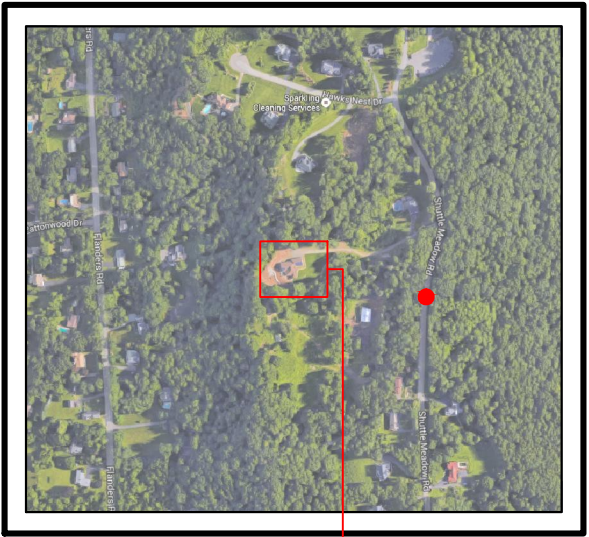


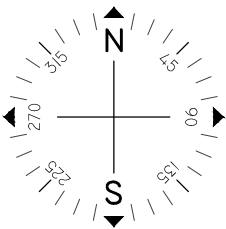
# INSTALLATION OF NEW ROOF MOUNTED 10.14kW PV SYSTEM 340 SHUTTLE MEADOW ROAD SOUTHINGTON, CT 06489

SHUTTLE MEADOW ROAD ●



VICINITY MAP  
SCALE: NTS

SITE



## Issued / Revisions

R1	MOVE A PANEL	12/22/2015
P1	ISSUED TO TOWNSHIP FOR PERMIT	12/9/2015
NO.	DESCRIPTION	DATE

Project Title:

TERRY, BRIAN  
TRINITY ACCT #: 2014-42344

Project Address:

340 SHUTTLE MEADOW ROAD  
SOUTHINGTON, CT 06489

Drawing Title:

PROPOSED 10.14kW  
SOLAR SYSTEM

Drawing Information

DRAWING DATE:	12/9/2015
DRAWN BY:	JC
REVISED BY:	JMG

System Information:

TOTAL SYSTEM SIZE:	10.14kW
TOTAL MODULE COUNT:	39
MODULES USED:	TRINA 260
MODULE SPEC #:	TSM-260 PD05.08
UTILITY COMPANY:	EVERSOURCE
UTILITY ACCT #:	51172956021
UTILITY METER #:	894180502
DEAL TYPE:	DIVIDEND

Rev. No.

R1

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Wall, New Jersey 07719  
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## 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 FUSES 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 BY THE MANUFACTURE 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 ELECTRIC 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

IF ISSUED DRAWING IS MARKED WITH A REVISION CHARACTER OTHER THAN "A", PLEASE BE ADVISED THAT FINAL EQUIPMENT AND/OR SYSTEM CHARACTERISTICS ARE SUBJECT TO CHANGE DUE TO AVAILABILITY OF EQUIPMENT.

## GENERAL NOTES CONTINUED

8. 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.
9. ALL PORTIONS OF THIS SOLAR PHOTOVOLTAIC SYSTEM SHALL BE MARKED CLEARLY IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE ARTICLE 690.
10. 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.
11. PRIOR TO THE SYSTEM START UP THE INSTALLATION CONTRACTOR SHALL ASSIST IN PERFORMING ALL INITIAL HARDWARE CHECKS AND DC WIRING CONDUCTIVITY CHECKS.
12. FOR THE PROPER MAINTENANCE AND ISOLATION OF THE INVERTS REFER TO THE ISOLATION PROCEDURES IN THE OPERATION MANUAL.
13. THE LOCATION OF PROPOSED ELECTRIC AND TELEPHONE UTILITIES ARE SUBJECT TO FINAL APPROVAL OF THE APPROPRIATE UTILITY COMPANIES AND OWNERS.
14. 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

14. B) CURRENT PREVAILING UTILITY COMPANY SPECIFICATIONS, STANDARDS, AND REQUIREMENTS
15. 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".
16. ALL INFORMATION SHOWN MUST BE CERTIFIED PRIOR TO USE FOR CONSTRUCTION ACTIVITIES.

## ABBREVIATIONS

AMP	AMPERE
AC	ALTERNATING CURRENT
AL	ALUMINUM
AF	AMP. FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AWG	AMERICAN WIRE GAUGE
C	CONDUIT ( GENERIC TERM OF SPECIFIED)
CB	COMBINER BOX
CKT	CIRCUIT
CT	CURRENT TRANSFORMER
CU	COPPER
DC	DIRECT CURRENT
DISC	DISCONNECT SWITCH
DWG	DRAWING
EC	ELECTRICAL SYSTEM INSTALLER
EMT	ELECTRICAL METALLIC TUBING
FS	FUSIBLE SWITCH
FU	FUSE
GND	GROUND
GFI	GROUND FAULT INTERRUPTER
HZ	FREQUENCY ( CYCLES PER SECOND)

## ABBREVIATIONS CONTINUED

JB	JUNCTION BOX
KCMIL	THOUSAND CIRCULAR MILS
KVA	KILO-VOLT AMPERE
KW	KILO-WATT
KWH	KILO-WATT HOUR
L	LINE
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MLO	MAIN LUG ONLY
MTD	MOUNTED
MTG	MOUNTING
N	NEUTRAL
NEC	NATIONAL ELECTRICAL CODE
NIC	NOT IN CONTRACT
NO #	NUMBER
NTS	NOT TO SCALE
OC	OVER CURRENT PROTECTION
P	POLE
PB	PULL BOX
PH Ø	PHASE
PVC	POLY-VINYL CHLORIDE CONDUIT
PWR	POWER
QTY	QUANTITY
RGS	RIGID GALVANIZED STEEL
SN	SOLID NEUTRAL
JSWBD	SWITCHBOARD
TYP	TYPICAL
U.O.I.	UNLESS OTHERWISE INDICATED
WP	WEATHERPROOF
XFMR	TRANSFORMER
+72	MOUNT 72 INCHES TO BOTTOM OF ABOVE FINISHED FLOOR OR GRADE

## SHEET INDEX

- PV-1 COVER SHEET W/ SITE INFO & NOTES  
PV-2 ROOF PLAN W/ MODULE LOCATIONS  
PV-3 ELECTRICAL 3 LINE DIAGRAM



- 1.) ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- 2.) ALL OUTDOOR EQUIPMENT SHALL BE RAIN TIGHT WITH MINIMUM NEMA 3R RATING.
- 3.) ALL LOCATIONS ARE APPROXIMATE AND REQUIRE FIELD VERIFICATION.
- 4.) ROOFTOP SOLAR INSTALLATION ONLY PV ARRAY WILL NOT EXTEND BEYOND THE EXISTING BUILDING ENVELOPE
- 5.) EQUIPMENT COLORED GREEN IS EXISTING PRIOR TO PROPOSED INSTALLATION.

ARRAY SCHEDULE		SYMBOL LEGEND				PLUMBING SCHEDULE		EQUIPMENT SCHEDULE	
<u>R1</u> ARRAY ORIENTATION = 260° MODULE PITCH = 26°		INDICATES ROOF DESIGNATION . REFER TO ARRAY SCHEDULE FOR MORE INFORMATION		INDICATES NEW UTILITY DISCONNECT TO BE INSTALLED OUTSIDE		NEW END CLIP, TYPICAL ( REFER TO THE UNIRAC CODE-COMPLIANT INSTALLATION MANUAL SECTION 3.2.5 FOR SPECS AND DETAILS)		QTY	SPEC #
<u>R2</u> ARRAY ORIENTATION = 260° MODULE PITCH = 33°		INDICATES EXISTING METER LOCATION		INDICATES NEW PV SOLAR MODULE. <b>RED</b> MODULES INDICATE PANELS THAT USE MICRO INVERTERS. REFER TO EQUIPMENT SCHEDULE FOR SPECS.		NEW MID CLIP, TYPICAL ( REFER TO THE UNIRAC CODE-COMPLIANT INSTALLATION MANUAL SECTION 3.2.5 FOR SPECS AND DETAILS)		39	TRINA 260 (TSM-260 PD05.08)
<u>R3</u> ARRAY ORIENTATION = 170° MODULE PITCH = 33°		INDICATES EXISTING ELECTRICAL PANEL LOCATION: IN BASEMENT		INDICATES NEW PRODUCTION METER TO BE INSTALLED OUTSIDE.	---	NEW UNIRAC RAIL,TYPICAL ( REFER TO THE UNIRAC CODE-COMPLIANT INSTALLATION MANUAL FOR SPECS AND DETAILS)		1	SE7600A-US
<u>R4</u> ARRAY ORIENTATION = 260° MODULE PITCH = 33°		INDICATES NEW MAIN DISCONNECT TO BE GROUPED WITH MAIN PANEL		INDICATES NEW INVERTER TO BE INSTALLED OUTSIDE. REFER TO EQUIPMENT SCHEDULE FOR SPECS.	●	NEW MOUNTING FOOT/ ATTACHMENT POINTS, TYPICAL ( REFER TO ENGINEERING LETTER FOR SPACING AND DETAILS)	OTHER OBSTRUCTIONS		
<u>R5</u> ARRAY ORIENTATION = 170° MODULE PITCH = 33°									

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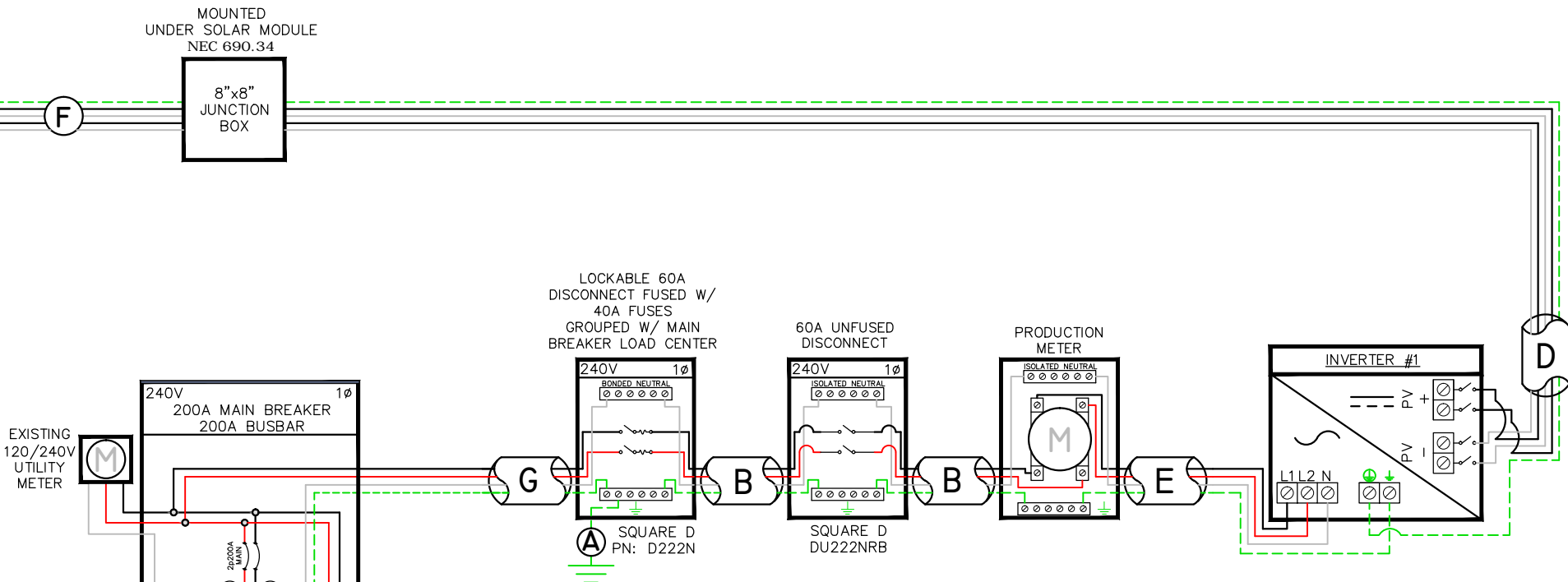
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DEAL TYPE:	DIVIDEND

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SOLAR MODULES MOUNTED TO ROOF ON 5 ARRAYS  
39 - 260W MODULES W/ 1 SOLAR EDGE P300 PER MODULE  
18.75 ADC MAX PER STRING

1 STRING OF 20 MODULES IN SERIES - 350 Vmax  
1 STRING OF 19 MODULES IN SERIES - 350 Vmax  
\*2 STRINGS TO BE TERMINATED IN PARALLEL INSIDE INVERTER 1



#### ARRAY CIRCUIT WIRING NOTES

Licensed Electrician Assumes all Responsibility for  
Determining Onsite Conditions and Executing Installation  
in Accordance with NEC 2011

1.) 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

2.) 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

3.) 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),

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

5.) ALL EQUIPMENT INSTALLED OUTDOORS SHALL HAVE  
A NEMA 3 RATING.

#### CALCULATIONS FOR CURRENT CARRYING

CONDUCTORS  
REQUIRED CONDUCTOR AMPACITY PER STRING  
[NEC 690.8(B)(1)]:  $(15.00 \times 1.25)1 = 18.75A$

AWG #10, DERATED AMPACITY  
AMBIENT TEMP: 55°C, TEMP DERATING FACTOR: .76  
RACEWAY DERATING = 4 CCC: 0.80  
 $(40 \times .76)0.80 = 24.32A$

$24.32A \geq 18.75A$ , THEREFORE WIRE SIZE IS VALID

TOTAL AC REQUIRED CONDUCTOR AMPACITY  
 $32.00A \times 1.25 = 40.00A$

AWG #8, DERATED AMPACITY  
AMBIENT TEMP: 30°C, TEMP DERATING: 1.0  
RACEWAY DERATING  $\leq 3$  CCC: N/A  
 $55A \times 1.0 = 55A$

$55A \geq 40.00A$ , THEREFORE AC WIRE SIZE IS VALID

#### CALCULATION FOR PV OVERCURRENT PROTECTION

TOTAL INVERTER CURRENT: 32.00A  
 $32.00A \times 1.25 = 40.00A$

---> 40A OVERCURRENT PROTECTION IS VALID

PV MODULE SPECIFICATIONS	
TRINA 260 (TSM-260 PD05.08)	
Imp	8.5
Vmp	30.6
Voc	38.2
Isc	9

INVERTER #1 - SE7600A-US			
DC		AC	
Imp	23.5	Pout	7600
Vmp	350	Iout	32
Voc	500	Imax	40
Isc	30	Vnom	240

#### EXISTING 8.67kW PV SOLAR SYSTEM

\*\*\*NOTE:  
NEW USAGE REPORTS HAVE WARRANTED  
AN INCREASE IN PV BACK FEED.  
SYSTEMS SHALL REMAIN SEPERATE TO  
SIMPLIFY MONITARY / REBATE FORMS.

A	#6 THWN-2 GEC TO EXISTING GROUND ROD
B	3/4" EMT W/ 2-#8 THWN-2, 1-#10 THWN-2 GROUND
C	3/4" EMT W/ 4-#10 THWN-2, 1-#10 THWN-2 GROUND
D	3/4" EMT W/ 4-#10 THWN-2, 1-#10 THWN-2 GROUND
E	3/4" EMT W/ 2-#8 THWN-2, 1-#10 THWN-2 GROUND
F	#12 PV WIRE W/ #6 BARE COPPER BOND TO MODULES AND RAILS
G	3/4" FMC W/ 3-#6 THWN-2, 1-#8 THWN-2 GROUND

Engineer / License Holder:

+

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