PRINCIPAL Engineering

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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**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:

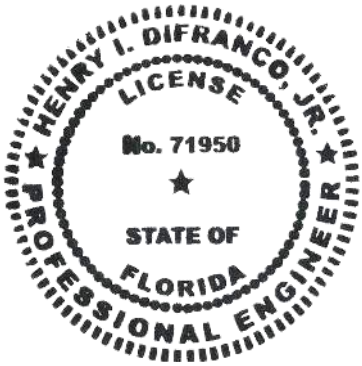
The solar panel array will be flush mounted (no more than 6" above the surrounding roof surface, and parallel to the roof surface. Any additional wind loading on the structure due to the presence of the array is negligible. The array structure is designed by the manufacturer to withstand uplift and downward 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 Chord | | |
| Roof Material | | Plywood | | |
| Risk Category: | | II | | |
| Basic Wind Speed: | | 118 | From 26.5-1 | |
| Exposure Category: | | C | Fig. 26.7 | |
| Topographic Factor ($K_{zt}$) | | 1.21 | Fig. 26.8-1 | |
| Wind Pressure @ h=30, $p_{net30}$ | | See Table Below | Fig. 30.4-1 | |
| Ht. & Exposure Adjustment (λ) | | 1.21 | Fig. 30.4-1 | |
| Adjusted Wind Pressures, $p_{net}$ | | See Table Below | Eq. 30.4-1 | |
| Effective Wind Area (sf): | | 8.22 | (Area per individual mount) | |

| Roof Zone Strip (a), in ft, Fig. 30.4-1, 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 (0.6W, ASCE 7-16) | θ |
| | | $P_{30net}$ | $IK_{zt}P_{30net}$ | | |
| gable /hip /flat | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Gable | | | | | |
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| | | | | | |
| | | | | | |
| Hip | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | Zone 1 | 35.3 | 51.7 | 31.0 | 20° < θ ≤ 27° |
| | Zone 2e,2r,3 | 48.7 | 71.4 | 42.8 | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

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| Snow Load | | |
|---|---|---|
| Ground Snow Load, $p_g$ | 0.0 | From ASCE 7 or AHJ |
| Terrain Category: | C | 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

PRINCIPAL Engineering

SDVOSB

## 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 |

## VICINITY MAP

## SATELLITE VIEW

## SHEET INDEX



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| R-005 | RESOURCE DOCUMENT |
| R-006 | RESOURCE DOCUMENT |
| R-007 | RESOURCE DOCUMENT |
| R-008 | RESOURCE DOCUMENT |



**CONTRACTOR**

ADT Solar

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

HENRY I. DIFRANCO, JR. LICENSE No. 71950 STATE OF FLORIDA PROFESSIONAL ENGINEER

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SHEET TITLE

**COVER PAGE**

| | |
|---|---|
| DRAWN DATE | 1/10/2023 |
| DRAWN BY | YP |

SHEET NUMBER

G-001

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 NEC 110.26.
2.2.3 WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY NEC 690.31 (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 [NEC 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).
2.5.5 EQUIPMENT GROUNDING CONDUCTORS SHALLBE SIZED ACCORDING TO NEC 690.45 AND MICROINVERTER MANUFACTORERS' INSTRUCTIONS.
2.5.6 EACH MODULE WILL BE GROUNDED USING WEEB 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 AHJ.
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**

ADT Solar

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PHONE: 9152011490

PROJECT NAME & ADDRESS

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**COUNTY:-COLUMBIA COUNTY**

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HENRY I. DIFRANCO, JR. LICENSE No. 71950 STATE OF FLORIDA PROFESSIONAL ENGINEER

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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

**NOTES**

| | |
|---|---|
| DRAWN DATE | 1/10/2023 |
| DRAWN BY | YP |

SHEET NUMBER

G-002

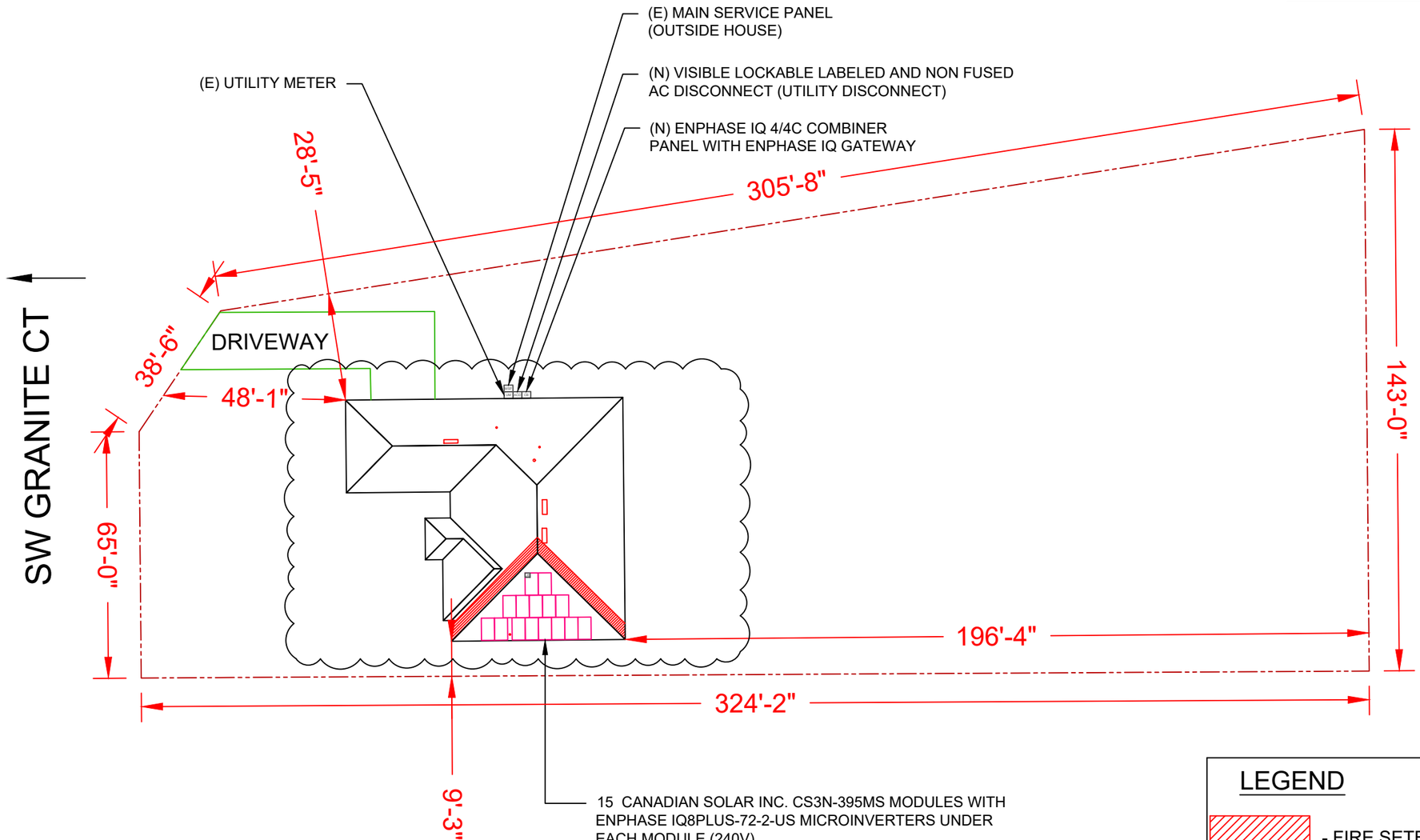
TOTAL ROOF SQUARE FOOTAGE IS: 3708.80 FT²
TOTAL ARRAY SQUARE FOOTAGE IS: 328.65 FT²
% COVERED BY SOLAR IS: 8.86%

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

(15) CANADIAN SOLAR INC. CS3N-395MS
(15) ENPHASE IQ8PLUS-72-2-US

ADDRESS : 289 SW GRANITE CT
CITY ZIP : LAKE CITY, FL 32024

METER NO: 156 210 842




N
W E
S

## 1 | SITE PLAN

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

LEGEND

- FIRE SETBACK
- PROPERTY LINE
- JB - JUNCTION BOX
- SKYLIGHT (ROOF OBSTRUCTION)
- CHIMNEY (ROOF OBSTRUCTION)
- VENT, ATTIC FAN (ROOF OBSTRUCTION)

**CONTRACTOR**

ADT Solar

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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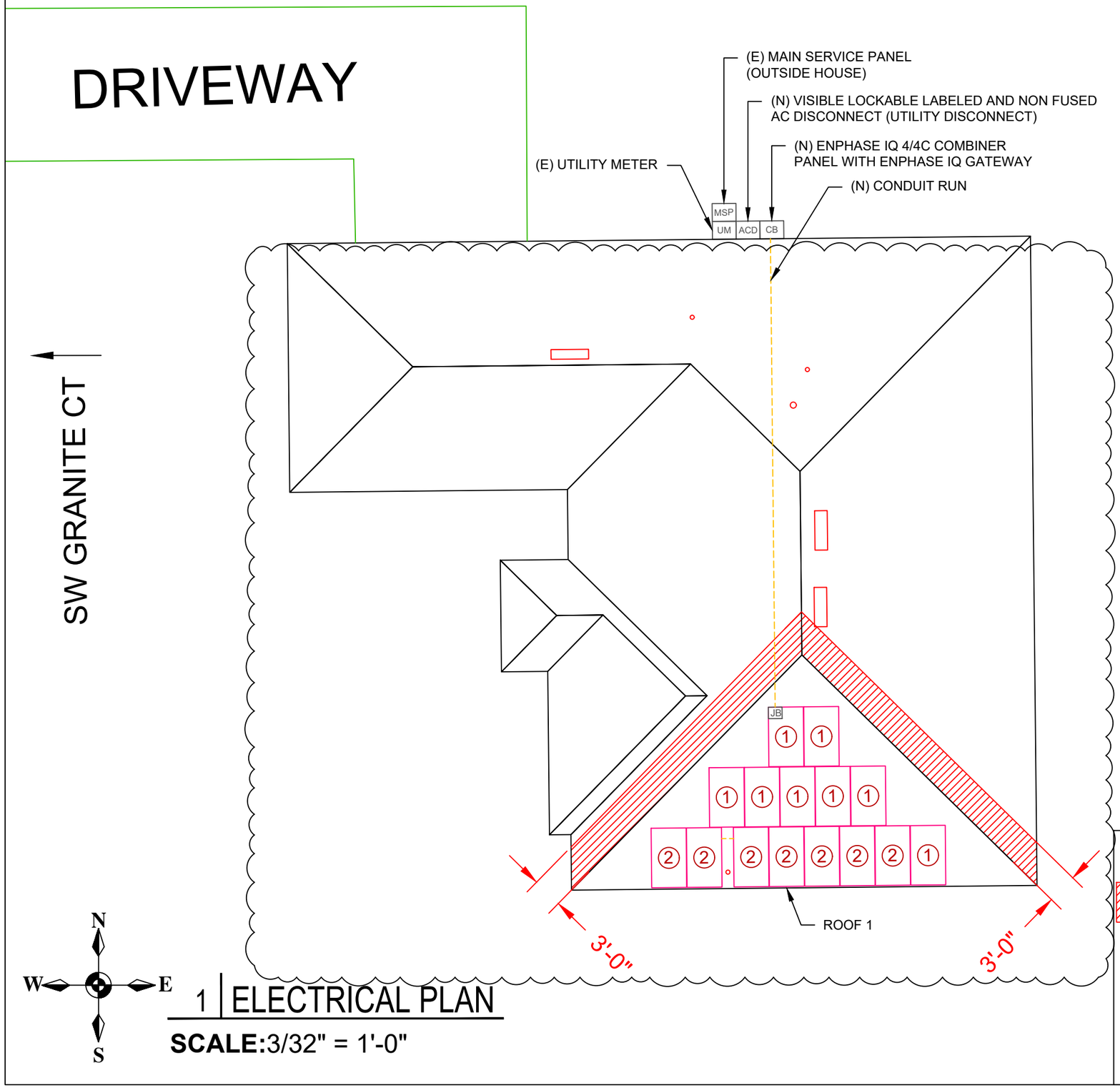
SHEET TITLE
**SITE PLAN**

| | |
|---|---|
| DRAWN DATE | 1/10/2023 |
| DRAWN BY | YP |

SHEET NUMBER
A-101




1 | ELECTRICAL PLAN

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

## ROOF SECTION(S)

| | |
|---|---|
| ROOF 1 | TILT - 23°<br>AZIMUTH - 179°<br>MODULE - 15<br>SYSTEM SIZE (KW)- 5.93 |

1 - MODULE STRING

2 - MODULE STRING

## LEGEND

- FIRE SETBACK
- PROPERTY LINE
- JB - JUNCTION BOX
- SKYLIGHT (ROOF OBSTRUCTION)
- CHIMNEY (ROOF OBSTRUCTION)
- VENT, ATTIC FAN (ROOF OBSTRUCTION)

**CONTRACTOR**

ADT Solar

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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

NESTOR J. HOUGHTON LICENSE No. 64501 STATE OF FLORIDA PROFESSIONAL ENGINEER

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FLORIDA FIRM NO. 30649

SHEET TITLE

**ELECTRICAL PLAN**

| | |
|---|---|
| DRAWN DATE | 1/10/2023 |
| DRAWN BY | YP |

SHEET NUMBER

A-102

## 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)

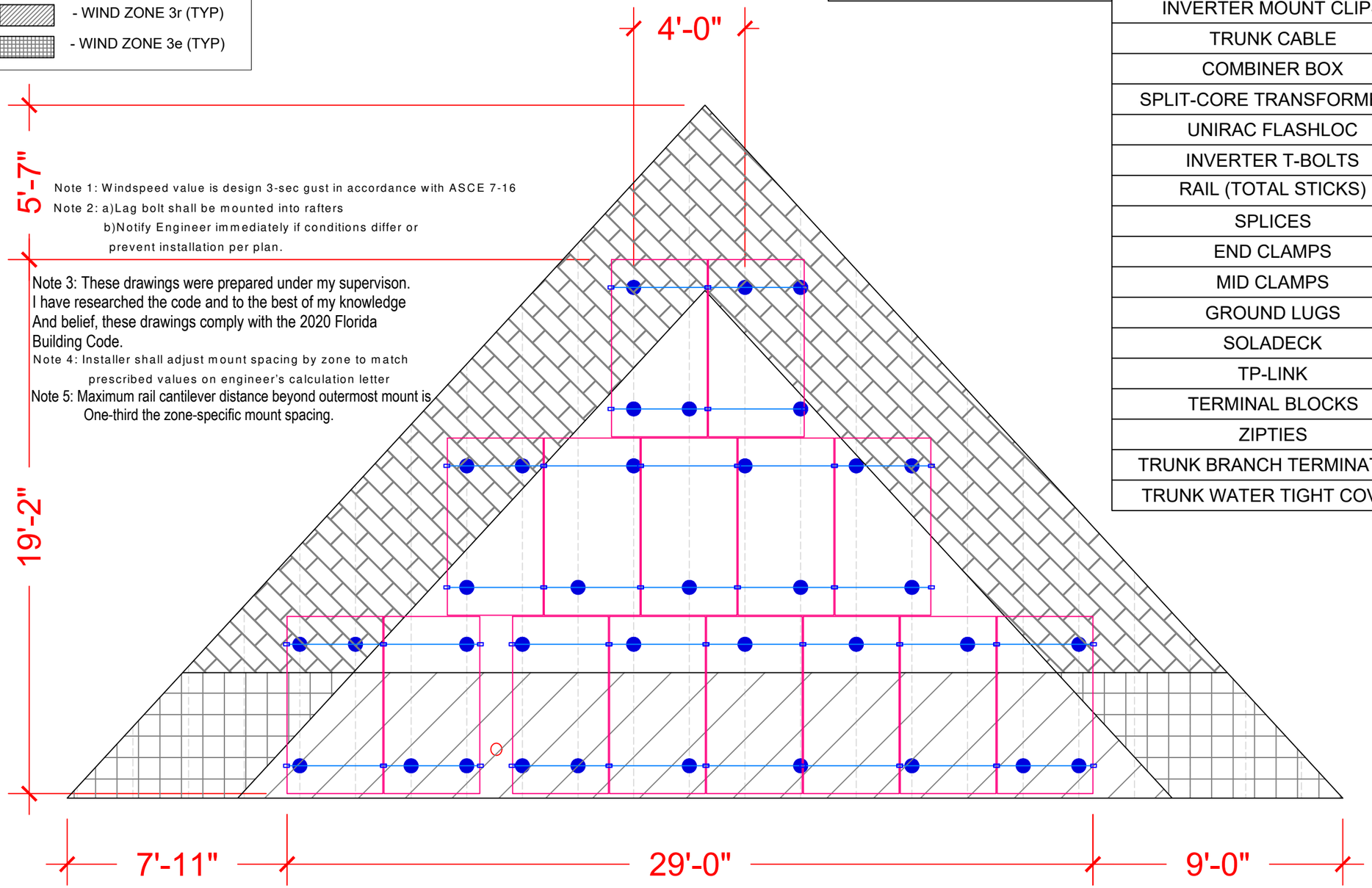
**WIND ZONE CALCULATIONS =**

OFFSET
DISTANCE = a = 0.4 X H = (0.4 x 15') = 6'
OR = a = 0.1 X L = (0.1 x 60') = 6'

- CLAMP
- UNIRAC FLASHLOC
- RAIL
- RAFTER

## BOM

| ITEM | NEEDED |
|---|---|
| CANADIAN SOLAR INC. CS3N-395MS | 15 |
| ENPHASE IQ8PLUS-72-2-US | 15 |
| INVERTER MOUNT CLIPS | 15 |
| TRUNK CABLE | 18 |
| COMBINER BOX | 1 |
| SPLIT-CORE TRANSFORMERS | 2 |
| UNIRAC FLASHLOC | 36 |
| INVERTER T-BOLTS | 15 |
| RAIL (TOTAL STICKS) | 8 |
| SPLICES | 4 |
| END CLAMPS | 16 |
| MID CLAMPS | 22 |
| GROUND LUGS | 8 |
| SOLADECK | 1 |
| TP-LINK | 1 |
| TERMINAL BLOCKS | 5 |
| ZIPTIES | 100 |
| TRUNK BRANCH TERMINATOR | 2 |
| TRUNK WATER TIGHT COVER | 4 |




Note 1: Windspeed value is design 3-sec gust in accordance with ASCE 7-16
Note 2: a)Lag bolt shall be mounted into rafters
b)Notify Engineer immediately if conditions differ or prevent installation per plan.

Note 3: These drawings were prepared under my supervison. I have researched the code and to the best of my knowledge And belief, these drawings comply with the 2020 Florida Building Code.

Note 4: Installer shall adjust mount spacing by zone to match prescribed values on engineer's calculation letter

Note 5: Maximum rail cantilever distance beyond outermost mount is One-third the zone-specific mount spacing.

ARRAY 1
TILT- 23 DEG
AZIMUTH - 179 DEG

1 | ATTACHMENT PLAN
**SCALE:**1/4"=1'-0"

**CONTRACTOR**

ADT Solar

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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SHEET TITLE

**ATTACHMENT PLAN**

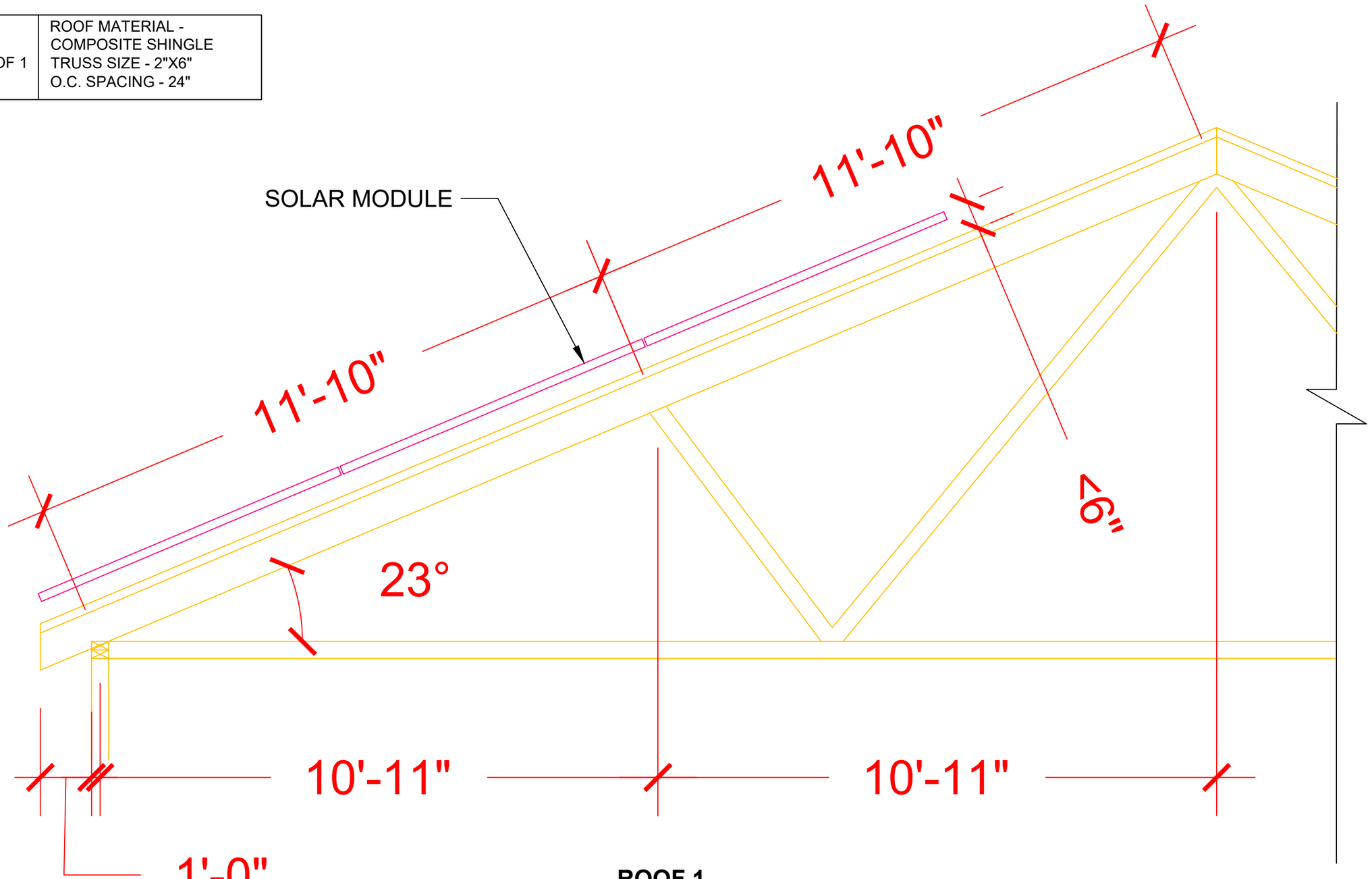
| | |
|---|---|
| DRAWN DATE | 1/10/2023 |
| DRAWN BY | YP |

SHEET NUMBER

A-103

## ROOF SECTION(S)

| | |
|---|---|
| ROOF 1 | ROOF MATERIAL - COMPOSITE SHINGLE<br>TRUSS SIZE - 2"X6"<br>O.C. SPACING - 24" |




**ROOF 1**

1 STRUCTURAL PLAN

**SCALE:**1/2"=1'-0"

All dimensions and information provided by ADT Solar inspection.

**CONTRACTOR**

ADT Solar

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SHEET TITLE

**STRUCTURAL PLAN**

| | |
|---|---|
| DRAWN DATE | 1/10/2023 |
| DRAWN BY | YP |

SHEET NUMBER

A-104

| 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) |

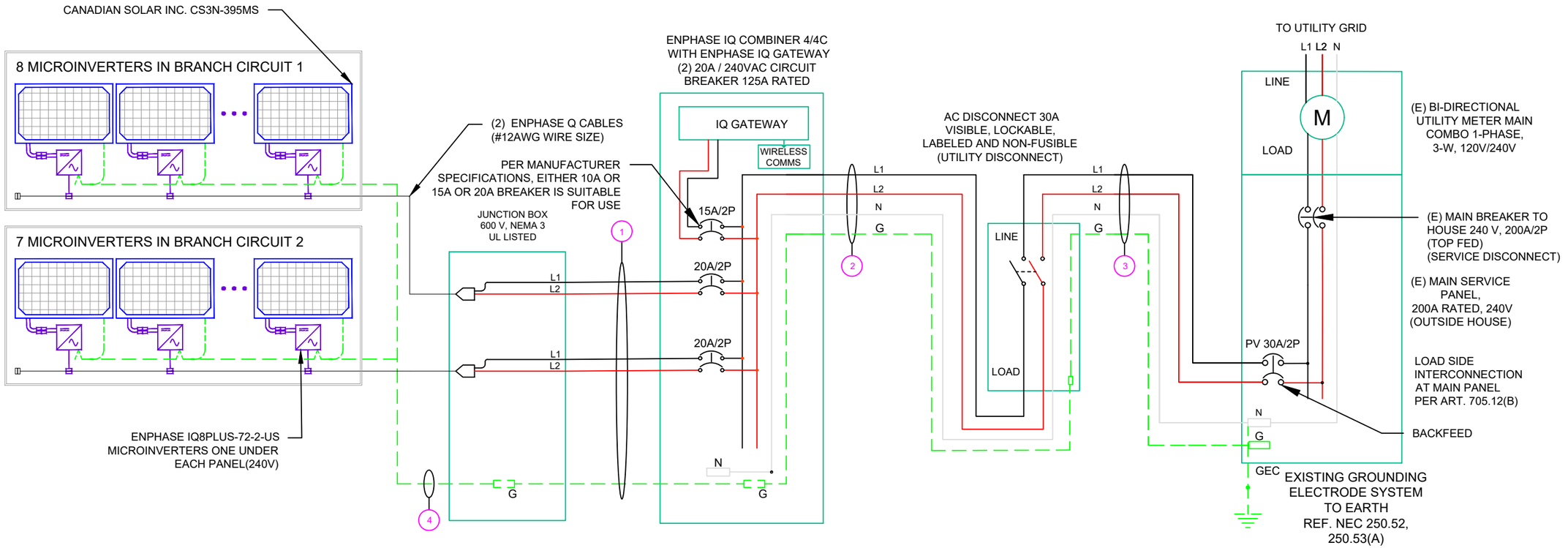
| INVERTER SPECIFICATIONS | |
|---|---|
| MANUFACTURER / MODEL # | ENPHASE IQ8PLUS-72-2-US MICROINVERTER |
| MIN/MAX DC VOLT RATING | 30V MIN/ 58V MAX |
| MAX INPUT POWER | 235W-440W |
| NOMINAL AC VOLTAGE RATING | 240V/ 211-264V |
| MAX AC CURRENT | 1.21A |
| MAX MODULES PER STRING | 13 (SINGLE PHASE)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

ADT Solar

22171 MCH RD
MANDEVILLE, LA 70471
PHONE: 9152011490

PROJECT NAME & ADDRESS

JOHN GOODRUM

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**COUNTY:-COLUMBIA COUNTY**

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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 |
|---|---|
| .80 | 4-6 |
| .70 | 7-9 |
| .50 | 10-20 |

## CALCULATIONS:

### 1. CURRENT CARRYING CONDUCTOR

**(A) BEFORE IQ COMBINER PANEL**

**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 ) x 1.25 / A.T.F / G.F ...NEC 690.8(B)**
**= [(8 x 1.21) x 1.25] / [0.96 x 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) x 1.25 / 0.96/ 1 ...NEC 690.8(B)**
**= [(15 x 1.21) x 1.25] / [0.96 x 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. 120% RULE FOR BACKFEED BREAKER ...NEC 705.12(B)(2)(3)(b)

| MCB RATING | + PV BREAKER RATING | <= (1.2 x BUS BAR RATING) |
|---|---|---|
| | | (200 + 30) <= 1.2 x 200A |
| | | 230.00 <= 240.00 HENCE OK |

**CONTRACTOR**

ADT Solar

22171 MCH RD
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AC SIZE: 4.350 KW AC

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INFO@PI-AEC.COM
FLORIDA FIRM NO. 30649

SHEET TITLE
**ELECTRICAL CALCULATIONS**

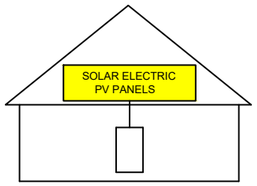
| | |
|---|---|
| DRAWN DATE | 1/10/2023 |
| DRAWN BY | YP |

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

**___ FT ←**

**→ FT ___**

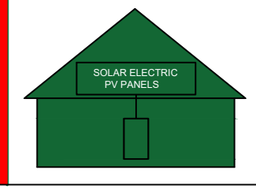
WARNING

**INVERTER OUTPUT CONNECTION**

DO NOT RELOCATE THIS OVERCURRENT DEVICE

**EMERGENCY RESPONDER**
**THIS SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN**

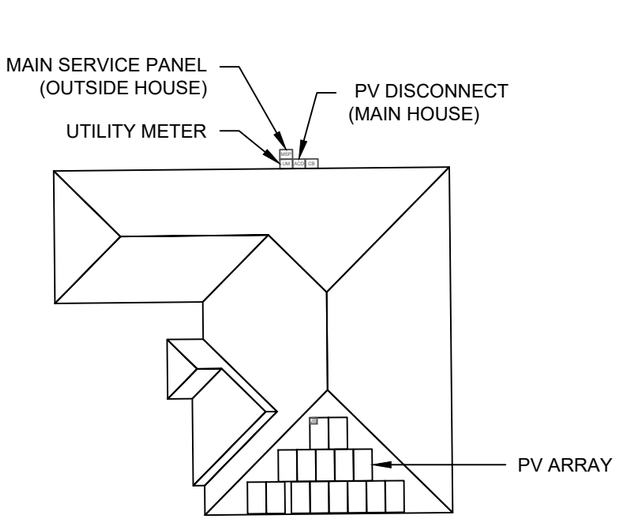
TURN RAPID SHUTDOWN SWITCH TO THE 'OFF' POSITION TO SHUTDOWN ENTIRE PV SYSTEM.




**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:





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FLORIDA FIRM NO. 30649


SHEET TITLE

**PLACARD**

| | |
|---|---|
| DRAWN DATE | 1/10/2023 |
| DRAWN BY | YP |

SHEET NUMBER

E-603

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

405 W — 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

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.

### 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.

### 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

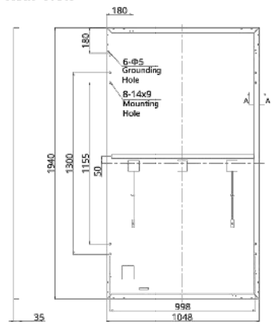
* The specific certificates applicable to different module types and markets will vary, and therefore not all of the certifications listed herein will simultaneously apply to the products you order or use. Please contact your local Canadian Solar sales representative to confirm the specific certificates 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 Insigh: Survey. Over the past 20 years, it has successfully delivered over 63 GW of premium-quality solar modules across the world.

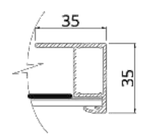
**CSI SOLAR (USA) CO., LTD.**
1350 Treat Blvd. Suite 500, Walnut Creek, CA 94598, USA | www.csisolar.com/na | service.ca@csisolar.com

### ENGINEERING DRAWING (mm)

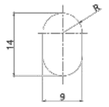
Rear View



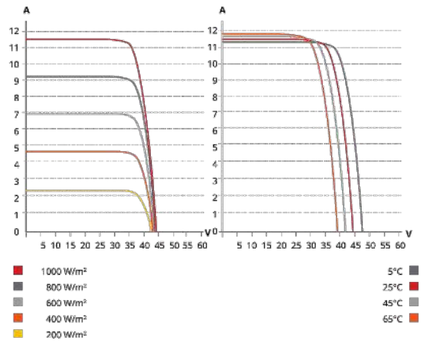

Frame Cross Section A - A




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.


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

**CONTRACTOR**

ADT Solar

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

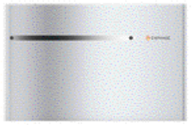
R-001

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.

**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

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

## 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 1m | | <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<br>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

**CONTRACTOR**

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MANDEVILLE, LA 70471

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PROJECT NAME & ADDRESS

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**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

R-002

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

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<br>COMMS-CELLMODEM-M1-06<br>CELLMODEM-M1-06-SP-05<br>CELLMODEM-M1-06-AT-05 | - Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with 5-year Sprint data plan for Ensemble sites<br>- 4G based LTE-M1 cellular modem with 5-year Sprint data plan<br>- 4G based LTE-M1 cellular modem with 5-year AT&T data plan |
| Circuit Breakers<br>BRK-10A-2-240V<br>BRK-15A-2-240V<br>BRK-20A-2P-240V<br>BRK-15A-2P-240V-B<br>BRK-20A-2P-240V-B | Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers.<br>Circuit breaker, 2 pole, 10A, Eaton BR210<br>Circuit breaker, 2 pole, 15A, Eaton BR215<br>Circuit breaker, 2 pole, 20A, Eaton BR220<br>Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support<br>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<br>• 60 A breaker branch input: 4 to 1/0 AWG copper conductors<br>• Main lug combined output: 10 to 2/0 AWG copper conductors<br>• Neutral and ground: 14 to 1/0 copper conductors<br>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<br>Production metering: ANSI C12.20 accuracy class 0.5 (PV production)<br>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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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

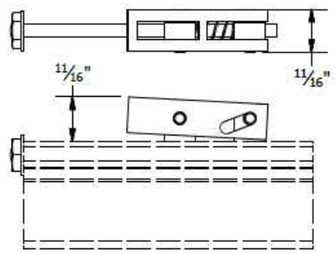
SHEET TITLE
**RESOURCE DOCUMENT**

| | |
|---|---|
| DRAWN DATE | 1/10/2023 |
| DRAWN BY | YP |

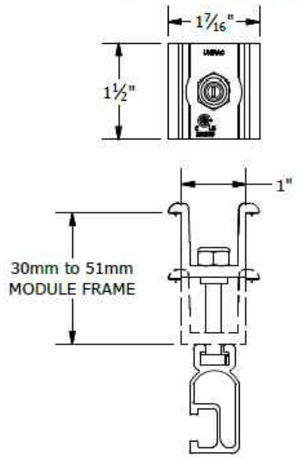
SHEET NUMBER

R-003

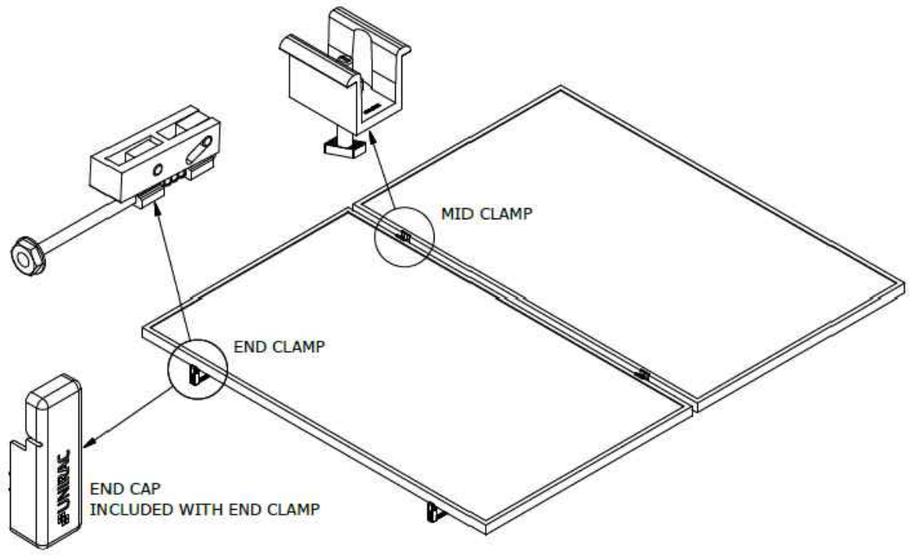
## PRO SERIES END CLAMP

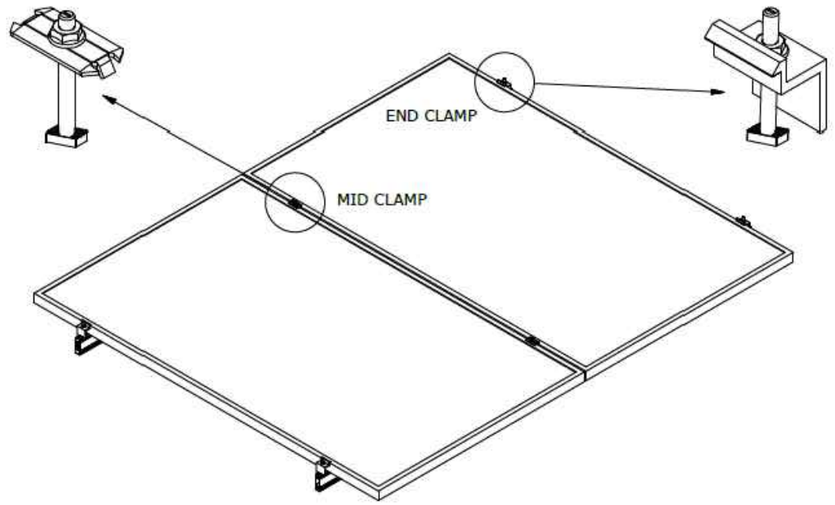



## PRO SERIES MID CLAMP

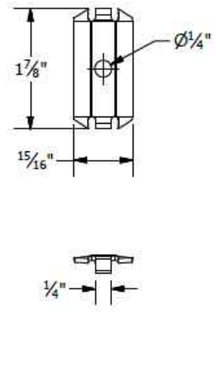



| PART # TABLE | |
|---|---|
| P/N | DESCRIPTION |
| 302035M | ENDCLAMP PRO |
| 302030M | MIDCLAMP PRO - MILL |
| 302030D | MIDCLAMP PRO - DRK |

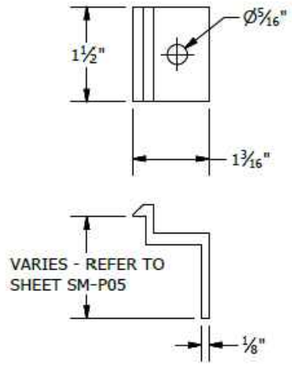



| PART # TABLE | |
|---|---|
| P/N | DESCRIPTION |
| 302027C | SM BND MIDCLAMP BC SS |
| 302027D | SM BND MIDCLAMP BC DRK SS |
| 302028C | SM BND MIDCLAMP EF SS |
| 302028D | SM BND MIDCLAMP EF DRK SS |
| 302029C | SM BND MIDCLAMP DK SS |
| 302029D | SM BND MIDCLAMP DK DRK SS |
| | FOR BONDING END CLAMP<br>REFER TO SHEET SM-P05 |




BONDING SM MID CLAMP




BONDING SM END CLAMP


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


| | |
|---|---|
| PRODUCT LINE: | SOLARMOUNT |
| DRAWING TYPE: | PART & ASSEMBLY |
| DESCRIPTION: | PRO SERIES BONDING CLAMPS |
| REVISION DATE: | 10/26/2017 |

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE OR MORE US PATENTS
LEGAL NOTICE

SM-A01
SHEET


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


| | |
|---|---|
| PRODUCT LINE: | SOLARMOUNT |
| DRAWING TYPE: | PART & ASSEMBLY |
| DESCRIPTION: | BONDING TOP CLAMPS |
| REVISION DATE: | 10/26/2017 |


DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE OR MORE US PATENTS
LEGAL NOTICE


SM-A01A
SHEET

**CONTRACTOR**

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PROJECT NAME & ADDRESS

JOHN GOODRUM

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

**COUNTY:-COLUMBIA COUNTY**

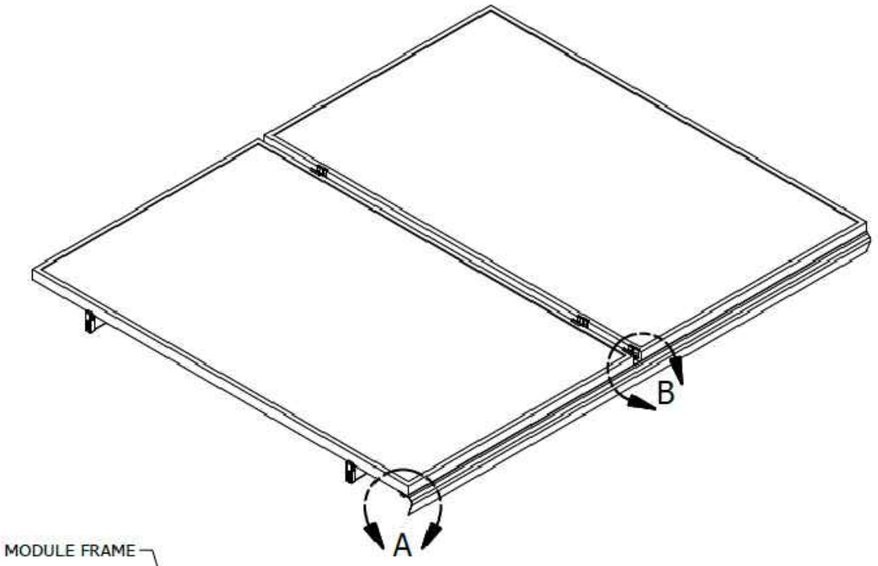
**SYSTEM SIZE**
DC SIZE: 5.925 KW DC-(STC)
AC SIZE: 4.350 KW AC

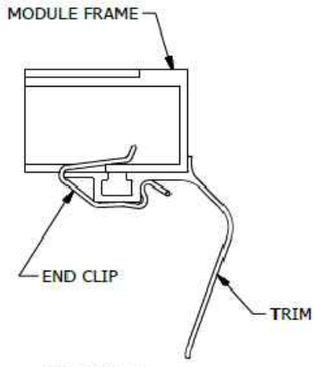
SHEET TITLE
**RESOURCE DOCUMENT**

| | |
|---|---|
| DRAWN DATE | 1/10/2023 |
| DRAWN BY | YP |

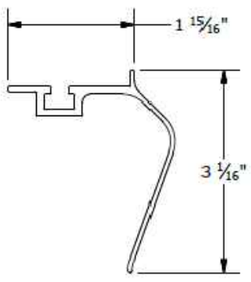
SHEET NUMBER

R-004

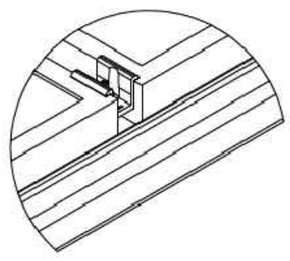



DETAIL A
TRIM END CLIP




TRIM



DETAIL B
MID CLAMP TRIM CONNECTION

| PART # TABLE | | |
|---|---|---|
| P/N | DESCRIPTION | LENGTH |
| 206072D-B | SM TRIM DRK | 168" |
| 008025S | SM TRIM END CLIP | - |

| | |
|---|---|
| PRODUCT LINE: | SOLARMOUNT |
| DRAWING TYPE: | PART & ASSEMBLY |
| DESCRIPTION: | SM TRIM END CLIP |
| REVISION DATE: | 9/27/2017 |

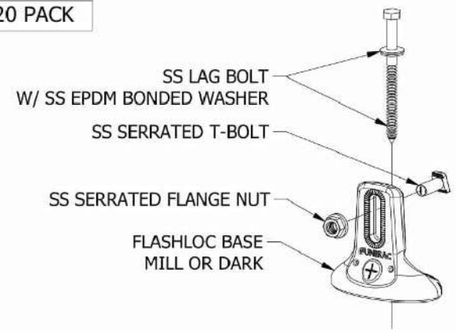
DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

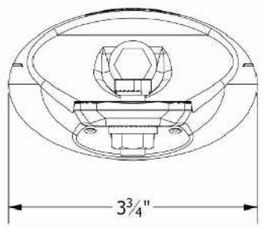
PRODUCT PROTECTED BY ONE OR MORE US PATENTS
LEGAL NOTICE

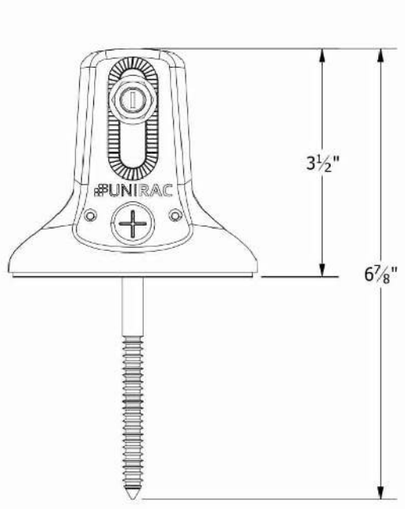
SM-A02
SHEET

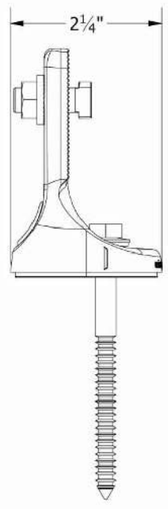
UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

| PART TABLE | |
|---|---|
| P/N | DESCRIPTION |
| 004085M | FLASHLOC COMP KIT MILL, 20 PACK |
| 004085D | FLASHLOC COMP KIT DARK, 20 PACK |




UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
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| | |
|---|---|
| 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

**CONTRACTOR**

ADT Solar

22171 MCH RD
MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

JOHN GOODRUM

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

**COUNTY:-COLUMBIA COUNTY**

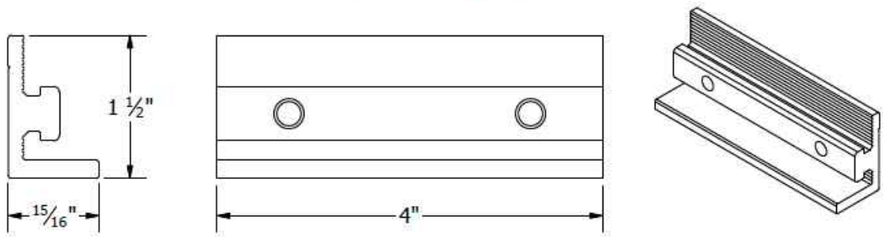
**SYSTEM SIZE**
DC SIZE: 5.925 KW DC-(STC)
AC SIZE: 4.350 KW AC

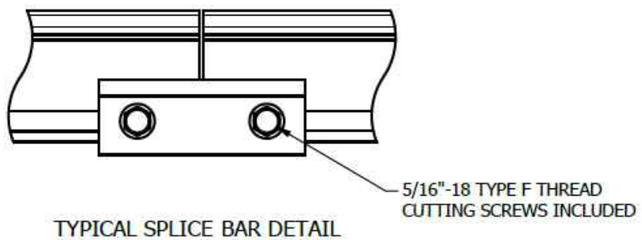
SHEET TITLE
**RESOURCE DOCUMENT**

| | |
|---|---|
| DRAWN DATE | 1/10/2023 |
| DRAWN BY | YP |

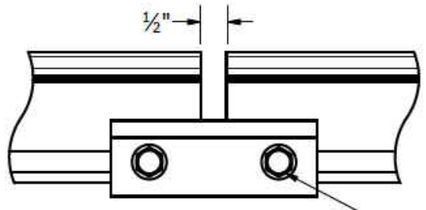
SHEET NUMBER
R-005

## BONDING SPLICE BAR




TYPICAL SPLICE BAR DETAIL




TYPICAL EXPANSION JOINT DETAIL

| PART # TABLE | |
|---|---|
| P/N | DESCRIPTION |
| 303019M | BND SPLICE BAR PRO SERIES MILL |
| 303019D | BND SPLICE BAR PRO SERIES DRK |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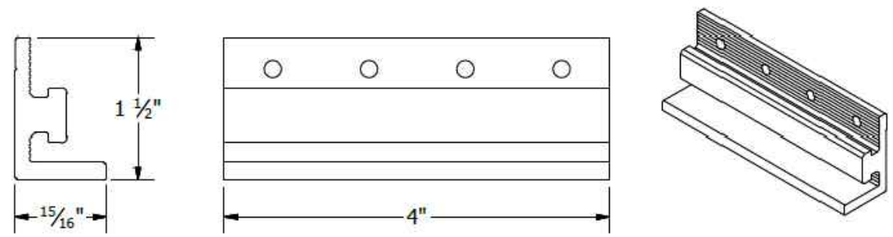
| | |
|---|---|
| PRODUCT LINE: | SOLARMOUNT |
| DRAWING TYPE: | PART & ASSEMBLY |
| DESCRIPTION: | BONDING SPLICE BAR PRO SERIES |
| REVISION DATE: | 8/23/2018 |

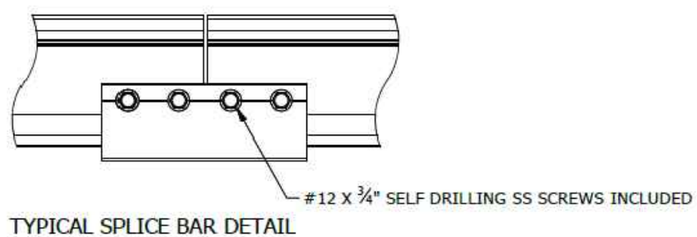
DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE OR MORE US PATENTS
LEGAL NOTICE

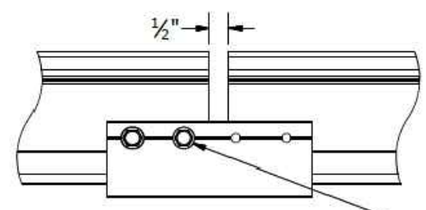
SM-A05
SHEET

## BONDING SPLICE BAR




TYPICAL SPLICE BAR DETAIL




TYPICAL EXPANSION JOINT DETAIL

| PART # TABLE | |
|---|---|
| P/N | DESCRIPTION |
| 303018C | BND SPLICE BAR SERRATED CLR |
| 303018D | BND SPLICE BAR SERRATED DRK |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| | |
|---|---|
| PRODUCT LINE: | SOLARMOUNT |
| DRAWING TYPE: | PART & ASSEMBLY |
| DESCRIPTION: | BONDING SPLICE BAR |
| REVISION DATE: | 9/27/2017 |


DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE OR MORE US PATENTS
LEGAL NOTICE

SM-A05
SHEET


**CONTRACTOR**

ADT Solar

22171 MCH RD
MANDEVILLE, LA 70471

PHONE: 9152011490

PROJECT NAME & ADDRESS

JOHN GOODRUM

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

**COUNTY:-COLUMBIA COUNTY**

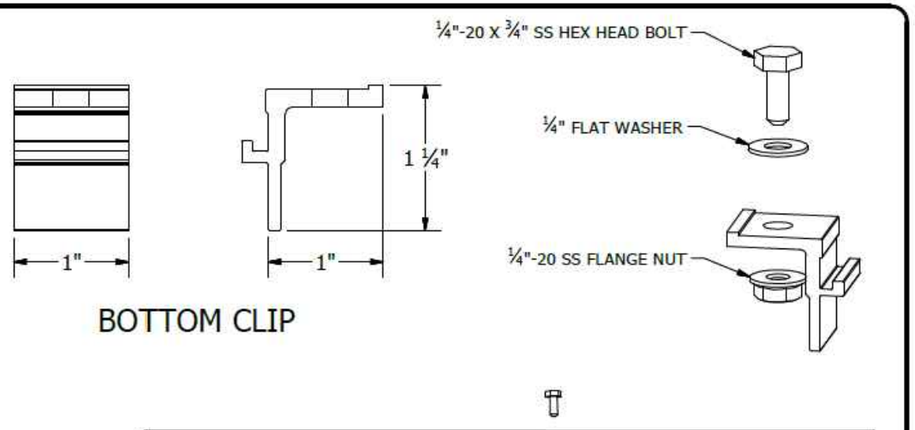
**SYSTEM SIZE**
DC SIZE: 5.925 KW DC-(STC)
AC SIZE: 4.350 KW AC

SHEET TITLE
**RESOURCE DOCUMENT**

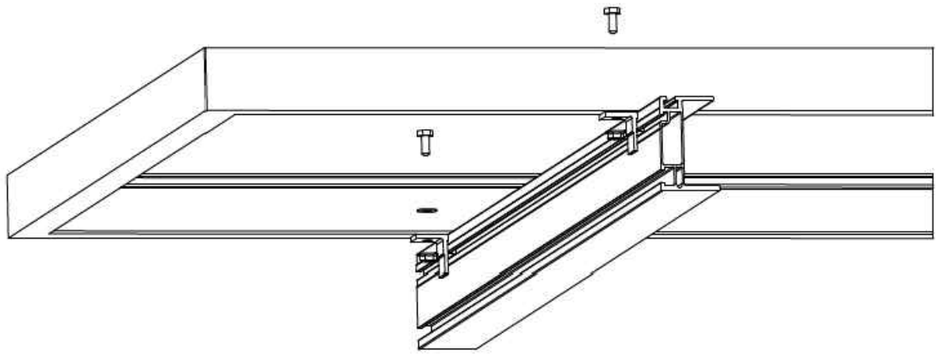
| | |
|---|---|
| DRAWN DATE | 1/10/2023 |
| DRAWN BY | YP |

SHEET NUMBER

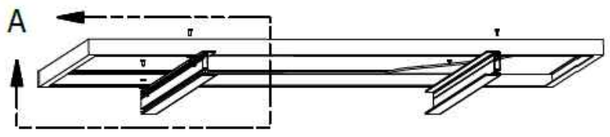
R-006




BOTTOM CLIP



DETAIL A




| PART # TABLE | |
|---|---|
| P/N | DESCRIPTION |
| 302000C | SMHD BOTTOM CLIPS W/HDW CLR |

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PHONE: 505.242.6411
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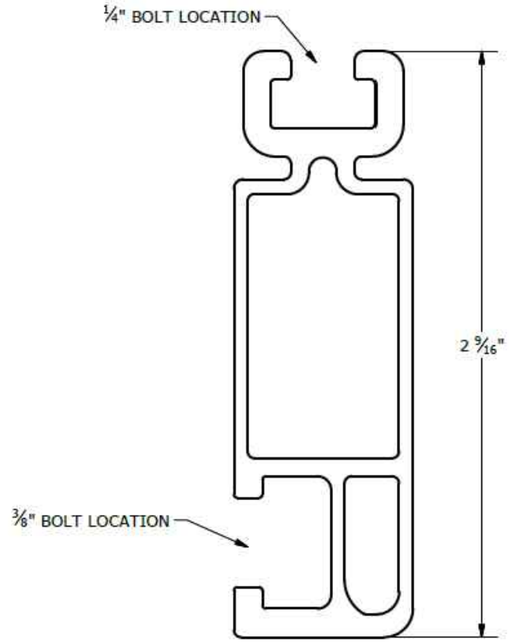
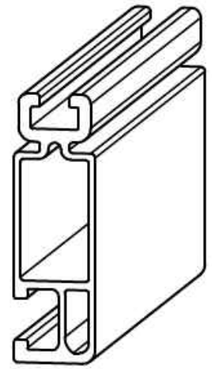
| | |
|---|---|
| PRODUCT LINE: | SOLARMOUNT HD |
| DRAWING TYPE: | PART & ASSEMBLY |
| DESCRIPTION: | BOTTOM CLIP |
| REVISION DATE: | 9/27/2017 |

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE OR MORE US PATENTS
LEGAL NOTICE

SM-A10
SHEET



| PART # TABLE | | |
|---|---|---|
| P/N | DESCRIPTION | LENGTH |
| 320132M | SM RAIL 132" MILL | 132" |
| 310132C | SM RAIL 132" CLR | 132" |
| 320168M | SM RAIL 168" MILL | 168" |
| 310168C | SM RAIL 168" CLR | 168" |
| 320168D | SM RAIL 168" DRK | 168" |
| 320208M | SM RAIL 208" MILL | 208" |
| 310208C | SM RAIL 208" CLR | 208" |
| 320240M | SM RAIL 240" MILL | 240" |
| 310240C | SM RAIL 240" CLR | 240" |
| 310240D | SM RAIL 240" DRK | 240" |

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| | |
|---|---|
| PRODUCT LINE: | SOLARMOUNT |
| DRAWING TYPE: | PART DETAIL |
| DESCRIPTION: | STANDARD RAIL |
| REVISION DATE: | 9/11/2017 |

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE OR MORE US PATENTS
LEGAL NOTICE

SM-P01
SHEET

**CONTRACTOR**

ADT Solar

22171 MCH RD
MANDEVILLE, LA 70471
PHONE: 9152011490

PROJECT NAME & ADDRESS

JOHN GOODRUM

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

**COUNTY:-COLUMBIA COUNTY**

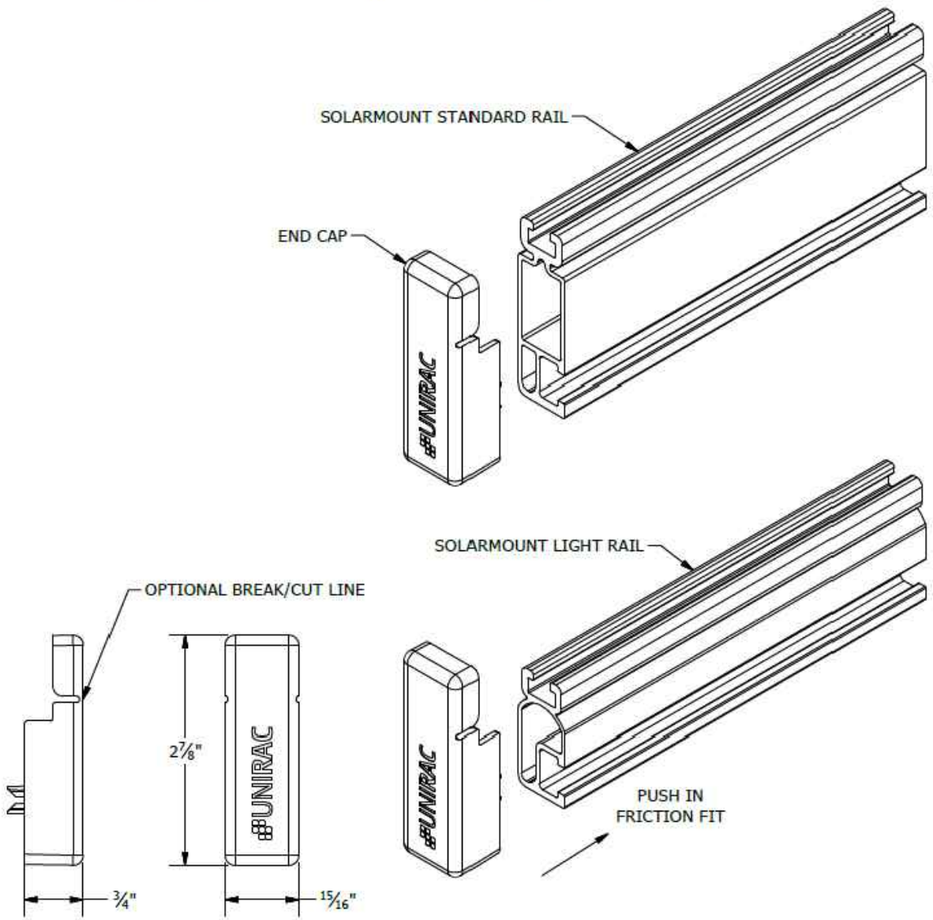
**SYSTEM SIZE**
DC SIZE: 5.925 KW DC-(STC)
AC SIZE: 4.350 KW AC

SHEET TITLE
**RESOURCE DOCUMENT**

| | |
|---|---|
| DRAWN DATE | 1/10/2023 |
| DRAWN BY | YP |

SHEET NUMBER
R-007

NOTES:
1. END CAP INCLUDED WITH EVERY END CLAMP.
2. END CAP FITS SOLARMOUNT LIGHT AND STANDARD RAIL PROFILES.





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ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
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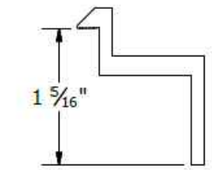
| | |
|---|---|
| PRODUCT LINE: | SOLARMOUNT |
| DRAWING TYPE: | PART DETAIL |
| DESCRIPTION: | END CAPS |
| REVISION DATE: | 9/27/2017 |

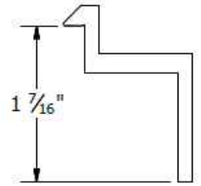
DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE OR MORE US PATENTS
LEGAL NOTICE

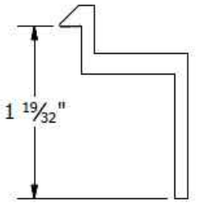
SM-P04
SHEET



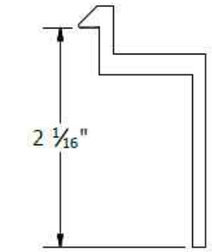

B CLAMP
30mm to 32mm Module Thickness
(1.18" to 1.26")



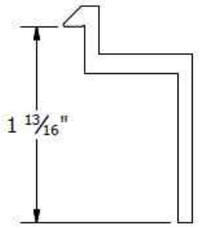

C CLAMP
33mm to 36mm Module Thickness
(1.30" to 1.42")



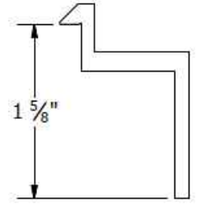

D CLAMP
38mm to 40mm Module Thickness
(1.50" to 1.57")




E CLAMP
50mm to 51mm Module Thickness
(1.97" to 2.00")

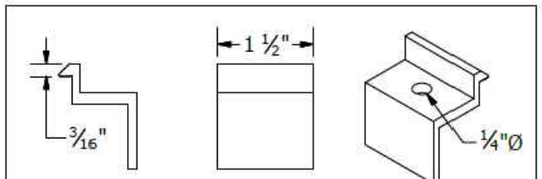



F CLAMP
45mm to 47mm Module Thickness
(1.77" to 1.85")




K CLAMP
39mm to 41mm Module Thickness
(1.54" to 1.61")

| PART # TABLE | |
|---|---|
| P/N | DESCRIPTION |
| 302021C | SM ENDCLAMP B CLR AL |
| 302021D | SM ENDCLAMP B DRK AL |
| 302022C | SM ENDCLAMP C CLR AL |
| 302022D | SM ENDCLAMP C DRK AL |
| 302023C | SM ENDCLAMP D CLR AL |
| 302023D | SM ENDCLAMP D DRK AL |
| 303024C | SM ENDCLAMP E CLR AL |
| 302024D | SM ENDCLAMP E DRK AL |
| 302025C | SM ENDCLAMP F CLR AL |
| 302025D | SM ENDCLAMP F DRK AL |
| 302026C | SM ENDCLAMP K CLR AL |
| 302026D | SM ENDCLAMP K DRK AL |




TYPICAL END CLAMP DETAILS


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


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


DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE OR MORE US PATENTS
LEGAL NOTICE


SM-P05
SHEET

CONTRACTOR

ADT Solar

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

R-008