

PHOTOVOLTAIC ROOF MOUNT SYSTEM

23 MODULES-ROOF MOUNTED - 7.935 kW DC, 6.670 kW AC

775 MAPLE RD, ANGIER, NC 27501

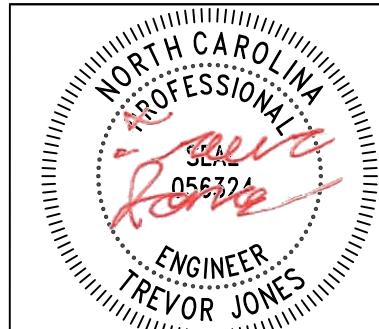


TOP TIER SOLAR SOLUTIONS

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

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	07/18/2025	
REVISION	07/25/2025	A
REVISION	10/10/2025	B



STRUCTURAL ONLY
10/29/2025

518 Lake Cleveland St.
Burley, ID 83313
Firm #: P-2910

PROJECT NAME & ADDRESS

JEFFREY BANKS
RESIDENCE
775 MAPLE RD,
ANGIER, NC 27501

PROJECT DATA

PROJECT ADDRESS: 775 MAPLE RD, ANGIER, NC 27501

OWNER: JEFFREY BANKS

DESIGNER: ESR

SCOPE: 7.935 kW DC ROOF MOUNT SOLAR PV SYSTEM WITH 23 MISSION SOLAR: MSE345SX5T 345W PV MODULES WITH 23 ENPHASE IQ8PLUS-72-2-US 290W MICRO INVERTERS EQUIPPED WITH RAPID SHUTDOWN

AUTHORITIES HAVING JURISDICTION:

BUILDING: HARNETT COUNTY

ZONING: HARNETT COUNTY

UTILITY: DUKE ENERGY

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

A

SIGNATURE



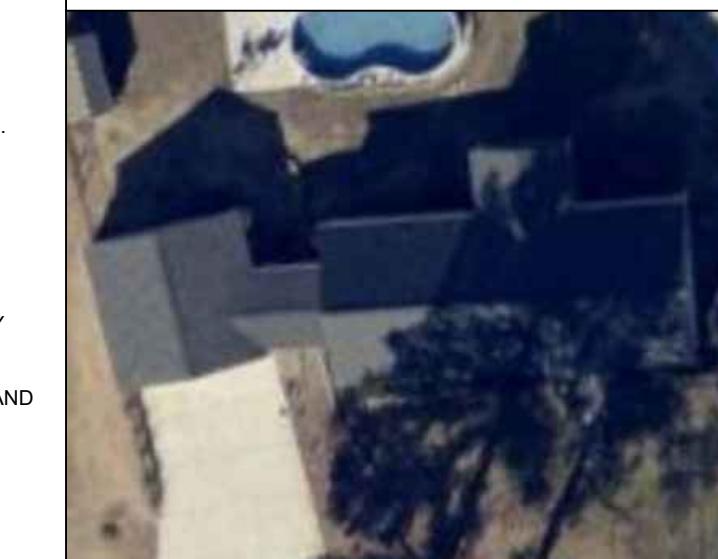
GENERAL NOTES

1. ALL COMPONENTS ARE UL LISTED AND CEC CERTIFIED, WHERE WARRANTED.
2. THE SOLAR PV SYSTEM WILL BE INSTALLED IN ACCORDANCE WITH ARTICLE 690 OF THE NEC 2017.
3. THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION.
4. 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.
5. WHERE METALLIC CONDUIT CONTAINING DC CONDUCTORS IS USED INSIDE THE BUILDING, IT SHALL BE IDENTIFIED AS "CAUTION: SOLAR CIRCUIT" EVERY 10FT.
6. HEIGHT OF THE AC DISCONNECT SHALL NOT EXCEED 6'-7" PER NEC CODE 240.24.
7. 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.
8. PHOTOVOLTAIC MODULES ARE TO BE CONSIDERED NON-COMBUSTIBLE.
9. PHOTOVOLTAIC INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
10. 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.
11. 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.
12. INVERTER(S) USED IN UNGROUNDED SYSTEM SHALL BE UL 1741 LISTED.
13. THE INSTALLATION OF EQUIPMENT AND ALL ASSOCIATED WIRING AND INTERCONNECTION SHALL BE PERFORMED ONLY BY QUALIFIED PERSONS [NEC 690.4(C)]
14. ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED (OR BETTER), INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES.
15. ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250.
16. SYSTEM GROUNDING SHALL BE IN ACCORDANCE WITH NEC 690.41.
17. PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION IN ACCORDANCE WITH NEC 690.12
18. 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)]
19. ALL WIRING METHODS SHALL BE IN ACCORDANCE WITH NEC 690.31
20. WORK CLEARANCES AROUND ELECTRICAL EQUIPMENT WILL BE MAINTAINED PER NEC 110.26(A)(1), 110.26(A)(2) AND 110.26(A)(3).
21. ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED & IDENTIFIED IN ACCORDANCE WITH UL1703
22. 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

DRAWN BY
ESR

SHEET NAME
COVER SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-1

PROJECT DESCRIPTION:

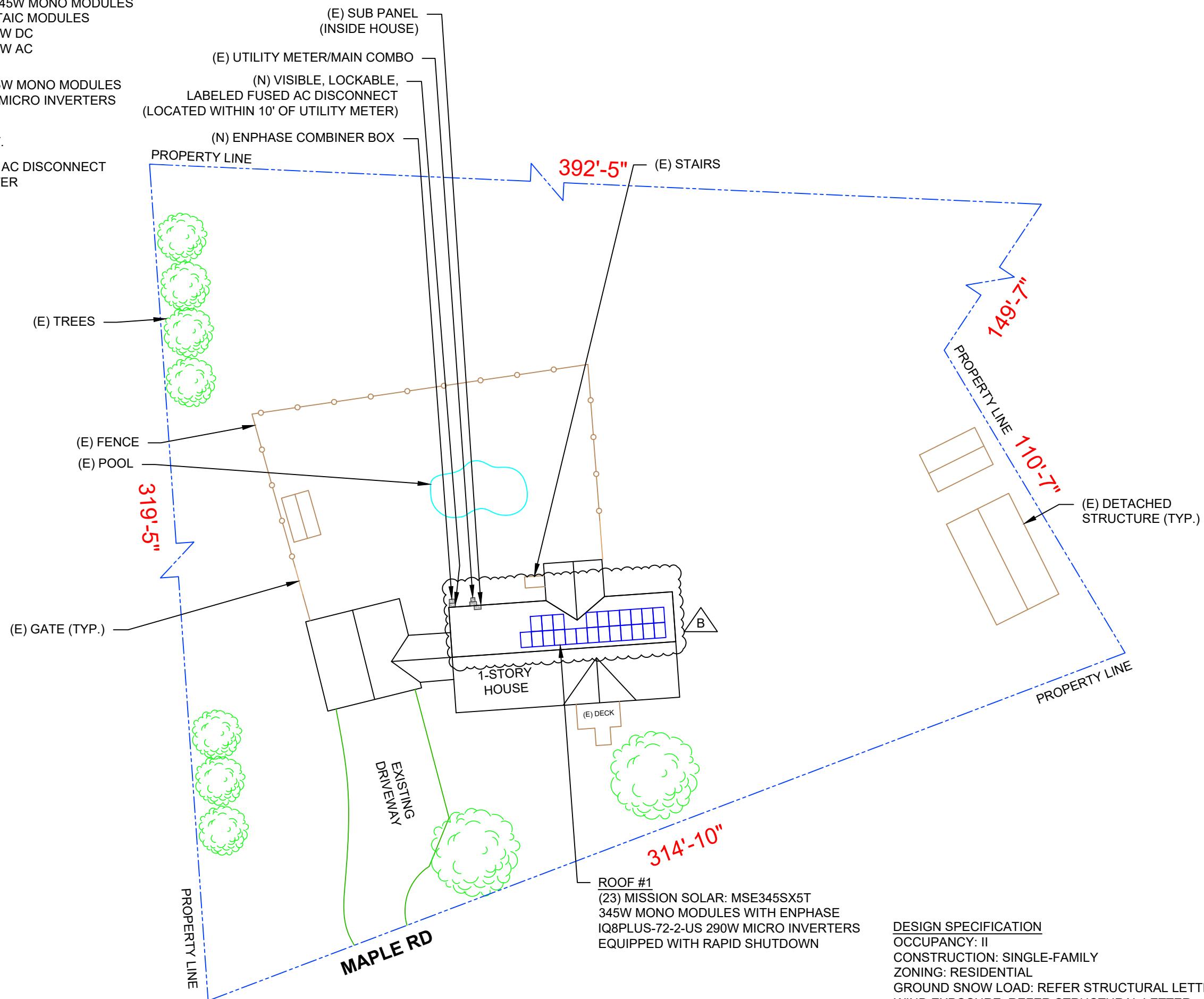
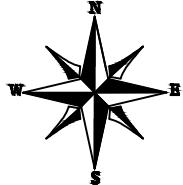
23 X MISSION SOLAR: MSE345SX5T 345W MONO MODULES
ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES
DC SYSTEM SIZE: $23 \times 345W = 7.935 \text{ kW DC}$
AC SYSTEM SIZE: $23 \times 290W = 6.670 \text{ kW AC}$

EQUIPMENT SUMMARY

23 MISSION SOLAR: MSE345SX5T 345W MONO MODULES
23 ENPHASE IQ8PLUS-72-2-US 290W MICRO INVERTERS
EQUIPPED WITH RAPID SHUTDOWN

ROOF ARRAY AREA #1: 456.09 SQ FT.

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



TOP TIER
SOLAR SOLUTIONS

TOP TIER SOLAR SOLUTIONS

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

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	07/18/2025	
REVISION	07/25/2025	A
REVISION	10/10/2025	B



STRUCTURAL ONLY
10/29/2025

518 Lake Cleveland St.
Burley, ID 83313
Firm #: P-2910



PROJECT NAME & ADDRESS

JEFFREY BANKS
RESIDENCE

775 MAPLE RD,
ANGIER, NC 27501

DRAWN BY
ESR

SHEET NAME
SITE PLAN

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-2

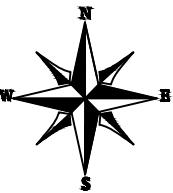
1 SITE PLAN

PV-2

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

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 23 MODULES
 MODULE TYPE = MISSION SOLAR: MSE345SX5T 345W MONO MODULES
 MODULE WEIGHT = 44.8 LBS / 20.3KG.
 MODULE DIMENSIONS = (68.82" x 41.50")/144 = 19.83 SF

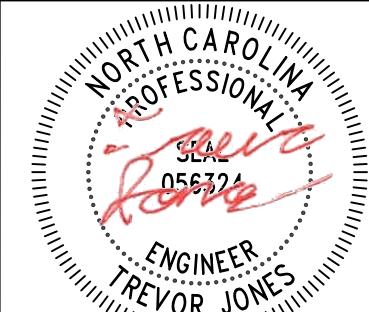


ROOF DESCRIPTION					
ROOF TYPE			ASPHALT SHINGLE		
ROOF LAYER			1 LAYER		
ROOF	# OF MODULES	ROOF PITCH	AZIMUTH	RAFTER SIZE	RAFTER SPACING
#1	23	34°	356°	2"X4"	24"



TOP TIER SOLAR SOLUTIONS
 1530 CENTER PARK DR #2911,
 CHARLOTTE, NC 28217,
 UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	07/18/2025	
REVISION	07/25/2025	A
REVISION	10/10/2025	B



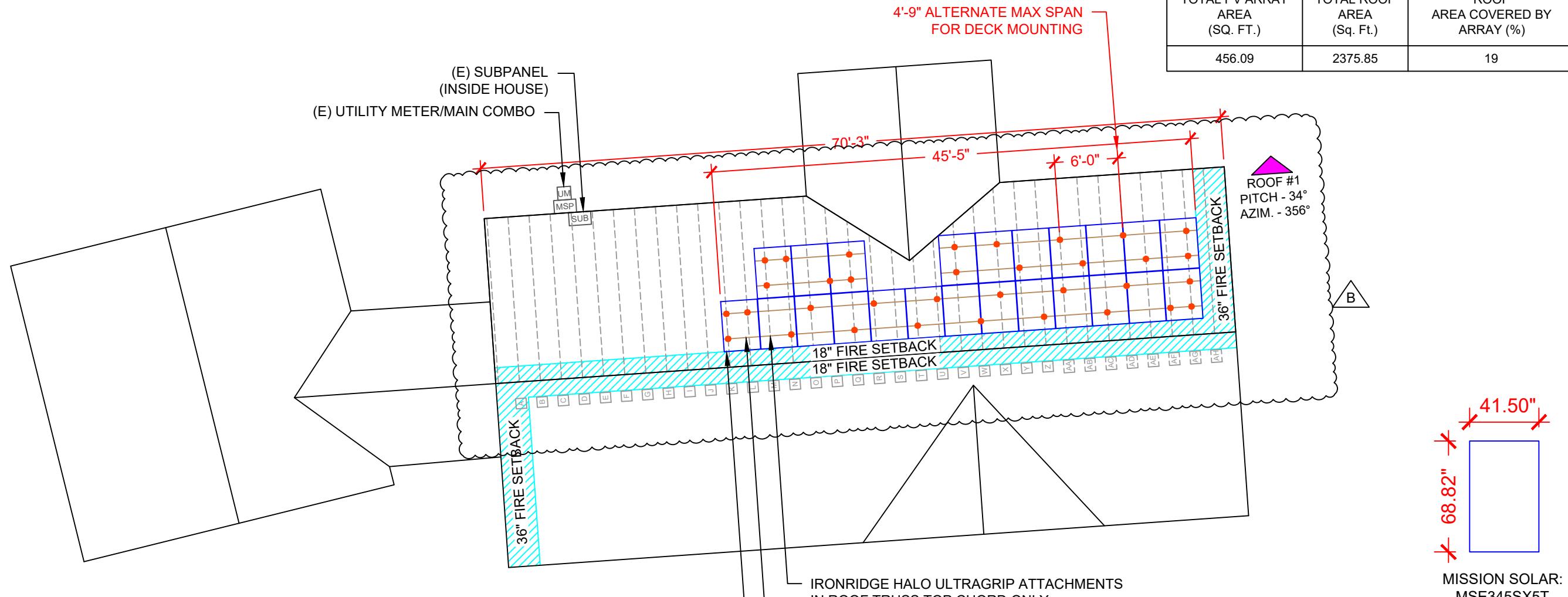
STRUCTURAL ONLY
 10/29/2025

518 Lake Cleveland St.
 Burley, ID 83313
 Firm #: P-2910

PV LETTERS

PROJECT NAME & ADDRESS

JEFFREY BANKS
 RESIDENCE
 775 MAPLE RD,
 ANGIER, NC 27501



LEGEND

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

DRAWN BY
 ESR

SHEET NAME
 ROOF PLAN &
 MODULES

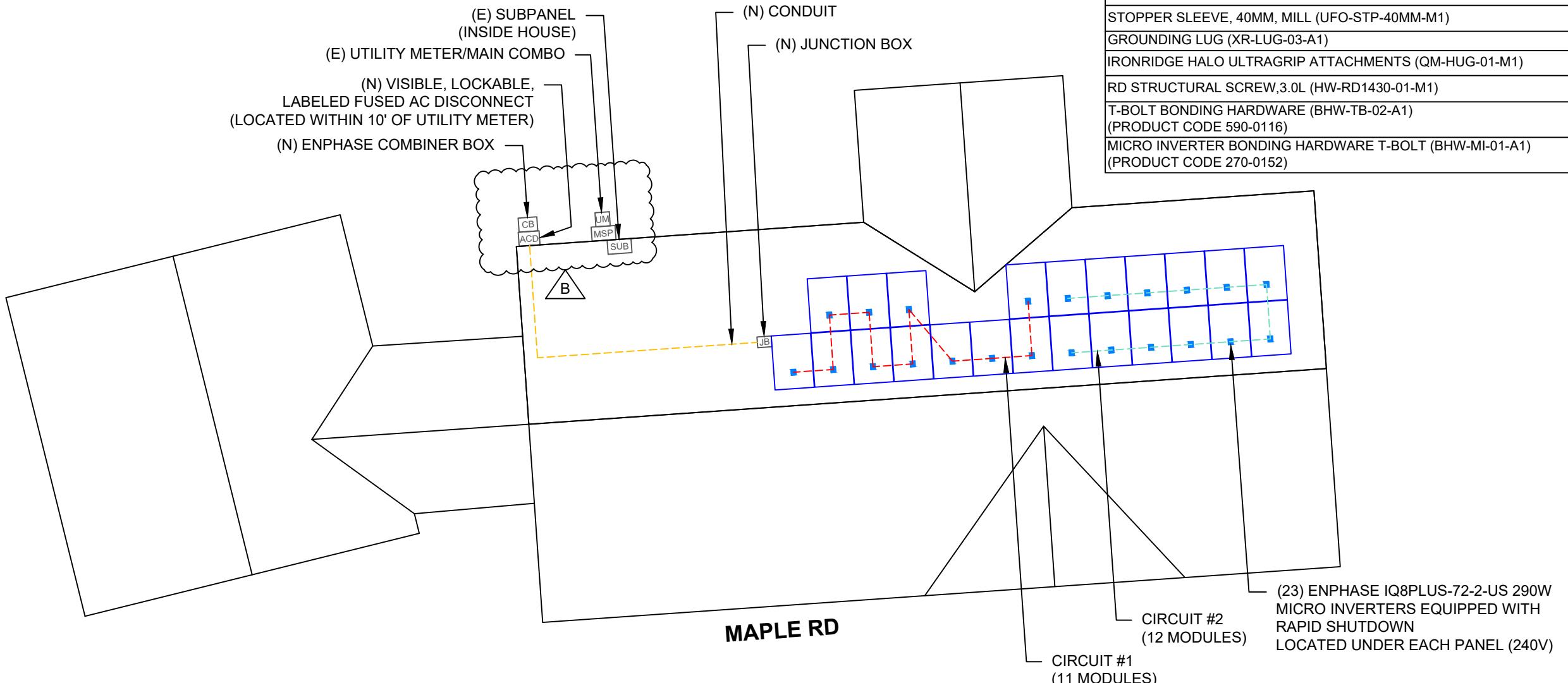
SHEET SIZE
 ANSI B
 11" X 17"

SHEET NUMBER
 PV-3

DC SYSTEM SIZE: 23 x 345W = 7.935 kW DC
 AC SYSTEM SIZE: 23 x 290W = 6.670 kW AC
 (23) MISSION SOLAR: MSE345SX5T 345W MONO MODULES
 WITH (23) ENPHASE IQ8PLUS-72-2-US 290W MICRO
 INVERTERS EQUIPPED WITH RAPID SHUTDOWN
 LOCATED UNDER EACH PANEL (240V)

CIRCUIT LEGENDS

- CIRCUIT #1
- CIRCUIT #2



BILL OF MATERIALS

EQUIPMENT DESCRIPTION	QTY
SOLAR PV MODULES: MISSION SOLAR: MSE345SX5T 345W MODULE	23
MICRO INVERTERS: ENPHASE IQ8PLUS-72-2-US 290W MICRO INVERTERS EQUIPPED WITH RAPID SHUTDOWN	23
JUNCTION BOX: JUNCTION BOX UL 1741, NEMA 3R CSA C22.2 NO.290	1
COMBINER BOX: ENPHASE IQ COMBINER X-IQ-AM1-240-4/4C 120/240VAC, 1φ, 3W 125A RATED BUS BAR, NEMA 3R SOLAR LOADS ONLY UL 1741 COMPLIANT	1
20A BREAKERS	2
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)	13
BONDED SPLICE, XR10 (XR10-BOSS-01-M1)	8
UNIVERSAL MODULE CLAMP, CLEAR (UFO-CL-01-A1)	40
STOPPER SLEEVE, 40MM, MILL (UFO-STP-40MM-M1)	12
GROUNDING LUG (XR-LUG-03-A1)	3
IRONRIDGE HALO ULTRAGRIP ATTACHMENTS (QM-HUG-01-M1)	33
RD STRUCTURAL SCREW, 3.0L (HW-RD1430-01-M1)	66
T-BOLT BONDING HARDWARE (BHW-TB-02-A1) (PRODUCT CODE 590-0116)	33
MICRO INVERTER BONDING HARDWARE T-BOLT (BHW-MI-01-A1) (PRODUCT CODE 270-0152)	23

TOP TIER
 SOLAR SOLUTIONS

TOP TIER SOLAR SOLUTIONS
 1530 CENTER PARK DR #2911,
 CHARLOTTE, NC 28217,
 UNITED STATES

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	07/18/2025	
REVISION	07/25/2025	A
REVISION	10/10/2025	B

PROJECT NAME & ADDRESS
 JEFFREY BANKS RESIDENCE
 775 MAPLE RD,
 ANGIER, NC 27501

DRAWN BY
 ESR

SHEET NAME
 ELECTRICAL PLAN

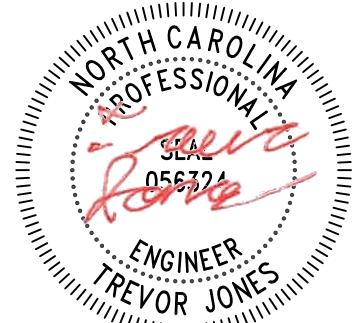
SHEET SIZE
 ANSI B
 11" X 17"

SHEET NUMBER
 PV-4

LEGEND	
SD	- SOLADECK
PM	- PV PRODUCTION METER
CB	- COMBINER BOX
ACD	- AC DISCONNECT
SLD	- SOLAR LOAD CENTER
UM	- UTILITY METER
MSP	- MAIN SERVICE PANEL
INV	- INVERTER
JB	- JUNCTION BOX
VENT	- VENT, ATTIC FAN (ROOF OBSTRUCTION)
ROOF ATTACHMENT	- ROOF ATTACHMENT
TRUSS	- TRUSS
CONDUIT	- CONDUIT

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	07/18/2025	
REVISION	07/25/2025	A
REVISION	10/10/2025	B



STRUCTURAL ONLY
10/29/2025

518 Lake Cleveland St.
Burley, ID 83313
Firm #: P-2910

PV LETTERS

PROJECT NAME & ADDRESS

JEFFREY BANKS
RESIDENCE

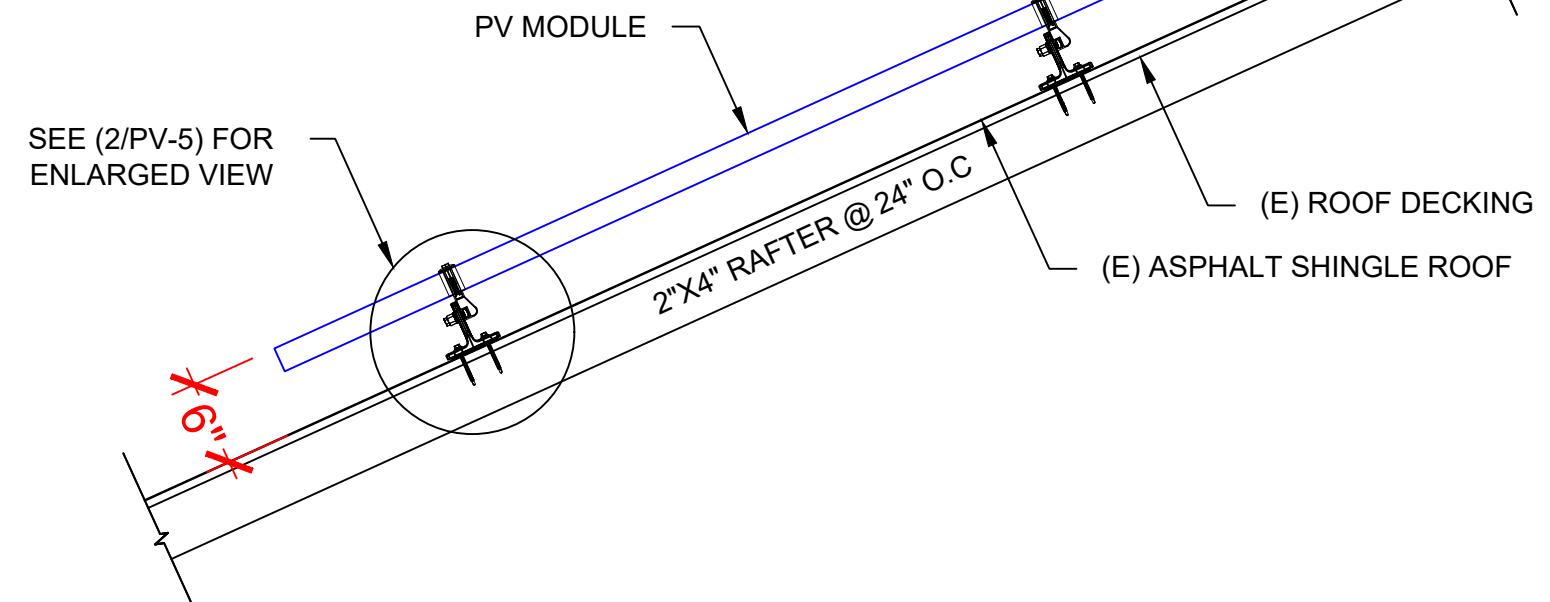
775 MAPLE RD,
ANGIER, NC 27501

DRAWN BY
ESR

SHEET NAME
STRUCTURAL DETAIL

SHEET SIZE
ANSI B
11" X 17"

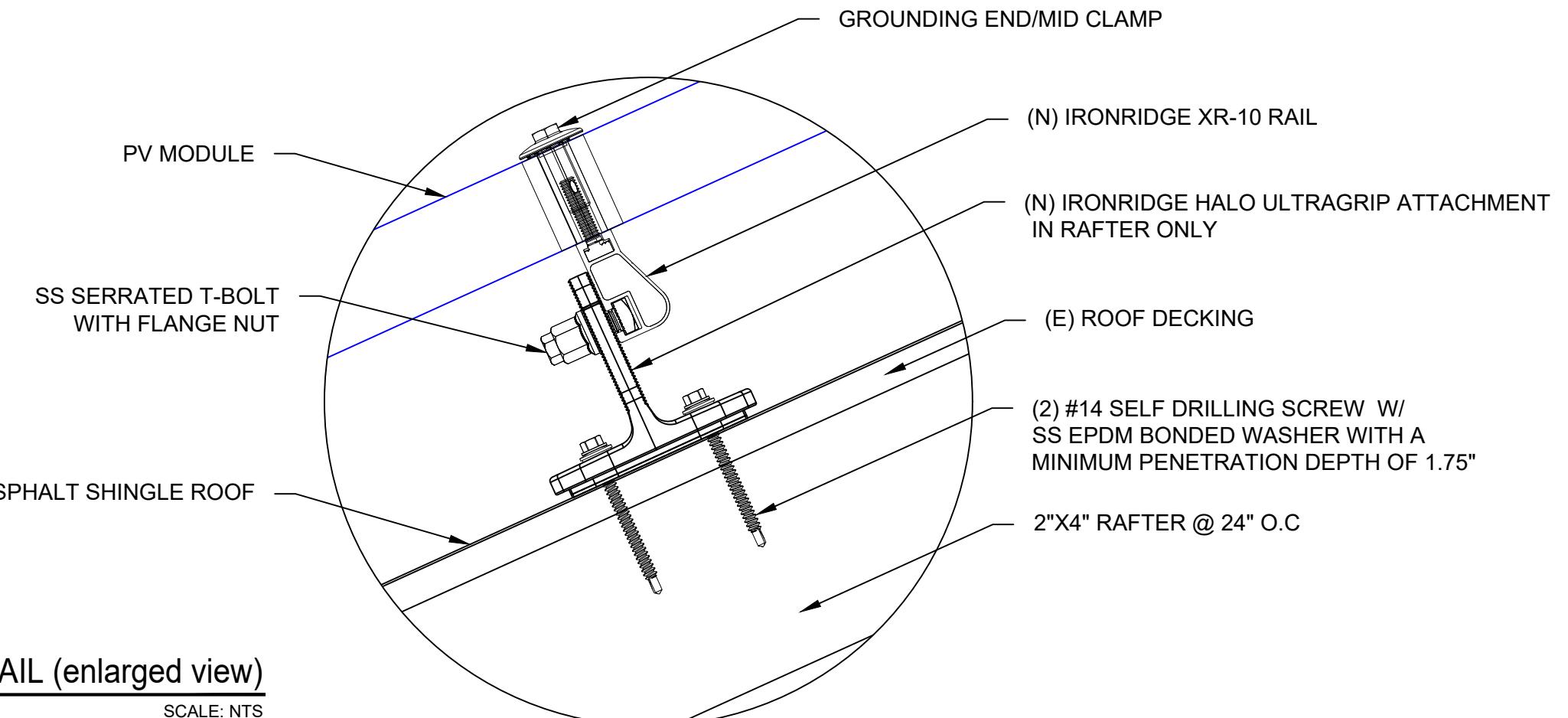
SHEET NUMBER
PV-5



1 | **STRUCTURAL ATTACHMENT (Side view)**

PV-5

SCALE: N.T.S



2 | **ATTACHMENT DETAIL (enlarged view)**

PV-5

SCALE: N.T.S

DC SYSTEM SIZE: $23 \times 345W = 7.935 \text{ kW DC}$
AC SYSTEM SIZE: $23 \times 290W = 6.670 \text{ kW AC}$

(23) MISSION SOLAR: MSE345SX5T 345W MONO MODULES WITH (23) ENPHASE IQ8PLUS-72-2-US 290W MICRO INVERTERS EQUIPPED WITH RAPID SHUTDOWN LOCATED UNDER EACH PANEL (240V)
(1) BRANCH CIRCUIT OF 11 MODULES AND (1) BRANCH CIRCUIT OF 12 MODULES ARE CONNECTED IN PARALLEL

BACKFEED BREAKER CALCULATION (120% RULE):
(MAIN BUS X 1.2 - MAIN BREAKER) \geq (PV BREAKER)
(200A X 1.2 - 200A) \geq (40A)
(40A) \geq (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].

GROUNDED & 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:

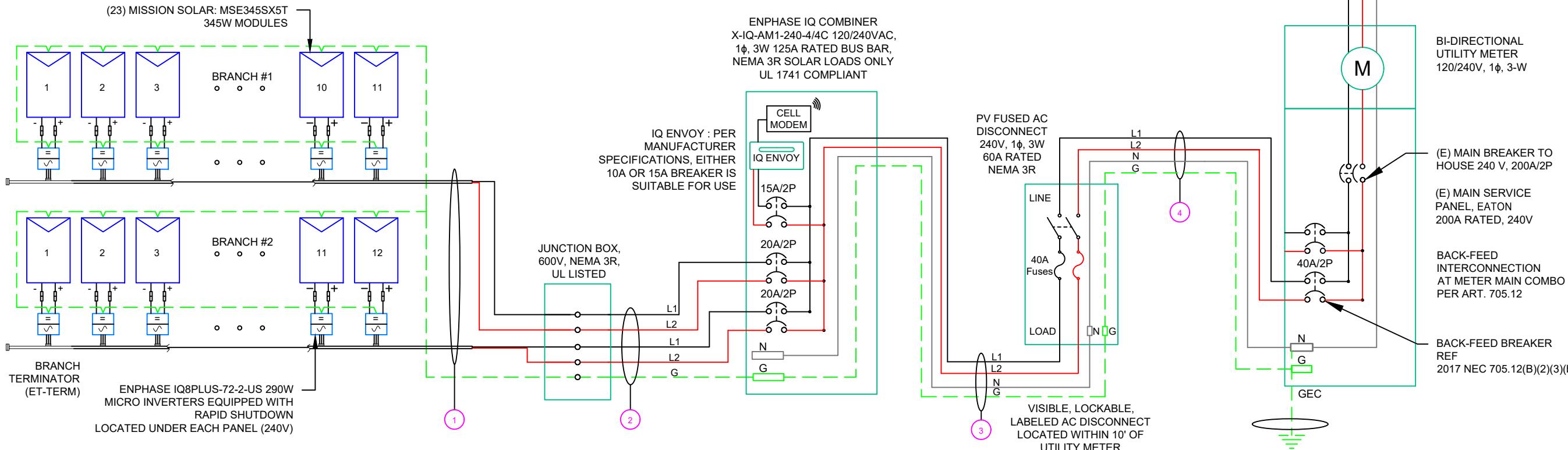
1. BOND EVERY OTHER RAIL WITH #6 BARE COPPER

TOP TIER
SOLAR SOLUTIONS

TOP TIER SOLAR SOLUTIONS
1530 CENTER PARK DR #2911,
CHARLOTTE, NC 28217,
UNITED STATES

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	07/18/2025	
REVISION	07/25/2025	A
REVISION	10/10/2025	B



QTY	CONDUCTOR INFORMATION	CONDUIT TYPE	CONDUIT SIZE
1	(4) #12AWG - ENPHASE ENGAGE CABLE (L1 & L2 NO NEUTRAL)	N/A	N/A
2	(1) #6AWG - BARE COPPER IN FREE AIR	EMT OR LFMC IN ATTIC	3/4"
3	(4) #10AWG - CU,THWN-2	EMT,LFMC OR PVC	3/4"
4	(1) #10AWG - CU,THWN-2 GND	EMT, LFMC OR PVC	3/4"
5	(2) #8AWG - CU,THWN-2	EMT, LFMC OR PVC	3/4"
6	(1) #8AWG - CU,THWN-2 N	EMT, LFMC OR PVC	3/4"
7	(1) #10AWG - CU,THWN-2 GND	EMT, LFMC OR PVC	3/4"
8	(2) #8AWG - CU,THWN-2	EMT, LFMC OR PVC	3/4"
9	(1) #8AWG - CU,THWN-2 N	EMT, LFMC OR PVC	3/4"
10	(1) #10AWG - CU,THWN-2 GND	EMT, LFMC OR PVC	3/4"

DRAWN BY	ESR
SHEET NAME	ELECTRICAL LINE DIAGRAM
SHEET SIZE	ANSI B 11" X 17"
SHEET NUMBER	PV-6

JEFFREY BANKS
RESIDENCE
775 MAPLE RD,
ANGIER, NC 27501

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

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	MISSION SOLAR: MSE345SX5T 345 W MODULE
VMP	33.37V
IMP	10.34A
VOC	41.00V
ISC	10.92A
TEMP. COEFF. VOC	-0.275%/°C
MODULE DIMENSION	68.82" L x 41.50" W x 1.18" D (In Inch)

AMBIENT TEMPERATURE SPECS		
AMBIENT TEMP (HIGH TEMP 2%)		38°
RECORD LOW TEMP		-9°
MODULE TEMPERATURE COEFFICIENT OF Voc		-0.275%/°C
PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT	
.80	4-6	
.70	7-9	
.50	10-20	



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 (%)
CIRCUIT 1	JUNCTION BOX	240	13.31	16.64	20	N/A	BARE COPPER #6 AWG	CU #12 AWG	25	PASS	38	2	30	0.91	1	27.3	PASS		0.55	N/A	#N/A	
CIRCUIT 2	JUNCTION BOX	240	14.52	18.15	20	N/A	BARE COPPER #6 AWG	CU #12 AWG	25	PASS	38	2	30	0.91	1	27.3	PASS		0.65	N/A	#N/A	
JUNCTION BOX	COMBINER BOX	240	14.52	18.15	20	N/A	CU #10 AWG	CU #10 AWG	35	PASS	38	4	40	0.91	0.8	29.12	PASS	15	1.24	0.225	3/4" EMT 19.79%	
COMBINER BOX	AC DISCONNECT	240	27.83	34.79	40	CU #8 AWG	CU #10 AWG	CU #8 AWG	50	PASS	38	2	55	0.91	1	50.05	PASS	1	0.778	0.018	3/4" EMT 24.56%	
AC DISCONNECT	POI	240	27.83	34.79	40	CU #8 AWG	CU #10 AWG	CU #8 AWG	50	PASS	38	2	55	0.91	1	50.05	PASS	1	0.778	0.018	3/4" EMT 24.56%	

Circuit 1 Voltage Drop	0.811
Circuit 2 Voltage Drop	0.911

PROJECT NAME & ADDRESS
JEFFREY BANKS RESIDENCE
775 MAPLE RD,
ANGIER, NC 27501
DRAWN BY
ESR
SHEET NAME
WIRING CALCULATIONS
SHEET SIZE
ANSI B
11" X 17"
SHEET NUMBER
PV-7

ELECTRICAL NOTES

- ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- ALL CONDUCTORS SHALL BE RATED UPTO 600V FOR RESIDENTIAL AND 1000V FOR COMMERCIAL 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 ILSCO 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.

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	07/18/2025	
REVISION	07/25/2025	A
REVISION	10/10/2025	B

PROJECT NAME & ADDRESS

JEFFREY BANKS
RESIDENCE
775 MAPLE RD,
ANGIER, NC 27501

DRAWN BY	ESR
SHEET NAME	LABELS
SHEET SIZE	ANSI B
	11" X 17"
SHEET NUMBER	PV-8

⚠ WARNING

ELECTRIC SHOCK HAZARD

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

LABEL- 1:
LABEL LOCATION:
AC DISCONNECT
CODE REF: NEC 690.13(B)

**⚠ WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM**

LABEL- 2:
LABEL LOCATION:
UTILITY METER
MAIN SERVICE PANEL
SUBPANEL
CODE REF: NEC 705.12(C) & NEC 690.59

⚠ WARNING

**TURN OFF PHOTOVOLTAIC AC
DISCONNECT PRIOR TO
WORKING INSIDE PANEL**

LABEL- 3:
LABEL LOCATION:
MAIN SERVICE PANEL
SUBPANEL
MAIN SERVICE DISCONNECT
COMBINER
CODE REF: NEC 110.27(C) & OSHA 1910.145 (f) (7)

⚠ CAUTION
PHOTOVOLTAIC SYSTEM CIRCUIT IS
BACKFEED

LABEL- 4:
LABEL LOCATION:
MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)
SUBPANEL (ONLY IF SOLAR IS BACK-FED)
CODE REF: NEC 705.12(B)(3-4) & NEC 690.59

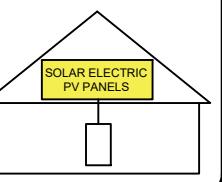
⚠ WARNING

**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
CODE REF: NEC 690.56(C)(2)

**PHOTOVOLTAIC
AC DISCONNECT**

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

**PHOTOVOLTAIC
AC DISCONNECT**

NOMINAL OPERATING AC VOLATGE **240 V**
RATED AC OUTPUT CURRENT **27.83 A**

LABEL- 9:
LABEL LOCATION:
MAIN SERVICE PANEL
SUBPANEL
AC DISCONNECT
CODE REF: NEC 690.54

**MAIN PHOTOVOLTAIC
SYSTEM DISCONNECT**

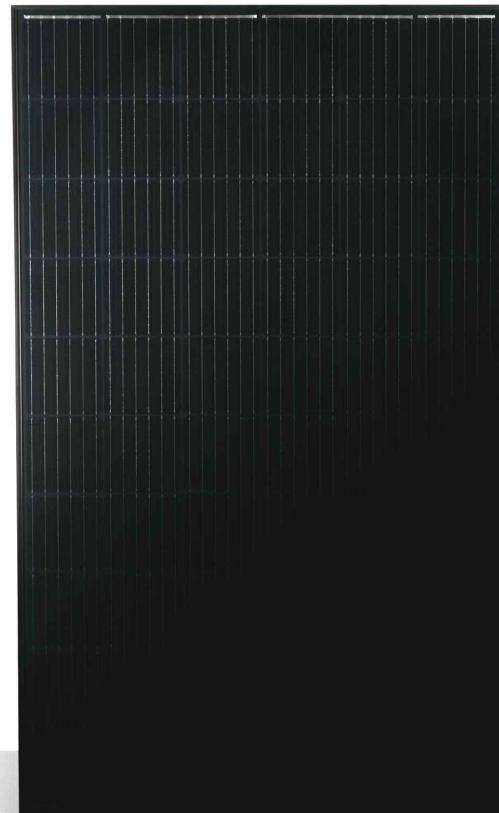
LABEL- 10:
LABEL LOCATION:
MAIN SERVICE DISCONNECT (ONLY IF MAIN SERVICE DISCONNECT IS PRESENT)
CODE REF: NEC 690.13(B)

MSE PERC 60

345W

Class leading power output

Positive
Power
Tolerance
-0 to +3%



MISSION SOLAR
ENERGY



True American Quality True American Brand

Mission Solar Energy is headquartered in San Antonio, Texas where we manufacture our modules. We produce American, high-quality solar modules ensuring the highest-in-class power output and best-in-class reliability. Our product line is tailored for residential, commercial and utility applications. Every Mission Solar Energy solar module is certified and surpasses industry standard regulations, proving excellent performance over the long term.

Demand the best. Demand Mission Solar Energy.



Certified Reliability

- Tested to UL 61730 & IEC Standards
- PID resistant
- Resistance to salt mist corrosion



Advanced Technology

- 6 Busbar
- Passivated Emitter Rear Contact
- Ideal for all applications



Extreme Weather Resilience

- Up to 5,600 Pa front load & 5,631 Pa back load
- Tested load to UL 61730
- 40 mm frame



BAA Compliant for Government Projects

- Buy American Act
- American Recovery & Reinvestment Act

FRAME-TO-FRAME WARRANTY

Degradation guaranteed not to exceed 2% in year one and 0.58% annually from years two to 30 with 84.08% capacity guaranteed in year 25.

For more information, visit www.missionsolar.com/warranty

CERTIFICATIONS



CEC
UL 61730 / IEC 61215 / IEC 61730 / IEC 61701

If you have questions or concerns about certification of our products in your area, please contact Mission Solar Energy.



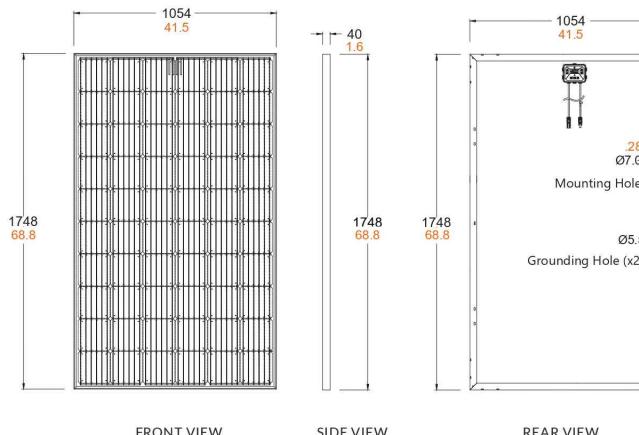
www.missionsolar.com | info@missionsolar.com

C-SA2-MKTG-0025 REV 4 05/05/2021

Class Leading
340-350W

BASIC DIMENSIONS

[UNITS: MM/IN]



FRONT VIEW

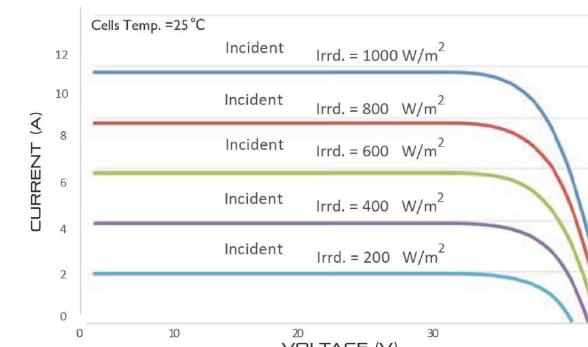
SIDE VIEW

REAR VIEW

CURRENT-VOLTAGE CURVE

MSE345SX5T: 345WP, 60 CELL SOLAR MODULE

Current-voltage characteristics with dependence on irradiance and module temperature



CERTIFICATIONS AND TESTS

IEC 61215, 61730, 61701
UL 61730



CEC



Mission Solar Energy

8303 S. New Braunfels Ave., San Antonio, Texas 78235
www.missionsolar.com | info@missionsolar.com

Mission Solar Energy reserves the right to make specification changes without notice.
C-SA2-MKTG-0025 REV 4 05/05/2021

MSE PERC 60

ELECTRICAL SPECIFICATION

PRODUCT TYPE MSE345SX5T (xxx = P_{max})

Power Output	P _{max}	W _p	340	345	350
Module Efficiency	%	18.5	18.7	19.0	
Tolerance	%	0/+3	0/+3	0/+3	
Short Circuit Current	I _{sc}	V	10.86	10.92	10.97
Open Circuit Voltage	V _{oc}	A	40.82	41.00	41.18
Rated Current	I _{mp}	V	10.24	10.34	10.44
Rated Voltage	V _{mp}	V	33.20	33.37	33.52
Fuse Rating	A	20	20	20	
System Voltage	V	1,000	1,000	1,000	

TEMPERATURE COEFFICIENTS

Normal Operating Cell Temperature (NOCT)	44.43°C (±3.7%)
Temperature Coefficient of Pmax	-0.361%/°C
Temperature Coefficient of Voc	-0.262%/°C
Temperature Coefficient of Isc	0.039%/°C

OPERATING CONDITIONS

Maximum System Voltage	1,000Vdc
Operating Temperature Range	-40°C (-40°F) to +85°C (185°F)
Maximum Series Fuse Rating	20A
Fire Safety Classification	Type 1
Front & Back Load (UL Standard)	Up to 5,600 Pa front and 5,631 Pa back load, Tested to UL 61730
Hail Safety Impact Velocity	25mm at 23 m/s

MECHANICAL DATA

Solar Cells	P-type mono-crystalline silicon
Cell Orientation	60 cells (6x10)
Module Dimension	1,748mm x 1,054mm x 40mm
Weight	20.3 kg (44.8 lbs.)
Front Glass	3.2mm, tempered, low-iron, anti-reflective
Frame	Anodized
Encapsulant	Ethylene vinyl acetate (EVA)
Junction Box	Protection class IP67 with 3 bypass-diodes
Cable	1.0m, Wire 4mm ² (12AWG)
Connector	Staubli PV-KBT4/6II-UR and PV-KST4/6II-UR, MC4, Renhe 05-8

SHIPPING INFORMATION

Container Feet	Ship To	Pallet	Panels	345 W Bin
53'	Most States	34	884	304.98 kW
Double Stack	CA	28	728	251.16 kW
PALLET [26 PANELS]				
Weight	Height	Width	Length	
1,263 lbs. (573 kg)	47.5 in (120.65 cm)	46 in (116.84 cm)	70.25 in (178.43 cm)	

www.missionsolar.com | info@missionsolar.com

TOP TIER
SOLAR SOLUTIONS

TOP TIER SOLAR SOLUTIONS
1530 CENTER PARK DR #2911,
CHARLOTTE, NC 28217,
UNITED STATES

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	07/18/2025	
REVISION	07/25/2025	A
REVISION	10/10/2025	B

PROJECT NAME & ADDRESS

JEFFREY BANKS
RESIDENCE

775 MAPLE RD,
ANGIER, NC 27501

DRAWN BY
ESR

SHEET NAME

SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-9

A



IQ8 and IQ8+ Microinverters

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



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



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



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



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

© 2022 Enphase Energy. All rights reserved. Enphase, the Enphase logo, IQ8 Microinverters, and other names are trademarks of Enphase Energy, Inc. Data subject to change.

IQ8SP-DS-0002-01-EN-US-2022-03-17

Easy to install

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

High productivity and reliability

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

Microgrid-forming

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

* Only when installed with IQ System Controller 2, meets UL 1741.

** IQ8 and IQ8Plus supports split phase, 240V installations only.

IQ8 and IQ8+ Microinverters

	IQ8-60-2-US		IQ8PLUS-72-2-US		
Commonly used module pairings ¹	W	235 – 350	235 – 440		
Module compatibility		60-cell/120 half-cell	60-cell/120 half-cell, 66-cell/132 half-cell and 72-cell/144 half-cell		
MPPT voltage range	V	27 – 37	29 – 45		
Operating range	V	25 – 48	25 – 58		
Min/max start voltage	V	30 / 48	30 / 58		
Max input DC voltage	V	50	60		
Max DC current ² [module Isc]	A	15			
Oversupply class DC port		II			
DC port backfeed current	mA	0			
PV array configuration		1x1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit			
	IQ8-60-2-US		IQ8PLUS-72-2-US		
Peak output power	VA	245	300		
Max continuous output power	VA	240	290		
Nominal (L-L) voltage/range ³	V	240 / 211 – 264			
Max continuous output current	A	1.0	1.21		
Nominal frequency	Hz	60			
Extended frequency range	Hz	50 – 68			
AC short circuit fault current over 3 cycles	Arms	2			
Max units per 20 A (L-L) branch circuit ⁴		16	13		
Total harmonic distortion		<5%			
Oversupply class AC port		III			
AC port backfeed current	mA	30			
Power factor setting		1.0			
Grid-tied power factor (adjustable)		0.85 leading – 0.85 lagging			
Peak efficiency	%	97.5	97.6		
CEC weighted efficiency	%	97	97		
Night-time power consumption	mW	60			
	MECHANICAL DATA				
Ambient temperature range		-40°C to +60°C (-40°F to +140°F)			
Relative humidity range		4% to 100% (condensing)			
DC Connector type		MC4			
Dimensions (HxWxD)		212 mm (8.3") x 175 mm (6.9") x 30.2 mm (1.2")			
Weight		1.08 kg (2.38 lbs)			
Cooling		Natural convection – no fans			
Approved for wet locations		Yes			
Pollution degree		PD3			
Enclosure		Class II double-insulated, corrosion resistant polymeric enclosure			
Environ. category / UV exposure rating		NEMA Type 6 / outdoor			
	COMPLIANCE				
Certifications	CA Rule 21 (UL 1741-SA), UL 62109-1, UL1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO.107.1-01				
	This product is UL Listed as PV Rapid Shut Down Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.				
	(1) No enforced DC/AC ratio. See the compatibility calculator at https://link.enphase.com/module-compatibility				
	(2) Maximum continuous input DC current is 10.6A (3) Nominal voltage range can be extended beyond nominal if required by the utility. (4) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.				

IQ8SP-DS-0002-01-EN-US-2022-03-17

JEFFREY BANKS
RESIDENCE

775 MAPLE RD,
ANGIER, NC 27501

DRAWN BY
ESR
SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-10

DESCRIPTION	DATE	REV
INITIAL DESIGN	07/18/2025	
REVISION	07/25/2025	A
REVISION	10/10/2025	B

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	07/18/2025	
REVISION	07/25/2025	A
REVISION	10/10/2025	B

PROJECT NAME & ADDRESS

JEFFREY BANKS
RESIDENCE

775 MAPLE RD,
ANGIER, NC 27501

DRAWN BY
ESR

SHEET NAME
**EQUIPMENT
SPECIFICATION**

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-11

Data Sheet
Enphase Networking

Enphase IQ Combiner 4/4C

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



To learn more about Enphase offerings, visit enphase.com



ENPHASE

Enphase IQ Combiner 4/4C

MODEL NUMBER

IQ Combiner 4 (X-IQ-AM1-240-4)

IQ Combiner 4 with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes a silver solar shield to match the IQ Battery system and IQ System Controller 2 and to deflect heat.

IQ Combiner 4C (X-IQ-AM1-240-4C)

IQ Combiner 4C with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), a plug-and-play industrial-grade cell modem for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.) Includes a silver solar shield to match the IQ Battery and IQ System Controller and to deflect heat.

ACCESSORIES AND REPLACEMENT PARTS

Ensemble Communications Kit
COMMS-CELLMODEM-M1-06
CELLMODEM-M1-06-SP-05
CELLMODEM-M1-06-AT-05

- Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with 5-year Sprint data plan for Ensemble sites
- 4G based LTE-M1 cellular modem with 5-year Sprint data plan
- 4G based LTE-M1 cellular modem with 5-year AT&T data plan

Circuit Breakers
BRK-10A-2-240V
BRK-15A-2-240V
BRK-20A-2P-240V
BRK-15A-2P-240V-B
BRK-20A-2P-240V-B

Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers.
Circuit breaker, 2 pole, 10A, Eaton BR210
Circuit breaker, 2 pole, 15A, Eaton BR215
Circuit breaker, 2 pole, 20A, Eaton BR220
Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support
Circuit breaker, 2 pole, 20A, Eaton BR220B with hold down kit support

EPLC-01

Power line carrier (communication bridge pair), quantity - one pair

XA-SOLARSHIELD-ES

Replacement solar shield for IQ Combiner 4/4C

XA-PLUG-120-3

Accessory receptacle for Power Line Carrier in IQ Combiner 4/4C (required for EPLC-01)

XA-ENV-PCBA-3

Replacement IQ Gateway printed circuit board (PCB) for Combiner 4/4C

X-IQ-NA-HD-125A

Hold down kit for Eaton circuit breaker with screws.

ELECTRICAL SPECIFICATIONS

Rating

Continuous duty

System voltage

120/240 VAC, 60 Hz

Eaton BR series busbar rating

125 A

Max. continuous current rating

65 A

Max. continuous current rating (input from PV/storage)

64 A

Max. fuse/circuit rating (output)

90 A

Branch circuits (solar and/or storage)

Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)

Max. total branch circuit breaker rating (input)

80A of distributed generation / 95A with IQ Gateway breaker included

Envoy breaker

10A or 15A rating GE/Siemens/Eaton included

Production metering CT

200 A solid core pre-installed and wired to IQ Gateway

Consumption monitoring CT (CT-200-SPLIT)

A pair of 200 A split core current transformers

MECHANICAL DATA

Dimensions (WxHxD)

37.5 x 49.5 x 16.8 cm (14.75" x 19.5" x 6.63"). Height is 21.06" (53.5 cm) with mounting brackets.

Weight

7.5 kg (16.5 lbs)

Ambient temperature range

-40° C to +46° C (-40° to 115° F)

Cooling

Natural convection, plus heat shield

Enclosure environmental rating

Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction

Wire sizes

- 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors
- 60 A breaker branch input: 4 to 1/0 AWG copper conductors
- Main lug combined output: 10 to 2/0 AWG copper conductors
- Neutral and ground: 14 to 1/0 copper conductors

Always follow local code requirements for conductor sizing.

Altitude

To 2000 meters (6,560 feet)

INTERNET CONNECTION OPTIONS

Integrated Wi-Fi

802.11b/g/n

Cellular

CELLMODEM-M1-06-SP-05, CELLMODEM-M1-06-AT-05 (4G based LTE-M1 cellular modem). Note that an Enphase Mobile Connect cellular modem is required for all Ensemble installations.

Ethernet

Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)

COMPLIANCE

Compliance, IQ Combiner

UL 1741, CAN/CSA C22.2 No. 107.1, 47 CFR, Part 15, Class B, ICES 003
Production metering: ANSI C12.20 accuracy class 0.5 (PV production)
Consumption metering: accuracy class 2.5

Compliance, IQ Gateway

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

To learn more about Enphase offerings, visit enphase.com

© 2022 Enphase Energy. All rights reserved. Enphase, the Enphase logo, IQ Combiner 4/4C, and other names are trademarks of Enphase Energy, Inc. Data subject to change. 02-14-2022

ENPHASE

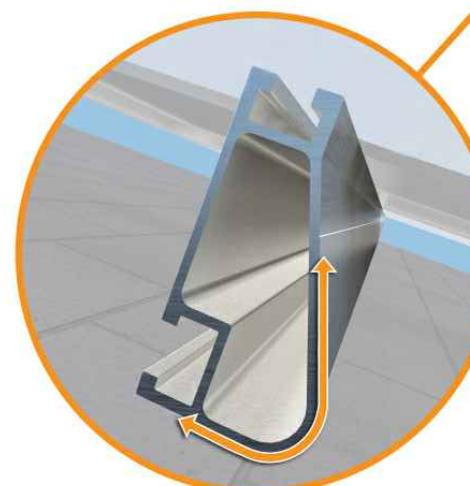
A



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.

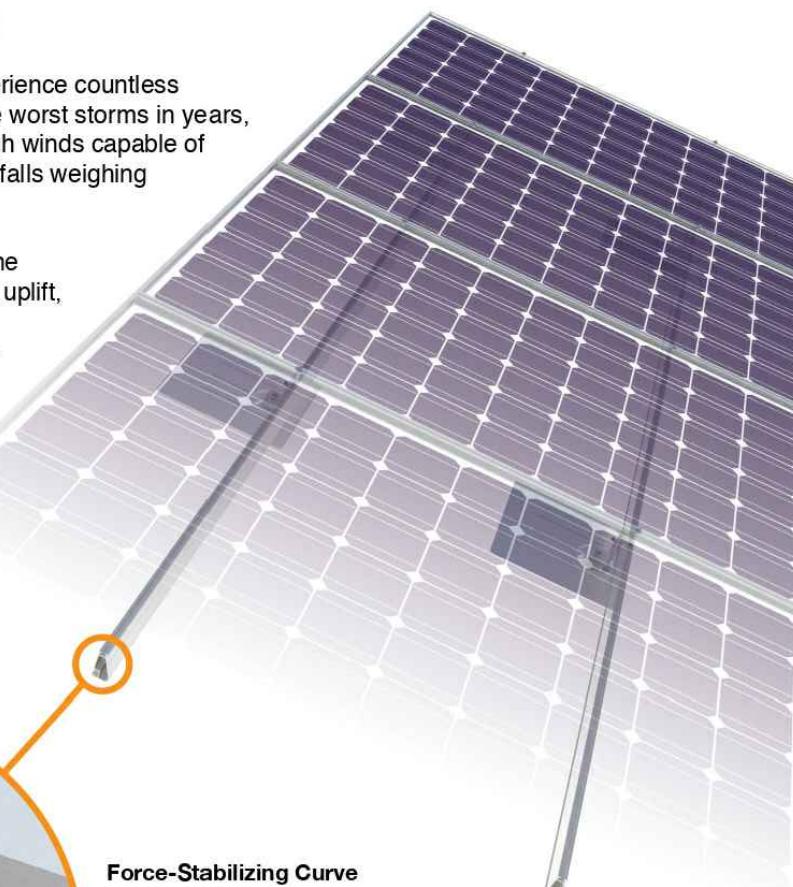
Corrosion-Resistant Materials

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

Tech Brief



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 for detailed certification letters.

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

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

DESCRIPTION	DATE	REV
INITIAL DESIGN	07/18/2025	
REVISION	07/25/2025	A
REVISION	10/10/2025	B



Tech Brief

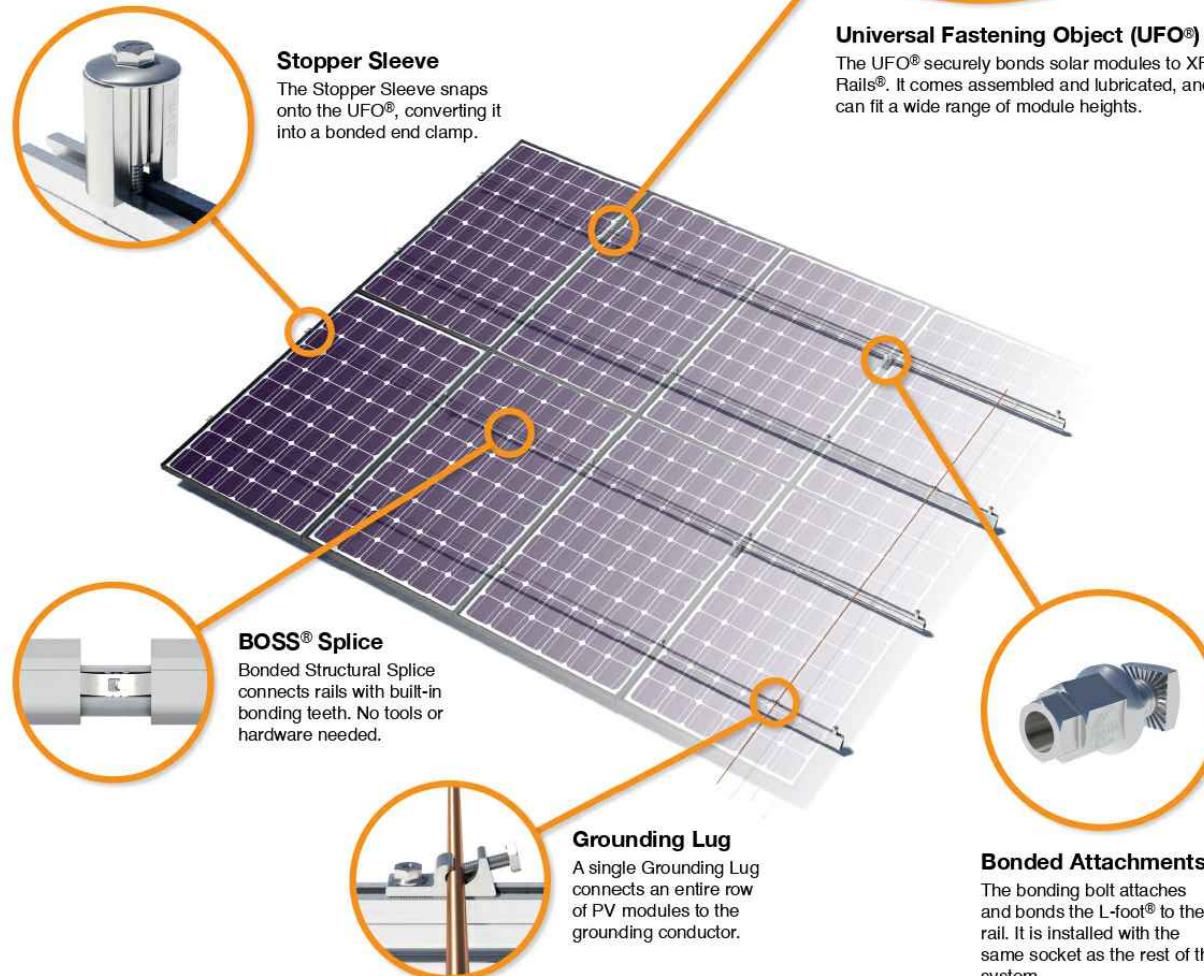
UFO® Family of Components

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.

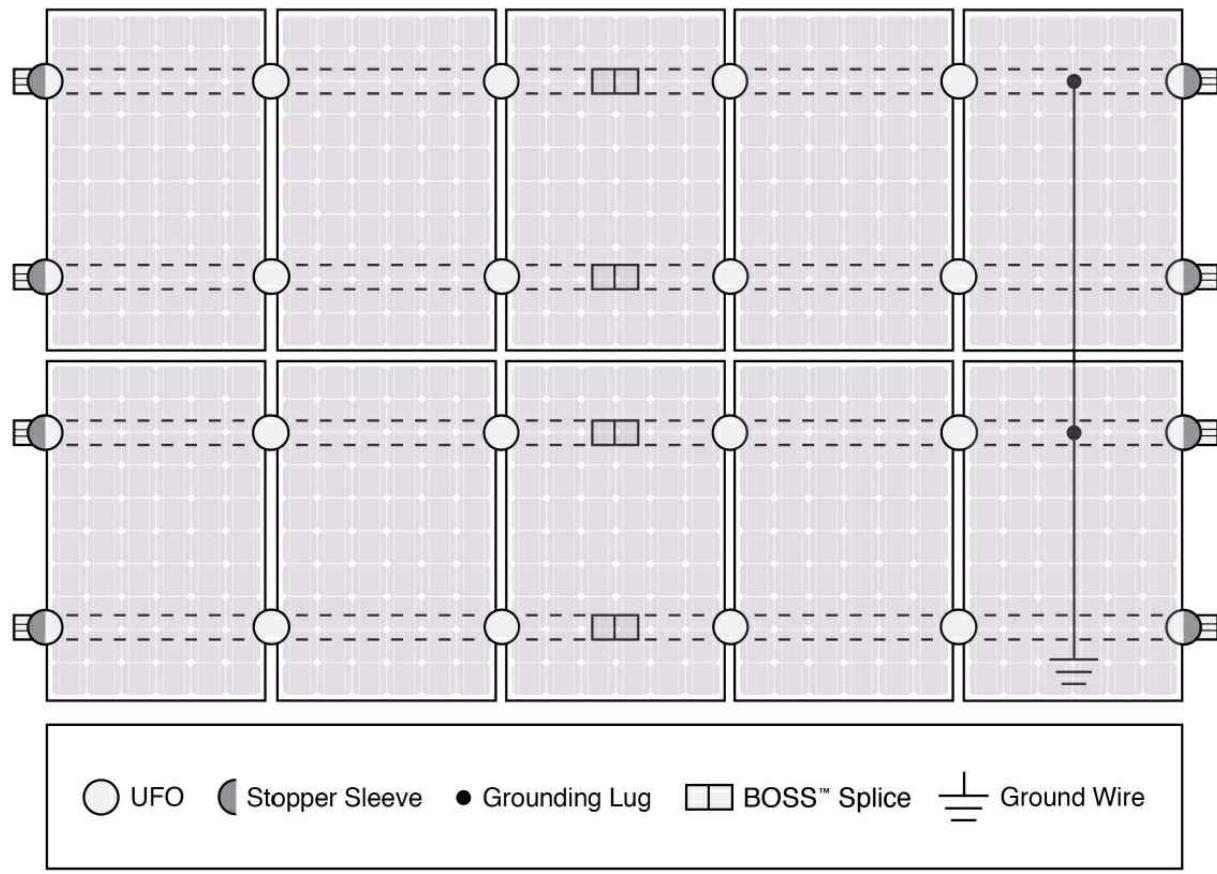
Only for installation and use with IronRidge products in accord with written instructions. See IronRidge.com/UFO



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

Tech Brief

System Diagram



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.		

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	07/18/2025	
REVISION	07/25/2025	A
REVISION	10/10/2025	B

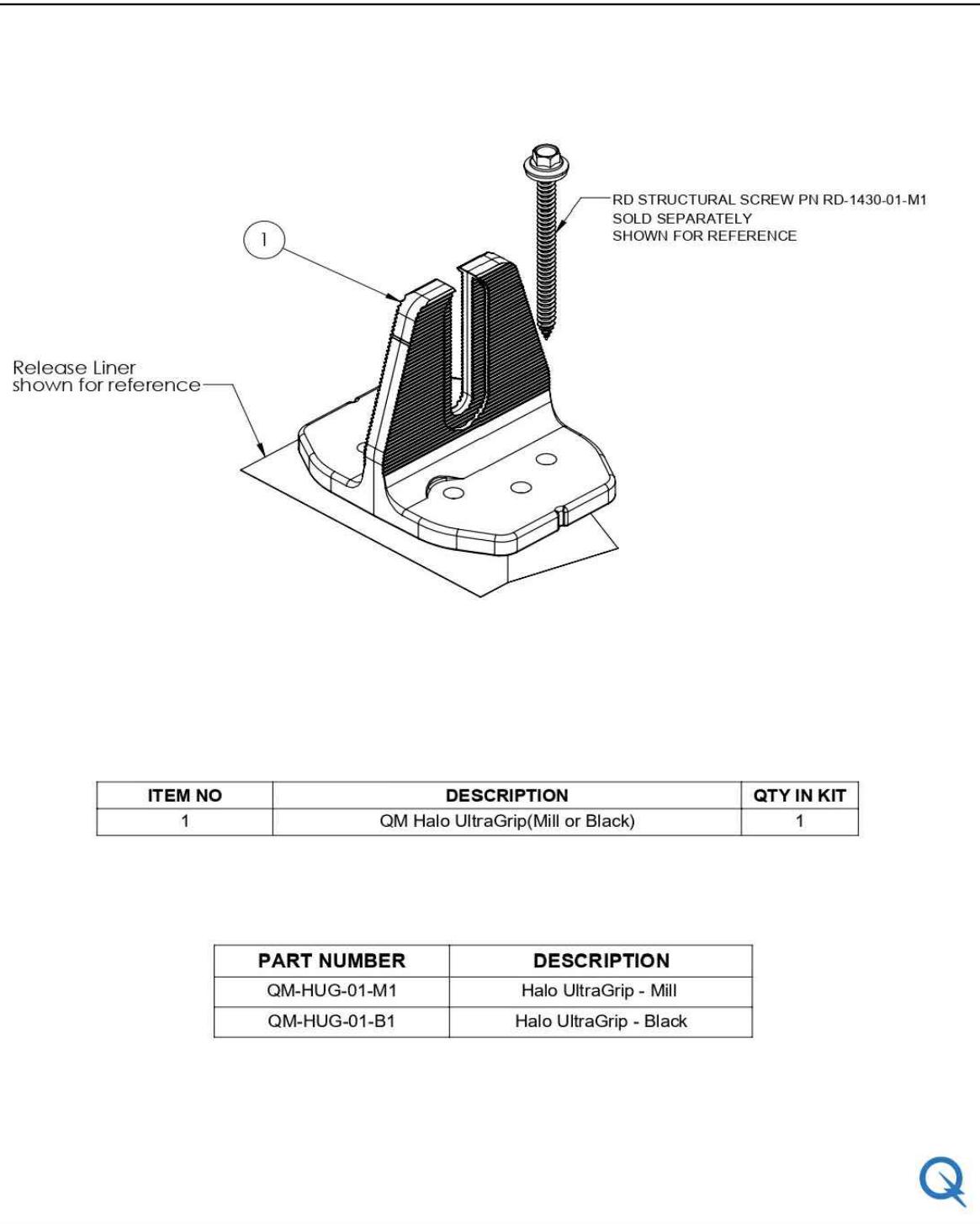
PROJECT NAME & ADDRESS

JEFFREY BANKS
RESIDENCE775 MAPLE RD,
ANGIER, NC 27501DRAWN BY
ESRSHEET NAME
EQUIPMENT
SPECIFICATIONSHEET SIZE
ANSI B
11" X 17"SHEET NUMBER
PV-13



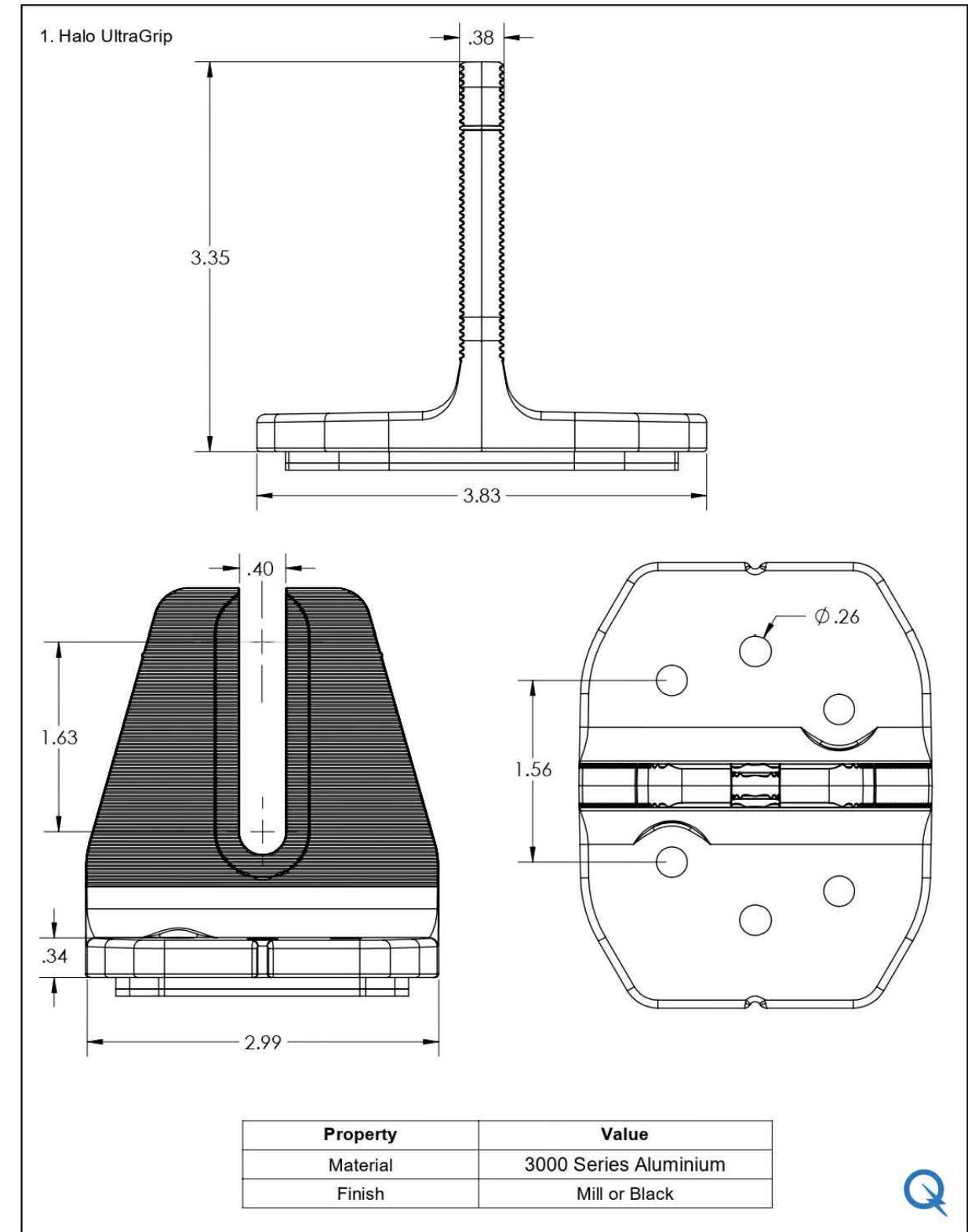
QuickMount® Halo UltraGrip

Cut Sheet



© 2022 IronRidge, Inc. All rights reserved. Visit www.ir-patents.com for patent information.

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



© 2022 IronRidge, Inc. All rights reserved. Visit www.ir-patents.com for patent information.

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



TOP TIER
SOLAR SOLUTIONS

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

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	07/18/2025	
REVISION	07/25/2025	A
REVISION	10/10/2025	B

PROJECT NAME & ADDRESS

JEFFREY BANKS
RESIDENCE

775 MAPLE RD,
ANGIER, NC 27501

DRAWN BY
ESR

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-14



QuickMount® RD Structural Screw

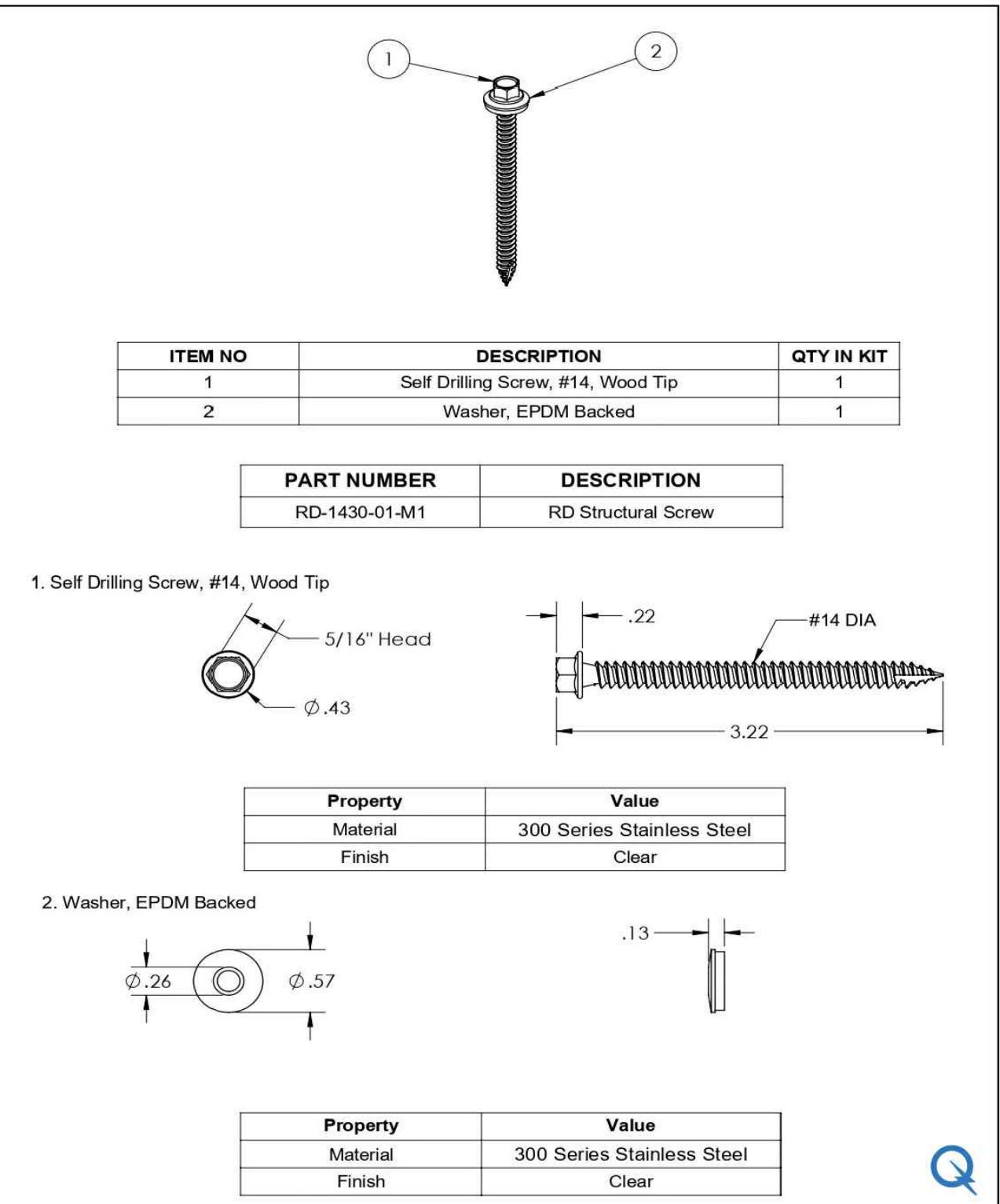


TOP TIER SOLAR SOLUTIONS

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

REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	07/18/2025	
REVISION	07/25/2025	A
REVISION	10/10/2025	B



PROJECT NAME & ADDRESS
**JEFFREY BANKS
RESIDENCE**
775 MAPLE RD,
ANGIER, NC 27501

DRAWN BY
ESR

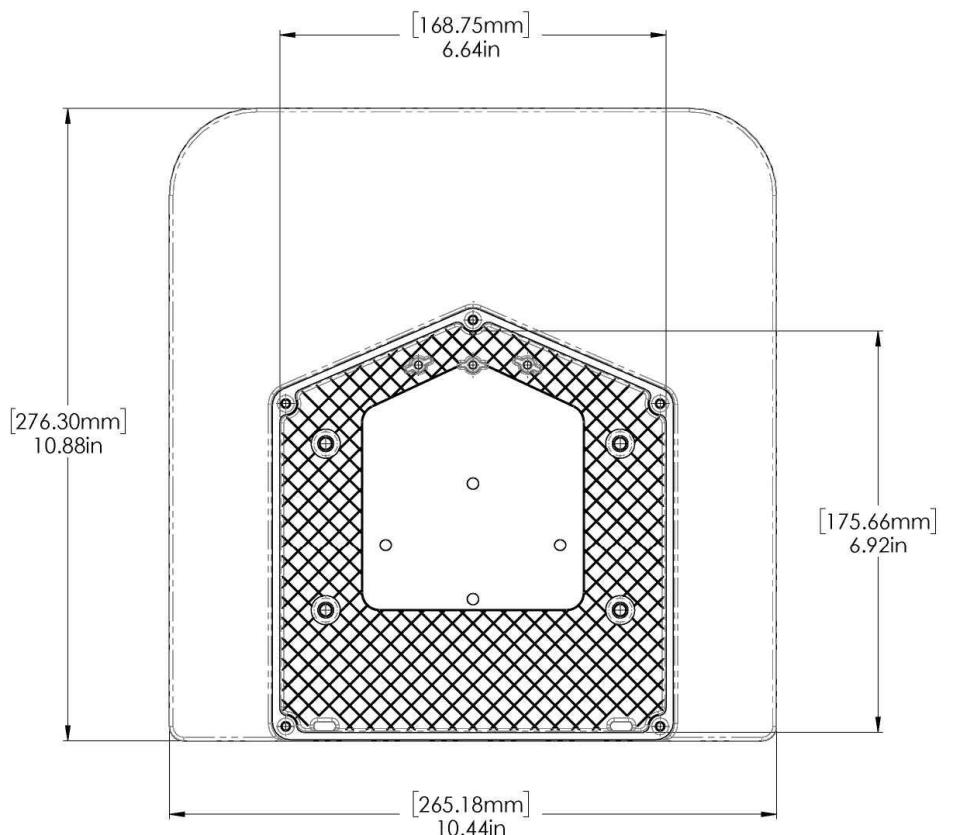
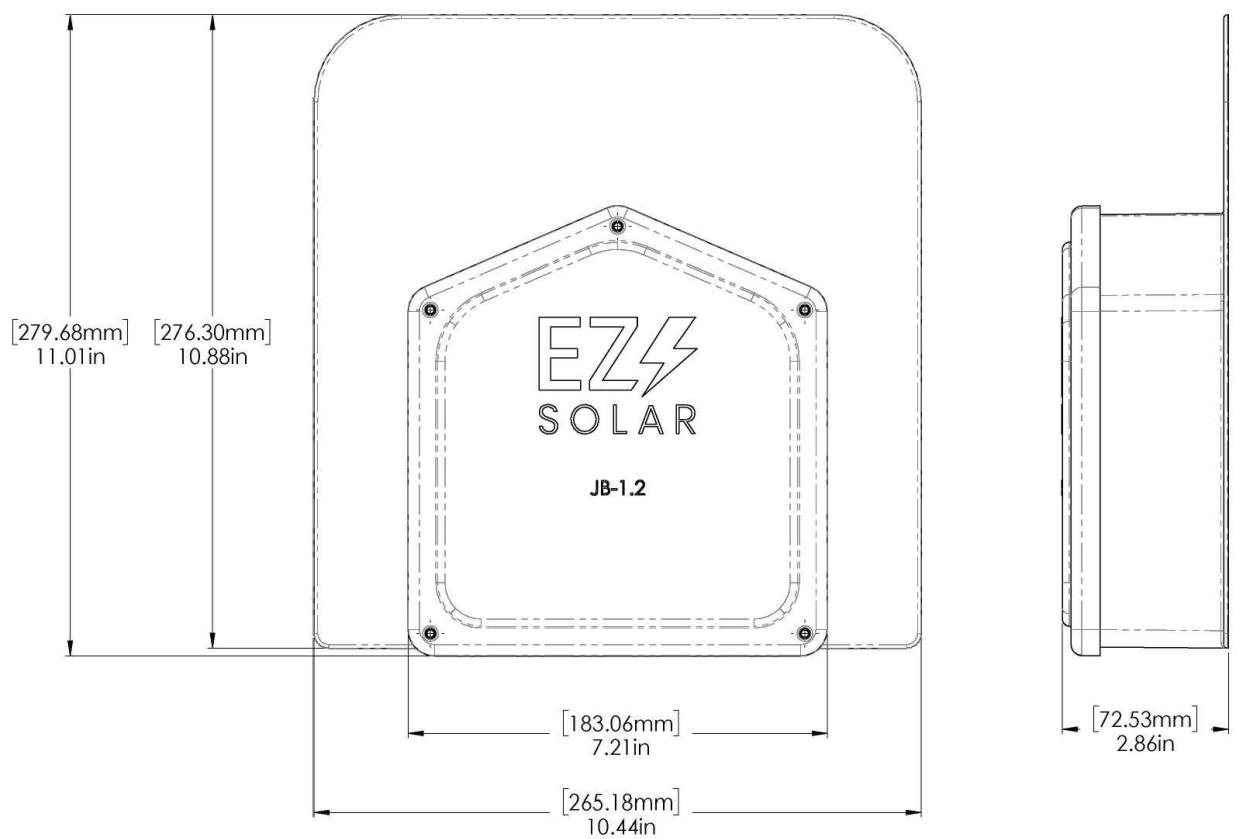
SHEET NAME
**EQUIPMENT
SPECIFICATION**

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

SHEET NUMBER
PV-15

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	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	



REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	07/18/2025	
REVISION	07/25/2025	A
REVISION	10/10/2025	B

PROJECT NAME & ADDRESS

JEFFREY BANKS
RESIDENCE
775 MAPLE RD,
ANGIER, NC 27501

DRAWN BY
ESR

SHEET NAME
**EQUIPMENT
SPECIFICATION**

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

SHEET NUMBER
PV-16