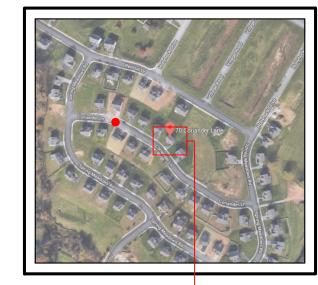
# INSTALLATION OF NEW **ROOF MOUNTED PV SOLAR SYSTEM 70 CORIANDER LN** MANCHESTER, PA 17345

## CORIANDER LN





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 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
- 4. 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. 6 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 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
- 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 OPERATION MANUAL
- THE LOCATION OF PROPOSED ELECTRIC AND TELEPHONE UTILITIES ARE SUBJECT TO FINAL APPROVAL OF THE 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 ALUMINUM AF AFF AMP. FRAME ABOVE FINISHED FLOOR AFG ABOVE FINISHED GRADE CONDUIT (GENERIC TERM OF RACEWAY PROVIDE AS

SPECIFIED) COMBINER BOX CIRCUIT CURRENT TRANSFORMER DC DIRECT CURRENT DISCONNECT SWITCH

DWG DRAWING ELECTRICAL SYSTEM INSTALLER ELECTRICAL METALLIC TUBING FUSIBLE SWITCH

FU

GND GROUND GROUND FAULT INTERRUPTER FREQUENCY (CYCLES PER

#### ABBREVIATIONS CONTINUED

JUNCTION BOX THOUSAND CIRCULAR MILS KILO-VOLT AMPERE kVA kW kWH KILO-WATT KILO-WATT HOUR

MCB MAIN CIRCUIT BREAKER MDP MLO MAIN DISTRIBUTION PANEL MAIN LUG ONLY MOUNTED MTG MOUNTING

NEUTRAL NATIONAL ELECTRICAL CODE NIC NO# NOT IN CONTRACT NUMBER

NOT TO SCALE OVER CURRENT PROTECTION POLE

PULL BOX PH Ø PVC POLY-VINYL CHLORIDE CONDUIT

POWER QTY RGS QUANTITY

RIGID GALVANIZED STEEL SOLID NEUTRAL JSWBD SWITCHBOARD

TYP TYPICAL
U.O.I. UNLESS OTHERWISE INDICATED WEATHERPROOF TRANSFORMER

MOUNT 72 INCHES TO BOTTOM OF ABOVE FINISHED FLOOR OR

# SHEET INDEX

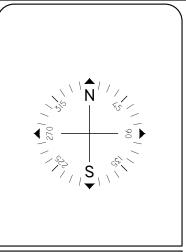
**COVER SHEET W/ SITE INFO & NOTES** 

ROOF PLAN W/ MODULE LOCATIONS

PV-3 SITE FAR

**ELECTRICAL 3 LINE DIAGRAM** 

**APPENDIX** 



	Issued / Revisions	
R1	MODULE CHANGE/PANEL DECREASE	11/21/2018
P1	ISSUED TO TOWNSHIP FOR PERMIT	9/7/2018
NO.	DESCRIPTION	DATE

#### Project Title:

JACKSON, JAMES

TRINITY ACCT #: 2018-08-284352

#### Project Address:

70 CORIANDER LN MANCHESTER, PA 17345 40.074001,-76.716222

## Drawing Title:

PROPOSED PV SOLAR SYSTEM

Drawing Information		
DRAWING DATE:	9/7/2018	
DRAWN BY:	IG	
REVISED BY:	JC	

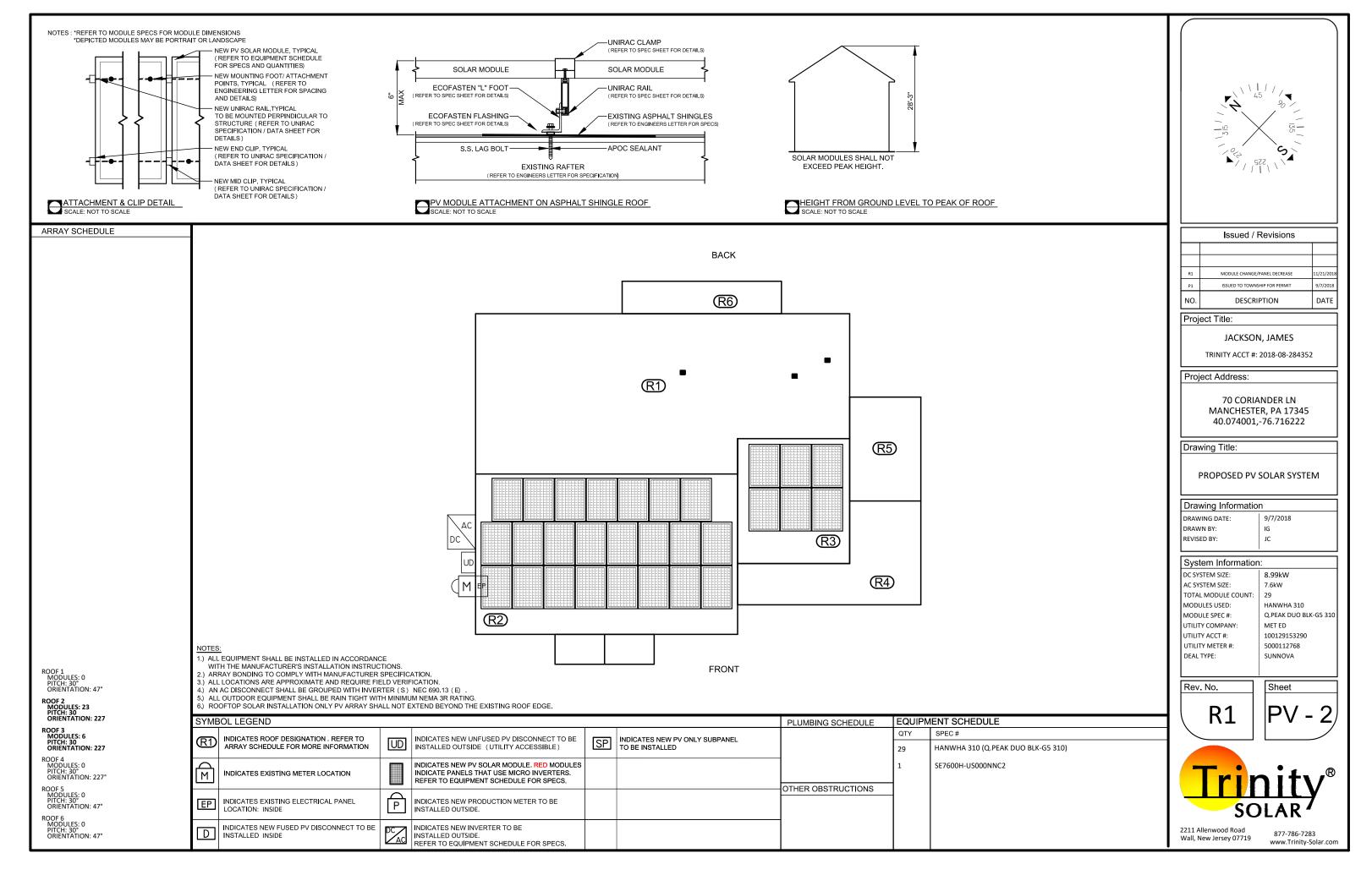
System Information:		
DC SYSTEM SIZE:	8.99kW	
AC SYSTEM SIZE:	7.6kW	
TOTAL MODULE COUNT:	29	
MODULES USED:	HANWHA 310	
MODULE SPEC #:	Q.PEAK DUO BLK-G5 31	
UTILITY COMPANY:	MET ED	
UTILITY ACCT #:	100129153290	
UTILITY METER #:	5000112768	
DEAL TYPE:	SUNNOVA	

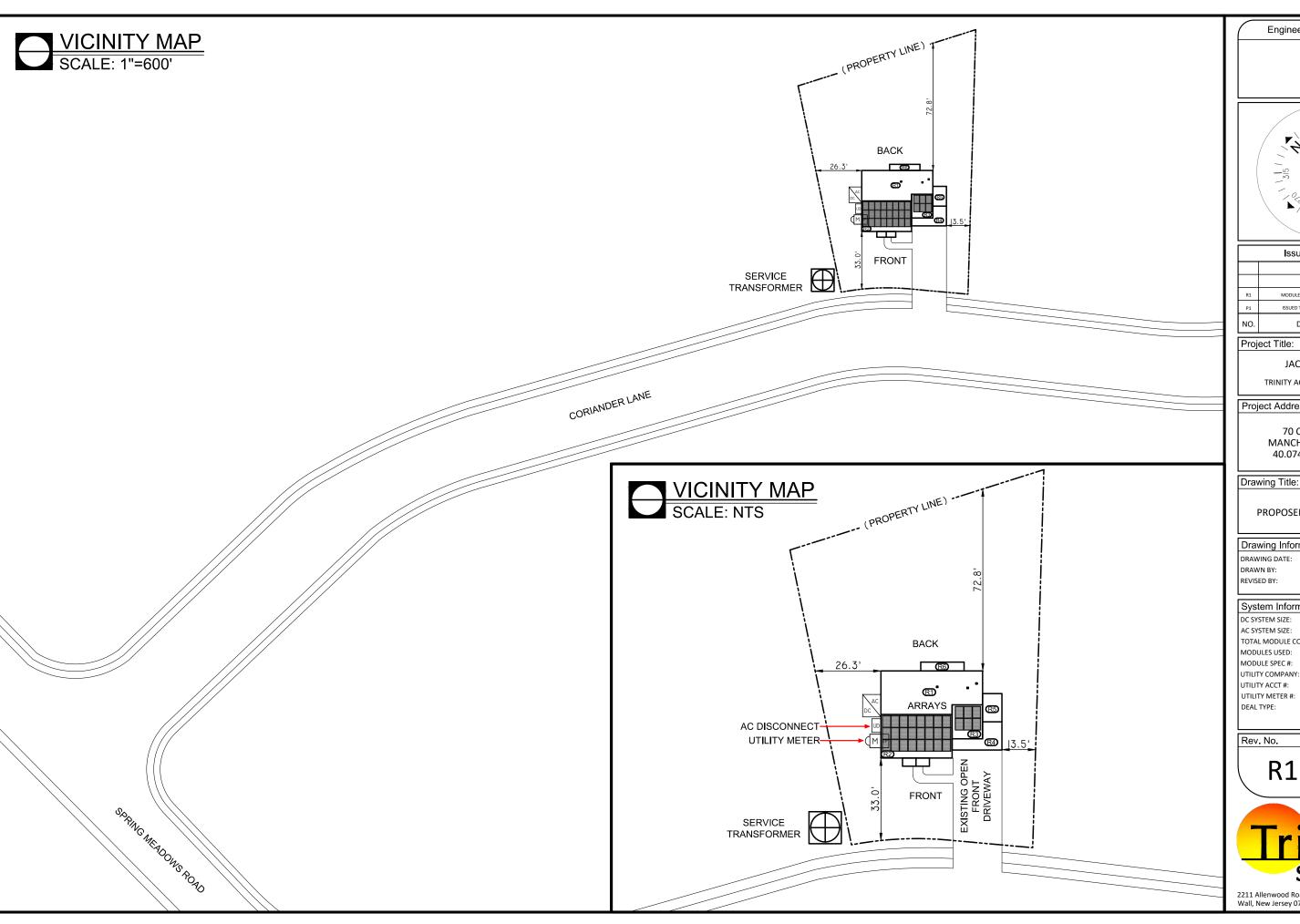
1167.1	10.	
	R1	_

Sheet

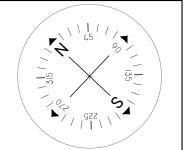


2211 Allenwood Road





Engineer / License Holder:



Issued / Revisions		
R1	MODULE CHANGE/PANEL DECREASE	11/21/2018
P1	ISSUED TO TOWNSHIP FOR PERMIT	9/7/2018
NO.	DESCRIPTION	DATE

JACKSON, JAMES

TRINITY ACCT #: 2018-08-284352

#### Project Address:

70 CORIANDER LN MANCHESTER, PA 17345 40.074001,-76.716222

PROPOSED PV SOLAR SYSTEM

Drawing Information		
DRAWING DATE:	9/7/2018	
DRAWN BY:	IG	
REVISED BY:	1C	

# System Information:

DC SYSTEM SIZE: AC SYSTEM SIZE: TOTAL MODULE COUNT: MODULES USED: MODULE SPEC #: UTILITY COMPANY: UTILITY ACCT #: UTILITY METER #:

7.6kW HANWHA 310 Q.PEAK DUO BLK-G5 310 MET ED 100129153290 5000112768 SUNNOVA

8.99kW

Sheet



2211 Allenwood Road Wall, New Jersey 07719

877-786-7283 www.Trinity-Solar.co

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 =  $-16^{\circ}C$ 

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 ≤ 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 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)]: (15.00\*1.25)1 = 18.75A

AWG #10, DERATED AMPACITY AMBIENT TEMP: 33°C, TEMP DERATING FACTOR: .96 RACEWAY DERATING = 4 CCC: 0.80 (40\*.96)0.80 = 30.72A

30.72A - 18.75A, THEREFORE WIRE SIZE IS VALID

TOTAL AC REQUIRED CONDUCTOR AMPACITY 32.00A\*1.25 = 40.00A

AWG #8, DERATED AMPACITY
AMBIENT TEMP: 30°C, TEMP DERATING: 1.0
RACEWAY DERATING 5 CCC: N/A
55A\*1.0 = 55A

55A <sup>></sup> 40.00A, THEREFORE AC WIRE SIZE IS VALID

CALCULATION FOR PV OVERCURRENT PROTECTION TOTAL INVERTER CURRENT: 32.00A

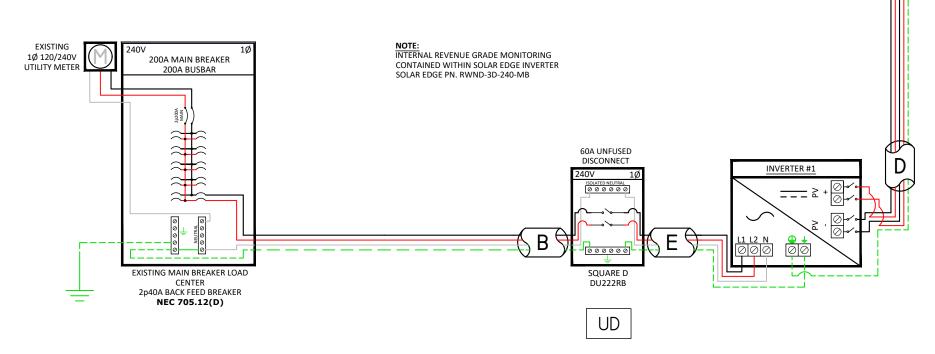
32.00A\*1.25 = 40.00A

--> 40A OVERCURRENT PROTECTION IS VALID

SOLAR MODULES MOUNTED TO ROOF ON 2 ARRAYS 29 - 310W MODULES W/ 1 SOLAR EDGE P320 PER MODULE

1 STRING OF 15 MODULES IN SERIES - 400 Vmax 1 STRING OF 14 MODULES IN SERIES - 400 Vmax

\*2 STRINGS TO BE TERMINATED IN PARALLEL INSIDE INVERTER 1



JUNCTION

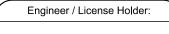
BOX

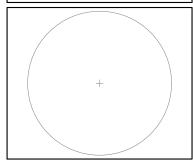
PV MODULE SPECIFICATIONS		
HANWHA 310 (Q.PEAK DUO BLK-G5 310)		
Imp	9.36	
Vmp	33.12	
Voc	40.02	
Isc	9.83	

INVERTER #1 - SE7600H-US000NNC2			NNC2	
	DC	A	AC	
Imp	22.48	Pout	7600	
Vmp	400	Imax	32	
Voc	480	OCPDmin	40	
Isc	30	Vnom	240	

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

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





Issued / Revisions			
R1	MODULE CHANGE/PANEL DECREASE	11/21/2018	
P1	ISSUED TO TOWNSHIP FOR PERMIT	9/7/2018	
NO.	DESCRIPTION	DATE	

## Project Title:

JACKSON, JAMES

TRINITY ACCT #: 2018-08-284352

#### Project Address:

70 CORIANDER LN MANCHESTER, PA 17345 40.074001,-76.716222

Drawing Title:

PROPOSED PV SOLAR SYSTEM

Drawing Information		
DRAWING DATE:	9/7/2018	
DRAWN BY:	IG	
REVISED BY:	JC	

System Information	1:
DC SYSTEM SIZE:	8.99kW
AC SYSTEM SIZE:	7.6kW
TOTAL MODULE COUNT:	29
MODULES USED:	HANWHA 310
MODULE SPEC #:	Q.PEAK DUO BLK-G5 3
UTILITY COMPANY:	MET ED
UTILITY ACCT #:	100129153290
UTILITY METER #:	5000112768
DEAL TYPE:	SUNNOVA



Sheet





2211 Allenwood Road Wall, New Jersey 07719

877-786-7283 www.Trinity-Solar.co