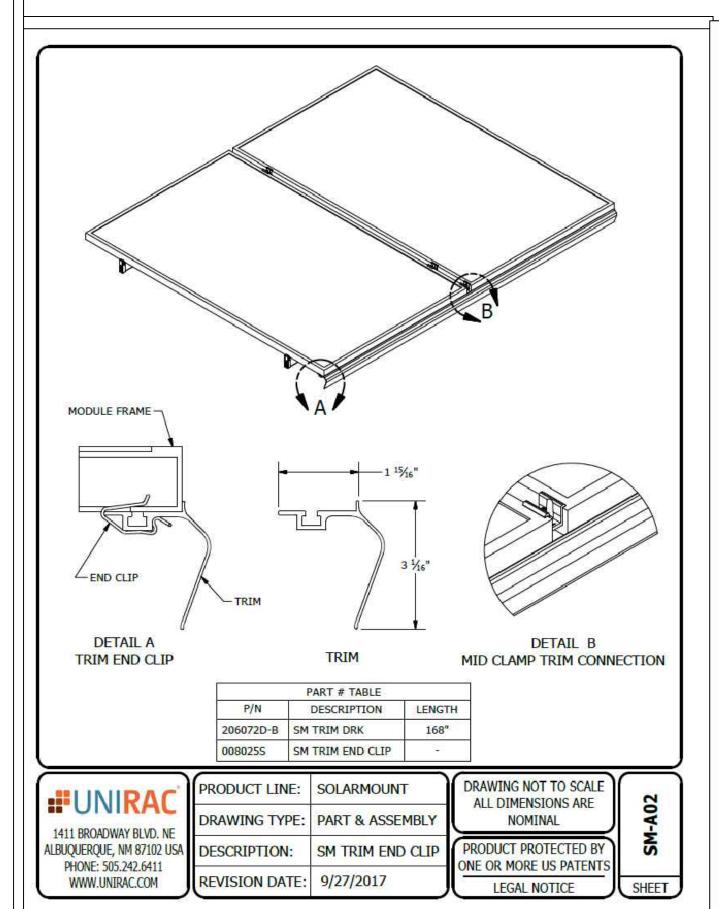
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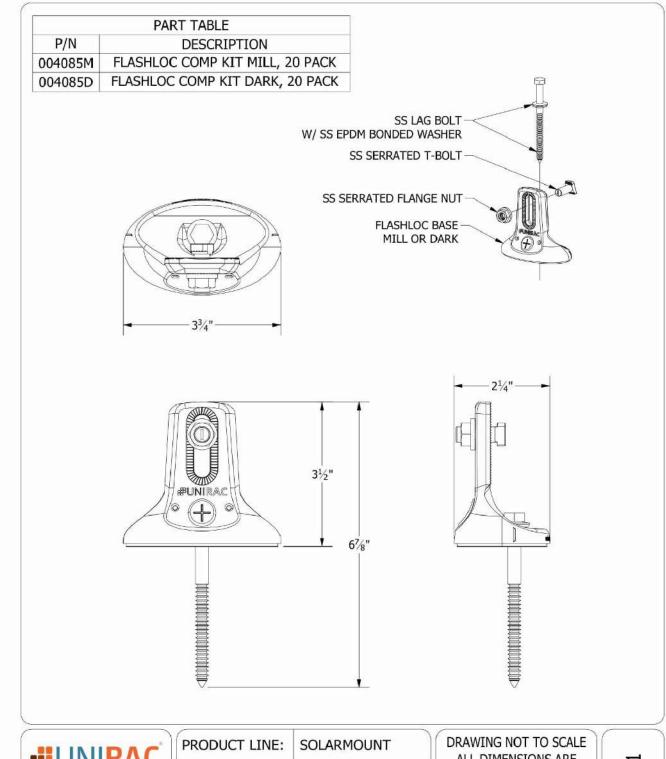
DRAWN DATE

DRAWN BY

Solar

AUT





#UNIRAC

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

DRAWING TYPE: PART DRAWING

DESCRIPTION: FLASHLOC COMP KIT

REVISION DATE: 10/3/2019

DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE OR MORE US PATENTS LEGAL NOTICE

FL-A01

SHEET TITLE RESOURCE DOCUMENT

CONTRACTOR

22171 MCH RD

MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

JOHN GOODRUM

289

SW GRANITE CT, LAKE CITY, FL 32024

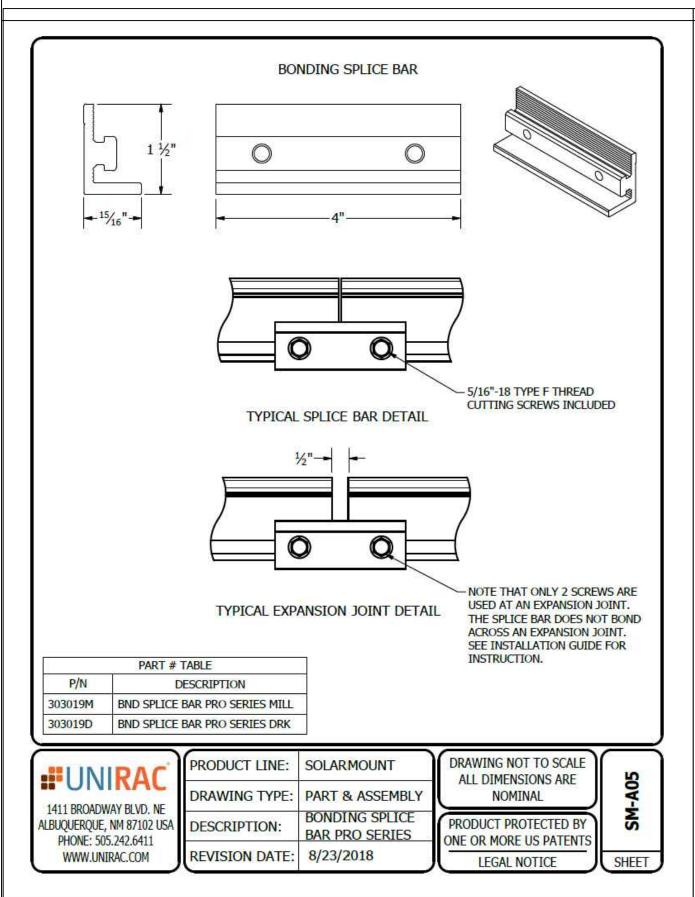
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AC SIZE: 4.350 KW AC

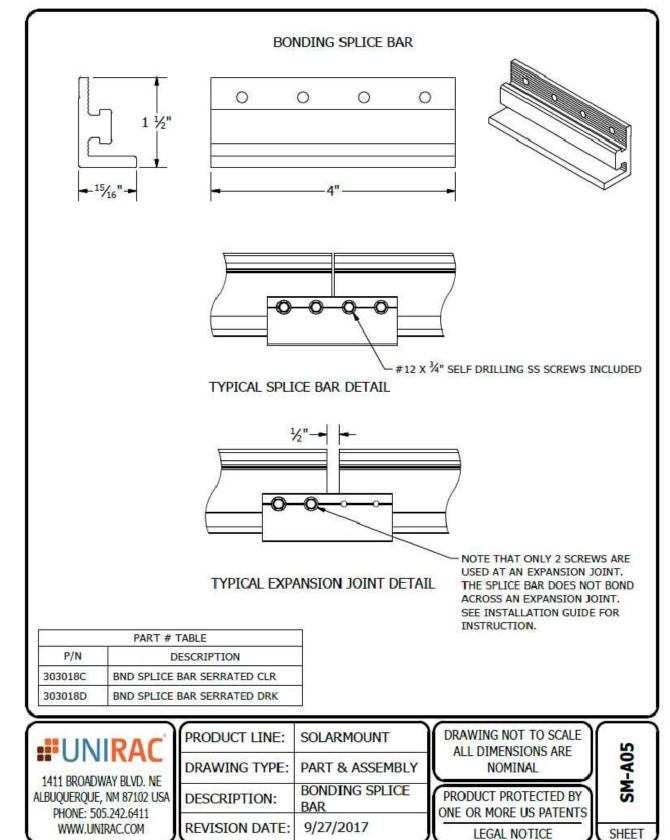
Solar

AUT

DRAWN DATE 1/10/2023
DRAWN BY YP

SHEET NUMBER





CONTRACTOR

22171 MCH RD MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

JOHN GOODRUM

289
SW GRANITE CT,
LAKE CITY,
FL 32024
COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE
DC SIZE: 5.925 KW DC-(STC)
AC SIZE: 4.350 KW AC

SHEET TITLE

RESOURCE

DOCUMENT

SHEET NUMBER

R-006

1/10/2023

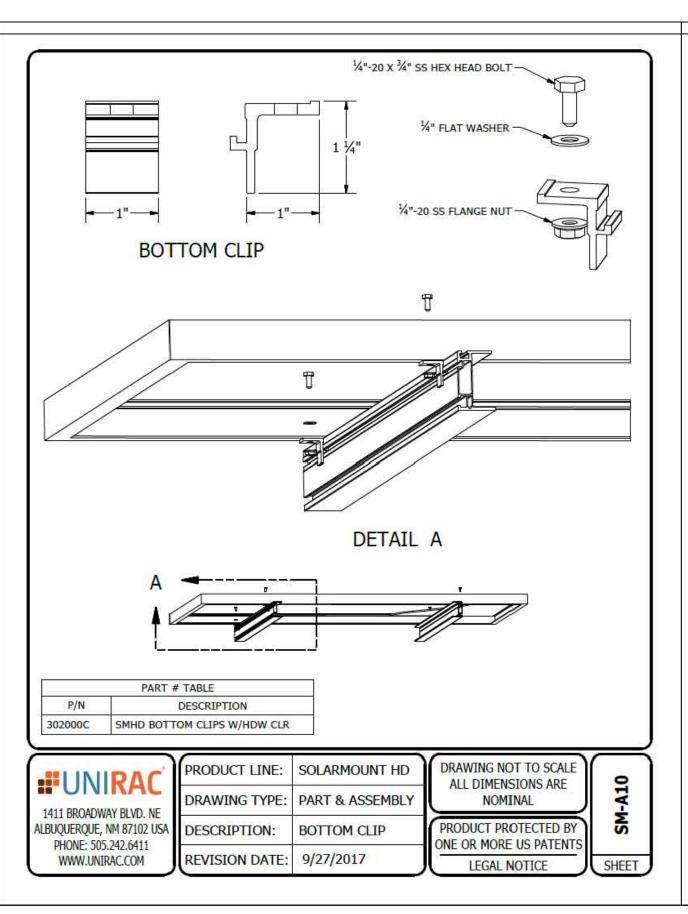
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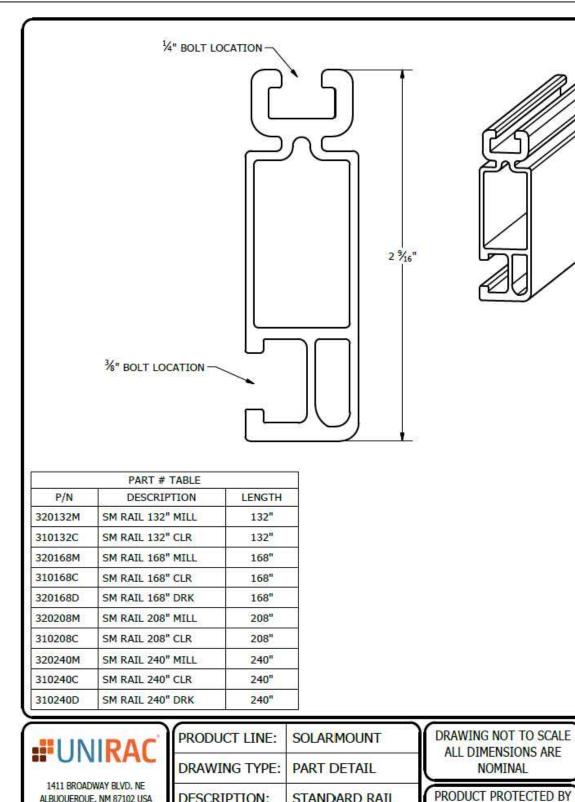
DRAWN DATE

DRAWN BY

Solar

AUT





ALBUQUERQUE, NM 87102 USA

PHONE: 505.242.6411

WWW.UNIRAC.COM

DESCRIPTION:

REVISION DATE:

STANDARD RAIL

9/11/2017

CONTRACTOR



22171 MCH RD MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

JOHN GOODRUM

289 SW GRANITE CT, LAKE CITY, FL 32024

COUNTY:-COLUMBIA COUNTY

SYSTEM SIZE

DC SIZE: 5.925 KW DC-(STC) AC SIZE: 4.350 KW AC

> SHEET TITLE **RESOURCE DOCUMENT**

DRAWN DATE	1/10/2023
DRAWN BY	YP

-P01

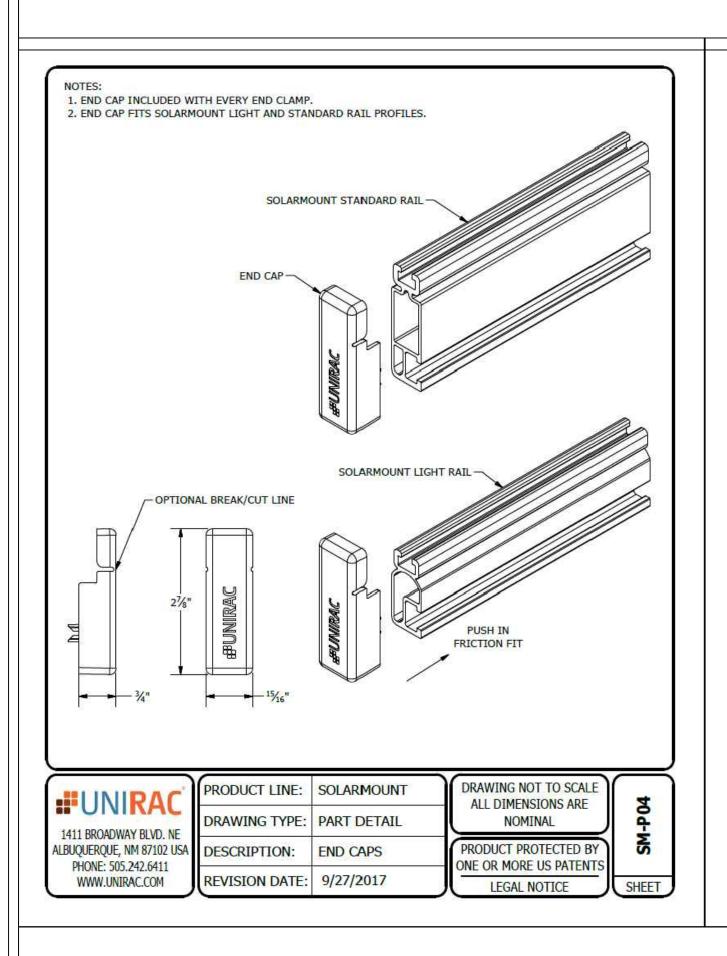
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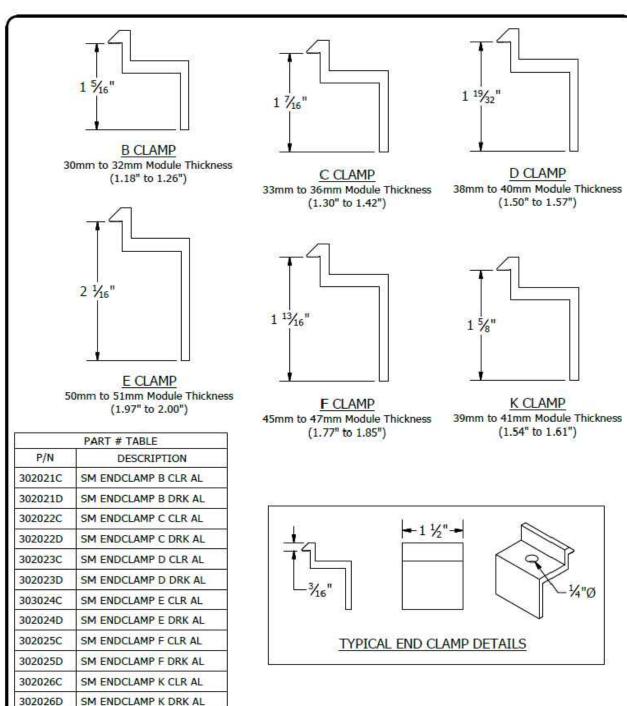
SHEET

ONE OR MORE US PATENTS

LEGAL NOTICE

SHEET NUMBER





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

PRODUCT LINE: SOLARMOUNT DRAWING TYPE: PART DETAIL END CLAMPS -DESCRIPTION: TOP MOUNTING 9/27/2017 REVISION DATE:

DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE OR MORE US PATENTS LEGAL NOTICE SHEET

SM

SHEET TITLE **RESOURCE DOCUMENT**

DRAWN DATE 1/10/2023 **DRAWN BY** ΥP

CONTRACTOR

22171 MCH RD MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

JOHN GOODRUM

289

SW GRANITE CT,

LAKE CITY,

FL 32024

COUNTY:-COLUMBIA COUNTY SYSTEM SIZE DC SIZE: 5.925 KW DC-(STC) AC SIZE: 4.350 KW AC

Solar

SHEET NUMBER