



COMMISSION OF ARCHITECTURAL REVIEW

APPLICATION FOR CERTIFICATE OF APPROPRIATENESS

PROPERTY (location of work)

Address 509 W 22nd St, Richmond, Virginia, 23225
Historic district Springhill City and Old Historic District

Date/time rec'd: _____
Rec'd by: _____
Application #: _____
Hearing date: _____

APPLICANT INFORMATION

Name James Poplin
Company ION Developer LLC
Mailing Address 4801 N University Ave Ste 900
Provo, UT 84604

Phone 888-781-7074x1109
Email permits@ionsolar.com
Applicant Type: Owner Agent
 Lessee Architect Contractor
 Other (please specify): _____

OWNER INFORMATION (if different from above)

Name Daniel Kraft
Mailing Address 509 W 22nd St, Richmond, Virginia, 23225

Company _____
Phone (804) 687-2019
Email brainiacdk@gmail.com

PROJECT INFORMATION

Review Type: Conceptual Review Final Review

Project Type: Alteration Demolition New Construction
(Conceptual Review Required)

Project Description: (attach additional sheets if needed)

Installation of solar panels on existing residential roof. 2.56 kW system (8 panels).

ACKNOWLEDGEMENT OF RESPONSIBILITY

Compliance: If granted, you agree to comply with all conditions of the COA. Revisions to approved work require staff review and may require a new application and CAR approval. Failure to comply with the COA may result in project delays or legal action. The COA is valid for one (1) year and may be extended for an additional year, upon written request.

Requirements: A complete application includes all applicable information requested on checklists to provide a complete and accurate description of existing and proposed conditions. Applicants proposing major new construction, including additions, should meet with Staff to review the application and requirements prior to submitting an application. Owner contact information and signature is required. Late or incomplete applications will not be considered.

Zoning Requirements: Prior to Commission review, it is the responsibility of the applicant to determine if zoning approval is required and application materials should be prepared in compliance with zoning.

DocuSigned by:
Signature of Owner DANIEL KRAFT
409AECC80AC244C...

Date 8/28/2019

CERTIFICATE OF APPROPRIATENESS APPLICATION INSTRUCTIONS

In advance of the application deadline please contact staff to discuss your project, application requirements, and if necessary, to make an appointment to meet with staff for a project consultation in the office or on-site. The Commission of Architectural Review website has additional project guidance and forms:

<http://www.richmondgov.com/CommissionArchitecturalReview/index.aspx>

Division of Planning and Preservation	804.646.6335	Carey.Jones@Richmondgov.com
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SUBMISSION INSTRUCTIONS

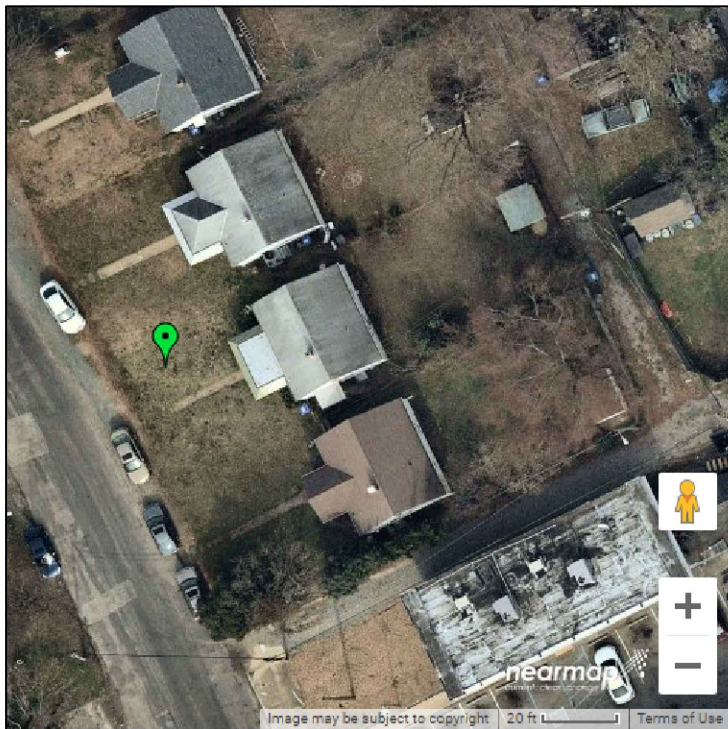
Submit the following items to the Division of Planning and Preservation, Rm. 510, 900 E. Broad Street:

- One (1) signed and completed application – property owners signature required
- Eleven (11) copies of supporting documentation, as indicated on appropriate check-list, collated and stapled
- All plans and elevations should be printed **11x17** and all text easily legible
- One digital copy of the application and supporting documentation, depending on size emailed to staff or saved to a thumb drive or CD and delivered with the application materials.
- Applications are due by 12 PM (noon) on the deadline date (see table below).
- Exception: revisions to items deferred, denied or presented conceptually at the previous Commission meeting are due one week after the application due date. Please contact staff to confirm this date.
- **Application deadlines are firm.** All materials must be submitted by the deadline to be considered at the following Commission meeting. Designs must be final at the time of application; revisions will not be accepted after the deadline. Incomplete and/or late applications will not be placed on the agenda.
- The Commission will not accept new materials, revisions, or redesigns at the meeting. Deferral until the following month's meeting may be necessary in such cases to allow for adequate review by staff, Commissioners, and public notice if required.

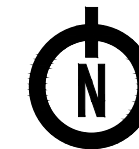
MEETING SCHEDULE AND DUE DATES

- Commission meetings start at 3:30 PM in the 5th floor conference room of City Hall, 900 E. Broad Street. The owner and/or applicant is *encouraged to attend* the meeting.

2019 Commission Meeting Date	Application Deadline (Friday at noon unless otherwise noted)
January 22 nd	December 28 th , 2018
February 26 th	January 25 th
March 26 th	March 1 st
April 23 rd	March 29 th
May 28 th	April 26 th
June 25 th	May 31 st
July 23 rd	June 28 th
August 27 th	July 26 th
September 24 th	August 30 th
October 22 nd	September 27 th
November 26 th	October 25 th
December 17 th	November 22 nd



MAP OF LOCATION



ION

4801 N UNIVERSITY AVE, #900
 PROVO, UT 84604
 (888) 781-7074

DANIEL KRAFT
 509 W 22ND STREET
 RICHMOND, VA 23225



LICENSED ELECTRICAL CONTRACTOR COMPANY:
 ION DEVELOPER LLC,
 DAVID CONRAD
 CLASSIFICATION:
 ELECTRICAL CONTRACTOR,
 CLASS B & AES | TRADESMAN MELE
 LICENSE NUMBER:
 2705169798 | 2710069944
 EXPIRATION:
 11/30/2020 | 9/30/2020 AUTHORIZED CONTRACTOR:
David S. Conrad

SYSTEM SIZE: 2.56 kW DC
 1.92 kW AC
 8 MODULES

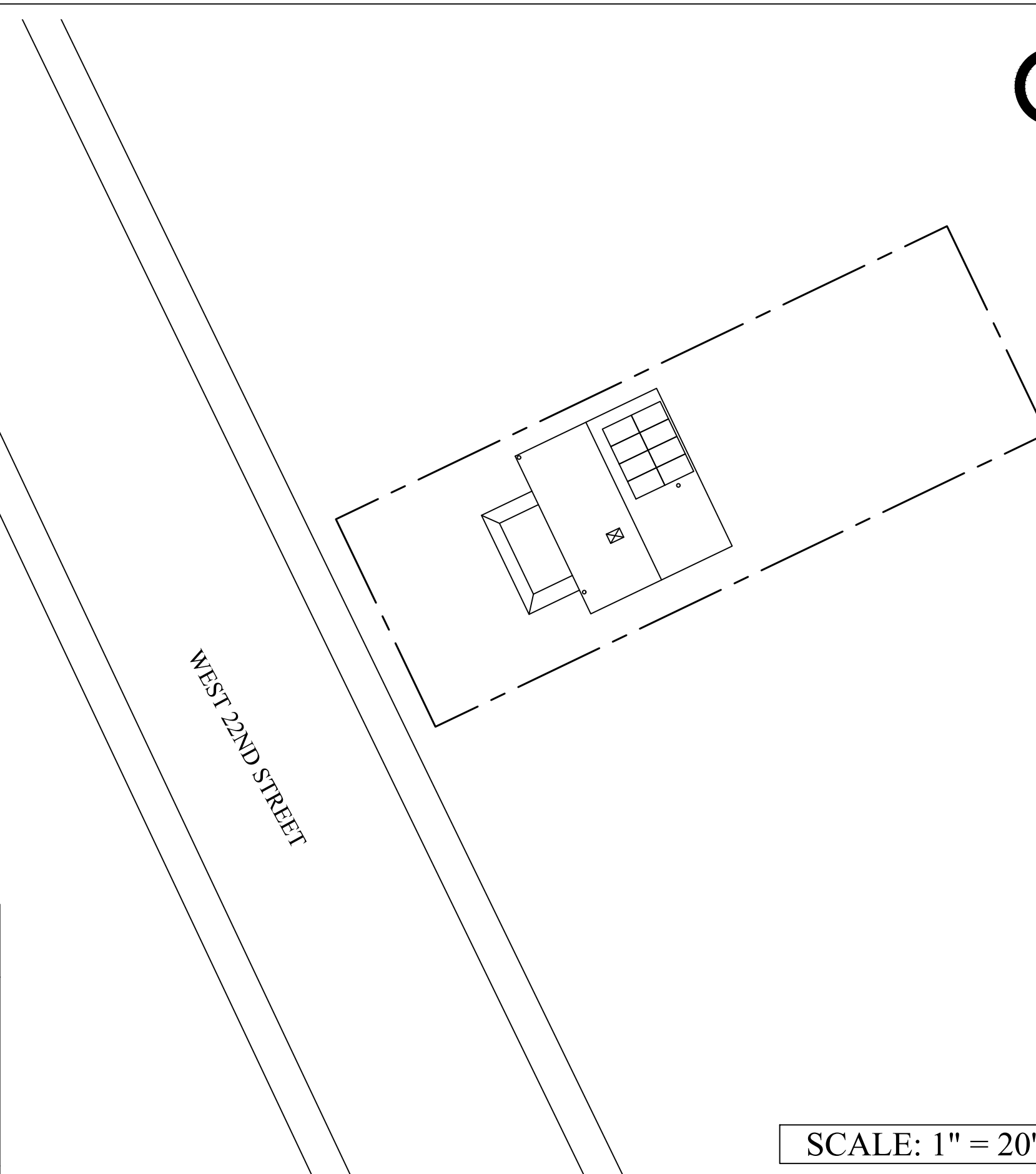
DATE: 8/29/2019

DRAWN BY: JCC

ADDITIONAL NOTES:

SCALE: 1" = 20'-7"

TOTAL AREA OF ROOF(S) USED: 405.09FT ² TOTAL AREA OF ARRAYS: 140.800000FT ² 34.76%	
SCOPE OF WORK: THE SYSTEM CONSISTS OF A 2.56 KW DC (1.92 KW AC) ROOF-MOUNTED PHOTOVOLTAIC POWER SYSTEM OPERATING IN PARALLEL WITH THE UTILITY GRID. THERE ARE (8) SILFAB SOLAR SLA-320M MODULES AND (8) ENPHASE IQ7-60-2-US MICRO-INVERTERS, MOUNTED ON THE BACK OF EACH PV MODULE, CONNECTING TO THE UTILITY GRID THROUGH THE EXISTING MAIN LOAD CENTER. ELECTRICAL MODIFICATIONS WILL BE MADE TO THE MAIN LOAD CENTER.	
INTERCONNECTION METHOD:	LOAD-SIDE BREAKER
ROOF MATERIAL:	COMPOSITE SHINGLE
PROJECT WILL COMPLY WITH THE 2014 NEC, 2015 IRC, 2015 IBC, 2015 IFC, AND 2015 VA UNIFORM STATEWIDE BUILDING CODES.	



ALL CONDUIT WILL BE PAINTED TO MATCH THE EXISTING STRUCTURE.
 AC DISCONNECT LOCATED NEXT TO OR WITHIN 10 FEET OF MAIN SERVICE PANEL(LINE OF SIGHT MAINTAINED).

SHEET:
**COVER
 PV 1.0**

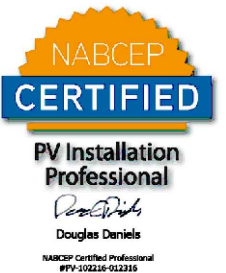
 PV CIRCUIT 1



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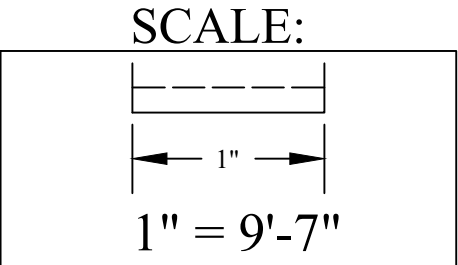
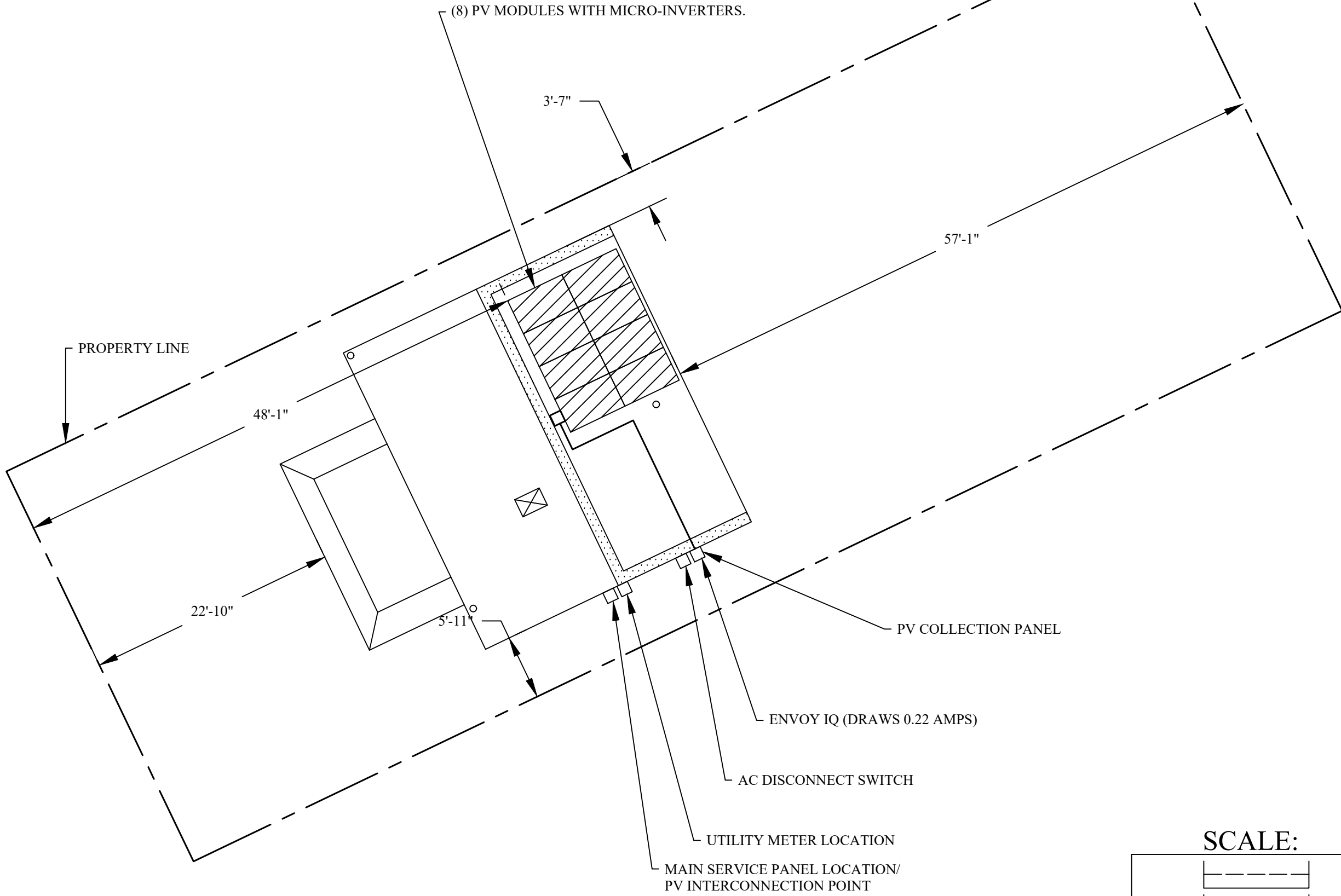
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ADDITIONAL NOTES:

SHEET:
**SITE PLAN
PV 2.0**



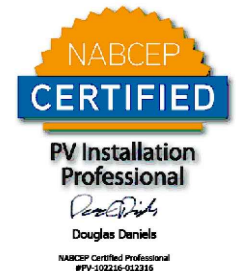
ALL WIRING WILL BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE AND WIRING WILL BE PERMANENTLY AND COMPLETELY HELD OFF OF THE ROOF SURFACE

ALL ARRAY SUPPORTS/MOUNTS SHALL BE STAGGERED FROM ONE ROW OF RACKING TO THE NEXT SUCH THAT NOT ALL SUPPORTS/MOUNTS DISTRIBUTE LOAD ONTO THE SAME TRUSSES

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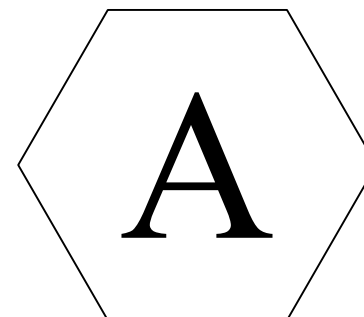
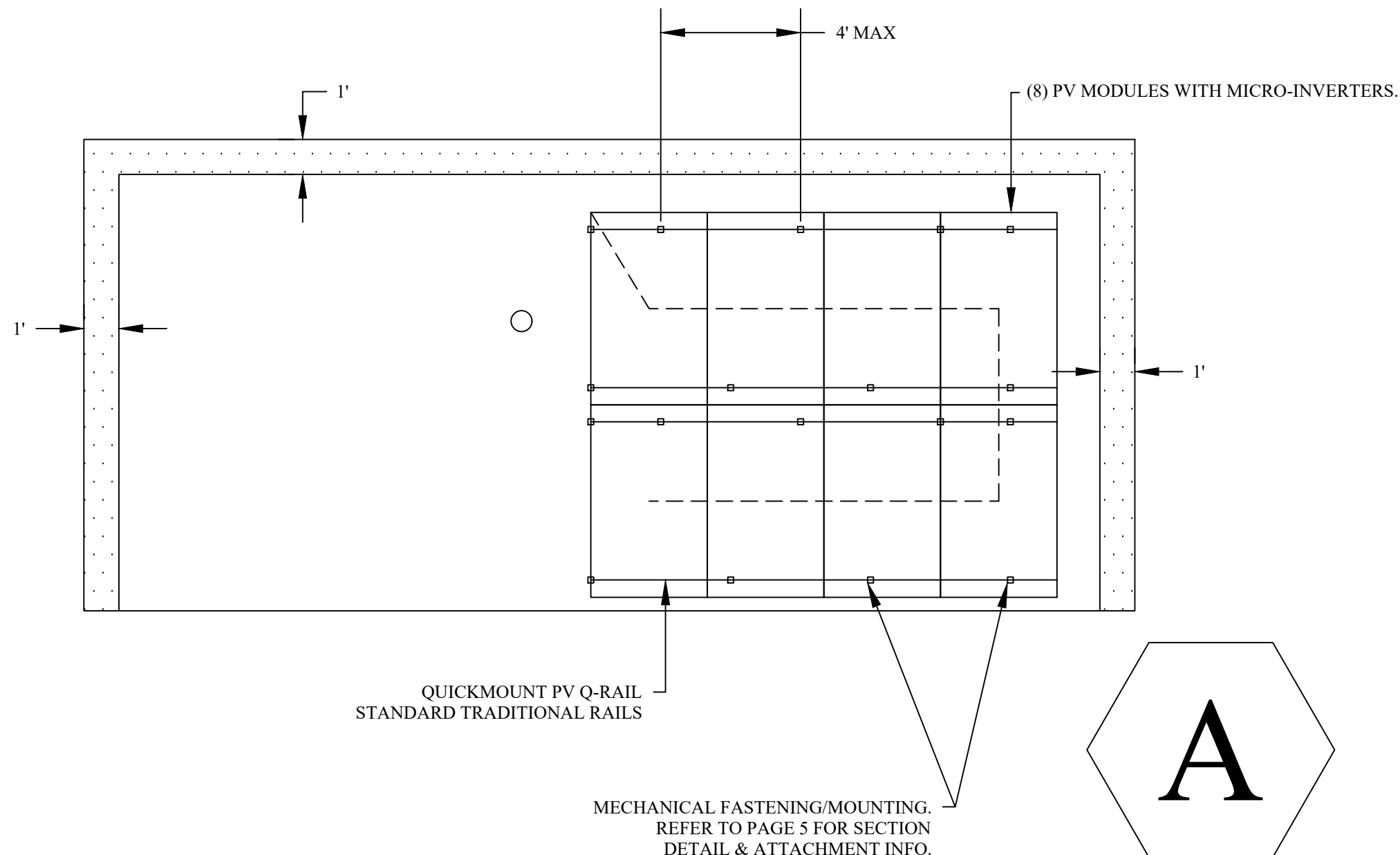
ADDITIONAL NOTES:

2" X 6" RAFTER SYSTEM 20"
ON CENTER

CANTILEVERS WILL BE NO
MORE THAN 24"

ATTACHMENT POINTS
WILL BE NO MORE THAN 4'
APART, STAGGERED

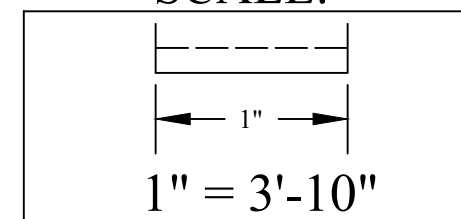
SHEET:
**ROOF PLAN
PV 3.0**



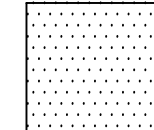
ROOF SECTION DATA

ROOF SECTION	A	B	C	D	E	F	G	H
MODULES	8							
TILT	39							
AZIMUTH	244							
SOLAR ACCESS AVG.	99.00%							

SCALE:



FIRE CODE OFFSET



WEATHER DATA	
HIGH TEMP, 2% AVG.	34 °C
MIN DESIGN TEMP	-13 °C
GROUND SNOW LOAD	20 psf
WIND SPEED	115 mph

- HIGH TEMPERATURE 2% AVERAGE BASED ON ASHRAE HIGHEST MONTH 2% DRY BULB TEMPERATURE FOR ASHRAE LOCATION MOST SIMILAR TO INSTALLATION LOCATION
- MINIMUM DESIGN TEMPERATURE BASED ON ASHRAE MINIMUM MEAN EXTREME DRY BULB TEMPERATURE FOR ASHRAE LOCATION MOST SIMILAR TO INSTALLATION LOCATION
- ALTERNATE POWER SOURCE PLACARD SHALL BE PERMANENTLY ATTACHED TO A/C DISCONNECT
- ELECTRICAL INSTALL SHALL COMPLY WITH 2014 NATIONAL ELECTRICAL CODE
- ALL SOLAR MODULES, EQUIPMENT, AND METALLIC COMPONENTS SHALL BE BONDED
- IF THE EXISTING MAIN SERVICE DOES NOT HAVE VERIFIABLE GROUNDING ELECTRODE, IT IS THE PV CONTRACTOR'S RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE
- EACH MODULE SHALL BE GROUNDED PER MANUFACTURER INSTRUCTIONS AND APPROVED METHODS
- PV INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL OR BUILDING ROOF VENTS
- CONNECTORS THAT ARE NOT READILY ACCESSIBLE AND THAT ARE USED IN THE CIRCUITS OPERATING AT OR OVER 30V AC OR DC SHALL REQUIRE A TOOL FOR OPERATING AND ARE REQUIRED TO BE MARKED "DO NOT DISCONNECT UNDER LOAD" OR "NOT FOR CURRENT INTERRUPTING"
- THIS SYSTEM IS IN FULL COMPLIANCE WITH 2014 NATIONAL ELECTRIC CODE AND STATE OF VIRGINIA AMENDMENTS FOR PHOTOVOLTAIC INSTALLATION, AND ARTICLE 690 OF THE NATIONAL ELECTRIC CODE (NEC NFPA 70)
- BUILDING CONSTRUCTION TYPE: TYPE V
- BUILDING OCCUPANCY TYPE: R3

ION

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 8 MODULES

DATE: 8/29/2019

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ADDITIONAL NOTES:

SHEET:
 LOCATION NOTES
 PV 4.0

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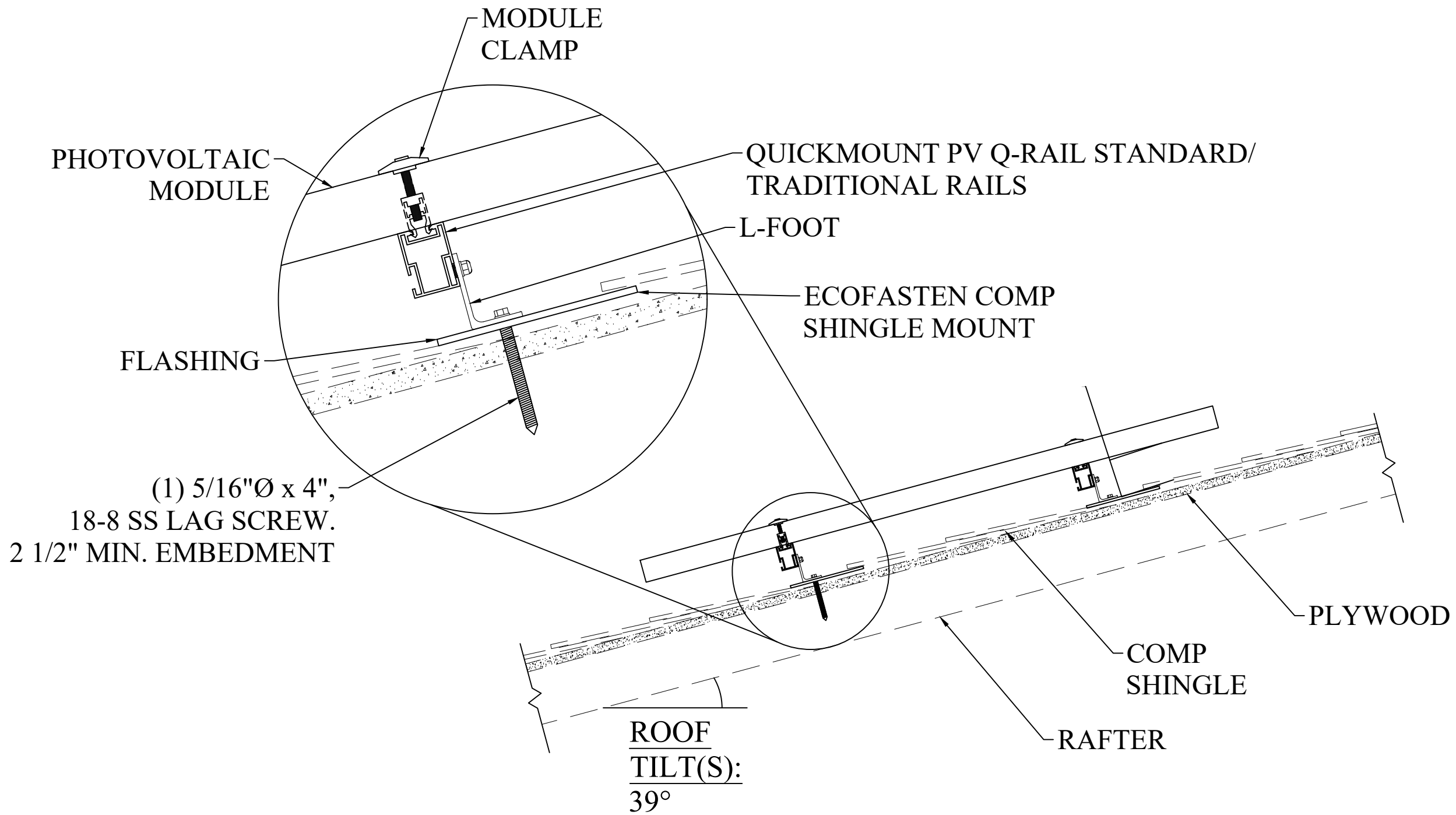
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ADDITIONAL NOTES:

5/16" X 4" LAG BOLTS,
MIN. EMBEDMENT 2 1/2"

SHEET:
**MOUNTING
PV 5.0**



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THIS PV SYSTEM WILL HAVE THE FOLLOWING MARKINGS:

- 1 -- MATERIALS USED FOR MARKINGS WILL BE WEATHER RESISTANT. THE UNDERWRITERS LABORATORIES MARKING AND LABELING SYSTEM 969 (UL969) WILL BE USED AS STANDARD TO DETERMINE WEATHER RATING.
- 2 -- MARKING STATING "CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED" WILL BE PLACED AT THE MAIN SERVICE DISCONNECT.
- 3 -- MARKING STATING "WARNING: PHOTOVOLTAIC POWER SOURCE" WILL BE PLACED ALONG DIRECT CURRENT CONDUIT, RACEWAYS, ENCLOSURES, CABLE ASSEMBLIES, AND JUNCTION BOXES.
- 4 -- THE MARKING WILL BE MADE TO THE FOLLOWING SPECIFICATIONS:
 - RED BACKGROUND
 - WHITE LETTERING
 - MINIMUM 3/8" LETTER HEIGHT
 - ALL CAPITAL LETTERS
 - ARIAL OR SIMILAR FONT, NON-BOLD
 - REFLECTIVE, WEATHER RESISTANT MATERIAL SUITABLE FOR THE ENVIRONMENT (DURABLE ADHESIVE MATERIALS MAY MEET THIS REQUIREMENT)
- 5 -- MARKING WILL BE PLACED ON ALL INTERIOR AND EXTERIOR CONDUIT, RACEWAYS, ENCLOSURES, CABLE ASSEMBLIES, AND JUNCTION BOXES TO ALERT THE FIRE SERVICE TO AVOID CUTTING THEM. MARKINGS WILL BE PLACED ON ALL EXTERIOR DC CONDUIT, RACEWAYS, ENCLOSURES, AND CABLE ASSEMBLIES EVERY 10 FEET, AT TURNS AND ABOVE AND/OR BELOW PENETRATIONS AND ALL DC COMBINER AND JUNCTION BOXES.

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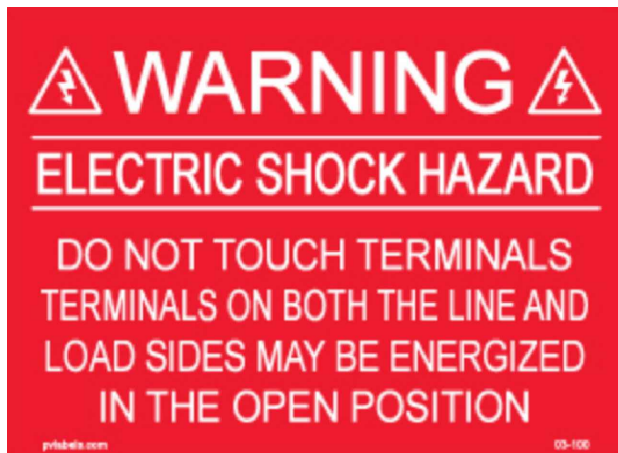
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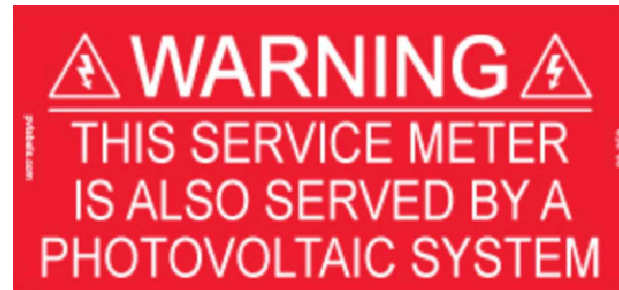
SHEET:
SYSTEM MARKINGS
PV 6.0



NEXT TO ALL SOLAR BREAKERS
(DIFFERENT STYLES TO MEET LOCAL CODES)



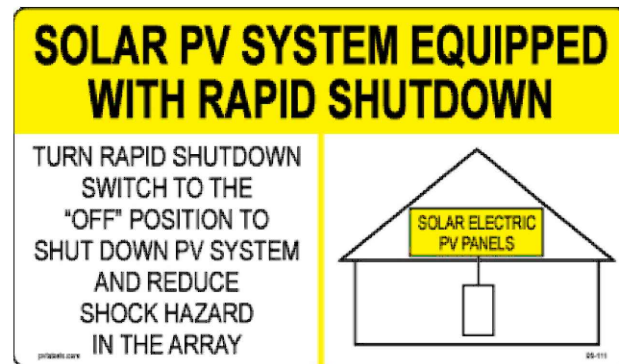
NEC 690.17 (4)
SERVICE PANEL - AC DISCONNECT - SUB PANEL



LOCAL CODES
MAIN SERVICE PANEL AND METER



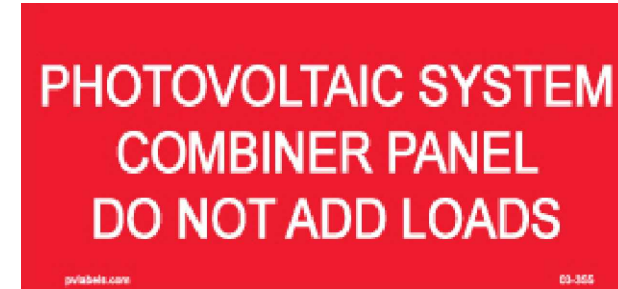
PANEL WITH SOLAR BACKFED BREAKER



NEC 690.56(C)(1)(A)

LABEL PLACED FOR PV SYSTEMS THAT SHUT DOWN THE ARRAY AND CONDUCTORS LEAVING THE ARRAY LEVEL (AFTER THE MICRO-INVERTER OUTPUT TERMINALS)

LOCATED NO MORE THAN 3 FT. AWAY FROM THE SERVICE DISCONNECTING MEANS TO WHICH THE PV SYSTEMS ARE CONNECTED AND AT ALL IDENTIFIED RAPID SHUTDOWN SWITCHES IF NOT IN THE SAME LOCATION



COMBINER PANEL OR SOLAR LOAD CENTER



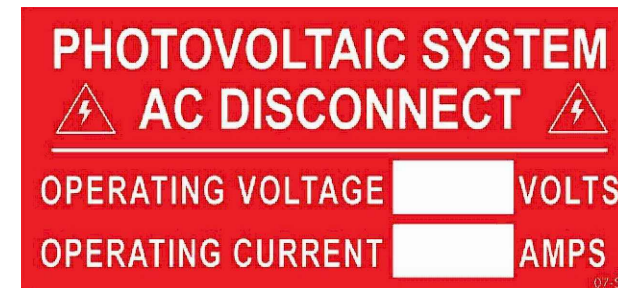
AC DISCONNECT



SOLAR REC METER



NEC 690.64 & NEC 705.12 (D)(4)
SERVICE PANEL

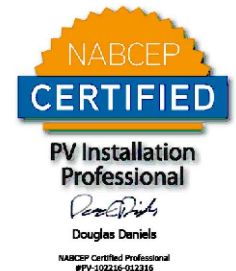


NEC 690.54
AC DISCONNECT

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1.92 kW AC
8 MODULES

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ADDITIONAL NOTES:

SHEET:
LABELS & SIGNAGE
PV 7.0

PV MODULE SPECIFICATIONS		
MODULE MAKE AND MODEL	SILFAB SLA 320M	
MAXIMUM POWER (DC)	320	WATTS
MAX POWER-POINT VOLTAGE (VMPP)	33.7	VOLTS
MAX POWER-POINT CURRENT (IMPP)	9.50	AMPS
OPEN CIRCUIT VOLTAGE (VOC)	40.45	VOLTS
SHORT CIRCUIT CURRENT (ISC)	9.96	AMPS
TEMPERATURE COEFFICIENT VOC	-0.3	%/°C
MAXIMUM SYSTEM VOLTAGE	1000V DC (UL)	

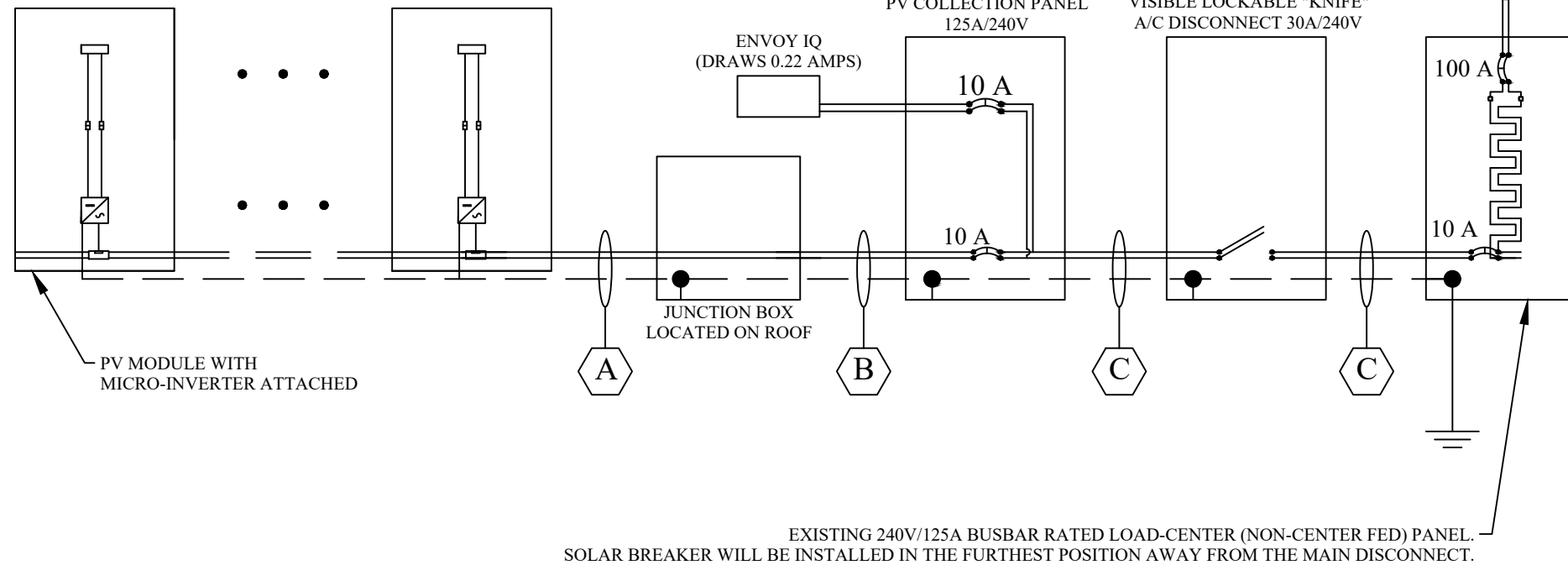
MICRO-INVERTER SPECIFICATIONS		
INVERTER MAKE AND MODEL	ENPHASE IQ7-60-2-US	
RATED OUTPUT POWER (AC)	240	WATTS
NOMINAL OUTPUT VOLTAGE (AC)	240	VOLTS
MAX OUTPUT CURRENT (AC)	1	AMPS
MAX INPUT VOLTAGE (DC)	48	VOLTS
MAX INPUT CURRENT (DC)	15	AMPS
MAX OCPD RATING (AC)	20	AMPS
MAX NUMBER OF PANELS PER CIRCUIT	16	

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PV CIRCUIT 1: 8 MODULES/PARALLEL

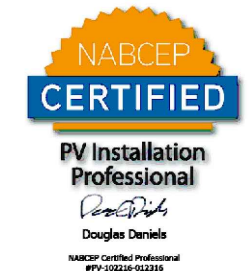


AC PHOTOVOLTAIC SYSTEM RATINGS

MAX AC OPERATING CURRENT	8	AMPS
MAX AC OPERATING VOLTAGE	240	VOLTS

*ROMEX/MC CABLE WILL BE RAN THROUGH THE ATTIC WHERE POSSIBLE

RACEWAY AND CONDUCTOR SCHEDULE					
TAG	CONDUCTOR TYPE	MINIMUM WIRE SIZE	# OF CONDUCTORS	RACEWAY / CABLE TYPE	MINIMUM CONDUIT SIZE
A	ENPHASE Q-CABLE (USE-2)	12	2	USE-2 / FREE AIR	FREE AIR
	BARE COPPER (EGC)	6	1	BARE / FREE AIR	
B	THWN-2 OR NM (ROMEX/MC) *	10	2	EMT OR ROMEX/MC CABLE	3/4"
	THWN-2 OR NM (ROMEX/MC) (EGC)	10	1		
C	THWN-2	10	3	EMT	3/4"
	THWN-2 (EGC)	10	1		



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ADDITIONAL NOTES:

SHEET:

1-LINE
EL 1.0

1. THE ENPHASE IQ6, IQ7, M250, M215 (M215-60-2LL-SXX-IG), AND C250 FOURTH GENERATION MICROINVERTERS MEET THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE ARTICLE 690.35 FOR UNGROUNDED PHOTOVOLTAIC POWER SYSTEMS. NEC 690.35 ALLOWS FOR PHOTOVOLTAIC POWER SYSTEMS TO BE INSTALLED WITH UNGROUNDED PHOTOVOLTAIC SOURCE AND OUTPUT CIRCUITS. SYSTEMS THAT MEET THE REQUIREMENTS OF NEC 690.35 ARE EXEMPT FROM THE SYSTEM GROUNDING REQUIREMENTS OF NEC 690.41 SYSTEM GROUNDING.

2. NEC ARTICLE 690.43 EQUIPMENT GROUNDING SPECIFIES THAT ALL EXPOSED NON-CURRENT-CARRYING

METAL PARTS OF PV MODULE FRAMES, ELECTRICAL EQUIPMENT, AND CONDUCTOR ENCLOSURES SHALL BE PROVIDED WITH EQUIPMENT GROUNDING. 690.43(C) STRUCTURE AS EQUIPMENT GROUNDING CONDUCTOR ALLOWS FOR EQUIPMENT TO BE USED AS THE EQUIPMENT GROUNDING CONDUCTOR IN A PHOTOVOLTAIC SYSTEM. SPECIFICALLY, “DEVICES LISTED AND IDENTIFIED FOR GROUNDING THE METALLIC FRAMES OF PV MODULES OR OTHER EQUIPMENT SHALL BE PERMITTED TO BOND THE EXPOSED METAL SURFACES OR OTHER EQUIPMENT TO MOUNTING SURFACES.”

THE DEVICES LISTED AND IDENTIFIED FOR GROUNDING THE EQUIPMENT MAY BE STAND-ALONE GROUNDING COMPONENTS

OR UL-2703 LISTED MOUNTING HARDWARE. IN AN ENPHASE MICROINVERTER SYSTEM, IF THE MICROINVERTERS AND MODULES ARE BONDED TO THE RACKING ASSEMBLIES WITH THE USE OF LISTED AND APPROVED GROUNDING CLIPS OR GROUNDING COMPONENTS, THE EQUIPMENT GROUNDING CONDUCTOR PROVIDED TO THE MICROINVERTERS THROUGH THE ENPHASE ENGAGE CABLE MAY ALSO BE USED TO GROUND THE OTHER PHOTOVOLTAIC SYSTEM COMPONENTS.

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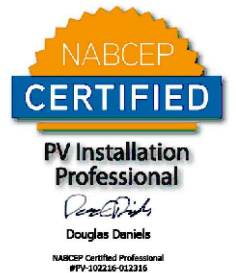
SHEET:
ELECTRICAL NOTES
EL 2.0

ELECTRICAL PHOTOS

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RICHMOND, VA 23225



LICENSED ELECTRICAL CONTRACTOR COMPANY:
ION DEVELOPER LLC,
DAVID CONRAD
CLASSIFICATION:
ELECTRICAL CONTRACTOR,
CLASS B & AES | TRADESMAN MELE
LICENSE NUMBER:
2705169798 | 2710069944
EXPIRATION:
11/30/2020 | 9/30/2020 AUTHORIZED CONTRACTOR:
David S. Conrad

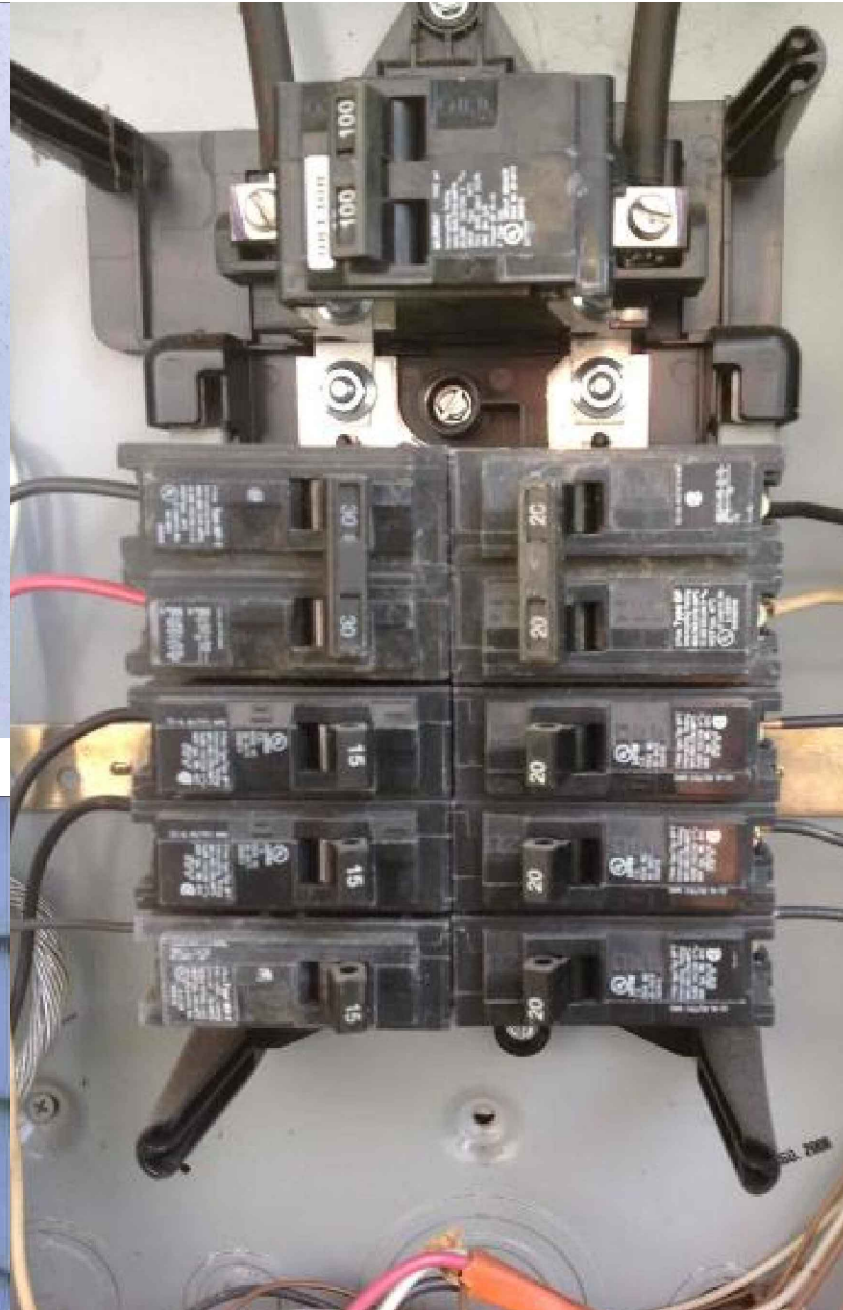
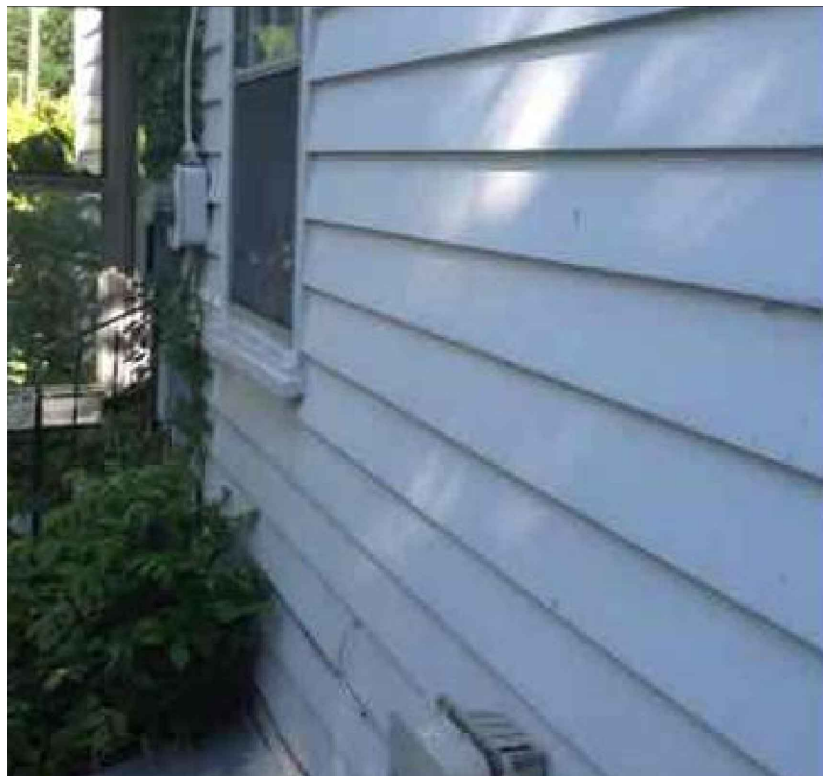
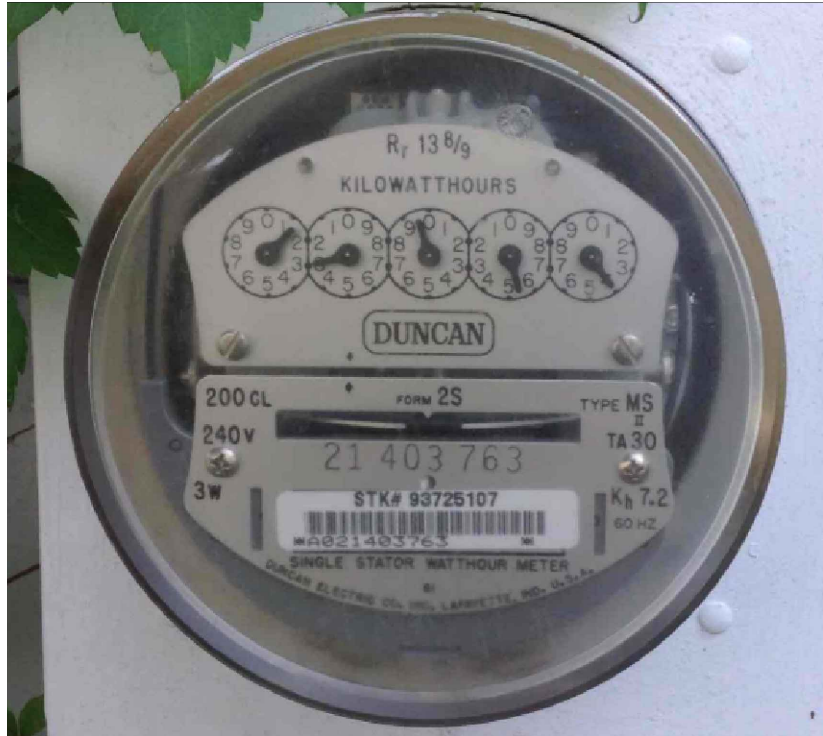
SYSTEM SIZE: 2.56 kW DC
1.92 kW AC
8 MODULES

DATE: 8/29/2019

DRAWN BY: JCC

ADDITIONAL NOTES:

SHEET:
ELECTRICAL PHOTOS
PV 8.0



Outdoor Load Center

Model: 2 Type 3R

CONDUIT HUBS	TRADE SIZE	CAT. NO.
1 INCH	ECH-15100	
1-1/4 INCH	ECH-15125	
1-1/2 INCH	ECH-15150	
2 INCH	ECH-15200	
2-1/2 INCH	ECH-15250	

RATINGS:
125A MAXIMUM - SEE MAIN BREAKER RATING IF USED.
BACKLASH BREAKER REQUIRES HOLD-DOWN KIT ECHMBRZ.
208Y/120 V~, 60 HZ, 10-3W
208Y/120 V~, 60 HZ, 10-3W

FOR INSTALLATION BY A QUALIFIED PERSON IN ACCORDANCE WITH ALL LOCAL ELECTRICAL CODES AND/OR THE NATIONAL ELECTRICAL CODE®.

SUITABLE FOR USE AS SERVICE EQUIPMENT WHEN MAIN BREAKER IS INSTALLED OR WHEN NOT MORE THAN SIX MAIN DISCONNECTING MEANS ARE PROVIDED AND WHEN NOT USED AS A LIGHTING AND APPLIANCE BRANCH CIRCUIT PANELBOARD (SEE ARTICLE 384-14 OR 408.14-2005 OF THE NATIONAL ELECTRICAL CODE®). WHEN USED AS SERVICE EQUIPMENT, APPLY "SERVICE DISCONNECT LABEL(S)" TO FRONT NEXT TO APPROPRIATE BREAKER HANDLE(S).

WHEN USED AS SERVICE EQUIPMENT, UNUSED NEUTRAL BAR TERMINALS MAY BE USED TO TERMINATE EQUIPMENT GROUNDING WIRES IN THE COMBINATIONS INDICATED FOR EQUIPMENT GROUND BAR TERMINALS.

TO BOND NEUTRAL TO ENCLOSURE, BOND STRAP PROVIDED TO POSITION FREE END INTO ANY NEUTRAL TAP HOLE. TIGHTEN CONNECTOR SET SCREW ON BOND STRAP TO 35 LB-IN. WHEN NEUTRAL IS BONDED, LEFT BAR BECOMES SPLIT NEUTRAL.

SUM OF MH-T BREAKER RATING IS NOT TO EXCEED 110 AMPS PER BRANCH CIRCUIT BUS STAB.

TO RESET BREAKERS WITH TRIPPED HANDLE POSITION BETWEEN "ON" AND "OFF", MOVE HANDLE TO "OFF" THEN TO "ON".

REMOVE TWISTOUTS FROM TRIM ONLY WHERE BREAKERS WILL BE INSTALLED. ALL OPENINGS MUST BE FILLED WITH BREAKERS OR FILLER PLATES. USE ONE ECHMBF125 FILLER PLATE TO FILL 100-125A MAIN BREAKER OPENING.

Murray Electrical Products
Suzanne Energy & Automation, Inc.
Alpharetta, Georgia U.S.A.

J2

MURRAY
40945866 Rev.A

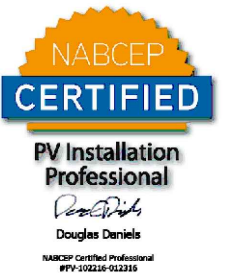
IMPORTANT: DO NOT ALLOW PETROLEUM BASED (HYDROCARBON) SPRAYS, CHEMICALS, SOLVENTS OR ANY PAINT TO CONTACT INTERIOR COMPONENTS. PETROLEUM BASED CHEMICALS CAN CAUSE DEGRADATION OF ELECTRICAL INSULATING MATERIALS.

⚠ DANGER ⚠

ION

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PROVO, UT 84604
(888) 781-7074

DANIEL KRAFT
509 W 22ND STREET
RICHMOND, VA 23225



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SHEET:
ELEVATION VIEW
PV 9.0

