

# PHOTOVOLTAIC ROOF MOUNT SYSTEM

14 MODULES-ROOF MOUNTED - 5.670 kW DC, 5.700 kW AC

905 DUKE ST, ERWIN, NC 28339



PHILLIPS ENERGY SYSTEMS

7901 ALLEN BLACK RD, MINT HILL,  
NC 28227, UNITED STATES

## PROJECT DATA

PROJECT ADDRESS: 905 DUKE ST,  
ERWIN, NC 28339

OWNER: RAYMOND WALKER

DESIGNER: ESR

SCOPE: 5.670 kW DC ROOF MOUNT  
SOLAR PV SYSTEM WITH  
14 JA SOLAR: JAM54S31-405/MR 405W  
PV MODULES WITH  
14 SOLAREEDGE: S440 POWER OPTIMIZERS AND  
01 SOLAREEDGE: SE5700H-US (240V/5700W)  
INVERTER  
**01 10 kWh SOLAREEDGE ENERGY BANK**

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

## SHEET INDEX

PV-1	COVER SHEET
PV-2	SITE PLAN
PV-3	ROOF PLAN & MODULES
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PV-7	WIRING CALCULATIONS
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PV-9+	EQUIPMENT SPECIFICATIONS

## SIGNATURE

## GENERAL NOTES

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

## VICINITY MAP



## HOUSE PHOTO



## CODE REFERENCES

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



REV1

### REVISIONS

DESCRIPTION	DATE	REV
INITIAL DESIGN	02/24/2025	
REVISION	03/07/2025	A



STRUCTURAL ONLY  
03/07/2025

### PROJECT NAME & ADDRESS

RAYMOND WALKER  
RESIDENCE  
905 DUKE ST,  
ERWIN, NC 28339

### DRAWN BY

ESR

### SHEET NAME

COVER SHEET

### SHEET SIZE

ANSI B  
11" X 17"

### SHEET NUMBER

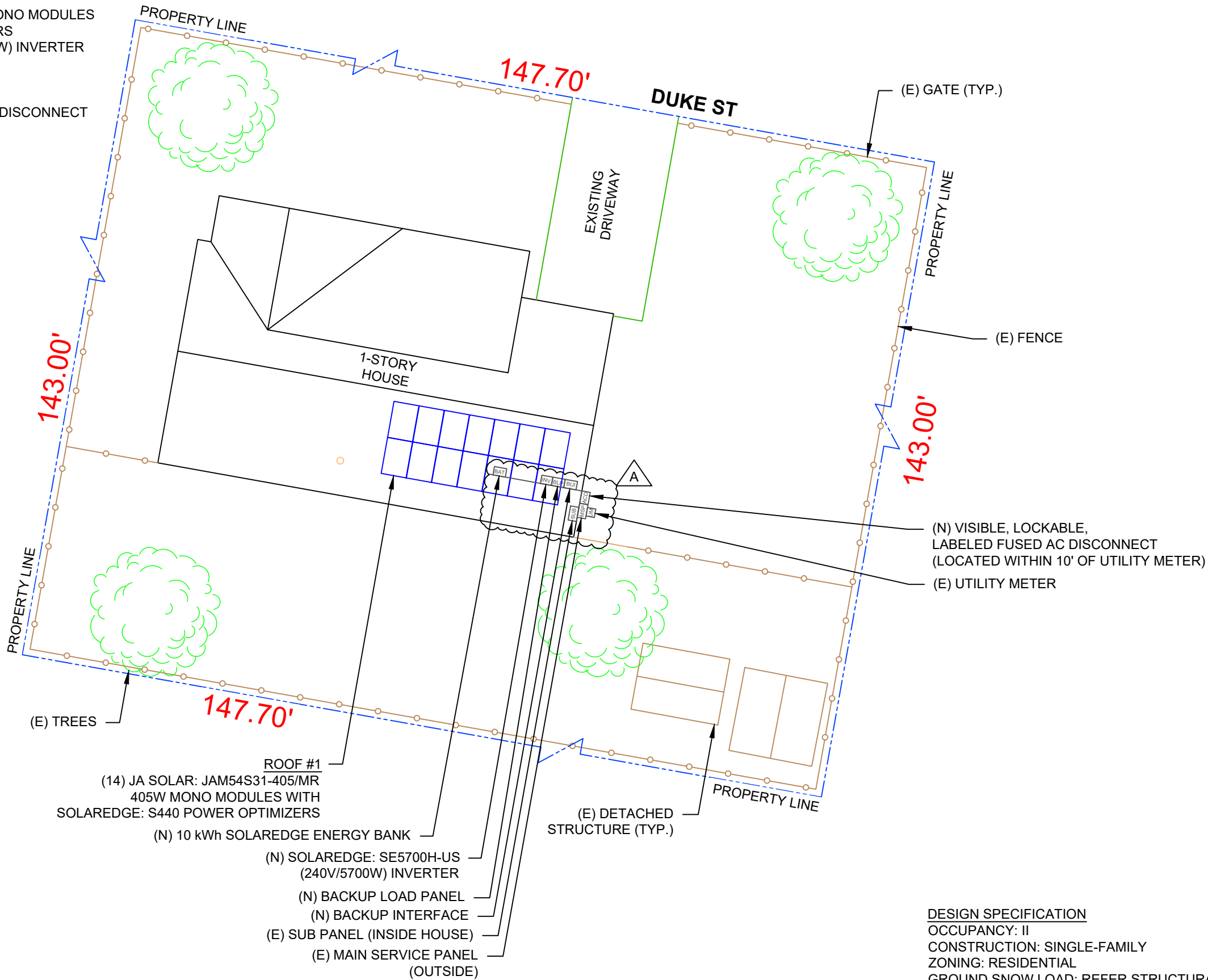
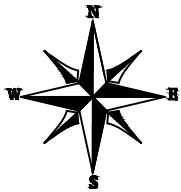
PV-1

PROJECT DESCRIPTION:

14 X JA SOLAR: JAM54S31-405/MR 405W MONO MODULES  
ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES  
DC SYSTEM SIZE: 5.670 kW DC  
AC SYSTEM SIZE: 5.700 kW AC

EQUIPMENT SUMMARY  
14 JA SOLAR: JAM54S31-405/MR 405W MONO MODULES  
14 SOLAREEDGE: S440 POWER OPTIMIZERS  
01 SOLAREEDGE: SE5700H-US (240V/5700W) INVERTER  
**01 10 kWh SOLAREEDGE ENERGY BANK**

ROOF ARRAY AREA #1:- 294.14 SQ. FT.  
NOTE: VISIBLE, LOCKABLE, LABELED AC DISCONNECT  
LOCATED WITHIN 10' OF UTILITY METER



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



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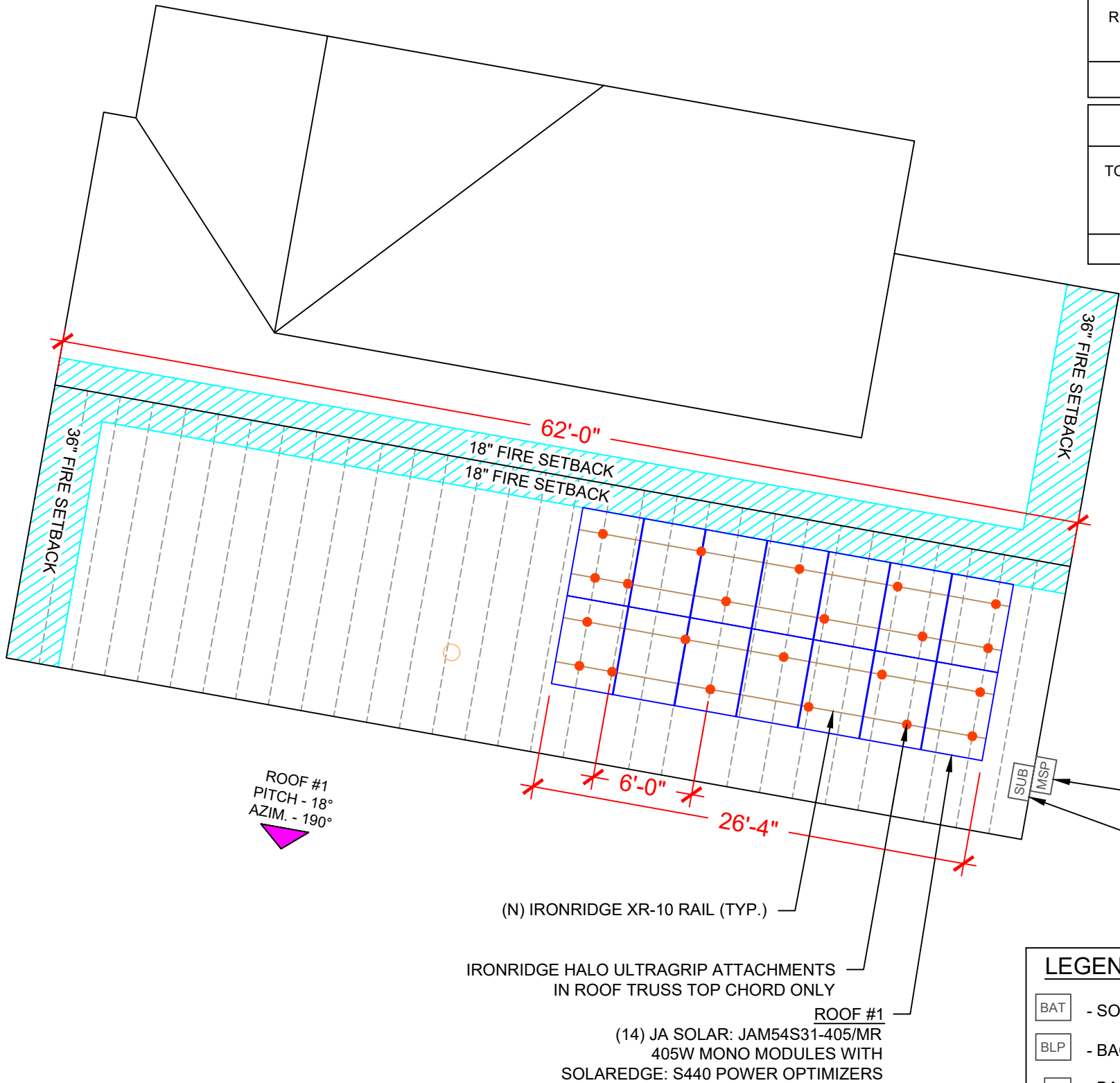
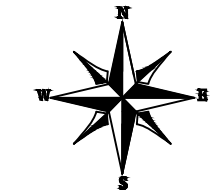
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DRAWN BY ESR
SHEET NAME SITE PLAN
SHEET SIZE ANSI B 11" X 17"
SHEET NUMBER PV-2

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 14 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	14	18°	190°	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 (%)
294.14	2383.42	12



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ESR

SHEET NAME

ROOF PLAN &  
MODULES

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-3

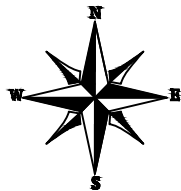
LEGEND

BAT	- SOLAREEDGE BATTERY	SUB	- SUB PANEL
BLP	- BACKUP LOAD PANEL	INV	- INVERTER
BUi	- BACKUP INTERFACE	JB	- JUNCTION BOX
ACD	- AC DISCONNECT		- VENT, ATTIC FAN (ROOF OBSTRUCTION)
UM	- UTILITY METER		- ROOF ATTACHMENT
MSD	- MAIN SERVICE DISCONNECT		- TRUSS
MSP	- MAIN SERVICE PANEL		- CONDUIT

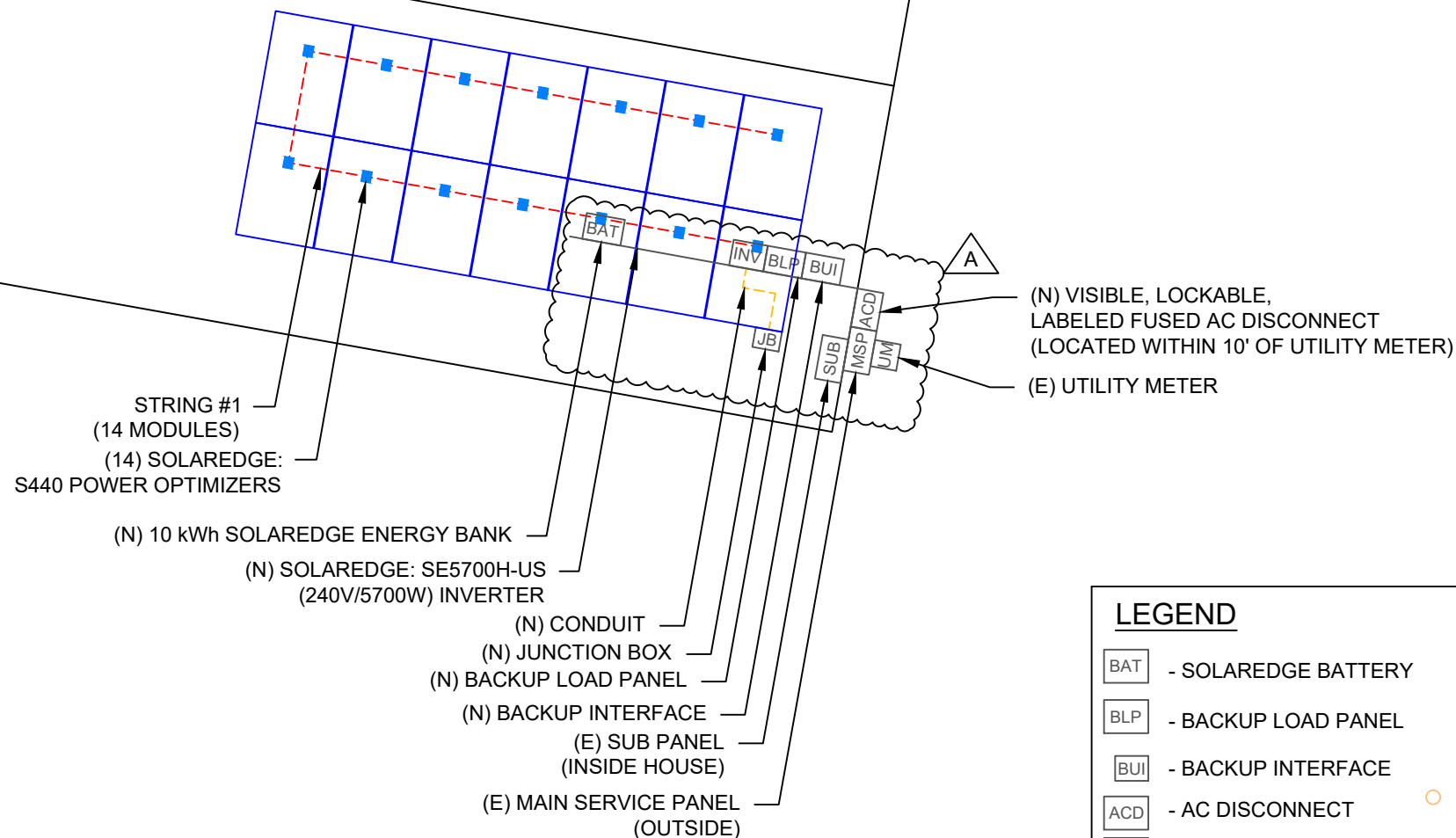


**STRING LEGENDS**

----- STRING #1



**DUKE ST**



BILL OF MATERIALS	
EQUIPMENT DESCRIPTION	QTY
SOLAR PV MODULES: JA SOLAR: JAM54S31-405/MR 405W MODULE	14
OPTIMIZERS: SOLAREEDGE: S440 POWER OPTIMIZERS	14
INVERTER: SOLAREEDGE: SE5700H-US (240V/5700W) INVERTER	01
BATTERY: 10 kWh SOLAREEDGE ENERGY BANK	1
BACKUP INTERFACE: SOLAREEDGE BACKUP INTERFACE <b>BI-NUSGN-01</b> 200A RATED, 240V NEMA 3R, UL LISTED	1
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)	8
BONDED SPLICE, XR10 (XR10-BOSS-01-M1)	4
UNIVERSAL MODULE CLAMP, CLEAR (UFO-CL-01-A1)	24
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)	22
RD STRUCTURAL SCREW,3.0L (HW-RD1430-01-M1)	44
T-BOLT BONDING HARDWARE (BHW-TB-02-A1) (PRODUCT CODE 590-0116)	22
OPTIMIZER BONDING HARDWARE T-BOLT (BHW-MI-01-A1) (PRODUCT CODE 270-0152)	14



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ESR

## ELECTRICAL PLAN

ANSI B

11" X 17"

PV-4

1

# ELECTRICAL PLAN

PV-4

SCALE: 1/8" = 1'-0"



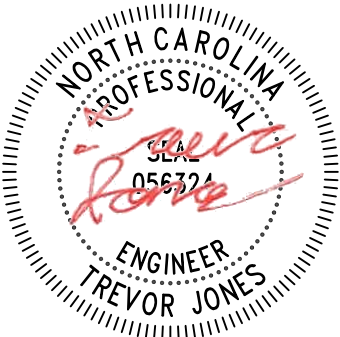


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SHEET NAME

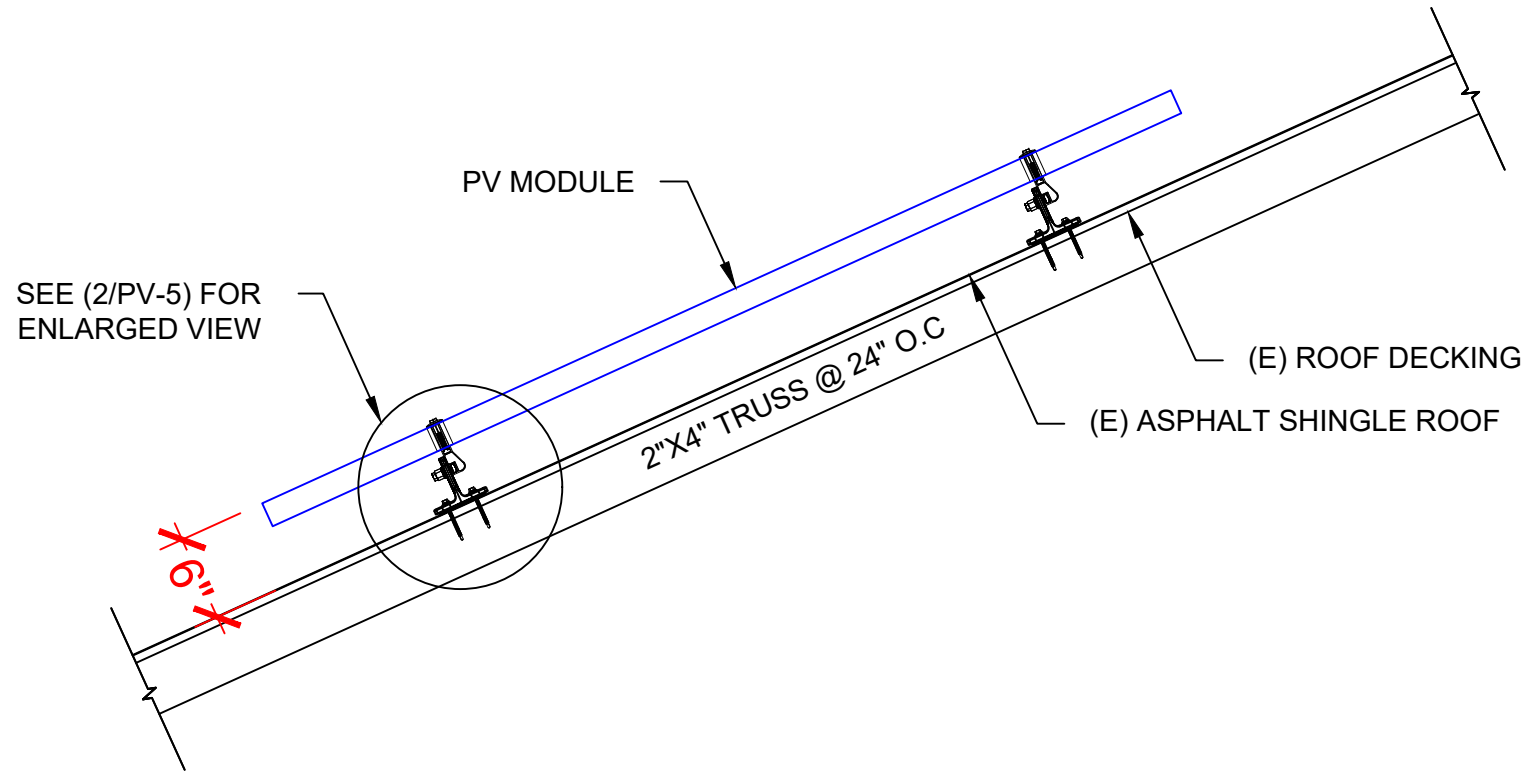
STRUCTURAL DETAIL

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-5

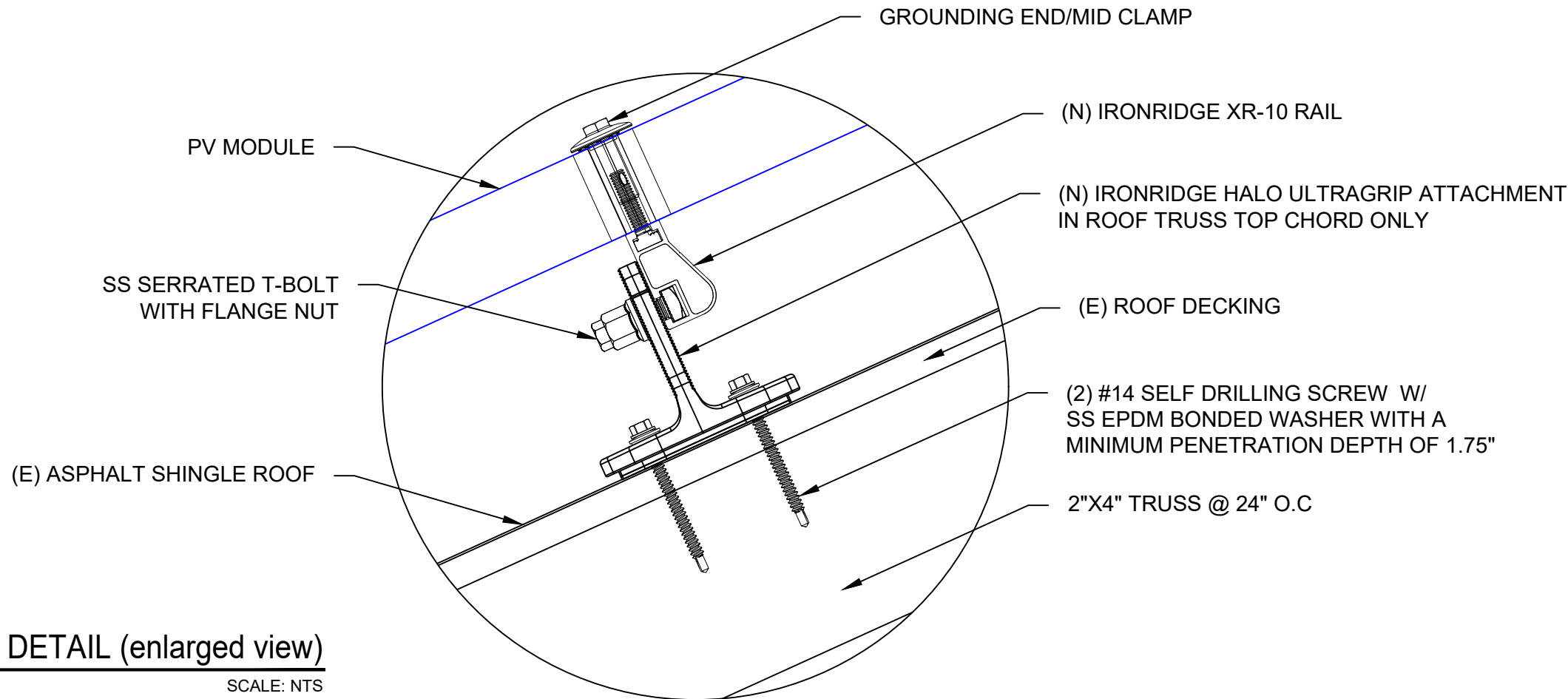


1

STRUCTURAL ATTACHMENT (Side view)

SCALE: N.T.S

PV-5



2

ATTACHMENT DETAIL (enlarged view)

SCALE: NTS

PV-5

DC SYSTEM SIZE: 5.670 kW DC  
AC SYSTEM SIZE: 5.700 kW AC

(14) JA SOLAR: JAM54S31-405/MR 405W MONO MODULES  
WITH (14) SOLAREEDGE: S440 POWER OPTIMIZERS  
LOCATED UNDER EACH PANEL (240V) AND  
(01) SOLAREEDGE: SE5700H-US (240V/5700W) INVERTER  
(01) STRING OF 14 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:

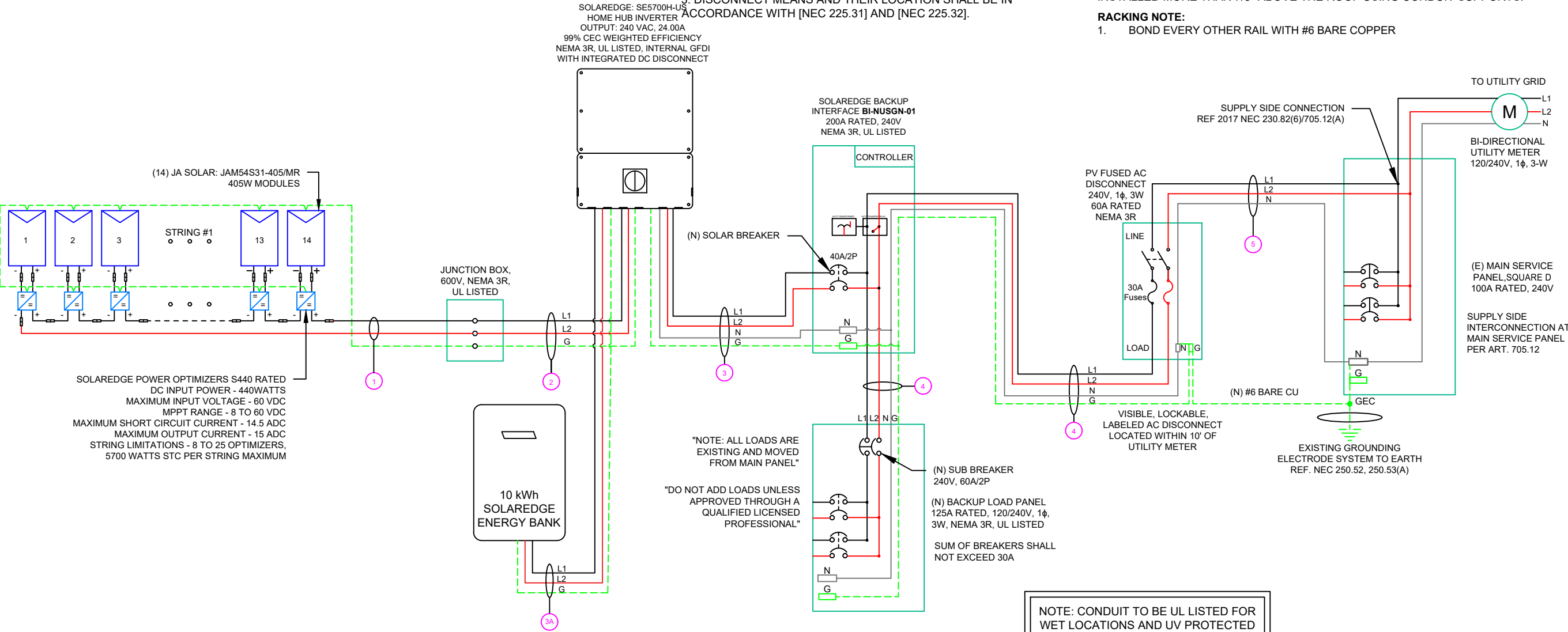
1. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING LIVE ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS)
2. AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
3.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



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

QTY	CONDUCTOR INFORMATION		CONDUIT TYPE	CONDUIT SIZE
1	(2)	#10AWG - PV WIRE/USE-2	N/A	N/A
	(1)	#6AWG - BARE COPPER IN FREE AIR		
2	(2)	#10AWG - CU, THWN-2	EMT OR LFMC IN ATTIC	3/4"
	(1)	#10AWG - CU, THWN-2 GND		
3	(2)	#8AWG - CU, THWN-2	EMT, LFMC OR PVC	3/4"
	(1)	#8AWG - CU, THWN-2 N		
	(1)	#10AWG - CU, THWN-2 GND	EMT, LFMC OR PVC	3/4"
3A	(2)	#10AWG - CU, THWN-2		
	(1)	#10AWG - CU, THWN-2 GND	EMT, LFMC OR PVC	3/4"
	(2)	#4AWG - CU, THWN-2		
	(1)	#4AWG - CU, THWN-2 N	EMT, LFMC OR PVC	1"
	(1)	#6AWG - CU, THWN-2 GND		
	(2)	#6AWG - CU, THWN-2	EMT, LFMC OR PVC	3/4"
	(1)	#6AWG - CU, THWN-2 N		



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ESR

SHEET NAME

ELECTRICAL LINE DIAGRAM

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-6

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 #	SOLAREEDGE: 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	-9°
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 CONDUCT ORS 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
INVERTER	SOLAREEDGE BANK	380	13.16	16.45	20	CU #10 AWG	CU #10 AWG	35	PASS	38	2	40	0.91	1	36.4	PASS	20	1.24	0.172	3/4" EMT	11.87617
String 1 Voltage Drop																		0.245			

AC FEEDER CALCULATIONS																						
CIRCUIT ORIGIN	CIRCUIT DESTINATION	VOLTAGE (V)	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OCPD SIZE (A)	NEUTRAL SIZE	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a)	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)	CONDUIT SIZE	CONDUIT FILL (%)
INVERTER	BACKUP INTERFACE	240	24	30	40	CU #8 AWG	CU #10 AWG	CU #8 AWG	50	PASS	38	2	55	0.91	1	50.05	PASS	5	0.778	0.078	3/4" EMT	24.5591
BACKUP INTERFACE	BACKUP LOAD PANEL	240	60	60	60	CU #4 AWG	CU #6 AWG	CU #4 AWG	85	PASS	38	2	95	0.91	1	86.45	PASS	5	0.308	0.077	1" EMT	34.4792
BACKUP INTERFACE	AC DISCONNECT	240	24	30	30	CU #4 AWG	CU #6 AWG	CU #4 AWG	85	PASS	38	2	95	0.91	1	86.45	PASS	5	0.308	0.031	1" EMT	34.4792
AC DISCONNECT	POI	240	24	30	30	CU #6 AWG	N/A	CU #6 AWG	65	PASS	38	2	75	0.91	1	68.25	PASS	5	0.491	0.049	3/4" EMT	28.5366
CUMULATIVE VOLTAGE DROP																				0.235		

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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SHEET NAME

WIRING CALCULATIONS

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-7



PHOTOVOLTAIC POWER SOURCE

EVERY 10' ON CONDUIT & ENCLOSURES

LABEL- 1:  
LABEL LOCATION:  
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



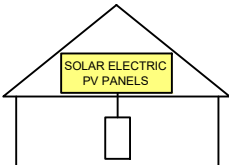
WARNING

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



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:  
INVERTER  
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



PHILLIPS ENERGY SYSTEMS

7901 ALLEN BLACK RD, MINT HILL,  
NC 28227, UNITED STATES

REVISIONS

DESCRIPTION	DATE	REV
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REVISION	03/07/2025	A

PROJECT NAME & ADDRESS

RAYMOND WALKER  
RESIDENCE

905 DUKE ST,  
ERWIN, NC 28339

DRAWN BY

ESR

SHEET NAME

LABELS

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-8



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

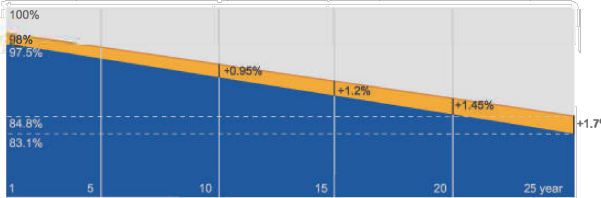


Better mechanical loading tolerance

Superior Warranty

- 25-year product warranty
- 25-year linear power output warranty

0.55% Annual Degradation Over 25 years



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



JASOLAR

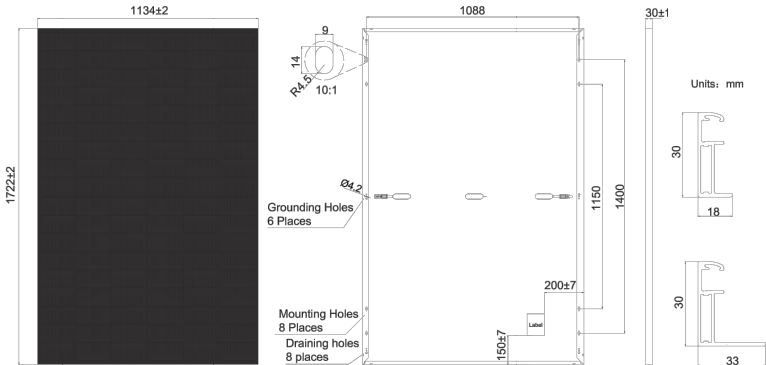
www.jasolar.com

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



JASOLAR

MECHANICAL DIAGRAMS



Remark: customized frame color and cable length available upon request

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 <sub>Isc</sub> )	+0.045%/°C					
Temperature Coefficient of Voc(β <sub>Voc</sub> )	-0.275%/°C					
Temperature Coefficient of Pmax(γ <sub>Pmp</sub> )	-0.350%/°C					
STC	Irradiance 1000W/m², cell temperature 25°C, AM1.5G					

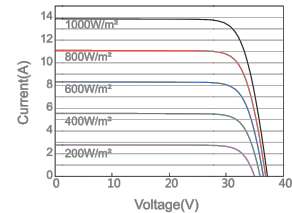
Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer.They only serve for comparison among different module types.

ELECTRICAL PARAMETERS AT NOCT

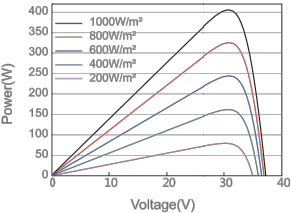
TYPE	JAM54S31 -380/MR	JAM54S31 -385/MR	JAM54S31 -390/MR	JAM54S31 -395/MR	JAM54S31 -400/MR	JAM54S31 -405/MR	OPERATING CONDITIONS
Rated Max Power(Pmax) [W]	286	290	294	298	302	306	Maximum System Voltage 1000V/1500V DC
Open Circuit Voltage(Voc) [V]	34.36	34.49	34.62	34.75	34.88	35.12	Operating Temperature -40 C ~+85 C
Max Power Voltage(Vmp) [V]	28.51	28.68	28.87	29.08	29.26	29.47	Maximum Series Fuse Rating 25A
Short Circuit Current(Isc) [A]	10.75	10.82	10.89	10.96	11.03	11.10	Maximum Static Load, Front* 5400Pa(112lb/ft²) Maximum Static Load, Back* 2400Pa(50lb/ft²)
Max Power Current(Imp) [A]	10.03	10.11	10.18	10.25	10.32	10.38	NOCT 45±2 C
NOCT	Irradiance 800W/m², ambient temperature 20°C, wind speed 1m/s, AM1.5G						Safety Class Class II
							Fire Performance UL Type 1

CHARACTERISTICS

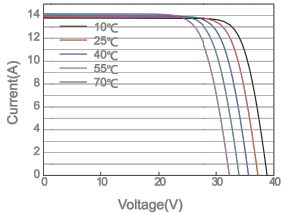
Current-Voltage Curve JAM54S31-405/MR



Power-Voltage Curve JAM54S31-405/MR



Current-Voltage Curve JAM54S31-405/MR



Premium Cells, Premium Modules

Version No. : Global\_EN\_20231130A



PHILLIPS ENERGY SYSTEMS

7901 ALLEN BLACK RD, MINT HILL,  
NC 28227, UNITED STATES

REVISIONS

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INITIAL DESIGN	02/24/2025	
REVISION	03/07/2025	A

PROJECT NAME & ADDRESS

RAYMOND WALKER  
RESIDENCE

905 DUKE ST,  
ERWIN, NC 28339

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
- Detected 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)

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			

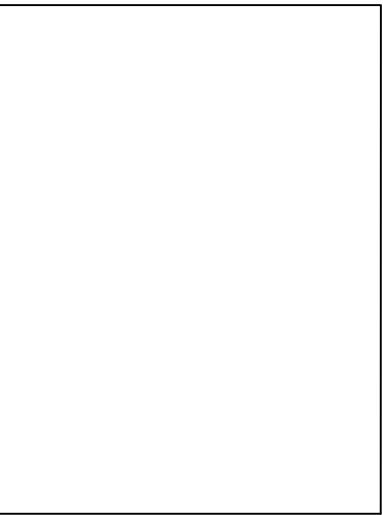
(6) It is not allowed to mix S-series and P-series Power Optimizers in new installations in the same string.  
(7) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement.  
(8) Refer to the [Single String Design Guidelines](#) 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.



PHILLIPS ENERGY SYSTEMS

7901 ALLEN BLACK RD, MINT HILL,  
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PROJECT NAME & ADDRESS

RAYMOND WALKER  
RESIDENCE

905 DUKE ST,  
ERWIN, NC 28339

DRAWN BY  
ESR

SHEET NAME  
EQUIPMENT  
SPECIFICATION

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

Table with specifications for SolarEdge Home Hub Inverter, including output and input details for various models.

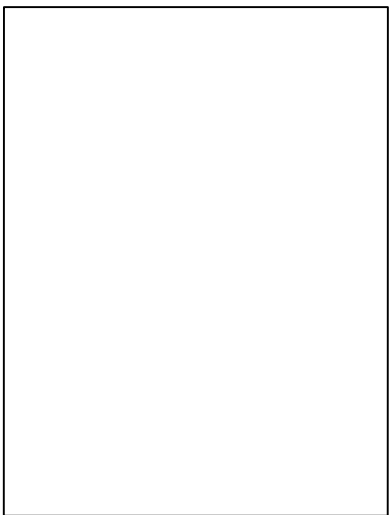
(1) These specifications apply to inverters with part numbers SExxxxH-USMNUxxx5 and SExxxxH-USMNFxxx5 and connection unit model number DCD-1PH-US-PXH-F-x.
(2) Inverters with part number SExxxxH-USMNFxxx5 are intended for upgrade installations only, as part of the "Re-Energize" program. Use on non-upgrade 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.



PHILLIPS ENERGY SYSTEMS

7901 ALLEN BLACK RD, MINT HILL, NC 28227, UNITED STATES

Table with 3 columns: DESCRIPTION, DATE, REV. Row 1: INITIAL DESIGN, 02/24/2025, . Row 2: REVISION, 03/07/2025, A.



PROJECT NAME & ADDRESS

RAYMOND WALKER RESIDENCE

905 DUKE ST, ERWIN, NC 28339

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>(9)(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					

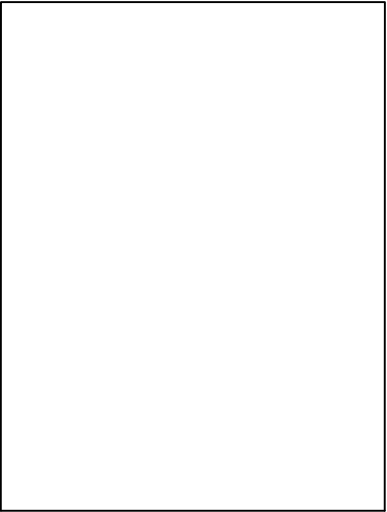
(8) Discharge power is limited up to the inverter's rated AC power for on-grid and stand-alone applications, as well as up to the installed batteries' rating.  
(9) For consumption metering current transformers should be ordered separately: SECT-SPL-225A-T-20 or SEACT1250-400NA-20. Revenue grade metering 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](#).



PHILLIPS ENERGY SYSTEMS

7901 ALLEN BLACK RD, MINT HILL,  
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PROJECT NAME & ADDRESS

RAYMOND WALKER  
RESIDENCE

905 DUKE ST,  
ERWIN, NC 28339

DRAWN BY ESR
SHEET NAME EQUIPMENT SPECIFICATION
SHEET SIZE ANSI B 11" X 17"
SHEET NUMBER PV-12



# Backup Interface for North America

BI-EUSGN-01 / BI-NUSGN-01



STOREDGE®

## Backup Interface for Flexible Backup

- Automatically provides backup power to home loads in the event of grid interruption
- Full flexibility in which loads to backup - the entire home or selected loads
- Scalable solution to support higher power & higher capacity<sup>(\*)</sup>
- Built-in Auto Transformer and Energy Meter for easier and faster installation
- Seamless integration with the Energy Hub Inverter with Prism Technology to manage and monitor both PV generation and energy storage
- Generator connection support<sup>(\*)</sup>

<sup>(\*)</sup> Requires supporting inverter firmware

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



## Backup Interface for North America

BI-EUSGN-01 / BI-NUSGN-01

	BI-EUSGN-01	BI-NUSGN-01
INPUT FROM GRID		
AC Current Input	200	A
AC Output Voltage (Nominal)	240	Vac
AC Output Voltage Range	211 - 264	Vac
AC Frequency (Nominal)	60	Hz
AC Frequency Range	59.3 - 60.5	Hz
Microgrid Interconnection Device Rated Current	200	A
Service Side AC Main Circuit Breaker Rated Current	200	N/A
Service Side AC Main Circuit Breaker Interrupt Current	10k	N/A
Grid Disconnection Switchover Time	<100	ms
OUTPUT TO MAIN DISTRIBUTION PANEL		
Maximum AC Current Output	200	A
AC L-L Output Voltage (Nominal)	240	Vac
AC L-L Output Voltage Range	211 - 264	Vac
AC Frequency (Nominal)	60	Hz
AC Frequency Range	59.3 - 60.5	Hz
Maximum Inverters AC Current Output in Backup Operation	78	A
Imbalance Compensation in Backup Operation	5000	W
AC L-N Output Voltage in Backup (Nominal)	120	V
AC L-N Output Voltage Range in Backup	105 - 132	V
AC Frequency Range in Backup	55 - 65	Hz
INPUT FROM INVERTER		
Number of Inverter Inputs	3	#
Rated AC Power	7,600	W
Maximum Continuous Input Current @ 240V	32	A
Rated AC Power in Continuous Backup Operation	6,100	W
Maximum Continuous Input Current in Backup Operation	26	A
Peak AC Power (<10 sec) in Backup Operation	7,000	W
Peak AC Current (<10 sec) in Backup Operation	30	A
Inverter Input AC Circuit Breaker	40	A
Upgradability	Up to 3 X 63A CB <sup>(1)</sup>	
GENERATOR <sup>(2)</sup>		
Maximum Rated AC Power	15,000	W
Maximum Continuous Input Current	63	Adc
Dry Contact Switch Voltage Rating	250/30	Vac/Vdc
Dry Contact Switch Current Rating	5	A
2-wire Start Switch	Yes	
ADDITIONAL FEATURES		
Installation Type	Suitable for use as service equipment	For main lug only
Number of Communication Inputs	2	
Communication	RS485	
Energy Meter (for Import/Export)	1% accuracy	
Manual Control Over Microgrid Interconnection Device	Yes	

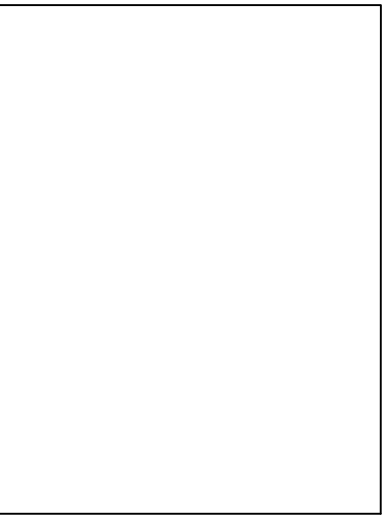
<sup>(1)</sup> Each 40A CB supports up to one 7.6kW inverter, with each 63A CB supporting one 10kW and one 11.4kW inverter. The CB upgrade kit is available with the following part numbers: for 40A CB, CB-UPG-40-01; for 63A, CB CB-UPG-63-01  
<sup>(2)</sup> Requires supporting inverter firmware



PHILLIPS ENERGY SYSTEMS

7901 ALLEN BLACK RD, MINT HILL,  
NC 28227, UNITED STATES

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PROJECT NAME & ADDRESS	
RAYMOND WALKER RESIDENCE	905 DUKE ST, ERWIN, NC 28339

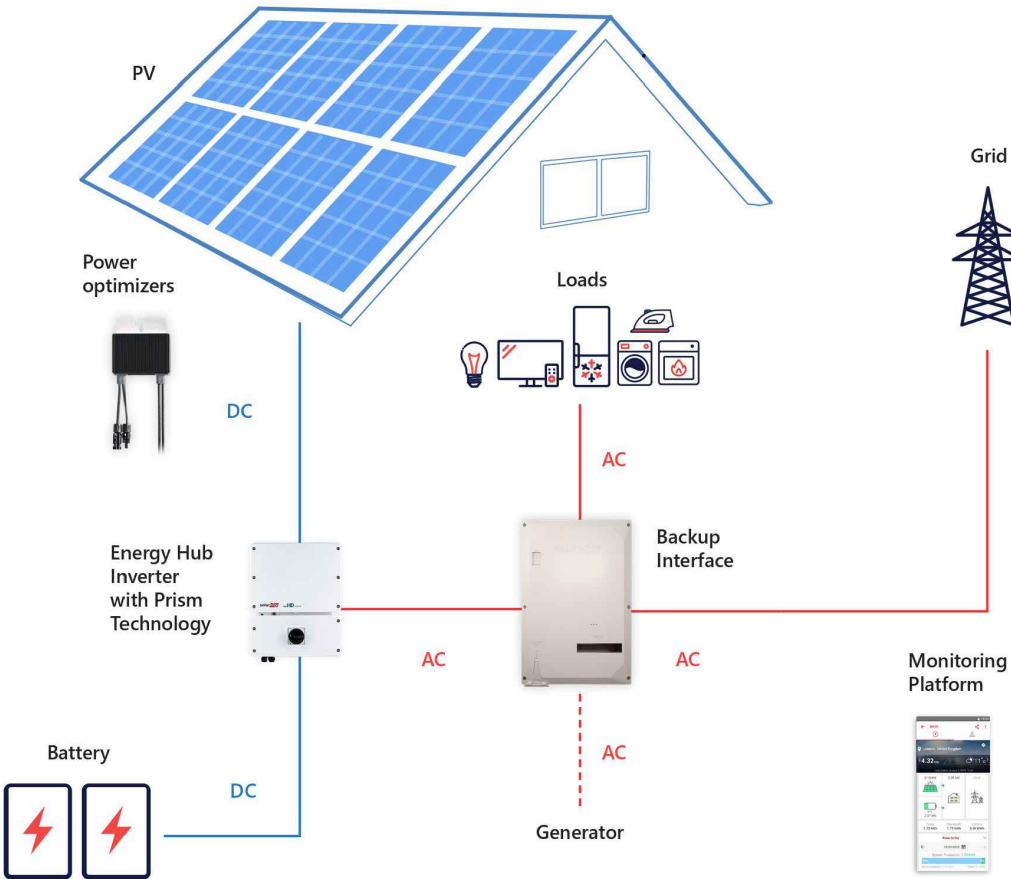
DRAWN BY ESR
SHEET NAME EQUIPMENT SPECIFICATION
SHEET SIZE ANSI B 11" X 17"
SHEET NUMBER PV-13



/ Backup Interface for North America

BI-EUSGN-01 / BI-NUSGN-01

		BI-EUSGN-01	BI-NUSGN-01
STANDARD COMPLIANCE			
Safety	UL1741, CSA 22.2 NO. 107		
	UL869A	N/A	
Emissions	FCC part 15 class B		
INSTALLATION SPECIFICATIONS			
Supported Inverters	StorEdge single phase inverter, Single phase Energy Hub inverter with Prism technology		
AC From Grid Conduit Size / AWG Range	2" conduits / #0 - 4/0 AWG		
AC Inverter Conduit Size / AWG Range	1" conduit / 14 - 4 AWG		
AC Generator Input Conduit Size / AWG Range	1" conduit / 8 - 3 AWG		
Communication Conduit Size / AWG Range	3/4" / 24 - 10 AWG		
Weight	73 / 33		lb / Kg
Cooling	Fan (user replaceable)		
Noise	< 50		dBA
Operating Temperature Range	-40 to +122 / -40 to +50		°F / °C
Protection Rating	NEMA 3R, IP44		
Dimensions (HxWxD)	20.59 x 13.88 x 8.62 / 523.5 x 352.5 x 219		in / mm



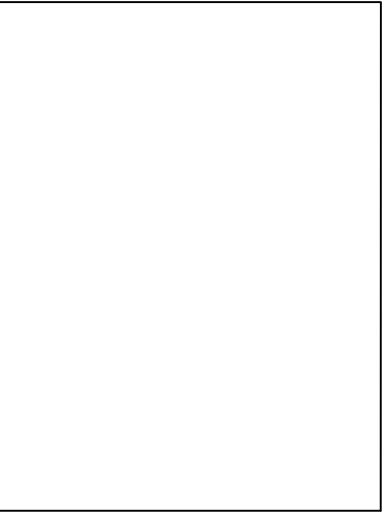
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PHILLIPS ENERGY SYSTEMS

7901 ALLEN BLACK RD, MINT HILL,  
NC 28227, UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	02/24/2025	
REVISION	03/07/2025	A



PROJECT NAME & ADDRESS	
RAYMOND WALKER RESIDENCE	905 DUKE ST, ERWIN, NC 28339

DRAWN BY ESR
SHEET NAME EQUIPMENT SPECIFICATION
SHEET SIZE ANSI B 11" X 17"
SHEET NUMBER PV-14

# SolarEdge Energy Bank 10kWh Battery For North America



HOME BACKUP

## Optimized for SolarEdge Energy Hub Inverters<sup>(1)</sup>

- Maximized system performance, gaining more energy to store and use for on-grid and backup power applications
- Integrates with the complete SolarEdge residential offering, providing a single point of contact for warranty, support, training, and simplified logistics & operations
- DC coupled battery featuring superior overall system efficiency, from PV to battery to grid
- Scalable solution for increased power and capacity with multiple SolarEdge inverters and batteries

- Solar, storage, EV charging, and smart devices all monitored and managed by a single app to optimize solar production, consumption and backup\* power
- Wireless communication to the inverter, reducing wiring, labor and installation faults
- Simple plug and play installation, with automatic SetApp-based configuration
- Includes multiple safety features for battery protection

\* Backup application are subject to local regulation and may require additional components and firmware upgrade

solaredge.com



## SolarEdge Energy Bank 10kWh Battery For North America

BAT-10K1P <sup>(2)</sup>		
BATTERY SPECIFICATION		
Usable Energy (100% depth of discharge)	9700	Wh
Continuous Output Power	5000	W
Peak Output Power (for 10 seconds)	7500	W
Peak Roundtrip Efficiency	> 94.5	%
Warranty <sup>(3)</sup>	10	Years
Voltage Range	350-450	Vdc
Communication Interfaces	Wireless*	
Batteries per Inverter	Up to 3 <sup>(4)</sup>	
STANDARD COMPLIANCE		
Safety	UL1642, UL1973, UL9540, UN38.3	
Emissions	FCC Part 15 Class B	
MECHANICAL SPECIFICATIONS		
Dimensions (W x H x D)	31.1 x 46.4 x 9.84 / 790 x 1179 x 250	in / mm
Weight	267 / 121	lb / kg
Mounting <sup>(5)</sup>	Floor or wall mount <sup>(6)</sup>	
Operating Temperature <sup>(7)</sup>	+14 to +122 / -10 to +50	°F / °C
Storage Temperature (more than 3 months)	+14 to +86 / -10 to +30	°F / °C
Storage Temperature (less than 3 months)	-22 to +140 / -30 to +60	°F / °C
Altitude	6562 / 2000	ft / m
Enclosure Protection	IP55 / NEMA 3R - indoor and outdoor (water and dust protection)	
Cooling	Natural convection	
Noise (at 1m distance)	<25	dBA

\* The SolarEdge Energy Bank is designed for use with SolarEdge Energy Net for wireless communication. The inverter might require a matching SolarEdge Energy Net Plug-In (more details below).  
Using RS485 could reduce the usable energy to 9500Wh.

<sup>(1)</sup> Please refer to the SolarEdge Energy Bank battery connections and configuration application note for compatible inverters.

<sup>(2)</sup> These specifications apply to part number BAT-10K1P50B-01.

<sup>(3)</sup> For warranty details please refer to the SolarEdge Energy Bank battery Limited Warranty.

<sup>(4)</sup> Installations with multiple SolarEdge Energy Bank batteries connected to a single inverter require a pair of branch connectors (DC + and DC -) per battery excluding the last battery. Support for 3 batteries is pending supporting inverter firmware. The branch connectors should be purchased separately.

<sup>(5)</sup> Installation and mounting requires handles that should be purchased separately. Please refer to the Accessories' PN table below.

<sup>(6)</sup> The floor stand is purchased separately. One floor stand is required per SolarEdge Energy Bank battery. Please refer to the Accessories' PN table below.

<sup>(7)</sup> Please note that operating the SolarEdge Energy Bank at extreme temperatures for extended durations of time may void the Energy Bank's warranty coverage.  
Please see the Energy Bank Limited Product Warranty for additional details.

### SolarEdge Energy Bank Battery – Accessories (purchased separately)

Accessory	PN
Floor stand	IAC-RBAT-FLRSTD-01
Branch connectors set (includes a pair of DC + and DC - connectors) Required for installations with multiple SolarEdge Energy Bank batteries with a single inverter	IAC-RBAT-USYCBL-01
Handles	IAC-RBAT-HANDLE-01
SolarEdge Energy Net Plug-in	ENET-HBNP-01
Battery inverter extension cable 2m long (MC4 to terminal block)	IAC-RBAT-10M420-01

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CE RoHS



PHILLIPS ENERGY SYSTEMS

7901 ALLEN BLACK RD, MINT HILL,  
NC 28227, UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	02/24/2025	
REVISION	03/07/2025	A

### PROJECT NAME & ADDRESS

RAYMOND WALKER  
RESIDENCE

905 DUKE ST,  
ERWIN, NC 28339

DRAWN BY

ESR

SHEET NAME  
EQUIPMENT  
SPECIFICATION

SHEET SIZE

ANSI B  
11" X 17"

SHEET NUMBER

PV-15





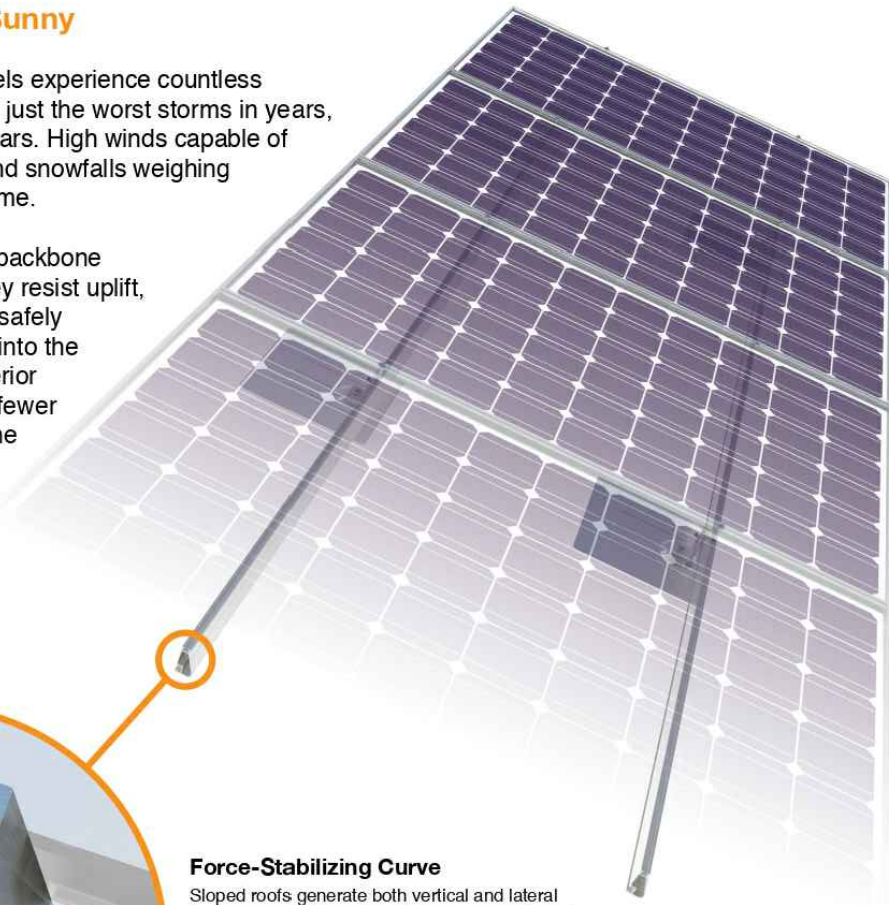
Tech Brief

## 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](http://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.



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905 DUKE ST,  
ERWIN, NC 28339

#### DRAWN BY

ESR

#### SHEET NAME

EQUIPMENT  
SPECIFICATION

#### SHEET SIZE

ANSI B  
11" X 17"

#### SHEET NUMBER

PV-16





## UFO® Family of Components

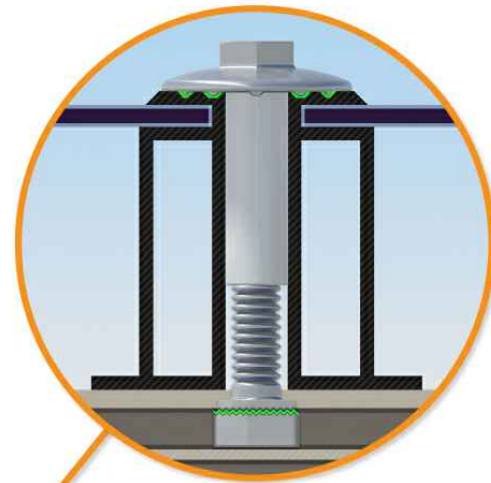
Tech Brief

### 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](https://www.ironridge.com/UFO)



#### Universal Fastening Object (UFO®)

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



#### Stopper Sleeve

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



#### BOSS® Splice

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



#### Grounding Lug

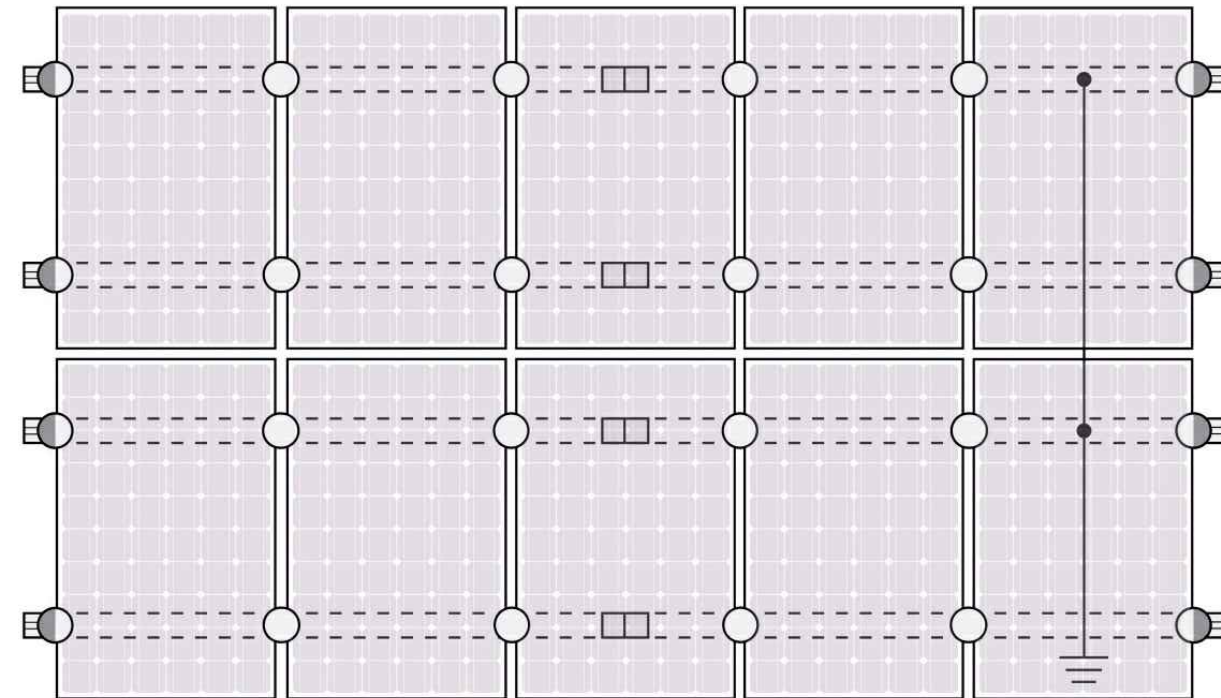
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.



#### Bonded Attachments

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

### System Diagram



○ UFO    ◐ Stopper Sleeve    ● Grounding Lug    □ BOSS™ Splice    — Ground Wire

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

### UL Certification

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

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

[Go to IronRidge.com/UFO](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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RESIDENCE

905 DUKE ST,  
ERWIN, NC 28339

#### DRAWN BY

ESR

#### SHEET NAME

EQUIPMENT  
SPECIFICATION

#### SHEET SIZE

ANSI B  
11" X 17"

#### SHEET NUMBER

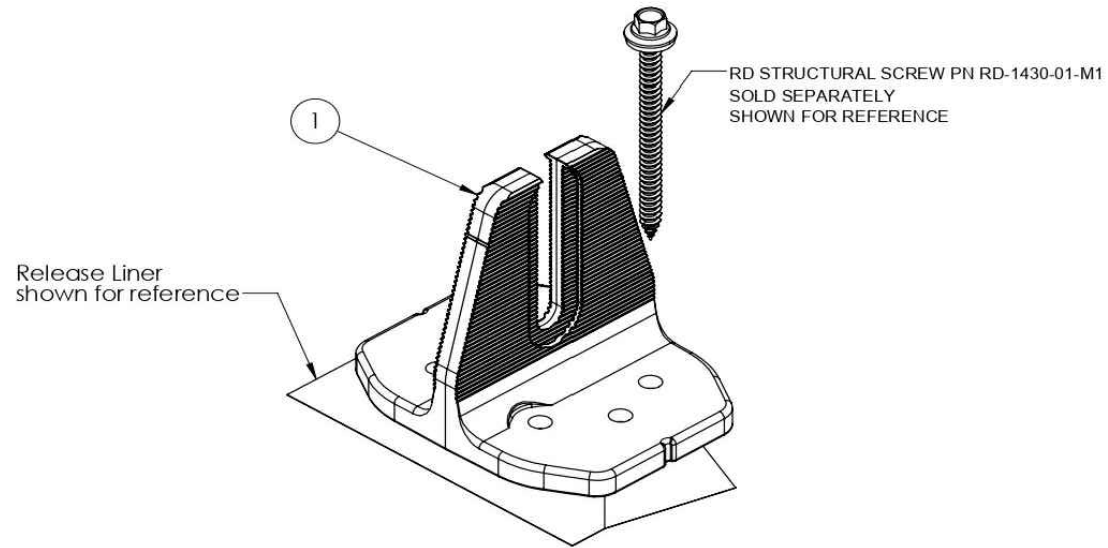
PV-17





# 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

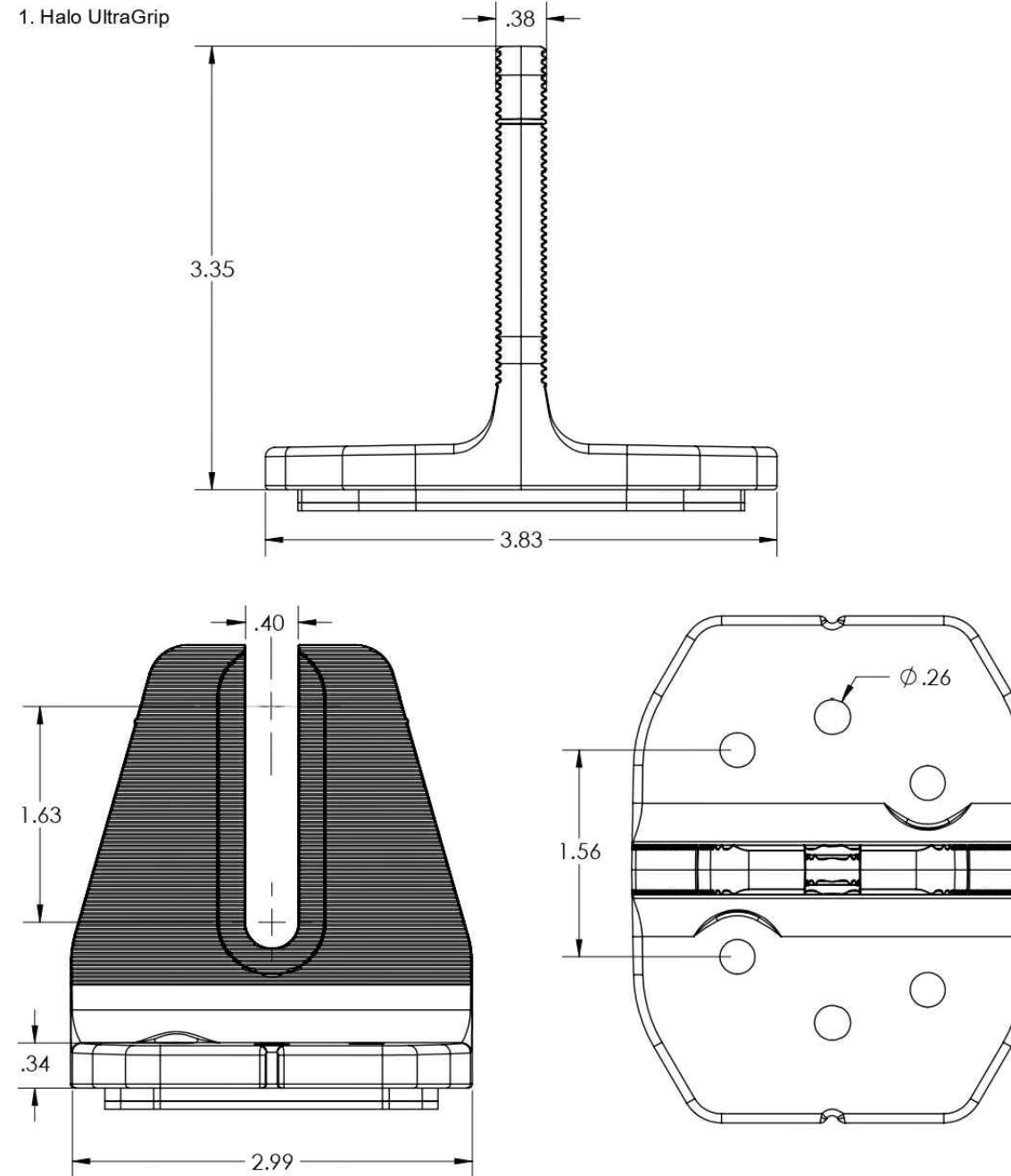


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QM-HUG-01-B1 or QM-HUG-01-M1 Cut Sheet Rev 1.0

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



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ERWIN, NC 28339

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ESR

## SHEET NAME EQUIPMENT SPECIFICATION

## SHEET SIZE

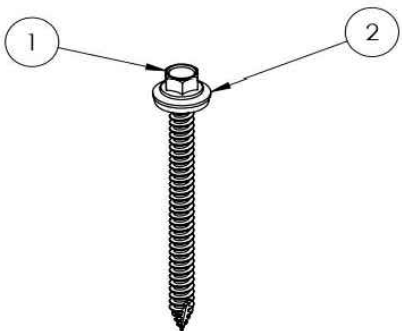
ANSI B  
11" X 17"

## SHEET NUMBER

PV-18



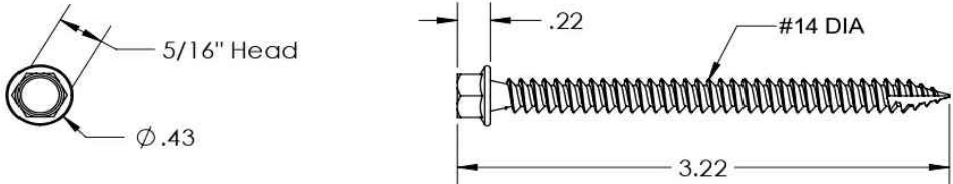
QuickMount® RD Structural Screw



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



PHILLIPS ENERGY SYSTEMS

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EQUIPMENT  
SPECIFICATION

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ANSI B  
11" X 17"

SHEET NUMBER

PV-19



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

SIZE	DWG. NO.	REV
<b>B</b>	JB-1.2	
SCALE: 1:2	WEIGHT: 1.45 LBS	SHEET 1 OF 3
TORQUE SPECIFICATION:		15-20 LBS
CERTIFICATION:		UL 1741, NEMA 3R CSA C22.2 NO. 290
WEIGHT:		1.45 LBS

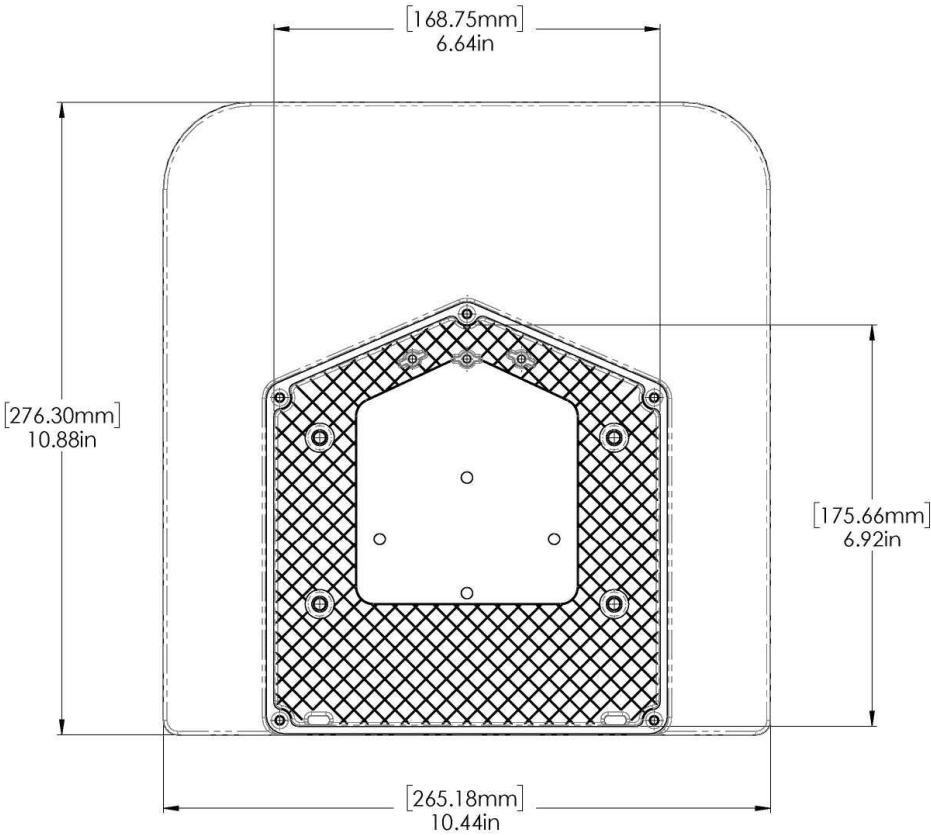
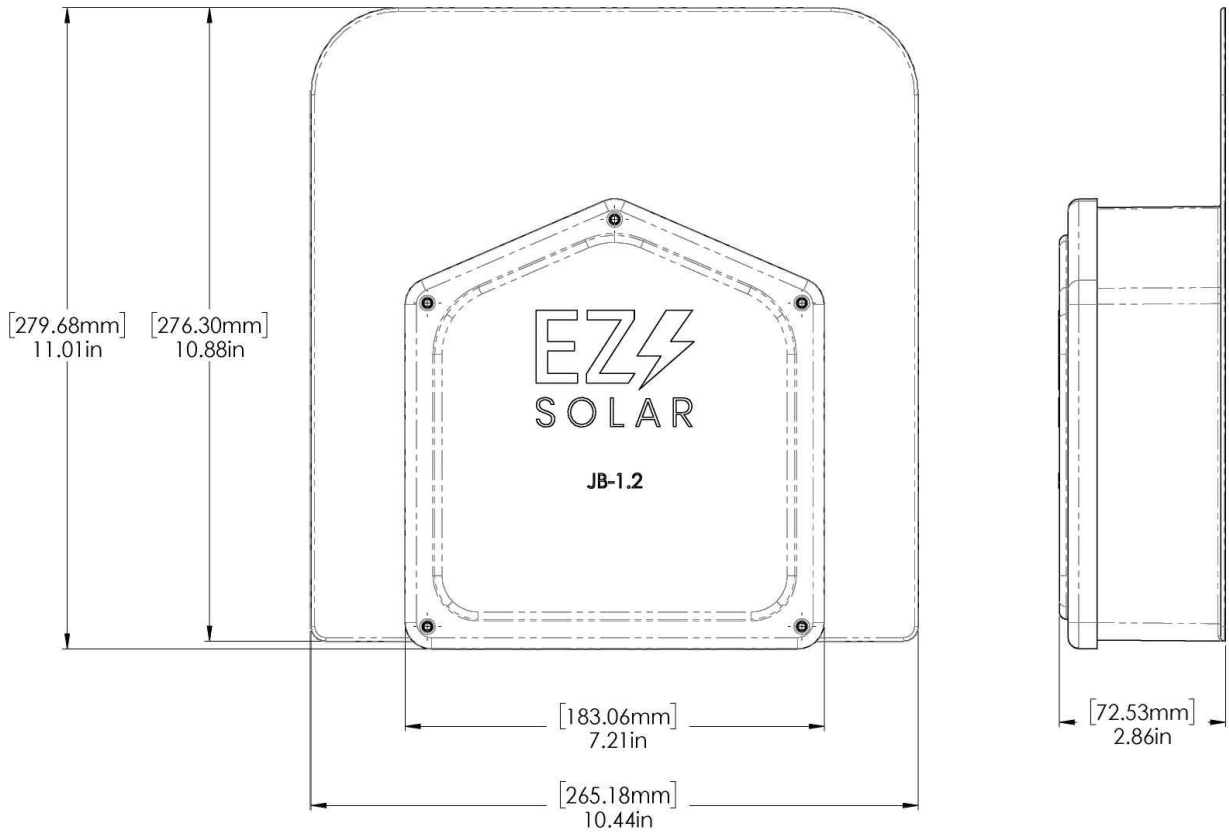
SIZE	DWG. NO.	REV
<b>B</b>	JB-1.2	
SCALE: 1:2	WEIGHT: 1.45 LBS	SHEET 2 OF 3



**PHILLIPS ENERGY SYSTEMS**

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