

# PHOTOVOLTAIC ROOF MOUNT SYSTEM

20 MODULES-ROOF MOUNTED - 7.800 kW DC, 7.600 kW AC

3861 US 401 N, FUQUAY-VARINA, NC 27526



TOP TIER SOLAR SOLUTIONS

1530 CENTER PARK DR #2911,  
CHARLOTTE, NC 28217,  
UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	08/28/2024	
AS BUILT	09/02/2024	A



PROJECT NAME & ADDRESS

**JAMES MANGUM  
RESIDENCE**

3861 US 401 N,  
FUQUAY-VARINA, NC 27526

DRAWN BY  
**ESR**

SHEET NAME  
**COVER SHEET**

SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-1**

## PROJECT DATA

PROJECT ADDRESS: 3861 US 401 N,  
FUQUAY-VARINA, NC 27526

OWNER: JAMES MANGUM

DESIGNER: ESR

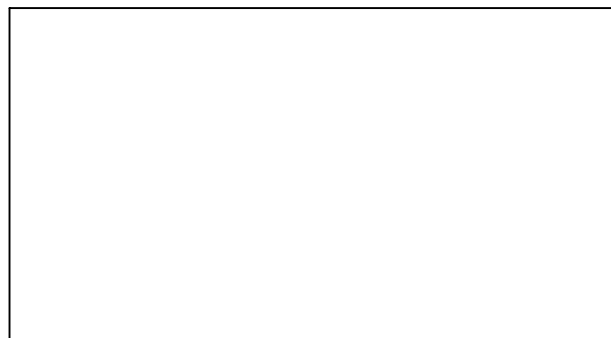
SCOPE: 7.800 kW DC ROOF MOUNT  
SOLAR PV SYSTEM WITH  
20 JINKO SOLAR: JKM390M-72HBL-V 390W  
PV MODULES WITH  
20 SOLAREEDGE: S440 POWER OPTIMIZERS AND  
01 SOLAREEDGE: SE7600H-US (240V/7600W)  
INVERTER

AUTHORITIES HAVING JURISDICTION:  
BUILDING: HARNETT COUNTY  
ZONING: HARNETT COUNTY  
UTILITY: DUKE ENERGY PROGRESS

## SHEET INDEX

PV-1	COVER SHEET
PV-2	SITE PLAN
PV-3	ROOF PLAN & MODULES
PV-4	ELECTRICAL PLAN
PV-5	STRUCTURAL DETAIL
PV-6	ELECTRICAL LINE DIAGRAM
PV-7	WIRING CALCULATIONS
PV-8	LABELS
PV-9+	EQUIPMENT SPECIFICATIONS

## SIGNATURE



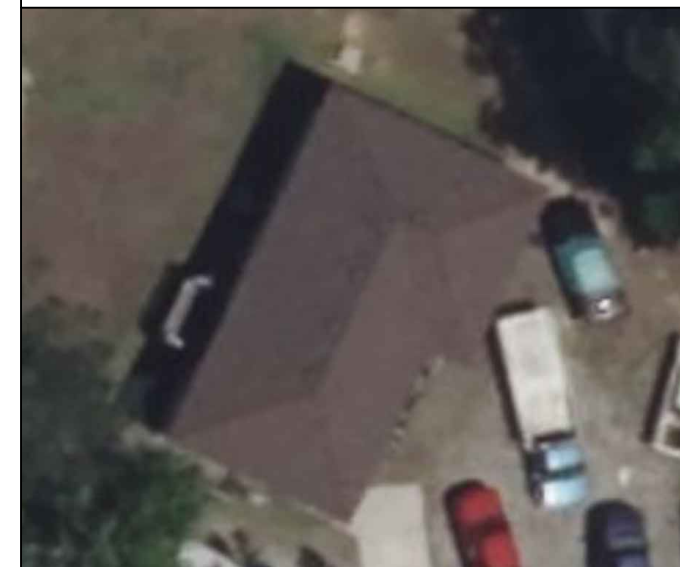
## GENERAL NOTES

- ALL COMPONENTS ARE UL LISTED AND CEC CERTIFIED, WHERE WARRANTED.
- THE SOLAR PV SYSTEM WILL BE INSTALLED IN ACCORDANCE WITH ARTICLE 690 OF THE NEC 2017.
- THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION.
- ALL CONDUCTORS OF A CIRCUIT, INCLUDING THE EGC, MUST BE INSTALLED IN THE SAME RACEWAY, OR CABLE, OR OTHERWISE RUN WITH THE PV ARRAY CIRCUIT CONDUCTORS WHEN THEY LEAVE THE VICINITY OF THE PV ARRAY.
- WHERE METALLIC CONDUIT CONTAINING DC CONDUCTORS IS USED INSIDE THE BUILDING, IT SHALL BE IDENTIFIED AS "CAUTION: SOLAR CIRCUIT" EVERY 10FT.
- HEIGHT OF THE AC DISCONNECT SHALL NOT EXCEED 6'-7" PER NEC CODE 240.24.
- A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH CEC 690.47 AND 250.50 THROUGH 60 AND 250-166 SHALL BE PROVIDED. PER NEC GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED AND BONDED TO THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE OR INADEQUATE A SUPPLEMENTAL GROUNDING ELECTRODE WILL BE USED AT THE INVERTER LOCATION CONSISTING OF A UL LISTED 8 FT. GROUND ROD WITH ACORN CLAMP. GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #8 AWG AND NO LARGER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE SYSTEM.
- PHOTOVOLTAIC MODULES ARE TO BE CONSIDERED NON-COMBUSTIBLE.
- PHOTOVOLTAIC INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
- ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE. WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF THE ROOF SURFACE.
- ALL SINAGE TO BE PLACED IN ACCORDANCE WITH THE LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SINAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.
- INVERTER(S) USED IN UNGROUNDED SYSTEM SHALL BE UL 1741 LISTED.
- THE INSTALLATION OF EQUIPMENT AND ALL ASSOCIATED WIRING AND INTERCONNECTION SHALL BE PERFORMED ONLY BY QUALIFIED PERSONS [NEC 690.4(C)]
- ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED (OR BETTER), INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES.
- ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250.
- SYSTEM GROUNDING SHALL BE IN ACCORDANCE WITH NEC 690.41.
- PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION IN ACCORDANCE WITH NEC 690.12
- DISCONNECTING MEANS SHALL BE LOCATED IN A VISIBLE, READILY ACCESSIBLE LOCATION WITHIN THE PV SYSTEM EQUIPMENT OR A MAXIMUM OF 10 FEET AWAY FROM THE SYSTEM [NEC 690.13(A)]
- ALL WIRING METHODS SHALL BE IN ACCORDANCE WITH NEC 690.31
- WORK CLEARANCES AROUND ELECTRICAL EQUIPMENT WILL BE MAINTAINED PER NEC 110.26(A)(1), 110.26(A)(2) AND 110.26(A)(3).
- ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED & IDENTIFIED IN ACCORDANCE WITH UL1703
- ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.

## VICINITY MAP



## HOUSE PHOTO



## CODE REFERENCES

2018 NORTH CAROLINA BUILDING CODE  
2018 NORTH CAROLINA RESIDENTIAL CODE  
2018 NORTH CAROLINA FIRE CODE  
2017 NATIONAL ELECTRICAL CODE

# PROJECT DESCRIPTION:

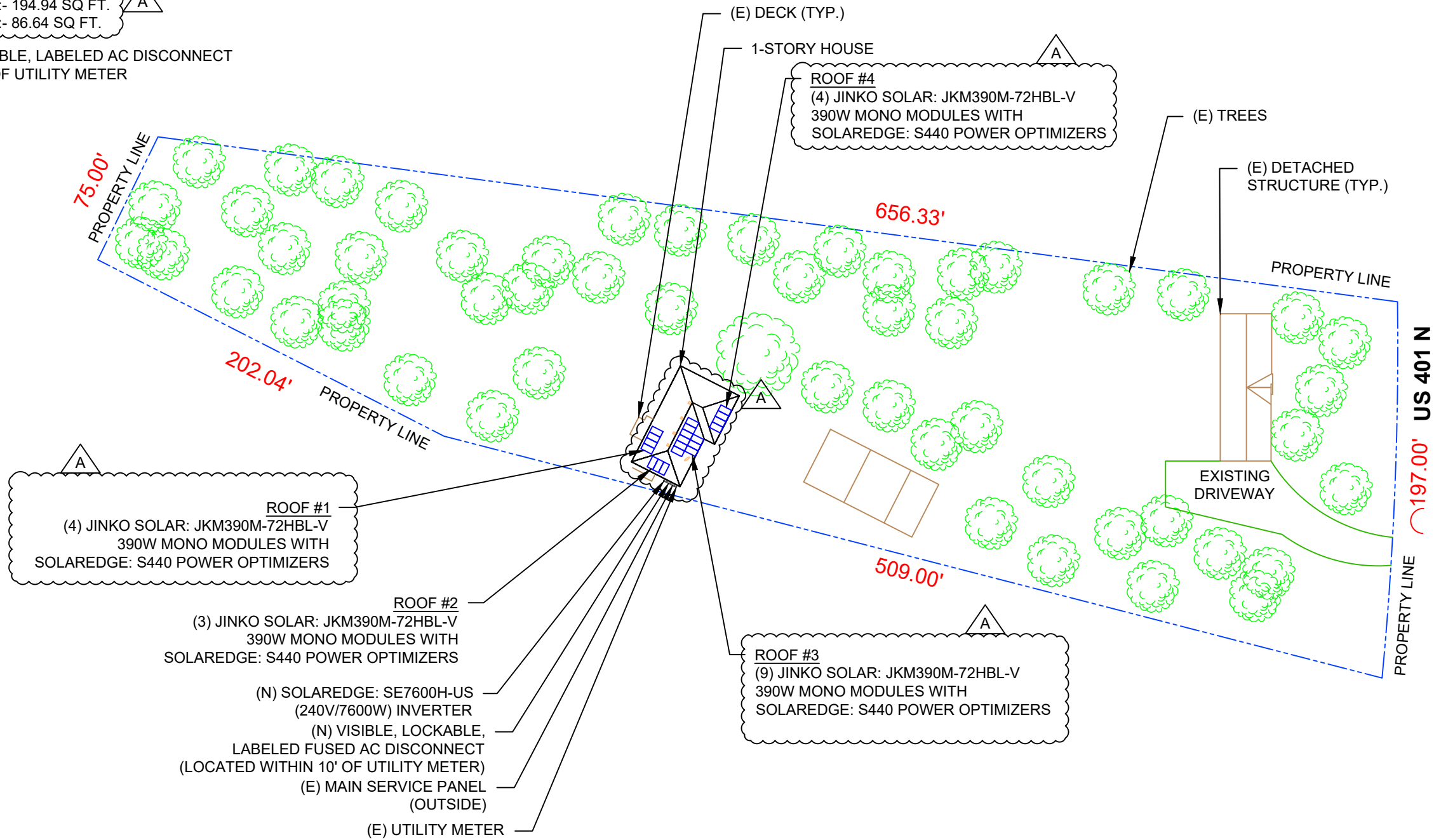
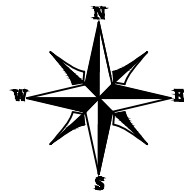
20 X JINKO SOLAR: JKM390M-72HBL-V 390W MONO MODULES  
 ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES  
 DC SYSTEM SIZE: 7.800 kW DC  
 AC SYSTEM SIZE: 7.600 kW AC

## EQUIPMENT SUMMARY

20 JINKO SOLAR: JKM390M-72HBL-V 390W MONO MODULES  
 20 SOLAREEDGE: S440 POWER OPTIMIZERS  
 01 SOLAREEDGE: SE7600H-US (240V/7600W) INVERTER

ROOF ARRAY AREA #1:- 86.64 SQ FT.  
 ROOF ARRAY AREA #2:- 64.98 SQ FT.  
 ROOF ARRAY AREA #3:- 194.94 SQ FT.  
 ROOF ARRAY AREA #4:- 86.64 SQ FT.

NOTE: VISIBLE, LOCKABLE, LABELED AC DISCONNECT  
 LOCATED WITHIN 10' OF UTILITY METER

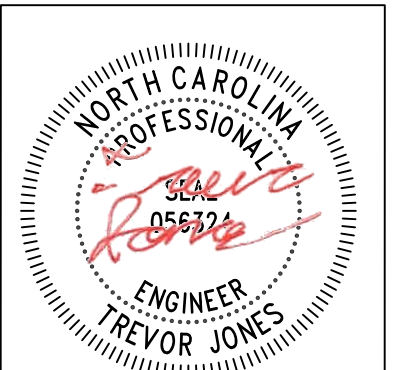


DESIGN SPECIFICATION  
 OCCUPANCY: II  
 CONSTRUCTION: SINGLE-FAMILY  
 ZONING: RESIDENTIAL  
 GROUND SNOW LOAD: REFER STRUCTURAL LETTER  
 WIND EXPOSURE: REFER STRUCTURAL LETTER  
 WIND SPEED: REFER STRUCTURAL LETTER



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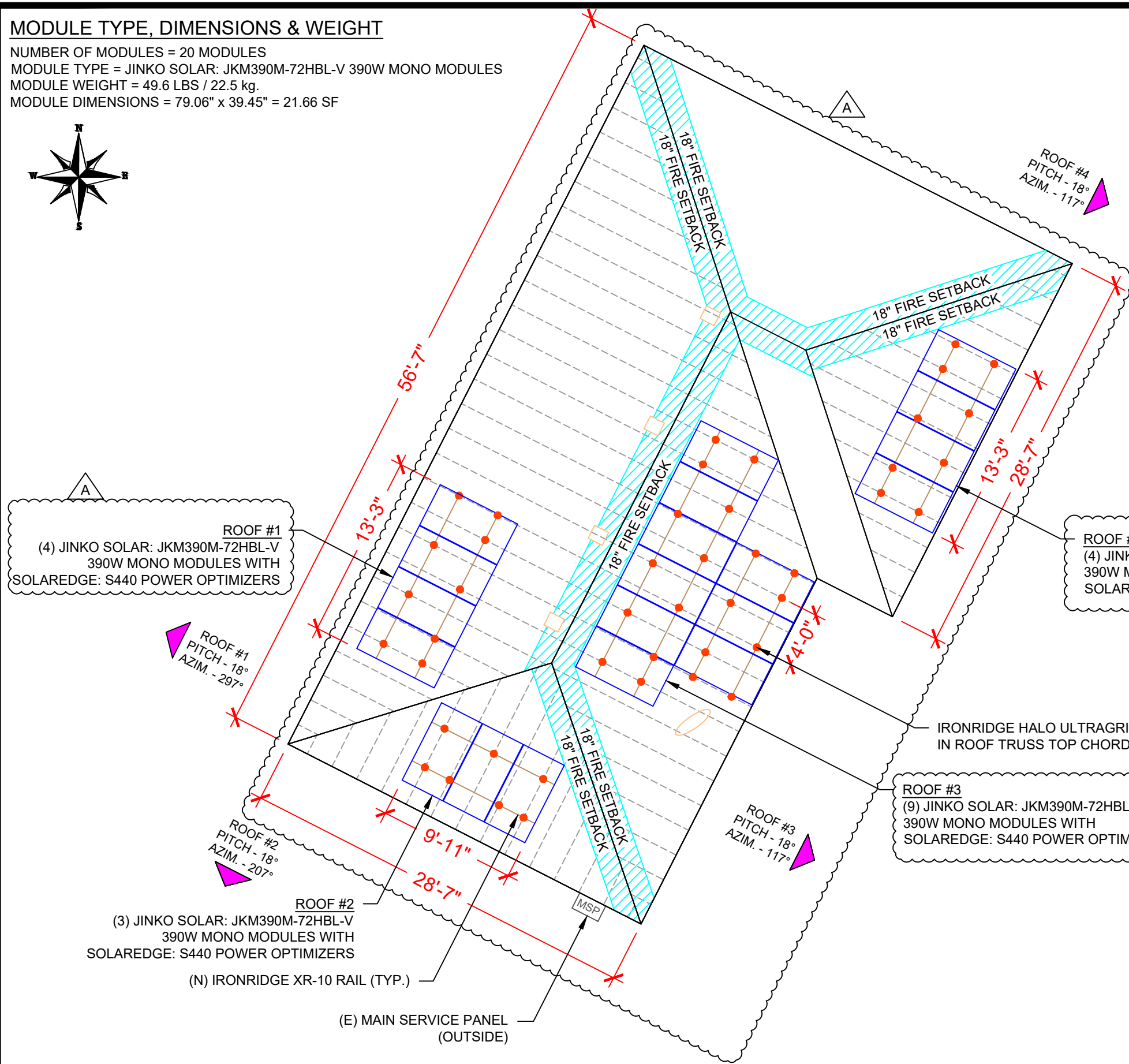
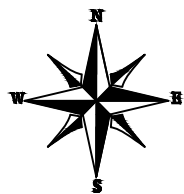
SHEET NAME  
**SITE PLAN**

SHEET SIZE  
**ANSI B  
 11" X 17"**

SHEET NUMBER  
**PV-2**

# MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 20 MODULES  
 MODULE TYPE = JINKO SOLAR: JKM390M-72HBL-V 390W MONO MODULES  
 MODULE WEIGHT = 49.6 LBS / 22.5 kg.  
 MODULE DIMENSIONS = 79.06" x 39.45" = 21.66 SF



ROOF DESCRIPTION					
ROOF TYPE				ASPHALT SHINGLE	
ROOF LAYER				1 LAYER	
ROOF	# OF MODULES	ROOF PITCH	AZIMUTH	TRUSS SIZE	TRUSS SPACING
#1	4	18°	297°	2"X4"	24"
#2	3	18°	207°	2"X4"	24"
#3	9	18°	117°	2"X4"	24"
#4	4	18°	117°	2"X4"	24"

ARRAY AREA & ROOF AREA CALC'S		
TOTAL PV ARRAY AREA (SQ. FT.)	TOTAL ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
433.20	1793.22	24

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**NORTH CAROLINA PROFESSIONAL SEAL**  
 ENGINEER  
**TREVOR JONES**  
 056324

STRUCTURAL ONLY  
 09/02/2024

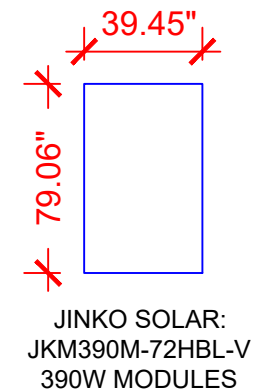
PROJECT NAME & ADDRESS  
**JAMES MANGUM RESIDENCE**  
 3861 US 401 N,  
 FUQUAY-VARINA, NC 27526

**ROOF #4**  
 (4) JINKO SOLAR: JKM390M-72HBL-V 390W MONO MODULES WITH SOLAREEDGE: S440 POWER OPTIMIZERS

**ROOF #3**  
 (9) JINKO SOLAR: JKM390M-72HBL-V 390W MONO MODULES WITH SOLAREEDGE: S440 POWER OPTIMIZERS

**ROOF #1**  
 (4) JINKO SOLAR: JKM390M-72HBL-V 390W MONO MODULES WITH SOLAREEDGE: S440 POWER OPTIMIZERS

**ROOF #2**  
 (3) JINKO SOLAR: JKM390M-72HBL-V 390W MONO MODULES WITH SOLAREEDGE: S440 POWER OPTIMIZERS  
 (N) IRONRIDGE XR-10 RAIL (TYP.)  
 (E) MAIN SERVICE PANEL (OUTSIDE)



**LEGEND**

- [JB] - JUNCTION BOX
- [INV] - INVERTER
- [ACD] - AC DISCONNECT
- [UM] - UTILITY METER
- [MSP] - MAIN SERVICE PANEL
- [SUB] - SUB PANEL
- - VENT, ATTIC FAN (ROOF OBSTRUCTION)
- - ROOF ATTACHMENT
- - - - TRUSS
- - - - CONDUIT

DRAWN BY  
**ESR**

SHEET NAME  
**ROOF PLAN & MODULES**

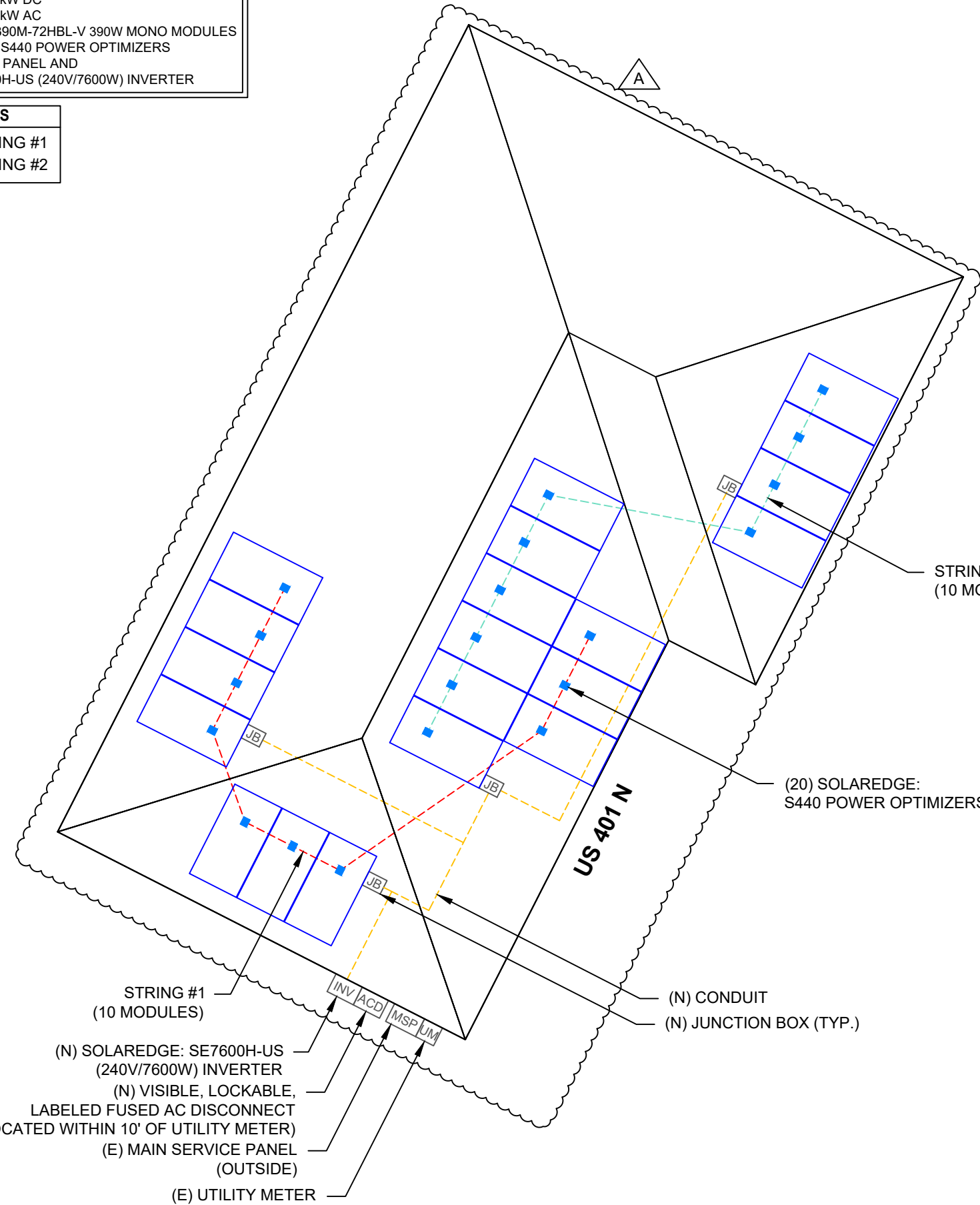
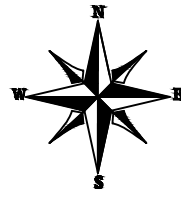
SHEET SIZE  
**ANSI B  
 11" X 17"**

SHEET NUMBER  
**PV-3**

DC SYSTEM SIZE: 7.800 kW DC  
 AC SYSTEM SIZE: 7.600 kW AC  
 (20) JINKO SOLAR: JKM390M-72HBL-V 390W MONO MODULES  
 WITH (20) SOLAREEDGE: S440 POWER OPTIMIZERS  
 LOCATED UNDER EACH PANEL AND  
 01 SOLAREEDGE: SE7600H-US (240V/7600W) INVERTER

**STRING LEGENDS**

--- STRING #1  
 --- STRING #2



BILL OF MATERIALS	
EQUIPMENT DESCRIPTION	QTY
SOLAR PV MODULES: JINKO SOLAR: JKM390M-72HBL-V 390W MODULE	20
OPTIMIZERS: SOLAREEDGE: S440 POWER OPTIMIZERS	20
INVERTER: SOLAREEDGE: SE7600H-US (240V/7600W) INVERTER	01
JUNCTION BOXES: JUNCTION BOX UL 1741, NEMA 3R CSA C22.2 NO.290	4
AC DISCONNECT: FUSED AC DISCONNECT, 60A FUSED, (2) 40A FUSES 240V NEMA 3R UL LISTED	1
IRONRIDGE XR10 RAIL (RAIL 168" (14 FEET) CLEAR) (XR-10-168A)	12
BONDED SPLICE, XR10 (XR10-BOSS-01-M1)	2
UNIVERSAL MODULE CLAMP, CLEAR (UFO-CL-01-A1)	50
STOPPER SLEEVE, 40MM, MILL (UFO-STP-40MM-M1)	20
GROUNDING LUG (XR-LUG-03-A1)	5
IRONRIDGE HALO ULTRAGRIP ATTACHMENTS (QM-HUG-01-M1)	45
RD STRUCTURAL SCREW, 3.0L (HW-RD1430-01-M1)	90
T-BOLT BONDING HARDWARE (BHW-TB-02-A1) (PRODUCT CODE 590-0116)	45
OPTIMIZER BONDING HARDWARE T-BOLT (BHW-MI-01-A1) (PRODUCT CODE 270-0152)	20

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SHEET NAME  
**ELECTRICAL PLAN**

SHEET SIZE  
**ANSI B  
 11" X 17"**

SHEET NUMBER  
**PV-4**

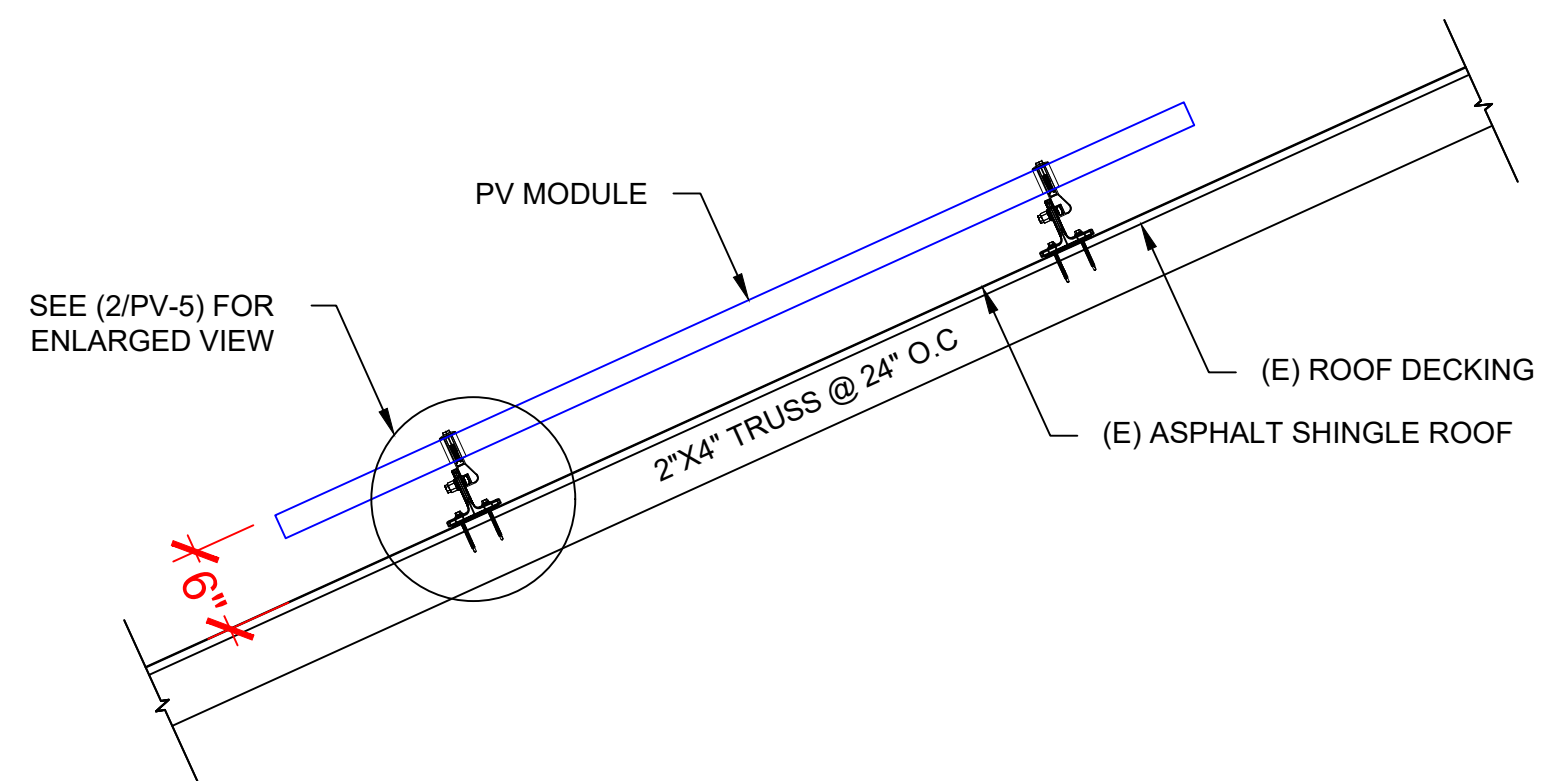
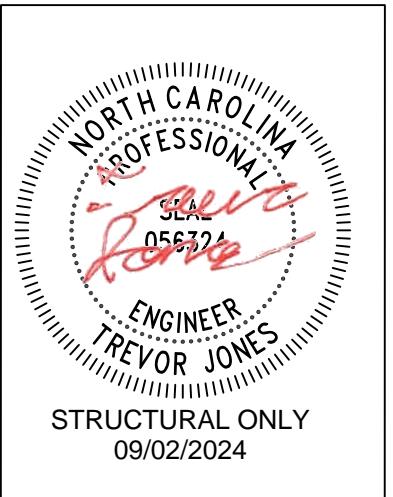
**LEGEND**

[JB]	- JUNCTION BOX
[INV]	- INVERTER
[ACD]	- AC DISCONNECT
[UM]	- UTILITY METER
[MSP]	- MAIN SERVICE PANEL
[SUB]	- SUB PANEL
○	- VENT, ATTIC FAN (ROOF OBSTRUCTION)
●	- ROOF ATTACHMENT
---	- TRUSS
---	- CONDUIT

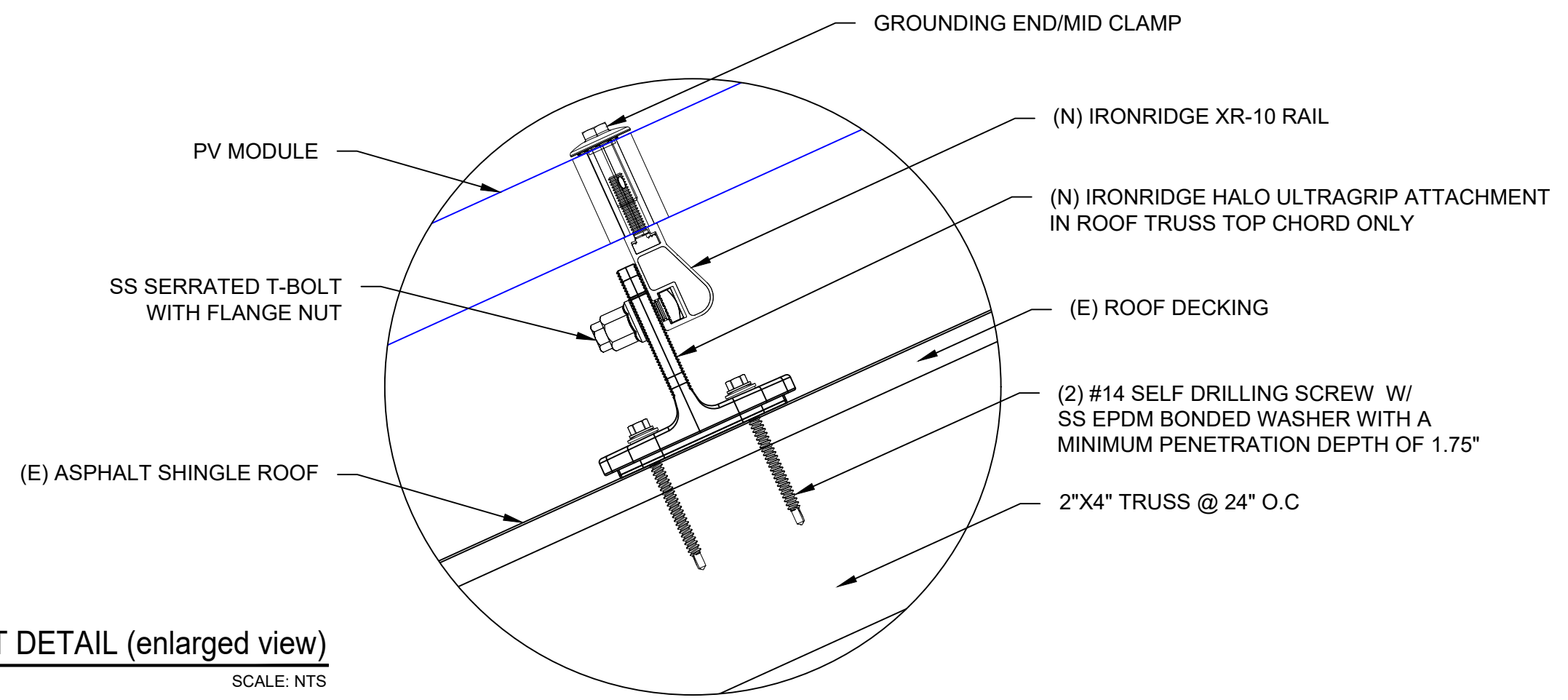


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**1** | **STRUCTURAL ATTACHMENT (Side view)**  
 PV-5 | SCALE: N.T.S



**2** | **ATTACHMENT DETAIL (enlarged view)**  
 PV-5 | SCALE: NTS

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SHEET NAME  
**STRUCTURAL DETAIL**

SHEET SIZE  
**ANSI B  
 11" X 17"**

SHEET NUMBER  
**PV-5**

DC SYSTEM SIZE: 7.800 kW DC  
AC SYSTEM SIZE: 7.600 kW AC

(20) JINKO SOLAR: JKM390M-72HBL-V 390W MONO MODULES WITH (20) SOLAREEDGE: S440 POWER OPTIMIZERS LOCATED UNDER EACH PANEL (240V) AND (01) SOLAREEDGE: SE7600H-US (240V/7600W) INVERTER (02) STRINGS OF 10 MODULES ARE CONNECTED IN SERIES

**BACKFEED BREAKER CALCULATION (120% RULE):**  
(MAIN BUS X 1.2 - MAIN BREAKER) >= (PV BREAKER)  
(200A X 1.2 - 200A) >= (40A)  
(40A) >= (40A) HENCE OK

**INTERCONNECTION NOTES:**

1. INTERCONNECTION SIZING, LIMITATIONS AND COMPLIANCE DETERMINED IN ACCORDANCE WITH [NEC 705.12], AND [NEC 690.59].
2. GROUND FAULT PROTECTION IN ACCORDANCE WITH [NEC 215.9], [NEC 230.95].
3. ALL EQUIPMENT TO BE RATED FOR BACKFEEDING.
4. PV BREAKER TO BE POSITIONED AT THE OPPOSITE END OF THE BUSBAR RELATIVE TO THE MAIN BREAKER.

**DISCONNECT NOTES:**

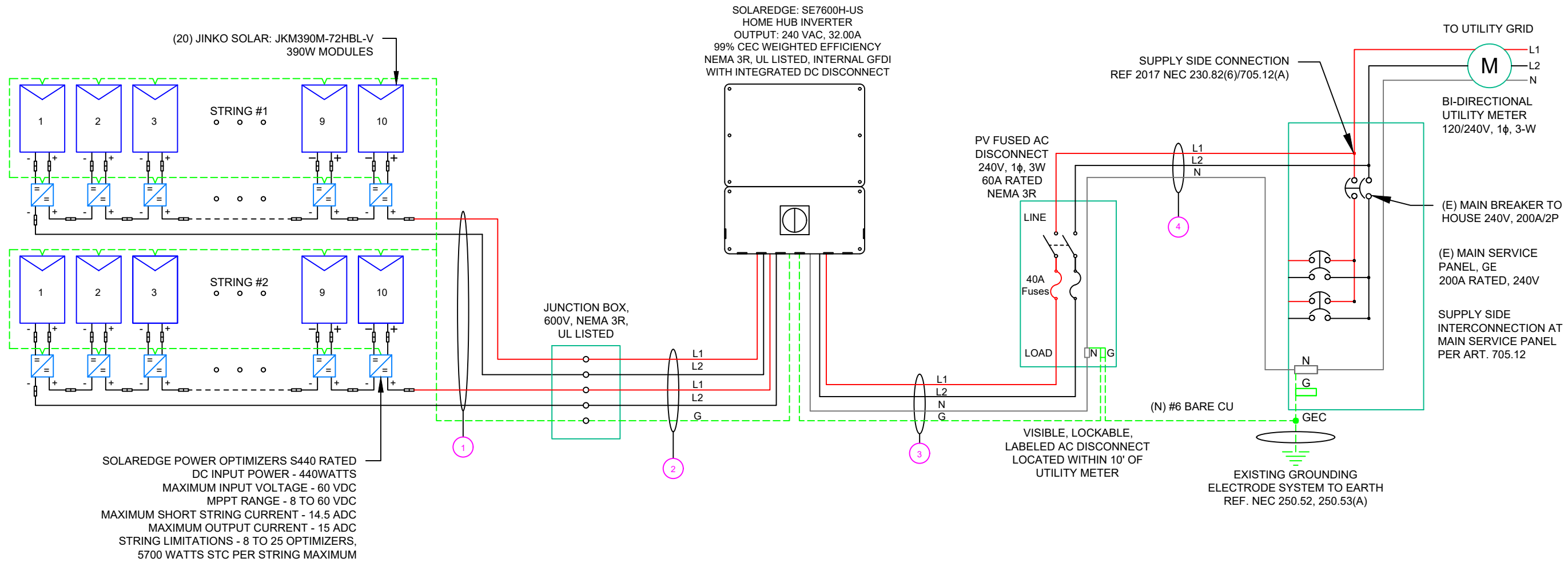
1. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING LIVE ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS)
2. AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
3. DISCONNECT MEANS AND THEIR LOCATION SHALL BE IN ACCORDANCE WITH [NEC 225.31] AND [NEC 225.32].

**GROUNDING & GENERAL NOTES:**

1. PV GROUNDING ELECTRODE SYSTEM NEEDS TO BE INSTALLED IN ACCORDANCE WITH [NEC 690.43]
2. PV INVERTER IS UNGROUNDED, TRANSFORMER-LESS TYPE.
3. DC GEC AND AC EGC TO REMAIN UNSPLICED, OR SPLICED TO EXISTING ELECTRODE
4. ANY EXISTING WIRING INVOLVED WITH PV SYSTEM CONNECTION THAT IS FOUND TO BE INADEQUATE PER CODE SHALL BE CORRECTED PRIOR TO FINAL INSPECTION.
5. JUNCTION BOX QUANTITIES, AND PLACEMENT SUBJECT TO CHANGE IN THE FIELD - JUNCTION BOX DEPICTED ON ELECTRICAL DIAGRAM REPRESENT WIRE TYPE TRANSITIONS.
6. AC DISCONNECT NOTED IN EQUIPMENT SCHEDULE OPTIONAL IF OTHER AC DISCONNECTING MEANS IS LOCATED WITHIN 10' OF SERVICE DISCONNECT.
7. RACEWAYS AND CABLES EXPOSED TO SUNLIGHT ON ROOFTOPS SHOULD BE INSTALLED MORE THAN 7/8" ABOVE THE ROOF USING CONDUIT SUPPORTS.

**RACKING NOTE:**

1. BOND EVERY OTHER RAIL WITH #6 BARE COPPER



SOLAREEDGE POWER OPTIMIZERS S440 RATED  
DC INPUT POWER - 440WATTS  
MAXIMUM INPUT VOLTAGE - 60 VDC  
MPPT RANGE - 8 TO 60 VDC  
MAXIMUM SHORT STRING CURRENT - 14.5 ADC  
MAXIMUM OUTPUT CURRENT - 15 ADC  
STRING LIMITATIONS - 8 TO 25 OPTIMIZERS,  
5700 WATTS STC PER STRING MAXIMUM

NOTE: CONDUIT TO BE UL LISTED FOR WET LOCATIONS AND UV PROTECTED

QTY	CONDUCTOR INFORMATION		CONDUIT TYPE	CONDUIT SIZE
① (4)	#10AWG -	PV WIRE/USE-2	N/A	N/A
(1)	#6AWG -	BARE COPPER IN FREE AIR		
② (4)	#10AWG -	CU, THWN-2	EMT OR LFMC IN ATTIC	3/4"
(1)	#10AWG -	CU, THWN-2 GND		
③ (2)	#6AWG -	CU, THWN-2	EMT, LFMC OR PVC	3/4"
(1)	#6AWG -	CU, THWN-2 N		
(1)	#6AWG -	CU, THWN-2 GND		
④ (2)	#6AWG -	CU, THWN-2	EMT, LFMC OR PVC	3/4"
(1)	#6AWG -	CU, THWN-2 N		

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SHEET NAME  
**ELECTRICAL LINE DIAGRAM**

SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-6**

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	JINKO SOLAR: JKM390M-72HBL-V 390W MODULE
VMP	39.64V
IMP	9.84A
VOC	48.60V
ISC	10.46A
TEMP. COEFF. VOC	-0.29%/°C
MODULE DIMENSION	79.06"L x 39.45"W x 1.57"D (In Inch)

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	SOLAREEDGE: SE7600H-US (240V/7600W) INVERTER
NOMINAL AC POWER	7.600 kW
NOMINAL OUTPUT VOLTAGE	240 VAC
NOMINAL OUTPUT CURRENT	32.00A

AMBIENT TEMPERATURE SPECS	
AMBIENT TEMP (HIGH TEMP 2%)	38°
RECORD LOW TEMPERATURE	-9°
MODULE TEMPERATURE COEFFICIENT OF Voc	-0.29%/°C

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

DC FEEDER CALCULATIONS																					
CIRCUIT ORIGIN	CIRCUIT DESTINATION	VOLTAGE (V)	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OCPD SIZE (A)	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a)	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)	CONDUIT SIZE	CONDUIT FILL (%)
STRING 1	JUNCTION BOX	380	15.00	18.75	20	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	38	2	40	0.91	1	36.4	PASS	5	1.24	0.049	N/A	#N/A
STRING 2	JUNCTION BOX	380	15.00	18.75	20	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	38	2	40	0.91	1	36.4	PASS	5	1.24	0.049	N/A	#N/A
JUNCTION BOX	INVERTER	380	15.00	18.75	20	CU #10 AWG	CU #10 AWG	35	PASS	38	4	40	0.91	0.8	29.12	PASS	20	1.24	0.196	3/4" EMT	19.79362

String 1 Voltage Drop	0.245
String 2 Voltage Drop	0.245

AC FEEDER CALCULATIONS																						
CIRCUIT ORIGIN	CIRCUIT DESTINATION	VOLTAGE (V)	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OCPD SIZE (A)	NEUTRAL SIZE	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a)	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)	CONDUIT SIZE	CONDUIT FILL (%)
INVERTER	AC DISCONNECT	240	32	40	40	CU #6 AWG	CU #6 AWG	CU #6 AWG	65	PASS	38	2	75	0.91	1	68.25	PASS	5	0.491	0.065	3/4" EMT	38.0488
AC DISCONNECT	POI	240	32	40	40	CU #6 AWG	N/A	CU #6 AWG	65	PASS	38	2	75	0.91	1	68.25	PASS	5	0.491	0.065	3/4" EMT	28.5366

CUMULATIVE VOLTAGE DROP	0.131
-------------------------	-------

#### ELECTRICAL NOTES

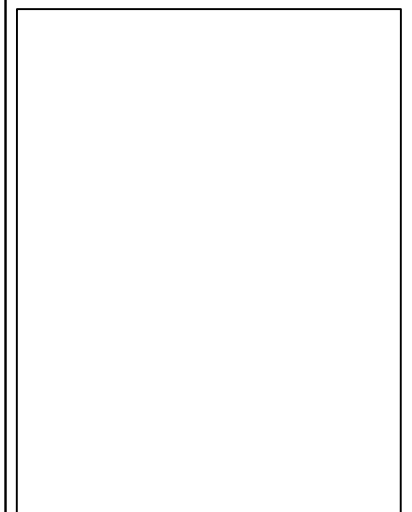
- ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
- WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
- WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
- WHERE SIZES OF JUNCTION BOX, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
- MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSKO GBL-4DBT LAY-IN LUG.
- TEMPERATURE RATINGS OF ALL CONDUCTORS, TERMINATIONS, BREAKERS, OR OTHER DEVICES ASSOCIATED WITH THE SOLAR PV SYSTEM SHALL BE RATED FOR AT LEAST 75 DEGREE C.



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UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	08/28/2024	
AS BUILT	09/02/2024	A



#### PROJECT NAME & ADDRESS

JAMES MANGUM  
RESIDENCE

3861 US 401 N,  
FUQUAY-VARINA, NC 27526

DRAWN BY	ESR
----------	-----

SHEET NAME	WIRING CALCULATIONS
------------	---------------------

SHEET SIZE	ANSI B 11" X 17"
------------	---------------------

SHEET NUMBER	PV-7
--------------	------

**PHOTOVOLTAIC POWER SOURCE**

EVERY 10' ON CONDUIT & ENCLOSURES

LABEL- 1:  
 LABEL LOCATION:  
 EMT/CONDUIT RACEWAY  
 SOLADECK / JUNCTION BOX  
 CODE REF: NEC 690.31 (D)(2)

**WARNING**

**ELECTRIC SHOCK HAZARD**

TERMINALS ON THE LINE AND LOAD SIDES MAY  
 BE ENERGIZED IN THE OPEN POSITION

LABEL- 2:  
 LABEL LOCATION:  
 AC DISCONNECT  
 CODE REF: NEC 690.13(B)

**WARNING**

**DUAL POWER SUPPLY**

SOURCE: UTILITY GRID AND  
 PV SOLAR ELECTRIC SYSTEM

LABEL- 3:  
 LABEL LOCATION:  
 MAIN SERVICE PANEL  
 CODE REF: NEC 705.12(C) & NEC 690.59

**SOLAR PV BREAKER:**

**BREAKER IS BACKFED  
 DO NOT RELOCATE**

LABEL-4:  
 LABEL LOCATION:  
 MAIN SERVICE PANEL  
 CODE REF: NEC 705.12(C) & NEC 690.59

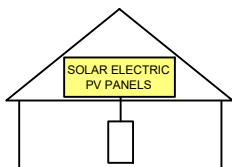
**WARNING**

**POWER SOURCE OUTPUT  
 CONNECTION. DO NOT  
 RELOCATE THIS  
 OVERCURRENT DEVICE**

LABEL- 5:  
 LABEL LOCATION:  
 MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)  
 SUBPANEL (ONLY IF SOLAR IS BACK-FED)  
 CODE REF: NEC 705.12(B)(3)(2)

**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- 6:  
 LABEL LOCATION:  
 AC DISCONNECT  
 CODE REF: [NEC 690.56(C)(1)(A)]

**RAPID SHUTDOWN SWITCH  
 FOR SOLAR PV SYSTEM**

LABEL- 7:  
 LABEL LOCATION:  
 AC DISCONNECT  
 MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)  
 CODE REF: NEC 690.56(C)(2)

**DC DISCONNECT**

LABEL- 8:  
 LABEL LOCATION:  
 INVERTER  
 CODE REF: NEC 690.13(B)

**AC DISCONNECT  
 PHOTOVOLTAIC SYSTEM  
 POWER SOURCE**

NOMINAL OPERATING AC VOLATGE **240 V**  
 RATED AC OUTPUT CURRENT **32.00 A**

LABEL- 9:  
 LABEL LOCATION:  
 AC DISCONNECT  
 CODE REF: NEC 690.54

MAXIMUM VOLTAGE **480 V**  
 MAXIMUM CIRCUIT CURRENT **14.00 A**  
 MAXIMUM RATED OUTPUT  
 CURRENT OF THE CHARGE  
 CONTROLLER OR DC-TO-DC  
 CONVERTER (IF INSTALLED)

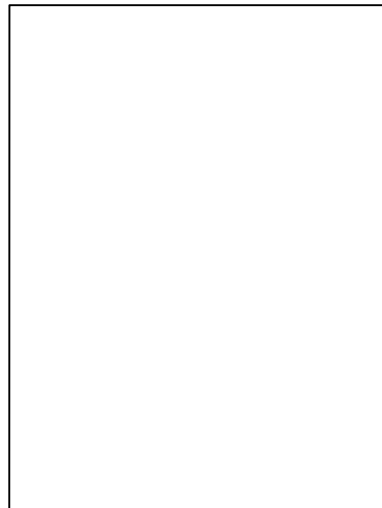
LABEL- 10:  
 LABEL LOCATION:  
 ON THE RIGHT SIDE OF THE INVERTER (PRE-EXISTING ON THE INVERTER)  
 CODE REF: NEC 690.53



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 RESIDENCE**  
 3861 US 401 N,  
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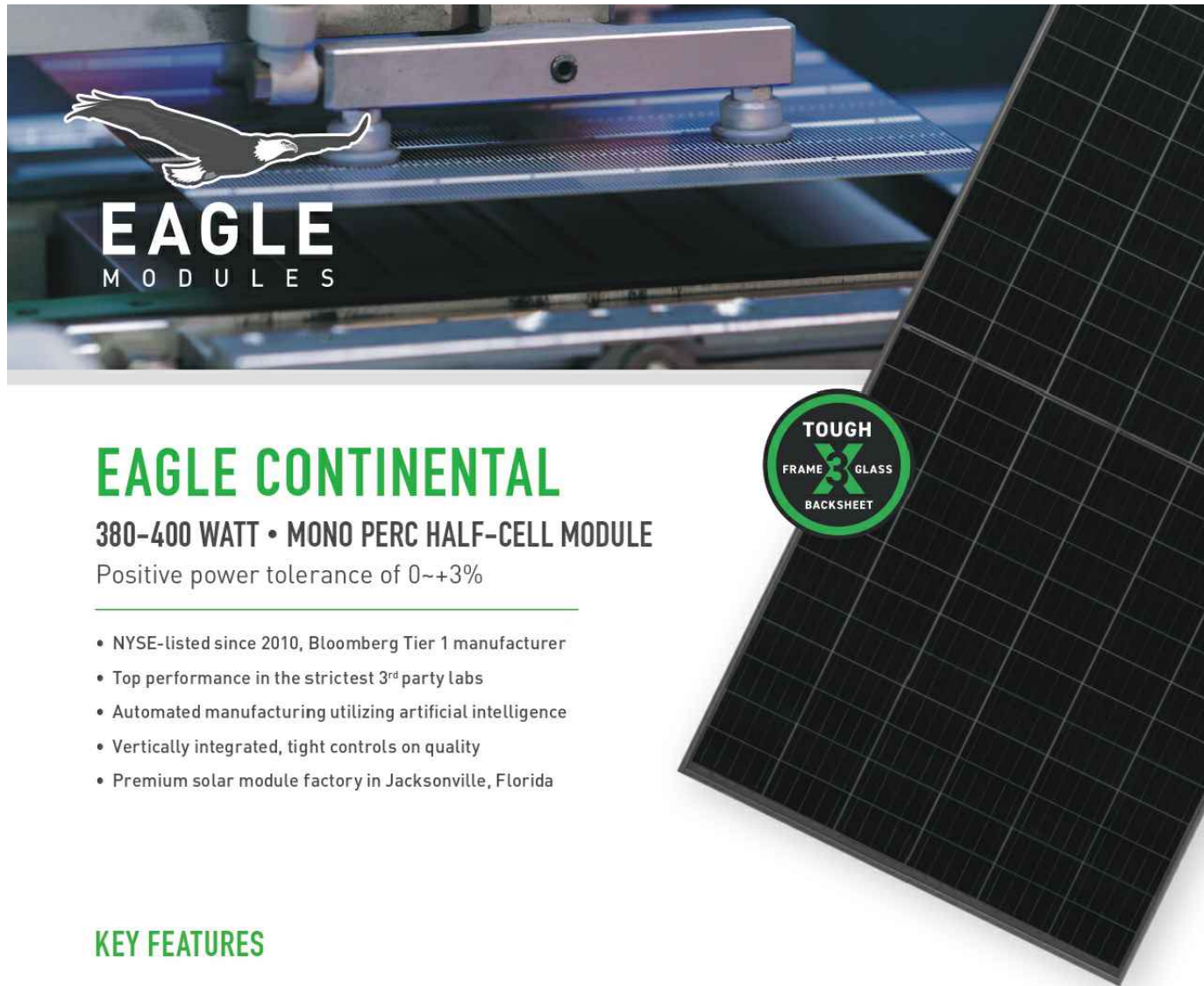
DRAWN BY  
**ESR**

SHEET NAME  
**LABELS**

SHEET SIZE  
**ANSI B  
 11" X 17"**

SHEET NUMBER  
**PV-8**





# EAGLE CONTINENTAL

380-400 WATT • MONO PERC HALF-CELL MODULE

Positive power tolerance of 0~+3%

- NYSE-listed since 2010, Bloomberg Tier 1 manufacturer
- Top performance in the strictest 3<sup>rd</sup> party labs
- Automated manufacturing utilizing artificial intelligence
- Vertically integrated, tight controls on quality
- Premium solar module factory in Jacksonville, Florida

## KEY FEATURES

- Superior Aesthetics**  
Black backsheet and black frame create ideal look for residential applications.
- Diamond Half-Cell Technology**  
World-record breaking efficient mono PERC half-cells deliver high power in a small footprint.
- Thick and Tough**  
Fire Type 1 rated module engineered with a thick frame, 3.2mm front side glass, and thick backsheet for added durability.
- Shade Tolerant**  
Twin array design allows continued performance even with shading by trees or debris.
- Protected Against All Environments**  
Certified to withstand humidity, heat, rain, marine environments, wind, hailstorms, and packed snow.
- Warranty**  
25-year product and 25-year linear power warranty.

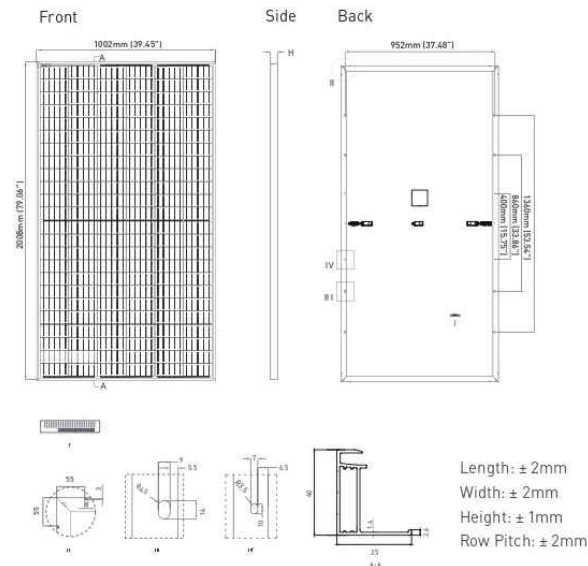
ASSEMBLED IN THE USA  
From foreign components

- ISO9001:2008 Quality Standards
- ISO14001:2004 Environmental Standards
- IEC61215, IEC61730 certified
- ISO 45001 2018 Occupational Health & Safety Standards
- UL1703/61730 certified

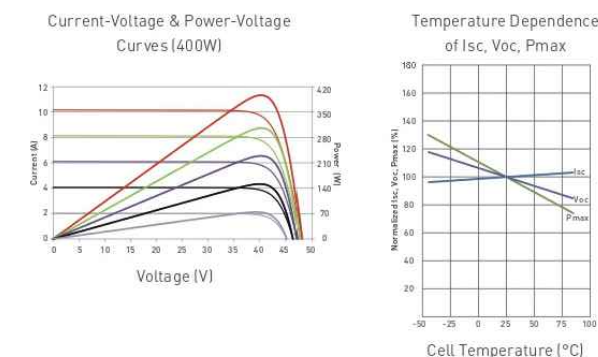
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## ENGINEERING DRAWINGS



## ELECTRICAL PERFORMANCE & TEMPERATURE DEPENDENCE



## ELECTRICAL CHARACTERISTICS

Module Type	JKM380M-72HBL-V		JKM385M-72HBL-V		JKM390M-72HBL-V		JKM395M-72HBL-V		JKM400M-72HBL-V	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	380Wp	280Wp	385Wp	283Wp	390Wp	287Wp	395Wp	291Wp	400Wp	294Wp
Maximum Power Voltage (Vmp)	39.10V	36.5V	39.37V	36.8V	39.64V	37.0V	39.90V	37.4V	40.16V	37.6V
Maximum Power Current (Imp)	9.72A	7.67A	9.78A	7.71A	9.84A	7.75A	9.90A	7.77A	9.96A	7.82A
Open-circuit Voltage (Voc)	48.2V	45.4V	48.4V	45.6V	48.6V	45.8V	48.8V	46.0V	49.1V	46.2V
Short-circuit Current (Isc)	10.30A	8.32A	10.38A	8.38A	10.46A	8.45A	10.54A	8.51A	10.61A	8.57A
Module Efficiency STC (%)	18.89%		19.13%		19.38%		19.63%		19.88%	

\*STC: ☀ Irradiance 1000W/m<sup>2</sup>    🌡 Cell Temperature 25°C    ☁ AM = 1.5  
 NOCT: ☀ Irradiance 800W/m<sup>2</sup>    🌡 Ambient Temperature 20°C    ☁ AM = 1.5    🌬 Wind Speed 1m/s

\*Power measurement tolerance: ±3%

The company reserves the final right for explanation on any of the information presented hereby. JKM380-400M-72HBL-V-F1-US

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## MECHANICAL CHARACTERISTICS

Cells	Mono PERC Diamond Cell (158.75 x 158.75mm)
No. of Half Cells	144 (6 x 24)
Dimensions	2008 x 1002 x 40mm (79.06 x 39.45 x 1.57in)
Weight	22.5kg (49.6lbs)
Front Glass	3.2mm, Anti-Reflection Coating High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminum Alloy
Junction Box	IP68 Rated
Output Cables	12 AWG, 1400mm (55.12in)
Connector	Staubli MC4 Series
Fire Type	Type 1
Pressure Rating	5400Pa (Snow) & 2400Pa (Wind)
Hailstone Test	50mm Hailstones at 35m/s

## TEMPERATURE CHARACTERISTICS

Temperature Coefficients of Pmax	-0.35%/°C
Temperature Coefficients of Voc	-0.29%/°C
Temperature Coefficients of Isc	0.048%/°C
Nominal Operating Cell Temperature (NOCT)	45±2°C

## MAXIMUM RATINGS

Operating Temperature (°C)	-40°C~+85°C
Maximum System Voltage	1500VDC (UL and IEC)
Maximum Series Fuse Rating	20A

## PACKAGING CONFIGURATION

(Two pallets = One stack)  
 27pcs/pallet, 54pcs/stack, 594pcs/40'HQ Container

## WARRANTY

25-year product and 25-year linear power warranty  
 1<sup>st</sup> year degradation not to exceed 2.5%, each subsequent year not to exceed 0.6%, minimum power at year 25 is 83.1% or greater.

**TOP TIER**  
SOLAR SOLUTIONS

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## REVISIONS

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INITIAL DESIGN	08/28/2024	
AS BUILT	09/02/2024	A

## PROJECT NAME & ADDRESS

JAMES MANGUM  
RESIDENCE

3861 US 401 N,  
 FUQUAY-VARINA, NC 27526

## DRAWN BY

ESR

SHEET NAME  
EQUIPMENT  
SPECIFICATION

## SHEET SIZE

ANSI B  
11" X 17"

## SHEET NUMBER

PV-9

# CERTIFICATE OF COMPLIANCE

**Certificate Number** E362479  
**Report Reference** E362479-20200410  
**Date** 2023-July-16

**Issued to:** JINKO SOLAR CO LTD  
 No.1, Yingbin Road, Economic Development Zone  
 Shangrao Jiangxi Sheng 334100 CN

**This is to certify that representative samples of** PHOTOVOLTAIC MODULES AND PANELS WITH SYSTEM VOLTAGE RATINGS OVER 600 VOLTS  
 See Addendum Page for Product Designation(s).  
 Have been evaluated by UL in accordance with the Standard(s) indicated on this Certificate.

**Standard(s) for Safety:** UL 61730-1 - Standard for Photovoltaic (PV) Module Safety Qualification - Part 1: Requirements for Construction, Edition 2, Issue Date 10/28/2022 and UL 61730-2, Photovoltaic (PV) Module Safety Qualification - Part 2: Requirements for Testing, Edition 2, Revision Date 04/25/2023 and CSA C22.2 No. 61730-1:19 December 2019, Photovoltaic (PV) module safety qualification — Part 1: Requirements for construction and CSA C22.2 No. 61730-2:19 December 2019, Photovoltaic (PV) module safety qualification — Part 2: Requirements for testing.

**Additional Information:** See the UL Online Certifications Directory at <https://iq.ulprospector.com> for additional information

This Certificate of Compliance indicates that representative samples of the product described in the certification report have met the requirements for UL certification. It does not provide authorization to apply the UL Mark. Only the Authorization Page that references the Follow-Up Services Procedure for ongoing surveillance provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

*Deborah Jennings-Conner*  
 Deborah Jennings-Conner, VP Regulatory Services  
 UL LLC



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# CERTIFICATE OF COMPLIANCE

**Certificate Number** E362479  
**Report Reference** E362479-20200410  
**Date** 2023-July-16

JKM525N-72HL4-V, JKM530N-72HL4-V, JKM535N-72HL4-V, JKM540N-72HL4-V, JKM545N-72HL4-V, JKM550N-72HL4-V, JKM555N-72HL4-V, JKM560N-72HL4-V, JKM565N-72HL4-V, JKM570N-72HL4-V, JKM575N-72HL4-V.

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JKM395N-54HL4-V, JKM400N-54HL4-V, JKM405N-54HL4-V, JKM410N-54HL4-V, JKM415N-54HL4-V, JKM420N-54HL4-V, JKM425N-54HL4-V, JKM430N-54HL4-V.

JKM565M-78HL4-V, JKM570M-78HL4-V, JKM575M-78HL4-V, JKM580M-78HL4-V, JKM585M-78HL4-V, JKM590M-78HL4-V, JKM595M-78HL4-V, JKM600M-78HL4-V, JKM605M-78HL4-V

JKM370M-72HBL-V, JKM375M-72HBL-V, JKM380M-72HBL-V, JKM385M-72HBL-V, **JKM390M-72HBL-V**, JKM395M-72HBL-V, JKM400M-72HBL-V, JKM405M-72HBL-V, JKM410M-72HBL-V, JKM415M-72HBL-V, JKM420M-72HBL-V.

JKM330M-60HBL-V, JKM335M-60HBL-V, JKM340M-60HBL-V, JKM345M-60HBL-V, JKM350M-60HBL-V.

JKM515N-72HL4-B-V, JKM520N-72HL4-B-V, JKM525N-72HL4-B-V, JKM530N-72HL4-B-V, JKM535N-72HL4-B-V, JKM540N-72HL4-B-V, JKM545N-72HL4-B-V, JKM550N-72HL4-B-V, JKM555N-72HL4-B-V, JKM560N-72HL4-B-V, JKM565N-72HL4-B-V, JKM570N-72HL4-B-V.

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JKM430N-60HL4-B-V, JKM435N-60HL4-B-V, JKM440N-60HL4-B-V, JKM445N-60HL4-B-V, JKM450N-60HL4-B-V, JKM455N-60HL4-B-V, JKM460N-60HL4-B-V, JKM465N-60HL4-B-V, JKM470N-60HL4-B-V.

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JKM585N-78HL4R-V, JKM590N-78HL4R-V, JKM595N-78HL4R-V, JKM600N-78HL4R-V, JKM605N-78HL4R-V, JKM610N-78HL4R-V, JKM615N-78HL4R-V, JKM620N-78HL4R-V, JKM625N-78HL4R-V, JKM630N-78HL4R-V, JKM635N-78HL4R-V, JKM640N-78HL4R-V, JKM645N-78HL4R-V, JKM650N-78HL4R-V

*Deborah Jennings-Conner*  
 Deborah Jennings-Conner, VP Regulatory Services  
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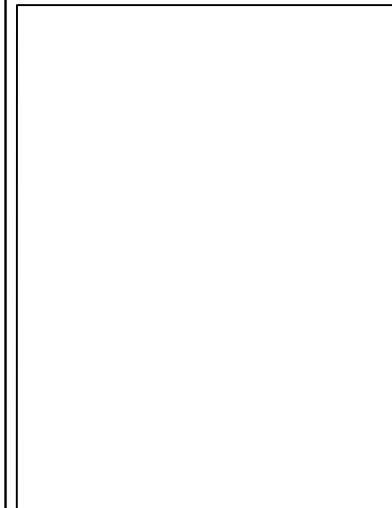


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DRAWN BY  
**ESR**

SHEET NAME  
**EQUIPMENT SPECIFICATION**

SHEET SIZE  
**ANSI B  
 11" X 17"**

SHEET NUMBER  
**PV-10**

# Power Optimizer For Residential Installations

S440 / S500 / S500B / S650B



POWER OPTIMIZER

## Enabling PV power optimization at the module level

- Specifically designed to work with SolarEdge residential inverters
- Mitigates all types of module mismatch loss, from manufacturing tolerance to partial shading
- Detects abnormal PV connector behavior, preventing potential safety issues\*
- Faster installations with simplified cable management and easy assembly using a single bolt
- Module-level voltage shutdown for installer and firefighter safety
- Flexible system design for maximum space utilization
- Superior efficiency (99.5%)
- Compatible with bifacial PV modules

\*Functionality subject to inverter model and firmware version

[solaredge.com](http://solaredge.com)



## Power Optimizer For Residential Installations

S440 / S500 / S500B / S650B

	S440	S500	S500B	S650B	UNIT
<b>INPUT</b>					
Rated Input DC Power <sup>(1)</sup>	440	500		650	W
Absolute Maximum Input Voltage (Voc)	60		125	85	Vdc
MPPT Operating Range	8 – 60		12.5 – 105	12.5 – 85	Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	14.5		15		Adc
Maximum Efficiency		99.5			%
Weighted Efficiency		98.6			%
Overvoltage Category		II			
<b>OUTPUT DURING OPERATION</b>					
Maximum Output Current		15			Adc
Maximum Output Voltage	60		80		Vdc
<b>OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)</b>					
Safety Output Voltage per Power Optimizer		1 ± 0.1			Vdc
<b>STANDARD COMPLIANCE<sup>(2)</sup></b>					
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3, CISPR11, EN-55011				
Safety	IEC62109-1 (class II safety), UL1741				
Material	UL94 V-0, UV Resistant				
RoHS	Yes				
Fire Safety	VDE-AR-E 2100-712:2018-12				
<b>INSTALLATION SPECIFICATIONS</b>					
Maximum Allowed System Voltage		1000			Vdc
Dimensions (W x L x H)	129 x 155 x 30		129 x 165 x 45		mm
Weight	720		790		gr
Input Connector		MC4 <sup>(3)</sup>			
Input Wire Length		0.1			m
Output Connector		MC4			
Output Wire Length		(+) 2.3, (-) 0.10			m
Operating Temperature Range <sup>(4)</sup>		-40 to +85			°C
Protection Rating		IP68			
Relative Humidity		0 – 100			%

(1) Rated power of the module at STC will not exceed the Power Optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed.

(2) For details about CE compliance, see [Declaration of Conformity - CE](#).

(3) For other connector types please contact SolarEdge.

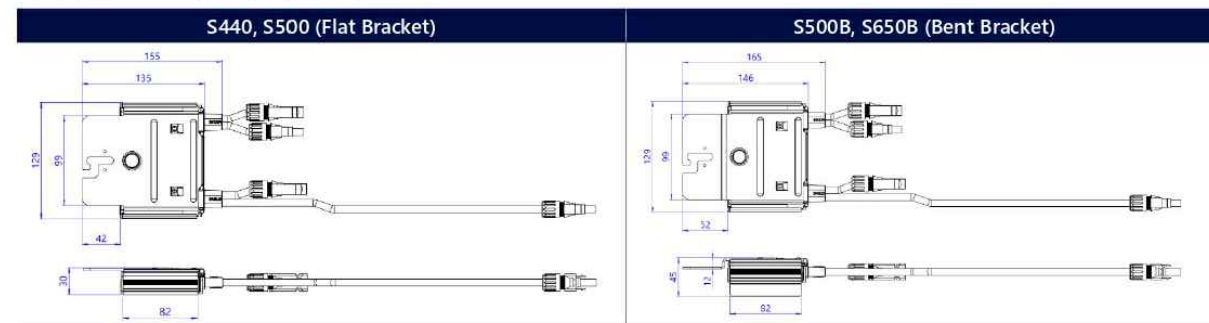
(4) Power de-rating is applied for ambient temperatures above +85°C for S440 and S500, and for ambient temperatures above +75°C for S500B. Refer to the [Power Optimizers Temperature De-Rating Technical Note](#) for details.

PV System Design Using a SolarEdge Inverter <sup>(5)</sup>	SolarEdge Home Wave Inverter Single Phase	SolarEdge Home Short String Inverter Three Phase	Three Phase for 230/400V Grid	Three Phase for 277/480V Grid	
Minimum String Length (Power Optimizers)	S440, S500: 8 S500B, S650B: 6	9 8	16	18	
Maximum String Length (Power Optimizers)	25	20	50	50	
Maximum Continuous Power per String	5700	5625	11250	12750	W
Maximum Allowed Connected Power per String (In multiple string designs, the maximum is permitted only when the difference in connected power between strings is 2,000W or less)	See <sup>(6)</sup>	See <sup>(6)</sup>	13500	15000	W
Parallel Strings of Different Lengths or Orientations			Yes		

(5) It is not allowed to mix S-series and P-series Power Optimizers in new installations in the same string.

(6) If the inverter's rated AC power ≤ maximum nominal power per string, then the maximum power per string will be able to reach up to the inverter's maximum input DC power.

Refer to [Application Note: Single String Design Guidelines](#).



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CE RoHS

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1530 CENTER PARK DR #2911,  
CHARLOTTE, NC 28217,  
UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	08/28/2024	
AS BUILT	09/02/2024	A

PROJECT NAME & ADDRESS

JAMES MANGUM  
RESIDENCE

3861 US 401 N,  
FUQUAY-VARINA, NC 27526

DRAWN BY

ESR

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-11

# SolarEdge Home Hub Inverter

## Single Phase, for North America

### For Inverters Assembled in the USA

SE3800H-US / SE5700H-US / **SE7600H-US** / SE10000H-US / SE11400H-US



HOME BACKUP

### Single phase inverter for storage and backup applications

- / The ultimate home energy manager in charge of PV production, battery storage, backup operation during a power outage\*, EV Charging, and smart energy devices
- / Record-breaking 99% weighted efficiency with up to 300% DC oversizing
- / Supports LRA – can provide the required energy for HVAC systems starting during backup operation
- / Integrates seamlessly with the complete SolarEdge Home Smart Energy Ecosystem, through SolarEdge Home Network
- / Module-level monitoring and visibility of battery status, PV production, and self-consumption data
- / Fast and easy installation – small and lightweight, with reduced commissioning time
- / A scalable solution that supports future homeowner needs through easy connection to a growing ecosystem of products
- / Advanced safety features with integrated arc fault protection and rapid shutdown for 690.11 and 690.12
- / Advanced reliability with automotive-grade components
- / Embedded revenue grade production data, ANSI C12.20 Class 0.5
- / IP65-rated, for indoor and outdoor installations

\*Requires additional hardware and firmware version upgrade.

solaredge.com



## / SolarEdge Home Hub Inverter

### Single Phase, for North America

SE3800H-US / SE5700H-US / **SE7600H-US** / SE10000H-US / SE11400H-US

Model Number <sup>(1)(2)</sup>	SE3800H-US	SE5700H-US	SE7600H-US	SE10000H-US	SE11400H-US	Units
<b>OUTPUT – AC ON GRID</b>						
Rated AC Power	3800 @ 240V 3300 @ 208V	5760 @ 240V 5000 @ 208V	7600	10000	11,400 @ 240V 10,000 @ 208V	W
Maximum AC Power Output	3800 @ 240V 3300 @ 208V	5760 @ 240V 5000 @ 208V	7600	10000	11,400 @ 240V 10,000 @ 208V	W
AC Output Voltage (Nominal)	208 / 240					Vac
AC Output Voltage (Range)	183 – 264					Vac
AC Frequency Range (min - nom - max)	59.3 – 60 – 60.5 <sup>(3)</sup>					Hz
Maximum Continuous Output Current	16	24	32	42	48	A
GFDI Threshold	1					A
Total Harmonic Distortion (THD)	< 3					%
Power Factor	1, adjustable -0.85 to 0.85					
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes					
Charge Battery from AC (if allowed)	Yes					
Typical Nighttime Power Consumption	< 2.5					W
<b>OUTPUT – AC STAND-ALONE (BACKUP)<sup>(4)(5)</sup></b>						
Rated AC Power in Stand-alone Operation	11,400 <sup>(6)</sup>					W
Maximum Stand-alone Capacity	11,400					W
AC L-L Output Voltage Range in Stand-alone Operation	211 – 264					Vac
AC L-N Output Voltage Range in Stand-alone Operation	105 – 132					Vac
AC Frequency Range in Stand-alone (min - nom - max)	55 – 60 – 65					Hz
Maximum Continuous Output Current in Stand-alone Operation	48					A
GFDI	1					A
THD	< 5					%
<b>OUTPUT – SOLAREEDGE HOME EV CHARGER AC</b>						
Rated AC Power	9600					W
AC Output Voltage Range	211 – 264					Vac
On-Grid AC Frequency Range (min - nom - max)	59.3 – 60 – 60.5					Hz
Maximum Continuous Output Current @240V (grid, PV and battery)	40					Aac
<b>INPUT – DC (PV AND BATTERY)</b>						
Transformer-less, Ungrounded	Yes					
Max Input Voltage	480					Vdc
Nom DC Input Voltage	380					Vdc
Reverse-Polarity Protection	Yes					
Ground-Fault Isolation Detection	600kΩ Sensitivity					
<b>INPUT – DC (PV)</b>						
Maximum DC Power @ 240V	11,400	11,520	15,200	20,000	22,800	W
Maximum DC Power @ 208V	6600	10,000	-	-	20,000	W
Maximum Input Current <sup>(7)</sup> @ 240V	20	30.5	40	53	60	Adc
Maximum Input Current <sup>(7)</sup> @ 208V	17.5	27	-	-	53	Adc
Maximum Input Short Circuit Current	45					Adc
Maximum Inverter Efficiency	99.2					%
CEC Weighted Efficiency	98.5		99		99 @ 240V 98.5 @ 208V	%
2-pole Disconnection	Yes					

(1) These specifications apply to inverters with part numbers SExxxxH-USMNUxxx5 and SExxxxH-USMNFxxx5 and connection unit model number DCD-1PH-US-PxH-F-x.  
 (2) Inverters with part number SExxxxH-USMNFxxx5 are intended for upgrade installations only, as part of the "Re-Energize" program. Use on non-upgrade installations will revoke the product warranty.  
 (3) For other regional settings please refer to the [SolarEdge Inverters, Power Control Options Application Note](#).  
 (4) Not designed for non-grid connected applications and requires AC for commissioning. Stand-alone (backup) functionality is only supported for the 240V grid.  
 (5) For LRA (Locked Rotor Amperage) values please refer to the [LRA for NAM Application Note](#).  
 (6) For models SE7600H-US and below, the rated AC stand-alone power is configurable between 7600W or 11,400W from CPU version 4.20.xx.  
 (7) A higher current source may be used. The inverter will limit its input current to the values stated.

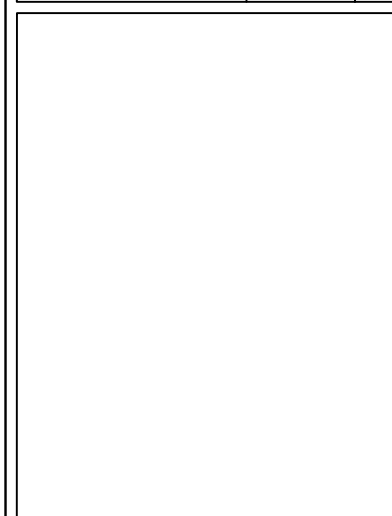
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PROJECT NAME & ADDRESS

**JAMES MANGUM  
RESIDENCE**  
  
 3861 US 401 N,  
FUQUAY-VARINA, NC 27526

DRAWN BY  
**ESR**

SHEET NAME  
**EQUIPMENT  
SPECIFICATION**

SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-12**

# / SolarEdge Home Hub Inverter

## Single Phase, for North America

SE3800H-US / SE5700H-US / **SE7600H-US** / SE10000H-US / SE11400H-US

Model Number <sup>(9)(2)</sup>	SE3800H-US	SE5700H-US	SE7600H-US	SE10000H-US	SE11400H-US	Units
<b>OUTPUT – DC (BATTERY)</b>						
Supported Battery Types	SolarEdge Home Battery, LG RESU Prime					
Number of Batteries per Inverter	Up to 3 SolarEdge Home Battery, up to 2 LG RESU Prime					
Continuous Power <sup>(8)</sup>	11,400 @ 240V 3800 @ 208V	11,400 @ 240V 5000 @ 208V	11400 @240V	11,400 @ 240V 10,000 @ 208V		W
Peak Power <sup>(8)</sup>	11,400 @ 240V 3800 @ 208V	11,400 @ 240V 5000 @ 208V	11400 @240V	11,400 @ 240V 10,000 @ 208V		W
Maximum Input Current	30					
2-pole Disconnection	Up to the inverter's rated stand-alone power					
<b>SMART ENERGY CAPABILITIES</b>						
Consumption Metering	Built-in <sup>(9)</sup>					
Stand-alone & Battery Storage	With Backup Interface (purchased separately) for service up to 200A; up to 3 inverters					
EV Charging	Direct connection to the SolarEdge Home EV Charger					
<b>ADDITIONAL FEATURES</b>						
Supported Communication Interfaces	RS485, Ethernet, Cellular <sup>(10)</sup> , Wi-Fi (optional), SolarEdge Home Network (optional)					
Revenue Grade Metering, ANSI C12.20	Built-in <sup>(9)</sup>					
Integrated AC, DC and Communication Connection Unit	Yes					
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi Access Point for local connection					
DC Voltage Rapid Shutdown (PV and Battery)	Yes, NEC 690.12					
<b>STANDARD COMPLIANCE</b>						
Safety	UL 1741, UL 1741SA, UL 1741SB, UL 1699B, CSA 22.2#107.1, C22.2#330, C22.3#9, ANSI/CAN/UL 9540					
Grid Connection Standards	IEEE1547 and IEEE-1547.1, Rule 21, Rule 14H					
Emissions	FCC Part 15 Class B					
<b>INSTALLATION SPECIFICATIONS</b>						
AC Terminals	L1, L2, N terminal blocks, PE busbar for inverter connection L1, L2 terminal blocks, PE busbar for EV Charger AC connection					
DC Terminals	4 x terminal block pairs for PV input; 1 x terminal block pair for battery input					
AC Output and EV AC Output Conduit Size / AWG Range	1" maximum / 14-4 AWG					
DC Input (PV and Battery) Conduit Size / AWG Range	1" maximum / 14-6 AWG					
Dimensions with Connection Unit (H x W x D)	21.06 x 14.6 x 8.2 / 535 x 370 x 208					
Weight with Connection Unit	44.9 / 20.3					
Noise	< 50					
Cooling	Natural Convection					
Operating Temperature Range	-40 to +140 / -40 to +60 <sup>(11)</sup>					
Protection Rating	NEMA 4X					

(8) Discharge power is limited up to the inverter's rated AC power for on-grid and stand-alone applications, as well as up to the installed batteries' rating.

(9) For consumption metering current transformers should be ordered separately: SECT-SPL-225A-T-20 or SEACT1250-400NA-20. Revenue grade metering is only for production metering.

(10) Information concerning the data plan terms & conditions is available in [SolarEdge Communication Plan Terms and Conditions](#).

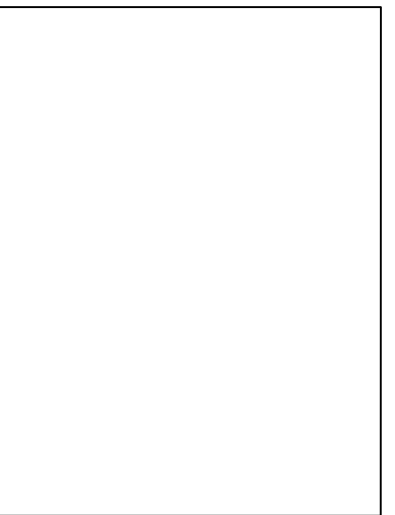
(11) Full power up to at least 50°C / 122°F; for power derating information refer to the [Temperature Derating Technical Note for North America](#).



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**ESR**

SHEET NAME  
**EQUIPMENT  
SPECIFICATION**

SHEET SIZE  
**ANSI B  
11" X 17"**

SHEET NUMBER  
**PV-13**



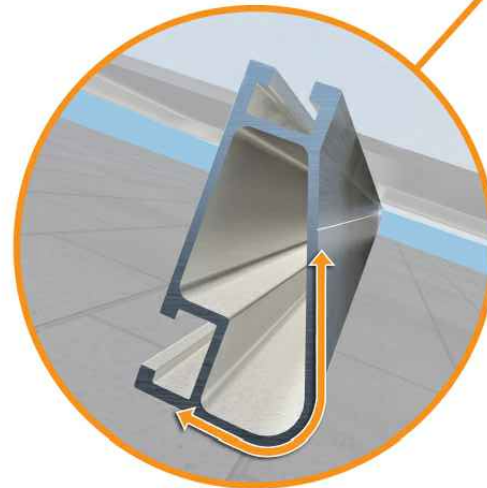
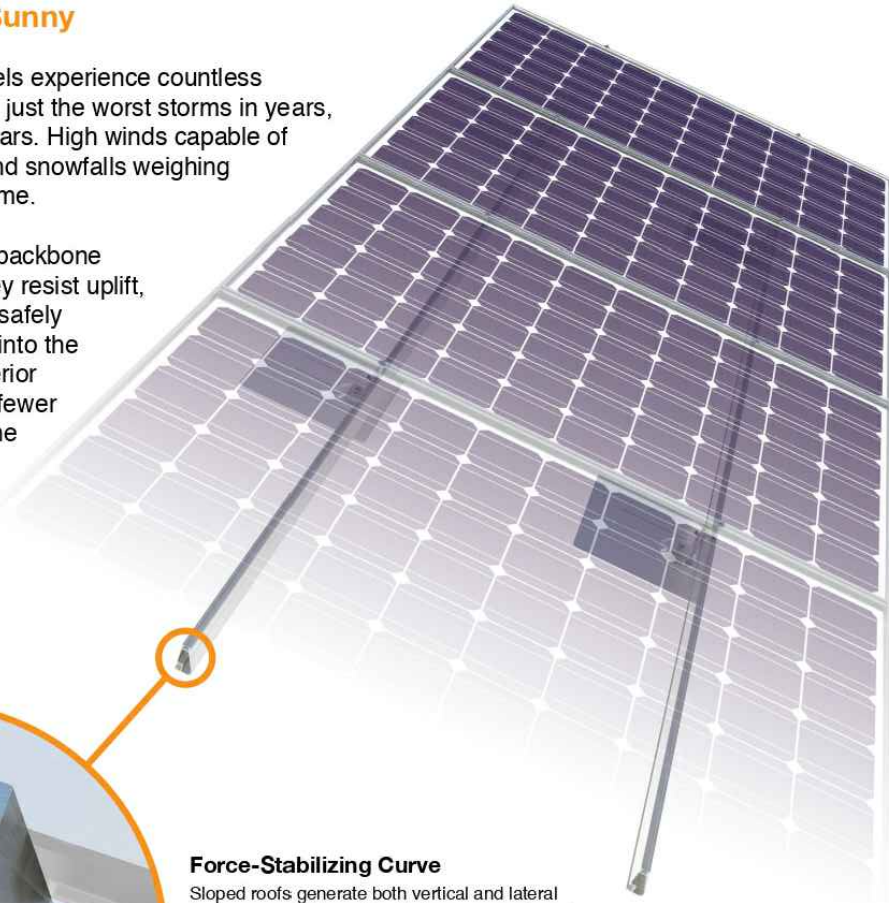


## XR Rail® Family

### 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.



### XR Rail® Family

The XR Rail® Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail® to match.



#### XR10

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves spans up to 6 feet, while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Clear & black anodized finish
- Internal splices available



#### XR100

XR100 is a residential and commercial mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 10 feet.

- 10' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



#### XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans up to 12 feet for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

### Rail Selection

The table below was prepared in compliance with applicable engineering codes and standards.\* Values are based on the following criteria: ASCE 7-16, Gable Roof Flush Mount, Roof Zones 1 & 2e, Exposure B, Roof Slope of 8 to 20 degrees and Mean Building Height of 30 ft. Visit [IronRidge.com](http://IronRidge.com) for detailed certification letters.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	90						
	120						
	140	XR10		XR100		XR1000	
	160						
20	90						
	120						
	140						
	160						
30	90						
	160						
40	90						
	160						
80	160						
	160						
120	160						
	160						

\*Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification letters for actual design guidance.



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SHEET NAME  
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SPECIFICATION

#### SHEET SIZE

ANSI B  
11" X 17"

#### SHEET NUMBER

PV-14



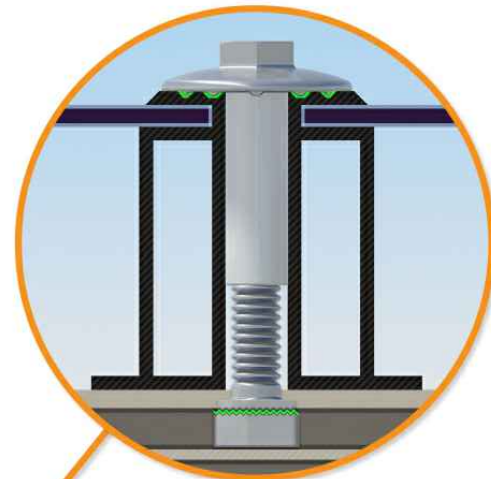
## UFO® Family of Components

### Simplified Grounding for Every Application

The UFO® family of components eliminates the need for separate grounding hardware by bonding solar modules directly to IronRidge® XR Rails®. All system types that feature the UFO® family—Flush Mount®, Tilt Mount® and Ground Mount®—are fully listed to the UL 2703 standard.

UFO® hardware forms secure electrical bonds with both the module and the rail, resulting in many parallel grounding paths throughout the system. This leads to safer and more reliable installations.

Only for installation and use with IronRidge products in accord with written instructions. See [IronRidge.com/UFO](http://IronRidge.com/UFO)



**Universal Fastening Object (UFO®)**  
The UFO® securely bonds solar modules to XR Rails®. It comes assembled and lubricated, and can fit a wide range of module heights.



**Stopper Sleeve**  
The Stopper Sleeve snaps onto the UFO®, converting it into a bonded end clamp.



**BOSS® Splice**  
Bonded Structural Splice connects rails with built-in bonding teeth. No tools or hardware needed.

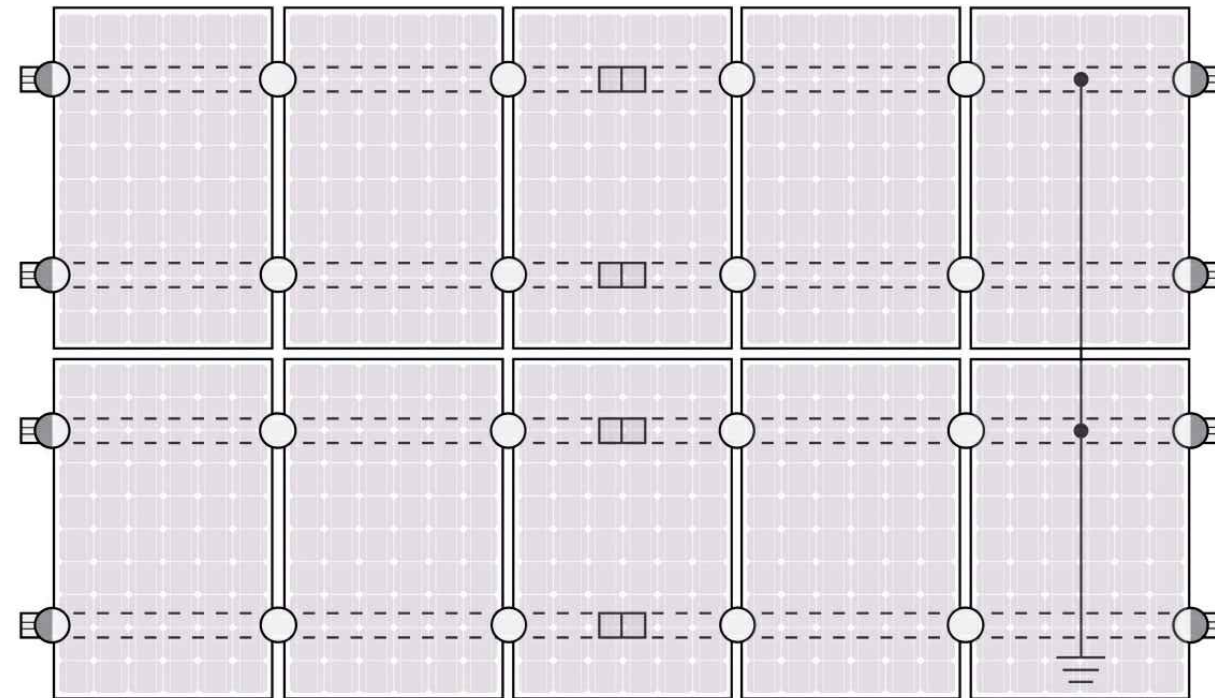


**Grounding Lug**  
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.



**Bonded Attachments**  
The bonding bolt attaches and bonds the L-foot® to the rail. It is installed with the same socket as the rest of the system.

### System Diagram



○ UFO   ◐ Stopper Sleeve   ● Grounding Lug   ◻ BOSS™ Splice   ≡ Ground Wire

⚡ Approved Enphase microinverters can provide equipment grounding of IronRidge systems, eliminating the need for grounding lugs and field installed equipment ground conductors (EGC). A minimum of two microinverters mounted to the same rail and connected to the same Engage cable is required. Refer to installation manuals for additional details.

### UL Certification

The IronRidge® Flush Mount®, Tilt Mount®, and Ground Mount Systems have been listed to UL 2703 by Intertek Group plc.

UL 2703 is the standard for evaluating solar mounting systems. It ensures these devices will maintain strong electrical and mechanical connections over an extended period of time in extreme outdoor environments.

[Go to IronRidge.com/UFO](http://IronRidge.com/UFO)

### Cross-System Compatibility

Feature	Flush Mount	Tilt Mount	Ground Mount
XR Rails®	✓	✓	XR100 & XR1000
UFO®/Stopper	✓	✓	✓
BOSS® Splice	✓	✓	N/A
Grounding Lugs	1 per Row	1 per Row	1 per Array
Microinverters & Power Optimizers	Compatible with most MLPE manufacturers. Refer to system installation manual.		
Fire Rating	Class A	Class A	N/A
Modules	Tested or Evaluated with over 400 Framed Modules. Refer to installation manuals for a detailed list.		



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11" X 17"

SHEET NUMBER  
PV-15



QuickMount® Halo UltraGrip

Cut Sheet

Cut Sheet

ITEM NO	DESCRIPTION	QTY IN KIT
1	QM Halo UltraGrip(Mill or Black)	1

PART NUMBER	DESCRIPTION
QM-HUG-01-M1	Halo UltraGrip - Mill
QM-HUG-01-B1	Halo UltraGrip - Black

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QM-HUG-01-B1 or QM-HUG-01-M1 Cut Sheet Rev 1.0

1. Halo UltraGrip

Property	Value
Material	3000 Series Aluminium
Finish	Mill or Black

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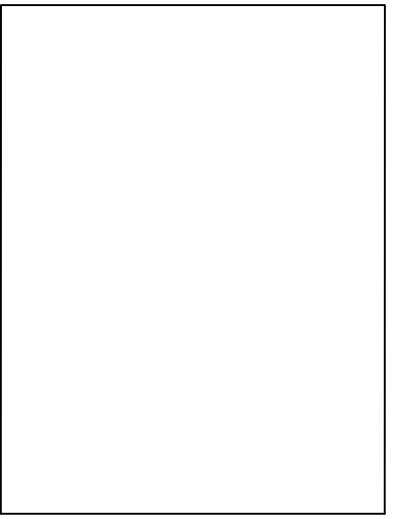
QM-HUG-01-B1 or QM-HUG-01-M1 Cut Sheet Rev 1.0



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SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-16





# QuickMount® RD Structural Screw



**TOP TIER SOLAR SOLUTIONS**

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UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
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ITEM NO	DESCRIPTION	QTY IN KIT
1	Self Drilling Screw, #14, Wood Tip	1
2	Washer, EPDM Backed	1

PART NUMBER	DESCRIPTION
RD-1430-01-M1	RD Structural Screw

1. Self Drilling Screw, #14, Wood Tip

Property	Value
Material	300 Series Stainless Steel
Finish	Clear

2. Washer, EPDM Backed

Property	Value
Material	300 Series Stainless Steel
Finish	Clear

PROJECT NAME & ADDRESS

**JAMES MANGUM  
RESIDENCE**  
  
 3861 US 401 N,  
FUQUAY-VARINA, NC 27526

DRAWN BY  
**ESR**

SHEET NAME  
**EQUIPMENT  
SPECIFICATION**

SHEET SIZE  
**ANSI B  
11" X 17"**

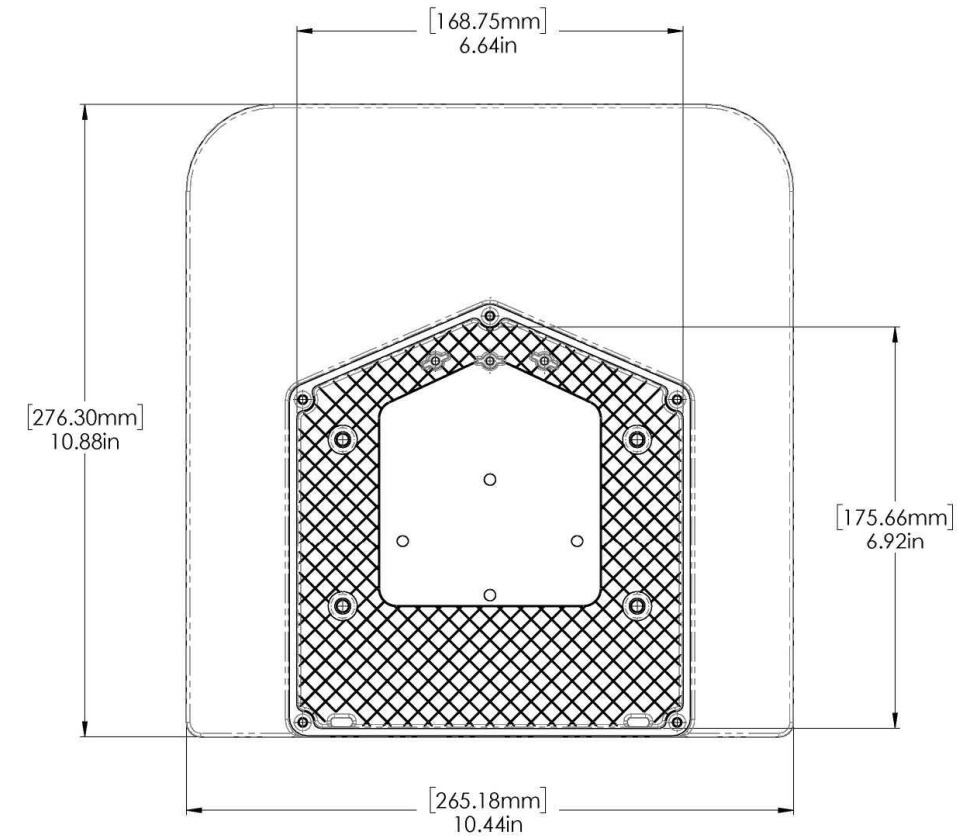
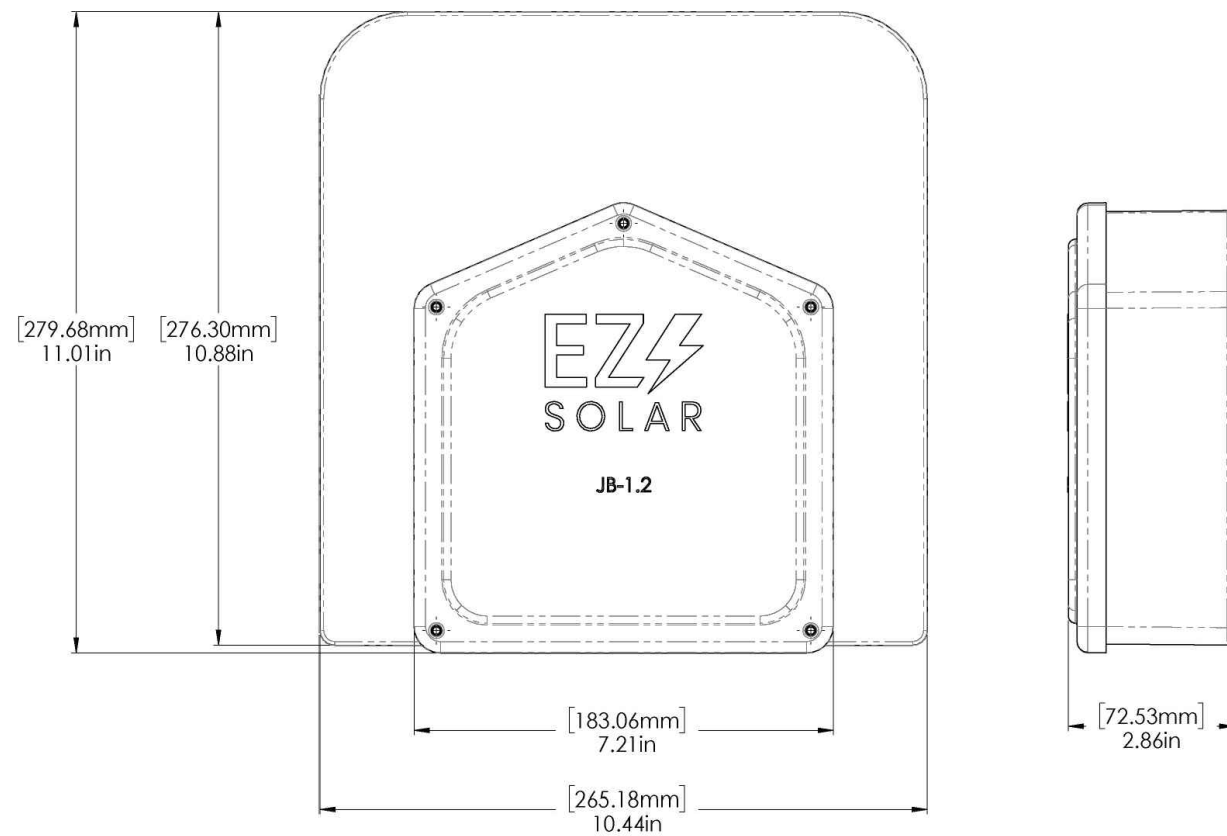
SHEET NUMBER  
**PV-17**

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	JB-1.2 BODY	POLYCARBONATE WITH UV INHIBITORS	1
2	JB-1.2 LID	POLYCARBONATE WITH UV INHIBITORS	1
3	#10 X 1-1/4" PHILLIPS PAN HEAD SCREW		6
4	#8 X 3/4" PHILLIPS PAN HEAD SCREW		6

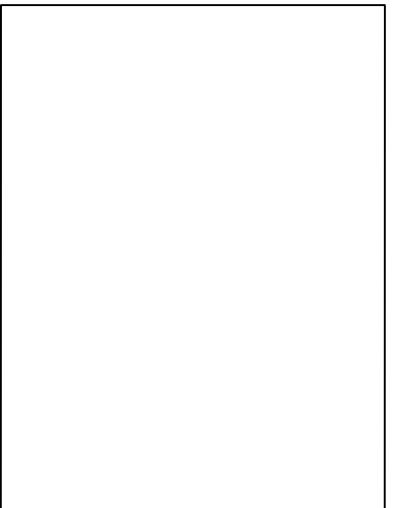
SIZE	DWG. NO.	REV
<b>B</b>	JB-1.2	
SCALE: 1:2	WEIGHT: 1.45 LBS	SHEET 1 OF 3

TORQUE SPECIFICATION:	15-20 LBS
CERTIFICATION:	UL 1741, NEMA 3R CSA C22.2 NO. 290
WEIGHT:	1.45 LBS

SIZE	DWG. NO.	REV
<b>B</b>	JB-1.2	
SCALE: 1:2	WEIGHT: 1.45 LBS	SHEET 2 OF 3



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SHEET NAME <b>EQUIPMENT SPECIFICATION</b>
--------------------------------------------------

SHEET SIZE <b>ANSI B 11" X 17"</b>
-------------------------------------------

SHEET NUMBER <b>PV-18</b>
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