

# PHOTOVOLTAIC ROOF MOUNT SYSTEM

15 MODULES-ROOF MOUNTED - 6.075 kW DC, 5.700 kW AC

35 TRACE TURNER LN, COATS, NC 27521

## PROJECT DATA

PROJECT ADDRESS: 35 TRACE TURNER LN, COATS, NC 27521

OWNER: JAMES CASSIDY

DESIGNER: ESR

SCOPE: 6.075 kW DC ROOF MOUNT SOLAR PV SYSTEM WITH 15 JA SOLAR: JAM54S31-405/MR 405W PV MODULES WITH 15 SOLAREEDGE: S440 POWER OPTIMIZERS AND 01 SOLAREEDGE: SE5700H-US (240V/5700W) INVERTER

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

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## 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

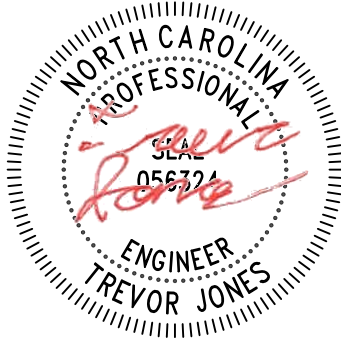
2018 NORTH CAROLINA BUILDING CODE  
2018 NORTH CAROLINA RESIDENTIAL CODE  
2018 NORTH CAROLINA FIRE CODE  
2017 NATIONAL ELECTRICAL CODE



### TOP TIER SOLAR SOLUTIONS

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

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	02/25/2025	



STRUCTURAL ONLY  
2/26/2025

### PROJECT NAME & ADDRESS

JAMES CASSIDY  
RESIDENCE

35 TRACE TURNER LN,  
COATS, NC 27521

DRAWN BY
ESR

SHEET NAME
COVER SHEET

SHEET SIZE
ANSI B 11" X 17"

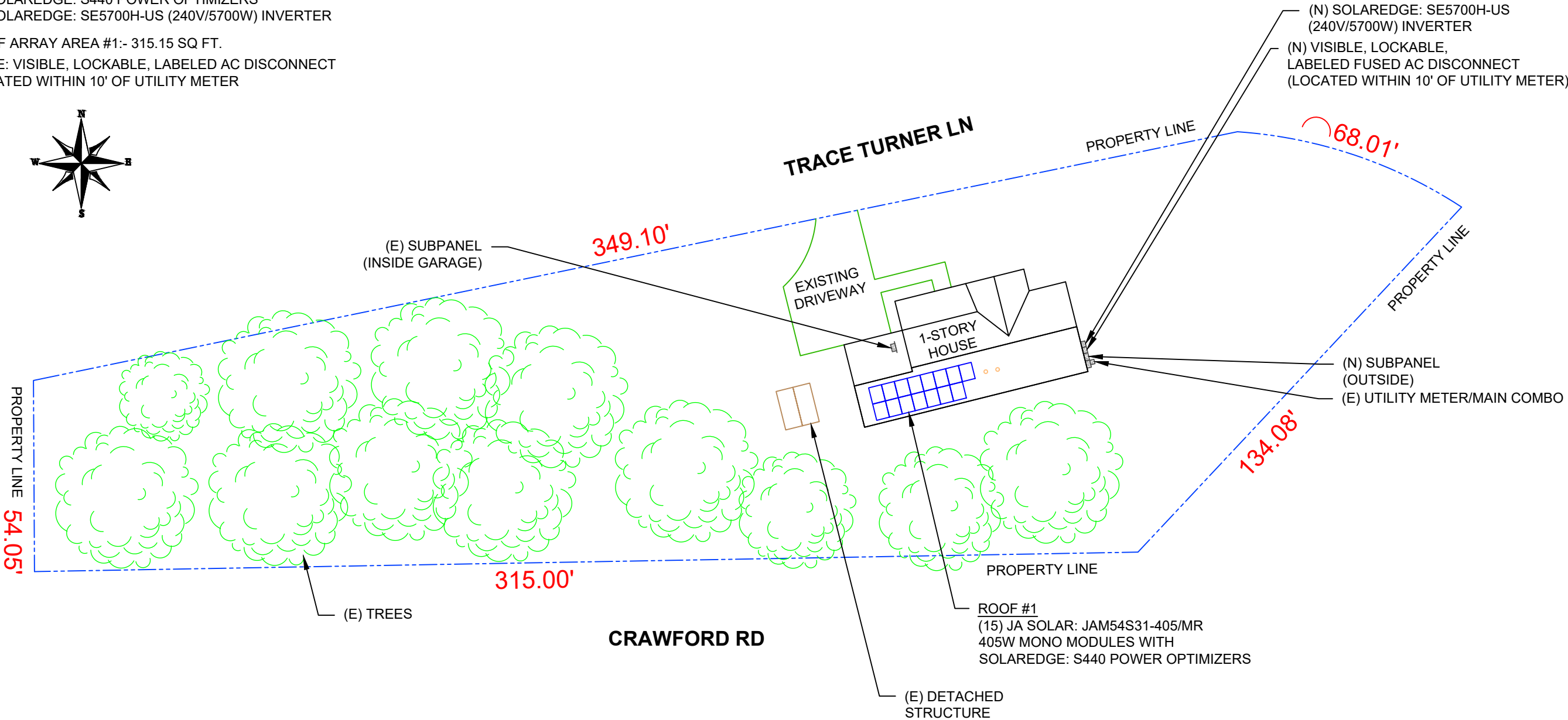
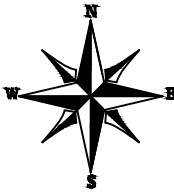
SHEET NUMBER
PV-1

PROJECT DESCRIPTION:

15 X JA SOLAR: JAM54S31-405/MR 405W MONO MODULES  
ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES  
DC SYSTEM SIZE: 6.075 kW DC  
AC SYSTEM SIZE: 5.700 kW AC

EQUIPMENT SUMMARY  
15 JA SOLAR: JAM54S31-405/MR 405W MONO MODULES  
15 SOLAREDGE: S440 POWER OPTIMIZERS  
01 SOLAREDGE: SE5700H-US (240V/5700W) INVERTER

ROOF ARRAY AREA #1:- 315.15 SQ FT.  
NOTE: VISIBLE, LOCKABLE, LABELED AC DISCONNECT  
LOCATED WITHIN 10' OF UTILITY METER



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SHEET NAME  
SITE PLAN

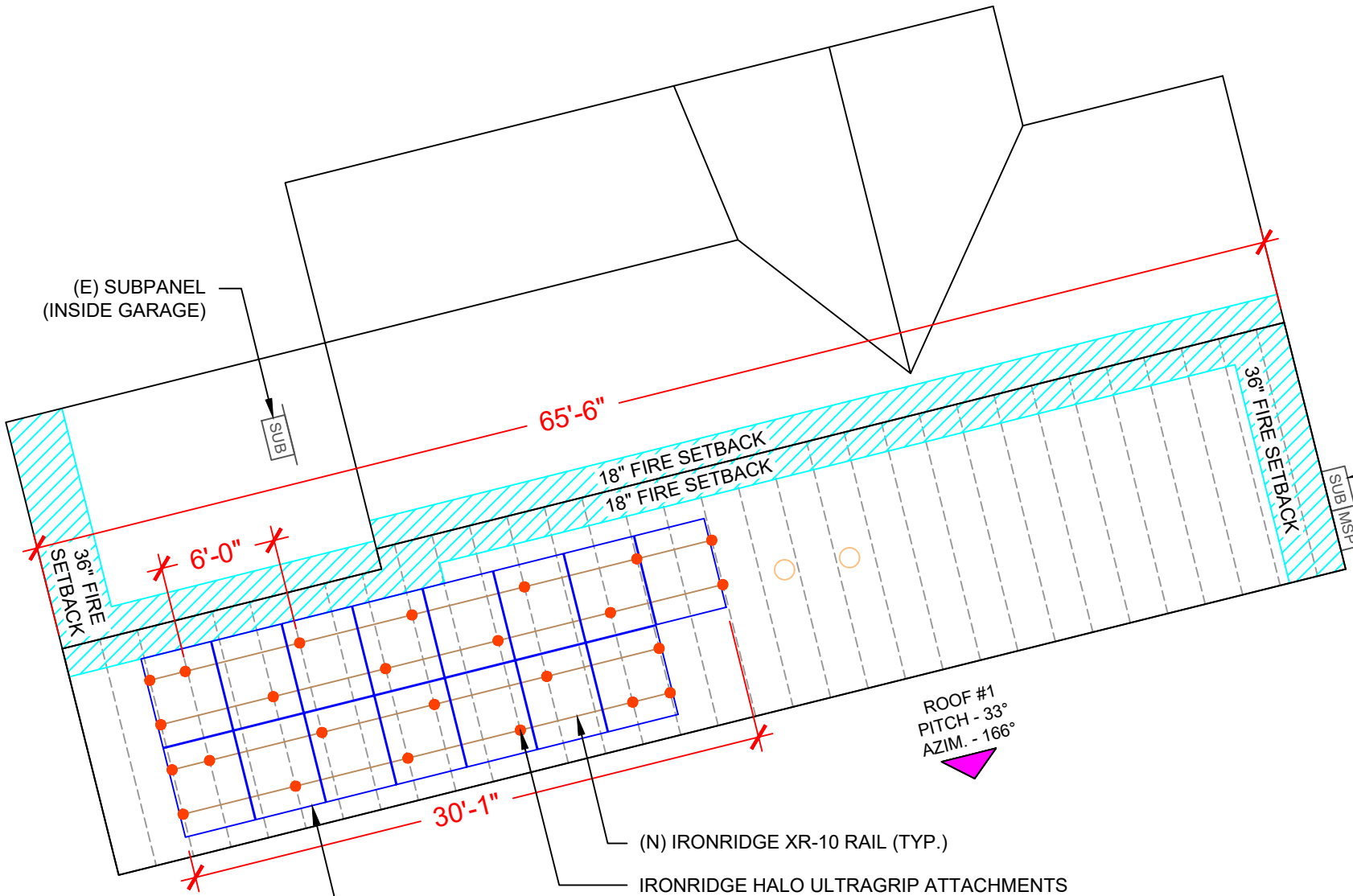
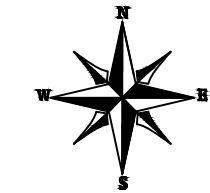
SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER  
PV-2

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

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 15 MODULES  
MODULE TYPE = JA SOLAR: JAM54S31-405/MR 405W MONO MODULES  
MODULE WEIGHT = 47.39 LBS / 21.5 kg.  
MODULE DIMENSIONS = 67.79" x 44.65" = 21.01 SF



ROOF DESCRIPTION					
ROOF TYPE			ASPHALT SHINGLE		
ROOF LAYER			1 LAYER		
ROOF	# OF MODULES	ROOF PITCH	AZIMUTH	TRUSS SIZE	TRUSS SPACING
#1	15	33°	166°	2"X4"	24"

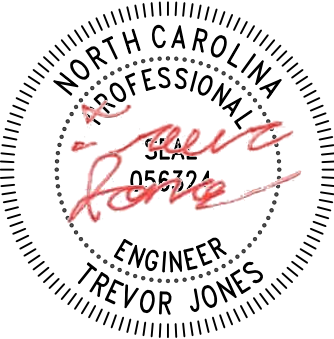
ARRAY AREA & ROOF AREA CALC'S		
TOTAL PV ARRAY AREA (SQ. FT.)	TOTAL ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
315.15	1928.83	16

**TOP TIER**  
SOLAR SOLUTIONS

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SHEET NAME  
**ROOF PLAN &  
MODULES**

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

SHEET NUMBER  
**PV-3**

1 | ROOF PLAN & MODULES

PV-3 | SCALE: 1/8" = 1'-0"

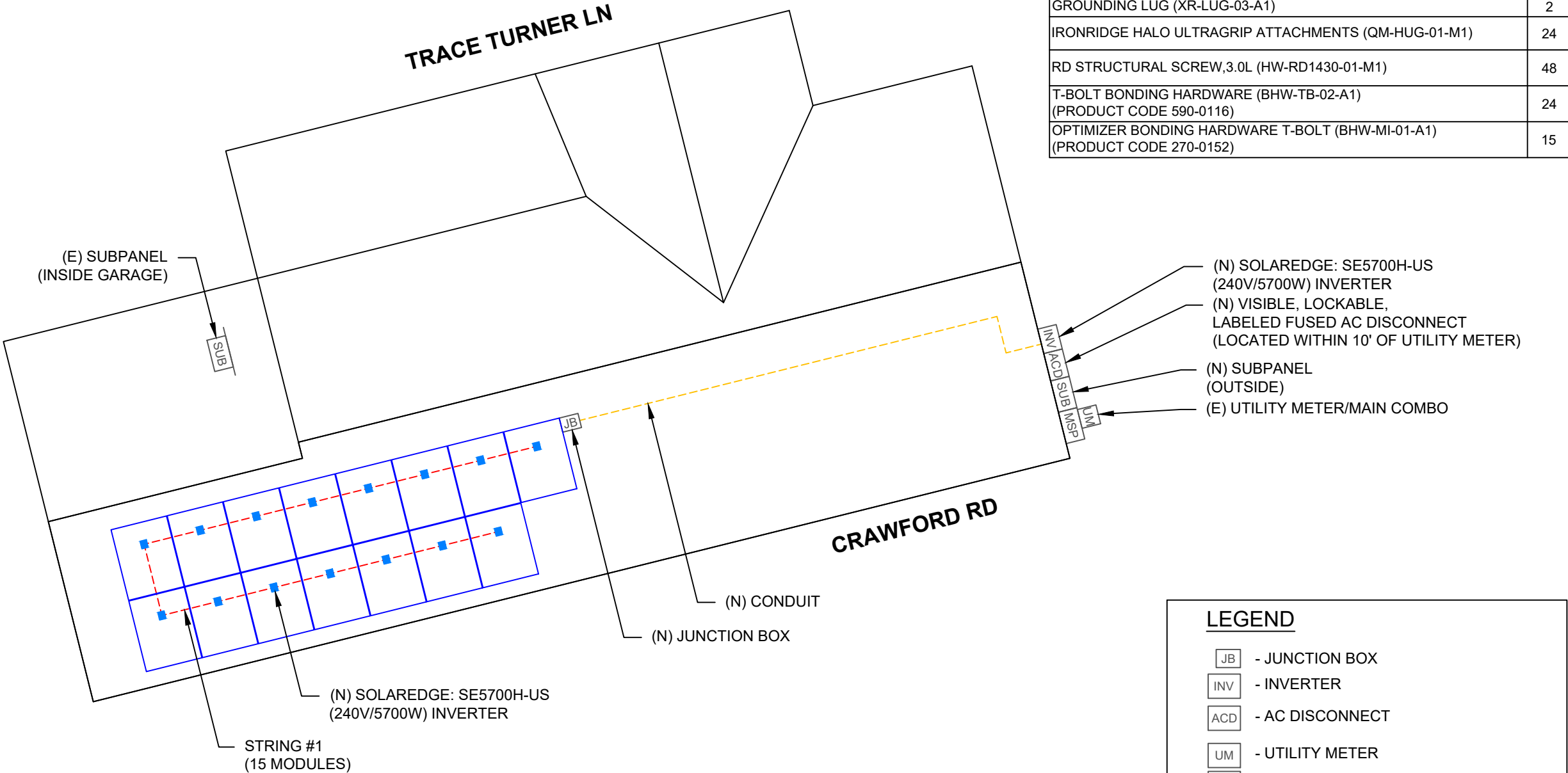
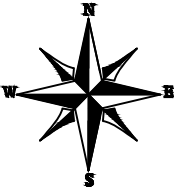
**LEGEND**

- JUNCTION BOX
- INVERTER
- AC DISCONNECT
- UTILITY METER
- MAIN SERVICE PANEL
- SUB PANEL
- VENT, ATTIC FAN (ROOF OBSTRUCTION)
- ROOF ATTACHMENT
- TRUSS
- CONDUIT

DC SYSTEM SIZE: 6.075 kW DC  
AC SYSTEM SIZE: 5.700 kW AC  
(15) JA SOLAR: JAM54S31-405/MR 405W MONO MODULES  
WITH (15) SOLAREEDGE: S440 POWER OPTIMIZERS  
LOCATED UNDER EACH PANEL AND  
01 SOLAREEDGE: SE5700H-US (240V/5700W) INVERTER

STRING LEGENDS

--- STRING #1



BILL OF MATERIALS	
EQUIPMENT DESCRIPTION	QTY
SOLAR PV MODULES: JA SOLAR: JAM54S31-405/MR 405W MODULE	15
OPTIMIZERS: SOLAREEDGE: S440 POWER OPTIMIZERS	15
INVERTER: SOLAREEDGE: SE5700H-US (240V/5700W) INVERTER	01
JUNCTION BOX: JUNCTION BOX UL 1741, NEMA 3R CSA C22.2 NO.290	1
AC DISCONNECT: FUSED AC DISCONNECT, 60A FUSED, (2) 30A FUSES 240V NEMA 3R, UL LISTED	1
IRONRIDGE XR10 RAIL (RAIL 168" (14 FEET) CLEAR) (XR-10-168A)	10
BONDED SPLICE, XR10 (XR10-BOSS-01-M1)	6
UNIVERSAL MODULE CLAMP, CLEAR (UFO-CL-01-A1)	26
END FASTENING OBJECT (END CLAMP, 30-40MM), MILL (UFO-END-01-A1)	8
GROUNDING LUG (XR-LUG-03-A1)	2
IRONRIDGE HALO ULTRAGRIP ATTACHMENTS (QM-HUG-01-M1)	24
RD STRUCTURAL SCREW,3.0L (HW-RD1430-01-M1)	48
T-BOLT BONDING HARDWARE (BHW-TB-02-A1) (PRODUCT CODE 590-0116)	24
OPTIMIZER BONDING HARDWARE T-BOLT (BHW-MI-01-A1) (PRODUCT CODE 270-0152)	15

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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SHEET NAME

ELECTRICAL PLAN

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-4





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SHEET NAME

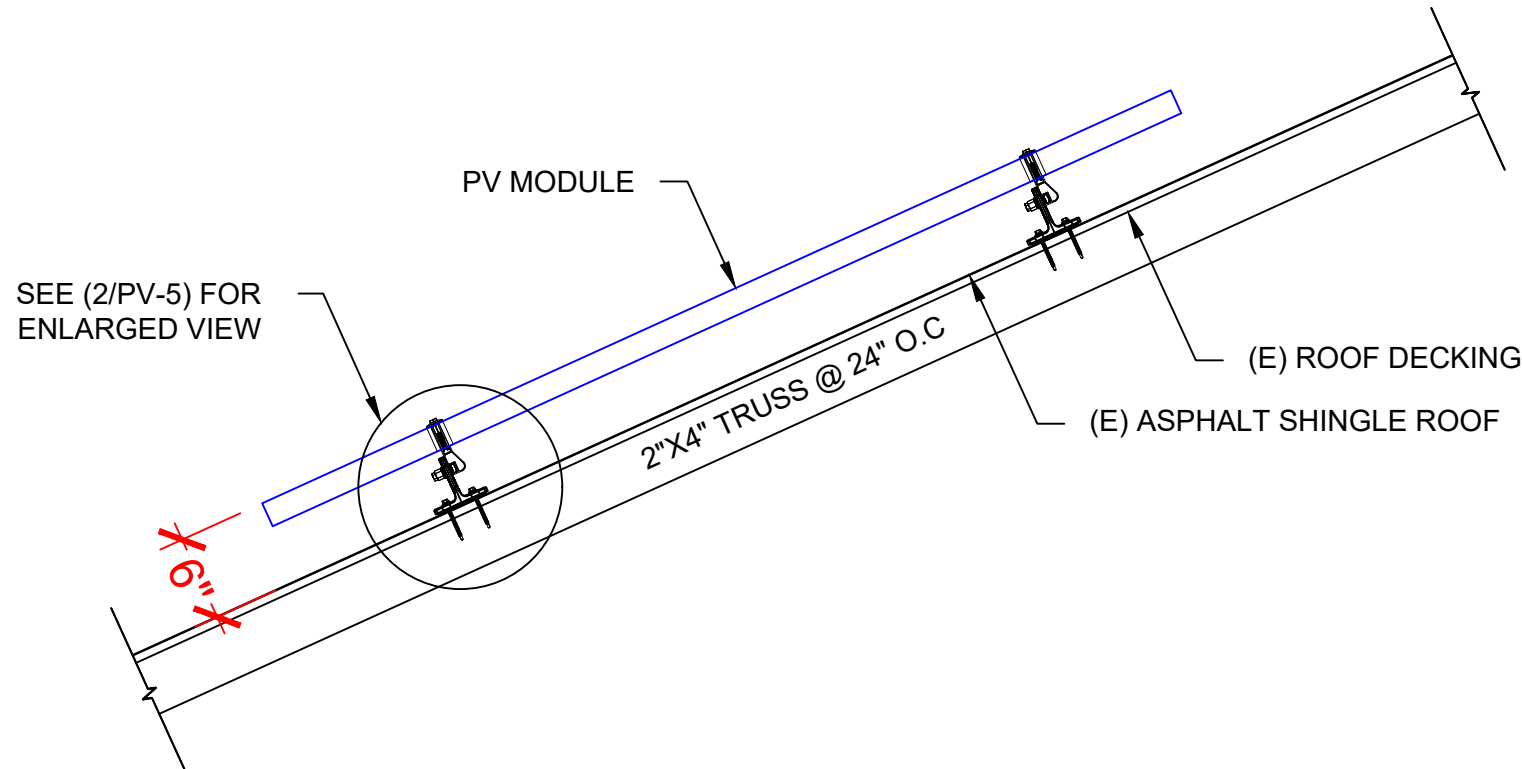
STRUCTURAL DETAIL

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-5



SEE (2/PV-5) FOR  
ENLARGED VIEW

PV MODULE

2"X4" TRUSS @ 24" O.C

(E) ROOF DECKING

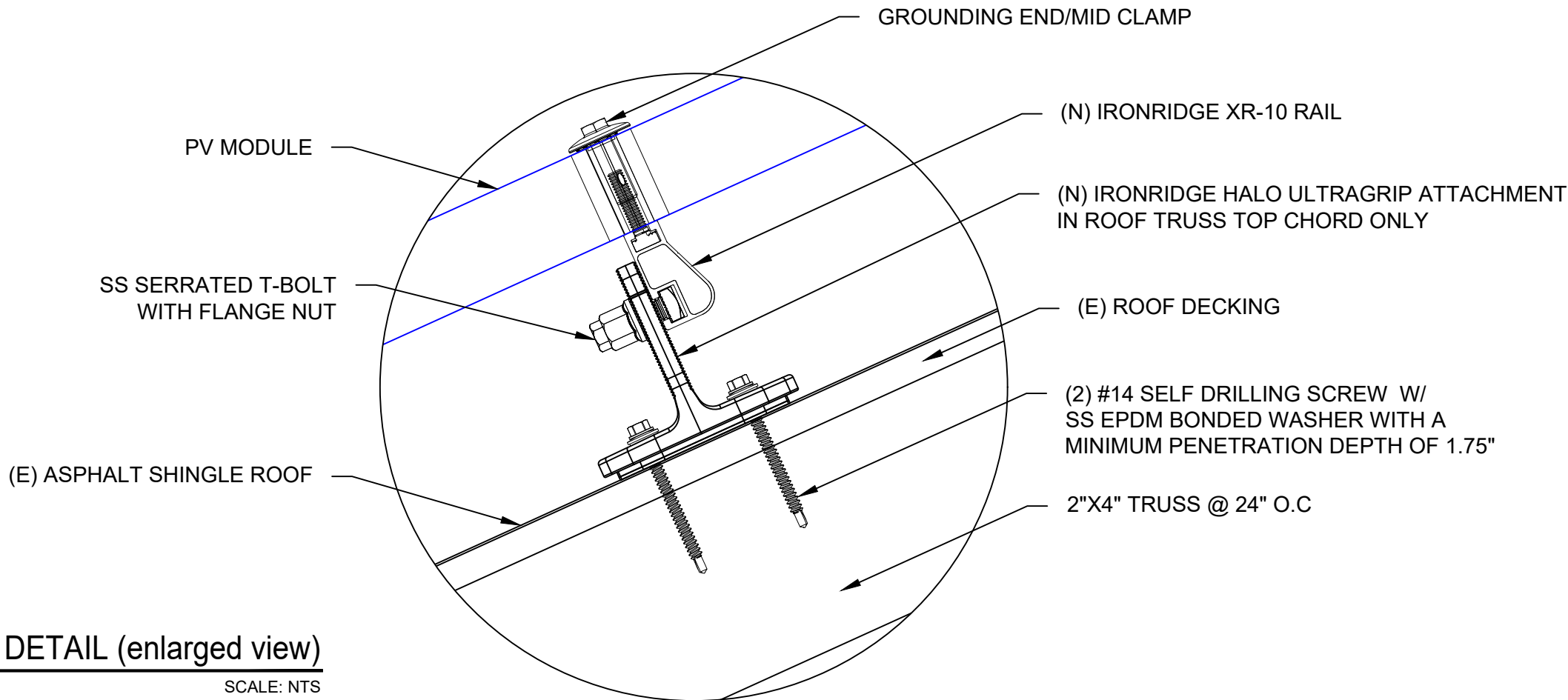
(E) ASPHALT SHINGLE ROOF

1

STRUCTURAL ATTACHMENT (Side view)

SCALE: N.T.S

PV-5



GROUNDING END/MID CLAMP

(N) IRONRIDGE XR-10 RAIL

(N) IRONRIDGE HALO ULTRAGRIP ATTACHMENT  
IN ROOF TRUSS TOP CHORD ONLY

(E) ROOF DECKING

(2) #14 SELF DRILLING SCREW W/  
SS EPDM BONDED WASHER WITH A  
MINIMUM PENETRATION DEPTH OF 1.75"

2"X4" TRUSS @ 24" O.C

PV MODULE

SS SERRATED T-BOLT  
WITH FLANGE NUT

(E) ASPHALT SHINGLE ROOF

2

ATTACHMENT DETAIL (enlarged view)

SCALE: NTS

PV-5

DC SYSTEM SIZE: 6.075 kW DC  
AC SYSTEM SIZE: 5.700 kW AC

(15) JA SOLAR: JAM54S31-405/MR 405W MONO MODULES  
WITH (15) SOLAREEDGE: S440 POWER OPTIMIZERS  
LOCATED UNDER EACH PANEL (240V) AND  
(01) SOLAREEDGE: SE5700H-US (240V/5700W) INVERTER  
(01) STRING OF 15 MODULES ARE CONNECTED IN SERIES

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:

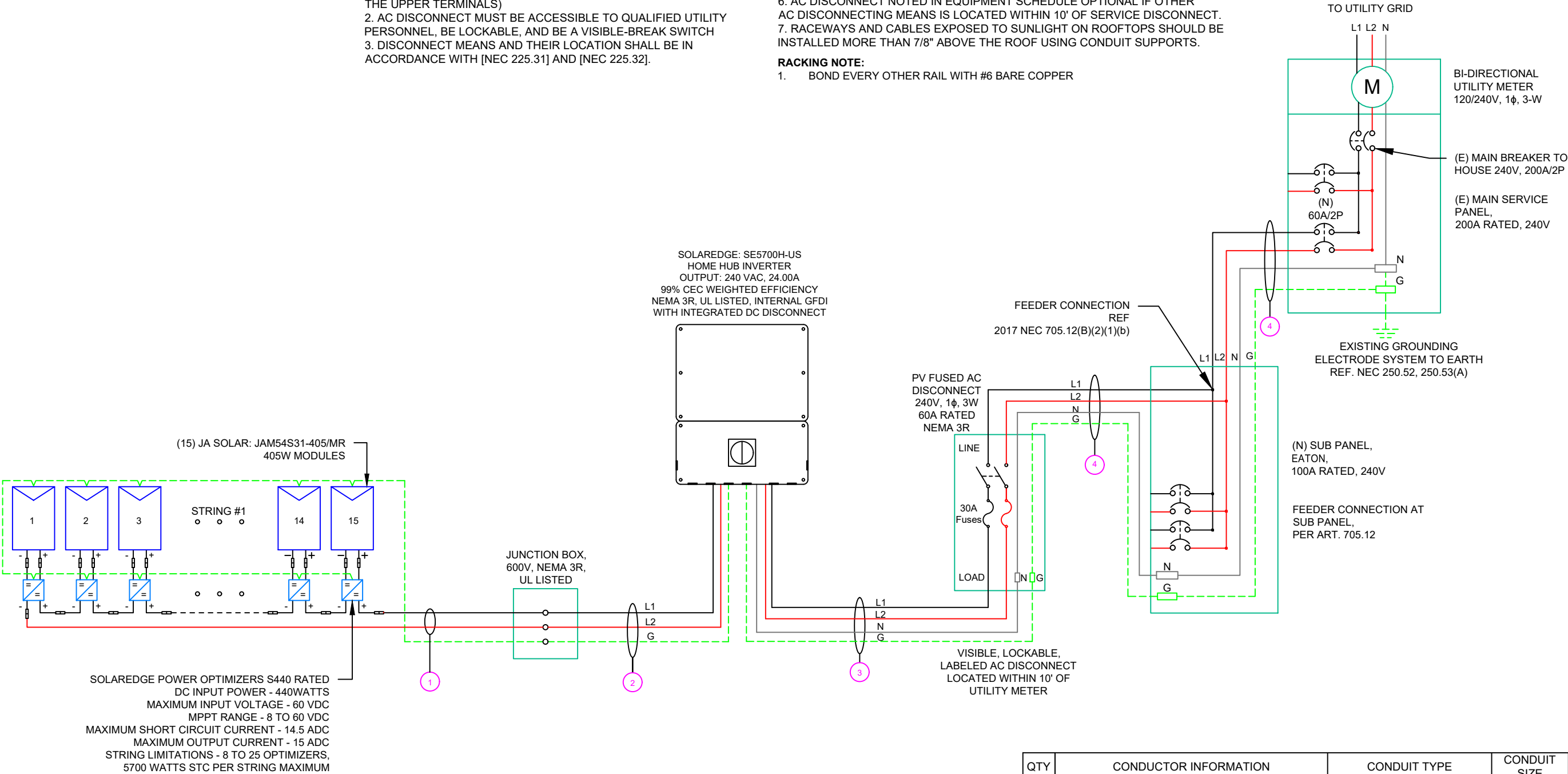
1. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING LIVE ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS)
2. AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
3.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



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



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DRAWN BY

ESR

SHEET NAME

ELECTRICAL LINE DIAGRAM

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-6

1

ELECTRICAL LINE DIAGRAM

PV-6

SCALE: NTS

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	JA SOLAR: JAM54S31-405/MR 405W MODULE
VMP	31.21V
IMP	12.98A
VOC	37.23V
ISC	13.87A
TEMP. COEFF. VOC	-0.275%/°C
MODULE DIMENSION	67.79"L x 44.65"W x 1.18"D (In Inch)

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	SOLAREdge: SE5700H-US (240V/5700W) INVERTER
NOMINAL AC POWER	5.700 kW
NOMINAL OUTPUT VOLTAGE	240 VAC
NOMINAL OUTPUT CURRENT	24.00A

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

AMBIENT TEMPERATURE SPECS	
AMBIENT TEMP (HIGH TEMP 2%)	38°
RECORD LOW TEMPERATURE	-8°
MODULE TEMPERATURE COEFFICIENT OF Voc	-0.275%/°C

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
JUNCTION BOX	INVERTER	380	15.00	18.75	20	CU #10 AWG	CU #10 AWG	35	PASS	38	2	40	0.91	1	36.4	PASS	20	1.24	0.196	3/4" EMT	11.87617

String 1 Voltage Drop	0.245
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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	24	30	30	CU #6 AWG	CU #6 AWG	CU #6 AWG	65	PASS	38	2	75	0.91	1	68.25	PASS	5	0.491	0.049	3/4" EMT	38.0488
AC DISCONNECT	SUBPANEL	240	24	30	30	CU #6 AWG	CU #6 AWG	CU #6 AWG	65	PASS	38	2	75	0.91	1	68.25	PASS	5	0.491	0.049	3/4" EMT	38.0488
SUBPANEL	METER MAIN COMBO	240	60	60	60	CU #6 AWG	CU #6 AWG	CU #6 AWG	65	PASS	38	2	75	0.91	1	68.25	PASS	5	0.491	0.123	3/4" EMT	38.0488

CUMULATIVE VOLTAGE DROP	0.098
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ELECTRICAL NOTES

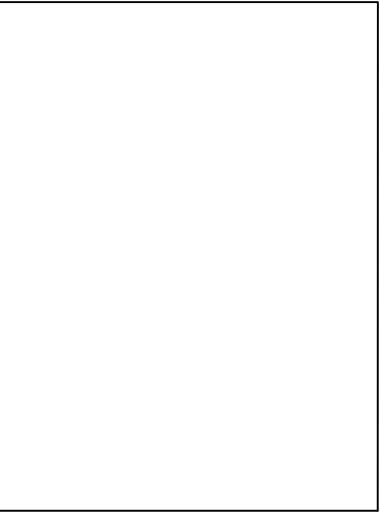
- ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- ALL CONDUCTORS SHALL BE RATED UPTO 600V FOR RESIDENTIAL AND 1000V FOR COMMERCIAL AND 90 DEGREE C WET ENVIRONMENT.
- WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE 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.



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DRAWN BY ESR
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SHEET NAME WIRING CALCULATIONS
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SHEET SIZE ANSI B 11" X 17"
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SHEET NUMBER PV-7
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PHOTOVOLTAIC POWER SOURCE

EVERY 10' ON CONDUIT & ENCLOSURES

LABEL- 1:  
LABEL LOCATION:  
DC/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

SOLAR ELECTRIC PV PANELS

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

24.00 A

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

MAXIMUM VOLTAGE

480 V

MAXIMUM CIRCUIT CURRENT

30.50 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

TOP TIER

SOLAR SOLUTIONS

TOP TIER SOLAR SOLUTIONS

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

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	02/25/2025	

PROJECT NAME & ADDRESS

JAMES CASSIDY  
RESIDENCE

35 TRACE TURNER LN,  
COATS, NC 27521

DRAWN BY

ESR

SHEET NAME

LABELS

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-8



Harvest the Sunshine

DEEP BLUE 3.0 Light

Mono

405W MBB  
Half-cell Black Module  
JAM54S31 380-405/MR Series

Introduction

Assembled with 11BB PERC cells, the half-cell configuration of the modules offers the advantages of higher power output, better temperature-dependent performance, reduced shading effect on the energy generation, lower risk of hot spot, as well as enhanced tolerance for mechanical loading.

Higher output power

Lower LCOE

Less shading and lower resistive loss

Better mechanical loading tolerance

Superior Warranty

25-year product warranty

25-year linear power output warranty

0.55% Annual Degradation Over 25 years

100%  
97.5%  
94.8%  
83.1%

15  
20  
25

10.95%  
+1.2%  
+1.45%  
+1.7%

New linear power warranty

Standard module linear power warranty

Comprehensive Certificates

IEC 61215, IEC 61730, UL 61215, UL 61730

ISO 9001: 2015 Quality management systems

ISO 14001: 2015 Environmental management systems

ISO 45001: 2018 Occupational health and safety management systems

IEC TS 62941: 2016 Terrestrial photovoltaic (PV) modules – Guidelines for increased confidence in PV module design qualification and type approval

TDV

CE

UL

JASOLAR

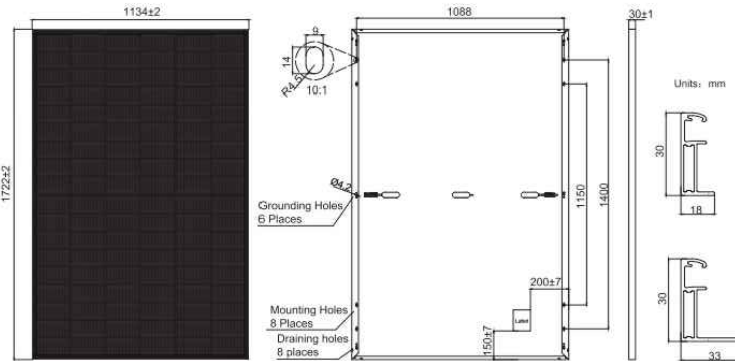
www.jasolar.com

Specifications subject to technical changes and tests. JA Solar reserves the right of final interpretation.

JASOLAR

JAM54S31 380-405/MR Series

MECHANICAL DIAGRAMS



Remark: customized frame color and cable length available upon request

SPECIFICATIONS

Cell	Mono
Weight	21.5kg±3%
Dimensions	1722±2mm×1134±2mm×30±1mm
Cable Cross Section Size	4mm² (IEC) , 12 AWG(UL)
No. of cells	108(6×18)
Junction Box	IP68, 3 diodes
Connector	MC4-EVO2(1500V)
Cable Length (Including Connector)	Portrait: 300mm(+)/400mm(-); Landscape: 1200mm(+)/1200mm(-)
Packaging Configuration	36pcs/Pallet, 864pcs/40ft Container

ELECTRICAL PARAMETERS AT STC

TYPE	JAM54S31 -380/MR	JAM54S31 -385/MR	JAM54S31 -390/MR	JAM54S31 -395/MR	JAM54S31 -400/MR	JAM54S31 -405/MR
Rated Maximum Power(Pmax) [W]	380	385	390	395	400	405
Open Circuit Voltage(Voc) [V]	36.58	36.71	36.85	36.98	37.07	37.23
Maximum Power Voltage(Vmp) [V]	30.28	30.46	30.64	30.84	31.01	31.21
Short Circuit Current(Isc) [A]	13.44	13.52	13.61	13.70	13.79	13.87
Maximum Power Current(Imp) [A]	12.55	12.64	12.73	12.81	12.90	12.98
Module Efficiency [%]	19.5	19.7	20.0	20.2	20.5	20.7
Power Tolerance	±2%					
Temperature Coefficient of Isc(α_Isc)	+0.045%/°C					
Temperature Coefficient of Voc(β_Voc)	-0.275%/°C					
Temperature Coefficient of Pmax(γ_Pmp)	-0.350%/°C					
STC	Irradiance 1000W/m², cell temperature 25°C, AM1.5G					

Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer.They only serve for comparison among different module types.

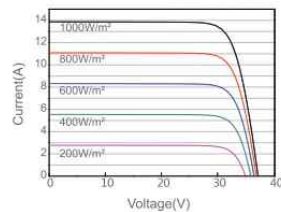
ELECTRICAL PARAMETERS AT NOCT

TYPE	JAM54S31 -380/MR	JAM54S31 -385/MR	JAM54S31 -390/MR	JAM54S31 -395/MR	JAM54S31 -400/MR	JAM54S31 -405/MR
Rated Max Power(Pmax) [W]	286	290	294	298	302	306
Open Circuit Voltage(Voc) [V]	34.36	34.49	34.62	34.75	34.88	35.12
Max Power Voltage(Vmp) [V]	28.51	28.68	28.87	29.08	29.26	29.47
Short Circuit Current(Isc) [A]	10.75	10.82	10.89	10.96	11.03	11.10
Max Power Current(Imp) [A]	10.03	10.11	10.18	10.25	10.32	10.38
NOCT	Irradiance 800W/m², ambient temperature 20°C, wind speed 1m/s, AM1.5G					

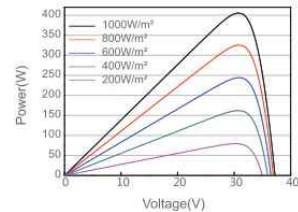
Maximum System Voltage	1000V/1500V DC
Operating Temperature	-40 °C ~+85 °C
Maximum Series Fuse Rating	25A
Maximum Static Load, Front*	5400Pa(112lb/ft²)
Maximum Static Load, Back*	2400Pa(50lb/ft²)
NOCT	45±2 °C
Safety Class	Class II
Fire Performance	UL Type 1

CHARACTERISTICS

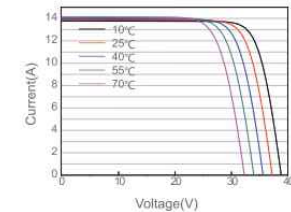
Current-Voltage Curve JAM54S31-405/MR



Power-Voltage Curve JAM54S31-405/MR



Current-Voltage Curve JAM54S31-405/MR



Premium Cells, Premium Modules

Version No. : Global\_EN\_20231130A

TOP TIER  
SOLAR SOLUTIONS

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JAMES CASSIDY  
RESIDENCE

35 TRACE TURNER LN,  
COATS, NC 27521

DRAWN BY

ESR

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE  
ANSI B  
11" X 17"

SHEET NUMBER

PV-9



# Residential Power Optimizer For North America

S440 / S500B / S650B



POWER OPTIMIZER

## PV power optimization at the module level

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

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



## Residential Power Optimizer

For North America

S440 / S500B / S650B

	S440	S500B	S650B	
INPUT				
Rated Input DC Power <sup>(1)</sup>	440 <sup>(2)</sup>	500 <sup>(3)</sup>	650	W
Absolute Maximum Input Voltage (Voc)	60	125	85	Vdc
MPPT Operating Range	8 – 60	12.5 – 105	12.5 – 85	Vdc
Maximum Input Current (Maximum Isc of Connected PV Module) <sup>(2)</sup>	14.5	15		Adc
Maximum Input Short Circuit Current <sup>(4)</sup>		18.75		Adc
Maximum Efficiency		99.5		%
Weighted Efficiency		98.6		%
Overvoltage Category		II		
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREdge INVERTER)				
Maximum Output Current		15		Adc
Maximum Output Voltage	60	80		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREdge INVERTER OR INVERTER OFF)				
Safety Output Voltage per Power Optimizer		1 ± 0.1		Vdc
STANDARD COMPLIANCE				
Photovoltaic Rapid Shutdown System		CSA C22.2#330, NEC 2014 – 2023		
EMC		FCC Part 15 Class B; IEC 61000-6-2; IEC 61000-6-3		
Safety		CSA C22.2#107.1; IEC 62109-1 (Class II Safety); UL 1741		
Material		UL 94 V-0, UV Resistant		
RoHS		Yes		
Fire Safety		VDE-AR-E 2100-712:2013-05		
INSTALLATION SPECIFICATIONS				
Maximum Allowed System Voltage		1000		Vdc
Dimensions (W x L x H)	129 x 155 x 30 / 5.07 x 6.10 x 1.18	129 x 165 x 45 / 5.07 x 6.49 x 1.77		mm / in
Weight	720 / 1.6	790 / 1.74		gr / lb
Input Connector		MC4		
Input Wire Length		0.1 / 0.32		m / ft
Output Connector		MC4		
Output Wire Length		(+) 2.3, (-) 0.10 / (+) 7.54, (-) 0.32		m / ft
Operating Temperature Range <sup>(5)</sup>		-40 to +85		°C
Protection Rating		IP68 / NEMA6P		
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 S440 with part number S440-1GM4MRMP, the Rated Input DC Power is 650W, and the Maximum Input Current is 15A.  
(3) For installations after Aug 1st, 2024, the Rated Input DC Power for S500B is 650W.  
(4) The Maximum Input Short Circuit Current is adjusted for worst case conditions of ambient temperature, irradiance, bifacial gain, and so on, in accordance with NEC and CSA.  
(5) Power derating is applied for ambient temperatures above +85°C / +185°F for S440, and for ambient temperatures above +75°C / 167°F for S500B and S650B. Refer to the [Power Optimizers Temperature Derating](#) technical note for more details.

PV System Design Using a SolarEdge Inverter <sup>(9)</sup>		SolarEdge Home Wave/Hub Single Phase	Three Phase for 208V Grid	Three Phase for 277/480V Grid	
Minimum String Length (Power Optimizers)	S440	8	10	18	
	S500B, S650B	6	8	14	
Maximum String Length (Power Optimizers)		25		50 <sup>(7)</sup>	
Maximum Usable Power Delivered per String		5700	6000	12,750	W
Maximum Allowed Connected Power per String <sup>(9),(10)</sup>	Inverters with Rated AC Power ≤ 5700W	Per the inverter's maximum input DC power <sup>(8)</sup>	One string: 7200 Two strings or more: 7800	15,000	W
	Inverters with Rated AC Power of 6000W	5700			
	Inverters with Rated AC Power ≥ 7600W	6800, only when connected to at least two strings			
Parallel Strings of Different Lengths or Orientations		Yes			

(6) It is not allowed to mix S-series and P-series Power Optimizers in new installations in the same string.  
(7) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement.  
(8) Refer to the [Single String Design Guidelines](#) application note for details.  
(9) For the 208V grid, the maximum is permitted only when the difference in connected power between strings is 1,000W or less.  
(10) For the 240V or 277/480V grids, the maximum is permitted only when the difference in connected power between strings is 2,000W or less.

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TOP TIER SOLAR SOLUTIONS

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

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	02/25/2025	



PROJECT NAME & ADDRESS	
JAMES CASSIDY RESIDENCE	35 TRACE TURNER LN, COATS, NC 27521

DRAWN BY ESR
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SHEET NAME EQUIPMENT SPECIFICATION
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SHEET SIZE ANSI B 11" X 17"
-----------------------------------

SHEET NUMBER PV-10
-----------------------

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
OUTPUT – AC ON GRID						
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
OUTPUT – AC STAND-ALONE (BACKUP) <sup>(4)(5)</sup>						
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					%
OUTPUT – SOLAREEDGE HOME EV CHARGER AC						
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
INPUT – DC (PV AND BATTERY)						
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					
INPUT – DC (PV)						
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.



TOP TIER SOLAR SOLUTIONS

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PROJECT NAME & ADDRESS	
JAMES CASSIDY RESIDENCE	35 TRACE TURNER LN, COATS, NC 27521

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

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
OUTPUT – DC (BATTERY)						
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					Adc
2-pole Disconnection	Up to the inverter's rated stand-alone power					
SMART ENERGY CAPABILITIES						
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					
ADDITIONAL FEATURES						
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					
STANDARD COMPLIANCE						
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					
INSTALLATION SPECIFICATIONS						
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					in / mm
Weight with Connection Unit	44.9 / 20.3					lb / kg
Noise	< 50					dBA
Cooling	Natural Convection					
Operating Temperature Range	-40 to +140 / -40 to +60 <sup>(11)</sup>					°F / °C
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](#).



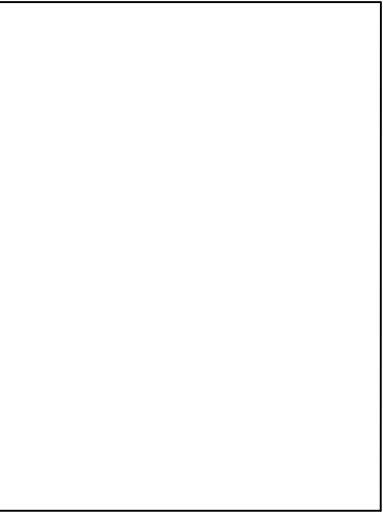
TOP TIER

SOLAR SOLUTIONS

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SHEET NUMBER PV-12





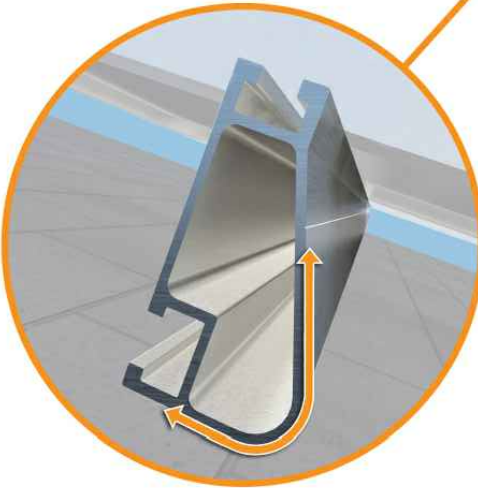
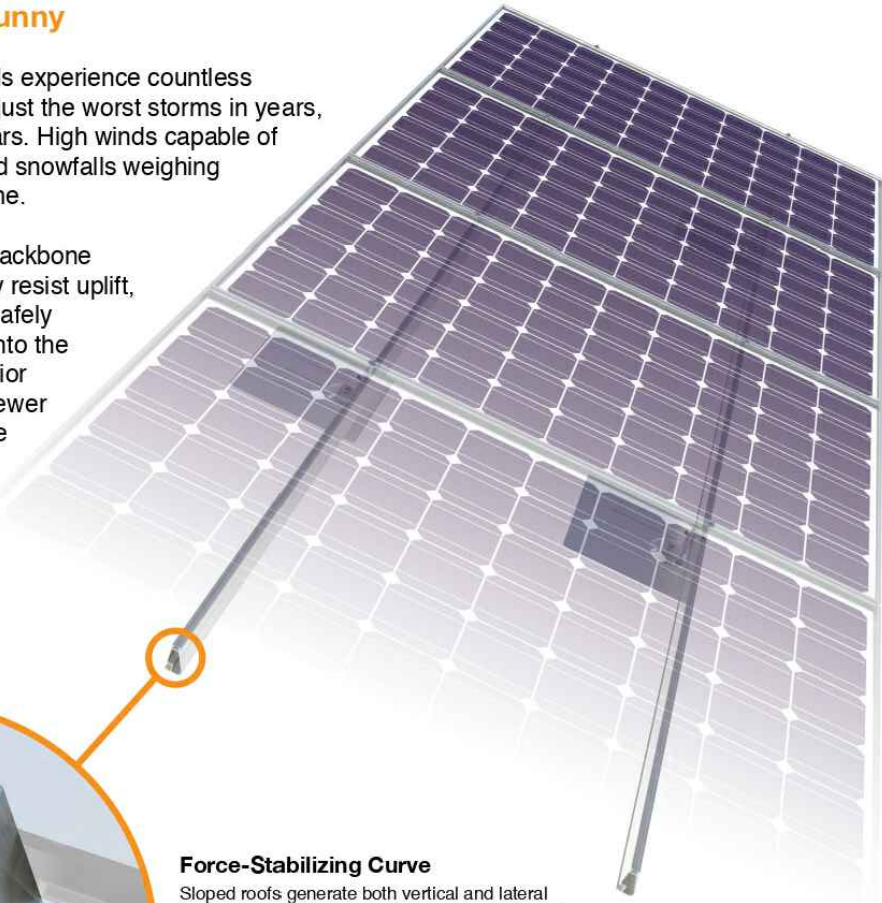
Tech Brief

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 for detailed certification letters.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	90	XR10		XR100		XR1000	
	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.



TOP TIER SOLAR SOLUTIONS

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

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	02/25/2025	



PROJECT NAME & ADDRESS

JAMES CASSIDY  
RESIDENCE  
35 TRACE TURNER LN,  
COATS, NC 27521

DRAWN BY

ESR

SHEET NAME

EQUIPMENT  
SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-13





UFO® Family of Components

Tech Brief

Simplified Grounding for Every Application

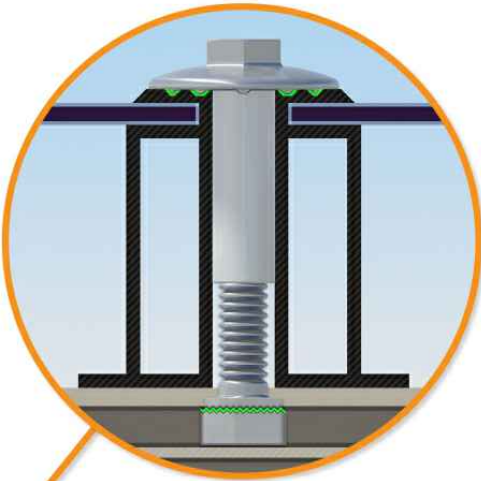
The UFO® family of components eliminates the need for separate grounding hardware by bonding solar modules directly to IronRidge® XR Rails®. All system types that feature the UFO® family—Flush Mount®, Tilt Mount® and Ground Mount®—are fully listed to the UL 2703 standard.

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



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



**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.



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

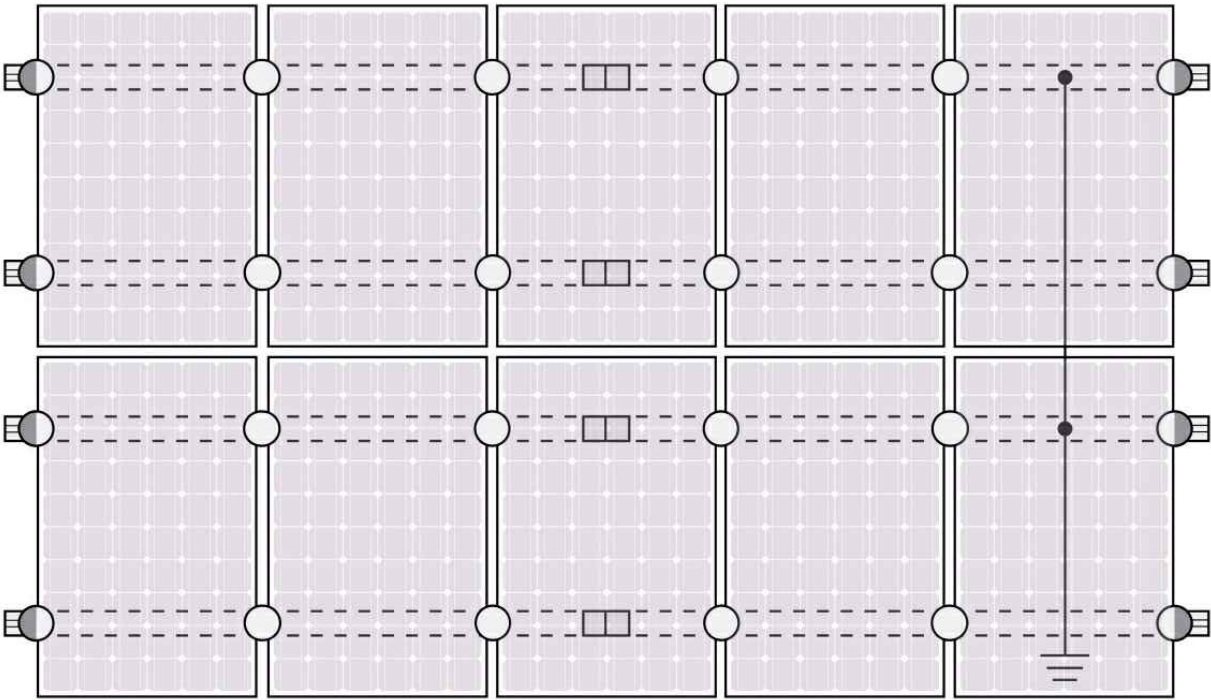


**Grounding Lug**  
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.



**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](https://www.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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1530 CENTER PARK DR #2911,  
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JAMES CASSIDY  
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COATS, NC 27521

DRAWN BY  
ESR

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE  
ANSI B  
11" X 17"

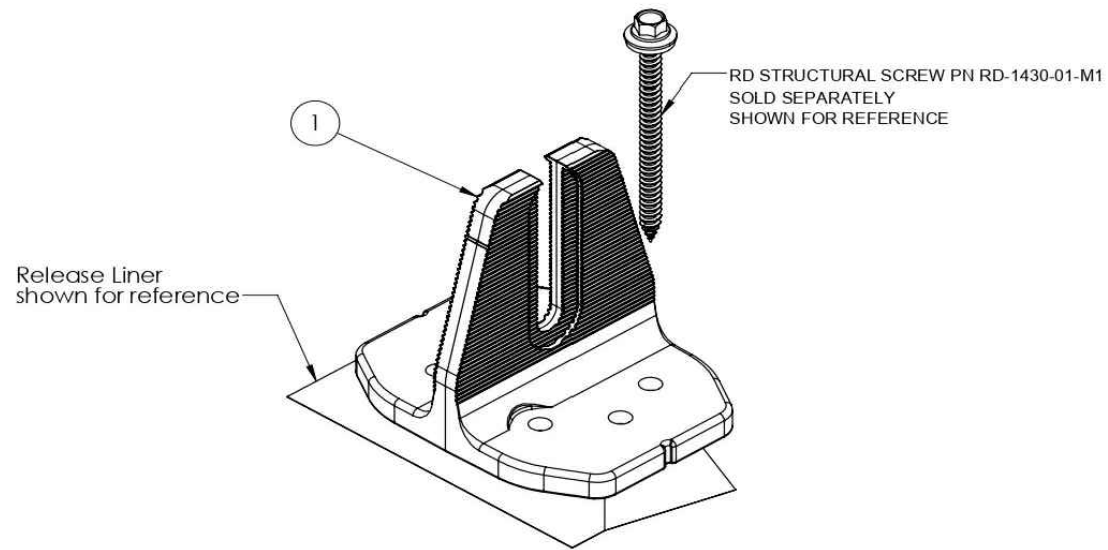
SHEET NUMBER  
PV-14





QuickMount® Halo UltraGrip

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

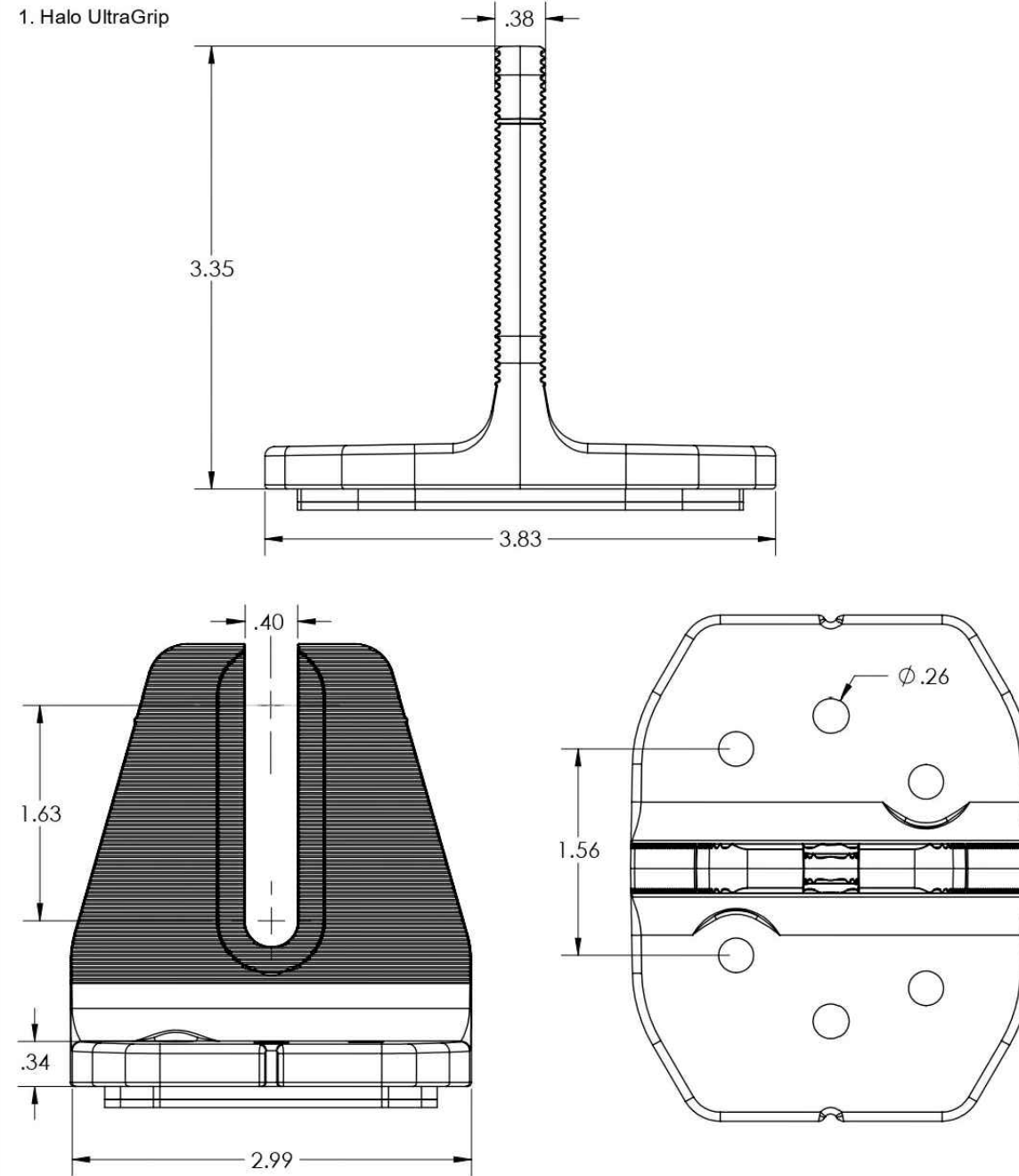


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QM-HUG-01-B1 or QM-HUG-01-M1 Cut Sheet Rev 1.0

Cut Sheet

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



TOP TIER SOLAR SOLUTIONS

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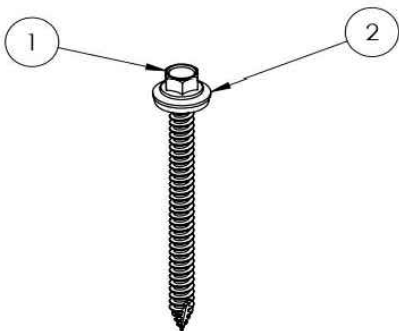
SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B 11" X 17"

SHEET NUMBER
PV-15



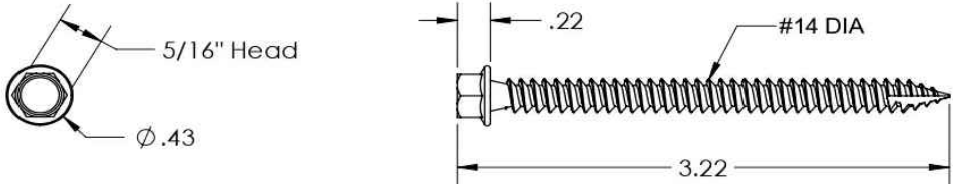
QuickMount® RD Structural Screw



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



TOP TIER SOLAR SOLUTIONS

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

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	02/25/2025	



PROJECT NAME & ADDRESS

JAMES CASSIDY  
RESIDENCE  
  
35 TRACE TURNER LN,  
COATS, NC 27521

DRAWN BY
ESR

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B 11" X 17"

SHEET NUMBER
PV-16





PHONE: 385-202-4150  
WWW.EZSOLARPRODUCTS.COM



PHONE: 385-202-4150  
WWW.EZSOLARPRODUCTS.COM

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 <b>B</b>	DWG. NO. <b>JB-1.2</b>	REV
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

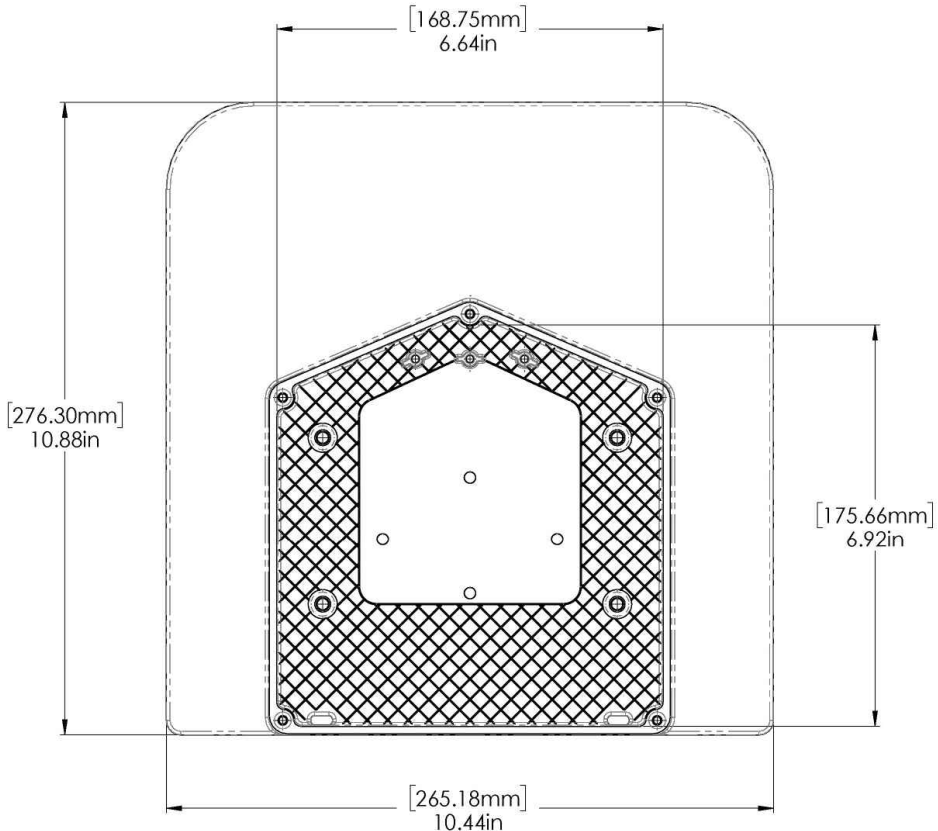
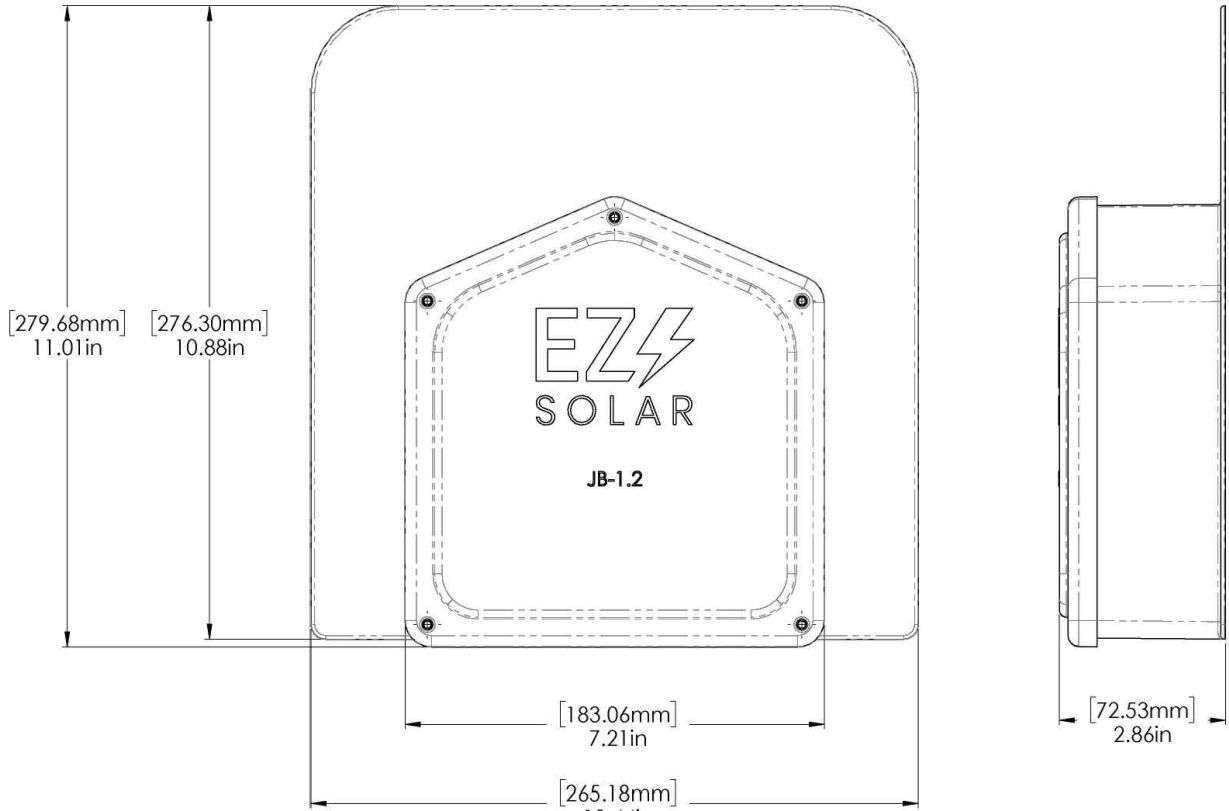
SIZE <b>B</b>	DWG. NO. <b>JB-1.2</b>	REV
SCALE: 1:2	WEIGHT: 1.45 LBS	SHEET 2 OF 3

**TOP TIER**  
SOLAR SOLUTIONS

## TOP TIER SOLAR SOLUTIONS

1530 CENTER PARK DR #291  
CHARLOTTE, NC 28217,  
UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	02/25/2025	



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RESIDENCE

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COATS NC 27521

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ES

SHEET NAME  
EQUIPMENT  
SPECIFICATIO

SHEET SIZE

ANSI E  
11" X 17"

SHEET NUMB

PV-1