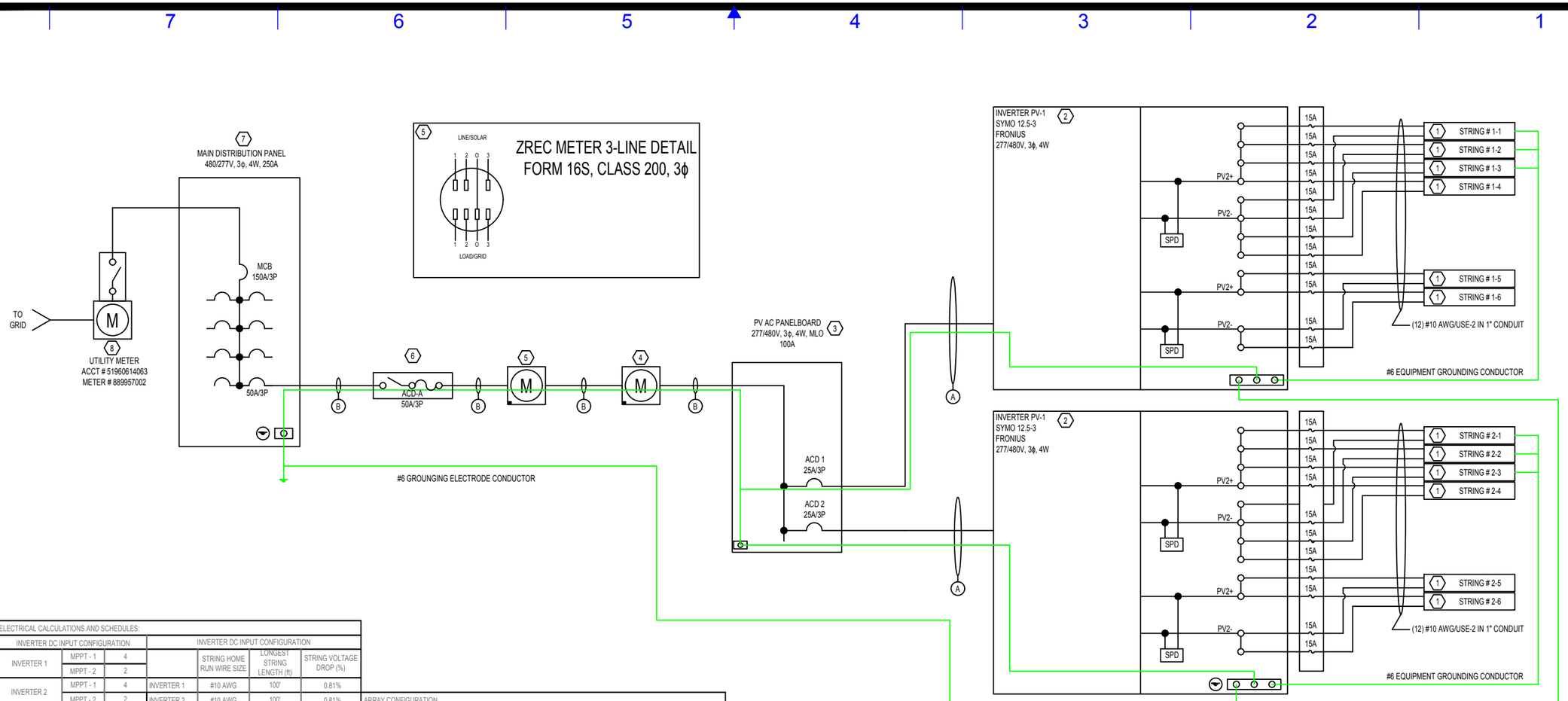

ELECTRICAL CALCULATIONS AND SCHEDULES:						
INVERTER DC INPUT CONFIGURATION			INVERTER DC INPUT CONFIGURATION			
INVERTER 1	MPPT - 1	4		STRING HOME RUN WIRE SIZE	LONGEST STRING LENGTH (ft)	STRING VOLTAGE DROP (%)
	MPPT - 2	2				
INVERTER 2	MPPT - 1	4	INVERTER 1	#10 AWG	100'	0.81%
	MPPT - 2	2	INVERTER 2	#10 AWG	100'	0.81%

AC WIRE AND CONDUIT SCHEDULE					
CONDUIT ID	MINIMUM WIRE SIZE	WIRE SIZE AND TYPE	MINIMUM CONDUIT	CONDUCTOR LENGTH	VOLTAGE DROP (%)
Ⓐ	#8 AWG	(8) # 8 CU THHN + #6 GND	1"	<20'	0.03%
Ⓑ	#3 AWG	(4) # 3 CU THHN + #6 GND	1½"	<50'	0.13%

ARRAY CONFIGURATION					
INVERTER NUMBER	MODULE TYPE	# OF MODULES	TILT	AZIMUTH	kW
INVERTER 1	JAP6 60-255/3BB	54	5°	260°	13.77
INVERTER 2	JAP6 60-255/3BB	54	5°	80°	13.77
TOTAL		108			27.54

GENERAL NOTES:

1. 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.
2. THE INSTALLATION CONTRACTOR WILL BE RESPONSIBLE FOR MAINTAINING THE INTEGRITY OF THE NEMA RATING OF THE INVERTER AND ENCLOSURES. ALL CUNDUIT MUST ENTER THE EQUIPMENT AND BE PROPERLY GASKETED.
3. 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
4. PROVIDE COMPRESSION LUGS AT BUS TERMINATIONS

KEY NOTES:

1. 9 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
2. (2) FRONIUS SYMO 12.5-3, 3ϕ, SOLAR PV INVERTERS. 12.5KW-AC EACH.
3. NEW NEMA-3R MLO 277/480V, 100A, PANEL BOARD. INSTALL (2) 25A BREAKERS TO MATCH MANUFACTURERS AIC RATING.
4. NEW FORM 16S, CLASS 200 ZREC METER. TO BE REVIEWED AND APPROVED BY UTILITY.
5. NEW LOCUS LGATE-320, REVENUE GRADE SOLAR PV GENERATION METER.
6. NEW SQUARE D DU322NRB, 60A, 3P FUSIBLE DISCONNECT WITH 50A FUSES. MOUNTED ADJACENT TO UTILITY REVENUE METER.
7. EXISTING 250A MAIN DISTRIBUTION PANEL WITH 150A MAIN CIRCUIT BREAKER. PV WILL INTERCONNECT VIA 50A BACKFED BREAKER.
8. EXISTING UTILITY REVENUE METER WITH MAIN SERVICE SWITCH.

PV MODULE - JAP6 60-255/3BB	
MAX POWER (W)	255w
OPEN CIRCUIT VOLTAGE (Voc)	37.82
MAX POWER VOLTAGE (Vmp)	30.29
MAX POWER CURRENT (Imp)	8.49
SHORT CIRCUIT CURRENT (Isc)	8.98
STRING SIZING CALCULATIONS	
# PANELS PER STRING	9
MIN TEMPERATURE (°C)	-19
TEMP. COEFF. OF VOLT (%/°C)	-0.33%
TEMPERATURE CORR FAC. =(25°C - MIN TEMP) x TEMP COEFF	14.52%
MAX SYSTEM VOLTAGE (NEC690.7) =Voc x TEMP CORR FAC x PANELS/STRING	389.8V
PV SOURCE CIRCUIT CURRENT (NEC690.8(A)(A)) =Isc x 1.25	11.225A
PV SHORT CIRCUIT CURRENT (NEC690.8(A1))	14.03A

INVERTER - SYMO 12.5-3	
MAX DC VOLTAGE:	600V
MPP VOLTAGE RANGE:	300-500V
MIN. DC VOLTAGE/START VOLTAGE:	200V
NOMINAL INPUT CURRENT (MPPT 1/MPPT 2):	25A/16.5A
# OF MPP TRACKERS/STRINGS PER:	2 - 4/2
AC NOMINAL POWER:	12,500W
MAX AC APPARENT POWER:	12,500VA
NOMINAL AC VOLTAGE:	480V, 3-PH
AC VOLTAGE RANGE:	-12%/+10%
AC GRID FREQUENCY/RANGE:	60Hz/59.3-60.5Hz
MAX OUTPUT CURRENT:	17.1A
POWER FACTOR:	0-1 IND./CAP.
HARMONICS:	<1.75%

INVERTER - SYMO 12.5-3 TRIP SETTINGS	
VOLTAGE PICKUP (p.u)	CLEARING TIME (S)
V<0.5	0.16
V<0.88	2.0
V>1.1	1.0
V>/= 1.2	0.16
FREQUENCY PICKUP (Hz)	CLEARING TIME (S)
F>60.5	0.16
F<57.0 F< {59.8-57.0} ADJUSTABLE F<59.3 STANDARD	0.16 {0.16-300} ADJ. 0.16 STD

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ENCON Solar Energy Division

REVISIONS:	REV. DATE:
REVISION 3	8.10.2015

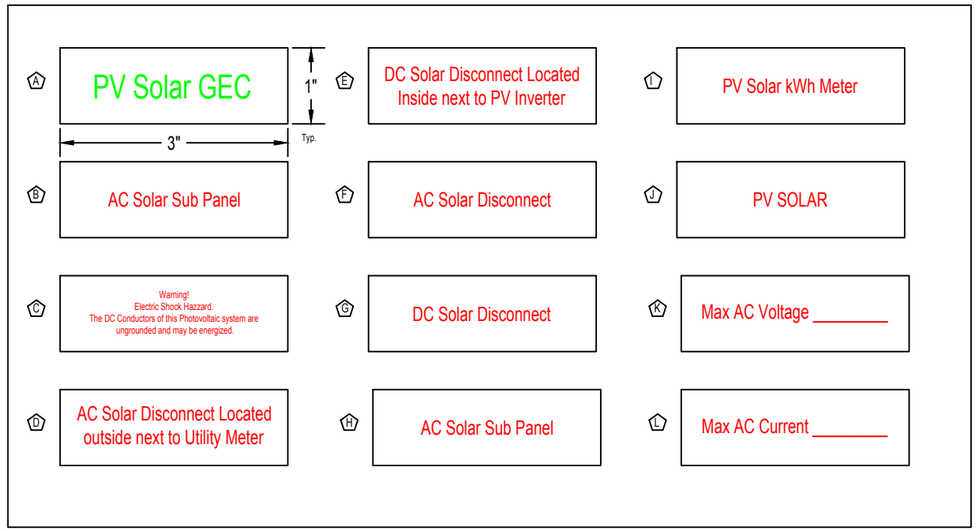
DC RATING:	27.54kW
ARRAY PITCH:	5°
AZIMUTH:	80° & 260°
INVERTER:	SYMO 12.5-3
NO. OF MODULES:	108
RACKING SYSTEM:	UniRac SM
SCALE:	NTS
DRAWN:	AP

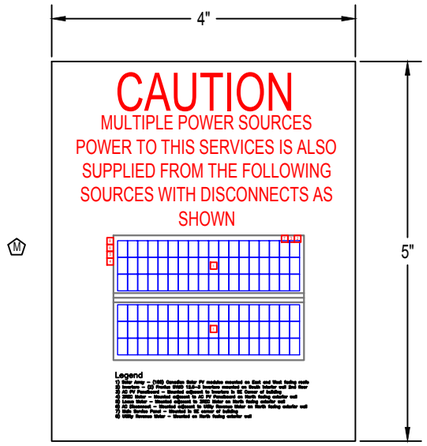
DRAWING TITLE: One-Line Schematic

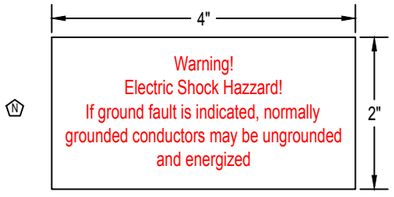
PROJECT: STAFFORD TRANSFER STATION 80 UPPER ROAD STAFFORD, CT

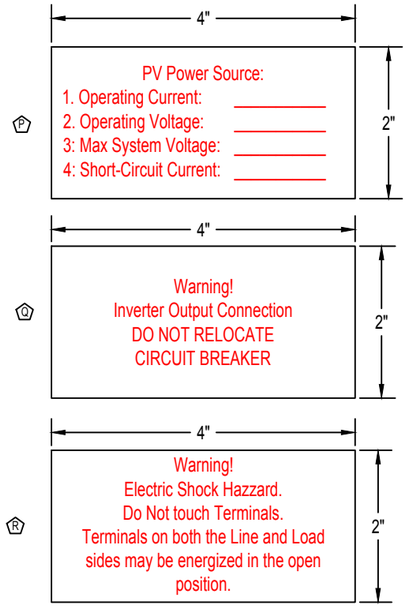
DRAWING NUMBER: PV-100

PROJECT NUMBER:









General Notes

1. LABELS AND MARKINGS SHALL BE APLIED 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 POLYVINAL 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 Gound 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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REVISION 3	8.10.2015

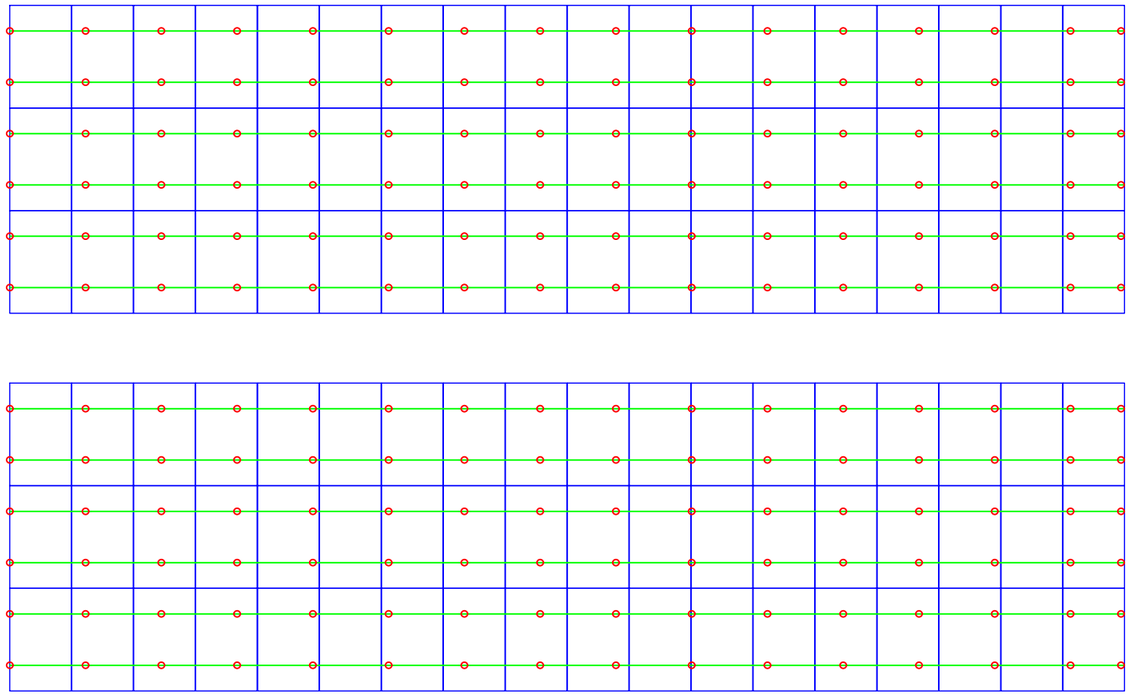
DC RATING:	27.54kW
ARRAY PITCH:	5°
AZIMUTH:	80° & 260°
INVERTER:	SYMO 12.5-3
NO. OF MODULES:	108
RACKING SYSTEM:	UniRac SM
SCALE:	N/A
DRAWN:	AP

DRAWING TITLE: Label Schedule

PROJECT: STAFFORD TRANSFER STATION
80 UPPER ROAD
STAFFORD, CT

DRAWING NUMBER: PV-101

PROJECT NUMBER:



Panel Hold Down Calculations – Unirac SolarMount & S-5 CorruBracket	108 Modules 12 Rails 192 L Feet Square Footage Per Panel JAP6 60-255/3BB 65" X 39" 5.42' X 3.25' 17.6 ft² per Panel	Distributed Dead Load System = 108 Panels Module Weight = 37 lbs Mounted Weight = 40 lbs Array Square Footage = 1,900.8 ft² Total Weight = 4,320 lbs Distributed Weight = 2.27 lbs/ft²
17.6 ft² per panel x 108 panels = 1,900.8 ft² array 51 lb/ft² wind pressure uplift (Category C, 25' roof height, 120mph) 51 lb/ft x 1,900.8 ft² = 96,940.8 lb wind uplift potential 844 lbs / attachment withdraw resistance (S-5 CorruBracket) 844 lbs x 192 = 162,048 lb's hold down 96,940.8<162,048 Hold down strength exceed that required @ 51 lb/ft² wind uplift potential 1.67 SAFETY FACTOR		

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DC RATING:	27.54kW
ARRAY PITCH:	5°
AZIMUTH:	80° & 260°
INVERTER:	SYMO 12.5-3
NO. OF MODULES:	108
RACKING SYSTEM:	UniRac SM
SCALE:	1/8" = 1'
DRAWN:	AP

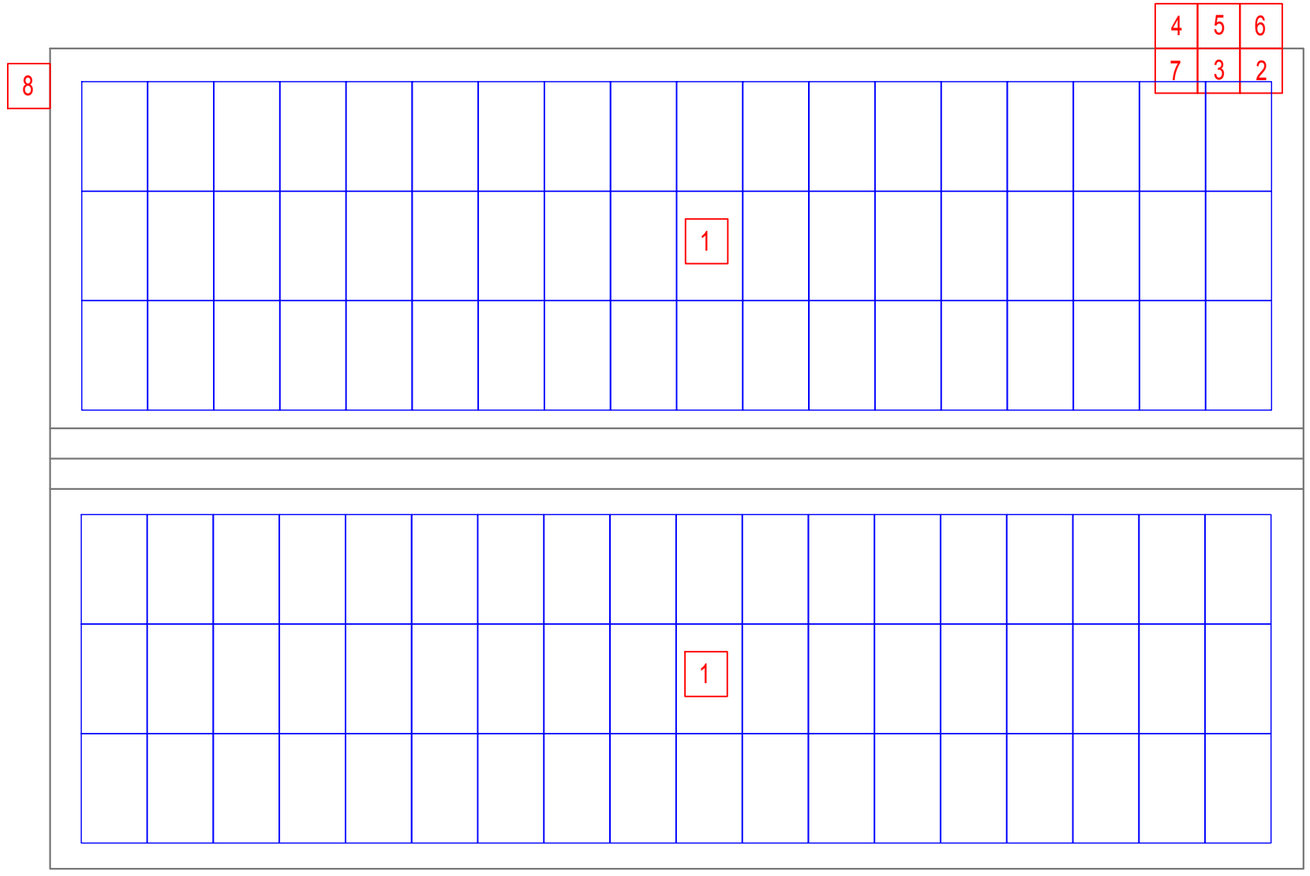
REVISIONS:	REV. DATE:
REVISION 3	8.10.2015

DRAWING TITLE: Array Layout

PROJECT: STAFFORD TRANSFER STATION
80 UPPER ROAD
STAFFORD, CT

DRAWING NUMBER: PV-200

PROJECT NUMBER:



Legend

1) Solar Array – (108) JA Solar PV modules mounted on East and West facing roofs
2) Inverters – (2) Fronius SYMO 12.5–3 inverters mounted on South interior wall 2nd floor
3) AC PV Subpanel – Mounted adjacent to inverters in SE Corner of building
4) ZREC Meter – Mounted on East facing exterior wall
5) Locus Meter – Mounted adjacent to ZREC Meter on North facing exterior wall
6) AC Disconnect – Mounted on East facing exterior wall; Permanent Placard to be placed at Utility Revenue Meter indicating location of AC Disconnect.
7) Main Service Panel – Mounted in SE corner of building
8) Utility Revenue Meter – Mounted on North facing exterior wall

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REVISION 3	8.10.2015

DC RATING:	27.54kW
ARRAY PITCH:	5°
AZIMUTH:	260° & 80°
INVERTER:	SYMO 12.5-3
NO. OF MODULES:	108
RACKING SYSTEM:	UniRac SM
SCALE:	NTS
DRAWN:	AP

DRAWING TITLE: Site Layout

PROJECT: STAFFORD TRANSFER STATION 80 UPPER ROAD STAFFORD, CT

DRAWING NUMBER: PV-300

PROJECT NUMBER: