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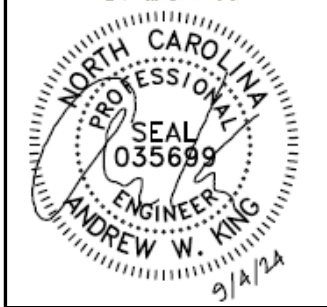
PV MATERIAL SUMMARY: DISTRIBUTOR	
REC420AA PURE 2	25
MCI-1	9
MI-BHW	9
Tesla PW3 1707000-xx-y	1
Tesla GW3 1841000-01-y	1
XR-10-168B	10
XR-10-204B	5
UFO-CL-01-B1	24
UFO-END-01-B1	52
XR-LUG-03-A1	14
4 IN QB1	33
S-5-S	25
LFT-03-M1	25
GC66803 Geocel Sealant	3
SOLADECK 0799-5B	5
SOLAR MESH-P-8	3
SNRAC 242-04105	103
QM-JBX-RLO2-B1	1



CLIENT INFO
 GRETCHEN SCHULZ
 487 COKESBURY PARK LANE
 FUQUAY-VARINA, NC 27526

PROJECT INFO
 DC INPUT: 10.500 kW
 AC OUTPUT: 11.500 kW
 DOI INSPT. METHOD: OPTION 2

Model Energy
 300 Fayetteville St.
 #1430
 Raleigh, NC 27602
 919-274-9905
 ModelEnergy.com
 P-1194



CODE REFERENCES
 NATIONAL ELECTRICAL CODE v. 2017
 NC FIRE PROTECTION CODE v. 2018
 NC BUILDING CODE v. 2018
 NC RESIDENTIAL CODE v. 2018
 ACSE v. 7-10

SITE CONDITIONS
 WIND SPEED: 120 MPH
 RISK CATEGORY: II
 EXPOSURE: B
 SNOW: 15 PSF

SHEET INDEX
 PV-1: COVER SHEET
 PV-2: PV STRUCTURAL
 PV-3: PV ELECTRICAL
 PV-4: PV EQUIPMENT LABELS
 PV-5: PV INSTALL GUIDE

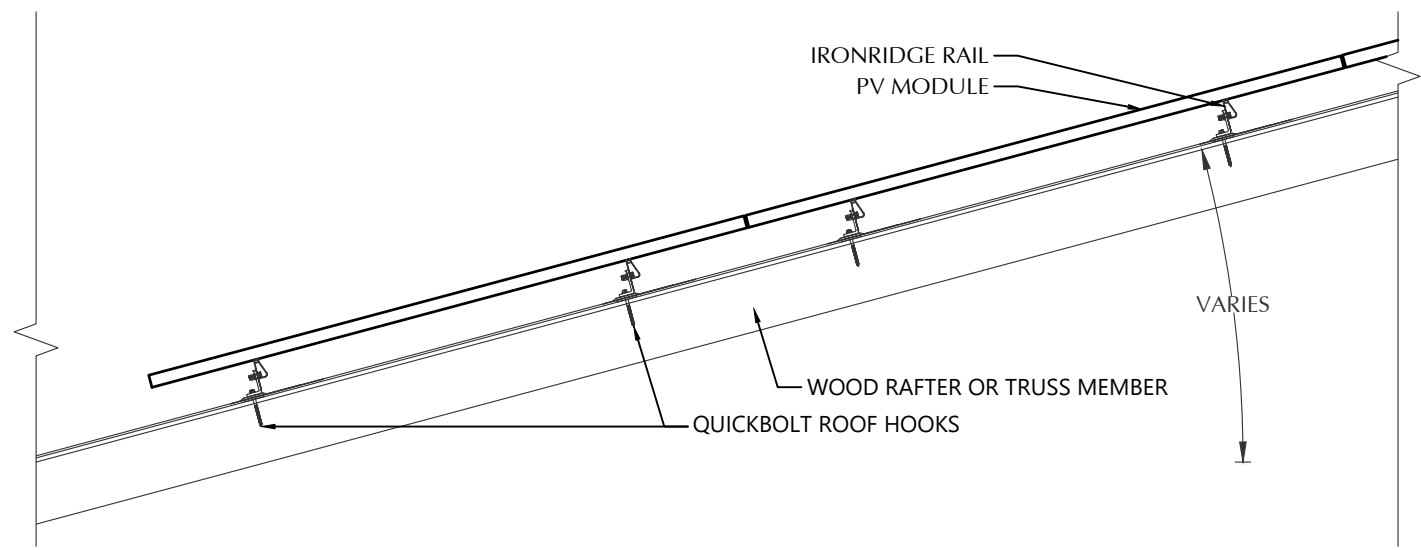
VERSIONS		
FOR:	DESIGNER	DATE
CONSTRUCTION	CRM	8/26/2024

PV SYSTEM COVER PAGE

PV-1.1



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STATEMENT OF STRUCTURAL COMPLIANCE

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 THESE DRAWINGS.

NAME: ANDREW W. KING, PE

SIGNED:

PV MODULES	
MAKE	REC
MODEL	REC420AA PURE 2
WIDTH	40.90 IN
LENGTH	73.40 IN
THICKNESS	30 MM
WEIGHT	47.60 LBS.
ARRAY AREA	229 SQFT.
ARRAY WEIGHT	573 LBS.

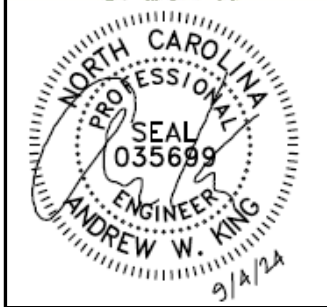
ROOF SUMMARY	
STRUCTURE:	
TYPE	RAFTERS
MATERIAL	SOUTHERN PINE #2
SIZE	2 X 6
SPACING	16 IN O.C.
EFFECTIVE SPAN	161 IN
PITCH	10/12
DENSITY	30 LBS./CU.FT.
DECKING:	
TYPE	OSB
MATERIAL	COMPOSITE
THICKNESS	7/16 IN
WEIGHT	1.60 LBS./SQFT
ROOFING:	
TYPE	ASPHALT SHINGLE
MATERIAL	ASPHALT
WEIGHT	2.30 LBS./SQFT.



CLIENT INFO
 GRETCHEN SCHULZ
 487 COKESBURY PARK LANE
 FUQUAY-VARINA, NC 27526

PROJECT INFO
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SITE CONDITIONS
 WIND SPEED: 120 MPH
 RISK CATEGORY: II
 EXPOSURE: B
 SNOW: 15 PSF

SHEET INDEX
 PV-1: COVER SHEET
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VERSIONS

FOR:	DESIGNER:	DATE:
CONSTRUCTION	CRM	8/26/2024

PV SYSTEM STRUCTURAL

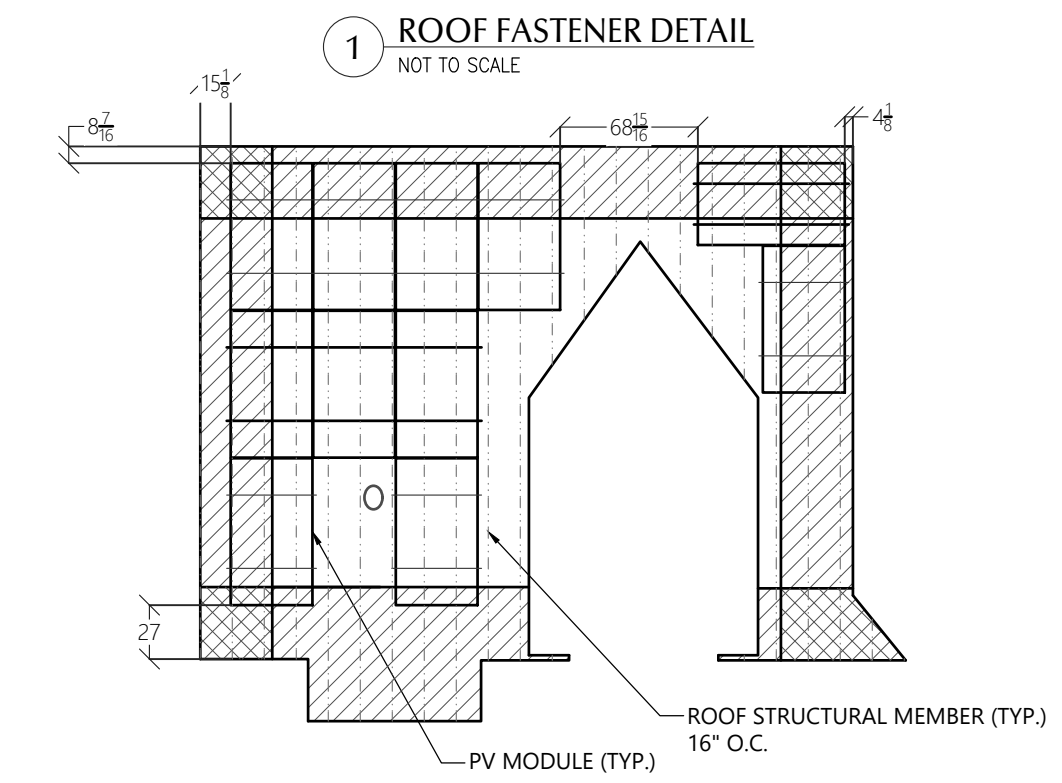
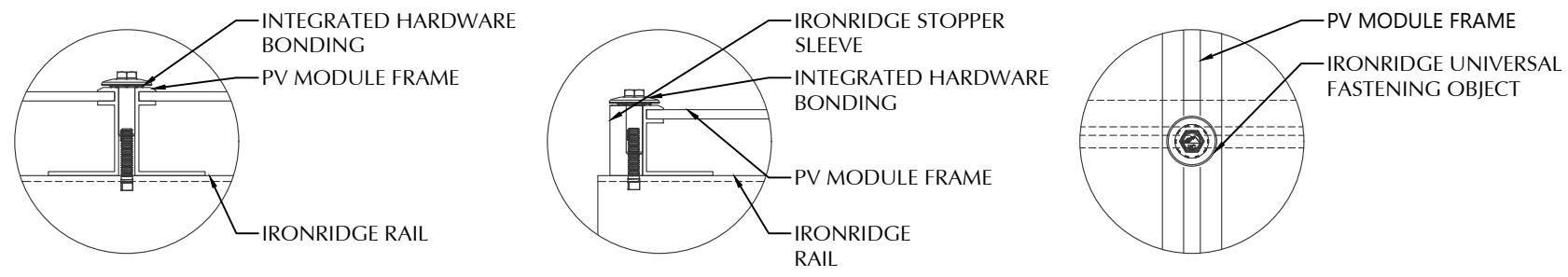
PV-2.1

ROOF MOUNT SUMMARY		
MAXIMUM (IN)	MOUNT SPACING	RAIL OVERHANG
WIND ZONE 1	PORT 64 LAND 64	PORT 16 IN LAND 16 IN
WIND ZONE 2	PORT 48 LAND 64	PORT 16 IN LAND 16 IN
WIND ZONE 3	PORT 48 LAND 64	PORT 16 IN LAND 16 IN

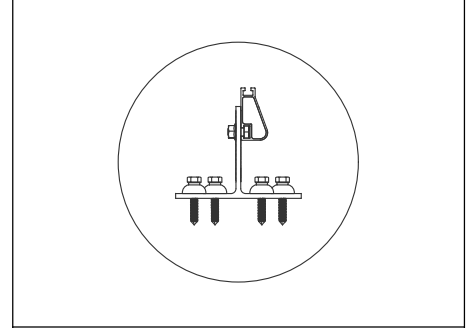
ROOF LOADING	
GROUND SNOW LOAD:	15 LBS./SQFT.
LIVE LOAD	20 LBS./SQFT.
DEAD LOAD	
ROOFING	3.9 LBS./SQFT.
PV ARRAY	2.5 LBS./SQFT.
TOTAL	6.4 LBS./SQFT.
WIND LOAD:	
UPLIFT ZONE 1	-24.6 LBS./SQFT.
UPLIFT ZONE 2	-29.0 LBS./SQFT.
UPLIFT ZONE 3	-29.0 LBS./SQFT.
DOWNWARD	23.0 LBS./SQFT.
FASTENER LOAD:	
UPLIFT ZONE 1	PORT -398 LAND -224
UPLIFT ZONE 2	PORT -352 LAND -264
UPLIFT ZONE 3	PORT -352 LAND -264
DOWNWARD	PORT 372 LAND 209

ROOF MOUNT & FASTENER	
ROOF MOUNT:	
MAKE	QUICKBOLT
MODEL	4 IN QB1
MATERIAL	STAINLESS / EPDM
FASTENER:	
MAKE	QUICK SCREWS
MODEL	HANGER BOLT
MATERIAL	304 SS
SIZE	5/16-18 X 5-1/4"
GENERAL:	
WEIGHT	0.56 LBS.
FASTENERS PER MOUNT	1
MAX. PULL-OUT FORCE	960.0 LBS.
SAFETY FACTOR	2
DESIGN PULL-OUT FORCE	480.0 LBS.

MOUNTING RAILS	
MAKE	IRONRIDGE
MODEL	XR10
MATERIAL	ALUMINUM
WEIGHT	0.425 LBS/IN
SPACING	37 IN



ALTERNATIVE ATTACHMENT:
 MAY BE USED WHERE STRUCTURAL MEMBERS ARE NOT ACCESSIBLE



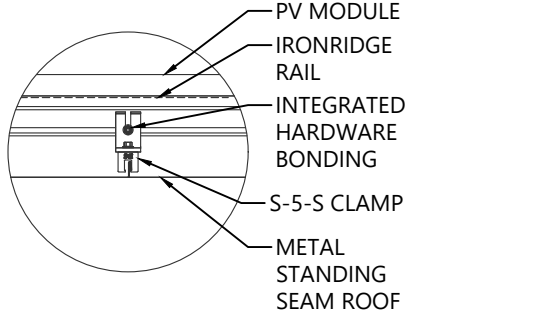
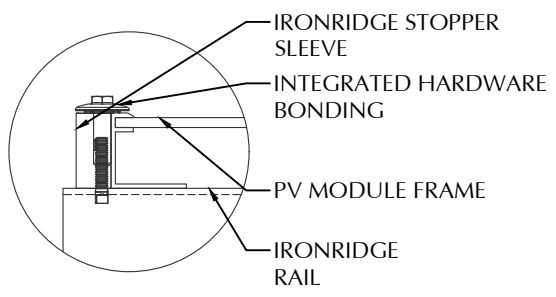
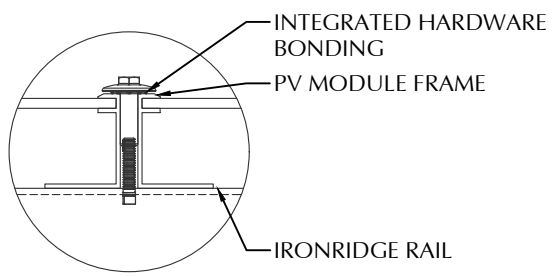
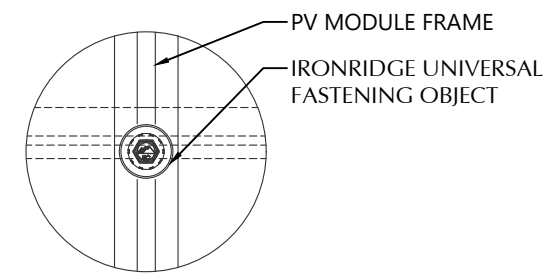
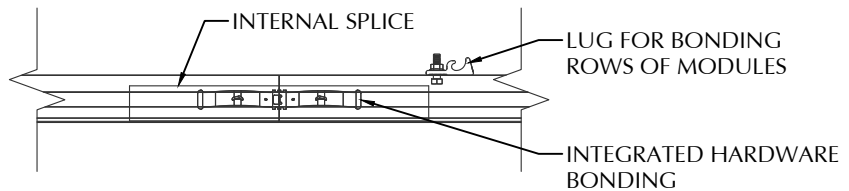
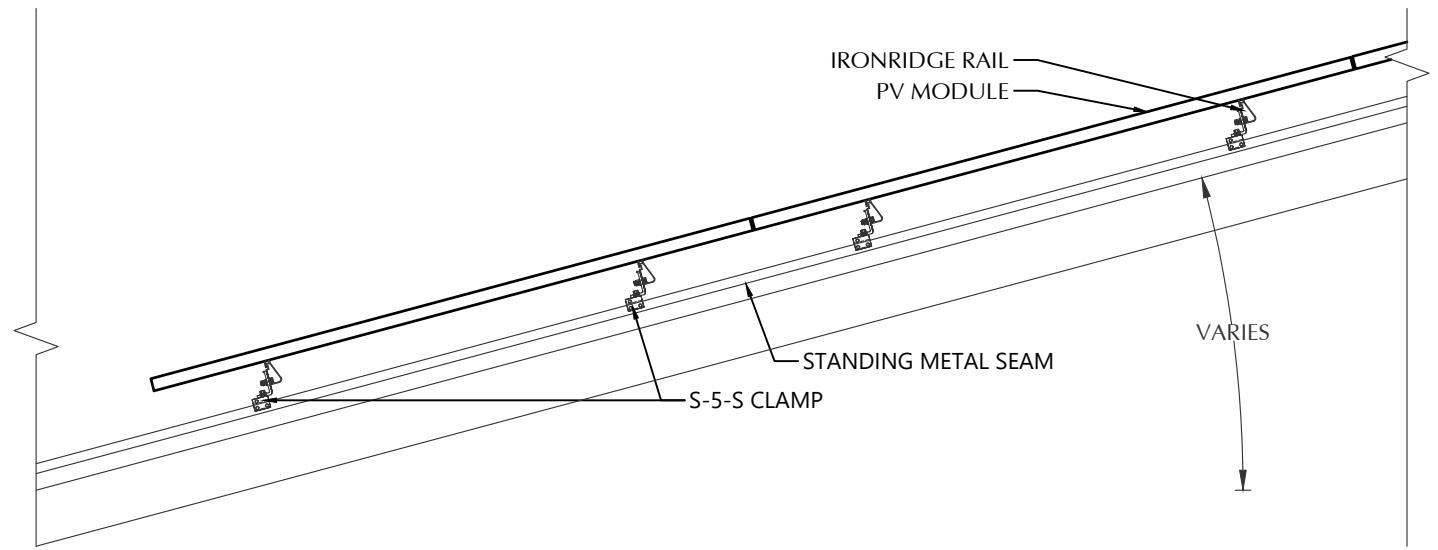
ROOF MOUNT & FASTENER	
ROOF MOUNT:	
MAKE	QUICKBOLT
MODEL	QB DECK MOUNT 16317
MATERIAL	STAINLESS / EPDM
FASTENER:	
MAKE	QUICK SCREWS
MODEL	HEX LAG PN# 16318
MATERIAL	304 SS
SIZE	5/16" X 1-3/4"
GENERAL:	
WEIGHT	0.8819
FASTENERS PER MOUNT	4
MAX. PULL-OUT FORCE	705.0 LBS.
SAFETY FACTOR	3
DESIGN PULL-OUT FORCE	235.0 LBS.

ROOF MOUNT SUMMARY		
MAXIMUM (IN)	MOUNT SPACING	RAIL OVERHANG
WIND ZONE 1	PORT 37 LAND 64	PORT 15 IN LAND 16 IN
WIND ZONE 2	PORT 29 LAND 51	PORT 11 IN LAND 16 IN
WIND ZONE 3	PORT 25 LAND 45	PORT 10 IN LAND 16 IN

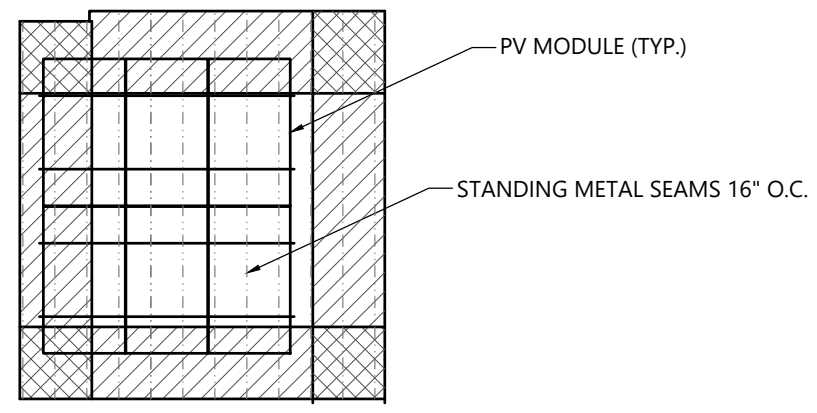
ROOF LOADING	
FASTENER LOAD:	
UPLIFT ZONE 1	PORT -230 LAND -224
UPLIFT ZONE 2	PORT -213 LAND -210
UPLIFT ZONE 3	PORT -183 LAND -185
DOWNWARD	PORT 215 LAND 209

2 ROOF A ARRAY LAYOUT
 1/8" = 1'-0"

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1 ROOF FASTENER DETAIL
NOT TO SCALE



2 ROOF B ARRAY LAYOUT
1/8" = 1'-0"

NOTE: POSITION ARRAY AS NEEDED IN ORDER TO AVOID ATTACHMENTS IN ZONE 3. ARRAY SHOULD BE PUSHED AS FAR LEFT AS POSSIBLE TO MINIMIZE SHADE FROM ROOF A

STATEMENT OF STRUCTURAL COMPLIANCE

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NAME: ANDREW W. KING, PE

SIGNED: *Andrew W. King*

PV MODULES	
MAKE	REC
MODEL	REC420AA PURE 2
WIDTH	40.90 IN
LENGTH	73.40 IN
THICKNESS	30 MM
WEIGHT	47.60 LBS.
ARRAY AREA	125 SQFT.
ARRAY WEIGHT	313 LBS.

ROOF SUMMARY	
STRUCTURE:	
TYPE	RAFTERS
MATERIAL	SOUTHERN PINE #2
SIZE	2 X 8
SPACING	16 IN O.C.
EFFECTIVE SPAN	186 IN
PITCH	2/12
DENSITY	30 LBS./CU.FT.
DECKING:	
TYPE	TONGUE & GROOVE
MATERIAL	SOUTHERN PINE #2
THICKNESS	1 IN
WEIGHT	2.50 LBS./SQFT
ROOFING:	
TYPE	STANDING SEAM METAL
MATERIAL	METAL
WEIGHT	1.30 LBS./SQFT.

ROOF MOUNT SUMMARY		
MAXIMUM (IN)	MOUNT SPACING	RAIL OVERHANG
WIND ZONE 1	32 IN	14 IN
WIND ZONE 2	16 IN	8 IN
WIND ZONE 3	0 IN	4 IN

ROOF 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	-23.0 LBS./SQFT.
UPLIFT ZONE 2	-38.0 LBS./SQFT.
UPLIFT ZONE 3	-57.1 LBS./SQFT.
DOWNWARD	13.6 LBS./SQFT.
FASTENER LOAD:	
UPLIFT ZONE 1	-186 LBS.
UPLIFT ZONE 2	-154 LBS.
UPLIFT ZONE 3	
DOWNWARD	110 LBS.

ROOF MOUNT & FASTENER	
ROOF MOUNT:	
MAKE	S-5I
MODEL	S-5-S
MATERIAL	ALUMINUM
FASTENER:	
MAKE	S-5I
MODEL	SET SCREW
MATERIAL	STAINLESS STEEL
SIZE	3/8-24 X 0.80"
GENERAL:	
WEIGHT	0.39 LBS.
FASTENERS PER MOUNT	2
MAX. PULL-OUT FORCE	426.0 LBS.
SAFETY FACTOR	2
DESIGN PULL-OUT FORCE	213.0 LBS.

MOUNTING RAILS	
MAKE	IRONRIDGE
MODEL	XR10
MATERIAL	ALUMINUM
WEIGHT	0.425 LBS/IN
SPACING	37 IN



CLIENT INFO

GRETCHEN SCHULZ
487 COKESBURY PARK LANE
FUQUAY-VARINA, NC 27526

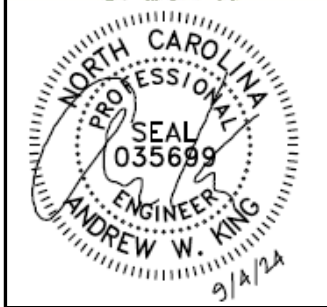
PROJECT INFO

DC INPUT: 10.500 kW
AC OUTPUT: 11.500 kW
DOI INSPT. METHOD: OPTION 2

Model Energy

300 Fayetteville St.
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Raleigh, NC 27602
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P-1194



CODE REFERENCES

NATIONAL ELECTRICAL CODE v. 2017
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NC BUILDING CODE v. 2018
NC RESIDENTIAL CODE v. 2018
ACSE v. 7-10

SITE CONDITIONS

WIND SPEED: 120 MPH
RISK CATEGORY: II
EXPOSURE: B
SNOW: 15 PSF

SHEET INDEX

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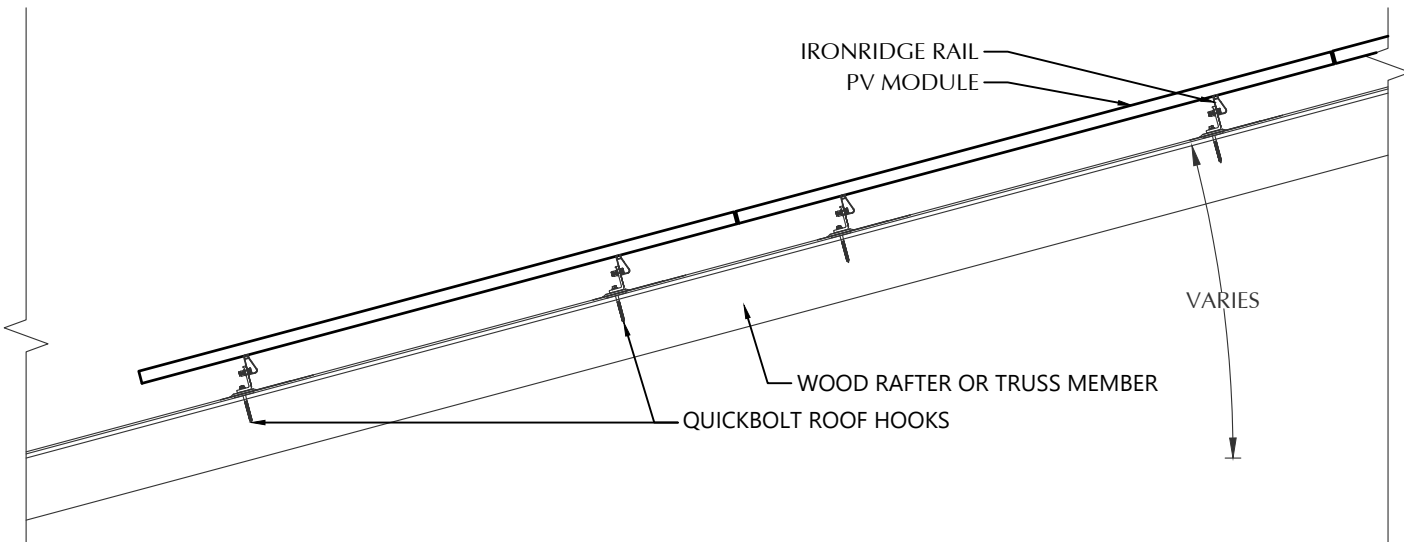
VERSIONS

FOR:	DESIGNER	DATE
CONSTRUCTION	CRM	8/26/2024

PV SYSTEM STRUCTURAL

PV-2.2

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NAME: ANDREW W. KING, PE

SIGNED:

PV MODULES	
MAKE	REC
MODEL	REC420AA PURE 2
WIDTH	40.90 IN
LENGTH	73.40 IN
THICKNESS	30 MM
WEIGHT	47.60 LBS.
ARRAY AREA	63 SQFT.
ARRAY WEIGHT	156 LBS.

ROOF SUMMARY	
STRUCTURE:	
TYPE	RAFTERS
MATERIAL	SOUTHERN PINE #2
SIZE	2 X 6
SPACING	16 IN O.C.
EFFECTIVE SPAN	87 IN
PITCH	10/12
DENSITY	30 LBS./CU.FT.
DECKING:	
TYPE	OSB
MATERIAL	COMPOSITE
THICKNESS	7/16 IN
WEIGHT	1.60 LBS./SQFT
ROOFING:	
TYPE	ASPHALT SHINGLE
MATERIAL	ASPHALT
WEIGHT	2.30 LBS./SQFT.



CLIENT INFO

GRETCHEN SCHULZ
487 COKEBURY PARK LANE
FUQUAY-VARINA, NC 27526

PROJECT INFO

DC INPUT: 10.500 kW
AC OUTPUT: 11.500 kW
DOI INSPT. METHOD: OPTION 2

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CODE REFERENCES

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SITE CONDITIONS

WIND SPEED: 120 MPH
RISK CATEGORY: II
EXPOSURE: B
SNOW: 15 PSF

SHEET INDEX

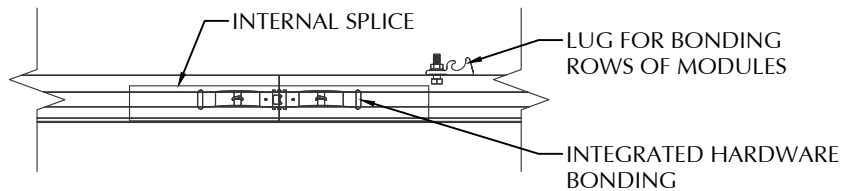
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VERSIONS

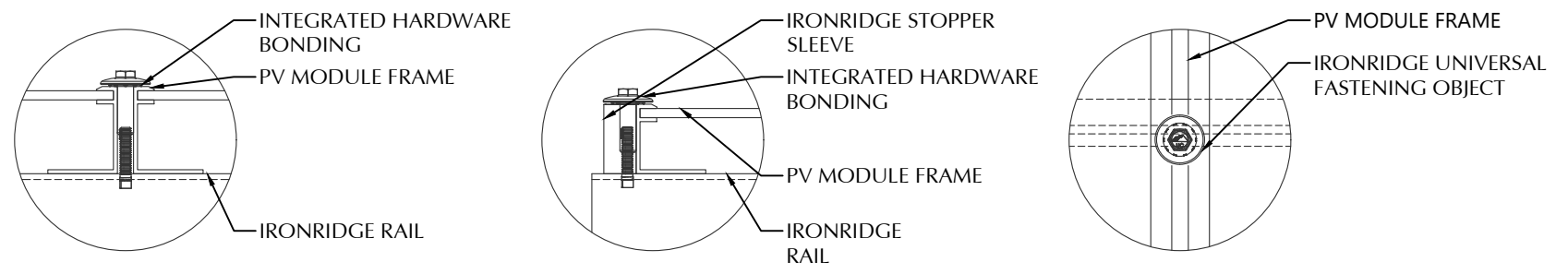
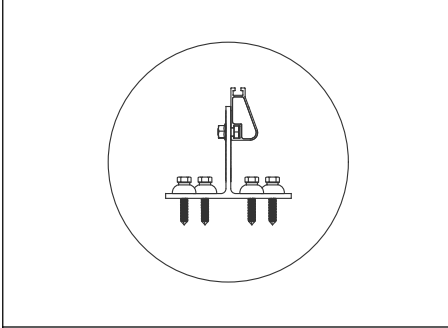
FOR:	DESIGNER:	DATE:
CONSTRUCTION	CRM	8/26/2024

PV SYSTEM STRUCTURAL

PV-2.3



ALTERNATIVE ATTACHMENT:
MAY BE USED WHERE STRUCTURAL MEMBERS ARE NOT ACCESSIBLE

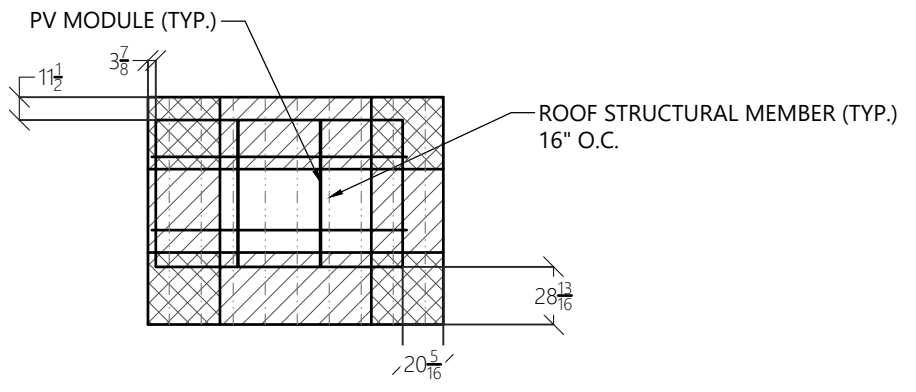


1 ROOF FASTENER DETAIL
NOT TO SCALE

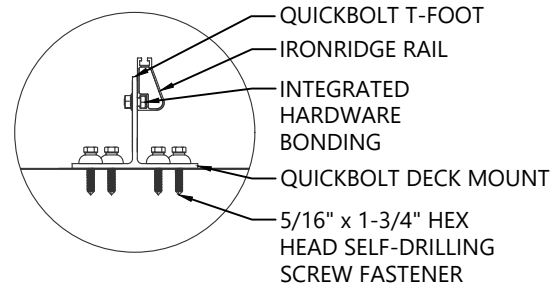
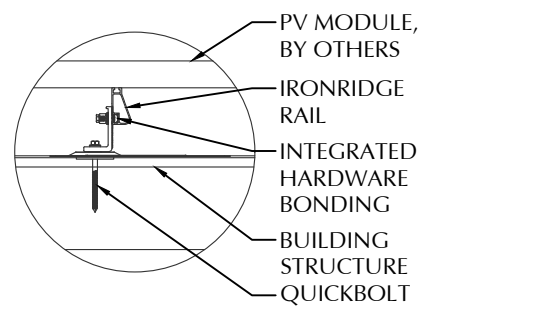
ROOF MOUNT & FASTENER	
ROOF MOUNT:	
MAKE	QUICKBOLT
MODEL	QB DECK MOUNT 16317
MATERIAL	STAINLESS / EPDM
FASTENER:	
MAKE	QUICK SCREWS
MODEL	HEX LAG PN# 16318
MATERIAL	304 SS
SIZE	5/16" X 1-3/4"
GENERAL:	
WEIGHT	0.8819
FASTENERS PER MOUNT	4
MAX. PULL-OUT FORCE	705.0 LBS.
SAFETY FACTOR	3
DESIGN PULL-OUT FORCE	235.0 LBS.

ROOF MOUNT SUMMARY		
MAXIMUM (IN)	MOUNT SPACING	RAIL OVERHANG
WIND ZONE 1	37 IN	15 IN
WIND ZONE 2	29 IN	11 IN
WIND ZONE 3	25 IN	10 IN

ROOF LOADING	
FASTENER LOAD:	
UPLIFT ZONE 1	-231 LBS.
UPLIFT ZONE 2	-213 LBS.
UPLIFT ZONE 3	-184 LBS.
DOWNWARD	216 LBS.



2 ROOF C ARRAY LAYOUT
1/8" = 1'-0"



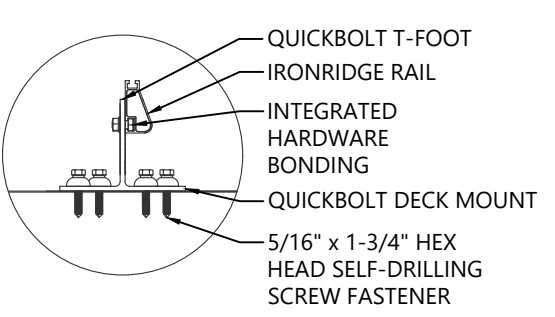
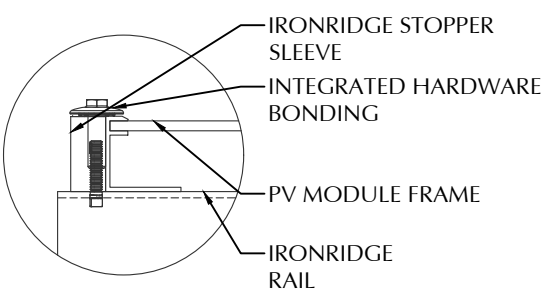
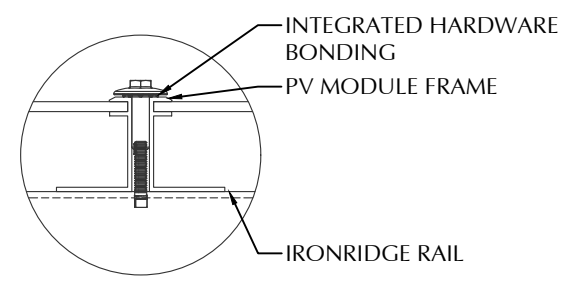
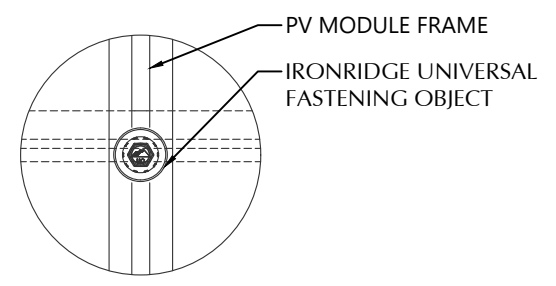
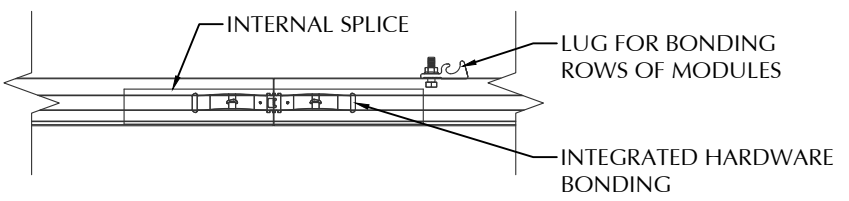
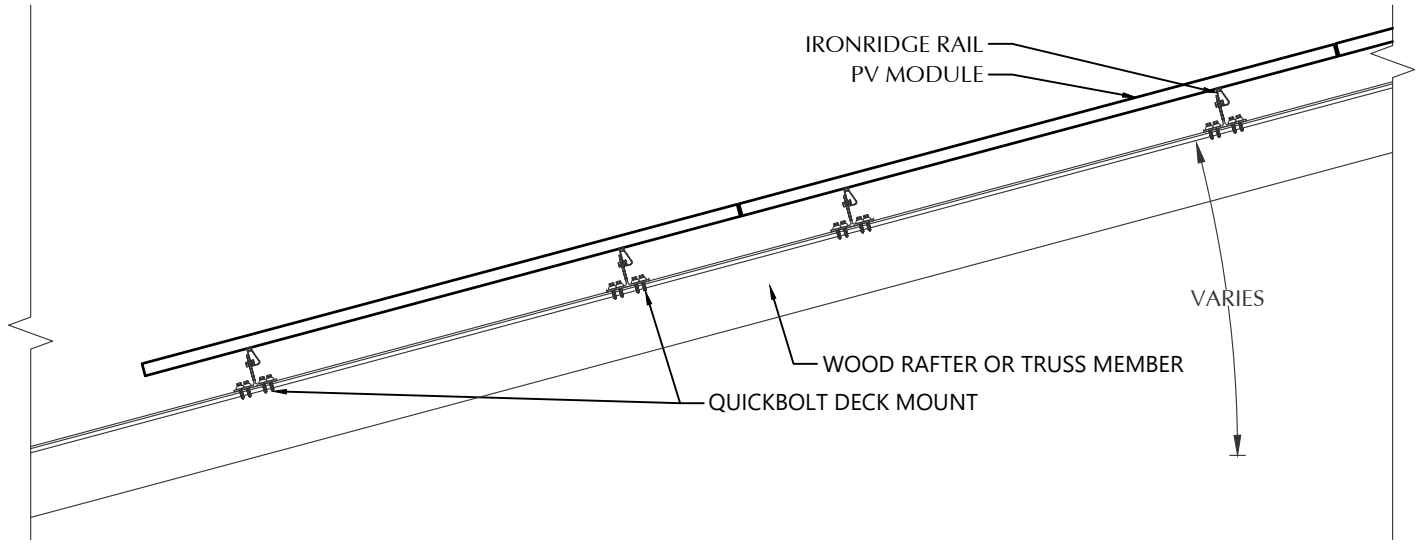
ROOF MOUNT SUMMARY		
MAXIMUM (IN)	MOUNT SPACING	RAIL OVERHANG
WIND ZONE 1	64 IN	16 IN
WIND ZONE 2	48 IN	16 IN
WIND ZONE 3	48 IN	16 IN

ROOF 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	-399 LBS.
UPLIFT ZONE 2	-353 LBS.
UPLIFT ZONE 3	-353 LBS.
DOWNWARD	373 LBS.

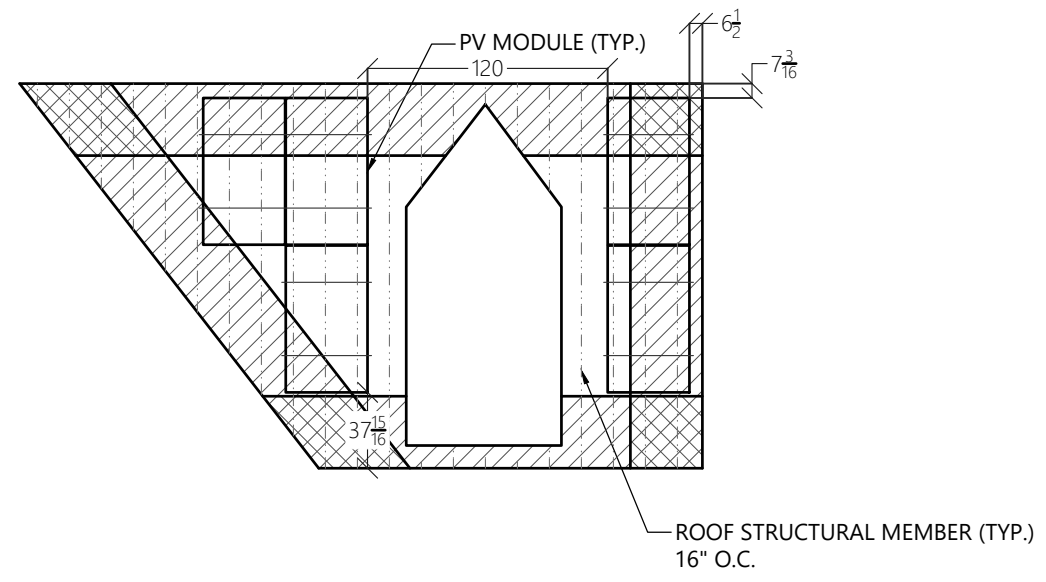
ROOF MOUNT & FASTENER	
ROOF MOUNT:	
MAKE	QUICKBOLT
MODEL	4 IN QB1
MATERIAL	STAINLESS / EPDM
FASTENER:	
MAKE	QUICK SCREWS
MODEL	HANGER BOLT
MATERIAL	304 SS
SIZE	5/16-18 X 5-1/4"
GENERAL:	
WEIGHT	0.56 LBS.
FASTENERS PER MOUNT	1
MAX. PULL-OUT FORCE	960.0 LBS.
SAFETY FACTOR	2
DESIGN PULL-OUT FORCE	480.0 LBS.

MOUNTING RAILS	
MAKE	IRONRIDGE
MODEL	XR10
MATERIAL	ALUMINUM
WEIGHT	0.425 LBS/IN
SPACING	37 IN

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1 ROOF FASTENER DETAIL
NOT TO SCALE



2 ROOF D ARRAY LAYOUT
1/8" = 1'-0"

STATEMENT OF STRUCTURAL COMPLIANCE

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 THESE DRAWINGS.

NAME: ANDREW W. KING, PE
SIGNED: *Andrew W. King*

PV MODULES	
MAKE	REC
MODEL	REC420AA PURE 2
WIDTH	40.90 IN
LENGTH	73.40 IN
THICKNESS	30 MM
WEIGHT	47.60 LBS.
ARRAY AREA	104 SQFT.
ARRAY WEIGHT	261 LBS.

ROOF SUMMARY	
STRUCTURE:	
TYPE	RAFTERS
MATERIAL	SOUTHERN PINE #2
SIZE	2 X 6
SPACING	16 IN O.C.
EFFECTIVE SPAN	147 IN
PITCH	10/12
DENSITY	30 LBS./CU.FT.
DECKING:	
TYPE	OSB
MATERIAL	COMPOSITE
THICKNESS	7/16 IN
WEIGHT	1.60 LBS/SQFT
ROOFING:	
TYPE	ASPHALT SHINGLE
MATERIAL	ASPHALT
WEIGHT	2.30 LBS/SQFT.

ROOF MOUNT SUMMARY		
MAXIMUM (IN)	MOUNT SPACING	RAIL OVERHANG
WIND ZONE 1	37 IN	15 IN
WIND ZONE 2	29 IN	11 IN
WIND ZONE 3	25 IN	10 IN

ROOF 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	-230 LBS.
UPLIFT ZONE 2	-213 LBS.
UPLIFT ZONE 3	-183 LBS.
DOWNWARD	215 LBS.

ROOF MOUNT & FASTENER	
ROOF MOUNT:	
MAKE	QUICKBOLT
MODEL	QB DECK MOUNT 16317
MATERIAL	STAINLESS / EPDM
FASTENER:	
MAKE	QUICK SCREWS
MODEL	HEX LAG PN# 16318
MATERIAL	304 SS
SIZE	5/16" X 1-3/4"
GENERAL:	
WEIGHT	0.88 LBS.
FASTENERS PER MOUNT	4
MAX. PULL-OUT FORCE	705.0 LBS.
SAFETY FACTOR	3
DESIGN PULL-OUT FORCE	235.0 LBS.

MOUNTING RAILS	
MAKE	IRONRIDGE
MODEL	XR10
MATERIAL	ALUMINUM
WEIGHT	0.425 LBS/IN
SPACING	37 IN



CLIENT INFO

GRETCHEN SCHULZ
487 COKESBURY PARK LANE
FUQUAY-VARINA, NC 27526

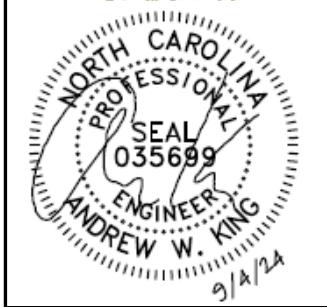
PROJECT INFO

DC INPUT: 10.500 kW
AC OUTPUT: 11.500 kW
DOI INSPT. METHOD: OPTION 2

Model Energy

300 Fayetteville St.
#1430
Raleigh, NC 27602
919-274-9905
ModelEnergy.com

P-1194



CODE REFERENCES

NATIONAL ELECTRICAL CODE v. 2017
NC FIRE PROTECTION CODE v. 2018
NC BUILDING CODE v. 2018
NC RESIDENTIAL CODE v. 2018
ACSE v. 7-10

SITE CONDITIONS

WIND SPEED: 120 MPH
RISK CATEGORY: II
EXPOSURE: B
SNOW: 15 PSF

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VERSIONS

FOR:	DESIGNER:	DATE:
CONSTRUCTION	CRM	8/26/2024

PV SYSTEM STRUCTURAL

PV-2.4

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CONDUCTOR SCHEDULE

TAG	CURRENT CARRYING CONDUCTORS			GROUNDING CONDUCTORS			CONDUIT/RACEWAY			NOTES
	QTY.	SIZE	INSULATION	QTY.	SIZE	INSULATION	QTY.	SIZE	LOCATION	
C1	8	10 AWG	PV WIRE	1	6 AWG	BARE	-	-	FREE AIR	1
C2	8	10 AWG	THWN	1	10 AWG	THWN	1	3/4"	EXT/INT	2,4
C3	3	6 AWG	THWN-2	1	10 AWG	THWN-2	1	1"	EXTERIOR	2,4
C4	3	4/0 AWG ALUMINUM	XHHW	1	6 AWG	THWN-2	1	2"	EXTERIOR	2,4
C5	3	4/0 AWG ALUMINUM	XHHW	-	-	-	1	2"	EXTERIOR	2,4
C6	2	6 AWG	THWN-2	1	10 AWG	THWN-2	1	1"	EXTERIOR	2,4
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 PLEASE REFERENCE NOTES ON PV-4.1 FOR ADDITIONAL DETAIL
 - EXISTING CONDUCTORS, FIELD VERIFY

MAX. DC VOLTAGE CALCULATION

$$V_{ocMAX} = V_{oc} * (1 + (T_{MIN} - T_{STC}) * (VTC / 100))$$

V_{ocMAX}	53.47
MAX STRING VOLTAGE	481.2

MAX. DC CURRENT CALCULATION

$$I_{scMAX} = I_{sc} * TCX$$

I_{scMAX} (AMPS)	13.43
--------------------	-------

UTILITY METER	
MAKE	SIEMENS
MODEL	OUTD-LAN UAT417-XGF
ENCL. RATING	NEMA 3R
VOLT. RATING	240 VOLTS
BUS RATING	200 AMPS
UL LIST. (Y/N)	YES

- REMOVE EXISTING METER COMBO PANEL AND REPLACE WITH METER BASE THAT FEEDS ENERGY MANAGEMENT
- RELOCATE ALL BREAKERS FROM METER COMBO TO NEW MD PANEL

AC DISCONNECT

MAKE	GENERIC
MODEL	NA
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

- 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
- DISCONNECT MARKED AND RATED PER NEC SECTION 690.13 AND 705.10

PV MODULE

MAKE	REC
MODEL	REC420AA PURE 2
NOM. POWER (PNOM)	420 WATTS
NOM. VOLT. (VMPP)	42.2 VOLTS
O.C. VOLT (VOC)	49.1 VOLTS
MAX. SYS. VOLT.	1000 VOLTS
NOM. CURR. (IMPP)	10.0 AMPS
S.C. CURR. (ISC)	10.7 AMPS
TEMP. COEF. (PMPP)	-0.24 %/C
TEMP. COEF. (Voc)	-0.24 %/C
MAX SERIES FUSE	25 AMPS
UL COMPLIANT (Y/N)	YES

ENERGY MANAGEMENT

MAKE	TESLA
MODEL	BACKUP GATEWAY 3
ENCL. RATING	NEMA 3R
VOLT. RATING	240 VOLTS
DISCONNECT CURR.	200 AMPS
UL LIST. (Y/N)	YES
MAIN BREAKER (Y/N)	YES
MAIN BREAKER RATING	200 AMPS

- TROUGH MAY BE USED IF NECESSARY
- INSTALL 200A MAIN BREAKER THAT WILL SERVE AS THE NEW SERVICE DISCONNECT SWITCH
- LAND POWERWALL 3 VIA 60A BREAKER ON INTERNAL PANELBOARD
- INSTALL BONDING JUMPER FROM NEUTRAL TO GROUND
- FEED BACKED-UP LOADS PANEL VIA BACKUP LUGS

MID-CIRCUIT INTERRUPTER

MAKE	TESLA
MODEL	MCI-1
ENCL. RATING	NEMA 4X / IP65
DC INPUT:	
MAX POWER	20000 WATTS
INPUT VOLT. RANGE	60-550 VOLTS
MPPT VOLT. RANGE	60-480 VOLTS
MAX. CURR. (Imp / Isc)	13 / 15 AMPS
STRING INPUTS	6 MPPTs
AC OUTPUT:	
MAX. CONT. POWER	11500 WATTS
NOM. VOLT.	120 / 240 VOLTS
MAX. CONT. CURRENT	48.00 AMPS
RAPID SHUTDOWN (Y/N)	YES
PROTECT. RATING	NEMA TYPE 3R
BATTERY INFO:	
USABLE ENERGY	13.5 kWh
NOM. VOLT.	240 VOLTS
MAX. CONT. CHARGE	5000 WATTS
MAX. CONT. DISCHARGE	11500 WATTS
UL LIST. (Y/N)	YES

JUNCTION BOX

MAKE	SOLADECK
PROTECT. RATING	NEMA TYPE 3R
UL LIST. (Y/N)	YES

EV CHARGER

MAKE	TESLA
MODEL	UNIVERSAL WALL CHARGER
ENCL. RATING	NEMA 3R
VOLT. RATING	250 VOLTS
UL LIST. (Y/N)	YES

DC/AC INVERTER & BATTERY

MAKE	TESLA POWERWALL 3
MODEL	1707000-XX-Y
DC INPUT:	
MAX POWER	20000 WATTS
INPUT VOLT. RANGE	60-550 VOLTS
MPPT VOLT. RANGE	60-480 VOLTS
MAX. CURR. (Imp / Isc)	13 / 15 AMPS
STRING INPUTS	6 MPPTs
AC OUTPUT:	
MAX. CONT. POWER	11500 WATTS
NOM. VOLT.	120 / 240 VOLTS
MAX. CONT. CURRENT	48.00 AMPS
RAPID SHUTDOWN (Y/N)	YES
PROTECT. RATING	NEMA TYPE 3R
BATTERY INFO:	
USABLE ENERGY	13.5 kWh
NOM. VOLT.	240 VOLTS
MAX. CONT. CHARGE	5000 WATTS
MAX. CONT. DISCHARGE	11500 WATTS
UL LIST. (Y/N)	YES

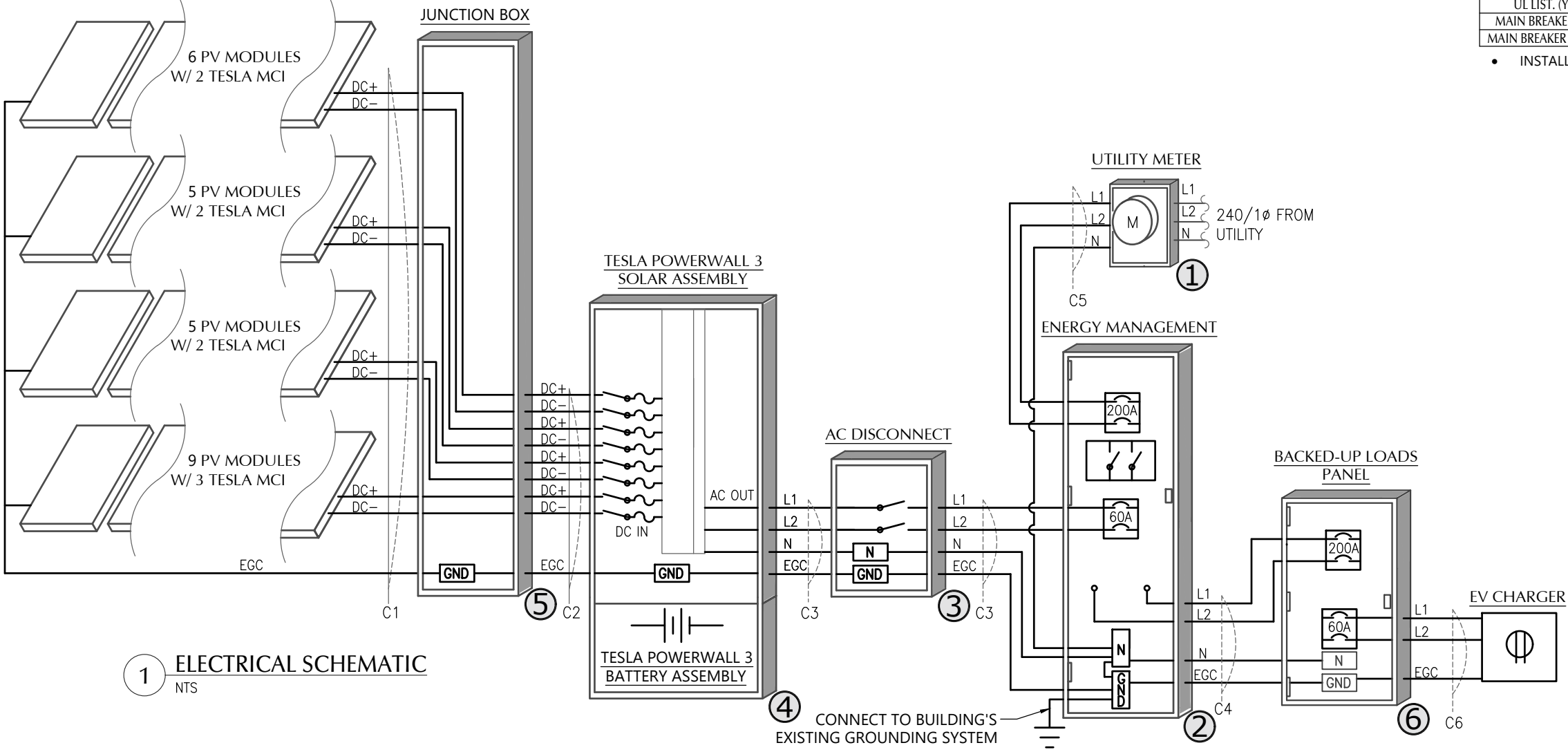
JUNCTION BOX

MAKE	IRONRIDGE
PROTECT. RATING	NEMA TYPE 3R
UL LIST. (Y/N)	YES

BACKED-UP LOADS PANEL

MAKE	GENERIC
MODEL	NA
ENCL. RATING	NEMA 3R
VOLT. RATING	240 VOLTS
BUS RATING	200 AMPS
UL LIST. (Y/N)	YES
MAIN BREAKER (Y/N)	YES
MAIN BREAKER RATING	200 AMPS

- INSTALL EV CHARGER ON 60A CIRCUIT



1 ELECTRICAL SCHEMATIC
NTS

4 CONNECT TO BUILDING'S EXISTING GROUNDING SYSTEM



CLIENT INFO

GRETCHEN SCHULZ
487 COKEBURY PARK LANE
FUQUAY-VARINA, NC 27526

PROJECT INFO

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PV SYSTEM ELECTRICAL

PV-3.1

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DIRECT CURRENT PHOTOVOLTAIC POWER SOURCE

MAXIMUM VOLTAGE 600 VDC
MAX CIRCUIT CURRENT 53.7 AMPS

④ NEC 690.53
PLACE ON ALL DC DISCONNECTING MEANS

WARNING

ELECTRIC SHOCK HAZARD

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

② NEC 690.13 (B)
PLACE ON PV SYSTEM DISCONNECTING MEANS.

WARNING

THREE POWER SOURCES

SOURCES: UTILITY GRID, BATTERY AND PV SOLAR ELECTRIC SYSTEM

①
②
⑥ NEC 705.12 (B)(3)
PLACE ON ALL EQUIPMENT THAT IS SUPPLIED BY BOTH POWER SOURCES

WARNING

THIS EQUIPMENT FED BY MULTIPLE SOURCES. TOTAL RATING OF ALL OVERCURRENT DEVICES EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE SHALL NOT EXCEED AMPACITY OF BUSBAR.

② NEC 705.12 (B)(2)(3)(c)
PLACE ON GATEWAY.

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

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

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

② 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

③ NEC 690.13 (B)
PLACE ON PV SYSTEM DISCONNECTING MEANS.

PHOTOVOLTAIC POWER SOURCE

OPERATING AC VOLTAGE 240 V
MAXIMUM OPERATING AC OUTPUT CURRENT 48.00 A

③ NEC 690.54
PLACE ON INTERCONNECTION DISCONNECTING MEANS

WARNING:

IN THE EVENT OF A UTILITY OUTAGE, THIS PANEL IS FED FROM ENERGY STORAGE SYSTEM.

②
⑥

WARNING: PHOTOVOLTAIC POWER SOURCE

⑤ 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, CEILINGS, OR FLOORS.

SERVICE DISCONNECT LOCATED:
EXTERIOR SOUTH WALL OF RESIDENCE

BATTERY DISCONNECT LOCATED:
EXTERIOR SOUTH WALL OF RESIDENCE

PV DISCONNECT LOCATED:
EXTERIOR SOUTH WALL OF RESIDENCE

②③ NEC 705.10
PLACE AT SERVICE EQUIPMENT AND PV SYSTEM DISCONNECTING MEANS.

LABEL NOTES

1. LABELS SHOWN ARE HALF THEIR ACTUAL REQUIRED SIZE.
2. LABEL MATERIAL SHALL BE SUITABLE FOR THE EQUIPMENT ENVIRONMENT.
3. DC CONDUIT SHALL BE MARKED WITH REQUIRED LABEL EVERY 10 FEET.
4. LABELS WILL BE APPLIED IN ACCORDANCE WITH THE NEC. SOME LABELS MAY NOT BE NECESSARY.

DC WIRING NOTES

1. CONDUCTORS SHALL BE COPPER, RATED AT NOT LESS THAN 600 VOLTS FOR RESIDENTIAL CONSTRUCTION AND NOT LESS THAN 1000 VOLTS FOR COMMERCIAL CONSTRUCTION.
2. MINIMUM SIZE SHALL BE #10 AWG UNLESS OTHERWISE NOTED ON THE DRAWINGS.
3. EXPOSED WIRING CONDUCTOR INSULATION SHALL BE TYPE PV WIRE, USE-2, OR RHW-2 WHERE THE OUTER LAYER OF THE INSULATION IS UV, SUNLIGHT, AND MOISTURE RESISTANT.
6. EXTERIOR WIRING CONDUCTOR INSULATION SHALL BE TYPE THWN-2 AND INSTALLED IN ELECTRICAL METALLIC TUBING(EMT) OR RIGID POLYVINYL CHLORIDE CONDUIT(PVC). ALTERNATIVELY, METAL CLAD CABLE(MC) CAN BE USED AS WELL WHEN RATED FOR USE IN WET LOCATIONS.
7. INTERIOR WIRING CONDUCTOR INSULATION SHALL BE TYPE THHN-2 AND INSTALLED IN ELECTRICAL METALLIC TUBING(EMT), FLEXIBLE METAL CONDUIT(FMC), OR METAL CLAD CABLE(MC).
6. USE SCHEDULE 40 PVC OUTDOORS WHERE NOT SUBJECT TO PHYSICAL DAMAGE OR BELOW FLOOR SLAB. USE SCHEDULE 80 PVC OUTDOORS WHERE SUBJECT TO PHYSICAL DAMMAGE
7. MINIMUM CONDUIT SIZE TO BE 1/2".
8. WIRING METHODS TO CONFORM TO ARTICLES 330, 334, 348, 350, 352, 356, AND 358 OF THE 2017 NEC.

AC WIRING NOTES

1. CONDUCTORS SHALL BE COPPER RATED AT NOT LESS THAN 600 VOLTS.
2. MINIMUM SIZE SHALL BE #14 AWG UNLESS OTHERWISE NOTED ON THE DRAWINGS.
3. EXTERIOR WIRING CONDUCTOR INSULATION SHALL BE TYPE THWN AND INSTALLED IN ELECTRICAL METALLIC TUBING(EMT), RIGID POLYVINYL CHLORIDE CONDUIT(PVC), LIQUID-TIGHT FLEXIBLE METAL CONDUIT(LFMC), OR LIQUID-TIGHT FLEXIBLE NON-METALLIC CONDUIT(LFNC) . ALTERNATIVELY, METAL CLAD CABLE(MC) CAN BE USED AS WELL WHEN RATED FOR USE IN WET LOCATIONS.
4. INTERIOR WIRING CONDUCTOR INSULATION SHALL BE TYPE THHN AND INSTALLED IN ELECTRICAL METALLIC TUBING(EMT), FLEXIBLE METAL CONDUIT(FMC), METAL CLAD CABLE(MC), OR ROMEX.
5. USE SCHEDULE 40 PVC OUTDOORS WHERE NOT SUBJECT TO PHYSICAL DAMAGE OR BELOW FLOOR SLAB. USE SCHEDULE 80 PVC OUTDOORS WHERE SUBJECT TO PHYSICAL DAMMAGE
6. MINIMUM CONDUIT SIZE TO BE 1/2".
7. WIRING METHODS TO CONFORM TO ARTICLES 330, 334, 348, 350, 352, 356, AND 358 OF THE 2017 NEC.

CONSTRUCTION NOTES

1. ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH THE NEC, STATE, AND LOCAL APPLICABLE CODES.
2. FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS, BEST PRACTICES, AND SPECIFICATIONS.
3. ENSURE REQUIRED MAINTENANCE ACCESS AND CLEARANCES ARE MAINTAINED.
4. WIRES SHALL BE RATED AND LABELED "SUNLIGHT RESISTANT" WHERE EXPOSED TO AMBIENT CONDITIONS.
5. FUSES 0 - 600 AMPS SHALL BE UL CLASS "RK-1" LOW PEAK DUAL ELEMENT TIME DELAY WITH 200,000 AMPERE INTERRUPTING RATING AS MANUFACTURED BY BUSSMANN, UNLESS NOTED OTHERWISE.
6. ALL TERMINALS/LUGS SHALL BE 75° RATED. ALL TERMINALS, SPlicing CONNECTORS, LUGS, ETC SHALL BE IDENTIFIED FOR USE WITH THE MATERIAL (CU/AL) OF THE CONDUCTOR AND SHALL BE PROPERLY INSTALLED.
7. PROVIDE A PULLWIRE IN ALL EMPTY CONDUITS.
8. ALL PENETRATIONS THROUGH EXTERIOR ROOFS SHALL BE FLASHED IN A WATERPROOF MANNER.
9. ALL PENETRATIONS THROUGH ATTIC FIRE BARRIERS SHALL BE SEALED WITH FIRE-BARRIER SEALANT CAULK.
10. SUPPORT ALL CONDUIT AND EQUIPMENT IN ACCORDANCE W/ NEC. ANY SUSPENDED MATERIALS SHALL BE DIRECTLY SUPPORTED BY THE BUILDING STRUCTURE.
11. METAL CONDUIT COUPLINGS CAN BE COMPRESSION TYPE, THREADED, OR BE SET-SCREW TYPE. PLASTIC CONDUIT COUPLINGS TO BE SOCKET GLUED TYPE.
12. A COMPLETE GROUNDING SYSTEM SHALL BE PRESENT OR PROVIDED AND INSTALLED IN ACCORDANCE WITH ARTICLE 250 OF THE NEC, AND AS SHOWN ON THE DRAWINGS.
13. 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.
14. WHERE APPLICABLE, GROUNDING ELECTRODE CONDUCTOR TO BE CONTINUOUS. GROUNDING CRIMPS TO BE IRREVERSIBLE.
15. PHOTOVOLTAIC SYSTEMS SHALL BE PERMANENTLY MARKED AT VARIOUS EQUIPMENT LOCATIONS TO IDENTIFY THAT A PHOTOVOLTAIC SYSTEM IS INSTALLED AND THAT VARIOUS DANGERS ARE PRESENT.
16. EACH PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS SHALL BE PERMANENTLY MARKED TO IDENTIFY IT AS A PHOTOVOLTAIC SYSTEM DISCONNECT.
17. 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.
18. A PERMANENT LABEL FOR THE DIRECT-CURRENT PHOTOVOLTAIC POWER SOURCE SHALL BE PROVIDED AT THE DC DISCONNECT MEANS.
19. 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.
20. ALL MODULE GROUND CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH NEC SECTION 690.4 (C)
21. A NORTH CAROLINA REGISTERED DESIGN PROFESSIONAL WILL BE REQUIRED TO SEAL THE STRUCTURAL DESIGN AT THE TIME OF PERMIT APPLICATION IF ANY OF THE FOLLOWING EXIST AND ARE ATTESTED TO BY THE APPLICANT:
 - I. THE WEIGHT OF THE PV SYSTEM EXCEEDS THREE (3) POUNDS PER SQUARE FOOT(PSF)
 - II. THE ROOF POSSESSES MORE THAN ONE (1) LAYER OF ASPHALT SHINGLES
 - III. THE ROOFING MATERIAL CONSISTS OF A TYPE OTHER THAN ASPHALT SHINGLES OR METAL
 - IV. THE ROOF IS LOCATED IN A 140 MPH OR GREATER WIND ZONE



CLIENT INFO

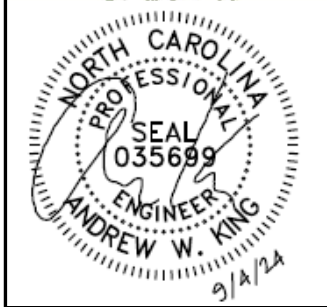
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487 COKESBURY PARK LANE
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PROJECT INFO

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AC OUTPUT: 11.500 kW
DOI INSP.T. METHOD: OPTION 2

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SITE CONDITIONS

WIND SPEED: 120 MPH
RISK CATEGORY: II
EXPOSURE: B
SNOW: 15 PSF

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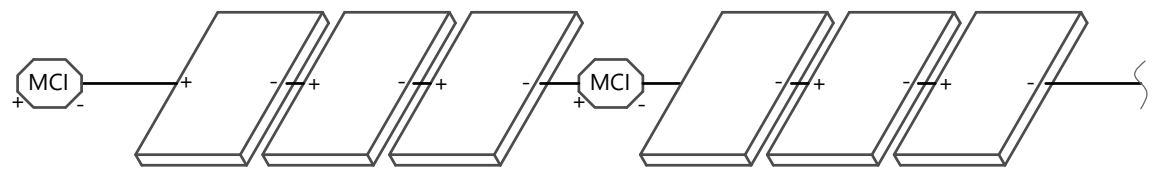
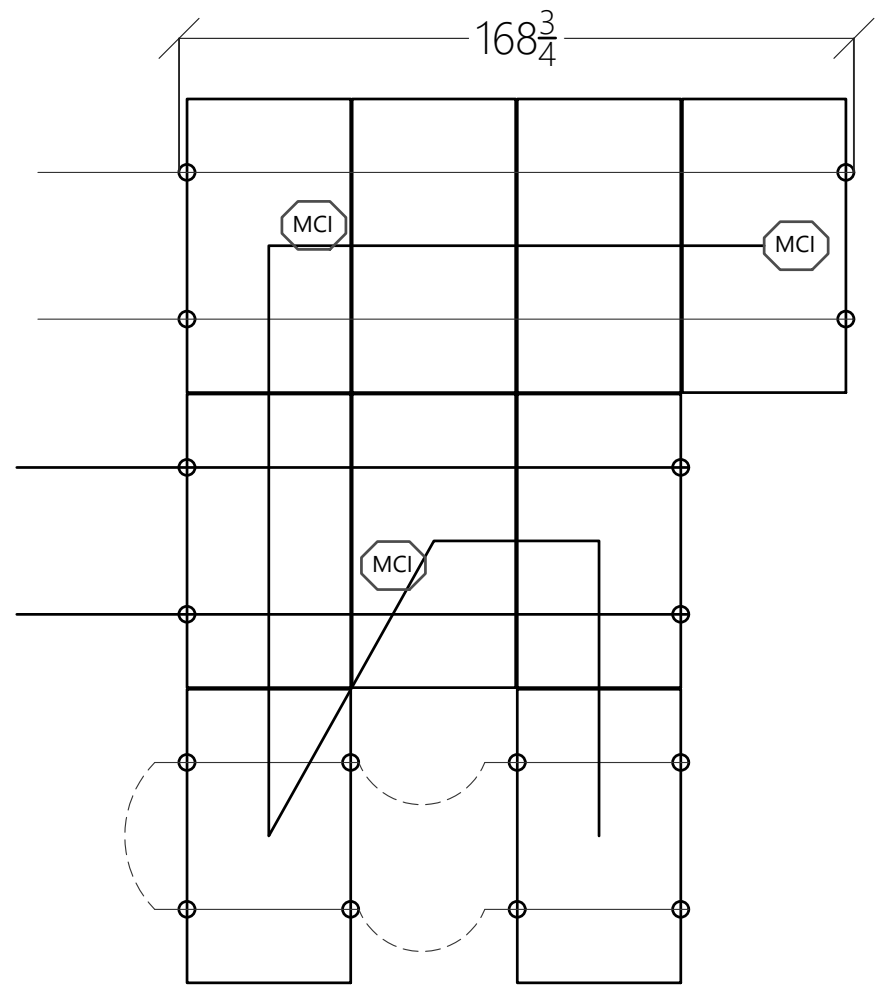
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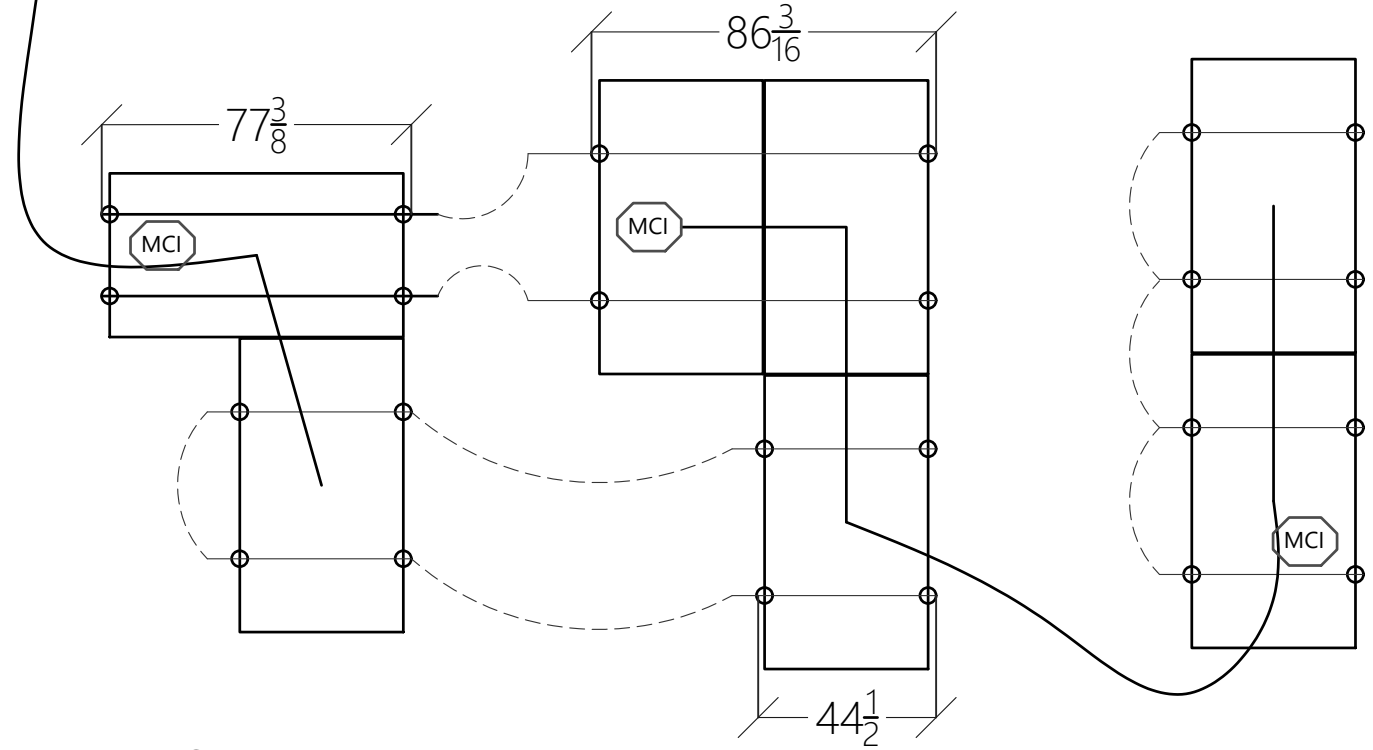
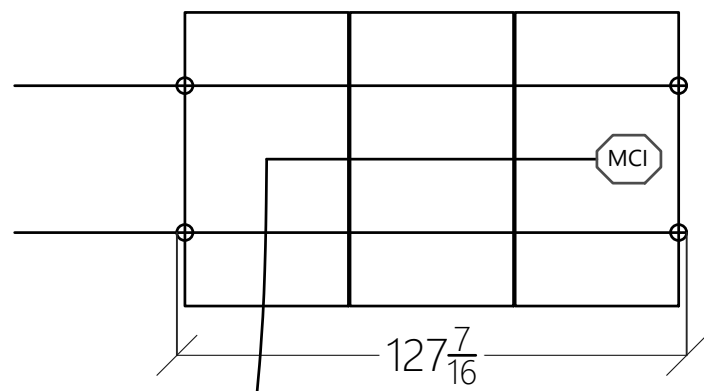
PV SYSTEM EQUIPMENT LABELS

PV-4.1

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1 STRING WIRING + MCI DETAIL
NOT TO SCALE



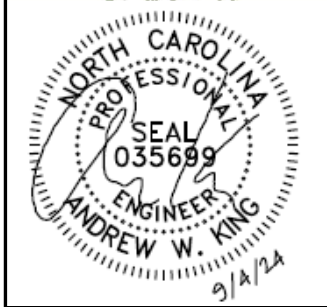
1 ARRAY LAYOUT DETAIL
NOT TO SCALE



CLIENT INFO
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PV-5: PV INSTALL GUIDE

VERSIONS

FOR:	DESIGNER:	DATE:
CONSTRUCTION	CRM	8/26/2024

PV SYSTEM INSTALL GUIDE

PV-5.1