INSTALLATION OF NEW **ROOF MOUNTED PV SOLAR SYSTEM 3 EDELWEISS LANE** VOORHEES, NJ 08043

EDELWEISS LANE





SITE

GENERAL NOTES

- 1. THE INSTALLATION CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL EQUIPMENT AND FOLLOWING ALL DIRECTIONS AND INSTRUCTIONS CONTAINED IN THE DRAWING PACKAGE AND INFORMATION RECEIVED FROM TRINITY.
- 2. THE INSTALLATION CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL EQUIPMENT AND FOLLOWING ALL DIRECTIONS AND INSTRUCTION CONTAINED IN THE COMPLETE MANUAL
- 3. THE INSTALLATION CONTRACTOR IS RESPONSIBLE FOR READING AND LINDERSTANDING ALL DRAWINGS COMPONENT AND INVERTER MANUALS PRIOR TO INSTALLATION. THE INSTALLATION CONTRACTOR IS ALSO REQUIRED TO HAVE ALL COMPONENT SWITCHES IN THE OFF POSITION AND FUSES REMOVED PRIOR TO THE INSTALLATION OF ALL FUSE BEARING SYSTEM COMPONENTS.
- ONCE THE PHOTOVOLTAIC MODULES ARE MOUNTED, THE INSTALLATION CONTRACTOR SHOULD HAVE A MINIMUM OF ONE ELECTRICIAN WHO HAS ATTENDED A SOLAR PHOTOVOLTAIC INSTALLATION COURSE ON SITE
- 5. FOR SAFETY, IT IS RECOMMENDED THAT THE INSTALLATION CREW ALWAYS HAVE A MINIMUM OF TWO PERSONS WORKING TOGETHER AND THAT EACH OF THE INSTALLATION CREW MEMBERS BE TRAINED IN FIRST AID AND CPR.
- . THIS SOLAR PHOTOVOLTAIC SYSTEM IS TO BE INSTALLED FOLLOWING THE CONVENTIONS OF THE NATIONAL ELECTRICAL CODE. ANY LOCAL CODE WHICH MAY SUPERSEDE THE NEC SHALL GOVERN.
- 7. ALL SYSTEM COMPONENTS TO BE INSTALLED WITH THIS SYSTEM ARE TO BE
 "UL" LISTED. ALL EQUIPMENT WILL BE NEMA 3R OUTDOOR RATED UNLESS INDOORS.

GENERAL NOTES CONTINUED

- THE DC VOLTAGE FROM THE PANELS IS ALWAYS PRESENT AT THE DC DISCONNECT ENCLOSURE AND THE DC TERMINALS OF THE INVERTER DURING DAYLIGHT HOURS ALL PERSONS WORKING ON OR INVOLVED WITH THE PHOTOVOLTAIC SYSTEM ARE WARNED THAT THE SOLAR MODULES ARE ENERGIZED WHENEVER THEY ARE EXPOSED TO LIGHT.
- ALL PORTIONS OF THIS SOLAR PHOTOVOLTAIC SYSTEM SHALL BE MARKED CLEARLY IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE ARTICLE 690 & 705.
- PRIOR TO THE INSTALLATION OF THIS PHOTOVOLTAIC SYSTEM THE INSTALLATION CONTRACTOR SHALL ATTEND A PRE-INSTALLTION MEETING FOR THE REVIEW OF THE INSTALLATION PROCEDURES, SCHEDULES, SAFETY AND COORDINATION.
- PRIOR TO THE SYSTEM START UP THE INSTALLATION CONTRACTOR SHALL ASSIST IN PERFORMING ALL INITIAL HARDWARE CHECKS AND DC WIRING CONDUCTIVITY CHECKS.
- FOR THE PROPER MAINTENANCE AND ISOLATION OF THE INVERTERS REFER TO THE ISOLATION PROCEDURES IN THE
- THE LOCATION OF PROPOSED ELECTRIC AND TELEPHONE UTILITIES ARE SUBJECT APPROPRIATE UTILITY COMPANIES AND OWNERS.
- ALL MATERIALS, WORKMANSHIP AND CONSTRUCTION FOR THE SITE IMPROVEMENTS SHOWN HEREIN SHALL BE IN ACCORDANCE WITH:
 - A) CURRENT PREVAILING MUNICIPAL AND/OR COUNTY SPECIFICATIONS STANDARDS AND REQUIREMENTS

GENERAL NOTES CONTINUED

- B) CURRENT PREVAILING UTILITY COMPANY SPECIFICATIONS. STANDARDS, AND REQUIREMENTS
- THIS SET OF PLANS HAVE BEEN PREPARED FOR THE PURPOSE OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL, THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DRAWINGS UNTIL REVISED TO INDICATE "ISSUED FOR CONSTRUCTION".
- ALL INFORMATION SHOWN MUST BE CERTIFIED PRIOR TO USE FOR CONSTRUCTION ACTIVITIES

ABBREVIATIONS

AMPERE

AC ALTERNATING CURRENT AMP FRAME ABOVE FINISHED FLOOR AWG

AMP

ABOVE FINISHED GRADE AMERICAN WIRE GAUGE CONDUIT (GENERIC TERM OF RACEWAY, PROVIDE AS SPECIFIED)

COMBINER BOX CKT CT CIRCUIT **CURRENT TRANSFORMER** CU

COPPER DIRECT CURRENT DISCONNECT SWITCH DWG DRAWING ELECTRICAL SYSTEM INSTALLER

FMT ELECTRICAL METALLIC TUBING FS FUSIBLE SWITCH FUSE GND GROUND

GFI GROUND FAULT INTERRUPTER FREQUENCY (CYCLES PER

ABBREVIATIONS CONTINUED

JUNCTION BOX THOUSAND CIRCULAR MILS KILO-VOLT AMPERE kCMIL kVA KILO-WATT kWH KILO-WATT HOUR MCB MAIN CIRCUIT BREAKER

MDP MAIN DISTRIBUTION PANEL MLO MAIN LUG ONLY MOUNTED MTG MOUNTING

NEUTRAL NATIONAL ELECTRICAL CODE NIC NO# NOT IN CONTRACT NUMBER

NTS OCP P PB OVER CURRENT PROTECTION POLF. **PULL BOX**

PHASE
POLY-VINYL CHLORIDE CONDUIT PVC

QTY QUANTITY RIGID GALVANIZED STEEL RGS

SOLID NEUTRAL JSWBD SWITCHBOARD TYPICAL

U.O.I. UNLESS OTHERWISE INDICATED WEATHERPROOF TRANSFORMER

> MOUNT 72 INCHES TO BOTTOM OF ABOVE FINISHED FLOOR OR

SHEET INDEX

COVER SHEET W/ SITE INFO & NOTES

ROOF PLAN W/ MODULE LOCATIONS

PV-3 ELECTRICAL 3 LINE DIAGRAM

EXISTING ELECTRICAL DIAGRAMS

LAYOUT REVISION ISSUED TO TOWNSHIP FOR PERMIT

NO.

Project Title: JESSE, ARNSTEIN

TRINITY ACCT #- 2018-01-223281

DESCRIPTION

Issued / Revisions

DATE

Project Address:

3 EDELWEISS LANE VOORHEES, NJ 08043 39.833052,-74.932477

Drawing Title:

AS BUILT PV SOLAR SYSTEM

Drawing Information DRAWING DATE 2/14/2018 DRAWN BY: REVISED BY: JMS

System Information: DC SYSTEM SIZE: 2.36kW AC SYSTEM SIZE: 1.84kW TOTAL MODULE COUNT MODULES USED: HANWHA 295 MODULE SPEC #: Q.PEAK-BLK G4.1 295 UTILITY COMPANY: ACE UTILITY ACCT #: 5500-9828-843 UTILITY METER # NXA119926601 DEAL TYPE: CASH CONTRACT

Rev. No.

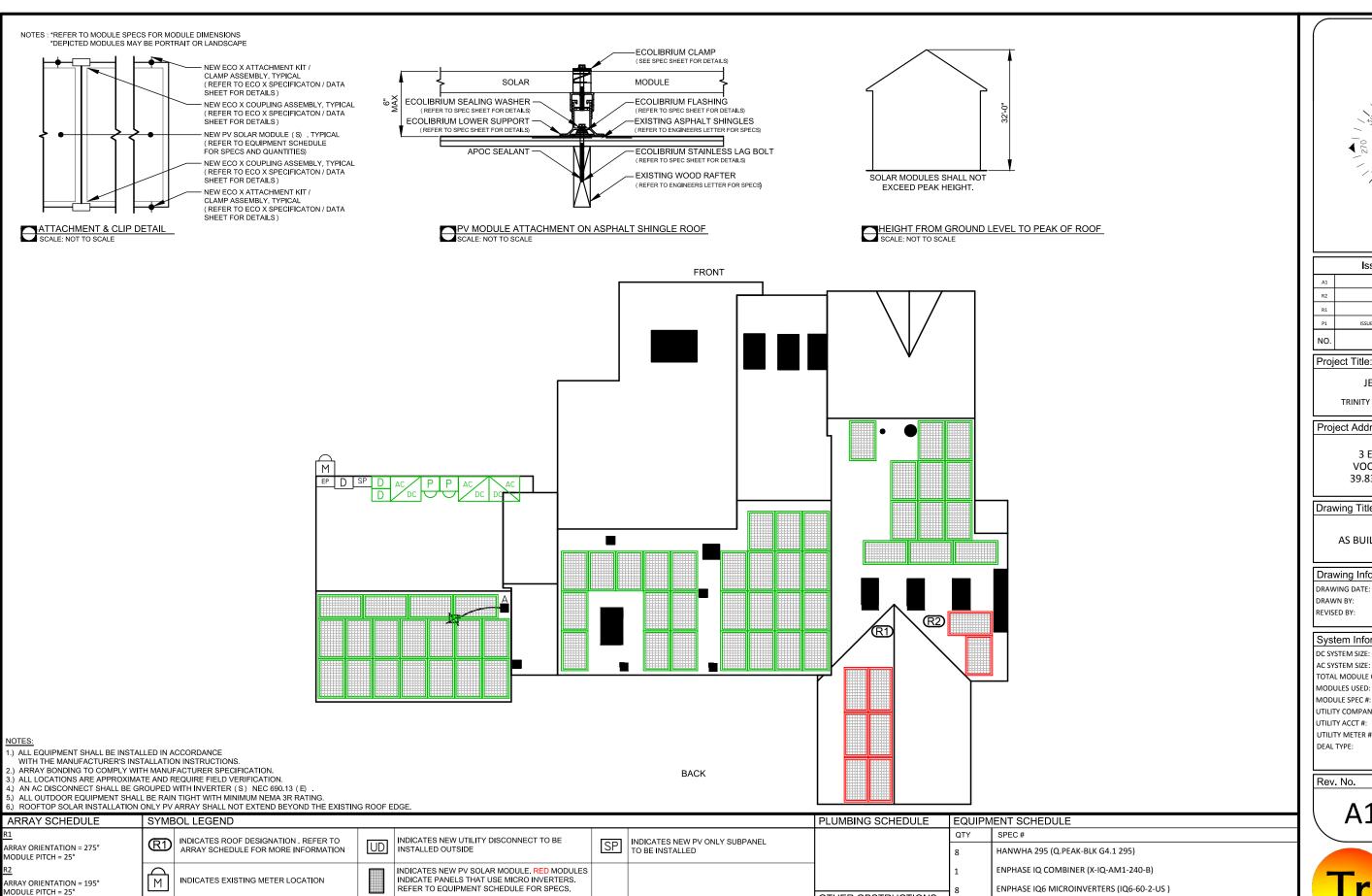
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APPENDIX

GENERAL NOTES



REFER TO EQUIPMENT SCHEDULE FOR SPECS.

INDICATES NEW PRODUCTION METER TO BE

REFER TO EQUIPMENT SCHEDULE FOR SPECS.

INSTALLED IN GARAGE .

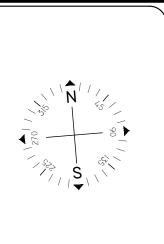
INSTALLED IN GARAGE

INDICATES NEW INVERTER TO BE

INDICATES EXISTING ELECTRICAL PANEL

INDICATES NEW MAIN DISCONNECT

LOCATION: IN GARAGE



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A1	AS BUILT	4/5/2018
R2	LAYOUT REVISION	2/20/2018
R1	LAYOUT REVISION	2/15/2018
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ENPHASE IQ6 MICROINVERTERS (IQ6-60-2-US)

OTHER OBSTRUCTIONS

A - RELOCATED 2" PVC VENT

Sheet



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ARRAY CIRCUIT WIRING NOTES

1.) LICENSED ELECTRICIAN ASSUMES ALL RESPONSIBILITY
FOR DETERMINING ONSITE CONDITIONS AND
EXECUTING INSTALLATION IN ACCORDANCE WITH NEC
2014

2.) LOWEST EXPECTED AMBIENT TEMPERATURE BASED ON ASHRAE MINIMUM MEAN EXTREME DRY BULB TEMPERATURE FOR ASHRAE LOCATION MOST SIMILAR TO INSTALLATION LOCATION. LOWEST EXPECTED AMBIENT TEMP = -16°C

3.) HIGHEST CONTINUOUS AMBIENT TEMPERATURE BASED ON ASHRAE HIGHEST MONTH 2% DRY BULB TEMPERATURE FOR ASHRAE LOCATION MOST SIMILAR TO INSTALLATION LOCATION. HIGHEST CONTINUOUS TEMP = 33°C

4.) 2005 ASHRAE FUNDAMENTALS 2% DESIGN TEMPERATURES DO NOT EXCEED 47°C IN THE UNITED STATES (PALM SPRINGS, CA IS 44.1°C). FOR LESS THAN 9 CURRENT-CARRYING CONDUCTORS IN A ROOF-MOUNTED SUNLIT CONDUIT AT LEAST 0.5" ABOVE ROOF AND USING THE OUTDOOR DESIGN TEMPERATURE OF 47°C OR LESS (ALL OF UNITED STATES)

5.) PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION THAT CONTROLS SPECIFIC CONDUCTORS IN ACCORDANCE WITH NEC 690.12(1) THROUGH (5)

6.) PHOTOVOLTAIC POWER SYSTEMS SHALL BE PERMITTED TO OPERATE WITH UNGROUNDED PHOTOVOLTAIC SOURCE AND OUTPUT CIRCUIT AS PER NEC 690.35

7.) UNGROUNDED DC CIRCUIT CONDUCTORS SHALL BE IDENTIFIED WITH THE FOLLOWING OUTER FINISH: POSITIVE CONDUCTORS = RED NEGATIVE CONDUCTORS = BLACK NEC 210.5(C)(2)

8.) ARRAY AND SUB ARRAY CONDUCTORS SHALL BE #10 PV WIRE TYPE RHW-2 OR EQUIVELANT AND SHALL BE PROTECTED BY CONDUIT WHERE EXPOSED TO DIRECT SUNLIGHT. SUB ARRAY CONDUIT LONGER THAN 24" SHALL CONTAIN \leq 20 CURRENT CARYING CONDUCTORS AND WHERE EXPOSED TO DIRECT SUNLIGHT SHALL CONTAIN \leq 9 CURRENT CARRYING CONDUCTORS.

9.) ALL WIRE LENGTHS SHALL BE LESS THAN 100' UNLESS OTHERWISE NOTED

10.) FLEXIBLE CONDUIT SHALL NOT BE INSTALLED ON ROOFTOP AND SHALL BE LIMITED TO 12" IF USED OUTDOORS

11.)OVERCURRENT PROTECTION FOR CONDUCTORS CONNECTED TO THE SUPPLY SIDE OF A SERVICE SHALL BE LOCATED WITHIN 10' OF THE POINT OF CONNECTION NEC 705 31

12.) WHERE TWO SOURCES FEED A BUSSBAR, ONE A UTILITY AND THE OTHER AN INVERTER, PV BACKFEED BREAKER(S) SHALL BE LOCATED OPPOSITE FROM UTILITY NEC 705.12(D)(2)(3)(b)

13.) ALL SOLAR SYSTEM LOAD CENTERS TO CONTAIN ONLY GENERATION CIRCUITS AND NO UNUSED POSITIONS OR LOADS

14.) ALL EQUIPMENT INSTALLED OUTDOORS SHALL HAVE A **NEMA 3R** RATING

CALCULATIONS FOR CURRENT CARRYING CONDUCTORS
REQUIRED CONDUCTOR AMPACITY PER STRING
[NEC 690.8(B)(1)]: (0.96*1.25)8 = 9.58A

AWG #10, DERATED AMPACITY
AMBIENT TEMP: 33°C, TEMP DERATING FACTOR: .96
RACEWAY DERATING = 1 CCC: 1.00
(40*.96)1.00 = 38.40A

38.40A - 9.58A, THEREFORE WIRE SIZE IS VALID

TOTAL AC REQUIRED CONDUCTOR AMPACITY 7.67A*1.25 = 9.58A

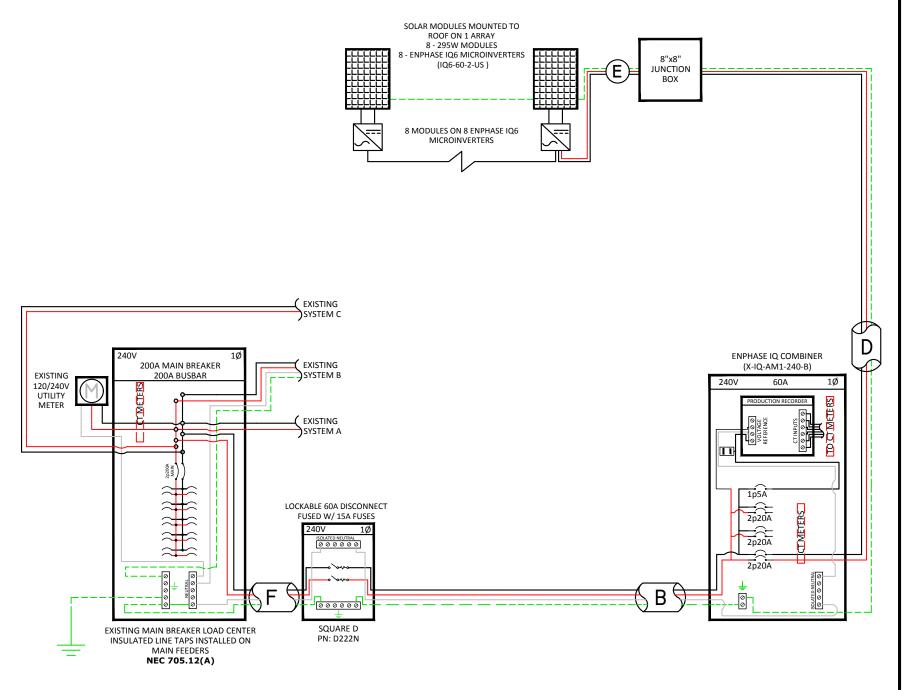
AWG #10, DERATED AMPACITY AMBIENT TEMP: 30°C, TEMP DERATING: 1.0 RACEWAY DERATING S CCC: N/A 40A*1.0 = 40A

40A [>] 9.58A, THEREFORE AC WIRE SIZE IS VALID

CALCULATION FOR PV OVERCURRENT PROTECTION
TOTAL INVERTER CURRENT: 7.67A

7 67A*1 25 = 9 58A

--> 15A OVERCURRENT PROTECTION IS VALID



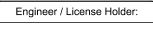
PV MODULE SPECIFICATIONS
HANWHA 295 (Q.PEAK-BLK G4.1 295)

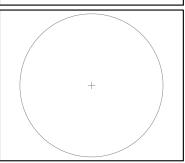
32.19

39.48

NOTE: CONDUIT TYPE SHALL BE CHOSEN BY THE INSTALLATION CONTRACTOR TO MEET OR EXCEED NEC AND LOCAL AHID REQUIREMENTS

	Α	#6 THWN-2 GEC TO EXISTING GROUND ROD
_	В	1" CONDUIT W/ 2-#6 THWN-2, 1-#10 THWN-2, 1-#10 THWN-2 GROUND
\dashv	С	3/4" CONDUIT W/ 2-#10 THWN-2, 1-#10 THWN-2 GROUND
	D	3/4" CONDUIT W/ 2-#10 THWN-2, 1-#10 THWN-2 GROUND
	Ε	#10 PV WIRE (FREE AIR) W/ #6 BARE COPPER BOND TO ARRAY
	F	1" CONDUIT W/ 2-#6 THWN-2, 1-#6 THWN-2, 1-#8 THWN-2 GROUND





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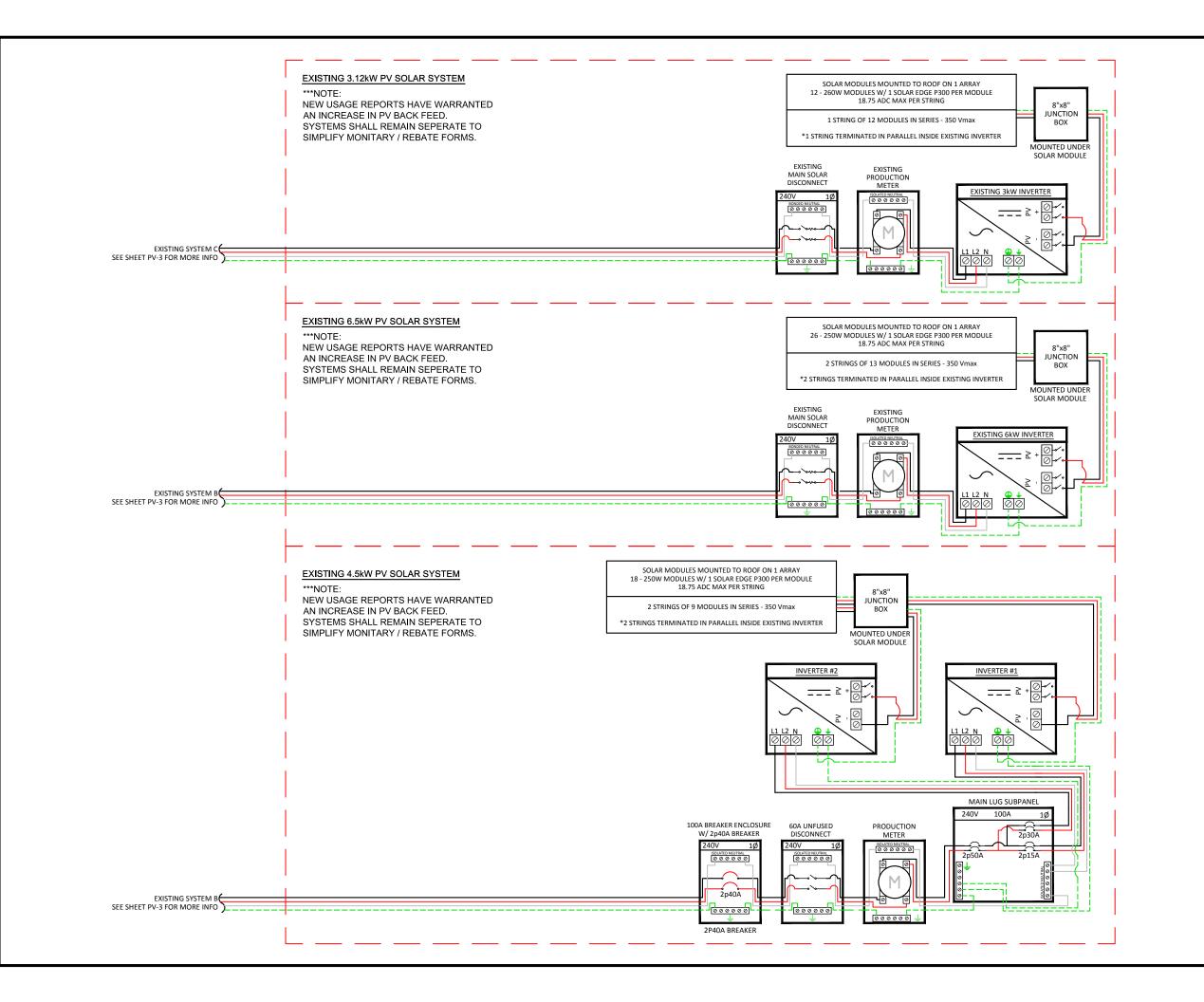
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UTILITY ACCT #:	5500-9828-843	
UTILITY METER #:	NXA119926601	
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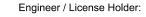


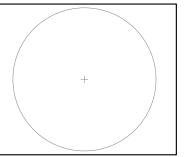




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PV - 4



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APPLICATIONS CHANGE (FOR INTERNAL USE ONLY)

UPDATE REVISION	ZONING REQUIF	RED?	UPDATE REVISION
BUILDING	YES I	NO	ELECTRICAL
REVISED LAYOUT	г	SYSTEM SIZE IN	CREASE
REVISED ENGINEER LETTER	F	SYSTEM SIZE DE	
ADD PANELS	=	ADD TAP BOX	\$100
REMOVE PANELS		ADD SUBPANEL	
RELOCATING PANELS	=	NEW METER PAI	
CHANGE RACKING	<u> </u>	NEW RISER	\$100
CHANGE NACKING		NEW MAIN PANE (includes meter pan a	EL \$800
		ADD INVERTER	
BUILDING NOTE: -2 PANELS MOVED TO NEW R2	Ē	ADD AMP FL	JSED DISCONNECT \$50
		ADD AMP BE	REAKER
		ADD BREAKER E	ENCLOSURE \$100
		ADD UNFUSED [DISCONNECT \$100
	×	REMOVE UNFUS	SED DISCONNECT
ELECTRICAL NOTE: -REMOVED UNFUSED DISCO		REMOVE FUSED	DISCONNECT
-KEIVIOVED UNFUSED DISCO		CHANGE POINT	OF INTERCONNECTION
		CHANGE METHO	DD OF INTERCONNECTION
		REMOVE PRODU	JCTION METER
		ADD PRODUCTION	ON METER
ZONING NOTE:		DECREASE FUSI	E SIZE
		INCREASE FUSE	SIZE
		INVERTER SIZE	DECREASE
	F	INVERTER SIZE	