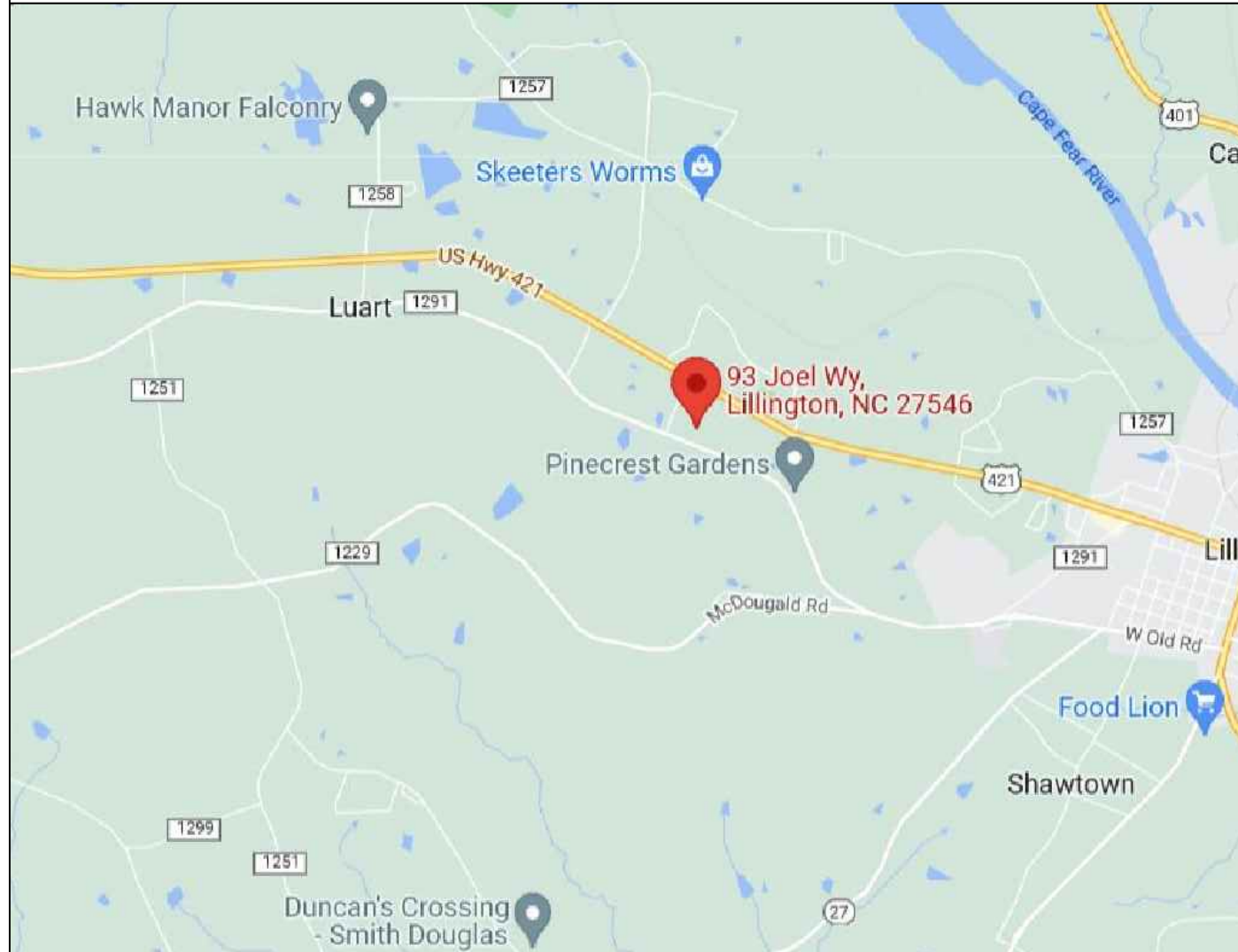


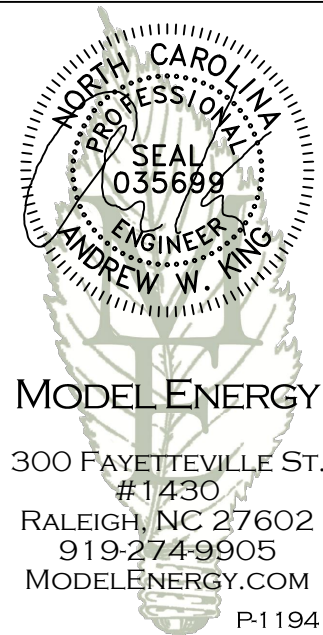
VICINITY MAP



PROPERTY MAP



ENGINEER:



JOB TITLE:

NEW SOLAR PV SYSTEM

9.480 kW DC INPUT
7.600 kW AC EXPORT

Cornett, Tracy
93 Joel Wy
Lillington, NC 27546

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CLIENT:

691 ELECTRIC

ISSUED FOR:	DATE:
CONSTRUCTION	11/12/2022

PROJECT INFORMATION

PV1.1

SCOPE OF WORK

(24) CS3N-395MS
(1) SOLAREEDGE SE7600H-US
ROOF MOUNT: FLASHFOOT 2
MOUNTING RAILS: XRI00

SITE CONDITION

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

SHEET INDEX

PV1.1 - 1.2 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

BACKFED BREAKER

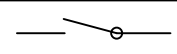
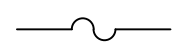
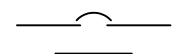

CODE REFERENCES

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

UTILITY COMPANY

DUKE ENERGY PROGRESS

LEGEND

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



AURORA SOLAR SHADE ANALYSIS

CORNETT, TRACY
 93 JOEL WY
 LILLINGTON, NC 27546
 9.480 KW DC STC
 7.600 KW AC

MODULES:

(24) CS3N-395MS

INVERTERS:

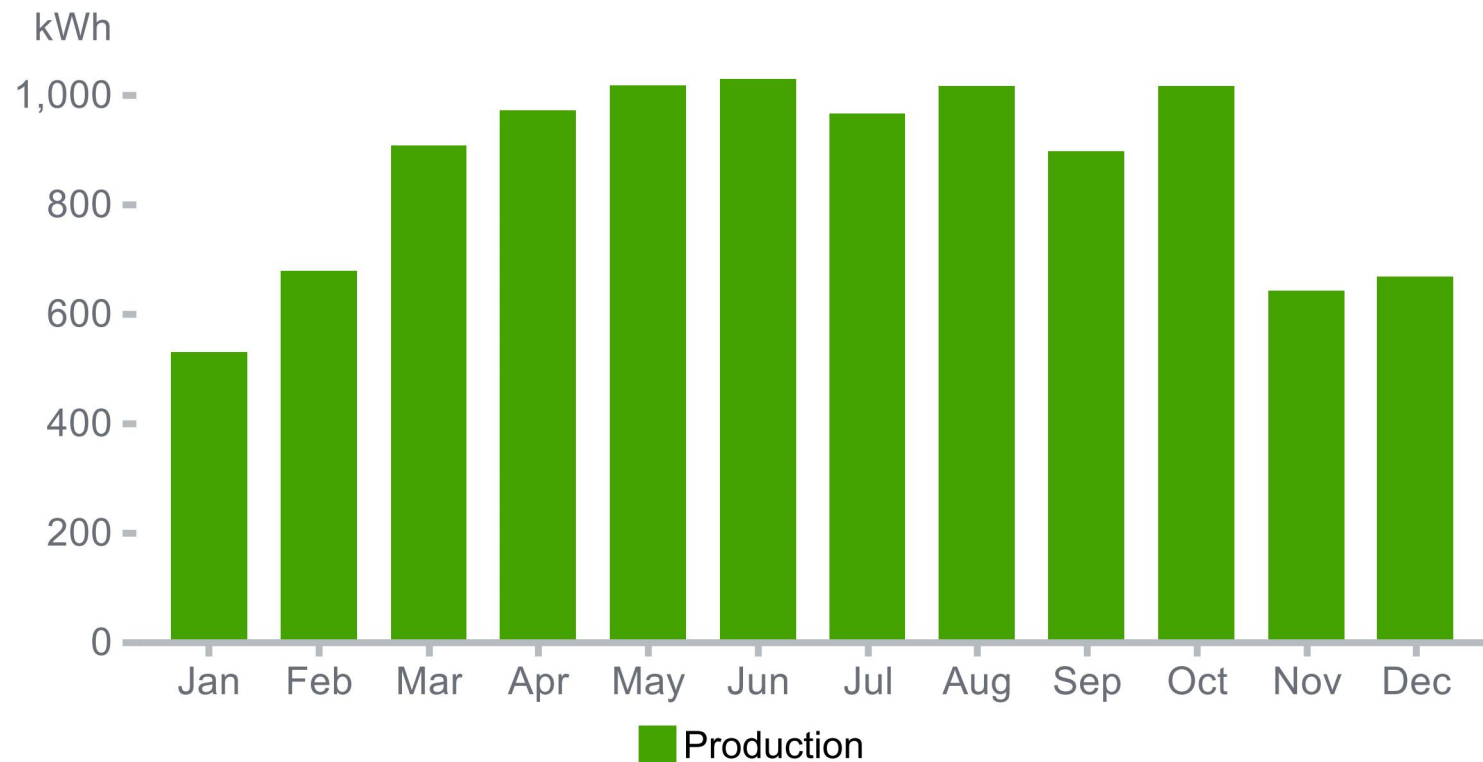
(1) SOLAREEDGE SE7600H-US

POWER OPTIMIZERS:

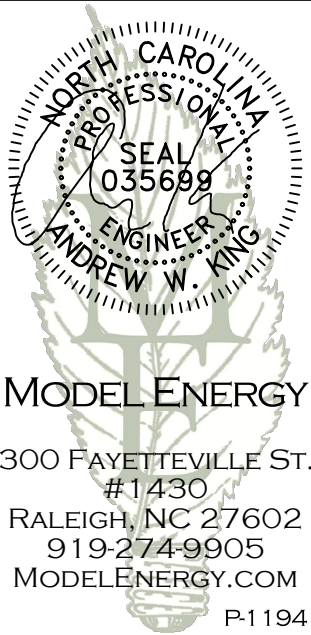
(24) S440

THE SYSTEM HAS A FIRST YEAR ANNUAL ENERGY PRODUCTION OF: 10,352 KWH/YEAR

THIS PRODUCTION IS AN ESTIMATE PREPARED USING AURORA SOLAR SHADE ANALYSIS SOFTWARE. ALL SOLAR SYSTEMS EXPERIENCE PERFORMANCE DEGRADATION OVER THEIR LIFETIME. THIS IS USUALLY APPROXIMATELY 1% PER YEAR, BUT VARIES BASED ON EQUIPMENT USED AND ENVIRONMENTAL CONDITIONS.



ENGINEER:



JOB TITLE:

NEW SOLAR PV SYSTEM

9.480 KW DC INPUT
 7.600 KW AC EXPORT

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 93 Joel Wy
 Lillington, NC 27546

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CLIENT:

691 ELECTRIC

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DATE:

CONSTRUCTION

11/12/2022

SITE INFORMATION

PV1.2

ENGINEER:



MODEL ENERGY

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

P-1194

JOB TITLE:

NEW SOLAR PV SYSTEM

9.480 kW DC INPUT
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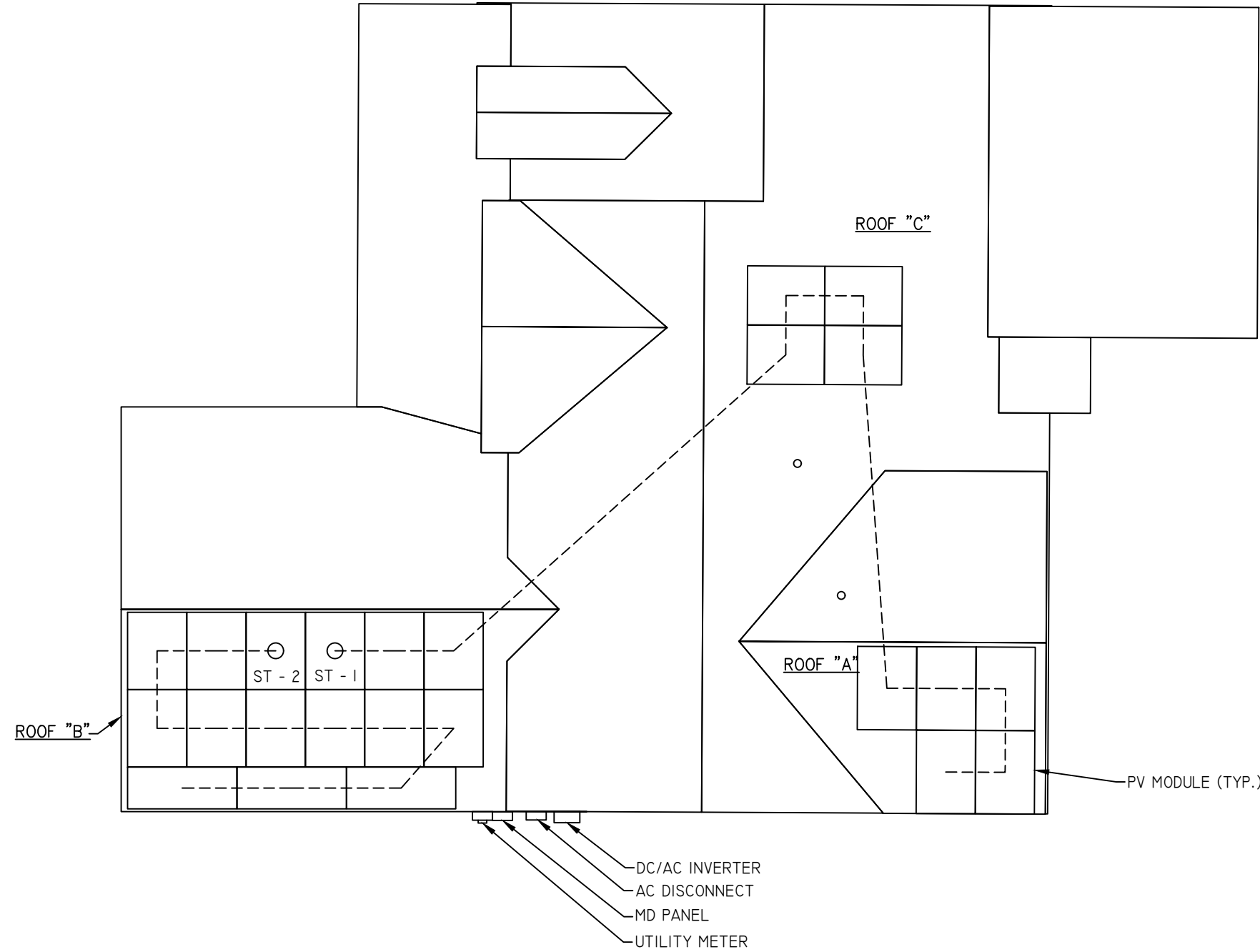
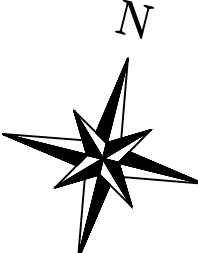
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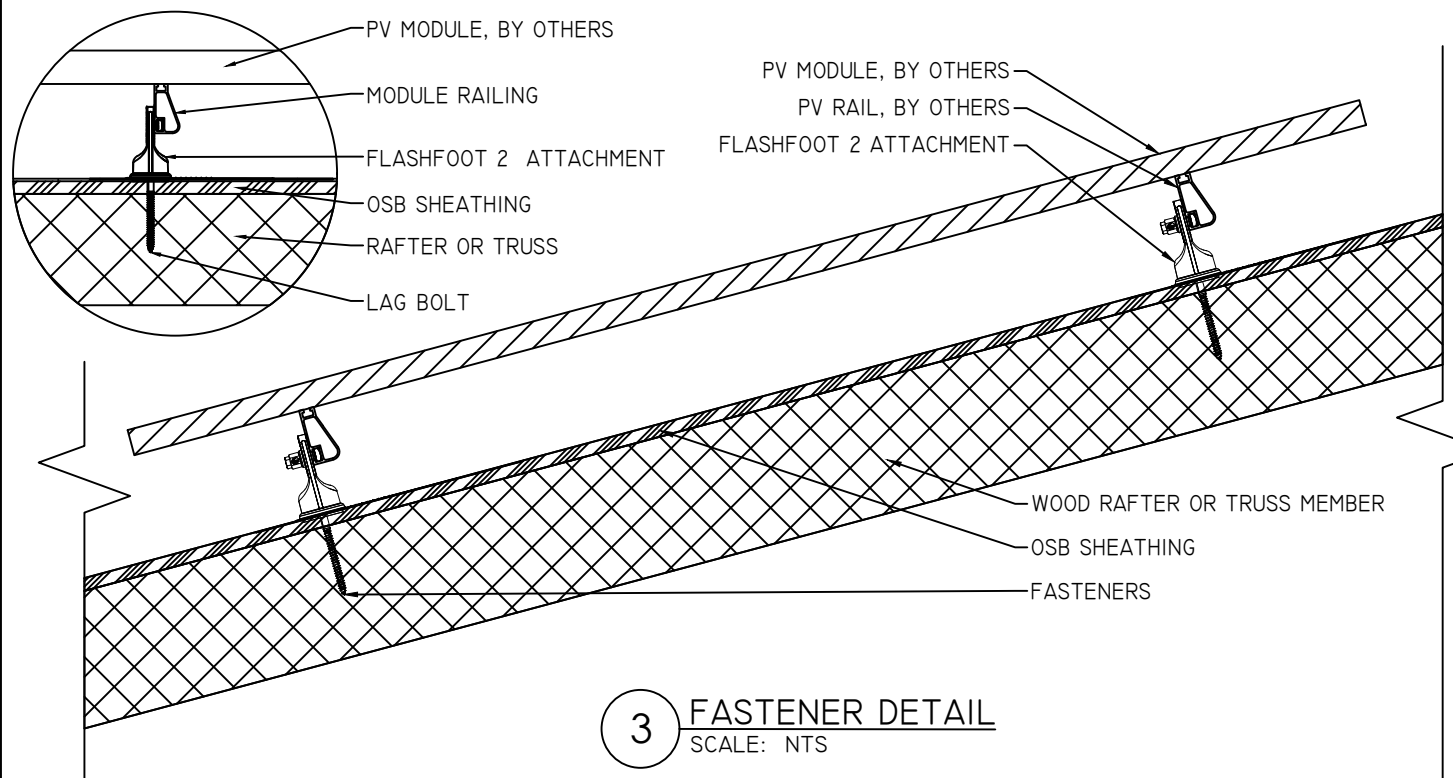
SITE INFORMATION

PV2.1



FRONT OF RESIDENCE

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



3 FASTENER DETAIL
SCALE: NTS

ARRAY "B" SUMMARY

# MODULES	15
# ROOF MOUNTS	52
RAIL LENGTH	111 FT.
ARRAY AREA	329 SQFT.
ARRAY WEIGHT	883 LBS.
AZIMUTH @ SN	166°
TILT ANGLE	45°

ARRAY "A" SUMMARY

# MODULES	5
# ROOF MOUNTS	18
RAIL LENGTH	42 FT.
ARRAY AREA	110 SQFT.
ARRAY WEIGHT	301 LBS.
AZIMUTH @ SN	166°
TILT ANGLE	40°

ROOF "A" SUMMARY

STRUCTURE:	
TYPE	RAFTER
MATERIAL	SOUTHERN PINE #2
SIZE	2" X 8"
SPACING	16"
EFF. SPAN	9'-9"
PITCH	10/12
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.

ROOF "B" SUMMARY

STRUCTURE:	
TYPE	RAFTER
MATERIAL	SOUTHERN PINE #2
SIZE	2" X 8"
SPACING	16"
EFF. SPAN	11'-9"
PITCH	12/12
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.

PV MODULES


MAKE	CAN. SOLAR
MODEL	CS3N-395MS
WIDTH	41.3"
LENGTH	76.4"
THICKNESS	1.4"
WEIGHT	50 LBS

MOUNTING RAILS

MAKE	IRONRIDGE
MODEL	XRI00
MATERIAL	ALUMINUM
WEIGHT	1.25 LBS/SQFT
SPACING	34"

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	FLASHFOOT2
MATERIAL	ALUMINUM
FASTENER:	
MAKE	GENERIC
MODEL	LAG BOLT
MATERIAL	304 SS
SIZE	5/16" X 4"
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 "B" 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.
STRUCTURAL	2.2 LBS./SQFT.
TOTAL	8.6 LBS./SQFT.
WIND LOAD:	
UPLIFT ZONE 1	-26.9 LBS/SQFT
UPLIFT ZONE 2	-32.4 LBS/SQFT
UPLIFT ZONE 3	-32.4 LBS/SQFT
DOWNWARD	24.7 LBS/SQFT
FASTENER LOAD:	
UPLIFT ZONE 1	-343 LBS
UPLIFT ZONE 2	-275 LBS
UPLIFT ZONE 3	-138 LBS
DOWNWARD	315 LBS

ROOF "A" LOADING

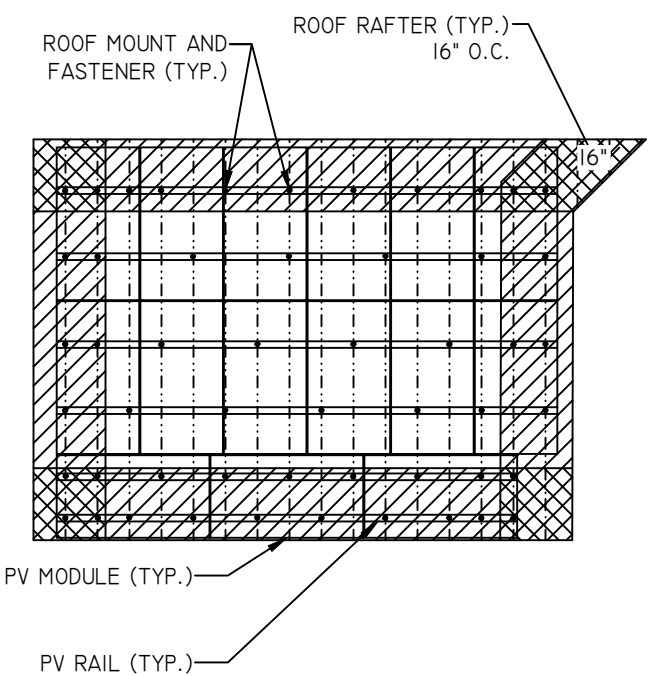
GROUND SNOW LOAD:	15 LBS./SQFT.
LIVE LOAD:	20 LBS./SQFT.
DEAD LOAD:	
ROOFING	3.9 LBS./SQFT.
PV ARRAY	2.5 LBS./SQFT.
STRUCTURAL	2.2 LBS./SQFT.
TOTAL	8.6 LBS./SQFT.
WIND LOAD:	
UPLIFT ZONE 1	-24.6 LBS/SQFT
UPLIFT ZONE 2	-29.0 LBS/SQFT
UPLIFT ZONE 3	-29.0 LBS/SQFT
DOWNWARD	23.0 LBS/SQFT
FASTENER LOAD:	
UPLIFT ZONE 1	-313 LBS
UPLIFT ZONE 2	-246 LBS
UPLIFT ZONE 3	-123 LBS
DOWNWARD	293 LBS

ROOF "B" ZONES:

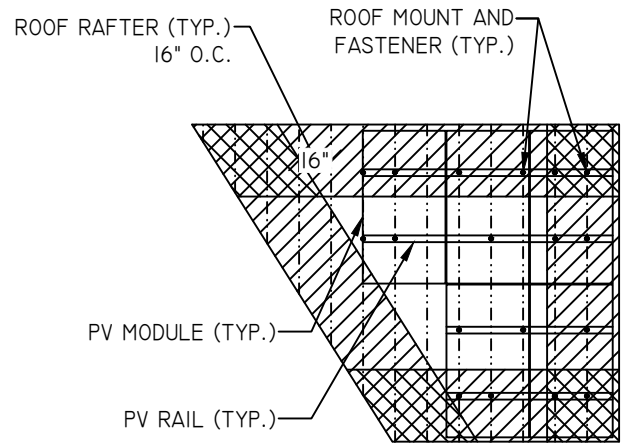
ALL ZONES	MAX. RAIL OVERHANG =	12"
☐ ZONE 1	MAX. FASTENER SPAN ZONE 1 =	48"
▨ ZONE 2	MAX. FASTENER SPAN ZONE 2 =	32"
▩ ZONE 3	MAX. FASTENER SPAN ZONE 3 =	16"

ROOF "A" ZONES:

ALL ZONES	MAX. RAIL OVERHANG =	12"
☐ ZONE 1	MAX. FASTENER SPAN ZONE 1 =	48"
▨ ZONE 2	MAX. FASTENER SPAN ZONE 2 =	32"
▩ ZONE 3	MAX. FASTENER SPAN ZONE 3 =	16"



2 ROOF "B" PLANAR VIEW
SCALE: 1/8" = 1' -0"



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

ENGINEER:



MODEL ENERGY

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

JOB TITLE:

NEW SOLAR PV SYSTEM

9.480 kW DC INPUT
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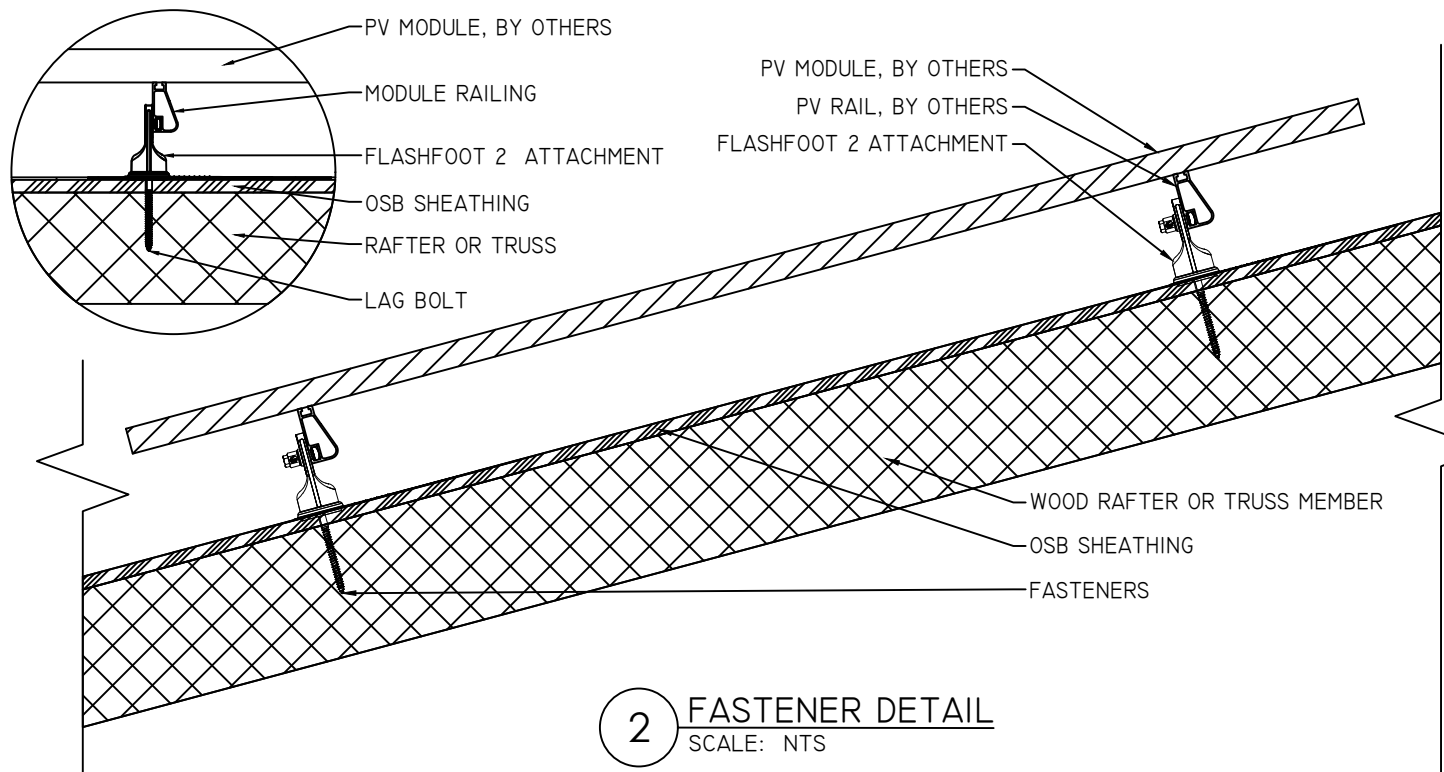
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CONSTRUCTION 11/12/2022

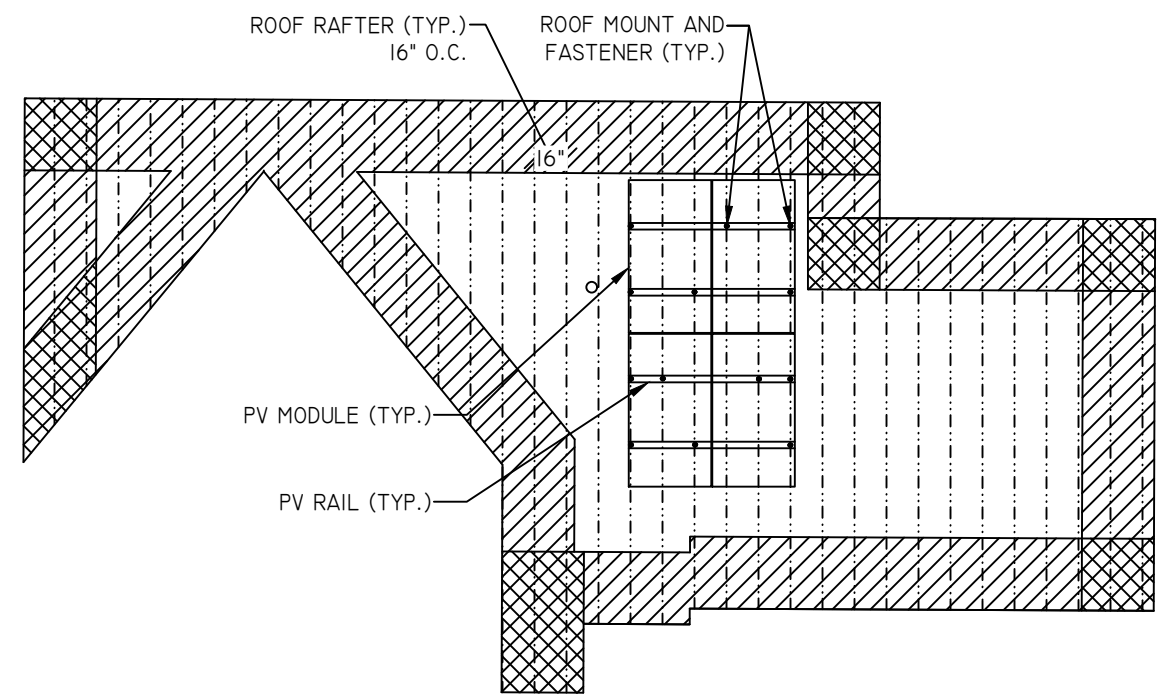
STRUCTURAL INFORMATION

PV3.1



2 FASTENER DETAIL
SCALE: NTS

ROOF "C" ZONES:			
ALL ZONES	MAX. RAIL OVERHANG =		12"
☐ ZONE 1	MAX. FASTENER SPAN ZONE 1 =		48"
▨ ZONE 2	MAX. FASTENER SPAN ZONE 2 =		32"
⊠ ZONE 3	MAX. FASTENER SPAN ZONE 3 =		16"



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


ARRAY "C" SUMMARY	
# MODULES	4
# ROOF MOUNTS	13
RAIL LENGTH	36 FT.
ARRAY AREA	88 SQFT.
ARRAY WEIGHT	243 LBS.
AZIMUTH @ SN	76°
TILT ANGLE	45°

MOUNTING RAILS	
MAKE	IRONRIDGE
MODEL	XRI00
MATERIAL	ALUMINUM
WEIGHT	1.25 LBS/SQFT
SPACING	34"

PV MODULES	
MAKE	CAN. SOLAR
MODEL	CS3N-395MS
WIDTH	41.3"
LENGTH	76.4"
THICKNESS	1.4"
WEIGHT	50 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	FLASHFOOT2
MATERIAL	ALUMINUM
FASTENER	
MAKE	GENERIC
MODEL	LAG BOLT
MATERIAL	304 SS
SIZE	5/16" X 4"
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 "C" SUMMARY	
STRUCTURE:	
TYPE	RAFTER
MATERIAL	SOUTHERN PINE #2
SIZE	2" X 8"
SPACING	16"
EFF. SPAN	20'-2"
PITCH	12/12
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.

ROOF "C" 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.
STRUCTURAL	2.2 LBS./SQFT.
TOTAL	8.6 LBS./SQFT.
WIND LOAD:	
UPLIFT ZONE 1	-26.9 LBS/SQFT
UPLIFT ZONE 2	-32.4 LBS/SQFT
UPLIFT ZONE 3	-32.4 LBS/SQFT
DOWNWARD	24.7 LBS/SQFT
FASTENER LOAD:	
UPLIFT ZONE 1	-343 LBS
UPLIFT ZONE 2	-275 LBS
UPLIFT ZONE 3	-138 LBS
DOWNWARD	315 LBS

ENGINEER:



MODEL ENERGY

300 FAYETTEVILLE ST.
#1430
RALEIGH, NC 27602
919-274-9905
MODELENERGY.COM
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JOB TITLE:

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9.480 kW DC INPUT
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CLIENT:

691 ELECTRIC

ISSUED FOR: CONSTRUCTION
DATE: 11/12/2022

STRUCTURAL INFORMATION

PV3.2

PV MODULES	
MAKE	CAN. SOLAR
MODEL	CS3N-395MS
TECHNOLOGY	MONO-CRYST.
NOM. POWER (P _{NOM})	395 WATTS
NOM. VOLT. (V _{MP})	37.0 VOLTS
O.C. VOLT. (V _{oc})	44.3 VOLTS
MAX. SYS. VOLT.	1000 V (UL)
TEMP. COEF. (V _{Tc})	-0.27 %/°C
NOM. CURR. (I _{mp})	10.68 AMPS
S.C. CURR. (I _{sc})	11.44 AMPS
MAX. SERIES FUSE	20 AMPS

MODULE OPTIMIZER	
MAKE	SOLAREEDGE
MODEL	S440
DC INPUT:	
RATED POWER	440 WATTS
VOLT. RANGE	8-60
MAX. SCC	14.5 AMPS
DC OUTPUT:	
MAX. CURRENT	15 AMPS
MAX. VOLT.	60 VOLTS
MAX. SYSTEM VOLT.	1000 VOLTS
MIN. STRING	8 OPTIMIZERS
MAX. STRING	25 OPTIMIZERS
MAX. POWER	5700 WATTS

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

NOTES:

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

CONDUCTOR SCHEDULE													
TAG	CURRENT CARRYING CONDUCTORS				GROUNDING CONDUCTORS				CONDUIT/RACEWAY			NOTES	
	QTY.	SIZE	MATERIAL	INSULATION	QTY.	SIZE	MATERIAL	INSULATION	QTY.	SIZE	MATERIAL		LOCATION
C1	4	10 AWG	COPPER	PV WIRE	1	6 AWG	COPPER	BARE WIRE	-	-	-	FREE AIR	1
C2	4	10 AWG	COPPER	THWN-2	1	10 AWG	COPPER	THWN-2	1	1/2"	FMC/EMT/MC	EXT/INT	2,4
C3	3	8 AWG	COPPER	THWN	1	10 AWG	COPPER	THWN	1	3/4"	NOTE 5	EXTERIOR	2,4,5
XC	-	-	-	-	-	-	-	-	-	-	-	-	3

NOTES:

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

DC/AC INVERTER	
MAKE	SOLAREEDGE
MODEL	SE7600H-US
TECHNOLOGY	TRANS-LESS
DC INPUT:	
MAX. POWER	11800 WATTS
MAX. VOLT	480 VOLTS
NOM. VOLT.	400 VOLTS
MAX. CURRENT	20 AMPS
MAX. SCC	45 AMPS
STRINGS INPUTS	2 STRINGS
AC OUTPUT:	
RATED POWER	7600 WATTS
MAX. POWER	7600 WATTS
NOM. VOLT.	240 VOLTS
MAX. CURR.	32 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

AC DISCONNECT	
MAKE	GENERIC
MODEL	N/A
ENCL. RATING	NEMA 3R
VOLT. RATING	240 VOLTS
AMP RATING	60 AMPS
UL LIST. (Y/N)	YES
FUSED (Y/N)	NO
FUSE RATING	N/A

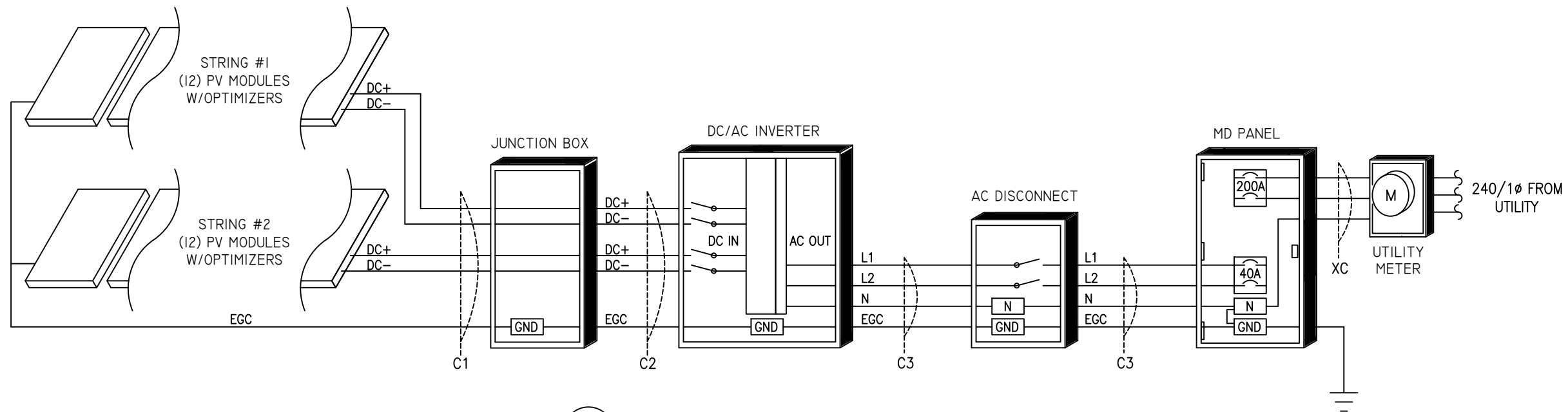
NOTES:

- 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

MD PANEL (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

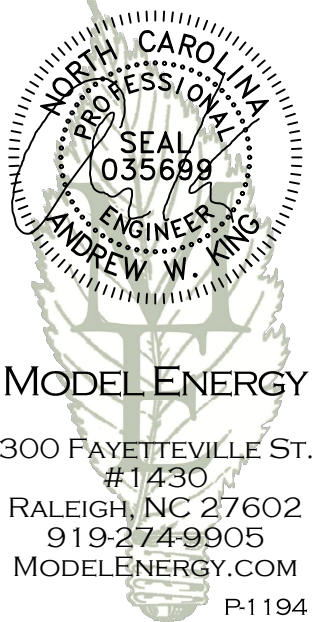
NOTES:

- BACK-FEED SOLAR OUTPUT VIA 40A BREAKER AT THE OPPOSITE END OF THE BUS BAR FROM MAIN BREAKER.
- MAIN BREAKER SERVES AS SERVICE DISCONNECT SWITCH.



1 PV SYSTEM ELECTRICAL WIRING SCHEMATIC
SCALE: NTS

ENGINEER:



JOB TITLE:

NEW SOLAR PV SYSTEM

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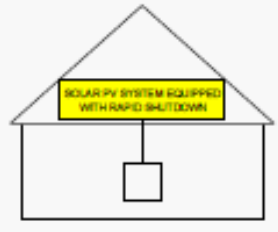
ELECTRICAL INFORMATION

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

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

⚠ WARNING ELECTRIC SHOCK HAZARD

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

⚠ WARNING POWER SOURCE OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE

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

WARNING: PHOTOVOLTAIC POWER SOURCE

NEC 690.31 (C)(3)&(4)
PLACE ON ALL JUNCTION BOXES, EXPOSED RACEWAYS, AND OTHER WIRING METHODS EVERY 10' AND ON EVERY SECTION SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, 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*

⚠ 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

EQUIPMENT LABEL NOTES
1. LABELS SHOWN ARE 1/2 THEIR ACTUAL MOUNTING SIZE.
2. LABEL MATERIAL SHALL BE SUITABLE FOR THE EQUIPMENT ENVIRONMENT.
3. COLOR SHALL BE IDENTICAL WITH MOUNTING LABEL EVERY 10 FEET.

DIRECT CURRENT PHOTOVOLTAIC POWER SOURCE

MAXIMUM VOLTAGE 600 VDC
MAX CIR. CURRENT 30 AMPS

NEC 690.53
PLACE ON ALL DC DISCONNECTING MEANS

PHOTOVOLTAIC POWER SOURCE

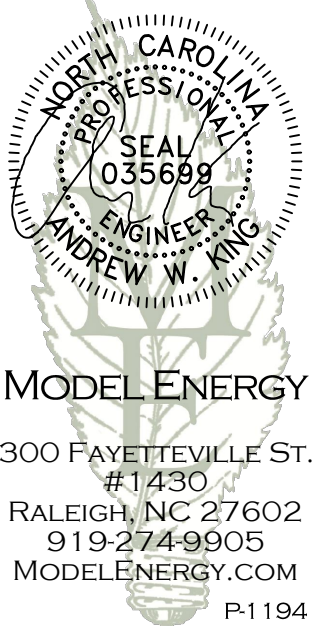
OPERATING AC VOLT. 240 VAC
MAXIMUM OPERATING AC OUTPUT CURRENT 32 AMPS

NEC 690.54
PLACE ON INTERCONNECTION DISCONNECTING MEANS

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:



JOB TITLE:

NEW SOLAR PV SYSTEM

9.480 kW DC INPUT
7.600 kW AC EXPORT

Cornett, Tracy
93 Joel Wy
Lillington, NC 27546

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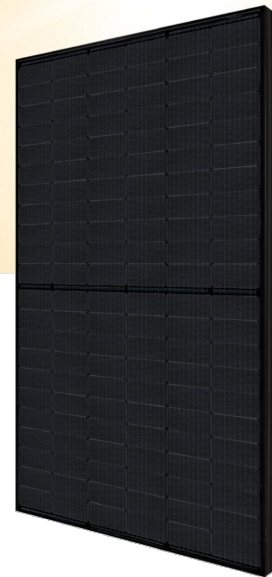
CLIENT:

691 ELECTRIC

ISSUED FOR:	DATE:
CONSTRUCTION	11/12/2022

ELECTRICAL
INFORMATION

PV4.2



HiKu Mono PERC (All-Black)

380 W ~ 400 W

CS3N-380 | 385 | 390 | 395 | 400MS

MORE POWER



Module power up to 400 W
Module efficiency up to 19.7%



Lower LCOE & BOS cost



Comprehensive LID / LeTID mitigation technology, up to 50% lower degradation



Better shading tolerance

MORE RELIABLE



Minimizes micro-crack impacts



Heavy snow load up to 5400 Pa,
enhanced wind load up to 2400 Pa*



Enhanced Product Warranty on Materials and Workmanship*



Linear Power Performance Warranty*

**1st year power degradation no more than 2%
Subsequent annual power degradation no more than 0.55%**

*According to the applicable Canadian Solar Limited Warranty Statement.

MANAGEMENT SYSTEM CERTIFICATES*

ISO 9001: 2015 / Quality management system
ISO 14001: 2015 / Standards for environmental management system
ISO 45001: 2018 / International standards for occupational health & safety

PRODUCT CERTIFICATES*

IEC 61215 / IEC 61730 / CE
FSEC (US Florida)
UL 61730 / IEC 61701 / IEC 62716
UNI 9177 Reaction to Fire: Class 1 / Take-e-way



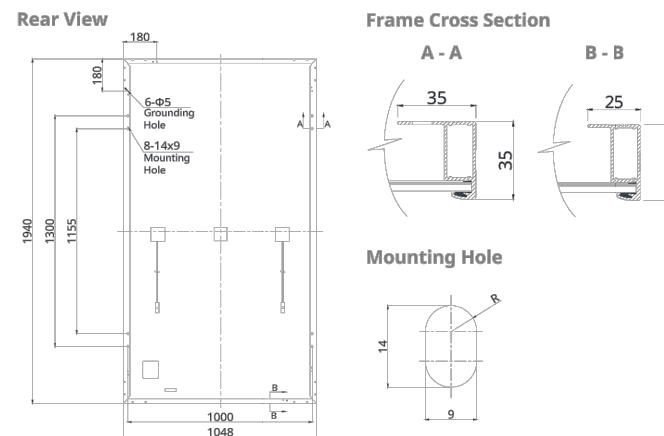
* The specific certificates applicable to different module types and markets will vary, and therefore not all of the certifications listed herein will simultaneously apply to the products you order or use. Please contact your local Canadian Solar sales representative to confirm the specific certificates available for your Product and applicable in the regions in which the products will be used.

Canadian Solar (USA) Inc. is committed to providing high quality solar products, solar system solutions and services to customers around the world. Canadian Solar was recognized as the No. 1 module supplier for quality and performance/price ratio in the IHS Module Customer Insight Survey, and is a leading PV project developer and manufacturer of solar modules, with over 52 GW deployed around the world since 2001.

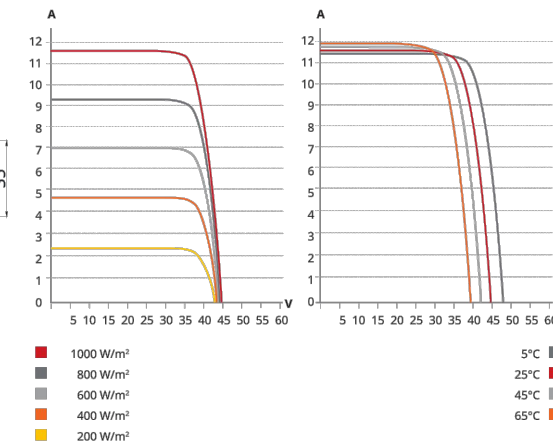
* For detailed information, please refer to the Installation Manual.

Canadian Solar (USA) Inc.
3000 Oak Road, Suite 400, Walnut Creek, CA 94597, USA, www.csisolar.com/na, service.ca@csisolar.com

ENGINEERING DRAWING (mm)



CS3N-400MS / I-V CURVES



ELECTRICAL DATA | STC*

CS3N	380MS	385MS	390MS	395MS	400MS
Nominal Max. Power (Pmax)	380 W	385 W	390 W	395 W	400 W
Opt. Operating Voltage (Vmp)	36.4 V	36.6 V	36.8 V	37.0 V	37.2 V
Opt. Operating Current (Imp)	10.44 A	10.52 A	10.60 A	10.68 A	10.76 A
Open Circuit Voltage (Voc)	43.7 V	43.9 V	44.1 V	44.3 V	44.5 V
Short Circuit Current (Isc)	11.26 A	11.32 A	11.38 A	11.44 A	11.50 A
Module Efficiency	18.7%	18.9%	19.2%	19.4%	19.7%
Operating Temperature	-40°C ~ +85°C				
Max. System Voltage	1000V (IEC/UL)				

Module Fire Performance	TYPE 1 (UL 61730 1500V) or TYPE 2 (UL 61730 1000V) or CLASS C (IEC 61730)				
Max. Series Fuse Rating	20 A				
Application Classification	Class A				
Power Tolerance	0 ~ + 10 W				

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

ELECTRICAL DATA | NMOT*

CS3N	380MS	385MS	390MS	395MS	400MS
Nominal Max. Power (Pmax)	283 W	287 W	291 W	295 W	298 W
Opt. Operating Voltage (Vmp)	33.9 V	34.1 V	34.3 V	34.5 V	34.7 V
Opt. Operating Current (Imp)	8.36 A	8.42 A	8.49 A	8.56 A	8.6 A
Open Circuit Voltage (Voc)	41.1 V	41.3 V	41.5 V	41.7 V	41.9 V
Short Circuit Current (Isc)	9.08 A	9.13 A	9.18 A	9.23 A	9.28 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m²-spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

MECHANICAL DATA

Specification	Data
Cell Type	Mono-crystalline
Cell Arrangement	132 [2 X (11 X 6)]
Dimensions	1940 X 1048 X 35 mm (76.4 X 41.3 X 1.38 in)
Weight	22.5 kg (49.6 lbs)
Front Cover	3.2 mm tempered glass
Frame	Anodized aluminium alloy
J-Box	IP68, 3 bypass diodes
Cable	4 mm² (IEC), 12 AWG (UL)
Cable Length (Including Connector)	Portrait: 400 mm (15.7 in) (+) / 280 mm (11.0 in) (-); landscape: 1250 mm (49.2 in)*
Connector	T4 series or MC4
Per Pallet	30 pieces
Per Container (40' HQ)	720 pieces

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.35 % / °C
Temperature Coefficient (Voc)	-0.27 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	42 ± 3°C

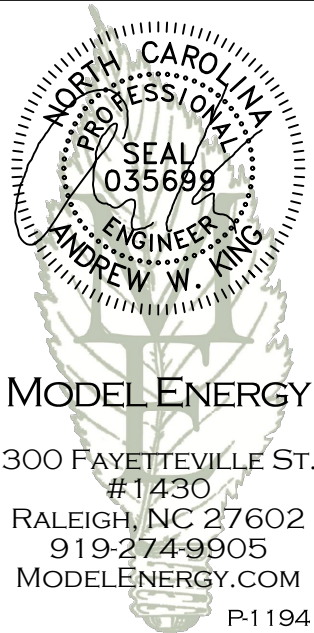
PARTNER SECTION



* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. CSI Solar Co., Ltd. reserves the right to make necessary adjustment to the information described herein at any time without further notice. Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

Canadian Solar (USA) Inc. May 2021 | All rights reserved | Module Product Datasheet v2.7_F30_J1_NA

ENGINEER:



MODEL ENERGY

300 FAYETTEVILLE ST.
#1430
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919-274-9905
MODELENERGY.COM
P-1194

JOB TITLE:

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9.480 kW DC INPUT
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ISSUED FOR: CONSTRUCTION
DATE: 11/12/2022

LABELS,
DETAILS & SPECS

PV5.1

Power Optimizer For Residential Installations

S440, S500



POWER OPTIMIZER

Enabling PV power optimization at the module level

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

* Functionality subject to inverter model and firmware version

solaredge.com



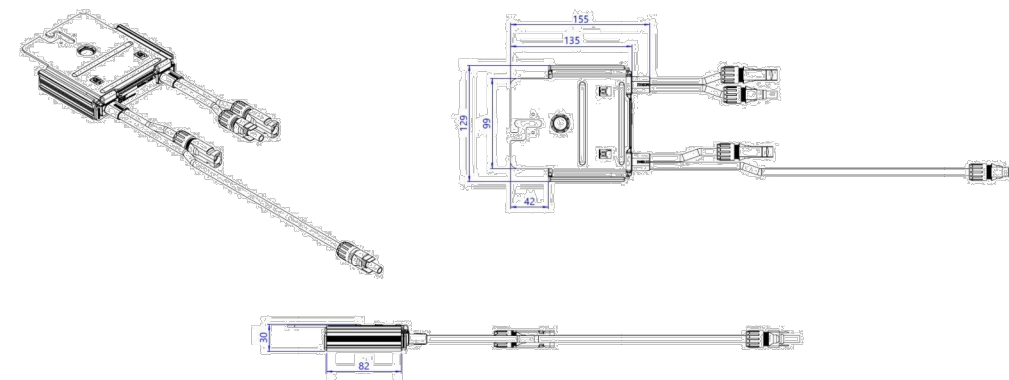
Power Optimizer For Residential Installations S440, S500

	S440	S500	UNIT
Rated Input DC Power ⁽¹⁾	440	500	W
Absolute Maximum Input Voltage (Voc)		60	Vdc
MPPT Operating Range		8 - 60	Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	14.5	15	Adc
Maximum Efficiency		99.5	%
Weighted Efficiency		98.6	%
Overtoltage Category		II	
OUTPUT DURING OPERATION			
Maximum Output Current		15	Adc
Maximum Output Voltage		60	Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)			
Safety Output Voltage per Power Optimizer		1	Vdc
STANDARD COMPLIANCE			
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3, CISPR11, EN-55011		
Safety	IEC62109-1 (class II safety), UL1741		
Material	UL94 V-0, UV Resistant		
RoHS	Yes		
Fire Safety	VDE-AR-E 2100-712:2013-05		
INSTALLATION SPECIFICATIONS			
Maximum Allowed System Voltage		1000	Vdc
Dimensions (W x L x H)		129 x 155 x 30	mm
Weight (including cables)		655 / 1.5	gr / lb
Input Connector		MC4 ⁽²⁾	
Input Wire Length		0.1	m
Output Connector		MC4	
Output Wire Length		(+) 2.3, (-) 0.10	m
Operating Temperature Range ⁽³⁾		-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 other connector types please contact SolarEdge
 (3) For ambient temperature above +70°C / +158°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	Single Phase HD-Wave	Three Phase	Three Phase for 277/480V Grid	
Minimum String Length (Power Optimizers)	S440, S500	8	16	18
Maximum String Length (Power Optimizers)		25	50	
Maximum Nominal Power per String ⁽⁴⁾		5700	11250 ⁽⁵⁾	12750 ⁽⁶⁾
Parallel Strings of Different Lengths or Orientations			Yes	

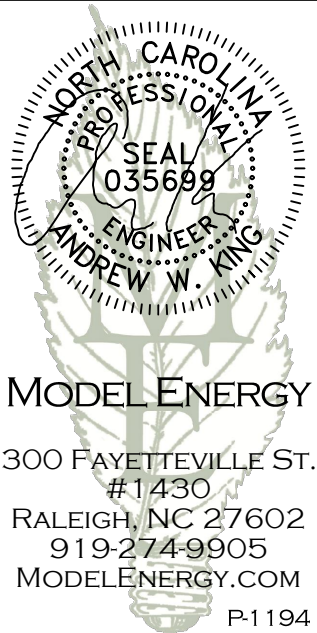
(4) If the inverters rated AC power \leq maximum nominal power per string, then the maximum power per string will be able to reach up to the inverters maximum input DC power Refer to: <https://www.solaredge.com/sites/default/files/se-power-optimizer-single-string-design-application-note.pdf>
 (5) For the 230/400V grid: it is allowed to install up to 13,500W per string when the maximum power difference between each string is 2,000W
 (6) For the 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
 (7) It is not allowed to mix S-series and P-series Power Optimizers in new installations



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CE RoHS

ENGINEER:



JOB TITLE:

NEW SOLAR PV SYSTEM

9.480 kW DC INPUT
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CLIENT:

691 ELECTRIC

ISSUED FOR: CONSTRUCTION DATE: 11/12/2022

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



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



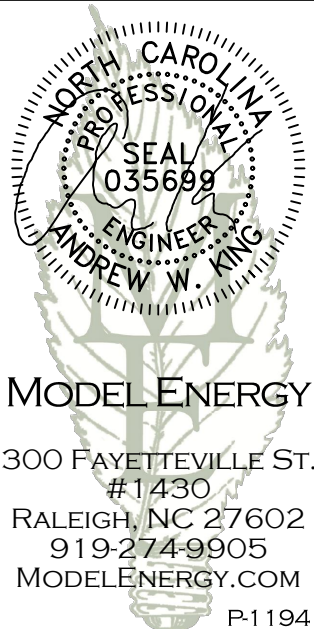
Single Phase Inverter with HD-Wave Technology for North America

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		
OUTPUT									
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 ⁽¹⁾							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								
INPUT									
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 ⁽²⁾	8.5	10.5	13.5	16.5	20	27	30.5	Adc	
Maximum Input Current @208V ⁽²⁾	-	9	-	13.5	-	-	27	Adc	
Max. Input Short Circuit Current	45							Adc	
Reverse-Polarity Protection	Yes								
Ground-Fault Isolation Detection	600k Ω 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	
ADDITIONAL FEATURES									
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)								
Revenue Grade Data, ANSI C12.20	Optional ⁽³⁾								
Rapid Shutdown - NEC 2014 and 2017 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect								
STANDARD COMPLIANCE									
Safety	UL1741, UL1741 SA, UL1599B, CSA C22.2, Canadian AFCE according to T.I.L. M-07								
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (HI)								
Emissions	FCC Part 15 Class B								
INSTALLATION SPECIFICATIONS									
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 ⁽⁴⁾ (-40°F / -40°C option) ⁽⁵⁾							°F / °C	
Protection Rating	NEMA 4X (Inverter with Safety Switch)								

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

ENGINEER:



JOB TITLE:

NEW SOLAR PV SYSTEM

9.480 kW DC INPUT
7.600 kW AC EXPORT

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Lillington, NC 27546

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ISSUED FOR: DATE:
CONSTRUCTION 11/12/2022

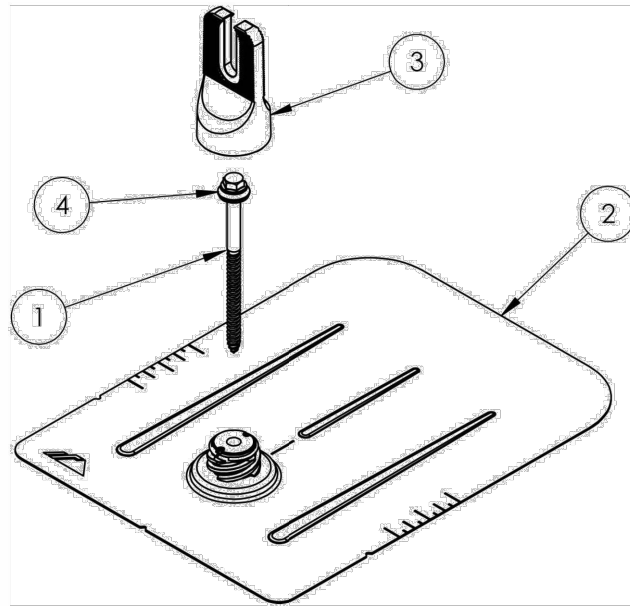
EQUIPMENT
SPEC SHEETS

PV5.3



FlashFoot2

Cut Sheet

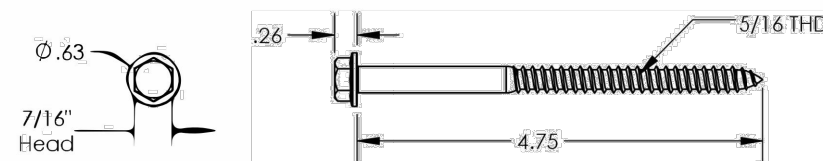


ITEM NO.	DESCRIPTION
1	BOLT LAG 5/16 X 4.75"
2	ASSY, FLASHING
3	ASSY, CAP
4	WASHER, EPDM BACKED

FLASHFOOT 2

Part Number	Description
FF2-01-M1	FLASHFOOT2, MILL
FF2-01-B1	FLASHFOOT2, BLACK

1) Bolt, Lag 5/16 x 4.75"

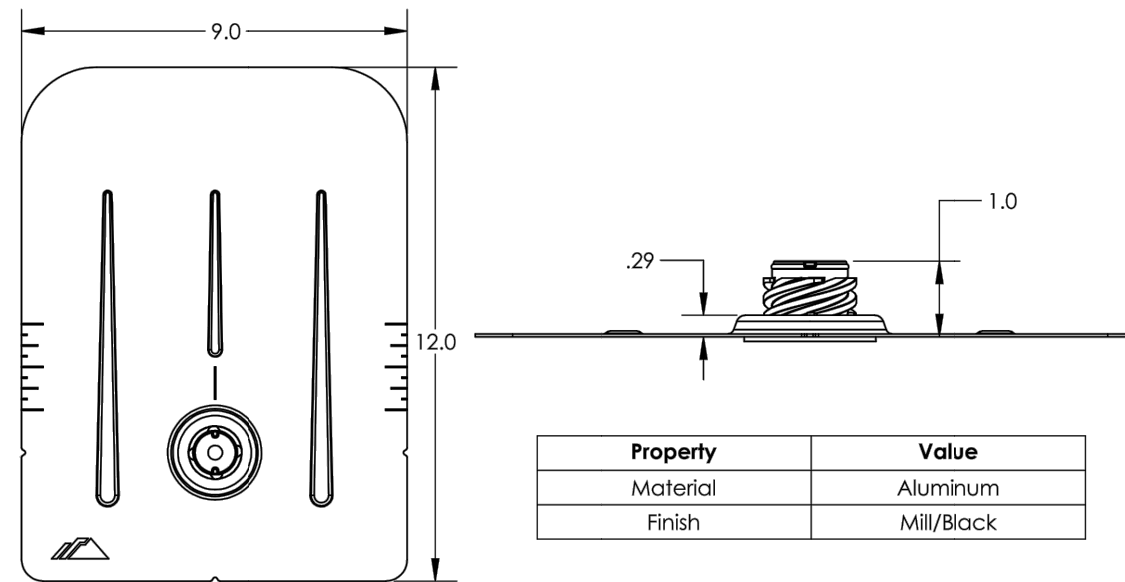


Property	Value
Material	300 Series Stainless Steel
Finish	Clear

v1.20

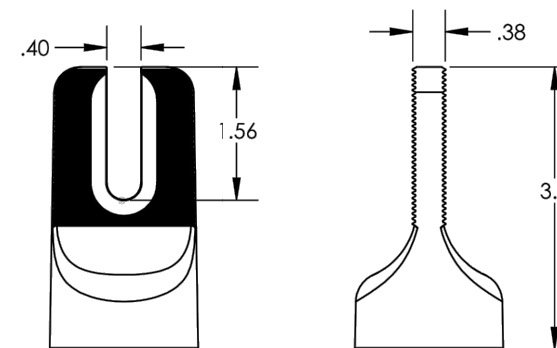
Cut Sheet

2) Assy, Flashing



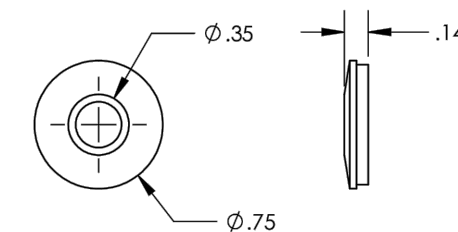
Property	Value
Material	Aluminum
Finish	Mill/Black

3) Assy, Cap



Property	Value
Material	Aluminum
Finish	Mill/Black

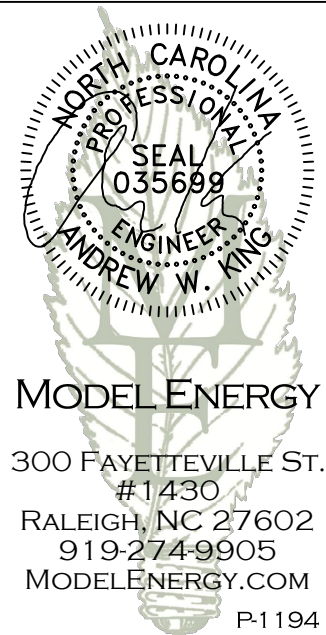
4) Washer, EPDM Backed



Property	Value
Material	300 Series Stainless Steel
Finish	Clear

v1.20

ENGINEER:



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

P-1194

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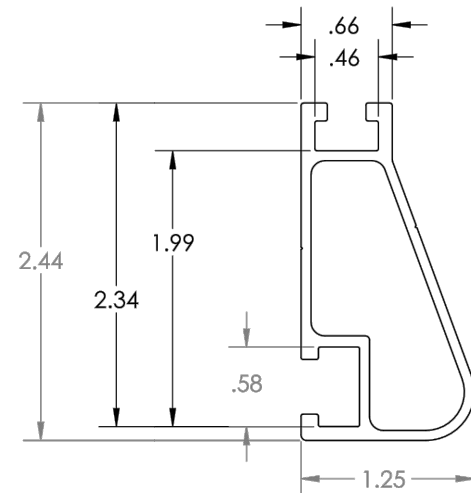
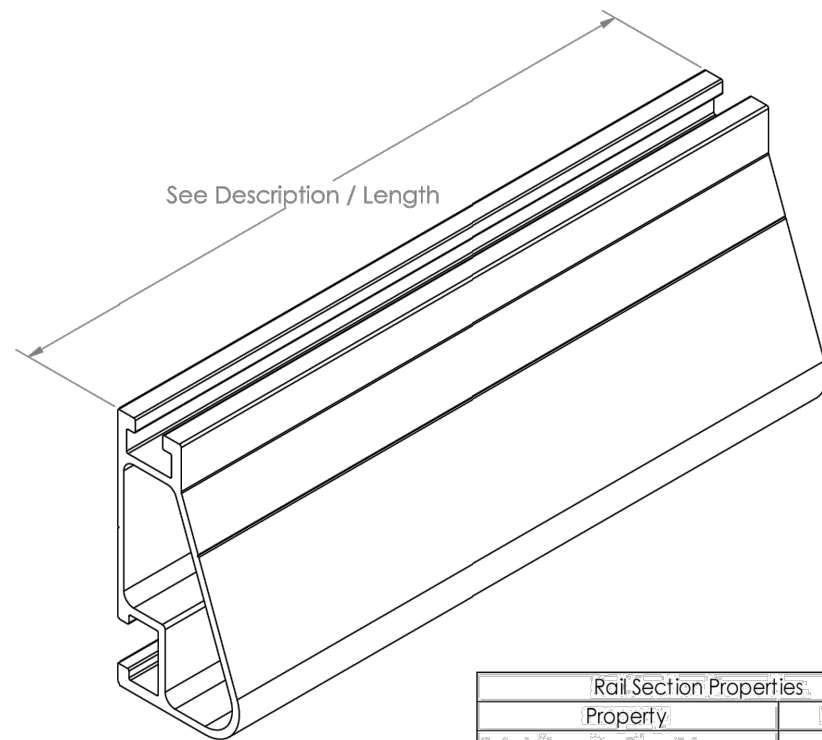
EQUIPMENT
SPEC SHEETS

PV5.4



XR100 Rail

Cut Sheet



Rail Section Properties	
Property	Value
Total Cross-Sectional Area	0.582 in ²
Section Modulus (X-axis)	0.297 in ³
Moment of Inertia (X-axis)	0.390 in ⁴
Moment of Inertia (Y-axis)	0.085 in ⁴
Torsional Constant	0.214 in ³
Polar Moment of Inertia	0.126 in ⁴

APPROVED MATERIALS:
6005-T6, 6005A-T61, 6105-T5, 6N01-T6
(34,000 PSI YIELD STRENGTH MINIMUM)

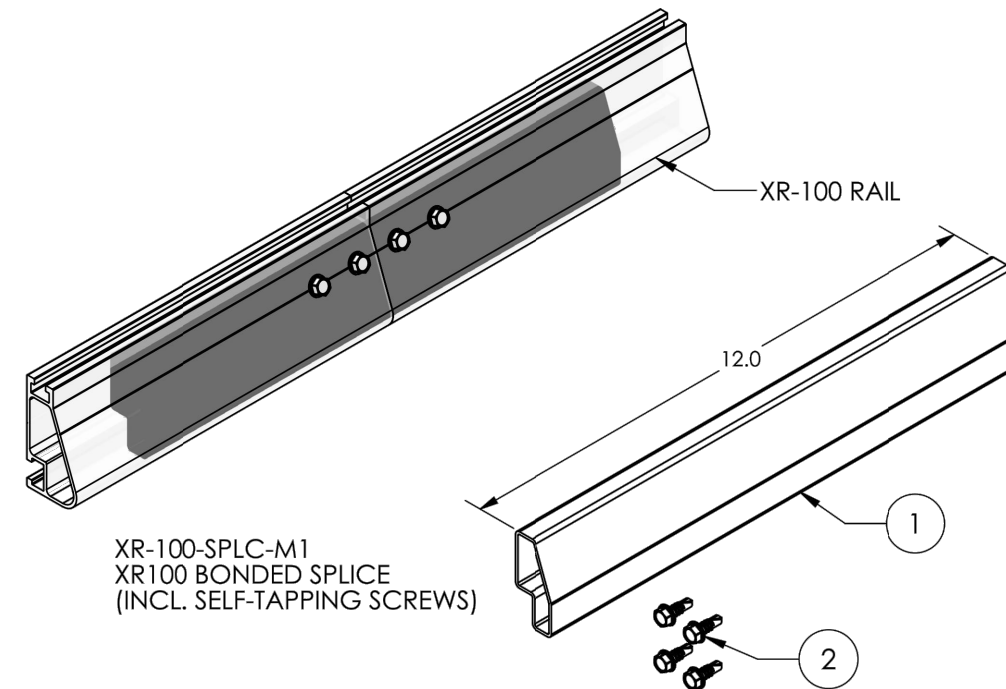
Clear Part Number	Black Part Number	Description / Length	Material	Weight
XR-100-132A	XR-100-132B	XR100, Rail 132" (11 Feet)	6000-Series Aluminum	7.50 lbs.
XR-100-168A	XR-100-168B	XR100, Rail 168" (14 Feet)		9.55 lbs.
XR-100-204A	XR-100-204B	XR100, Rail 204" (17 Feet)		11.60 lbs.

v1.1

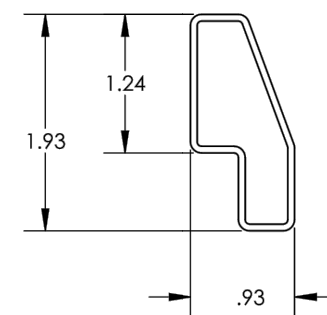


XR100 Bonded Splice

Cut Sheet

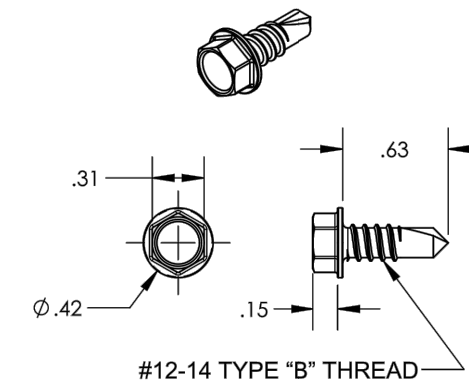


1) Splice, XR100, Mill 12" long



Property	Value
Material	6000 Series Aluminum
Finish	Mill

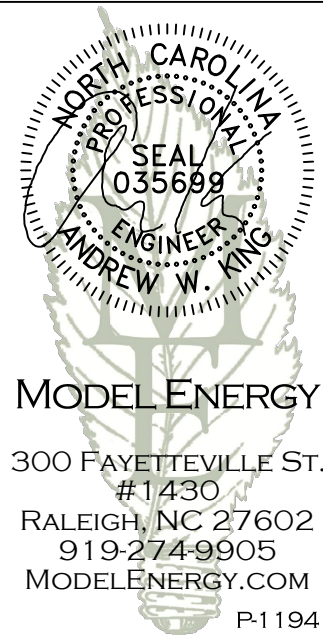
2) Screw, Self Drilling



Property	Value
Material	300 Series Stainless Steel
Finish	Clear

v1.0

ENGINEER:



MODEL ENERGY

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

P-1194

JOB TITLE:

NEW SOLAR PV SYSTEM

9.480 kW DC INPUT
7.600 kW AC EXPORT

Cornett, Tracy
93 Joel Wy
Lillington, NC 27546

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CLIENT:

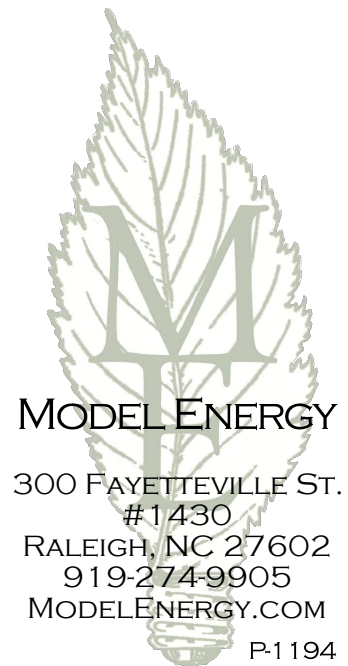
691 ELECTRIC

ISSUED FOR: DATE:
CONSTRUCTION 11/12/2022

EQUIPMENT
SPEC SHEETS

PV5.5

Customer: Cornett, Tracy
Installer: 691 Electric
Subject: PV System Structural Compliance
Date: 11/12/2022



To whom it may concern:

Model Energy, PLLC has reviewed the installation details of the proposed PV system that is to be installed by 691 Electric at 93 Joel Wy, Lillington, NC 27546. 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

