

ELECTRICAL CALCULATIONS AND SCHEDULES:

INVERTER DC INPUT CONFIGURATION			INVERTER DC INPUT CONFIGURATION		
INVERTER 1	MPPT - 1	3	STRING HOME RUN WIRE SIZE	LONGEST STRING LENGTH (ft)	STRING VOLTAGE DROP (%)
	MPPT - 2	3			
INVERTER 2	MPPT - 1	2	INVERTER 1	#10 AWG	110'
	MPPT - 2	2	INVERTER 2	#10 AWG	175'

ARRAY CONFIGURATION					
INVERTER NUMBER	MODULE TYPE	# OF MODULES	TILT	AZIMUTH	kW
INVERTER 1	JAP6 60-255/3BB	69	5°	168°	17.595
INVERTER 2	JAP6 60-255/3BB	48	5°	168°	12.24
TOTAL		117			29.835

AC WIRE AND CONDUIT SCHEDULE					
CONDUIT ID	MINIMUM WIRE SIZE	WIRE SIZE AND TYPE	MINIMUM CONDUIT	CONDUCTOR LENGTH	VOLTAGE DROP (%)
A	#8 AWG	(4) # 8 CU THHN + #10 GND	1/2" EMT	<10'	0.26%
B	#3 AWG	(4) # 2 CU THHN + #6 GND	1/2" EMT	<50'	0.82%

- GENERAL NOTES:**
- THE INSTALLATION CONTRACTOR WILL BE REQUIRED TO INSTALL WEATHERPROOF STRAIN RELIEFS FOR ALL WIRES ENTERING OR EXITING THE COMBINER BOX THAT ARE NOT PULLED THROUGH CONDUIT.
 - THE INSTALLATION CONTRACTOR WILL BE RESPONSIBLE FOR MAINTAINING THE INTEGRITY OF THE NEMA RATING OF THE INVERTER AND ENCLOSURES. ALL CONDUIT MUST ENTER THE EQUIPMENT AND BE PROPERLY GASKETED.
 - ELECTRICAL CONTRACTOR SHALL COLOR CODE SOURCE WIRING AS POSITIVE-RED AND NEGATIVE-WHITE. IF THE REQUIRED INSULATION COLOR IS NOT AVAILABLE, TAPING WITH CORRECT COLOR SHALL SUFFICE.
 - PROVIDE COMPRESSION LUGS AT BUS TERMINATIONS.

- KEY NOTES:**
- 12 JA SOLAR JAP6 60-255/3BB SOLAR PANELS WIRED IN SERIES. EACH MODULE INCLUDES 1 #10 AWG OUTDOOR RATED QUICK CONNECT FOR MODULE INTERCONNECTION. DO NOT REMOVE QUICK CONNECTS, OTHERWISE THE MODULE WARRANTY AND UL LISTING MAY BE INVALIDATED. QUICK CONNECTS WILL COMPLY WITH NEC 690.33
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 - 2 SOLECTRIA PV14TL, 3Φ, SOLAR PV INVERTERS. 14.0KW-AC EACH.
 - NEW NEMA-3R MLO 120/208V, 100A, PANEL BOARD. INSTALL (2) 50A BREAKERS TO MATCH MANUFACTURERS AIC RATING.
 - NEW FORM 16S, CLASS 200 ZREC METER. TO BE REVIEWED AND APPROVED BY UTILITY.
 - NEW LOCUS LGATE-320, REVENUE GRADE SOLAR PV GENERATION METER
 - NEW SQUARE D DU323NRB, 100A, 3P FUSIBLE DISCONNECT WITH 100A FUSES. MOUNTED ADJACENT TO UTILITY REVENUE METER.
 - NEW SQUARE D SINGLE POSITION CIRCUIT BREAKER ENCLOSURE LOCATED WITHIN 10' OF POINT OF COMMON COUPLING. INSTALL 100A CIRCUIT BREAKER.
 - EXISTING 400A MAIN DISTRIBUTION PANEL. PV WILL INTERCONNECT VIA CUSTOMER-LINE/UTILITY-LOAD SIDE TAP USING INSULATED SPLICE BLOCKS. EXISTING UTILITY REVENUE METER

PV MODULE - JAP6 60-255/3BB		PV MODULE - JAP6 60-255/3BB	
MAX POWER (W)	255w	MAX POWER (W)	255w
OPEN CIRCUIT VOLTAGE (Voc)	37.82	OPEN CIRCUIT VOLTAGE (Voc)	37.82
MAX POWER VOLTAGE (Vmp)	30.29	MAX POWER VOLTAGE (Vmp)	30.29
MAX POWER CURRENT (Imp)	8.49	MAX POWER CURRENT (Imp)	8.49
SHORT CIRCUIT CURRENT (Isc)	8.98	SHORT CIRCUIT CURRENT (Isc)	8.98

STRING SIZING CALCULATIONS		STRING SIZING CALCULATIONS	
# PANELS PER STRING	12	# PANELS PER STRING	11
MIN TEMPERATURE (°C)	-19	MIN TEMPERATURE (°C)	-19
TEMP. COEFF. OF VOLT (%/°C)	-0.33%	TEMP. COEFF. OF VOLT (%/°C)	-0.33%
TEMPERATURE CORR FAC.	14.52%	TEMPERATURE CORR FAC.	14.52%
=Voc x TEMP CORR FAC x PANELS/STRING	519.74V	=Voc x TEMP CORR FAC x PANELS/STRING	476.43V
PV SOURCE CIRCUIT CURRENT (NEC690.8(A)(1))	11.225A	PV SOURCE CIRCUIT CURRENT (NEC690.8(A)(1))	11.225A
=Isc x 1.25		=Isc x 1.25	
PV SHORT CIRCUIT CURRENT (NEC690.8(A)(1))	14.03A	PV SHORT CIRCUIT CURRENT (NEC690.8(A)(1))	14.03A

INVERTER - PV14TL		INVERTER - PV14TL TRIP SETTINGS	
MAX DC VOLTAGE:	600V	VOLTAGE PICKUP (p.u)	CLEARING TIME (S)
MPP VOLTAGE RANGE:	180-580V	V<0.5	0.16
MIN. DC VOLTAGE/START VOLTAGE:	300V	V<0.88	2.0
NOMINAL INPUT CURRENT:	50A	V>1.1	1.0
# OF MPP TRACKERS/STRINGS PER:	2/4	V>= 1.2	0.16
AC NOMINAL POWER:	14,000W	FREQUENCY PICKUP (Hz)	CLEARING TIME (S)
MAX AC APPARENT POWER:	14,000VA	F>60.5	0.16
NOMINAL AC VOLTAGE:	208V, 3-PH	F<57.0	0.16
AC VOLTAGE RANGE:	-12%/+10%	F< [59.8-57.0] ADJUSTABLE	(0.16-300) ADJ
AC GRID FREQUENCY/RANGE:	60Hz/59.3-60.5Hz	F<59.3 STANDARD	0.16 STD
MAX OUTPUT CURRENT:	39A		
POWER FACTOR:	>0.99 (+/- 0.8 ADJ)		
HARMONICS:	<3%		

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REV. DATE:	REVISIONS:	DC RATING:	ARRAY PITCH:	AZIMUTH:	INVERTER:	NO. OF MODULES:	RACKING SYSTEM:	SCALE:	DRAWN:
7.30.2015	REVISION 5	29.835KW	5°	168°	(2) PV14TL	117	S51 & UniRac SM	NTS	AP

One-Line Schematic

PROJECT:

WEST STAFFORD
FIRE DEPARTMENT
144 W. STAFFORD RD
STAFFORD, CT

DRAWING NUMBER: PV-100

PROJECT NUMBER:

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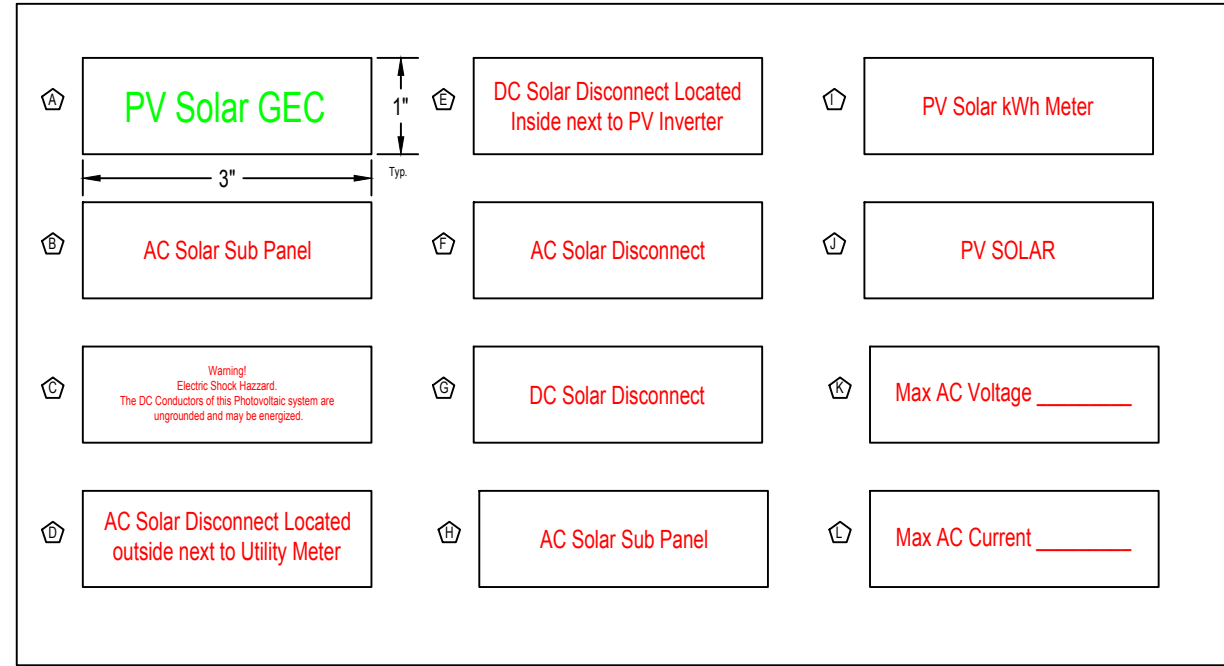
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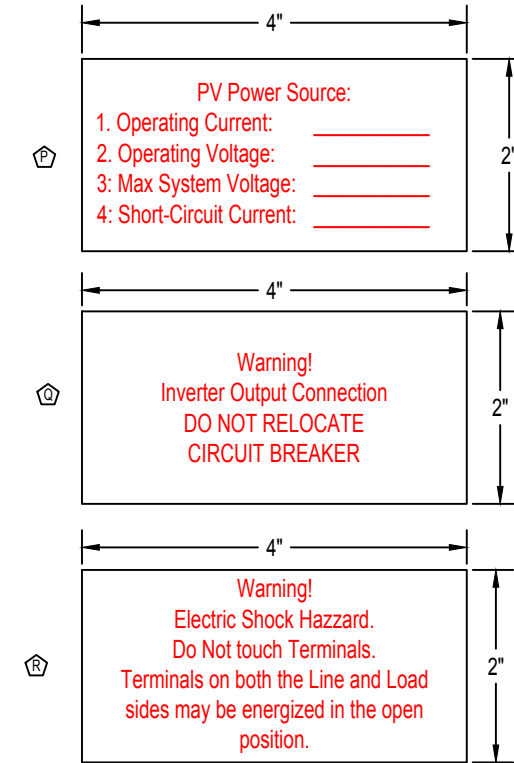
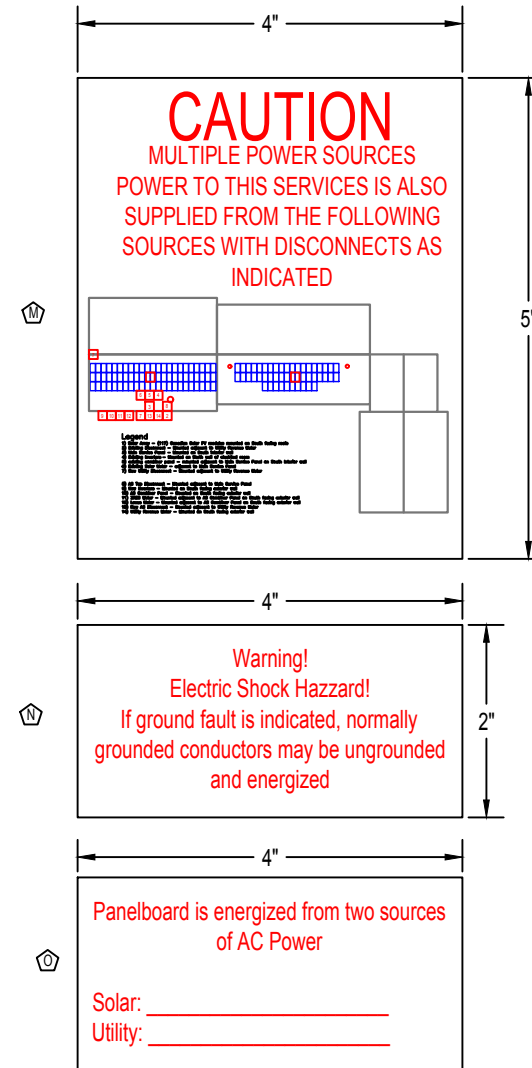
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A



- General Notes**
1. LABELS AND MARKINGS SHALL BE APPLIED TO THE APPROPRIATE COMPONENTS IN ACCORDANCE WITH NEC 2011
 2. SOLAR MODULES ARE SUPPLIED FROM THE MANUFACTURER WITH MARKINGS PRE-APPLIED TO MEET THE REQUIREMENTS OF NEC 2011
 3. THE INVERTERS ARE SUPPLIED FROM THE MANUFACTURER WITH THE APPROPRIATE LABELS AND MARKINGS
 4. TEXT LABELS WILL BE ADHESIVE POLYVINYL STICKERS USING WHITE BACKGROUND AND RED LETTERING
 5. MASTER DIRECTORY, LABEL "L", WILL BE ETCHED WITH RED GRAPHICS ONTO RED PLASTIC PLACARD

A	Grounding Electrode conductor will be identified	Label on Grounding Electrode Conductor	J	PV Solar equipment label	Label on all PV equipment
B	Inverter disconnect breaker label	Label inverter breaker enclosure	K	AC Solar Disconnect - Max Voltage	Label on AC Disconnect
C	Ungrounded System Label	Label on inverter	L	AC Solar Disconnect - Max Current	Label on AC Disconnect
D	AC Solar Disconnect location label	Label on DC Disconnect	M	Master Directory	Label on Utility Meter
E	DC Solar Disconnect location label	Label on AC Disconnect	N	Ground Fault Warning Label - Applied to all inverters	Label on Inverter
F	AC Solar Disconnect Label	Label on AC Solar Disconnect	O	Warning Label for PV Electric Panel and Facilities Main Distribution Panel	Label on Solar and/or Main Distribution Panels
G	DC Solar Disconnect Label	Label on DC Solar Disconnect	P	PV Power Source Label - Located at Inverter	Label on Inverter
H	AC Solar Sub Panel	Label on AC Sub Panel	Q	Back-Fed Breaker warning label - located at Main Distribution Panel	Label at breaker location on MDP cover panel
I	Solar kWh Meter Label	Label on kWh Meter	R	AC Disconnect warning label	Label on AC Disconnect



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REV. DATE:	7.30.2015
REVISIONS:	REVISION 5
DC RATING:	29.835KW
INVERTER:	(2) PV114TL
NO. OF MODULES:	117
NO. OF PV STRINGS:	551 & UniRac SM
SCALE:	N/A
DRAWN:	AP

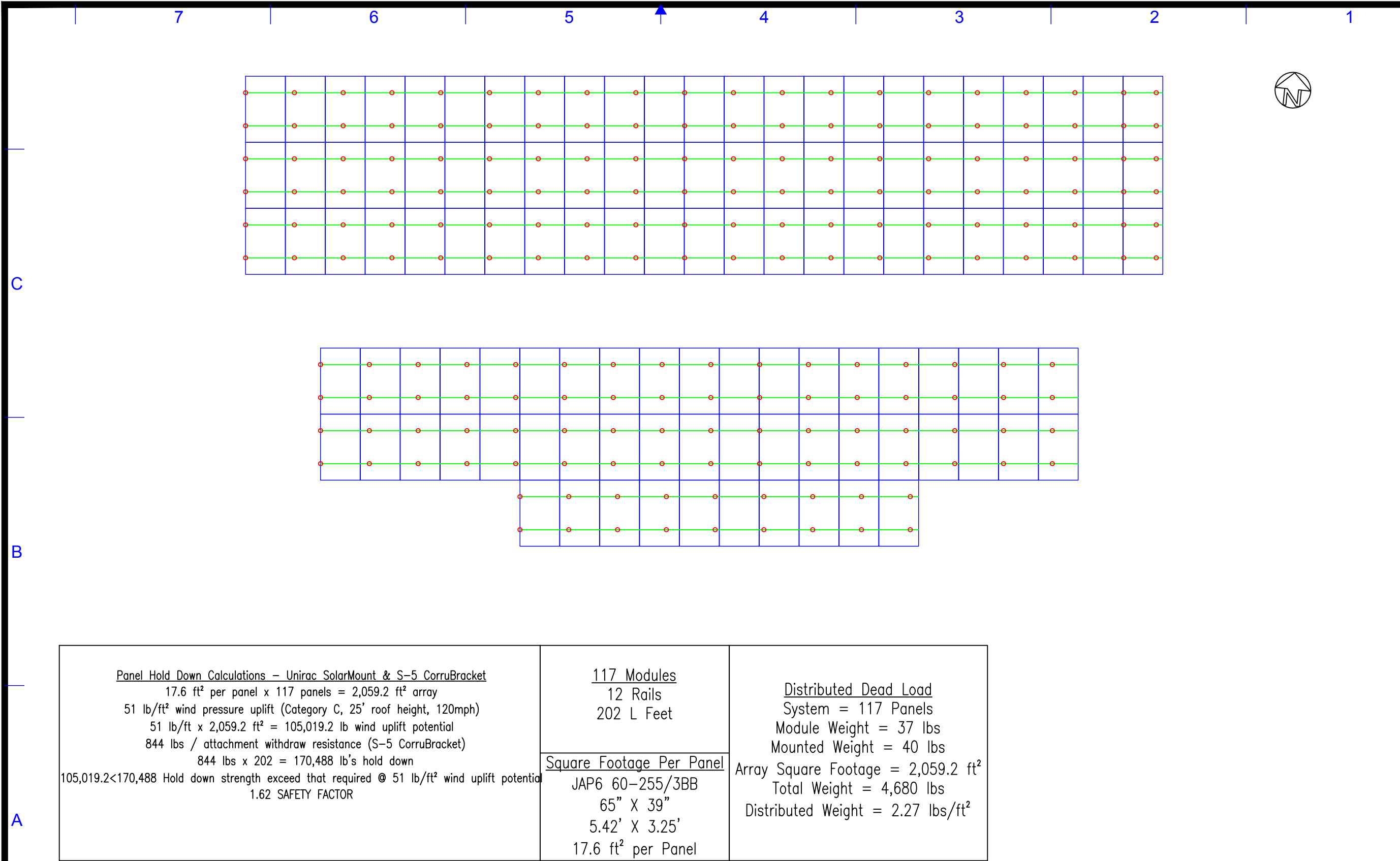
DRAWING TITLE:
Label Schedule

PROJECT:
**WEST STAFFORD
 FIRE DEPARTMENT
 144 W. STAFFORD RD
 STAFFORD, CT**

DRAWING NUMBER:
PV-101

PROJECT NUMBER:

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REV. DATE:	7.30.2015
REVISIONS:	REVISION 5
DC RATING:	29.835KW
ARRAY PITCH:	5°
AZIMUTH:	168°
INVERTER:	(2) PV114TL
NO. OF MODULES:	117
RACKING SYSTEM:	S51 & UniRac SM
SCALE:	1/8" = 1'
DRAWN:	AP

DRAWING TITLE:
Array Layout

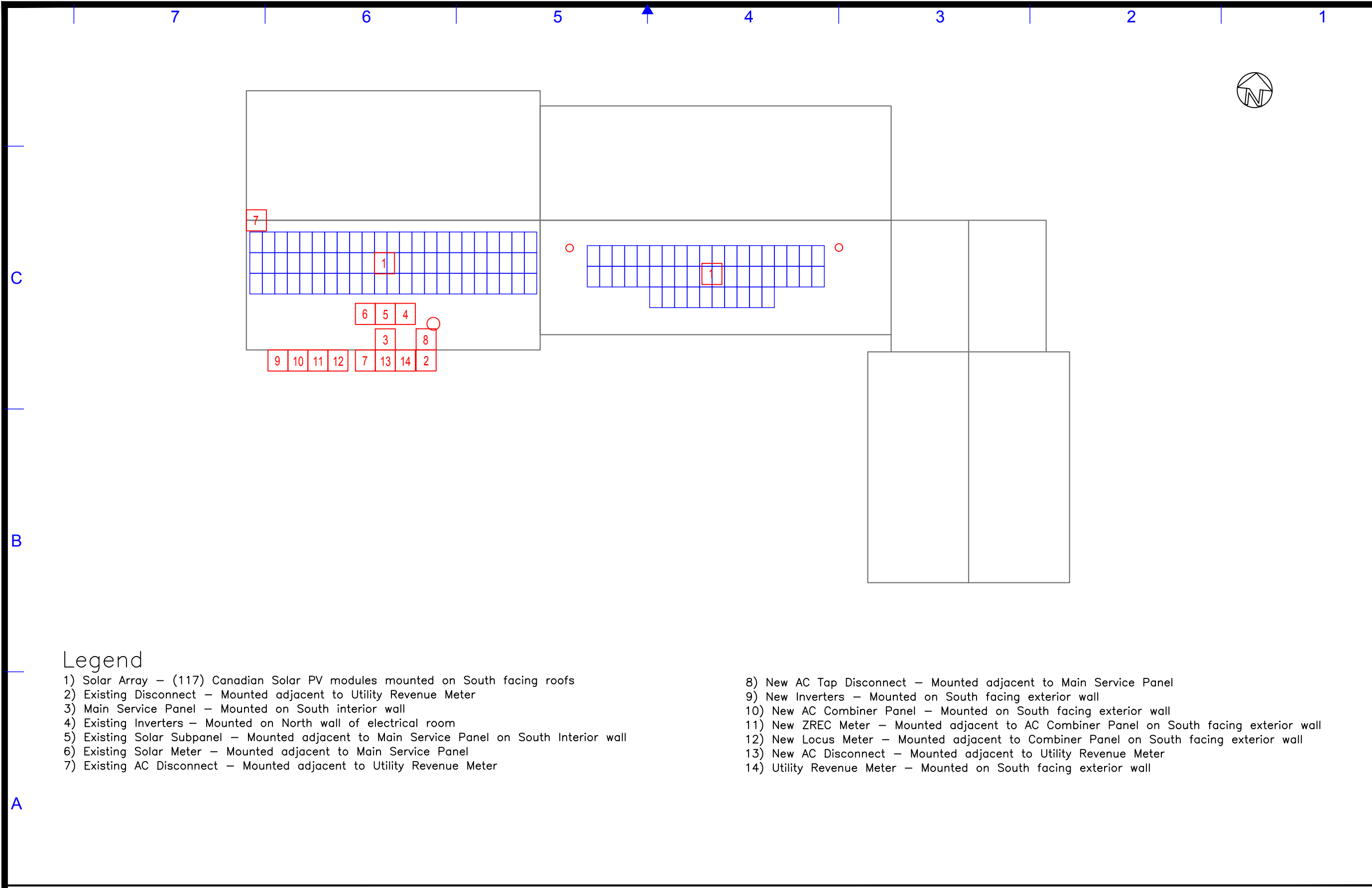
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 FIRE DEPARTMENT
 144 W. STAFFORD RD
 STAFFORD, CT**

DRAWING NUMBER:
PV-200

PROJECT NUMBER:

<p><u>Panel Hold Down Calculations – Unirac SolarMount & S-5 CorruBracket</u> 17.6 ft² per panel x 117 panels = 2,059.2 ft² array 51 lb/ft² wind pressure uplift (Category C, 25' roof height, 120mph) 51 lb/ft x 2,059.2 ft² = 105,019.2 lb wind uplift potential 844 lbs / attachment withdraw resistance (S-5 CorruBracket) 844 lbs x 202 = 170,488 lb's hold down 105,019.2 < 170,488 Hold down strength exceed that required @ 51 lb/ft² wind uplift potential 1.62 SAFETY FACTOR</p>	<p><u>117 Modules</u> 12 Rails 202 L Feet</p>	<p><u>Distributed Dead Load</u> System = 117 Panels Module Weight = 37 lbs Mounted Weight = 40 lbs Array Square Footage = 2,059.2 ft² Total Weight = 4,680 lbs Distributed Weight = 2.27 lbs/ft²</p>
	<p><u>Square Footage Per Panel</u> JAP6 60-255/3BB 65" X 39" 5.42' X 3.25' 17.6 ft² per Panel</p>	

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Legend

- 1) Solar Array – (117) Canadian Solar PV modules mounted on South facing roofs
- 2) Existing Disconnect – Mounted adjacent to Utility Revenue Meter
- 3) Main Service Panel – Mounted on South interior wall
- 4) Existing Inverters – Mounted on North wall of electrical room
- 5) Existing Solar Subpanel – Mounted adjacent to Main Service Panel on South Interior wall
- 6) Existing Solar Meter – Mounted adjacent to Main Service Panel
- 7) Existing AC Disconnect – Mounted adjacent to Utility Revenue Meter
- 8) New AC Tap Disconnect – Mounted adjacent to Main Service Panel
- 9) New Inverters – Mounted on South facing exterior wall
- 10) New AC Combiner Panel – Mounted on South facing exterior wall
- 11) New ZREC Meter – Mounted adjacent to AC Combiner Panel on South facing exterior wall
- 12) New Locus Meter – Mounted adjacent to Combiner Panel on South facing exterior wall
- 13) New AC Disconnect – Mounted adjacent to Utility Revenue Meter
- 14) Utility Revenue Meter – Mounted on South facing exterior wall

	
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REV. DATE: 7.30.2015 REVISION 5	
DC RATING: 29.25KW ARRAY PITCH: 5° AZIMUTH: 168° INVERTER: (2) PVI14TL NO. OF MODULES: 117 MOUNTING SYSTEM: S51 & UniRac SM SCALE: NTS DRAWN: AP	
DRAWING TITLE: <h2 style="margin: 0;">Site Layout</h2>	
PROJECT: WEST STAFFORD FIRE DEPARTMENT 144 W. STAFFORD RD STAFFORD, CT	
DRAWING NUMBER: <h1 style="margin: 0;">PV-300</h1>	PROJECT NUMBER:

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