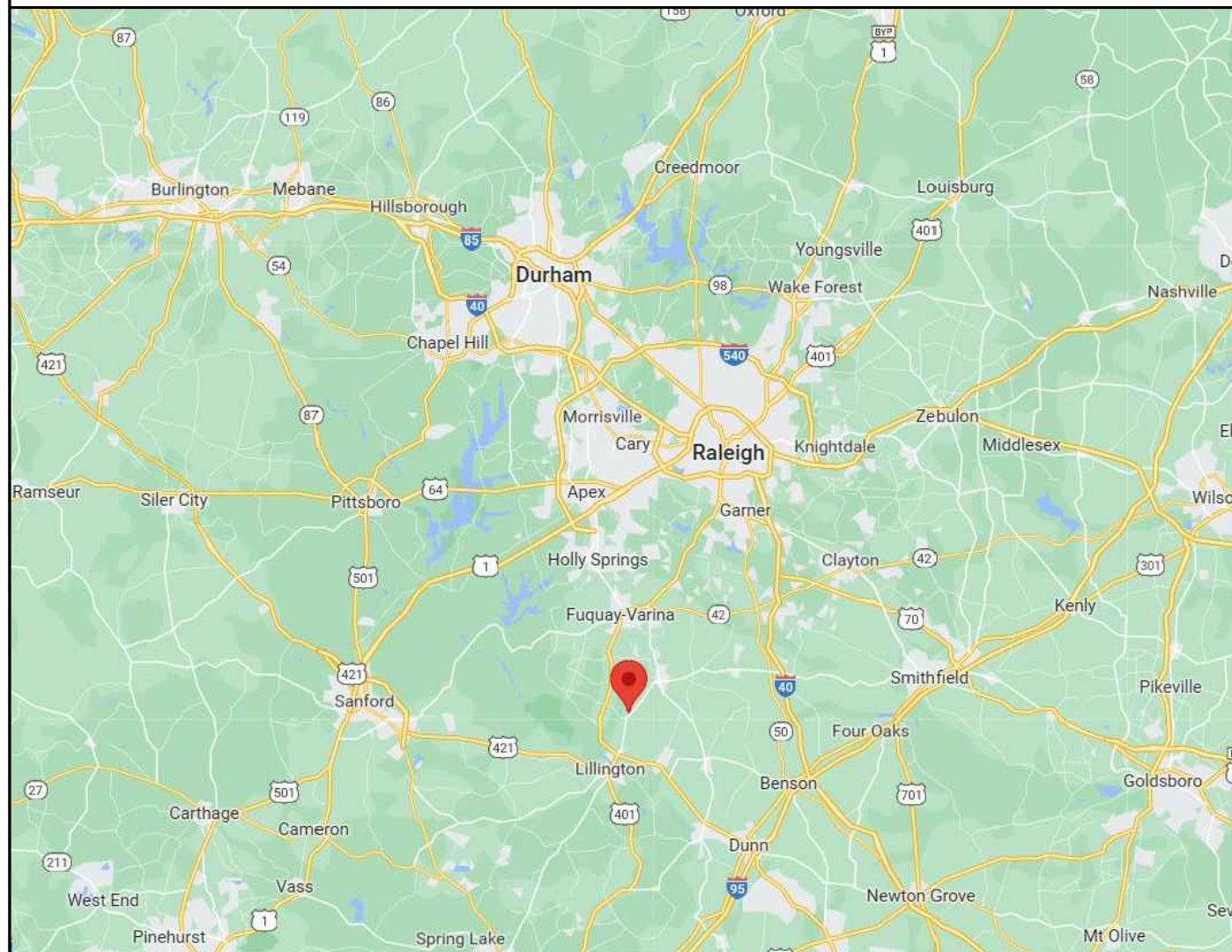
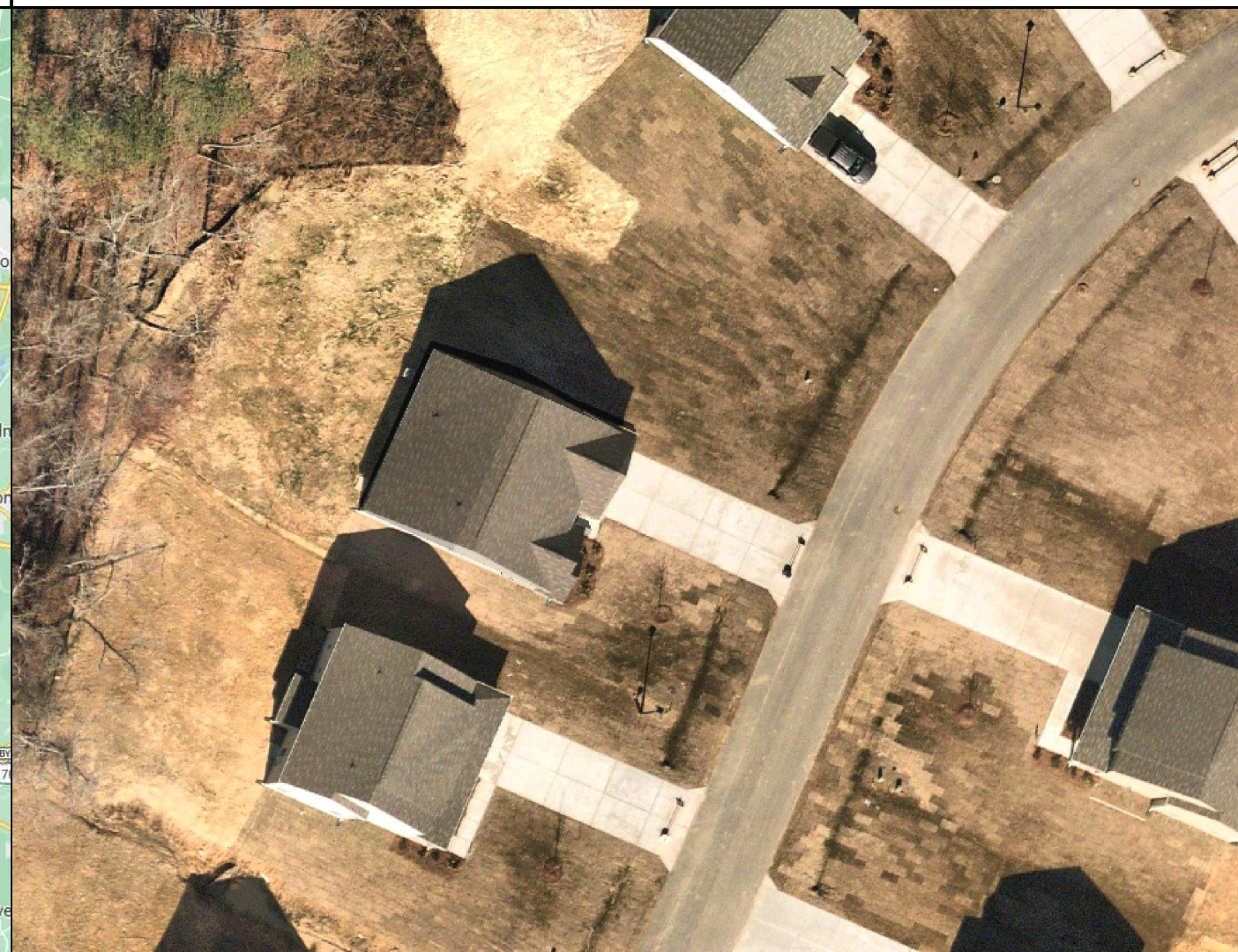


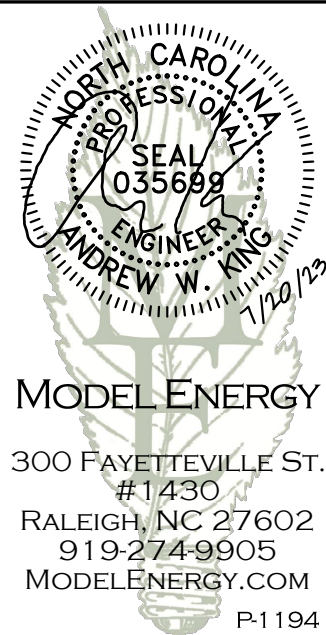
## VICINITY MAP



## PROPERTY MAP



ENGINEER:



**MODEL ENERGY**  
 300 FAYETTEVILLE ST.  
 #1430  
 RALEIGH, NC 27602  
 919-274-9905  
 MODELENERGY.COM  
 P-1194

JOB TITLE:

### NEW SOLAR PV SYSTEM

3.950 kW DC INPUT  
 3.800 kW AC EXPORT

Dorothy Burney  
 132 Chedworth Dr,  
 Angier, NC 27501

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CLIENT:



ISSUED FOR: CONSTRUCTION  
 DATE: 07/19/23


PROJECT INFORMATION

# PV1.1

### SCOPE OF WORK

(10) MISION SOLAR MSE395SX9R  
 (1) SOLAREEDGE SE3800H-US  
 (10) SOLAREEDGE P505  
 ROOF MOUNT: FLASH VUE FLASHING  
 MOUNTING RAILS: IRONRIDGE XR10

### SITE CONDITION

ASCE 7-10 WIND SPEED - 117 MPH  
 EXPOSURE CATEGORY - B  
 RISK CATEGORY - II  
 SNOW LOAD - 15 LBS/SQFT

### SHEET INDEX

PV1.1 PROJECT INFORMATION  
 PV2.1 SITE INFORMATION  
 PV3.1 STRUCTURAL INFORMATION  
 PV4.1 - 4.2 ELECTRICAL INFORMATION  
 PV5.1 - 5.5 LABELS, DETAILS & SPECS

### INTERCONNECTIONS TYPE

BACK FEED BREAKER

### CODE REFERENCES

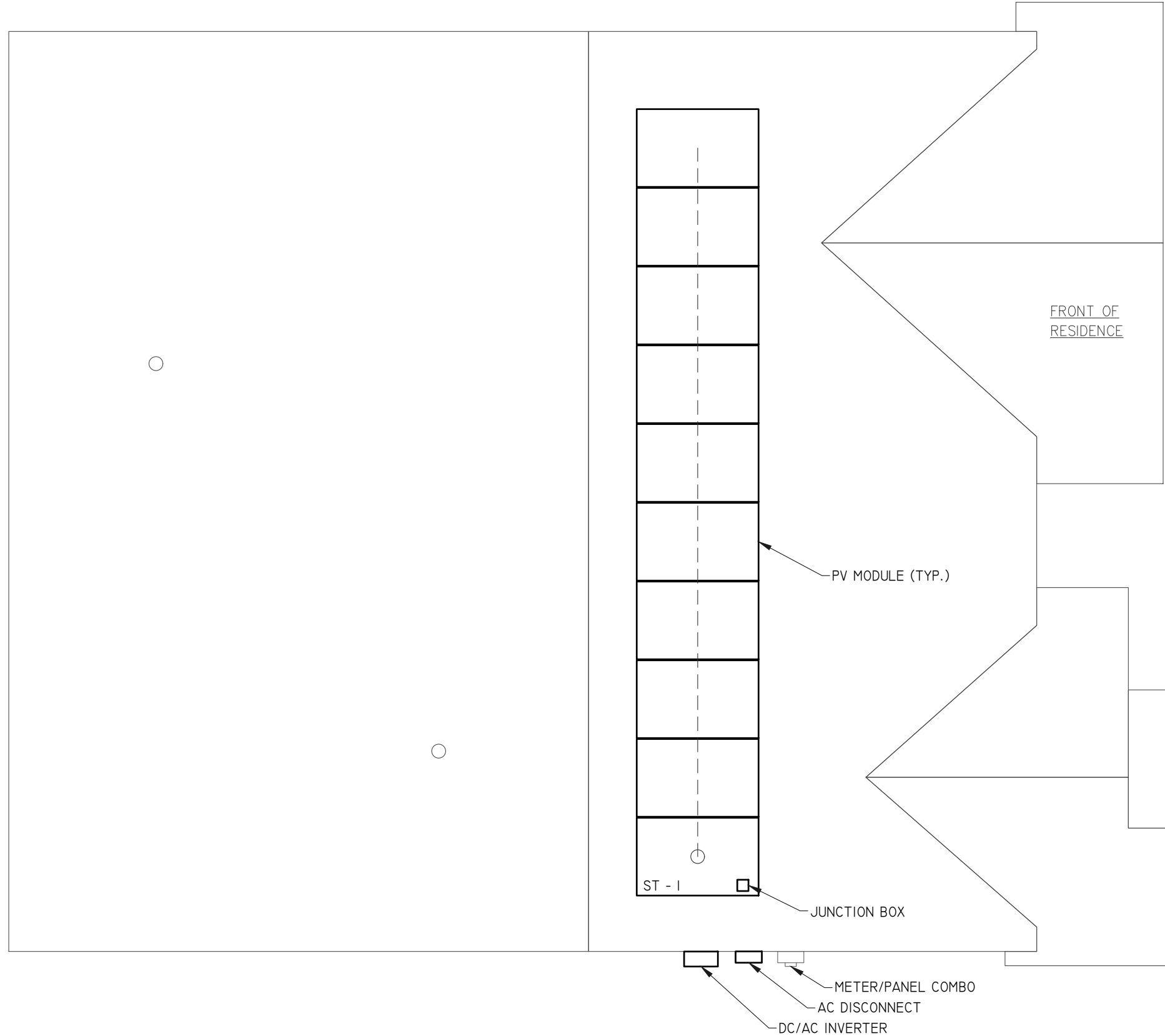
2017 NATIONAL ELECTRIC CODE  
 2018 NORTH CAROLINA FIRE CODE  
 2018 NORTH CAROLINA BUILDING CODE  
 2018 NORTH CAROLINA RESIDENTIAL CODE

### UTILITY COMPANY

DUKE ENERGY PROGRESS

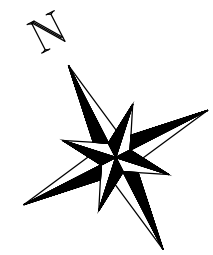
### LEGEND

- DISCONNECT SWITCH
- FUSE
- CIRCUIT BREAKER
- EQUIP. GROUND



NOTE: PROVIDE ADDITIONAL JUNCTION BOXES AS REQUIRED TO COMBINE MODULES ON DIFFERENT ARRAYS INTO A SINGLE STRING

**1** SITE PLAN  
SCALE: 3/16" = 1' -0"



ENGINEER:

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CLIENT:

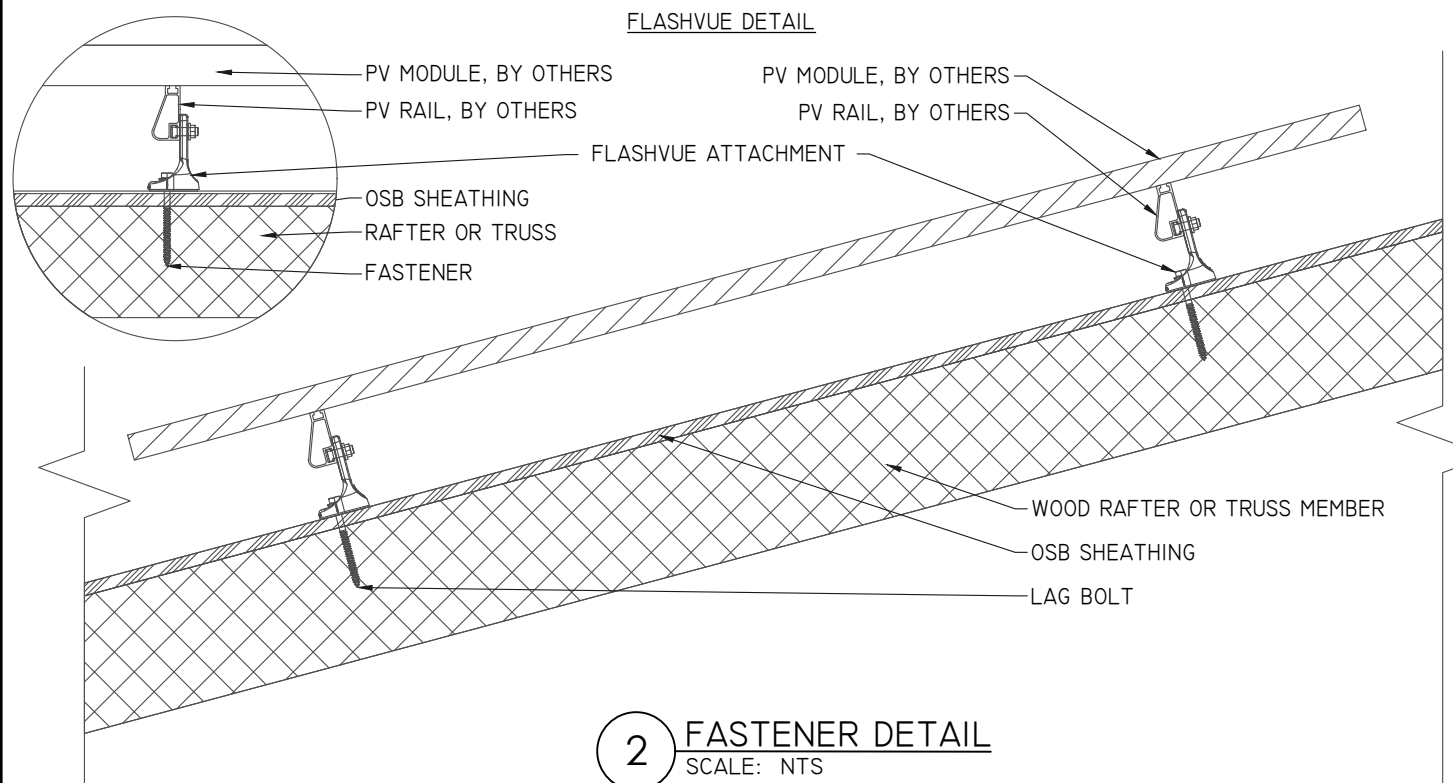


ISSUED FOR: DATE:

CONSTRUCTION 07/19/23


SITE INFORMATION

**PV2.1**



**2 FASTENER DETAIL**  
SCALE: NTS

ARRAY "A" SUMMARY	
# MODULES	10
# ROOF MOUNTS	42
RAIL LENGTH	178 FT.
ARRAY AREA	216 SQFT.
ARRAY WEIGHT	1082 LBS.
AZIMUTH @ SN	135°
TILT ANGLE	31°


MOUNTING RAILS	
MAKE	IRONRIDGE
MODEL	XR10
MATERIAL	ALUMINUM
WEIGHT	1.25 LBS/SQFT
SPACING	34"

ROOF "A" ZONES:			
ALL ZONES	MAX. RAIL OVERHANG =		16"
□ ZONE 1	MAX. FASTENER SPAN ZONE 1 =		48"
▨ ZONE 2	MAX. FASTENER SPAN ZONE 2 =		48"
▩ ZONE 3	MAX. FASTENER SPAN ZONE 3 =		24"

PV MODULES	
MAKE	MISSION SOLAR
MODEL	MSE395SX9R
WIDTH	41.5"
LENGTH	75.1"
THICKNESS	1.6"
WEIGHT	49 LBS

**STATEMENT OF STRUCTURAL COMPLIANCE**

THE EXISTING ROOF STRUCTURE HAS BEEN DESIGNED TO SUPPORT THE ADDITIONAL LOADS OF THE PURPOSED PV SYSTEM. IN ADDITION, THE RACKING AND FASTENING SYSTEM SHALL BE CAPABLE OF SECURING THE SYSTEM TO THE STRUCTURE UNDER DESIGN CONDITIONS WHEN INSTALLED PROPERLY AND IN ACCORDANCE WITH THE RACKING AND FASTENING ARRANGEMENT DETAILED WITHIN THESE DRAWINGS.

SIGNED: 

NAME: ANDREW W. KING, PE

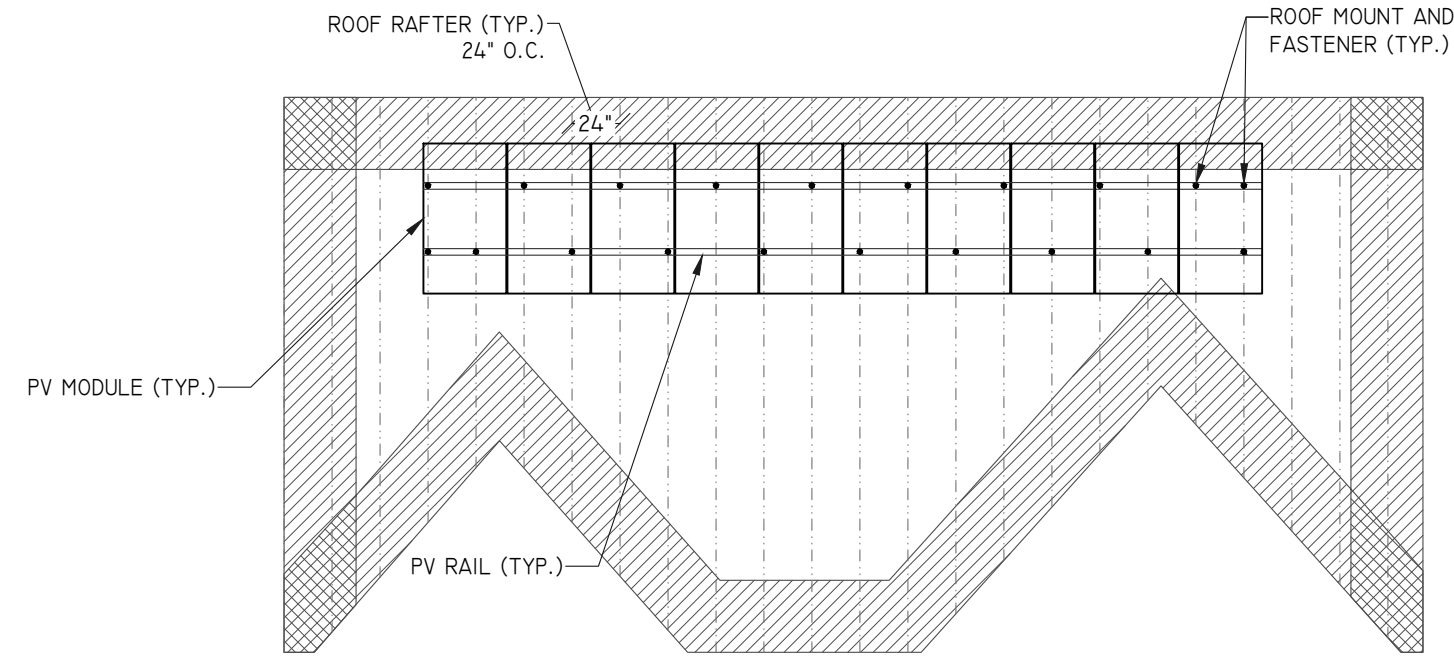
TITLE: PROFESSIONAL ENGINEER

ROOF MOUNT & FASTENER	
ROOF MOUNT:	
MAKE	IRONRIDGE
MODEL	FLASHVUE
MATERIAL	ALUMINUM
FASTENER	
MAKE	GENERIC
MODEL	LAG BOLT
MATERIAL	300 SERIES SS
SIZE	5/16" X 4.5"
GENERAL	
WEIGHT	1 LBS
FASTENERS PER MOUNT	1 PER MOUNT
MAX. PULL-OUT FORCE	800 LBS.
SAFETY FACTOR	2
DESIGN PULL-OUT FORCE	400 LBS.

- LAG BOLT EMBEDDED WITH 2.5" OF THREAD IN WOOD RAFTER OR TRUSSES MEMBER


ROOF "A" LOADING	
GROUND SNOW LOAD:	15 LBS./SQFT.
LIVE LOAD:	20 LBS./SQFT.
DEAD LOAD:	
ROOFING	3.9 LBS./SQFT.
PV ARRAY	2.5 LBS./SQFT.
TOTAL	6.4 LBS./SQFT.
WIND LOAD:	
UPLIFT ZONE 1	-24.6 LBS/SQFT
UPLIFT ZONE 2	-29.0 LBS/SQFT
UPLIFT ZONE 3	-29.0 LBS/SQFT
DOWNWARD	23.0 LBS/SQFT
FASTENER LOAD:	
UPLIFT ZONE 1	-308 LBS
UPLIFT ZONE 2	-363 LBS
UPLIFT ZONE 3	-181 LBS
DOWNWARD	288 LBS

ROOF "A" SUMMARY	
STRUCTURE:	
TYPE	TRUSS
MATERIAL	SOUTHERN PINE #2
SIZE	2" X 4"
SPACING	24"
EFF. SPAN	19'-11"
PITCH	7/12
DENSITY	30 LBS./CU.FT.
DECKING:	
TYPE	OSB
MATERIAL	WOOD COMPOSITE
THICKNESS	7/16
WEIGHT	1.6 LBS./SQFT.
ROOFING:	
TYPE	ARCH SHINGLE
MATERIAL	ASPHALT
WEIGHT	2.3 LBS./SQFT.



**1 ROOF "A" PLANAR VIEW**  
SCALE: 1/8" = 1' -0"

ENGINEER:



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JOB TITLE:


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CLIENT:



ISSUED FOR:	DATE:
CONSTRUCTION	07/19/23

STRUCTURAL INFORMATION

# PV3.1

PV MODULES	
MAKE	MISION SOLAR
MODEL	MSE395SX9R
TECHNOLOGY	MONO-CRYST.
NOM. POWER (P <sub>NOM</sub> )	395 WATTS
NOM. VOLT. (V <sub>MP</sub> )	36.99 VOLTS
O.C. VOLT. (V <sub>oc</sub> )	45.18 VOLTS
MAX. SYS. VOLT.	1000 V (UL)
TEMP. COEF. (V <sub>Tc</sub> )	-0.259 %/°C
NOM. CURR. (I <sub>MP</sub> )	10.68 AMPS
S.C. CURR. (I <sub>sc</sub> )	11.24 AMPS
MAX. SERIES FUSE	20 AMPS

MODULE OPTIMIZER	
MAKE	SOLAREEDGE
MODEL	P505
DC INPUT:	
RATED POWER	505 WATTS
VOLT. RANGE	12.5-87
MAX. SCC	14.0 AMPS
MAX. DC INPUT CURRENT	17.5 AMPS
DC OUTPUT:	
MAX. CURRENT	15 AMPS
MAX. VOLT.	85 VOLTS
MAX. SYSTEM VOLT.	1000 VOLTS
MIN. STRING	6 OPTIMIZERS
MAX. STRING	25 OPTIMIZERS
MAX. POWER	
INVERTERS: SE3000H-SE6000H	5700 WATTS
INVERTERS: SE7600H-SE11400H	6000 WATTS

DC/AC INVERTER	
MAKE	SOLAREEDGE
MODEL	SE3800H-US
TECHNOLOGY	TRANS-LESS
DC INPUT:	
MAX. POWER	5900 WATTS
MAX. VOLT	480 VOLTS
NOM. VOLT.	380 VOLTS
MAX. CURRENT	10.5 AMPS
MAX. SCC	45 AMPS
STRINGS INPUTS	2 STRINGS
AC OUTPUT:	
RATED POWER	3800 WATTS
MAX. POWER	3800 WATTS
NOM. VOLT.	240 VOLTS
MAX. CURR.	16 AMPS
GFP (Y/N)	YES
RPP (Y/N)	YES
GFCI (Y/N)	YES
AFCI (Y/N)	YES
DC DISC. (Y/N)	YES
RAPID SHUTDOWN	AUTOMATIC
FUSE RATING	15 AMPS
PROTECT. RATING	NEMA 4X

CONDUCTOR SCHEDULE													
TAG	CURRENT CARRYING CONDUCTORS				GROUNDING CONDUCTORS				CONDUIT/RACEWAY				NOTES
	QTY.	SIZE	MATERIAL	INSULATION	QTY.	SIZE	MATERIAL	INSULATION	QTY.	SIZE	MATERIAL	LOCATION	
C1	2	10 AWG	COPPER	PV WIRE	1	6 AWG	COPPER	BARE WIRE	-	-	-	FREE AIR	1
C2	2	10 AWG	COPPER	THWN-2	1	10 AWG	COPPER	THWN-2	1	1/2"	FMC/EMT/MC	EXT/INT	2,4
C3	3	10 AWG	COPPER	THWN	1	10 AWG	COPPER	THWN	1	1/2"	NOTE 5	EXTERIOR	2,4,5
XC	-	-	-	-	-	-	-	-	-	-	-	-	3

NOTES:

1. MANUFACTURER PROVIDED, UL LISTED WIRING HARNESS FOR USE ON EXPOSED ROOFS
2. CONDUIT SIZE SHOWN IS CODE MINIMUM. LARGER SIZES ARE ALLOWED.
3. EXISTING CONDUCTORS, FIELD VERIFY
4. EQUIPMENT TERMINAL RATING SHALL BE A MINIMUM OF 75°C AT BOTH END OF CONDUCTOR
5. PVC, EMT, ROMEX, LFNMC & FMC ARE ACCEPTABLE WHEN USED IN ACCORDANCE WITH ARTICLES 330, 334, 348, 350, 352, 356, & 358 OF THE 2017 NEC

JUNCTION BOX	
MAKE	SOLADECK
MODEL	0783-3R
PRO. RATING	NEMA 3R
VOLT. RATING	600 VOLTS
AMP RATING	120 AMPS
UL LISTING	UL 50

AC DISCONNECT	
MAKE	GENERIC
MODEL	N/A
ENCL. RATING	NEMA 3R
VOLT. RATING	240 VOLTS
AMP RATING	30 AMPS
UL LIST. (Y/N)	YES
FUSED (Y/N)	NO
FUSE RATING	N/A

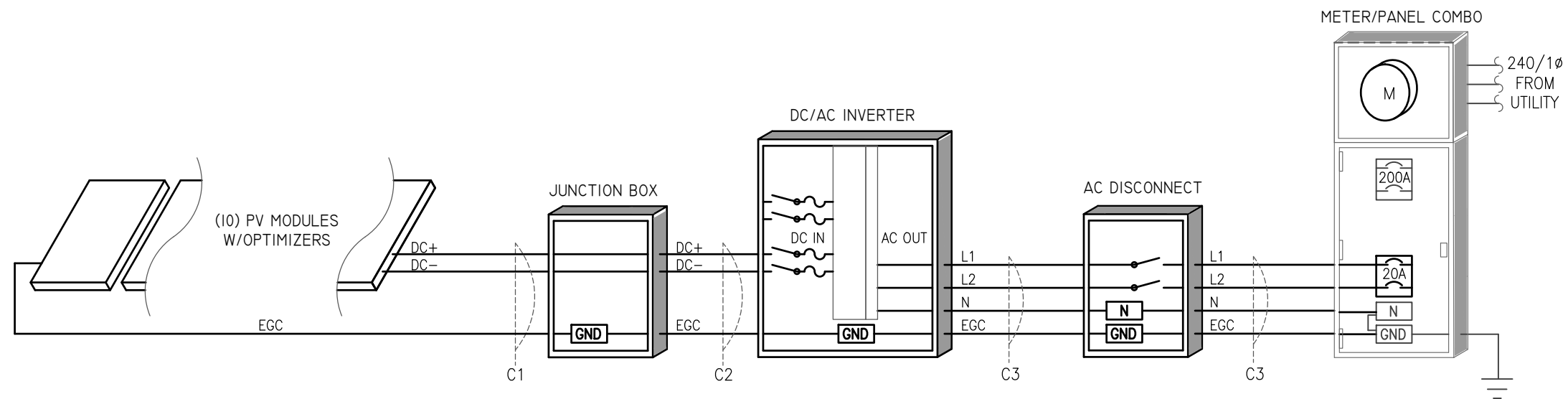
METER/PANEL COMBO (EXISTING)	
MAKE	N/A
MODEL	N/A
ENCL. RATING	NEMA 3R
VOLT. RATING	240 VOLTS
BUS RATING	200 AMPS
UL LIST. (Y/N)	YES
MAIN BREAKER (Y/N)	YES
BREAKER RATING	200 AMPS

NOTES:

- LOAD-BREAK RATED
- VISIBLE OPEN
- LOCKABLE IN OPEN POSITION
- INSTALL ADJACENT TO METER
- DISCONNECT TO BE READILY ACCESSIBLE TO UTILITY COMPANY PERSONNEL AT ALL TIMES

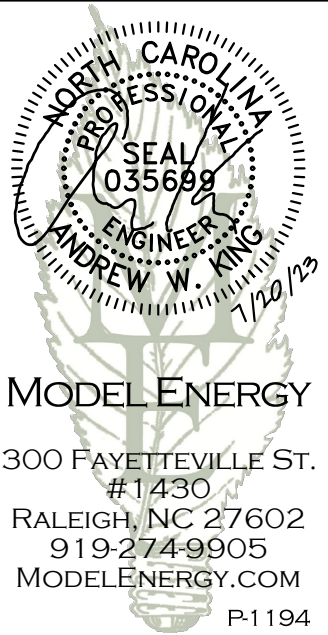
NOTES:

- MAIN BREAKER SERVES AS SERVICE DISCONNECT SWITCH
- BACK-FEED SOLAR OUTPUT VIA (1) 20A BREAKER AT THE OPPOSITE END OF THE BUS BAR FROM THE MAIN BREAKER.



1 PV SYSTEM ELECTRICAL WIRING SCHEMATIC  
SCALE: NTS

ENGINEER:



JOB TITLE:

NEW SOLAR PV SYSTEM

3.950 kW DC INPUT  
3.800 kW AC EXPORT

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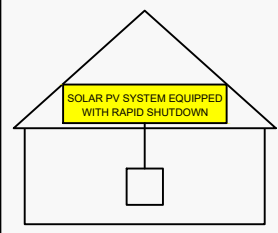
ELECTRICAL INFORMATION

PV4.1

## EQUIPMENT LABELS

### 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



NEC 690.56 (C)(1)(a)  
PLACE WITHIN 3FT OF SERVICE DISCONNECTING MEANS TO WHICH THE PV SYSTEMS ARE CONNECTED AND SHALL INDICATE THE LOCATIONS OF RAPID SHUTDOWN SWITCHES

### WARNING: PHOTOVOLTAIC POWER SOURCE

NEC 690.31 (G)(3)&(4)  
PLACE ON ALL JUNCTION BOXES, EXPOSED RACEWAYS, AND OTHER WIRING METHODS EVERY 10' AND ON EVERY SECTION SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILING, OR FLOORS.

### RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

NEC 690.56 (C)(3)  
PLACE ON RAPID SHUTDOWN SWITCH OR EQUIPMENT WITH INTEGRATED RAPID SHUTDOWN \*REFLECTIVE\*

### PV SYSTEM DISCONNECT

NEC 690.13 (B)  
PLACE ON PV SYSTEM DISCONNECTING MEANS.

### WARNING DUAL POWER SUPPLY

SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

NEC 705.12 (B)(3)  
PLACE ON ALL EQUIPMENT THAT IS SUPPLIED BY BOTH POWER SOURCES

#### EQUIPMENT LABEL NOTES

1. LABELS SHOWN ARE 1/2 THEIR ACTUAL REQUIRED SIZE.
2. LABEL MATERIAL SHALL BE SUITABLE FOR THE EQUIPMENT ENVIRONMENT.
3. CONDUIT SHALL BE MARKED WITH REQUIRED LABEL EVERY 10 FEET.

### WARNING

FED BY MULTIPLE POWER SOURCES

TOTAL RATING OF ALL OVERCURRENT DEVICES EXCLUDING UTILITY OVERCURRENT DEVICE SHALL NOT EXCEED AMPACITY OF BUSBAR

NEC 705.12 (B)(2)(3)(c)  
PLACE ADJACENT TO BACK-FED BREAKER

### WARNING

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

NEC 690.13 (B)  
PLACE ON PV SYSTEM DISCONNECTING MEANS.

### DIRECT CURRENT PHOTOVOLTAIC POWER SOURCE

MAXIMUM VOLTAGE 600 VDC  
MAX CIR. CURRENT 15 AMPS

NEC 690.53  
PLACE ON ALL DC DISCONNECTING MEANS

### PHOTOVOLTAIC POWER SOURCE

OPERATING AC VOLT. 240 VAC  
MAXIMUM OPERATING AC OUTPUT CURRENT 16 AMPS

NEC 690.54  
PLACE ON INTERCONNECTION DISCONNECTING MEANS

### WARNING

POWER SOURCE OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE

NEC 705.12 (B)(2)(3)(b)  
PLACE ADJACENT TO BACK-FED BREAKER

## CONSTRUCTION NOTES

1. ALL WORK AND EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST NATIONAL, STATE, AND LOCAL CODES AND ORDINANCES
2. FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS, BEST PRACTICES, AND SPECIFICATIONS
3. WIRES SHALL BE RATED AND LABELED "SUNLIGHT RESISTANT" WHERE EXPOSED TO AMBIENT CONDITIONS
4. THE PHOTOVOLTAIC SYSTEM SHALL NOT EXCEED 600 VOLTS OR 800 AMPS
5. EACH ELECTRICAL APPLIANCE SHALL BE PROVIDED WITH A NAMEPLATE GIVING THE IDENTIFYING NAME AND THE RATING IN VOLTS AND AMPERES, OR VOLTS AND WATTS. IF THE APPLIANCE IS TO BE USED ON A SPECIFIC FREQUENCY OR FREQUENCIES, IT SHALL BE SO MARKED. WHERE MOTOR OVERLOAD PROTECTION EXTERNAL TO THE APPLIANCES IS REQUIRED, THE APPLIANCE SHALL BE SO MARKED
6. WHERE APPLICABLE, GROUNDING ELECTRODE CONDUCTOR TO BE CONTINUOUS. GROUNDING CRIMPS TO BE IRREVERSIBLE
7. IN ONE- AND TWO-FAMILY DWELLINGS, LIVE PARTS IN PHOTOVOLTAIC SOURCE CIRCUITS AND PHOTOVOLTAIC OUTPUT CIRCUITS OVER 150 VOLTS TO GROUND, SHALL ONLY BE ACCESSIBLE TO QUALIFIED PERSONS WHILE ENERGIZED.
8. PHOTOVOLTAIC SYSTEMS SHALL BE PERMANENTLY MARKED AT VARIOUS EQUIPMENT LOCATIONS TO IDENTIFY THAT A PHOTOVOLTAIC SYSTEM IS INSTALLED AND THAT VARIOUS DANGERS ARE PRESENT.
9. EACH PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS SHALL BE PERMANENTLY MARKED TO IDENTIFY IT AS A PHOTOVOLTAIC SYSTEM DISCONNECT
10. WHERE ALL TERMINALS OF A DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION, A WARNING SIGN SHALL BE MOUNTED ON OR ADJACENT TO THE DISCONNECT
11. A PERMANENT LABEL FOR THE DIRECT-CURRENT PHOTOVOLTAIC POWER SOURCE SHALL BE PROVIDED BY THE INSTALLED AT THE DC DISCONNECT MEANS
12. A PERMANENT PLAQUE OR DIRECTORY, DENOTING ALL ELECTRIC POWER SOURCES SERVING THE PREMISES, SHALL BE INSTALLED AT EACH SERVICE EQUIPMENT LOCATION AND AT LOCATIONS OF ALL POWER PRODUCTION SOURCES.
13. A PERMANENT PLAQUE OR DIRECTORY SHALL BE PROVIDED DENOTING THE LOCATIONS OF THE SERVICE DISCONNECT MEANS AND THE PHOTOVOLTAIC SYSTEM DISCONNECT MEANS IF THEY ARE NOT LOCATED AT THE SAME LOCATION.
14. ALL MODULE GROUND CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH NEC SECTION 690.4 (C)

ENGINEER:



MODEL ENERGY

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CLIENT:



ISSUED FOR: CONSTRUCTION  
DATE: 07/19/23

ELECTRICAL INFORMATION

PV4.2

# MSE PERC 66

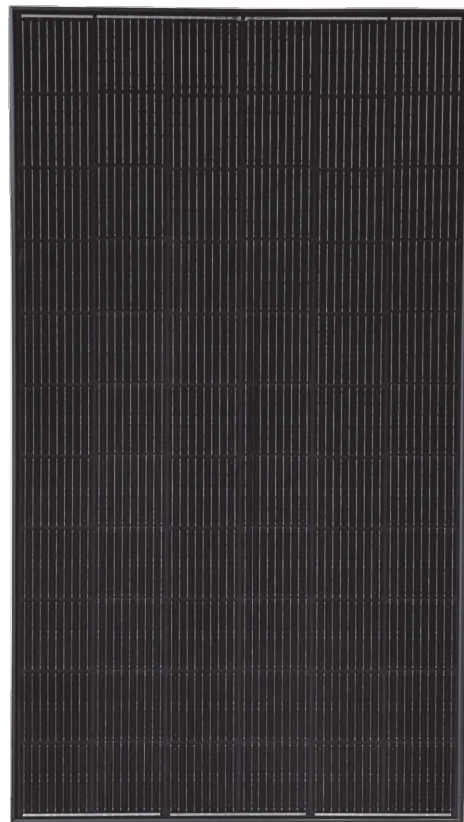
MISSION SOLAR ENERGY



## 395W

Class leading power output -0 to +3%

Positive Power Tolerance



## True American Quality True American Brand

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

Demand the best. Demand Mission Solar Energy.



### Certified Reliability

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



### Advanced Technology

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



### Extreme Weather Resilience

- Up to 5,400 Pa front load & 3,600 Pa back load
- Tested load to UL 61730
- 40 mm frame



### BAA Compliant for Government Projects

- Buy American Act
- American Recovery & Reinvestment Act

### CERTIFICATIONS

CEC

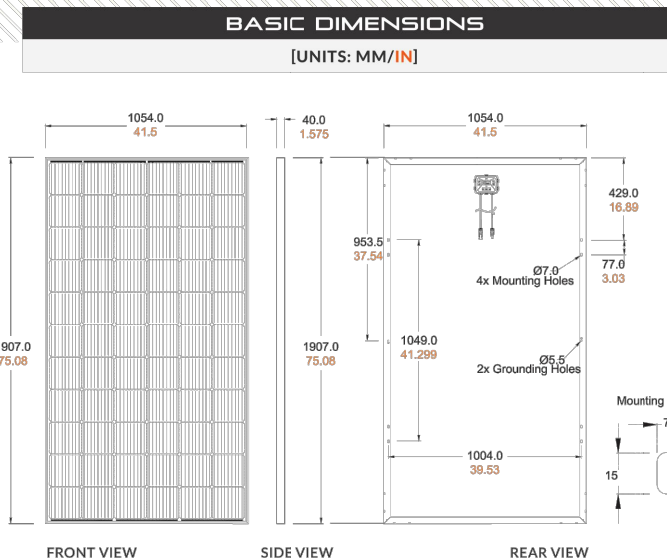


If you have questions or concerns about certification of our products in your area, please contact Mission Solar Energy.

UL 61730 / IEC 61215 / IEC 61730 / IEC 61701

Class Leading  
390-400W

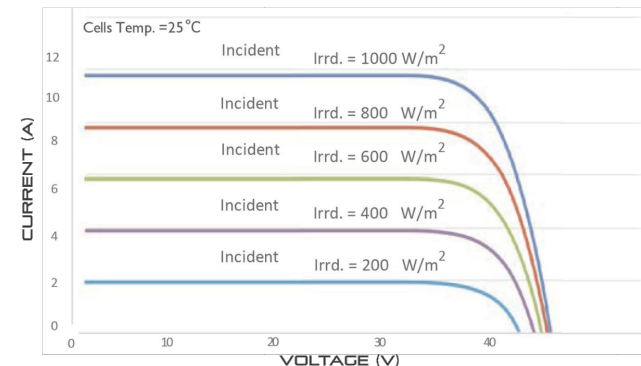
# MSE PERC 66



### CURRENT-VOLTAGE CURVE

MSE385SX9R: 385WP, 66 CELL SOLAR MODULE

Current-voltage characteristics with dependence on irradiance and module temperature



CERTIFICATIONS AND TESTS		
IEC	61215, 61730, 61701	
UL	61730	



CEC



## Mission Solar Energy

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

ELECTRICAL SPECIFICATION				
PRODUCT TYPE	MSExxxSX9R (xxx = P <sub>max</sub> )			
Power Output	P <sub>max</sub> W <sub>p</sub>	390	395	400
Module Efficiency	%	19.4	19.7	19.9
Tolerance	%	0/+3	0/+3	0/+3
Short Circuit Current	I <sub>sc</sub> A	11.19	11.24	11.31
Open Circuit Voltage	V <sub>oc</sub> V	45.04	45.18	45.33
Rated Current	I <sub>mp</sub> A	10.63	10.68	10.79
Rated Voltage	V <sub>mp</sub> V	36.68	36.99	37.07
Fuse Rating	A	20	20	20
System Voltage	V	1,000	1,000	1,000

TEMPERATURE COEFFICIENTS	
Normal Operating Cell Temperature (NOCT)	43.75°C (±3.7%)
Temperature Coefficient of P <sub>max</sub>	-0.367%/°C
Temperature Coefficient of V <sub>oc</sub>	-0.259%/°C
Temperature Coefficient of I <sub>sc</sub>	0.033%/°C

OPERATING CONDITIONS	
Maximum System Voltage	1,000Vdc
Operating Temperature Range	-40°F to 185°F (-40°C to +85°C)
Maximum Series Fuse Rating	20A
Fire Safety Classification	Type 1*
Front & Back Load (UL Standard)	Up to 5,400 Pa front and 3,600 Pa back load, Tested to UL 61730
Hail Safety Impact Velocity	25mm at 23 m/s

\*Mission Solar Energy uses quality sourced materials that result in a Type 1 fire rating. Please note, the 'Fire Class' Rating is designated for the fully-installed PV system, which includes, but is not limited to, the module, the type of mounting used, pitch and roof composition.

MECHANICAL DATA	
Solar Cells	P-type mono-crystalline silicon
Cell Orientation	66 cells (6x11)
Module Dimension	1,907mm x 1,054mm x 40mm
Weight	48.5 lbs. (22 kg)
Front Glass	3.2mm tempered, low-iron, anti-reflective
Frame	40mm Anodized
Encapsulant	Ethylene vinyl acetate (EVA)
Junction Box	Protection class IP67 with 3 bypass-diodes
Cable	1.2m, Wire 4mm <sup>2</sup> (12AWG)
Connector	Staubli PV-KBT4/6II-UR and PV-KST4/6II-UR, MC4, Renhe 05-8

SHIPPING INFORMATION				
Container Feet	Ship To	Pallet	Panels	390W Bin
53'	Most States	30	780	304.20 kW
Double Stack	CA	26	676	263.64 kW
PALLET [26 PANELS]				
Weight	Height	Width	Length	
1,300 lbs. (572 kg)	47.56 in (120.80 cm)	46 in (116.84 cm)	77 in (195.58 cm)	

ENGINEER:



MODEL ENERGY

300 FAYETTEVILLE ST.  
#1430  
RALEIGH, NC 27602  
919-274-9905  
MODELENERGY.COM  
P-1194

JOB TITLE:

NEW SOLAR PV SYSTEM

3.950 kW DC INPUT  
3.800 kW AC EXPORT

Dorothy Burney  
132 Chedworth Dr,  
Angier, NC 27501

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CLIENT:



ISSUED FOR: DATE:

CONSTRUCTION 07/19/23

LABELS,  
DETAILS & SPECS

# PV5.1

# Power Optimizer

For North America

P320 / P340 / P370 / P400 / P401 / P405 / P485 / P505



POWER OPTIMIZER

## PV power optimization at the module-level

- Specifically designed to work with SolarEdge inverters
- Up to 25% more energy
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch losses, from manufacturing tolerance to partial shading
- Flexible system design for maximum space utilization
- Fast installation with a single bolt
- Next generation maintenance with module-level monitoring
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)
- Module-level voltage shutdown for installer and firefighter safety

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



## Power Optimizer For North America

P320 / P340 / P370 / P400 / P401 / P405 / P485 / P505

Optimizer model (typical module compatibility)	P320 (for 60-cell modules)	P340 (for high-power 60-cell modules)	P370 (for higher-power 60 and 72-cell modules)	P400 (for 72 & 96-cell modules)	P401 (for high-power 60 and 72 cell modules)	P405 (for high-voltage modules)	P485 (for high-voltage modules)	P505 (for higher current modules)		
<b>INPUT</b>										
Rated Input DC Power <sup>(1)</sup>	320	340	370	400		405	485	505	W	
Absolute Maximum Input Voltage (Voc at lowest temperature)	48		60	80	60	125 <sup>(2)</sup>		83 <sup>(2)</sup>	Vdc	
MPPT Operating Range	8 - 48		8 - 60	8 - 80	8-60	12.5 - 105		12.5 - 83	Vdc	
Maximum Short Circuit Current (Isc)	11			10.1	11.75	11		14	Adc	
Maximum Efficiency	99.5									
Weighted Efficiency	98.8								98.6	%
Overvoltage Category	II									
<b>OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREEDGE INVERTER)</b>										
Maximum Output Current	15								Adc	
Maximum Output Voltage	60				85				Vdc	
<b>OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREEDGE INVERTER OR SOLAREEDGE INVERTER OFF)</b>										
Safety Output Voltage per Power Optimizer	1 ± 0.1									Vdc
<b>STANDARD COMPLIANCE</b>										
EMC	FCC Part15 Class B, IEC61000-6-2, IEC61000-6-3									
Safety	IEC62109-1 (class II safety), UL1741									
Material	UL94 V-0, UV Resistant									
RoHS	Yes									
<b>INSTALLATION SPECIFICATIONS</b>										
Maximum Allowed System Voltage	1000									Vdc
Compatible inverters	All SolarEdge Single Phase and Three Phase inverters									
Dimensions (W x L x H)	129 x 153 x 27.5 / 5.1 x 6 x 1.1		129 x 153 x 33.5 / 5.1 x 6 x 1.3	129 x 153 x 29.5 / 5.1 x 6 x 1.16	129 x 159 x 49.5 / 5.1 x 6.3 x 1.9		129 x 162 x 59 / 5.1 x 6.4 x 2.3		mm / in	
Weight (including cables)	630 / 1.4		750 / 1.7	655 / 1.5	845 / 1.9		1064 / 2.3		gr / lb	
Input Connector	MC4 <sup>(3)</sup>						Single or dual MC4 <sup>(3)(4)</sup>	MC4 <sup>(3)</sup>		
Input Wire Length	0.16 / 0.52									m / ft
Output Wire Type / Connector	Double Insulated / MC4									
Output Wire Length	0.9 / 2.95			1.2 / 3.9						m / ft
Operating Temperature Range <sup>(5)</sup>	-40 - +85 / -40 - +185									°C / °F
Protection Rating	IP68 / NEMA6P									
Relative Humidity	0 - 100									%

(1) Rated power of the module at STC will not exceed the optimizer "Rated Input DC Power". Modules with up to +5% power tolerance are allowed  
 (2) NEC 2017 requires max input voltage be not more than 80V  
 (3) For other connector types please contact SolarEdge  
 (4) For dual version for parallel connection of two modules use P485-4NMDMRM. In the case of an odd number of PV modules in one string, installing one P485 dual version power optimizer connected to one PV module. When connecting a single module seal the unused input connectors with the supplied pair of seals.  
 (5) For ambient temperature above +85°C / +185°F power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details.

PV System Design Using a SolarEdge Inverter <sup>(6)(7)</sup>	Single Phase HD-Wave	Single phase	Three Phase for 208V grid	Three Phase for 277/480V grid	
Minimum String Length (Power Optimizers)	P320, P340, P370, P400, P401 P405, P485, P505	8	10	18	
Maximum String Length (Power Optimizers)		6	8	14	
Maximum Power per String	5700 (6000 with SE7600-US - SE11400-US)	25	25	50 <sup>(8)</sup>	W
Parallel Strings of Different Lengths or Orientations	Yes				

(6) For detailed string sizing information refer to: [http://www.solaredge.com/sites/default/files/string\\_sizing\\_na.pdf](http://www.solaredge.com/sites/default/files/string_sizing_na.pdf)  
 (7) It is not allowed to mix P405/P485/P505 with P320/P340/P370/P400/P401 in one string  
 (8) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement  
 (9) For 208V grid: it is allowed to install up to 7,200W per string when the maximum power difference between each string is 1,000W  
 (10) For 277/480V grid: it is allowed to install up to 15,000W per string when the maximum power difference between each string is 2,000W

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ENGINEER:



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CLIENT:



ISSUED FOR: CONSTRUCTION  
 DATE: 07/19/23

EQUIPMENT SPEC SHEETS

PV5.2

# Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US



**12-25**  
YEAR  
WARRANTY

INVERTERS

## Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking efficiency
- Fixed voltage inverter for longer strings
- Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Extremely small
- Built-in module-level monitoring
- Outdoor and indoor installation
- Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)

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



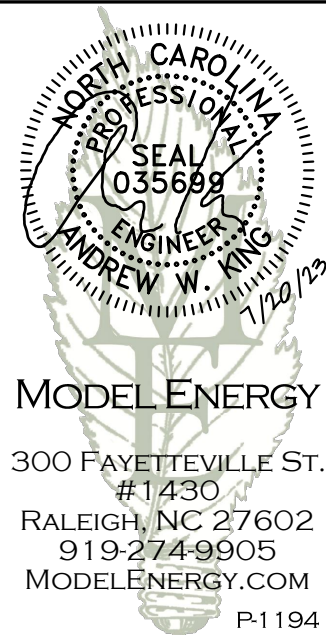
## Single Phase Inverter with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US		
<b>OUTPUT</b>									
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA	
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA	
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓	Vac	
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	✓	-	✓	-	-	✓	Vac	
AC Frequency (Nominal)	59.3 - 60 - 60.5 <sup>(1)</sup>							Hz	
Maximum Continuous Output Current @240V	12.5	16	21	25	32	42	47.5	A	
Maximum Continuous Output Current @208V	-	16	-	24	-	-	48.5	A	
GFDI Threshold	1							A	
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes								
<b>INPUT</b>									
Maximum DC Power @240V	4650	5900	7750	9300	11800	15500	17650	W	
Maximum DC Power @208V	-	5100	-	7750	-	-	15500	W	
Transformer-less, Ungrounded	Yes								
Maximum Input Voltage	480							Vdc	
Nominal DC Input Voltage	380				400			Vdc	
Maximum Input Current @240V <sup>(2)</sup>	8.5	10.5	13.5	16.5	20	27	30.5	Adc	
Maximum Input Current @208V <sup>(2)</sup>	-	9	-	13.5	-	-	27	Adc	
Max. Input Short Circuit Current	45							Adc	
Reverse-Polarity Protection	Yes								
Ground-Fault Isolation Detection	600k $\Omega$ Sensitivity								
Maximum Inverter Efficiency	99	99.2				99 @ 240V 98.5 @ 208V		%	
CEC Weighted Efficiency	99						99 @ 240V 98.5 @ 208V	%	
Nighttime Power Consumption	< 2.5							W	
<b>ADDITIONAL FEATURES</b>									
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)								
Revenue Grade Data, ANSI C12.20	Optional <sup>(3)</sup>								
Rapid Shutdown - NEC 2014 and 2017 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect								
<b>STANDARD COMPLIANCE</b>									
Safety	UL1741, UL1741 SA, UL1599B, CSA C22.2, Canadian AFCEI according to T.I.L. M-07								
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (HI)								
Emissions	FCC Part 15 Class B								
<b>INSTALLATION SPECIFICATIONS</b>									
AC Output Conduit Size / AWG Range	1" Maximum / 14-6 AWG				1" Maximum / 14-4 AWG				
DC Input Conduit Size / # of Strings / AWG Range	1" Maximum / 1-2 strings / 14-6 AWG				1" Maximum / 1-3 strings / 14-6 AWG				
Dimensions with Safety Switch (HxWxD)	17.7 x 14.6 x 6.8 / 450 x 370 x 174				21.3 x 14.6 x 7.3 / 540 x 370 x 185				in / mm
Weight with Safety Switch	22 / 10	25.1 / 11.4	26.2 / 11.9	38.8 / 17.6			lb / kg		
Noise	< 25				<50				dBA
Cooling	Natural Convection								
Operating Temperature Range	-13 to +140 / -25 to +60 <sup>(4)</sup> (-40°F / -40°C option) <sup>(5)</sup>							°F / °C	
Protection Rating	NEMA 4X (Inverter with Safety Switch)								

<sup>(1)</sup> For other regional settings please contact SolarEdge support  
<sup>(2)</sup> A higher current source may be used; the inverter will limit its input current to the values stated  
<sup>(3)</sup> Revenue grade inverter P/N: SExxxxH-US000NNC2  
<sup>(4)</sup> For power de-rating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf>  
<sup>(5)</sup> -40 version P/N: SExxxxH-US000NNU4

ENGINEER:



JOB TITLE:

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CLIENT:



ISSUED FOR: DATE:  
CONSTRUCTION 07/19/23

EQUIPMENT  
SPEC SHEETS

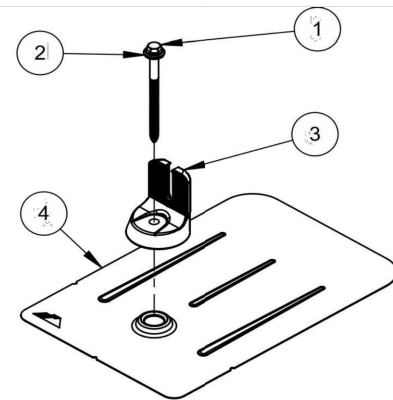
PV5.3





# FlashVue

Cut Sheet

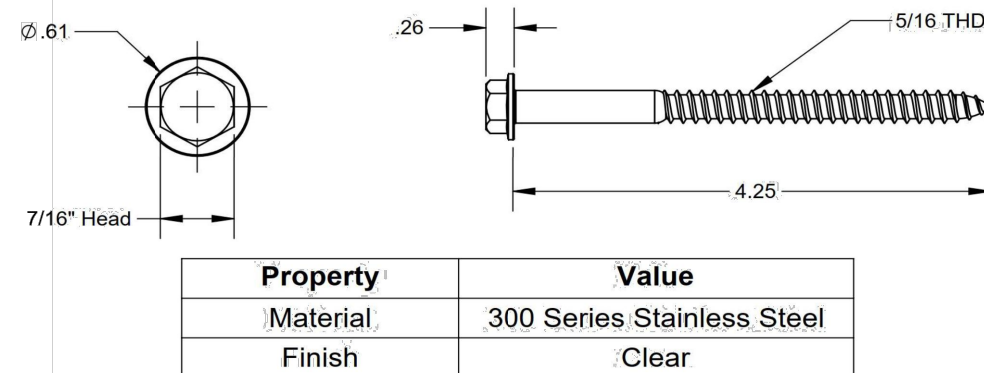


ITEM NO	DESCRIPTION	QTY IN KIT
1	BOLT, LAG 5/16 X 4.25"	1
2	WASHER, EPDM BACKED	1
3	FM FLASHING, MILL OR BLACK	1
4	GRIP CAP, MILL OR BLACK	1

## FLASHVUE

PART NUMBER	DESCRIPTION
FV-01-M1	FLASHING, FLASHFOOT, MILL
FV-01-B1	FLASHING, FLASHFOOT, BLACK

### 1) BOLT, LAG 5/16 x 4.25"

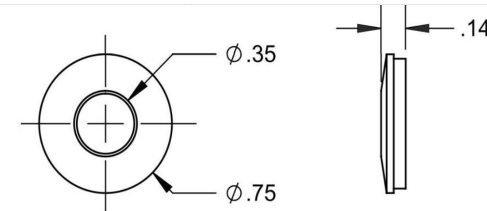


Property	Value
Material	300 Series Stainless Steel
Finish	Clear

v1.0

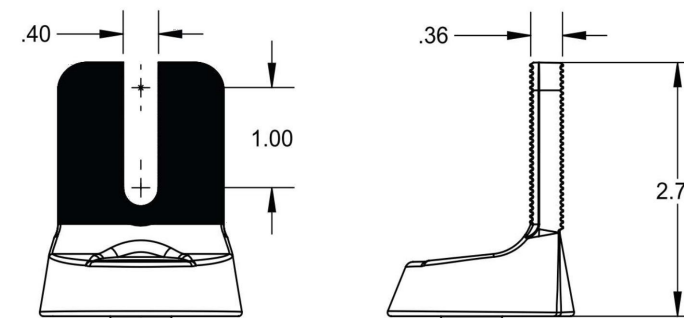
Cut Sheet

### 2) Washer, EPDM Backed



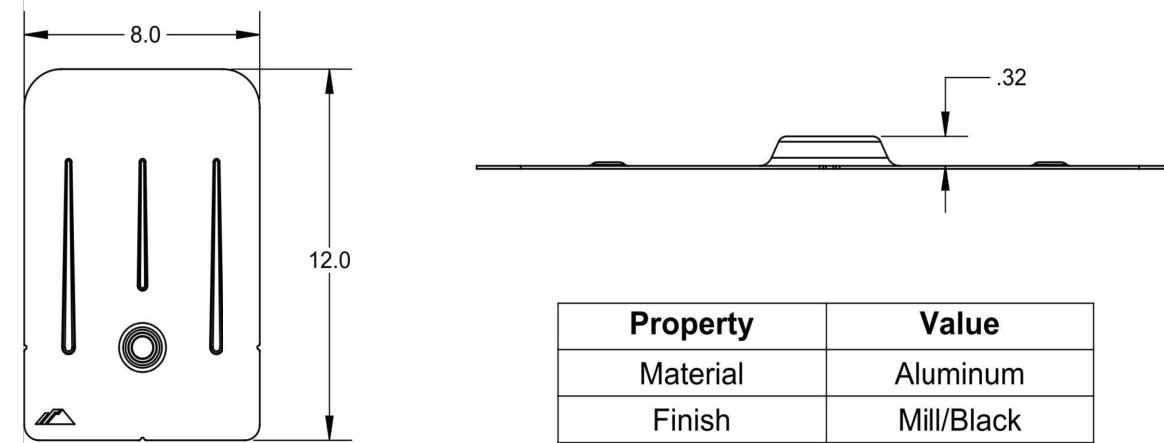
Property	Value
Material	300 Series Stainless Steel
Finish	Clear

### 3) Grip Cap



Property	Value
Material	Aluminum
Finish	Mill/Black

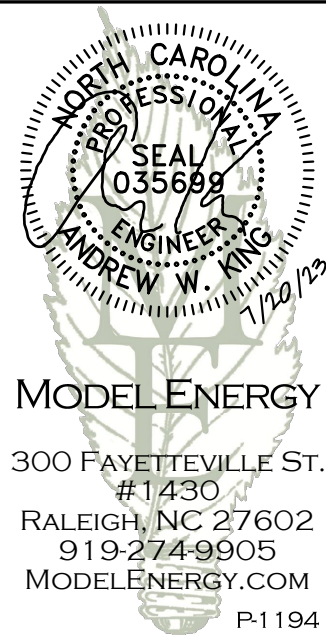
### 4) FM Flashing



Property	Value
Material	Aluminum
Finish	Mill/Black

v1.0

ENGINEER:



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DATE: 07/19/23

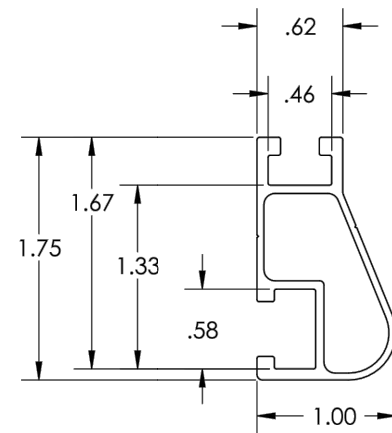
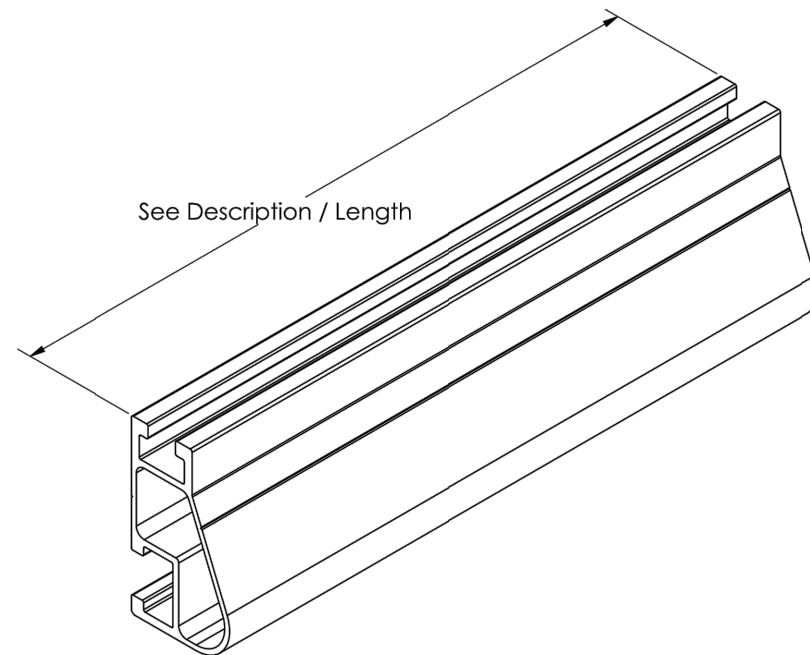

EQUIPMENT SPEC SHEETS

# PV5.4



## XR10 Rail

Cut Sheet



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

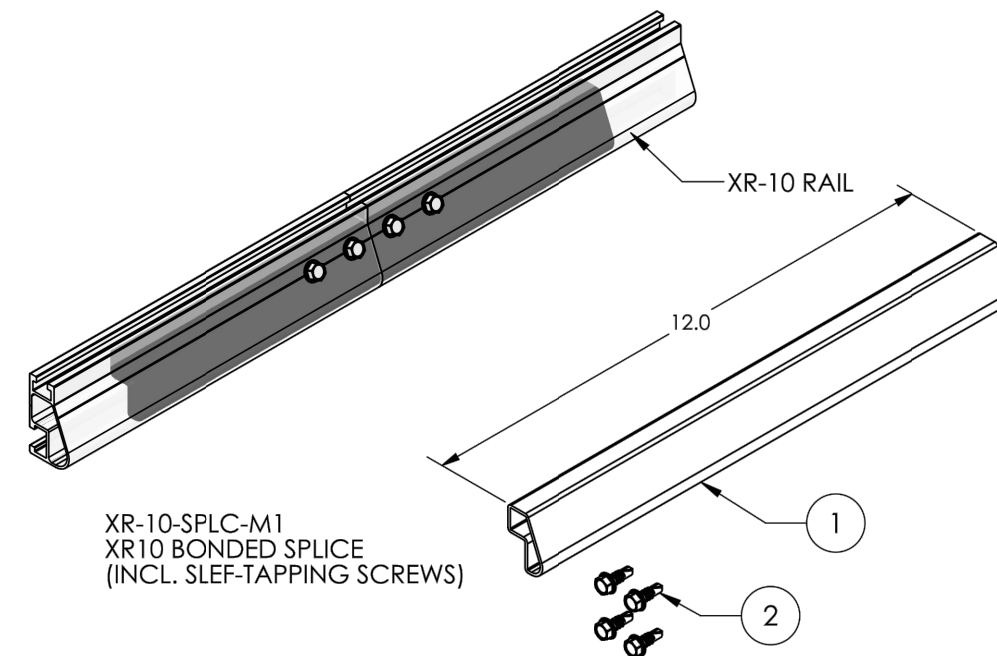
Clear Part Number	Black Part Number	Description / Length	Material	Weight
XR-10-132A	XR-10-132B	XR10, Rail 132" (11 Feet)	6000-Series Aluminum	4.67 lbs.
XR-10-168A	XR-10-168B	XR10, Rail 168" (14 Feet)		5.95 lbs.
XR-10-204A	XR-10-204B	XR10, Rail 204" (17 Feet)		7.22 lbs.

v1.0

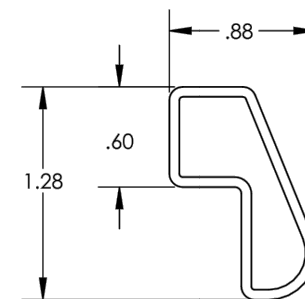


## XR10 Bonded Splice

Cut Sheet

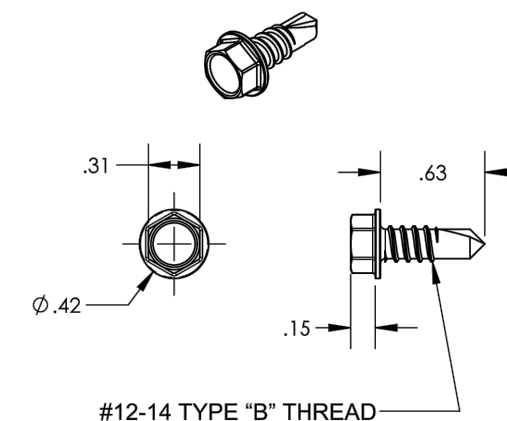


### 1) Splice, XR10, Mill 12" long



Property	Value
Material	6000 Series Aluminum
Finish	Mill

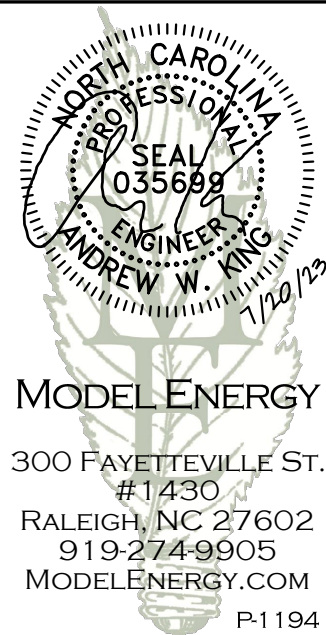
### 2) Screw, Self Drilling



Property	Value
Material	300 Series Stainless Steel
Finish	Clear

v1.10

ENGINEER:



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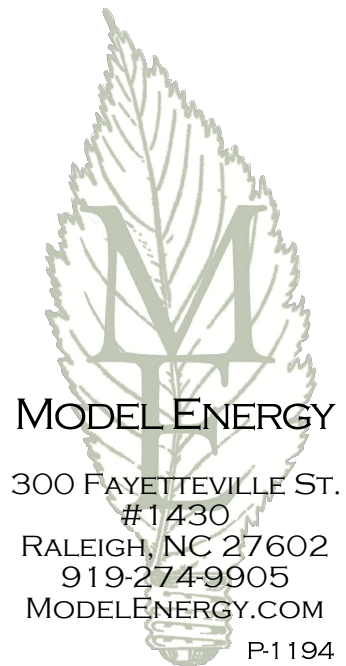
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CONSTRUCTION 07/19/23


EQUIPMENT  
SPEC SHEETS

# PV5.5



Customer: Dorothy Burney  
 Installer: Emerald Energy  
 Subject: PV System Structural Compliance  
 Date: 07/19/23



To whom it may concern:

Model Energy, PLLC has reviewed the installation details of the proposed PV system that is to be installed by Emerald Energy at 132 Chedworth Dr, Angier, NC 27501. The conditions of the existing structure have been reviewed and validated by Model Energy, PLLC. The existing roof structure has been designed to support the additional loads of the proposed PV system. In addition, the racking and fastening system shall be capable of securing the system to the structure under design conditions when installed properly and in accordance with the racking and fastening arrangement detailed within the accompanying permit set. The installation design is compliant with current 2018 North Carolina state and national building codes.

Thank you,

Andrew King, PE

