INSTALLATION OF NEW **ROOF MOUNTED PV SOLAR SYSTEM** 12401DORSEY LANE UPPER MARLBORO, MD 20772



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 UNDERSTANDING 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

ALTERNATING CURRENT AMP FRAME ABOVE FINISHED FLOOR ABOVE FINISHED GRADE AWG AMERICAN WIRE GAUGE CONDUIT (GENERIC TERM OF RACEWAY, PROVIDE AS

AMP

SPECIFIED) COMBINER BOX CIRCUIT CURRENT TRANSFORMER COPPER

FUSE

DIRECT CURRENT DISCONNECT SWITCH DWG DRAWING ELECTRICAL SYSTEM INSTALLER ELECTRICAL METALLIC TUBING FUSIBLE SWITCH

> 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

MAIN DISTRIBUTION PANEL MAIN LUG ONLY MDP MLO 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 PWR QTY QUANTITY RIGID GALVANIZED STEEL

RGS SOLID NEUTRAL JSWBD SWITCHBOARD TYPICAL

UNLESS OTHERWISE INDICATED WEATHERPROOF TRANSFORMER

MOUNT 72 INCHES TO BOTTOM OF ABOVE FINISHED FLOOR OR

COVER SHEET W/ SITE INFO & GENERAL NOTES PLOT PLAN W/ DWELLING & EQUIPMENT / ELEVATION ROOF PLAN W/ MODULE LOCATIONS & DIMENSIONS ELECTRICAL 3 LINE DIAGRAM

PV SYSTEM SUMMARY

INTERCONNECTION

UTILITY COMPANY

SYSTEM SIZE : 3.54kW DC / 3kW AC HANWHA 295 (Q.PEAK-BLK G4.1 SOLAREDGE INVERTER TYPE # OF ARRAYS ATTACHMENT METHOD UNIRAC MOUNTING SYSTEM

LINE-SIDE TAP

LANE

Issued / Revisions			
P1	ISSUED TO TOWNSHIP FOR PERMIT	4/9/2018	
NO.	DESCRIPTION	DATE	

Project Title: HARRIS, RAYMOND

TRINITY ACCT #: 2018-02-232526

Project Address:

12401DORSEY LANE UPPER MARLBORO, MD 20772 38.763846,-76.790889

Drawing Title:

COVER SHEET

Drawing Information DRAWING DATE 4/9/2018 DRAWN BY: REVISED BY:

System Information: DC SYSTEM SIZE: 3.54kW AC SYSTEM SIZE: TOTAL MODULE COUNT MODULES USED: HANWHA 295 MODULE SPEC #: O.PEAK-BLK G4.1 295 UTILITY COMPANY: PEPCO UTILITY ACCT #: 55019904022 UTILITY METER # NYA111236438 DEAL TYPE: SUNNOVA

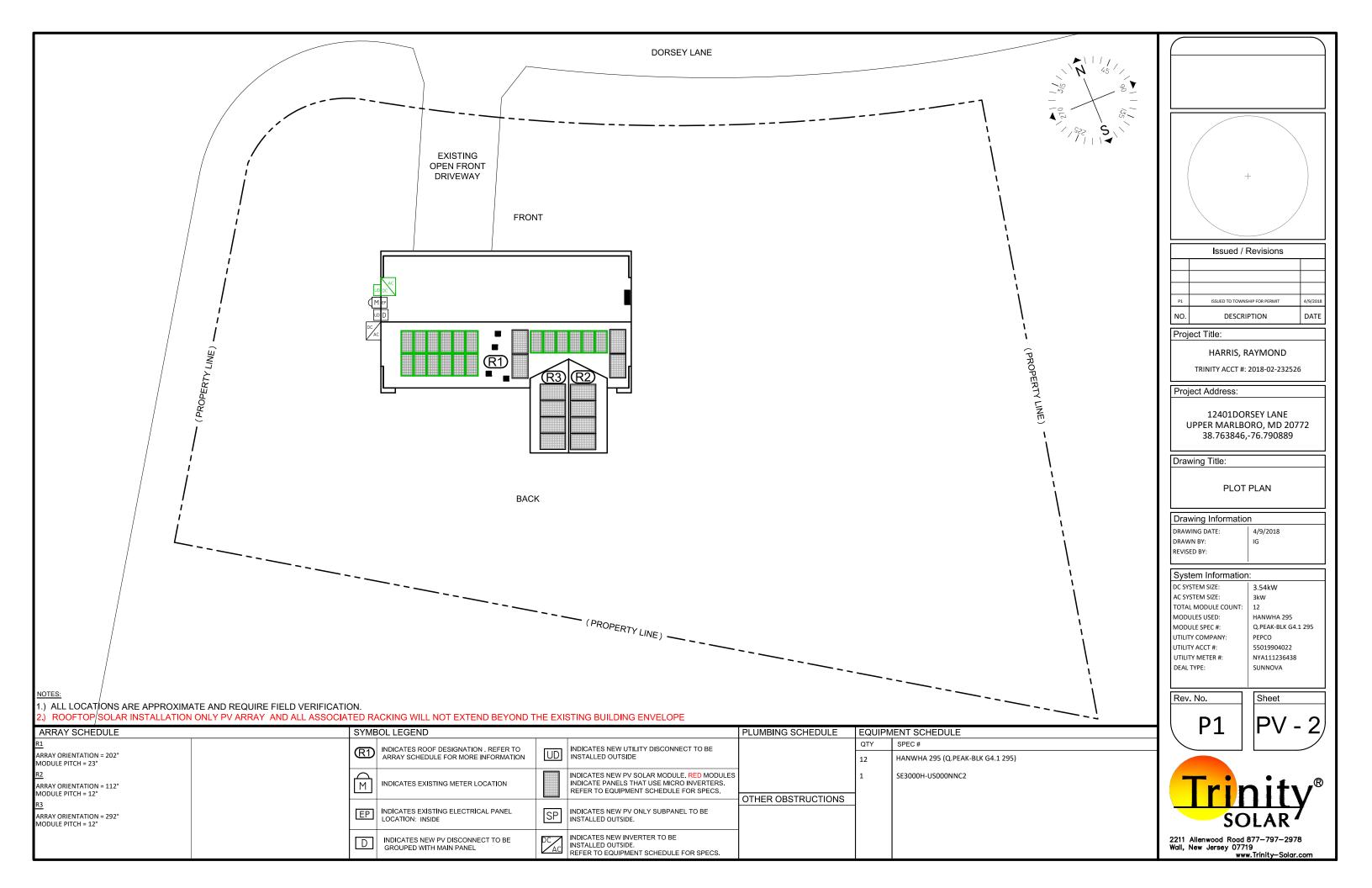
Rev. No.

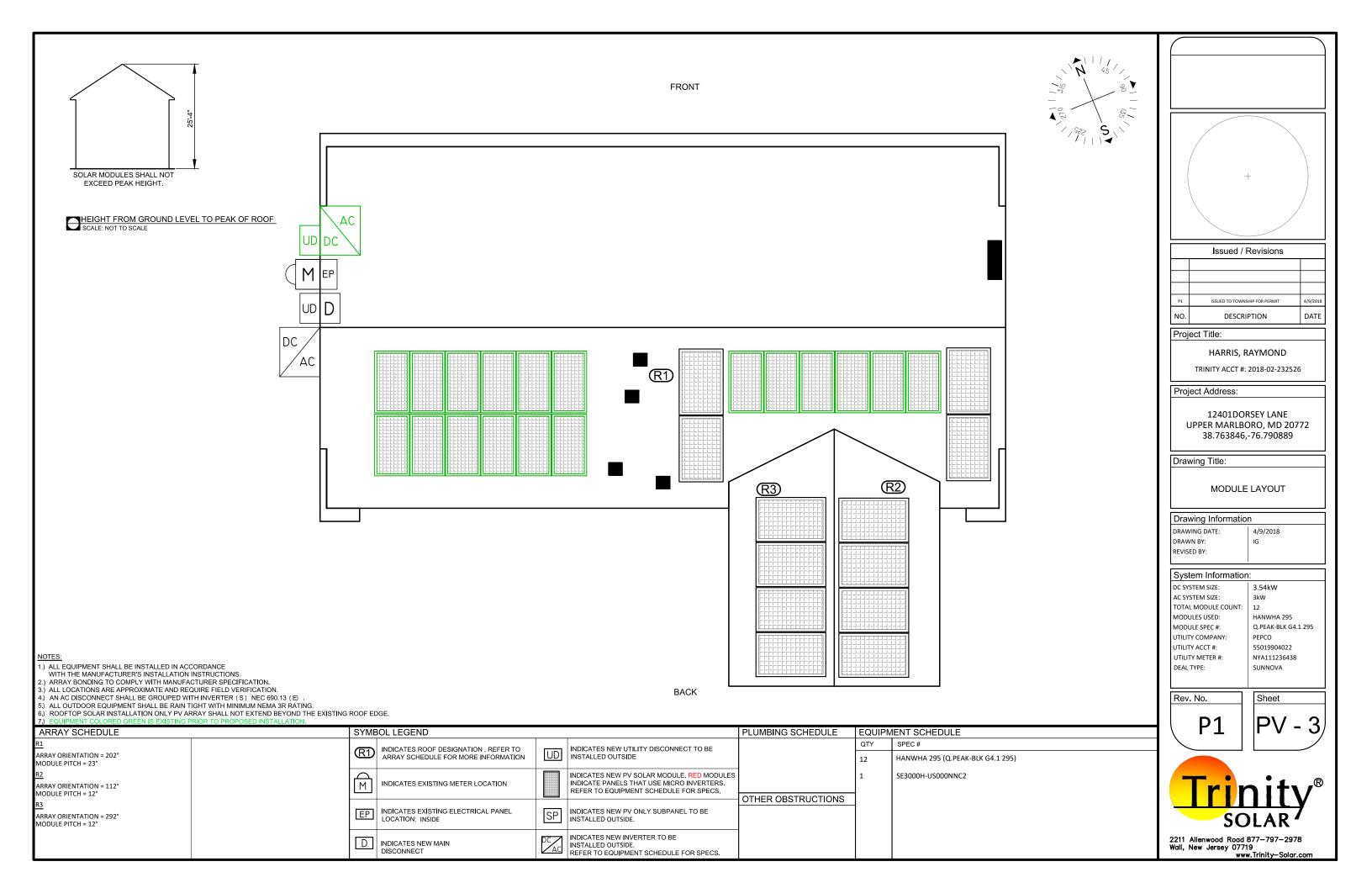
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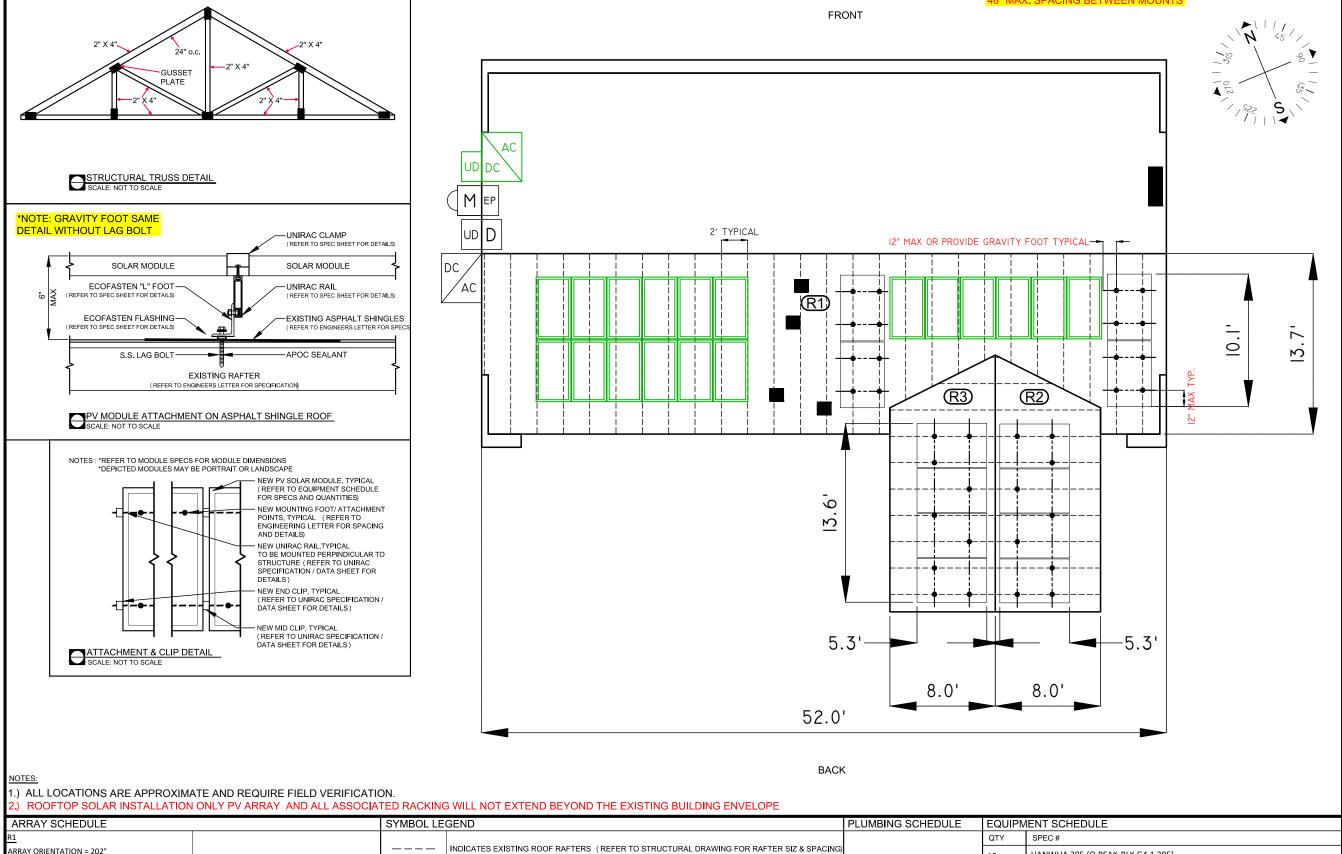


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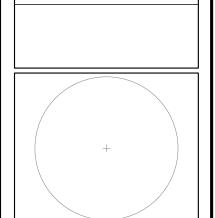
GENERAL NOTES







ARRAY SCHEDULE	SYMBOL LE	GEND	PLUMBING SCHEDULE	EQUI	PMENT SCHEDULE	7
<u>R1</u>				QTY	SPEC#	
ARRAY ORIENTATION = 202° MODULE PITCH = 23°		INDICATES EXISTING ROOF RAFTERS (REFER TO STRUCTURAL DRAWING FOR RAFTER SIZ & SPACING)		12	HANWHA 295 (Q.PEAK-BLK G4.1 295)	
R2 ARRAY ORIENTATION = 112° MODULE PITCH = 12°		INDICATES NEW RAIL, TYPICAL (REFER TO SPECIFICATION / DATA SHEET FOR DETAILS)	OTHER OPOTRUOTIONS	1	SE3000H-US000NNC2	
R3 ARRAY ORIENTATION = 292° MODULE PITCH = 12°	•	INDICATES NEW MOUNTING FOOT / ATTACHMENT POINTS, TYPICAL	OTHER OBSTRUCTIONS			
		INDICATES NEW PV SOLAR MODULE. RED MODULES INDICATE PANELS THAT USE MICRO INVERTERS. (REFER TO EQUIPMENT SCHEDULE FOR SPECS.)				



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TRINITY ACCT #: 2018-02-232526

Project Address:

12401DORSEY LANE UPPER MARLBORO, MD 20772 38.763846,-76.790889

Drawing Title:
STRUCTURAL

Drawing Information		
DRAWING DATE:	4/9/2018	
DRAWN BY:	IG	
REVISED BY:		

System Information:			
DC SYSTEM SIZE:	3.54kW		
AC SYSTEM SIZE:	3kW		
TOTAL MODULE COUNT:	12		
MODULES USED:	HANWHA 295		
MODULE SPEC #:	Q.PEAK-BLK G4.1 295		
UTILITY COMPANY:	PEPCO		
UTILITY ACCT #:	55019904022		
UTILITY METER #:	NYA111236438		
DEAL TYPE:	SUNNOVA		

Rev.	No.	
	P	1

PV - 4



2211 Allenwood Road 877-797-2978 Wall, New Jersey 07719 www.Trinity-Solar.com 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

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 =

4) 2005 ASHRAF 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)

5.) PHOTOVOLTAIC POWER SYSTEMS SHALL BE PERMITTED TÓ 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 ≤ 20 CURRENT CARYING CONDUCTORS AND WHERE EXPOSED TO DIRECT SUNLIGHT SHALL CONTAIN ≤ 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

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

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)]: (15.00*1.25)1 = 18.75A

AWG #10, DERATED AMPACITY AMBIENT TEMP: 33°C, TEMP DERATING FACTOR: .96 RACEWAY DERATING = 2 CCC: 1.00 (40*.96)1.00 = 38.40A

38.40A [>] 18.75A, THEREFORE WIRE SIZE IS VALID

TOTAL AC REQUIRED CONDUCTOR AMPACITY 12.50A*1.25 = 15.63A

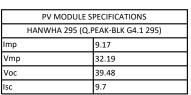
AWG #10, DERATED AMPACITY AMBIENT TEMP: 30°C, TEMP DERATING: 1.0 RACEWAY DERATING 5 3 CCC: N/A 40A*1.0 = 40A

40A - 15.63A, THEREFORE AC WIRE SIZE IS VALID

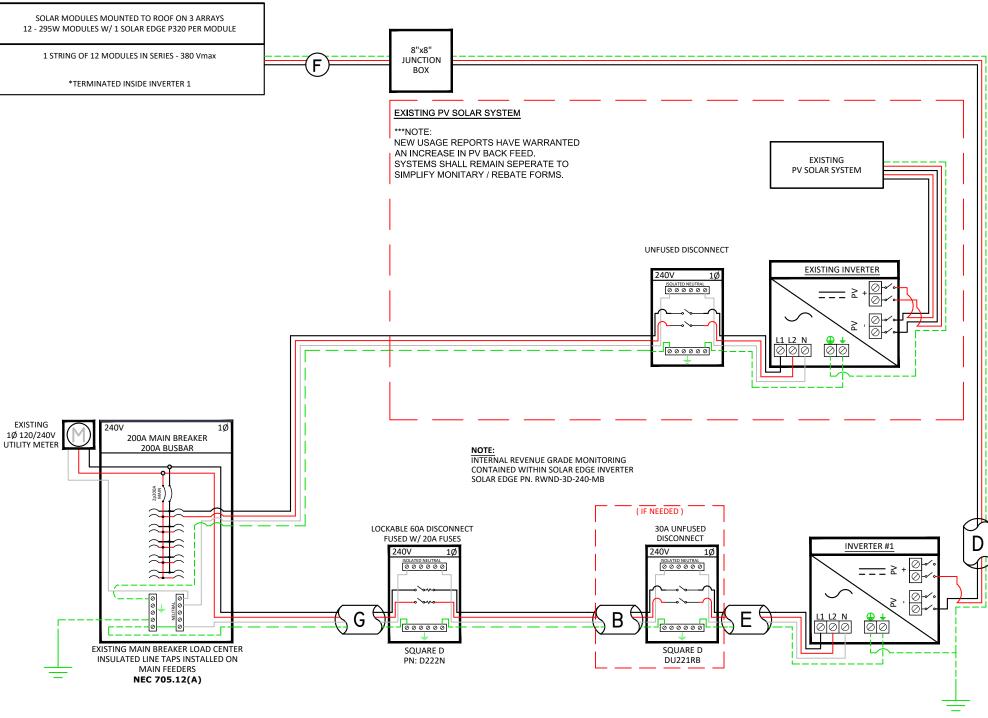
CALCULATION FOR PV OVERCURRENT PROTECTION TOTAL INVERTER CURRENT: 12.50A

12.50A*1.25 = 15.63A --> 20A OVERCURRENT PROTECTION IS VALID

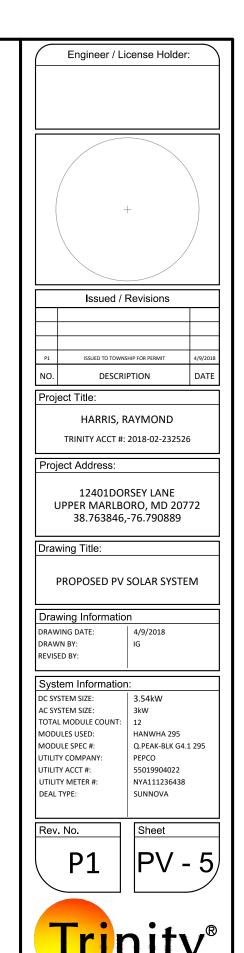
EXISTING 1Ø 120/240V UTILITY METE



INVERTER #1 - SE3000H-US000NNC2			
DC		А	.C
Imp	8.5	Pout	3000
Vmp	380	Imax	12.5
Voc	480	OCPDmin	15.625
Isc	15	Vnom	240



	: CONDUIT TYPE SHALL BE CHOSEN BY THE INSTALLATION CONTRACTOR EET OR EXCEED NEC AND LOCAL AHJD REQUIREMENTS
Α	#6 THWN-2 GEC TO EXISTING GROUND ROD
В	3/4" CONDUIT W/ 2-#10 THWN-2, 1-#10 THWN-2, 1-#10 THWN-2 GROUND
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
E	3/4" CONDUIT W/ 2-#10 THWN-2, 1-#10 THWN-2, 1-#10 THWN-2 GROUND
F	#10 PV WIRE (FREE AIR) W/ #6 BARE COPPER BOND TO ARRAY
G	3/4" CONDUIT W/ 2-#6 THWN-2, 1-#6 THWN-2, 1-#8 THWN-2 GROUND



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