

Cross Residence- 2072 W Lake Rd., Skaneateles, NY 13152

Installation of a Pole Mounted Solar Array

We propose the installation of a 6.48kW pole mounted solar array, consisting of 18 Sunpower AC 360W panels with micro inverters. No tree clearing, grading, or significant excavation is required. Ground disturbance is minimal. The solar array will not adversely affect surrounding land uses. After a minimal construction period, there will be no additional traffic, noise, dust, odors, pollution, glare, or other nuisances.



NOTES: 1. EQUIPMENT LOCATION TO BE FIELD VERIFIED
2. SITE COMPLIANCE WITH APPROPRIATE STATE AND LOCAL CODES TO BE VERIFIED BY AUTHORITY HAVING JURISDICTION



PV SYSTEM SUMMARY	
TOTAL STC DC SYSTEM SIZE	8.48 kW
SOLAR MODULE MODEL	SUNPOWER AC
SOLAR MODULE STC DC RATING	380 W
SOLAR MODULE INFO	61.3" x 41.2" x 1.8", 45.5 lbs
SOLAR MODULE COUNT	18
RACKING SYSTEM	MT SOLAR POLE MOUNT
PITCH OF ARRAY	30°
INVERTER MODEL	INTEGRATED MICROINVERTERS
BATTERY MODEL	1 x TESLA POWERWALL2
ARRAY AZIMUTH	180°
PANEL CLEARANCE	3'
INTERCONNECTION VOLTAGE	240V/1Φ

LEGEND	
	UNSHADED SOLAR MODULE
	SHADED SOLAR MODULE
	MIXED ORIENTATION SOLAR MODULE
	INVERTER
	EASY TO READ METER
	AC COMBINER BOX
	UTILITY METER
	AC DISCONNECT
	MAIN BREAKER PANEL
	BATTERY
	ELECTRICAL TRENCH
	VENTING AND PATHWAYS
	GROUND ACCESS AREA

General Notes	
THE INSTALLATION OF PV SYSTEM SHALL BE IN ACCORDANCE WITH THE MOST RECENT NATIONAL ELECTRIC AND BUILDING CODES AND STANDARDS, AS AMENDED BY JURISDICTION.	
ELECTRICAL STAMP AREA	
THIS INFORMATION IS CONFIDENTIAL AND NOT BE LOANED, REPRODUCED, COPIED, OR DISTRIBUTED WITHOUT THE WRITTEN PERMISSION OF SOLARLIBERTY, LLC.	
1	Project Name
2	Client Name
3	Install Per Code/Standard
4	Original Site Plan
5	Revised/Amend
6	Date
SOLARLIBERTY NEW YORK'S FIRST INSTALLERS	
6500 Sheridan Drive Suite 120 Buffalo, NY 14221 866-80-RENEW	
CERTIFIED PV Installation Professional	
Project Name and Address	
Crosby Residence 2072 W Lake Rd. Schenectady NY 12312	
Drawn By	Checked By
CR	
Date	Date
11/12/2020	
As NOTED	PV-S1

2 PV SYSTEM OVERVIEW

Scale: N.T.S.



3 SITE SURVEY

Drawn By: CR
Checked By: [Signature]
Date: 11/12/2020
As NOTED: PV-S1

MT SOLAR POLE MOUNT PROJECT INFORMATION

Name or Company:	Solar Liberty
Email:	carrie.cosentino@solarliberty.com
Project Name:	Don Cross
Project Location:	

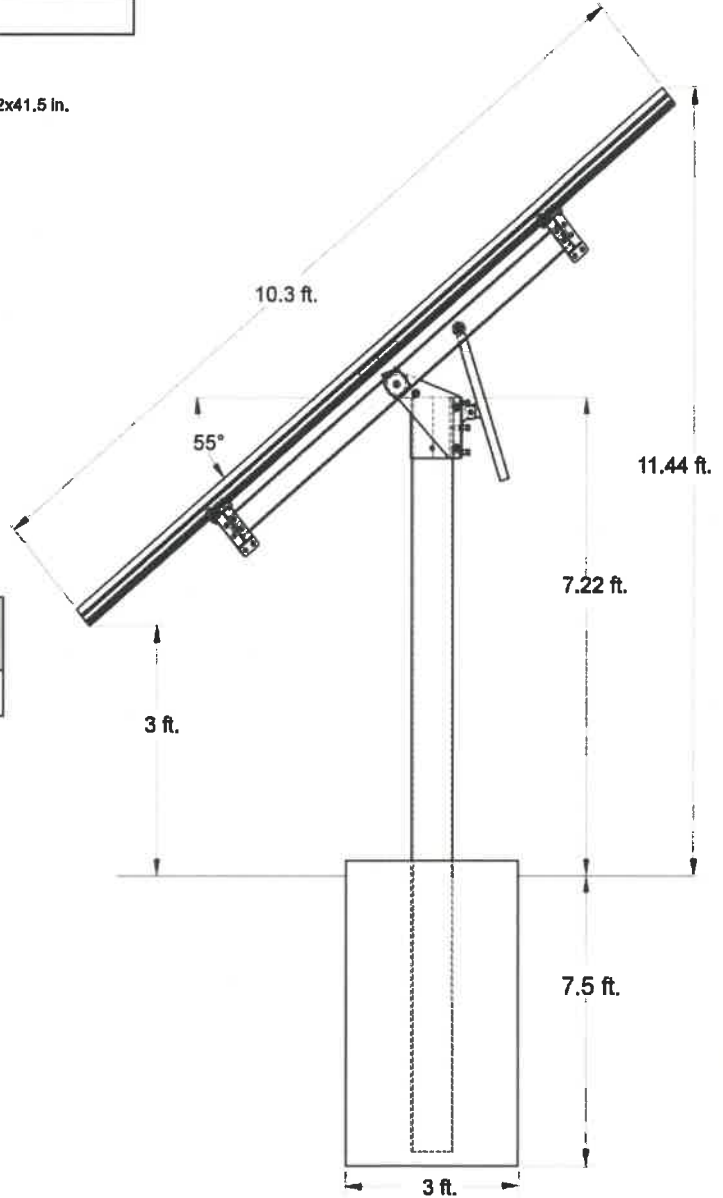
INPUTS	
Module Size	96 Cell
Pole Mount Model	TOP-9
Desired Tilt Angle (°)	55
Front Edge Ground Clearance (ft.)	3
Wind Speed (mph)	115
Exposure Category	D - Coastline
Ground Snow Load (psf)	45
Pole Size Desired	AUTO CALC
FOUNDATION	
Foundation Shape Desired	Square
Foundation Size Desired (ft.)	3
Site Soil Classification	4 - Sand, Silty Sand

Dim: 62x41.5 in.

OUTPUTS	
SKU	8-TOP-9-96C-Standard
Number of Poles	1
Support Pole Size Required	8" Sch 40
Mount Frame Duty	Standard Duty
Spin Prevention Bolts	1 Bolt(s)
Pole Length Above Grade (ft.)	7.22
Total Pole Length (ft.)	14.72
Foundation Depth (ft.)	7.50
Total Concrete for 1 Pole(s)	2.3 cu. yards
Pole Spacing (ft.)	Not Applicable
Array Dimensions:	
Overall Array Height (ft.)	11.4
Array E/W Dimension (ft.)	15.5
Array N/S Dimension (ft.)	10.3

Product Link:

https://mtsolar.us/product/top-9/?attribute_pa_module-size=96&attribute_pa_pole-size=8&attribute_pa_use-duty=Standard&attribute_pa_with-rail-kit=no-rail-kit



SIDE VIEW

Note: Drawing Not to Scale

Conversational Output

Based on your inputs this solar pole mount project will use a TOP-9-96 Cell Standard Duty Pole Mount installed at a 55 degree tilt, with the front edge at 3ft. off of the ground. This solar installation will be mounted on 8" Sch 40 pipe that will need to be sourced locally.

The maximum wind speed selected for the site is 115 mph, Exposure D - Coastline. The effective ground snow load selected is 45psf. This is reduced to a 'sloped roof snow load' of 10 psf based on the array tilt. You selected the IBC Soil Type 4 - Sand, Silty Sand. The IBC (International Building Code) is known to be very conservative so you may wish to consult a licensed geotech engineer to determine your exact soil condition.

Based on the calculations set forth by the 2018 IBC (International Building Code) and the ASCE 7-16 (American Society of Civil Engineers) the minimum foundation size per pole for the 1 pole(s) using the variables you provided is 3ft. Square by 7.5 ft deep. The entire solar project will require 2.3 cu. yards of concrete. If you place the pipe all the way to the bottom of the hole, each 8" Sch 40 pipe will need to be 14.72 feet long and you will need 1 pipe(s) total. You will need to source 14.7 ft of 8" Sch 40 pipe total for this solar project.

Forces

Calculated Wind Load on Array: **5,107** lbs.

Force at Ground Level: **36,873** (Wind Load x Pole Length)

(Picture the pole as a lever arm, the wind applies the force and the pole tries to move the dirt to lean over)

Rotational Twist/Torque (per Pole): **15,832** ft-lbs.

(Using ASCE 7-10 calculations for offset wind loads that cause rotational forces on single pole arrays)

Calculated Snow Load on Array **916** lbs.

(For reference, a 1966 VW Beetle weighs 1,700 pounds)



WIND FORCE CALCULATIONS			
Array N/S Dimensions (ft.)	10.30	ft	
Array E/W Dimensions (ft.)	15.50	ft	B
Total Square Feet of Array	159.65	sq. ft.	
Tilt Angle in Radians	0.96		
Effective Vert Dimension at Tilt Angle (ft.)	8.44	ft	s
Effective Horizontal Dimension at Tilt Angle (ft.)	5.91	ft	
Effective Squ Ft. at Tilt Angle	130.78	sq. ft.	As
Total Array Height at Tilt Including Clearance (ft.)	11.44	ft	h
Simple Wind PSF	33.86	psf	
Simple Wind Force Total	4,427.61	lbf	
Height/Exposure Coefficient ASCE 7-16 29.3-1	1.03		Kz
Terrain Coefficient	1.00		Kzt
Wind Directionality Factor ASCE 7-16 26.6-1	0.85		Kd
Wind Force	29.64	psf	Qz
Gust Factor ASCE 7-16 26.9.1	0.85		G
Ratio s/h	0.74	Chart Row 0.71	
Ratio B/s	1.84	Chart Column 1	
Force Coefficient	1.55		Cf
Effective Wind Load PSF	39.05	lb/sq.ft	
Effective Wind Total Force on Array (Case A)	5,107.12	lbf	
Offset Wind Loading Force (Case B)	15.83	ft-kips	
Effective Wind Total Force Per Pole	5,107.1	lbf	
Max Load:	5,108.0	lbs	
Force at ground level:	36,866.4	ft-lbs	
Frame Duty:	Standard Duty		

SNOW LOAD CALCULATIONS		
Array Slope:	55	deg
Low-Slope Array:	No	
E/W Dimension:	10.30	ft.
N/S Dimension:	8.89	ft.
Type of Roof:	Monoslope	
Risk Category:	I	
Importance Factor (I):	0.8	
Thermal Factor (Ct):	1.2	
Exposure Factor (Ce):	0.9	
Ground Snow Load (Pg):	45	psf
Flat Roof Snow Load (Pf):	34.02	psf
Unobstructed Slippery Surface:	Yes	
Minimum Snow Load for Low-Slope Roofs:	N/A	
Sloped-Roof Factor:	0.27	
Balance Snow Load (Ps):	9.3	psf

Uniform Roof Design Snow Load:	10	psf
Total Load on Array:	916	lbf
Snow Load Total Vertical per Pole:	916	lbf

FOUNDATION DEPTH CALCULATIONS			
Force Per Pole (at Top of Pole)	5,107.1	lbs	Pe
Pole Height Above Grade	7.2	ft	H
Site Soil Lateral Bearing Cap.	300	psf	Pba
Site Soil Vertical Bearing Cap.	2,000	psf	
Vertical Bearing Area of Hole	9.00	sq. ft.	
Max Vertical Bearing Cap.	18,000	lbs	
Hole Dimension	4.24	ft.	b
Allowable Lat. Soil Pressure	3,181.50	psf	S1
Variable	0.89		A
Foundation Depth Required	7.5	ft.	L

