

CONTRACTOR



22171 MCH RD
MANDEVILLE, LA 70471
PHONE: 9152011490

SYSTEM SIZE:

DC SIZE: 8.030 KW DC-(STC)
AC SIZE: 6.380 KW AC

CUSTOMER NAME & ADDRESS

WILLIAM HUME
3201 SW MARY ST, LEE'S
SUMMIT,
MO 64081, USA

REVISIONS

REV	DESCRIPTION
DRAWN DATE	7/2/2021
DRAWN BY	JAI
REVIEWED BY	-

Signature with Seal

NOTES

SHEET NUMBER

G-002

2.1.1 SITE NOTES:

2.1.2 A LADDER WILL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.

2.1.3 THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY INTERACTIVE SYSTEM WITH NO STORAGE BATTERIES.

2.1.4 THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.

2.1.5 PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER SECTION NEC 110.26.

2.1.6 ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THIS CODE AND THE APPROVED MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERING SERVES TO PROTECT THE BUILDING OR STRUCTURE.

2.2.1 EQUIPMENT LOCATIONS:

2.2.2 ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY NEC 110.26.

2.2.3 WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY NEC 690.31 (A),(C) AND NEC TABLES 310.15 (B)(2)(A) AND 310.15 (B)(3)(C).

2.2.4 JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV MODULES ACCORDING TO NEC 690.34.

2.2.5 ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE INVERTER IS NOT WITHIN SIGHT OF THE AC SERVICING DISCONNECT.

2.2.6 ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL ACCORDING TO NEC APPLICABLE CODES.

2.2.7 ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.

2.3.1 STRUCTURAL NOTES:

2.3.2 RACKING SYSTEM & PV ARRAY WILL BE INSTALLED ACCORDING TO CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUST ALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY, ACCORDING TO RAI MANUFACTURER'S INSTRUCTIONS.

2.3.3 JUNCTION BOX WILL BE INSTALLED PER MANUFACTURERS' SPECIFICATIONS. IF ROOF-PENETRATING TYPE, IT SHALL BE FLASHED & SEALED PER LOCAL REQUIREMENTS.

2.3.4 ROOFTOP PENETRATIONS FOR PV RACEWAY WILL BE COMPLETED AND SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.

2.3.5 ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER.

2.3.6 WHEN POSSIBLE, ALL PV RELATED RACKING ATTACHMENTS WILL BE STAGGERED AMONGST THE ROOF FRAMING MEMBERS.

2.4.1 WIRING & CONDUIT NOTES:

2.4.2 ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.

2.4.3 CONDUCTORS SIZED ACCORDING TO NEC 690.8, NEC 690.7.

2.4.4 VOLTAGE DROP LIMITED TO 1.5%.

2.4.5 DC WIRING LIMITED TO MODULE FOOTPRINT.

MICROINVERTER WIRING SYSTEMS SHALL BE LOCATED AND SECURED UNDER THE ARRAY W/ SUITABLE WIRING CLIPS.

2.4.6 AC CONDUCTORS COLORED OR MARKED AS FOLLOWS: PHASE A OR L1- BLACK PHASE B OR L2- RED, OR OTHER CONVENTION IF THREE PHASE PHASE C OR L3- BLUE, YELLOW, ORANGE**, OR OTHER CONVENTION NEUTRAL-WHITE OR GREY IN 4-WIRE DELTA CONNECTED SYSTEMS THE PHASE WITH HIGHER VOLTAGE TO BE MARKED ORANGE [NEC 110.15].

2.5.1 GROUNDING NOTES:

2.5.2 GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVICES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH USE.

2.5.3 PV EQUIPMENT SHALL BE GROUNDED ACCORDING TO NEC 690.43 AND MINIMUM NEC TABLE 250.122.

2.5.4 METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND ENCLOSURES CONSIDERED GROUNDED IN ACCORD WITH 250.134 AND 250.136(A).

2.5.5 EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED ACCORDING TO NEC 690.45 AND MICROINVERTER MANUFACTURERS' INSTRUCTIONS.

2.5.6 EACH MODULE WILL BE GROUNDED USING WEEB GROUNDING CLIPS AS SHOWN IN

MANUFACTURER DOCUMENTATION AND APPROVED BY THE AHJ. IF WEEBS ARE NOT USED, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE SPECIFIED GROUNDING LUG HOLES PER THE MANUFACTURERS' INSTALLATION REQUIREMENTS.

2.5.7 THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OF A MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE.

2.5.8 GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLORED GREEN OR MARKED GREEN IF #4 AWG OR LARGER [NEC 250.119]

2.5.9 THE GROUNDING ELECTRODE SYSTEM COMPLIES WITH NEC 690.47 AND NEC 250.50 THROUGH 250.106. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, A GROUNDING ELECTRODE SYSTEM PROVIDED ACCORDING TO NEC 250, NEC 690.47 AND AHJ.

2.5.10 GROUND-FAULT DETECTION SHALL COMPLY WITH NEC 690.41(B)(1) AND (2) TO REDUCE FIRE HAZARDS

2.6.1 DISCONNECTION AND OVER-CURRENT PROTECTION NOTES:

2.6.2 DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARE RECONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS).

2.6.3 DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH

2.6.4 PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION TO REDUCE SHOCK HAZARD FOR EMERGENCY RESPONDERS IN ACCORDANCE WITH 690.12(A) THROUGH (D).

2.6.5 ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING TO NEC 690.8, 690.9, AND 240.

2.6.6 MICROINVERTER BRANCHES CONNECTED TO A SINGLE BREAKER OR GROUPED FUSES IN ACCORDANCE WITH NEC 110.3(B).

2.6.7 IF REQUIRED BY AHJ, SYSTEM WILL INCLUDE ARC-FAULT CIRCUIT PROTECTION ACCORDING TO NEC 690.11 AND UL1699B.

2.7.1 INTERCONNECTION NOTES:

2.7.2 LOAD-SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH [NEC 705.12 (B)]

2.7.3 THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS OUTPUT MAY NOT EXCEED 120% OF BUSBAR RATING [NEC 705.12(B)(2)(3)(b)].

2.7.4 THE SUM OF 125 PERCENT OF THE POWER SOURCE(S) OUTPUT CIRCUIT CURRENT AND THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE BUSBAR SHALL NOT EXCEED 120 PERCENT OF THE AMPACITY OF THE BUSBAR, PV DEDICATED BACKFEED BREAKERS MUST BE LOCATED OPPOSITE END OF THE BUS FROM THE UTILITY SOURCE OCPD [NEC 705.12(B)(2)(3)].

2.7.5 AT MULTIPLE ELECTRIC POWER SOURCES OUTPUT COMBINER PANEL, TOTAL RATING OF ALL OVERCURRENT DEVICES SHALL NOT EXCEED AMPACITY OF BUSBAR. HOWEVER, THE COMBINED OVERCURRENT DEVICE MAY BE EXCLUDED ACCORDING TO NEC 705.12 (B)(2)(3)(C).

2.7.6 FEEDER TAP INTERCONNECTION (LOADSIDE) ACCORDING TO NEC 705.12 (B)(2)(1)

2.7.7 SUPPLY SIDE TAP INTERCONNECTION ACCORDING TO NEC 705.12 (A) WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.42

2.7.8 BACKFEEDING BREAKER FOR ELECTRIC POWER SOURCES OUTPUT IS EXEMPT FROM ADDITIONAL FASTENING [NEC 705.12 (B)(5)].

ROOF SECTION(S)

ROOF 1	TILT - 7° AZIMUTH - 171° MODULE - 8 SYSTEM SIZE (KW)- 2.92
ROOF 2	TILT - 32° AZIMUTH - 171° MODULE - 9 SYSTEM SIZE (KW)- 3.29
ROOF 3	TILT - 30° AZIMUTH - 261° MODULE - 5 SYSTEM SIZE (KW)- 1.83

LEGEND

-  - FIRE SETBACK
-  - PROPERTY LINE
-  - JUNCTION BOX
-  - SKYLIGHT (ROOF OBSTRUCTION)
-  - CHIMNEY (ROOF OBSTRUCTION)
-  - VENT, ATTIC FAN (ROOF OBSTRUCTION)

-  - MODULE STRING
-  - MODULE STRING

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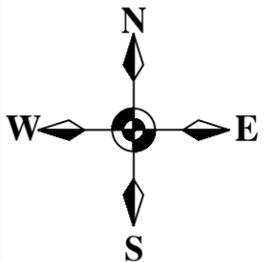
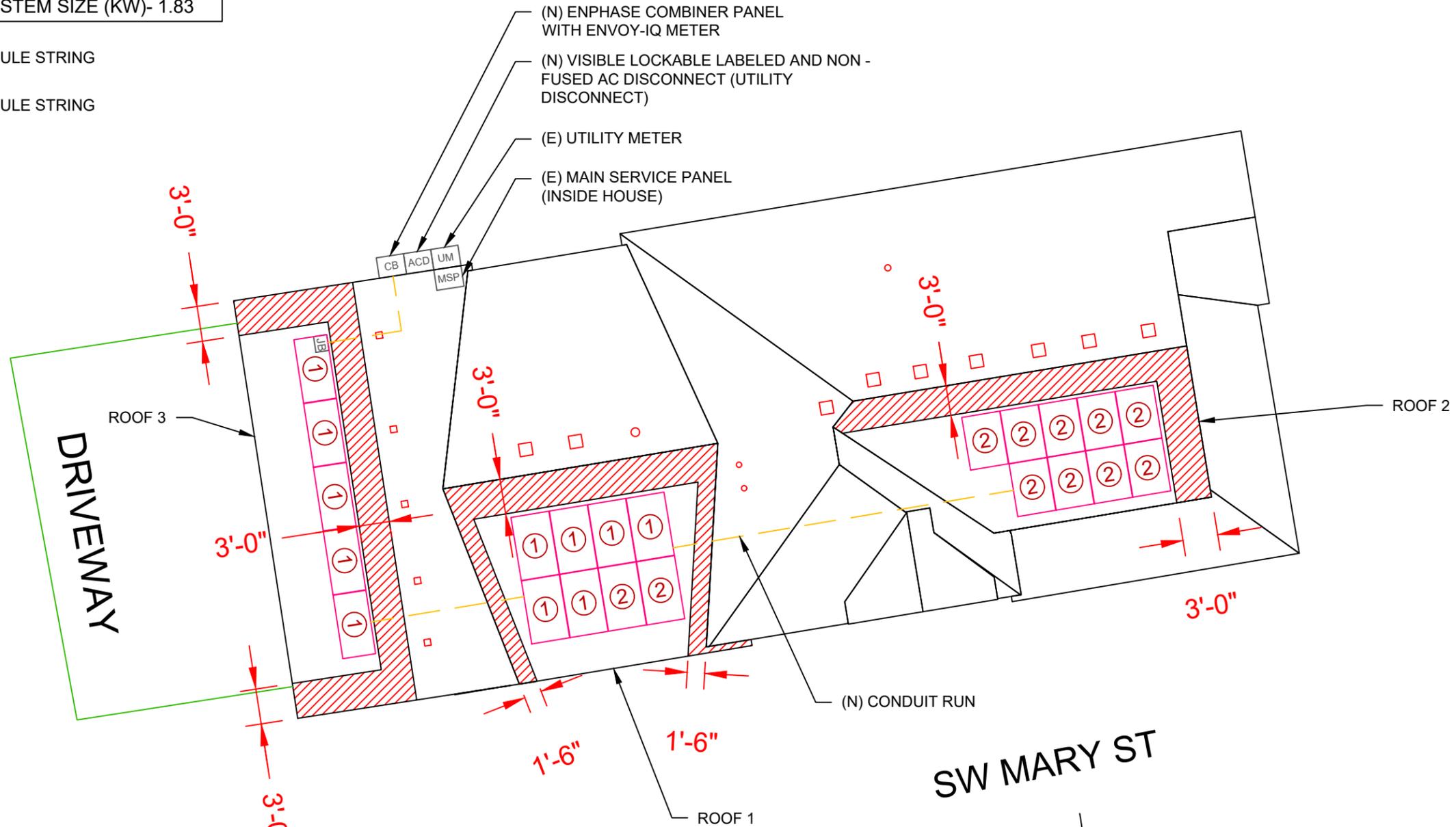
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DRAWN BY	JAI
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ELECTRICAL PLAN

SHEET NUMBER

A-102



1 | ELECTRICAL PLAN
SCALE: 3/32" = 1'-0"

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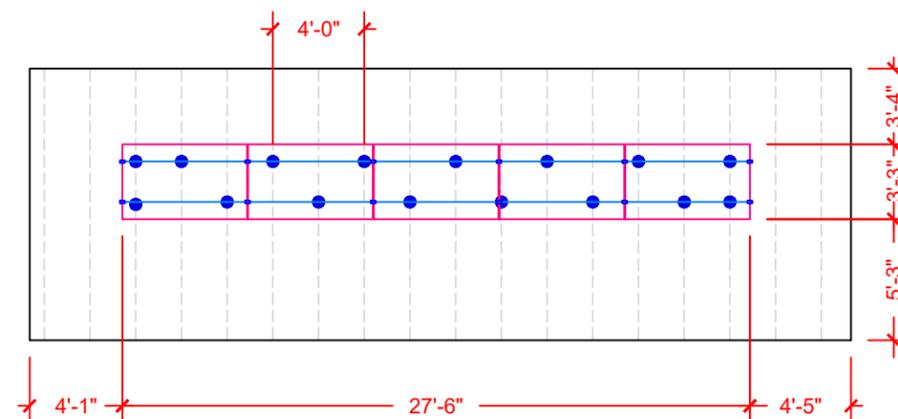
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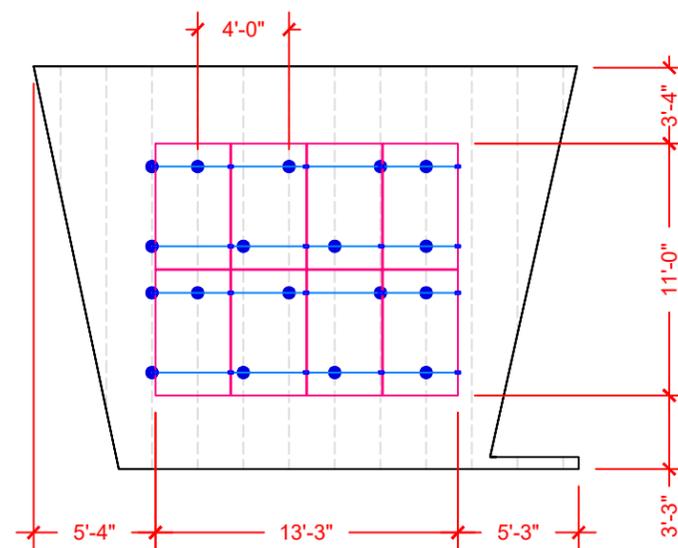
ATTACHMENT PLAN

SHEET NUMBER

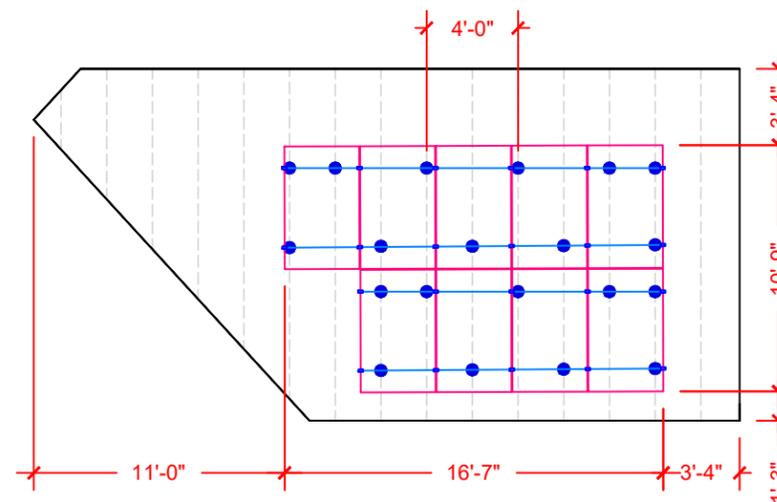
A-103



ARRAY 3
 TILT- 30 DEG
 AZIMUTH - 261 DEG



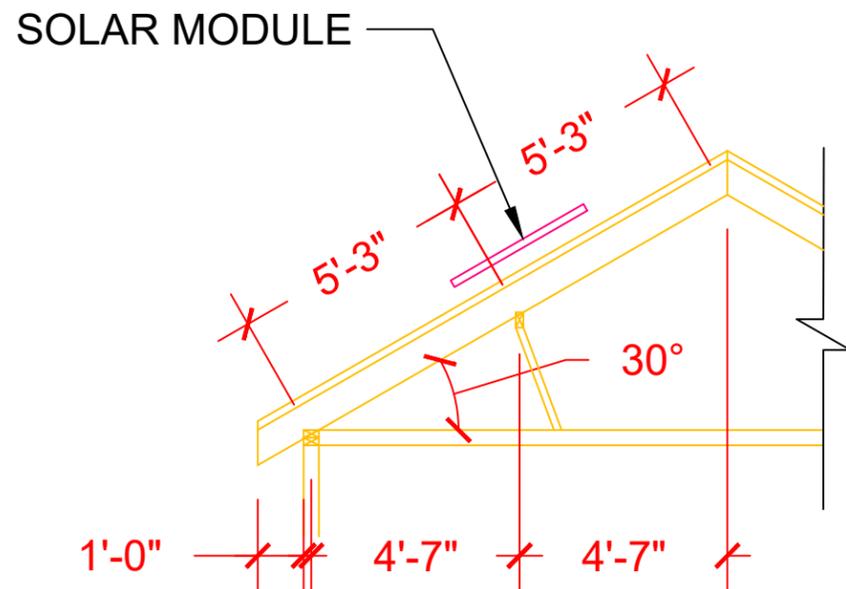
ARRAY 1
 TILT- 7 DEG
 AZIMUTH - 171 DEG



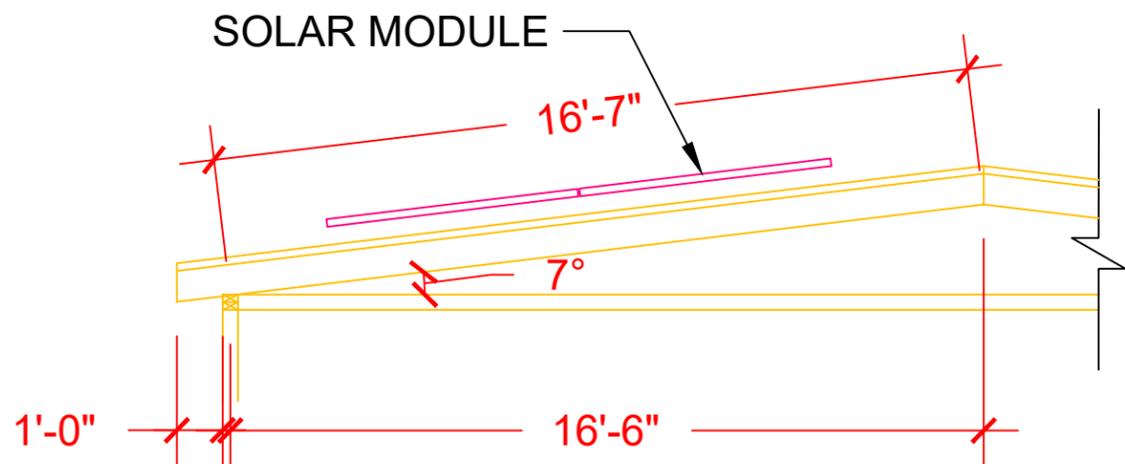
ARRAY 2
 TILT- 32 DEG
 AZIMUTH - 171 DEG

1 | ATTACHMENT PLAN

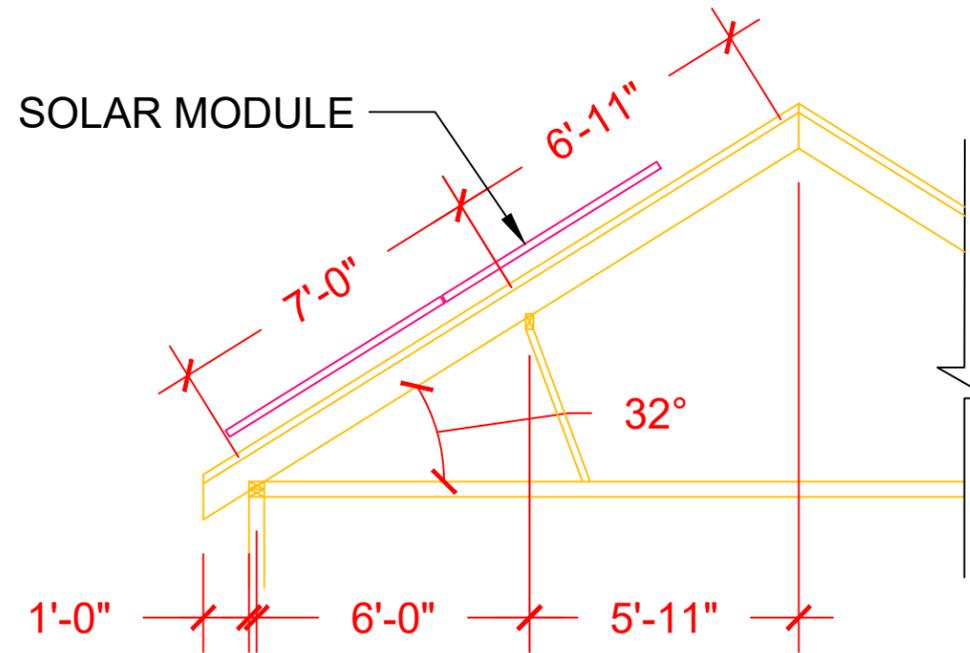
SCALE: 1/8"=1'-0"



ROOF 3



ROOF 1



ROOF 2

ROOF SECTION(S)

ROOF 1	ROOF MATERIAL - COMPOSITE SHINGLE RAFTER SIZE - 2"X6" O.C. SPACING - 24"
ROOF 2	ROOF MATERIAL - COMPOSITE SHINGLE RAFTER SIZE - 2"X6" O.C. SPACING - 24"
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STRUCTURAL PLAN

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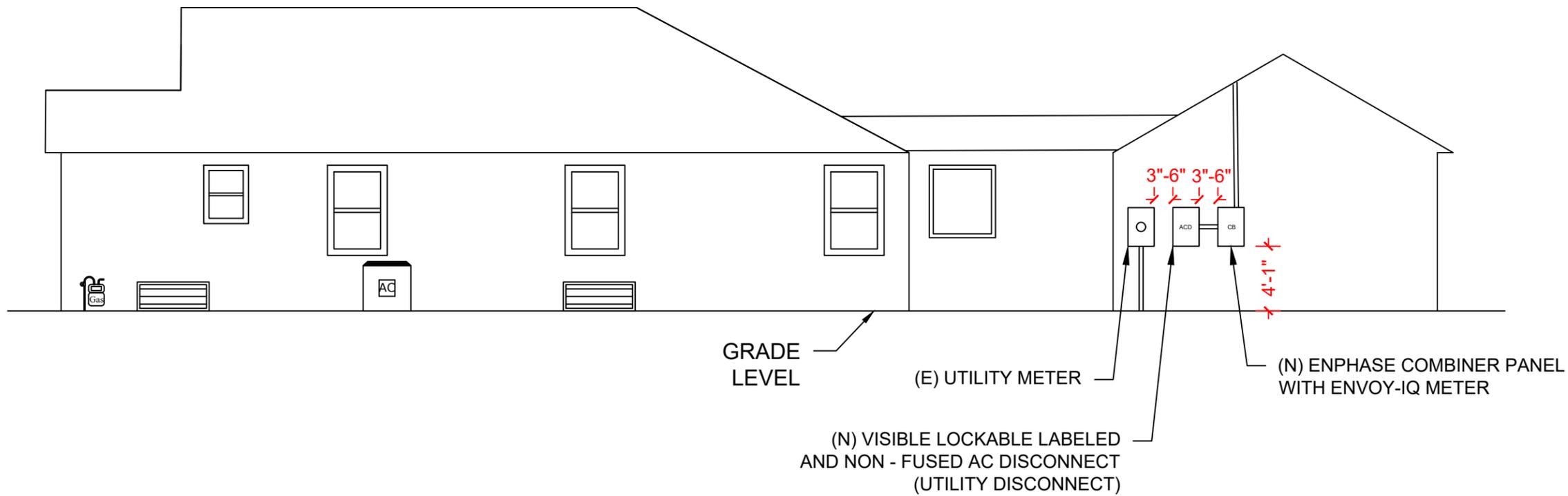
A-104

1 | **STRUCTURAL PLAN**

SCALE: 1/4"=1'-0"

LEGEND	
CB	ENPHASE IQ COMBINER (19.5" X 14.75" X 6.63")
ACD	AC DISCONNECT (17.5" X 10.5" X 6.5")
UM	UTILITY METER
MSP	MAIN SERVICE PANEL

NOTE: DISTANCE BETWEEN ELECTRICAL EQUIPMENTS SHOULD BE 3"-6"



1 | ELEVATION PLAN

SCALE: 1/8"=1'-0"

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ELEVATION PLAN

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A-105

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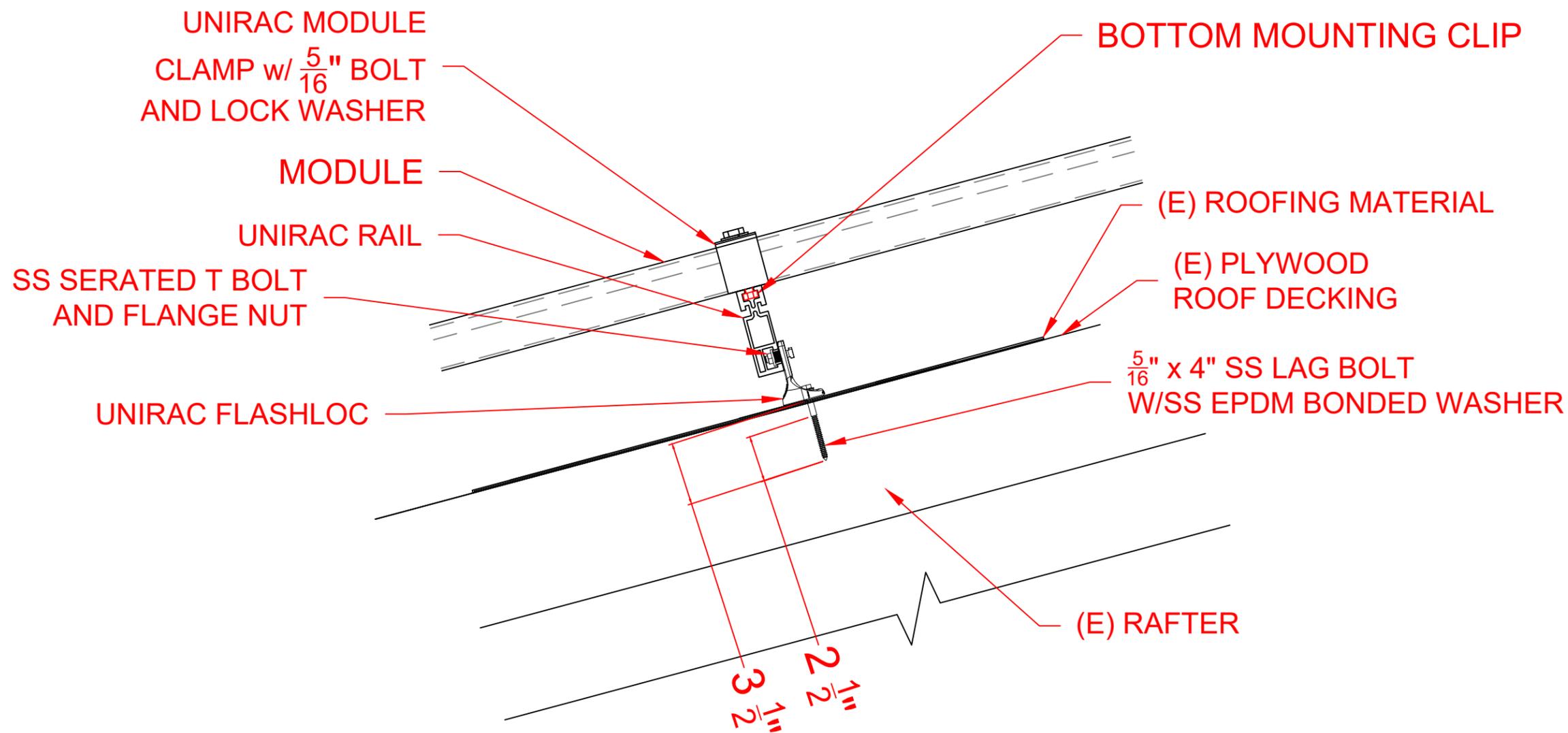
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MOUNTING DETAILS

SHEET NUMBER

A-106



1 | MOUNTING DETAILS

SCALE:NTS

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-19°
AMBIENT TEMP (HIGH TEMP 2%)	35°
CONDUIT HEIGHT	0.5"
CONDUCTOR TEMPERATURE RATE	90°

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS
.80	4-6
.70	7-9
.50	10-20

CALCULATIONS:

1. CURRENT CARRYING CONDUCTOR

(A) BEFORE IQ COMBINER PANEL

AMBIENT TEMPERATURE - (35)°C ...NEC 310.15(B)(3)(c)
 TEMPERATURE DERATE FACTOR - 0.96 ...NEC 310.15(B)(2)(a)
 GROUPING FACTOR - 0.8...NEC 310.15(B)(3)(a)

CONDUCTOR AMPACITY

= (INV O/P CURRENT) x 1.25 / A.T.F / G.F ...NEC 690.8(B)
 = [(11 x 1.21) x 1.25] / [0.96 x 0.8]
 = 21.66A

SELECTED CONDUCTOR - #12 THWN-2 ...NEC 310.15(B)(16)

(B) AFTER IQ COMBINER PANEL

TEMPERATURE DERATE FACTOR - 0.96
 GROUPING FACTOR - 1

CONDUCTOR AMPACITY

= (TOTAL INV O/P CURRENT) x 1.25 / 0.96/ 1 ...NEC 690.8(B)
 = [(22 x 1.21) x 1.25] / [0.96 x 1]
 = 34.66 A

SELECTED CONDUCTOR - #6 THWN-2 ...NEC 310.15(B)(16)

2. PV OVER CURRENT PROTECTION ...NEC 690.9(B)

= TOTAL INVERTER O/P CURRENT x 1.25
 = (22 x 1.21) x 1.25 = 33.28 A
 SELECTED OCPD = 40 A ...NEC 240.6

3. 120% RULE FOR BACKFEED BREAKER

...NEC 705.12(B)(2)(3)(b)

MCB + PV BREAKER <= (1.2 x BUS BAR RATING)
 RATING RATING RATING)
 (200 + 40) <= 1.2 x 200A
 240.00 <= 240.00 HENCE OK

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ELECTRICAL CALCULATIONS

SHEET NUMBER

E-602

CONTRACTOR



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PLACARD

SHEET NUMBER

E-603

WARNING:
PHOTOVOLTAIC
POWER SOURCE

LABEL 1
ON ALL CONDUITS SPACED AT MAX 10FT

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

LABEL 5
AT EACH AC DISCONNECT

! CAUTION !
SOLAR POINT OF
INTERCONNECTION

LABEL 9
AT UTILITY METER

! CAUTION !
SOLAR ELECTRIC
SYSTEM CONNECTED
AND ENERGIZED

LABEL 2
AT INVERTER

PHOTOVOLTAIC
AC DISCONNECT

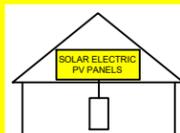
LABEL 6
AT EACH AC DISCONNECT

! WARNING !
THE SERVICE METER IS ALSO SERVED
BY A PHOTOVOLTAIC SYSTEM

LABEL 10
AT UTILITY METER

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



LABEL 3
AT INVERTER

! WARNING !
DUAL POWER SOURCES
SECOND SOURCE IS PV SYSTEM

LABEL 7
AT MEP

PHOTOVOLTAIC
DC DISCONNECT

LABEL 4
AT DC DISCONNECT

! WARNING !
SOLAR SYSTEM CONNECTED
AND ENERGIZED

LABEL 8
AT MEP

CAUTION

POWER TO THIS BUILDING IS ALSO SUPPLIED
FROM THE FOLLOWING SOURCES WITH
DISCONNECTS LOCATED AS SHOWN:

