

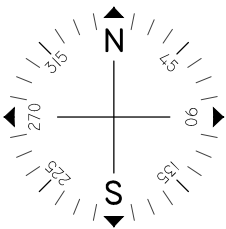
INSTALLATION OF NEW ROOF MOUNTED 5.415kW PV SYSTEM 147 WILLOW STREET WEST BARNSTABLE, MA 02668

WILLOW STREET ●



 VICINITY MAP
SCALE: NTS

SITE



Issued / Revisions

A1	AS BUILT	4/25/2016
R2	LAYOUT / ELEVATION REVISION	2/4/2016
R1	ELEVATIONS	2/1/2016
P1	ISSUED TO TOWNSHIP FOR PERMIT	1/29/2016
NO.	DESCRIPTION	DATE

Project Title:

AGIN. KENNETH

TRINITY ACCT #: 2015-70071

Project Address:

147 WILLOW STREET
WEST BARNSTABLE, MA 02668

Drawing Title:

AS BUILT 5.415kW
SOLAR SYSTEM

Drawing Information

DRAWING DATE:	1/29/2016
DRAWN BY:	JC
REVISED BY:	JMG

System Information:

TOTAL SYSTEM SIZE:	5.415kW
TOTAL MODULE COUNT:	19
MODULES USED:	CENTRO 285
MODULE SPEC #:	CM60 285
UTILITY COMPANY:	EVERSOURCE
UTILITY ACCT #:	1451 325 0028
UTILITY METER #:	2301447
DEAL TYPE:	ORE

Rev. No.

A1

Sheet

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2211 Allenwood Road
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

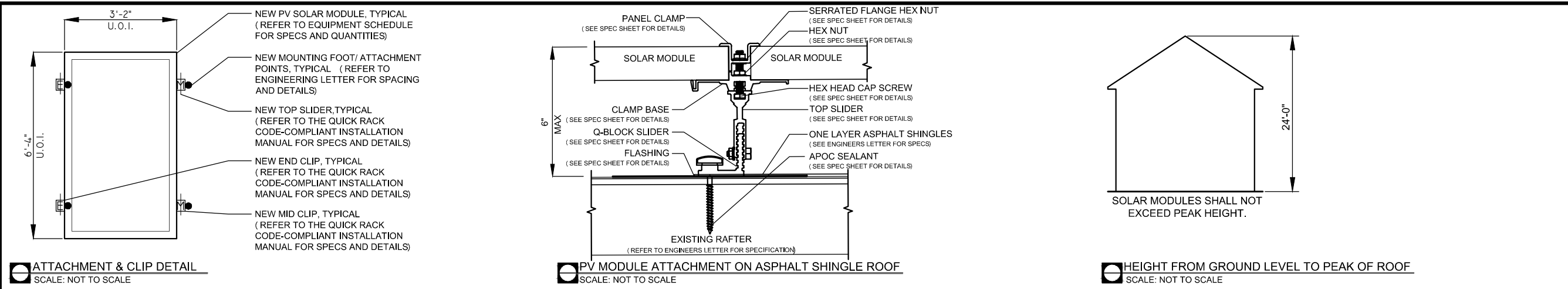
AMP	AMPERE
AC	ALTERNATING CURRENT
AL	ALUMINUM
AF	AMP. FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AWG	AMERICAN WIRE GAUGE
C	CONDUIT (GENERIC TERM OF SPECIFIED)
CB	COMBINER BOX
CKT	CIRCUIT
CT	CURRENT TRANSFORMER
CU	COPPER
DC	DIRECT CURRENT
DISC	DISCONNECT SWITCH
DWG	DRAWING
EC	ELECTRICAL SYSTEM 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 ∅	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 ELEVATION
- PV-4 PANEL LOCATION
- PV-5 ELECTRICAL 3 LINE DIAGRAM





 **SOUTHWEST ELEVATION**
SCALE: NOT TO SCALE

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**AS BUILT 5.415kW
SOLAR SYSTEM**

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DRAWN BY:	JC
REVISED BY:	JMG

System Information:	
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MODULES USED:	CENTRO 285
MODULE SPEC #:	CM60 285
UTILITY COMPANY:	EVERSOURCE
UTILITY ACCT #:	1451 325 0028
UTILITY METER #:	2301447
DEAL TYPE:	ORE

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A1	PV - 3





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SOLAR MODULES MOUNTED TO ROOF ON 2 ARRAYS 19 - 285W MODULES W/ 1 SOLAR EDGE P300 PER MODULE 18.75 ADC MAX PER STRING
1 STRING OF 10 MODULES IN SERIES - 350 Vmax 1 STRING OF 9 MODULES IN SERIES - 350 Vmax *2 STRINGS TO BE TERMINATED IN PARALLEL INSIDE INVERTER 1

MOUNTED
UNDER SOLAR MODULE
NEC 690.34

8"x8"
JUNCTION
BOX

F

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*1.25)1 = 18.75A

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

24.32A ≥ 18.75A, THEREFORE WIRE SIZE IS VALID

TOTAL AC REQUIRED CONDUCTOR AMPACITY
23.00A*1.25 = 28.75A

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

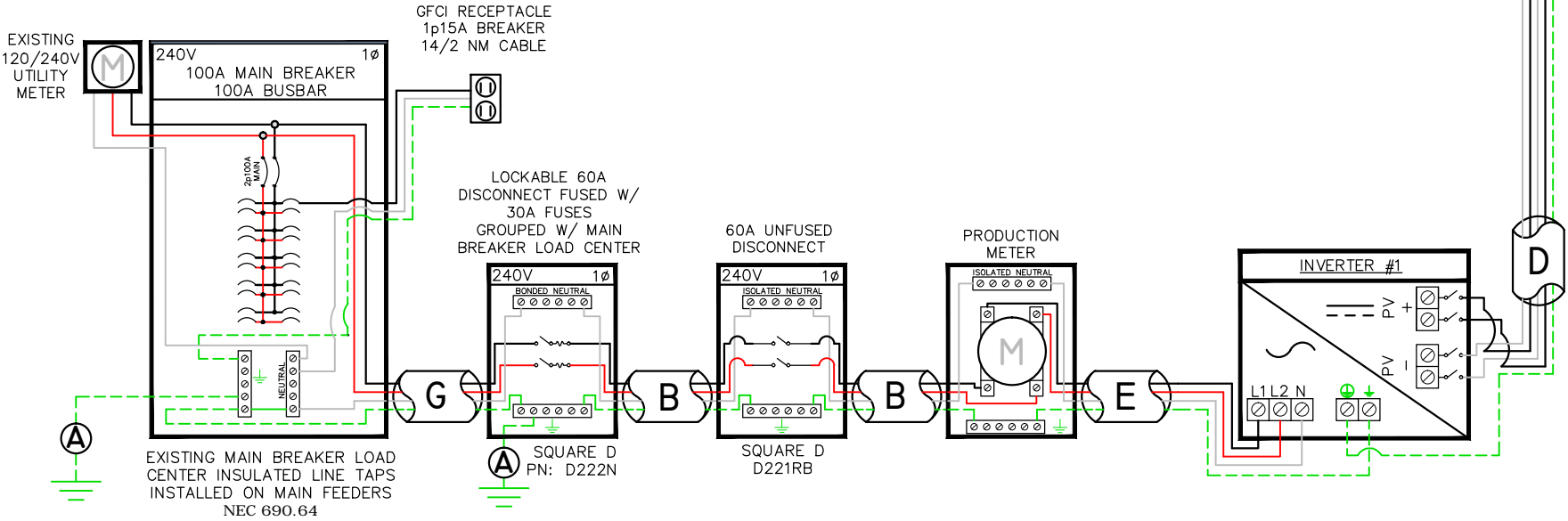
40A ≥ 28.75A, THEREFORE AC WIRE SIZE IS VALID

CALCULATION FOR PV OVERCURRENT PROTECTION

TOTAL INVERTER CURRENT: 23.00A
23.00A*1.25 = 28.75A
--> 30A OVERCURRENT PROTECTION IS VALID

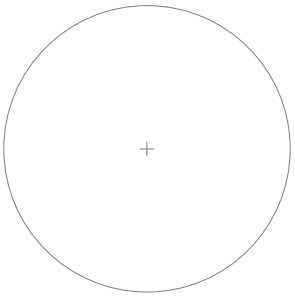
PV MODULE SPECIFICATIONS	
CENTRO 285 (CM60 285)	
Imp	8.96
Vmp	31.81
Voc	39.16
Isc	9.49

INVERTER #1 - SE5000A-US			
DC		AC	
Imp	15.47	Pout	5000
Vmp	350	Iout	23
Voc	500	Imax	28.75
Isc	30	Vnom	240



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

Engineer / License Holder:



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