

## HISTORIC AND DESIGN REVIEW COMMISSION

September 07, 2016

Agenda Item No: 13

**HDRC CASE NO:** 2016-346  
**ADDRESS:** 2354 W GRAMERCY PLACE  
**LEGAL DESCRIPTION:** NCB 9075 BLK LOT 3 AND W 19 FT OF 4  
**ZONING:** R6 H  
**CITY COUNCIL DIST.:** 7  
**DISTRICT:** Monticello Park Historic District  
**APPLICANT:** Aaron Jensen  
**OWNER:** Patricia Ledesma  
**TYPE OF WORK:** Installation of Solar Panels  
**REQUEST:**

The applicant is requesting a Certificate of Appropriateness for approval to install 19 solar panels on the rear slope of the hipped roof and install 2 solar panels on the left slope of the hipped roof

### APPLICABLE CITATIONS:

*Historic Design Guidelines, Chapter 3, Guidelines for Additions*

#### 6. Designing for Energy Efficiency

##### C. SOLAR COLLECTORS

*i. Location*—Locate solar collectors on side or rear roof pitch of the primary historic structure to the maximum extent feasible to minimize visibility from the public right-of-way while maximizing solar access. Alternatively, locate solar collectors on a garage or outbuilding or consider a ground-mount system where solar access to the primary structure is limited.

*ii. Mounting* (sloped roof surfaces)—Mount solar collectors flush with the surface of a sloped roof. Select collectors that are similar in color to the roof surface to reduce visibility.

### FINDINGS:

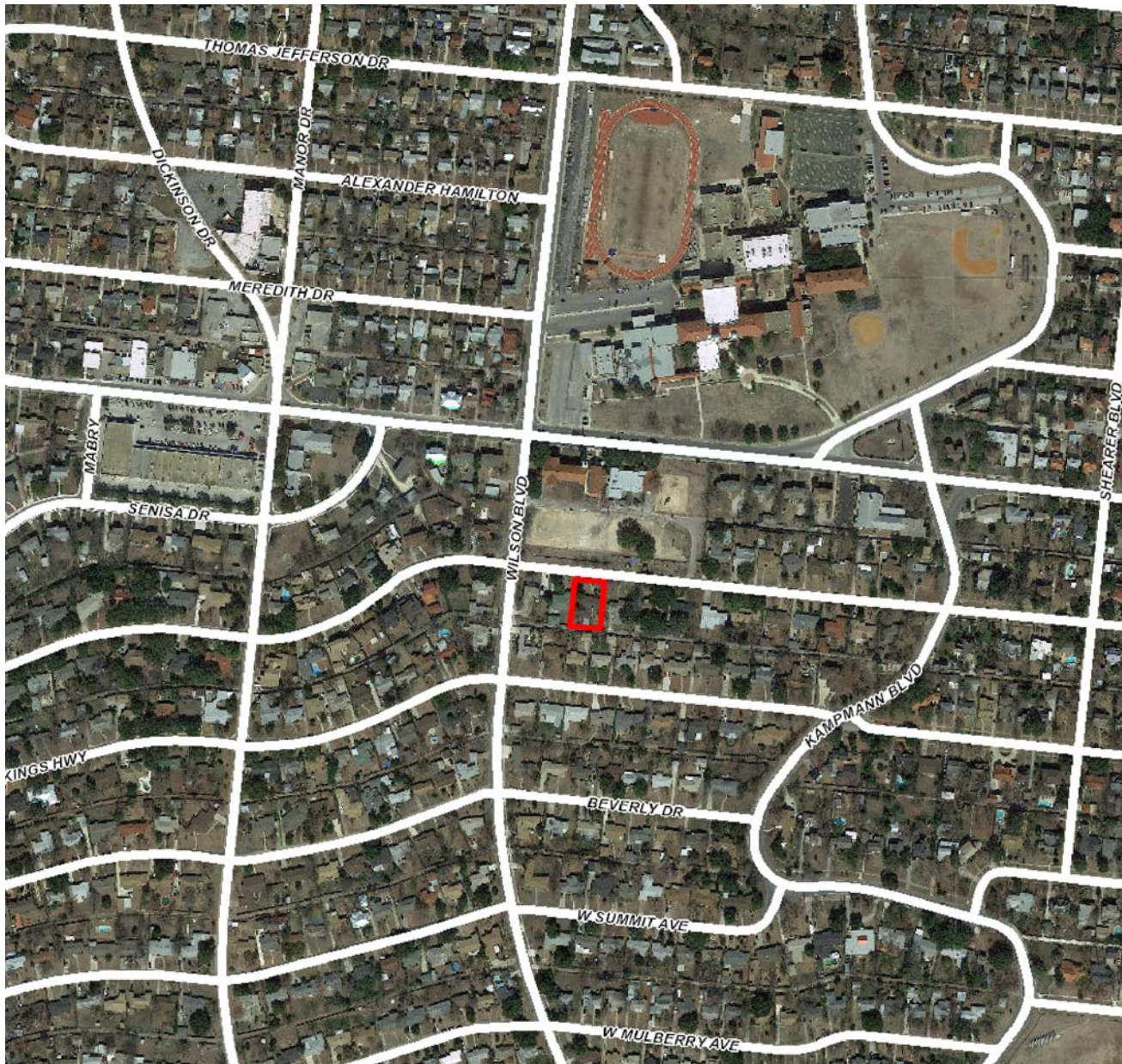
- a. The home is in the Monticello Park Historic District; this phase was designated in 2003.
- b. The structure at 2354 W Gramercy has a hip roof with a small hip on the left hip. The applicant is proposing to install 21 total solar panels on composition shingles roof of the primary structure. 19 panels will be installed on the rear slope and 2 will be installed on the left slope behind the small secondary hip bump out. According to the Guidelines for Additions 6.C., installations should be in locations that minimize visibility from the public right-of-way.
- c. Staff visited the site on August 23, 2016, and found that the home as a low-pitched roof, that the left slope is behind the ridge of the side gable with two dormers, and that the home is in the interior of the historic district. Staff finds the pitch of the roof and the side roof form minimizes the visibility from the public right-of-way. This is consistent with the Guidelines.
- d. The applicant is proposing to mount the panels flush with the pitched roof. This is consistent with Guidelines for Additions 6.C.ii, which states solar collectors should be flush with the roof surface.

### RECOMMENDATION:

Staff recommends approval as submitted based on findings a through c.

### CASE MANAGER:

Lauren Sage



## Flex Viewer

Powered by ArcGIS Server

Printed: Aug 23, 2016

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28854

FOR SALE BY OWNER  
28854  
CALL 800-858-8888





2354



















PATRICIA LEDESMA  
2354 W Gramercy Place  
San Antonio TX 78201  
5.250 kW DC  
4.515 kW AC  
PITCH = 12°  
AZIMUTH = 96°, 186°

MODULE  
(21) Boviet Solar Technology BVM6610P-250  
INVERTER  
(21) Enphase Energy M215-60-2LL-S22  
RACKING  
-EVEREST CROSSRAIL 48-S RAIL

NOTE:  
UTILITY HAS 24 HR. UNRESTRICTED  
ACCESS TO ALL PV SYSTEM  
COMPONENTS LOCATED AT SERVICE  
ENTRANCE.

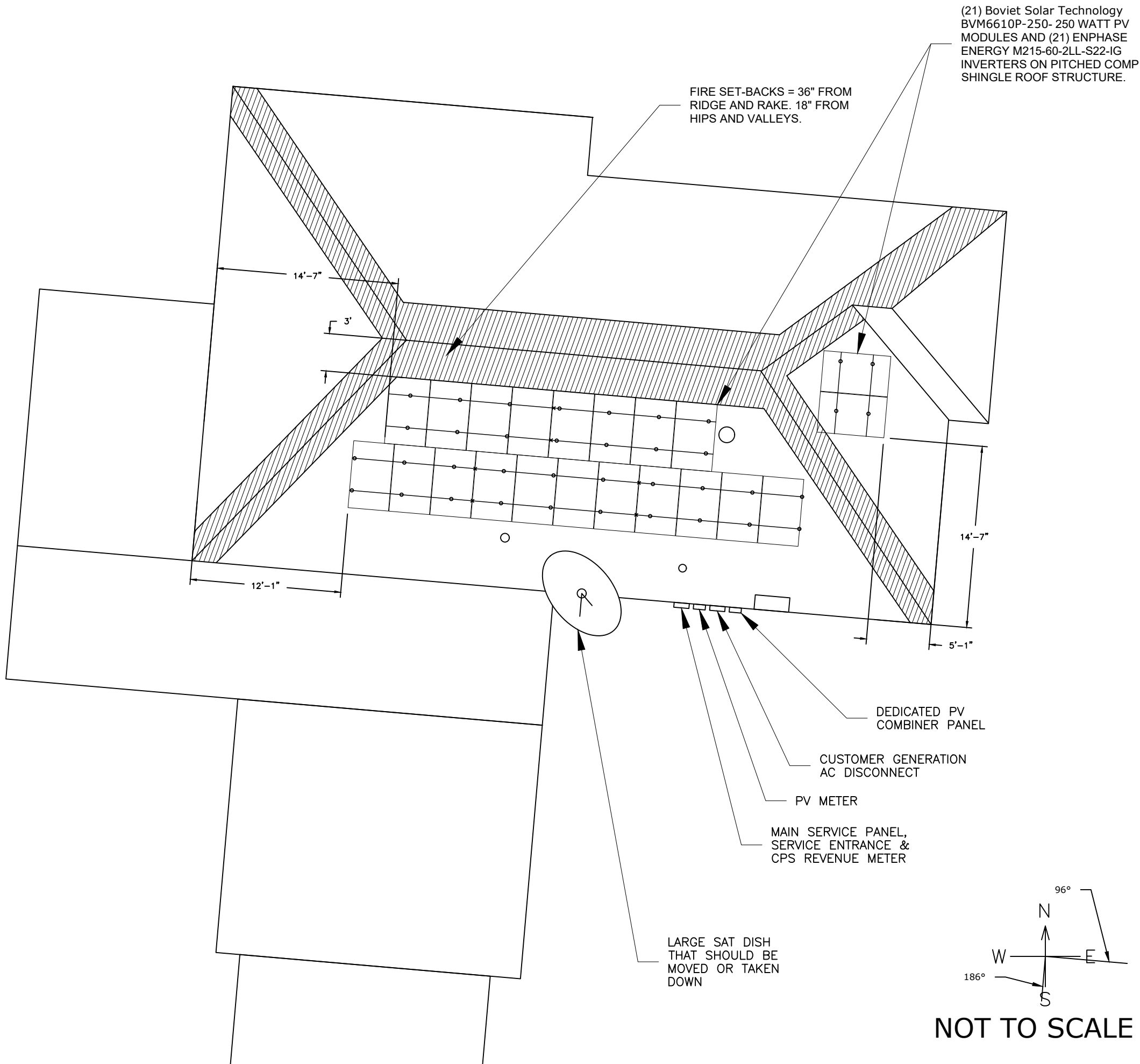
NOTE:  
ALL CONSTRUCTION / INSTALLATION IS  
TO COMPLY WITH THE FOLLOWING:  
2009 IRC      2015 IFC  
2014 NEC  
ALL DIMENSIONS ARE APPROXIMATE

ARRAY STRUCTURAL  
CALCULATIONS

**2 PANEL ARRAY**  
UPLIFT CALCULATION  
PANEL GROUP AREA 34 SQ. FT. X WIND LOAD 30 PSF =  
TOTAL LOAD 1020 LBS.  
CONNECTOR TYPE: 5 / 16" HANGER BOLT (EMBED MIN 2")  
# OF MOUNTING POINTS: 4  
PULL OUT STRENGTH: 210 LBS. PER INCH OF EMBED  
4 X 2 X 210 LBS. = 1680 LBS.  
POINT LOAD CALCULATION  
ARRAY WEIGHT: 100 LBS / 4 MOUNTING POINTS =  
25 LBS. PER MOUNTING POINT

**19 PANEL ARRAY**  
UPLIFT CALCULATION  
PANEL GROUP AREA 323 SQ. FT. X WIND LOAD 30 PSF =  
TOTAL LOAD 9690 LBS.  
CONNECTOR TYPE: 5 / 16" HANGER BOLT (EMBED MIN 2")  
# OF MOUNTING POINTS: 34  
PULL OUT STRENGTH: 210 LBS. PER INCH OF EMBED  
34 X 2 X 210 LBS. = 14280 LBS.  
POINT LOAD CALCULATION  
ARRAY WEIGHT: 950 LBS / 34 MOUNTING POINTS =  
27.94 LBS. PER MOUNTING POINT

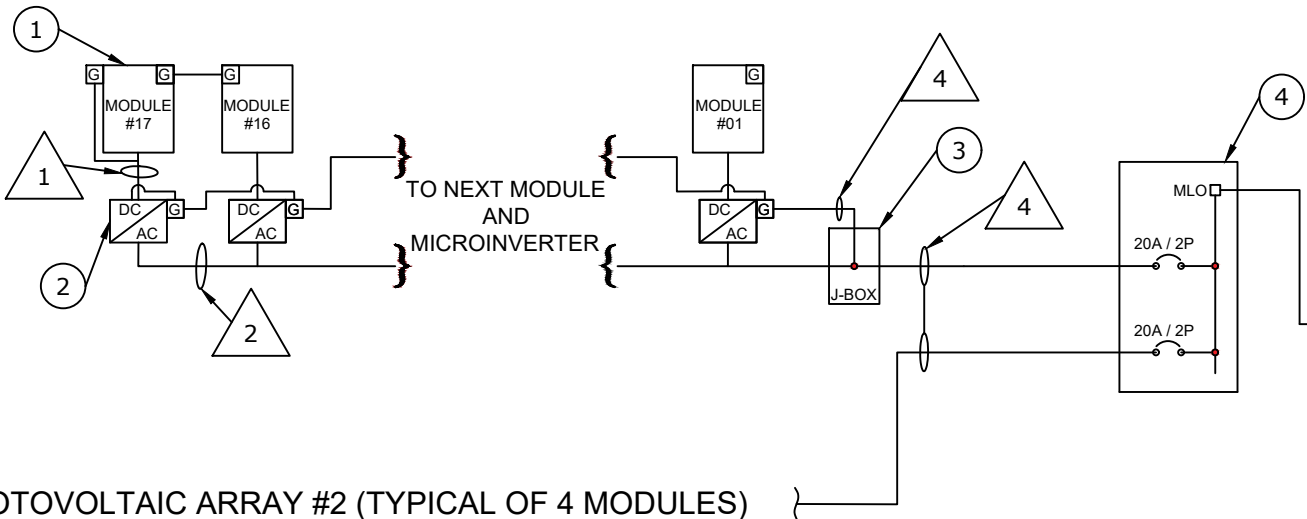
**WORST CASE DISTRIBUTED LOAD CALCULATION**  
950LBS. / 323 SQ. FT.=2.94 PSF



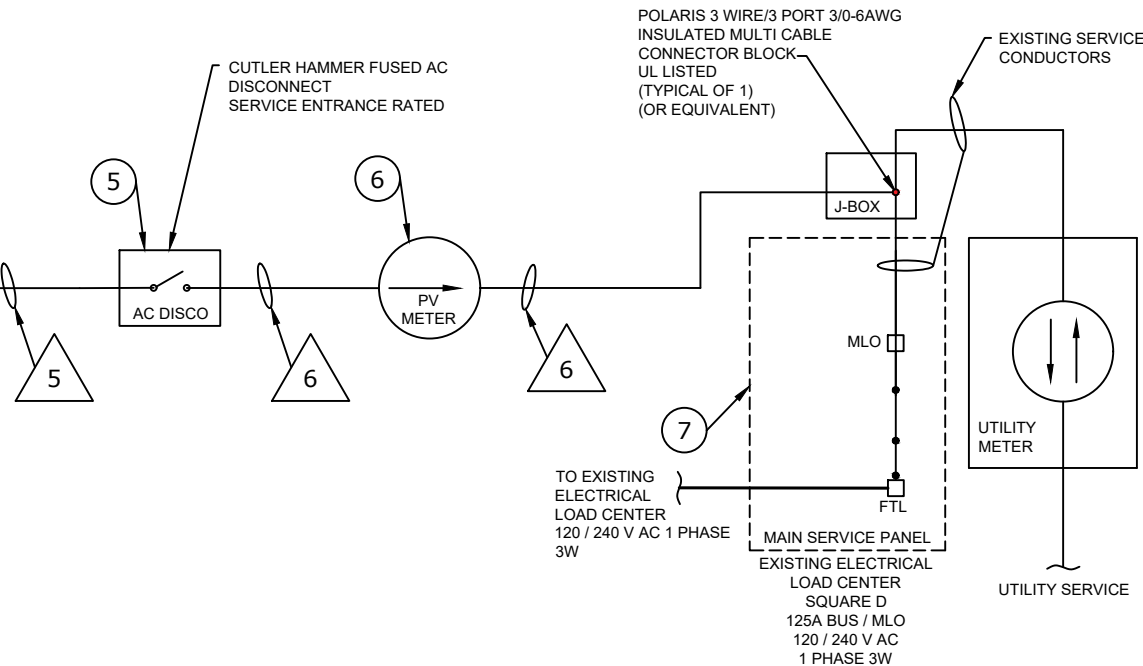
ERUSENERGY <sup>®</sup>				2141 E. CAMELBACK RD. # 250 PHOENIX, AZ 85016 [844] 272-8336; [602] 507-6530	
PROJECT INFORMATION		DRAWN	PHILIP W.		
AHJ	SAN ANTONIO	DATE	07/19/2016		
UTILITY	CPS				
SITE PLAN		5.250 kW <sub>DC</sub> /4.515 kW <sub>AC</sub> PV SYSTEM		2354 W Gramercy Place San Antonio TX 78201	
CUSTOMER:		PATRICIA LEDESMA			



PHOTOVOLTAIC ARRAY #1 (TYPICAL OF 17 MODULES)



PHOTOVOLTAIC ARRAY #2 (TYPICAL OF 4 MODULES)



EQUIPMENT SCHEDULE		
TAG	COMPONENT	DESCRIPTION
1	PV DC MODULE	BOVIET SOLAR BVM6610-10-P-250
2	MICROINVERTER	ENPHASE ENERGY M215-60-2LL-S22
3	JUNCTION BOX	AS REQUIRED FOR INSTALLATION
4	AC COMBINER	SQUARE D HOM48L125GRB 120/240VAC 125A OR EQUIV.
5	AC DISCONNECT	CUTLER HAMMER DG221NRB 240V 30A FUSED AC DISCO(25A FUSES)
6	PV GEN METER	MILBANK WATT HOUR METER, 240V 60 Hz CLASS 200
7	SERVICE PANEL	SQUARE D 125A BUS/ MLO

CONDUCTOR AND CONDUIT SCHEDULE				
TAG	CONDUCTOR DESCRIPTION	CONDUCTOR GAUGE	NO. OF CONDUCTORS	CONDUIT
1	PV WIRE	PER MODULE MFG.	2	N/A
2	ENPHASE ENGAGE CABLE	#12	4	N/A
3	BARE COPPER EGC	#8	1	N/A
4	THWN-2	#10	4	3/4" ENT/FMC/EMT
5	THWN-2	#8	4	3/4" EMT
6	THWN-2	#8	4	3/4" EMT

PV MODULE RATINGS @STC	
MAKE AND MODEL: BOVIET SOLAR BVM6610-10-P-250	
MAX POWER-POINT CURRENT I <sub>MP</sub>	8.31 A
MAX POWER-POINT VOLTAGE V <sub>MP</sub>	30.1 V
OPEN-CIRCUIT VOLTAGE V <sub>OC</sub>	37.5 V
SHORT-CIRCUIT CURRENT I <sub>SC</sub>	8.85 A
MAX SERIES FUSE (OCPD)	15 A
MAXIMUM POWER P <sub>MAX</sub>	250 W
MAX VOLTAGE	1000 VDC
V <sub>OC</sub> TEMPERATURE COEFFICIENT	-0.33 %/°C

INVERTER RATINGS	
MAKE AND MODEL: ENPHASE ENERGY M215-60-2LL-S22	
MAX DC VOLTAGE RATING	48 V
MAX POWER @ 40°C	215 W
NOMINAL AC VOLTAGE	240 V
MAX AC CURRENT	0.9 A
MAX OCPD RATING	15 A

CONDUCTOR SIZING PER NEC TABLE 310.15(B)(16) & 310.15(B)(2)(A) AND ADJUSTMENT FACTORS .58 (56-60°C) AND .82 (42-45°C).  
OVERCURRENT DEVICE SIZING PER NEC 240.4(B) AND 240.6(A).

AC CALCULATIONS: PER NEC 690.8(A)(3) AND (B)(1):

I X 1.25  
ARRAY #1  
[(.9 A)(17)] X 1.25 = 19.125 A  
ARRAY #2  
[(.9 A)(4)] X 1.25 = 4.5 A  
SYSTEM  
[(.9 A)(21)] X 1.25 = 23.625 A

MINIMUM DISTANCE FROM CONDUIT TO ROOFTOP IS 3.5" PER NEC 310.15(B)(c)

ALL SUPPLIED EQUIPMENT IS UL LISTED

EQUIPMENT TO BE INSTALLED PER LISTING AND / OR LABELING TO 2014 NEC REQUIREMENTS.

GROUNDING CONDUCTORS CONNECTED TO EACH MODEL FRAME AND RACK ASSEMBLY

ALL SOLAR PANELS ARE LISTED TO UL1703 AND HAVE A CLASS C FIRE RATING.

AC:  
L1 = BLACK  
L2 = RED  
NEUTRAL = WHITE  
GROUND = GREEN / BARE WIRE

2141 E. CAMELBACK RD. # 250  
PHOENIX, AZ 85016  
[844] 272-8336, [602] 507-6530

PHILIP W.

DRAWN

DATE

07/19/2016

PROJECT INFORMATION

SAHJ

SAHJ

UTILITY

CPS

5.250 kW<sub>DC</sub>/4.515 kW<sub>AC</sub> PV SYSTEM

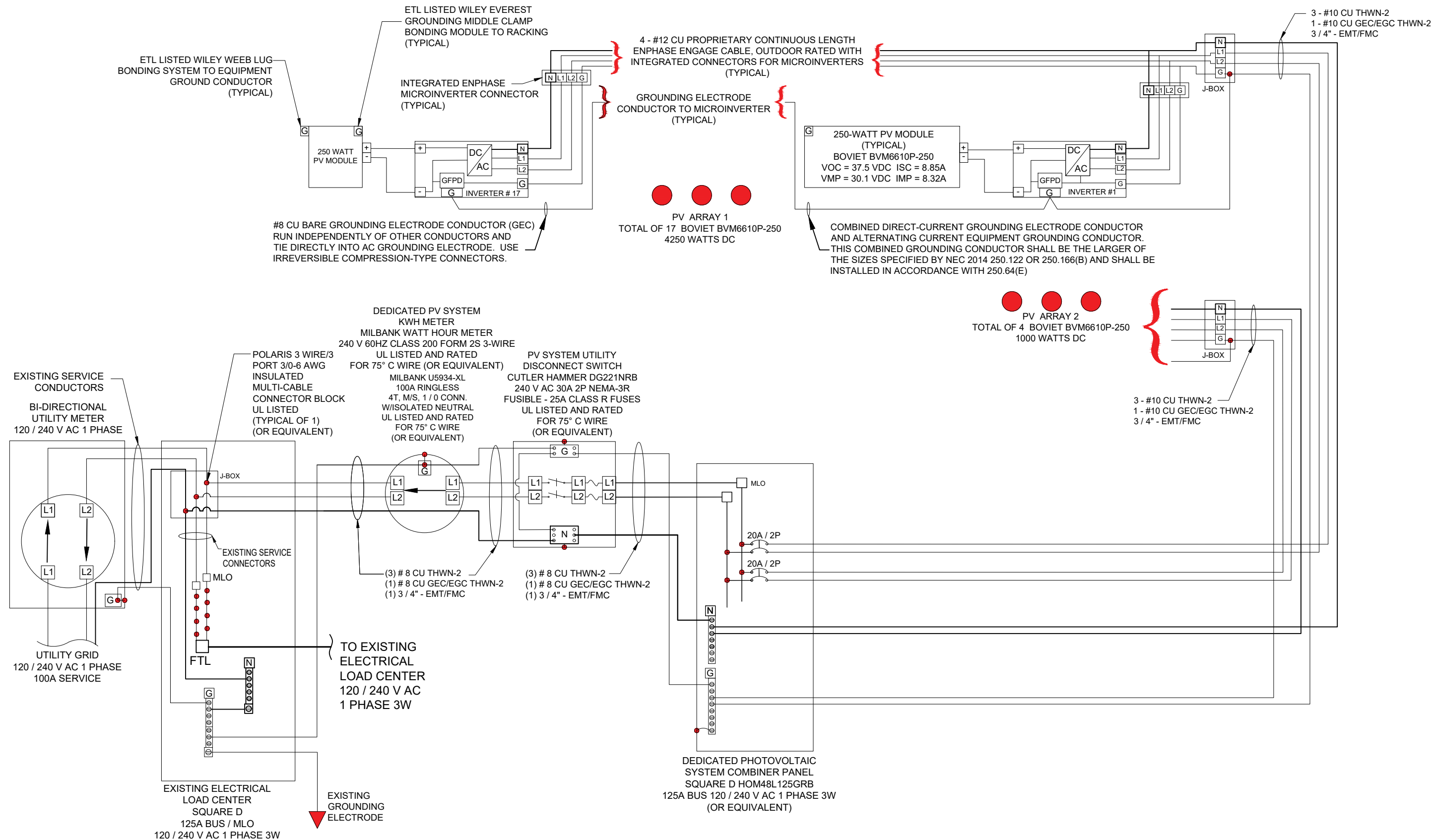
2354 W Gramercy Place

San Antonio TX 78201

CUSTOMER: PATRICIA LEDESMA

2







AC COMBINER

WARNING

ELECTRIC SHOCK HAZARD  
-DO NOT TOUCH TERMINALS-  
TERMINALS ON BOTH LINE AND  
LOAD SIDES MAY BE ENERGIZED  
IN THE OPEN POSITION

NOTICE

DEDICATED PHOTOVOLTAIC  
SYSTEM COMBINER PANEL  
DO NOT ADD LOADS TO  
THIS PANEL

WARNING

INVERTER OUTPUT CONNECTION  
DO NOT RELOCATE THIS  
OVERCURRENT DEVICE

UTILITY METER

REVENUE METER

AC DISCONNECT

PHOTOVOLTAIC SYSTEM  
AC DISCONNECT

OPERATING CURRENT 23.625 AMPS  
OPERATING VOLTAGE 240 VOLTS

WARNING

ELECTRIC SHOCK HAZARD  
-DO NOT TOUCH TERMINALS-  
TERMINALS ON BOTH LINE AND  
LOAD SIDES MAY BE ENERGIZED  
IN THE OPEN POSITION

UTILITY SAFETY DISCONNECT:  
USE TO ISOLATE FROM CUSTOMER  
GENERATION

DEDICATED PV SYSTEM  
KHW METER

PV METER

WARNING

CUSTOMER-OWNED GENERATOR  
CONNECTED. SEE DRAWING FOR  
DISCONNECT LOCATION

MAIN SERVICE PANEL

PHOTOVOLTAIC POWER SOURCE

SYSTEM AC VOLTAGE: 240 VAC  
MAXIMUM AC CURRENT: 23.625 AMPS

WARNING

ELECTRIC SHOCK HAZARD  
-DO NOT TOUCH TERMINALS-  
TERMINALS ON BOTH LINE AND  
LOAD SIDES MAY BE ENERGIZED  
IN THE OPEN POSITION

PANELBOARD IS ENERGIZED FROM TWO  
SOURCES OF AC POWER  
SOLAR - 23.625 AMPS  
UTILITY - 100 A AT 240V

TO BE LOCATED ADJACENT TO PV BREAKER.

WARNING

INVERTER OUTPUT CONNECTION  
DO NOT RELOCATE THIS  
OVERCURRENT DEVICE

IF SYSTEM IS CONNECTED BY SUPPLY-SIDE TAP.

WARNING

A GENERATION SOURCE IS CONNECTED TO THE SUPPLY  
(UTILITY) SIDE OF THE SERVICE DISCONNECTING  
MEANS. FOLLOW PROPER LOCK-OUT/TAG-OUT  
PROCEDURES TO ENSURE THE PHOTOVOLTAIC SYSTEM  
UTILITY DISCONNECT SWITCH IS OPENED PRIOR TO  
PERFORMING WORK ON THIS DEVICE.

ERUS ENERGY™				2141 E. CAMELBACK RD. # 250 PHOENIX, AZ 85016 [844] 272-8336, [602] 507-6530			
PLACARDS		PROJECT INFORMATION		DRAWN		PHILIP W.	
5.250 kW <sub>dc</sub> /4.515 kW <sub>ac</sub> PV SYSTEM 2354 W Gramercy Place San Antonio TX 78201		AHJ	SAN ANTONIO	DATE	07/19/2016		
		UTILITY	CPS				
CUSTOMER:						PATRICIA LEDESMA	
4							



PHOTOVOLTAIC SYSTEM SHALL BE INSTALLED ACCORDING TO THE 2014 NATIONAL ELECTRIC CODE WITH REFERENCE TO THE FOLLOWING:  
ARTICLE 690, AND SECTIONS 200-6, 210-6, 230-70, 240-3, 250-26, 250-50, 250-122 TO INCLUDE REFERENCED SECTIONS AND TABLES  
ALL EQUIPMENT PROVIDED SHALL BE LISTED BY AN INDEPENDENT TESTING AGENCY

PARTICULAR NOTE TO THE FOLLOWING:

NEC 240.4B

OVERCURRENT DEVICE RATING (ABOVE THE AMPACITY OF THE CONDUCTORS BEING PROTECTED) SHALL BE PERMITTED TO BE USED IF: 1) THE CONDUCTORS BEING PROTECTED ARE NOT PART OF A MULTIOUTLET BRANCH CIRCUIT SUPPLYING RECEPTACLES FOR CORD-AND-PLUG-CONNECTED PORTABLE LOADS. 2) THE AMPACITY OF THE CONDUCTORS DOES NOT CORRESPOND WITH THE STANDARD AMPERE RATING OF A FUSE OR A CIRCUIT BREAKER WITHOUT OVERLOAD TRIP ADJUSTMENTS ABOVE ITS RATING. 3) THE NEXT HIGHER STANDARD RATING SELECTED DOES NOT EXCEED 800 AMPERES.

NEC 240.6(A)

FUSES AND FIXED-TRIP CIRCUIT BREAKERS. THE STANDARD AMPERE RATINGS FOR FUSES AND INVERSE TIME CIRCUIT BREAKERS SHALL BE CONSIDERED: 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100, 110,125, 150, 175, 200, 225, 250, 300, 350, 400, 450, 500, 600, 700, 800, 1000, 1200, 1600, 2000, 2500, 3000, 4000, 5000, 6000 AMPERES.

NEC 240.64(C), 250.160 AND PART VII

GROUNDING ELECTRODE CONDUCTOR BE CONTINUOUS, GROUND CRIMPS TO BE IRREVERSIBLE

NEC 250.97

FOR CIRCUITS OVER 250 VOLTS TO GROUND, THE ELECTRICAL CONTINUITY OF METAL RACEWAYS AND CABLES WITH METAL SHEATHS THAT CONTAIN ANY CONDUCTOR OTHER THAN SERVICE CONDUCTORS SHALL BE ENSURED BY ONE OR MORE OF THE METHODS SPECIFIED FOR SERVICES IN 250.90(B), EXCEPT OR (B)(1).

NEC 422.30

DISCONNECTING MEANS

NEC 422.60

NAMEPLATE MARKING

NEC 422.62(B)

ADDITIONAL NAMEPLATE MARKING

NEC 690.4(C)

MODULE CONNECTION ARRANGEMENT SHALL BE ARRANGED SO THAT REMOVAL OF A MODULE OR PANEL FROM A PHOTOVOLTAIC SOURCE CIRCUIT DOES NOT INTERRUPT A GROUNDED CONDUCTOR TO ANOTHER PHOTOVOLTAIC SOURCE CURRENT

NEC 690.5

GROUND FAULT PROTECTION

NEC 690.7(D)

....OUTPUT CIRCUITS OVER 150 VOLTS TO GROUND SHALL NOT BE ACCESSIBLE TO OTHER THAN QUALIFIED PERSONS WHILE ENERGIZED.

NEC 690.8(A)(1)

PHOTOVOLTAIC SOURCE CIRCUIT CURRENTS. THE MAXIMUM CURRENT SHALL BE THE SUM OF THE PARALLEL MODULE RATED SHORT-CIRCUIT CURRENTS MULTIPLIED BY 125 PERCENT.

NEC 690.8(A)(3)

INVERTER OUTPUT CIRCUIT CURRENT. THE MAXIMUM CURRENT SHALL BE THE INVERTER CONTINUOUS OUTPUT CURRENT RATING.

NEC 690.8(B)(1)

SIZING OF CONDUCTORS AND OVERCURRENT DEVICES. THE CIRCUIT CONDUCTORS AND OVERCURRENT DEVICES SHALL BE SIZED TO CARRY NOT LESS THAN 125 PERCENT OF THE MAXIMUM CURRENTS AS CALCULATED IN 690.8(A). THE RATING OR SETTING OF OVERCURRENT DEVICES SHALL BE PERMITTED IN ACCORDANCE WITH 240.4(B) AND (C).

NEC 690.17

PV SYSTEM DISCONNECT SHALL BE SIGNED LABELED:

- WARNING - ELECTRICAL SHOCK HAZARD
- TERMINALS ON BOTH LINE AND LOAD SIDES
- MAY BE ENERGIZED IN THE OPEN POSITION

NEC 690.14(C)(2)

PV SYSTEM DISCONNECT SHALL BE PERMANENTLY MARKED AS A "PHOTOVOLTAIC SYSTEM DISCONNECT"

NEC 690.33

- (A) CONFIGURATION
- (B) INTERRUPTION OF CIRCUIT
- (C) CONNECTORS SHALL BE OF THE LOCKING OR LATCHING TYPE
- (E) LABELED "DO NOT OPEN UNDER LOAD"

NEC 690.53

PERMANENT LABEL FOR DIRECT-CURRENT PHOTOVOLTAIC POWER SOURCE AT DISCONNECTING MEANS

- RATED MAXIMUM POWER-POINT CURRENT
- RATED MAXIMUM POWER-POINT VOLTAGE
- MAXIMUM SYSTEM VOLTAGE [REF: 690.7 (A)]
- SHORT-CIRCUIT CURRENT [REF: 690.8 (A)]
- MAXIMUM RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER [IF INSTALLED]

NEC 690.56(B)

PERMANENT LABEL/PLAQUE: [SOURCE/LABEL]  
PV SYSTEM DISCONNECT / REF: NEC690.14 (C) (2)  
UTILITY SERVICE PANEL / "UTILITY SERVICE DISCONNECT"

NEC 690.64(B)(5)

CIRCUIT BREAKERS, IF BACKFED, SHALL BE SUITABLE FOR SUCH OPERATION

NEC 705.10

A PERMANENT PLAQUE OR DIRECTORY, DENOTING ALL ELECTRIC POWER SOURCES ON OR IN THE PREMISES, SHALL BE INSTALLED AT EACH SERVICE EQUIPMENT LOCATION AND AT LOCATIONS OF ALL ELECTRIC POWER PRODUCTION SOURCES CAPABLE OF BEING INTERCONNECTED. EXCEPTION: INSTALLATIONS WITH LARGE NUMBERS OF POWER PRODUCTION SOURCES SHALL BE PERMITTED TO BE DESIGNATED BY GROUPS

NEC TABLE 250.66

SIZE OF ALTERNATING-CURRENT GROUNDING ELECTRODE CONDUCTOR. THE SIZE OF THE GROUNDING ELECTRODE CONDUCTOR AT THE SERVICE, AT EACH BUILDING OR STRUCTURE WHERE SUPPLIED BY A FEEDER(S) OR BRANCH CIRCUIT(S), OR AT A SEPARATELY DERIVED SYSTEM OF A GROUNDED OR UNGROUNDED AC SYSTEM SHALL NOT BE LESS THAN GIVEN IN TABLE 250.66, EXCEPT AS PERMITTED IN 250.66(A) THROUGH (C).

NEC TABLE 310.16

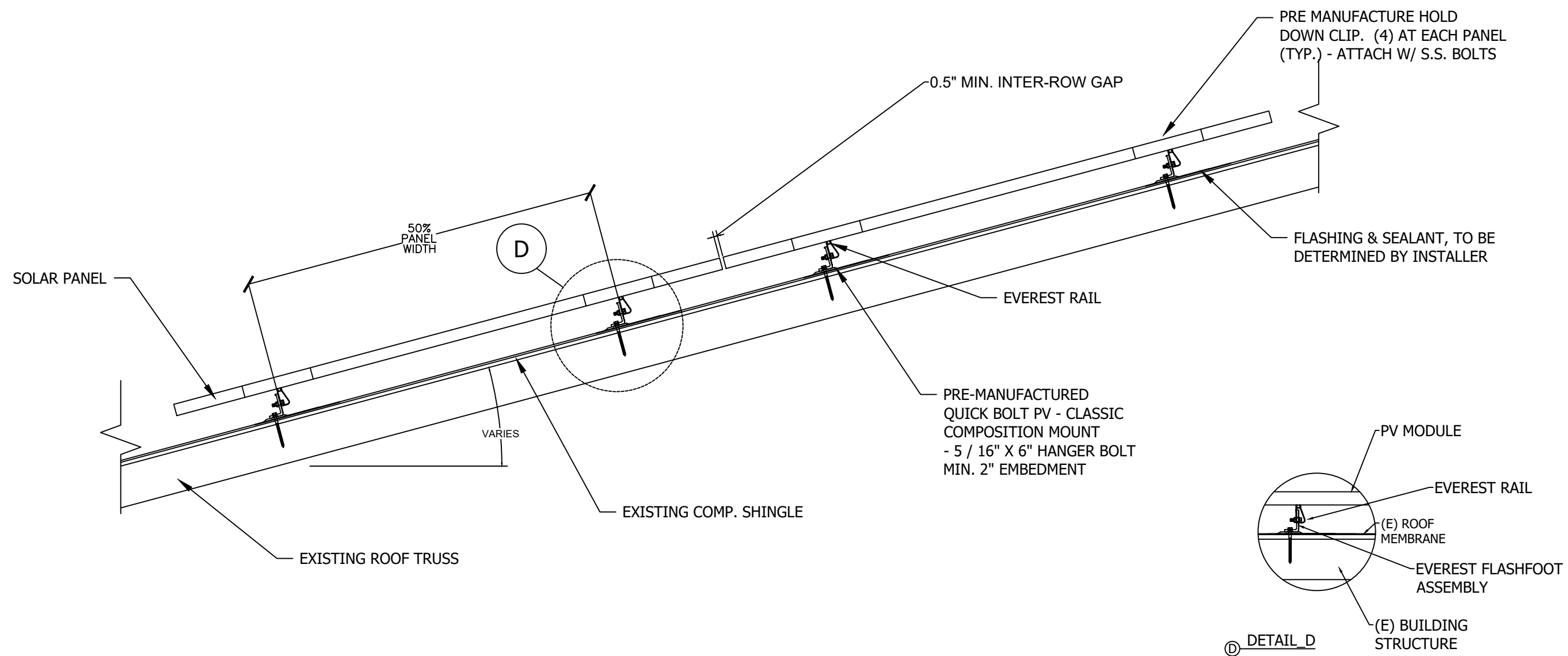
ALLOWABLE AMPACITIES OF INSULATED CONDUCTORS RATED 0 THROUGH 2000 VOLTS, 60°C THROUGH 90°C, NOT MORE THAN THREE CURRENT-CARRYING CONDUCTORS IN RACEWAY, CABLE, OR EARTH, BASED ON AMBIENT TEMPERATURE OF 30°C. NOTE CORRECTION FACTORS FOR AMBIENT TEMPERATURE AT END OF TABLE.

NEC 705.12(D)(1)

DEDICATED OVERCURRENT AND DISCONNECT. THE SOURCE INTERCONNECTION OF ONE OR MORE INVERTERS INSTALLED IN ONE SYSTEM SHALL BE MADE AT A DEDICATED CIRCUIT BREAKER OR FUSIBLE DISCONNECTING MEANS.

PROJECT INFORMATION		DRAWN	PHILIP W.	
AHU	SAN ANTONIO	DATE	07/19/2016	
UTILITY	CPS			
NEC NOTES 5.250 kW <sub>DC</sub> /4.515 kW <sub>AC</sub> PV SYSTEM 2354 W Gramercy Place San Antonio TX 78201		CUSTOMER: PATRICIA LEDESMA		







Patricia Ledesma  
2354 W. Gramercy Place  
San Antonio, TX 78201

AC  
to  
Roof

TAP

J-Box

PV  
O  
Meter

AC  
Disco

Combiner  
Panel

