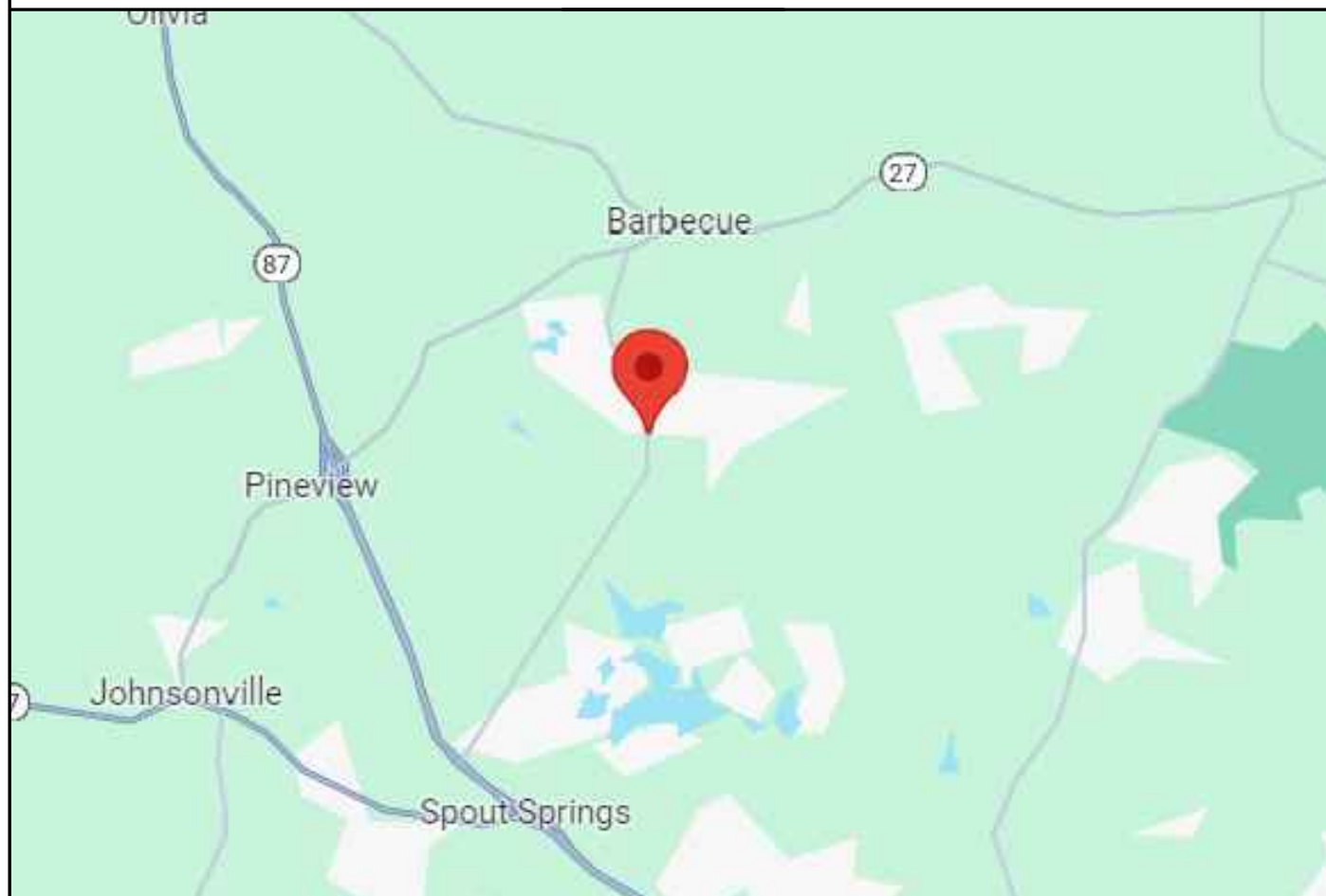


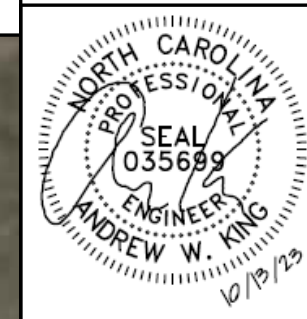
VICINITY MAP



PROPERTY MAP



SEAL:



ENGINEER:

MODEL ENERGY

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

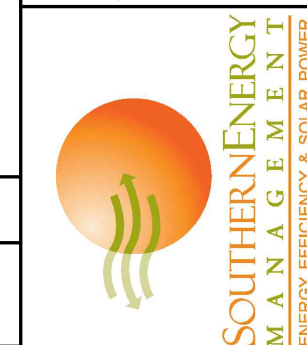
P-1194

JOB TITLE:

NEW SOLAR PV SYSTEM
11.745 kW DC INPUT
7.600 kW AC EXPORT

ABDO ZACHEUS
55 VAIL COURT
SANFORD, NC 27332

CLIENT:



ISSUED FOR: CONSTRUCTION
DATE: 10/11/23

PROJECT INFORMATION

PV1.1

CONSTRUCTION NOTES

- ALL WORK AND EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST NATIONAL, STATE, AND LOCAL CODES AND ORDINANCES
- FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS, BEST PRACTICES, AND SPECIFICATIONS
- WIRES SHALL BE RATED AND LABELED "SUNLIGHT RESISTANT" WHERE EXPOSED TO AMBIENT CONDITIONS
- THE PHOTOVOLTAIC SYSTEM SHALL NOT EXCEED 600 VOLTS OR 800 AMPS
- 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
- WHERE APPLICABLE, GROUNDING ELECTRODE CONDUCTOR TO BE CONTINUOUS. GROUNDING CRIMPS TO BE IRREVERSIBLE
- 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.
- PHOTOVOLTAIC SYSTEMS SHALL BE PERMANENTLY MARKED AT VARIOUS EQUIPMENT LOCATIONS TO IDENTIFY THAT A PHOTOVOLTAIC SYSTEM IS INSTALLED AND THAT VARIOUS DANGERS ARE PRESENT.
- EACH PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS SHALL BE PERMANENTLY MARKED TO IDENTIFY IT AS A PHOTOVOLTAIC SYSTEM DISCONNECT
- 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
- A PERMANENT LABEL FOR THE DIRECT-CURRENT PHOTOVOLTAIC POWER SOURCE SHALL BE PROVIDED BY THE INSTALLED AT THE DC DISCONNECT MEANS
- 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.
- 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.
- ALL MODULE GROUND CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH NEC SECTION 690.4 (C)

ABBREVIATIONS

A	AMPERE
AC	ALTERNATING CURRENT
DC	DIRECT CURRENT
EGC	EQUIPMENT GROUNDING CONDUCTOR
EMT	ELECTRICAL METAL TUBING
GALV	GALVANIZED
GEC	GROUNDING ELECTRODE CONDUCTOR
GND	GROUND
I	CURRENT
IMP	CURRENT AT MAXIMUM POWER
ISC	SHORT-CIRCUIT CURRENT
KVA	KILOVOLT AMPERE
KW	KILOWATT
MAX	MAXIMUM
MIN	MINIMUM
MCB	MAIN CIRCUIT BREAKER
MLO	MAIN LUG ONLY
NOM	NOMINAL
NTS	NOT TO SCALE
PnOM	NOMINAL POWER
PV	PHOTOVOLTAIC
PVC	POLYVINYL CHLORIDE
SN	SOLAR NOON
STC	STANDARD TEST CONDITIONS
TYP	TYPICAL
V	VOLT
VMP	VOLTAGE AT MAXIMUM POWER
Voc	OPEN-CIRCUIT VOLTAGE
W	WATT

CODE REFERENCES

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

SHEET INDEX

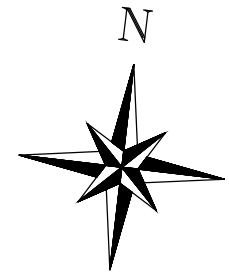
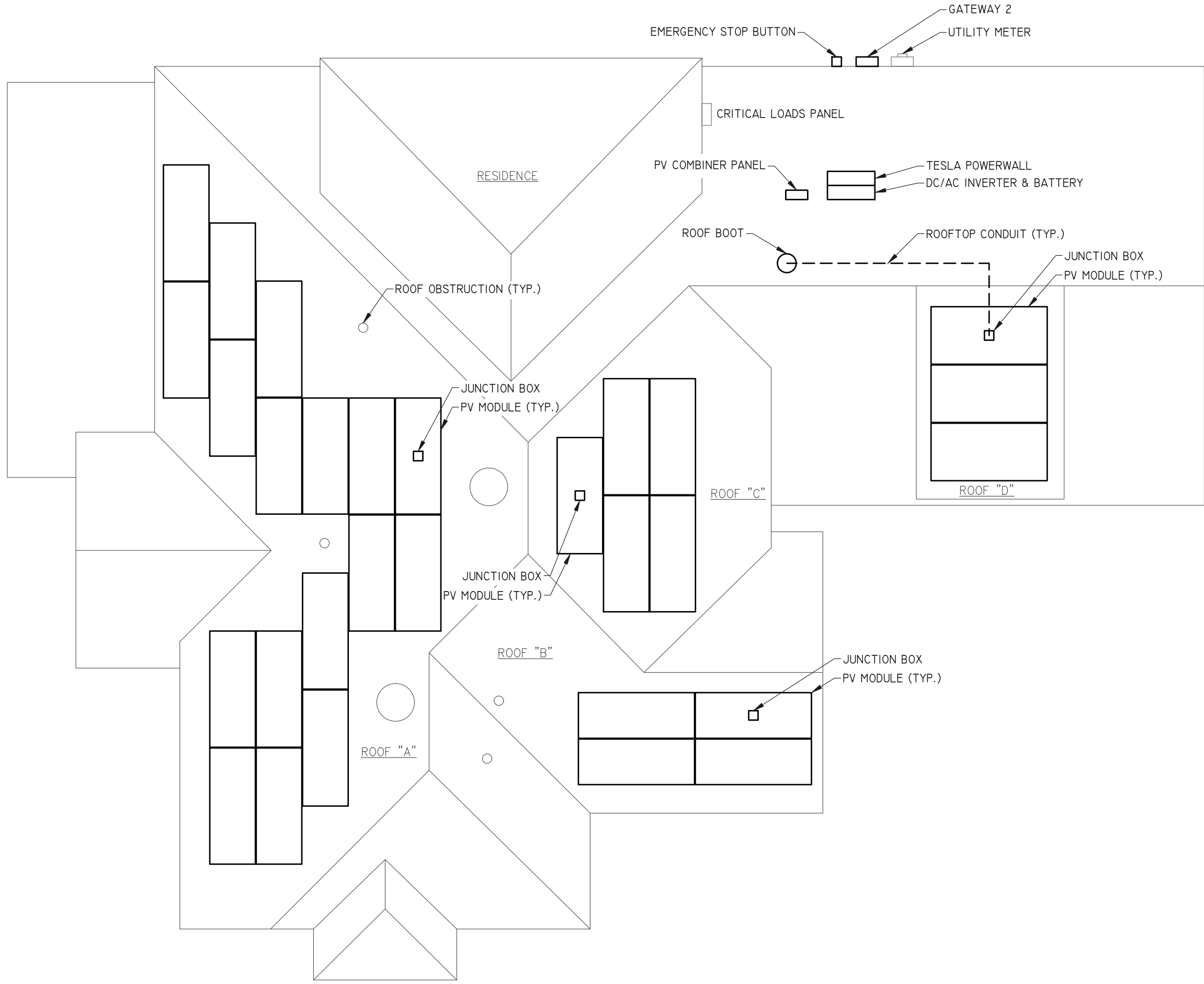
PV1.1 - PROJECT INFORMATION
PV2.1 - SITE INFORMATION
PV3.1 - PV3.4 - STRUCTURAL INFORMATION
PV4.1 - PV4.2 - ELECTRICAL INFORMATION
PV5.1 - EQUIPMENT LABELS

SITE CONDITIONS

ASCE 7-10 WIND SPEED - 115 MPH
EXPOSURE CATEGORY - B
RISK CATEGORY - II

LEGEND

	DISCONNECT SWITCH
	FUSE
	CIRCUIT BREAKER
	EQUIP. GROUND



SEAL:

ENGINEER:

MODEL ENERGY
 300 FAYETTEVILLE ST.
 #1430
 RALEIGH, NC 27602
 919-274-9905
 MODELENERGY.COM
 P1194

JOB TITLE:

NEW SOLAR PV SYSTEM
 11.745 kW DC INPUT
 7.600 kW AC EXPORT

ABDO ZACHEUS
 55 VAIL COURT
 SANFORD, NC 27332

CLIENT:

SOUTHERN ENERGY MANAGEMENT
 ENERGY EFFICIENCY & SOLAR POWER

ISSUED FOR:	DATE:
CONSTRUCTION	10/11/23

SITE INFORMATION

PV2.1

© 2023 MODEL ENERGY, PLLC EXPRESSLY RESERVES ITS COMMON LAW COPYRIGHT AND OTHER PROPERTY RIGHTS IN THESE PLANS. THESE PLANS ARE NOT TO BE REPRODUCED, CHANGED OR COPIED IN ANY FORM OR MANNER WHATSOEVER, NOR ARE THEY TO BE ASSIGNED TO ANY THIRD PARTY WITHOUT FIRST OBTAINING THE EXPRESSED WRITTEN PERMISSION AND CONSENT OF MODEL ENERGY, PLLC.

ROOF LOADING	
GROUND SNOW LOAD:	15 LBS./SQFT.
LIVE LOAD:	20 LBS./SQFT.
DEAD LOAD:	
ROOFING	3.9 LBS./SQFT.
PV ARRAY	2.7 LBS./SQFT.
TOTAL	6.4 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	-246 LBS.
UPLIFT ZONE 2	-222 LBS.
UPLIFT ZONE 3	-74 LBS.
DOWNWARD	226 LBS.

MOUNTING RAILS	
MAKE	IRONRIDGE
MODEL	XRIO
MATERIAL	ALUMINUM
WEIGHT	0.42 LBS./FT.
SPACING	21 IN.

NOTES:

- PROVIDE 1/8" TO 1/4" GAP BETWEEN FULL RAIL LENGTHS FOR THERMAL EXPANSION

ROOF MOUNT & FASTENER	
ROOF MOUNT:	
MAKE	IRONRIDGE
MODEL	HALO ULTRA GRIP
MATERIAL	ALUMINUM
FASTENER	
MAKE	IRONRIDGE
MODEL	RD-1430-01-MI
MATERIAL	SS,#14 EPDM WASHER
SIZE	#14
GENERAL	
WEIGHT	1 LBS
FASTENERS PER MOUNT	2 PER MOUNT
MAX. PULL-OUT FORCE	960 LBS.
SAFETY FACTOR	2
DESIGN PULL-OUT FORCE	480 LBS.

- LAG BOLT EMBEDDED WITH 2" OF THREAD IN WOOD RAFTER OR TRUSSES MEMBER

ARRAY SUMMARY	
# MODULES	17
# ROOF MOUNTS	70
RAIL LENGTH	211 FEET
ARRAY AREA	359 SQFT.
ARRAY WEIGHT	984 LBS.
AZIMUTH @ SN	263°
TILT ANGLE	45°

PV MODULES	
MAKE	QCELLS
MODEL	ML-G10+-405
WIDTH	41.1"
LENGTH	74.0"
THICKNESS	1.26"
WEIGHT	48.5 LBS

ROOF SUMMARY	
STRUCTURE:	
TYPE	TRUSSES
MATERIAL	SOUTHERN PINE #2
SIZE	2" X 4"
SPACING	24" o.c.
EFF. SPAN	11'-6"
PITCH	12 / 12
DENSITY	30 LBS./CU.FT.
DECKING:	
TYPE	OSB
MATERIAL	WOOD COMPOSITE
THICKNESS	3/8"
WEIGHT	1.6 LBS./SQFT.
ROOFING:	
TYPE	ARCH SHINGLE
MATERIAL	ASPHALT
WEIGHT	2.3 LBS./SQFT.

STATEMENT OF STRUCTURAL COMPLIANCE

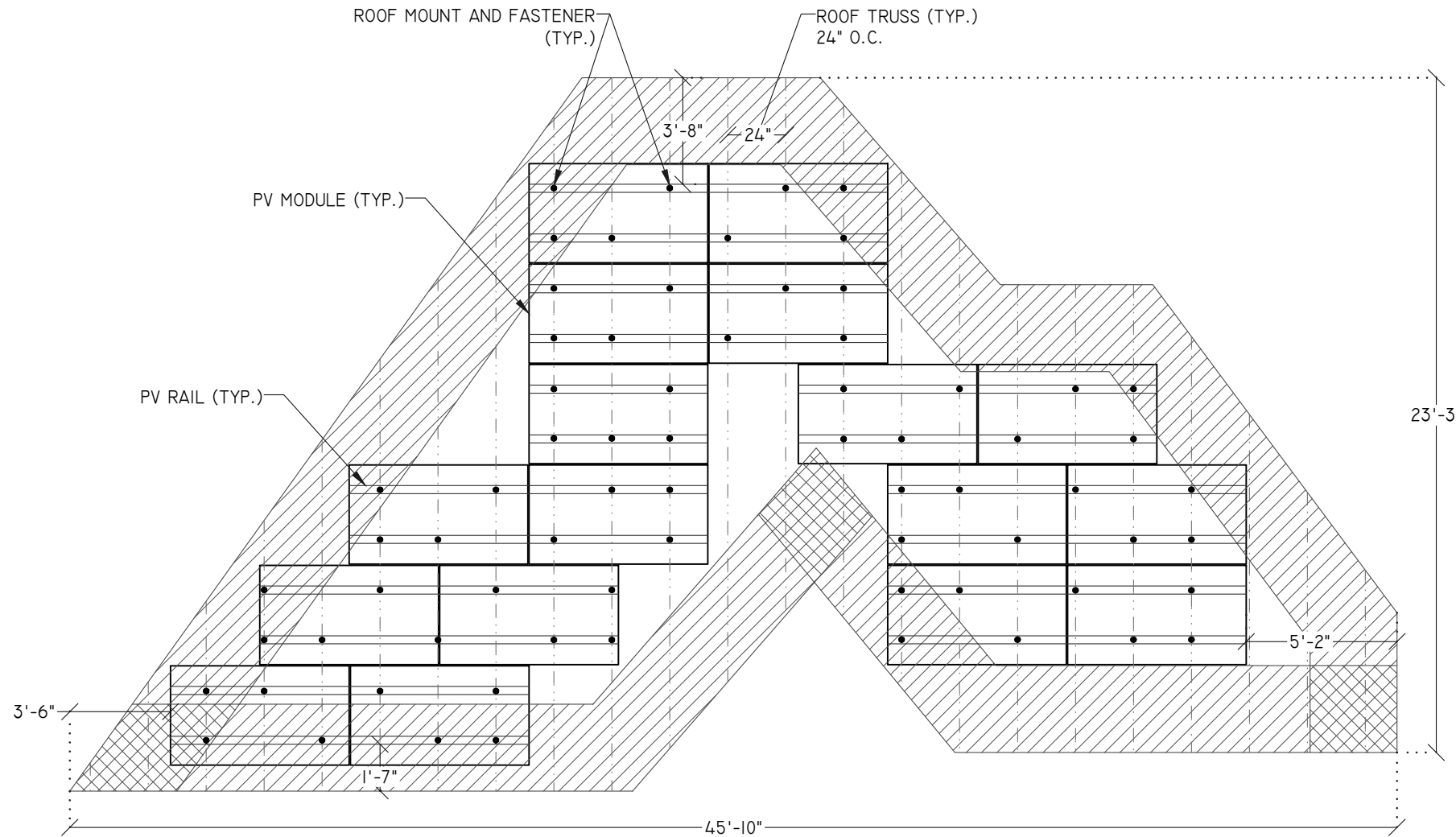
THE EXISTING ROOF STRUCTURE HAS BEEN DESIGNED TO SUPPORT THE ADDITIONAL LOADS OF THE PROPOSED PV SYSTEM. IN ADDITION, THE RACKING AND FASTENING SYSTEM SHALL BE CAPABLE OF SECURING THE SYSTEM TO THE STRUCTURE UNDER DESIGN CONDITIONS WHEN INSTALLED PROPERLY AND IN ACCORDANCE WITH THE RACKING AND FASTENING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

NAME: ANDREW W. KING, PE

TITLE: PROFESSIONAL ENGINEER

ROOF 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"



1 | MODULE, RACKING, AND FASTENER LAYOUT – ROOF "A" PLANAR VIEW

SCALE: 3/16" = 1'-0"

SEAL:



ENGINEER:

MODEL ENERGY

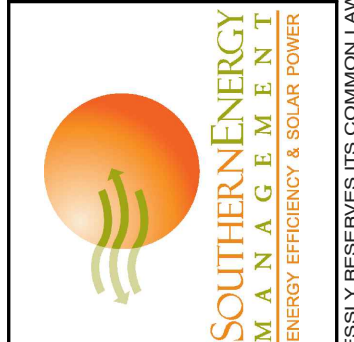
300 FAYETTEVILLE ST.
#1430
RALEIGH, NC 27602
919-274-9905
MODELENERGY.COM

P1194

JOB TITLE:

NEW SOLAR PV SYSTEM
11.745 kW DC INPUT
7.600 kW AC EXPORT
ABDO ZACHEUS
55 VAIL COURT
SANFORD, NC 27332

CLIENT:



ISSUED FOR:	DATE:
CONSTRUCTION	10/11/23

STRUCTURAL INFORMATION

PV3.1

© 2023 MODEL ENERGY, PLLC EXPRESSLY RESERVES ITS COMMON LAW COPYRIGHT AND OTHER PROPERTY RIGHTS IN THESE PLANS. THESE PLANS ARE NOT TO BE REPRODUCED, CHANGED OR COPIED IN ANY FORM OR MANNER WHATSOEVER, NOR ARE THEY TO BE ASSIGNED TO ANY THIRD PARTY WITHOUT FIRST OBTAINING THE EXPRESSED WRITTEN PERMISSION AND CONSENT OF MODEL ENERGY, PLLC.

ROOF LOADING	
GROUND SNOW LOAD:	15 LBS./SQFT.
LIVE LOAD:	20 LBS./SQFT.
DEAD LOAD:	
ROOFING	3.9 LBS./SQFT.
PV ARRAY	2.8 LBS./SQFT.
TOTAL	6.7 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	-276 LBS.
UPLIFT ZONE 2	-222 LBS.
UPLIFT ZONE 3	-111 LBS.
DOWNWARD	254 LBS.

MOUNTING RAILS	
MAKE	IRONRIDGE
MODEL	XRIO
MATERIAL	ALUMINUM
WEIGHT	0.42 LBS./FT.
SPACING	21 IN.

- NOTES:
- PROVIDE 1/8" TO 1/4" GAP BETWEEN FULL RAIL LENGTHS FOR THERMAL EXPANSION

ROOF MOUNT & FASTENER	
ROOF MOUNT:	
MAKE	IRONRIDGE
MODEL	HALO ULTRA GRIP
MATERIAL	ALUMINUM
FASTENER	
MAKE	IRONRIDGE
MODEL	RD-I430-01-MI
MATERIAL	SS,#14 EPDM WASHER
SIZE	#14
GENERAL	
WEIGHT	1 LBS
FASTENERS PER MOUNT	2 PER MOUNT
MAX. PULL-OUT FORCE	960 LBS.
SAFETY FACTOR	2
DESIGN PULL-OUT FORCE	480 LBS.

- LAG BOLT EMBEDDED WITH 2" OF THREAD IN WOOD RAFTER OR TRUSSES MEMBER

ARRAY SUMMARY	
# MODULES	4
# ROOF MOUNTS	20
RAIL LENGTH	50 FEET
ARRAY AREA	84 SQFT.
ARRAY WEIGHT	235 LBS.
AZIMUTH @ SN	173°
TILT ANGLE	45°

PV MODULES	
MAKE	QCELLS
MODEL	ML-G10+-405
WIDTH	41.1"
LENGTH	74.0"
THICKNESS	1.26"
WEIGHT	48.5 LBS

ROOF SUMMARY	
STRUCTURE:	
TYPE	TRUSSES
MATERIAL	SOUTHERN PINE #2
SIZE	2" X 4"
SPACING	24" o.c.
EFF. SPAN	6'-0"
PITCH	12 / 12
DENSITY	30 LBS./CU.FT.
DECKING:	
TYPE	OSB
MATERIAL	WOOD COMPOSITE
THICKNESS	3/8"
WEIGHT	1.6 LBS./SQFT.
ROOFING:	
TYPE	ARCH SHINGLE
MATERIAL	ASPHALT
WEIGHT	2.3 LBS./SQFT.

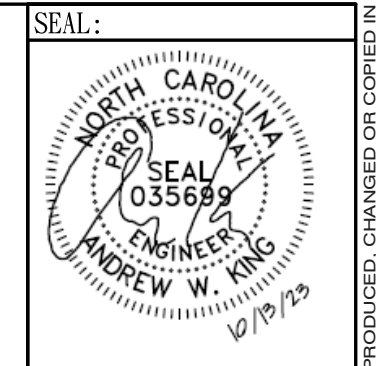
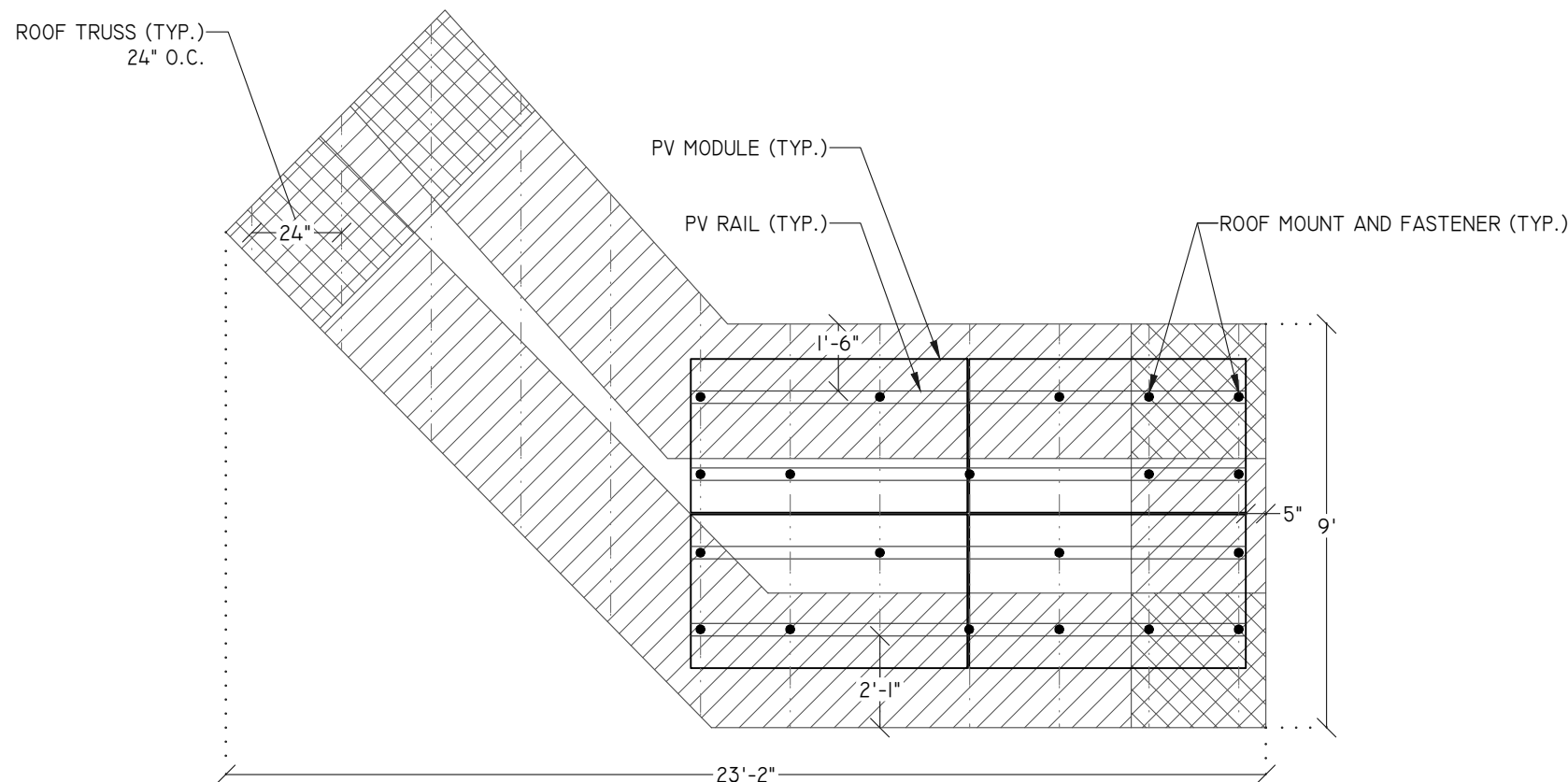
STATEMENT OF STRUCTURAL COMPLIANCE

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

TITLE: PROFESSIONAL ENGINEER

ROOF 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"



ENGINEER:

MODEL ENERGY

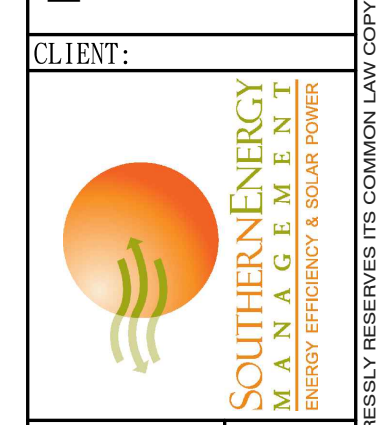
300 FAYETTEVILLE ST.
#1430
RALEIGH, NC 27602
919-274-9905
MODELENERGY.COM

P1194

JOB TITLE:

NEW SOLAR PV SYSTEM
11.745 kW DC INPUT
7.600 kW AC EXPORT

ABDO ZACHEUS
55 VAIL COURT
SANFORD, NC 27332



ISSUED FOR:	DATE:
CONSTRUCTION	10/11/23

STRUCTURAL INFORMATION

PV3.2

© 2023 MODEL ENERGY, PLLC EXPRESSLY RESERVES ITS COMMON LAW COPYRIGHT AND OTHER PROPERTY RIGHTS IN THESE PLANS. THESE PLANS ARE NOT TO BE REPRODUCED, CHANGED OR COPIED IN ANY FORM OR MANNER WHATSOEVER, NOR ARE THEY TO BE ASSIGNED TO ANY THIRD PARTY WITHOUT FIRST OBTAINING THE EXPRESSED WRITTEN PERMISSION AND CONSENT OF MODEL ENERGY, PLLC.

ROOF LOADING	
GROUND SNOW LOAD:	15 LBS./SQFT.
LIVE LOAD:	20 LBS./SQFT.
DEAD LOAD:	
ROOFING	3.9 LBS./SQFT.
PV ARRAY	2.8 LBS./SQFT.
TOTAL	6.7 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	-276 LBS.
UPLIFT ZONE 2	-222 LBS.
UPLIFT ZONE 3	-111 LBS.
DOWNWARD	254 LBS.

ROOF MOUNT & FASTENER	
ROOF MOUNT:	
MAKE	IRONRIDGE
MODEL	HALO ULTRA GRIP
MATERIAL	ALUMINUM
FASTENER	
MAKE	IRONRIDGE
MODEL	RD-I430-01-MI
MATERIAL	SS,#14 EPDM WASHER
SIZE	#14
GENERAL	
WEIGHT	1 LBS
FASTENERS PER MOUNT	2 PER MOUNT
MAX. PULL-OUT FORCE	960 LBS.
SAFETY FACTOR	2
DESIGN PULL-OUT FORCE	480 LBS.

ARRAY SUMMARY	
# MODULES	5
# ROOF MOUNTS	22
RAIL LENGTH	62 FEET
ARRAY AREA	106 SQFT.
ARRAY WEIGHT	291 LBS.
AZIMUTH @ SN	83°
TILT ANGLE	45°

PV MODULES	
MAKE	QCELLS
MODEL	ML-G10+-405
WIDTH	41.1"
LENGTH	74.0"
THICKNESS	1.26"
WEIGHT	48.5 LBS

ROOF SUMMARY	
STRUCTURE:	
TYPE	TRUSSES
MATERIAL	SOUTHERN PINE #2
SIZE	2" X 4"
SPACING	24" o.c.
EFF. SPAN	11'-6"
PITCH	12 / 12
DENSITY	30 LBS./CU.FT.
DECKING:	
TYPE	OSB
MATERIAL	WOOD COMPOSITE
THICKNESS	3/8"
WEIGHT	1.6 LBS./SQFT.
ROOFING:	
TYPE	ARCH SHINGLE
MATERIAL	ASPHALT
WEIGHT	2.3 LBS./SQFT.

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

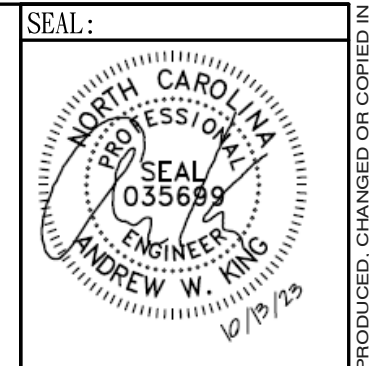
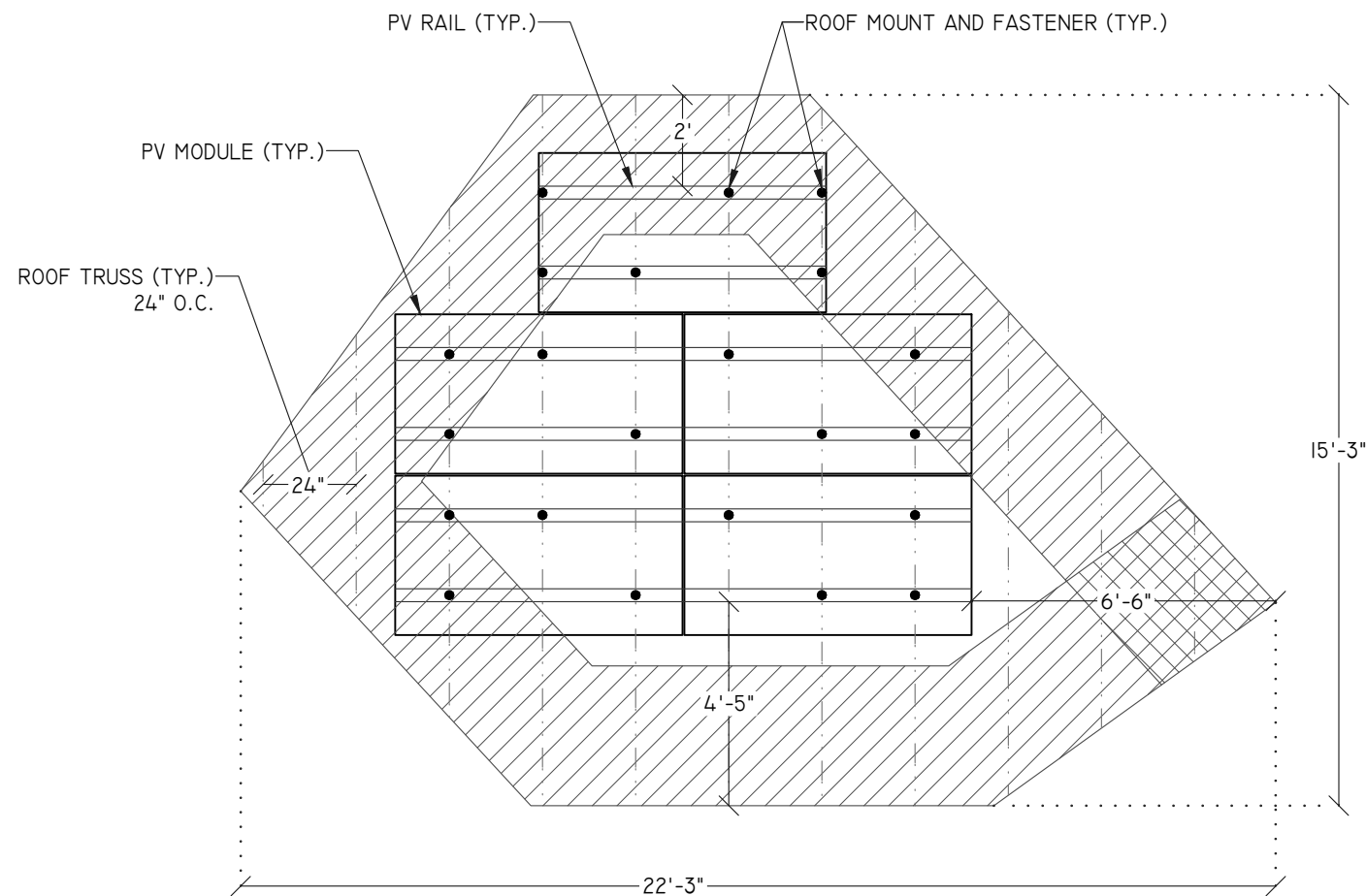
TITLE: PROFESSIONAL ENGINEER

ROOF ZONES:	
ALL ZONES	MAX. RAIL OVERHANG = 16"
<input type="checkbox"/> ZONE 1	MAX. FASTENER SPAN ZONE 1 = 48"
<input checked="" type="checkbox"/> ZONE 2	MAX. FASTENER SPAN ZONE 2 = 48"
<input checked="" type="checkbox"/> ZONE 3	MAX. FASTENER SPAN ZONE 3 = 24"

MOUNTING RAILS	
MAKE	IRONRIDGE
MODEL	XRIO
MATERIAL	ALUMINUM
WEIGHT	0.42 LBS./FT.
SPACING	21 IN.

- NOTES:
- PROVIDE 1/8" TO 1/4" GAP BETWEEN FULL RAIL LENGTHS FOR THERMAL EXPANSION

- LAG BOLT EMBEDDED WITH 2" OF THREAD IN WOOD RAFTER OR TRUSSES MEMBER



ENGINEER:

MODEL ENERGY

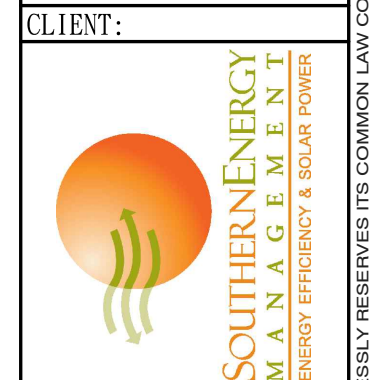
300 FAYETTEVILLE ST.
#1430
RALEIGH, NC 27602
919-274-9905
MODELENERGY.COM

P1194

JOB TITLE:

NEW SOLAR PV SYSTEM
11.745 kW DC INPUT
7.600 kW AC EXPORT

ABDO ZACHEUS
55 VAIL COURT
SANFORD, NC 27332



ISSUED FOR:	DATE:
CONSTRUCTION	10/11/23

STRUCTURAL INFORMATION

PV3.3

ROOF LOADING	
GROUND SNOW LOAD:	15 LBS./SQFT.
LIVE LOAD:	20 LBS./SQFT.
DEAD LOAD:	
ROOFING	3.9 LBS./SQFT.
PV ARRAY	2.8 LBS./SQFT.
TOTAL	6.7 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	-253 LBS.
UPLIFT ZONE 2	-199 LBS.
UPLIFT ZONE 3	-99 LBS.
DOWNWARD	236 LBS.

MOUNTING RAILS	
MAKE	IRONRIDGE
MODEL	XRIO
MATERIAL	ALUMINUM
WEIGHT	0.42 LBS./FT.
SPACING	21 IN.

NOTES:

- PROVIDE 1/8" TO 1/4" GAP BETWEEN FULL RAIL LENGTHS FOR THERMAL EXPANSION

ROOF MOUNT & FASTENER	
ROOF MOUNT:	
MAKE	IRONRIDGE
MODEL	HALO ULTRA GRIP
MATERIAL	ALUMINUM
FASTENER	
MAKE	IRONRIDGE
MODEL	RD-1430-01-MI
MATERIAL	SS,#14 EPDM WASHER
SIZE	#14
GENERAL	
WEIGHT	1 LBS
FASTENERS PER MOUNT	2 PER MOUNT
MAX. PULL-OUT FORCE	960 LBS.
SAFETY FACTOR	2
DESIGN PULL-OUT FORCE	480 LBS.

- LAG BOLT EMBEDDED WITH 2" OF THREAD IN WOOD RAFTER OR TRUSSES MEMBER

ARRAY SUMMARY	
# MODULES	3
# ROOF MOUNTS	18
RAIL LENGTH	37 FEET
ARRAY AREA	63 SQFT.
ARRAY WEIGHT	180 LBS.
AZIMUTH @ SN	173°
TILT ANGLE	27°

PV MODULES	
MAKE	QCELLS
MODEL	ML-G10+-405
WIDTH	41.1"
LENGTH	74.0"
THICKNESS	1.26"
WEIGHT	48.5 LBS

ROOF SUMMARY	
STRUCTURE:	
TYPE	TRUSSES
MATERIAL	SOUTHERN PINE #2
SIZE	2" X 4"
SPACING	24" o.c.
EFF. SPAN	11'-6"
PITCH	6 / 12
DENSITY	30 LBS./CU.FT.
DECKING:	
TYPE	OSB
MATERIAL	WOOD COMPOSITE
THICKNESS	3/8"
WEIGHT	1.6 LBS./SQFT.
ROOFING:	
TYPE	ARCH SHINGLE
MATERIAL	ASPHALT
WEIGHT	2.3 LBS./SQFT.

STATEMENT OF STRUCTURAL COMPLIANCE

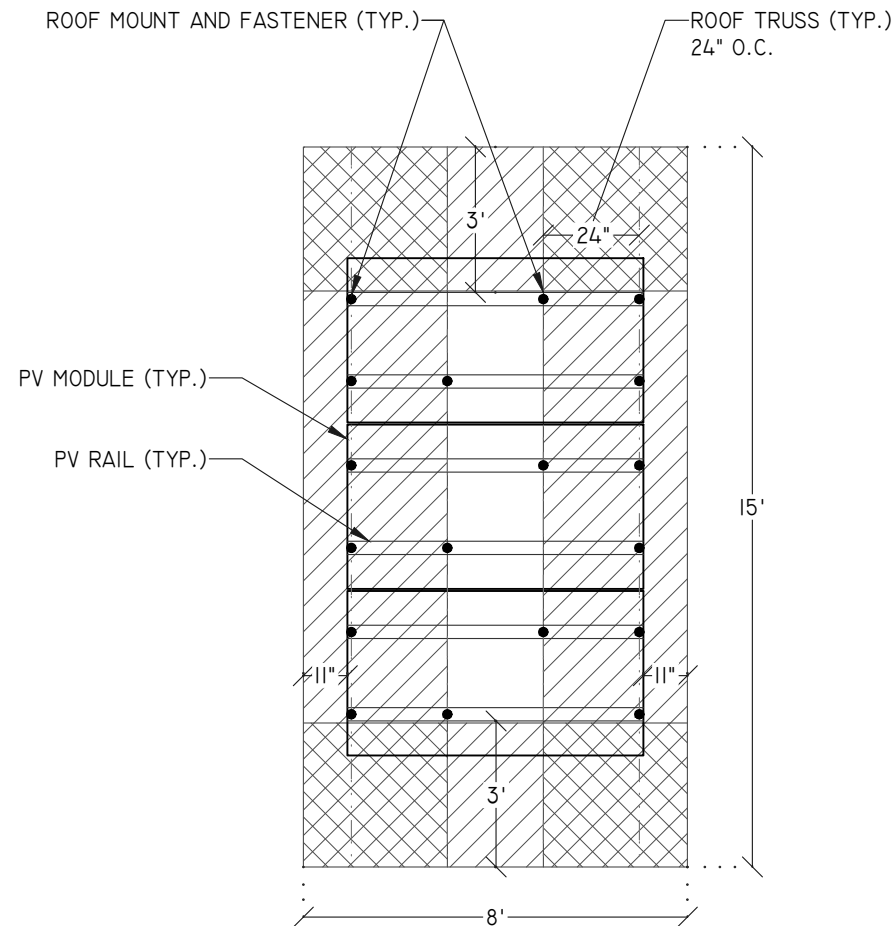
THE EXISTING ROOF STRUCTURE HAS BEEN DESIGNED TO SUPPORT THE ADDITIONAL LOADS OF THE PROPOSED PV SYSTEM. IN ADDITION, THE RACKING AND FASTENING SYSTEM SHALL BE CAPABLE OF SECURING THE SYSTEM TO THE STRUCTURE UNDER DESIGN CONDITIONS WHEN INSTALLED PROPERLY AND IN ACCORDANCE WITH THE RACKING AND FASTENING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

NAME: ANDREW W. KING, PE

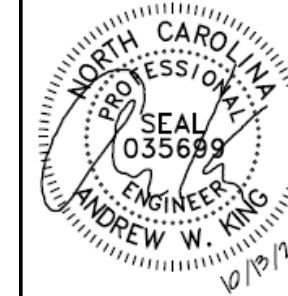
TITLE: PROFESSIONAL ENGINEER

ROOF 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"



SEAL:



ENGINEER:

MODEL ENERGY

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

P-1194

JOB TITLE:

NEW SOLAR PV SYSTEM
11.745 kW DC INPUT
7.600 kW AC EXPORT
ABDO ZACHEUS
55 VAIL COURT
SANFORD, NC 27332

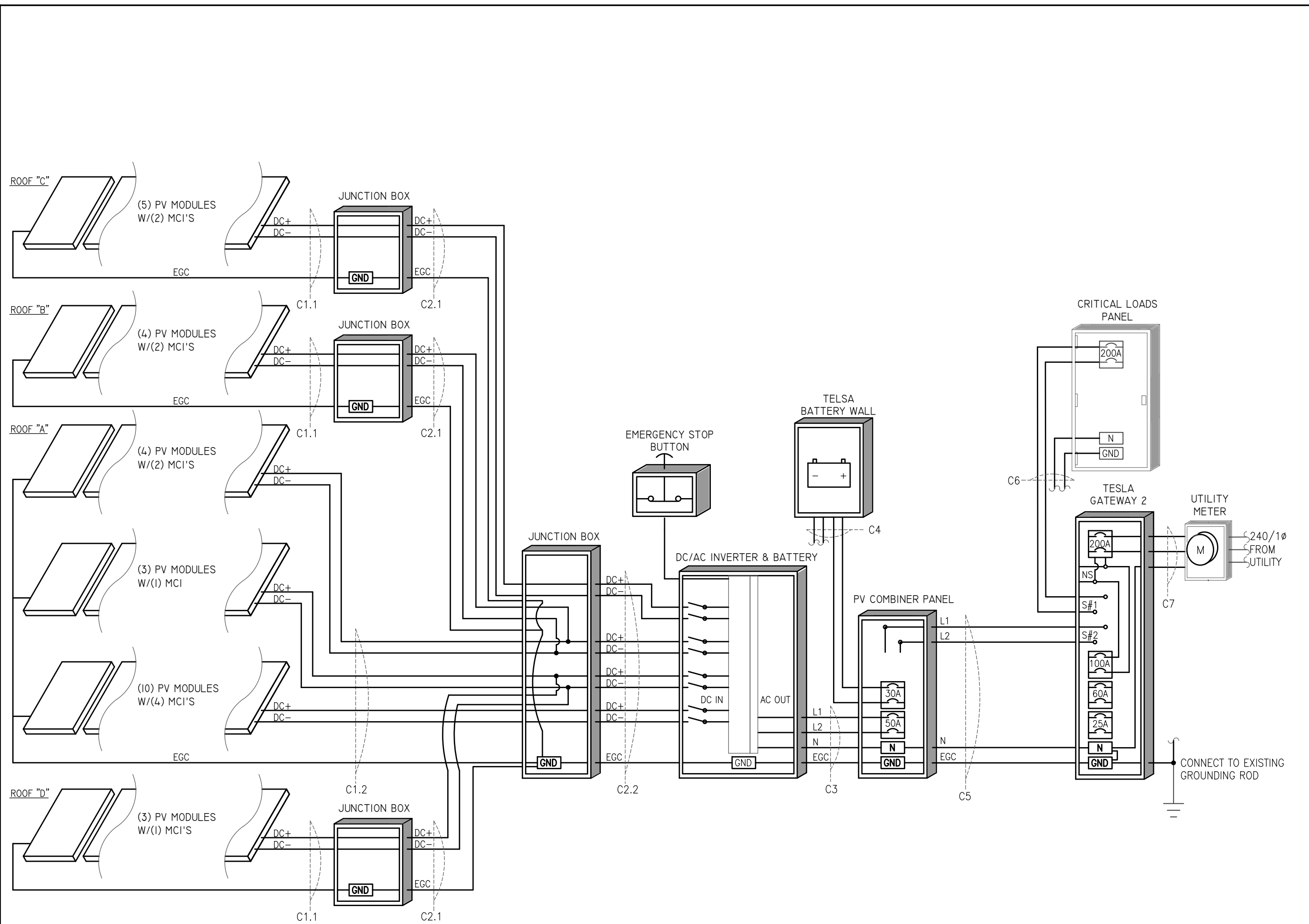
CLIENT:



ISSUED FOR: CONSTRUCTION DATE: 10/11/23

STRUCTURAL INFORMATION

PV3.4



1 | PV SYSTEM ELECTRICAL WIRING SCHEMATIC

SCALE : NTS

SEAL:

 NORTH CAROLINA
 PROFESSIONAL
 SEAL
 035689
 ENGINEER
 ANDREW W. KING
 10/13/23

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

JOB TITLE:
NEW SOLAR PV SYSTEM
 11.745 kW DC INPUT
 7.600 kW AC EXPORT
ABDO ZACHEUS
 55 VAIL COURT
 SANFORD, NC 27332

CLIENT:

SOUTHERN ENERGY MANAGEMENT
 ENERGY EFFICIENCY & SOLAR POWER

ISSUED FOR:	DATE:
CONSTRUCTION	10/11/23

ELECTRICAL INFORMATION

PV4.1

© 2023 MODEL ENERGY, PLLC EXPRESSLY RESERVES ITS COMMON LAW COPYRIGHT AND OTHER PROPERTY RIGHTS IN THESE PLANS. THESE PLANS ARE NOT TO BE REPRODUCED, CHANGED OR COPIED IN ANY FORM OR MANNER WHATSOEVER, NOR ARE THEY TO BE ASSIGNED TO ANY THIRD PARTY WITHOUT FIRST OBTAINING THE EXPRESSED WRITTEN PERMISSION AND CONSENT OF MODEL ENERGY, PLLC.

PV MODULES	
MAKE	QCELLS
MODEL	ML-G10+-405
TECHNOLOGY	MONO-CRYST.
NOM. POWER (P _{NOM})	405 WATTS
NOM. VOLT. (V _{MP})	37.39 VOLTS
O.C. VOLT. (V _{OC})	45.34 VOLTS
MAX. SYS. VOLT.	1000 V (UL)
TEMP. COEF. (V _{Tc})	-0.27 %/°C
NOM. CURR. (I _{MP})	10.83 AMPS
S.C. CURR. (I _{SC})	11.17 AMPS
MAX. SERIES FUSE	20 AMPS

MID-CIRCUIT INTERRUPTER (NEW)	
MAKE	TESLA
MODEL	MCI-2
NOMINAL DC INPUT CURRENT	13 AMPS
MAX DC INPUT I _{SC}	17 AMPS
MAX DC VOLTAGE	1000 VOLTS
MAX DEVICES PER STRING	5
CONNECTOR	MC4
ENCLOSURE RATING	NEMA 4

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

DC/AC INVERTER & BATTERY	
MAKE	POWERWALL+
MODEL #	1850000-XX-Y
TECHNOLOGY	TRANS-LESS
NOMINAL BATTERY ENERGY	13.4 KWH
DC INPUT:	
MAX. POWER	9600 WATTS
MAX. VOLT	600 VDC
NOM. VOLT.	60-550 VDC
MAX. CURRENT	13 AMPS
MAX. SCC	17 AMPS
STRINGS INPUTS	4 STRINGS
AC OUTPUT:	
MAX CONT. POWER ON-GRID	7600 WATTS
MAX CONT. POWER OFF-GRID	9600 WATTS
PEAK OFF-GRID POWER (10s)	22000 WATTS
NOM. VOLT.	240 VOLTS
MAX. CURR.	40 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
PROTECT. RATING	NEMA 4X

BATTERY STORAGE SYSTEM (NEW)	
MAKE	TESLA
MODEL	POWERWALL
TOTAL ENERGY	14 KWH
USABLE ENERGY	13.5 KWH
REAL PWR. (CONT.)	5 kW
REAL PWR. (10s)	7 kW
APPR. PWR. (CONT.)	5.8 kW
APPR. PWR. (10s)	7.2 kW
OCP	30 AMPS

NOTES:

- QUANTITY: (1)
- PCS IN GATEWAY SET TO NO EXPORT OF BATTERY POWER

CONDUCTOR SCHEDULE													
TAG	CURRENT CARRYING CONDUCTORS				GROUNDING CONDUCTORS				CONDUIT/RACEWAY				NOTES
	QTY.	SIZE	MATERIAL	INSULATION	QTY.	SIZE	MATERIAL	INSULATION	QTY.	SIZE	MATERIAL	LOCATION	
C1.1	2	10 AWG	COPPER	PV WIRE	1	6 AWG	COPPER	PV WIRE	-	-	-	FREE AIR	1
C1.2	6	10 AWG	COPPER	PV WIRE	1	6 AWG	COPPER	PV WIRE	-	-	-	FREE AIR	1
C2.1	2	10 AWG	COPPER	THWN-2	1	10 AWG	COPPER	THWN-2	1	3/4"	FMC/EMT/MC	EXT/INT	2,4
C2.2	8	8 AWG	COPPER	THWN-2	1	10 AWG	COPPER	THWN-2	1	1"	FMC/EMT/MC	EXT/INT	2,4
C3	3	8 AWG	COPPER	THWN	1	10 AWG	COPPER	THWN	1	3/4"	NOTE 5	INTERIOR	2,4,5
C4	3	10 AWG	COPPER	THWN	1	10 AWG	COPPER	THWN	1	1/2"	NOTE 5	INTERIOR	2,4,5
C5	3	4 AWG	COPPER	THWN	1	8 AWG	COPPER	THWN	1	1"	NOTE 5	EXT/INT	2,4,5
C6	3	3/0	COPPER	THWN	1	6 AWG	COPPER	THWN	1	2"	NOTE 5	EXT/INT	2,4,5
C7	3	3/0	COPPER	THWN	-	-	-	-	1	1-1/2"	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

PV COMBINER PANEL (NEW)	
MAKE	N/A
MODEL	N/A
ENCL. RATING	NEMA 3R
VOLT. RATING	240 VOLTS
BUS RATING	125 AMPS
UL LIST. (Y/N)	YES
MAIN BREAKER (Y/N)	NO
BREAKER RATING	N/A

NOTES:

- BACK-FEED DC/AC INVERTER & BATTERY OUTPUT VIA (1) 50 AMP BREAKERS AT THE OPPOSITE END OF THE BUS BAR FROM THE INCOMING FEEDERS
- BACK-FEED POWERWALL OUTPUT VIA (1) 30A BREAKER.
- PROVIDE WITH PERMANENT LABEL THAT READS, "PV COMBINER PANEL. DO NOT ADD ADDITIONAL LOADS."
- PROVIDE WITH PERMANENT LABEL THAT READS, "FED BY MULTIPLE POWER SOURCES".

POWER MANAGEMENT SYSTEM (NEW)	
MAKE	TESLA
MODEL	BACKUP GATEWAY
AC VOLTAGE	240 VOLTS
MAX. AC CURR.	200 AMPS
PROTECT. RATING	NEMA 3R
FUSED (Y/N)	YES
FUSE RATING	200 AMPS

NOTES:

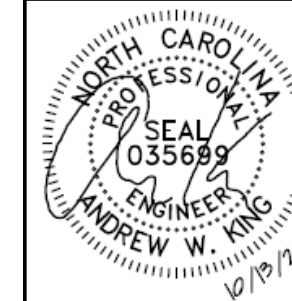
- MAIN BREAKER SERVES AS SERVICE DISCONNECT SWITCH.
- CONNECT CRITICAL LOADS PANEL VIA GATEWAY OUTPUTS.
- GATEWAY INTERNAL PANEL (NON-GENERATION OPTION) INSTALLED.
- RELOCATE 60 AMP & 25 AMP BREAKER IN GATEWAY INTERNAL PANEL.
- PROVIDE 100 AMP BREAKER IN GATEWAY INTERNAL PANEL FOR NON SECURE MAIN BREAKER.
- BACKFEED PV COMBINER PANEL OUTPUT VIA SECURE LUGS.
- PCS IN GATEWAY SET TO NO EXPORT OF BATTERY POWER.
- SERVICE DISCONNECT LABEL
- PROVIDE N/G BOND
- PROVIDE GEC

CRITICAL LOADS PANEL (EXISTING)	
MAKE	SQUARE D
MODEL	HOMC40UC
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:

- REMOVE SERVICE DISCONNECT LABEL
- REMOVE N/G BOND
- REMOVE GEC

SEAL:



ENGINEER:

MODEL ENERGY

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

P-1194

JOB TITLE:

NEW SOLAR PV SYSTEM
11.745 kW DC INPUT
7.600 kW AC EXPORT
ABDO ZACHEUS
55 VAIL COURT
SANFORD, NC 27332

CLIENT:



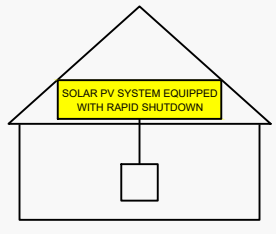
ISSUED FOR: CONSTRUCTION DATE: 10/11/23

ELECTRICAL INFORMATION

PV4.2

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY



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, 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
MULTIPLE POWER SOURCES ONSITE
UTILITY SERVICE DISCONNECT LOCATED

NEC 705.10
PLACE AT SERVICE EQUIPMENT AND PV SYSTEM DISCONNECT MEANS

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

PCS CONTROLLED CURRENT SETTING: 200 AMPS
THE MAXIMUM OUTPUT CURRENT FROM THIS SYSTEM TOWARDS THE MAIN PANEL IS CONTROLLED ELECTRICALLY. REFER TO THE MANUFACTURER'S INSTRUCTIONS FOR MORE INFORMATION.

NEC 705.13
PLACE ON PANELS CONNECTED TO GATEWAY

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 REQUIRED SIZE.
2. LABEL MATERIAL SHALL BE SUITABLE FOR THE EQUIPMENT ENVIRONMENT.
3. CONDUIT SHALL BE MARKED WITH REQUIRED LABEL EVERY 10 FEET.

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.

WARNING
POWER SOURCE OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE

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

DIRECT CURRENT PHOTOVOLTAIC POWER SOURCE
MAXIMUM VOLTAGE 600 VDC
MAX CIR. CURRENT 52.0 AMPS

NEC 690.53
PLACE ON ALL DC DISCONNECTING MEANS

PHOTOVOLTAIC POWER SOURCE
OPERATING AC VOLT. 240 VAC
MAXIMUM OPERATING AC OUTPUT CURRENT 40.0 AMPS

NEC 690.54
PLACE ON INTERCONNECTION DISCONNECTING MEANS

SEAL:



ENGINEER:

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

JOB TITLE:

NEW SOLAR PV SYSTEM
11.745 kW DC INPUT
7.600 kW AC EXPORT
ABDO ZACHEUS
55 VAIL COURT
SANFORD, NC 27332

CLIENT:



ISSUED FOR: CONSTRUCTION
DATE: 10/11/23

EQUIPMENT LABELS

PV5.1

© 2023 MODEL ENERGY, PLLC EXPRESSLY RESERVES ITS COMMON LAW COPYRIGHT AND OTHER PROPERTY RIGHTS IN THESE PLANS. THESE PLANS ARE NOT TO BE REPRODUCED, CHANGED OR COPIED IN ANY FORM OR MANNER WHATSOEVER, NOR ARE THEY TO BE ASSIGNED TO ANY THIRD PARTY WITHOUT FIRST OBTAINING THE EXPRESSED WRITTEN PERMISSION AND CONSENT OF MODEL ENERGY, PLLC.