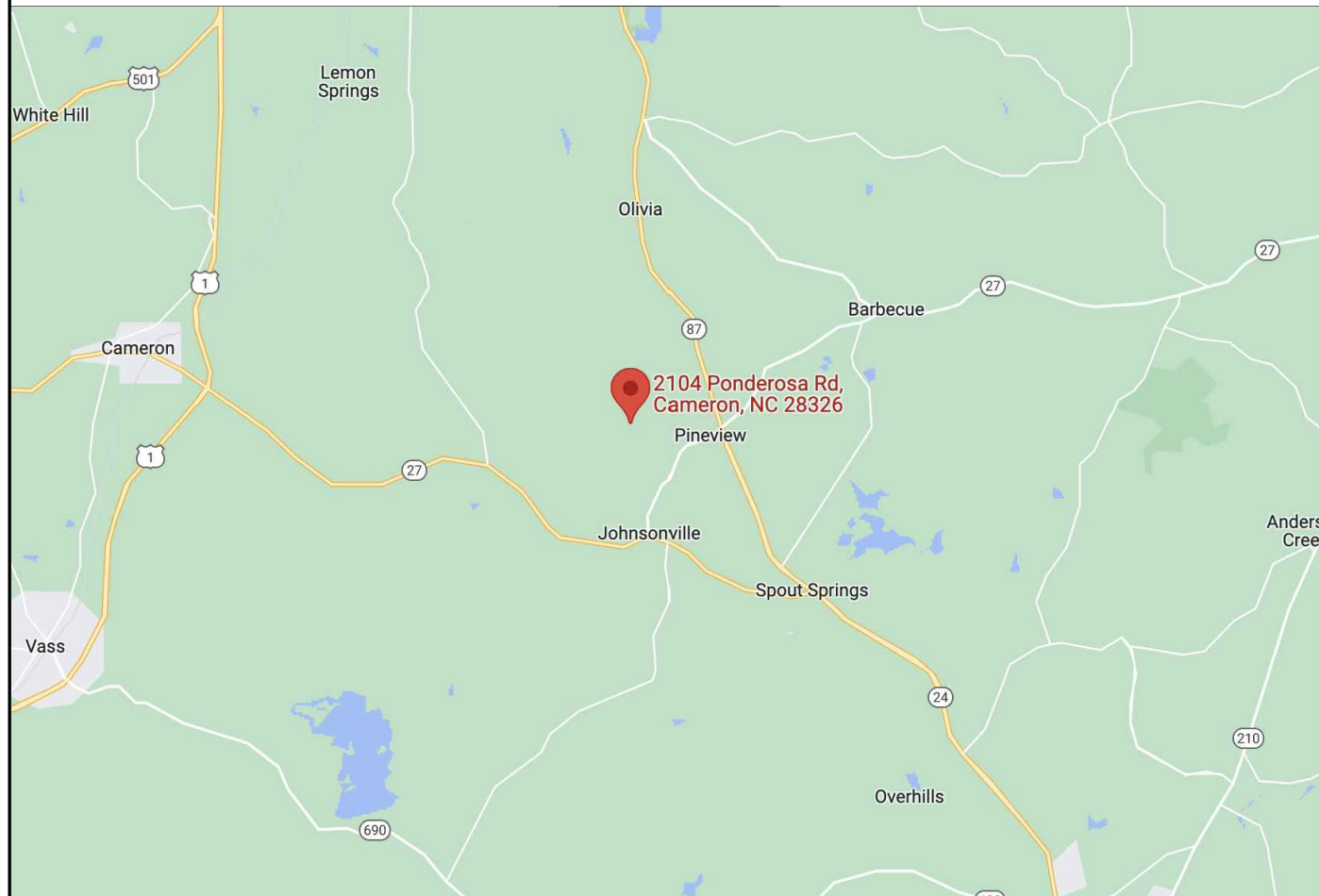
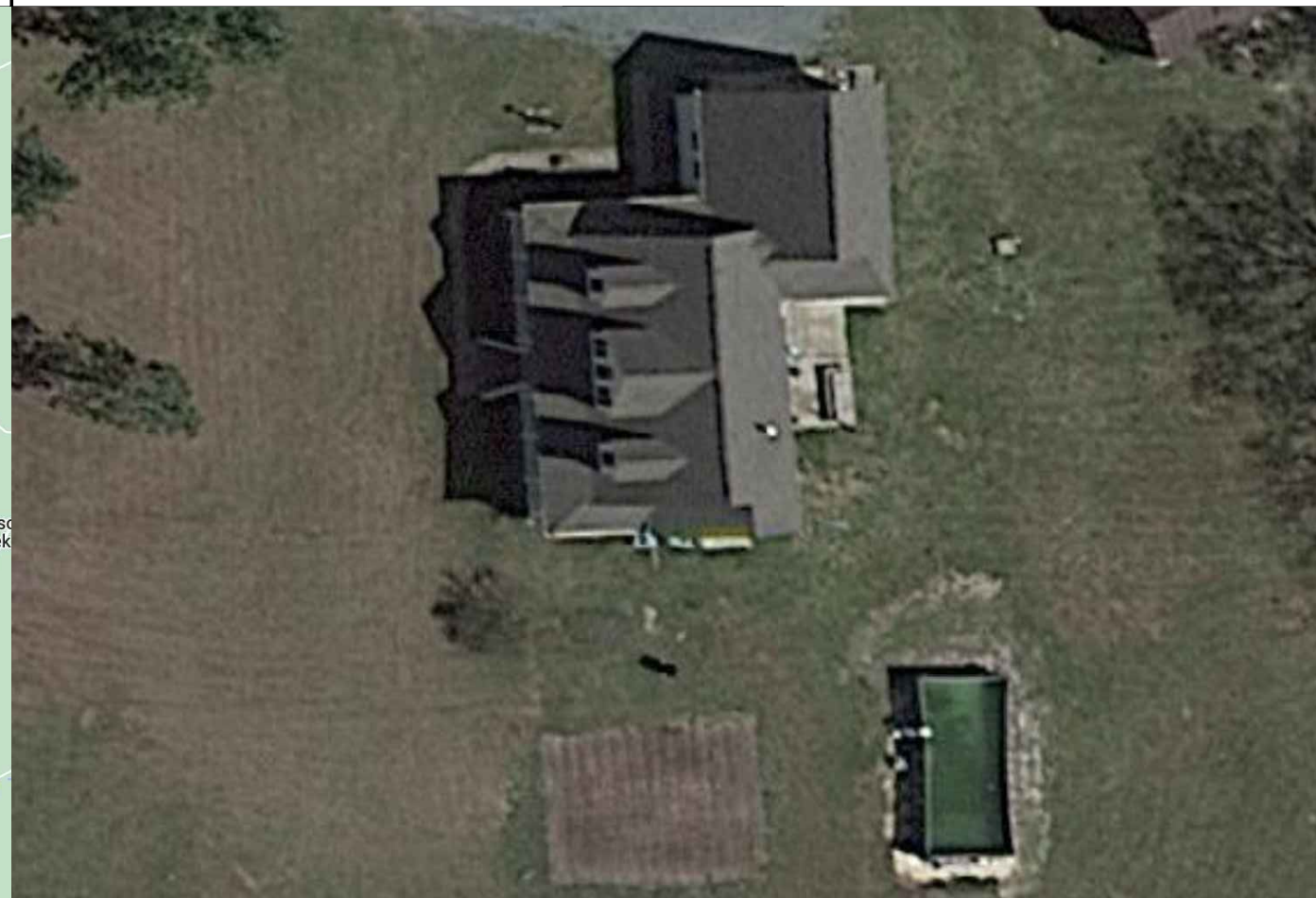


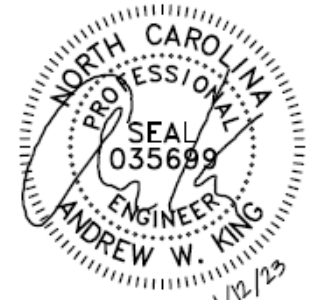
## VICINITY MAP



## PROPERTY MAP



ENGINEER:



**MODEL ENERGY**

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

JOB TITLE:

**NEW SOLAR PV SYSTEM**  
13.800 kW DC INPUT  
10.000 kW AC EXPORT

**WES CARVER**  
2104 PONDEROSA ROAD  
CAMERON, NC 28326

## 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
P <sub>NOM</sub>	NOMINAL POWER
PV	PHOTOVOLTAIC
PVC	POLYVINYL CHLORIDE
SN	SOLAR NOON
STC	STANDARD TEST CONDITIONS
TYP	TYPICAL
V	VOLT
V <sub>MP</sub>	VOLTAGE AT MAXIMUM POWER
V <sub>oc</sub>	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 - PV3.2 - ELECTRICAL INFORMATION  
PV4.1 - EQUIPMENT LABELS

## SITE CONDITIONS

ASCE 7-10 WIND SPEED - 117 MPH  
EXPOSURE CATEGORY - B  
RISK CATEGORY - II

## LEGEND

	DISCONNECT SWITCH
	FUSE
	CIRCUIT BREAKER
	EQUIP. GROUND

CLIENT:

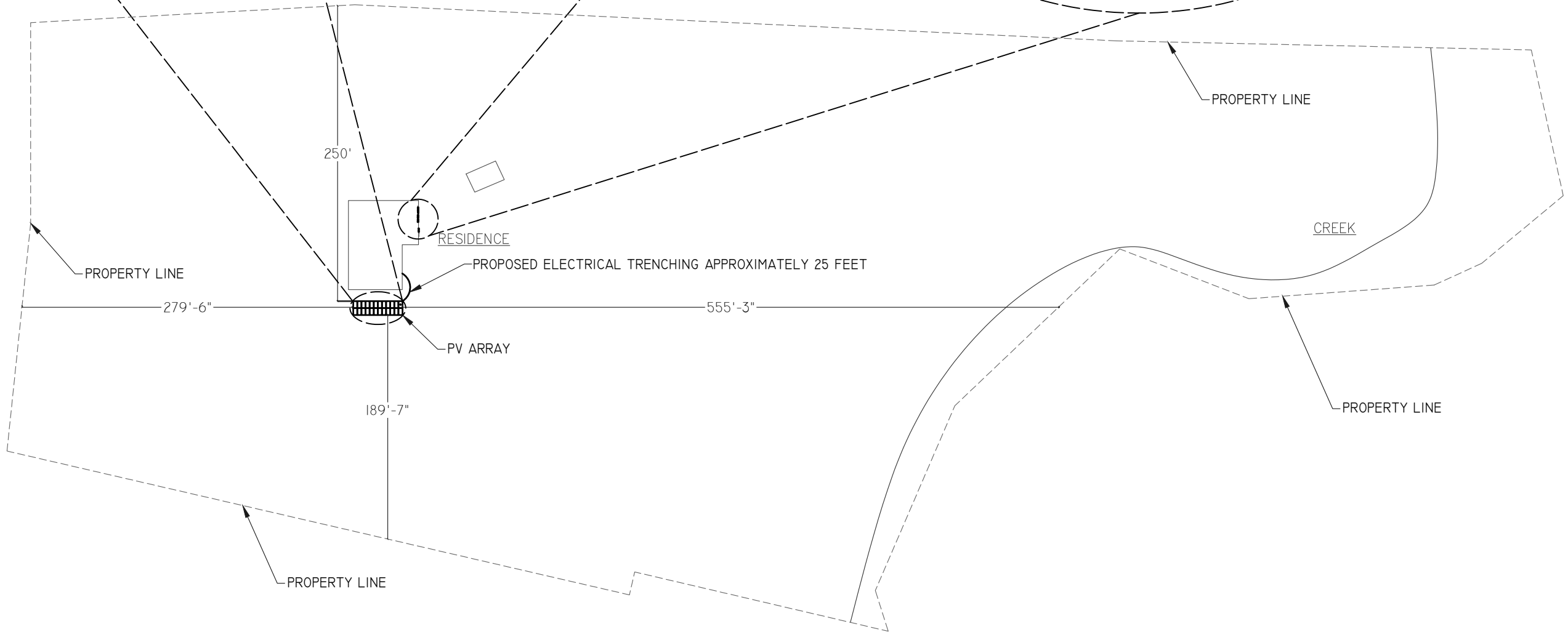
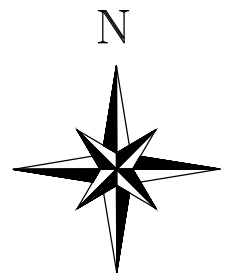
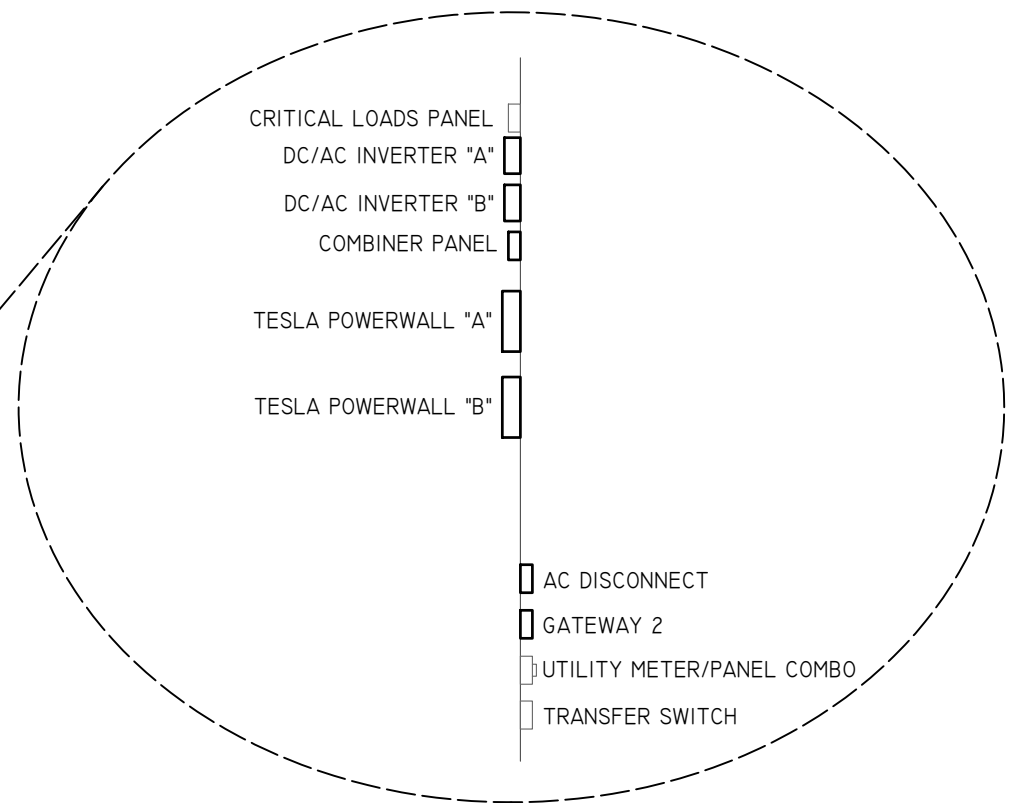
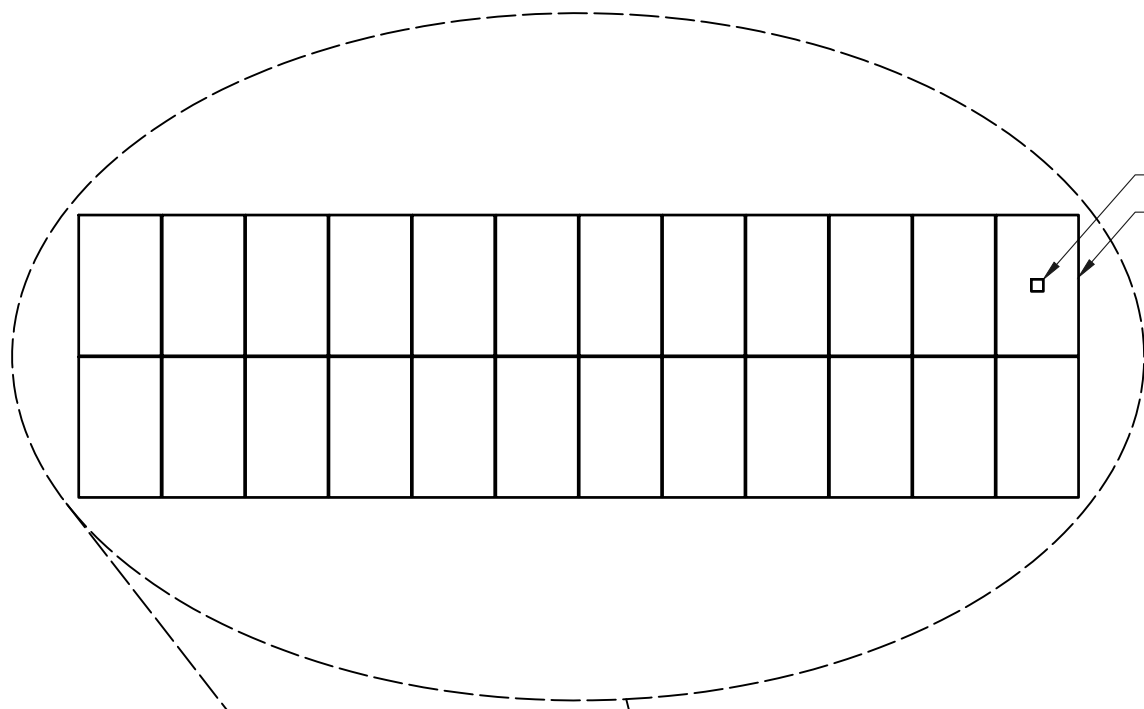


ISSUED FOR:	DATE:
CONSTRUCTION	01/12/23

PROJECT INFORMATION

# PV1.1

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 P-1194

JOB TITLE:

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 13.800 kW DC INPUT  
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CLIENT:

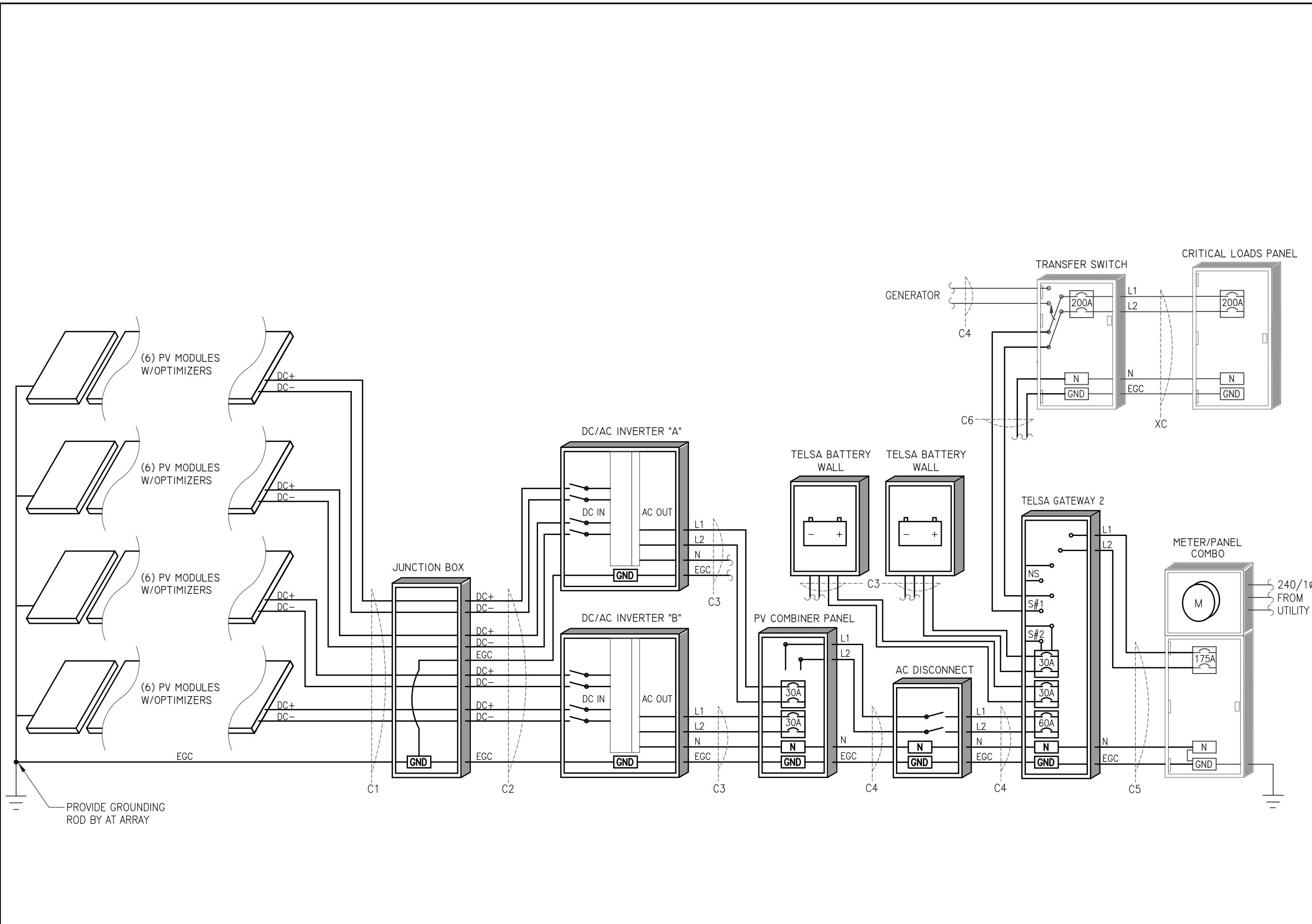
**SOUTHERN ENERGY MANAGEMENT**  
 ENERGY EFFICIENCY & SOLAR POWER

ISSUED FOR:	DATE:
CONSTRUCTION	01/12/23

SITE INFORMATION

**PV2.1**

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ENGINEER

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ELECTRICAL INFORMATION

**PV3.1**

1 PV SYSTEM ELECTRICAL WIRING SCHEMATIC

SCALE : NTS

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PV MODULES	
MAKE	HANWHA Q.CELL
MODEL	Q.PEAK DUO XL-GII.3
TECHNOLOGY	MONO-CRYST.
NOM. POWER (P <sub>nom</sub> )	575 WATTS
NOM. VOLT. (V <sub>mp</sub> )	44.66 VOLTS
O.C. VOLT. (V <sub>oc</sub> )	53.53 VOLTS
MAX. SYS. VOLT.	1500 V (UL)
TEMP. COEF. (V <sub>tc</sub> )	-0.282 %/°C
NOM. CURR. (I <sub>mp</sub> )	12.87 AMPS
S.C. CURR. (I <sub>sc</sub> )	13.52 AMPS
MAX. SERIES FUSE	20 AMPS

JUNCTION BOX	
MAKE	GENERIC
MODEL	N/A
PRO. RATING	NEMA 3R
VOLT. RATING	600 VOLTS
AMP RATING	120 AMPS
UL LISTING	UL 50

DC/AC INVERTER "A" & "B"	
MAKE	SMA
MODEL	SUNNY BOY 5.0-US
TECHNOLOGY	TRANS-LESS
DC INPUT:	
MAX. POWER	8000 WATTS
VOLT. RANGE	220-480 VOLTS
NOM. VOLT.	150 VOLTS
MAX. CURRENT	18 AMPS
STRING INPUTS	3 STRINGS
AC OUTPUT:	
NOM. POWER	5000 WATTS
NOM. VOLT.	240 VOLTS
MAX. CURR.	21.0 AMPS
GFP (Y/N)	YES
GFCI (Y/N)	YES
AFCI (Y/N)	YES
DC DISC. (Y/N)	YES
RAPID SHUTDOWN	YES
FUSE RATING	15 AMPS
PROTECT. RATING	NEMA 3R

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: (2)
- 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	8	10 AWG	COPPER	PV WIRE	1	6 AWG	COPPER	PV WIRE	-	-	-	FREE AIR	1
C2	4	10 AWG	COPPER	THWN-2	1	10 AWG	COPPER	THWN-2	1	3/4"	PVC/IMC	EXT/INT	2,4
C3	3	10 AWG	COPPER	THWN	1	10 AWG	COPPER	THWN	1	3/4"	NOTE 5	EXTERIOR	2,4,5
C4	3	6 AWG	COPPER	THWN	1	10 AWG	COPPER	THWN	1	3/4"	NOTE 5	EXTERIOR	2,4,5
C5	3	2/0	COPPER	THWN	1	6 AWG	COPPER	THWN	1	1-1/2"	NOTE 5	INTERIOR	2,4,5
C6	3	3/0	COPPER	THWN	1	6 AWG	COPPER	THWN	1	2"	NOTE 5	INTERIOR	2,4,5
XC	-	-	-	-	-	-	-	-	-	-	-	-	3

NOTES:

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

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:

- CONNECT CRITICAL LOADS PANEL VIA GATEWAY OUTPUTS.
- GATEWAY INTERNAL PANEL (GENERATION OPTION) INSTALLED.
- BACK-FEED POWERWALL OUTPUT VIA (2) 30A BREAKER IN GATEWAY PANEL.
- BACK-FEED INVERTER OUTPUT VIA 60A BREAKER IN GATEWAY PANEL.
- PCS IN GATEWAY SET TO NO EXPORT OF BATTERY POWER.

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

CRITICAL LOADS PANEL (EXISTING)	
MAKE	SIEMENS
MODEL	G3040BI200
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

TRANSFER SWITCH (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 SUPPLY SIDE TAP IN TRANSFER SWITCH

ENGINEER:



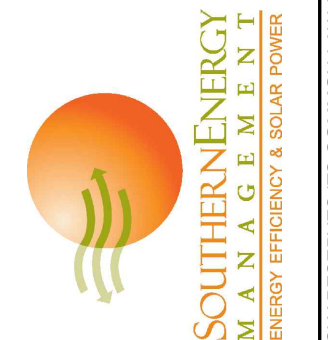
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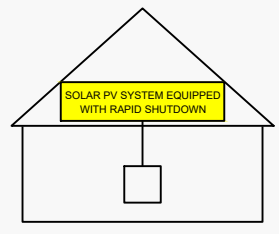
ELECTRICAL INFORMATION

**PV3.2**

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**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 33.8 AMPS

NEC 690.53  
PLACE ON ALL DC DISCONNECTING MEANS

**PHOTOVOLTAIC POWER SOURCE**

OPERATING AC VOLT. 240 VAC  
MAXIMUM OPERATING AC OUTPUT CURRENT 42.0 AMPS

NEC 690.54  
PLACE ON INTERCONNECTION DISCONNECTING MEANS

ENGINEER:



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EQUIPMENT LABELS

**PV4.1**

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