WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

Scott E. Wyssling, PE
Jon P. Ward, SE, PE
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swyssling@wysslingconsulting.com

June 16, 2022

Current Insight
2852 W. Amini Way
South Jordan, UT 84095

Scott E Wyssling, PE

Digitally signed by Scott E Wyssling, PE
DN: C=US, S=Utah, L=Alpine, O=Wyssling Consulting, CN="Scott E Wyssling, PE", E=swyssling@wysslingconsulting.com
Reason: I am the author of this document
Location: your signing location here
Date: 2022.08.08 08:42:21-06'00'
Foxit PDF Editor Version: 11.1.0

Re: Engineering Services
Allen Residence
102 Sonora Drive, Lillington NC
6.480 kW System

To Whom It May Concern:

We have received information regarding solar panel installation on the roof of the above referenced structure. Our evaluation of the structure is to verify the existing capacity of the roof system and its ability to support the additional loads imposed by the proposed solar system.

A. Site Assessment Information

1. Site visit documentation identifying attic information including size and spacing of framing for the existing roof structure.
2. Design drawings of the proposed system including a site plan, roof plan and connection details for the solar panels. This information will be utilized for approval and construction of the proposed system.

B. Description of Structure:

Roof Framing:	Prefabricated wood trusses at 24" on center. All truss members are constructed of 2x4 dimensional lumber.
Roof Material:	Composite Asphalt Shingles
Roof Slope:	33 degrees
Attic Access:	Accessible
Foundation:	Permanent

C. Loading Criteria Used

- **Dead Load**
  - Existing Roofing and framing = 7 psf
  - New Solar Panels and Racking = 3 psf
  - TOTAL = 10 PSF
- **Live Load** = 20 psf (reducible) – 0 psf at locations of solar panels
- **Ground Snow Load** = 15 psf
- **Wind Load** based on ASCE 7-16
  - Ultimate Wind Speed = 120 mph (based on Risk Category II)
  - Exposure Category C

Analysis performed of the existing roof structure utilizing the above loading criteria is in accordance with the 2018 North Carolina Residential Code*, including provisions allowing existing structures to not require strengthening if the new loads do not exceed existing design loads by 105% for gravity elements and 110% for seismic elements. This analysis indicates that the existing framing will support the additional panel loading without damage, if installed correctly.*

D. Solar Panel Anchorage

1. The solar panels shall be mounted in accordance with the most recent "*RT-MINI Installation Manual*", which can be found on the RT-MINI website (https://roof-tech.us/). If during solar panel installation, the roof framing members appear unstable or deflect non-uniformly, our office should be notified before proceeding with the installation.
2. Connection on the roof is utilizing (5) #14 screws into the existing decking to resist uplift forces. Contractor to verify installation to be performed in accordance with the A-Roof Tech recommendations. Pull out values per screw are based on National Design Specification values for CDX plywood and are identified as 208 lbs/inch. Based on ½" sheathing the value per screw would be 104 lbs providing 520 lbs uplift resistance per attachment.
3. Considering the roof slopes, the size, spacing, condition of roof, the panel supports shall be placed no greater than 48" o/c.
4. Panel supports connections shall be staggered to distribute load to adjacent rafters.

Based on the above evaluation, this office certifies that with the racking and mounting specified, the existing roof system will adequately support the additional loading imposed by the solar system. This evaluation is in conformance with the 2018 North Carolina Residential Code, current industry standards, and is based on information supplied to us at the time of this report.

Should you have any questions regarding the above or if you require further information do not hesitate to contact me.

Very truly yours,

Scott E. Wyssling, PE
North Carolina License No. 46546

signed 08-08-22

NEW PHOTOVOLTAIC SYSTEM 6.48 KW DC
102 SONORA DR, LILLINGTON, NC 27546

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 - IRONRIDGE XR10
1.3.3 PV MODULE AND INVERTER INSTALLATION - TRINA SOLAR TSM-360DE06X.05(II) / SMA-SUNNY BOY 5.0-US (SB5.0-1SP-US-41) 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: ALLEN ROBERT

NORTH CAROLINA PROFESSIONAL SEAL 046546 ENGINEER SCOTT E. WYSSLING

signed 08-08-22

SCOPE OF WORK
SYSTEM SIZE: STC:18 X 360W= 6.48 kW DC
PTC: 18 x 334.6W = 6.02 kW DC
(18) TRINA SOLAR TSM-360DE06X.05(II)
(1) SMA-SUNNY BOY 5.0-US (SB5.0-1SP-US-41)

ATTACHMENT TYPE: ROOF MOUNT
MSP UPGRADE: NO
UTILITY METER UPGRADE: NO

AUTHORITIES HAVING JURISDICTION
BUILDING: HARNETT COUNTY
ZONING: HARNETT COUNTY
UTILITY: SOUTH RIVER ELEC MEMBER CORP
METER NO: 81973687

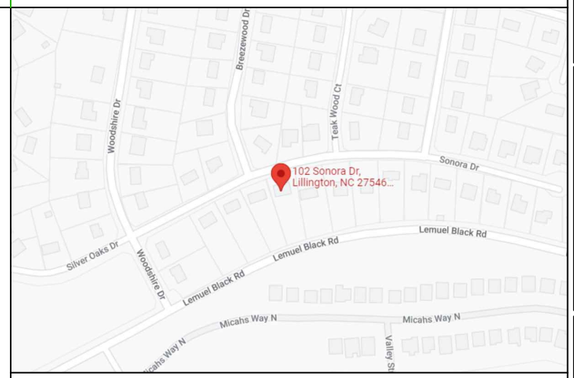
DESIGN SPECIFICATION

OCCUPANCY:	II
CONSTRUCTION:	SINGLE-FAMILY
ZONING:	RESIDENTIAL
GROUND SNOW LOAD:	10 LB/SQFT
WIND EXPOSURE:	B
WIND SPEED:	127 MPH

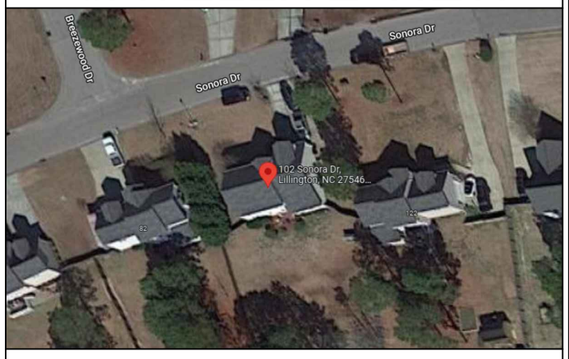
APPLICABLE CODES & STANDARDS

BUILDING:	NCBC 2018, NCRC 2018
ELECTRICAL:	NEC 2017
FIRE:	NCFC 2018

VICINITY MAP



SATELLITE VIEW



SHEET INDEX

CONTRACTOR

COMPLETE SOLAR
3000 EXECUTIVE PKWY
SUITE #504
SAN RAMON, CA 94583
PHONE NUMBER:
(877) 299-4943
Lic# 961988

PROJECT NAME & ADDRESS

ALLEN ROBERT

102 SONORA DR, LILLINGTON, NC 27546

COUNTY:-HARNETT COUNTY

SYSTEM SIZE
DC SIZE: 6.480 KW DC-(STC)
AC SIZE: 5.000 KW AC

NOTICE TO CONTRACTOR
All construction must comply with current NC Building Codes and is subject to field inspection and verification.
APPROVED
Limited building only review
Permit holder responsible for full compliance with the code
08/23/2022
Harnett COUNTY NORTH CAROLINA

SHEET TITLE
COVER PAGE

DRAWN DATE	7/29/2022
DRAWN BY	AP

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 MODULES ARE CONSIDERED 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

COMPLETE SOLAR
3000 EXECUTIVE PKWY
SUITE #504
SAN RAMON, CA 94583
PHONE NUMBER:
(877) 299-4943
Lic# 961988

PROJECT NAME & ADDRESS

ALLEN ROBERT

102 SONORA DR, LILLINGTON, NC 27546

COUNTY:-HARNETT COUNTY

SYSTEM SIZE
DC SIZE: 6.480 KW DC-(STC)
AC SIZE: 5.000 KW AC

signed 08-08-22

SHEET TITLE
NOTES

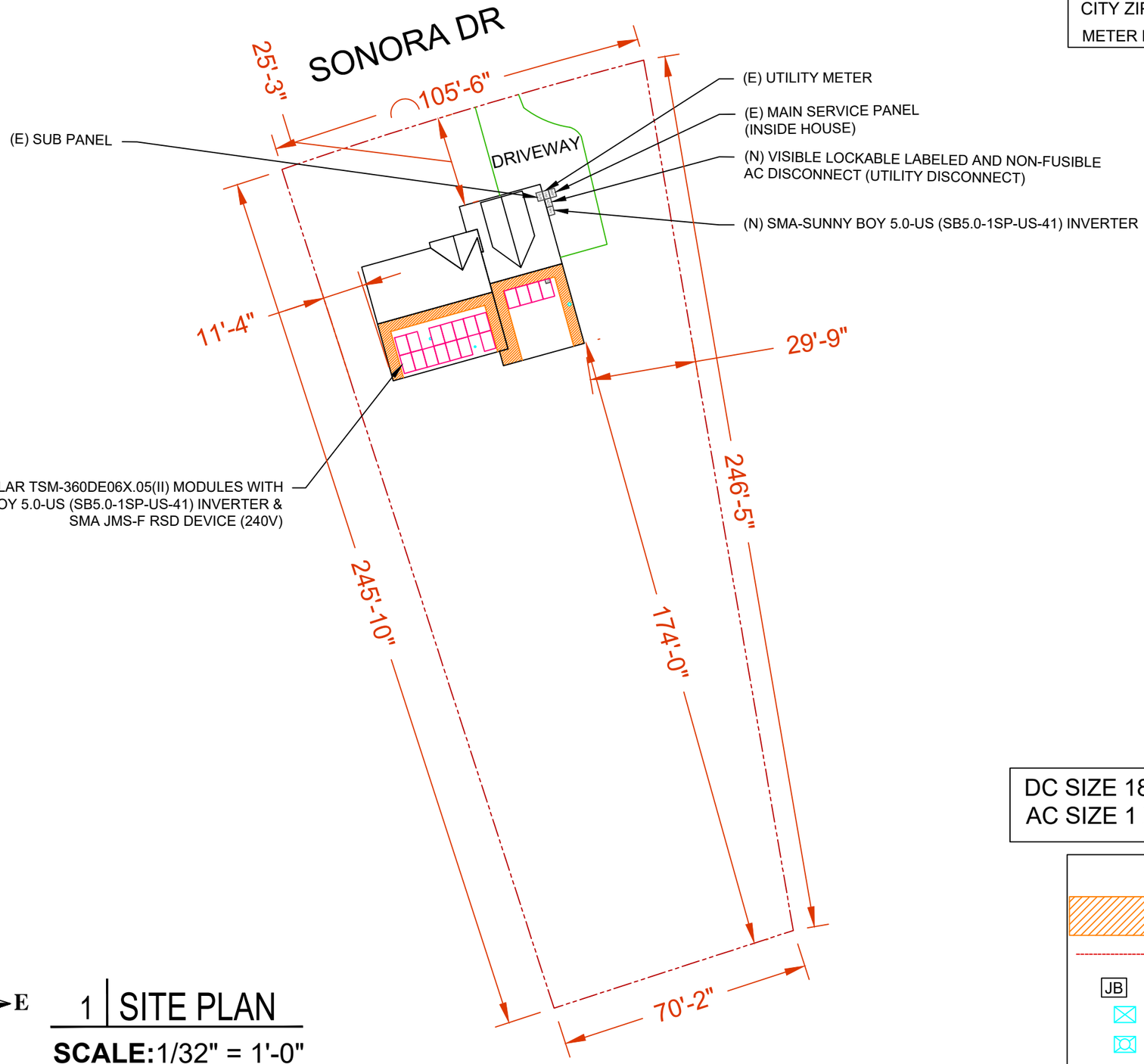
DRAWN DATE	7/29/2022
DRAWN BY	AP

SHEET NUMBER
G-002

TOTAL HOME SQUARE FOOTAGE IS:2105 FT²
TOTAL ARRAY SQUARE FOOTAGE IS: 357.21 FT²
% COVERED BY SOLAR IS: 16.97%

(18) TRINA SOLAR TSM-360DE06X.05(II)
(1) SMA-SUNNY BOY 5.0-US (SB5.0-1SP-US-41)

ADDRESS : 102 SONORA DR
CITY ZIP : LILLINGTON, NC 27546
METER NO: 81973687



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1 | SITE PLAN

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

DC SIZE 18 X 360W = 6.480 kW DC-STC
AC SIZE 1 X 5000W = 5.000 kW AC

LEGEND

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

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102 SONORA DR,
LILLINGTON,
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COUNTY:-HARNETT COUNTY

SYSTEM SIZE
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AC SIZE: 5.000 KW AC

NORTH CAROLINA PROFESSIONAL SEAL 046546 ENGINEER SCOTT E. WYSSLING

signed 08-08-22

SHEET TITLE

SITE PLAN

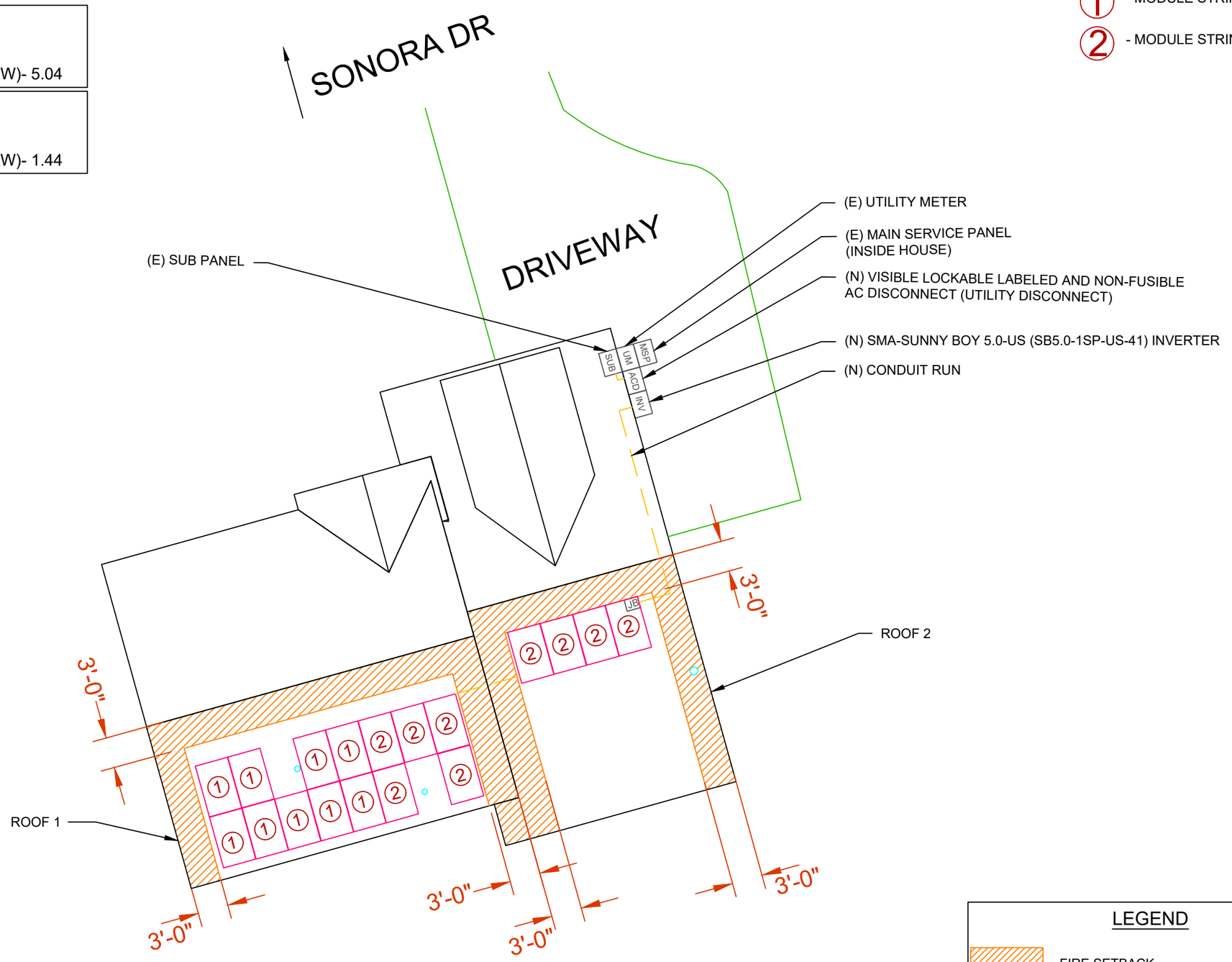
DRAWN DATE	7/29/2022
DRAWN BY	AP

SHEET NUMBER

A-101

ROOF SECTION(S)

ROOF 1	TILT - 34° AZIMUTH - 165° MODULE - 14 SYSTEM SIZE (KW)- 5.04
ROOF 2	TILT - 34° AZIMUTH - 165° MODULE - 4 SYSTEM SIZE (KW)- 1.44



① - MODULE STRING

② - MODULE STRING

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1 | ELECTRICAL PLAN

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

LEGEND

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

CONTRACTOR

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PROJECT NAME & ADDRESS

ALLEN ROBERT

102 SONORA DR,
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NC 27546

COUNTY:-HARNETT COUNTY

SYSTEM SIZE

DC SIZE: 6.480 KW DC-(STC)
AC SIZE: 5.000 KW AC

NORTH CAROLINA PROFESSIONAL SEAL 046546 ENGINEER SCOTT E. WYSSLING

signed 08-08-22

SHEET TITLE

ELECTRICAL PLAN

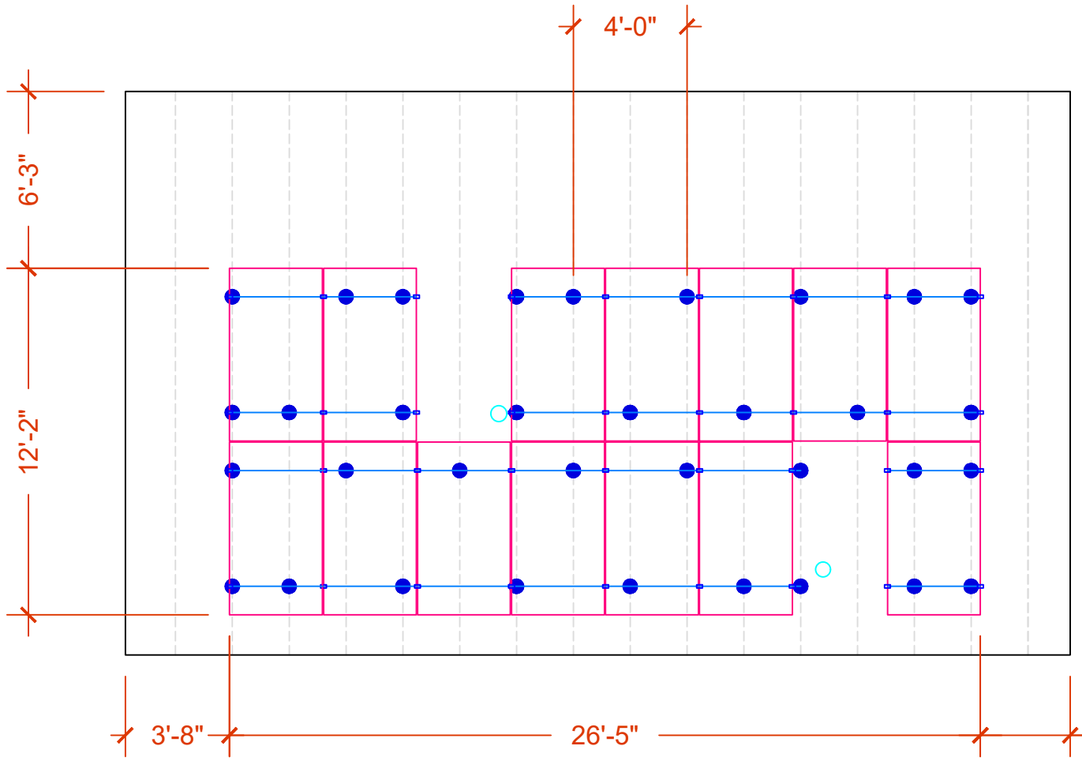
DRAWN DATE	7/29/2022
DRAWN BY	AP

SHEET NUMBER

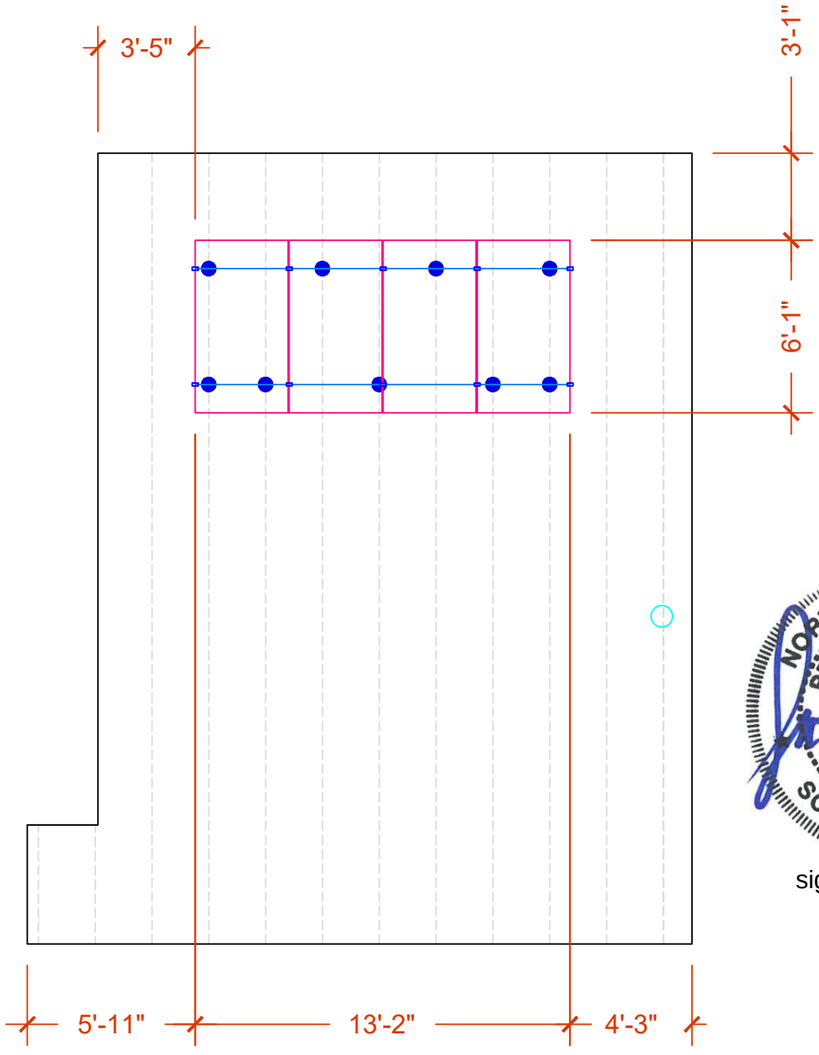
A-102

- CLAMP
- RT MINI MOUNT
- RAIL
-TRUSS

43 - TOTAL MOUNT



ARRAY 1
TILT- 34 DEG
AZIMUTH - 165 DEG



ARRAY 2
TILT- 34 DEG
AZIMUTH - 165 DEG

1 ATTACHMENT PLAN

SCALE:3/16"=1'-0"

CONTRACTOR

COMPLETE SOLAR

3000 EXECUTIVE PKWY
SUITE #504
SAN RAMON, CA 94583
PHONE NUMBER:
(877) 299-4943
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PROJECT NAME & ADDRESS

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102 SONORA DR,
LILLINGTON,
NC 27546

COUNTY:-HARNETT COUNTY

SYSTEM SIZE
DC SIZE: 6.480 KW DC-(STC)
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NORTH CAROLINA PROFESSIONAL SEAL 046546 ENGINEER SCOTT E. WYSSLING

signed 08-08-22

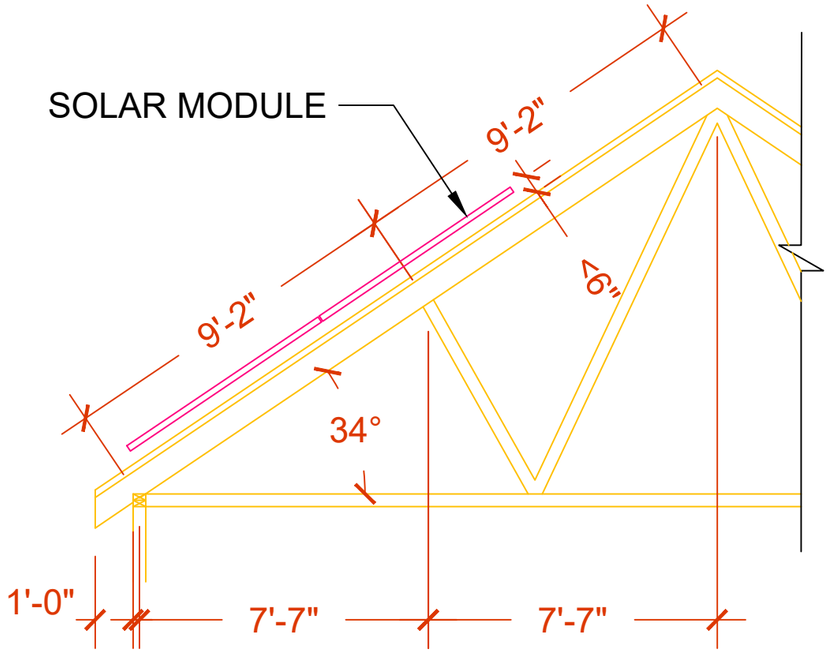
SHEET TITLE
ATTACHMENT PLAN

DRAWN DATE	7/29/2022
DRAWN BY	AP

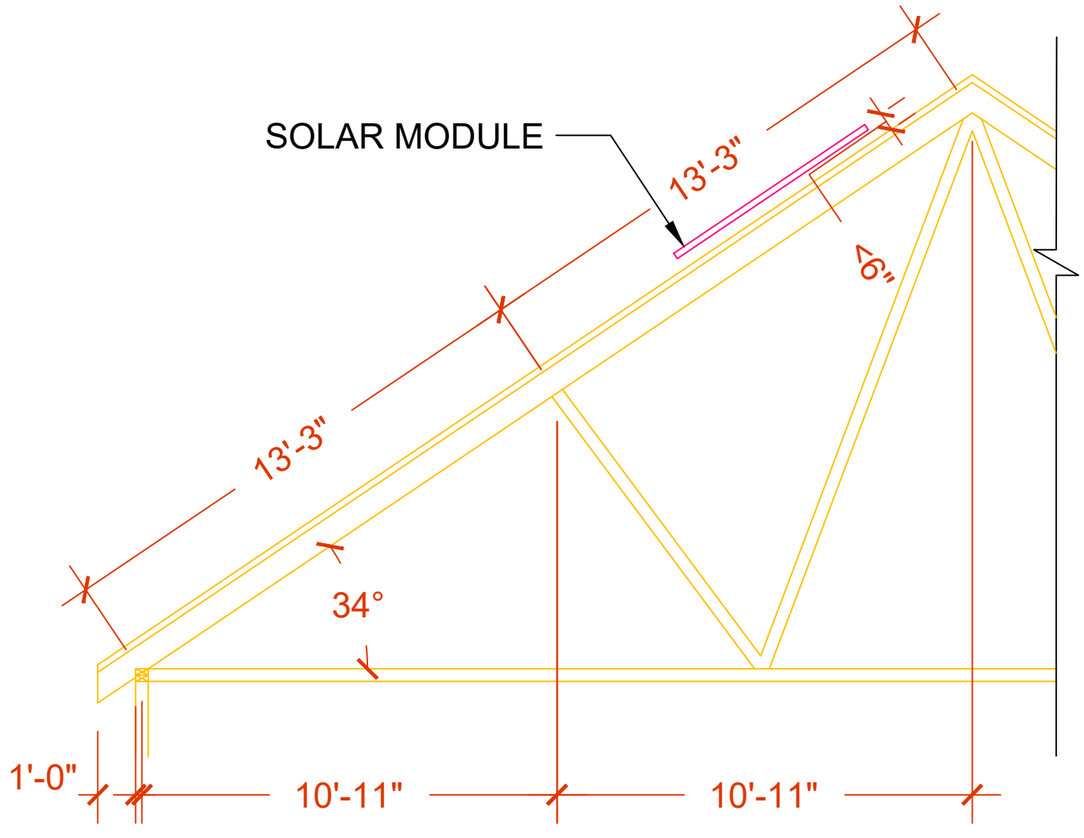
SHEET NUMBER
A-103

ROOF SECTION(S)

ROOF 1	ROOF MATERIAL - COMPOSITE SHINGLE TRUSS SIZE - 2"X4" O.C. SPACING - 24"
ROOF 2	ROOF MATERIAL - COMPOSITE SHINGLE TRUSS SIZE - 2"X4" O.C. SPACING - 24"



ROOF 1



ROOF 2

1 STRUCTURAL PLAN

SCALE:1/4"=1'-0"

CONTRACTOR

COMPLETE SOLAR

3000 EXECUTIVE PKWY
SUITE #504
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NORTH CAROLINA PROFESSIONAL SEAL 046546 ENGINEER SCOTT E. WYSSLING

signed 08-08-22

SHEET TITLE
STRUCTURAL PLAN

DRAWN DATE	7/29/2022
DRAWN BY	AP

SHEET NUMBER

A-104

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	TRINA SOLAR TSM-360DE06X.05(II)
VMP	37 V
IMP	9.74 A
VOC	44.8 V
ISC	10.3A
TEMP. COEFF. VOC	-0.25%/°C
MODULE DIMENSION	72.9"L x 39.2"W x 1.4"D (In Inch)

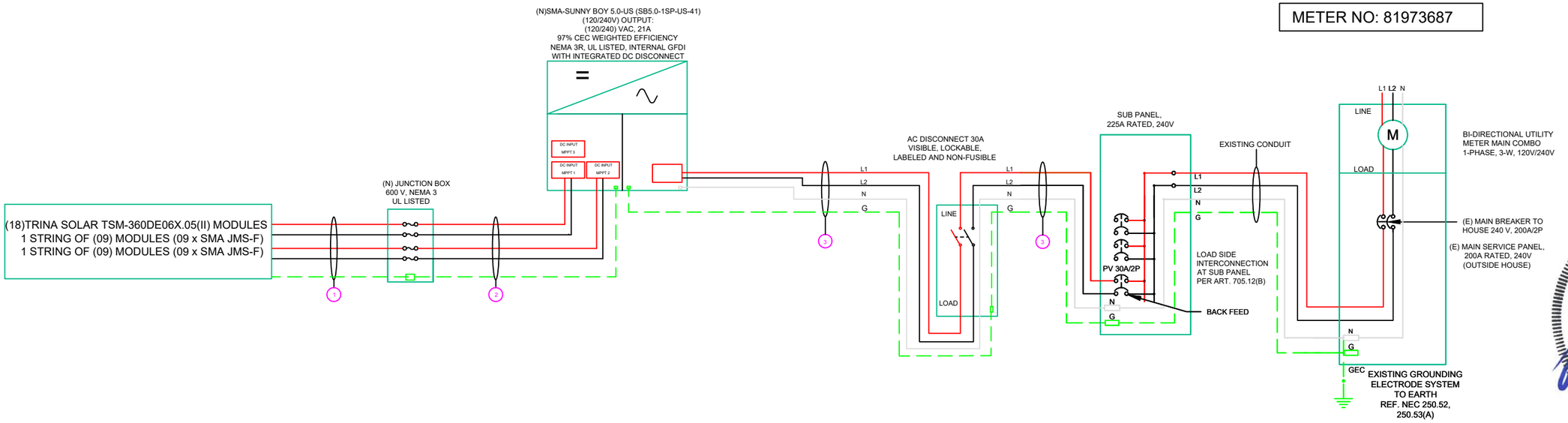
DC SIZE 18 X 360W = 6.480 kW DC-STC
AC SIZE 1 X 5000W = 5.000 kW AC

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	SMA-SUNNY BOY 5.0-US (SB5.0-1SP-US-41) INVERTER
POWER RATING	5000W
MAX OUTPUT CURRENT	21A
CEC WEIGHTED EFFICIENCY	97%
MAX INPUT CURRENT	18A (PER MPPT)
MAX DC VOLTAGE	600V

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

VMAX=VOC+((TLOW-TSTC) X (VOCCOEF X VOC/100))
VMAX=44.8+(-10-25) X (-0.25 X 44.8/100)
VMAX=44.8+(-35) X (-0.112)
VMAX=44.8+3.92
VMAX=48.72V
VMAX FOR 09 MODULE = 438.48
DC SYSTEM VOLTAGE OF INVERTER = 600V
600/48.72 = 12.32

METER NO: 81973687



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

ID	PHASE CONDUCTOR QTY, SIZE AND TYPE PER CONDUIT			GROUND CONDUCTOR QTY, SIZE AND TYPE PER CONDUIT			CONDUIT SIZE	CONDUIT TYPE
1	4	AWG #10	THWN-2	1	AWG #10	THWN-2, COPPER	3/4"	FREE AIR
2	4	AWG #10	THWN-2	1	AWG #10	THWN-2, COPPER	3/4"	EMT
3	3	AWG #6	THWN-2	1	AWG #10	THWN-2, COPPER	3/4"	EMT

CONTRACTOR

COMPLETE SOLAR
3000 EXECUTIVE PKWY
SUITE #504
SAN RAMON, CA 94583
PHONE NUMBER:
(877) 299-4943
Lic# 961988

PROJECT NAME & ADDRESS

ALLEN ROBERT

102 SONORA DR,
LILLINGTON,
NC 27546

COUNTY:-HARNETT COUNTY

SYSTEM SIZE
DC SIZE: 6.480 KW DC-(STC)
AC SIZE: 5.000 KW AC

signed 08-08-22

SHEET TITLE
LINE DIAGRAM

DRAWN DATE	7/29/2022
DRAWN BY	AP

SHEET NUMBER
E-601

2. PV OVER CURRENT PROTECTION ...NEC 690.9(B)

= TOTAL INVERTER O/P CURRENT x 1.25
= (1 x 21) x 1.25 = 26.25 A
SELECTED OCPD = 30 A ...NEC 240.6

3. 120% RULE FOR BACKFEED BREAKER

...CEC 705.12(B)(2)(3)(b)

MCB RATING + PV BREAKER RATING <= (1.2 x BUS BAR RATING)
(200 + 30) <= 1.2 x 225A
230.00 <= 270.00 HENCE OK

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-10°
AMBIENT TEMP (HIGH TEMP 2%)	36°
CONDUIT HEIGHT	0.5"
CONDUCTOR TEMPERATURE RATE	90°
MODULE TEMPERATURE COEFFICIENT OF VOC	-0.25%/°C

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

DC WIRE CALCULATION

WIRE ID	EXPECTED WIRE TEMP (In Celsius)	TEMP. CORRECTION PER TABLE 310.15(B)(2)(a)	NO. OF CURRENT CARRYING CONDUCTORS	CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a)	CIRCUIT CONDUCTOR SIZE	CIRCUIT CONDUCTOR AMPACITY @90°(PER FEEDER SET)	REQUIRED CIRCUIT CONDUCTOR AMPACITY PER CEC 690.8(A&B) 1.56 X Isc	DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC TABLE 310.16 TEMP. CORRECTION PER TABLE (310.16) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(A) X CIRCUIT CONDUCTOR AMPACITY @90°(PER FEEDER SET)	GROUND WIRE SIZE & GROUND WIRE TYPE
1	36°	0.91	4	1	10 AWG	40A	**16.07**A	**36.40**A	#10 THWN-2
2	36°	0.91	4	0.8	10 AWG	40A	**16.07**A	**29.12**A	#10 THWN-2

AC WIRE CALCULATION

WIRE ID	EXPECTED WIRE TEMP (In Celsius)	TEMP. CORRECTION PER TABLE 310.15(B)(2)(a)	NO. OF CURRENT CARRYING CONDUCTORS	CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a)	CIRCUIT CONDUCTOR SIZE	CIRCUIT CONDUCTOR AMPACITY @75°(PER FEEDER SET)	REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B) 1.25 X Inv Qnt.	DERATED AMPACITY OF CIRCUIT CONDUCTOR PER NEC TABLE 310.16 TEMP. CORRECTION PER TABLE (310.16) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(2)(A) X CIRCUIT CONDUCTOR AMPACITY @75°(PER FEEDER SET)	GROUND WIRE SIZE & GROUND WIRE TYPE
3	36°	0.91	3	1	6 AWG	65A	**26.25**A	**59.15**A	#10 THWN-2
4	36°	0.91	3	1	6 AWG	65A	**26.25**A	**59.15**A	#10 THWN-2

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SHEET TITLE
ELECTRICAL CALCULATIONS

DRAWN DATE	7/29/2022
DRAWN BY	AP

SHEET NUMBER

E-602

WARNING: PHOTOVOLTAIC POWER SOURCE

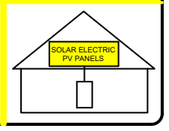
LABEL 1
ON ALL CONDUITS SPACED AT MAX 10FT

! CAUTION !
SOLAR ELECTRIC SYSTEM CONNECTED AND ENERGIZED

LABEL 2
AT INVERTER

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY



LABEL 3
AT INVERTER

PHOTOVOLTAIC DC DISCONNECT

LABEL 4
AT DC DISCONNECT

! WARNING !
ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS.
TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LABEL 5
AT EACH AC DISCONNECT

PHOTOVOLTAIC AC DISCONNECT

LABEL 6
AT EACH AC DISCONNECT

! WARNING !
DUAL POWER SOURCES SECOND SOURCE IS PV SYSTEM

LABEL 7
AT MEP

! WARNING !
SOLAR SYSTEM CONNECTED AND ENERGIZED

LABEL 8
AT MEP

! CAUTION !
SOLAR POINT OF INTERCONNECTION

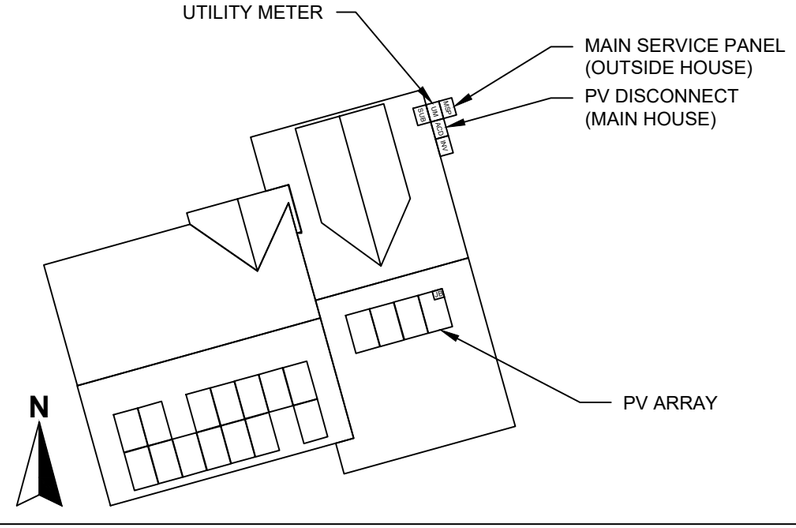
LABEL 9
AT UTILITY METER

! WARNING !
THE SERVICE METER IS ALSO SERVED BY A PHOTOVOLTAIC SYSTEM

LABEL 10
AT UTILITY METER

CAUTION

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



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SHEET TITLE
PLACARD

DRAWN DATE	7/29/2022
DRAWN BY	AP

SHEET NUMBER
E-603

Mono Multi Solutions

THE

Residential Module

MULTI-BUSBAR MONO PERC MODULE

132-Cell
MONOCRYSTALLINE MODULE

355-380W
POWER OUTPUT RANGE

20.6%
MAXIMUM EFFICIENCY

0~+5W
POSITIVE POWER TOLERANCE

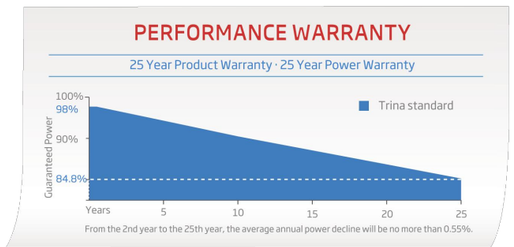
PRODUCTS	POWER RANGE
TSM-DE06X.05(II)	355-380W

High power and High Efficiency
- Up to 380W front power and 20.6% module efficiency with half-cut and MBB (Multi Busbar) technology bringing more BOS savings
- Reduce BOS cost with higher power bin and 1500V system voltage

Outstanding visual appearance
- Designed with aesthetics in mind
- High standard Production, Excellent cell color control by dedicated cell blackening treatment and machine selection
- Thinner wires that appear all black at a distance

High reliability
- Ensured PID resistance through cell process and module material control
- Resistant to salt, acid and ammonia
- Mechanical performance: Up to 5400 Pa positive load and 2400 Pa negative load

Certified to withstand the most chanllenging environmental conditions
- Excellent IAM and low light performance validated by 3rd party with cell process and module material optimization
- Lower temp co-efficient (-0.34%) and NOCT bring more energy leading to lower LCOE
- Better anti-shading performance and lower operating temperature



Founded in 1997, Trina Solar is the world's leading total solution provider for solar energy. With local presence around the globe, Trina Solar is able to provide exceptional service to each customer in each market and deliver our innovative, reliable products with the backing of Trina as a strong, bankable brand. Trina Solar now distributes its PV products to over 100 countries all over the world. We are committed to building strategic, mutually beneficial collaborations with installers, developers, distributors and other partners in driving smart energy together.

Comprehensive Products and System Certificates

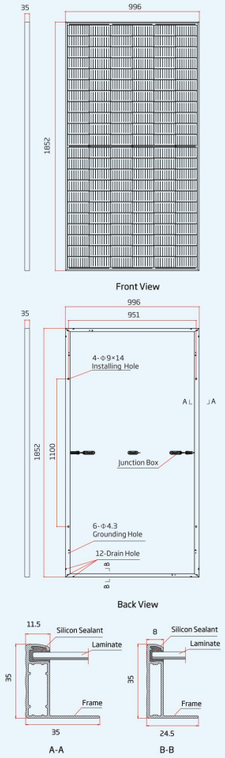
IEC61215/IEC61730/IEC61701/IEC62716/UL61730
ISO 9001: Quality Management System
ISO 14001: Environmental Management System
ISO14064: Greenhouse Gases Emissions Verification
OHSAS 18001: Occupation Health and Safety Management System

Trinasolar

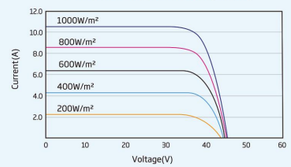
Residential Module

MULTI-BUSBAR MONO PERC MODULE

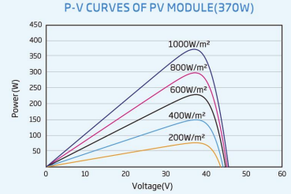
DIMENSIONS OF PV MODULE(mm)



I-V CURVES OF PV MODULE(370W)



P-V CURVES OF PV MODULE(370W)



ELECTRICAL DATA (STC)

Peak Power Watts-P_{MAX}(Wp)*	355	360	365	370	375	380
Power Output Tolerance-P_{MAX}(W)			0 ~ +5			
Maximum Power Voltage-V_{MPP}(V)	36.8	37.0	37.2	37.4	37.6	37.8
Maximum Power Current-I_{MPP}(A)	9.66	9.74	9.82	9.90	9.98	10.07
Open Circuit Voltage-V_{OC}(V)	44.6	44.8	45.0	45.2	45.3	45.5
Short Circuit Current-I_{SC}(A)	10.24	10.30	10.35	10.40	10.45	10.51
Module Efficiency η_m(%)	19.2	19.5	19.8	20.1	20.3	20.6

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
*Measurement tolerance: ±3%.

ELECTRICAL DATA (NOCT)

Maximum Power-P_{MAX}(Wp)	268	272	276	279	283	287
Maximum Power Voltage-V_{MPP}(V)	34.4	34.7	34.9	35.1	35.3	35.6
Maximum Power Current-I_{MPP}(A)	7.80	7.85	7.90	7.96	8.01	8.06
Open Circuit Voltage-V_{OC}(V)	42.0	42.2	42.4	42.6	42.6	42.8
Short Circuit Current-I_{SC}(A)	8.25	8.30	8.34	8.38	8.42	8.47

NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

MECHANICAL DATA

Solar Cells	Monocrystalline
Cell Orientation	132 cells
Module Dimensions	1852 × 996 × 35 mm (72.91×39.21× 1.38 inches)
Weight	19.7 kg (43.4 lb)
Glass	3.2 mm (0.13 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant Material	EVA
Backsheet	Black-White
Frame	35 mm (inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm² (0.006 inches²), Portrait: N 280mm/P 280mm(11.02/11.02inches) Landscape: N 1400 mm /P 1400 mm (55.12/55.12 inches)
Connector	MC4 EVO2
Fire Type	Type 2

TEMPERATURE RATINGS

NOCT(Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P_{MAX}	- 0.34%/°C
Temperature Coefficient of V_{OC}	- 0.25%/°C
Temperature Coefficient of I_{SC}	0.04%/°C

MAXIMUM RATINGS

Operational Temperature	-40~+85°C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	20A

WARRANTY

25 year Product Workmanship Warranty
25 year Linear Power Warranty

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

Modules per box: 31 pieces
Modules per 40' container: 744 pieces

Trinasolar

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

Version number: TSM_DE06X.05(II)_NA_2020_PA3 www.trinasolar.com

CONTRACTOR

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PROJECT NAME & ADDRESS

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102 SONORA DR,
LILLINGTON,
NC 27546

COUNTY:-HARNETT COUNTY

SYSTEM SIZE
DC SIZE: 6.480 KW DC-(STC)
AC SIZE: 5.000 KW AC

SHEET TITLE
RESOURCE DOCUMENT

DRAWN DATE	7/29/2022
DRAWN BY	AP

SHEET NUMBER
R-001

SUNNY BOY
3.0-US / 3.8-US / 5.0-US / 6.0-US / 7.0-US / 7.7-US

Value-Added Improvements

- SunSpec certified technology for cost-effective module-level shutdown
- Advanced AFCI compliant to UL 1699B for arc fault protection

Reduced Labor

- New Installation Assistant with direct access via smartphone minimizes time in the field
- Advanced communication interface with fewer components creates 50% faster setup and commissioning

Optimized Power Production

- ShadeFix, SMA's proprietary shade management solution, produces more power than alternatives
- Reduced component count provides maximum system reliability

Trouble-Free Service

- SMA Service Mobile App provides simplified, expedited field service
- Equipped with SMA Smart Connected, a proactive service solution that is integrated into Sunny Portal

SUNNY BOY 3.0-US / 3.8-US / 5.0-US / 6.0-US / 7.0-US / 7.7-US

Power with a purpose

The residential PV market is changing rapidly. Your bottom line matters more than ever–so we've designed a superior residential solution to help you decrease costs at every stage of your business operations. The Sunny Boy 3.0-US/3.8-US/5.0-US/6.0-US/7.0-US/7.7-US join the SMA lineup of field-proven solar technology backed by the world's #1 service team. This improved residential solution features ShadeFix, SMA's proprietary technology that optimizes system performance. ShadeFix also provides superior power production with a reduced component count versus competitors, which provides maximum reliability. No other optimized solution generates more power or is as easy as systems featuring SMA ShadeFix and SunSpec certified devices. Finally, SMA Smart Connected will automatically detect errors and initiate the repair and replacement process so that installers can reduce service calls and save time and money.

www.SMA-America.com

Technical data	Sunny Boy 3.0-US		Sunny Boy 3.8-US		Sunny Boy 5.0-US	
	208 V	240 V	208 V	240 V	208 V	240 V
Input (DC)						
Max. PV power	4800 Wp		6144 Wp		8000 Wp	
Max. DC voltage	600 V					
Rated MPP voltage range	155 - 480 V		195 - 480 V		220 – 480 V	
MPPT operating voltage range	100 – 550 V					
Min. DC voltage / start voltage	100 V / 125 V					
Max. operating input current per MPPT	10 A					
Max. short circuit current per MPPT	18 A					
Number of MPPT tracker / string per MPPT tracker	2/1				3 / 1	
Output (AC)						
AC nominal power	3000 W	3000 W	3330 W	3840 W	5000 W	5000 W
Max. AC apparent power	3000 VA	3000 VA	3330 VA	3840 VA	5000 VA	5000 VA
Nominal voltage / adjustable	208 V / ●	240 V / ●	208 V / ●	240 V / ●	208 V / ●	240 V / ●
AC voltage range	183 – 229 V	211 – 264 V	183 – 229 V	211 – 264 V	183 – 229 V	211 – 264 V
AC grid frequency	60 Hz / 50 Hz					
Max. output current	14.5 A	12.5 A	16.0 A	16.0 A	24.0 A	21.0 A
Power factor (cos φ) / harmonics	1 / < 4 %					
Output phases / line connections	1 / 2					
Efficiency						
Max. efficiency	97.2 %	97.6 %	97.3 %	97.6 %	97.3 %	97.6 %
CEC efficiency	96.0 %	96.5 %	96.5 %	96.5 %	96.5 %	97.0 %
Protection devices						
DC disconnect device / DC reverse polarity protection	● / ●					
Ground fault monitoring / Grid monitoring	●					
AC short circuit protection	●					
All-pole sensitive residual current monitoring unit (RCMU)	●					
Arc fault circuit interrupter (AFCI)	●					
Protection class / overvoltage category	I / IV					
General data						
Dimensions (W / H / D) in mm (in)	535 x 730 x 198 (21.1 x 28.5 x 7.8)					
Packaging dimensions (W / H / D) in mm (in)	600 x 800 x 300 (23.6 x 31.5 x 11.8)					
Weight / packaging weight	26 kg (57 lb) / 30 kg (66 lb)					
Temperature range: operating / non-operating	-25°C ...+60°C / -40°C ...+60°C					
Environmental protection rating	NEMA 3R					
Noise emission (typical)	39 dB(A)					
Internal power consumption at night	< 5 W					
Topology / cooling concept	transformerless / convection					
Features						
Ethernet ports	2					
Secure Power Supply	● 1)					
Display (2 x 16 characters)	●					
2.4 GHz WLAN / External WLAN antenna	▲ / ○					
ShadeFix technology for string level optimization	●					
Cellular (4G / 3G) / Revenue Grade Meter	○ / ○ 2)					
Warranty: 10 / 15 / 20 years	● / ○ / ○ 3)					
Certificates and approvals	UL 1741, UL 1741 SA incl. CA Rule 21 RSD, UL 1998, UL 1699B Ed. 1, IEEE1547, FCC Part 15 (Class A & B), CAN/CSA V22.2 107.1-1, HECO Rule 14H, PV Rapid Shutdown System Equipment					
● Standard features ○ Optional features – Not available ▲ Subject to availability						
Data at nominal conditions 1) Not compatible with SunSpec shutdown devices 2) Standard in SBX.X-1TP-US-41						
Type designation	SB3.0-1SP-US-41 / SB3.0-1TP-US-41		SB3.8-1SP-US-41 / SB3.8-1TP-US-41		SB5.0-1SP-US-41 / SB5.0-1TP-US-41	

Accessories

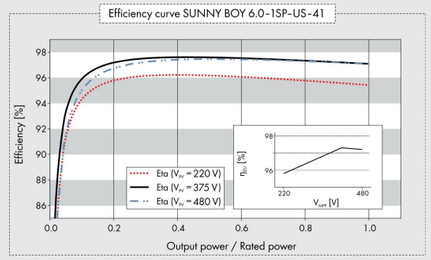
External WLAN antenna
EXTANT-US-40

SunSpec Certified Rapid Shutdown Receivers

Revenue Grade Meter Kit
RGM05KIT-US-10

Cellular Modem Kit
CELLMODKIT-US-10

3) Listed warranty terms are applicable in SMA-designated primary support countries, including the U.S., Canada, and Mexico. Reduced terms or restrictions may apply in other Americas regions and territories including the Pacific and Caribbean.



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SHEET TITLE
RESOURCE DOCUMENT

DRAWN DATE	7/29/2022
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SHEET NUMBER
R-002

JMS-F SUNSPEC RAPID SHUTDOWN DEVICE

Cost-effective

- Simple plug-and-play installation
- No additional components necessary, reducing balance of system costs

Simple and robust

- Power line based communication certified for compatibility with the SunSpec signal for rapid shutdown
- Shuts down PV module whenever SunSpec signal is interrupted

Safe and certified

- Certified and listed for compliance to:
  - » UL 1741 Rapid Shutdown System Equipment
  - » NEC 2017 690.12(B)(2) Module Level Shutdown

Reduced risk

- Technical support from SMA's #1 ranked service organization
- Fully SunSpec certified solution when paired with an SMA SunSpec certified inverter

JMS-F SUNSPEC RAPID SHUTDOWN DEVICE

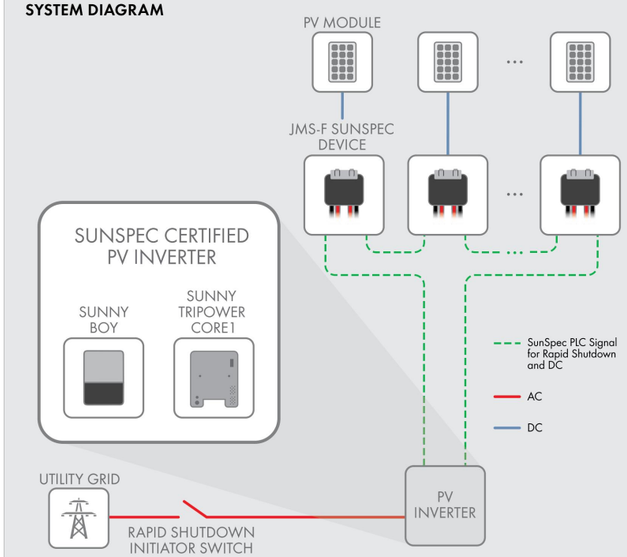
The easy module level rapid shutdown solution

The SunSpec Certified Rapid Shutdown System (model JMS-F), available from SMA, is the most cost-effective and reliable solution for fulfilling NEC 2017 module level shutdown requirements. The module-level device is certified for compatibility with the SunSpec communication signal and SMA inverters, making compliance simple and easy. By using the existing DC lines between the inverter and PV array for power line communications, installation and labor are significantly reduced. No additional wires or communication equipment is needed. The solution also features up to 50% fewer internal components vs alternatives, resulting in greater lifetime reliability.

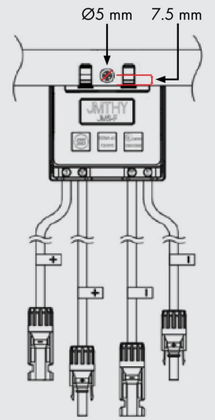
www.SMA-America.com

Technical data	JMS-F
Input (DC)	
Rated DC input power	600 Wp
Maximum PV module open circuit voltage	60 V
Minimum input voltage	10 V
Maximum continuous input current I_{MAX}	15 A
Maximum short-circuit input current I_{SC}	15 A
Output (DC)	
Output power range	0 W to 600 W
Maximum output voltage	60 V
Standby output voltage	1 V
Maximum system voltage	1500 V
Allowable series string connections	6 to 30 JMS-F devices
Mechanical	
Dimensions L / W / H in mm (in)	89 x 88.5 x 23.1 (3.5 x 3.48 x 0.9)
Weight (including cables)	0.95 lb (435 g)
Input / output connector	MC4
Output wire length	1.2 m
Operating temperature range	−40°C to +75°C (−40°F to +167°F)
Enclosure rating	Type 4X (as per UL 50E)
Relative humidity	0% to 100%
Features and compliance	
Certification	UL 1741 Rapid Shutdown Equipment
Communication mode	Power Line Communication (PLC)
SunSpec Rapid Shutdown Communication Protocol	SunSpec certified
Rapid shutdown time	10 seconds
Warranty (contact SMA Service Line)	25 years
SunSpec certified SMA inverters	Sunny Boy US (SBx.x-1SP-US-41) Sunny Tripower CORE1-US (STP xx-US-41)
Type designation	JMS-F
SMA part number	119814-00.01
Package quantity	40

SYSTEM DIAGRAM



BRACKET DIMENSIONS



Toll Free +1 888 4 SMA USA
www.SMA-America.com

SMA America, LLC

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RESOURCE DOCUMENT

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R-003

Tech Brief

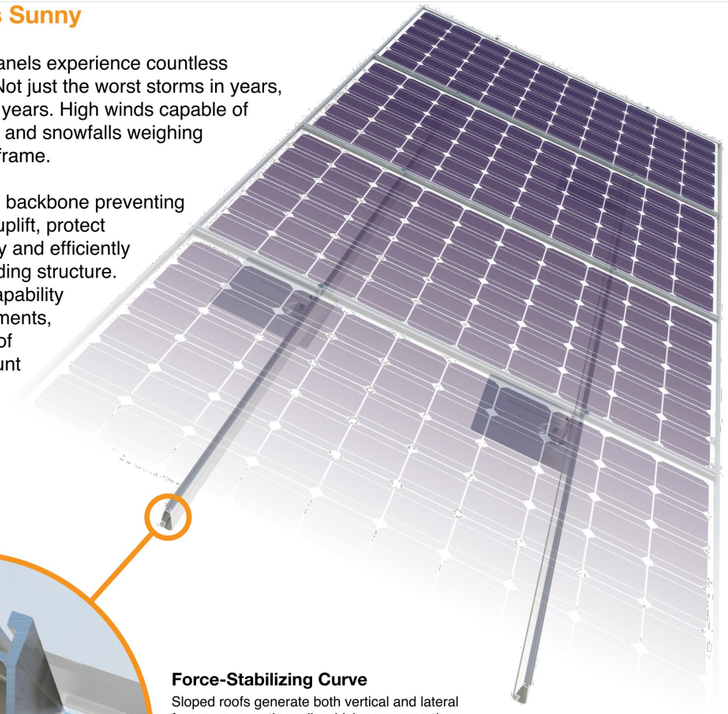
IRONRIDGE

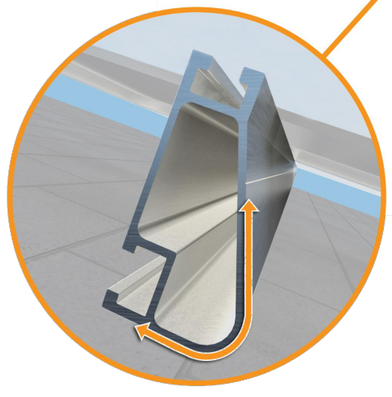
XR Rail Family

Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.





Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

Compatible with Flat & Pitched Roofs

XR Rails are compatible with FlashFoot and other pitched roof attachments.

IronRidge offers a range of tilt leg options for flat roof mounting applications.

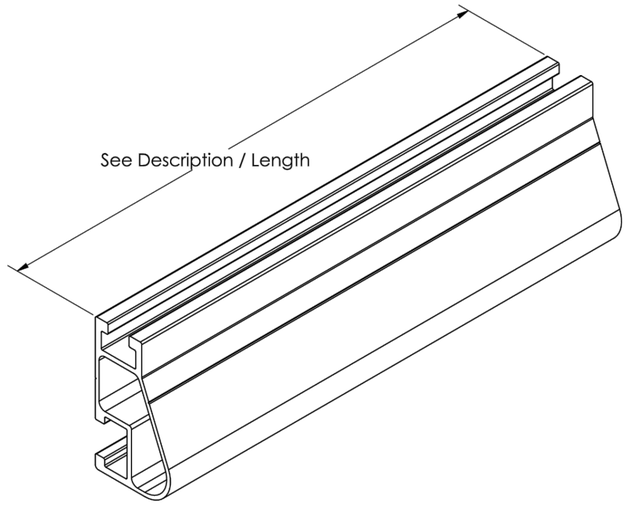
Corrosion-Resistant Materials

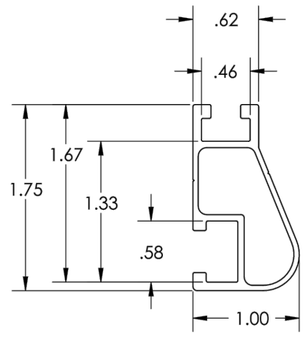
All XR Rails are made of 6000-series aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.

Cut Sheet

IRONRIDGE

XR10 Rail





Rail Section Properties	
Property	Value
Total Cross-Sectional Area	0.363 in^2
Section Modulus (X-axis)	0.136 in^3
Moment of Inertia (X-axis)	0.124 in^4
Moment of Inertia (Y-axis)	0.032 in^4
Torsional Constant	0.076 in^3
Polar Moment of Inertia	0.033 in^4

Clear Part Number	Black Part Number	Description / Length	Material	Weight
XR-10-132A	XR-10-132B	XR10, Rail 132" (11 Feet)	6000-Series Aluminum	4.67 lbs.
XR-10-168A	XR-10-168B	XR10, Rail 168" (14 Feet)		5.95 lbs.
XR-10-204A	XR-10-204B	XR10, Rail 204" (17 Feet)		7.22 lbs.

v1.0

CONTRACTOR

COMPLETE SOLAR
3000 EXECUTIVE PKWY
SUITE #504
SAN RAMON, CA 94583
PHONE NUMBER:
(877) 299-4943
Lic# 961988

PROJECT NAME & ADDRESS

ALLEN ROBERT

102 SONORA DR,
LILLINGTON,
NC 27546

COUNTY:-HARNETT COUNTY

SYSTEM SIZE
DC SIZE: 6.480 KW DC-(STC)
AC SIZE: 5.000 KW AC

SHEET TITLE
RESOURCE DOCUMENT

DRAWN DATE	7/29/2022
DRAWN BY	AP

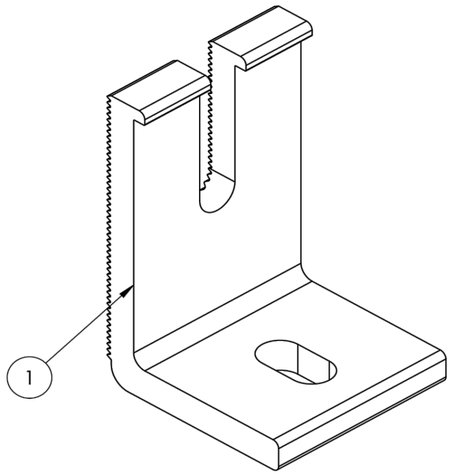
SHEET NUMBER

R-004

Cut Sheet

IRONRIDGE

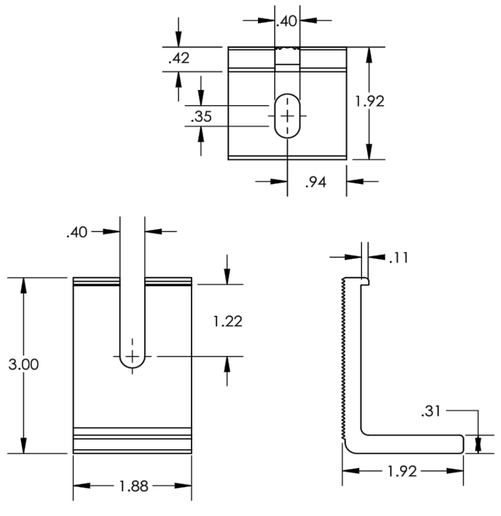
L-Foot



ITEM NO	DESCRIPTION	QTY IN KIT
1	FOOT, EXTRUDED L - SLOTTED	4

PART NUMBER	DESCRIPTION
FM-LFT-003	Kit, 4Pcs, Slotted L-Foot, Mill
FM-LFT-003-B	Kit, 4Pcs, Slotted L-Foot, Black

1) Foot, Extruded L - Slotted



v1.11

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RT-MINI

Self-flashing base for asphalt & metal roof-top PV mounting systems

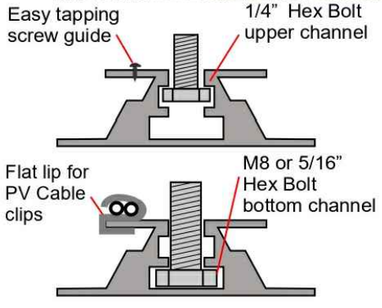
RT-MINI is suitable for mounting any rail system with a conventional L-Foot.

Dual bolt design: M8 or 5/16” for L-Foot & 1/4” for EMC

Installation Manual

ICC ES

ICC ESR 3575



RT-MINI

Flexible Flashing certified by the International Code Council (ICC)

Engineered to ASTM D 1761 (Standard Test Methods for Mechanical Fasteners in Wood)

Components

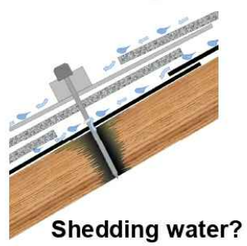
RT2-00-MINIBK

MINI base : 20 ea.
Screw : 40 ea.
Extra RT-Butyl : 10 ea.

Optional item
5 x 60mm Mounting screw (RT2-04-SD5-60) : 100 ea./Bag
5/16” Hex bolt, washer & nut set (RT-04-BN30SL-US) : 100 ea./Bag
RT-Butyl (RT2-04-BUTYLT) : 10 ea./Box

RT-Butyl is Roof Tech’s flexible flashing used in one million residential PV systems for the last 26 years. It is the first PV mounting system with Flexible Flashing certified by the ICC. Engineered to withstand wind speeds up to 180 mph and ground snow up to 90 psf.

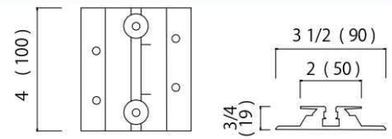
Metal Flashing Retrofit **Flexible Flashing**



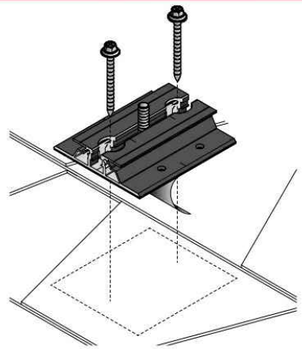
Shedding water? **100% Waterproof**

ICC ESR-3575 ASTM2140 testing UV testing (7500 hrs.)

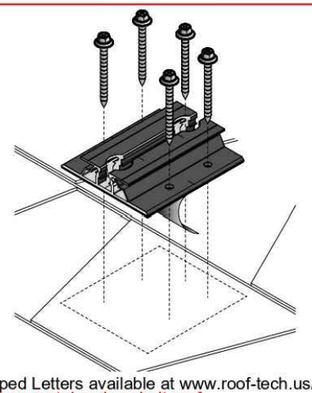
Dimensions in (mm)



Rafter installation



Deck installation



P.E. Stamped Letters available at www.roof-tech.us/support
TAS 100 A on metal and asphalt roof.

Roof Tech
The Standard for Waterproof Flexible Flashing Since 1994
www.roof-tech.us info@roof-tech.us

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858.935.6064

March 2020

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