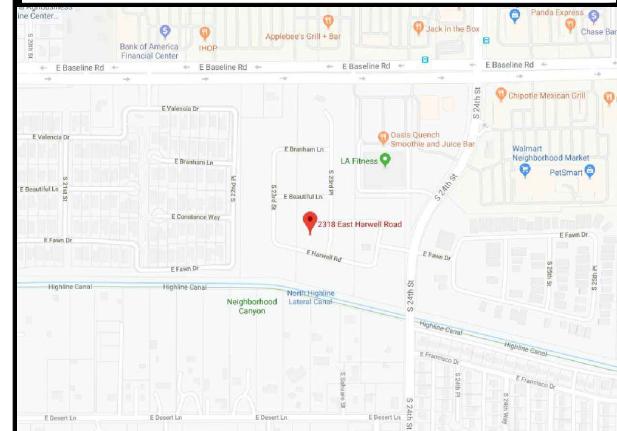


PHOTOVOLTAIC SYSTEM

AHJ: CITY OF PHOENIX
APN: 301-30-324
LOT: 16
SECTION: 3 1S 3E
SUBDIVISION: MOUNTAIN TRAILS WEST

VICINITY MAP:



EQUIPMENT:

(13) REC N-PEAK REC320NP 320W MODULES
(13) SOLAR EDGE P320 POWER OPTIMIZERS
(1) SOLAR EDGE SE3800H-US INVERTER

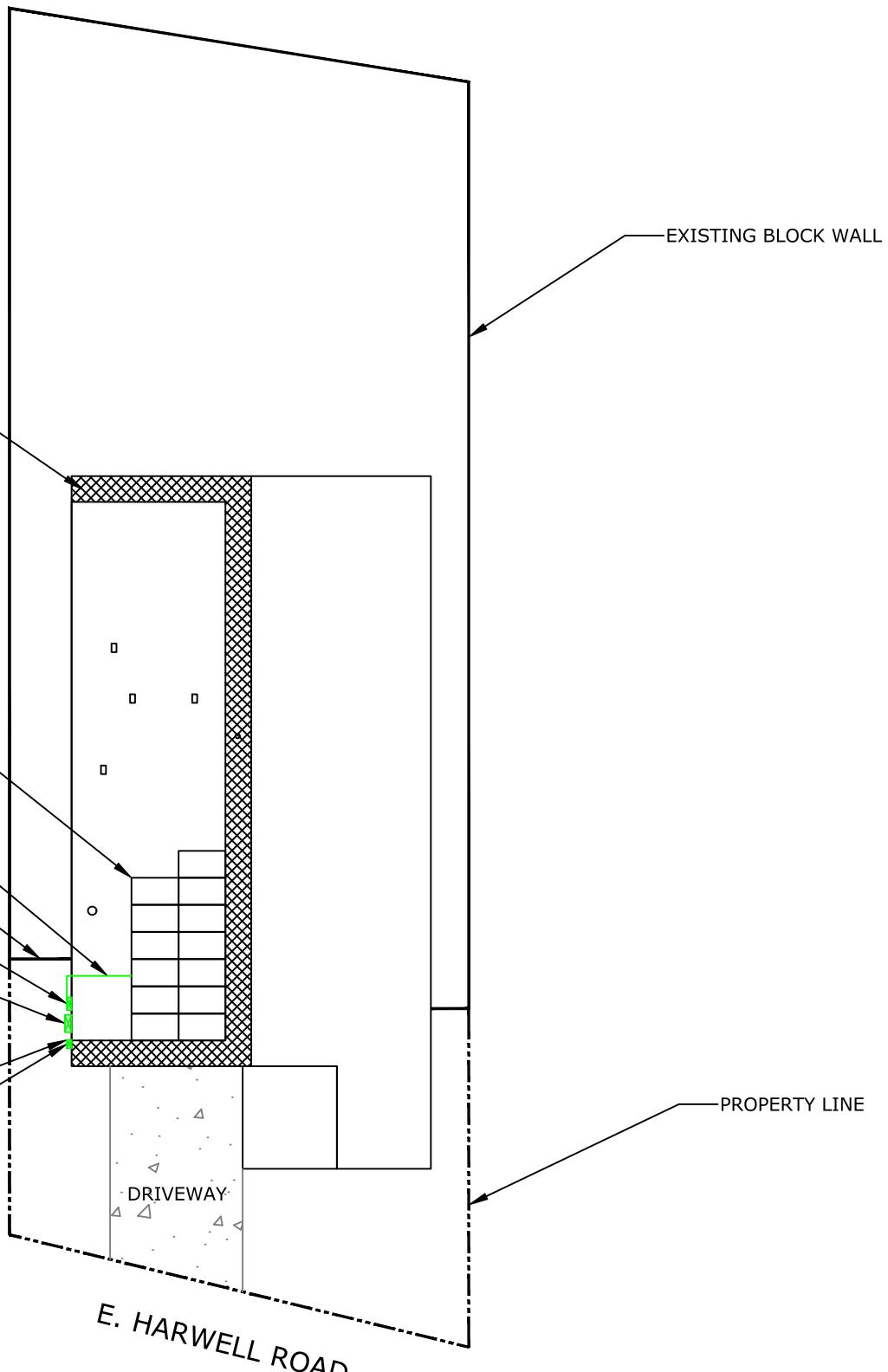
ARRAY	PITCH	TRUE ORIENTATION
AR-01	20°	270°

PROJECT NOTES:

1. SYSTEM SIZE: 3.8KW AC & 4.16KW DC
2. SINGLE STORY FLAT TILE ROOF AT 20° PITCH
3. ROOF STRUCTURE: 2X4 PRE-FABRICATED TRUSSES 24" O.C.
4. CONNECT PV SYSTEM VIA LINE SIDE CONNECTION.
5. SOLAR MODULES MOUNTED FLUSH TO ROOF USING UNIRAC NON BALLAST RAIL SYSTEM.

TABLE OF CONTENTS

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PV-01	SITE PLAN
PV-02	MODULE LAYOUT
PV-03	ONE LINE DIAGRAM
PV-04	THREE LINE DIAGRAM
PV-05	ARRAY DIAGRAM
PV-06	MOUNTING DETAIL
PV-07	NOTES
PV-08	LABELS



SITE PLAN
SCALE: 1" = 20'

INSTALLATION NOTES:

- 1) INSTALLATION SHALL BE PER: 2017 NEC, 2018 IRC & 2012 IFC.
- 2) UTILITY HAS 24-HR UNRESTRICTED ACCESS TO ALL PV SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE.

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TEMPE, AZ 85281
(480) 257-3283
ROC# 301018

PHOTOVOLTAIC INSTALLATION

DESIGNED BY:	J.C.	NO.	DATE	REVISION
REVIEWED BY:	R.C.			
DATE:	10/7/2019			

SHEET
PV-01

13 PANEL ARRAY**UPLIFT CALCULATION**

PANEL GROUP AREA 233 SQ. FT. x WIND LOAD 30 PSF =
TOTAL LOAD 7,004 LBS.

CONNECTOR TYPE: 5/16" LAG SCREW (EMBED MIN. 2.5")

OF MOUNTING POINTS: 18

PULL OUT STRENGTH: 210 LBS. PER INCH OF EMBED

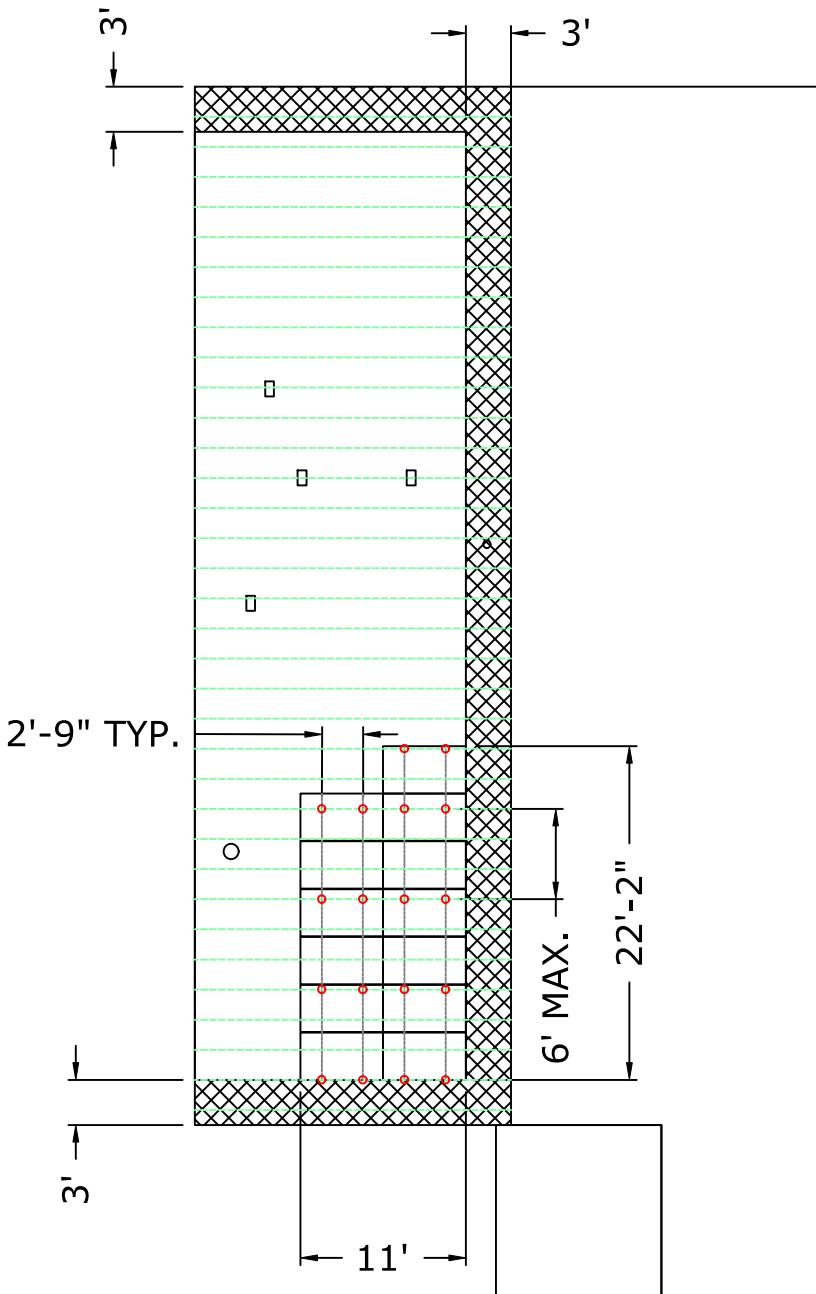
18 x 2.5 x 210 LBS. = 9,450 LBS.

POINT LOAD CALCULATION

ARRAY WEIGHT: 516.10 LBS / 18 MOUNTING POINTS =
28.67 LBS. PER MOUNTING POINT

DISTRIBUTED LOAD CALCULATION

516.10 LBS. / 233 SQ. FT. = 2.21 PSF



MODULE LAYOUT
SCALE: N.T.S.

SYSTEM WEIGHT INFORMATION:

- DISTRIBUTED LOAD OF SYSTEM = 2.21 LB/FT²
- MAXIMUM POINT LOAD PER PENETRATION = 28.67 LB/POINT LOAD

MODULE NOTES:

REC: N-PEAK REC320NP
320W MODULES
1.18" x 39.2" x 65.9"

RACKING NOTES:

USE UNIRAC RACKING SYSTEM
SOLARMOUNT RACKING
MAX 6' SPAN, MAX OVERHANG 2'6".

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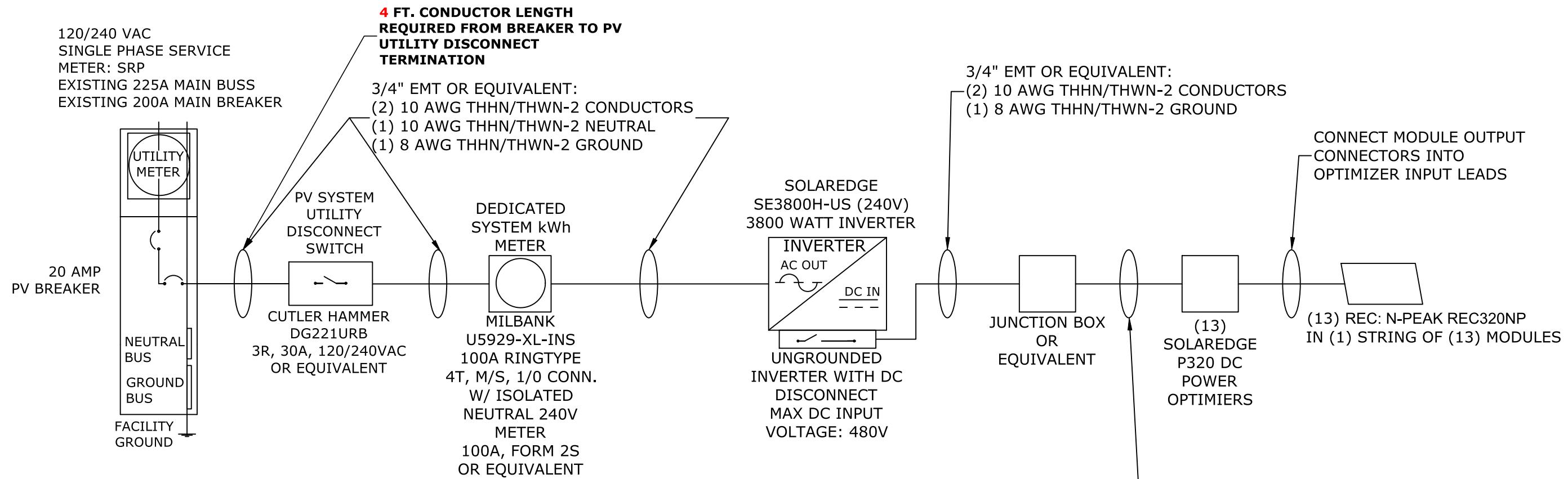
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PV-02

3.8 KW AC SYSTEM & 4.16 KW DC SYSTEM



ELECTRICAL NOTES:

1. ELECTRICAL SYSTEM GROUNDING WILL COMPLY WITH 2017 NEC 250.
2. MODULE INTERCONNECTIONS WILL BE MADE WITH 10 AWG PV WIRE.
3. ARRAY CONDUCTORS ARE SIZED FOR DERATED CURRENT PER STRING.
 - 10.18 AMPS SHORT CIRCUIT CURRENT
 - 125% DERATING FOR EXTREME IRRADIANCE CONDITIONS
(NEC 690-8 (a))
 - 125% DERATING, CONTINUOUS PHOTOVOLTAIC SOURCE CURRENT
(NEC 690-8 (b))
 - 156% TOTAL DERATING (COMBINATION OF ABOVE)
 - 15.88 AMPS TOTAL CAPACITY
(AMPS TOTAL CAPACITY = STRING SHORT CIRCUIT CURRENT MULTIPLIED BY TWO ABOVE DERATES, $1.25 \times 1.25 \times$ SHORT CIRCUIT CURRENT)
4. INVERTER PROVIDES NECESSARY GROUND FAULT PROTECTION AS REQUIRED BY 2017 NEC 690.20 GROUND FAULT PROTECTION.
5. PHOTOVOLTAIC SYSTEM HAS CONDUCTOR BONDED TO GROUND IN INVERTER AS REQUIRED NEC 690.41 SYSTEM GROUNDING, AND 690.42 POINT OF SYSTEM GROUNDING CONNECTION.
6. WHERE DC PHOTOVOLTAIC OUTPUT CIRCUITS ARE RUN INSIDE A BUILDING THEY SHALL BE CONTAINED IN A METALLIC RACEWAY OR ENCLOSURE FROM THE POINT OF PENETRATION TO THE READILY ACCESSIBLE DISCONNECTING MEANS - 2017 NEC 690.31 (E).
7. USE UL APPROVED BONDING FITTINGS AT ALL CONDUIT/BOX JUNCTIONS.
8. MODULES CONFORM TO AND ARE LISTED UNDER UL 1703.
9. INVERTER CONFORMS TO AND IS LISTED UNDER UL 1741.
10. ALL TERMINALS TO BE RATED MAXIMUM 75° FOR TEMPERATURE CORRECTIONS PER NEC ARTICLE 110.14(C), AND TABLE 310.15(B)(16) 75° COLUMN.

ONE LINE DIAGRAM

<u>MODULE CHARACTERISTICS</u>			
REC: N-PEAK REC320NP	320	Watts	
Open Circuit Voltage	40.8	V	
Open Circuit Voltage: (NEC 690.7)	47.5	V	
Max Power Voltage	34.2	V	
Short Circuit Current	10.18	Amps	
Short Circuit Current: (NEC690.8(A)(1))	12.73	Amps	

<u>POWER OPTIMIZER CHARACTERISTICS</u>		
P320		
MAXIMUM INPUT POWER (Imp)	320	W
MINIMUM INPUT VOLTAGE	8	Vdc
MAXIMUM INPUT VOLTAGE	48	Vdc
MAXIMUM MODULE I_{sc}	11	Adc
MAXIMUM OUTPUT CURRENT	15	Adc

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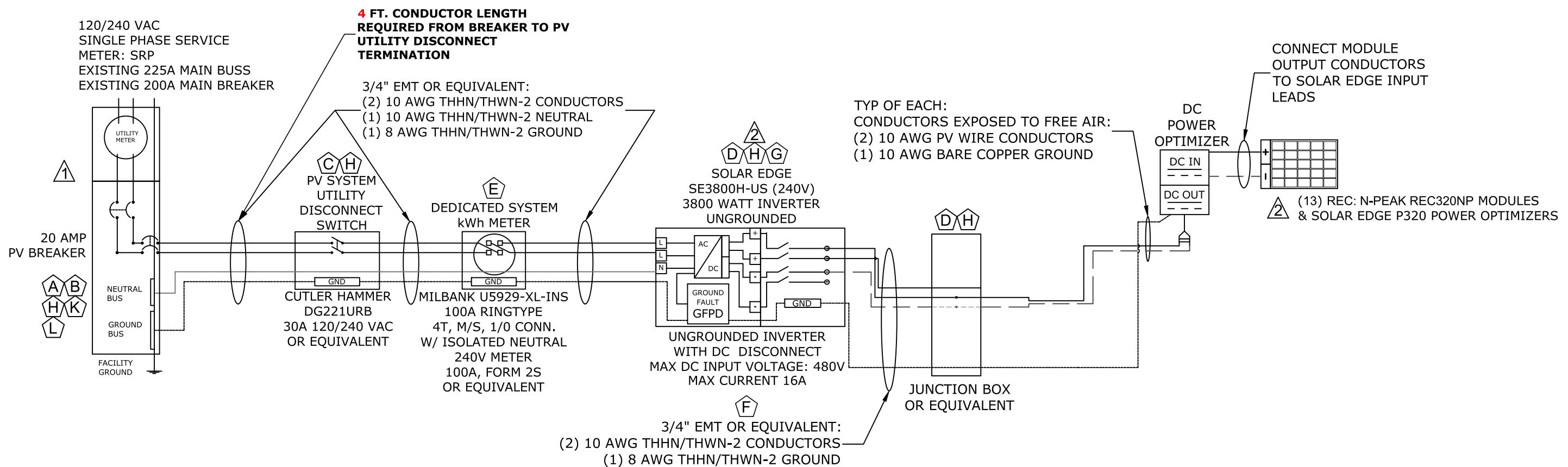
PHOTOVOLTAIC INSTALLATION

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REVIEWED BY: RC			
DATE: 10/7/2019			

SHEE

PV-03

3.8 KW AC SYSTEM & 4.16 KW DC SYSTEM



NOTE: SEE NOTES ON
SHEET PV-07

THREE LINE DIAGRAM
SCALE: N.T.S.

MODULE CHARACTERISTICS		
REC: N-PEAK REC320NP	320	Watts
Open Circuit Voltage	40.8	V
Open Circuit Voltage: (NEC 690.7)	47.5	V
Max Power Voltage	34.2	V
Short Circuit Current	10.18	Amps
Short Circuit Current: (NEC690.8(A)(1))	12.73	Amps

POWER OPTIMIZER CHARACTERISTICS		
P320		
MAXIMUM INPUT POWER (Imp)	320	W
MINIMUM INPUT VOLTAGE	8	Vdc
MAXIMUM INPUT VOLTAGE	48	Vdc
MAXIMUM MODULE Isc	11	Adc
MAXIMUM OUTPUT CURRENT	15	Adc

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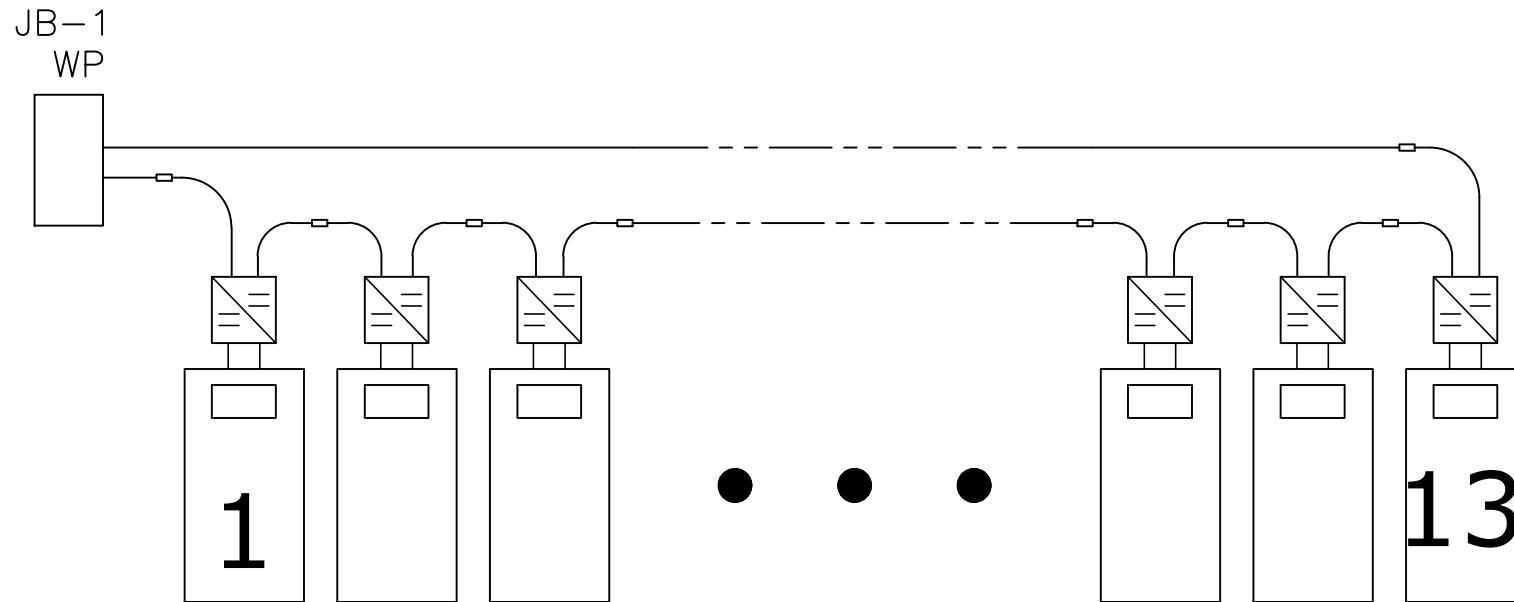
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DATE: 10/7/2019			

**SHEET
PV-04**



ARRAY DIAGRAM
SCALE: N.T.S.

MODULE CHARACTERISTICS		
REC: N-PEAK REC320NP	320	Watts
Open Circuit Voltage	40.8	V
Open Circuit Voltage: (NEC 690.7)	47.5	V
Max Power Voltage	34.2	V
Short Circuit Current	10.18	Amps
Short Circuit Current: (NEC690.8(A)(1))	12.73	Amps

POWER OPTIMIZER CHARACTERISTICS		
P320		
MAXIMUM INPUT POWER (Imp)	320	W
MINIMUM INPUT VOLTAGE	8	Vdc
MAXIMUM INPUT VOLTAGE	48	Vdc
MAXIMUM MODULE Isc	11	Adc
MAXIMUM OUTPUT CURRENT	15	Adc

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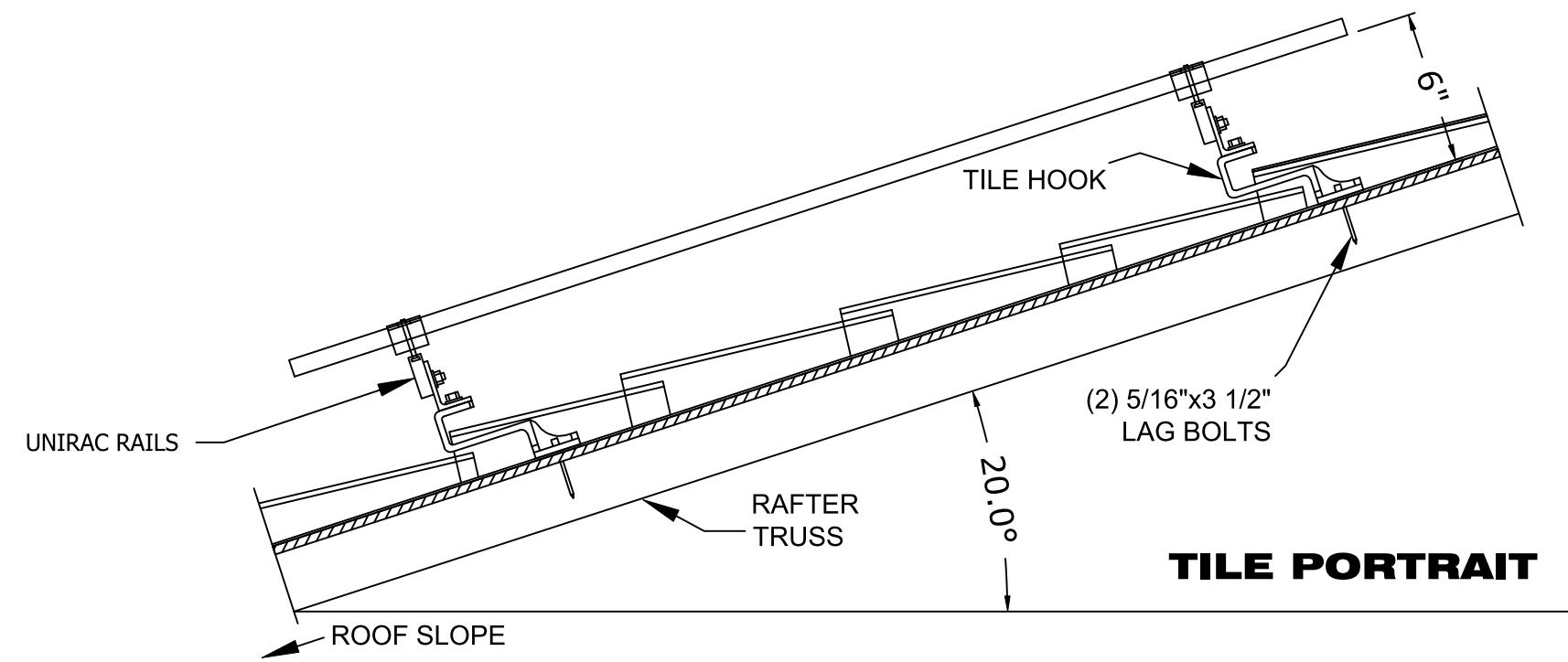
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**SHEET
PV-05**



TILE PORTRAIT

MOUNTING DETAIL
SCALE: N.T.S.

INSTALL NOTES:

MOUNTING:

-QUICKMOUNT INTERIOR STAND-OFF SPACE ALONG THE RAIL 6' OC MAX.

-PRIMETER STAND-OFFS IN THE ARRAY SHALL BE SPACED ALONG THE RAIL AT 6' MAX. OC WHENEVER POSSIBLE.

SUPPORT ASSEMBLY:

-UNIRAC SOLAR MOUNT RAILS.

-ALL PV MODULE CABLING SHALL BE HELD ABOVE THE ROOF SURFACE PER NEC.

-INTEGRATED BONDING RAIL SPLICING, MODULE MIDCLAMP AND ENDCLAMP ASSEMBLY.

-DESIGNED PER ASCE 7-05 AND ASCE 7-10 BUILDING CODE.

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DATE:	10/7/2019			

SHEET

PV-06

NOTES:

- ① ALL EQUIPMENT SHALL BE INSTALLED AND LABELED IN ACCORDANCE WITH THE NEC AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRIC UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION.
- ② A PERMANENT PLACARD OR DIRECTORY IS INSTALLED PER NEC 705.10.
- ③ PROVIDE WARNING SIGN PER NEC ARTICLE 690.17 READING "WARNING-ELECTRIC SHOCK HAZARD-DO NOT TOUCH TERMINALS-TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OFF POSITION."
- ④ PROVIDE SERIES-RATED LABELING PER NEC 240.86(b) AND 110.22. REFER TO EQUIPMENT TAG LIST ON SHEET 6 FOR ADDITIONAL INFORMATION.
- ⑤ EQUIPMENT SHALL BE TESTED, LISTED AND MARKED TO WITHSTAND THE AVAILABLE SHORT CIRCUIT CURRENT.
- ⑥ LISTING AGENCY NAMES AND NUMBERS TO BE INDICATED ON POWER INVERTER AND SOLAR MODULES PER NEC 110.3(B).
- ⑦ DC ARC FAULT PROTECTION TO BE INCLUDED IN THE INVERTER PER NEC 2014, CODE 690.11 AS REQUIRED BY MUNICIPALITY.
- ⑧ LABEL "PHOTOVOLTAIC ARRAY DC DISCONNECT DEVICE" PER NEC 690.14(C)(2). LABEL WITH OPERATING CURRENT, OPERATING VOLTAGE, MAXIMUM SYSTEM VOLTAGE, AND SHORT CIRCUIT CURRENT PER NEC 690.53. SWITCH TO BE LOCKED PER NEC 690.7(D).
- ⑨ LABEL, "WARNING - ELECTRIC SHOCK HAZARD, THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED." PER NEC 690.35 (F)
- ⑩ METALLIC CONDUIT SHALL BE USED WITHIN BUILDING PER NEC 690.31 (E).
- ⑪ GEC TO BE INSTALLED AS REQUIRED BY MANUFACTURER INSTRUCTIONS PER NEC ARTICLE 250.66
- ⑫ UTILITY SIDE CONNECTION LABEL "UTILITY SIDE CONNECTION / METER ADAPTER".
- ⑬ LABEL "PHOTOVOLTAIC SYSTEM UTILITY FUSED DISCONNECT SWITCH". SWITCH COVER TO BE LOCKED AT ALL TIMES. SWITCH TO BE VISUAL OPEN AND ACCESSIBLE PER UTILITY REQUIREMENT AND CONFORM TO NEC 705.22, AND IS RATED FOR THE AVAILABLE FAULT CURRENT.
- ⑭ CONDUITS AND POINT OF INTERCONNECT MUST BE MARKED "WARNING PHOTOVOLTAIC POWER SOURCE" WITH REFLECTIVE WARNING LABELS PER NEC 690.31 & IFC 605.11.1.2
- ⑮ LABEL "PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN" PER NEC 690.12 AND 690.56(C)

NOTES:

SCALE: N.T.S.

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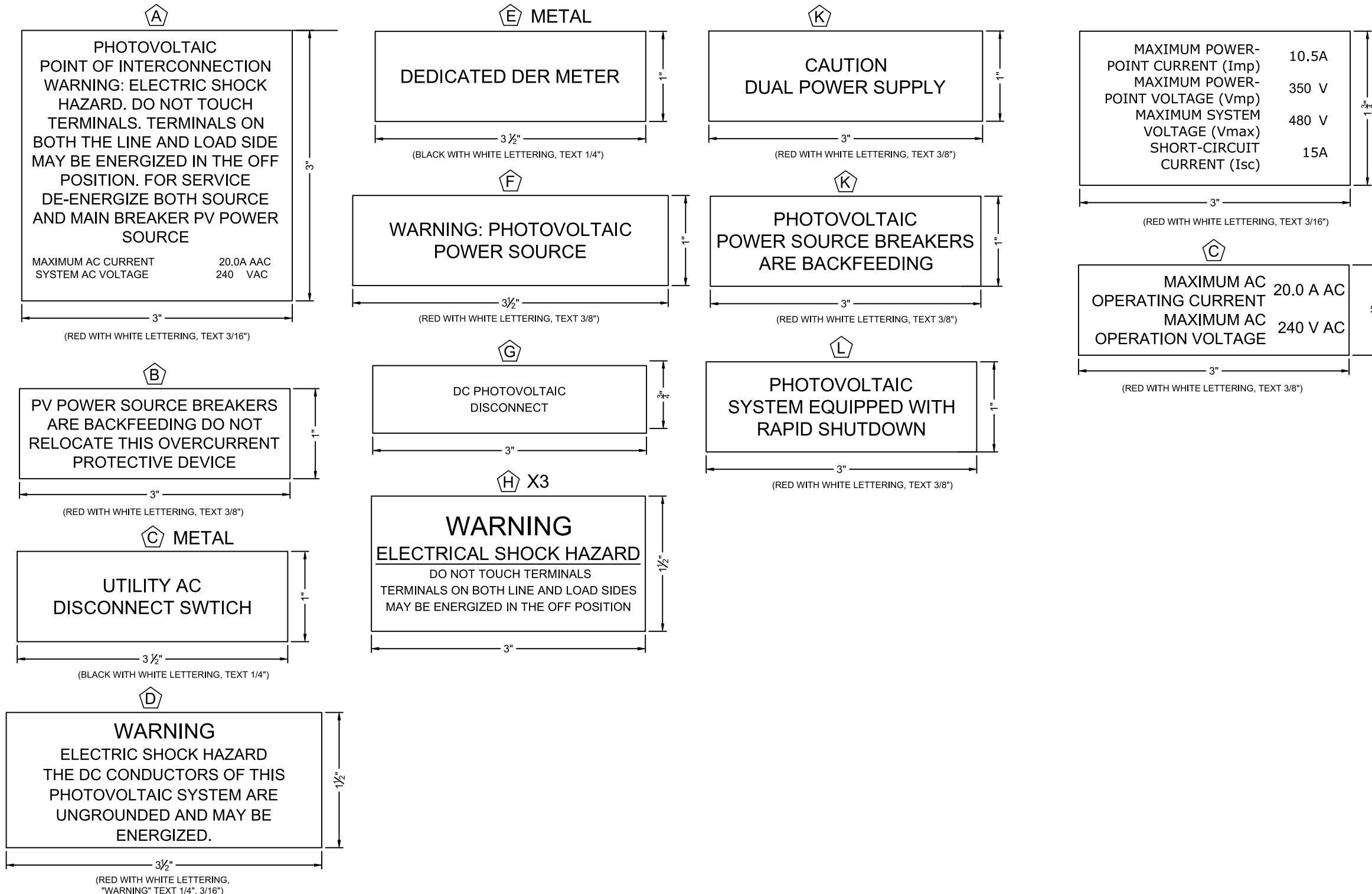
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SHEET

PV-07



LABELS: _____
SCALE: N.T.S.

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DATE:	10/7/2019			

SHEET
PV-08